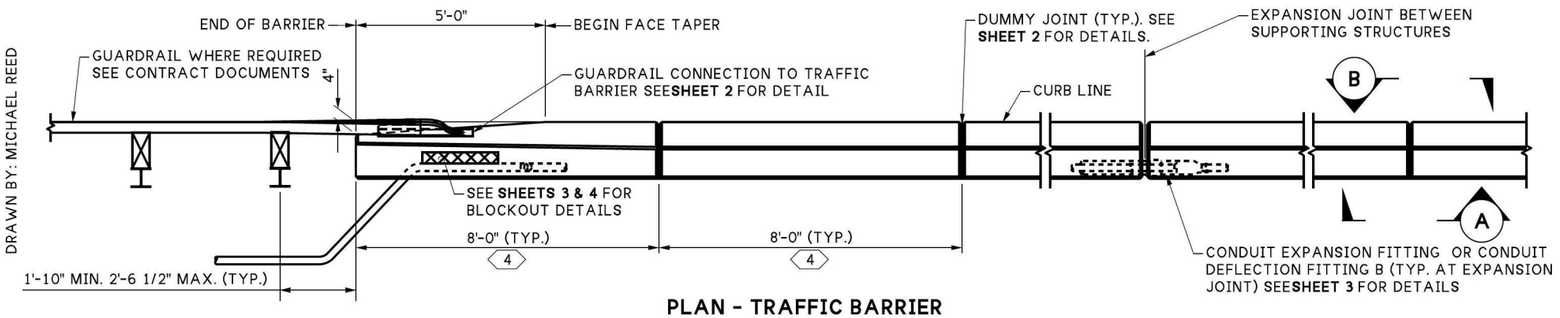
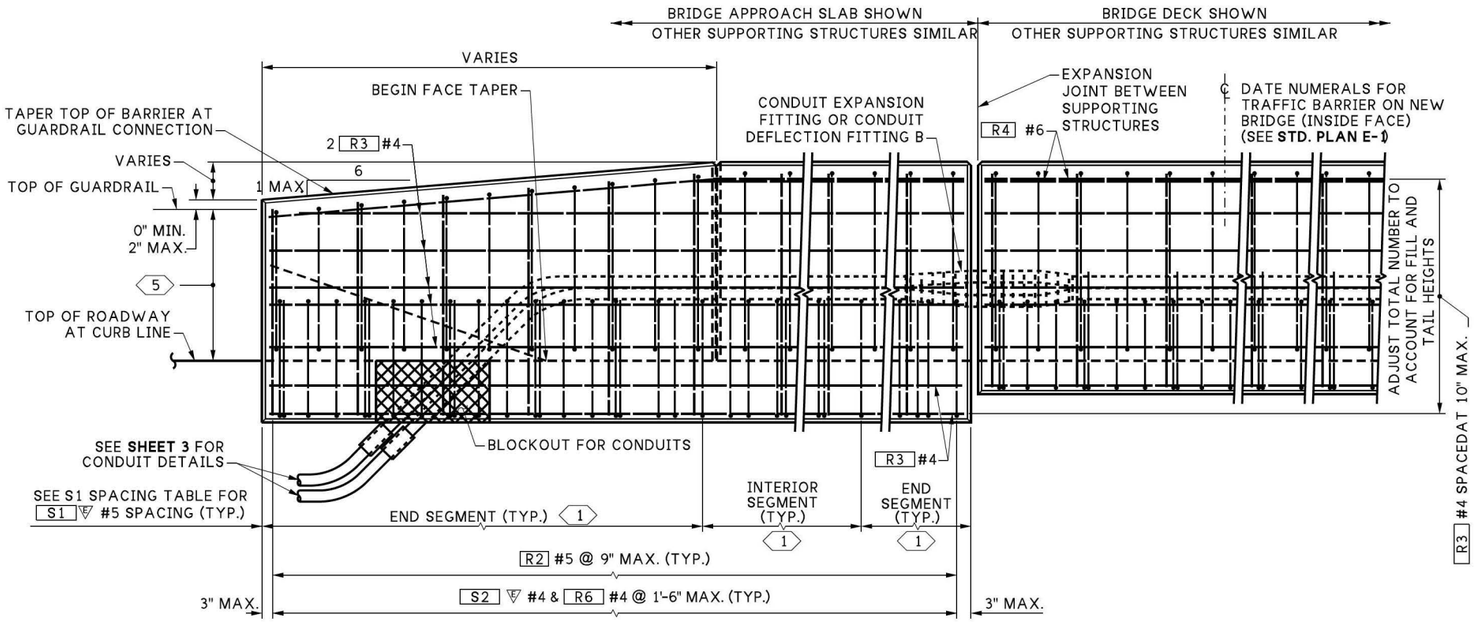
DRAWN BY: MICHAEL REED

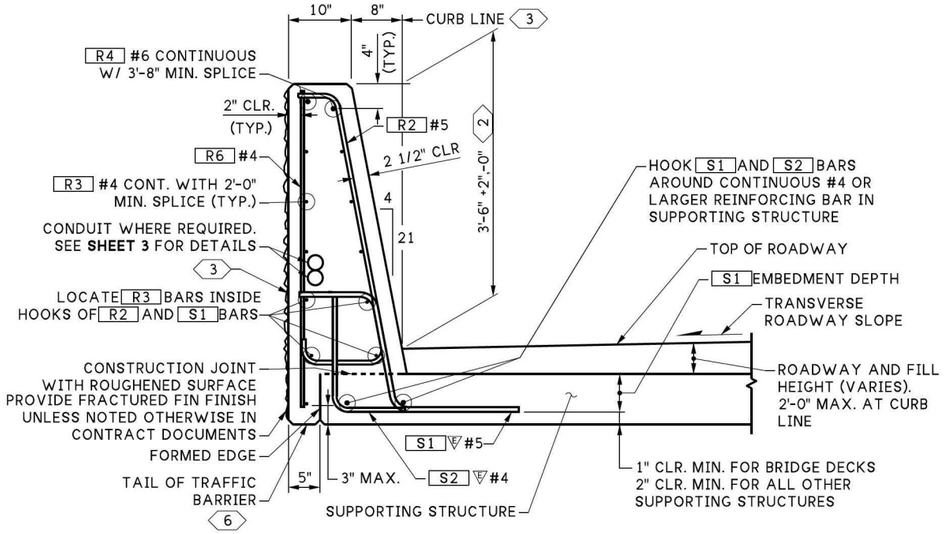


PLAN - TRAFFIC BARRIER

1

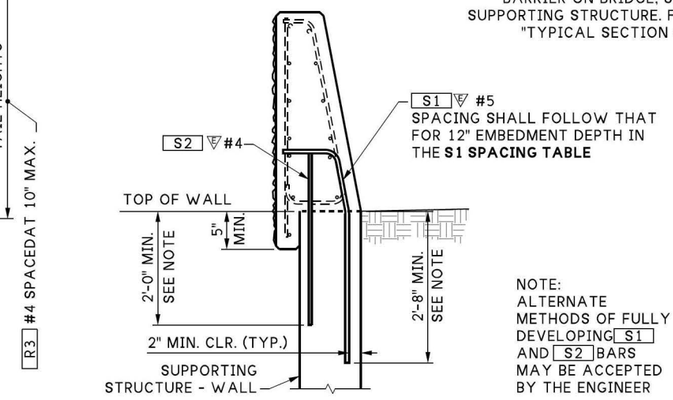


OUTSIDE ELEVATION - END OF TRAFFIC BARRIER



TYPICAL SECTION - TRAFFIC BARRIER

BARRIER ON BRIDGE, SLAB, OR OTHER SIMILAR SUPPORTING STRUCTURE. FOR BARRIERS ON WALLS SEE "TYPICAL SECTION - BARRIER ON WALL".



TYPICAL SECTION - TRAFFIC BARRIER ON WALL

FOR DETAILS NOT SHOWN SEE "TYPICAL SECTION - TRAFFIC BARRIER".

S1 SPACING TABLE		
S1 EMBEDMENT DEPTH (in)	S1 MAX. SPACING (in) (INTERIOR SEGMENT)	S1 MAX. SPACING (in) (END SEGMENT)
≥ 12	13.5	7
11	13	7
10	12	6
9	10.5	5.5
8	9.5	5
7	8	4
6	7	3.75

GENERAL NOTES

1. All material and workmanship shall be in accordance with requirements of current edition of the **WSDOT Standard Specifications for Road, Bridge and Municipal Construction (M41-10).**
2. This standard does not waive the requirement for engineering in it's application. The stamped plan covers all applicable limit states within the limitations and ranges provided herein. Elements which require engineering under separate cover include but are not limited to the design of supporting structure, applicability of the TL-4 barrier to the site, and roadside safety considerations inclusive of proper transitions. Consult the **WSDOT Design Manual and the WSDOT Bridge Design Manual** for requirements.
3. It is permissible to place BP rail on the barrier. The BP rail requires design and stamp.

KEY NOTES

1. BARRIER CONTINUOUS BETWEEN EXPANSION JOINTS. BARRIER WITHIN THE END SEGMENT LENGTH FROM AN END OR EXPANSION JOINT SHALL BE REINFORCED AS AN END SEGMENT. REMAINING LENGTHS OF BARRIER SHALL BE REINFORCED AS AN INTERIOR SEGMENT. LENGTH OF EACH CONTINUOUS RUN OF BARRIER SHALL NOT BE LESS THAN THE END SEGMENT LENGTH. CONSTRUCTION JOINTS WITH SHEAR KEYS ARE PERMISSIBLE AT DUMMY JOINT LOCATIONS. SEE **SHEET 4** FOR THE END SEGMENT LENGTH.
2. HEIGHT MAY VARY WITHIN TOLERANCE TO PROVIDE A SMOOTH PROFILE PLEASING TO THE EYE.
3. PERPENDICULAR TO TRANSVERSE ROADWAY SLOPE. PERPENDICULAR TO 8% TRANSVERSE ROADWAY SLOPE FOR LOW SIDE BARRIER FOR TRANSVERSE ROADWAY SLOPES GREATER THAN 8%.
4. MAY VARY BETWEEN 6'-0" AND 10'-0" AS NECESSARY. FOR CONTINUOUS LENGTHS OF BARRIER (BETWEEN ENDS OR EXPANSION JOINTS) GREATER THAN 10'-0" AND LESS THAN 18'-0", PLACE ONE DUMMY JOINT CENTERED.
5. 2'-8" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 21 (STD. PLAN C-25.20).**
   2'-7" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 24 (STD. PLAN C-25.30).**
   2'-7" FOR **BEAM GUARDRAIL TYPE 31.**
6. TAIL SOFFIT TO MATCH SOFFIT OF SUPPORTING STRUCTURE UNLESS NOTED OTHERWISE. SEE SECTIONS ON **SHEET 2** FOR TAIL DETAILS.

PATRICK RYAN O'NEILL
STATE OF WASHINGTON
53580
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

Aug 10, 2026

42" SINGLE SLOPE BARRIER ON STRUCTURE (TL-4)

STANDARD PLAN C-81.10-01

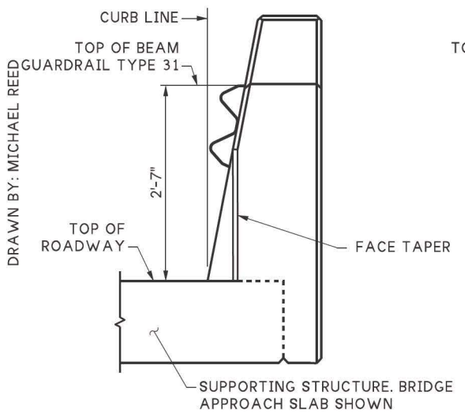
APPROVED FOR PUBLICATION

Aug 10, 2026

STATE DESIGN ENGINEER

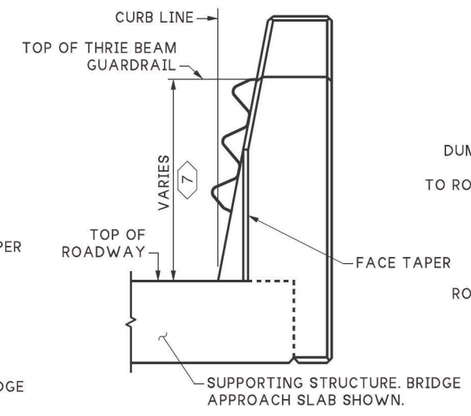
Washington State Department of Transportation

DRAWN BY: MICHAEL REED



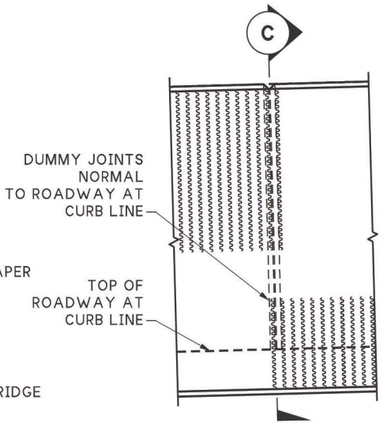
END VIEW

BEAM GUARDRAIL TYPE 31 SHOWN WITH "D" CONNECTION OR "F" CONNECTION (SEE **STD. PLAN C-7** AND **C-24.10**).

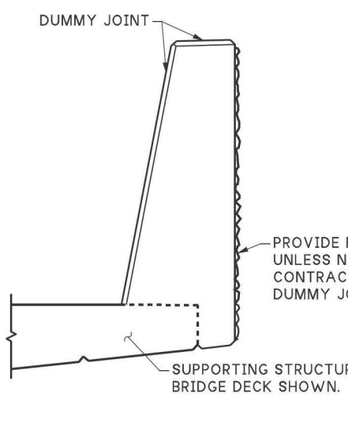


END VIEW

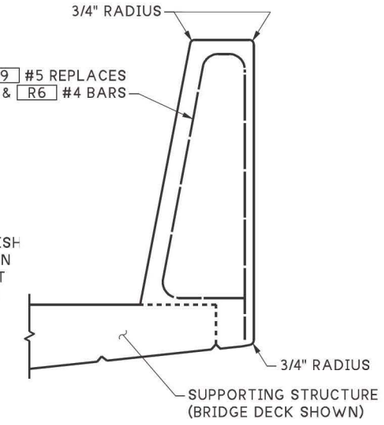
THRIE BEAM SHOWN WITH "D" CONNECTION OR "F" CONNECTION (SEE **STD. PLAN C-7a** AND **C-24.10**)



VIEW (A)

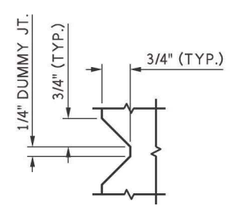


SECTION (C)

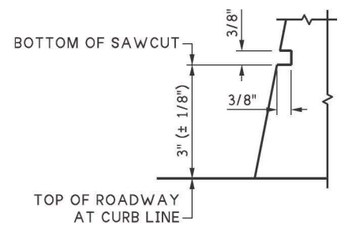


SLIPFORM ALTERNATE

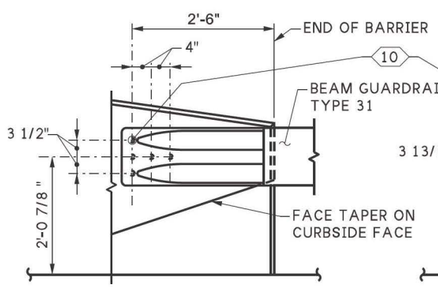
SEE "TYPICAL SECTION TRAFFIC BARRIER" FOR ADDITIONAL DETAILS 9



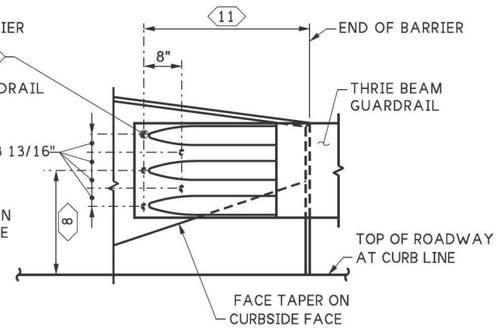
DUMMY JOINT DETAIL



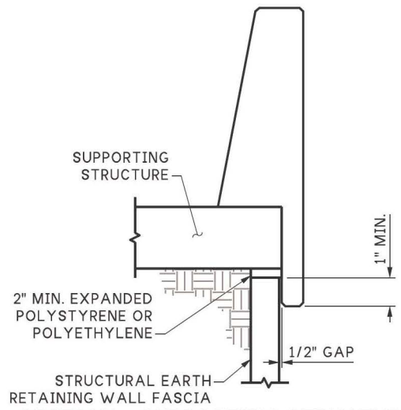
SECTION (D)



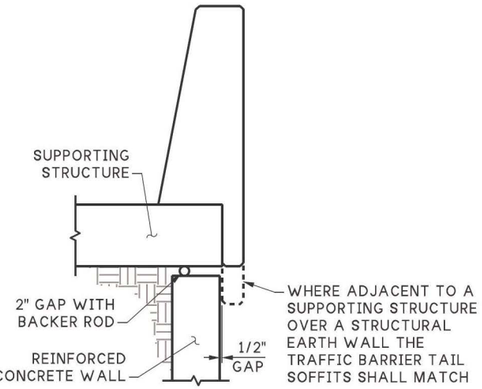
BEAM GUARDRAIL END SECTION DESIGN "F"
(SEE STD. PLAN C-7)



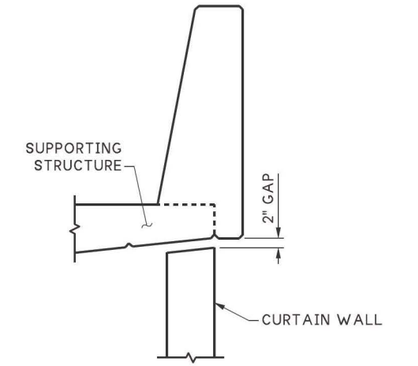
THRIE BEAM END SECTION DESIGN "F"
(SEE STD. PLAN C-7a)



SECTION - SUPPORTING STRUCTURE OVER STRUCTURAL EARTH WALL



SECTION - SUPPORTING STRUCTURE OVER REINFORCED CONCRETE WALL



SECTION - SUPPORTING STRUCTURE OVER CURTAIN WALL

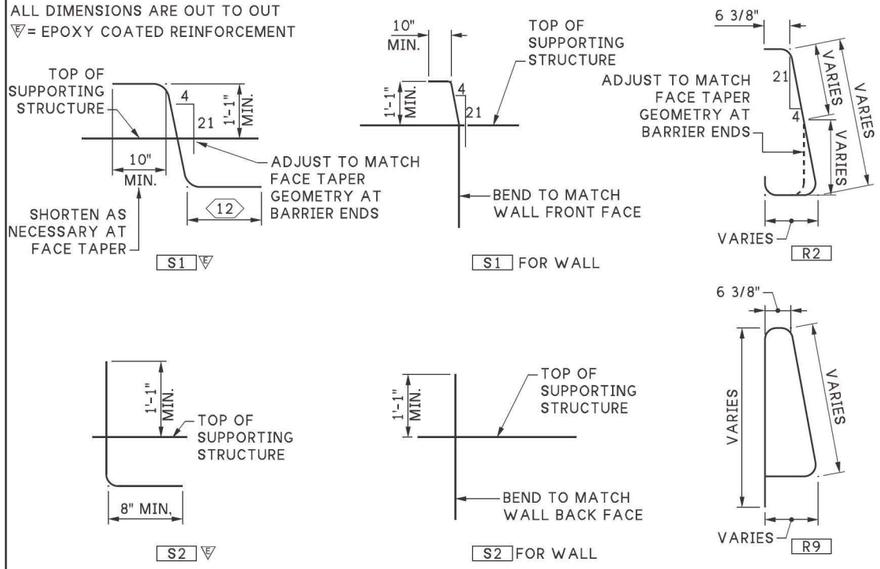
ELEVATION - TRAFFIC BARRIER GUARDRAIL CONNECTION

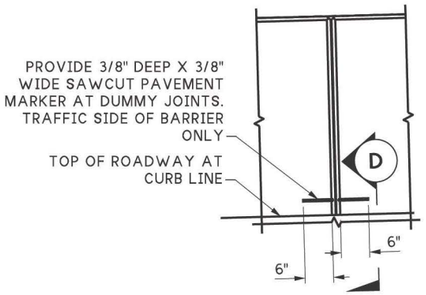
(WHERE SHOWN IN CONTRACT DOCUMENTS)

BENDING DIAGRAM

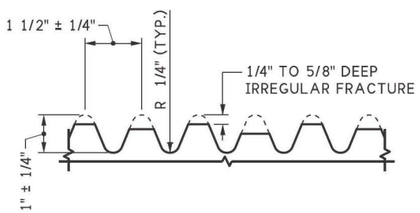
ALL DIMENSIONS ARE OUT TO OUT

▽ = EPOXY COATED REINFORCEMENT





VIEW (B)



FRACTURED FIN FINISH

KEY NOTES:

7 VARIES. SEE CONTRACT DOCUMENTS FOR GUARDRAIL CONNECTION REQUIREMENTS.
2'-8" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 21 (STD. PLAN C-25.20)**
2'-7" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 24 (STD. PLAN C-25.30)**

8 VARIES. SEE CONTRACT DOCUMENTS FOR GUARDRAIL CONNECTION REQUIREMENTS.
1'-10" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 21 (STD. PLAN C-25.20)**
1'-9" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 24 (STD. PLAN C-25.30)**

9 THE CONTRACTOR IS ADVISED THAT THE SLIPFORM CONSTRUCTION METHOD IS A PATENTED PROPRIETARY PROCESS FOR BARRIERS WITH A FRACTURED FIN FINISH.

10 7/8"Ø ROCKET/KOHLER F-50, LANCASTER MALLEABLE, OR DAYTON/RICHMOND F-62 FLARED THIN SLAB FERRULE INSERTS OR APPROVED EQUAL (TYP.). RESIN BONDED ANCHORS IN ACCORDANCE WITH **STANDARD SPECIFICATIONS 6-02.3(18)A AND 9-06.4** MAY BE SUBSTITUTED.

11 VARIES. SEE CONTRACT DOCUMENTS FOR GUARDRAIL CONNECTION REQUIREMENTS.
2'-11" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 21 (STD. PLAN C-25.20)**
2'-4" FOR **BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION TYPE 24 (STD. PLAN C-25.30)**

12 1'-8" MIN. FOR BRIDGE DECKS. 10" MIN. FOR ALL OTHER SUPPORTING STRUCTURES.

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PROFESSIONAL ENGINEER

Aug 10, 2026

42" SINGLE SLOPE BARRIER ON STRUCTURE (TL-4)

STANDARD PLAN C-81.10-01

SHEET 2 OF 4 SHEETS

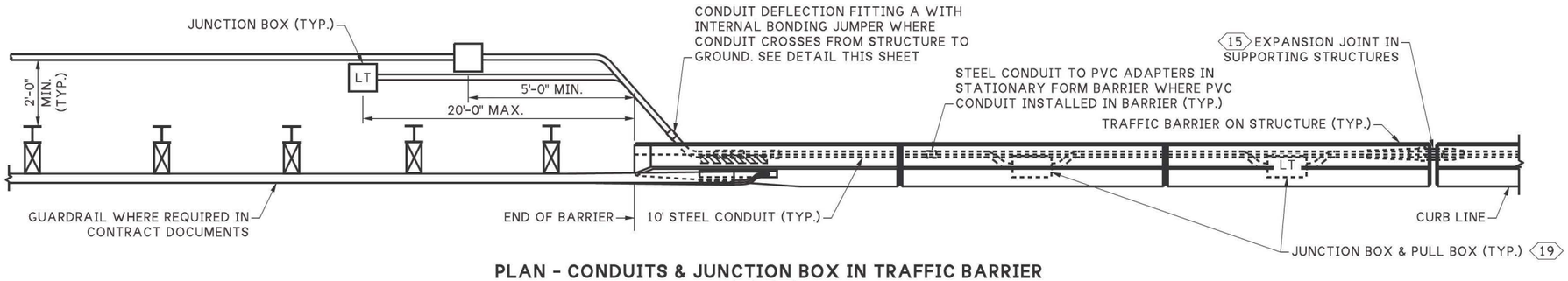
APPROVED FOR PUBLICATION

Mark A Gaines — Aug 10, 2026

STATE DESIGN ENGINEER

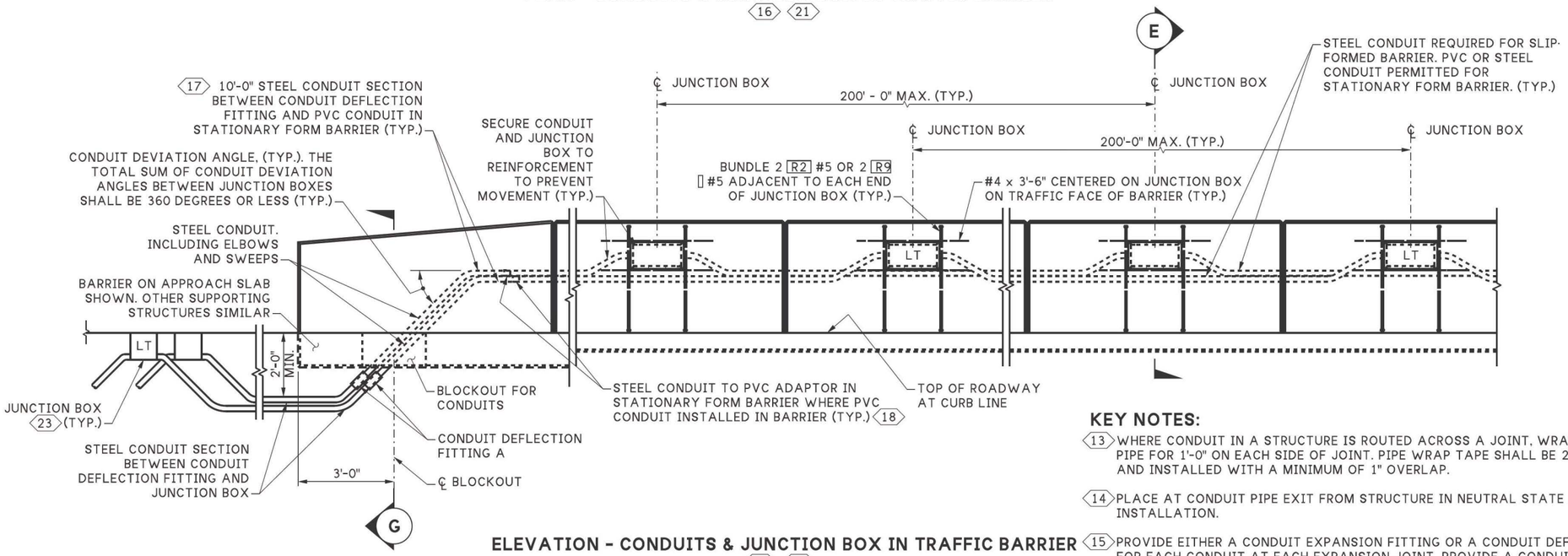
Washington State Department of Transportation

DRAWN BY: MICHAEL REED



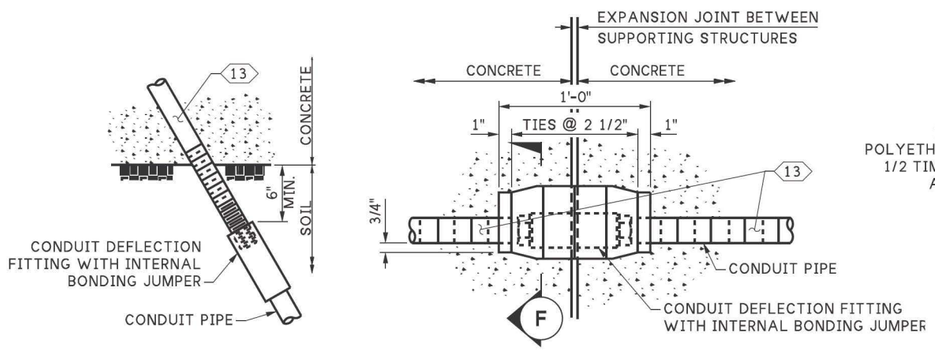
PLAN - CONDUITS & JUNCTION BOX IN TRAFFIC BARRIER

16 21



ELEVATION - CONDUITS & JUNCTION BOX IN TRAFFIC BARRIER

16 21



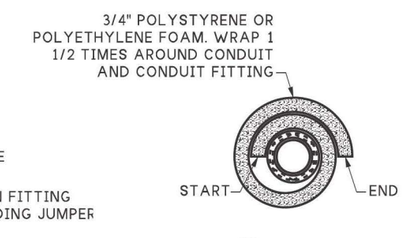
CONDUIT DEFLECTION FITTING A

CONDUIT FITTING - TYPE DX FOR ANGULAR DEFLECTION OF 30°AND 3/4" LONGITUDINAL AND LATERAL MOVEMENT

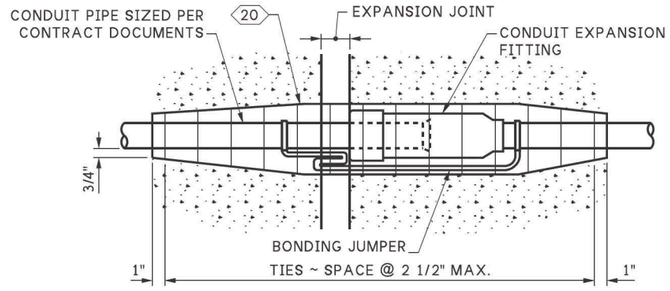
14

CONDUIT DEFLECTION FITTING B

CONDUIT FITTING - TYPE DX FOR ANGULAR DEFLECTION OF 30°AND 3/4" LONGITUDINAL AND LATERAL MOVEMENT

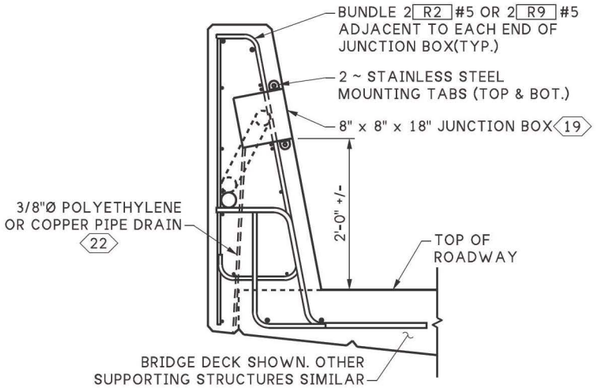


SECTION (F)



CONDUIT EXPANSION FITTING

CONDUIT FITTING - TYPE AX FOR LONGITUDINAL MOVEMENT OF ± 2" AND TYPE EXTENDED AX FOR LONGITUDINAL MOVEMENT OF ± 4" AT EXPANSION JOINTS



SECTION (E)

KEY NOTES:

13 WHERE CONDUIT IN A STRUCTURE IS ROUTED ACROSS A JOINT, WRAP STEEL CONDUIT PIPE FOR 1'-0" ON EACH SIDE OF JOINT. PIPE WRAP TAPE SHALL BE 2" WIDE, 20 ML THICK, AND INSTALLED WITH A MINIMUM OF 1" OVERLAP.

14 PLACE AT CONDUIT PIPE EXIT FROM STRUCTURE IN NEUTRAL STATE AFTER INSTALLATION.

15 PROVIDE EITHER A CONDUIT EXPANSION FITTING OR A CONDUIT DEFLECTION FITTING B FOR EACH CONDUIT AT EACH EXPANSION JOINT. PROVIDE A CONDUIT EXPANSION FITTING AT EXPANSION JOINTS WHERE ONLY LONGITUDINAL MOVEMENT IS POSSIBLE SUCH AS BETWEEN A BRIDGE APPROACH SLAB AND A BRIDGE DECK. PROVIDE A CONDUIT DEFLECTION FITTING B WHERE LONGITUDINAL AND LATERAL MOVEMENT IS POSSIBLE ACROSS THE EXPANSION JOINT, SUCH AS BETWEEN STRUCTURES ON SEPARATE FOUNDATIONS.

16 LABEL JUNCTION BOX COVER IN ACCORDANCE WITH **STANDARD SPECIFICATION SECTION 9-29.2(4)**, AND AS REQUIRED IN THE CONTRACT DOCUMENTS. WHERE 2 SPARE CONDUITS ARE INSTALLED, LABEL JUNCTION BOX LIDS AS SHOWN UNLESS NOTED OTHERWISE.

17 TERMINATE STEEL CONDUIT IN JUNCTION BOX IF LESS THAN 10'-0" FROM ELBOW OR SWEEP.

18 INSTALL ONLY WHERE CONDUIT IS HORIZONTAL.

19 NEMA 4X IN STATIONARY FORM BARRIER, OR NEMA 3R IN SLIP FORM BARRIER. MOUNT JUNCTION BOX SO COVER IS FLUSH WITH BARRIER. CAN BE RECESSED UP TO 1/8".

20 3'-0" LONG EXPANDED POLYSTYRENE OR POLYETHYLENE SLEEVE AROUND CONDUIT. DUCT TAPE SEAMS AND ENDS TO SEAL AND PREVENT CONCRETE FROM BONDING WITH FITTING AND CONDUIT.

21 NUMBER AND SIZES OF CONDUITS SHALL BE AS REQUIRED IN THE CONTRACT DOCUMENTS. LOCATE JUNCTION BOXES AND CONDUIT AS SHOWN UNLESS NOTED OTHERWISE IN CONTRACT DOCUMENTS. JUNCTION BOXES WITHIN THE BARRIER MAY BE OMITTED WHEN THE CONDUIT DISTANCE BETWEEN JUCTION BOXES OFF THE BARRIER ENDS IS 200'-0" OR LESS, AND THE SUM OF THE CONDUIT DEVIATION ANGLES FOR THE CONDUIT ARE 360 DEGREES OR LESS. CENTER JUNCTION BOXES BETWEEN ADJACENT DUMMY JOINTS.

22 INSTALL ALL CONDUIT RUNS TO DRAIN TO A BARRIER END OR PROVIDE DRAIN AT ALL LOW POINTS IN CONDUIT RUN.

23 TERMINATE EACH CONDUIT IN SEPARATE TYPE 1 JUNCTION BOXES OFF END OF BARRIER UNLESS NOTED OTHERWISE IN CONTRACT DOCUMENTS.

PATRICK RYAN O'NEILL
STATE OF WASHINGTON
53580
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER

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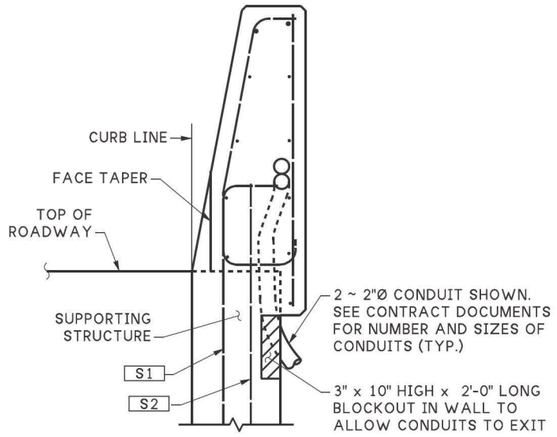
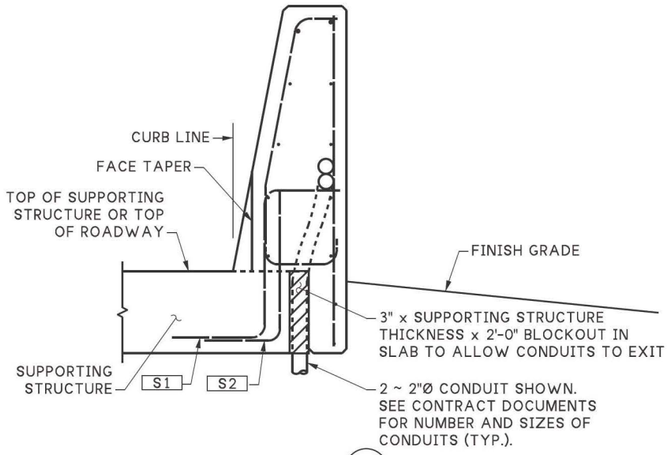


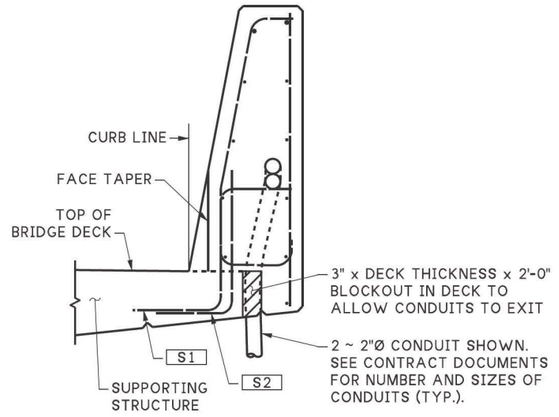
SECTION G

BLOCKOUT AT WALL



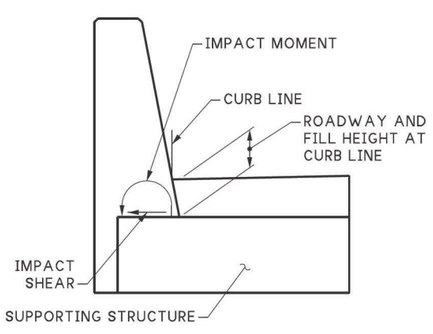
SECTION G

BLOCKOUT AT BRIDGE APPROACH SLABS AND MOMENT SLABS ON GRADE



SECTION G

BLOCKOUT AT BRIDGE DECK



IMPACT SHEAR AND MOMENT DETAIL ⟨24⟩

⟨25⟩ **IMPACT SHEAR AND MOMENT TABLE DECK OVERHANG & CONNECTIONS**

		INTERIOR SEGMENT					END SEGMENT				
ROADWAY AND FILL HEIGHT AT CURB LINE (in)		0	6	12	18	24	0	6	12	18	24
END SEGMENT LENGTH (ft)	⟨26⟩	–	–	–	–	–	10.00	10.50	11.25	11.75	12.50
IMPACT MOMENT (kip*ft/ft)	⟨24⟩	13.18	14.66	15.98	17.20	18.35	20.80	25.17	29.65	32.85	35.22
IMPACT SHEAR (kip/ft)	⟨24⟩	5.24	4.91	4.66	4.47	4.34	8.27	8.39	8.54	8.36	8.07

⟨25⟩ **IMPACT SHEAR AND MOMENT TABLE OTHER SUPPORTING STRUCTURES**

		INTERIOR SEGMENT					END SEGMENT				
ROADWAY AND FILL HEIGHT AT CURB LINE (in)		0	6	12	18	24	0	6	12	18	24
END SEGMENT LENGTH (ft)	⟨26⟩	–	–	–	–	–	10.00	10.50	11.25	11.75	12.50
IMPACT MOMENT (kip*ft/ft)	⟨24⟩	19.86	24.12	28.55	33.16	37.97	20.80	25.17	29.65	34.27	39.04
IMPACT SHEAR (kip/ft)	⟨24⟩	7.89	8.04	8.23	8.44	8.68	8.27	8.39	8.54	8.72	8.92

NOTES

1. Adjust reinforcement in supporting structure to avoid blockout. Blockout may be provided by blocking out tail of barrier instead where it is below finish grade.
2. Blockout width may be increased from 3" up to 6" to allow conduits of larger diameter than 2" to exit structure without reinforcing steel conflict.
3. Deck overhangs for this use constitute plain reinforced concrete typically around 8" in thickness, non-prestressed moment slabs or approach slabs, or plain reinforced and longitudinally prestressed box girders which employ a topping slab. Other Supporting Structure Systems inclusive of post-tensioned decks, walls, and or Structure segments tied together without a topping slab, with the ties in the barrier resistance load path, shall use the impact shear and moments for other structures.

KEY NOTES

⟨24⟩ SUPPORTING STRUCTURE SHALL BE DESIGNED FOR ALL FORCES TRANSMITTED FROM THE BARRIER INCLUDING BUT NOT LIMITED TO THE IMPACT MOMENT AND IMPACT SHEAR AND SHALL HAVE A MINIMUM DESIGN CONCRETE COMPRESSIVE STRENGTH OF 4.0 KSI. THE IMPACT MOMENT AND IMPACT SHEAR ARE FOR THE EXTREME EVENT II LIMIT STATE.

⟨25⟩ INTERPOLATE FOR INTERMEDIATE VALUES OF ROADWAY AND FILL HEIGHT.

⟨26⟩ BARRIER CONTINUOUS BETWEEN EXPANSION JOINTS. BARRIER WITHIN THE END SEGMENT LENGTH FROM AN END OR EXPANSION JOINT SHALL BE REINFORCED AS AN END SEGMENT. REMAINING LENGTHS OF BARRIER SHALL BE REINFORCED AS AN INTERIOR SEGMENT. LENGTH OF EACH CONTINUOUS RUN OF BARRIER SHALL NOT BE LESS THAN THE END SEGMENT LENGTH. CONSTRUCTION JOINTS WITH SHEAR KEYS ARE PERMISSIBLE AT DUMMY JOINT LOCATIONS.

Aug 10, 2026

42" SINGLE SLOPE BARRIER ON STRUCTURE (TL-4)

STANDARD PLAN C-81.10-01

SHEET 4 OF 4 SHEETS

APPROVED FOR PUBLICATION

Mark A Gaines — Aug 10, 2026

STATE DESIGN ENGINEER

Washington State Department of Transportation