STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
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JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

INSTRUCTIONAL BULLETIN NO. 16-15

Regarding Revised, New and Voided Standard Drawings and Revised Chapter 5 of the Roadway Design Guidelines

Effective March 31, 2017 letting (January 18, 2017 Turn-in), the following Standard Drawings have either been revised, are new, or have been voided. Also, Chapter 5 of the Roadway Design Guidelines has been revised to incorporate these changes.

Revised Standard Drawings:

DRAWING NUMBER	CURRENT REVISION DATE	DESCRIPTION
D-PE-4[3]	10-10-16	STRAIGHT CONCRETE ENDWALL
D-PE-30A[1]	10-10-16	30" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
RD01-TS-6[5]	10-10-16	TYPICAL CURB AND GUTTER SECTIONS WITH SHOULDER
RP-H-3[1]	10-10-16	CURB RAMP AND TRUNCATED DOME SURFACE DETAIL
RP-H-4[1,2]	10-10-16	PERPENDICULAR CURB RAMP
RP-H-5[1,2]	10-10-16	PARALLEL CURB RAMP
RP-H-6[5]	10-10-16	PEDESTRIAN REFUGE
RP-H-7[1,2]	10-10-16	PERPENDICULAR CURB RAMP IN CURVE
RP-H-8[1,2]	10-10-16	PERPENDICULAR CURB RAMP PLACED OUTSIDE CURVE
RP-H-9[5]	10-10-16	PARALLEL CURB RAMP IN CURVE
S-GR31-1[1]	10-20-16	W-BEAM GUARDRAIL
S-GRA-4[1,2]	10-10-16	IN-LINE GUARDRAIL ANCHOR
S-GRC-1[5]	10-10-16	GUARDRAIL CONNECTION TO BRIDGE ENDS OR BARRIER WALL
S-GRC-3[5]	10-10-16	MEDIAN DIVIDER GUARDRAIL TRANSITION TO

		CONCRETE MEDIAN BARRIER
S-GRT-3[4]	10-10-16	TYPE 21 GUARDRAIL END TERMINAL
S-GRT-4[5]	10-10-16	TYPE 13 GUARDRAIL END TERMINAL (TRAILING END)
S-PL-2[5]	10-10-16	SAFETY PLAN AT SIDEROADS OR PRIVATE DRIVES
S-PL-3[5]	10-10-16	SAFETY PLAN: MINIMUM INSTALLATION AT BRIDGE ENDS
S-PL-4[5]	10-10-16	SAFETY PLAN FOR BRIDGE PIERS IN CLEAR ZONE
S-PL-5[2]	10-10-16	SAFETY PLAN FOR BRIDGE ENDS IN MEDIANS
S-SSMB-6[5]	10-10-16	GUARDRAIL ATTACHMENT TO SINGLE SLOPE CONCRETE BARRIER WALL
T-M-2[2]	10-10-16	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS
T-M-4[5]	10-10-16	STANDARD INTERSECTION PAVEMENT MARKINGS
T-M-11[5]	10-10-16	SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANE OR ROUTES
T-WZ-55[1]	10-10-16	SIDEWALK TRAFFIC CONTROL

Revised Standard Drawings with New Titles:

DRAWING NUMBER	CURRENT REVISION DATE	DESCRIPTION
S-GRA-1[1,2]	10-10-16	TYPE 12 GUARDRAIL ANCHOR
S-GRA-3[5]	10-10-16	TYPE 13 GUARDRAIL ANCHOR
S-GRC-2[1,2]	10-10-16	GUARDRAIL CONNECTION TO BRIDGE END FOR LOCAL ROADS (ADT <2000)
S-GRT-2P[1,2]	10-10-16	EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINALS
S-GRT-2R[1,2]	10-10-16	EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINALS (RETROFIT)
S-PL-6[5]	10-10-16	SAFETY PLAN SAFETY HARDWARE PLACEMENT ON OUTSIDE EDGE

New Standard Drawings:

DRAWING NUMBER	CURRENT REVISION DATE	DESCRIPTION
S-GRA-5		FLARED GUARDRAIL ANCHOR
S-PL-6A		SAFETY PLAN SAFETY HARDWARE PLACEMENT IN MEDIAN

Voided Standard Drawings:

DRAWING NUMBER	CURRENT REVISION DATE	DESCRIPTION
S-GRT-3D		TYPE 21 GUARDRAIL TERMINAL (DETAILS)

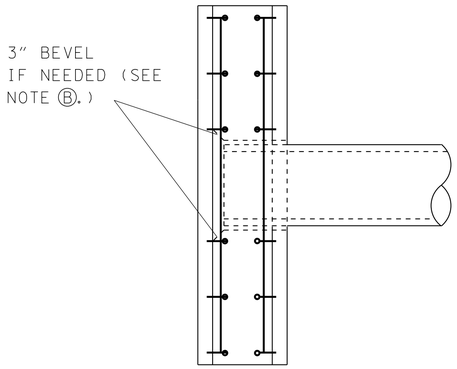
Note 1: Minor revisions, revised notes, and/or revised references to other standard drawings
Note 2: Minor revisions, revised details
Note 3: Minor revisions, revised tables
Note 4: Minor revisions, revised pay item numbers and/or pay item limits
Note 5: Major revisions, add/remove details and/or tables, revised notes

Copies of the revised and new standard drawings and revised Chapter 5 of the Roadway Design Guidelines are attached.

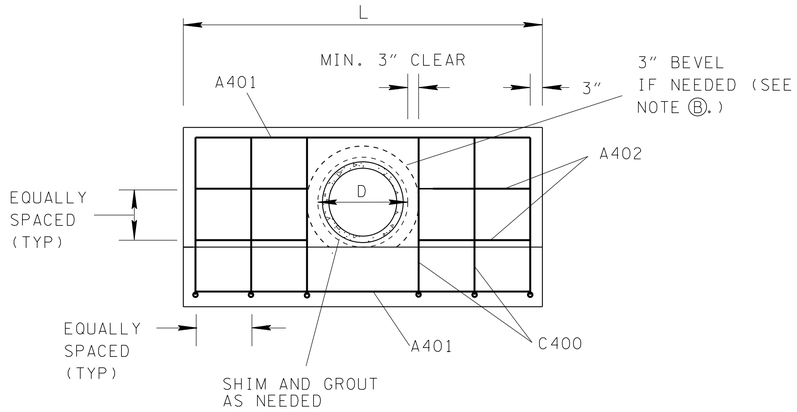
Jennifer Lloyd, PE
Civil Engineering Director
Roadway Design Division

KJL:ARH:RBB:VLN
12/5/2016

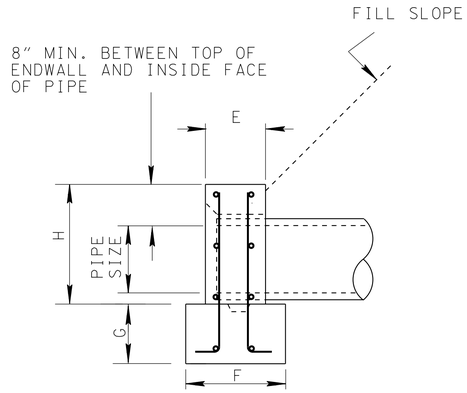
STRAIGHT TYPE CONCRETE ENDWALL



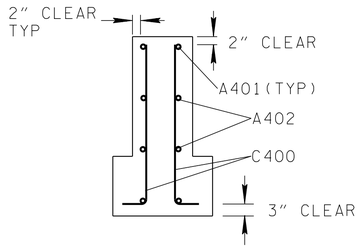
PLAN



FRONT ELEVATION
VIEW



SIDE ELEVATION
VIEW



REINFORCEMENT DETAILS

REINFORCING STEEL LEGEND				
a	A400	b	a	C400

DIMENSIONS AND ESTIMATED QUANTITIES FOR STRAIGHT CONCRETE ENDWALL								
PIPE SIZE	HOLE SIZE	WALL			FOOTING		CONC.	REINF. STEEL
	D	L	H	E	F	G	C.Y.	LB
18"	26"	6'-0"	2'-8"	1'-3"	2'-1"	1'-3"	1.0	45
24"	33"	8'-0"	3'-3"	1'-4"	2'-2"	1'-4"	1.5	70
30"	40"	10'-0"	3'-10"	1'-6"	2'-4"	1'-6"	2.0	93

BILL OF STEEL												
	18" PIPE				24" PIPE				30" PIPE			
BAR	a	b	LENGTH	NUMBER	a	b	LENGTH	NUMBER	a	b	LENGTH	NUMBER
A401	66	0	66	4	90	0	90	4	114	0	114	4
C400	42	6	48	8	50	6	56	12	59	6	65	12
A402	18.5	0	18.5	8	27	0	27	8	35.5	0	35.5	12
	TOTAL LB		796 in 45		TOTAL LB		1248 in 70		TOTAL LB		1662 in 93	

GENERAL NOTES

(A) CONCRETE ENDWALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD CONSTRUCTION SPECIFICATIONS, SECTION 611, AND/OR SPECIAL PROVISIONS.

(B) ALL STRAIGHT CONCRETE ENDWALLS ON THE INLET END OF THE PIPE AND AT 90° SKEW SHALL BE BEVELED AT 3" WITH A 45° ANGLE. BEVEL WILL NOT BE REQUIRED WHEN ENDWALL IS CONSTRUCTED ON THE "BELLED "END OF CONCRETE PIPE.

(C) ENDWALL MAY BE MODIFIED TO ACCOMMODATE MULTIPLE PIPES WHEN MORE THAN ONE PIPE IS PROPOSED, THE DISTANCE FROM CENTER TO CENTER OF PIPE SHALL BE D + 1'-0".

(D) PAYMENT FOR ENDWALLS WILL BE MADE AS FOLLOWS:

ITEM 611-07.01 CLASS "A" CONCRETE (PIPE ENDWALLS) PER CUBIC YARD.
ITEM 611-07.02 STEEL BAR REINFORCING (PIPE ENDWALLS) PER POUND.

(E) SEE SECTION 6.04.3.3 IN THE TDOT ROADWAY DRAINAGE MANUAL FOR RIPRAP APRON REQUIREMENT.

(F) PRECASTING IS ALLOWED.

(G) PIPE OPENING TO BE BASED ON TYPE "B" WALL THICKNESS (AASHTO M170).

(H) PIPE ENDWALLS FOR SLOPES STEEPER THAN 3:1 (PREVIOUSLY TYPE "U") WILL NOW USE TYPE "B" SEE D-PE-9.

REV. 9-28-83: REDREW AND ADDED TABLE FOR STRAIGHT ENDWALL WHEN PIPE IS SKEWED.

REV. 2-19-88: ADDED SAFETY ADJUSTMENTS " U " TYPE ENDWALL.

☐ REV. 1-19-94 : REDREW AND REORGANIZED DRAWING. ELIMINATED TYPE " U " ENDWALL FOR 3:1 SLOPE.

☐ REV. 1-19-97: ADDED UNITS TO HEADING FOR TABLE FOR SKEWED PIPE.

☐ REV. 6-1-09: ADDED GENERAL NOTE Ⓓ.

☐ REV. 7-19-10: REMOVED GENERAL NOTE Ⓓ.

☐ REV. 1-15-13: ADDED REINFORCEMENT AND CHANGED NOTES. ADDED BILL OF STEEL, REMOVED "U" AND "L" TYPE ENDWALL.

☐ REV. 12-1-14: REVISED BAR DESIGNATION MINOR EDITING.

☐ REV. 4-23-15: REVISED DIMENSIONS AND ESTIMATED QUANTITIES FOR STRAIGHT CONCRETE ENDWALL.

☐ REV. 2-3-16: REVISED FRONT AND SIDE ELEVATION VIEW.

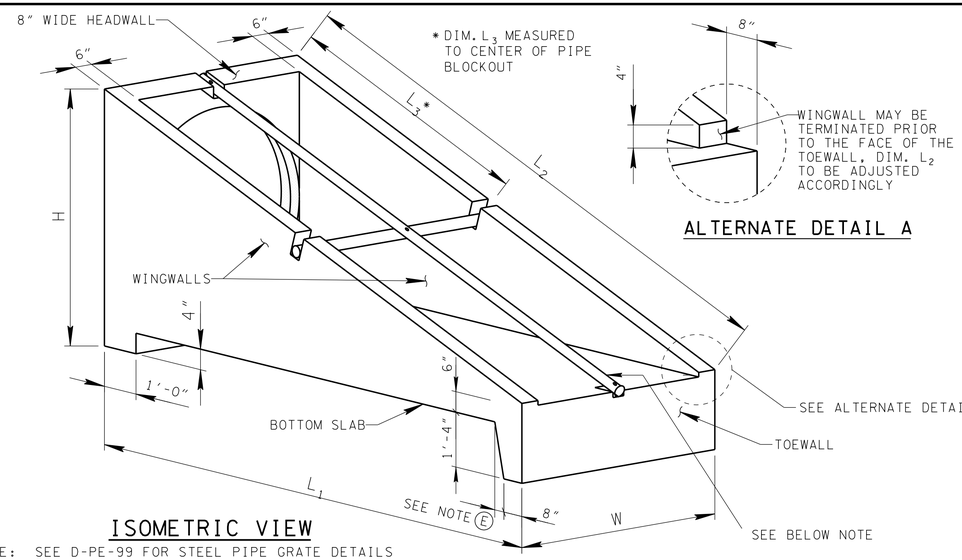
REV. 10-10-16: REVISED 'H' DIMENSIONS IN TABLE AND REVISED BILL OF STEEL.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

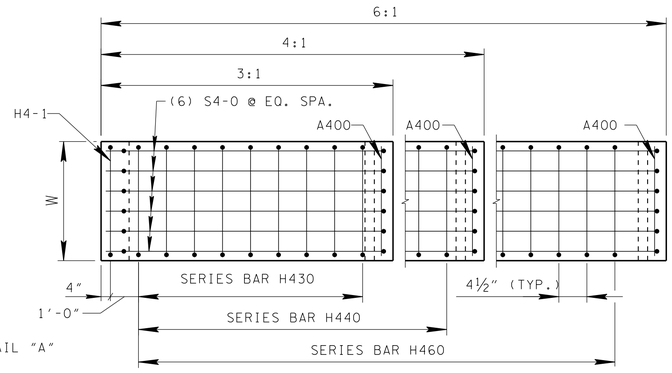
STRAIGHT
CONCRETE ENDWALL

3-1-94 | D-PE-4



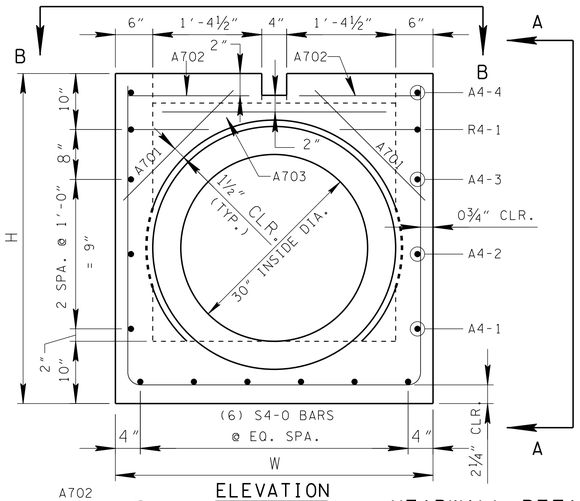
ISOMETRIC VIEW

ALTERNATE DETAIL A

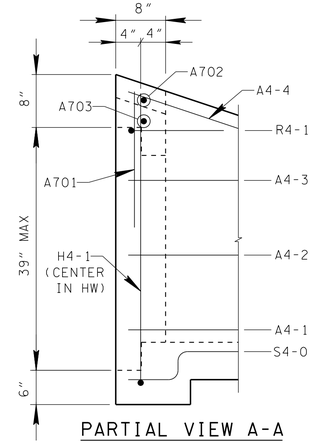


BOTTOM SLAB PLAN

NOTE: SEE D-PE-99 FOR STEEL PIPE GRATE DETAILS
¾" CHAMFER REQUIRED ON ALL EXPOSED EDGES



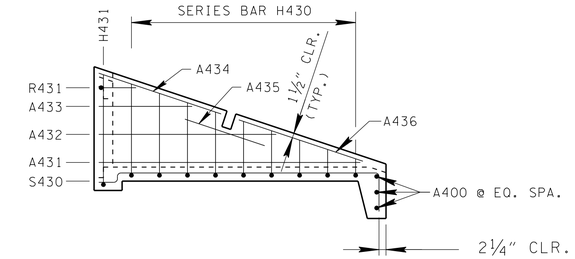
ELEVATION



PARTIAL VIEW A-A

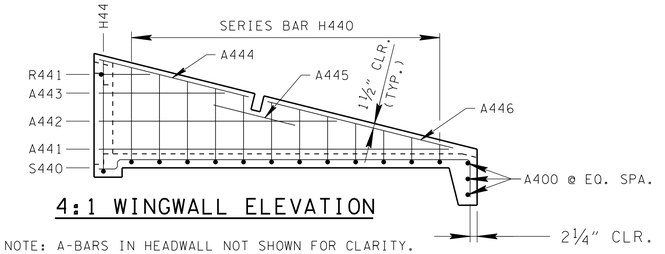
HEADWALL DETAILS

NOTES: INSTALL BARS A701 AT 45°
SEE GENERAL NOTES (C) & (F)



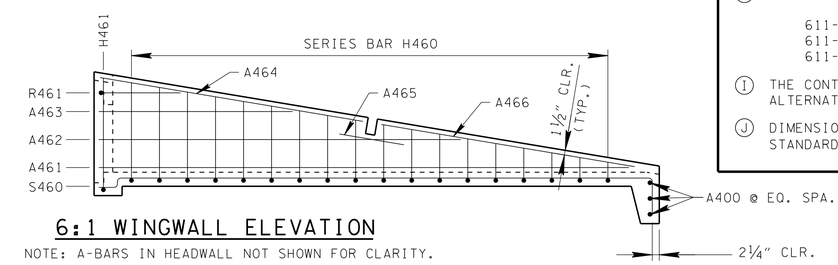
3:1 WINGWALL ELEVATION

NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.



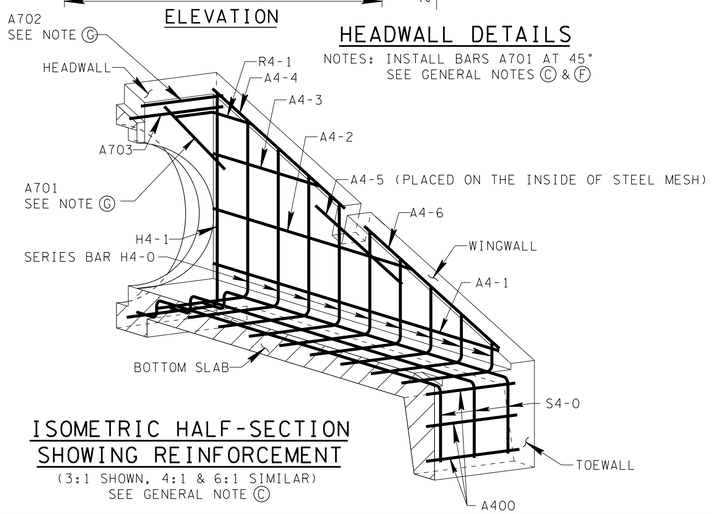
4:1 WINGWALL ELEVATION

NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.



6:1 WINGWALL ELEVATION

NOTE: A-BARS IN HEADWALL NOT SHOWN FOR CLARITY.

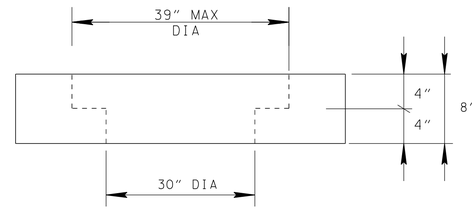


ISOMETRIC HALF-SECTION SHOWING REINFORCEMENT

(3:1 SHOWN, 4:1 & 6:1 SIMILAR)
SEE GENERAL NOTE (C)

- REV. 6-14-13: REVISED NOTE (G). ADDED NOTE (H) AND (I).
- REV. 1-6-15: REVISED HOLE OPENING SIZE. ADDED STEPPED HOLE DETAIL.
- REV. 1-21-16: REVISED GENERAL NOTE (B).
- REV. 10-10-16: REVISED GENERAL NOTE (A).

STEPPED HOLE DETAIL



PARTIAL VIEW B-B

SEE NOTE (F)

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE AND ALL PRECAST 30" CONCRETE ENDWALLS (TYPE "U") FOR CROSS DRAINS ONLY. "U" ENDWALL TO BE PLACED AT 90° SKEW TO CENTERLINE. SEE D-PE-99 FOR SKEWED CONNECTION DETAIL WHEN CROSS DRAIN IS NOT PERPENDICULAR TO CENTERLINE. CAST-IN-PLACE CONCRETE ENDWALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.

(B) SEE D-PE-30B FOR BILL OF STEEL & PRECAST NOTES.

(C) "-" IN BAR DESIGNATION REPRESENTS 3, 4 OR 6 FOR 3:1, 4:1 OR 6:1 SLOPES, RESPECTIVELY.

(D) SPLICING OF REINFORCEMENT IS ACCEPTABLE, PROVIDED THAT A MINIMUM 21" SPLICE LENGTH IS USED.

(E) TOEWALL BACK SLOPE MAY BE CONSTRUCTED VARIABLE FROM VERTICAL UP TO 15°.

(F) 90° STEPS ARE SHOWN ON THE STEPPED HOLE DETAIL; HOWEVER MINOR VARIATIONS OF THE TAPER ARE ACCEPTABLE.

(G) OPTIONAL STEPPED HOLE OR HOLE FORMERS ARE ALLOWED, PROVIDED THE AMOUNT OF COVER BETWEEN THE PIPE OPENING AND BARS A701 AND A702 IS THE SAME OR GREATER THAN SHOWN ON THIS DRAWING.

(H) PAYMENT WILL BE MADE UNDER:

611-07.60 30IN ENDWALL (CROSS DRAIN) 3:1 PER EACH
611-07.61 30IN ENDWALL (CROSS DRAIN) 4:1 PER EACH
611-07.62 30IN ENDWALL (CROSS DRAIN) 6:1 PER EACH

(I) THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN.

(J) DIMENSIONAL AND REINFORCING TOLERANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE 5-3.

DIMENSIONS AND QUANTITIES FOR ONE ENDWALL 30" PIPE

SLOPE	CONCRETE ENDWALL DIMENSIONS					STRUCTURAL STEEL PIPE DIMENSIONS		ESTIMATED QUANTITIES		
	H	L_1	L_2	L_3	W	LG	WG	CLASS "A" CONC. CU. YD.	STEEL BAR REINF. LB.	STRUCTURAL STEEL LB.
3:1	4' - 5"	10' - 5"	10' - 11¾"	5' - 2"	4' - 1"	10' - 10⅝"	4' - 1"	1.84	174	114
4:1		13' - 8"	14' - 1"	6' - 1"		14' - 0⅛"		2.32	216	137
6:1		20' - 2"	20' - 5⅜"	10' - 1"		20' - 4⅜"		3.29	303	186

NOTE: SEE D-PE-99 FOR STRUCTURAL STEEL PIPE DIMENSIONS LG & WG.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

30" CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE

(FOR 3:1, 4:1 & 6:1 SLOPES)

NOT TO SCALE | 3-1-12 | D-PE-30A

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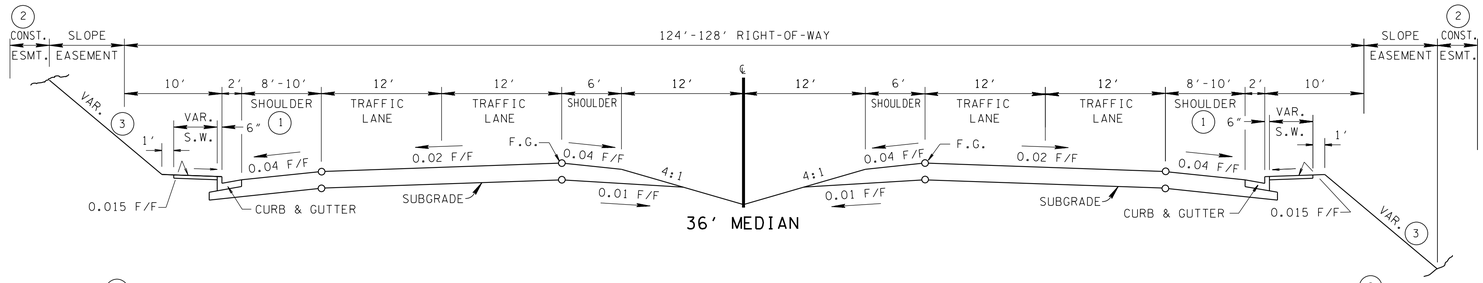
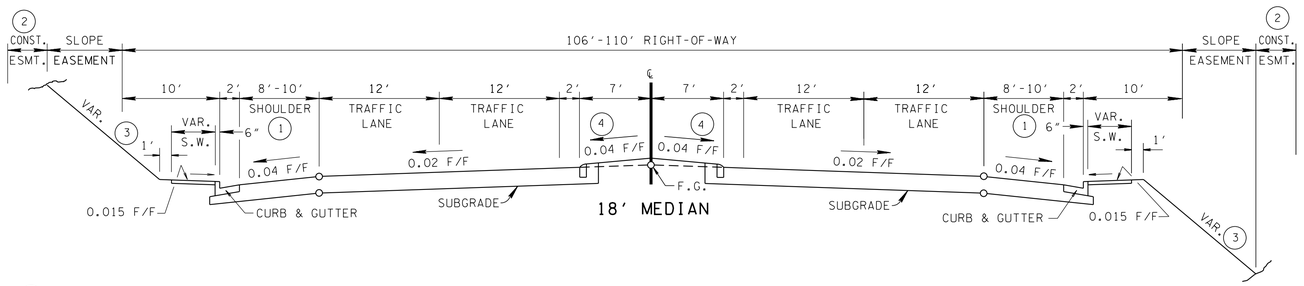
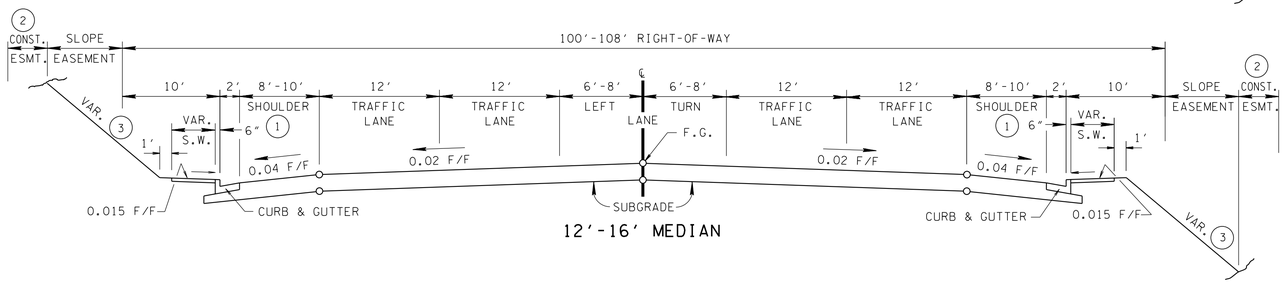
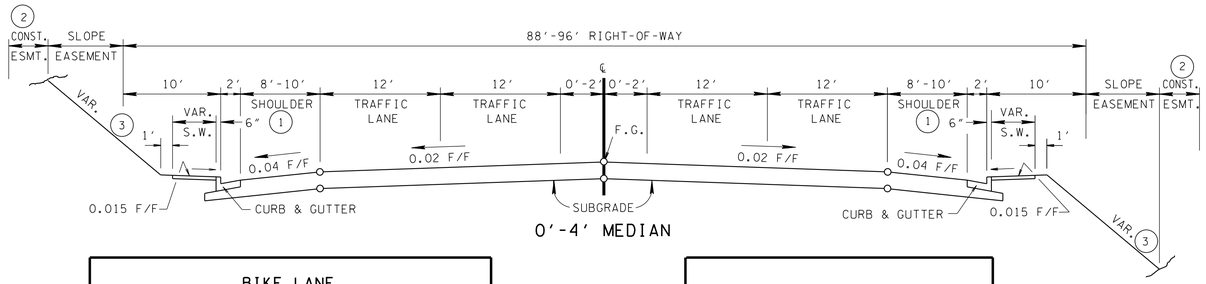


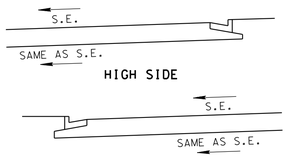




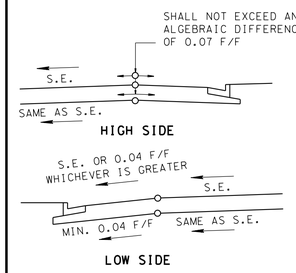


BIKE LANE SHOULDER CROSS SLOPES

ON PROJECTS, WHERE IN THE NEAR FUTURE THE SHOULDER MAY BE USED AS A THROUGH TRAFFIC LANE, THE PAVEMENT SLOPE (0.02 FOOT/FOOT) SHOULD BE USED ON THE SHOULDER IN PLACE OF THE 0.04 FOOT/FOOT SLOPE SHOWN ON THE TYPICAL SECTION. SEE DETAIL FOR SUPERELEVATION OF SHOULDER WITH 0.02 FOOT/FOOT SLOPE.



SUPERELEVATION DETAIL FOR SHOULDERS



SUPERELEVATION DETAIL FOR SHOULDERS

REV. 10-15-02: NEW SHEET. REPLACES RD-TS-6.

☐ REV. 7-31-13: REVISED SIDEWALK WIDTH.

☐ REV: 1-25-16: REVISED GENERAL NOTES.

REV: 10-10-16: REVISED GENERAL NOTES. CLARIFIED SIDEWALK DIMENSION.

GENERAL NOTES

DESIGN SPEED

THESE SECTIONS ARE FOR 45 MILES PER HOUR OR LESS. IF HIGHER SPEED IS PROPOSED USE RD01-TS-6B.

ALIGNMENT

SEE S-PL-6.

SUPERELEVATION AND MEDIAN BARRIERS

SEE APPROPRIATE STANDARD DRAWING IN THE RD01-SE-SERIES AND S-SSMB-SERIES.

SHOULDER

(1) IF SHOULDERS LESS THAN 8', USE RD01-TS-6A.

8' MIN. SHOULDER IS REQUIRED FOR VEHICLE EMERGENCIES AND TO PROVIDE PROPER HORIZONTAL OFFSET TO PEDESTRIAN FACILITIES. UNDER NO CIRCUMSTANCES SHALL THE SHOULDER BE CONSIDERED TO FACILITATE PEDESTRIAN ACCESS. LOCATIONS WHERE EXISTING ROADWAY IS LACKING MIN 8' SHOULDER WIDTH (3R PROJECTS-RESURFACING, RETROFITTING, AND RECONSTRUCTION), MIN 4' SHALL BE PROVIDED. IN SOME INSTANCES, ADJUSTMENT TO LANE WIDTH MAY BE REQUIRED.

CONSTRUCTION EASEMENT

(2) 10' MINIMUM DESIRABLE.

SLOPES

(3) ON URBAN PROJECTS, THE BACKSLOPE AND FORESLOPE DESIGN WILL VERY FROM PROJECT TO PROJECT; AS A GENERAL RULE USE THE FOLLOWING:
3:1 SLOPES OR FLATTER ARE DESIRABLE AND ARE THE MAXIMUM IN REGION IV. 2:1 SLOPES ARE APPLICABLE IN AREAS WHERE RIGHT-OF-WAY RESTRICTIONS OR COST WARRANTS A STEEPER THAN 3:1 SLOPE.

CURBS

(4) MEDIAN CURBS WILL BE 6" SLOPING CURBS. OUTSIDE CURBS WILL BE 4" SLOPING CURBS (SEE RP-MC-1). 6" VERTICAL CURBS MAY BE USED IN URBAN ZONES.

SIDEWALKS AND BIKE LANES

SIDEWALK WIDTH SHALL NOT INCLUDE THE 6" WIDTH OF PROPOSED CURB. SIDEWALK SHALL BE A MINIMUM OF 5' WIDE. REFER TO RP-H-SERIES FOR CURB RAMP DETAILS. IF BIKE LANE IS PROPOSED, BIKE LANE SHALL BE PLACED AS FAR AWAY AS POSSIBLE FROM THE EDGE OF TRAVELED WAY. SEE BIKE LANE BUFFER DETAILS ON T-M-12.

PARKING LANES

FOR SPECIFIC CONDITIONS NOT COVERED ON THIS SHEET, REFERENCE SHOULD BE MADE TO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS," AASHTO, 2011 PAGE NUMBERS 4-72 THROUGH 4-74, 5-14, 6-14, 7-34, AND TO THE CURRENT MUTCD.

3R PROJECTS-RESURFACING, RETROFITTING, AND RECONSTRUCTION

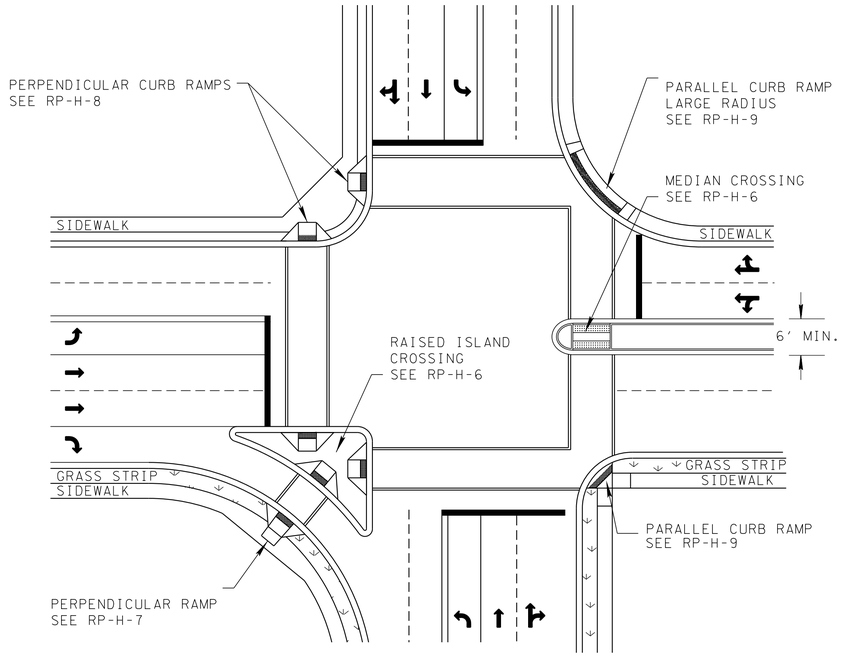
LOCATIONS WHERE EXISTING ROADWAY IS LACKING MIN 8' SHOULDER WIDTH, MIN 4' SHALL BE PROVIDED. IN SOME INSTANCES, ADJUSTMENT TO LANE WIDTH MAY BE REQUIRED. IF MIN 4' SHOULDER CANNOT BE ACHIEVED DUE TO THE ROW LIMITATIONS, UTILITY CONFLICTS, ETC, THEN ADDITIONAL MITIGATION STRATEGIES SUCH AS REDUCING DESIGN SPEED OR GROUND MOUNTED ADVANCED WARNING SIGNS SHALL BE CONSIDERED.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

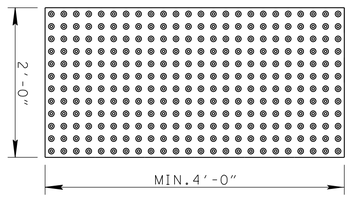
TYPICAL CURB AND GUTTER SECTIONS WITH SHOULDER

10-15-02 | RD01-TS-6

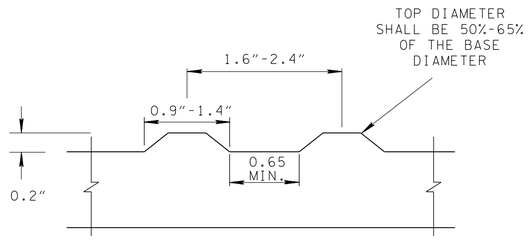


PLAN VIEW

(EXAMPLE LAYOUT SHOWING EACH RAMP TYPE; SEE REFERENCED STANDARD DRAWINGS FOR SPECIFIC ALIGNMENT INFORMATION)



TRUNCATED DOME SURFACE DETAIL



TRUNCATED DOME SURFACE
ELEVATION VIEW (TYP.)

TRUNCATED DOME SURFACE NOTES

(1) THE DETECTABLE WARNING SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP (EXCLUSIVE OF FLARED SIDES) AND SHOULD EXTEND ONLY 2 FEET IN THE DIRECTION OF TRAVEL.

(2) THE DETECTABLE WARNING SURFACES SHALL BE YELLOW. THE COLOR YELLOW IS USED BECAUSE YELLOW IS THE LAST COLOR A VISUALLY IMPAIRED PERSON CAN DETECT PRIOR TO TOTAL LOSS OF VISION. TRUNCATED DOME SURFACES SHALL BE CONSTRUCTED USING PRODUCTS APPROVED ON THE TDOT QUALIFIED PRODUCTS LIST (QPL) 37.

GENERAL NOTES

(A) DETAILS SHOWN ON THIS PLAN APPLY TO THE CONSTRUCTION OR RECONSTRUCTION OF STREETS, CURBS, OR SIDEWALKS.

(B) CURB RAMPS ARE TO BE LOCATED AS SHOWN ON THE PLANS.

(C) CURB RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTER-SECTIONS WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB. RAMPS SHALL ALSO BE PROVIDED AT MIDBLOCK CROSS-WALK LOCATIONS AND ACROSS FROM CORNER RAMPS AT T-INTERSECTIONS.

(D) THE FIRST TWO FEET OF RAMP MUST CONSIST OF A TRUNCATED DOME SURFACE. RAMPS SHALL INCLUDE THE TRUNCATED DOME SURFACE TO PROVIDE A DETECTABLE WARNING FOR VISUALLY IMPAIRED PEDESTRIANS.

(E) CARE SHALL BE TAKEN TO ENSURE A UNIFORM GRADE ON THE RAMP. THE GRADE SHALL BE FREE OF SAGS AND SHORT GRADE CHANGES.

(F) DRAINAGE STRUCTURES SHALL NOT BE PLACED IN LINE WITH RAMPS. INSTALL CATCH BASINS ON UPSTREAM SIDE OF RAMP FOR ROADS WITH GRADES LESS THAN 2%.

(G) CROSS-WALK MARKINGS, IF USED, SHALL BE LOCATED AS SHOWN ON THE APPLICABLE CURB RAMP STANDARD DRAWING. FOR CROSS-WALK MARKING DETAILS, SEE T-M-4.

(H) FOR PERPENDICULAR CURB RAMP DESIGN DETAILS, SEE RP-H-4. FOR PARALLEL CURB RAMP DESIGN DETAILS, SEE RP-H-5.

(I) PAYMENT:
COST OF THE LOWERED CURB AND GUTTER TO BE INCLUDED IN THE PRICE OF ITEM NO. 702-01, CONCRETE CURB OR ITEM NO. 702-03, CONCRETE COMBINED CURB & GUTTER.

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN EXISTING SIDEWALK AREAS, REMOVAL OF THE EXISTING SIDEWALK, AND ADJUSTMENT OF GUTTER PAN SLOPE, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.01 CONCRETE CURB RAMP (RETROFIT) PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN NEWLY CONSTRUCTED SIDEWALK AREAS, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

(J) FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSHBUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS.

- REV. 7-17-07: REVISED SIZE AND SPACING OF TRUNCATED DOMES, ADDED NOTE (E), MODIFIED SPECIAL PAVER NOTES.
- REV. 4-13-11: ADDED LOWERED CURB FOOTNOTE (1) TO TRUNCATED DOME DETAIL. MISC. EDITS TO DRAWING.

  REV. 5-8-13: ADDED GUTTER SLOPE DETAIL AND REVISED NOTE (I), UPDATED TERMINOLOGY.
- REV. 6-4-13: ADDED SECTION A-A. CLARIFIED NOTE (I), ADDED NOTE (J), CHANGED ITEM DESCRIPTION.
- REV. 11-25-13: REVISED NOTES (C), (F), (M), (N), AND ADDED NOTE (R).

  REV. 1-30-15: VARIOUS DRAFTING EDITS. REVISED GENERAL NOTES.
- REV. 10-10-16: REVISED GENERAL NOTES AND TRUNCATED DOME SURFACE NOTES.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

CURB RAMP AND TRUNCATED DOME SURFACE DETAIL

1-15-07 | RP-H-3

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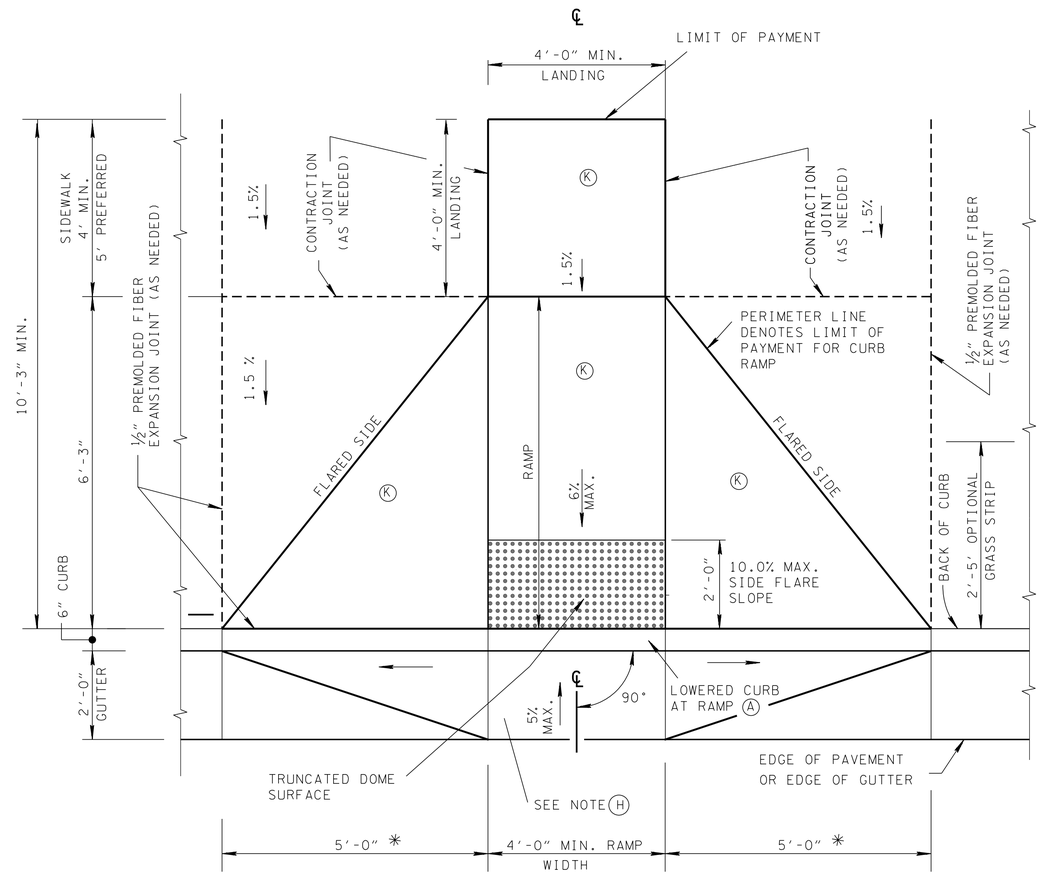
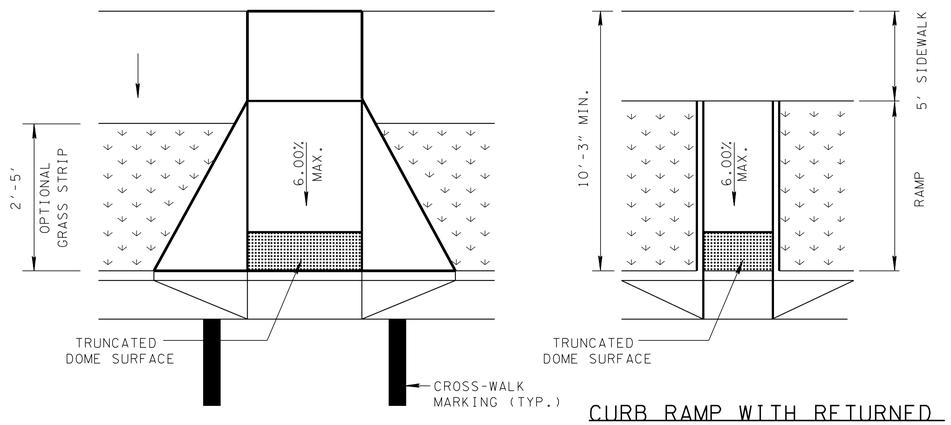


PLAN VIEW

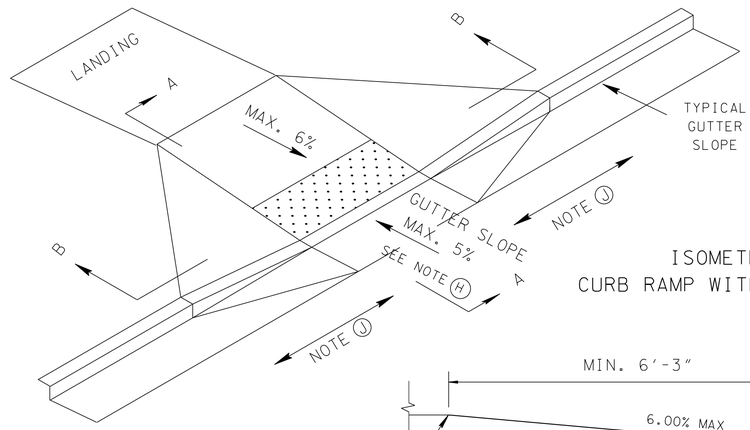


CURB RAMP WITH SIDE FLARES

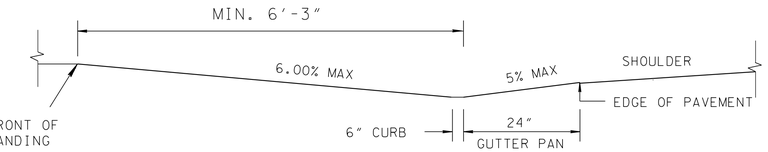
CURB RAMP WITH RETURNED CURB

NOTE TO DESIGNER

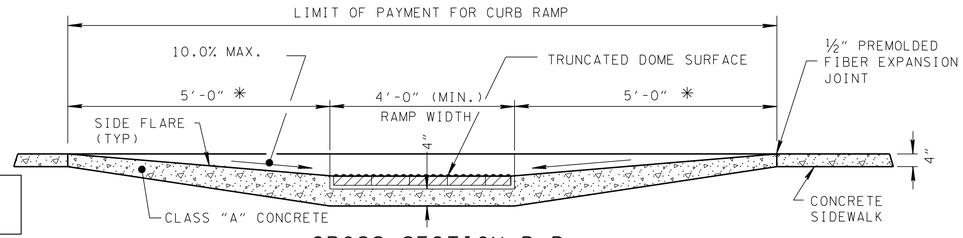
PERPENDICULAR CURB RAMPS TO BE USED WHEN TOTAL SIDEWALK OR SIDEWALK AND GRASS STRIP WIDTH IS 10′-3″ OR GREATER, SEE RP-H-7 FOR PERPENDICULAR CURB RAMP IN CURVE, AND SEE RP-H-8 FOR PERPENDICULAR CURB RAMP PLACED OUTSIDE CURVE. PERPENDICULAR RAMP WITH 6″ VERTICAL CURB SHOWN; OTHERS SIMILAR.



ISOMETRIC VIEW
CURB RAMP WITH GUTTER DETAIL



CROSS SECTION A-A
(SHOWN 30″ CURB AND GUTTER TRANSITION)
THE GRADE CHANGE ALGEBRAIC DIFFERENCE SHOULD BE LESS THAN 11%



CROSS-SECTION B-B

✳ DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE

- REV. 4-13-11: ADDED CURB NOTE AND REVISED RAMP DIMENSION IN SECTION A-A, ADDED FOOTNOTE (I), MISC. EDITS TO DRAWING.
- REV. 1-15-13: ADDED GENERAL NOTES. REVISED RAMP LENGTH.
- REV. 6-4-13: CORRECTED SECTION A-A. CHANGED CROSS SLOPE TO 1.5 % DESIRABLE. ADDED NOTES (H) AND (I) CHANGED ITEM DESCRIPTION.

  REV. 1-30-15: UPDATED NOTES, REMOVED PAVERS. VARIOUS DRAFTING EDITS.
- REV. 10-10-16: REVISED GENERAL NOTES, MISC, REVISIONS TO DETAILS.

GENERAL NOTE

(A) CURB SHALL BE LOWERED ACROSS ENTIRE WIDTH OF RAMP. THE FIRST TWO FEET OF RAMP MUST CONSIST OF A TRUNCATED DOME SURFACE. RAMPS SHALL INCLUDE THE TRUNCATED DOME SURFACE TO PROVIDE A DETECTABLE WARNING FOR VISUALLY IMPAIRED PEDESTRIANS. SEE RP-H-3 FOR TRUNCATED DOME SURFACE DETAILS.

(B) DESIGN/CONSTRUCTION MODIFICATIONS MAY BE REQUIRED FOR CURB RAMPS TO BE INSTALLED ALONG A ROADWAY WITH LONGITUDINAL GRADES EXCEEDING 5%. ENGINEER SHOULD BE NOTIFIED FOR ASSESMENT IF THE CURB RAMP SIDE FLARES EXCEED 10′ IN LENGTH DUE TO THE LONGITUDINAL GRADE.

(C) PAYMENT:

COST OF THE LOWERED CURB AND GUTTER TO BE INCLUDED IN THE PRICE OF ITEM NO. 702-01, CONCRETE CURB OR ITEM NO. 702-03, CONCRETE COMBINED CURB & GUTTER.

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN EXISTING SIDEWALK AREAS, REMOVAL OF THE EXISTING SIDEWALK, AND ADJUSTMENT OF GUTTER PAN SLOPE, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.01 CONCRETE CURB RAMP (RETROFIT) PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN NEWLY CONSTRUCTED SIDEWALK AREAS, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

(D) FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSHBUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR DETAILS.

(E) IF MAILBOXES ARE REMOVED DURING INSTALLATION OF THE RAMP, PROVIDE A 12″ X 12″ OPENING BEHIND THE CURB. SEE RP-S-7.

(F) IF GRASS STRIP IS LARGER THAN 6′, THE SIDE FLARES MAY BE OMITTED AND A RETURNED CURB OPTION MAY BE USED.

(G) DESIRABLE SIDEWALK CROSS SLOPE IS 1.5 %, ABSOLUTE MAXIMUM IS 2 %.

(H) THE GUTTER LONGITUDINAL SLOPE SHALL MATCH THE ROADWAY AT THE RAMP, AND THE GUTTER CROSS SLOPE AT THE RAMP SHALL NOT EXCEED 5%.

(I) DESIGN THE RAMP AND GUTTER WITH A CROSS SLOPE OF MAX. 2.0 %.

(J) TRANSITION GUTTER CROSS SLOPE FROM NORMAL SLOPE TO 5%, SIMILAR TO SUPERELEVATION TRANSITION AREAS. MATCH GUTTER TRANSITION TO RAMP FLARES FOR PERPENDICULAR (TYPICAL 5′) OR RAMP AREA FOR PARALLEL (TYPICAL 6′)

(K) SURFACE TEXTURE TO BE OBTAINED BY A COARSE BROOMING TRANSVERSE TO THE SLOPE OF RAMP.

(L) SEE T-M-4 FOR CROSS-WALK MARKING DETAILS.

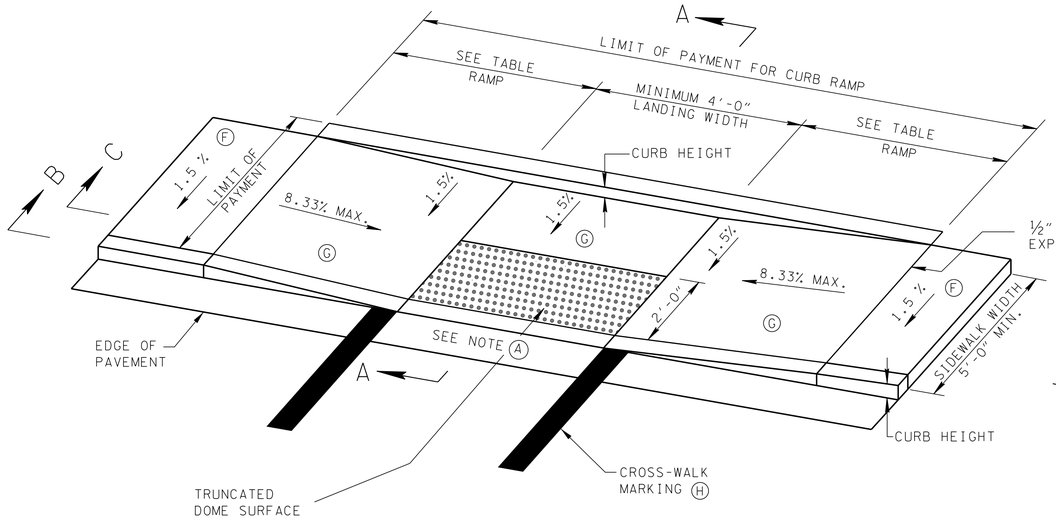
☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PERPENDICULAR CURB RAMP

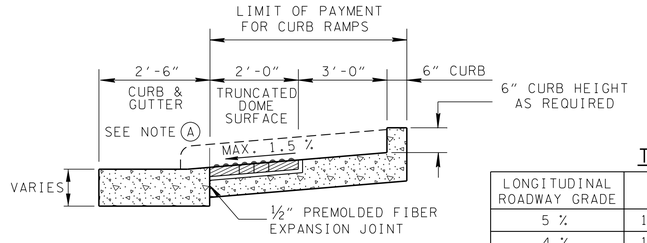
1-15-07 | RP-H-4

- REV. 4-13-11: ADDED FOOTNOTE (I), ADJUSTED DIMENSIONS IN RAMP DETAIL, MISC. EDITS TO DRAWING.
- REV 1-15-13: MODIFIED LANDING WIDTH, REVISED NOTES.
- REV. 6-4-13: CHANGED CROSS SLOPE TO 1.5 % DESIRABLE. ADDED NOTES (G) AND (H). CHANGED ITEM DESCRIPTION.
- REV. 1-30-15: UPDATE NOTES, REMOVED PAVERS. UPDATED TABLE A.
- REV. 10-10-16: REVISED GENERAL NOTES, MISC. REVISIONS TO DETAILS.



PARALLEL CURB RAMP DETAIL

DIMENSIONS SHOWN ABOVE FOR 0% LONGITUDINAL ROADWAY GRADE

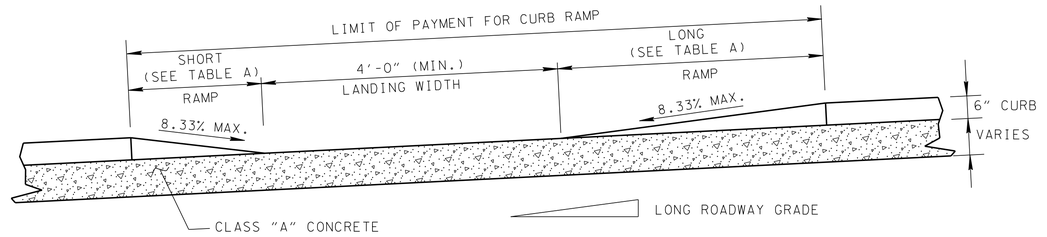


SECTION A-A

TABLE A

LONGITUDINAL ROADWAY GRADE	LONG	SHORT	PAY AREA S.F.
5 %	15'-0"	3'-9"	114
4 %	11'-6"	4'-1"	98
3 %	9'-5"	4'-5"	90
2 %	7'-11"	4'-10"	84
1 %	6'-10"	5'-5"	82
0 %	6'-0"	6'-0"	

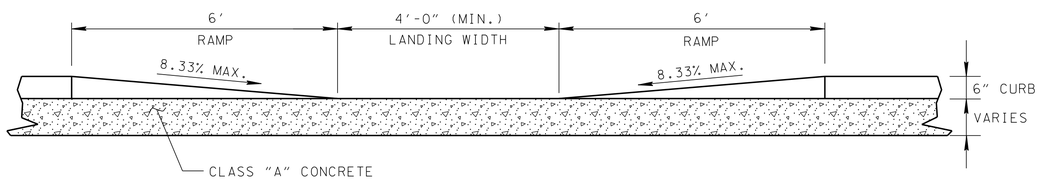
BASED ON 5' SIDEWALK WIDTH



ALTERNATE SECTION B-B

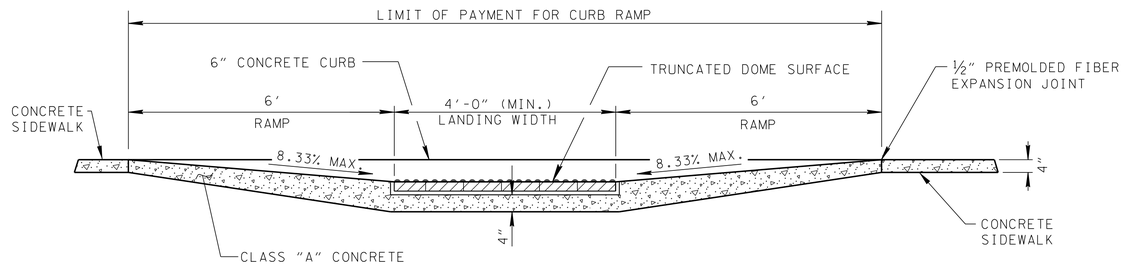
PARALLEL CURB RAMP DETAIL SHOWN WITH LONGIUDINAL ROADWAY GRADE

NOTE: MODIFICATIONS MAY BE REQUIRED FOR LONGITUDINAL ROADWAY GRADES STEEPER THAN 5%. ENGINEER SHOULD BE NOTIFIED FOR ASSESMENT IF THE CURB RAMP SIDE FLARES EXCEED 15' IN LENGTH DUE TO THE LONGITUDINAL ROADWAY GRADE.



SECTION B-B

DIMENSIONS SHOWN ABOVE FOR 0% LONGITUDINAL ROADWAY GRADE



SECTION C-C

NOTE TO DESIGNER

PARALLEL CURB RAMPS ARE TO BE USE WHEN SIDEWALK WIDTH IS LESS THAN 10' AND CURB RAMP IS LOCATED ALONG TANGENT SIDEWALK SECTION OF ROADWAY.

GENERAL NOTES

(A) CURB SHALL BE LOWERED ACROSS ENTIRE WIDTH OF RAMP. THE FIRST 2' OF RAMP MUST CONSIST OF A TRUNCATED DOME SURFACE. RAMPS SHALL INCLUDE THE TRUNCATED DOME SURFACE TO PROVIDE A DETECTABLE WARNING FOR VISUALLY IMPAIRED PEDESTRIANS. SEE RP-H-3 FOR TRUNCATED DOME SURFACE DETAILS. PARALLEL RAMPS DO NOT NEED GUTTER SLOPE CORRECTION.

(B) DESIGN/CONSTRUCTION MODIFICATIONS MAY BE REQUIRED FOR CURB RAMPS TO BE INSTALLED ALONG A ROADWAY WITH LONGITUDINAL GRADES EXCEEDING 5%.

(C) PAYMENT:

COST OF THE LOWERED CURB AND GUTTER TO BE INCLUDED IN THE PRICE OF ITEM NO. 702-01, CONCRETE CURB OR ITEM NO. 702-03, CONCRETE COMBINED CURB & GUTTER.

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN EXISTING SIDEWALK AREAS, REMOVAL OF THE EXISTING SIDEWALK, AND ADJUSTMENT OF GUTTER PAN SLOPE, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.01 CONCRETE CURB RAMP (RETROFIT) PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN NEWLY CONSTRUCTED SIDEWALK AREAS, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

(D) FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSHBUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS.

(E) IF MAILBOXES ARE REMOVED DURING INSTALLATION OF THE RAMP, PROVIDE A 12" X 12" OPENING BEHIND THE CURB. SEE RP-S-7.

(F) DESIRABLE CROSS SLOPE IS 1.5%, ABSOLUTE MAXIMUM IS 2%.

(G) SURFACE TEXTURE TO BE OBTAINED BY A COARSE BROOMING TRANSVERSE TO THE SLOPE OF RAMP.

(H) SEE T-M-4 FOR CROSS-WALK MARKING DETAILS.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

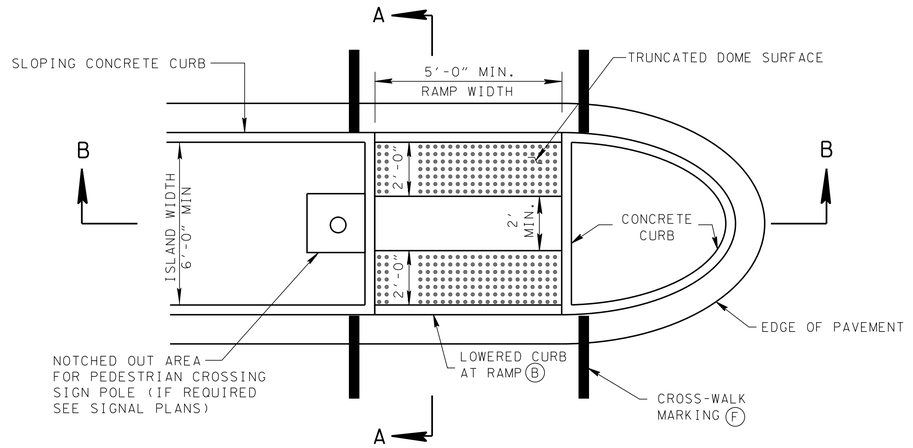
PARALLEL CURB RAMP

1-15-07 | RP-H-5

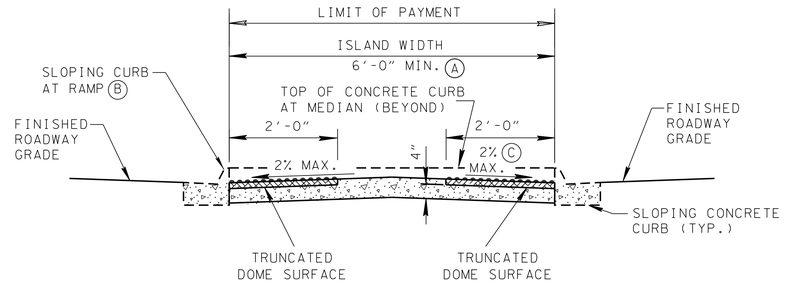
REV. 4-13-11: CHANGED CURB TYPE, ADJUSTED CROSSWALK MARKINGS, ADDED FOOTNOTE (1), MISC. EDITS TO DRAWING.

REV. 1-30-15: ADDED GENERAL NOTES. CHANGED ISLAND WIDTH, CHANGED SHEET TITLE.

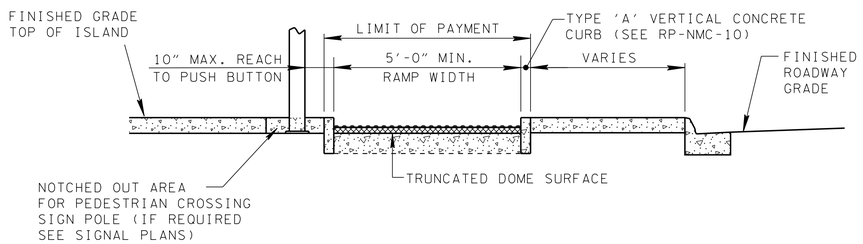
REV. 10-10-16: ADDED GENERAL NOTES (D) AND (G), REVISED RAMP WIDTH, MISC . REVISIONS TO DETAILS.



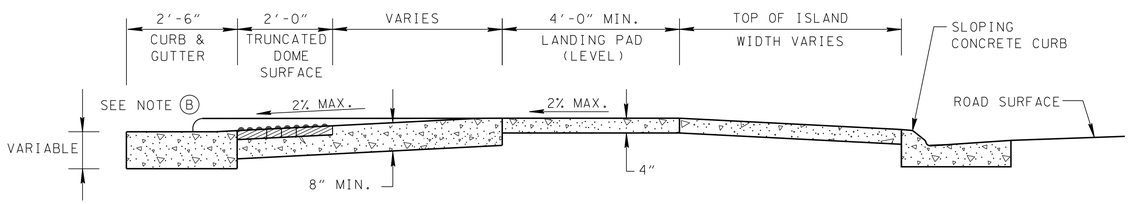
MEDIAN REFUGE PLAN VIEW



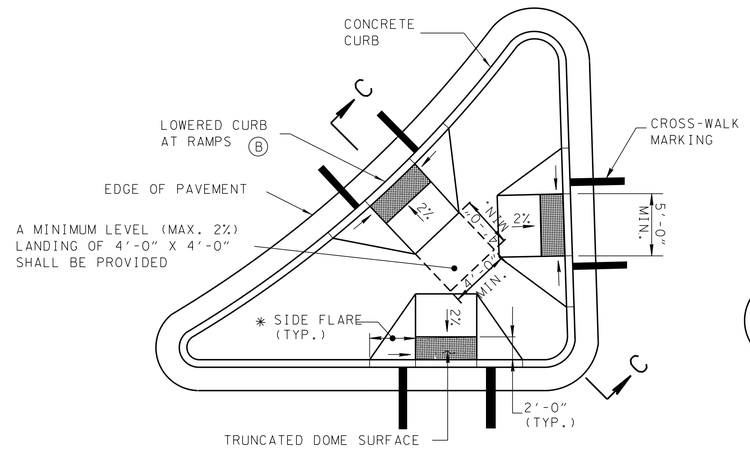
MEDIAN REFUGE SECTION A-A



MEDIAN REFUGE SECTION B-B

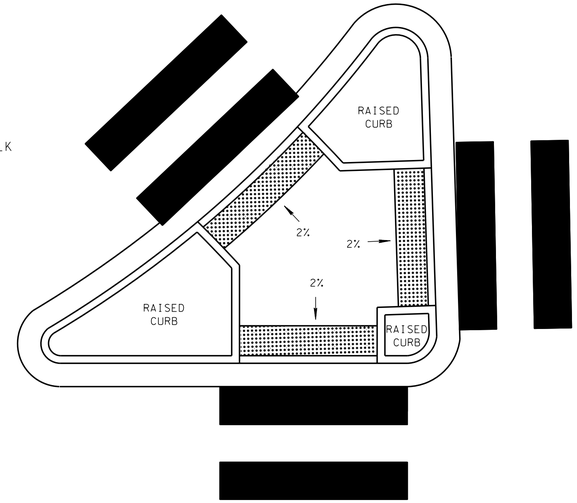


SECTION C-C



RAISED RIGHT TURN CHANNELIZATION ISLAND PLAN VIEW

* DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE 10.0% MAX.(8.33% DESIRABLE)



RAISED RIGHT TURN CHANNELIZATION ISLAND PLAN VIEW ALTERNATE

GENERAL NOTES

(A) IF THE MEDIAN IS LESS THAN 6' WIDE, THE AREA IS NOT A PEDESTRIAN REFUGE AND NO TRUNCATED DOMES ARE REQUIRED.

(B) CURB SHALL BE LOWERED ACROSS ENTIRE WIDTH OF RAMP.

(C) THE GRADE OF THE MEDIAN REFUGE SHOULD NOT EXCEED 2%. IF ROADWAY GEOMETRY SLOPES EXCEED 2%, THEN A 5' WIDE FLAT AREA BETWEEN THE RAMPS IS REQUIRED.

(D) FOR ADDITIONAL DETAILS AND OTHER INFORMATION NOT SHOWN ON THIS DRAWING, SUCH AS LIMITS OF PAYMENT, SEE RP-H-4.

(E) FOR TRUNCATED DOME SURFACE DETAILS, SEE RP-H-3.

(F) FOR CROSS-WALK MARKING DETAILS, SEE T-M-4.

(G) THE 5'-0" MIN. RAMP WIDTH IS APPLICABLE FOR MEDIANS AND PEDESTRIAN ISLAND REFUGES ONLY, OTHERWISE 4'-0" MIN. RAMP WIDTH MAY BE USED.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

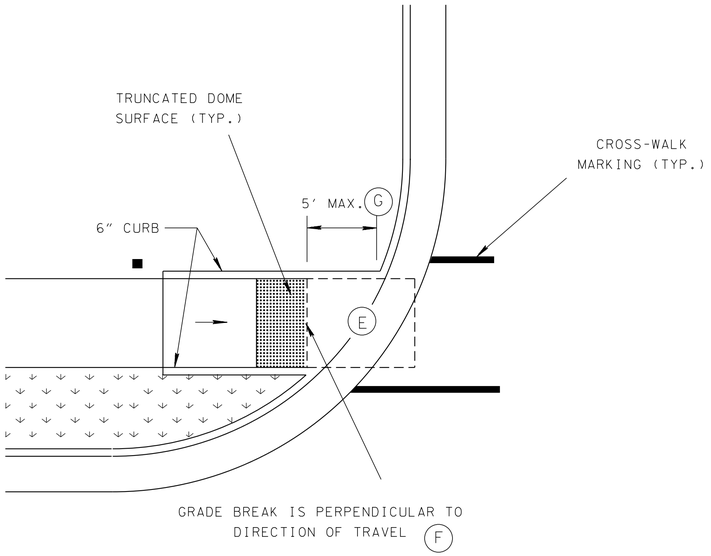
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

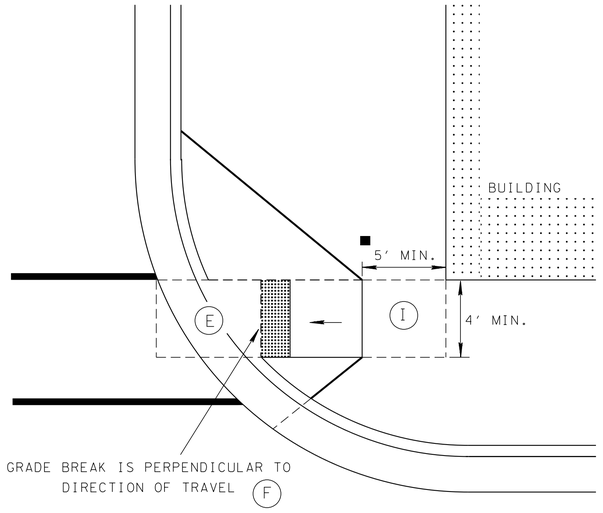
PEDESTRIAN REFUGE

1-15-07 | RP-H-6

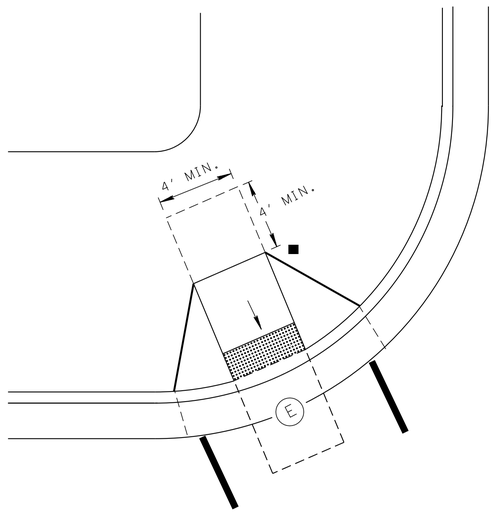
- REV. 4-13-11: REVISED TABLE DIMENSIONS, ADDED NOTE (I), AND ADDED GUTTER TO CROSSWALK INTERSECTION DIMENSION.
- REV. 5-8-13: REVISED TITLE FOR TERMINOLOGY.
- REV. 6-4-13: REVISED NOTE (C), CHANGED TITLE.

  REV. 1-30-15: REMOVED ALTERNATE. ADDED GENERAL NOTE (E), (F), (G), (H), (I), AND (J). ADDED GRADE BREAKS DETAILS.
- REV. 10-10-16: REVISED GENERAL NOTES, MISC. REVISIONS TO DETAILS.





GRADE BREAKS
OPTION TO PERPENDICULAR CURB RAMP



■ DENOTES: PEDESTRIAN PUSHBUTTON LOCATION FOR SIGNALIZED INTERSECTIONS

PERPENDICULAR CURB RAMP

THIS CURB RAMP DETAIL SHALL ONLY BE USED TO ACCESS A PEDESTRIAN REFUGE ISLAND. THIS CURB RAMP DETAIL IS NOT RECOMMENDED FOR ANY OTHER USE.

GENERAL NOTES

(A) FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSHBUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS.

(B) FOR ADDITIONAL DETAILS AND OTHER INFORMATION NOT SHOWN ON THIS DRAWING, SEE RP-H-4.

(C) SIDEWALK WIDTH SHALL NOT INCLUDE 6″ CONCRETE CURB.

(D) GRATES FOR STORM DRAINS SHALL NOT BE PLACED IN THE ACCESSIBLE ROUTE.

(E) BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE 4′ MIN. BY 4′ MIN. SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE.

(F) GRADE BREAKS AT THE TOP AND BOTTOM OF CURB RAMP RUNS SHALL BE PERPENDICULAR TO THE DIRECTION OF THE RAMP RUN. GRADE BREAKS SHALL NOT BE PERMITTED ON THE SURFACE OF RAMP RUNS AND TURNING SPACES. SURFACE SLOPES THAT MEET AT GRADE BREAKS SHALL BE FLUSH.

(G) WHERE THE END OF BOTTOM GRADE BREAK IS BEHIND THE BACK OF CURB AND THE DISTANCE FROM EITHER END OF THE BOTTOM GRADE BREAK TO THE BACK OF CURB IS 5′ OR LESS, DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE RAMP RUN WITHIN ONE DOME SPACING OF THE BOTTOM GRADE BREAK.

(H) WHERE PEDESTRIAN SIGNALS ARE PROVIDED AT PEDESTRIAN STREET CROSSINGS, THEY SHALL INCLUDE ACCESSIBLE PEDESTRIAN SIGNALS AND PEDESTRIAN PUSHBUTTONS COMPLYING WITH SECTIONS 4E.08 THROUGH 4E.13 OF THE MUTCD.

(I) WHERE THE TURNING SPACE IS CONSTRAINED AT THE BACK-OF-SIDEWALK, THE TURNING SPACE SHALL BE 4′ MIN. BY 5′ MIN. THE 5′ DIMENSION SHALL BE PROVIDED IN THE DIRECTION OF THE RAMP RUN.

(J) FOR TRUNCATED DOME SURFACE DETAILS, SEE RP-H-3. FOR CROSS-WALK MARKING DETAILS, SEE T-M-4.

(K) PAYMENT:

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN EXISTING SIDEWALK AREAS, REMOVAL OF THE EXISTING SIDEWALK, AND ADJUSTMENT OF GUTTER PAN SLOPE, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.01 CONCRETE CURB RAMP (RETROFIT) PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN NEWLY CONSTRUCTED SIDEWALK AREAS, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PERPENDICULAR CURB RAMP IN CURVE

1-15-07 | RP-H-7

11/15/2016 9:26:19 AM
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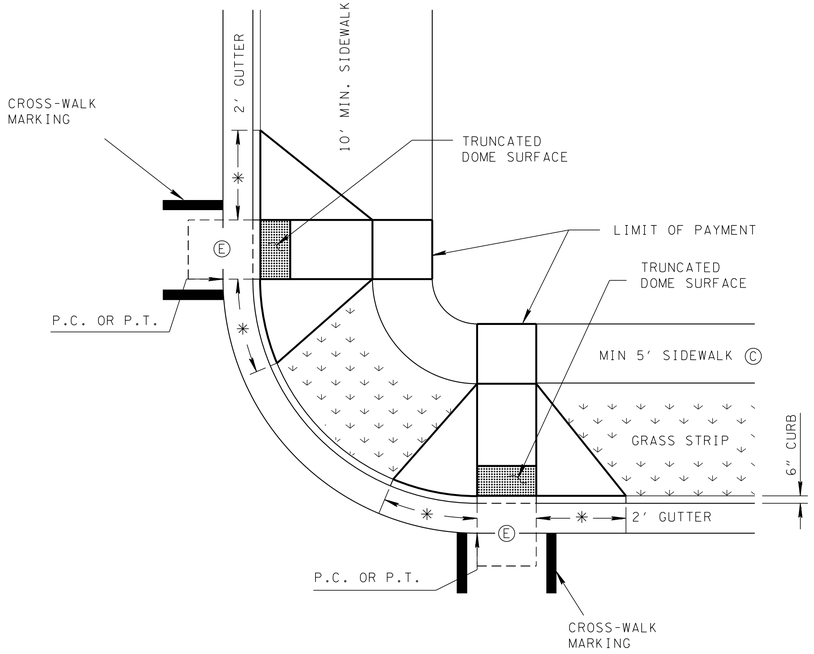
- REV. 4-13-11: ADJUSTED CROSSWALK MARKINGS, ADDED TYPE 2 SIDEWALK DIMEMSION, MISC. EDITS TO DRAWING.
- REV. 5-8-13: REVISED TITLE FOR TERMINOLOGY.
- REV. 6-4-13: REVISED NOTE Ⓒ AND Ⓓ, CHANGED TITLE.
- REV. 1-15-14: REMOVED ALTERNATE, REMOVED NOTE Ⓔ, ADDED NOTE Ⓔ.

  REV. 2-5-16: RENAMED TITLE, REMOVED ALTERNATE. MINOR DRAFTING EDITS.

  REV. 10-10-16: ADDED GENERAL NOTES, MISC. REVISIONS TO DRAWINGS.



RAMP OUTSIDE RADIUS (WITH GRASS STRIP OR WIDE SIDEWALK)

✳ DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE

GENERAL NOTES

Ⓐ FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSHBUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS.

Ⓑ FOR ADDITIONAL DETAILS AND OTHER INFORMATION NOT SHOWN ON THIS DRAWING, SEE RP-H-4.

Ⓒ SIDEWALK WIDTH SHALL NOT INCLUDE 6" CONCRETE CURB.

Ⓓ GRATES FOR STORM DRAINS SHALL NOT BE PLACED IN THE CROSS-WALK OR IN FRONT OF THE CURB RAMP.

Ⓔ BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE 4' MIN. BY 4' MIN. SHALL BE PROVIDED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE.

Ⓕ FOR TRUNCATED DOME SURFACE DETAILS, SEE RP-H-3. FOR CROSS-WALK MARKING DETAILS, SEE T-M-4.

Ⓖ PAYMENT:
ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN EXISTING SIDEWALK AREAS, REMOVAL OF THE EXISTING SIDEWALK, AND ADJUSTMENT OF GUTTER PAN SLOPE, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.01 CONCRETE CURB RAMP (RETROFIT) PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN NEWLY CONSTRUCTED SIDEWALK AREAS, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

Ⓗ IF THE RAMP AND LANDING CANNOT BE CONSTRUCTED DUE TO LIMITED RIGHT-OF-WAY, USE PARALLEL RAMP INSTEAD.

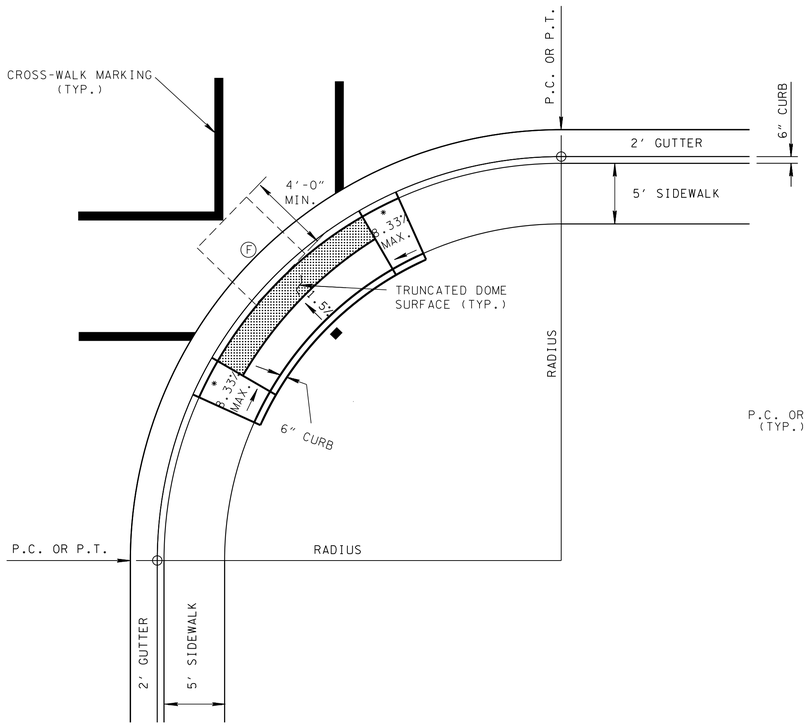
Ⓘ WHERE PEDESTRIAN SIGNALS ARE PROVIDED AT PEDESTRIAN STREET CROSSINGS, THEY SHALL INCLUDE ACCESSIBLE PEDESTRIAN SIGNALS AND PEDESTRIAN PUSHBUTTONS COMPLYING WITH SECTIONS 4E.08 THROUGH 4E.13 OF THE MUTCD.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PERPENDICULAR CURB RAMP PLACED OUTSIDE CURVE

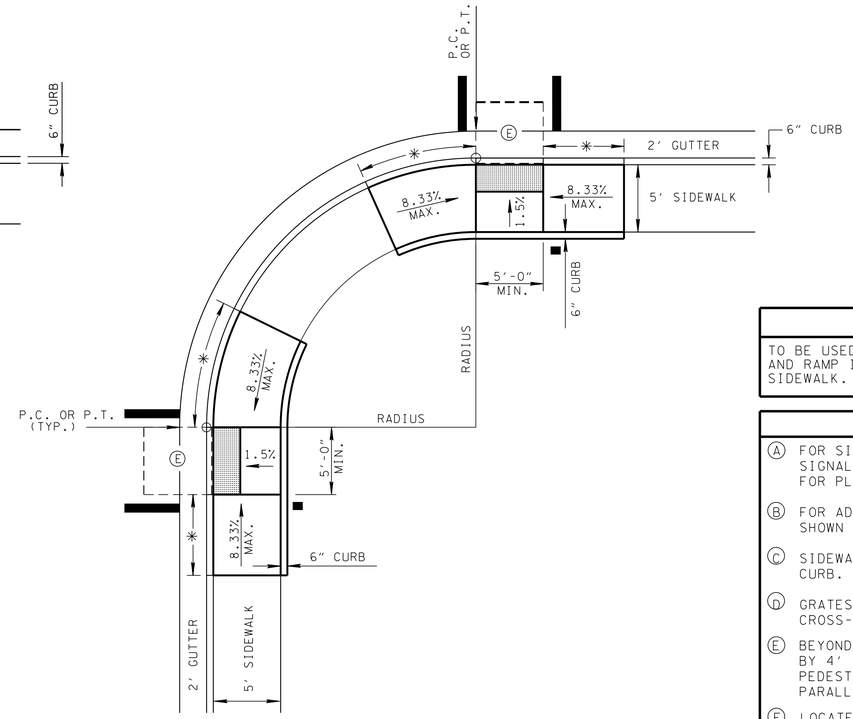
1-15-07 | RP-H-8



LOWERED CORNER RAMP

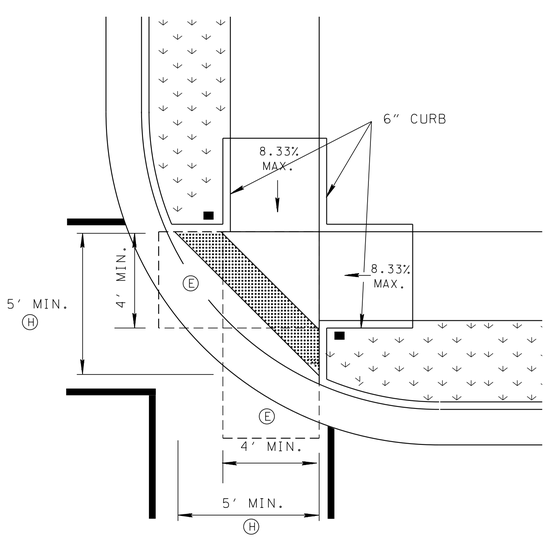
LOWERED CORNER RAMP TO BE USED AS AN ALTERNATE TO BLENDED TRANSITION WHEN REQUIRED DUE TO GEOMETRIC LIMITATIONS. (RAMP IN RADIUS)

✳ DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE

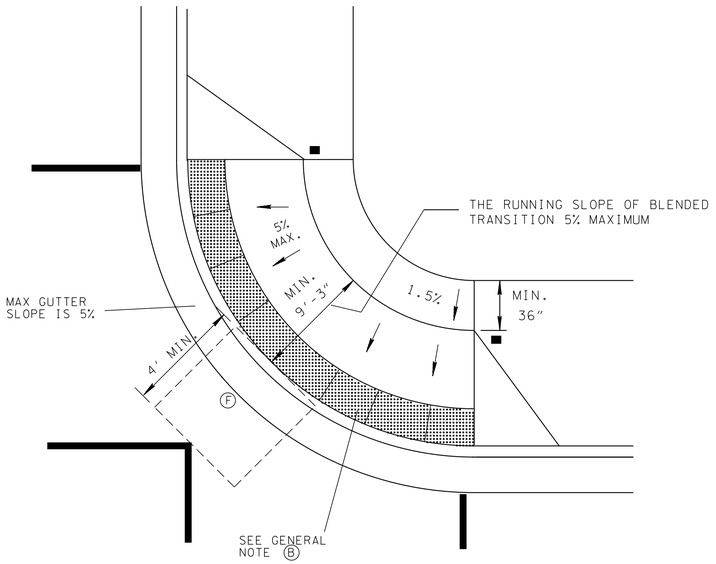


PARALLEL CURB RAMPS OUTSIDE RADIUS

✳ DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE



PARALLEL CURB RAMP



BLENDED TRANSITION

BLENDED TRANSITIONS ARE RAISED PEDESTRIAN STREET CROSSINGS, DEPRESSED CORNERS, OR SIMILAR CONNECTIONS BETWEEN PEDESTRIAN ACCESS ROUTES AT THE LEVEL OF THE SIDEWALK AND THE LEVEL OF THE PEDESTRIAN STREET CROSSING THAT HAVE A GRADE OF 5% OR LESS. BLENDED TRANSITIONS ARE SUITABLE FOR A RANGE OF SIDEWALK CONDITIONS.

- REV. 4-13-11: ADJUSTED CROSSWALK MARKINGS, ADDED NOTE Ⓘ, REVISED TABLE DIMENSIONS, ADDED GUTTER TO CROSSWALK INTERSECT DIMENSION, OTHER MISC. EDITS TO DRAWINGS.
- REV. 5-8-13: REVISED TITLE FOR TERMINOLOGY.
- REV. 6-4-13: ADDED NOTE Ⓖ, MODIFIED NOTE Ⓒ, CHANGED SHEET NAME.

  REV. 1-30-15: REMOVED TYPE 4 REVISED NOTE Ⓑ, ADDED NOTES Ⓗ, Ⓘ AND Ⓙ, REMOVED TABLE A. ADDED NEW DETAILS.

  REV. 10-10-16: ADDED GENERAL NOTES, MISC. REVISIONS TO DRAWINGS.

NOTE TO DESIGNER

TO BE USED WHERE SIDEWALK WIDTHS ARE LESS THAN 10' WIDE AND RAMP IS LOCATED ANYWHERE WITHIN A CURVED SECTION OF SIDEWALK.

GENERAL NOTES

Ⓐ FOR SIGNALIZED INTERSECTIONS THAT REQUIRE PEDESTRIAN SIGNAL PUSHBUTTONS, SEE TDOT TRAFFIC DESIGN MANUAL FOR PLACEMENT DETAILS.

Ⓑ FOR ADDITIONAL DETAILS AND OTHER INFORMATION NOT SHOWN ON THIS DRAWING, SEE RP-H-5.

Ⓒ SIDEWALK WIDTH SHALL NOT INCLUDE 6" CONCRETE CURB.

Ⓓ GRATES FOR STORM DRAINS SHALL NOT BE PLACED IN THE CROSS-WALK OR IN FRONT OF THE CURB RAMP.

Ⓔ BEYOND THE BOTTOM GRADE BREAK, A CLEAR SPACE 4' MIN. BY 4' MIN. SHALL BE PROVIED WITHIN THE WIDTH OF THE PEDESTRIAN STREET CROSSING AND WHOLLY OUTSIDE THE PARALLEL VEHICLE TRAVEL LANE.

Ⓕ LOCATE CROSS-WALK(S) SUCH THAT A 4' MIN. X 4' MIN. MANEUVERING AREA IS LOCATED AT THE TOE OF THE RAMP AND IS LOCATED ENTIRELY WITHIN THE CROSS-WALK.

Ⓖ DESIREABLE CROSS SLOPE IS 1.5 %, ABSOLUTE MAXIMUM IS 2.0%.

Ⓗ WHERE THE ENDS OF BOTTOM GRADE BREAK ARE BEHIND THE BACK OF CURB AND THE DISTANCE FROM EITHER END OF THE BOTTOM GRADE BREAK TO THE BACK OF CURB IS MORE THAN 5', DETECTABLE WARNING SURFACES SHALL BE PLACED ON THE LOWER LANDING AT THE BACK OF CURB.

Ⓘ FOR TRUNCATED DOME DETAILS, SEE RP-H-3. FOR CROSS-WALK MARKING DETAILS, SEE T-M-4.

Ⓙ PAYMENT:

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN EXISTING SIDEWALK AREAS, REMOVAL OF THE EXISTING SIDEWALK, AND ADJUSTMENT OF GUTTER PAN SLOPE, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.01 CONCRETE CURB RAMP (RETROFIT) PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

ALL COSTS OF INSTALLING CURB RAMP(S), INCLUDING TRUNCATED DOME SURFACE(S) IN NEWLY CONSTRUCTED SIDEWALK AREAS, SHALL BE BID FOR UNDER THE FOLLOWING PAY ITEM:

701-02.03 CONCRETE CURB RAMP PER SQUARE FOOT.

PAYMENT SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY FOR CONSTRUCTION OF THE CURB RAMP(S), INCLUDING INSTALLATION OF TRUNCATED DOME SURFACE(S).

Ⓚ WHERE PEDESTRIAN SIGNALS ARE PROVIDED AT PEDESTRIAN STREET CROSSINGS, THEY SHALL INCLUDE ACCESSIBLE PEDESTRIAN SIGNALS AND PEDESTRIAN PUSHBUTTONS COMPLYING WITH SECTIONS 4E.08 THROUGH 4E.13 OF THE MUTCD.

LEGEND

■ DENOTES: PEDESTRIAN PUSHBUTTON LOCATION FOR SIGNALIZED INTERSECTIONS

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PARALLEL CURB RAMP IN CURVE

1-15-07 | RP-H-9

11/5/2016 9:29:35 AM
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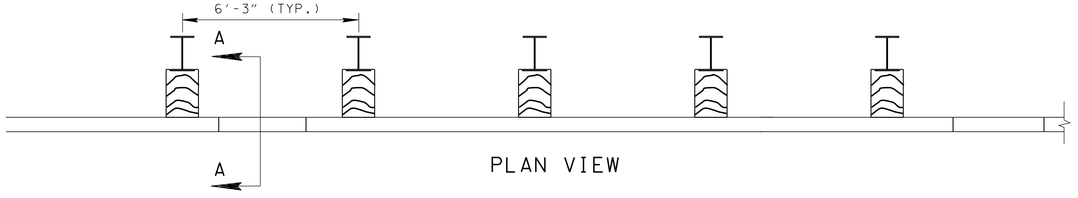
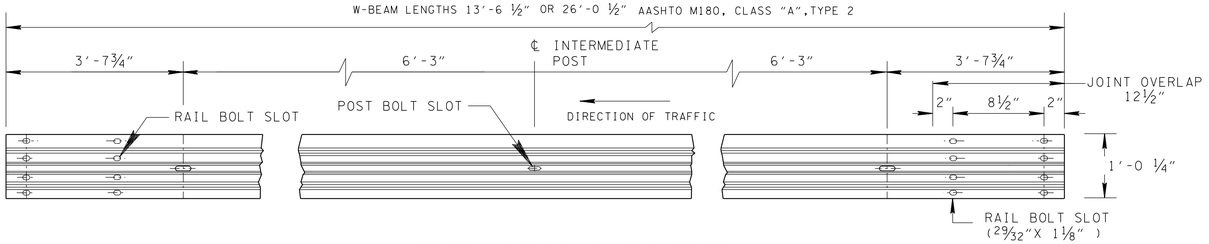
REV. 12-1-14: REVISED NOTE (L)

REV.4-4-16: REVISED NOTES.

REV. 10-20-16: ADDED NOTE TO ADDRESS ADDITIONAL HOLES.

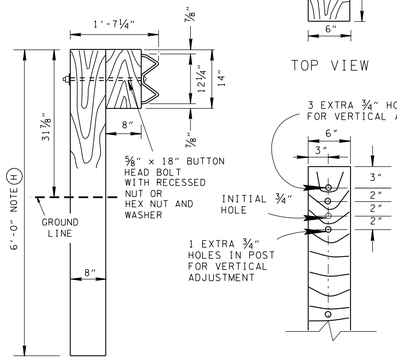


PLAN VIEW

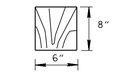


FRONT ELEVATION "W"-BEAM

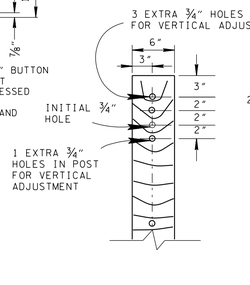
NOTE:
ADDITIONAL ¾" HOLES ON OTHER SIDE OF THE FLANGE OR BACK FLANGE WILL BE ACCEPTABLE IF THEY ARE LOCATED WITHIN TOP 9" OF THE POST.



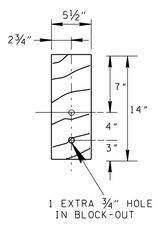
SIDE VIEW
SINGLE GUARDRAIL
WOOD POST



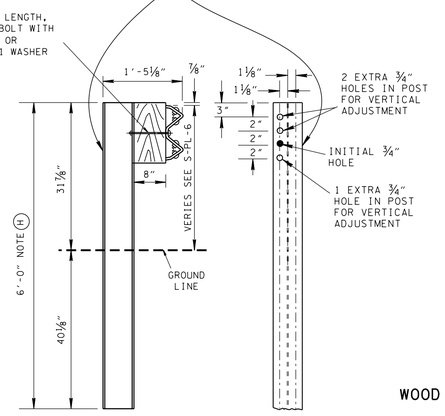
TOP VIEW



FRONT ELEVATION
WOOD POST

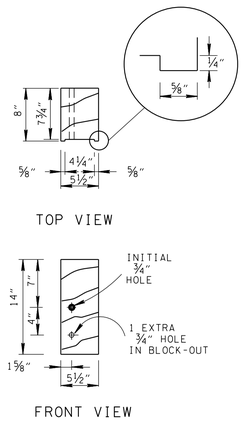


FRONT ELEVATION
WOOD BLOCK-OUT
FOR WOOD POST



SIDE VIEW
SINGLE GUARDRAIL
STEEL POST

FRONT ELEVATION
STEEL POST



WOOD OR COMPOSITE (SEE OPL)
BLOCK-OUT DETAIL
FOR STEEL POST WITH
VERTICAL
ADJUSTMENT HOLES

NOTE: SIDE VIEW FOR STEEL POST DIMENSIONS BASED ON W6 X 8.5, OTHER DETAILS APPLY TO W6 x 9.0 AND W6 x 15.0 POSTS AND BLOCK-OUTS. SEE S-GR31-1A FOR FASTENING HARDWARE DETAILS.

GENERAL NOTES

METAL BEAM

(A) METAL BEAMS SHALL CONFORM TO AASHTO M 180: TYPE 2, CLASS "A" UNLESS OTHERWISE NOTED ON THE PLANS.

(B) WHERE GUARDRAIL IS PLACED ON A CURVE WITH A RADIUS LESS THAN 150 FEET, THE RAIL IS TO BE SHOP-FORMED TO THE REQUIRED RADIUS.

(C) AT THE OPTION OF THE CONTRACTOR THE RAIL ELEMENTS FOR THE GUARDRAIL MAY BE FURNISHED IN EITHER 12½ OR 25 FOOT NOMINAL LENGTHS WITH POST BOLT SLOTS FOR CONNECTION TO POSTS.

POSTS

(D) THE CONTRACTOR MAY HAVE THE CHOICE OF EITHER HOT ROLLED OR WELDED STEEL W6 X 8.5 OR W6 X 9 OR 8" X 6" WOOD POST. EXCEPT AS NOTED

(1) THE MIXING OF ANY POST TYPES ON A GIVEN PROJECT WILL BE AVOIDED IF AT ALL POSSIBLE.

(2) SHOULD IT BECOME NECESSARY TO MIX POST TYPES ON A GIVEN PROJECT POSTS SHALL NOT BE MIXED ON A SINGLE RUN OF GUARDRAIL EXCEPT AS NECESSARY AT END TERMINALS.

(3) W6 X 15 IS USED WITH GUARDRAIL CONNECTION TO STRUCTURES.

(E) STEEL POSTS SHALL CONFORM TO ASTM A36 AND BE GALVANIZED IN ACCORDANCE WITH ASTM A123. BOLT HOLES SHALL BE APPROXIMATELY CENTERED BETWEEN WEB AND EDGE OF FLANGE OF SPACERS AND POSTS.

(F) WOOD POSTS SHALL CONFORM WITH TDOT CONSTRUCTION STANDARD SPECIFICATION.

(G) WELDED STEEL POSTS SHALL CONFORM TO ASTM A769 AND BE GALVANIZED IN ACCORDANCE WITH ASTM A123, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

(H) ON STEEP SLOPES, WHEN GUARDRAIL IS PLACED AT SLOPE BREAK, MINIMUM POST LENGTH SHALL BE BASED ON TABLE ON STANDARD DRAWING S-PL-6. ADDITIONAL EXPENSE TO BE INCLUDED IN THE COST OF THE RUN OF GUARDRAIL.

BLOCKOUTS

(I) BLOCKOUTS SHALL BE WOOD CONFORMING TO THE REQUIREMENTS OF TDOT CONSTRUCTION STANDARD SPECIFICATIONS OR PLASTIC GUARDRAIL BLOCKOUTS LISTED ON THE TDOT QUALIFIED PRODUCT LIST.

(J) ONLY WOODEN BLOCKOUTS MAY BE USED WITH WOODEN POSTS, PLASTIC OR WOODEN BLOCKOUTS MAY BE USED WITH STEEL POSTS.

(K) ALL BLOCKOUTS SHALL MEET NCHRP-350 OR MASH GUIDELINES.

(L) MIXING THE BLOCKOUT MATERIAL ON A GIVEN PROJECT SHOULD BE AVOIDED. IF MIXING OF BLOCKOUT MATERIAL IS NECESSARY, BLOCKOUTS SHALL NOT BE MIXED ON A SINGLE RUN OF GUARDRAIL.

FUTURE ADJUSTMENTS

(M) BLOCKOUTS SHALL HAVE ONE ADDITIONAL ¾" HOLE, FOUR INCHES BELOW THE INITIAL HOLE FOR FUTURE ADJUSTMENT.

(N) INITIAL INSTALLATION REQUIRES ONE BOLT CONNECTION, EACH ADJUSTMENT THEREAFTER REQUIRES TWO BOLT CONNECTIONS.

END TREATMENTS

(O) ALL RUNS OF GUARDRAIL WILL BEGIN AND END WITH AN ANCHOR SYSTEM (SEE S-GRA-SERIES).

(P) GUARDRAIL ENDS THAT ARE INSIDE THE CLEARZONE AND EXPOSED TO ONCOMING TRAFFIC SHALL HAVE A CRASH WORTHY END TERMINAL AS NOTED:

(1) ANY ROAD WITH SUITABLE BACKSLOPES SHALL USE END TERMINALS BURIED IN BACK SLOPE (SEE S-GRT-1).

(2) ALL HIGHWAY SYSTEM ROADS WITHOUT SUITABLE BACKSLOPES SHALL USE TANGENTIAL END TERMINALS (SEE S-GRT-2).

(3) ALL OTHER ROADS SHALL USE SLOTTED RAIL END TERMINALS UNLESS OTHERWISE NOTED (SEE S-GRT-3).

DESIGN

(Q) 4' BEHIND GUARDRAIL SHALL BE CLEAR AT OBSTRUCTION FOR DEFLECTION.

(R) REFER TO SAFETY PLAN STANDARDS FOR HOW TO DETERMINE THE BEGINNING AND END.

PAYMENT

(S) PAYMENT FOR GUARDRAIL WILL BE UNDER ITEM:

705-02.02 SINGLE GUARDRAIL (TYPE 2) LF

(T) GUARDRAIL WILL BE PAID FOR ONLY IN LENGTHS THAT ARE MULTIPLES OF 6'-3".

(U) PAYMENT FOR SPECIAL CONNECTIONS AND GUARDRAIL SECTIONS REQUIRED FOR END TREATMENTS WILL BE AS NOTED ON THOSE DRAWINGS.

(V) FOR W-GR BEAM INSTALLATION, LOCATION, AND DEFLECTION NOTES SEE S-PL-6.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

W-BEAM GUARDRAIL

7-11-13 | S-GR31-1

12/6/2016 12:37:00 PM
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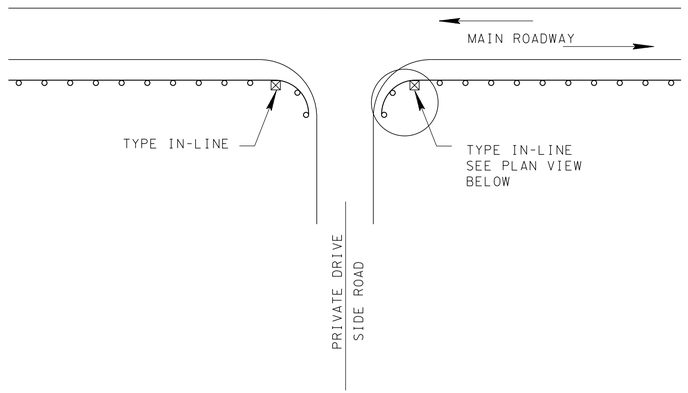
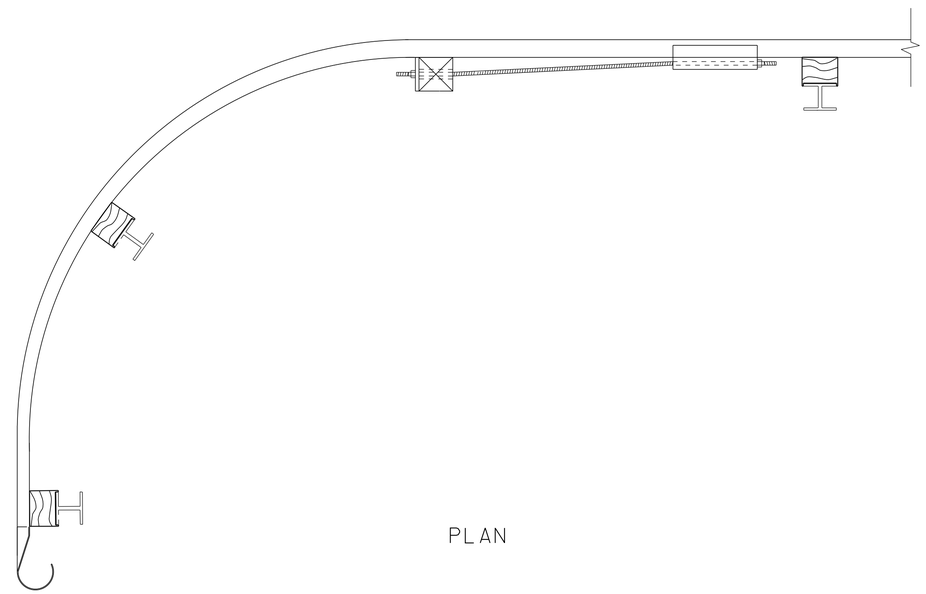
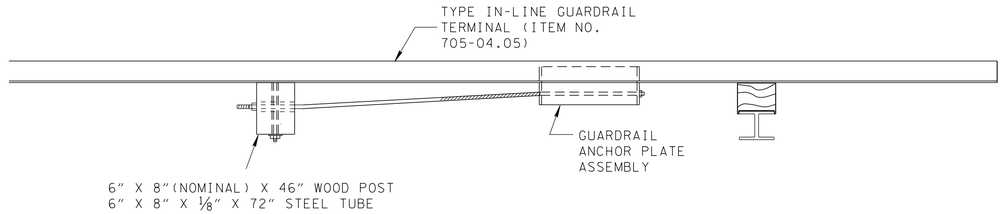
REV. 10-10-16: REVISED POST SIZE IN PLAN VIEW. ADDED DIMENSIONS, REVISED DETAIL, REVISED NOTES.



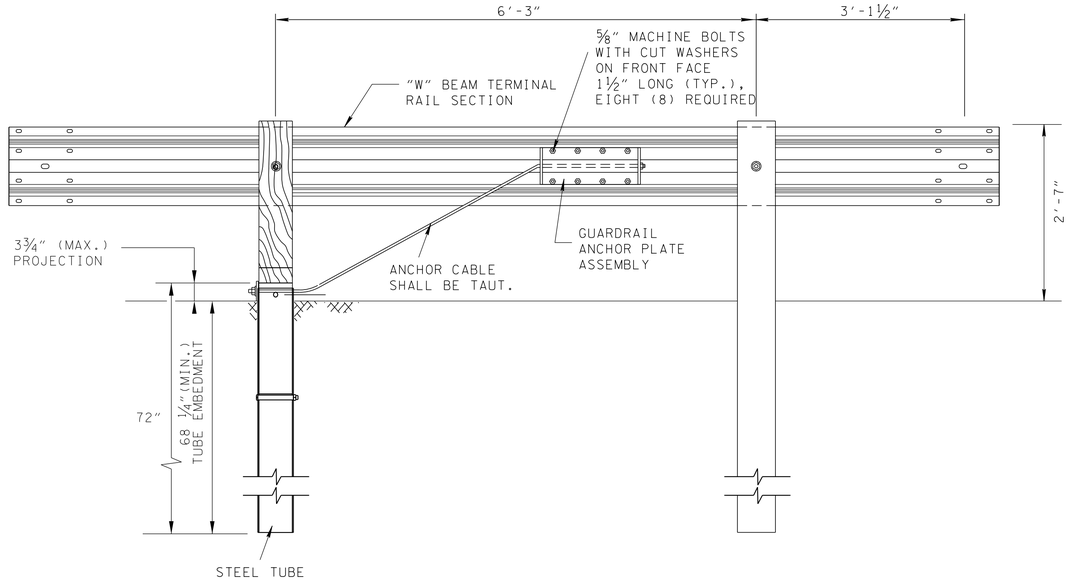
GUARDRAIL TERMINAL ANCHOR (TYPE IN-LINE) APPLICATION



PLAN



PLAN



ELEVATION FROM BEHIND GUARDRAIL

(SEE S-GRA-3 FOR HARDWARE DETAILS)

NOTE TO DESIGNER

DO NOT USE ON NATIONAL HIGHWAY SYSTEM (NHS), USE S-PL-2 ON NHS

DO NOT USE WITHOUT ALSO REFERENCING S-GRA-3.

GENERAL NOTES

(A) THIS ANCHORAGE MAY ONLY BE USED ON THE TRAILING END OF A BARRIER WHICH IS NOT EXPOSED TO DIRECT VEHICULAR IMPACT OR IS OUTSIDE THE CLEAR ZONE (ONLY DIVIDED HIGHWAYS OR ROADS WITH ONE WAY TRAFFIC) USE S-PL-1 TO DETERMINE LENGTH OF NEED.

(B) IN-LINE GUARDRAIL TRMINAL TO BE PAID FOR UNDER ITEM NUMBER:

PAY ITEM NO. 705-04.05 GUARDRAIL TERMINAL (TYPE IN-LINE) PER EACH

COST TO INCLUDE WOOD POST, STEEL TUBE, ANCHOR CABLE, AND CABLE ASSEMBLY.

☒ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

IN-LINE
GUARDRAIL
ANCHOR

7-11-13 | S-GRA-4

11/5/2016 9:34:56 AM
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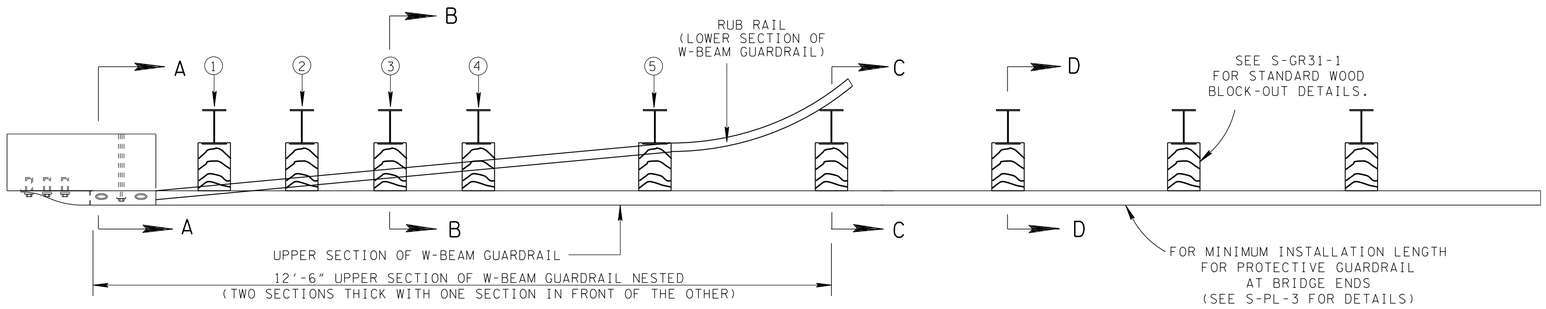
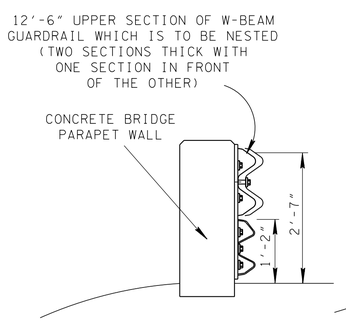
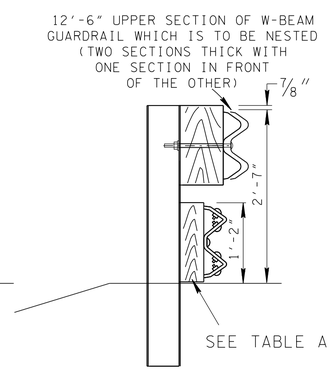
REV. 10-10-16: UPDATED REFERENCES TO OTHER STANDARD DRAWINGS. MODIFIED PLAN AND ELEVATION VIEW.



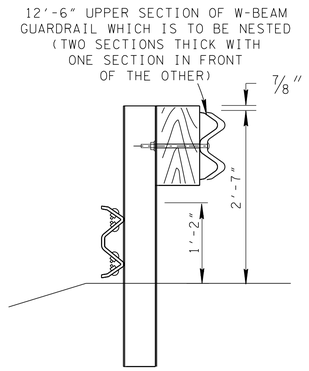
PLAN



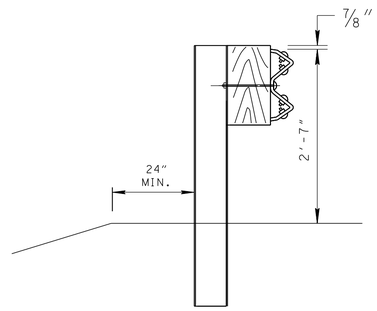
SECTION A-A



SECTION B-B



SECTION C-C



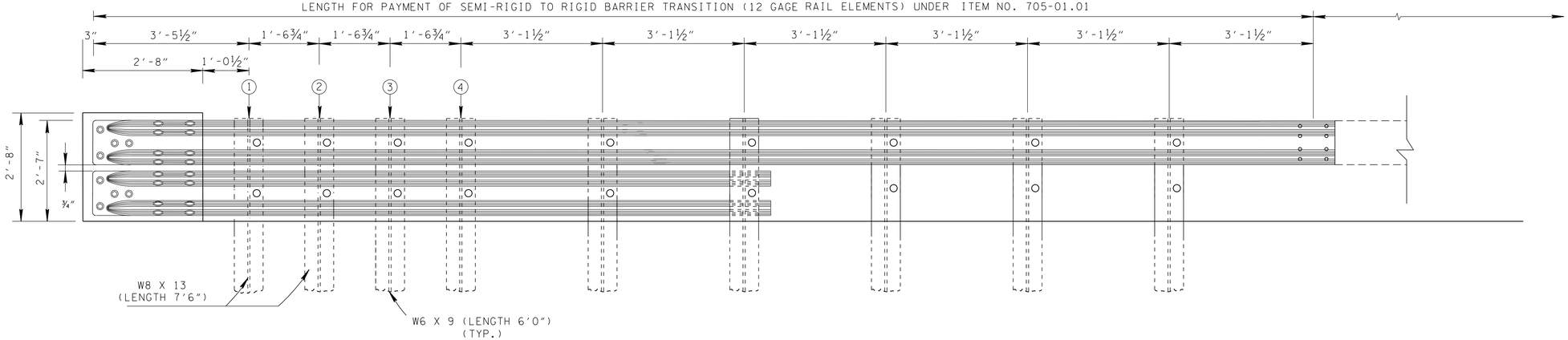
SECTION D-D

TABLE A

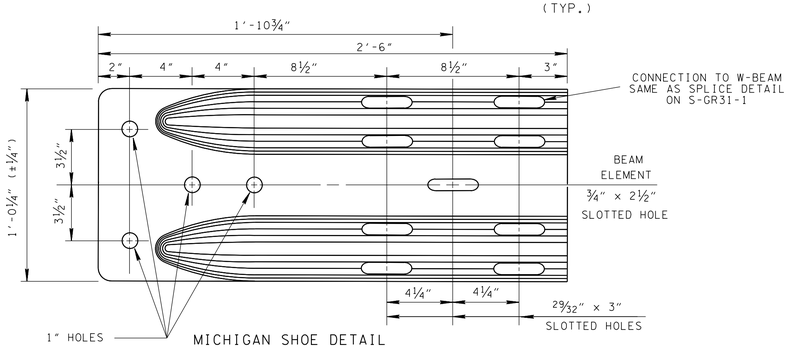
GUARDRAIL RUB-RAIL BLOCK-OUT THICKNESS TABLE	
POST	THICKNESS
①	0.556'
②	0.446'
③	0.338'
④	0.230'
⑤	NO BLOCK

TREATED TIMBER 14½" X 4" BLOCK-OUT

26'-10¾"
LENGTH FOR PAYMENT OF SEMI-RIGID TO RIGID BARRIER TRANSITION (12 GAGE RAIL ELEMENTS) UNDER ITEM NO. 705-01.01



ELEVATION



MICHIGAN SHOE DETAIL

GENERAL NOTES

(A) TO BE USED AT ALL GUARDRAIL TRANSITIONS TO BRIDGE RAIL OR CONCRETE BARRIER WALLS WITH ADT>400 VEH/DAY.

(B) CONNECTION TO BRIDGE RAIL SHOWN; FOR CONNECTION TO CONCRETE BARRIER WALLS, SEE S-SSMB-6.

(C) BOLTS FROM MICHIGAN SHOE TO BRIDGE RAIL TO BE AS SHOWN ON STRUCTURE'S BRIDGE RAIL STANDARD DRAWINGS.

(D) SEE S-GR31-1 FOR ALL OTHER DETAILS AND MATERIAL PROPERTIES NOT SHOWN.

(E) RUB RAIL IS ONLY REQUIRED AT BRIDGES.

(F) PAY ITEM 705-01.01 GUARDRAIL AT BRIDGE ENDS.

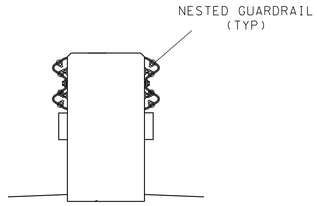
(G) SEE S-PL-3 FOR MINIMUM LENGTH AND DELINEATOR REQUIREMENTS.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

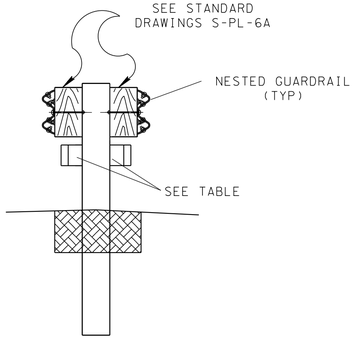
GUARDRAIL CONNECTION TO BRIDGE ENDS OR BARRIER WALL

7-11-13 | S-GRC-1

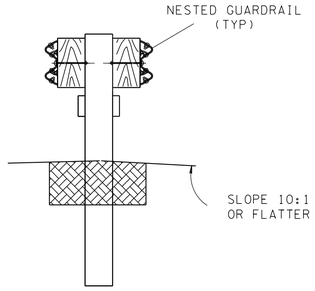
REV. 10-10-16: UPDATED REFERENCES TO OTHER STANDARD DRAWINGS. REVISED ELEVATION DETAIL.



SECTION A-A

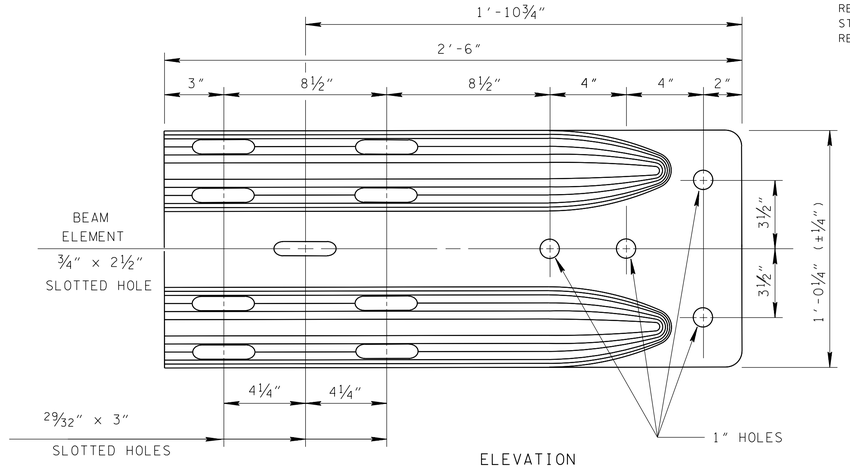


SECTION B-B

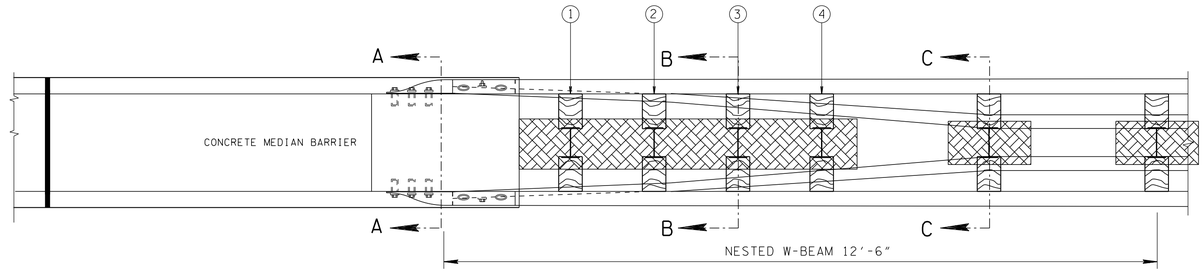


SECTION C-C

COMPACTED
EARTH
NO ASPHALT



ELEVATION
(FRONT)



TRANSITION TO CONCRETE MEDIAN BARRIER DETAIL
PLAN

GUARDRAIL RUB-RAIL BLOCK-OUT THICKNESS TABLE	
POST	THICKNESS
1	0.556′
2	0.446′
3	0.338′
4	0.230′

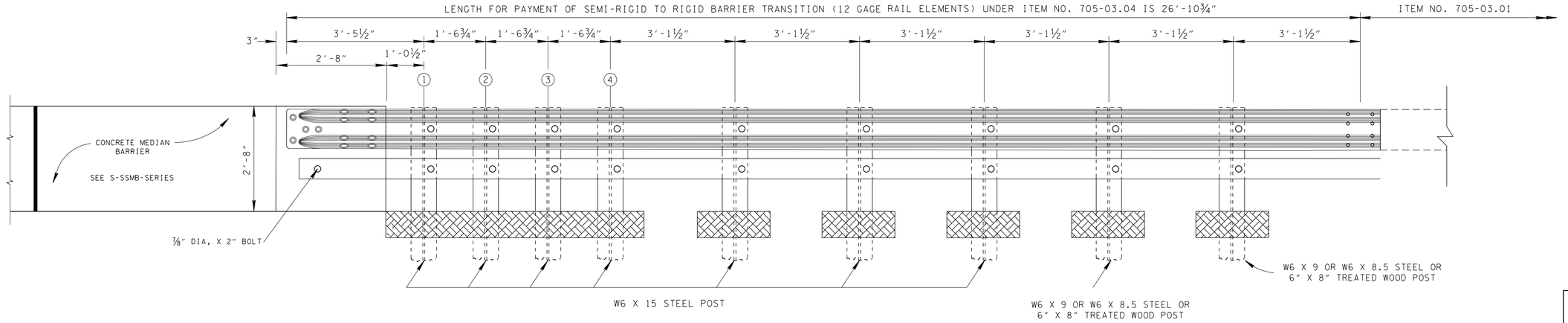
TREATED TIMBER 14½″ X 4″ BLOCK-OUT

GENERAL NOTES

(A) TO BE USED AT ALL TRANSITIONS FROM CONCRETE MEDIAN BARRIER TO MEDIAN DIVIDER GUARDRAIL.

(B) SEE S-SSMB-6 FOR CONNECTION DETAILS TO MEDIAN BARRIER.

(C) PAY ITEM NO. 705-03.04. MEDIAN DIVIDER GUARDRAIL AT CONCRETE BARRIER PER LF.



ELEVATION

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

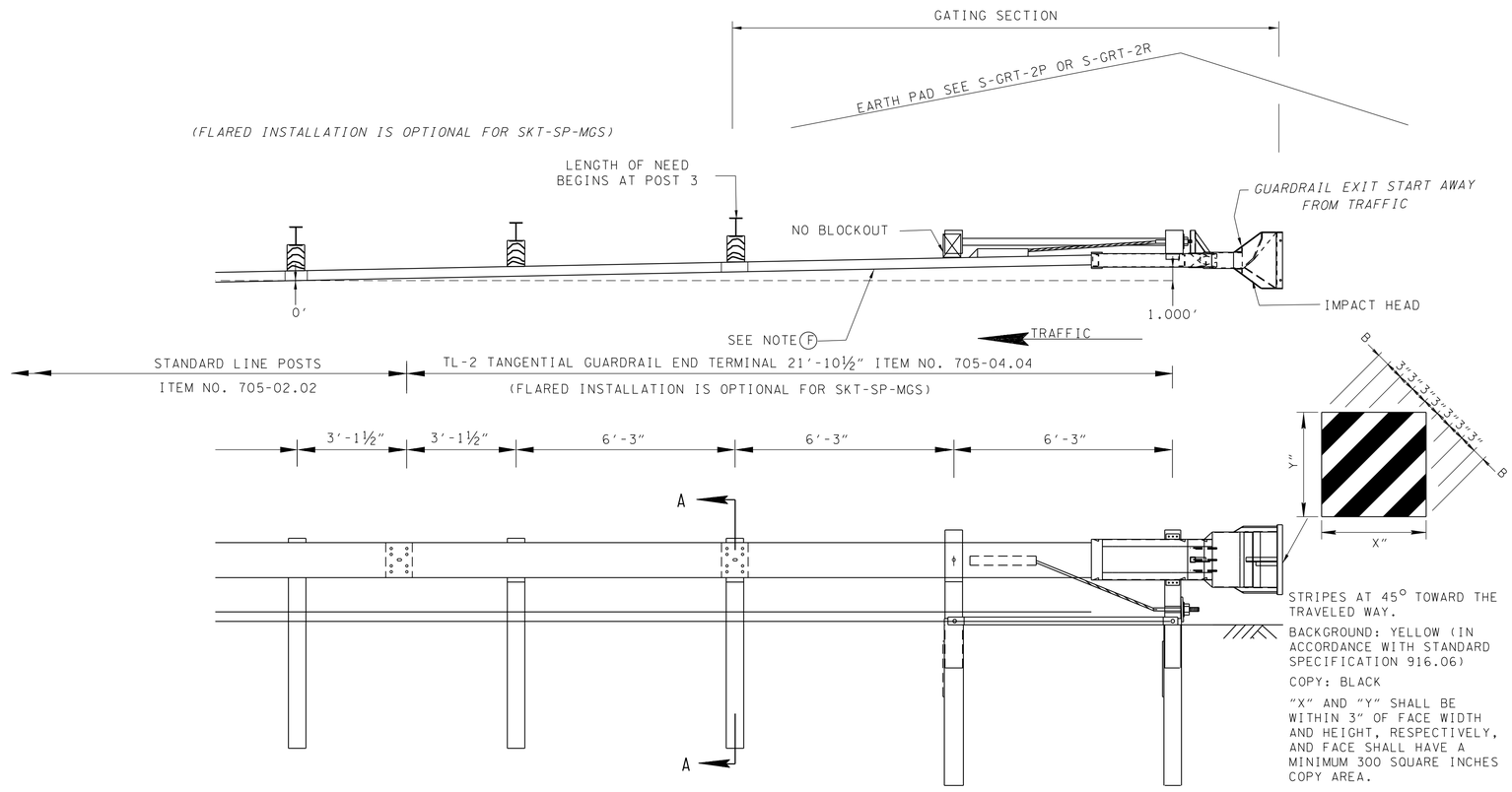
MEDIAN DIVIDER
GUARDRAIL
TRANSITION
TO CONCRETE
MEDIAN BARRIER

7-11-13 | S-GRC-3

- REV. 11-3-14: MODIFIED PAY LENGTH FOR TYPE 38 END TERMINAL.

  REV. 4-4-16: THE PREVIOUSLY SHOWN SKT75 (SLOTTED FLARED GUARDRAIL TERMINAL) IS NO LONGER AVAILABLE FOR 31" INSTALLATION. REVISED TO SHOW TL-2 T-350 TERMINAL.

- REV. 10-10-16: UPDATED LIMIT OF PAYMENT.

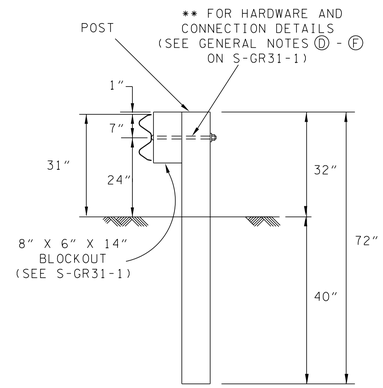


STRIPES AT 45° TOWARD THE TRAVELED WAY.

BACKGROUND: YELLOW (IN ACCORDANCE WITH STANDARD SPECIFICATION 916.06)

COPY: BLACK

"X" AND "Y" SHALL BE WITHIN 3" OF FACE WIDTH AND HEIGHT, RESPECTIVELY, AND FACE SHALL HAVE A MINIMUM 300 SQUARE INCHES COPY AREA.



SECTION A-A

NOTE TO DESIGNER

DO NOT USE WITHOUT REFERENCING S-GRT-2P OR S-GRT-2R

NOTE TO INSTALLER

SKT 350 WITH 21'-10½" INSTALLATION IS SHOWN, POST MATERIAL TYPE, SIZE, GUARDRAIL SPLICING LOCATION, TAPER RATE, OFFSET, GUARDRAIL HEIGHT, IMPACT HEAD DIMENSION, AND ALL OTHER MISCELLANEOUS HARDWARE MAY BE DIFFERENT FOR OTHER DEVICES. INSTALLATION SHALL FOLLOW THE MANUFACTURER'S SHOP DRAWINGS.

GENERAL NOTES

Ⓐ THIS TERMINAL SHALL ONLY BE USED ON ROADWAYS WITH POSTED SPEED LIMIT OF 45 MPH OR LESS.

Ⓑ ONLY NCHRP 350 OR MASH COMPLIANT TL-2 END TERMINALS ON THE TDOT QPL MAY BE INSTALLED. MANUFACTURER'S SHOP DRAWINGS SHALL BE REQUIRED BEFORE ANY TANGENTIAL END TERMINAL INSTALLATIONS CAN BEGIN. THE CONTRACTOR SHALL HAVE ONE COMPLETE SET OF SHOP DRAWINGS ON SITE DURING INSTALLATION OR REPAIR OF ANY TANGENTIAL GUARDRAIL TERMINAL ANCHOR. THE CONTRACTOR SHALL ALSO PROVIDE THE CONSTRUCTION OR MAINTENANCE SUPERVISOR WITH ONE COMPLETE SET OF SHOP DRAWINGS INCLUDING TDOT QPL EVALUATION NUMBER.

Ⓒ FOR THE TYPE 21 GUARDRAIL TERMINAL TO FUNCTION AS IT WAS CRASH TESTED UNDER NCHRP 350 OR MASH TL-2 THE EARTH PAD MUST BE CONSTRUCTED PER STANDARD DRAWING NO. S-GRT-2P OR S-GRT-2R.

Ⓓ THE TERMINAL (INCLUDING ANCHOR) IS TO BE INSTALLED UNDER THE PRICE BID FOR ITEM NO. 705-04.04 PER EACH.

Ⓔ TERMINAL SYSTEM MUST BE CONSTRUCTED SO THAT THE FULL LENGTH OF THE TERMINAL SYSTEM GUARD RAILING IS IN A STRAIGHT ALIGNMENT.

Ⓕ DIFFERENT TERMINAL SYSTEMS OR PARTS SHALL NOT BE COMBINED ON A RUN OF GUARDRAIL.

Ⓖ THE FIRST 12'-6" FROM THE IMPACT HEAD IS GATING FOR SKT-SP-MGS, DO NOT USE THIS SECTION IN LENGTH OF NEED.

Ⓗ IF THE GUARDRAIL NEEDS TO BE EXTENDED, EXTEND IT IN INCREMENTS OF 12'-6".

Ⓘ IF WOOD POSTS ARE USED, ALL HOLES IN WOOD POSTS ARE TO BE DRILLED BEFORE PRESERVATIVE TREATMENT IS APPLIED.

Ⓙ ALL CUTTING, DRILLING, AND WELDING OF STEEL COMPONENTS SHALL BE DONE BEFORE GALVANIZING.

Ⓚ THE FINISHED CABLE ASSEMBLY WILL NOT BE ACCEPTABLE UNLESS IT IS IN TENSION WITH NO SAG.

Ⓛ IF THE SHOULDER IS LESS THAN 2'-0", END TERMINAL MUST BE FLARED. IF THE SHOULDER IS GREATER THAN 2'-0", END TERMINAL MAY BE TANGENTIAL. IF FLARED INSTALLATION IS IMPLEMENTED, USE 25:1 MAXIMUM FLARE RATE OR INSTALL END TERMINAL AS DIRECTED BY THE FIELD ENGINEER.

Ⓜ FOR RETROFIT PROJECTS, SEE S-GRT-2R.

Ⓝ FOR NEW CONSTRUCTION, INSTALL TERMINALS AT 31" HEIGHT. FOR RETROFIT PROJECTS, USE GUARDRAIL HEIGHT TRANSITION DETAIL. SEE S-GRS-4.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPE 21 GUARDRAIL END TERMINAL

7-11-13 | S-GRT-3

11/6/2016 9:44:06 AM
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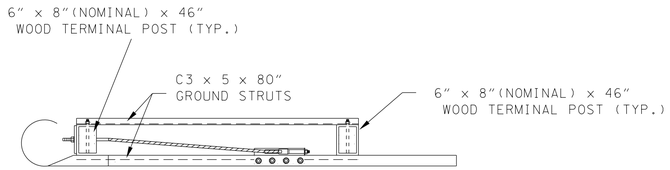
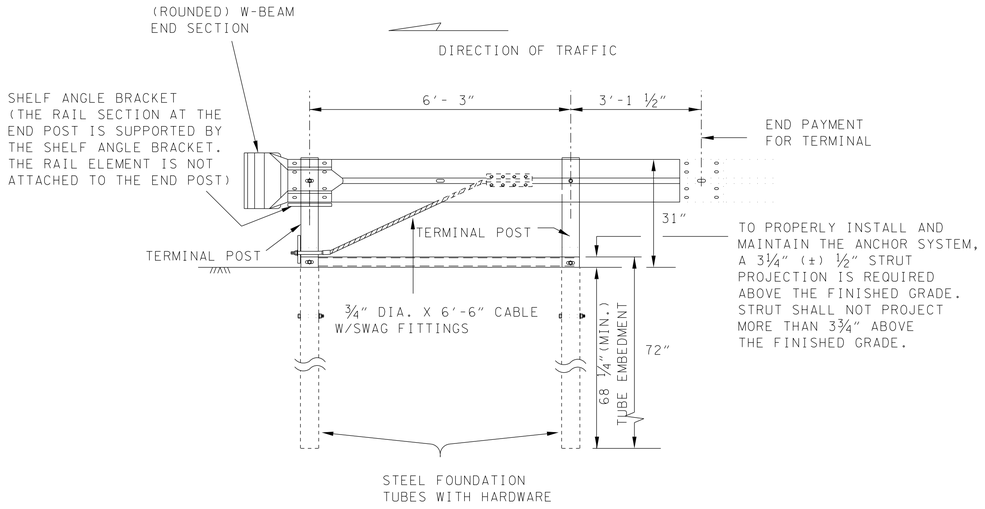
- REV. 11-06-14: EXTENDED GUARDRAIL TERMINAL PAY LIMITS.
- REV. 4-23-15: REVISED TERMINAL RAIL ELEMENT DETAILS. ADDED ALTERNATE DETAIL.

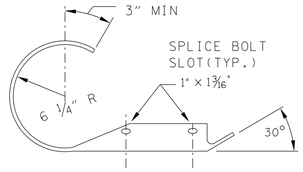
  REV. 10-10-16: UPDATED DETAILS TO MATCH UPDATED S-GRA-3.



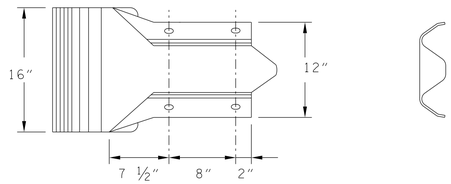
PLAN



ELEVATION FROM FRONT OF GUARDRAIL

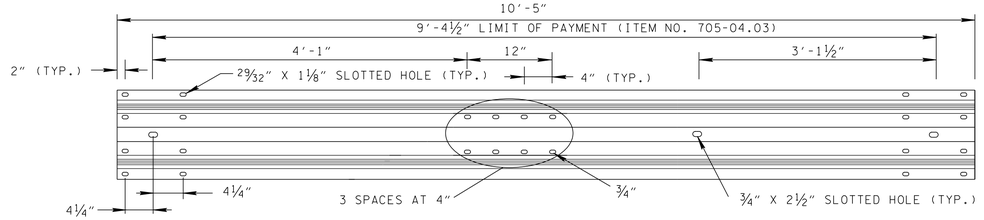


PLAN

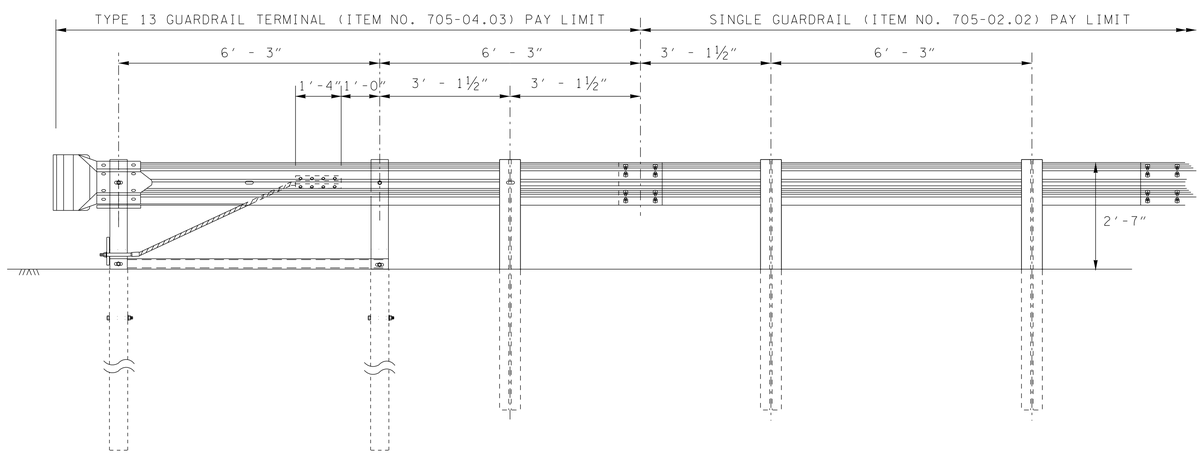


ELEVATION

W-BEAM END SECTION (ROUNDED) (12 GA.)



TERMINAL RAIL ELEMENT DETAILS



ALTERNATE INSTALLATION DETAIL

NOTE TO DESIGNER

DO NOT USE WITHOUT ALSO REFERENCING S-GRA-3

GENERAL NOTES

(A) THIS ANCHORAGE MAY ONLY BE USED ON THE TRAILING END OF A BARRIER WHICH IS NOT EXPOSED TO DIRECT VEHICULAR IMPACT OR OUTSIDE THE CLEAR ZONE (ONLY DIVIDED HIGHWAYS OR ROADS WITH ONE WAY TRAFFIC) USE S-PL-1 TO DETERMINE LENGTH OF NEED.

(B) GUARDRAIL SHALL MEET THE REQUIREMENTS OF AASHTO M 180, CLASS A, TYPE 1 UNLESS OTHERWISE DESIGNATED.

(C) PAY ITEM NO. 705-04.03 GUARDRAIL TERMINAL (TYPE13)

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPE 13 GUARDRAIL TERMINAL (TRAILING END)

7-11-13 | S-GRT-4

11/15/2016 9:44:09 AM
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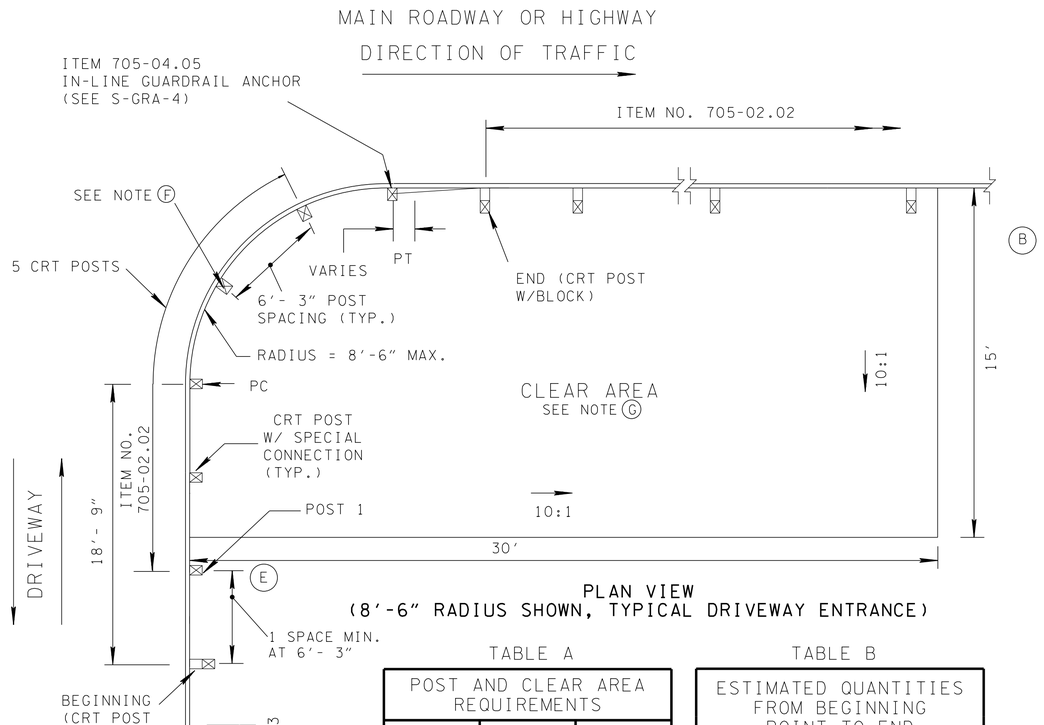
REV. 10-10-16: ADDED SEPARATE PLAN VIEW FOR PRIVATE DRIVES. REVISED GUARDRAIL TERMINAL TYPES. REVISED GENERAL NOTES.



PLAN VIEW
(8'-6" RADIUS SHOWN, TYPICAL DRIVEWAY ENTRANCE)

TABLE A

POST AND CLEAR AREA REQUIREMENTS

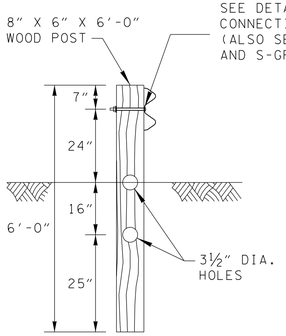
GUARDRAIL RADIUS	NUMBER OF CRT POSTS	CLEAR AREA L	CLEAR AREA W
(F) 8'- 6"	5	30'	15'
17'- 0"	6	30'	15'
25'- 6"	8	40'	20'
35'- 0"	11	50'	20'

TABLE B

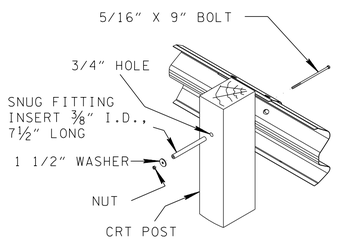
ESTIMATED QUANTITIES FROM BEGINNING POINT TO END

RADIUS	705-02.02	705-04.05
(F) 8'- 6"	37'-6"	1 *
17'- 0"	50'-0"	1 *
25'- 6"	62'-6"	1 *
35'- 0"	75'-0"	1 *

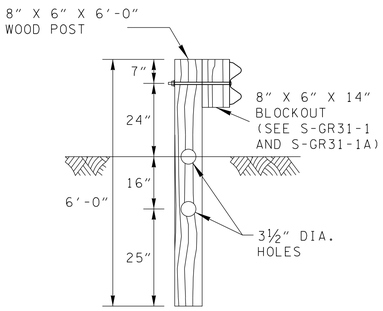
* IF GUARDRAIL CONTINUES BEYOND POST 1, SEE NOTE (E)



TYPICAL CRT POST DETAIL



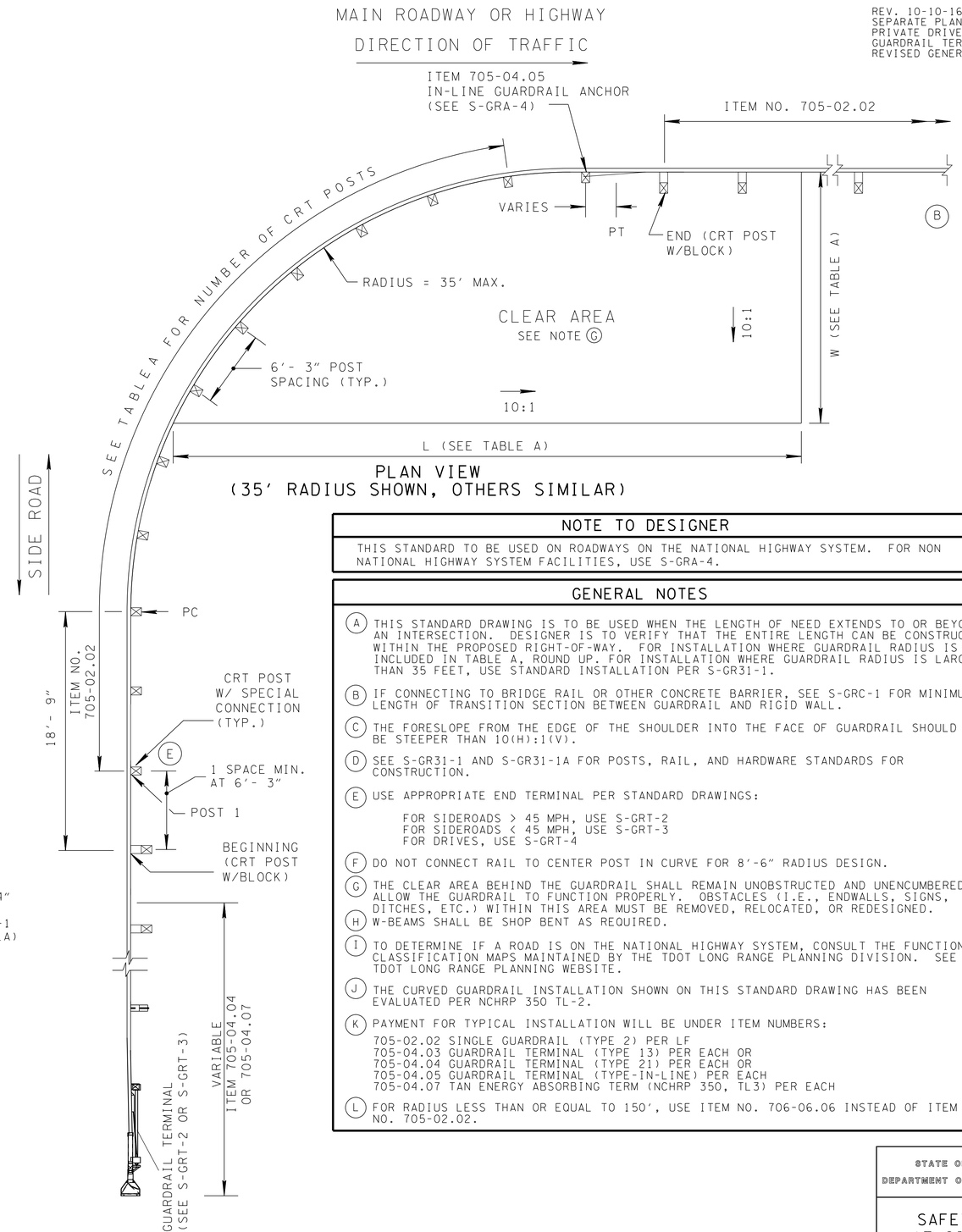
DETAIL A
SPECIAL CONNECTION DETAIL



CRT POST WITH BLOCK DETAIL

SPECIAL CRT POST NOTES

1. FEWER CRT POSTS ARE REQUIRED FOR SMALLER RADII; INCLUDE CRT POST AT POINT B. ATTACH GUARDRAIL TO POST WITH A 5/16" X 9" LONG BOLT, A ⅜" X 7½" SNUG FITTING INSERT AND A 1½" WASHER WITH NUT ON BACK OF POST.
2. THE FLAT WASHER IS USED UNDER THE NUT, BEHIND THE POST ONLY. NO WASHER IS USED AT THE RAIL.



PLAN VIEW
(35' RADIUS SHOWN, OTHERS SIMILAR)

NOTE TO DESIGNER

THIS STANDARD TO BE USED ON ROADWAYS ON THE NATIONAL HIGHWAY SYSTEM. FOR NON NATIONAL HIGHWAY SYSTEM FACILITIES, USE S-GRA-4.

GENERAL NOTES

(A) THIS STANDARD DRAWING IS TO BE USED WHEN THE LENGTH OF NEED EXTENDS TO OR BEYOND AN INTERSECTION. DESIGNER IS TO VERIFY THAT THE ENTIRE LENGTH CAN BE CONSTRUCTED WITHIN THE PROPOSED RIGHT-OF-WAY. FOR INSTALLATION WHERE GUARDRAIL RADIUS IS NOT INCLUDED IN TABLE A, ROUND UP. FOR INSTALLATION WHERE GUARDRAIL RADIUS IS LARGER THAN 35 FEET, USE STANDARD INSTALLATION PER S-GR31-1.

(B) IF CONNECTING TO BRIDGE RAIL OR OTHER CONCRETE BARRIER, SEE S-GRC-1 FOR MINIMUM LENGTH OF TRANSITION SECTION BETWEEN GUARDRAIL AND RIGID WALL.

(C) THE FORESLOPE FROM THE EDGE OF THE SHOULDER INTO THE FACE OF GUARDRAIL SHOULD NOT BE STEEPER THAN 10(H):1(V).

(D) SEE S-GR31-1 AND S-GR31-1A FOR POSTS, RAIL, AND HARDWARE STANDARDS FOR CONSTRUCTION.

(E) USE APPROPRIATE END TERMINAL PER STANDARD DRAWINGS:

FOR SIDEROADS > 45 MPH, USE S-GRT-2
FOR SIDEROADS < 45 MPH, USE S-GRT-3
FOR DRIVES, USE S-GRT-4

(F) DO NOT CONNECT RAIL TO CENTER POST IN CURVE FOR 8'-6" RADIUS DESIGN.

(G) THE CLEAR AREA BEHIND THE GUARDRAIL SHALL REMAIN UNOBSTRUCTED AND UNENCUMBERED TO ALLOW THE GUARDRAIL TO FUNCTION PROPERLY. OBSTACLES (I.E., ENDWALLS, SIGNS, DITCHES, ETC.) WITHIN THIS AREA MUST BE REMOVED, RELOCATED, OR REDESIGNED.

(H) W-BEAMS SHALL BE SHOP BENT AS REQUIRED.

(I) TO DETERMINE IF A ROAD IS ON THE NATIONAL HIGHWAY SYSTEM, CONSULT THE FUNCTIONAL CLASSIFICATION MAPS MAINTAINED BY THE TDOT LONG RANGE PLANNING DIVISION. SEE TDOT LONG RANGE PLANNING WEBSITE.

(J) THE CURVED GUARDRAIL INSTALLATION SHOWN ON THIS STANDARD DRAWING HAS BEEN EVALUATED PER NCHRP 350 TL-2.

(K) PAYMENT FOR TYPICAL INSTALLATION WILL BE UNDER ITEM NUMBERS:

705-02.02 SINGLE GUARDRAIL (TYPE 2) PER LF
705-04.03 GUARDRAIL TERMINAL (TYPE 13) PER EACH OR
705-04.04 GUARDRAIL TERMINAL (TYPE 21) PER EACH OR
705-04.05 GUARDRAIL TERMINAL (TYPE-IN-LINE) PER EACH
705-04.07 TAN ENERGY ABSORBING TERM (NCHRP 350, TL3) PER EACH

(L) FOR RADIUS LESS THAN OR EQUAL TO 150', USE ITEM NO. 706-06.06 INSTEAD OF ITEM NO. 705-02.02.

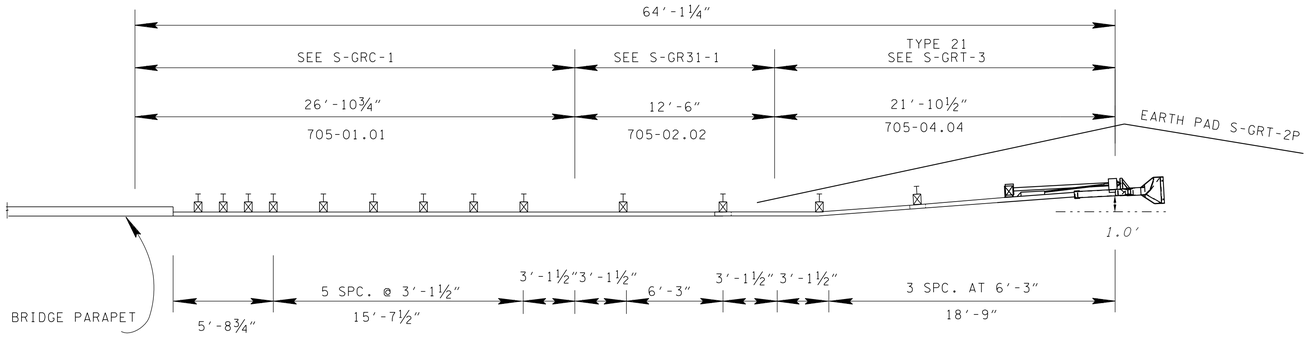
☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SAFETY PLAN AT SIDEROADS OR PRIVATE DRIVES

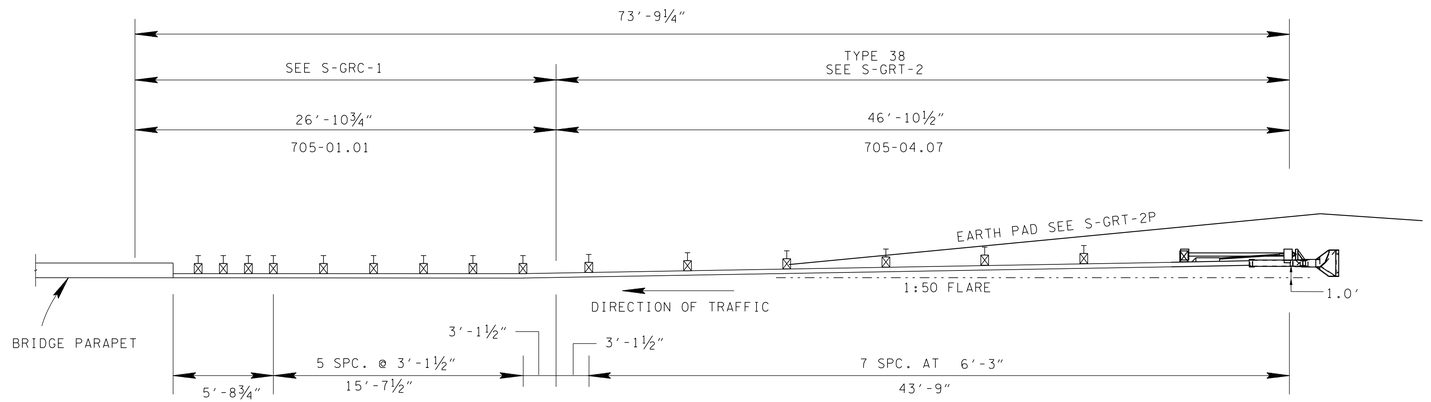
7-11-13 | S-PL-2

REV. 10-10-16: UPDATED REFERENCES TO OTHER STANDARD DRAWINGS. UPDATED LENGTH OF TYPE 38 TERMINAL AND MODIFIED PLAN VIEW FOR TYPE 38 TERMINAL.



PLAN FOR TYPE 21
MINIMUM INSTALLATION LENGTH FOR TL-2 GUARDRAIL TERMINAL (FOR LOW SPEED FACILITIES V < 45 MPH)

SAFETY PERFORMANCE OF SLOTTED GUARDRAIL TERMINAL IS ACCEPTABLE ACCORDING TO THE TL-2 EVALUATION CRITERIA SPECIFIED IN NCHRP 350. SLOTTED GUARDRAIL TERMINAL MAY BE USED ON ALL LOW SPEED ROADS ON THE NATIONAL HIGHWAY SYSTEM WHEN THE CURRENT DESIGN SPEED IS LESS THAN 45 MPH. EARTH PAD IS REQUIRED AS SHOWN ON S-GRT-2P. FOR LOW SPEED LOCAL ROADS WITH ADT<2000 VEH/DAY, S-GRC-2 MAY BE USED.



PLAN FOR TYPE 38
MINIMUM INSTALLATION LENGTH FOR TANGENTIAL GUARDRAIL END TERMINAL

SAFETY PERFORMANCE OF TANGENTIAL GUARDRAIL TERMINAL END SHALL MEET THE TL-3 EVALUATION CRITERIA SPECIFIED IN NCHRP 350 OR AASHTO MASH. ONLY TERMINALS LISTED ON QPL LIST 17 SHALL BE USED. EARTH PAD IS REQUIRED AS SHOWN ON S-GRT-2P AS DESCRIBED ON THE DRAWING.

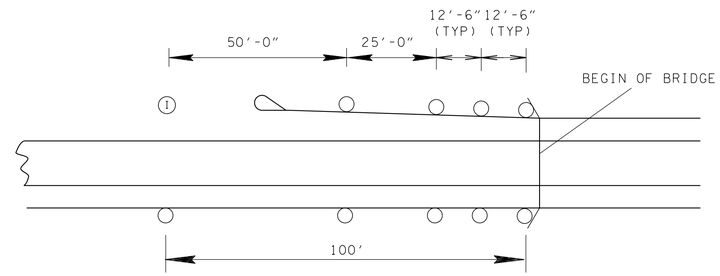
GENERAL NOTES

(A) THIS DRAWING SHALL BE USED FOR BRIDGE ENDS OR RIGID CONCRETE BARRIER WALL ENDS ONLY. FOR OTHER HAZARDS, S-PL-1 SHALL BE USED TO DETERMINE LENGTH OF NEED FOR GUARDRAIL.

(B) SEE S-GRC-1 FOR DETAILS AND SPECIFICATIONS REGARDING INSTALLATION OF PROTECTIVE GUARDRAIL AT BRIDGE ENDS. TO BE PAID FOR UNDER ITEM NO. 705-01.01 GUARDRAIL AT BRIDGE ENDS.

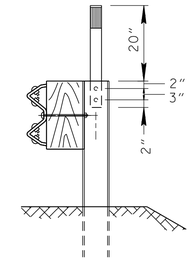
(C) IF A FIELD EVALUATION DISCOVERS A SECONDARY HAZARD, THEN S-PL-1 SHALL BE USED TO DETERMINE LENGTH OF NEED.

(D) LOCATIONS WHERE THE ABOVE SHOWN MINIMUM TRANSITION AND GUARDRAIL TERMINAL ANCHOR CANNOT BE INSTALLED DUE TO A SIDE ROAD OR DRIVEWAY, OTHER ALTERNATIVES SHALL BE CONSIDERED SUCH AS CURVED GUARDRAIL (S-PL-2) OR INTRODUCING A NON-GATING ATTENUATOR.



MIN. DELINEATOR PLACEMENT AT BRIDGE APPROACHES INSTALLED ON GUARDRAIL POSTS

LEGEND: "o" DENOTES GUARDRAIL DELINEATORS. (SHOULDER LINES AND GUARDRAIL POSTS NOT SHOWN FOR CLARITY.)



STEEL POST

FLEXIBLE DELINEATOR GENERAL NOTES

(A) DELINEATORS SHALL CONFORM TO NOTES AND DETAILS SPECIFIED ON STANDARD DRAWING T-S-11,

(B) DELINEATORS SHALL BE INSTALLED ACROSS BRIDGES ONLY WHEN GUARDRAIL IS CONTINUOUS ACROSS BRIDGES. DELINIATOR SPACING ON BRIDGES SHALL BE AT 12′-6″ INTERVALS.

(C) THE COLOR OF DELINEATORS SHALL CONFORM TO THE COLOR OF EDGELINES STIPULATED IN SECTION 3B.06 OF THE MUTCD (CURRENT EDITION).

(D) DELINEATORS SHALL BE FACED TOWARD THE APPROACHING TRAFFIC IN THE LANE ADJACENT TO THE GUARDRAIL AT ALL LOCATIONS.

(E) DELINEATORS SHALL BE FIRMLY SECURED TO THE POST BY TWO CONNECTIONS.

(F) THE TWO HOLES IN THE STEEL GUARDRAIL POSTS ARE USED TO ATTACH THE DELINEATOR POST IN THE FIELD. THE HOLES SHALL BE ¼″ IN DIAMETER. IF THE HOLES ARE SHOP DRILLED, THEY SHALL BE DRILLED PRIOR TO GALVANIZING THE POST. IF THE HOLES ARE FIELD DRILLED, THEY SHALL BE THOROUGHLY PAINTED WITH A TOUCH-UP GALVANIZING SPRAY PAINT PRIOR TO ATTACHING THE DELINEATOR POST.

(G) THE COST OF FURNISHING AND INSTALLING THESE BRIDGE APPROACH GUARDRAIL DELINEATORS SHALL BE INCLUDED IN THE PRICE BID FOR THE ITEMS OF GUARDRAIL TO WHICH THE DELINEATORS ARE ATTACHED.

(H) ONLY DELINEATORS LISTED ON THE QPL, LIST 1. SECTION G.2 GUARDRAIL POST DELINEATION, MAY BE USED.

(I) DELINEATORS ARE NOT REQUIRED IF GUARDRAIL IS TERMINATED PRIOR TO INDICATED LOCATION.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

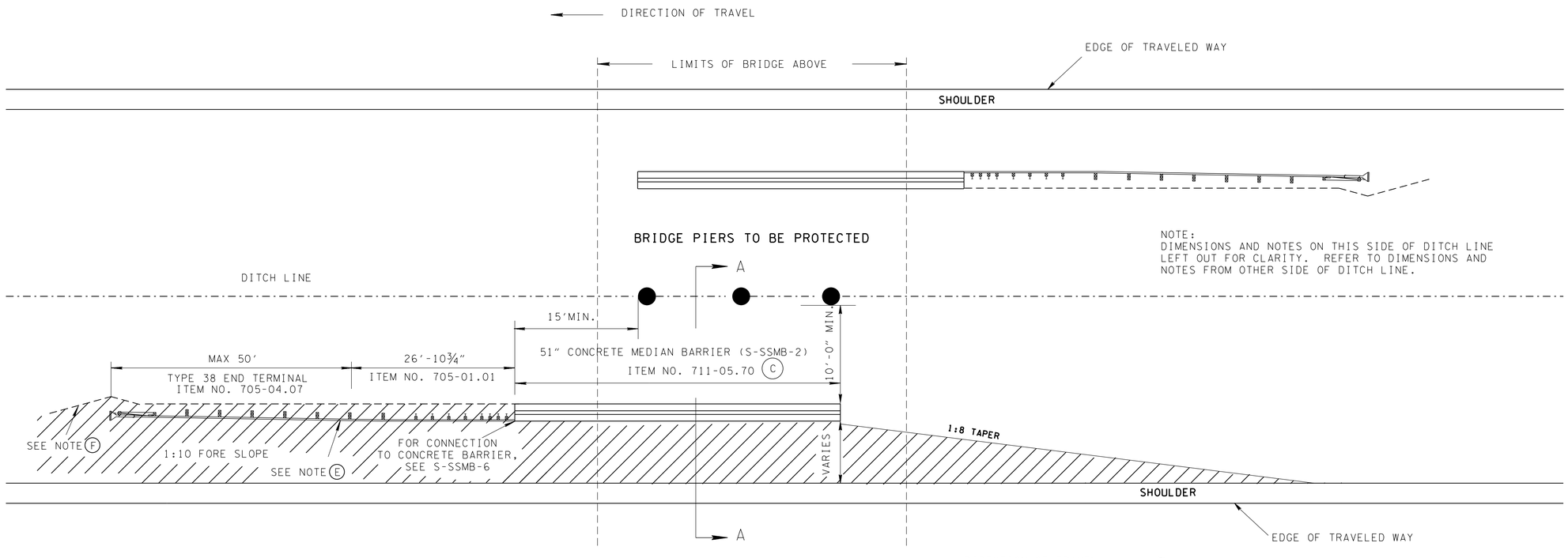
SAFETY PLAN:
MINIMUM
INSTALLATION
AT BRIDGE ENDS

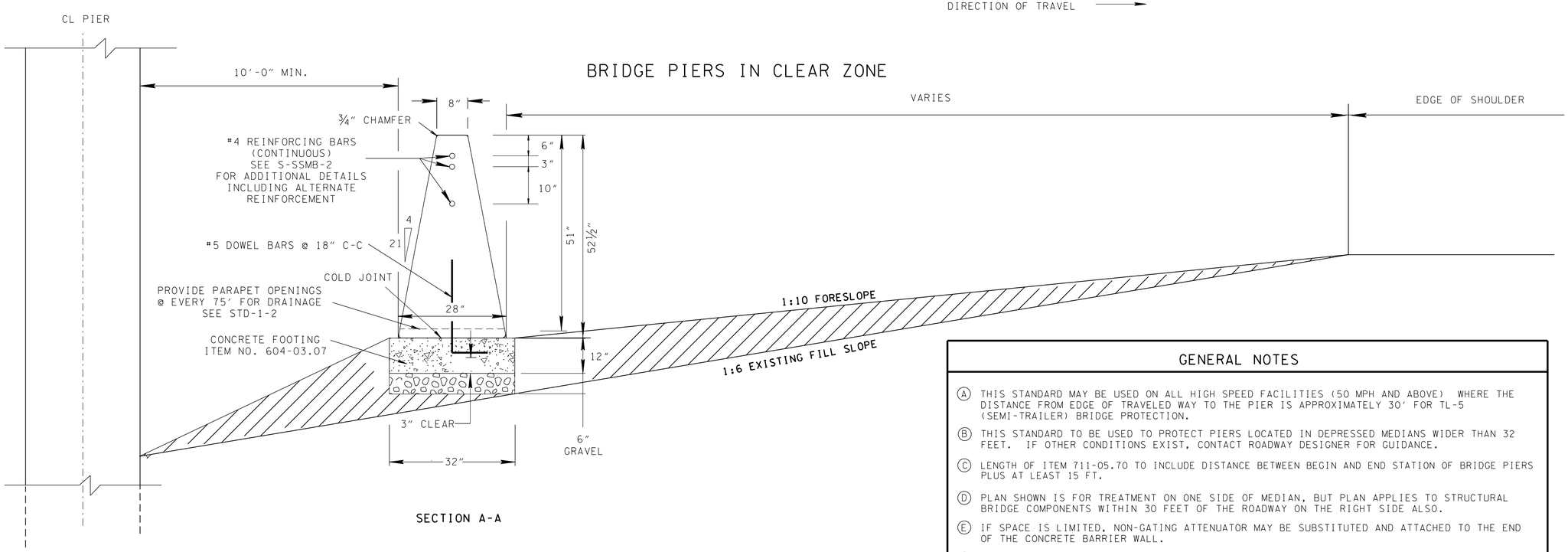
7-11-13 | S-PL-3

REV. 4-11-14: ADDED NOTE Ⓖ.

REV. 2-5-16: ADDED WALL SECTION DETAIL. UPDATED GENERAL NOTES.

REV. 10-10-16: REVISED BARRIER LOCATION. REMOVED LENGTH OF NEED TABLE.





GENERAL NOTES

(A) THIS STANDARD MAY BE USED ON ALL HIGH SPEED FACILITIES (50 MPH AND ABOVE) WHERE THE DISTANCE FROM EDGE OF TRAVELED WAY TO THE PIER IS APPROXIMATELY 30' FOR TL-5 (SEMI-TRAILER) BRIDGE PROTECTION.

(B) THIS STANDARD TO BE USED TO PROTECT PIERS LOCATED IN DEPRESSED MEDIANS WIDER THAN 32 FEET. IF OTHER CONDITIONS EXIST, CONTACT ROADWAY DESIGNER FOR GUIDANCE.

(C) LENGTH OF ITEM 711-05.70 TO INCLUDE DISTANCE BETWEEN BEGIN AND END STATION OF BRIDGE PIERS PLUS AT LEAST 15 FT.

(D) PLAN SHOWN IS FOR TREATMENT ON ONE SIDE OF MEDIAN, BUT PLAN APPLIES TO STRUCTURAL BRIDGE COMPONENTS WITHIN 30 FEET OF THE ROADWAY ON THE RIGHT SIDE ALSO.

(E) IF SPACE IS LIMITED, NON-GATING ATTENUATOR MAY BE SUBSTITUTED AND ATTACHED TO THE END OF THE CONCRETE BARRIER WALL.

(F) FOR ADDITIONAL GRADING REQUIREMENTS AT END TERMINAL, SEE S-GRT-2P OR S-GRT-2R.

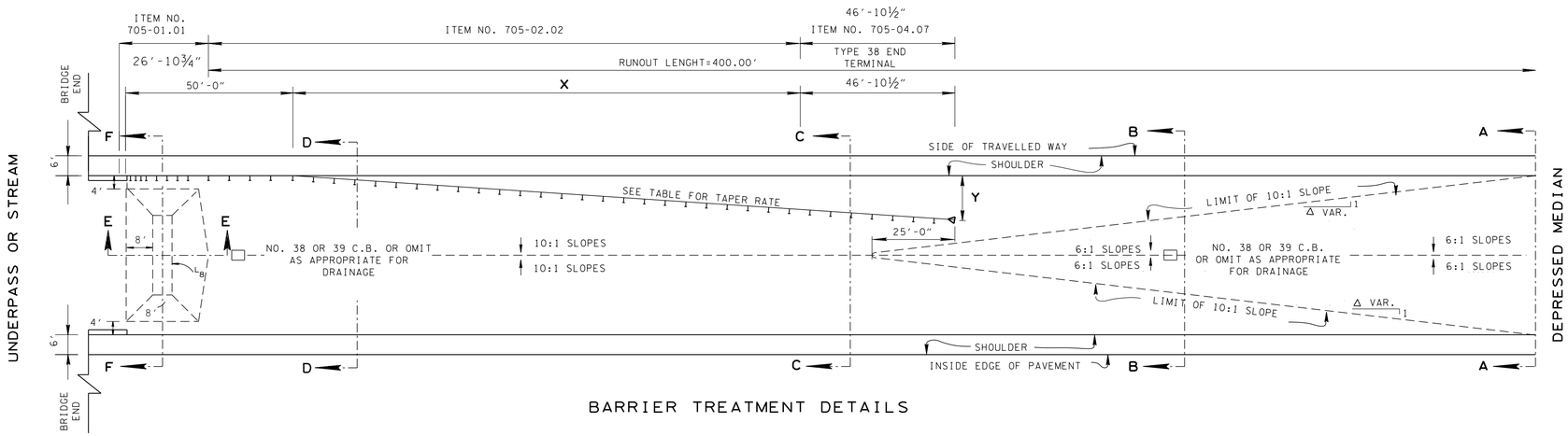
☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

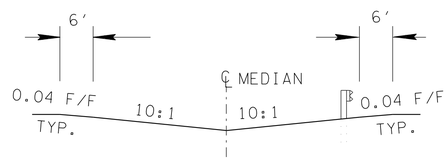
SAFETY PLAN FOR BRIDGE PIERS IN CLEAR ZONE

7-11-13 | S-PL-4

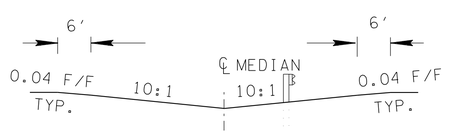
- REV. 4-11-14: CORRECTED CUT SECTION LABELS.
- REV. 10-10-16: UPDATED LENGTH OF TYPE 38 TERMINAL.



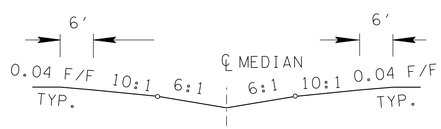
BARRIER TREATMENT DETAILS



SECTION D-D



SECTION C-C



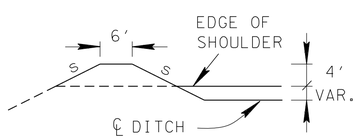
SECTION B-B

SECTION A-A

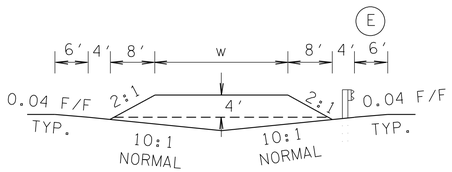
DESIGN SPEED MPH	DIMENSIONS			ESTIMATED QUANTITIES (D)		
	TAPER RATE	X	Y	705-01.01	705-02.02	705-04.07
70	15:1	200'-0"	16'-8"	26'-10¾"	200'-0"	1 EACH
60	14:1	137'-6"	13'-5"	26'-10¾"	137'-6"	1 EACH
≤55	12:1	100'-0"	12'-6"	26'-10¾"	100'-0"	1 EACH

GUARDRAIL DIMENSIONS AND QUANTITIES

EARTHEN BERM DETAILS



SECTION E-E



SECTION F-F

MEDIAN WIDTH	W	ITEM NO 203-01 CY	FILL SLOPE S
36'	4	23	1.5:1
40'	8	33	1.5:1
48'	12	49	2:1
60'	24	83	2:1
64'	28	96	2:1

EARTHEN BERM DIMENSIONS AND QUANTITIES

GENERAL NOTES

(A) THE CONTRACTOR IS TO ELIMINATE THE 1 FOOT FLARE SHOWN ON GUARDRAIL STANDARD DRAWINGS FOR TANGENTIAL GUARDRAIL TERMINAL ANCHORS (FLARED INSTALLATIONS ONLY).

(B) ONLY ONE APPROACH SHOWN; OTHER APPROACH IDENTICAL.

(C) THE DIMENSIONS SHOWN IN THIS TABLE ARE TO BE USED IN ALL TANGENT OR NEARLY TANGENT SITUATIONS WITH DESIGN SPEEDS 70 MPH OR BELOW. WHEN THE DESIGN SPEED EXCEEDS 70 MPH OR OTHER GEOMETRIC FEATURES SUCH AS CURVATURE, SKEWED BRIDGES, OR ADDITIONAL HAZARDS ARE PRESENT, THE DESIGNER SHALL USE STANDARD DRAWING S-PL-1.

(D) QUANTITIES SHOWN ARE FOR ONE APPROACH.

(E) BASED ON 6' SHOULDER; FOR OTHER SHOULDER WIDTHS ADJUST WIDTH OF BERM AS NECESSARY. PLACEMENT OF GUARDRAIL IS NOT AFFECTED.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SAFETY PLAN FOR BRIDGE ENDS IN MEDIANS

7-11-13 | S-PL-5

10/7/2016 9:47:27 AM
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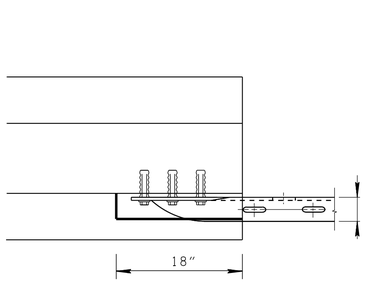
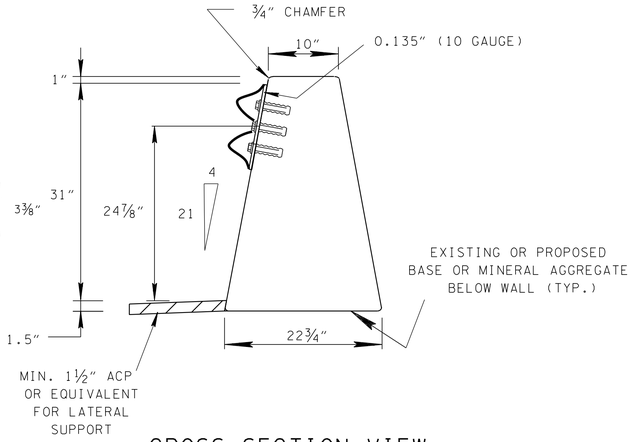
32" SINGLE SLOPE CONCRETE BARRIER WALL

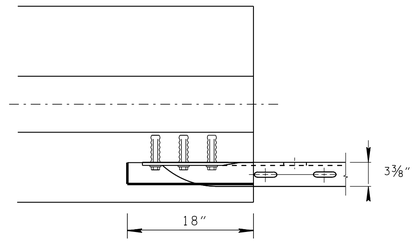


PLAN VIEW

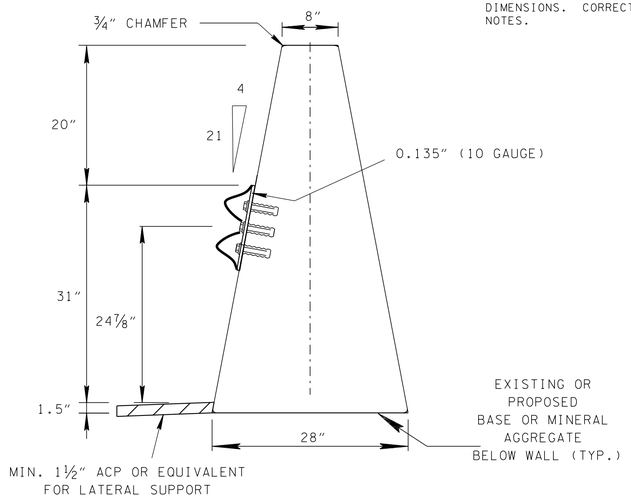


CROSS-SECTION VIEW
(ALTERNATE)

51" SINGLE SLOPE CONCRETE BARRIER WALL



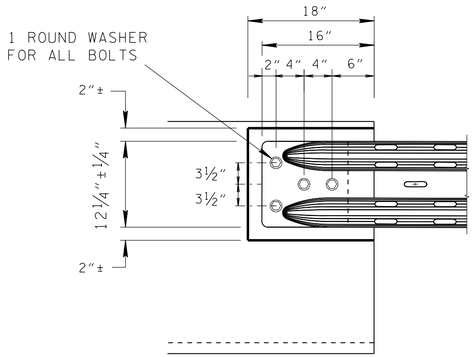
PLAN VIEW



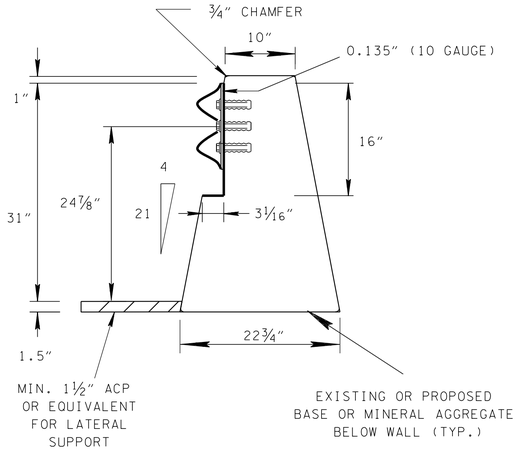
CROSS-SECTION VIEW
(ALTERNATE)

REV. 10-24-13: DELETED NOTE (6).

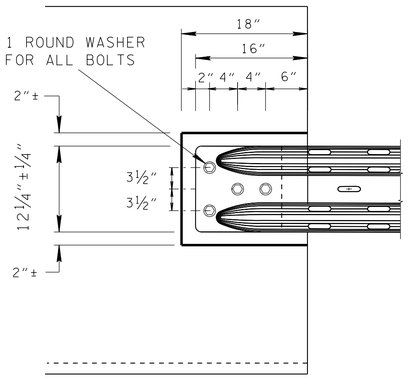
REV. 10-10-16: ADDED ALTERNATE CROSS-SECTION DETAILS. REVISED DIMENSIONS. CORRECTED GENERAL NOTES.



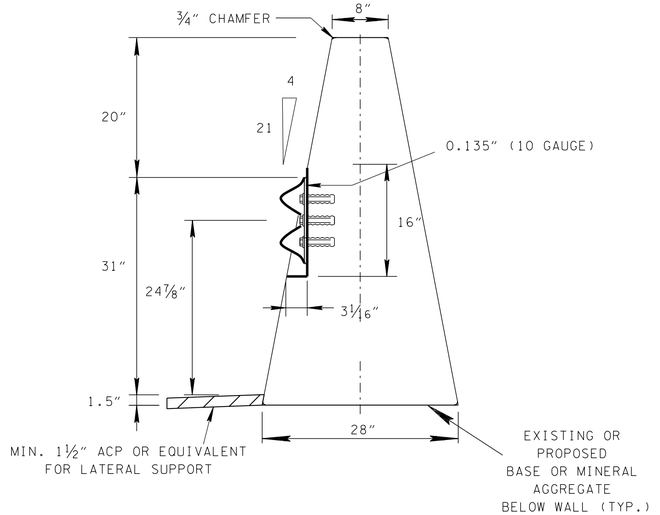
ELEVATION VIEW



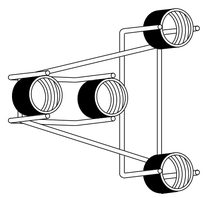
CROSS-SECTION VIEW



ELEVATION VIEW



CROSS-SECTION VIEW



ANCHOR BLOCK INSERT ASSEMBLY

CAST IN PLACE THREADED STEEL INSERT WITH
⅞" DIA. X 2" HEX HEAD GALVANIZED BOLTS (ASTM A307)
HOT DIP ZINC COATING (ASTM A153)

GENERAL NOTES

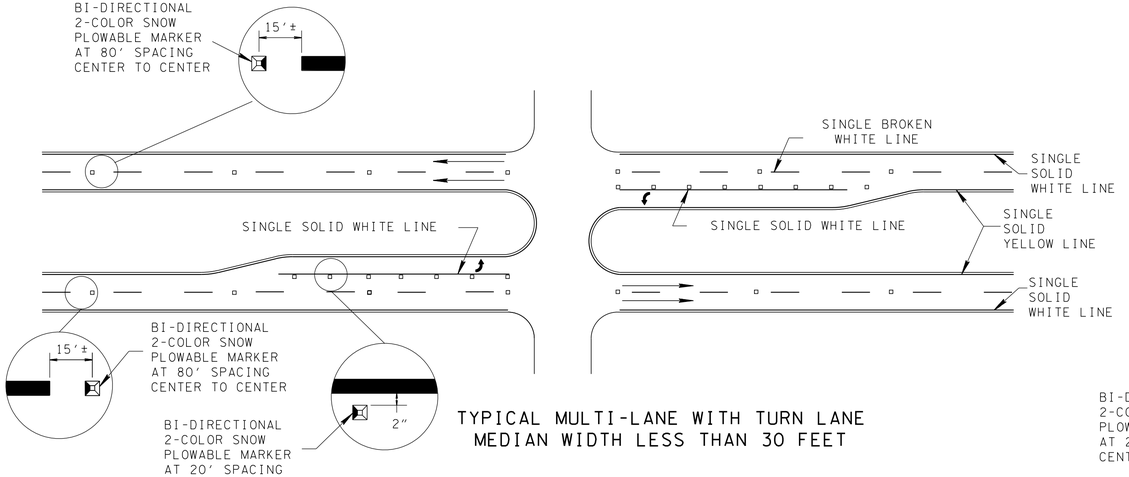
1. ANCHOR INSERT BOLTS SHALL BE ⅞" HEX HEAD INSTALLED IN ⅞" MASONRY ANCHOR. THE INSERTS ARE TO BE THREADED A MINIMUM OF 1¾". THE CONTRACTOR SHALL FURNISH ANCHOR PULL-OUT DATA FROM AN INDEPENDENT TESTING LABORATORY USING CLASS "A" CONCRETE IN ACCORDANCE WITH STATE OF TENNESSEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" THE ULTIMATE LOAD FOR ⅞" ANCHOR SHALL BE 19,000 POUNDS. BOLTS SHALL CONFORM TO ASTM A307.
2. THE MASONRY ANCHORS SHALL BE SUB-SET IN THE CONCRETE AT A DEPTH OF BETWEEN 3/32" TO ¼" AND TORQUED WITH THE END TERMINAL IN THE PLACE TO AN EQUIVALENT DIRECT PULL-OUT LOAD OF 12,000 POUNDS. SLIPPAGE SHALL NOT EXCEED ¼".
3. THE CONTRACTOR WILL PERFORM ON-SITE TESTING OF EACH BOLT IN THE PRESENCE OF TDOT PERSONNEL TO ENSURE THESE REQUIREMENTS ARE MET. ANY INSTALLATION NOT MEETING WILL BE REJECTED.
4. BOLTS AND WASHERS TO BE GALVANIZED CONFORMING TO REQUIREMENTS OF ASTM A153.
5. SEE S-SSMB-1 AND S-SSMB-2 FOR ADDITIONAL DETAILS.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

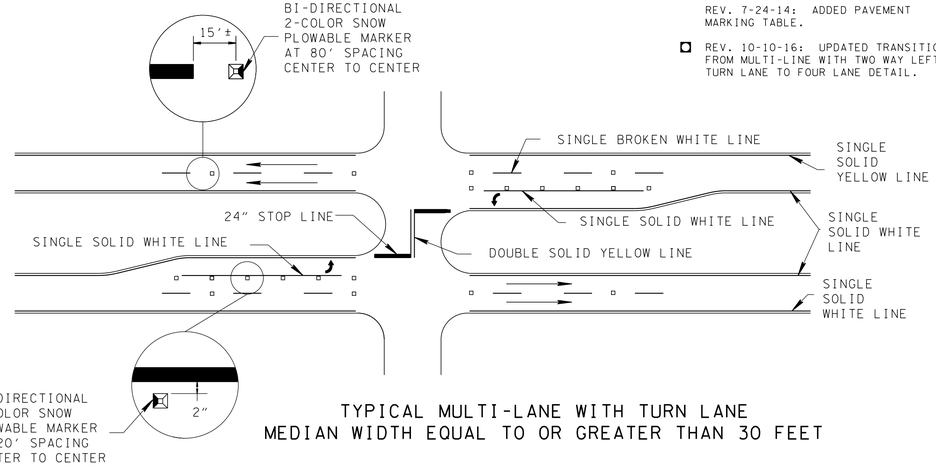
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL ATTACHMENT TO SINGLE SLOPE CONCRETE BARRIER WALL

8-30-10 | S-SSMB-6



TYPICAL MULTI-LANE WITH TURN LANE
MEDIAN WIDTH LESS THAN 30 FEET



TYPICAL MULTI-LANE WITH TURN LANE
MEDIAN WIDTH EQUAL TO OR GREATER THAN 30 FEET

REV. 7-24-14: ADDED PAVEMENT MARKING TABLE.

☐ REV. 10-10-16: UPDATED TRANSITION FROM MULTI-LINE WITH TWO WAY LEFT TURN LANE TO FOUR LANE DETAIL.

REV. 2-22-88: ADDED EDGE-LINES, NOTES, AND DETAILS FOR TRANSITION MARKING. CHANGED SHEET TITLE AND DRAWING NO. FROM T-M-8 TO T-M-2. ADDED DETAILS ON RIGHT OF SHEET.

REV. 3-20-91: REDREW SHEET. CHANGED TYPE 2 PAVEMENT MARKERS (CLEAR) TO MONO-DIRECTIONAL PAVEMENT MARKERS (CLEAR) AND TYPE 1 PAVEMENT MARKERS (YELLOW) TO BI-DIRECTIONAL MARKERS (YELLOW).

☐ REV. 10-26-92: ADDED GENERAL NOTE Ⓒ.

☐ REV. 12-18-93: ADDED EDGELINES INSIDE MEDIAN CROSSOVERS FOR MEDIAN WIDTHS LESS THAN 44 FEET.

☐ REV. 1-19-94: CHANGED WIDTH CRITERION FOR MEDIAN WIDTH FROM 44 FEET TO 64 FEET.

☐ REV. 1-19-96: CHANGED DETAIL ON LEFT BOTTOM OF SHEET.

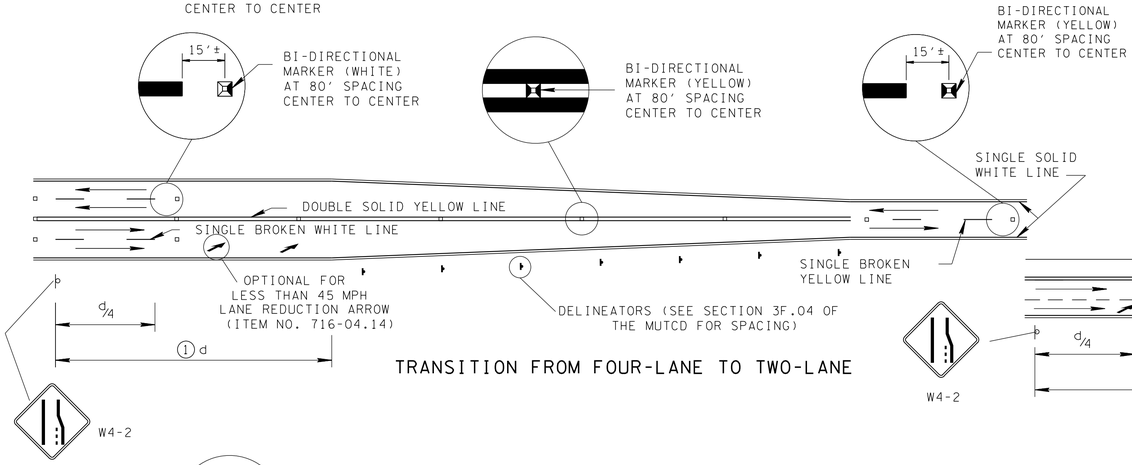
☐ REV. 4-15-04: CHANGED W4-2 SIGNS AND FOOTNOTE ① TO COMPLY WITH 2003 MUTCD.

☐ REV. 9-5-04: CHANGED FOOTNOTE ① TO COMPLY WITH 2003 MUTCD.

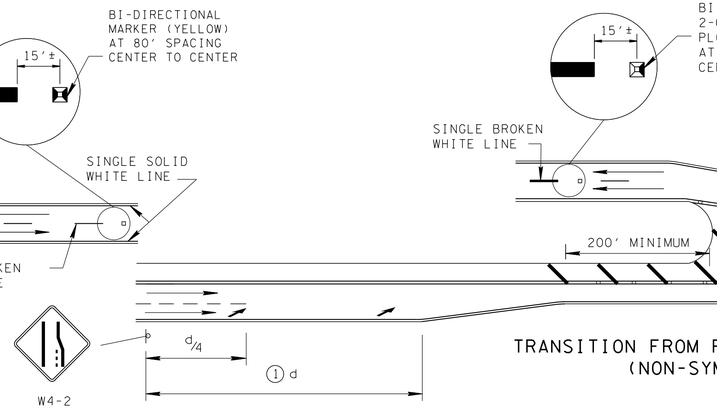
REV. 11-1-11: ADDED DELINEATORS WITH NOTE AND LANE REDUCTION ARROWS WITH NOTE. ADDED PAY ITEM 716-04.14 AND GENERAL NOTE Ⓓ.

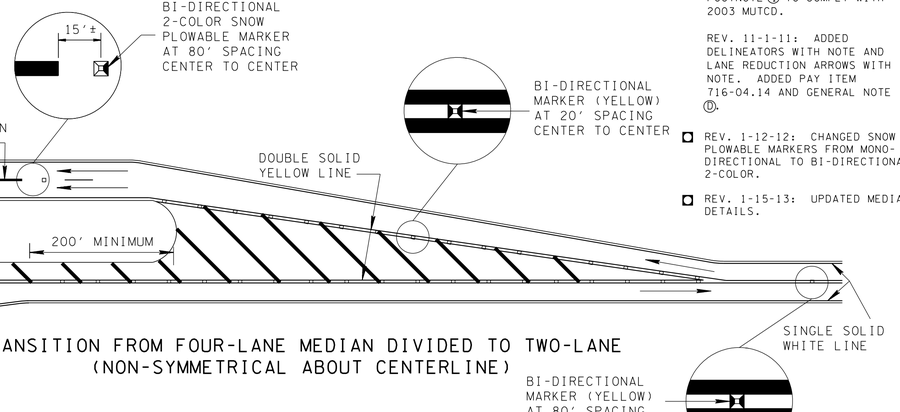
☐ REV. 1-12-12: CHANGED SNOW PLOWABLE MARKERS FROM MONO-DIRECTIONAL TO BI-DIRECTIONAL 2-COLOR.

☐ REV. 1-15-13: UPDATED MEDIAN DETAILS.

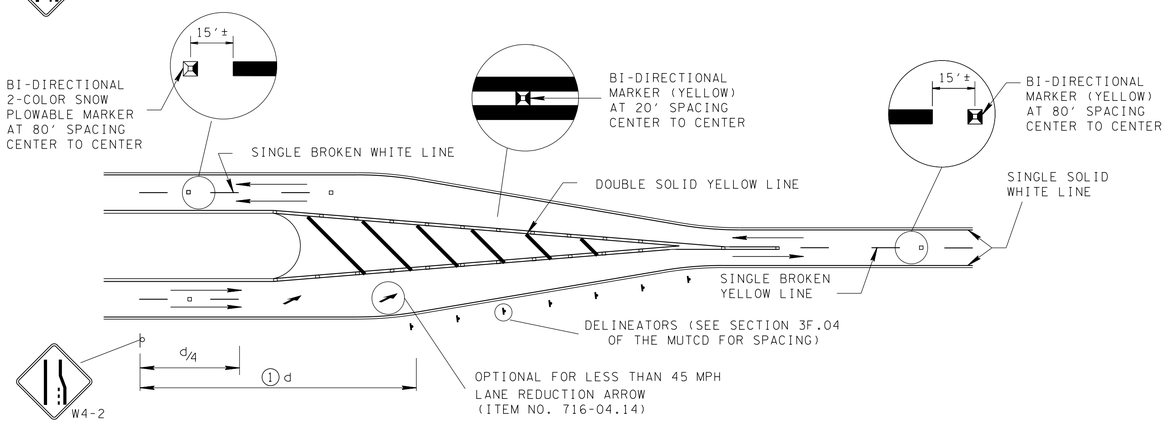


TRANSITION FROM FOUR-LANE TO TWO-LANE

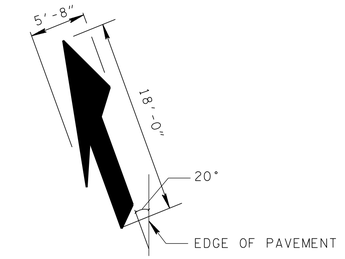




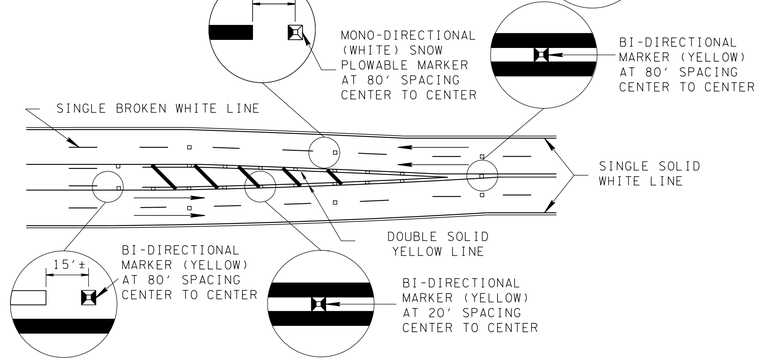
TRANSITION FROM FOUR-LANE MEDIAN DIVIDED TO TWO-LANE
(NON-SYMMETRICAL ABOUT CENTERLINE)



TRANSITION FROM FOUR-LANE MEDIAN DIVIDED TO TWO-LANE
(SYMMETRICAL ABOUT CENTERLINE)
(SIMILAR FOR MULTI-LANE WITH TWO WAY LEFT TURN LANE TO TWO-LANE)



LANE-REDUCTION ARROW



TRANSITION FROM MULTI-LANE WITH TWO WAY
LEFT TURN LANE TO FOUR-LANE

FOOTNOTE
① SEE TABLE 2C-4 OF PART 2 OF THE MANUAL ON UNIFORM TRAFFIC DEVICES (MUTCD) FOR GUIDELINES FOR ADVANCE PLACEMENT OF WARNING SIGNS DISTANCE d.

GENERAL NOTES
Ⓐ EDGE LINES ARE NOT REQUIRED FOR PAVEMENT WIDTH LESS THAN 16 FEET OR ON CURB AND GUTTER SECTIONS UNLESS SPECIFIED IN PLANS.
Ⓑ SEE STANDARD DRAWING NOS. T-M-3 AND T-M-4 FOR CHANNELIZATION MARKING AND INTERSECTION MARKING DETAILS.
Ⓒ PAVEMENT MARKERS ARE REQUIRED ONLY WHEN SPECIFIED IN THE PLANS.
Ⓓ SEE STD. DWG. T-S-11 FOR DETAILS OF DELINEATORS.

PAVEMENT MARKING TABLE		
DESIGN SPEED	EDGE LINE	LANE LINE
V ≥ 45 MPH	6″ ✳	6″
V < 45 MPH	4″	4″

✳ IF SHOULDER IS LESS THAN 2′ WIDE USE 4″ LINE

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS

T-M-2

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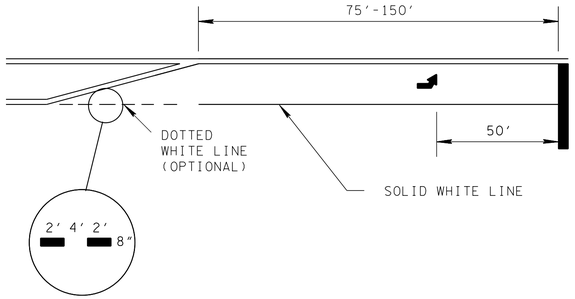
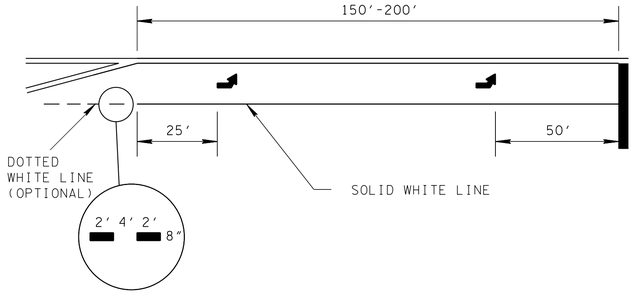
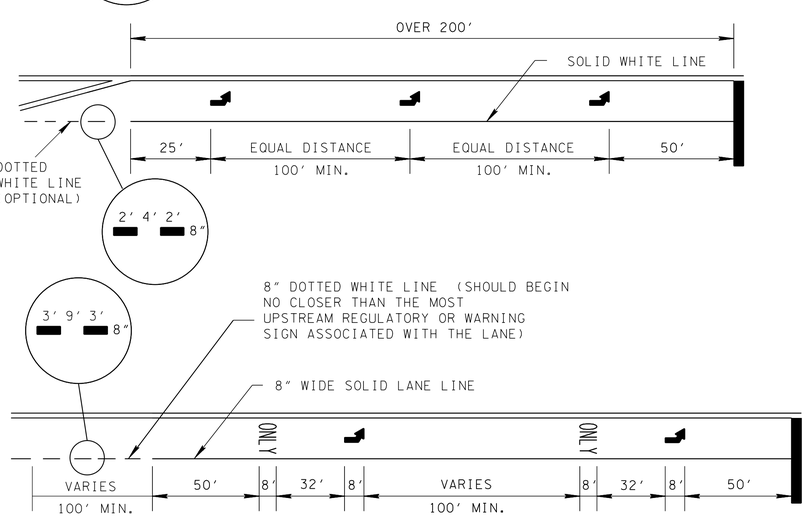
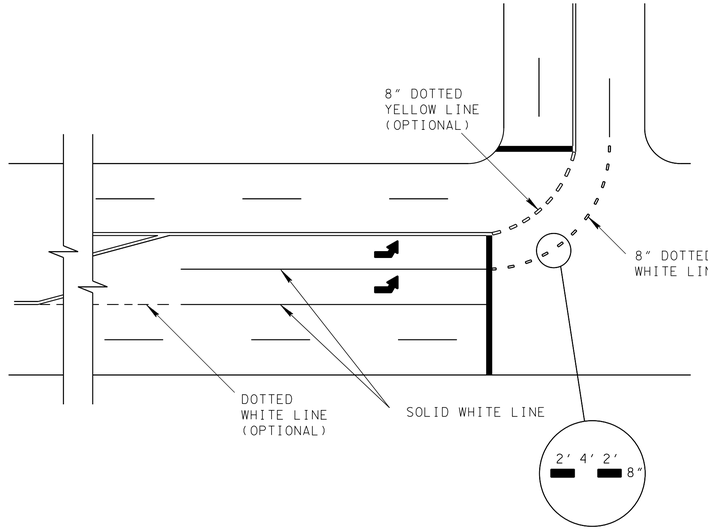






IF A THROUGH LANE BECOMES AN EXCLUSIVE LEFT TURN LANE, AN "ONLY" MESSAGE IS REQUIRED FOR EACH ARROW. THE "ONLY" MESSAGE SHALL BE PAID FOR UNDER ITEM NO. 716-03.01, PLASTIC WORD PAVEMENT MARKING (ONLY) PER EACH.

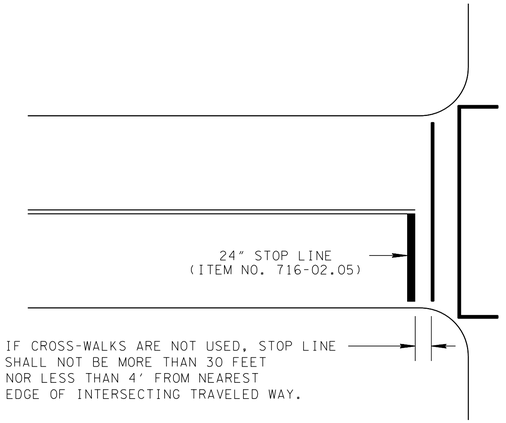
TYPICAL MARKING FOR LEFT TURN LANES
ALSO APPLICABLE FOR RIGHT TURN LANES



LEFT TURN ARROWS SHALL BE PAID FOR UNDER ITEM NO. 716-02.06, PLASTIC PAVEMENT MARKING (TURN LANE ARROW) PER EACH.

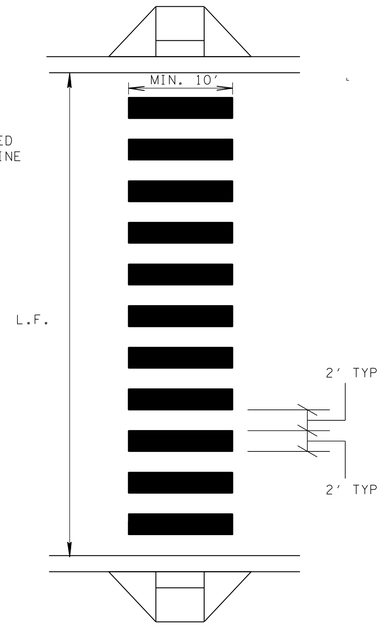
EIGHT INCH DOTTED WHITE LINE SHALL BE PAID FOR UNDER ITEM NO. 716-02.08

TYPICAL MARKING FOR DOUBLE LEFT TURN LANES



TYPICAL MARKING FOR STOP LANE

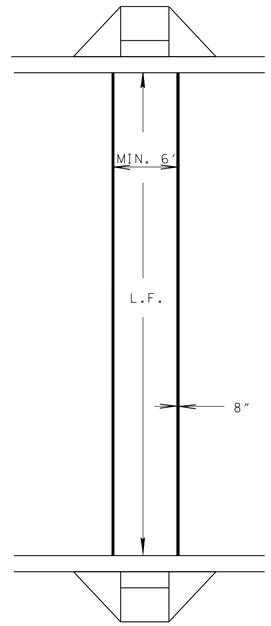
ITEM NO. 716-02.09



LONGITUDINAL CROSS-WALK MARKING
(FOR SPECIAL EMPHASIS)

PAVEMENT MARKINGS SHALL BE PAID FOR UNDER ITEM NO. 716-02.09 PLASTIC PAVEMENT MARKING (LONGITUDINAL CROSS-WALK) PER LINEAR FOOT. MEASUREMENT IS CALCULATED AS THE FULL WIDTH OF PAVEMENT.

ITEM NO. 716-02.03



TRANSVERSE CROSS-WALK MARKING

PAVEMENT MARKINGS SHALL BE PAID FOR UNDER ITEM NO. 716-02.03, PLASTIC PAVEMENT MARKING (CROSS-WALK) PER LINEAR FOOT. MEASUREMENT IS CALCULATED AS THE FULL WIDTH OF PAVEMENT.

CROSS-WALK NOTES

Ⓐ SPECIAL PAVERS AND PAVEMENT TEXTURES ALONE ARE NOT ACCEPTABLE CROSS-WALK MARKINGS. THEREFORE, SPECIAL PAVERS AND PAVEMENT TEXTURES SHALL ONLY BE USED IN CONJUNCTION WITH TRANSVERSE CROSS-WALK MARKINGS.

Ⓑ IF SPECIAL PAVERS, PAVEMENT TEXTURES, OR ANY OTHER ARCHITECTURAL PAVEMENT MATERIALS ARE USED, THE ARCHITECTURAL PAVEMENT MATERIALS SHALL PROVIDE A WALKABLE/RIDEABLE, STABLE, FIRM AND SLIP-RESISTANT SURFACE PER ADA STANDARDS.

STOP LINE PLACEMENT NOTES

Ⓐ LOCATION SHALL BE DETERMINED BY VEHICLE TURNING PATHS FROM INTERSECTION ROADWAY, AND IF SIGNALIZED, ITS POSITION RELATIVE TO SIGNAL HEADS, PER MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

Ⓑ STOP LINES SHALL BE PAID FOR UNDER ITEM NO. 716-02.05, PLASTIC PAVEMENT MARKING (STOP LINE) PER LINEAR FOOT.

Ⓒ STOP LINES REQUIRED ONLY ON APPROACHES CONTROLLED BY STOP SIGNS OR TRAFFIC SIGNALS.

PAVEMENT MARKING TABLE

DESIGN SPEED	EDGE LINE	LANE LINE
V ≥ 45 MPH	6" *	6"
V < 45 MPH	4"	4"

* IF SHOULDER IS LESS THAN 2' WIDE USE 4" LINE

REV. 2-22-88: REVISED DETAIL LEFT TURN LANE MARKING. ADDED NOTE FOR STOP LINE TO BE PARALLEL TO CROSS-WALK. NOTED LONGITUDINAL CROSS-WALK LINES TO BE WHITE. CHANGED DWG. NO. FROM T-M-11 TO T-M-4. ADDED DETAIL FOR DOUBLE LEFT TURN LANE.

REV. 3-20-91: REDREW AND REORGANIZED SHEET. ADDED PAY ITEMS AND THEIR DESCRIPTIONS.

☐ REV. 5-27-01: CHANGED DESCRIPTION IN ITEM NO. 716-02.09.

☐ REV. 9-5-01: CHANGED DESCRIPTION IN ITEM NO. 716-02.03.

☐ REV.1-19-05: CHANGED HANDICAP RAMP DETAIL SHOWN ON CROSSWALK MARKING DETAILS.

☐ REV.3-15-07: REVISED TO REFER THE HANDICAP RAMP STANDARDS TO DETERMINE THE MINMUM WIDTH OF CROSS WALK MARKINGS.

☐ REV.6-1-09: TYPICAL STOP LINE PLACEMENT NOTE REVISED.

REV. 11-1-11: REVISED PAVEMENT MARKINGS FOR LEFT TURN DETAILS.

☐ REV. 7-24-14: REVISED CROSSWALK TO SHOW LONGITUDINAL LINES AS PREFERRED OPTION. ADDED PAVEMENT MARKING TABLE.

REV. 10-10-16: ADDED DETAIL FOR CROSS-WALK MARKING, UPDATED ITEM NUMBERS FOR CROSS-WALK MARKING, UPDATED NOTES FOR STOP LINE PLACEMENT AND CROSS-WALK MARKING.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STANDARD INTERSECTION PAVEMENT MARKINGS

T-M-4

10/7/2016 9:52:51 AM
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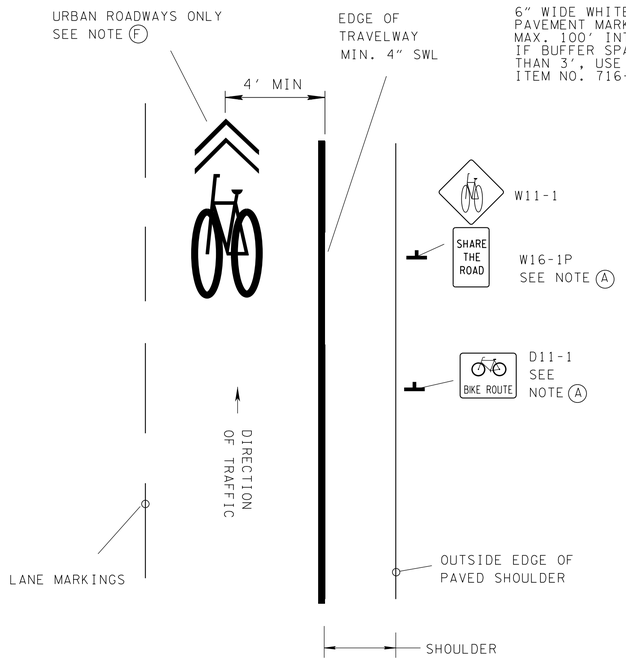
REV. 10-10-16: REVISED GENERAL NOTES. ADDED DETAIL NOTES.

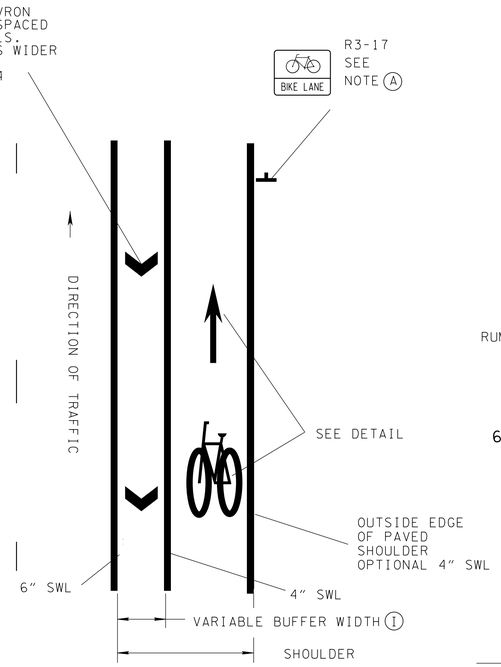
- ☐ REV. 12-1-09: REMOVED RUMBLE DETAILS TO T-M-15 AND 15A.

  REV. 11-1-11: REVISED GENERAL NOTE (B). ADDED GENERAL NOTE E AND (F), UPDATED PLAN VIEW, AND ADDED BIKE SYMBOL/ARROW SHARED LANE MARKING DETAIL.

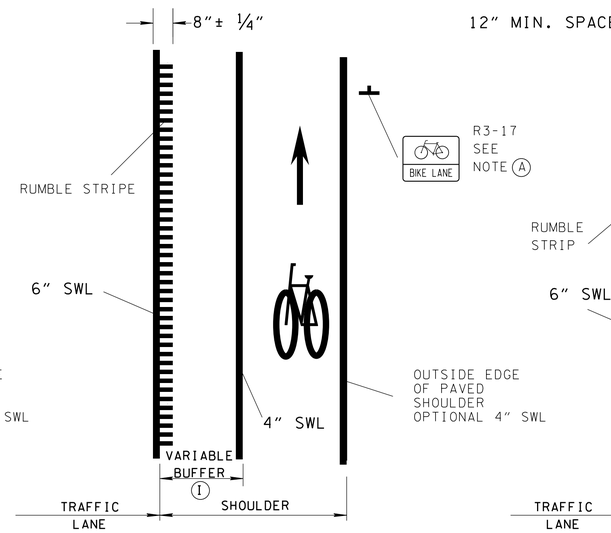
  REV. 6-15-12: ADDED NOTE (G).
- ☐ REV. 10-24-13: ADDED NOTE (H).
- ☐ REV. 12-1-14: ADDED BUFFERED LANE DETAILS.



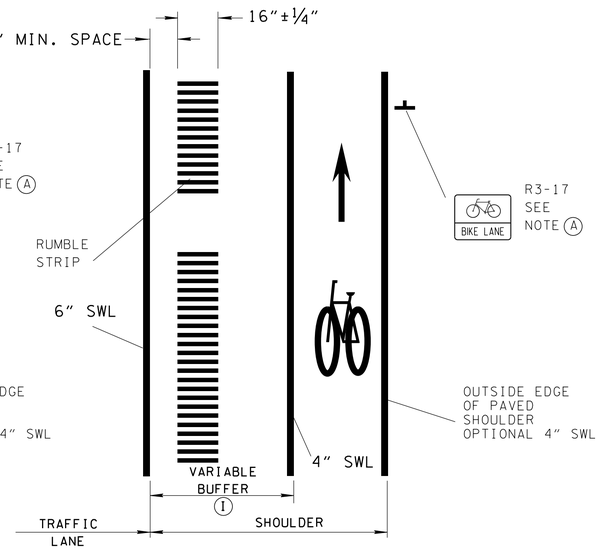
BIKE ROUTE
MARKING AND SIGN DETAILS



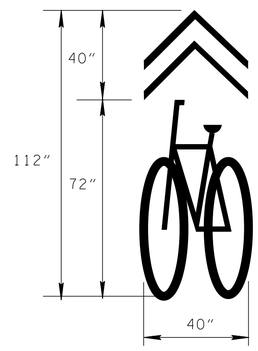
TYPICAL BIKE LANE
ON MAJOR SUBURBAN ROADWAY



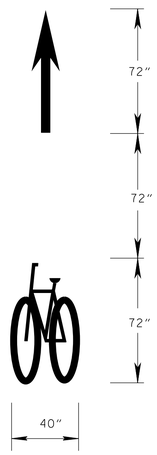
TYPICAL BIKE LANE/RUMBLE
STRIPE DETAIL



TYPICAL BIKE LANE/RUMBLE
STRIP DETAIL



TYPICAL PAVEMENT MARKING
FOR BICYCLE ROUTES
ITEM NO. 716-04.15
SEE NOTE (F)



TYPICAL PAVEMENT MARKING
FOR BICYCLE LANES
ITEM NO. 716-04.13

NOTE: SPACED AT INTERVALS NOT GREATER THAN 1000 FEET

GENERAL NOTES

(A) SIGNS SHOULD BE PLACED APPROXIMATELY EVERY 0.25 MILE, AT EVERY TURN, AND AT ALL SIGNALIZED INTERSECTIONS. WHERE MULTIPLE SIDE ROADS/TURNS EXIST, IT IS NOT REQUIRED TO LOCATE SIGNS AT EVERY TURN; HOWEVER, SIGN SPACING SHOULD NOT EXCEED 0.25 MILE. SIGN SPACING SHOULD NOT EXCEED A MILE ON RURAL ROADS.

(B) SEE T-M-15A AND T-M-16 IF RUMBLE STRIP OR RUMBLE STRIPE IS PROPOSED IN CONJUNCTION WITH BIKE ROUTE.

(C) BIKE LANES AND BIKE ROUTES ARE NOT PERMITTED ON ACCESS CONTROLLED FACILITIES.

(D) IF BIKE LANE IS PROPOSED ON PAVED SHOULDER, RUMBLE STRIPS SHOULD NOT BE USED WHEN THEIR INSTALLATION WOULD LEAVE A CLEAR SHOULDER PATHWAY LESS THAN 4' WIDE (OR LESS THAN 5' WIDE IF THERE IS AN OBSTRUCTION SUCH AS A CURB OR GUARDRAIL) TO THE RIGHT OF THE RUMBLE STRIP FOR BICYCLE USE.

(E) SEE MUTCD SECTIONS 9B.04, 9B.06, 9B.18, 9B.19, 9B.20, 9C.04, AND 9C.07, AND MUTCD TABLE 9B-1 FOR ADDITIONAL SIGNING AND PAVEMENT MARKING INFORMATION.

(F) SHARED BIKE LANE MARKINGS SHOULD NOT BE PLACED ON ROADWAYS THAT HAVE A SPEED LIMIT ABOVE 35 MPH. MARKING TO BE PLACED IMMEDIATELY AFTER AN INTERSECTION AND SPACED AT INTERVALS NOT GREATER THAN 250 FEET.

(G) IF USED, RUMBLE STRIP TO BE PAID FOR UNDER ITEM:
411-12.02 SCORING SHOULDERS (NON-CONTINUOUS) (16IN WIDTH) PER LINEAR MILE
AND RUMBLE STRIPE TO BE PAID FOR UNDER ITEM:
411-12.03 SCORING FOR RUMBLE STRIPE (NON-CONTINUOUS) (8IN WIDTH) PER LINEAR MILE

(H) PAVEMENT MARKINGS FOR BICYCLE LANES OR ROUTES TO BE PAID FOR UNDER ITEMS:
716-04.13 PLASTIC PAVEMENT MARKING (BIKELANE SYMBOL & ARROW) PER EACH
716-04.15 PLASTIC PAVEMENT MARKING-BIKE SYMBOL/ARROW SHARED PER EACH

(I) ON MAJOR ROADWAYS APPROACHING URBAN AREAS, A BUFFERED BIKE LANE MAY BE USED, CONTACT THE TDOT BIKE COORDINATOR FOR GUIDANCE.

(J) SEE T-M-12 THROUGH T-M-14 FOR ADDITIONAL BIKE LANE GUIDANCE.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANE OR ROUTES

5-1-07 | T-M-11

11/5/2016 9:48:5 AM
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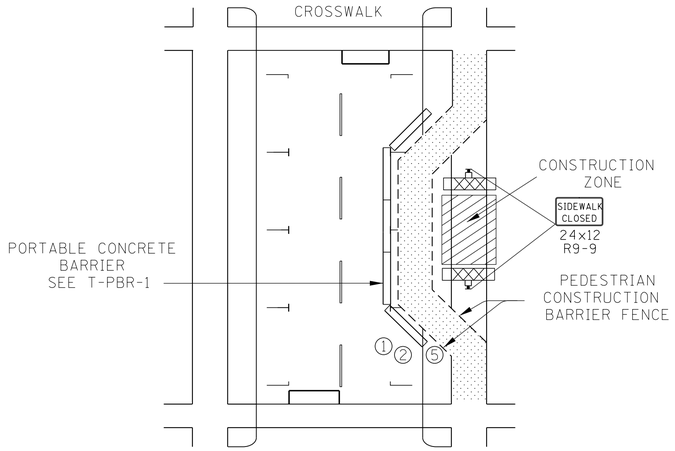
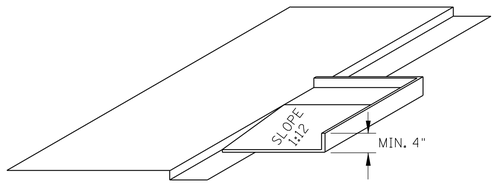
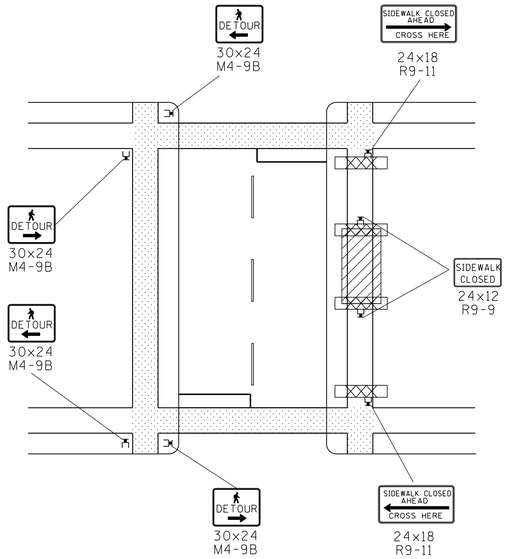
- REV. 6-30-14: ADDED ITEM NUMBER FOR PEDESTRIAN CONSTRUCTION BARRIER FENCE.
- REV. 10-10-16: UPDATED GENERAL NOTE Ⓔ FOR SIDEWALK DIVERSION.



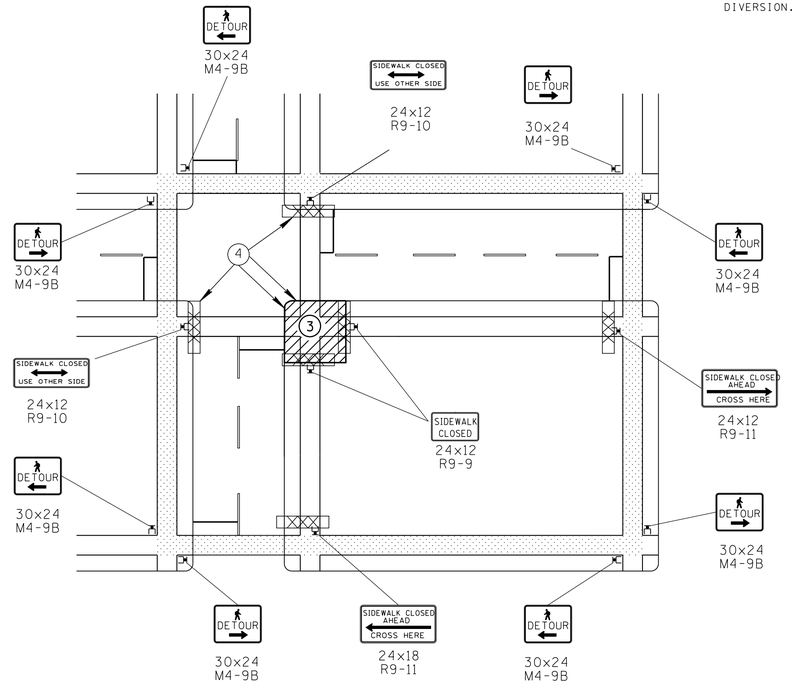
SIDEWALK DIVERSION



PLYWOOD CURB RAMP DETAIL



SIDEWALK CLOSURE, MIDBLOCK



SIDEWALK CLOSURE, CORNER

GENERAL NOTES FOR SIDEWALK DIVERSION

Ⓐ SIDEWALK DIVERSION MAY BE USED ON ROADS WITH ON STREET PARKING LANES ADJACENT TO THE SIDEWALK CLOSURE.

Ⓑ THE PEDESTRIAN WALKWAY SHALL BE AT LEAST 5′ WIDE.

Ⓒ TEMPORARY FACILITIES SHALL BE COMPLIANT WITH THE CURRENT VERSION OF THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG).

Ⓓ DIVERSIONS MUST BE CLEARLY IDENTIFIED, PROTECTED FROM TRAFFIC AND FREE FROM HAZARDS.

Ⓔ PEDESTRIAN CONSTRUCTION BARRIER FENCE SHALL BE CONTINUOUS THROUGHOUT THE LENGTH OF THE DIVERSION WITH A DETECTABLE EDGING WITH A BOTTOM NO HIGHER THAN 2″ ABOVE THE SURFACE AND A TOP NO LOWER THAN 32″ ABOVE THE SURFACE. THE PEDESTRIAN CHANNELIZATION DEVICE SHALL BE ORANGE. HIGH VISIBILITY FENCE, PEDESTRIAN, RAIL, AND CHAIN LINK FENCE ARE ACCEPTABLE. COST OF FENCE TO BE PAID UNDER ITEM NUMBER:

707-11.01 PEDESTRIAN CONSTRUCTION BARRIER FENCE PER L.F.

Ⓕ CROSSING THE DIVERSION PATH BY CONSTRUCTION VEHICLES SHOULD BE AVOIDED, WHEN NECESSARY, IT SHALL BE CONTROLLED BY FLAGGER.

Ⓖ TRAFFIC CONTROL DEVICES FOR VEHICULAR TRAFFIC ARE NOT SHOWN BUT ARE REQUIRED FOR CLOSING THE LANE.

Ⓗ A SMOOTH, HARD, CONTINUOUS AND RIDEABLE SURFACE SHALL BE PROVIDED THROUGHOUT THE LENGTH OF THE DIVERSION.

Ⓘ THE COST OF MAINTAINING PEDESTRIAN DIVERSION, INCLUDING CURB RAMPS IF NEEDED, SHALL NOT BE PAID DIRECTLY BUT PAID FOR IN THE COST OF OTHER ITEMS.

FOOTNOTES

① IF PARKING STALLS ARE USED FOR DIVERSION, CHANNELIZING DEVICES MAY BE SUBSTITUTED FOR PORTABLE BARRIER RAILS IF PORTABLE BARRIER RAILS ARE DEEMED UNNECESSARY BY ENGINEERING JUDGEMENT.

② IF DIVERSION REQUIRES A LANE CLOSURE SEE T-WZ-SERIES FOR FURTHER INFORMATION.

③ LIMIT WORK TO ONE CORNER AT A TIME TO MINIMIZE DISRUPTION TO PEDESTRIAN TRAFFIC.

④ PEDESTRIAN TRAFFIC SIGNAL DISPLAYS CONTROLLING CLOSED CROSSWALKS SHALL BE COVERED.

⑤ IN AREAS WHERE THE ROUTE CROSSES GRASSY TERRAIN OR ELEVATION CHANGES, PLYWOOD MAY BE USED WITH A HIGHLIGHTED BEVEL AT THE JOINT.

LEGEND

PORTABLE BARRIER RAIL

PEDESTRIAN TRAFFIC

UNDER CONSTRUCTION

PEDESTRIAN CONSTRUCTION BARRIER FENCE

GENERAL NOTES FOR SIDEWALK CLOSURE

Ⓐ TRAFFIC CONTROL DEVICES FOR VEHICULAR TRAFFIC ARE NOT SHOWN BUT MAY BE REQUIRED TO CONTROL VEHICLES THROUGH WORK ZONE.

Ⓑ SIGNS R9-9, R9-10 AND R9-11 TO BE ATTACHED TO TYPE III BARRICADE. ALL OTHER SIGNS SHOWN ON THIS PLAN MAY BE PLACED ON PORTABLE SUPPORTS.

Ⓒ MINIMIZE PEDESTRIAN OUT-OF-DIRECTION TRAVEL. IT IS NOT ACCEPTABLE TO REQUIRE PEDESTRIANS TO RETRACE THEIR PATH TO FIND A SAFE CROSSING.

Ⓓ DETOUR SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING FACILITY.

Ⓔ BARRICADES SHALL BE PLACED ACROSS THE FULL WIDTH OF THE CLOSED SIDEWALK.

Ⓕ WORK SHALL BE EXPEDITED TO MINIMIZE IMPACTS TO BUSINESS CAUSED BY THE SIDEWALK CLOSURE.

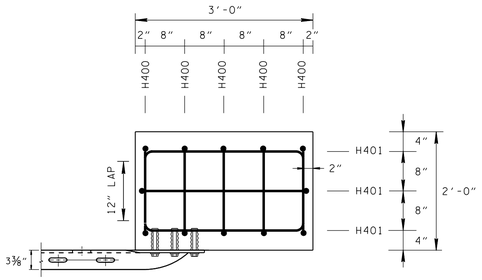
☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

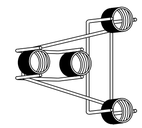
SIDEWALK TRAFFIC CONTROL

2-29-12 | T-WZ-55

REV. 10-10-16: CHANGED TITLE, REFORMATTED GENERAL NOTES TO BE CONSISTENT WITH OTHER STANDARD DRAWINGS. SEPARATED ELEVATION (SIDE) DETAIL INTO (2) DETAILS.

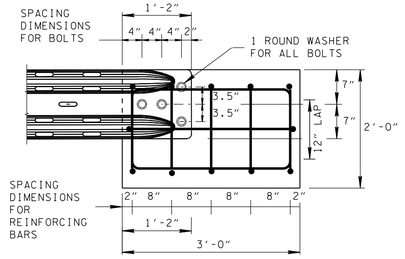


PLAN

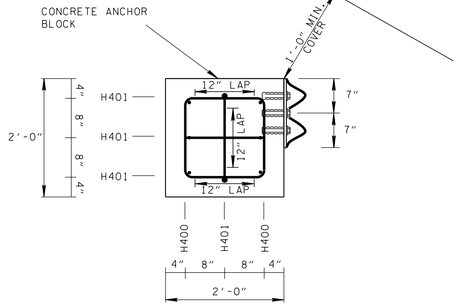


ANCHOR BLOCK INSERT ASSEMBLY

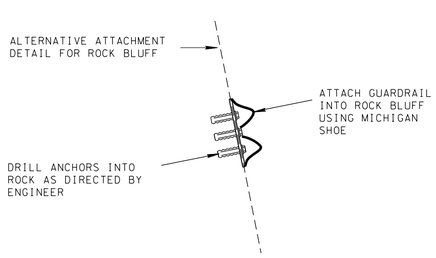
CAST IN PLACE THREADED STEEL INSERT WITH
⅞" DIA. X 2" HEX HEAD GALVANIZED BOLTS (ASTM A307)
HOT DIP ZINC COATING ASTM A153



ELEVATION
(FRONT)



ELEVATION
(SIDE)



ALTERNATE ELEVATION
(SIDE)

NOTE TO DESIGNER

TO BE USED WITH S-GRT-1 ONLY

SPECIAL INSTALLATION NOTE

FOR THIS GUARDRAIL ANCHOR TO FUNCTION AS IT WAS CRASH TESTED UNDER NCHRP 350 TL-3 IT MUST BE CONSTRUCTED PER S-GRT-1.

GENERAL NOTES

(A) REQUIREMENTS FOR ANCHOR INSERT BOLTS SHALL BE ⅞" HEX HEAD INSTALLED IN ⅞" MASONRY ANCHOR. THE INSERTS ARE TO BE THREADED AT A MINIMUM OF 1¾". THE CONTRACTOR SHALL FURNISH ANCHOR PULL-OUT DATA FROM AN INDEPENDENT TESTING LABORATORY USING CLASS "A" CONCRETE IN ACCORDANCE WITH STATE OF TENNESSEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION". THE MAXIMUM LOAD FOR ⅞" ANCHOR SHALL BE 19,000 POUNDS. BOLTS SHALL CONFORM TO ASTM A307.

(B) THE MASONRY ANCHORS SHALL BE SUB-SET IN THE CONCRETE AT A DEPTH OF BETWEEN 3/32" TO ¼" AND TORQUED WITH THE END TERMINAL IN THE PLACE TO AN EQUIVALENT DIRECT PULL-OUT LOAD OF 12,000 POUNDS. SLIPPAGE SHALL NOT EXCEED ¼".

(C) THE CONTRACTOR WILL PERFORM ON-SITE TESTING OF EACH BOLT IN THE PRESENCE OF TDOT PERSONNEL TO ENSURE THESE REQUIREMENTS ARE MET. ANY INSTALLATION NOT MEETING THESE REQUIREMENTS SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.

(D) THE CONTRACTOR MAY ELECT TO USE ⅞" DIAMETER DRILLED IN ANCHORS WITH 50 KIPS PER SQUARE INCH OR GREATER YIELD STRENGTH WHEN ATTACHING THE TERMINAL END ELEMENTS INTO ROCK. SEE ABOVE GENERAL NOTE (B) FOR PULL-OUT REQUIREMENTS.

(E) IF THE CONTRACTOR DRILLS THESE ANCHOR BOLTS IN ROCK, THE SAME FLARE RATE MUST BE USED THAT WOULD BE USED WITH THE CRASH TESTED CONCRETE ANCHOR BLOCK.

(F) COST OF CONCRETE ANCHOR BLOCK TO BE INCLUDED IN THE COST OF ITEM NO. 705-04.02.

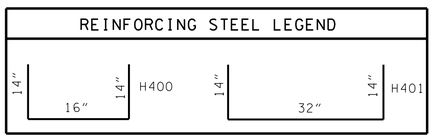
(G) ESTIMATED QUANTITIES OF CONCRETE AND STEEL ARE:

CLASS "A" CONCRETE= 0.44 CUBIC YARD

NO. 4 STEEL REINFORCING BARS= 52 POUNDS

(H) SEE S-GRA-1A FOR ALTERNATE BURIED-IN-BACKSLOPE ANCHOR.

REINFORCING STEEL LEGEND



MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

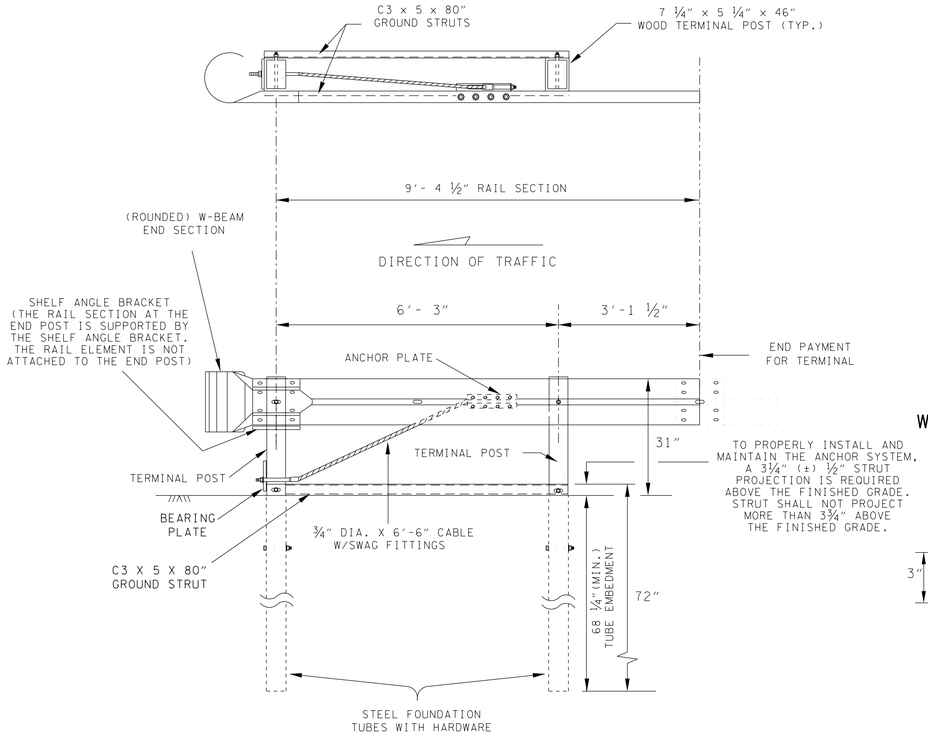
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPE 12 GUARDRAIL ANCHOR

7-11-13 | S-GRA-1

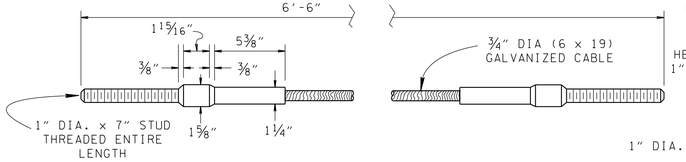
REV. 5-1-15: REVISED NO.1 & 2 BREAK WAY POSTS WITH 5'-0" TUBE SLEEVE.

REV. 10-10-16: REMOVED TYPE 21 AND IN-LINE FROM TITLE, UPDATED POST DETAIL, UPDATED STRUT DETAIL, ADDED RAIL DETAIL, AND UPDATED NOTES.



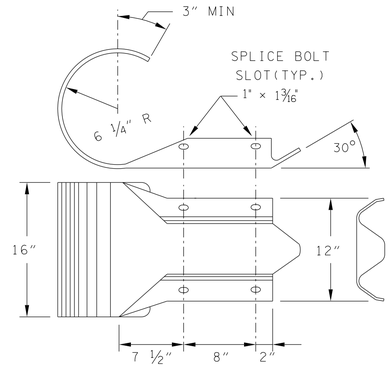
DOWNSTREAM ANCHOR TERMINAL

ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC

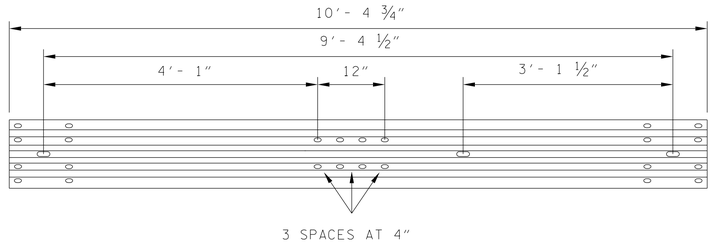


STANDARD SWAGE FITTING AND STUD

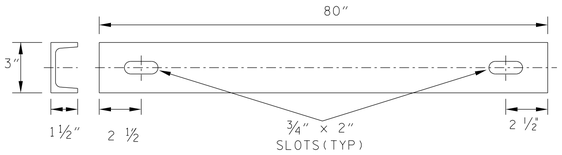
NOTE: CABLE TO BE SWAGE-CONNECTED



W-BEAM END SECTION (ROUNDED) (12 GA.)

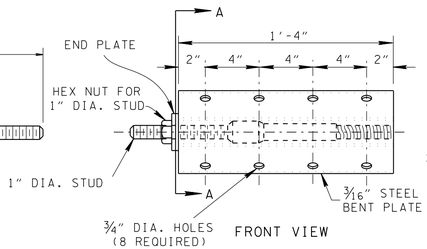


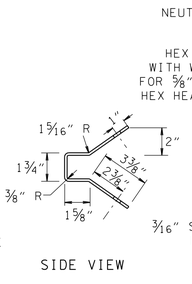
TERMINAL RAIL ELEMENT

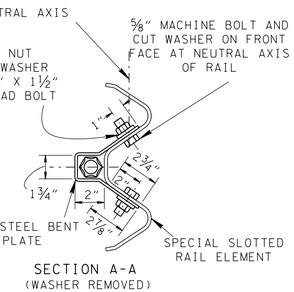


GROUND STRUT

C3 x 5 x 80",GRADE A36

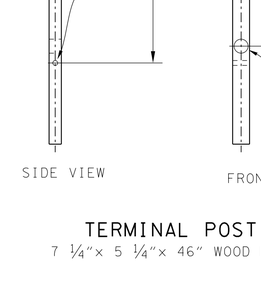






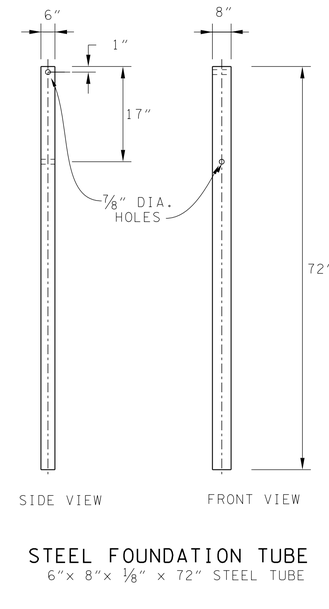
ANCHOR PLATE ASSEMBLY DETAILS

(ANCHOR PLATE, (8) ⅝" X 1½" HEX HEAD BOLTS, NUTS, AND WASHERS)



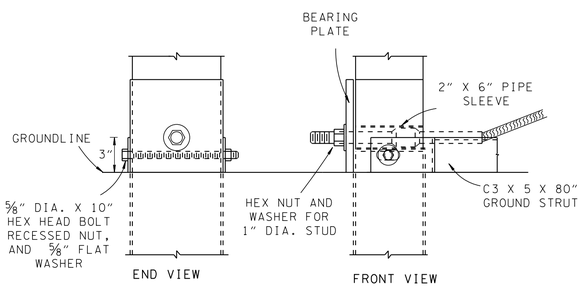
TERMINAL POST

7 ¼"x 5 ¼"x 46" WOOD POST

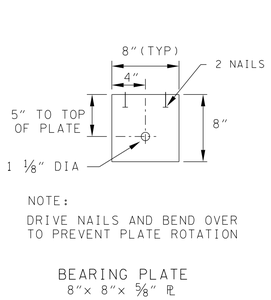


STEEL FOUNDATION TUBE

6"x 8"x ⅛" x 72" STEEL TUBE

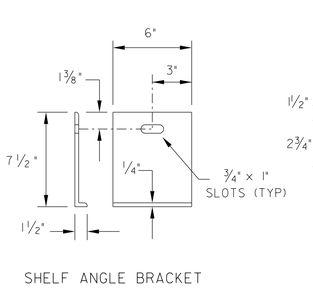


BEARING PLATE ASSEMBLY DETAIL

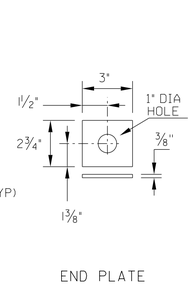


BEARING PLATE

8"x 8"x ⅝" ℞



SHELF ANGLE BRACKET



END PLATE

GENERAL NOTES

(A) TYPE 13 GUARDRAIL TERMINAL SHALL ONLY BE INSTALLED AT TRAILING ENDS(DOWNSTREAM) WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC. SEE S-CZ-1.

(B) ALL HOLES IN WOOD POSTS ARE TO BE DRILLED BEFORE PRESERVATIVE TREATMENT IS APPLIED.

(C) ALL CUTTING, DRILLING, AND WELDING OF STEEL COMPONENTS SHALL BE DONE BEFORE GALVANIZING.

(D) THE FINISHED CABLE ASSEMBLY WILL NOT BE ACCEPTABLE UNLESS IT IS IN TENSION WITH NO SAG.

(E) OTHER ANCHOR CABLE ASSEMBLIES PROVIDING A MINIMUM BREAKING STRENGTH OF 40,000 POUNDS PER SQUARE INCH WILL BE ACCEPTABLE.

(F) TO BE PAID UNDER ITEM NO. 705-04.03 GUARDRAIL TERMINAL (TYPE 13) PER EACH. (SEE S-PL-2)

(G) ALL HARDWARE SHALL CONFORM TO ASTM A307 UNLESS OTHERWISE SHOWN.

(H) DESIGN BASED ON AASHTO MASH TL-3, TTI REPORT 9-1002-6.

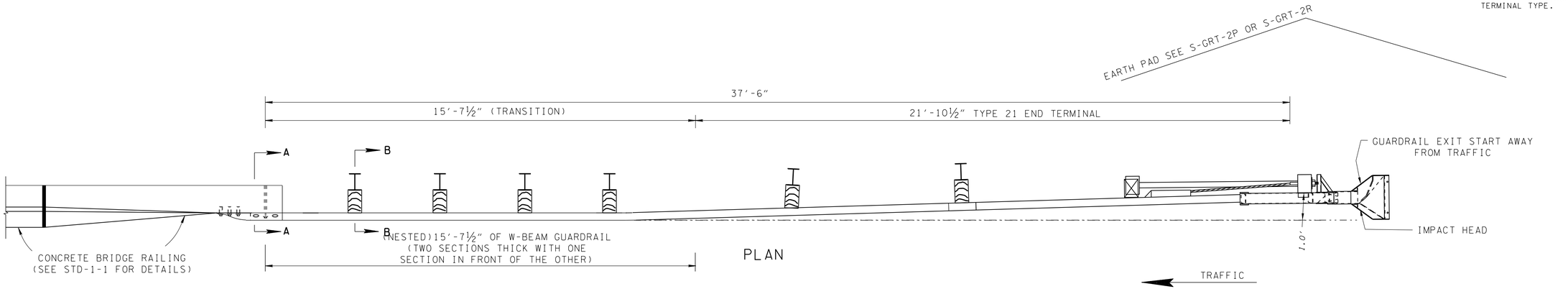
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPE 13 GUARDRAIL ANCHOR

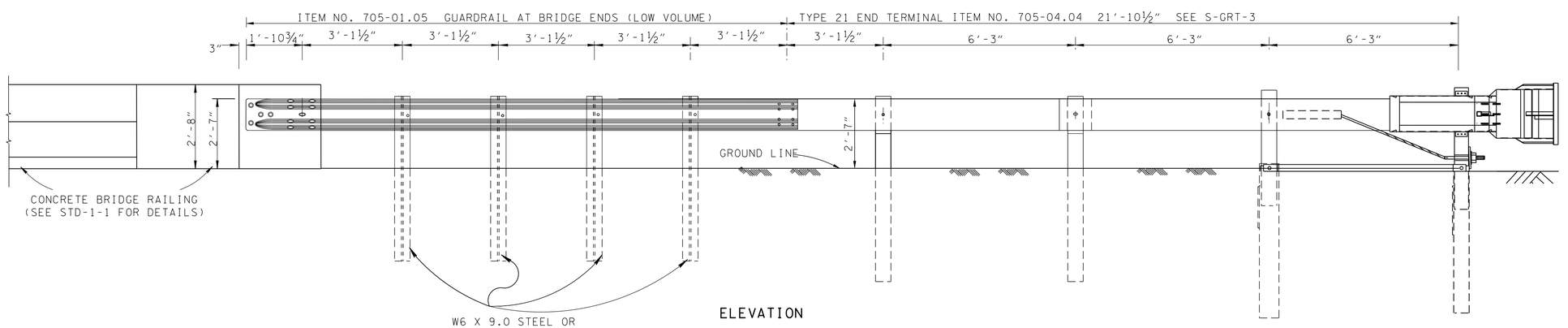
7-11-13 | S-GRA-3

- REV. 4-11-14: ADDED ITEM NUMBER FOR TRANSITION.
- REV. 10-10-16: CHANGED TITLE. UPDATED REFERENCES TO OTHER STANDARD DRAWINGS. CHANGED TERMINAL TYPE.

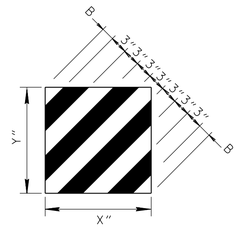


PLAN

TRAFFIC



ELEVATION

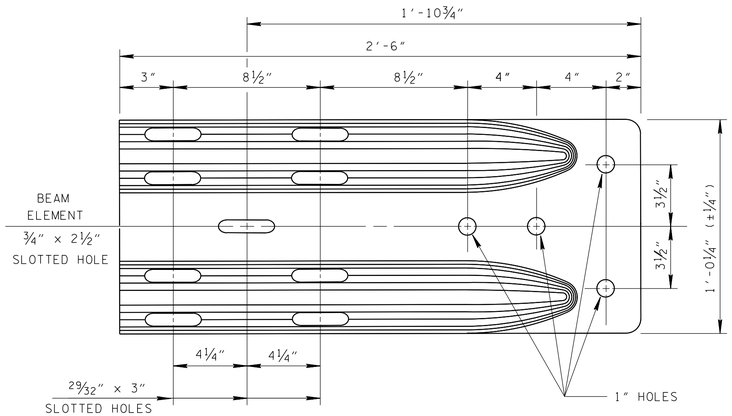


STRIPES AT 45° TOWARD THE TRAVELED WAY.

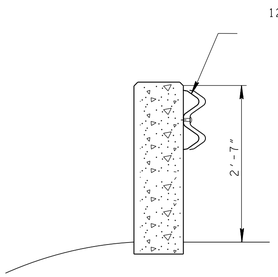
BACKGROUND: YELLOW (IN ACCORDANCE WITH STANDARD SPECIFICATION 916.06)

COPY: BLACK

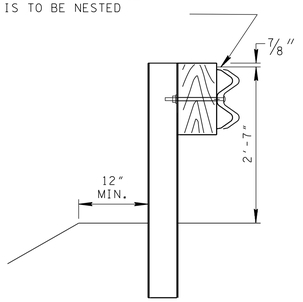
"X" AND "Y" SHALL BE WITHIN 3" OF FACE WIDTH AND HEIGHT, RESPECTIVELY, AND FACE SHALL HAVE A MINIMUM 300 SQUARE INCHES COPY AREA.



ELEVATION (FRONT)



SECTION A-A



SECTION B-B

5/8" X 1¼" BUTTON HEAD BOLTS, NUTS, AND WASHERS TO BE INSTALLED THROUGH ENLARGED AREA OF SLOT

NOTE TO DESIGNER

THIS DRAWING IS TO BE USED FOR LOW SPEED (V< 45 MPH) LOCAL ROADS (ADT < 2000) ONLY

GENERAL NOTES

(A) SEE STANDARD DRAWING RD01-TS-1A FOR DETAILS AND SPECIFICATIONS REGARDING DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS.

(B) THE POST OFFSET DIMENSIONS ARE GIVEN TO THE CENTER OF THE TRAFFIC FACE OF THE BLOCK-OUTS, EXCEPT AT THE FIRST TWO POSTS, WHERE THE DIMENSION IS TO THE CENTER OF THE TRAFFIC FACE OF THE POST. OFFSET POINTS ARE TO BE LOCATED BY CHORD MEASUREMENTS AT THE BACK OF THE RAIL EQUAL TO THE NOMINAL POST SPACINGS SHOWN. POSTS ARE TO BE SET APPROXIMATELY RADIAL TO THE RAILINGS AT EACH POST LOCATION.

(C) SEE MANUFACTURER'S FABRICATION DRAWINGS FOR DETAILS.

(D) SEE STRUCTURE'S BRIDGE RAIL STANDARD DRAWING FOR BOLT CONNECTION FOR MICHIGAN SHOE TO BRIDGE RAIL.

(E) TO BE USED ONLY FOR LOW SPEED TL-2 CONDITIONS. TRANSITION WAS EVALUATED BY TTI (REPORT 4564-1) AT NCHRP 350 TL-2.

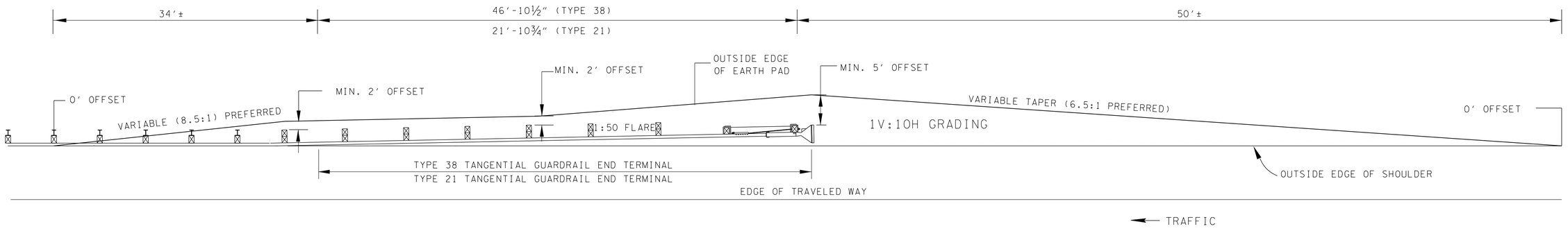
- MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL CONNECTION TO BRIDGE END FOR LOCAL ROADS (ADT<2000)

7-11-13 | S-GRC-2

- REV. 5-26-16: CORRECTED PREFERRED TAPER RATE.
- REV. 10-10-16: UPDATED TITLE AND GENERAL NOTES TO INCLUDE TYPE 21 TERMINAL.



PLAN VIEW OF EARTH PAD CONSTRUCTION

GENERAL NOTES

(A) REFER TO RD01-S-SERIES FOR ROADSIDE SLOPE DEVELOPMENT AND ROADSIDE DITCH DETAILS.

(B) EARTH PAD FOR TYPE 38 TERMINAL IS SHOWN. TYPE 21 TERMINAL HAS 3 LESS SPANS THAN TYPE 38 TERMINAL. SEE S-GRT-2 FOR TYPE 38 TERMINAL DETAILS. SEE S-GRT-3 FOR TYPE 21 TERMINAL DETAILS. APPLICABLE FOR TANGENT INSTALLATIONS ONLY.

(C) THE DESIGNER SHALL INCORPORATE AN EARTH PAD IN CONJUNCTION WITH ALL TYPE 38 AND TYPE 21 GUARDRAIL TERMINALS IN THE RIGHT-OF-WAY AND CONSTRUCTION PLANS AS WELL AS THE ROADWAY CROSS-SECTION SHEETS.

(D) THE CONTRACTOR SHALL CONSTRUCT AN EARTH PAD AS PART OF THE INITIAL GRADING OPERATIONS AS SHOWN ON THIS STANDARD DRAWING AFTER FIELD VERIFICATION OF HAZARD LOCATION AND ENGINEER'S APPROVAL. THE OFFSETS SHOWN INDICATE THE MINIMUM OFFSETS REQUIRED BEHIND THE GUARDRAIL END TERMINAL, ACTUAL OFFSETS FROM THE OUTSIDE SHOULDER FOR THE GRADED PAD WILL DEPEND ON THE APPROVED TYPE 38 OR TYPE 21 GUARDRAIL END TERMINAL WHICH IS UTILIZED IN THE LOCATION.

(E) ON ALL NEW GRADE AND DRAIN PROJECTS, THE EARTH PAD SHALL BE BUILT AS SHOWN ON THIS STANDARD DRAWING WITHOUT EXCEPTION AND PAID UNDER ROADWAY GRADING. RESURFACING, MAINTENANCE OR BRIDGE REPAIR PROJECTS MAY SUBSTITUTE RETROFIT STANDARD S-GRT-2R.

(F) REFER TO S-PL-1 FOR LENGTH OF NEED AND CLEAR ZONE REQUIREMENTS.

(G) ON PROJECTS OF LIMITED SCOPE OR WITH NO ADDITIONAL ROADWAY GRADING, THE EARTH PAD SHALL BE PAID UNDER THE ITEM NUMBER:

705-04.09 EARTH PAD FOR TYPE 38 GR END TREATMENT PER EACH
OR
705-04.10 EARTH PAD FOR GUARD RAIL END TREATMENT PER EACH

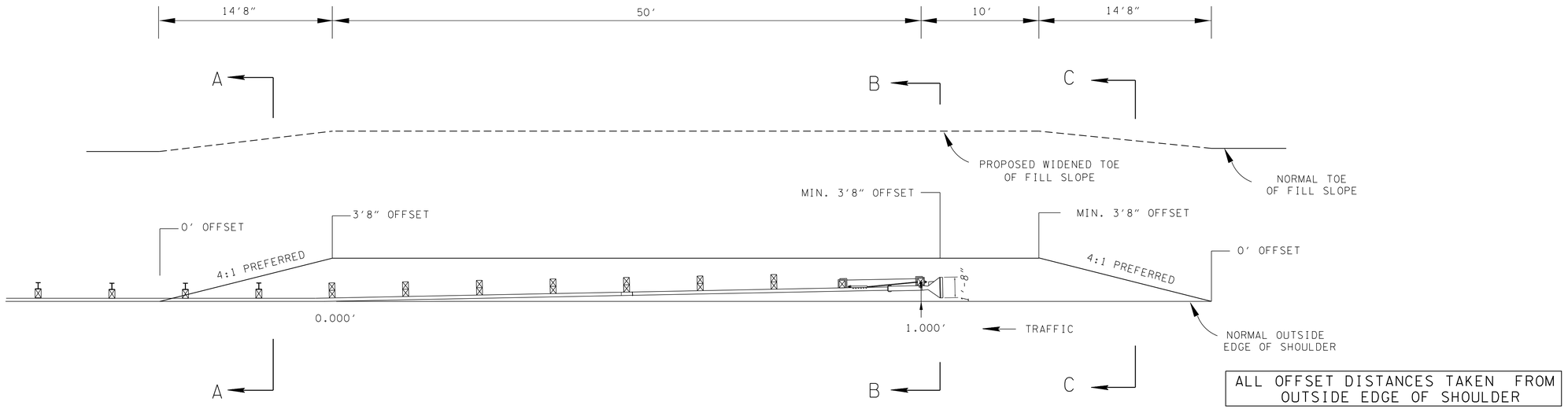
- MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINALS

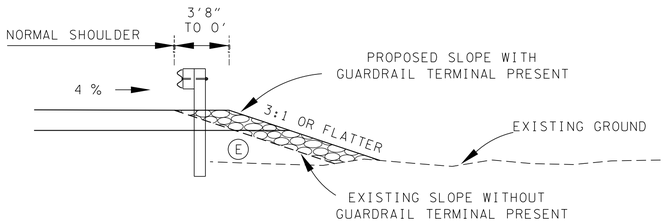
7-11-13 | S-GRT-2P

REV. 10-10-16: UPDATED TITLE AND GENERAL NOTES TO INCLUDE TYPE 21 TERMINAL.

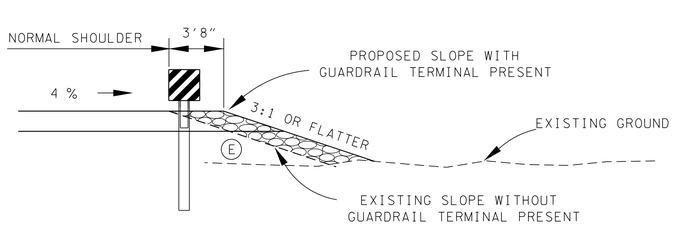


ALL OFFSET DISTANCES TAKEN FROM OUTSIDE EDGE OF SHOULDER

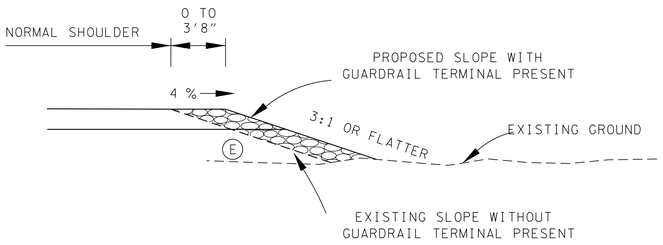
PLAN VIEW OF PROPOSED CONSTRUCTION OF EARTH PAD FOR TYPE 38 GUARDRAIL TERMINAL



SECTION A-A



SECTION B-B



SECTION C-C

NOTE TO DESIGNER

THIS STANDARD DRAWING IS AN ALTERNATE TO THE PREFERRED STANDARD DRAWING S-GRT-2P TO BE USED ON MAINTENANCE, RESURFACING AND BRIDGE REPAIR PROJECTS.

GENERAL NOTES

(A) THIS STANDARD DRAWING MAY BE USED WHEN RIGHT-OF-WAY OR OTHER LIMITATIONS PROHIBIT THE USE OF S-GRT-2P.

(B) EARTH PAD FOR TYPE 38 TERMINAL IS SHOWN. TYPE 21 TERMINAL HAS 3 LESS SPANS THAN TYPE 38 TERMINAL. SEE S-GRT-2 FOR TYPE 38 TERMINAL DETAILS. SEE S-GRT-3 FOR TYPE 21 TERMINAL DETAILS.

(C) THE FORESLOPE MUST BE A 3:1 OR FLATTER. WHEN THE SLOPE IS STEEPER THAN 3:1 OR DRAINAGE DITCHES EXIST THAT DO NOT ALLOW THE USE OF THIS PAD DETAIL, THE GUARDRAIL MAY BE EXTENDED BEYOND THE MINIMUM LENGTH OF NEED AS SHOWN ON S-PL-1.

(D) REFER TO S-PL-1 FOR LENGTH OF NEED REQUIREMENTS AND CLEAR AREAS AT GUARDRAIL TERMINALS.

(E) EARTH PAD SHALL BE CONSTRUCTED OF AGGREGATE MEETING THE REQUIREMENTS OF STANDARD SPECIFICATION 903.05. THE AGGREGATE SHALL BE PLACED IN LAYERS AND COMPACTED.

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

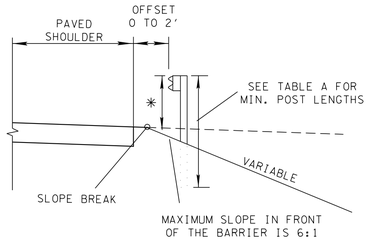
EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINALS (RETROFIT)

7-11-13 | S-GRT-2R

REV. 12-1-14: ADDED NOTE TO DETAIL (E) MINOR DRAFTING UPDATE. ADDED TABLE.

REV.10-10-16: GENERAL REVISION.

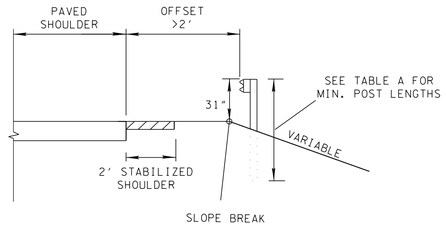
TYPICAL SECTIONS



DETAIL A

GUARDRAIL PLACEMENT
(ALL SPEEDS)

* **NOTE: INSTALL POST AT 31" RELATIVE TO A LINE EXTENDED FROM THE SHOULDER SLOPE**



DETAIL B

OFFSET GUARDRAIL PLACEMENT

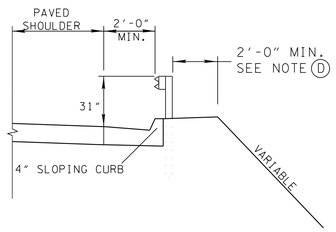
NOTE: INSTALL POST AT 31" RELATIVE TO GROUND ELEVATION

ROADWAY FILL SLOPE	MIN. POST LENGTH REQUIRED
6:1	6'
4:1	7'
3:1	8'
2:1	9'
1:1	11'

SEE NOTE (D)

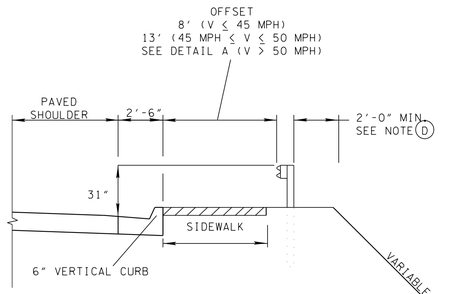
TABLE A

TYPICAL SECTIONS WITH CURB AND GUTTER



DETAIL C

GUARDRAIL PLACEMENT ON CURB AND GUTTER SECTION
(ALL SPEEDS)



DETAIL D

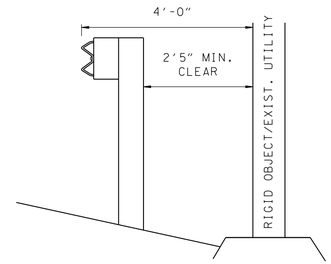
OFFSET GUARDRAIL PLACEMENT ON CURB AND GUTTER SECTION

GUARDRAIL POST REDUCTION IN DEFLECTION

	POST SPACING		
	6'-3"	3'-1½"	1'-6¾"
SINGLE W-BEAM	2'-6"	2'-0"	1'-6"
NESTED W-BEAM	2'-0"	1'-6"	1'-0"

TABLE B

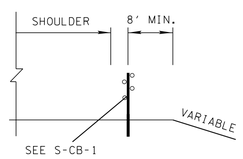
BASED ON NCHRP 350 TL-3



TYPICAL MIN. CLEAR TO A RIGID OBJECT

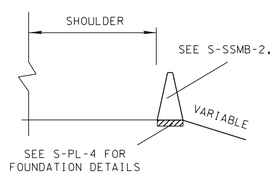
(SEE TABLE B IF LESS DEFLECTION IS DESIRED)

ALTERNATE TO W-BEAM GUARDRAIL WHERE HIGHER PERFORMANCE IS NEEDED



DETAIL E

HIGH TENSION 4 STRAND CABLE BARRIER
(TL-4)



DETAIL F

FREE STANDING CONCRETE BARRIER RAIL
(TL-5)

GENERAL NOTES FOR GUARDRAIL

(A) THIS DRAWING PROVIDES GUIDANCE FOR FACILITIES WITH POSTED SPEED LIMIT EQUAL TO OR GREATER THAN 60 MPH. SOME GUIDANCE FOR FACILITIES WITH POSTED SPEED LIMITS LESS THAN 60 MPH ARE INCLUDED IN THIS DRAWING AND ARE LESS STRINGENT, REFER TO THE STANDARDS AND POLICY OFFICE IN THE ROADWAY DESIGN DIVISION FOR ADDITIONAL GUIDANCE.

(B) IF GUARDRAIL IS IN A CURB AND GUTTER SECTION, IT SHALL BE PLACED SUCH THAT THE GUARDRAIL FACE IS EVEN WITH THE CURB (DETAIL C) OR A MINIMUM OF 8' FROM THE CURB (DETAIL D).

(C) ON 6:1 OR FLATTER SLOPE GUARDRAIL MAY BE PLACED AT THE SLOPE BREAK.

(D) ON SLOPES STEEPER THAN 6:1, GUARDRAIL MAY BE PLACED AT A MINIMUM OF 2' IN FRONT OF SLOPE BREAK USING A 6' POST. IF POST CANNOT BE PLACED AT A MINIMUM OF 2' IN FRONT OF SLOPE BREAK, SEE TABLE A FOR MINIMUM POST LENGTH REQUIRED.

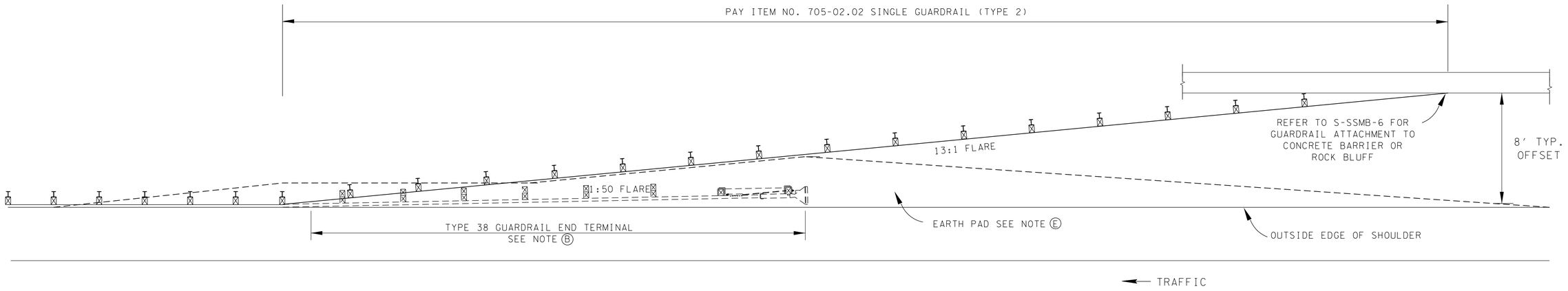
(E) IF THE CONDITION IN NOTE (C) CANNOT BE MET, GUARDRAIL MAY BE PLACED AT SLOPE BREAK IF POSTS ARE LENGTHENED IN ACCORDANCE TO TABLE A.

(F) REFER TO RD01-TS SERIES OF STANDARD DRAWINGS FOR MORE INFORMATION.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SAFETY PLAN
SAFETY HARDWARE
PLACEMENT ON
OUTSIDE EDGE

7-11-13 | S-PL-6



PLAN VIEW OF FLARED GUARDRAIL ANCHORED TO CONCRETE BARRIER OR ROCK BLUFF

GENERAL NOTES

(A) THIS ANCHOR MAY BE USED AT LOCATIONS WHERE THE ROADWAY SIDE SLOPE IS 6:1 OR LESS.

(B) FOR NEW PROJECTS, FLARED GUARDRAIL ANCHORED TO CONCRETE BARRIER OR ROCK BLUFF IS AN ALTERNATE TO TYPE 38 GUARDRAIL END TERMINAL. FOR RETROFIT PROJECTS, FLARED GUARDRAIL ANCHORED TO CONCRETE BARRIER OR ROCK BLUFF REPLACES AN EXISTING TYPE 38 GUARDRAIL END TERMINAL. REFER TO S-GRT-2 FOR TYPE 38 GUARDRAIL END TERMINAL DETAILS.

(C) PAYMENT FOR GUARDRAIL WILL BE UNDER PAY ITEM NUMBER:
705-02.02 SINGLE GUARDRAIL (TYPE 2) PER LF
COST TO INCLUDE ATTACHMENT TO CONCRETE BARRIER OR ROCK BLUFF.

(D) REFER TO S-GR31-1 FOR GUARDRAIL DETAILS.

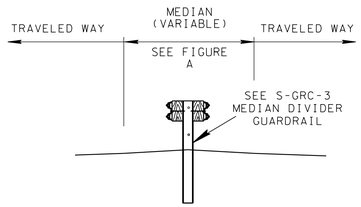
(E) REFER TO S-GRT-2P OR S-GRT-2R FOR EARTH PAD DETAILS.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

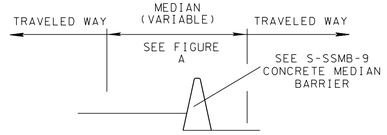
FLARED GUARDRAIL ANCHOR

5-26-16 | S-GRA-5

10/7/2016 9:33:35 AM
F:\backup d\pak on J96208\WORKSTD\2016 std dwg\SGRA5_052716.DGN

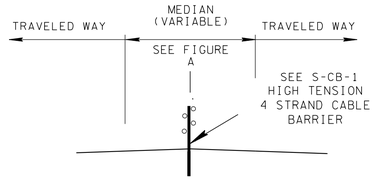


TL-3



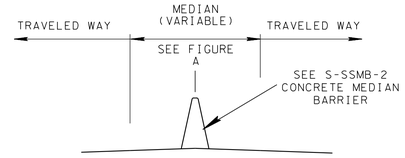
TL-4

(6' OR LESS GRADE DIFFERENCE)



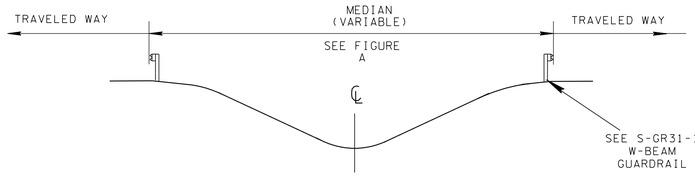
TL-4

(16' OR LESS MEDIAN)

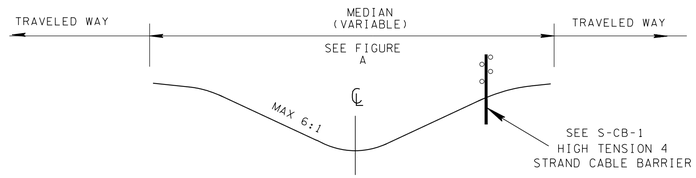


TL-5

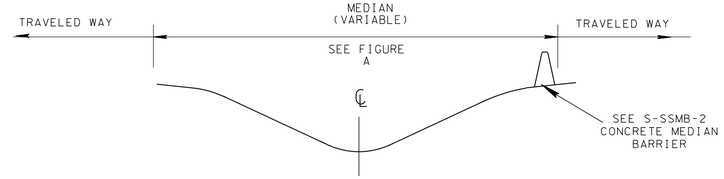
NARROW MEDIANS (28' OR LESS)



TL-3



TL-4



TL-5

DEPRESSED MEDIANS (28' TO 64')

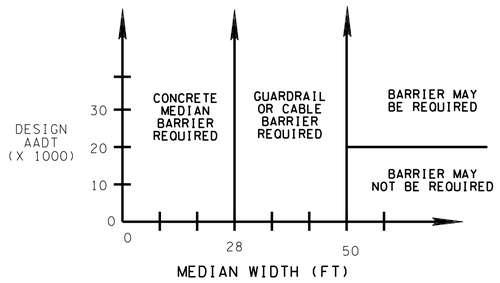


FIGURE A

THE NEED OF BARRIER DETERMINATION GUIDE FOR MEDIAN BARRIER INSTALLATION

FIGURE A IS TO BE USED AS A GUIDE, BUT IS NOT A SUBSTITUTE FOR GOOD ENGINEERING JUDGEMENT. OTHER CONSIDERATIONS, SUCH AS CRASH HISTORY, MAY BE USED TO JUSTIFY BARRIER INSTALLATION. THIS STANDARD DOES NOT APPLY TO FREEWAYS WITH INDEPENDENT ROADWAYS (SEE RD01-TS-5A)

GENERAL NOTES FOR MEDIAN DIVIDER GUARDRAIL

(A) TO BE USED IN MEDIANS BETWEEN 10 TO 32' WIDE ONLY WHERE CONCRETE MEDIAN BARRIER CANNOT BE INSTALLED.

(B) SEE S-GR31-1 FOR DETAILS NOT SHOWN.

(C) THE POST SHALL NOT BE PLACED IN ASPHALT. IF NECESSARY PAVED MEDIAN ASPHALT SHALL BE REMOVED AT POST LOCATIONS.

(D) FOR CONNECTION TO CONCRETE MEDIAN BARRIER SEE S-GRC-3.

(E) THIS SYSTEM HAS BEEN EVALUATED AND DOCUMENTED ON THE TTL TEST REPORT 9-1002-12-8(2016).

(F) PRODUCTS MUST BE LISTED ON THE TDOT QPL.

(G) PAY ITEM NUMBERS:

705-03.02 MEDIAN DIVIDER GUARDRAIL (TYPE 2)	PER LF
705-04.13 MEDIAN GUARDRAIL END TERMINAL	PER EACH

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

SAFETY PLAN
SAFETY HARDWARE
PLACEMENT
IN MEDIAN

5-31-16 | S-PL-6A

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SECTION 1 - STANDARD ROADWAY DRAWINGS

5-100.00 ROADWAY DESIGN STANDARDS

5-100.01 STANDARD ABBREVIATIONS AND LEGENDS

DRAWING	REVISION DATE	DESCRIPTION
RD-A-1	12-18-99	STANDARD ABBREVIATIONS
RD-L-1	10-26-94	STANDARD LEGEND
RD-L-2	09-05-01	STANDARD LEGEND FOR UTILITY INSTALLATIONS
RD-L-3	04-15-04	STANDARD LEGEND FOR SIGNALIZATION AND LIGHTING
RD-L-4	04-15-04	STANDARD LEGEND FOR SIGNALIZATION AND LIGHTING
RD-L-5	05-01-08	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-6	03-30-10	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-7	05-24-12	STANDARD LEGEND FOR EROSION PREVENTION AND SEDIMENT CONTROL
RD-L-8		STANDARD LEGEND FOR NATURAL STREAM DESIGN

5-100.02 TYPICAL SECTIONS AND DESIGN CRITERIA

DRAWING	REVISION DATE	DESCRIPTION
RD01-TS-1	02-05-16	DESIGN STANDARDS FOR LOCAL ROADS AND STREETS
RD01-TS-1A	02-05-16	DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS (ADT<=400)

RD01-TS-2	10-15-02	DESIGN STANDARDS FOR COLLECTOR ROADS AND STREETS
RD01-TS-2A	10-15-02	DESIGN STANDARDS 4 AND 6 LANE COLLECTOR HIGHWAYS WITH DEPRESSED MEDIANS
RD01-TS-2B	10-15-02	DESIGN STANDARDS 4 AND 6 LANE COLLECTOR HIGHWAYS WITH FLUSH MEDIANS
RD01-TS-3	10-15-02	DESIGN STANDARD FOR 2-LANE ARTERIAL HIGHWAYS
RD01-TS-3A	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIAL HIGHWAYS WITH DEPRESSED MEDIANS
RD01-TS-3B	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIALS WITH INDEPENDENT ROADWAYS
RD01-TS-3C	10-15-02	DESIGN STANDARDS 4 AND 6 LANE ARTERIAL HIGHWAYS WITH FLUSH MEDIANS
RD01-TS-4	07-23-13	DESIGN STANDARDS 1 AND 2 LANE RAMPS
RD01-TS-5	10-15-02	DESIGN STANDARDS FREEWAYS WITH DEPRESSED MEDIANS
RD01-TS-5A	10-15-02	DESIGN STANDARDS FREEWAYS WITH INDEPENDENT ROADWAYS
RD01-TS-5B	10-15-02	DESIGN STANDARDS FREEWAYS WITH MEDIAN BARRIER
RD01-TS-5W		TYPICAL DETAIL FOR INSIDE LANE WIDENING OF FREEWAYS
RD01-TS-6	10-10-16	TYPICAL CURB AND GUTTER SECTIONS WITH SHOULDER
RD01-TS-6A	07-31-13	TYPICAL CURB AND GUTTER SECTIONS WITHOUT SHOULDER
RD01-TS-6B		TYPICAL CURB AND GUTTER FOR HIGH SPEED SUBURBAN ROADWAYS
RD01-TS-7	10-15-02	DESIGN STANDARDS 2-LANE HIGHWAY WITH CONTINUOUS 2-WAY LEFT-TURN LANE
RD01-TS-7A	10-15-02	DESIGN STANDARDS 2-LANE CURB AND GUTTER WITH CONTINUOUS 2-WAY LEFT-TURN LANE
RD01-TS-8	04-08-16	SHARED USE PATH TYPICAL SECTIONS
RD01-TS-9	06-15-12	DESIGN STANDARDS FOR SINGLE LANE URBAN AND RURAL ROUNDABOUTS

RD01-TS-10	06-15-12	DESIGN STANDARDS FOR MULTI-LANE URBAN AND RURAL ROUNDABOUTS
RD01-SE-2	10-15-02	URBAN SUPERELEVATION DETAILS
RD01-SE-3	10-15-02	RURAL SUPERELEVATION DETAILS

5-100.03 SLOPE DEVELOPMENT

DRAWING	REVISION DATE	DESCRIPTION
RD01-S-11	04-04-03	DESIGN AND CONSTRUCTION DETAILS FOR ROADSIDE SLOPE DEVELOPMENT
RD01-S-11A	10-15-02	ROADSIDE DITCH DETAILS FOR DESIGN AND CONSTRUCTION
RD01-S-11B	10-15-02	DESIGN AND CONSTRUCTION DETAILS FOR ROCK CUT SLOPE AND CATCHMENT
RD01-SA-1	10-15-02	SAFETY APPROACH TO UNDERPASSES GRADING DESIGN AND SLOPE PROTECTION

5-100.04 INTERSECTION SIGHT DISTANCE

DRAWING	REVISION DATE	DESCRIPTION
RD01-SD-1		INTERSECTION SIGHT DISTANCE DESIGN AND GENERAL NOTES
RD01-SD-2		INTERSECTION SIGHT DISTANCE LANDSCAPE AND OBSTRUCTION
RD01-SD-3		INTERSECTION SIGHT DISTANCE 2-LANE ROADWAYS
RD01-SD-4		INTERSECTION SIGHT DISTANCE 5-LANE AND 4- LANE UNDIVIDED ROADWAYS
RD01-SD-5		INTERSECTION SIGHT DISTANCE 4-LANE DIVIDED HIGHWAYS
RD01-SD-6		INTERSECTION SIGHT DISTANCE 6-LANE DIVIDED HIGHWAYS

RD01-SD-7	INTERSECTION SIGHT DISTANCE FOR PASSIVE RAILROAD HIGHWAY GRADE CROSSINGS

5-100.05 UNDERDRAINS

DRAWING	REVISION DATE	DESCRIPTION
RD-UD-3	09-05-96	UNDERDRAIN DETAILS
RD-UD-4	01-25-16	UNDERDRAIN LATERAL DETAILS
RD-UD-6	12-18-94	LATERAL UNDERDRAIN ENDWALL DETAIL FOR 1:1 & 2:1 SLOPES
RD-UD-7	12-18-94	LATERAL UNDERDRAIN ENDWALL DETAIL FOR 3:1 & 4:1 SLOPES
RD-UD-8		LATERAL UNDERDRAIN ENDWALL DETAIL FOR 5:1 SLOPES
RD-UD-9	12-18-94	LATERAL UNDERDRAIN ENDWALL DETAIL FOR 6:1 SLOPES

5-110.00 PIPE CULVERTS AND ENDWALLS

5-110.01 PIPE CULVERTS AND FLUME

DRAWING	REVISION DATE	DESCRIPTION
D-FLU-1		FLUME DETAILS
D-PB-1	01-02-13	STANDARD DETAILS FOR CONCRETE PIPE INSTALLATION
D-PB-2	01-29-14	STANDARD DETAILS FOR FLEXIBLE PIPE INSTALLATION
D-PB-3		INDUCED TRENCH SOIL EMBANKMENT FOR PIPE CULVERT INSTALLATION
D-PG-3	04-15-97	FERROUS AND ALUMINUM CORRUGATED METAL PIPE
D-PG-4	07-29-94	FERROUS AND ALUMINUM CORR. METAL PIPE- ARCHES
D-PO-1	05-27-01	STANDARD OVAL & FLAT BASE CONCRETE CULVERT PIPE
D-PS-1	03-15-76	STRUTTING DETAILS FOR CORR. METAL & STRUCTURAL PLATE ROUND PIPE

5-110.02 SAFETY CROSS DRAIN ENDWALLS

DRAWING	REVISION DATE	DESCRIPTION
D-PE-15A	06-14-13	15” CONCRETE ENDWALL CROSS DRAIN (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-15B		15” CONCRETE ENDWALL CROSS DRAIN (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-18A	01-06-15	18” CONCRETE ENDWALL CROSS DRAIN (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-18B		18” CONCRETE ENDWALL CROSS DRAIN (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-24A	01-21-16	24” CONCRETE ENDWALL CROSS DRAIN (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-24B		24” CONCRETE ENDWALL CROSS DRAIN (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-30A	10-10-16	30” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-30B		30” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-36A	06-14-13	36” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-36B		36” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-42A	06-14-13	42” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-42B		42” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-48A	06-14-13	48” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-48B		48” CONCRETE ENDWALL CROSS DRAIN WITH STEEL PIPE GRATE (FOR 3:1, 4:1 & 6:1 SLOPES)
D-PE-99	11-01-13	PIPE GRATE & SKEWED CONNECTION DETAILS FOR “U” ENDWALLS (FOR 3:1, 4:1 & 6:1 SLOPES)

5-110.03 SAFETY SIDE DRAIN ENDWALLS

DRAWING	REVISION DATE	DESCRIPTION
D-SEW-1A	06-14-13	SIDE DRAIN CONCRETE ENDWALL WITH STEEL PIPE GRATE FOR 15” THRU 48” PIPES – 6:1 SLOPE
D-SEW-12D	06-14-13	CONCRETE ENDWALL TYPE “SD” WITH STEEL PIPE GRATE FOR 15” THRU 48” PIPES – 12:1 SLOPE

5-110.04 PROTECTED ENDWALLS*

DRAWING	REVISION DATE	DESCRIPTION
D-PE-1	02-12-76	TYPE “A” CONCRETE ENDWALL 2:1 SLOPE, 36” TO 78”
D-PE-4	10-10-16	STRAIGHT CONCRETE ENDWALL
D-PE-5	05-27-01	STANDARD WINGWALLS HORIZONTAL OVAL CONCRETE PIPES
D-PE-7	05-27-01	STANDARD STRAIGHT ENDWALLS FLATBASE CONCRETE PIPES
D-PE-7A	05-27-01	STANDARD WINGWALLS FLATBASE CONCRETE PIPES
D-PE-8	01-19-97	DETAIL OF STANDARD PIPE AND PIPE-ARCH CULVERT WITH BEVELED ENDS AND RIP-RAP
D-PE-9	04-25-90	CONCRETE ENDWALLS TYPE "B" (FOR ROUND & SIDE TAPERED INLETS, PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 AND 4:1 SLOPES) 1976
D-PE-9A	10-25-82	GENERAL DIMENSION QUANTITIES ROUND PIPE CONCRETE ENDWALLS TYPE “B” (PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 AND 4:1 SLOPES) 1976
D-PE-9B		GEN. DIMENSIONS AND QUANTITIES SIDE TAPER INLETS CONCRETE ENDWALLS - TYPE “B” (PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 AND 4:1 SLOPES) 1976
D-PE-9C		BILL OF STEEL (SHEET 1 OF 4) CONCRETE ENDWALLS TYPE “B” (FOR CONCRETE ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 SLOPE) 1976

D-PE-9D	BILL OF STEEL (SHEET 2 OF 4) CONCRETE ENDWALLS TYPE “B” (FOR CONCRETE ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 4:1 SLOPE) 1976
D-PE-9E	BILL OF STEEL (SHEET 3 OF 4) CONCRETE ENDWALLS TYPE “B” (FOR STEEL ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 2:1 SLOPE) 1976
D-PE-9E	BILL OF STEEL (SHEET 4 OF 4) CONCRETE ENDWALLS TYPE “B” (FOR STEEL ROUND AND SIDE TAPERED INLET, PIPE SIZES 15" TO 78", ALL SKEWS, 4:1 SLOPE) 1976

*NOTE: THE PROTECTED ENDWALLS MAY NOT BE USED INSIDE THE CLEAR ZONE UNLESS SHIELDED BY GUARDRAIL OR OTHER SAFETY DEVICE.

5-120.00 CATCH BASINS AND MANHOLES

5-120.01 CATCH BASINS

DRAWING	REVISION DATE	DESCRIPTION
D-CB-10LPC	08-01-12	LOW PROFILE LOWERED CURB 32" X 26" RECTANGULAR CONCRETE NO. 10LPC CATCH BASIN
D-CB-10RA	03-11-14	STANDARD PRECAST 48" CIRCULAR NO. 10 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-10S	03-11-14	STANDARD RECTANGULAR CONCRETE N0. 10 CATCH BASIN
D-CB-10SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 10 CATCH BASIN
D-CB-12LP	08-01-12	LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 12LP CATCH BASIN (FOR USE WITH 6” NON-MOUNTABLE CURB)
D-CB-12P	03-11-14	STANDARD PRECAST RECTANGULAR CONCRETE NO.12 CATCH BASIN
D-CB-12RA	03-11-14	STANDARD PRECAST 48" CIRCULAR NO. 12 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-12RB	03-11-14	STANDARD PRECAST 60" AND 72" CIRCULAR NO. 12 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-12RC	03-11-14	STANDARD PRECAST 84" THRU 120" CIRCULAR NO. 12 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)

D-CB-12S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 12 CATCH BASIN
D-CB-12SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-12SC	03-11-14	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-12SD	03-11-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-12SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 12 CATCH BASIN
D-CB-13P	03-11-14	STANDARD PRECAST RECTANGULAR CONCRETE NO. 13 CATCH BASIN
D-CB-13RA	03-11-14	STANDARD PRECAST 48" CIRCULAR NO. 13 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-13RB	03-11-14	STANDARD PRECAST 60" AND 72" CIRCULAR NO. 13 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-13RC	03-11-14	STANDARD PRECAST 84" THRU 120" CIRCULAR NO. 13 CATCH BASIN (FOR USE WITH 6" NONMOUNTABLE CURB)
D-CB-13S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 13 CATCH BASIN
D-CB-14P	03-11-14	STANDARD PRECAST RECTANGULAR CONCRETE NO. 14 CATCH BASIN
D-CB-14RB	03-11-14	STANDARD PRECAST CIRCULAR NO. 14RB CATCH BASIN
D-CB-14S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 14 CATCH BASIN
D-CB-14SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 14 CATCH BASIN
D-CB-16S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 16 CATCH BASIN
D-CB-17S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 17 CATCH BASIN
D-CB-25LP	08-01-12	LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 25LP CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)

D-CB-25P	03-11-14	STANDARD PRECAST RECTANGULAR CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25RA	01-27-16	STANDARD PRECAST 48" CIRCULAR NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25RB	01-27-16	STANDARD PRECAST CIRCULAR NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SC	03-11-14	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SD	03-11-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-25SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 25 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-26P	03-11-14	STANDARD PRECAST RECTANGULAR CONCRETE NO. 26 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-26S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 26 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-27S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 27 CATCH BASIN (FOR USE WITH 6" MOUNTABLE CURB)
D-CB-28LP	08-01-12	LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 28LP CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-28P	03-11-14	STANDARD PRECAST RECTANGULAR CONCRETE NO. 28 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-28RA	04-12-16	STANDARD PRECAST 48" CIRCULAR NO. 28 CATCH BASIN (FOR USE WITH 4" SLOPING CURB)
D-CB-28RB	04-12-16	STANDARD PRECAST CIRCULAR NO. 28 CATCH BASIN (FOR USE WITH 4" SLOPING CURB)
D-CB-28S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 28 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-29P	03-11-14	STANDARD PRECAST RECTANGULAR CONCRETE NO. 29 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)

D-CB-29S	03-11-14	STANDARD RECTANGULAR CONCRETE NO. 29 CATCH BASIN (FOR USE WITH 4" MOUNTABLE CURB)
D-CB-31R	03-11-14	STANDARD PRECAST CIRCULAR NO. 31 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-31SD	03-11-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 31 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-31SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 31 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-32LP	08-01-12	STANDARD 80” X 32” RECTANGULAR CONCRETE NO. 32 CATCH BASIN (FOR USE UNDER CONCRETE MEDIUM BARRIER WALL)
D-CB-38RB	03-11-14	STANDARD PRECAST CIRCULAR NO. 38 CATCH BASIN
D-CB-38S	08-01-12	STANDARD 32" X 32" SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-38SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-38SC	03-11-14	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-39RB	03-11-14	STANDARD PRECAST CIRCULAR NO. 39 CATCH BASIN
D-CB-39S	08-01-12	STANDARD 4' X 4' SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-39SC	03-11-14	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 39 CATCHBASIN
D-CB-39SD	03-11-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-39SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-40S	08-01-12	STANDARD 4' X 8' RECTANGULAR CONCRETE NO. 40 CATCH BASIN
D-CB-40SE	03-11-14	STANDARD 9’ X 9’ SQUARE CONCRETE NO. 40. CATCH BASIN

D-CB-41LP	08-01-12	LOW PROFILE 32" X 32" SQUARE CONCRETE NO. 41LP CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41P	03-11-14	STANDARD 4' X 3' PRECAST RECTANGULAR CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41RB	03-11-14	STANDARD PRECAST CIRCULAR NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41S	03-11-14	STANDARD 4' X 3' RECTANGULAR CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SC	03-11-14	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SD	03-11-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-41SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 41 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-42RB	03-11-14	STANDARD PRECAST CIRCULAR NO. 42 CATCH BASIN
D-CB-42S	08-01-12	STANDARD 32" X 32" SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-42SB	03-11-14	STANDARD 4' X 4' SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-42SC	03-11-14	STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-42SD	03-11-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 42 CATCH BASIN
D-CB-43R	03-11-14	STANDARD PRECAST CIRCULAR NO. 43R CATCH BASIN
D-CB-43SB	03-11-14	STANDARD 8' X 4' RECTANGULAR CONCRETE NO. 43SB CATCH BASIN

D-CB-43SC	03-11-14	STANDARD 8' X 5' 2" RECTANGULAR CONCRETE NO. 43SC CATCH BASIN
D-CB-44SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 44 CATCH BASIN
D-CB-45S	03-11-14	STANDARD 8' X 4' RECTANGULAR CONCRETE NO. 45 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-46SE	03-11-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 46 CATCH BASIN (FOR USE UNDER CONCRETE MEDIAN BARRIER WALL)
D-CB-51SC	03-11-14	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 51 CATCH BASIN (FOR USE IN FRONT OF CONCRETE RETAINING WALL)
D-CB-51SD	03-11-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 51 CATCH BASIN (FOR USE IN FRONT OF CONCRETE RETAINING WALL)
D-CB-51SE	03-11-14	STANDARD 9’ X 9’ SQUARE CONCRETE NO. 51 CATCH BASIN
D-CB-52SE	03-11-14	STANDARD 9’ x 9’ SQUARE CONCRETE NO. 52 CATCH BASIN
D-CB-99	05-20-14	MISCELLANEOUS DETAILS FOR RECTANGULAR STRUCTURES
D-CB-99R	03-11-14	MISCELLANEOUS DETAILS FOR ROUND STRUCTURES
D-CB-99RA	03-19-14	BILL OF STEEL FOR ROUND CATCH BASIN LIDS
D-CB-99RB		ROUND JUNCTION BOX SPRING DRAIN BOX
D-CBB-12A	05-27-01	TYPE ‘B’ CAST IRON FRAME, GRATE & NONMOUNTABLE INLET DETAILS FOR NOS. 10, 12, 14, 16, & 17 TYPE CATCH BASINS
D-CBB-12B	05-27-01	TYPE ‘B’ CAST IRON FRAME, GRATE & 6" MOUNTABLE INLET DETAILS FOR NOS. 25, 26 & 27 TYPE CATCH BASINS
D-CBB-12C	05-27-01	TYPE ‘B’ CAST IRON FRAME, GRATE & 4" MOUNTABLE INLET DETAILS FOR NOS. 28 & 29 TYPE CATCH BASINS
D-CBB-13	05-27-01	TYPE ‘B’ CAST IRON FRAME, GRATE & NONMOUNTABLE INLET DETAILS FOR NO. 13 TYPE CATCH BASINS

D-CBB-31	05-27-01	TYPE 'B' CAST IRON FRAME, GRATE & INLET DETAILS FOR NOS. 31, 41, 45, 46, & 51 TYPE CATCH BASINS
D-CBB-42	05-27-01	CAST IRON GRATE DETAILS FOR NOS. 42, 43 & 44 TYPE CATCH BASINS

5-120.02 JUNCTION BOXES

DRAWING	REVISION DATE	DESCRIPTION
D-JBS-1	08-01-12	STANDARD 32" X 32" SQUARE CONCRETE NO. 1 JUNCTION BOX
D-JBS-2	08-01-12	STANDARD 4' X 4' SQUARE CONCRETE NO. 2 JUNCTION BOX
D-JBS-3	08-01-12	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 3 JUNCTION BOX
D-JBS-4	08-01-12	STANDARD 7' X 7' SQUARE CONCRETE NO. 4 JUNCTION BOX
D-JBS-5	08-01-12	STANDARD 9' X 9' SQUARE CONCRETE NO. 5 JUNCTION BOX

5-120.03 MANHOLES

DRAWING	REVISION DATE	DESCRIPTION
D-MH-2	02-02-16	STANDARD MASONRY & PRECAST NO. 3 MANHOLE
D-MH-3	04-21-14	TYPICAL DESIGN OF LIDS FOR NO. 3 MANHOLE
D-MH-4	08-01-12	STANDARD NO. 3 MANHOLE CASTINGS AND STEPS
D-MH-5	04-01-14	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 3 MANHOLE
D-MH-6	04-01-14	STANDARD 7' X 7' SQUARE CONCRETE NO. 3 MANHOLE
D-MH-7	04-01-14	STANDARD 9' X 9' SQUARE CONCRETE NO. 3 MANHOLE
D-RF-1	02-02-16	STANDARD PRECAST RISER

5-120.04 SPRING DRAIN BOXES

DRAWING	REVISION DATE	DESCRIPTION
D-SDS-1	08-01-12	STANDARD 32" X 32" SQUARE CONCRETE NO. 1 SPRING DRAIN BOX
D-SDS-2A	08-01-12	STANDARD 4' X 4' SQUARE CONCRETE NO. 2A SPRING DRAIN BOX
D-SDS-2B	08-01-12	STANDARD 4' X 4' SQUARE CONCRETE NO. 2B SPRING DRAIN BOX
D-SDS-3A	08-01-12	STANDARD 5' 2" X 5' 2" SQUARE CONCRETE NO. 3A SPRING DRAIN BOX

5-120.05 SLOTTED AND TRENCH DRAINS

DRAWING	REVISION DATE	DESCRIPTION
D-SLD-1	02-02-16	SLOTTED DRAINS
D-SLD-2	05-27-01	SLOTTED DRAINS
D-SLD-3	02-02-16	SLOTTED DRAINS
D-TD-1		TRENCH DRAIN

5-130.00 NATURAL STREAM DESIGN

5-130.01 DEFLECTORS, VANES & ENERGY DISSIPATORS

DRAWING	REVISION DATE	DESCRIPTION
D-NSD-1		BOULDER CLUSTERS
D-NSD-2		ROCK VANES
D-NSD-3		LOG DEFELECTORS AND LOG VANES
D-NSD-4		LOG DROPS AND STEP POOLS

D-NSD-5	BOULDER RIFFLES
D-NSD-6	CONSTRUCTED RIFFLES
D-NSD-7	COCONUT FIBER ROLLS AND LIVE SILTATION
D-NSD-8	LIVE FASCINES AND WILLOW CUTTINGS
D-NSD-9	BRUSH MATTRESS
D-NSD-10	LARGE WOODY DEBRIS
D-NSD-11	VEGETATED RIPRAP AND GABIONS
D-NSD-12	VEGETATED MSE WALLS
D-NSD-13	LONGITUDINAL STONE TOE AND ARTICULATED CONCRETE MAT

5-140.00 ROADWAY AND PAVEMENT APPURTENANCES

5-140.01 CONCRETE PAVEMENT

DRAWING	REVISION DATE	DESCRIPTION
RP-CS-1	09-29-10	CONCRETE SHOULDER RUMBLE STRIP DETAIL (FOR 4-LANE DIVIDED HIGHWAY)
RP-CS-2	09-29-10	CONCRETE SHOULDER RUMBLE STRIP DETAIL (FOR 6-LANE OR WIDER DIVIDED HIGHWAY)
RP-J-1	10-26-00	PORTLAND CEMENT CONCRETE PAVEMENT JOINT TYPES AND SPACING
RP-J-3	10-26-00	PORTLAND CEMENT CONCRETE PAVEMENT JOINT TYPES AND SPACING
RP-J-5	07-01-01	TYPICAL ACCELERATION AND DECELERATION LANE JOINT TYPES AND SPACING FOR CONCRETE RAMPS
RP-J-7	07-14-14	CONCRETE RAMP JOINT TYPES AND SPACING
RP-J-9	02-02-12	CONTRACTION AND CONSTRUCTION JOINTS FOR CONCRETE PAVEMENT
RP-J-11	07-29-96	3/4" AND 1 3/4" EXPANSION AND EDGE PAVEMENT JOINTS

RP-J-13	03-20-91	3/4" AND 1 3/4" ELASTOMERIC COMPRESSION JOINT SEALS
RP-J-15	01-19-02	LONGITUDINAL CONTRACTION AND CONSTRUCTION JOINTS
RP-J-17	02-02-12	DOWEL ASSEMBLY DEVICES
RP-J-18	02-02-12	DOWEL ASSEMBLY DEVICES
RP-J-19	02-02-12	DOWEL ASSEMBLY DEVICES
RP-J-23	07-25-12	CONCRETE PAVEMENT REPAIR DETAILS
RP-J-24	05-27-01	CONCRETE PAVEMENT SPALL AND RANDOM CRACK REPAIR DETAILS
RP-J-25	05-27-01	CONCRETE PAVEMENT JOINT REPAIR DETAILS

5-140.02 INTERSECTIONS

DRAWING	REVISION DATE	DESCRIPTION
RP-D-15	04-08-16	DETAILS OF STANDARD CONCRETE DRIVEWAYS
RP-D-16	04-08-16	DETAILS OF LOWERED STANDARD CONCRETE DRIVEWAYS
RP-DHO-1	10-26-93	MEDIAN OPENINGS ON 4-LANE DIVIDED HIGHWAY
RP-I-5	12-18-96	EXAMPLES OF STREET & ALLEY INTERSECTIONS
RP-R-1	05-27-01	STANDARD RAMPS TO SIDE ROADS
RP-PMR-1	05-27-01	STANDARD DETAILS FOR PROPOSED PERMANENT MAINTENANCE RAMP

5-140.03 CURBS

DRAWING	REVISION DATE	DESCRIPTION
RP-MC-1	02-28-02	STANDARD 4" SLOPING (MOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS

RP-MC-2	02-28-02	STANDARD 6" SLOPING (MOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS
RP-NMC-10	07-29-03	STANDARD VERTICAL (NONMOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS
RP-NMC-11	02-28-02	STANDARD VERTICAL (NONMOUNTABLE) CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS
RP-R-2		STANDARD CONSTRUCTION DETAILS FOR ROUNDABOUTS

5-140.04 SIDEWALKS

DRAWING	REVISION DATE	DESCRIPTION
RP-H-3	10-10-16	CURB RAMP AND TRUNCATED DOME SURFACE DETAIL
RP-H-4	10-10-16	PERPENDICULAR CURB RAMP
RP-H-5	10-10-16	PARALLEL CURB RAMP
RP-H-6	10-10-16	PEDESTRIAN REFUGE
RP-H-7	10-10-16	PERPENDICULAR CURB RAMP IN CURVE
RP-H-8	10-10-16	PERPENDICULAR CURB RAMP PLACED OUTSIDE CURVE
RP-H-9	10-10-16	PARALLEL CURB RAMP IN CURVE
RP-S-7	02-05-16	DETAILS FOR CONCRETE SIDEWALKS
RP-S-8	02-05-16	DETAILS FOR STANDARD CONCRETE STEPS AND PIPE HANDRAILS
RP-S-9		ALTERNATE DETAILS FOR PEDESTRIAN FACILITIES

5-140.05 WALLS

DRAWING	REVISION DATE	DESCRIPTION
W-CIP-1		ROADWAY FEATURES AT CAST IN PLACE RETAINING WALL
W-MSE-1		ROADWAY FEATURES FOR MSE SEGMENTAL PRECAST FACING RETAININGG WALL

W-MSE-2	ROADWAY FEATURES FOR MSE MODULAR BLOCK FACING RETAINING WALL
W-SG-1	STANDARD GRAVITY-TYPE RETAINING WALLS
W-SP-1	ROADWAY FEATURES AT SOLDIER PILE AND SOIL ANCHORED RETAINING WALLS
W-TW-1	DETAILS OF TREE WALLS

5-150.00 SAFETY DESIGN AND FENCES

5-150.01 CLEAR ZONE AND SAFETY PLANS

DRAWING	REVISION DATE	DESCRIPTION
S-CZ-1		CLEAR ZONE CRITERIA
S-PL-1		SAFETY PLAN AT ROADSIDE HAZARDS
S-PL-2	10-10-16	SAFETY PLAN AT SIDEROADS OR PRIVATE DRIVES
S-PL-3	10-10-16	SAFETY PLAN: MINIMUM INSTALLATION AT BRIDGE ENDS
S-PL-4	10-10-16	SAFETY PLAN FOR BRIDGE PIERS IN CLEAR ZONE
S-PL-5	10-10-16	SAFETY PLAN FOR BRIDGE ENDS IN MEDIANS
S-PL-6	10-10-16	SAFETY PLAN SAFETY HARDWARE PLACEMENT ON OUTSIDE EDGE
S-PL-6A		SAFETY PLAN SAFETY HARDWARE PLACEMENT IN MEDIAN

5-150.02 CABLE BARRIER

DRAWING	REVISION DATE	DESCRIPTION
S-CB-1		CABLE BARRIER PLACEMENT

5-150.03 CRASH CUSHIONS

DRAWING	REVISION DATE	DESCRIPTION
S-CC-1	08-26-15	CRASH CUSHION
S-CC-2		CRASH CUSHION (GATING) BARREL ARRAY

5-150.04 GUARDRAIL DETAILS

DRAWING	REVISION DATE	DESCRIPTION
S-GR31-1	10-20-16	W-BEAM GUARDRAIL
S-GR31-1A		W-BEAM BARRIER FASTENING HARDWARE
S-GRS-1	01-29-16	SPECIAL CASE LONG SPAN GUARDRAIL ONE POST OMITTED
S-GRS-2	05-25-16	SPECIAL CASE: GUARDRAIL ATTACHMENT TO CONCRETE DECKS
S-GRS-3		SPECIAL CASE: GUARDRAIL FOOTING
S-GRS-4	04-12-16	SPECIAL CASE GUARDRAIL HEIGHT TRANSITION DETAIL
S-GRC-1	10-10-16	GUARDRAIL CONNECTION TO BRIDGE ENDS OR BARRIER WALL
S-GRC-2	10-10-16	GUARDRAIL CONNECTION TO BRIDGE END FOR LOCAL ROADS (ADT< 2000)
S-GRC-3	10-10-16	MEDIAN DIVIDER GUARDRAIL TRANSITION TO CONCRETE MEDIAN BARRIER

5-150.05 GUARDRAIL TERMINALS

DRAWING	REVISION DATE	DESCRIPTION
S-GRT-1		TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE

S-GRT-2	04-04-16	TYPE 38 GUARDRAIL END TERMINAL
S-GRT-2P	10-10-16	EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINAL
S-GRT-2R	10-10-16	EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINAL (RETROFIT)
S-GRT-3	10-10-16	TYPE 21 GUARDRAIL END TERMINAL
S-GRT-4	10-10-16	TYPE 13 GUARDRAIL END TERMINAL (TRAILING END)

5-150.06 GUARDRAIL ANCHORS

DRAWING	REVISION DATE	DESCRIPTION
S-GRA-1	10-10-16	TYPE 12 GUARDRAIL ANCHOR
S-GRA-1A		GUARDRAIL ANCHOR FOR TYPE 12 TERMINAL (ALTERNATIVE)
S-GRA-3	10-10-16	TYPE 13 GUARDRAIL ANCHOR
S-GRA-4	10-10-16	IN-LINE GUARDRAIL ANCHOR
S-GRA-5		FLARED GUARDRAIL ANCHOR

5-150.07 CONCRETE MEDIAN BARRIERS

DRAWING	REVISION DATE	DESCRIPTION
S-SSMB-1	08-19-13	32” SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-2	08-19-13	51” SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-3	07-16-13	51” HALF SIZE SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-4	04-12-16	FLARED SINGLE SLOPE CONCRETE MEDIAN BARRIER WALL (VERTICAL BACK)
S-SSMB-5		SINGLE SLOPE MEDIAN BARRIER WALL CATCH BASIN DETAIL
S-SSMB-6	10-10-16	GUARDRAIL ATTACHMENT TO SINGLE SLOPE CONCRETE BARRIER WALL

S-SSMB-7	05-10-14	FOOTING DETAILS FOR OVERHEAD SIGN STRUCTURE 32" MEDIAN BARRIER WALL
S-SSMB-8	05-20-14	FOOTING DETAILS FOR OVERHEAD SIGN STRUCTURE 51" MEDIAN BARRIER WALL
S-SSMB-9	07-16-13	SINGLE SLOPE BARRIER WALL FOR GRADE SEPARATED MEDIAN

5-150.08 BICYCLE/PEDESTRIAN RAIL

DRAWING	REVISION DATE	DESCRIPTION
S-BPR-1	02-05-16	BIKE/PEDESTRIAN SAFETY RAIL

5-150.09 FENCE AND RIGHT-OF-WAY MARKERS

DRAWING	REVISION DATE	DESCRIPTION
S-F-1	05-24-12	HIGH VISIBILITY FENCE
S-F-10	06-01-09	STANDARD RIGHT-OF-WAY STOCK FENCE
S-F-10A	06-01-09	STANDARD RIGHT-OF-WAY STOCK FENCE WITH TIMBER POSTS
S-F-10B	05-14-10	STANDARD RIGHT-OF-WAY CHAIN LINK FENCE
S-F-10C	05-14-10	RIGHT-OF-WAY FENCE AT BRIDGES AND BOX CULVERTS
S-F-10D		RIGHT-OF-WAY FENCE LOCATIONS AT INTERCHANGES
S-FG-11	05-14-10	STANDARD STOCK FENCE GATE
S-FG-2	01-24-08	EXAMPLES OF WATER GATES AND WATER CROSSINGS
S-RP-2	02-08-16	STANDARD CONCRETE RIGHT-OF-WAY MARKERS

5-160.00 DESIGN - TRAFFIC CONTROL

5-160.01 PAVEMENT MARKINGS

DRAWING	REVISION DATE	DESCRIPTION
T-M-1	07-24-14	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS AND MARKING ABBREVIATIONS
T-M-2	10-10-16	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS
T-M-3	07-24-14	MARKING STANDARDS FOR TRAFFIC ISLANDS, MEDIANS & PAVED SHOULDERS ON CONVENTIONAL ROADS
T-M-4	10-10-16	STANDARD INTERSECTION PAVEMENT MARKINGS
T-M-5	04-23-13	MARKING DETAILS FOR EXPRESSWAYS & FREEWAYS
T-M-6	06-22-12	MARKING DETAIL FOR EXPRESSWAY & FREEWAY INTERCHANGES
T-M-7	01-12-12	GORE MARKING DETAILS FOR EXPRESSWAY & FREEWAY INTERCHANGES
T-M-8	01-12-12	MARKING DETAILS FOR EXPRESSWAYS & FREEWAYS
T-M-9	11-01-11	PAVEMENT MARKING AND SIGNING DETAILS FOR RAMP INTERSECTIONS
T-M-10	06-15-12	SIGNING AND PAVEMENT MARKINGS FOR SHARED- USE PATHS
T-M-11	10-10-16	SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANE OR ROUTES
T-M-12	01-30-15	SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES ON URBAN ROADWAYS
T-M-13		SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES
T-M-14	11-01-11	SIGNING AND PAVEMENT MARKINGS FOR BICYCLE LANES AT INTERSECTIONS
T-M-15		ASPHALT SHOULDER RUMBLE STRIP INSTALLATION DETAILS FOR INTERSTATE AND ACCESS CONTROLLED ROUTES

T-M-15A	01-30-15	ASPHALT SHOULDER RUMBLE STRIP INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES
T-M-16	01-30-15	ASPHALT SHOULDER RUMBLE STRIPE INSTALLATION DETAILS FOR NON-ACCESS CONTROLLED ROUTES
T-M-16A	07-24-14	ASPHALT CENTER LINE RUMBLE STRIPE
T-M-17	02-20-14	PAVEMENT MARKING DETAILS FOR ROUNDABOUTS

5-160.02 WORK ZONES

DRAWING	REVISION DATE	DESCRIPTION
T-FAB-1	05-27-97	FLASHING YELLOW ARROW BOARD
T-PBR-1	06-30-09	INTERCONNECTED PORTABLE BARRIER RAIL
T-PBR-2	11-01-11	DETAIL FOR VERTICAL PANELS AND FLEXIBLE DELINEATORS
T-WZ-10	04-02-12	ADVANCE ROAD WORK SIGNING ON HIGHWAYS AND FREEWAYS
T-WZ-11	03-13-09	ONE LANE CLOSURE DETAIL ON DIVIDED HIGHWAYS
T-WZ-12	03-13-09	ONE LANE CLOSURE DETAIL FOR BRIDGES ON DIVIDED HIGHWAYS
T-WZ-13	03-13-09	TWO-OUTSIDE LANE CLOSURE ON FREEWAY OR EXPRESSWAY
T-WZ-14	03-13-09	TWO-OUTSIDE LANE CLOSURE ON INTERSTATES AND EXPRESSWAYS (PORTABLE BARRIER RAIL)
T-WZ-15	04-02-12	INTERIOR LANE CLOSURE ON FREEWAYS OR EXPRESSWAYS
T-WZ-16	03-13-09	LANE SHIFT ON DIVIDED HIGHWAYS AND FREEWAYS
T-WZ-18	03-13-09	SHOULDER CLOSURE DETAIL FOR FREEWAYS AND DIVIDED HIGHWAYS
T-WZ-19	04-02-12	MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS
T-WZ-20	12-18-99	GEOMETRIC MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS

T-WZ-21	03-15-11	LANE CLOSURE WITH LEFT HAND MERGE AND LANE SHIFT
T-WZ-30	09-01-05	TRAFFIC CONTROL 2-LANE, 2-WAY DIVERSION (40 MPH OR LESS)
T-WZ-31	09-01-05	TRAFFIC CONTROL 2-LANE, 2-WAY DIVERSION (GREATER THAN 40 MPH)
T-WZ-32	10-29-13	TRAFFIC CONTROL PLAN SIGNAL LAYOUT FOR TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-33	05-27-98	TRAFFIC CONTROL PLAN FOR CLOSE INTERSECTION CONDITIONS USING TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-34	09-01-05	TRAFFIC CONTROL PLAN GENERAL NOTES FOR TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-35	04-02-12	TRAFFIC CONTROL PLAN PAY ITEM AND SIGN DETAILS FOR TRAFFIC SIGNAL AT TWO LANE BRIDGE RECONSTRUCTION SITE
T-WZ-36	04-02-12	LANE CLOSURE ON LOW-VOLUME 2-LANE HIGHWAY
T-WZ-40	04-02-12	RIGHT LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-41	04-02-12	LEFT LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-42	04-02-12	CENTER LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-50	04-02-12	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 2 OR 3 LANE MAJOR ROUTES
T-WZ-51	04-02-12	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR 5 LANE MAJOR ROUTES
T-WZ-52	04-02-12	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR 5 LANE MAJOR AND MINOR ROUTES
T-WZ-53	04-02-12	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR MORE LANE DIVIDED MAJOR ROUTES
T-WZ-54	04-02-12	TRAFFIC CONTROL FOR SIGNALS ONLY PROJECTS ON 4 OR MORE LANE DIVIDED MAJOR ROUTES AND 4 OR MORE LANE MINOR ROUTES
T-WZ-55	10-10-16	SIDEWALK TRAFFIC CONTROL

5-170.00 EROSION PREVENTION AND SEDIMENT CONTROL

5-170.01 DEWATERING DEVICES

DRAWING	REVISION DATE	DESCRIPTION
EC-STR-1	08-01-12	DEWATERING STRUCTURE
EC-STR-2	08-01-12	SEDIMENT FILTER BAG

5-170.02 SLOPE DEVICES

DRAWING	REVISION DATE	DESCRIPTION
EC-STR-3B	08-01-12	SILT FENCE
EC-STR-3C	08-01-12	SILT FENCE WITH WIRE BACKING
EC-STR-3D	04-01-08	ENHANCED SILT FENCE
EC-STR-3E	04-01-08	SILT FENCE FABRIC JOINING DETAILS
EC-STR-8	06-10-14	FILTER SOCK
EC-STR-27	08-01-12	TEMPORARY SLOPE DRAIN AND BERM
EC-STR-29	08-01-12	PERMANENT SLOPE DRAIN PIPE
EC-STR-34	08-01-12	EROSION CONTROL BLANKET FOR SLOPE INSTALLATION
EC-STR-35	08-01-12	FILTER BERMS
EC-STR-37	06-10-14	SEDIMENT TUBE

5-170.03 DITCH DEVICES

DRAWING	REVISION DATE	DESCRIPTION
EC-STR-4	08-01-12	ENHANCED SILT FENCE CHECK (TRAPEZOIDAL DITCH)
EC-STR-4A	08-01-12	ENHANCED SILT FENCE CHECK (V-DITCH)

EC-STR-4B	08-01-12	ENHANCED SILT FENCE CHECK DETAILS
EC-STR-6	05-06-16	ROCK CHECK DAM
EC-STR-6A	05-06-16	ENHANCED ROCK CHECK DAM
EC-STR-7	08-01-12	SEDIMENT TRAP WITH CHECK DAM
EC-STR-55	08-01-12	GABION CHECK DAM
EC-STR-56	04-01-08	GABION CHECK DAM DESIGN TABLES
EC-STR-57	04-01-08	GABION ASSEMBLY DETAILS
EC-STR-58	04-01-08	GABION ASSEMBLY DETAILS
EC-STR-59	08-01-12	GABION CHECK DAM GENERAL NOTES AND COMPONENT PROPERTIES
EC-STR-61	08-01-12	LEVEL SPREADERS

5-170.04 INLET PROTECTION

DRAWING	REVISION DATE	DESCRIPTION
EC-STR-11	08-01-12	CULVERT PROTECTION TYPE 1
EC-STR-19	04-01-08	CATCH BASIN PROTECTION
EC-STR-39	08-01-12	CURB INLET PROTECTION TYPE 1 & 2
EC-STR-39A	08-01-12	CURB INLET PROTECTION TYPE 3 & 4
EC-STE-40		CATCH BASIN FILTER ASSEMBLY FOR CIRCULAR STRUCTURES
EC-STR-41		CATCH BASIN FILTER ASSEMBLY (TYPE 1)
EC-STR-41A		CATCH BASIN FILTER ASSEMBLY (TYPE 1) SLIPCOVER DETAILS
EC-STR-42		CATCH BASIN FILTER ASSEMBLY (TYPE 2)
EC-STR-42A		CATCH BASIN FILTER ASSEMBLY (TYPE 2) SLIPCOVER DETAILS
EC-STR-43		CATCH BASIN FILTER ASSEMBLY (TYPE 3)

EC-STR-43A	CATCH BASIN FILTER ASSEMBLY (TYPE 3) SLIPCOVER DETAILS
EC-STR-44	CATCH BASIN FILTER ASSEMBLY (TYPE 4)
EC-STR-44A	CATCH BASIN FILTER ASSEMBLY (TYPE 4) SLIPCOVER DETAILS
EC-STR-45	CATCH BASIN FILTER ASSEMBLY (TYPE 5)
EC-STR-45A	CATCH BASIN FILTER ASSEMBLY (TYPE 5) SLIPCOVER DETAILS
EC-STR-46	CATCH BASIN FILTER ASSEMBLY (TYPE 6)
EC-STR-46A	CATCH BASIN FILTER ASSEMBLY (TYPE 6) SLIPCOVER DETAILS
EC-STR-47	CATCH BASIN FILTER ASSEMBLY (TYPE 7)
EC-STR-47A	CATCH BASIN FILTER ASSEMBLY (TYPE 7) SLIPCOVER DETAILS
EC-STR-48	CATCH BASIN FILTER ASSEMBLY (TYPE 8)
EC-STR-48A	CATCH BASIN FILTER ASSEMBLY (TYPE 8) SLIPCOVER DETAILS
EC-STR-49	CATCH BASIN FILTER ASSEMBLY (TYPE 9)
EC-STR-49A	CATCH BASIN FILTER ASSEMBLY (TYPE 9) SLIPCOVER DETAILS
EC-STR-50	CATCH BASIN FILTER ASSEMBLY (TYPE 10)
EC-STR-50A	CATCH BASIN FILTER ASSEMBLY (TYPE 10) SLIPCOVER DETAILS
EC-STR-51	CATCH BASIN FILTER ASSEMBLY (TYPE 11)
EC-STR-51A	CATCH BASIN FILTER ASSEMBLY (TYPE 11) SLIPCOVER DETAILS

5-170.05 DETAINING DEVICES

DRAWING	REVISION DATE	DESCRIPTION
EC-STR-12	08-01-12	ROCK SEDIMENT DAM
EC-STR-13	08-01-12	ROCK AND EARTH SEDIMENT EMBANKMENT
EC-STR-15	08-01-12	SEDIMENT BASIN
EC-STR-16	08-01-12	SEDIMENT BASINS RISER AND COLLAR APPURTENANCES
EC-STR-17	08-01-12	SEDIMENT BASIN EMBANKMENT DETAILS
EC-STR-18		SEDIMENT BASIN FLOATING OUTLET STRUCTURE
EC-STR-21	08-01-12	PERMANENT RIPRAP BASIN ENERGY DISSIPATORS

5-170.06 IN-STREAM DEVICES

DRAWING	REVISION DATE	DESCRIPTION
EC-STR-11A	08-01-12	CULVERT PROTECTION TYPE 2
EC-STR-25	08-01-12	TEMPORARY CULVERT CROSSING, CONSTRUCTION EXIT, CONSTRUCTION FORD
EC-STR-30		INSTREAM DIVERSION (WITHOUT TRAFFIC)
EC-STR-30A		INSTREAM DIVERSION (WITH TRAFFIC)
EC-STR-31	08-01-12	TEMPORARY DIVERSION CHANNEL
EC-STR-31A	04-01-08	TEMPORARY DIVERSION CHANNEL DESIGN
EC-STR-32	08-01-12	TEMPORARY DIVERSION CULVERTS
EC-STR-33	08-01-12	SUSPENDED PIPE DIVERSION (DOWNSTREAM)
EC-STR-33A	08-01-12	SUSPENDED PIPE DIVERSION (UPSTREAM)
EC-STR-36	08-01-12	TURF REINFORCEMENT MAT FOR CHANNEL INSTALLATION
EC-STR-38	08-01-12	FLOATING TURBIDITY CURTAIN

SECTION 2 – STANDARD TRAFFIC OPERATIONS DRAWINGS

5-200.00 SIGNS

DRAWING	REVISION DATE	DESCRIPTION
T-S-6	02-12-91	STANDARD MOUNTING DETAILS - BOLTED EXTRUDED PANELS
T-S-7	02-12-91	HIGHWAY SHIELDS USED ON INTERSTATE AND U.S. NUMBERED ROUTES
T-S-8	07-15-91	HIGHWAY SHIELDS USED ON STATE NUMBERED ROUTES AND ARROWS
T-S-9	06-10-14	STANDARD LAYOUT - GROUND MOUNTED SIGNS
T-S-10	04-04-12	STANDARD MOUNTING DETAILS - FLAT SHEET SIGNS, ALUMINUM-STEEL DESIGN
T-S-11	06-06-11	DELINEATOR AND MILEPOST DETAILS
T-S-12	07-02-15	STANDARD STEEL GROUND MOUNTED SIGNS, BREAK-AWAY TYPE POST FOOTING DETAILS, SQUARE TUBES
T-S-13	07-20-12	STANDARD STEEL GROUND MOUNTED SIGNS, BREAK-AWAY TYPE POST FOOTING DETAILS, I-BEAMS
T-S-14	08-17-12	STANDARD STEEL GROUND MOUNTED SIGNS, BREAK-AWAY TYPE POST FOOTING DETAILS, WF-BEAMS
T-S-15	12-07-90	STANDARD CONDUIT & GROUND DETAILS FOR OVERHEAD & CANTILEVER SIGN STRUCTURES
T-S-16	07-02-15	GROUND MOUNTED ROADSIDE SIGN PLACEMENT DETAILS
T-S-16A	07-02-15	GROUND MOUNTED ROADSIDE SIGN PLACEMENT DETAILS
T-S-17	07-02-15	STANDARD GROUND MOUNTED SIGN USING PERFORATED/KNOCKOUT SQUARE TUBE
T-S-18	02-14-14	END OF ROADWAY, DEAD END SIGNS, AND METAL BARRICADES (TYPE III)
T-S-19	07-19-15	STANDARD STEEL SIGN SUPPORTS
T-S-20	11-01-11	SIGN DETAILS

T-S-21	07-02-15	DETAILS FOR SIGNS MOUNTS ON CONCRETE MEDIAN BARRIERS
T-S-22	09-12-13	SIGN LAYOUT FOR HOV LANES
T-S-23A	07-02-15	MULTI-DIRECTIONAL SLIP BASE BREAKAWAY P-POST SIGN SUPPORT
T-S-23B	07-19-13	MULTI-DIRECTIONAL SLIP BASE BREAKAWAY STRUCTURAL PIPE SIGN SUPPORT
T-S-23C	07-02-15	BREAKWAY POST SIGN SUPPORTS
T-S-24	08-02-13	DETAILS OF SIGN WITH SOLAR FLASHING ASSEMBLY

5-210.00 SIGNALS

DRAWING	REVISION DATE	DESCRIPTION
T-SG-1	06-27-16	WOOD POLE DETAILS FOR SPAN MOUNTED SIGNALS
T-SG-2	06-27-16	LOOP LEAD-INS, CONDUIT, AND PULL BOXES
T-SG-3	06-27-16	STANDARD NOTES AND DETAILS OF INDUCTIVE LOOPS
T-SG-3A	06-27-16	ALTERNATE DETECTION DETAILS
T-SG-4	06-27-16	SPAN WIRE AND MESSENGER CABLE DETAILS
T-SG-5	06-27-16	CONTROLLER CABINET DETAILS
T-SG-6		PEDESTRIAN SIGNAL DETAILS
T-SG-7	06-27-16	SIGNAL HEAD ASSEMBLIES
T-SG-7A		TYPICAL SIGNAL HEAD PLACEMENT APPROACHES WITH NO THROUGH MOVEMENTS
T-SG-7B		TYPICAL SIGNAL HEAD PLACEMENT APPROACHES WITH NO THROUGH MOVEMENTS
T-SG-7C		TYPICAL SIGNAL HEAD PLACEMENT ONE-LANE AND TWO-LANE APPROACHES
T-SG-7D		TYPICAL SIGNAL HEAD PLACEMENT TWO-LANE APPROACHES

T-SG-7E		TYPICAL SIGNAL HEAD PLACEMENT THREE-LANE APPROACHES
T-SG-7F		TYPICAL SIGNAL HEAD PLACEMENT THREE-LANE APPROACHES
T-SG-7G		TYPICAL SIGNAL HEAD PLACEMENT THREE-LANE APPROACHES
T-SG-7H		TYPICAL SIGNAL HEAD PLACEMENT THREE-LANE AND FOUR-LANE APPROACHES
T-SG-7I		TYPICAL SIGNAL HEAD PLACEMENT FOUR-LANE APROACHES
T-SG-7J		TYPICAL SIGNAL HEAD PLACEMENT FOUR-LANE APPROACHES
T-SG-7K		TYPICAL SIGNAL HEAD PLACEMENT FOUR-LANE APPROACHES
T-SG-7L		TYPICAL SIGNAL HEAD PLACEMENT FOUR-LANE APPROACHES
T-SG-7M		TYPICAL SIGNAL HEAD PLACEMENT FIVE-LANE APPROACHES
T-SG-7N		TYPICAL SIGNAL HEAD PLACEMENT FIVE-LANE APPROACHES
T-SG-7O		TYPICAL SIGNAL HEAD PLACEMENT FIVE-LANE APPROACHES
T-SG-7P		TYPICAL SIGNAL HEAD PLACEMENT FIVE-LANE APPROACHES
T-SG-7Q		TYPICAL SIGNAL HEAD PLACEMENT FIVE-LANE APPROACHES
T-SG-7R		TYPICAL SIGNAL HEAD PLACEMENT SIX-LANE APPROACHES
T-SG-7S		TYPICAL SIGNAL HEAD PLACEMENT SIX-LANE AND SEVEN-LANE APPROACHES
T-SG-8	06-27-16	STRAIN POLE DETAILS FOR SPAN MOUNTED SIGNALS
T-SG-9	06-27-16	DETAILS OF CANTILEVER SIGNAL SUPPORT
T-SG-9A	06-27-16	MISCELLANEOUS SIGNAL DETAILS

T-SG-10	06-27-16	MAST ARM POLE AND STRAIN POLES FOUNDATION DETAILS
T-SG-11	06-27-16	MAINTENANCE OF EXISTING SIGNALS DURING HIGHWAY CONSTRUCTION
T-SG-12	06-27-16	TYPICAL WIRING FOR SIGNAL HEADS AND DETECTION LOOPS
T-SG-13	06-27-16	FLASHING BEACON DETAIL

5-220.00 LIGHTING AND UTILITY POLES

DRAWING	REVISION DATE	DESCRIPTION
T-FO-1		FIBER OPTIC AERIAL ENTRANCE DETAILS
T-FO-2		FIBER OPTIC UNDERGROUND ENTRANCE DETAILS
T-FO-3		FIBER OPTIC AERIAL CONNECTION DETAILS
T-FO-4		FIBER OPTIC PULL BOX, CABINET & POLE DETAILS
T-L-1	12-04-13	STANDARD LIGHTING FOUNDATION DETAILS
T-L-1SA	09-11-13	STANDARD LIGHTING DETAILS FOR SINGLE ARM SUPPORTS
T-L-1TM		STANDARD LIGHTING DETAILS TENON MOUNTED OFFSET LIGHTING SUPPORTS
T-L-2	12-04-13	FOUNDATION DETAIL FOR LUMINAIRE MOUNTED ON CONCRETE MEDIAN BARRIER
T-L-3	04-15-96	STANDARD LIGHTING DETAILS PULL BOXES
T-L-4	05-25-11	STANDARD LIGHTING DETAILS CONDUIT, CABLE INSTALLATION

5-230.00 RAILROAD CROSSING

DRAWING	REVISION DATE	DESCRIPTION
T-RR-1	11-01-11	TYPICAL PAVEMENT MARKING AT RAILROAD ACTIVE HIGHWAY GRADE CROSSINGS AND RAILROAD ADVANCE WARNING SIGN
T-RR-2	11-01-11	STANDARD DRAWING FOR RAILROAD AND HIGHWAY CROSSING SIGNAL WITH GATE
T-RR-3	11-01-11	STANDARD DRAWING FOR RAILROAD-HIGHWAY CROSSING SIGNAL
T-RR-4	11-01-11	STANDARD DRAWING FOR TYPICAL CURB & GUTTER PLAN FOR RAILROAD-HIGHWAY CROSSING WITH OR WITHOUT GATES
T-RR-5	11-01-11	RAILROAD-HIGHWAY CROSSING SIGNAL WITH CANTILEVER SPAN
T-RR-6	10-25-13	TYPICAL SIGNING AND MARKING AT PASSIVE RAILROAD HIGHWAY GRADE CROSSINGS

SECTION 3 – STANDARD STRUCTURE DRAWINGS

5-300.00 NEW STRUCTURES

DRAWING	REVISION DATE	DESCRIPTION
STD-1-1	05-01-14	BRIDGE RAILING CONCRETE PARAPET
STD-1-1SS	05-01-14	BRIDGE RAILING SINGLE SLOPE CONCRETE PARAPET
STD-1-2	03-28-08	SLIDER PLATE AND DECK DRAIN
STD-1-2SS		SLIDER PLATES FOR SINGLE SLOPE PARAPETS AND DECK DRAINS
STD-1- 3	07-31-00	STD. CONCRETE MEDIAN BARRIER
STD-1-3SS	11-01-10	STD. SINGLE SLOPE CONCRETE MEDIAN BARRIER
STD-1-4	01-05-01	SLIDER PLATES FOR MEDIAN BARRIER
STD-1-4SS		SLIDER PLATE ASSEMBLIES FOR SINGLE SLOPE MEDIAN BARRIER
STD-1-5	03-26-14	PAVEMENT AT BRIDGE ENDS
STD-1-6	04-28-97	BRIDGE END DRAIN W/ PAVEMENT AT BRIDGE ENDS
STD-1-7	08-24-11	BRIDGE END DRAIN W/ PAVEMENT AT BRIDGE ENDS
STD-1-8	05-01-95	BRIDGE END DRAIN 2’ X 8’ 7” W/PAVEMENT AT BRIDGE ENDS
STD-1-9	05-01-95	BRIDGE END DRAIN 4’ X 7” W/PAVEMENT AT BRIDGE ENDS
STD-1-10	03-28-94	BRIDGE END DRAIN W/O PAVEMENT AT BRIDGE ENDS
STD-1-11	08-24-11	BRIDGE END DRAIN W/O PAVEMENT AT BRIDGE ENDS
STD-1-12	03-28-94	BRIDGE END DRAIN 2’x8’7” W/O PAVEMENT AT BRIDGE ENDS
STD-1-13	03-28-94	BRIDGE END DRAIN 4’x8’7” W/O PAVEMENT AT BRIDGE ENDS
STD-2-1	11-01-10	BRIDGE MOUNTED INTERCONNECTED PORTABLE BARRIER RAIL

STD-2-2		VERTICAL PANEL DETAILS
STD-3-1	11-01-10	STRIPSEAL EXPANSION JOINT
STD-3-2	11-01-10	STRIPSEAL EXPANSION JOINT
STD-4-1	04-08-05	STD. PRECAST PRESTRESSED BRIDGE DECK PANELS GENERAL DETAILS
STD-4-2	04-08-05	STD. PRECAST PRESTRESSED BRIDGE DECK PANELS DESIGN CRITERIA
STD-4-3	03-02-02	STD.PRECAST PRESTRESSED BRIDGE DECK PANELS GENERAL DETAILS
STD-4-4	06-10-96	STD. PRECAST PRESTRESSED BRIDGE DECK PANELS CONSTRUCTION DETAILS
STD-5-1	10-25-93	STD. PILE DETAILS
STD-5-2	05-01-14	STD. PILE DETAILS
STD-6-1	11-01-10	STANDARD SEISMIC DETAILS
STD-6-2	11-07-94	STANDARD SEISMIC DETAILS
STD-7-1	06-02-14	STD. CONCRETE RAIL
STD-8-2	11-01-10	LIGHT STANDARD SUPPORT DETAILS
STD-8-2SS		SINGLE SLOPE PARAPET STANDARD LIGHT SUPPORT DETAILS
STD-8-3	09-01-91	MEDIAN BARRIER LIGHT STANDARD SUPPORT DETAILS
STD-8-3SS		SINGLE SLOPE MEDIAN BARRIER STANDARD LIGHT SUPPORT DETAILS
STD-8-4		SIGN, LUMINAIRE, AND TRAFFIC SIGNAL SUPPORTS
STD-9-1	10-07-08	REINFORCING BAR SUPPORT DETAILS FOR CONCRETE SLABS
STD-10-1	04-08-05	MISCELLANEOUS ABUTMENT AND DRAINAGE DETAILS
STD-11-1	05-01-14	BRIDGE RAILING W/ STRUCTURAL TUBING
STD-11-2	05-01-14	STANDARD CONCRETE CLASSIC RAIL
STD-14-1	05-01-14	STD. DETAILS AND INT. DIAPH.DETAILS FOR BULB - TEE BEAMS

STD-14-2	11-01-10	STD. DETAILS AND INT. DIAPH.DETAILS FOR I-BEAMS
STD-14-3	10-15-08	STD. DETAILS FOR PRESTRESSED BOX BEAMS

5-310.00 LRFD BOX CULVERTS

(See Section 4-604.00)

DRAWING	REVISION DATE	DESCRIPTION
STD-17-1		INDEX OF DRAWINGS
STD-17-2		TERMINOLOGY
STD-17-3		GENERAL NOTES
STD-17-4		DESIGN SECTION LIMITS
STD-17-5		TYPICAL SECTION AND DETAILS
STD-17-6		TYPICAL ELEVATIONS
STD-17-7		CURB, RAIL & EDGE BEAM DETAILS - SKEW NOT LESS THAN 45 DEG.
STD-17-8		EDGE BEAM DETAILS FOR FILLS GREATER THAN 3’ - 6”
STD-17-9		INTERIOR WALL END TREATMENTS
STD-17-10		TYPICAL WINGWALL DETAILS AND NOTES
STD-17-11		WINGWALL DIMENSIONS AND QUANTITIES
STD-17-12		WINGWALL DIMENSIONS AND QUANTITIES
STD-17-13		WINGWALL DIMENSIONS AND QUANTITIES
STD-17-14		WINGWALL DIMENSIONS AND QUANTITIES
STD-17-15		WINGWALL & SPECIAL RETAINING WALL DESIGN SECTION
STD-17-16		WINGWALL DESIGN SECTION
STD-17-17	06-01-11	BACKFILL AND DRAINAGE DETAILS
STD-17-18		BACKFILL DETAILS
STD-17-19		PAVED OUTLET DETAIL

STD-17-20		LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET
STD-17-21		DEBRIS DEFLECTION WALL FOR BOX BRIDGE
STD-17-22		DEBRIS DEFLECTION WALL FOR SLAB BRIDGE
STD-17-23		SIDEWALK AND MISCELLANEOUS DETAILS
STD-17-24		WARPED SLOPE DETAIL
STD-17-25		STAGE CONSTRUCTION JOINT DETAIL (FILL ABOVE TOP OF SLAB NOT GREATER THAN 3’-6”)
STD-17-26		EXTENSION DETAILS
STD-17-27		EXTENSION DETAILS FOR SCOURED OUTLET
STD-17-28		END SECTION DETAILS
STD-17-29		PRECAST BOX CULVERT DETAILS
STD-17-34		INTERNAL ENERGY DISSIPATOR FOR BOX AND PIPE CULVERTS
STD-17-51	05-01-14	BOX BRIDGE, 1 BARREL AT 6’, CLEAR HTS. 3’ - 6’, 0 - 60’ FILL
STD-17-52		BOX BRIDGE, 1 BARREL AT 8’, CLEAR HTS. 3’ - 5’, 0 - 60’ FILL
STD-17-53		BOX BRIDGE, 1 BARREL AT 8’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-54		BOX BRIDGE, 1 BARREL AT 10’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-17-55		BOX BRIDGE, 1 BARREL AT 10’, CLEAR HTS. 7’ - 10’, 0 - 60’ FILL
STD-17-56		BOX BRIDGE, 1 BARREL AT 12’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-17-57		BOX BRIDGE, 1 BARREL AT 12’, CLEAR HTS. 7’ - 9’, 0 - 60’ FILL
STD-17-58		BOX BRIDGE, 1 BARREL AT 12’, CLEAR HTS. 10’ - 12’, 0 - 60’ FILL
STD-17-59		BOX BRIDGE, 1 BARREL AT 14’, CLEAR HTS. 5’ - 7’, 0 - 60’ FILL

STD-17-60		BOX BRIDGE, 1 BARREL AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-17-61		BOX BRIDGE, 1 BARREL AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-17-62		BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-63		BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-17-64		BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-17-65		BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-66		BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 9' - 11', 0 - 60' FILL
STD-17-67		BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-17-68		BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 15' - 18', 0 - 60' FILL
STD-17-71	05-01-14	BOX BRIDGE, 2 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-17-72		BOX BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 3' - 5', 0 - 60' FILL
STD-17-73		BOX BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-74		BOX BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-17-75		BOX BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-17-76		BOX BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-17-77		BOX BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 7' - 9', 0 - 60' FILL
STD-17-78		BOX BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 10' - 12', 0 - 60' FILL

STD-17-79	BOX BRIDGE, 2 BARRELS AT 14’, CLEAR HTS. 5’ - 7’, 0 - 60’ FILL
STD-17-80	BOX BRIDGE, 2 BARRELS AT 14’, CLEAR HTS. 8’ - 11’, 0 - 60’ FILL
STD-17-81	BOX BRIDGE, 2 BARRELS AT 14’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-17-82	BOX BRIDGE, 2 BARRELS AT 16’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-83	BOX BRIDGE, 2 BARRELS AT 16’, CLEAR HTS. 9’ - 12’, 0 - 60’ FILL
STD-17-84	BOX BRIDGE, 2 BARRELS AT 16’, CLEAR HTS. 13’ - 16’, 0 - 60’ FILL
STD-17-85	BOX BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-86	BOX BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 9’ - 11’, 0 - 60’ FILL
STD-17-87	BOX BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-17-88	BOX BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 15’ - 18’, 0 - 60’ FILL
STD-17-91	BOX BRIDGE, 3 BARRELS AT 6’, CLEAR HTS. 3’ - 6’, 0 - 60’ FILL
STD-17-92	BOX BRIDGE, 3 BARRELS AT 8’, CLEAR HTS. 3’ - 5’, 0 - 60’ FILL
STD-17-93	BOX BRIDGE, 3 BARRELS AT 8’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-94	BOX BRIDGE, 3 BARRELS AT 10’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-17-95	BOX BRIDGE, 3 BARRELS AT 10’, CLEAR HTS. 7’ - 10’, 0 - 60’ FILL
STD-17-96	BOX BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-17-97	BOX BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 7’ - 9’, 0 - 60’ FILL

STD-17-98	BOX BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 10’ - 12’, 0 - 60’ FILL
STD-17-99	BOX BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 5’ - 7’, 0 - 60’ FILL
STD-17-100	BOX BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 8’ - 11’, 0 - 60’ FILL
STD-17-101	BOX BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-17-102	BOX BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-103	BOX BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 9’ - 12’, 0 - 60’ FILL
STD-17-104	BOX BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 13’ - 16’, 0 - 60’ FILL
STD-17-105	BOX BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-106	BOX BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 9’ - 11’, 0 - 60’ FILL
STD-17-107	BOX BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-17-108	BOX BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 15’ - 18’, 0 - 60’ FILL
STD-17-111	SLAB BRIDGE, 1 BARREL AT 6’, CLEAR HTS. 3’ - 6’, 0 - 60’ FILL
STD-17-112	SLAB BRIDGE, 1 BARREL AT 8’, CLEAR HTS. 3’ - 5’, 0 - 60’ FILL
STD-17-113	SLAB BRIDGE, 1 BARREL AT 8’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-114	SLAB BRIDGE, 1 BARREL AT 10’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-17-115	SLAB BRIDGE, 1 BARREL AT 10’, CLEAR HTS. 7’ - 10’, 0 - 60’ FILL
STD-17-116	SLAB BRIDGE, 1 BARREL AT 12’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL

STD-17-117	SLAB BRIDGE, 1 BARREL AT 12', CLEAR HTS. 7' - 9', 0 - 60' FILL
STD-17-118	SLAB BRIDGE, 1 BARREL AT 12', CLEAR HTS. 10' - 12', 0 - 60' FILL
STD-17-119	SLAB BRIDGE, 1 BARREL AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-17-120	SLAB BRIDGE, 1 BARREL AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-17-121	SLAB BRIDGE, 1 BARREL AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-17-122	SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-123	SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-17-124	SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-17-125	SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-126	SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 9' - 11', 0 - 60' FILL
STD-17-127	SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-17-128	SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 15' - 18', 0 - 60' FILL
STD-17-131	SLAB BRIDGE, 2 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-17-132	SLAB BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 3' - 5', 0 - 60' FILL
STD-17-133	SLAB BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-134	SLAB BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-17-135	SLAB BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL

STD-17-136	SLAB BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-17-137	SLAB BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 7' - 9', 0 - 60' FILL
STD-17-138	SLAB BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 10' - 12', 0 - 60' FILL
STD-17-139	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-17-140	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-17-141	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-17-142	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-143	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-17-144	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-17-145	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-146	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 9' - 11', 0 - 60' FILL
STD-17-147	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-17-148	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 15' - 18', 0 - 60' FILL
STD-17-151	SLAB BRIDGE, 3 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-17-152	SLAB BRIDGE, 3 BARRELS AT 8', CLEAR HTS. 3' - 5', 0 - 60' FILL
STD-17-153	SLAB BRIDGE, 3 BARRELS AT 8', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-17-154	SLAB BRIDGE, 3 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL

STD-17-155	SLAB BRIDGE, 3 BARRELS AT 10’, CLEAR HTS. 7’ - 10’, 0 - 60’ FILL
STD-17-156	SLAB BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-17-157	SLAB BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 7’ - 9’, 0 - 60’ FILL
STD-17-158	SLAB BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 10’ - 12’, 0 - 60’ FILL
STD-17-159	SLAB BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 5’ - 7’, 0 - 60’ FILL
STD-17-160	SLAB BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 8’ - 11’, 0 - 60’ FILL
STD-17-161	SLAB BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-17-162	SLAB BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-163	SLAB BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 9’ - 12’, 0 - 60’ FILL
STD-17-164	SLAB BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 13’ - 16’, 0 - 60’ FILL
STD-17-165	SLAB BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-17-166	SLAB BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 9’ - 11’, 0 - 60’ FILL
STD-17-167	SLAB BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-17-168	SLAB BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 15’ - 18’, 0 - 60’ FILL

5-320.00 BRIDGE REPAIRS

DRAWING	REVISION DATE	DESCRIPTION
SBR-2-115	06-15-16	GENERAL NOTES AND DETAILS FOR EXPANSION JOINT REPLACEMENT CONSTRUCTION TYPES “A” THRU “J” – 1991
SBR-2-116	01-04-96	GENERAL DETAILS FOR STRIPSEAL EXPANSION JOINT REPLACEMENTCONSTRUCTION DETAILS TYPES “A” THRU “J” – 1991
SBR-2-117	05-30-96	STRIPSEAL EXPANSION JOINTS - REPLACEMENT CONSTRUCTION DETAILS TYPE “A” AND TYPE “B” – 1991
SBR-2-118	05-30-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE “C” AND TYPE “D” – 1991
SBR-2-119	05-30-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE “E” AND TYPE “F” – 1991
SBR-2-120	05-30-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE “G” AND “H” – 1991
SBR-2-121	01-04-96	STRIPSEAL EXPANSION JOINT REPLACEMENT CONSTRUCTION DETAILS TYPE “J” – 1991
SBR-2-122	01-04-96	DETAILS FOR PRECAST SLAB BRIDGE CHANNELS, SPANS 16’ - 0” THRU 34’ - 0”, DEGREE OF SKEW 90 - 75 - 60 - 45 – 1992
SBR-2-123	01-04-96	DETAILS FOR PRECAST SLAB BRIDGE CHANNELS, SPANS 16’ - 0” THRU 34’ -0”, DEGREE OF SKEW 90 - 75 - 60 - 45 – 1992
SBR-2-124	01-04-96	DETAILS SHOWING REPLACEMENT OF EXISTING BRIDGERAIL SYSTEM WITH NEW JERSEY SHAPE CONCRETE PARAPET AND NEW 10’ -2” ENDPOST – 1988
SBR-2-125	11-05-01	DETAILS SHOWING REPLACEMENT OF EXISTING BRIDGERAIL SYSTEM WITH NEW JERSEY SHAPE CONCRETE PARAPET AND NEW 10’ -2” ENDPOST – 1988
SBR-2-126	01-04-96	DETAILS SHOWING REPLACEMENT OF EXISTING BRIDGERAIL SYSTEM WITH NEW JERSEY SHAPE CONCRETE PARAPET AND NEW 10’ -2” ENDPOST – 1988
SBR-2-127	11-05-01	DETAILS SHOWING PIER PROTECTION WITH NEW CONCRETE BARRIER WALL – 1988

SBR-2-128	01-04-96	DETAILS SHOWING PIER PROTECTION WITH NEW CONCRETE BARRIER WALL – 1988
SBR-2-129	11-05-01	DETAILS SHOWING PIER PROTECTION WITH NEW VERTICAL CONCRETE BARRIER – 1988
SBR-2-130	01-04-96	DETAILS SHOWING PIER PROTECTION WITH NEW VERTICAL CONCRETE BARRIER – 1988
SBR-2-131	01-22-02	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS TO EXISTING CONCRETE SLOPE FACE ENDPOST – 1989
SBR-2-132	01-04-96	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS EXISTING CONCRETE SLOPE FACE ENDPOST – 1989
SBR-2-133	01-22-02	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS TO EXISTING CONCRETE VERTICAL FACE ENDPOST – 1989
SBR-2-134	01-04-96	DETAILS SHOWING GUARDRAIL ATTACHMENT AT BRIDGE ENDS TO EXISTING CONCRETE VERTICAL FACE ENDPOST – 1989
SBR-2-135	01-22-02	GUARDRAIL ATACHMENT TO EXISTING PIER PROTECTION – 1991
SBR-2-136	11-05-01	STANDARD DRAWING FOR REPLACING EXISTING CONCRETE ENDPOST AND GUARDRAIL AT EXISTING BRIDGE ENDS – 1992
SBR-2-137	11-05-01	STANDARD SHOWING DETAILS FOR ATTACHING NEW GUARDRAIL TO EXISTING END OF BRIDGE – 1992
SBR-2-138	11-05-01	STANDARD SHOWING DETAILS FOR ATTACHING NEW GUARDRAIL AT EXISTING BRIDGE END AND ALONG EXISTING BRIDGE RAIL – 1992
SBR-2-140	11-05-01	STANDARD SHOWING DETAILS FOR ATTACHING NEW GUARDRAIL ALONG EXISTING BRIDGE RAILS – 1992
SBR-2-144	01-22-02	STANDARD SHOWING DETAILS OF ATTACHING GUARDRAIL BRIDGERAIL TO TOP OF EXISTING CURBS – 1992

5-330.00 BOX CULVERTS (Previous)

(See Section 4-604.00)

DRAWING	REVISION DATE	DESCRIPTION
STD-15-1	11-06-08	INDEX OF DRAWINGS AND TERMINOLOGY
STD-15-2	03-28-08	GENERAL NOTES
STD-15-3	02-28-03	DESIGN SECTION LIMITS
STD-15-4	12-07-01	TYPICAL SECTION AND DETAILS
STD-15-5	02-28-03	TYPICAL ELEVATION
STD-15-6	03-28-08	CURB AND RAIL DETAILS SKEW NOT LESS THAN 45 DEG.
STD-15-7	03-02-02	STANDARD EDGE BEAM DETAILS FOR FILLS GREATER THAN 3’ - 8”
STD-15-8	12-07-01	INTERIOR WALL END TREATMENTS
STD-15-9	02-28-03	TYPICAL WINGWALL DETAILS AND NOTES
STD-15-10	11-06-08	WINGWALL DIMENSIONS AND QUANTITIES
STD-15-11		WINGWALL DIMENSIONS AND QUANTITIES
STD-15-12	03-28-08	WINGWALL & SPECIAL RETAINING WALL DESIGN SECTION
STD-15-13		WINGWALL DESIGN SECTION
STD-15-14	06-01-11	BACKFILL AND DRAINAGE DETAILS
STD-15-15		BACKFILL AND DRAINAGE DETAILS
STD-15-16	12-07-01	PAVED OUTLET DETAIL
STD-15-16A		LOW FLOW CHANNEL CONSTRUCTION DETAILS FOR CULVERT INLET AND OUTLET
STD-15-17		DEBRIS DEFLECTION WALL
STD-15-18		DEBRIS DEFLECTION WALL
STD-15-19		SIDEWALK AND MISCELLANEOUS DETAILS
STD-15-20		WARPED SLOPE DETAIL

STD-15-21	03-02-02	STAGE CONSTRUCTION JOINT DETAIL (FILL ABOVE TOP OF SLAB NOT GREATER THAN 3’-8”)
STD-15-22	02-28-03	EXTENSION DETAILS
STD-15-23	12-07-01	EXTENSION DETAILS FOR SCOURED OUTLET
STD-15-24	12-07-01	END SECTION DETAILS
STD-15-25	11-01-10	PRECAST BOX CULVERT DETAILS
STD-15-26		PRECAST BOX CULVERT DETAILS
STD-15-27		PRECAST BOX CULVERT DETAILS
STD-15-28		PRECAST BOX CULVERT DETAILS
STD-15-29		PRECAST BOX CULVERT DETAILS
STD-15-30		STANDARD INTERNAL ENERGY DISSIPATOR FOR BOX AND PIPE CULVERTS
STD-15-35		BOX BRIDGE, 1 BARREL AT 6’, CLEAR HTS. 3’ - 6’, 0 - 60’ FILL
STD-15-36		BOX BRIDGE, 1 BARREL AT 8’, CLEAR HTS. 3’ - 4’, 0 - 60’ FILL
STD-15-37	05-01-14	BOX BRIDGE, 1 BARREL AT 8’, CLEAR HTS. 5’ - 8’, 0 - 60’ FILL
STD-15-38	09-19-06	BOX BRIDGE, 1 BARREL AT 10’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-15-39		BOX BRIDGE, 1 BARREL AT 10’, CLEAR HTS. 7’ - 10’, 0 - 60’ FILL
STD-15-40		BOX BRIDGE, 1 BARREL AT 12’, CLEAR HTS. 4’ - 7’, 0 - 60’ FILL
STD-15-41		BOX BRIDGE, 1 BARREL AT 12’, CLEAR HTS. 8’ - 12’, 0 - 60’ FILL
STD-15-42		BOX BRIDGE, 1 BARREL AT 14’, CLEAR HTS. 5’ - 7’, 0 - 60’ FILL
STD-15-43		BOX BRIDGE, 1 BARREL AT 14’, CLEAR HTS. 8’ - 11’, 0 - 60’ FILL
STD-15-44		BOX BRIDGE, 1 BARREL AT 14’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL

STD-15-45		BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-46		BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-47		BOX BRIDGE, 1 BARREL AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-48		BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-49		BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL
STD-15-50		BOX BRIDGE, 1 BARREL AT 18', CLEAR HTS. 14' - 18', 0 - 60' FILL
STD-15-55		BOX BRIDGE, 2 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-56		BOX BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-57		BOX BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-58	06-01-11	BOX BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-59		BOX BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-60		BOX BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 4' - 7', 0 - 60' FILL
STD-15-61		BOX BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-62		BOX BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-15-63		BOX BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-15-64		BOX BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-15-65		BOX BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL

STD-15-66		BOX BRIDGE, 2 BARRELS AT 16’, CLEAR HTS. 9’ - 12’, 0 - 60’ FILL
STD-15-67		BOX BRIDGE, 2 BARRELS AT 16’, CLEAR HTS. 13’ - 16’, 0 - 60’ FILL
STD-15-68		BOX BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-15-69		BOX BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 9’ - 13’, 0 - 60’ FILL
STD-15-70		BOX BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 14’ - 18’, 0 - 60’ FILL
STD-15-75		BOX BRIDGE, 3 BARRELS AT 6’, CLEAR HTS. 3’ - 6’, 0 - 60’ FILL
STD-15-76		BOX BRIDGE, 3 BARRELS AT 8’, CLEAR HTS. 3’ - 4’, 0 - 60’ FILL
STD-15-77	12-07-01	BOX BRIDGE, 3 BARRELS AT 8’, CLEAR HTS. 5’ - 8’, 0 - 60’ FILL
STD-15-78	12-07-01	BOX BRIDGE, 3 BARRELS AT 10’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-15-79	12-07-01	BOX BRIDGE, 3 BARRELS AT 10’, CLEAR HTS. 7’ - 10’, 0 - 60’ FILL
STD-15-80		BOX BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 4’ - 7’, 0 - 60’ FILL
STD-15-81		BOX BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 8’ - 12’, 0 - 60’ FILL
STD-15-82		BOX BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 5’ - 7’, 0 - 60’ FILL
STD-15-83		BOX BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 8’ - 11’, 0 - 60’ FILL
STD-15-84		BOX BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-15-85		BOX BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-15-86		BOX BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 9’ - 12’, 0 - 60’ FILL

STD-15-87		BOX BRIDGE, 3 BARRELS AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-88		BOX BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-89		BOX BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL
STD-15-90		BOX BRIDGE, 3 BARRELS AT 18', CLEAR HTS. 14' - 18', 0 - 60' FILL
STD-15-95		SLAB BRIDGE, 1 BARREL AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-96		SLAB BRIDGE, 1 BARREL AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-97		SLAB BRIDGE, 1 BARREL AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-98		SLAB BRIDGE, 1 BARREL AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-99	02-28-03	SLAB BRIDGE, 1 BARREL AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-100	02-28-03	SLAB BRIDGE, 1 BARREL AT 12', CLEAR HTS. 4' - 7', 0 - 60' FILL
STD-15-101	02-28-03	SLAB BRIDGE, 1 BARREL AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-102		SLAB BRIDGE, 1 BARREL AT 14', CLEAR HTS. 5' - 9', 0 - 60' FILL
STD-15-103		SLAB BRIDGE, 1 BARREL AT 14', CLEAR HTS. 10' - 14', 0 - 60' FILL
STD-15-104		SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-105		SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-106		SLAB BRIDGE, 1 BARREL AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-107		SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL

STD-15-108		SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL
STD-15-109		SLAB BRIDGE, 1 BARREL AT 18', CLEAR HTS. 14' - 18', 0 - 60' FILL
STD-15-115	02-28-03	SLAB BRIDGE, 2 BARRELS AT 6', CLEAR HTS. 3' - 6', 0 - 60' FILL
STD-15-116	02-28-03	SLAB BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 3' - 4', 0 - 60' FILL
STD-15-117	06-01-11	SLAB BRIDGE, 2 BARRELS AT 8', CLEAR HTS. 5' - 8', 0 - 60' FILL
STD-15-118	02-28-03	SLAB BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 4' - 6', 0 - 60' FILL
STD-15-119	02-28-03	SLAB BRIDGE, 2 BARRELS AT 10', CLEAR HTS. 7' - 10', 0 - 60' FILL
STD-15-120	02-28-03	SLAB BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 4' - 7', 0 - 60' FILL
STD-15-121	02-28-03	SLAB BRIDGE, 2 BARRELS AT 12', CLEAR HTS. 8' - 12', 0 - 60' FILL
STD-15-122	02-28-03	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 5' - 7', 0 - 60' FILL
STD-15-123	02-28-03	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 8' - 11', 0 - 60' FILL
STD-15-124	02-28-03	SLAB BRIDGE, 2 BARRELS AT 14', CLEAR HTS. 12' - 14', 0 - 60' FILL
STD-15-125	02-28-03	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-126	02-28-03	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 9' - 12', 0 - 60' FILL
STD-15-127	02-28-03	SLAB BRIDGE, 2 BARRELS AT 16', CLEAR HTS. 13' - 16', 0 - 60' FILL
STD-15-128	02-28-03	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 6' - 8', 0 - 60' FILL
STD-15-129	02-28-03	SLAB BRIDGE, 2 BARRELS AT 18', CLEAR HTS. 9' - 13', 0 - 60' FILL

STD-15-130	02-28-03	SLAB BRIDGE, 2 BARRELS AT 18’, CLEAR HTS. 14’ - 18’, 0 - 60’ FILL
STD-15-135		SLAB BRIDGE, 3 BARRELS AT 6’, CLEAR HTS. 3’ - 6’, 0 - 60’ FILL
STD-15-136		SLAB BRIDGE, 3 BARRELS AT 8’, CLEAR HTS. 3’ - 4’, 0 - 60’ FILL
STD-15-137		SLAB BRIDGE, 3 BARRELS AT 8’, CLEAR HTS. 5’ - 8’, 0 - 60’ FILL
STD-15-138		SLAB BRIDGE, 3 BARRELS AT 10’, CLEAR HTS. 4’ - 6’, 0 - 60’ FILL
STD-15-139		SLAB BRIDGE, 3 BARRELS AT 10’, CLEAR HTS. 7’ - 10’, 0 - 60’ FILL
STD-15-140		SLAB BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 4’ - 7’, 0 - 60’ FILL
STD-15-141		SLAB BRIDGE, 3 BARRELS AT 12’, CLEAR HTS. 8’ - 12’, 0 - 60’ FILL
STD-15-142		SLAB BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 5’ - 7’, 0 - 60’ FILL
STD-15-143		SLAB BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 8’ - 11’, 0 - 60’ FILL
STD-15-144		SLAB BRIDGE, 3 BARRELS AT 14’, CLEAR HTS. 12’ - 14’, 0 - 60’ FILL
STD-15-145		SLAB BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-15-146		SLAB BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 9’ - 12’, 0 - 60’ FILL
STD-15-147		SLAB BRIDGE, 3 BARRELS AT 16’, CLEAR HTS. 13’ - 16’, 0 - 60’ FILL
STD-15-148	12-07-01	SLAB BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 6’ - 8’, 0 - 60’ FILL
STD-15-149	12-07-01	SLAB BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 9’ - 13’, 0 - 60’ FILL
STD-15-150	12-07-01	SLAB BRIDGE, 3 BARRELS AT 18’, CLEAR HTS. 14’ - 18’, 0 - 60’ FILL