STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
SUITE 1300 JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-3848
(615) 741-2221

JOHN C. SCHROER
COMMISSIONER

BILL HASLAM
GOVERNOR

INSTRUCTIONAL BULLETIN NO. 18-06

MAINTENANCE OF THE EXISTING GUARDRAIL LOCATION

Regarding New Standard Drawings for Guardrail Maintenance-Only Purposes

Effective immediately, the following new standard drawings have been developed to provide guardrail installation details for 3R projects and on-call guardrail repairs. Refer to circular letters 705-05.01 and 705-05.02 for more information. These drawings are **NOT** intended to be used for new construction projects.

Also, Chapter 5, Index of Standard Drawings, of the Roadway Design Guidelines has been revised to incorporate these changes. All these new standard drawings are located in the new section 5-150.10 Guardrail Maintenance of Chapter 5.

New Standard Drawings:

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-GR28-1		W-BEAM & THRIE BEAM BARRIER RAIL AND RUB RAIL DETAILS
S-GR28-2		GUARDRAIL HARDWARE DETAILS
S-GR28-3		GUARDRAIL HEIGHT ADJUSTMENT
S-GR28-4		GUARDRAIL TERMINAL ANCHOR TYPE 13
S-GR28-5		MEDIAN DIVIDER GUARDRAIL

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-GR28-6		GUARDRAIL ATTACHMENT TO CONCRETE DECKS
S-GR28-7		GUARDRAIL ATTACHMENT TO BRIDGE END DETAILS

These new standard drawings and the revised Chapter 5, Index of Standard Drawings, of the Roadway Design Guidelines are available online.

Standard Drawings:
https://www.tn.gov/content/tn/tdot/roadway-design/standard-drawings-library/standard-roadway-drawings.html
Roadway Design Guidelines:
https://www.tn.gov/content/tn/tdot/roadway-design/design-standards/design-guidelines.html

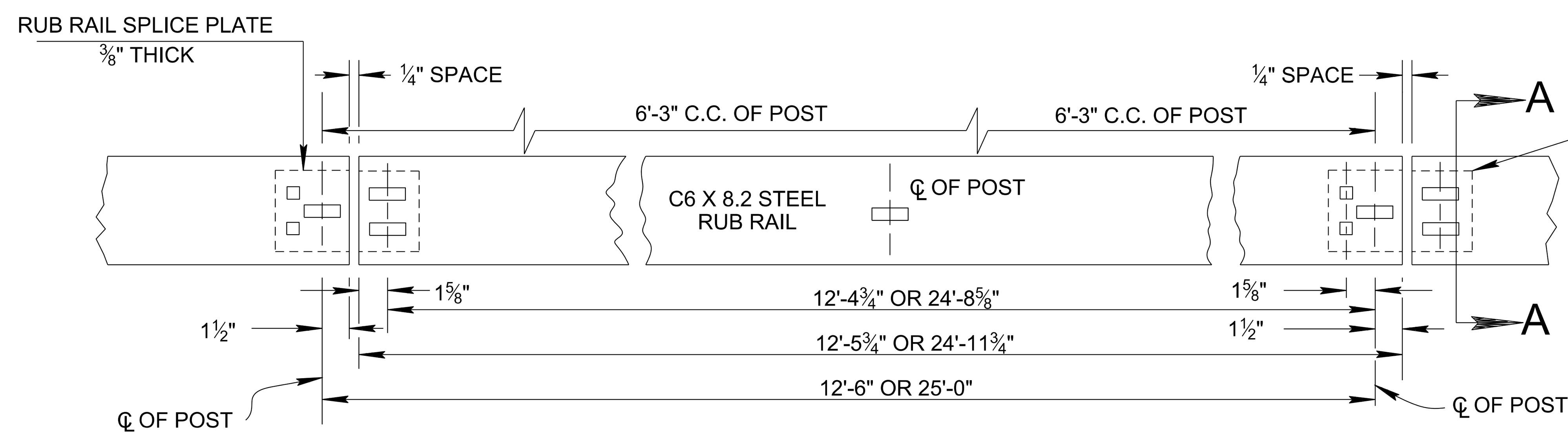
This Instruction Bulletin voids IB 17-09, IB 17-12, IB 17-13, and IB 17-14 due to incorporation into the revised Roadway Design Guidelines Chapter 5, Index of Standard Drawings.

Jennifer Lloyd

Jennifer Lloyd, PE
Civil Engineering Director
Roadway Design Division

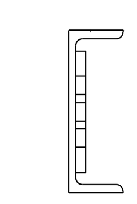
KJL:ARH:RBB:SSH
March 15, 2018

THIS DRAWING IS TO BE USED FOR RESURFACING, MAINTENANCE, AND BRIDGE REPAIR PROJECTS ONLY, THIS DRAWING IS NOT INTENDED TO BE USED FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS.



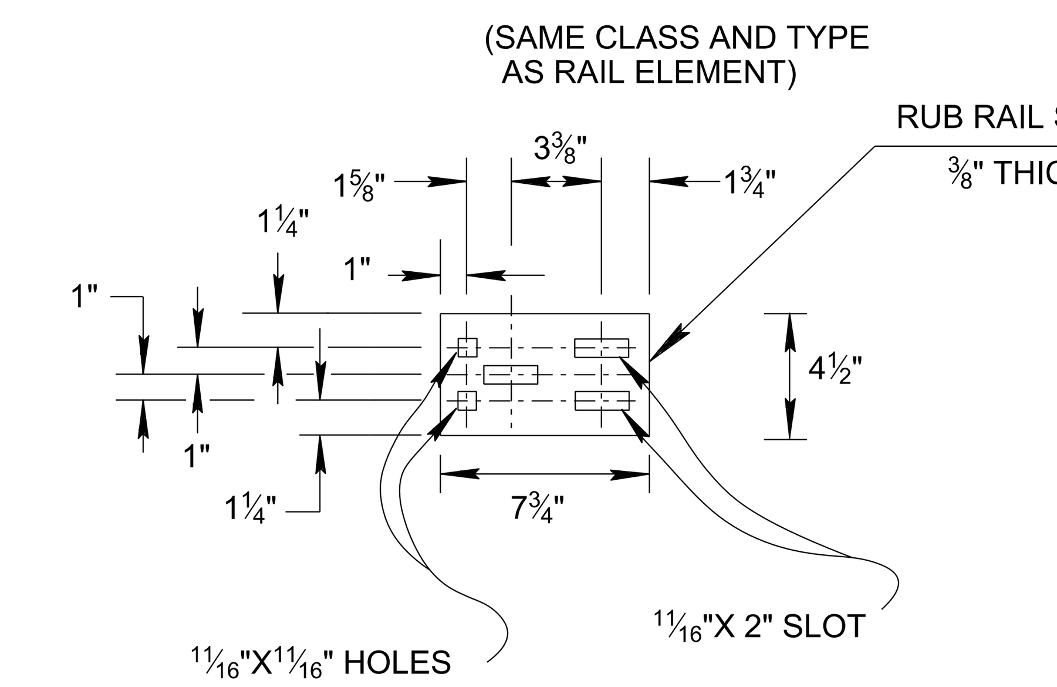
CHANNEL RUB RAIL

RAIL SPLICES PERMITTED ONLY AT POST



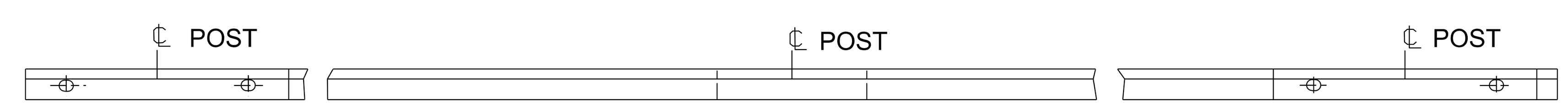
SECTION A-A

NOTE: HOLES IN RUB-RAIL SAME AS IN SPICE PLATE

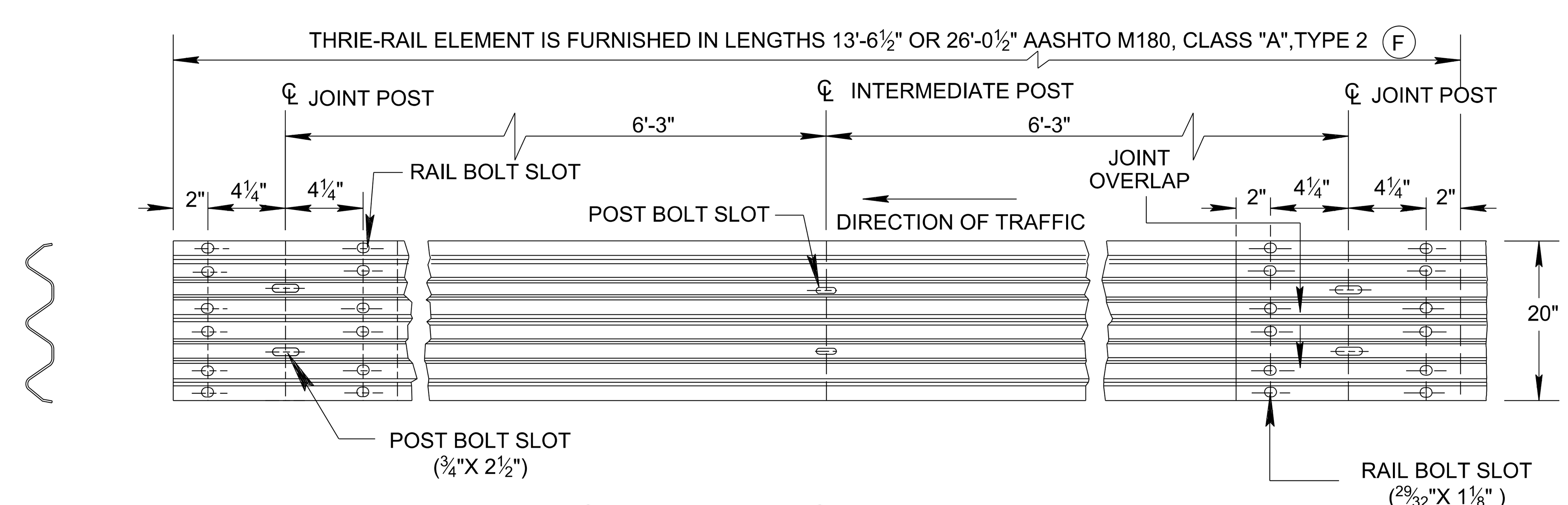


RUB RAIL SPLICE DETAIL

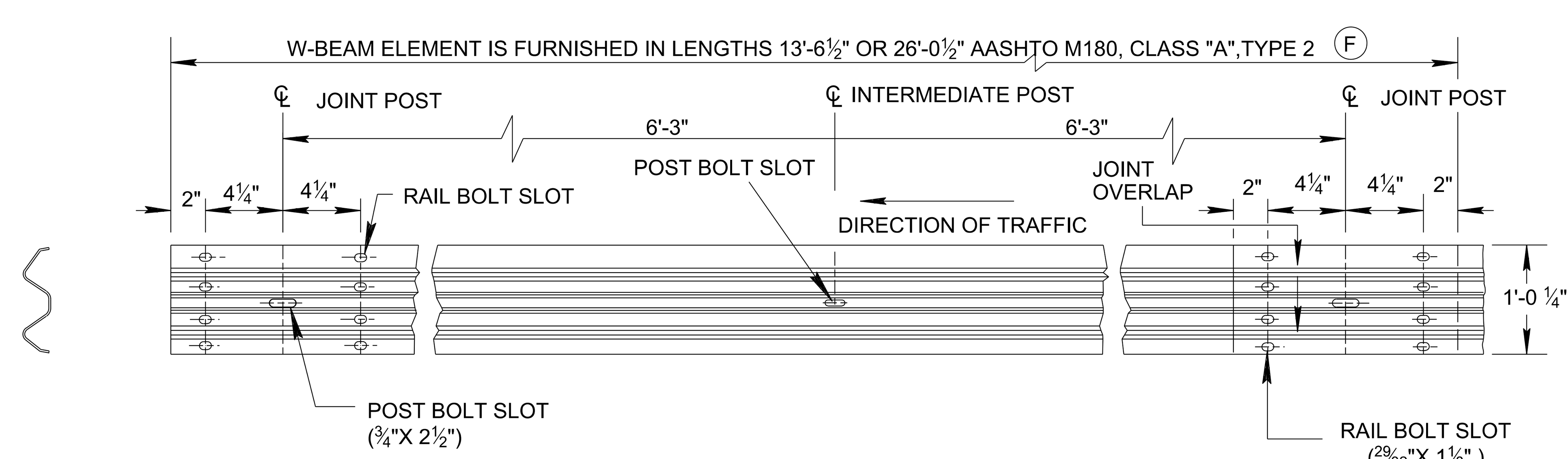
NOTE: HOLES IN RUB-RAIL SAME AS IN SPICE PLATE



PLAN VIEW
W-BEAM OR THRIE RAIL



FRONT ELEVATION "THRIE" RAIL



FRONT ELEVATION "W"-BEAM

GENERAL NOTES

(A) CORRUGATED SHEET STEEL BEAMS SHALL CONFORM TO THE CURRENT REQUIREMENTS OF AASHTO M180, CLASS A, TYPE 2 . RAIL MATERIAL SHALL HAVE A MINIMUM YIELD STRENGTH OF 50 KIPS PER SQUARE INCH AND A TENSILE STRENGTH OF 70 KIPS PER SQUARE INCH.

(B) RUB RAILS AND RUB RAIL SPLICE PLATES SHALL CONFORM TO ASTM A36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

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

(D) SEE THE "S-PL" STANDARD SERIES FOR GUARDRAIL PLACEMENT.

(E) ITEM NUMBERS FOR PAYMENT AS DETAILED ON THESE "S-GR" SERIES OF DRAWINGS ARE AS FOLLOWS:

ITEM NO.	DESCRIPTION	
705-02.01	SINGLE GUARDRAIL WITH RUB-RAIL (TYPE 2)	PER L.F.
705-02.02	SINGLE GUARDRAIL (TYPE 2)	PER L.F.
706-06.01	SINGLE THRIE RAIL (TYPE2)	PER L.F.

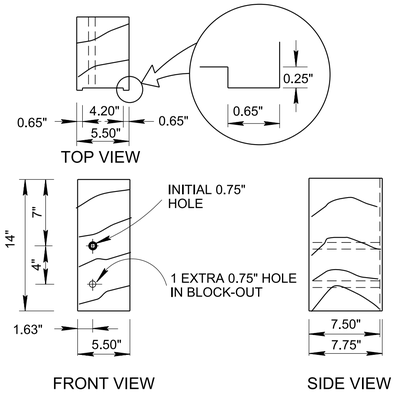
STATE OF TENNESSEE
DEPARTMENT OF
TRANSPORTATION

W-BEAM & THRIE BEAM
BARRIER RAIL
AND RUB RAIL
DETAILS

3-15-18

S-GR28-1

THIS DRAWING IS TO BE USED FOR RESURFACING, MAINTENANCE, AND BRIDGE REPAIR PROJECTS ONLY, THIS DRAWING IS NOT INTENDED TO BE USED FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS.

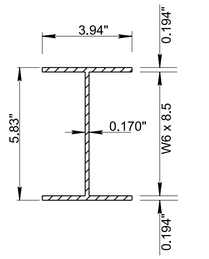


WOOD BLOCK-OUT FOR WOOD POST INSTALLATION NOTES

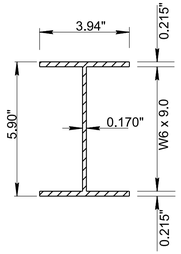
(B1) THE INITIAL INSTALLATION WILL REQUIRE ONE ⅝" DIAMETER X 18" LONG BUTTON HEAD BOLT WITH ROUND STEEL WASHER.

(B2) THE FIRST ADJUSTMENT AND THE SECOND ADJUSTMENT WILL REQUIRE ONE ⅝" DIAMETER X 18" LONG BUTTON HEAD BOLT AND ONE ⅝" DIAMETER X 18" LONG HEX HEAD BOLT. EACH WILL HAVE ONE ROUND STEEL WASHER.

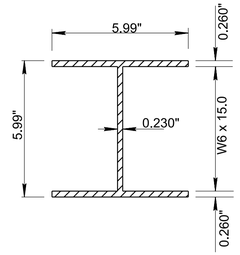
WOOD BLOCK-OUT DETAIL FOR STEEL POST WITH VERTICAL ADJUSTMENT HOLES



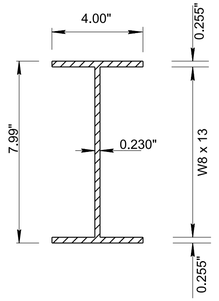
WELDED STEEL SHAPE



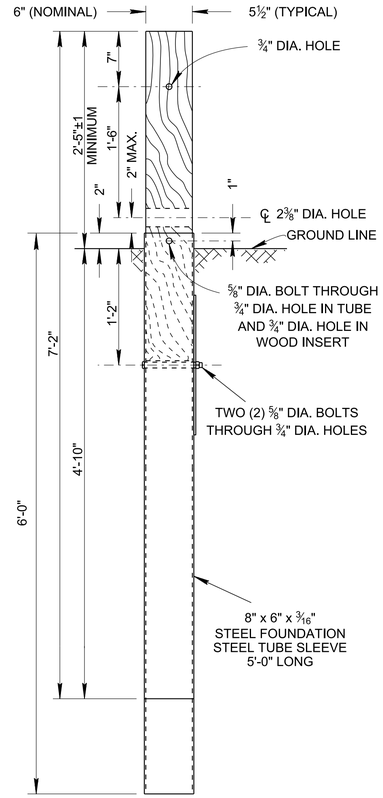
WELDED STEEL SHAPE



WELDED STEEL SHAPE

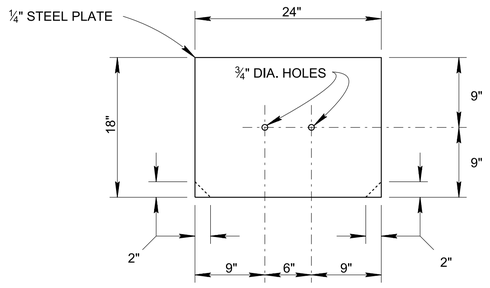


WELDED STEEL SHAPE



BREAKAWAY POSTS ①&②WITH 5'-0" STEEL TUBE SLEEVE

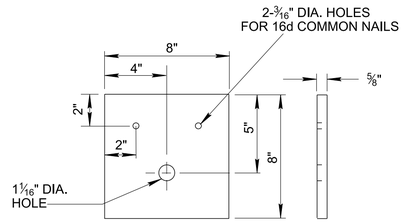
* 6'-0" POST MAY BE USED TO SUBSTITUTE 5' POST WITH SOIL PLATE.



FOUNDATION TUBE SOIL PLATE DETAIL

(TO BE ATTACHED TO BREAKAWAY POST ① & ② ON SIDE OPPOSITE TO END TERMINAL SECTION)

NOTE: THE CONTRACTOR HAS THE OPTION OF CLIPPING 2" x 2" TRIANGLES OFF BOTTOM CORNERS TO AID IN DRIVING.



8"x8" STEEL BEARING PLATE

BREAKAWAY POST NOTES

(A) THE BREAKAWAY POSTS ①AND②WILL HAVE A 6" x 8" (NOMINAL) CROSS-SECTION AREA AND WILL HAVE A 2⅜" DIAMETER HOLE CENTERED 2'-0" BELOW THE TOP OF THE POST ON THE 8" SIDE AS SHOWN. ALL POSTS SHALL BE ERECTED SO THAT THE GUARDRAIL WILL HAVE A TOP-OF-RAIL HEIGHT OF 2'-3".

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

(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 WILL BE ACCEPTABLE.

(F) SEE STANDARD DRAWING NO. S-GR28-4 FOR ADDITIONAL DETAILS AND GENERAL NOTES.

(G) THIS SYSTEM HAS BEEN EVALUATED UNDER NCHRP 350 TL-3.

WOOD SPECIFICATIONS

(S1) POSTS AND BLOCK-OUTS SHALL BE OF TIMBER WITH A STRESS GRADE OF 1200 P. S. I. OR MORE, POSTS WILL HAVE NOMINAL SIZE OF 6" X 8". BLOCK-OUTS WILL HAVE NOMINAL SIZE OF 6" X 8" (TYPICAL SIZE 5.5" X 7.5"). TESTING SHALL BE IN ACCORDANCE WITH WEST COAST LUMBER INSPECTION BUREAU, SOUTHERN PINE INSPECTION BUREAU, OR OTHER APPROPRIATE TIMBER ASSOCIATIONS. TIMBER FOR POSTS SHALL BE ROUGH SAWN (UNPLANED) WITH NOMINAL DIMENSIONS INDICATED. TIMBER FOR BLOCK-OUTS SHALL BE S4S WITH THE TYPICAL DIMENSIONS INDICATED.

(S2) ALL WOOD POSTS AND BLOCK-OUTS SHALL BE TREATED WITH TIMBER PRESERVATIVE AS REQUIRED BY SUBSECTION 911.02(A) OF THE TENNESSEE STANDARD SPECIFICATION.

(S3) WOOD POSTS AND BLOCK-OUTS SHALL BE FURNISHED WITH HOLES FOR FUTURE RAIL ADJUSTMENT IN ACCORDANCE WITH DETAILS SHOWN ON STANDARD DRAWING S-GR28-3.

GENERAL NOTES

(A) MATERIALS AND SPECIFICATIONS NOT SHOWN IN THESE "S-GR28" SERIES OF DRAWINGS SHALL BE IN ACCORDANCE WITH STANDARD PROVISIONS REGARDING SECTION 705.

(B) THE CONTRACTOR MAY HAVE OPTIONAL CHOICE OF EITHER THE STEEL W6 X 8.5 W6 x 9.0 HOT ROLLED OR WELDED STEEL SHAPE, OR THE WOOD POSTS WITH THEIR COMPANION BLOCK-OUTS AS SHOWN ABOVE, WITHIN THE FOLLOWING STIPULATIONS:

(1) THE MIXING OF ANY OF THE ABOVE POSTS TYPES ON A GIVEN PROJECT WILL BE AVOIDED IF POSSIBLE.

(2) SHOULD IT BECOME NECESSARY TO CHANGE THE TYPE OF POSTS ON A GIVEN PROJECT, THE POSTS SHALL NOT BE MIXED ON ANY GIVEN RUN OF GUARDRAIL. (EXCEPTION, WOOD POSTS ON GUARDRAIL TERMINALS).

(C) ON EXISTING STRUCTURES NOT HAVING A VERTICAL FACE FOR THE ATTACHMENT OF TWO RAIL ELEMENTS, USE OF THE W6 x 15.0 POSTS IS REQUIRED ON THE SEMI-RIGID TO RIGID BARRIER TRANSITION DETAILS, SEE STANDARD DRAWING S-GR28-5. THE BOLT HOLES WILL BE ORIENTED TO THE CENTER LINE OF THE FLANGE OF THE STEEL POST AND WILL BE THE SAME SIZE AND DIMENSION AS THOSE SHOWN ON STANDARD DRAWING S-GR28-3.

(D) ALL BLOCK-OUTS SHALL BE FURNISHED WITH HOLES FOR FUTURE RAIL ADJUSTMENT IN ACCORDANCE WITH DETAILS SHOWN ABOVE.

(E) METAL POSTS SHALL BE FURNISHED WITH HOLES FOR FUTURE RAIL ADJUSTMENT IN ACCORDANCE WITH DETAILS SHOWN ON STANDARD DRAWINGS S-GR28-3.

(F) W6 x 9.0 OR W6 x 8.5 POST SHALL BE USED FOR INSTALLATIONS ON BRIDGES AS SHOWN ON STANDARD DRAWING S-GR28-7.

(G) WELDED STEEL POSTS MAY BE USED AS ALTERNATES TO THE HOT ROLLED STEEL SHAPE. THEY MUST CONFORM TO ASTM A-769 AND BE GALVANIZED ACCORDING TO ASTM A-123.

(H) THIS SYSTEM HAS BEEN EVALUATED UNDER NCHRP 350 TL-3.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL HARDWARE DETAILS

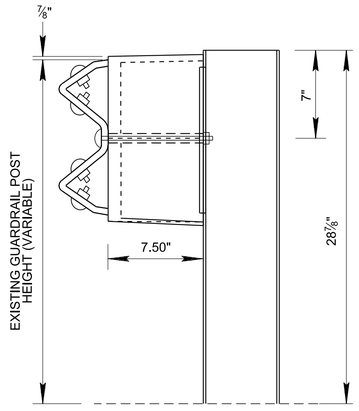
3-15-18 S-GR28-2

13-MAR-2018 10:56
\\Ag03sdcwf00010\projects\Standard Drawings Folder\Working Folder for Eugene\DRAFT\6 SAFETY DESIGN AND FENCES\10 GUARDRAIL MAINTENANCE\SGR282-20180315.DGN

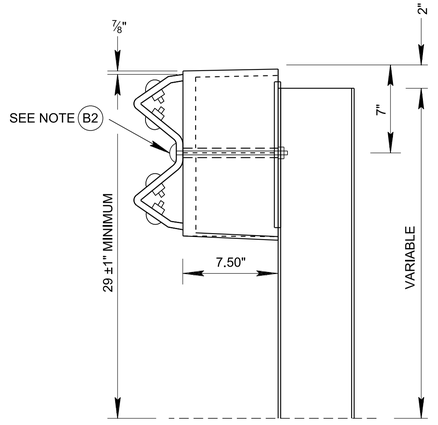
THIS DRAWING IS TO BE USED FOR RESURFACING, MAINTENANCE, AND BRIDGE REPAIR PROJECTS ONLY, THIS DRAWING IS NOT INTENDED TO BE USED FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS.

GUARDRAIL HEIGHT ADJUSTMENT

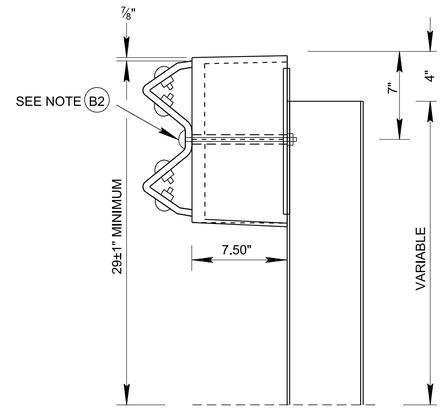
(USING EXISTING ADJUSTMENT HOLES)



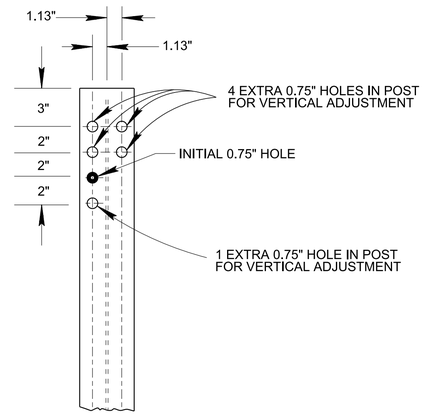
INITIAL INSTALLATION



2" ADJUSTMENT



4" ADJUSTMENT



FRONT ELEVATION
STEEL POST

ADJUSTABLE STEEL POSTS AND BLOCK-OUTS

GUARDRAIL HEIGHT ADJUSTMENT TABLE		
EXISTING HEIGHT	ADJUST.	FINAL
24"	4"	28"
* 25"	4"	29"
* 26"	2"	28"
* 27"	2"	29"

* GUARDRAIL HEIGHTS 25" OR MORE MAY REMAIN ON EXISTING ROADWAYS WITH POSTED SPEED LIMITS < 45 MPH AT LOCATIONS WITH NO CRASH HISTORY.

INSTALLATION NOTES FOR BLOCK-OUTS WITH HORIZONTAL ADJUSTMENT HOLES

(B1) THE INITIAL INSTALLATION WILL REQUIRE ONE 5/8" DIAMETER X 9 1/2" LONG BUTTON HEAD BOLT WITH ROUND STEEL WASHER.

(B2) THE FIRST ADJUSTMENT AND THE SECOND ADJUSTMENT WILL REQUIRE TWO 5/8" DIAMETER X 9 1/2" LONG BUTTON HEAD BOLTS. EACH BOLT WILL REQUIRE ONE ROUND STEEL WASHER.

GENERAL NOTES

(A) SEE STANDARD DRAWING S-GR28-2 FOR ADDITIONAL POST DETAILS AND SPECIFICATIONS.

(B) SEE STANDARD DRAWING S-GR31-1A FOR ADDITIONAL BOLT, WASHER AND NUT DETAILS AND SPECIFICATIONS.

(C) THE METAL POST SHOWN ON THIS SHEET MAY BE USED WITH WOOD OR COMPOSITE BLOCK-OUTS.

(D) ONLY RECYCLED PLASTIC OR WOOD GUARDRAIL BLOCK-OUTS LISTED ON THE TENNESSEE DEPARTMENT OF TRANSPORTATION'S QUALIFIED PRODUCTS LIST SHALL BE USED. SHOULD IT BECOME NECESSARY TO CHANGE THE BLOCK-OUT TYPE ON A GIVEN PROJECT, THE BLOCK-OUTS SHOULD NOT BE MIXED ON A GIVEN RUN OF GUARDRAIL.

(E) UP TO 4" BLOCKOUT ADJUSTMENTS HAS BEEN EVALUATED UNDER MASH TL-3.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

GUARDRAIL HEIGHT ADJUSTMENT

3-15-18 | S-GR28-3

13-MAR-2018 10:54
\\Ag03sdcw\00010\projects\Standard Drawings Folder\Working Folder for Eugene\DRAFT\6 SAFETY DESIGN AND FENCES\10 GUARDRAIL MAINTENANCE\SGR283-20180315.DGN

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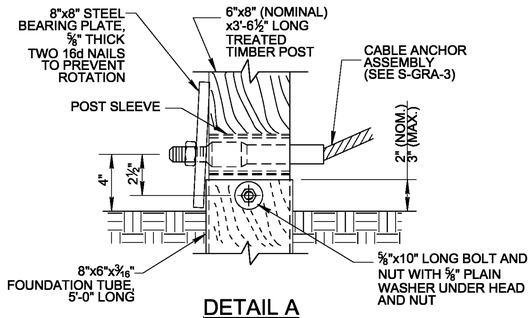
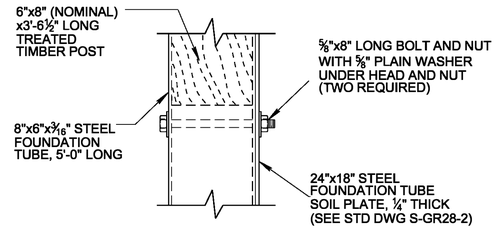
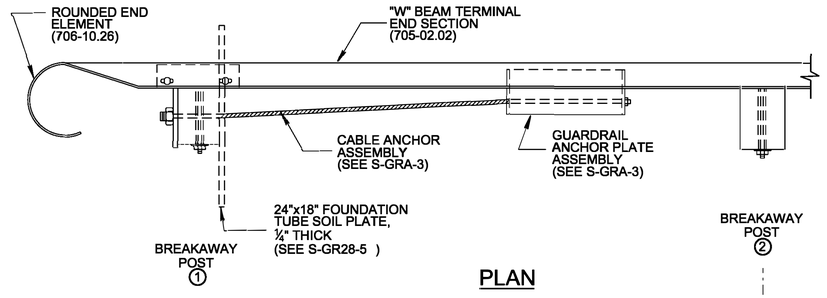


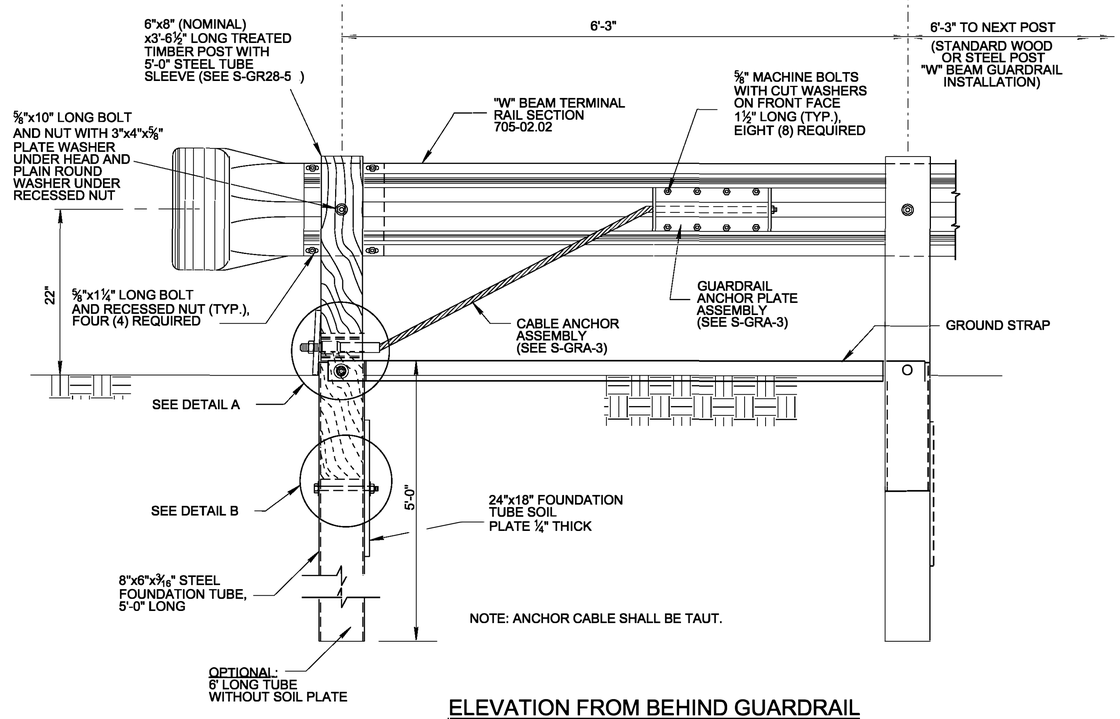
DETAIL A



DETAIL B



PLAN



ELEVATION FROM BEHIND GUARDRAIL

BREAKAWAY POST NOTES

(A) THE BREAKAWAY POSTS①AND②WILL HAVE A 6" x 8" (NOMINAL) CROSS-SECTION AREA AND WILL HAVE A 2⅜" DIAMETER HOLE CENTERED 2'-0" BELOW THE TOP OF THE POST ON THE 8" SIDE AS SHOWN. ALL POSTS SHALL BE ERECTED SO THAT THE GUARDRAIL WILL HAVE A TOP-OF-RAIL HEIGHT OF 2'-3".

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

(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 WILL BE ACCEPTABLE.

(F) SEE STANDARD DRAWING NO. S-GR28-2 FOR ADDITIONAL DETAILS AND GENERAL NOTES.

(G) THIS SYSTEM HAS BEEN EVALUATED UNDER NCHRP 350 TL-3.

GENERAL NOTES

(A) THIS ANCHORAGE MAY ONLY BE USED ON THE TRAILING END OF A BARRIER WHICH IS NOT EXPOSED TO VEHICULAR IMPACT.

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

(C) ALL WOOD POSTS AND BLOCKOUTS SHALL BE TREATED TIMBER IN ACCORDANCE WITH TENNESSEE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

(D) STEEL TUBES AND ATTACHED SOIL PLATE MAY BE INSTALLED BY:

① EXCAVATING, BACKFILLING AND COMPACTING TO PROVIDE FULL PASSIVE SOIL RESISTANCE TO ALL SURFACES OF THE TUBE AND SOIL PLATE.

② DRIVING STEEL TUBE AND SOIL PLATE AS A UNIT WITH A DUMMY TIMBER POST TO PREVENT DAMAGE TO BREAKAWAY POST.

(E) UNIT PRICE FOR ITEM NO. 705-04.03 GUARDRAIL TERMINAL (TYPE 13) PER EACH SHALL INCLUDE COSTS OF FURNISHING AND INSTALLING ALL COMPONENTS AS DETAILED, COMPLETE IN-PLACE.

(F) THIS SYSTEM HAS BEEN EVALUATED UNDER NCHRP 350 TL-3.

☐ MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

GUARDRAIL TERMINAL ANCHOR TYPE 13

3-15-18 | S-GR28-4

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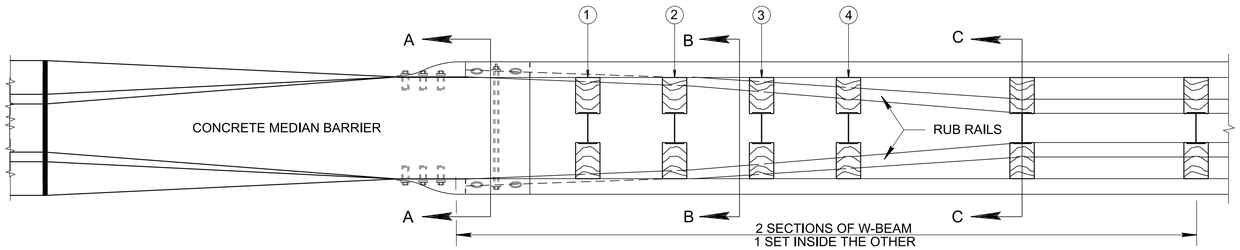


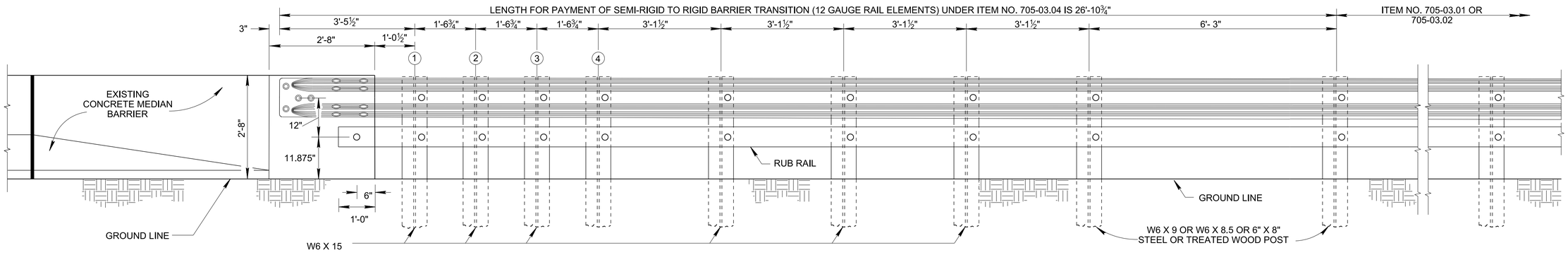
PLAN

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

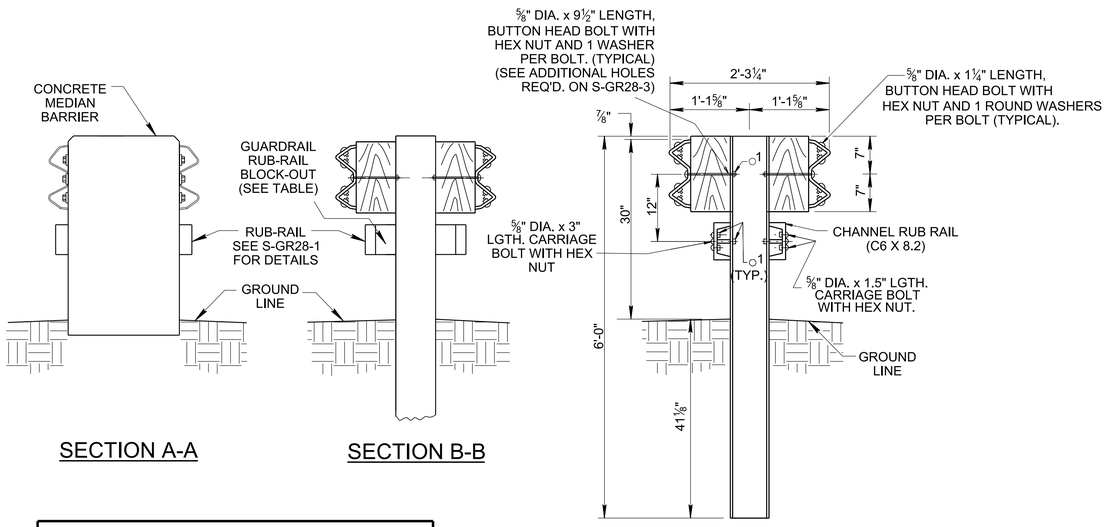
TREATED TIMBER 14½" X 4" BLOCK-OUT

MEDIAN DIVIDER GUARDRAIL TERMINAL NOTES

1. AN APPROVED NCHRP 350 O MASH CRASH CUSHION OR MEDIAN GUARDRAIL TERMINAL SHALL BE USED FOR TERMINATING MEDIAN DIVIDER METAL - BEAM GUARDRAIL AND CONCRETE MEDIAN BARRIER WALL.
2. PAY ITEM WILL INCLUDE FURNISHING AND INSTALLING ALL COMPONENTS AS LISTED ON THE MANUFACTURER'S BILL OF MATERIALS.
3. THIS SYSTEM HAS BEEN EVALUATED UNDER NCHRP 350 TL-3.



ELEVATION



SECTION A-A

SECTION B-B

SECTION C-C

LEGEND FOR WASHER REQUIREMENTS
1 OR 2 ROUND WASHERS — o1 o2

NOTE: METAL POSTS AND WOOD BLOCK- OUTS SHALL BE FURNISHED WITH HOLES FOR FUTURE ADJUSTMENT IN ACCORDANCE W/DETAILS SHOWN ON STANDARD DRAWING S-GR28-3.

DETAILS FOR STEEL POSTS AND WOOD BLOCK-OUTS

SIDE VIEW DIMENSIONS BASED ON W6 X 8.5, OTHER DETAILS APPLY TO W6 x 9.0 AND W6 x 15.0 POSTS AND BLOCK-OUTS.

GENERAL NOTES

A. MATERIALS AND SPECIFICATIONS NOT SHOWN IN THESE "S-GR28" SERIES OF DRAWINGS SHALL BE IN ACCORDANCE WITH STANDARD PROVISIONS REGARDING SECTION 705.

B. THE CONTRACTOR MAY HAVE OPTIONAL CHOICE OF EITHER THE STEEL W6 X 8.5 W6 x 9.0 HOT ROLLED OR WELDED STEEL SHAPE, WITH THEIR COMPANION BLOCK-OUTS AS SHOWN ABOVE, WITHIN THE FOLLOWING STIPULATIONS:

(1) THE MIXING OF ANY OF THE ABOVE POSTS TYPES ON A GIVEN PROJECT WILL BE AVOIDED IF POSSIBLE.

(2) SHOULD IT BECOME NECESSARY TO CHANGE THE TYPE OF POSTS ON A GIVEN PROJECT, THE POSTS SHALL NOT BE MIXED ON ANY GIVEN RUN OF GUARDRAIL.

C. ON EXISTING STRUCTURES NOT HAVING A VERTICAL FACE FOR THE ATTACHMENT OF TWO RAIL ELEMENTS, USE OF THE W6 x 15.0 POSTS IS REQUIRED ON THE SEMI-RIGID TO RIGID BARRIER TRANSITION DETAILS. THE BOLT HOLES WILL BE ORIENTED TO THE CENTER LINE OF THE FLANGE OF THE STEEL POST AND WILL BE THE SAME SIZE AND DIMENSION AS THOSE SHOWN ON STANDARD DRAWING S-GR28-3.

D. METAL POSTS AND ALL BLOCK-OUTS SHALL BE FURNISHED WITH HOLES FOR FUTURE RAIL ADJUSTMENT IN ACCORDANCE WITH DETAILS SHOWN ON STANDARD DRAWINGS S-GR28-2 AND S-GR28-3.

E. W6 x 9.0 OR W6 x 8.5 POST SHALL BE USED FOR INSTALLATIONS ON BRIDGES AS SHOWN ON STANDARD DRAWING S-GR28-6.

F. WELDED STEEL POSTS MAY BE USED AS ALTERNATES TO THE HOT ROLLED STEEL SHAPE. THEY MUST CONFORM TO ASTM A-769 AND BE GALVANIZED ACCORDING TO ASTM A-123.

G. THIS SYSTEM HAS BEEN EVALUATED UNDER NCHRP 350 TL-3.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

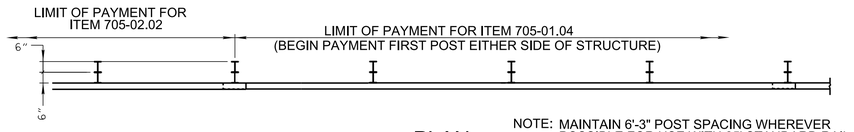
MEDIAN DIVIDER GUARDRAIL

3-15-18

S-GR28-5

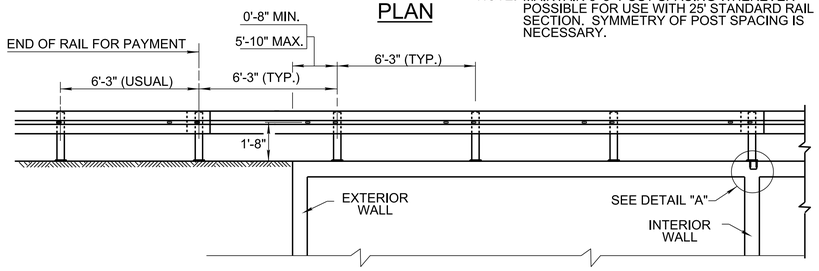
13-MAR-2018 10:54
\\Ag03sdcwf0010\projects\Standard Drawings Folder\Working Folder for Eugene\DRAFT\6 SAFETY DESIGN AND FENCES\10 GUARDRAIL MAINTENANCE\SGR28S-20180315.DGN

THIS DRAWING IS TO BE USED FOR RESURFACING, MAINTENANCE, AND BRIDGE REPAIR PROJECTS ONLY, THIS DRAWING IS NOT INTENDED TO BE USED FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS.

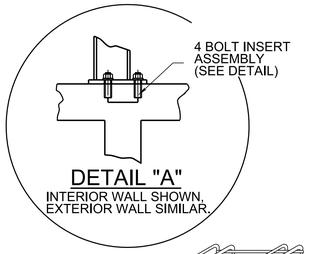


PLAN

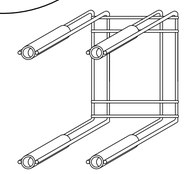
NOTE: MAINTAIN 6'-3" POST SPACING WHEREVER POSSIBLE FOR USE WITH 25' STANDARD RAIL SECTION. SYMMETRY OF POST SPACING IS NECESSARY.



INSIDE ELEVATION GUARDRAIL

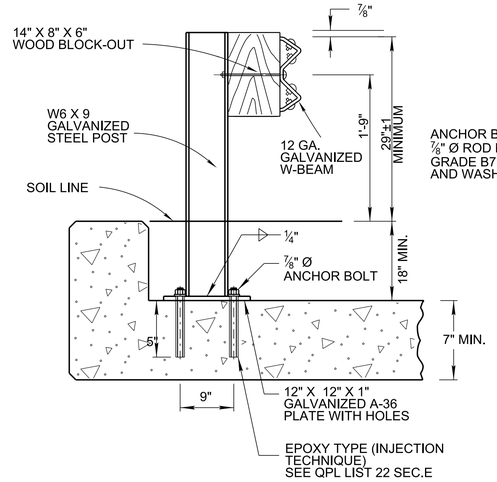


DETAIL "A"
INTERIOR WALL SHOWN, EXTERIOR WALL SIMILAR.



INSERT ASSEMBLY
FOR ¾" DIAMETER X 4" HEX HEAD BOLTS (ASTM A-307 SPECIFICATION)

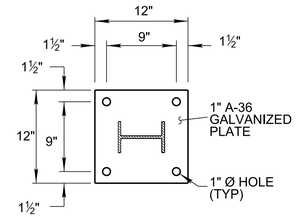
INSERT ASSEMBLY IS FOR CONNECTION OF POSTS OVER WALLS ONLY AND NOT A SUBSTITUTE FOR PLATE ASSEMBLY ELSEWHERE.



ANCHOR BOLT:
⅞" Ø ROD MATERIAL ASTM A193, GRADE B7 MATERIAL WITH NUTS AND WASHERS GALVANIZED

ALTERNATE POST ATTACHMENT USING ANCHOR BOLTS

SEE NOTE⑥



BASEPLATE DETAILS

DETAIL FOR CONCRETE DECK USED AS A RIDING SURFACE SHOWING OUTLET END

SECTION "A-A"

DETAIL FOR CONCRETE DECK WITH 6" TO 1'-0" OF ROADWAY FILL COVER

DETAIL FOR CONCRETE DECK WITH 1'-0" TO 3'-6" OF ROADWAY FILL COVER

* DENOTES ADJOINING ROADWAY SIDE SLOPE

GENERAL NOTES

(A) THE EXACT POSITION OF GUARDRAIL SHALL BE AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. GUARDRAIL SHALL BE TRANSITIONED TO A SMOOTH CONNECTION WITH OTHER GUARDRAIL OR STRUCTURE RAILING AS SHOWN ELSEWHERE ON PLANS.

(B) 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.

(C) BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.

(D) GUARDRAIL THAT IS INSTALLED ON CURVE WITH A RADIUS OF 150 FEET OR LESS SHALL BE SHOP BENT.

(E) STEEL POST SHALL BE BLOCKED OUT. A 8" X 6" WOOD BLOCK-OUT SHALL BE USED WITH EACH STEEL POST. SEE STANDARD DRAWING S-GR28-6 FOR SPECIFICATIONS AND DETAILS.

(F) WELDED STEEL POSTS SHALL MEET THE REQUIREMENTS OF ASTM A-769. THE FLANGE WIDTH AND THICKNESS, WEB THICKNESS, AND DEPTH OF WELDED POSTS SHALL EQUAL OR EXCEED THE DIMENSIONS OF A STANDARD ROLLED W6 X 8.5 OR W6 X 9.0 STEEL POST.

(G) STEEL POSTS SHALL MEET THE REQUIREMENTS OF ASTM A-36. BOLT HOLES SHALL BE APPROXIMATELY CENTERED BETWEEN WEB AND EDGE OF FLANGE OF SPACERS AND POSTS.

DESIGN NOTES

1. WHEN DEPTH OF FILL AT FACE OF GUARDRAIL EXCEEDS 3'-6" DELETE THE USE OF BOLTED BASE PLATES AND DRIVE POSTS.
2. THE USE OF PRECAST, PRESTRESSED CONCRETE DECK PANELS IN BOX AND SLAB TYPE CULVERTS IS PROHIBITED.
3. THIS RAIL SYSTEM HAS BEEN TESTED BY MIDWEST ROADSIDE SAFETY FACILITY IN ACCORDANCE WITH THE CRITERIA SET FORTH IN NCHRP REPORT NUMBER 350 TL-3, REFERENCE REPORT STR-3(017), NOVEMBER 1986.
4. ANY REINFORCING STEEL THAT INTERFERES WITH THE 1¼" DIAMETER FORMED HOLES SHALL BE MOVED HORIZONTALLY TO PROVIDE A 1" MINIMUM CLEARANCE TO THE HOLE.
5. GUARDRAIL POST ATTACHMENT USING BASE PLATE AND ANCHOR BOLTS HAS BEEN TESTED PER NCHRP 350-TL3 BY TEXAS TRANSPORTATION INSTITUTE. REPORT NUMBER 405160-12, JANUARY 29, 2009.
6. DURING REPAIR A NEW POST MAY BE ATTACHED TO DECK BY USING ANCHOR BOLTS. POST LOCATION CAN BE MOVED NOT TO EXCEED 6'-3" TYPICAL SPAN AND NOT LESS THAN 3'-1½". ALL SHOP DRILLED HOLES TO W-BEAM RAIL OR CUT POST SHALL RECEIVE GALVANIZED COATING.

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL ATTACHMENT TO CONCRETE DECKS

3-15-18 | S-GR28-6

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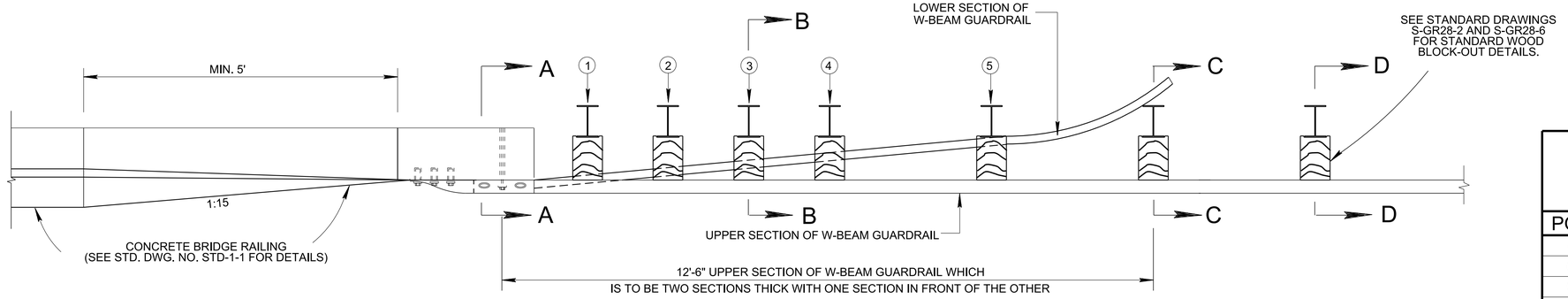
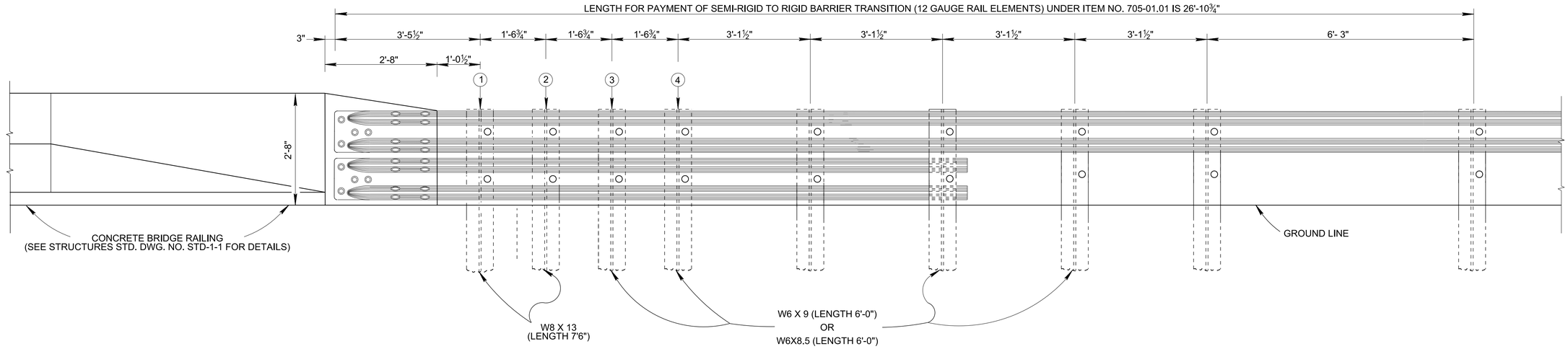
NOTE: THIS SYSTEM HAS BEEN EVALUATED UNDER NCHRP 350 TL-3.



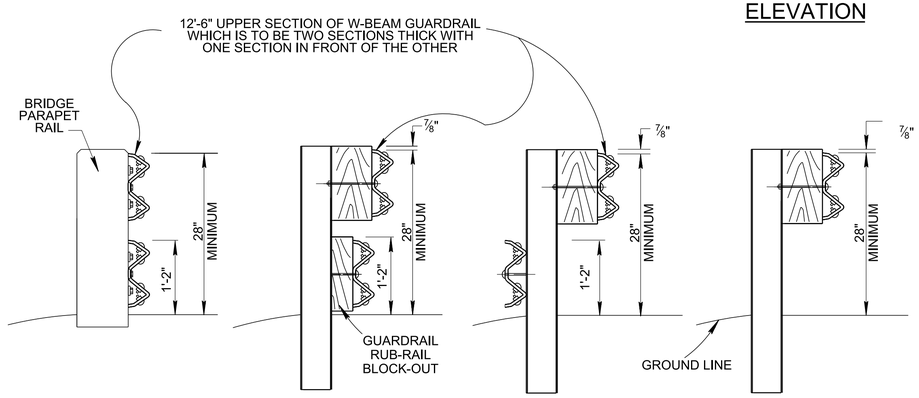
PLAN

GUARDRAIL RUB-RAIL BLOCK-OUT THICKNESS TABLE	
POST	THICKNESS
1	6.67"
2	5.35"
3	4.06"
4	2.76"
5	NO BLOCK

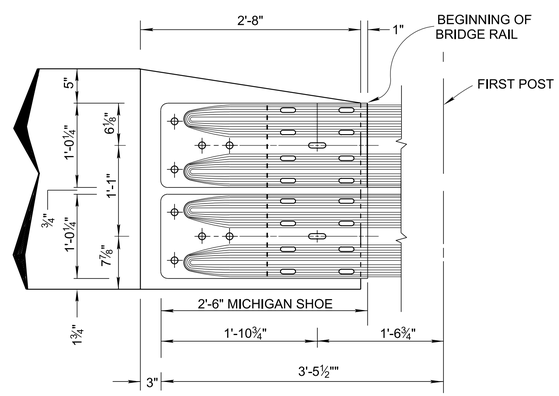
TREATED TIMBER 14½" X 4" BLOCK-OUT



ELEVATION



SECTION A-A SECTION B-B SECTION C-C SECTION D-D



ENLARGED DETAIL FOR GUARDRAIL ATTACHMENT TO CONCRETE BRIDGE RAIL

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED.

STATE OF TENNESSEE DEPARTMENT OF TRANSPORTATION

GUARDRAIL ATTACHMENT TO BRIDGE END DETAILS

3-15-18 S-GR28-7

13-MAR-2018 10:54
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CHAPTER 5 – TABLE OF CONTENTS

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CHAPTER 5 - LIST OF CURRENT STANDARD DRAWINGS

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	03-16-17	STANDARD LEGEND FOR SIGNALIZATION AND LIGHTING
RD-L-4	03-16-17	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	09-15-17	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	03-16-17	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	03-16-17	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	03-16-17	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	07-05-17	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	03-16-17	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
SD-MSE-1		SIDE DRAIN MITERED END SECTION

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-9F	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-13	11-01-16	LONGITUDINAL STONE TOE

D-NSD-21	09-15-17	BOULDER CLUSTERS
D-NSD-22	09-15-17	BOULDER CROSS VANE
D-NSD-23	09-15-17	BOULDER CROSS VANE WITH STEP
D-NSD-24	09-15-17	BOULDER W-WEIR
D-NSD-25	09-15-17	BOULDER VANES AND J-HOOK
D-NSD-26	09-15-17	LOG VANES, ROOT WADS, AND BOULDER J-HOOK
D-NSD-27	09-15-17	LOG AND BOULDER STEP POOLS
D-NSD-28	09-15-17	BOULDER RIFFLES
D-NSD-28A	09-15-17	LOG RIFFLES
D-NSD-29	09-15-17	CONSTRUCTED ALLUVIAL RIFFLE
D-NSD-30		SUBSTRATE RESTORATION
D-NSD-31	09-15-17	CLAY CHANNEL PLUG
D-NSD-32	09-15-17	WOOD TOE WITH GEO-LIFTS
D-NSD-32A	09-15-17	BOULDER TOE WITH GEO-LIFTS
D-NSD-33	09-15-17	COIR FIBER EROSION CONTROL BLANKET AND COIR FIBER ROLLS
D-NSD-34	09-15-17	LIVE STAKES AND LIVE SILTATION
D-NSD-35	09-15-17	LIVE FASCINES
D-NSD-36	09-15-17	BRUSH MATTRESS
D-NSD-37		SPECIAL NOTES FOR NATURAL STREAM DESIGN

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	07-05-17	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	07-05-17	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	03-28-17	CRASH CUSHION
S-CC-2		CRASH CUSHION (GATING) BARREL ARRAY

5-150.04 GUARDRAIL DETAILS

DRAWING	REVISION DATE	DESCRIPTION
S-GR31-1	03-28-17	W-BEAM GUARDRAIL
S-GR31-1A		W-BEAM BARRIER FASTENING HARDWARE
S-GRS-1	03-28-17	SPECIAL CASE LONG SPAN GUARDRAIL ONE POST OMITTED
S-GRS-2	07-05-17	SPECIAL CASE: GUARDRAIL ATTACHMENT TO CONCRETE DECKS
S-GRS-3	03-28-17	SPECIAL CASE: GUARDRAIL FOOTING

S-GRS-4	03-16-17	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	03-16-17	TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE
S-GRT-2	03-28-17	TYPE 38 GUARDRAIL END TERMINAL
S-GRT-2P	07-05-17	EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINAL
S-GRT-2R	07-05-17	EARTH PAD FOR TYPE 38 AND TYPE 21 TERMINAL (RETROFIT)
S-GRT-3	03-28-17	TYPE 21 GUARDRAIL END TERMINAL

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	07-05-17	TYPE 13 GUARDRAIL ANCHOR
S-GRA-4	07-05-17	IN-LINE GUARDRAIL ANCHOR
S-GRA-5	03-28-17	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	07-05-17	BIKE/PEDESTRIAN SAFETY RAIL
S-BPR-2		BARRIER BIKE/PEDESTRIAN MEDIAN 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	11-15-17	STANDARD RIGHT-OF-WAY STOCK FENCE

S-F-10A	11-15-17	STANDARD RIGHT-OF-WAY STOCK FENCE WITH TIMBER POSTS
S-F-10B	11-15-17	STANDARD RIGHT-OF-WAY CHAIN LINK FENCE
S-F-10C	11-15-17	RIGHT-OF-WAY FENCE AT BRIDGES AND BOX CULVERTS
S-F-10D	11-15-17	RIGHT-OF-WAY FENCE LOCATIONS AT INTERCHANGES
S-FG-11	11-15-17	STANDARD STOCK FENCE GATE
S-FG-20	11-15-17	EXAMPLES OF WATER GATES AND WATER CROSSINGS
S-RP-2	02-08-16	STANDARD CONCRETE RIGHT-OF-WAY MARKERS

5-150.10 GUARDRAIL MAINTENANCE

DRAWING	REVISION DATE	DESCRIPTION
S-GR28-1		W-BEAM & THRIE BEAM BARRIER RAIL AND RUB RAIL DETAILS
S-GR28-2		GUARDRAIL HARDWARE DETAILS
S-GR28-3		GUARDRAIL HEIGHT ADJUSTMENT
S-GR28-4		GUARDRAIL TERMINAL ANCHOR TYPE 13
S-GR28-5		MEDIAN DIVIDER GUARDRAIL
S-GR28-6		GUARDRAIL ATTACHMENT TO CONCRETE DECKS
S-GR28-7		GUARDRAIL ATTACHMENT TO BRIDGE END DETAILS MAINTENANCE ONLY

5-160.00 DESIGN - TRAFFIC CONTROL

5-160.01 PAVEMENT MARKINGS

DRAWING	REVISION DATE	DESCRIPTION
T-M-1	07-05-17	DETAILS OF PAVEMENT MARKINGS FOR CONVENTIONAL ROADS AND MARKING ABBREVIATIONS

T-M-2	07-05-17	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	03-16-17	INTERCONNECTED PORTABLE BARRIER RAIL
T-PBR-2	03-16-17	DETAIL FOR FLEXIBLE DELINEATORS
T-WZ-10	04-02-12	ADVANCE ROAD WORK SIGNING ON HIGHWAYS AND FREEWAYS
T-WZ-11	03-05-17	ONE LANE CLOSURE DETAIL ON DIVIDED HIGHWAYS
T-WZ-12	03-05-17	ONE LANE CLOSURE DETAIL FOR BRIDGES ON DIVIDED HIGHWAYS
T-WZ-13	03-05-17	TWO-OUTSIDE LANE CLOSURE ON FREEWAY OR EXPRESSWAY
T-WZ-14	03-05-17	TWO-OUTSIDE LANE CLOSURE ON INTERSTATES AND EXPRESSWAYS (PORTABLE BARRIER RAIL)
T-WZ-15	03-05-17	INTERIOR LANE CLOSURE ON FREEWAYS OR EXPRESSWAYS
T-WZ-16	03-05-17	LANE SHIFT ON DIVIDED HIGHWAYS AND FREEWAYS
T-WZ-18	03-05-17	SHOULDER CLOSURE DETAIL FOR FREEWAYS AND DIVIDED HIGHWAYS
T-WZ-19	03-05-17	MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS
T-WZ-20	12-18-99	GEOMETRIC MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS
T-WZ-21	03-05-17	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	03-05-17	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	03-05-17	LANE CLOSURE ON LOW-VOLUME 2-LANE HIGHWAY
T-WZ-40	03-05-17	RIGHT LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-41	03-05-17	LEFT LANE CLOSURES AT NEAR SIDE OF INTERSECTIONS
T-WZ-42	03-05-17	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	03-16-17	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	03-16-17	LEVEL SPREADERS

5-170.04 INLET PROTECTION

DRAWING	REVISION DATE	DESCRIPTION
EC-STR-11	03-16-17	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