

Appendix C

Standard Plans



△	
△	
△	
△	
△	DATE 09-20-18
△	REVISIONS

WOODINVILLE SIGNAGE

KEY PLAN:

City of Woodinville

DRAWN BY : DS
CHECKED BY : MK

DIRECTIONAL SIGN

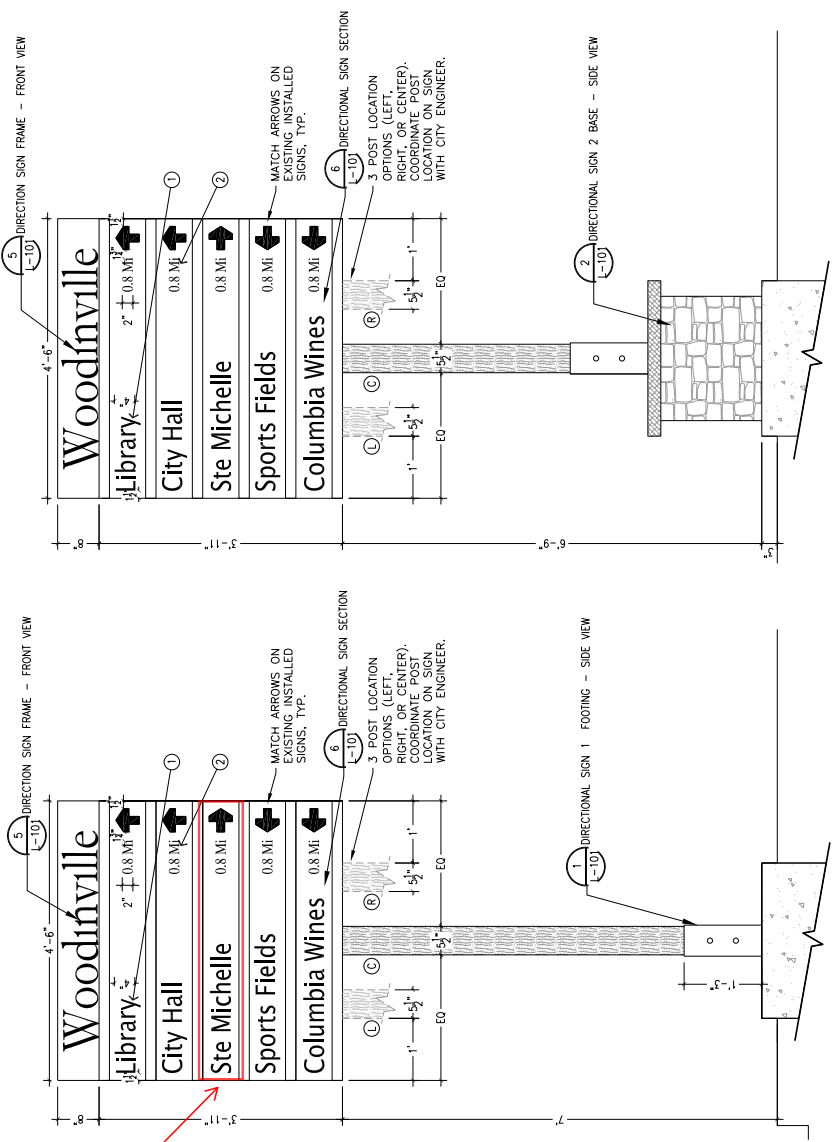
L-100

SIGN UPDATE

1. 4" WHITE REFLECTIVE VINYL LETTERS, FONT IS "LUCIDA SANS" WITH ADHESIVE BACK, LASER CUT
2. 2" WHITE REFLECTIVE VINYL NUMBERS, FONT IS "ROMANTIC" WITH ADHESIVE BACK, LASER CUT

NOTES:

- a. STONE BASE OPTION IS ADD ALTERNATE
- b. SHOP DRAWINGS REQUIRED FOR SIGN PANEL, LETTERS, ARROWS
- c. ALL SIGNS TO HAVE 5 BLADES. FOR COSTING PURPOSES ASSUME ALL SIGNS TO HAVE 10 LETTERS EACH WITH 2 CAPITAL LETTERS.
- d. CITY ENGINEER TO LOCATE EXTENTS OF FOUNDATION IN THE FIELD



.080 Aluminum 6500 - 54" x 7'-7 7/8" blades

2 DIRECTIONAL SIGN 2

SCALE: 1" = 1'-0"

1 DIRECTIONAL SIGN 1

SCALE: 1" = 1'-0"



DATE: 09-20-18
REVISIONS:
1. UPDATE
2. DATE: 09-20-18

WOODINVILLE SIGNAGE

KEY PLAN:

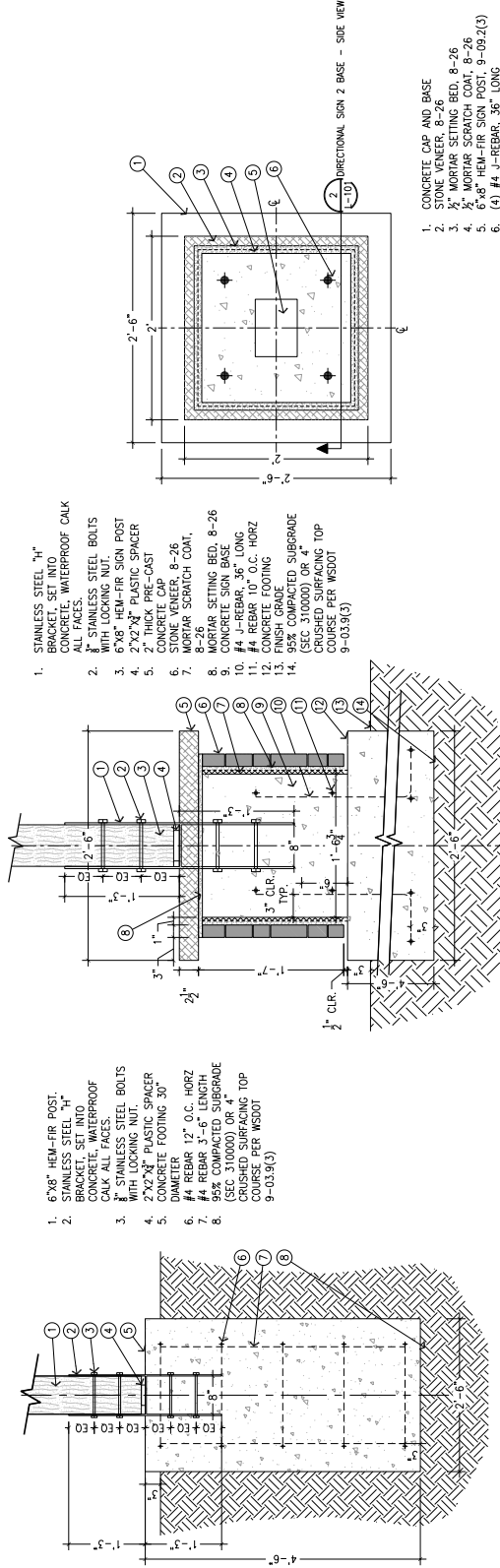
City of Woodinville

DRAWN BY: DS
CHECKED BY: JKC

DIRECTIONAL SIGN DETAILS

L-101

SIGN UPDATE



1 DIRECTIONAL SIGN 1 FOOTING - SIDE VIEW
SCALE: 1" = 1'-0"

2 DIRECTIONAL SIGN 2 BASE - SIDE VIEW
SCALE: 1 1/2" = 1'-0"

3 DIRECTIONAL SIGN 2 PLAN VIEW
SCALE: 1 1/2" = 1'-0"

WOODINVILLE SIGNAGE

KEY PLAN:

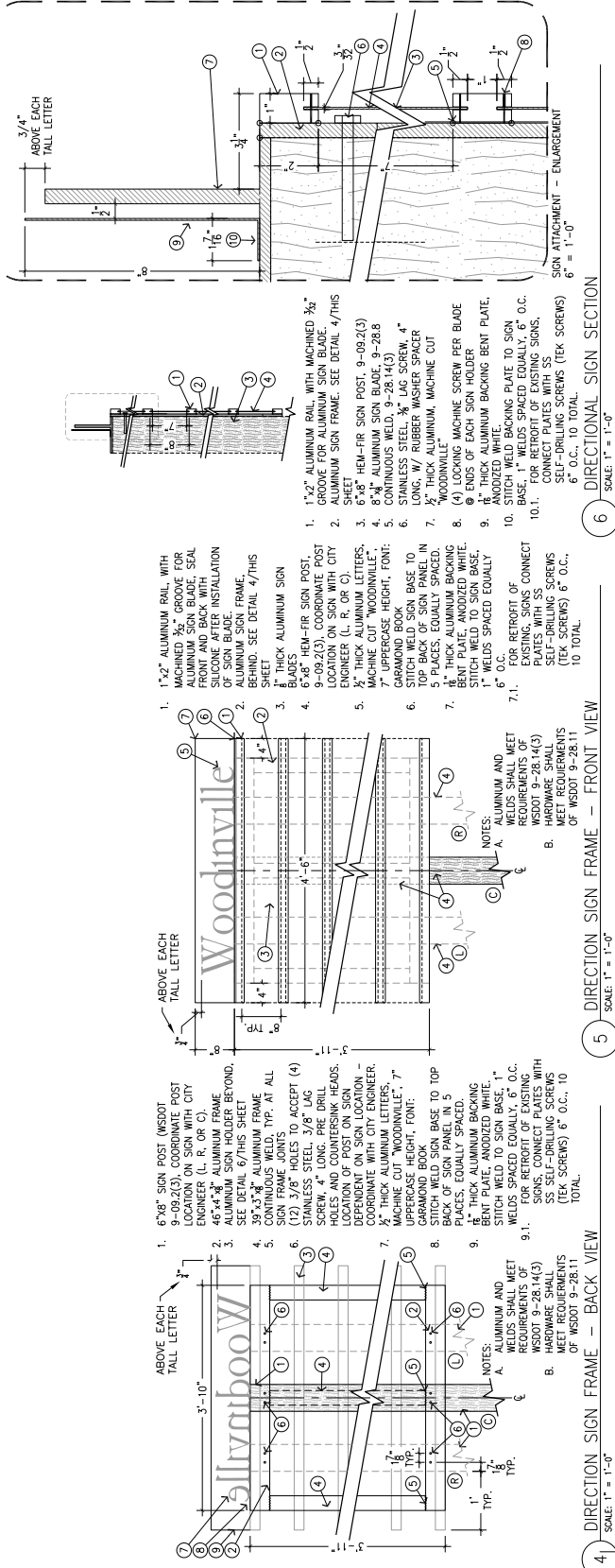
City of Woodinville

DRAWN BY: DS
CHECKED BY: JKC

DIRECTIONAL SIGN DETAILS

L-101

SIGN UPDATE



4 DIRECTION SIGN FRAME - BACK VIEW
SCALE: 1" = 1'-0"

5 DIRECTION SIGN FRAME - FRONT VIEW
SCALE: 1" = 1'-0"

6 DIRECTIONAL SIGN SECTION
SCALE: 1" = 1'-0"

WOODINVILLE SIGNAGE

KEY PLAN:

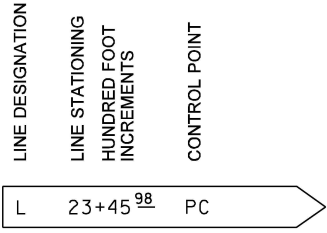
City of Woodinville

DRAWN BY: DS
CHECKED BY: JKC

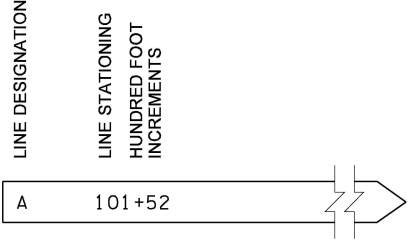
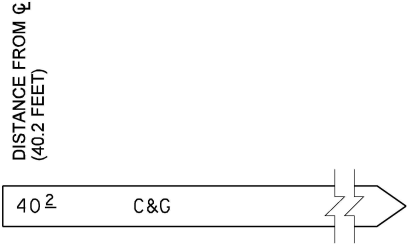
DIRECTIONAL SIGN DETAILS

L-101

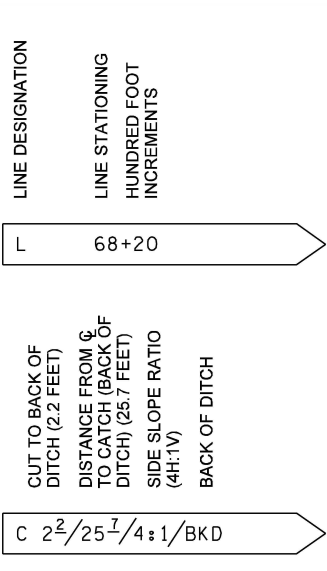
SIGN UPDATE



ALIGNMENT STAKE
STAKE EVERY 100 FEET ON TANGENTS,
EVERY 25 FEET ON CURVES



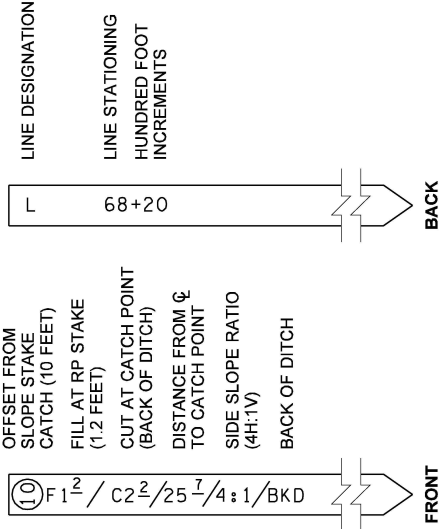
CLEARING/GRUBBING (C&G) LATH
STAKE AT EACH FULL STATION,
100 FEET ON TANGENTS,
EVERY 25 FEET ON CURVES.
NO HUB NECESSARY.



SLOPE STAKE

BACK

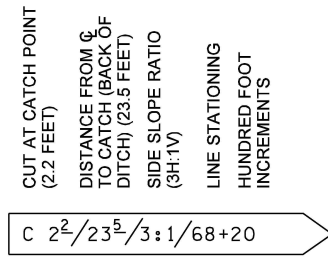
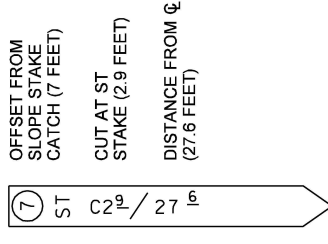
FRONT



LATH FOR SLOPE REFERENCES

FRONT

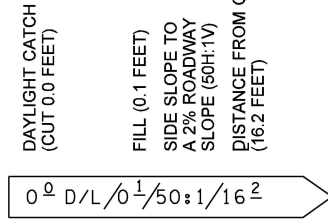
BACK



**SLOPE TREATMENT (ST) STAKE
FOR CUT SECTIONS**

FRONT

BACK



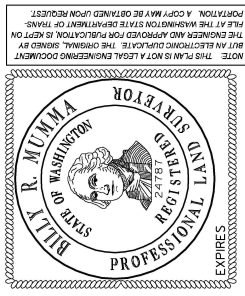
DAYLIGHT CATCH
(CUT 0.0 FEET)

FILL (0.1 FEET)

SIDE SLOPE TO
A 2% ROADWAY
SLOPE (50H:1V)

DISTANCE FROM C
(16.2 FEET)

DAYLIGHT (D/L) STAKE



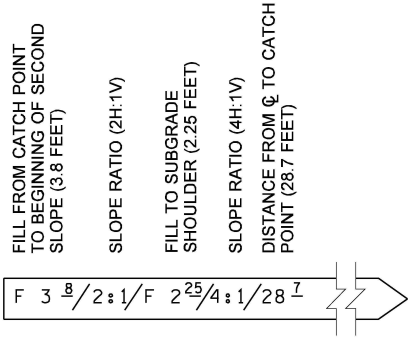
SURVEY STAKES

STANDARD PLAN A-10.10-00

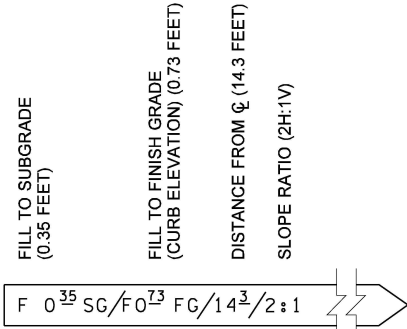
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

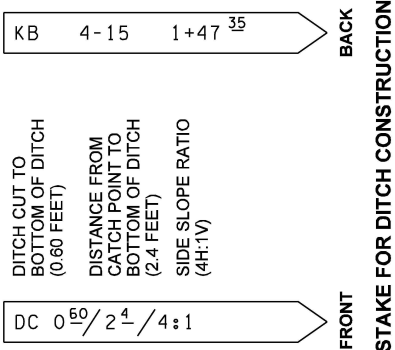
Pasco Bakotich III 08-07-07
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation



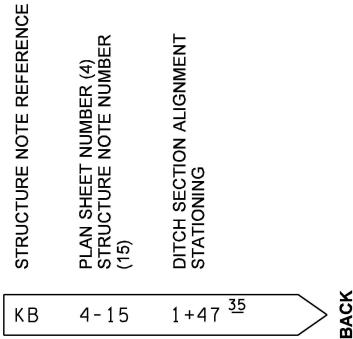
COMPOUND SLOPE LATH



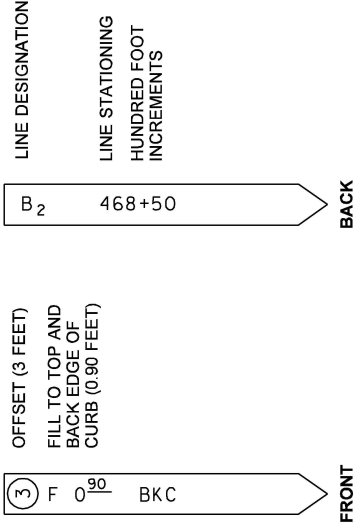
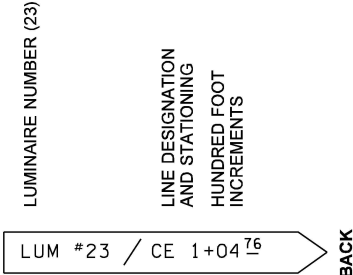
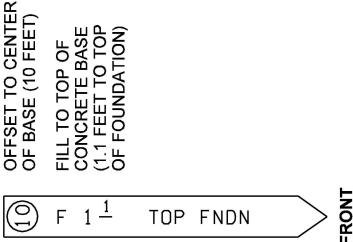
SLOPE LATH FOR CURB SECTION



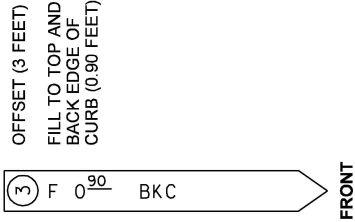
STAKE FOR DITCH CONSTRUCTION



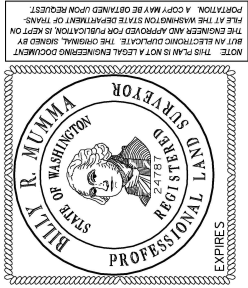
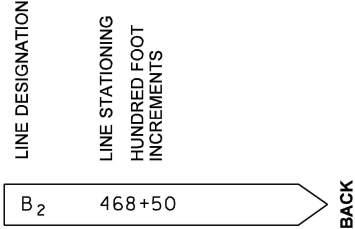
STAKE FOR FOUNDATION OF LUMINAIRES, SIGNALS OR SIGN STRUCTURES



STAKE FOR DRAINAGE



STAKE FOR CURB/GUTTER



SURVEY STAKES

STANDARD PLAN A-10.10-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Pasco Bakotich III 08-07-07

STATE DESIGN ENGINEER

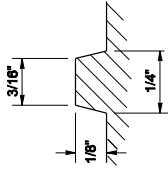
Washington State Department of Transportation



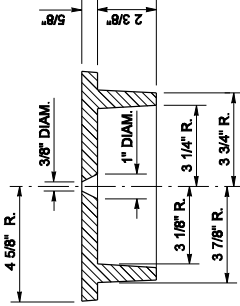
RISER RING DIMENSIONS			
A (SIZE)	1 1/2"	2"	3"

- NOTES**
1. Dimensions may vary according to manufacturer.
 2. Base to be placed on a well compacted foundation.
 3. Monument case to be installed by contractor.
 4. See Standard Plan A-10.20 for Monument (brass disc) type to place in 2" O.D. galvanized pipe.

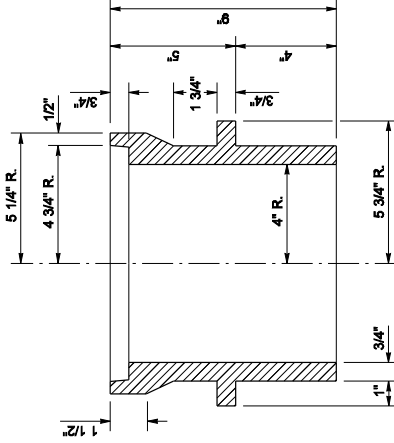
APPROXIMATE WEIGHTS	
CASE	60 LBS
COVER	19 LBS
TOTAL	79 LBS



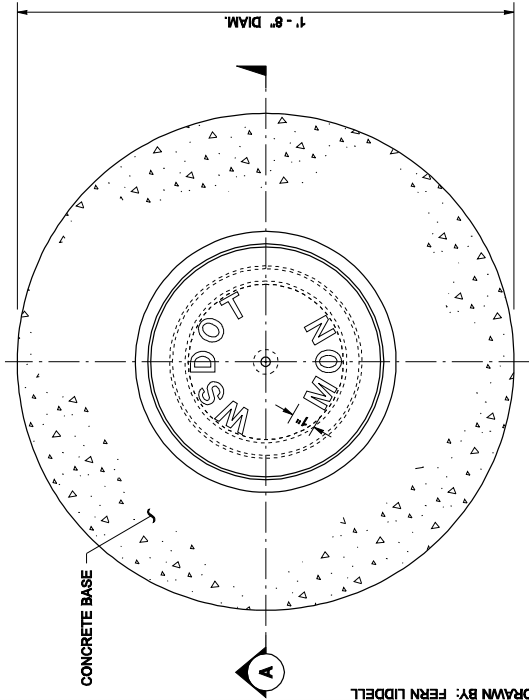
SECTION OF LETTER



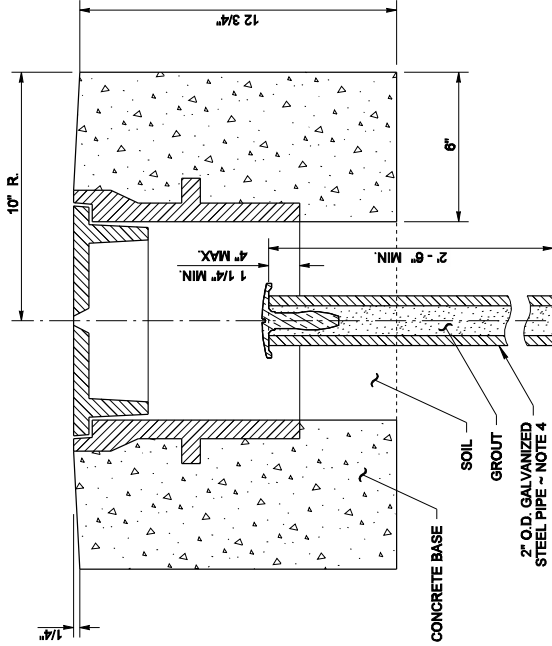
SECTION
COVER



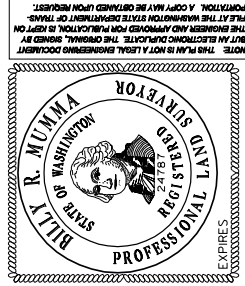
SECTION
CASE



PLAN VIEW



SECTION A
INSTALLATION



**MONUMENT CASE
AND COVER**

STANDARD PLAN A-10.30-00

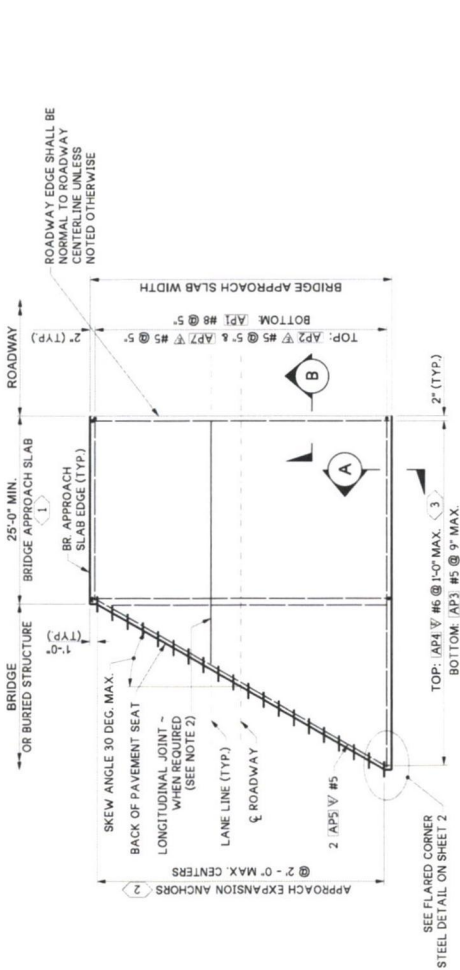
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

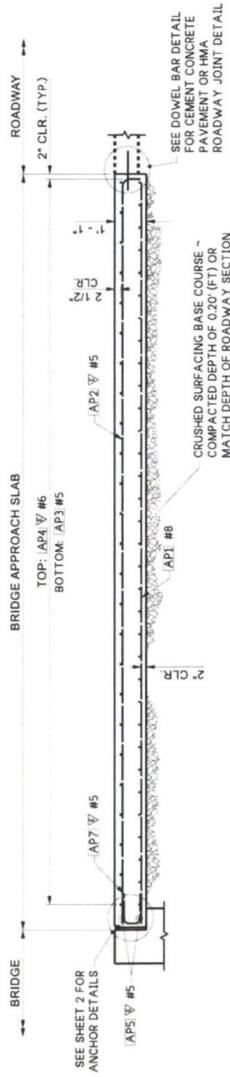
Pasco Bakofich III 10-05-07

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation



PLAN
(FOR STEPPED APPROACH SLAB SEE SHEET 2)

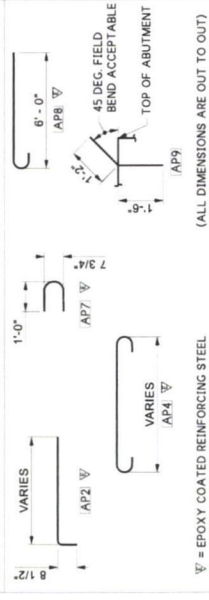


LONGITUDINAL SECTION

KEY NOTES

1. FOR BURIED STRUCTURES AND WITH THE APPROVAL OF THE STATE GEOTECHNICAL ENGINEER, THE LENGTH MAY BE REDUCED TO THE CLEAR SPAN OR 10 FEET, WHICHEVER IS GREATER.
2. EXPANSION ANCHORS FOR SEMI-INTEGRAL TYPE ABUTMENT OR BURIED STRUCTURE SHOWN L-TYPE ABUTMENT PINNED ANCHORS SIMILAR EXCEPT AT 1'-0" MAX. SPACING.
3. APPROACH SLAB EDGES WITH CONCRETE TRAFFIC BARRIER SHALL ALSO HAVE AP8 ∇ #6 PLACED MIDWAY BETWEEN EACH SET OF AP4 REINFORCING BARS.
4. MECHANICAL COUPLERS MEETING THE REQUIREMENTS OF SECTION 6-02.3/2AF MAY BE SUBSTITUTED IN PLACE OF LAP SPICE.

BENDING DIAGRAM

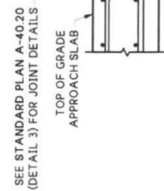


∇ = EPOXY COATED REINFORCING STEEL

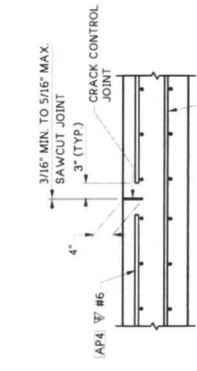
IF AP4 IS SPLICED, HOOKS ARE ONLY REQUIRED AT EDGE OF APPROACH SLAB.

NOTES

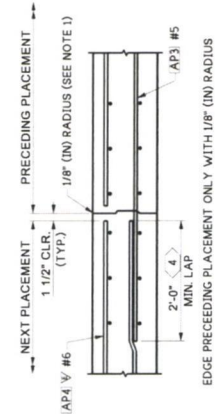
1. All edges of the approach slab shall have 1/2" (in) radii except at longitudinal construction joints and adjacent to L-Type abutments.
2. Longitudinal joints shall be placed on lane lines and shall be constructed and sealed in accordance with Standard Specification Section 5-05.318. Joints shall be sealed with a sealant meeting the requirements of the specification. Sawcut joints shall terminate 1'-0" before reaching edge of slab and must be sawcut as soon as possible after placement of concrete.
3. (A) Approach slabs less than 40' (ft) wide - no joint is required.
(B) Approach slabs wider than 40' (ft) - one or more joints are required to divide the slab into approximately 24' (ft) wide sections.
Optional lap splices are permitted for AP1, AP2, AP3, and AP4 reinforcing bars. The minimum lap splice of #5 is 2'-0", #6 is 2'-6", #7 is 3'-0", and #8 is 3'-3". Alternate lap splice location on adjacent reinforcing bars so that no more than 50% of rebar is spliced at the same location.
4. Concrete for approach slabs shall be class 4000A.



SECTION (B)
AT HMA ROADWAY JOINTS



LONGITUDINAL JOINT
(SEE NOTE 2)



ALTERNATE LONGITUDINAL JOINT DETAIL
(SEE NOTE 2)



Sep 11, 2023

BRIDGE APPROACH SLAB

STANDARD PLAN A-40.50-03

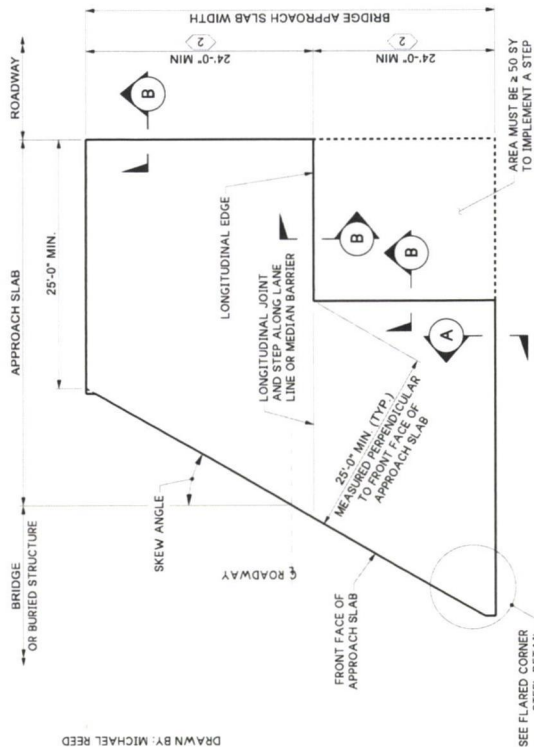
SHEET 1 OF 3 SHEETS

APPROVED FOR PUBLICATION

Sep 12, 2023

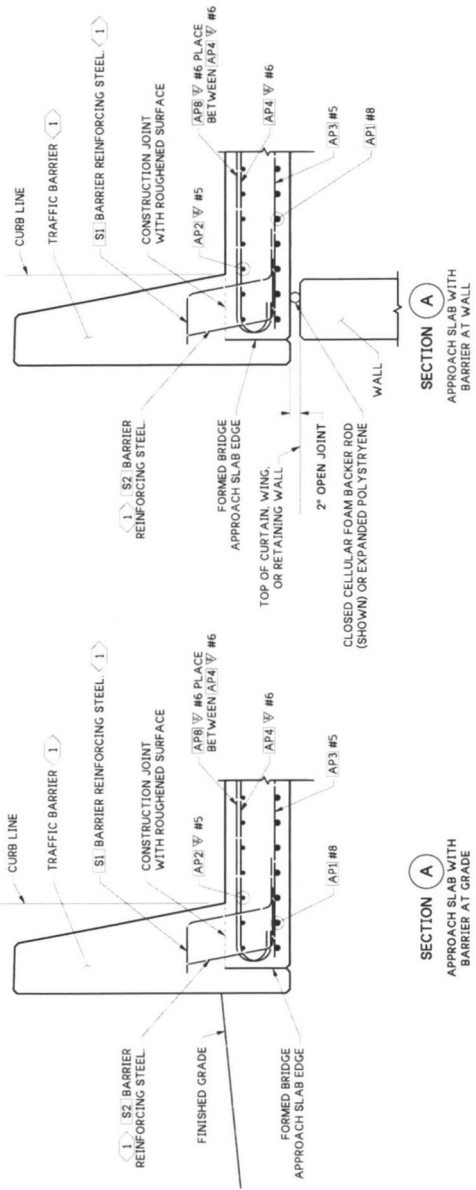
Washington State
Department of Transportation

STATE DESIGN ENGINEER



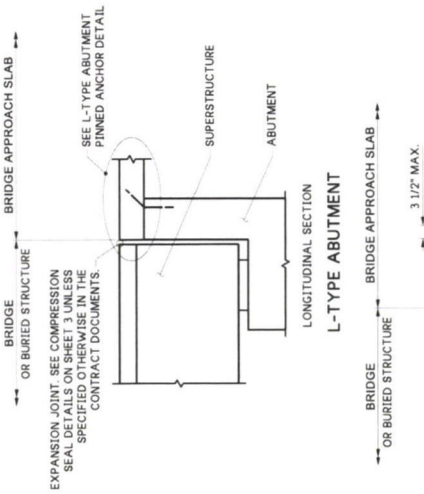
**PLAN
STEPPED APPROACH SLAB**
(FOR REINFORCING REQUIREMENTS AND OTHER INFORMATION
NOT SHOWN SEE PLAN ON SHEET 1)

DRAWN BY: MICHAEL REED

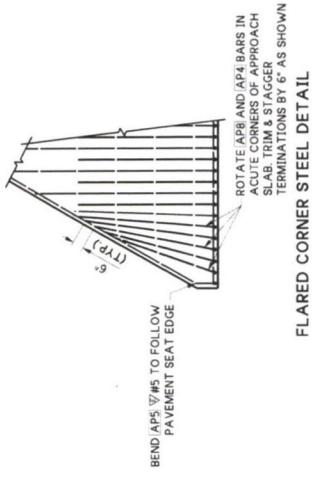


SECTION A-A
APPROACH SLAB WITH
BARRIER AT WALL

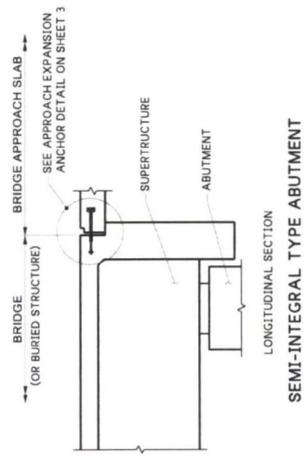
SECTION A-A
APPROACH SLAB WITH
BARRIER AT GRADE



**L-TYPE ABUTMENT PINNED
ANCHOR DETAIL**



FLARED CORNER STEEL DETAIL



NOTE:
1. For approach slab seat and expansion anchor details for buried structures, see Standard Plans E-20.10 and E-20.20.

KEY NOTES

- SEE CONTRACT DOCUMENTS FOR TRAFFIC BARRIER AND CONDUIT BLOCKOUT REQUIREMENTS. 42" SINGLE SLOPE CONCRETE TRAFFIC BARRIER SHOWN. OTHER TEST LEVEL 4 OR LOWER CONCRETE TRAFFIC BARRIERS ARE ACCEPTABLE. FOR 42" SINGLE SLOPE BARRIER (TL-4) ON STRUCTURE DETAILS SEE STANDARD PLAN C-6110.
- DIMENSION MAY BE TWO LANE WIDTHS OR ONE LANE WIDTH PLUS THE SHOULDER WIDTH IF THE SHOULDER ≥ 8'-0".
- SEE CONTRACT PLANS FOR BLOCKOUT DETAILS WHEN EXPANSION JOINTS OTHER THAN COMPRESSION SEALS ARE USED.



Sep 11, 2023

BRIDGE APPROACH SLAB

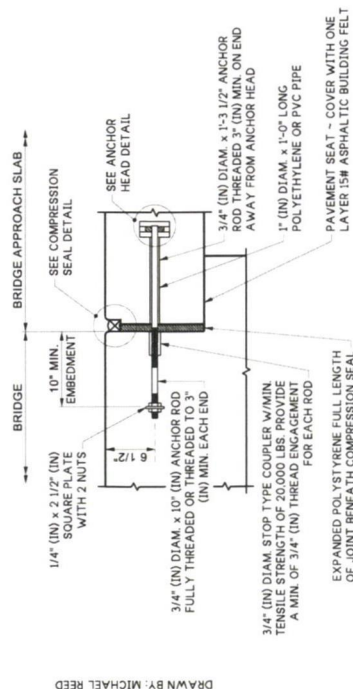
STANDARD PLAN A-40.50-03

SHEET 2 OF 3 SHEETS

APPROVED FOR PUBLICATION

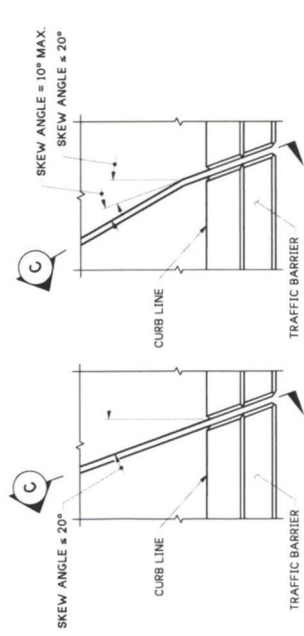
Sep 12, 2023

STATE DESIGN ENGINEER
Washington State
Department of Transportation

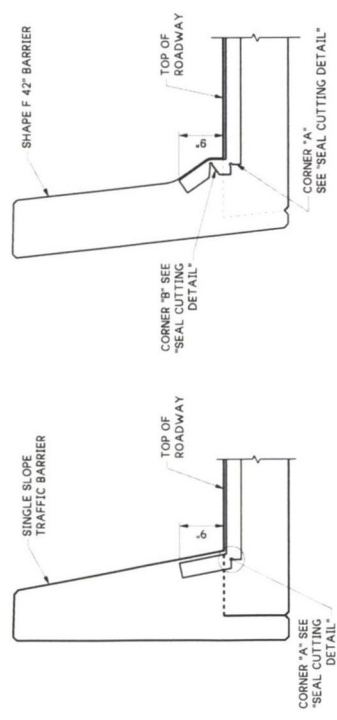


APPROACH EXPANSION ANCHOR - METHOD A

SEMI-INTEGRAL TYPE ONLY
(SIMILAR FOR SPLIT BOX AND 3-SIDED BURIED STRUCTURES.
SEE STD. PLANS D-20.10 AND D-20.20 FOR DETAILS)

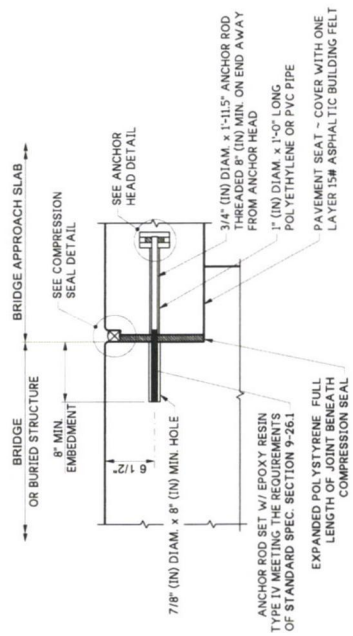


PLAN - EXPANSION JOINT
(FOR SKEW ANGLE > 30 DEGREES A SPECIAL DESIGN IS REQUIRED.)



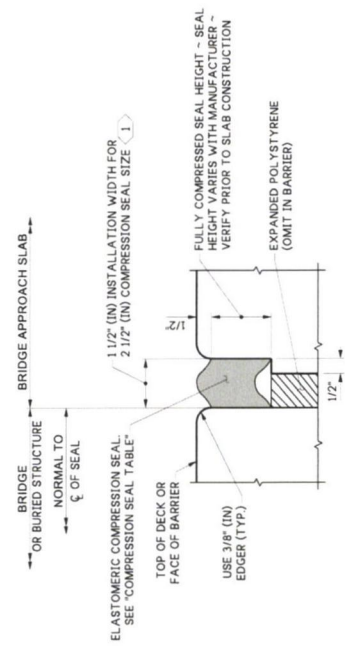
SINGLE SLOPE TRAFFIC BARRIER

SECTION C

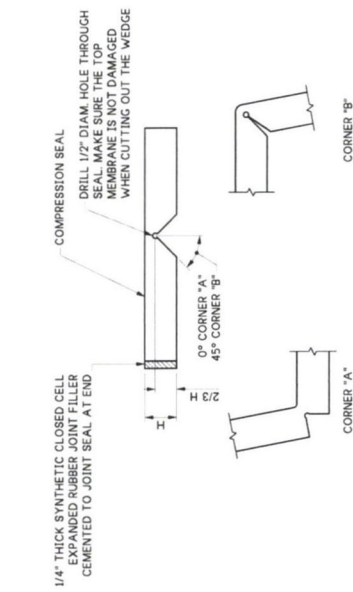


APPROACH EXPANSION ANCHOR - METHOD B

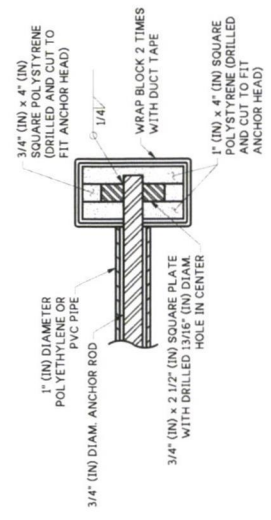
SEMI-INTEGRAL TYPE ONLY
(SIMILAR FOR SPLIT BOX AND 3-SIDED BURIED STRUCTURES.
SEE STD. PLANS D-20.10 AND D-20.20 FOR DETAILS)



COMPRESSION SEAL DETAIL



SEAL CUTTING DETAIL



ANCHOR HEAD DETAIL

NOTE
The metal components of the approach expansion anchor shall either be painted with one coat of zinc primer paint conforming to Standard Specification Section 9-08.12(f) or be galvanized in accordance with AASHTO M 232 or ASTM F3329, as applicable.

COMPRESSION SEAL TABLE			
D.S. BROWN		WATSON BOWMAN ACME	
SEAL	WIDTH (IN)	SEAL	WIDTH (IN)
CV-2502	2 1/2	W-A-250	2 1/2

TESTING SHALL BE PER ASTM D2628 PRIOR TO USE

TESTING SHALL BE PER ASTM D2628 PRIOR TO USE

KEY NOTES

- 1 WHEN AN HMA AND WATERPROOF MEMBRANE IS PLACED OVER BRIDGE/BURRED STRUCTURE AND APPROACH SLAB, REPLACE COMPRESSION SEAL WITH REMOLDED JOINT FILLER AND USE JOINT DETAIL 6 FOR THE HMA ON STANDARD PLAN A-40-20. FOR NEW CONSTRUCTION, JOINT WIDTH MAY BE REDUCED TO 1".



Sep 11, 2023

BRIDGE APPROACH SLAB

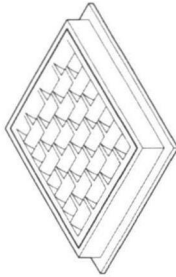
STANDARD PLAN A-40.50-03

SHEET 3 OF 3 SHEETS

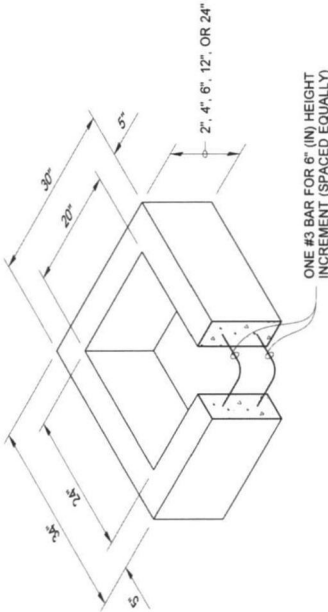
APPROVED FOR PUBLICATION

Sep 12, 2023

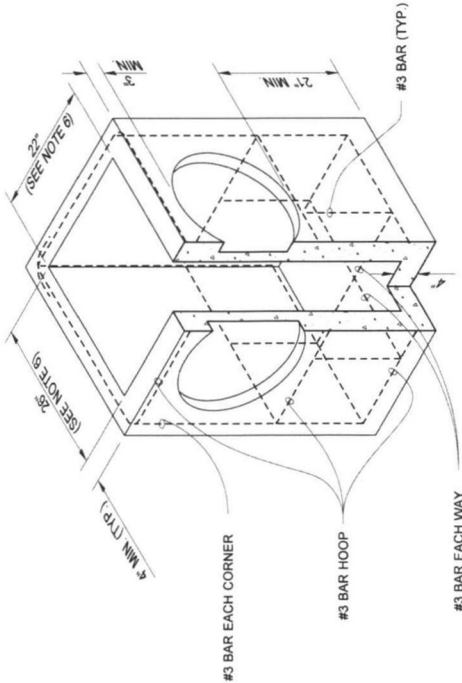




FRAME AND VANED GRATE



RECTANGULAR ADJUSTMENT SECTION



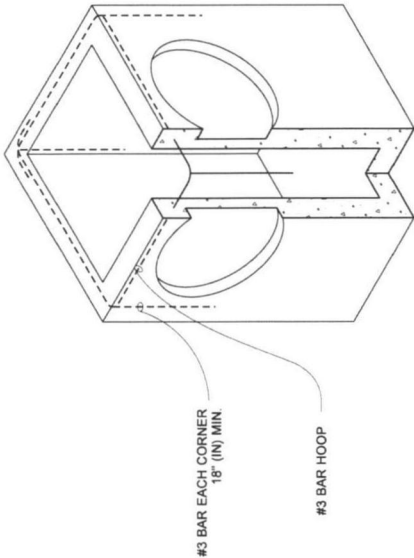
PRECAST BASE SECTION

PIPE ALLOWANCES	
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)
REINFORCED OR PLAIN CONCRETE	12"
ALL METAL PIPE	15"
CPSSP ★ (STD. SPEC. SECT. 9-05.20)	12"
SOLID WALL PVC (STD. SPEC. SECT. 9-05.12(1))	15"
PROFILE WALL PVC (STD. SPEC. SECT. 9-05.12(2))	15"

★ CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

- As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.
- The knockout diameter shall not be greater than 20" (in). Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.
- The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).
- The frame and grate may be installed with the flange down, or integrally cast into the adjustment section with flange up.
- The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.
- The opening shall be measured at the top of the **Precast Base Section**.
- All pickup holes shall be grouted full after the basin has been placed.



(SEE NOTE 1)

ALTERNATIVE PRECAST BASE SECTION



Julie Heilman
2020.09.01 07:52:50 -0700

CATCH BASIN TYPE 1

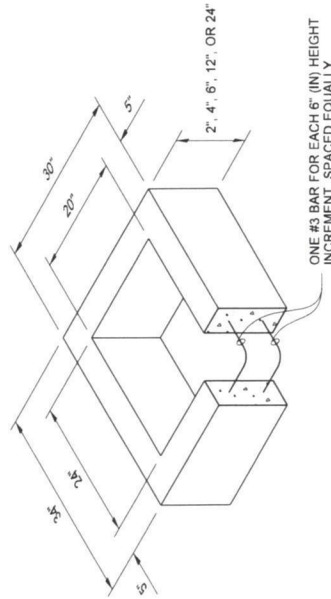
STANDARD PLAN B-5.20-03

SHEET 1 OF 1 SHEET

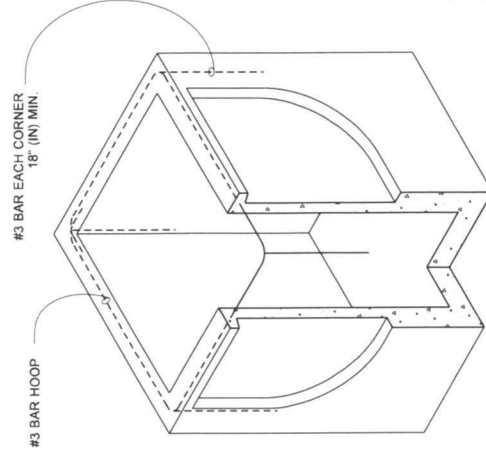
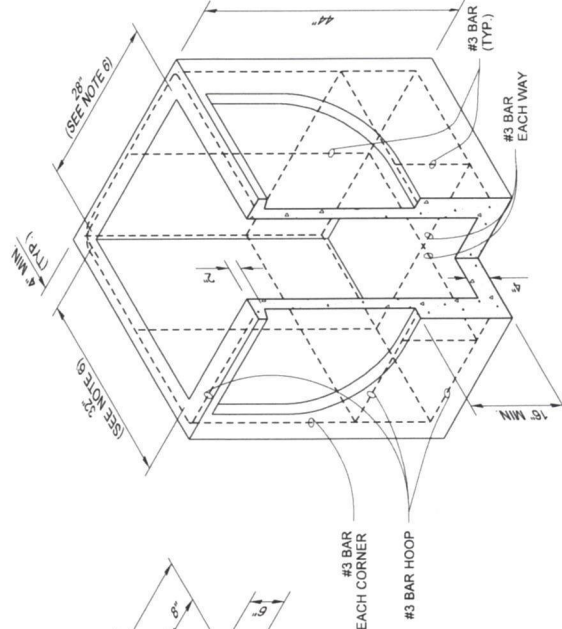
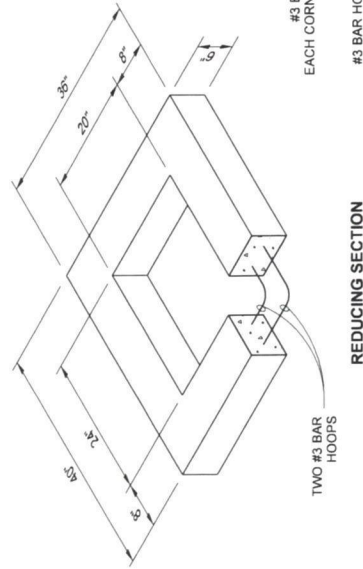
APPROVED FOR PUBLICATION
Digitally signed by Roark, Steve
Date: 2020.09.09 09:45:23 -0700
STATE DESIGN ENGINEER
Washington State Department of Transportation

1. As acceptable alternatives to the rebar shown in the **PRECAST BASE SECTION**, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot, shall be used with the minimum required rebar shown in the **ALTERNATIVE PRECAST BASE SECTION**. Wire mesh shall not be placed in the knockouts.

2. The knockout shall not be greater than 26" (in), in any direction. Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.
3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).
4. The frame and grate may be installed with the flange down or integrally cast into the adjustment section with flange up.
5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.
6. The opening shall be measured at the top of the Precast Base Section.
7. All pickup holes shall be grouted full after the basin has been placed.



RECTANGULAR ADJUSTMENT SECTION



(SEE NOTE 1)

PRECAST BASE SECTION

ALTERNATIVE PRECAST BASE SECTION



Julie Heilman
Heilman, Julie
Jan 25 2017 2:...

CATCH BASIN TYPE 1L

STANDARD PLAN B-5.40-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Carpenter, Jeff
Jan 26 2017 6:49 AM

STATE DESIGN ENGINEER



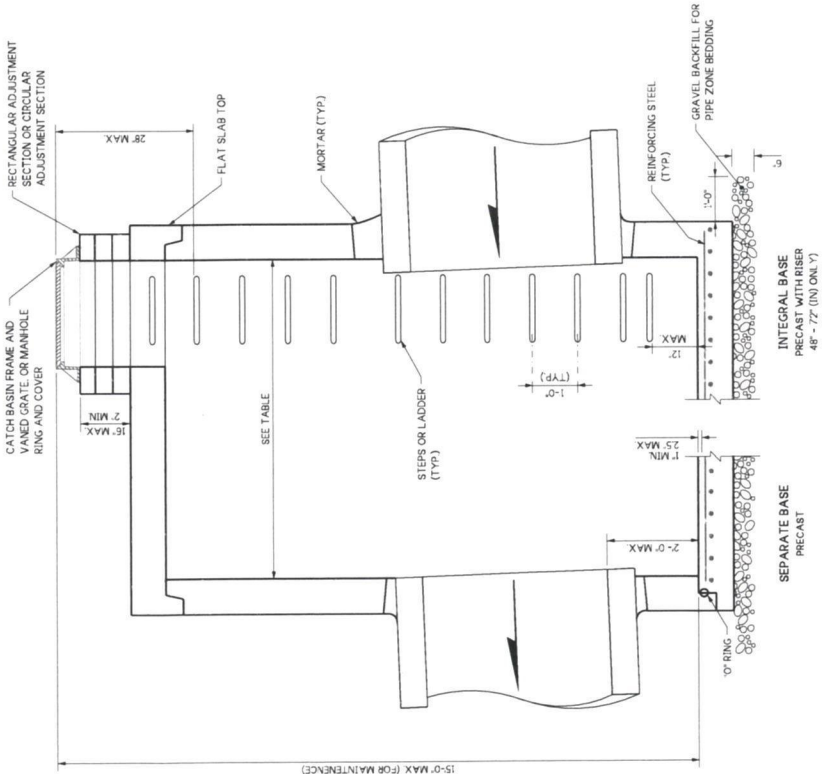
STATE DESIGN ENGINEER
on State Department of Transportation

NOTES:

1. No steps are required when height is 4' or less.
2. The bottom of the precast catch basin may be sloped to facilitate cleaning.
3. The rectangular frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
4. Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.
5. Pipe allowances will vary depending on the pipe material used. Contact the Region Hydraulics Engineer for assistance.

CATCH BASIN DIMENSIONS				
CATCH BASIN DIAMETER	MIN WALL THICKNESS	MIN BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

PIPE ALLOWANCES				
CATCH BASIN DIAMETER	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER		SOLID WALL PROFILE	
	CONCRETE	ALL METAL	PP (1)	PVC (2)
48"	24"	30"	24"	30"
54"	30"	36"	30"	36"
60"	36"	42"	36"	42"
72"	42"	54"	42"	48"
84"	54"	60"	54"	48"
96"	60"	72"	60"	48"
120"	66"	84"	60"	48"
144"	78"	96"	60"	48"



Aug 23, 2023

CATCH BASIN TYPE 2

STANDARD PLAN B-10.20-03

SHEET 1 OF 1 SHEET

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Aug 23, 2023

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- ① Corrugated Polyethylene Storm Sewer Pipe (See Standard Specification Section 9-05.20)
- ② (See Standard Specification Section 9-05.12(1))
- ③ (See Standard Specification Section 9-05.12(1))
- ④ Polypropylene Pipe (See Standard Specification Section 9-05.24)

29 1/4"

BOLT DOWN HOLE (TYP.) -
3/8" DIA. (SEE
DETAIL & NOTE 2)

25 1/4"

3. Refer to **Standard Specification Section 9-05.15** and **9-05.15(2)** for additional requirements.

TOP

DRAWN BY: FERN LIDDELL

Diagram illustrating the adjustment section of a precast frame joint. The diagram shows a cross-section of a joint where a precast frame is cast into a precast adjustment section. The adjustment section is labeled "FRAME CAST INTO PRECAST ADJUSTMENT SECTION. SEE STANDARD PLAN B-30.90 FOR ADJUSTMENT SECTION DETAILS". The flange is labeled "FLANGE UPWARD".

ISOMETRIC VIEW SHOWING THE VARIATIONS



Julie Heilman
Heilman, Julie
Feb 20 2018 12:52 PM
Cengage

**RECTANGULAR FRAME
(REVERSIBLE)**

STANDARD PLAN B-30.10-03

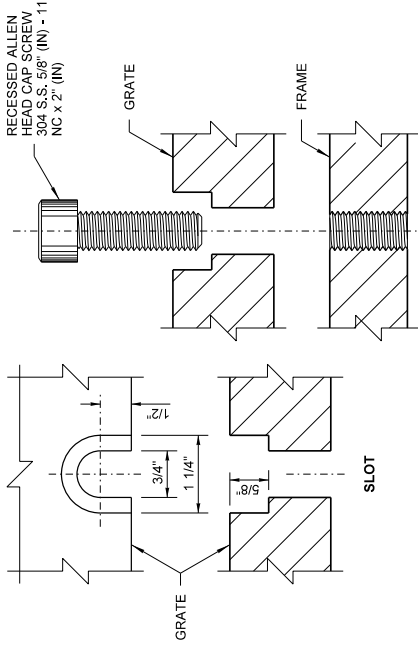
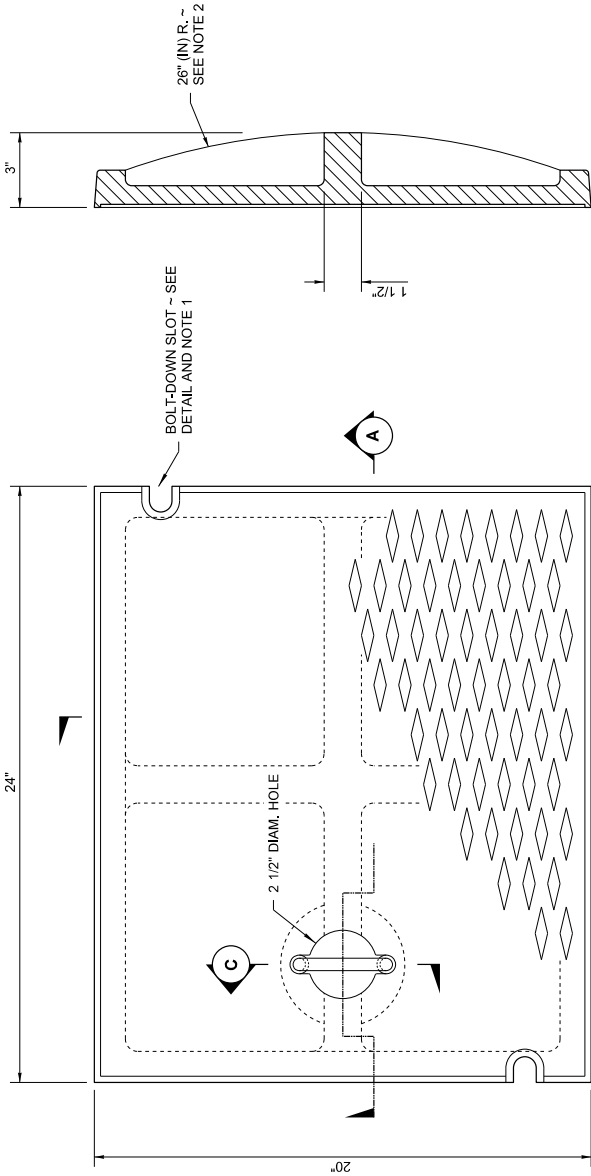
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Carpenter, Jeff
Feb 27 2018 7:55 AM

 **Washington State Department of Transportation**
STATE DESIGN ENGINEER

NOTES

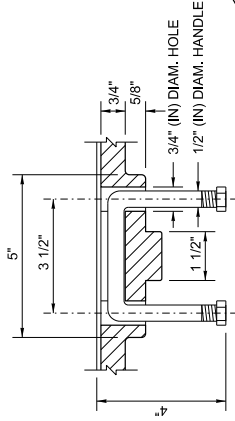
1. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC x 2" (in) allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
2. Alternative reinforcing designs are acceptable in lieu of the rib design.
3. Refer to **Standard Specification Section 9-05.15** and **9-05.15(2)** for additional requirements.
4. For frame details, see **Standard Plan B-30.10**.



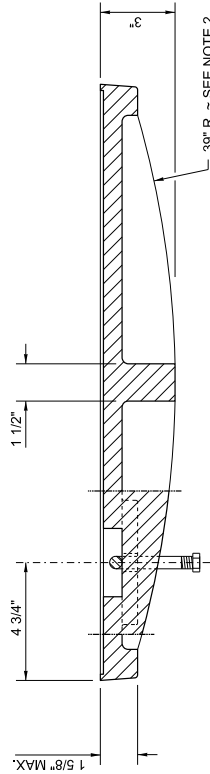
BOLT-DOWN DETAILS
SEE NOTE 1

SECTION B

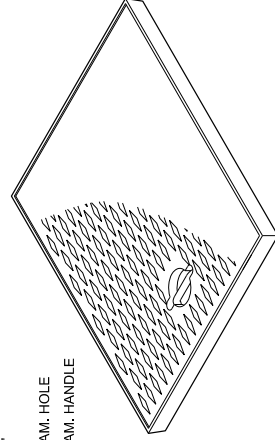
TOP



SECTION C



SECTION A



ISOMETRIC



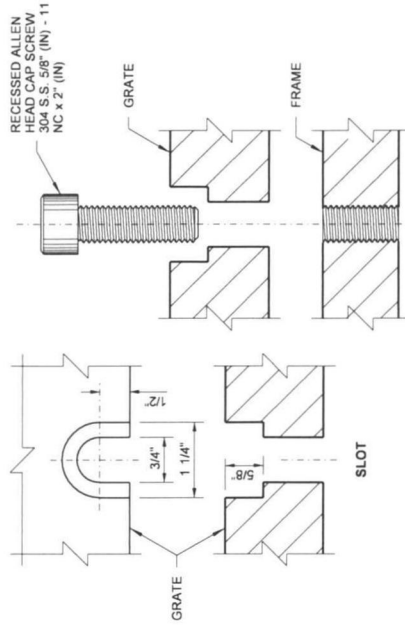
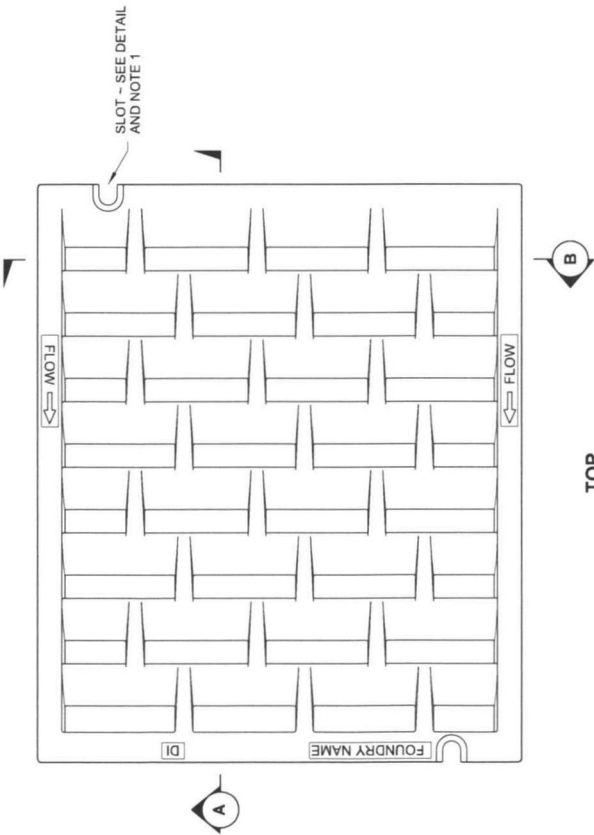
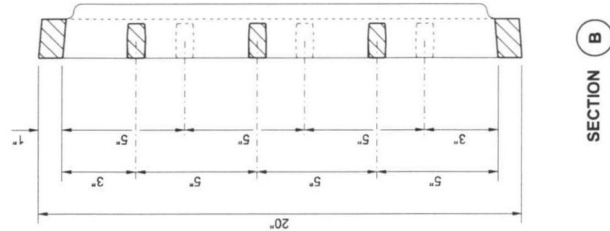
**RECTANGULAR SOLID
METAL COVER**
STANDARD PLAN B-30.20-04
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

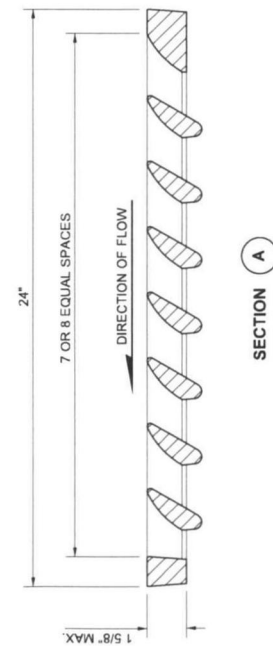
STATE DESIGN ENGINEER
Washington State Department of Transportation

NOTES

1. Bolt-down capability is required on all frames, grates, and covers, unless specified otherwise in the Contract. Provide 2 holes in the frame that are vertically aligned with the grate or cover slots. The frame shall accept the 304 Stainless Steel (S.S.) 5/8" (in) - 11 NC x 2" (in) allen head cap screw by being tapped, or other approved mechanism. Location of bolt-down holes varies by manufacturer.
2. Refer to **Standard Specification Section 9-05.15** and **9-05.15(2)** for additional requirements.
3. For frame details, see **Standard Plan B-30.10**.



BOLT-DOWN DETAILS
SEE NOTE 1



Heilman, Julie
Feb 20 2018 12:54 PM
COOGE

RECTANGULAR VANED GRATE

STANDARD PLAN B-30.30-03

SHEET 1 OF 1 SHEET

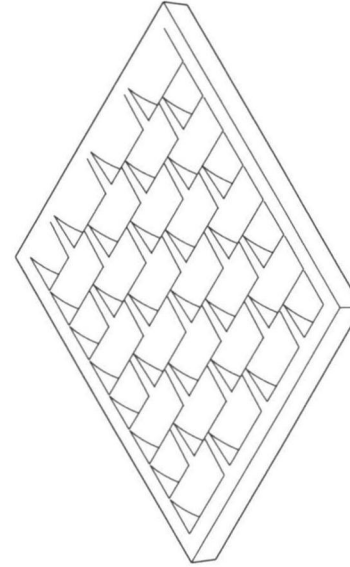
APPROVED FOR PUBLICATION

Engineer Jeff
Feb 27 2018 7:58 AM

STATE DESIGN ENGINEER

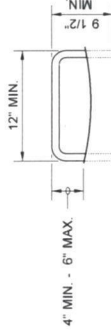
Washington State Department of Transportation

ISOMETRIC

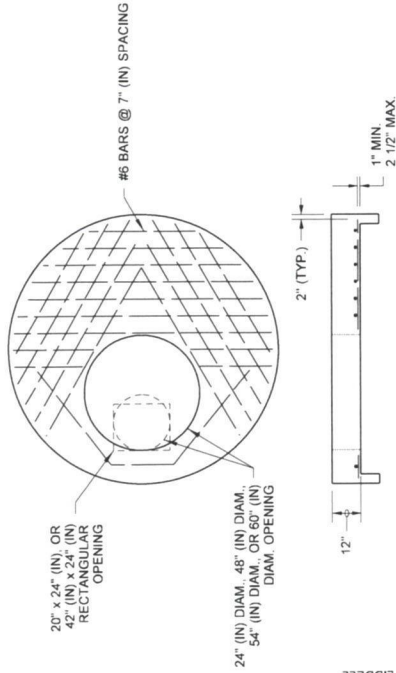


NOTE

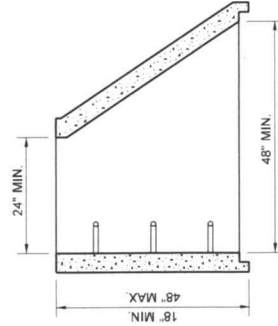
- Ladder rungs for manholes and catch basins shall meet the requirements of AASHTO M 199.



STEP

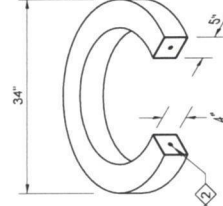


TYPICAL ORIENTATION
FOR ACCESS AND STEPS



RECTANGULAR ADJUSTMENT SECTION

- As an acceptable alternative to rebar, wire mesh having a minimum area of 0.12 square inches per foot may be used for adjustment sections.
- As an acceptable alternative to conventional steel reinforcement, manufacturers shall use Synthetic Structural Fibers meeting the requirements of Standard Specification Section 9.05.50(10).

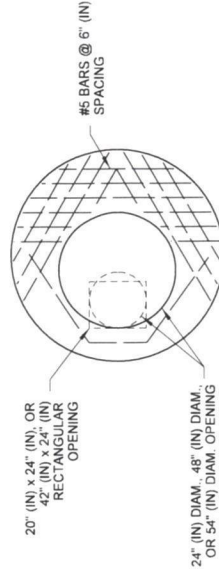


CIRCULAR ADJUSTMENT SECTION

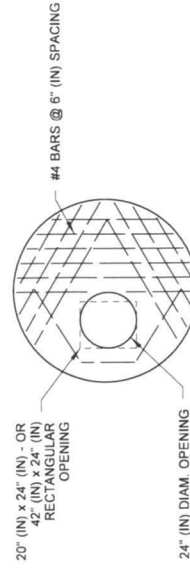
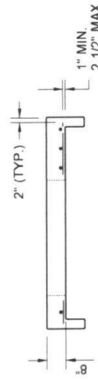
For rectangular and circular adjustment sections, approved alternate material compositions are acceptable in lieu of precast concrete designs

DRAWN BY: FERN LIDDELL

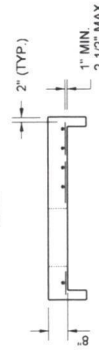
84" (IN) or 96" (IN) FLAT SLAB TOP



72" (IN) FLAT SLAB TOP



48" (IN), 54" (IN), or 60" (IN) FLAT SLAB TOP



Julie Helman
Professional Engineer
No. 18153
Exp. 12/31/2021

MISCELLANEOUS DETAILS FOR DRAINAGE STRUCTURES STANDARD PLAN B-30.90-02

SHEET 1 OF 1 SHEET



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-

TYPICAL CONDITION FOR DRAINAGE STRUCTURE

PIPE ARCHES



PIPE ZONE BEDDING AND BACKFILL

APPROVED FOR PUBLICATION

STATE DESIGN ENGINEER

Washington State Department of Transportation
STATE DESIGN ENGINEER

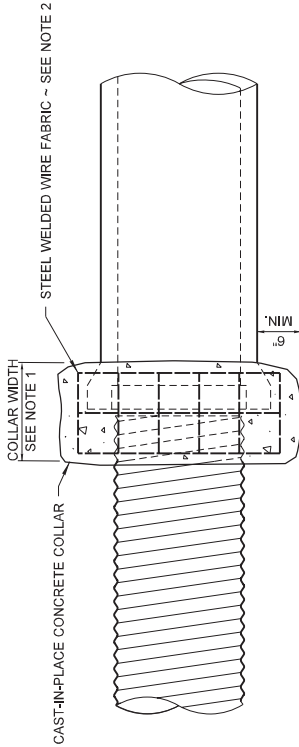
**METAL AND STEEL RIB
REINFORCED POLYETHYLENE PIPE**

NOTES

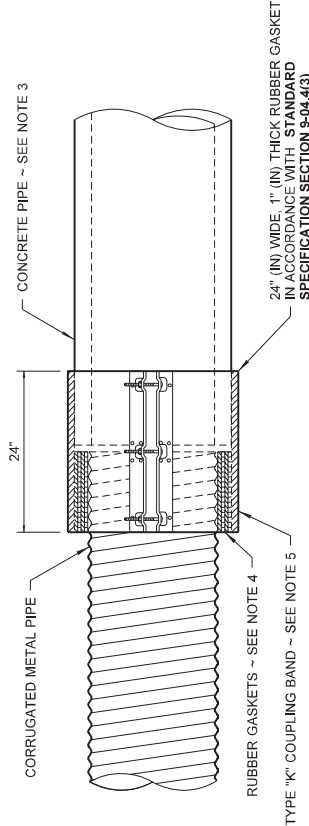
- The Concrete Collar width shall be one half of the outside pipe diameter of the largest pipe. The minimum Concrete Collar width shall be 12" (in). Concrete Collars may be used with all pipe materials and diameters. The Concrete Collar option shall only be used to extend existing pipes. Concrete shall be Commercial Concrete in accordance with **Standard Specification Section 6-02.3(2)**.
- Steel Welded Wire Fabric shall be in accordance with **Standard Specification Section 9-07.7**. Install two wraps for size 6 x 6 W1.4 x W1.4 (10 Gage) Steel Welded Wire Fabric or one wrap for any of the following sizes:

6 x 6 W2.1 x W2.1 (8 Gage)
 6 x 6 W2.9 x W2.9 (6 Gage)
 4 x 4 W2.9 x W2.9 (6 Gage)
 4 x 4 W4.0 x W4.0 (4 Gage)

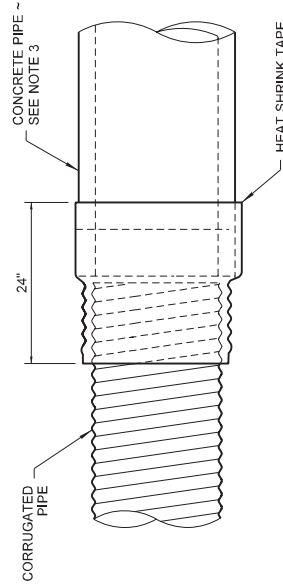
 Provide 1 1/2" min. covering over wire fabric.
- When a Coupling Band connection requires attachment to the bell end of a concrete pipe, the bell end of the pipe shall be removed before the connection is installed.
- Increase the outside diameter of the metal pipe to match the outside diameter of the concrete pipe by installing 12" (in) wide rubber gaskets, thickness as required (Coupling Band only). The rubber gaskets shall be in accordance with **Standard Specification Section 9-04.4(3)**.
- Use a flat Type K Coupling Band. Type K Coupling Bands with dimples are not allowed for the installation detail shown. The Coupling Band option shall only be used for extending existing pipes that have an inside diameter of 36" (in) or less.
- Heat shrink shall have a width of 24" (in). The material shall be wrapped around the outside of the pipe with a 2" (in) minimum overlap. There shall also be a 4" (in) minimum closure patch of material centered along the entire length of the seam.



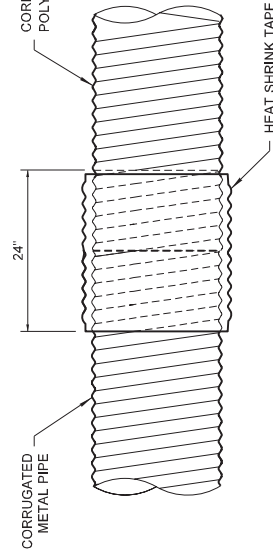
CONCRETE COLLAR OPTION



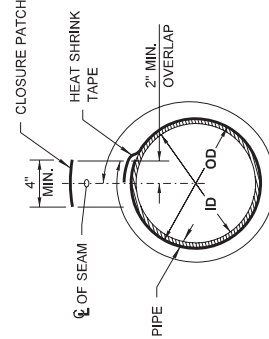
COUPLING BAND OPTION



HEAT SHRINK OPTION CORRUGATED PIPE TO CONCRETE PIPE



HEAT SHRINK OPTION CORRUGATED METAL PIPE TO CORRUGATED POLYETHYLENE PIPE



SECTION DETAIL



Julie Heilman
2020.09.01 07:54:03 -4700'

CONNECTION DETAILS FOR DISSIMILAR CULVERT PIPE STANDARD PLAN B-60.20-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Roark, Steve

Digitally signed by Roark, Steve
Date: 2020.09.09 09:52:35 -4700'

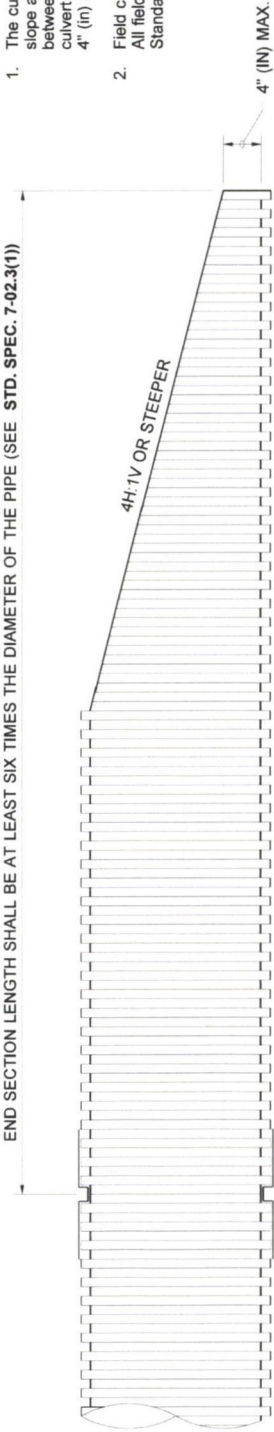
STATE DESIGN ENGINEER

Washington State Department of Transportation

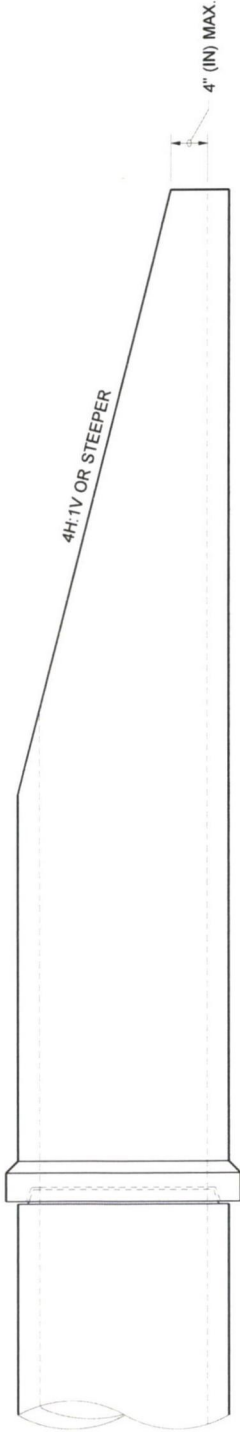


NOTES

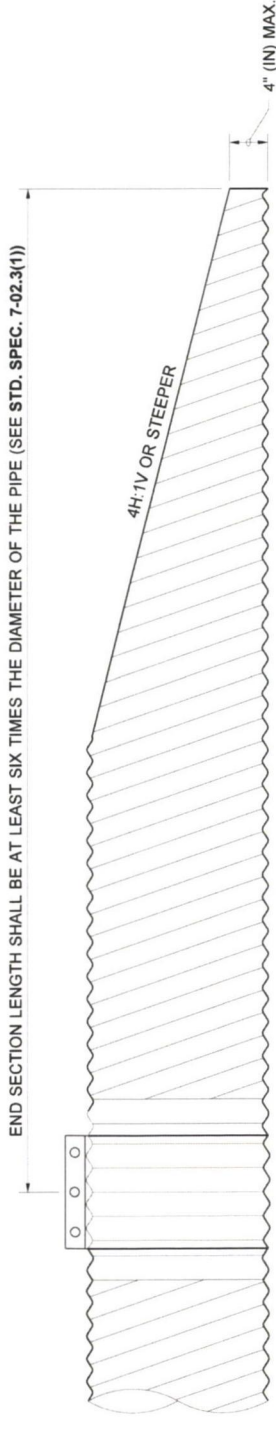
1. The culvert ends shall be mitered to match the embankment or ditch slope and shall not be mitered flatter than 4H : 1V. When slopes are between 4H : 1V and 6H : 1V, shape the slope in the vicinity of the culvert end to ensure that no part of the culvert protrudes more than 4" (in) above the ground line.
2. Field cutting of culvert ends is permitted when approved by the Engineer. All field-cut culvert pipe shall be treated with treatment as shown in the Standard Specifications or General Special Provisions.



THERMOPLASTIC PIPE



CONCRETE PIPE



METAL PIPE

FOR CULVERTS 30" (IN)
DIAMETER OR LESS



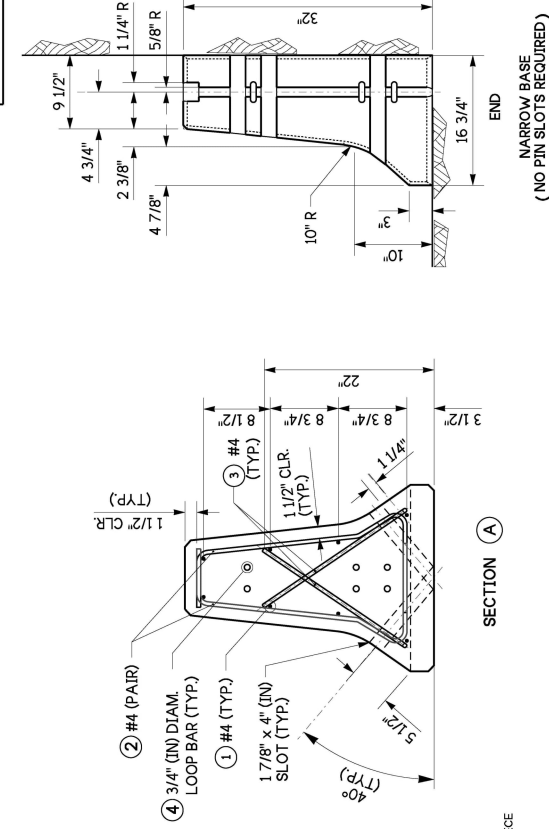
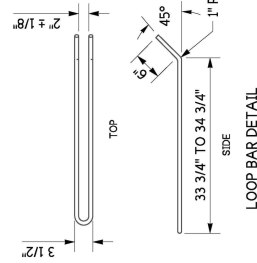
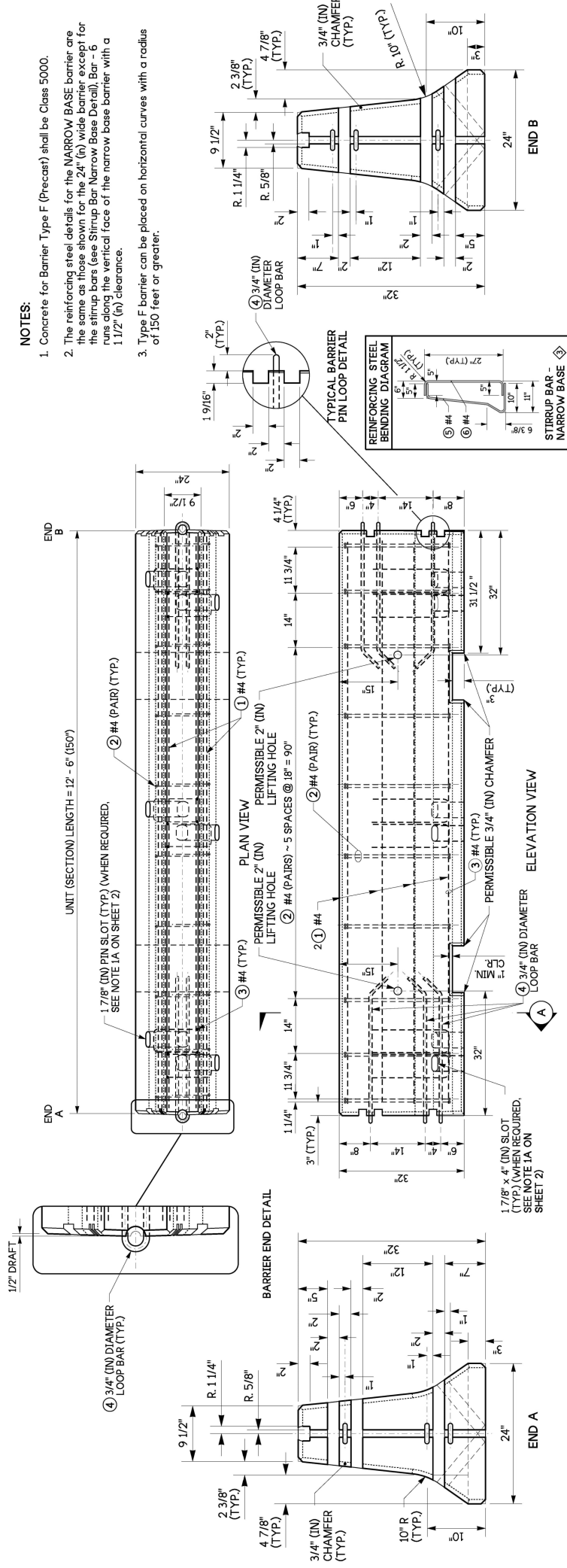
Mar 14, 2022

MITERED END SECTIONS

STANDARD PLAN B-70.20-01

SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION
Mark Gathert
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
STATE DESIGN ENGINEER
Mar 15, 2022
Washington State Department of Transportation

1. Concrete for Barrier Type F (Precast) shall be Class 5000.
2. The reinforcing steel details for the NARROW BASE barrier are the same as those shown for the 24" (in) wide barrier except for the stirrup bars (see Stirrup Bar Narrow Base Detail). Bar - 6 runs along the vertical face of the narrow base barrier with a 1 1/2" (in) clearance.
3. Type F barrier can be placed on horizontal curves with a radius of 150 feet or greater.

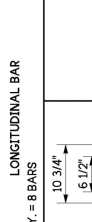


CONCRETE BARRIER
TYPE F (PRECAST)



Washington State
Department of Transportation

**NARROW BASE
(NO PIN SLOTS REQUIRED)**

REINFORCING STEEL BENDING DIAGRAM	 12' - 0" = 144" ① #4	LONGITUDINAL BAR QTY. = 8 BARS	 27" 10 3/4" 6 1/2" 6" 1 1/2" R (TYP) 13 1/2" 14 7/8" 3/8" ② #4 (PAIR)	STIRRUP BAR QTY. = 20 BARS
			 22" 1 1/2" R (TYP) 6 3/8" ③ #4	PIN SLOT BAR QTY. = 6 BARS

NOTES: (Anchoring and Joining Barrier)

1. Precast Concrete Barrier Type F can be installed in the following configurations:

A. Unanchored on hot mix asphalt (HMA) or cement concrete pavement in permanent or temporary installations, and on compacted soil in temporary installations. It is permissible to manufacture the Type F Barrier without pin slots and pin slot bars when barrier is not anchored.

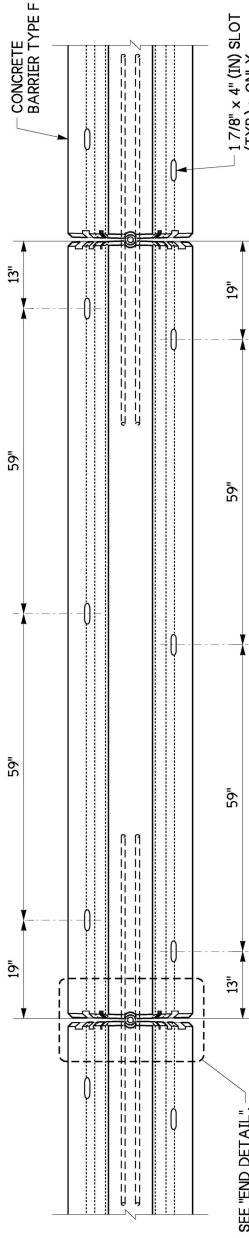
B. Anchored on hot mix asphalt (HMA) or cement concrete pavement in permanent or temporary installations as shown on this plan. See Standard Plans K-80.35 and K-80.37 for anchoring Type F Narrow Base in temporary installations on cement concrete pavement or bridge decks.

2. See Standard Plan C-60.70 for anchoring patterns when transitioning from Type F anchored runs to another type of barrier run.

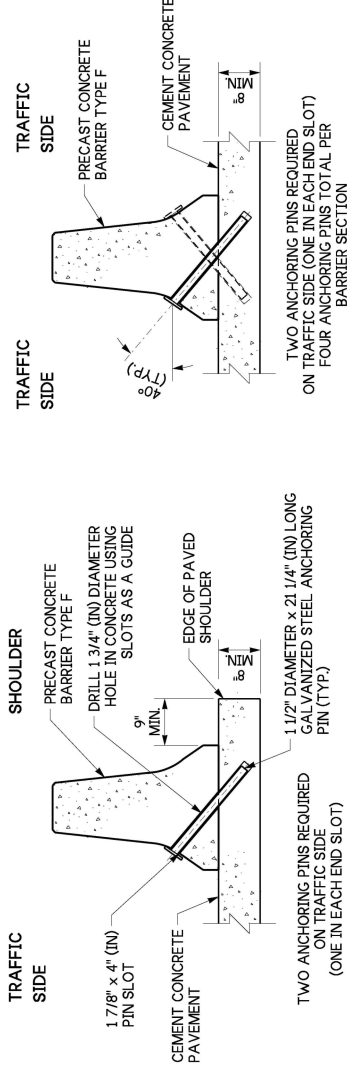
3. After removing the anchoring pins, clean the pin holes and fill them with sealant according to Std. Specification Section 9-04.2.

4. Remove slack between barrier segments after inserting the connecting pin.

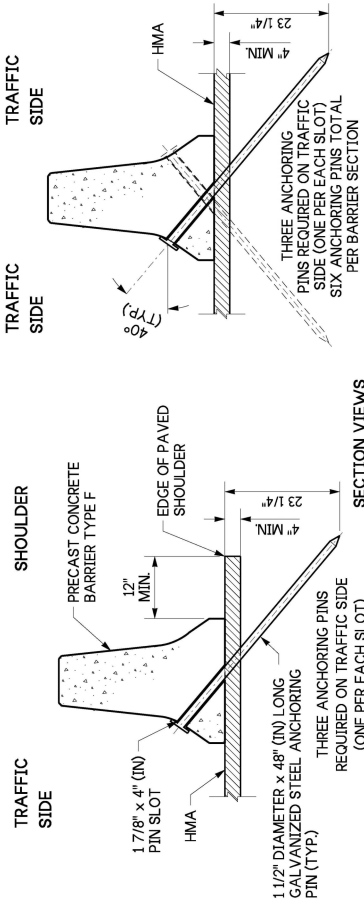
5. Connecting Pin head designs vary among different Mfrs. Pin designs that are shaped differently than those shown in the details are acceptable if the bearing surface is within the minimum and maximum widths specified.



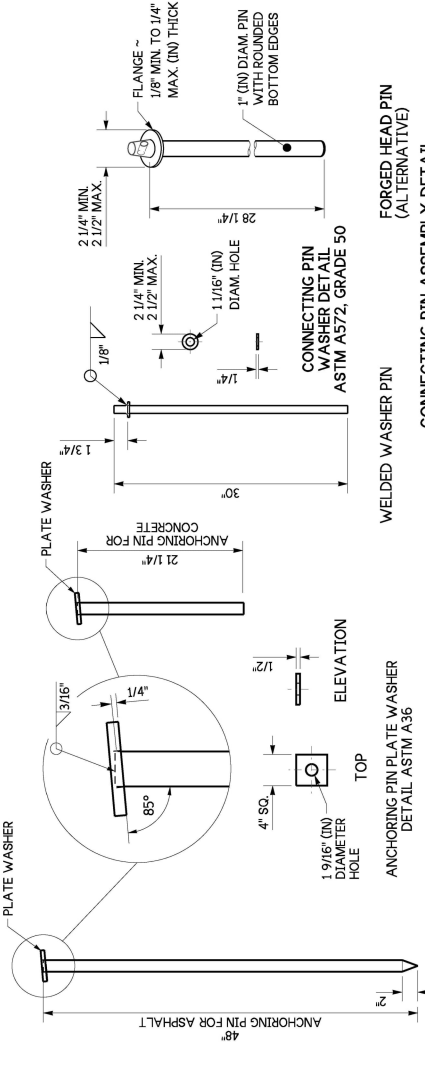
PLAN VIEW
CONCRETE BARRIER TYPE F - ANCHORING PIN LOCATIONS



SECTION VIEWS
CONCRETE ANCHORING PIN LOCATIONS



SECTION VIEWS
HMA ANCHORING PIN LOCATIONS



ANCHORING PIN ASSEMBLY DETAIL
1 1/2" (IN) DIAMETER PER ASTM A36, HOT ROLL,
HOT DIP GALVANIZE AFTER FABRICATION
PER ASTM F2329

CONNECTING PIN ASSEMBLY DETAIL
(SEE NOTE 5)
1" (IN) DIAMETER PER ASTM A449
HOT DIP GALVANIZE AFTER FABRICATION
PER ASTM F2329



Jul 18, 2024

CONCRETE BARRIER
TYPE F (PRECAST)

STANDARD PLAN C-60.10-04

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Jul 21, 2024

STATE DESIGN ENGINEER

Washington State
Department of Transportation

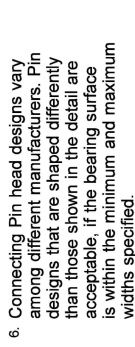
SECTION B

(SEE NOTE 4)

END DETAIL

JOINING TWO BARRIER SEGMENTS

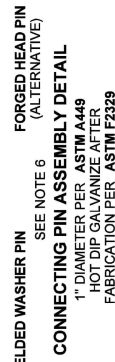
1. Concrete shall be Class 5000.
2. Remove slack between barrier segments after inserting connecting pin.
3. Precast Concrete Barrier Type F with Scupper can be installed in the following configurations:
 - A) Unanchored on hot mix asphalt (HMA), or cement concrete pavement in permanent or temporary installations, and on compacted soil in temporary installations. It is permissible to manufacture the Type F scupper barrier without pin slots and pin slot bars when barrier is not anchored.
 - B) Anchored on hot mix asphalt (HMA) or cement concrete pavement in permanent or temporary installations as shown on **Std. Plan C-60.10**. See **Std. Plan C-60.10** for anchoring pin details.



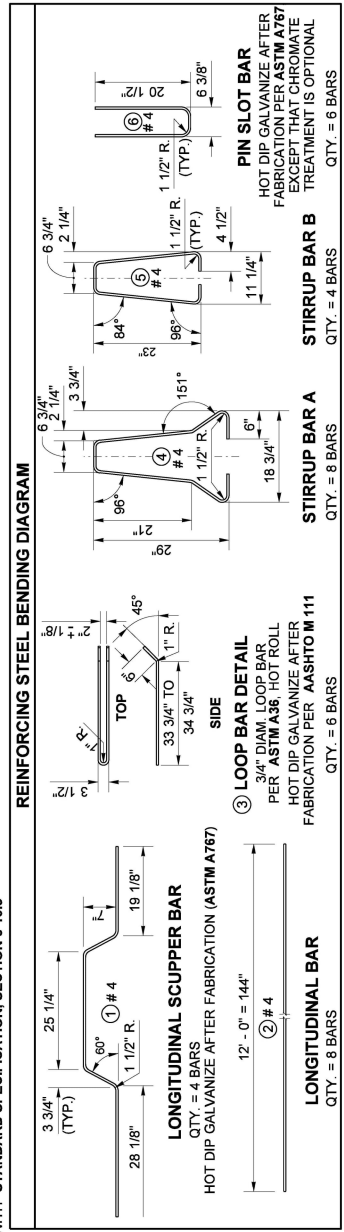
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Mark A. Davis
Jul 21, 2024

STATE DESIGN ENGINEER
 Washington State Department of Transportation



NOTE: STEEL WELDED WIRE REINFORCEMENT DEFORMED FOR CONCRETE MAY BE SUBSTITUTED FOR REINFORCING STEEL IN ACCORDANCE WITH STANDARD SPECIFICATION, SECTION 6-10.3



QTY. = 4 BARS
HOT DIP GALVANIZE AFTER FABRICATION (ASTM A767)

③ LOOP BAR DETAIL

3/4" DIAM. LOOP BAR
PER ASTM A36 HOT ROLL

HOT DIP GALVANIZE AFTER

QTY. = 6 BARS

QTY. = 4 BARS

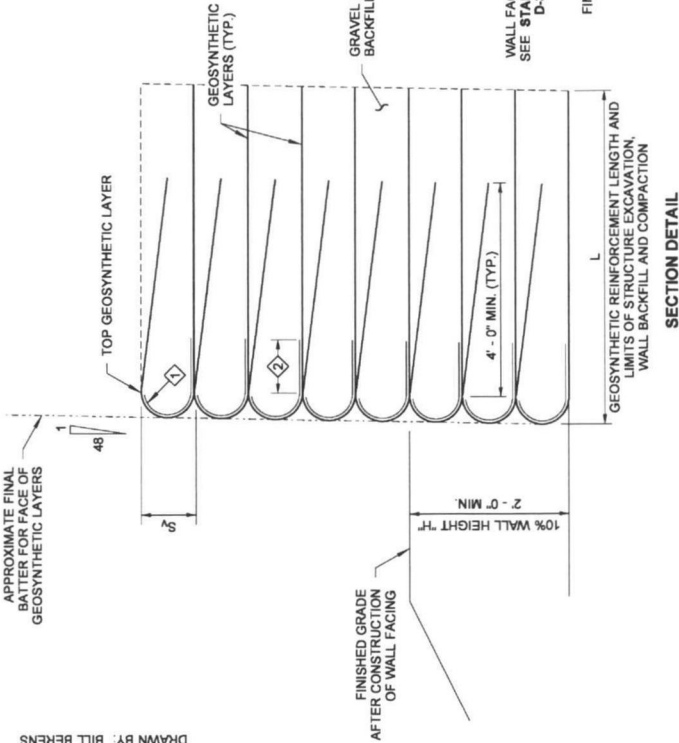
QTY. = 4 BARS

QTY. = 8 BARS

QTY. = 6 BARS

LONGITUDINAL DATA
QTY. = 8 BARS

APPROXIMATE FINAL
BATTER FOR FACE OF
GEOSYNTHETIC LAYERS

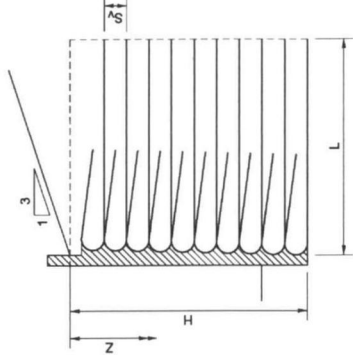
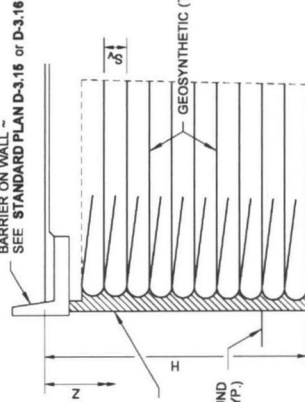


KEY NOTES

- ① GEOTEXTILE FOR UNDERGROUND DRAINAGE CLASS A. MODERATE SURVIVABILITY (ONLY NEEDED IF A GEOTEXTILE IS USED FOR GEOSYNTHETIC REINFORCEMENT)
- ② 1' - 0" MIN. GEOTEXTILE OVERLAP, TOP & BOTTOM

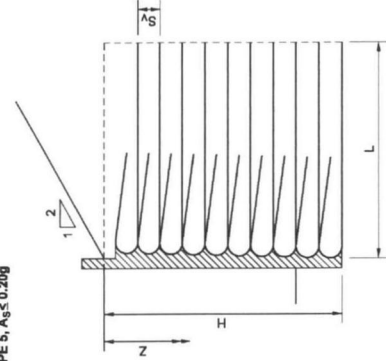
NOTES

1. For the values of "L," see sheet 3, and for the values of "S_v" see sheet 2.
2. For Geosynthetic Wall Construction Sequence, see sheet 4.
3. "A_s" is the peak seismic ground acceleration as defined and applied in the AASHTO LRFD Bridge Design Specifications, Articles 3.10.4.1 and 11.6.5.
4. The long-term geosynthetic design strength "T_{al}" shall be determined in accordance with WSDOT Standard Practice 1925. See Qualified Products List (QPL), Appendix "D," for products in which "T_{al}" has been determined. "H" and "Z" are graphically defined. "Z" is the distance from the top of the wall to a geosynthetic layer, and is used to determine "T_{al}" for that layer.
5. "L," the geosynthetic reinforcement length behind the wall face, is graphically defined. The maximum factored bearing stress acts in the vertical direction at the base of the wall. The load factors used are as specified in the AASHTO LRFD Bridge Design Specifications for each specified limit state.
6. Fascia or facing type shall be selected from **Standard Plans D-3.10 or D-3.11** and called out in the Contract Plans. Region is to coordinate with the Geotechnical Services and Bridge & Structures offices.



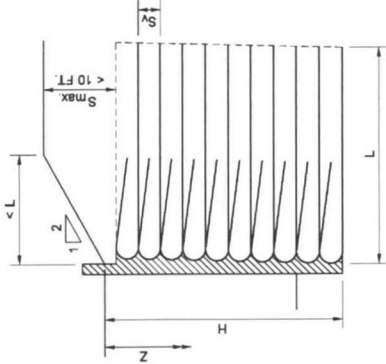
GEOSYNTHETIC WALL WITH 2 FT TRAFFIC SURCHARGE

TYPE 1, A_s ≤ 0.51g
TYPE 5, A_s ≤ 0.20g



GEOSYNTHETIC WALL

TYPE 4, A_s ≤ 0.51g
TYPE 8, A_s ≤ 0.20g



GEOSYNTHETIC WALL

TYPE 2, A_s ≤ 0.51g
TYPE 6, A_s ≤ 0.20g



PERMANENT GEOSYNTHETIC WALL STANDARD PLAN D-3.09-00

SHEET 1 OF 4 SHEETS

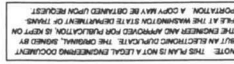
APPROVED FOR PUBLICATION

Pasco Bakotich III 05/17/12
STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

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NOTE: See Note 4, sheet 1.



**PERMANENT
GEOSYNTHETIC WALL
STANDARD PLAN D-3.09-00**

SHEET 2 OF 4 SHEETS

APPROVED FOR PUBLICATION

Pasco Bakotich III 05/17/12
STATE DESIGN ENGINEER
Washington State Department of Transportation

PERMANENT GEOSYNTHETIC WALL - EXTERNAL STABILITY DESIGN
(INCLUDES SEISMIC DESIGN FOR LARGE EARTHQUAKE: $A_s \leq 0.51g$)

TOTAL WALL HEIGHT, H (ft)	GEOSYNTHETIC WALL TYPE 1				GEOSYNTHETIC WALL TYPE 2				GEOSYNTHETIC WALL TYPE 3				GEOSYNTHETIC WALL TYPE 4			
	L (ft)	SERVICE 1	STRENGTH 1	EXTREME EVENT I	L (ft)	SERVICE 1	STRENGTH 1	EXTREME EVENT I	L (ft)	SERVICE 1	STRENGTH 1	EXTREME EVENT I	L (ft)	SERVICE 1	STRENGTH 1	EXTREME EVENT I
5	11	847	1220	1011	1192	1057	1535	1391	6	852	1168	1284	7	975	1343	1473
6	11	1081	1566	1388	1849	8	1295	1862	1671	7	1028	1415	9	1171	1613	1756
7	11	1248	1800	1685	2165	9	1469	2099	1981	8	1203	1657	10	1366	1882	2058
8	11	1415	2034	1982	2381	10	1617	2336	2291	9	1378	1899	11	1551	2151	2360
9	11	1582	2268	2279	2597	11	1817	2573	2601	10	1553	2141	12	1756	2420	2662
10	11	1768	2531	2609	3278	11	2069	2968	3006	10	1738	2384	14	1951	2685	2947
11	11	1916	2796	2873	3029	12	2165	3047	3221	11	1903	2625	15	2146	2958	3266
12	11	2083	3270	3170	3245	13	2339	3284	3531	12	2078	2867	16	2341	3227	3568
13	11	2250	3204	3467	3461	14	2513	3521	3521	13	2253	3109	18	2536	3496	3870
14	11	2417	3438	3764	3677	15	2687	3758	4151	14	2426	3351	19	2731	3765	4172
15	11	2584	3703	4188	4188	16	2860	4012	4151	15	2600	3595	20	2924	4029	4494
16	11	2751	4016	4335	4335	17	3035	4312	4711	16	2776	3835	21	3116	4273	4816
17	12	2918	4140	4655	4325	18	3209	4466	5081	17	2953	4077	22	3316	4572	5078
18	13	3085	4374	4952	4541	19	3383	4708	5361	18	3128	4319	23	3511	4841	5390
19	14	3252	4608	5249	4757	20	3557	4943	5701	19	3303	4561	24	3706	5110	5682
20	15	3412	4835	5424	4927	21	3811	5286	5975	20	3476	4787	25	3899	5371	5965
21	15	3586	5076	5643	5189	21	3905	5417	6321	21	3653	5045	26	4096	5648	6286
22	16	3753	5310	5840	5405	22	4079	5654	6631	22	3828	5287	28	4291	5917	6588
23	16	3920	5544	6037	5621	23	4253	5891	6941	23	4003	5529	31	4486	6186	6890
24	17	4087	5778	6234	5837	24	4427	6128	7251	23	4178	5771	32	4681	6455	7192
25	18	4254	6008	6431	6027	25	4601	6365	7561	24	4352	6022	33	4876	6724	7504
26	18	4421	6246	6628	6224	26	4775	6602	7871	25	4526	6255	35	5071	6993	7798
27	19	4588	6480	6825	6421	26	4949	6839	8181	26	4703	6487	36	5266	7262	8098
28	19	4755	6714	7022	6609	27	5123	7076	8491	27	4878	6739	37	5461	7531	8400
29	20	4922	6948	7219	6797	28	5297	7313	8801	28	5053	6981	38	5656	7800	8702
30	21	5089	7182	7416	6984	29	5471	7550	9111	29	5228	7228	40	5851	8069	8988
31	22	5256	7416	7613	7171	30	5645	7787	9421	30	5403	7475	41	6046	8338	9280
32	23	5423	7650	7810	7358	31	5819	8024	9731	31	5578	7702	42	6241	8607	9572
33	24	5590	7884	8007	7564	32	5993	8261	10041	32	5753	7949	43	6436	8876	9860
34	25	5757	8118	8204	7811	32	6167	8498	10351	33	5928	8191	44	6631	9145	10212
35	25	5924	8352	8441	8059	32	6340	8737	10661	34	6102	8425	45	6826	9414	10544

NOTE: See General Note 5, sheet 1.

PERMANENT GEOSYNTHETIC WALL - EXTERNAL STABILITY DESIGN
(INCLUDES SEISMIC DESIGN FOR LARGE EARTHQUAKE: $A_s \leq 0.20g$)

TOTAL WALL HEIGHT, H (ft)	GEOSYNTHETIC WALL TYPE 5				GEOSYNTHETIC WALL TYPE 6				GEOSYNTHETIC WALL TYPE 7				GEOSYNTHETIC WALL TYPE 8				
	L (FT)	MAX. FACTORED BEARING STRESS (psf)		EXTREME EVENT II	L (FT)	MAX. FACTORED BEARING STRESS (psf)		EXTREME EVENT I	L (FT)	MAX. FACTORED BEARING STRESS (psf)		EXTREME EVENT I	L (FT)	MAX. FACTORED BEARING STRESS (psf)		EXTREME EVENT I	
		SERVICE 1	STRENGTH 1			SERVICE 1	STRENGTH 1			SERVICE 1	STRENGTH 1			SERVICE 1	STRENGTH 1		
5	11	847	1220	992	1192	1057	1535	1294	6	852	1168	1155	6	977	1349	1326	
6	11	1105	1607	1320	1688	6	1358	1928	1574	6	1107	1536	1560	6	1278	1786	1868
7	11	1273	1843	1553	2090	6	1569	2226	1889	6	1302	1809	1842	6	1504	2105	2214
8	10	1441	2079	1786	2463	7	1780	2527	2211	7	1497	2082	2124	7	1730	2424	2560
9	10	1609	2315	2019	2808	7	1991	2831	2540	7	1692	2355	2406	7	1956	2743	2906
10	10	1768	2531	2229	3278	7	2286	3372	2776	7	1924	2692	2773	7	2228	3145	3381
11	10	1945	2787	2485	3424	8	2413	3445	3213	8	2082	2901	2970	8	2408	3381	3598
12	10	2113	3023	2718	3699	9	2624	3755	3555	9	2277	3174	3252	9	2634	3700	3944
13	11	2281	3259	2951	3954	10	2835	4066	3801	10	2472	3447	3534	10	2860	4019	4290
14	11	2449	3495	3184	4190	11	3046	4378	4249	11	2697	3720	3816	11	3086	4338	4638
15	11	2711	3884	3516	4396	11	3245	4598	4737	11	2886	4037	4159	11	3342	4718	5072
16	12	2785	3967	3650	4616	12	3488	5004	4948	12	3057	4266	4380	12	3538	4876	5328
17	12	2953	4203	3883	4809	12	3679	5316	5297	12	3252	4539	4662	12	3764	5295	5674
18	13	3121	4439	4116	4980	13	3890	5628	5644	13	3447	4812	4944	13	3990	5614	6020
19	14	3289	4675	4349	5163	14	4101	5939	5990	14	3642	5085	5226	14	4216	5933	6366
20	14	3522	5015	4642	5201	14	4326	6125	6321	14	3848	5383	5546	14	4458	6291	6762
21	15	3625	5147	4815	5489	15	4523	6557	6672	15	4032	5651	5790	15	4668	6571	7058
22	16	3793	5383	5048	5946	16	4734	6983	7006	16	4227	5904	6072	16	4894	6890	7404
23	17	3961	5619	5281	5801	17	4945	7466	7335	17	4422	6177	6354	17	5120	7209	7750
24	18	4129	5855	5514	5955	18	5156	7891	7657	18	4617	6450	6636	18	5346	7528	8096
25	18	4325	6131	5763	6146	18	5417	8307	7891	18	4810	6729	6932	18	5570	7863	8453
26	19	4495	6327	5980	6272	19	5678	8657	8290	19	5007	6998	7200	19	5798	8166	8788
27	19	4633	6553	6213	6348	19	5789	8834	8578	19	5202	7269	7482	19	6024	8485	9134
28	20	4801	6799	6446	6611	20	6000	9183	8896	20	5397	7542	7764	20	6250	8804	9490
29	21	4969	7035	6679	6849	21	6211	9512	9144	21	5592	7815	8046	21	6476	9123	9826
30	21	5123	7238	6891	7148	21	6577	9906	9515	21	5773	8075	8319	21	6694	9436	10143
31	22	5305	7507	7145	7392	22	6833	10467	9814	22	5982	8610	8862	22	6928	9761	10458
32	23	5473	7743	7378	7612	23	6944	10940	10205	23	6177	8834	9082	23	7154	10080	10864
33	24	5641	7979	7611	7849	24	7055	11431	10543	24	6372	8907	9174	24	7380	10399	11210
34	25	5809	8215	7844	8004	25	7266	11928	10943	25	6567	9180	9456	25	7606	10718	11556
35	25	5918	8341	7968	8177	25	7311	12373	10950	25	6735	9421	9705	25	7768	11009	11834

NOTE: See Note 5, sheet 1.

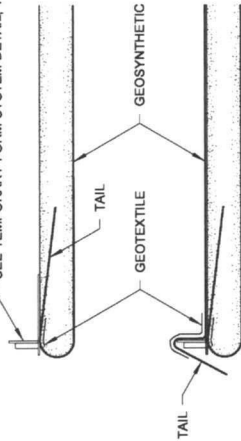
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THE ENGINEER HAS REVIEWED THE INFORMATION AND DATA SUBMITTED BY THE CLIENT AND HAS FOUND IT TO BE SUFFICIENT FOR THE DESIGN OF THIS PROJECT. THE ENGINEER HAS NOT CONDUCTED A FIELD SURVEY OF THE PROJECT AREA.
A COPY MAY BE OBTAINED UPON REQUEST.



PERMANENT
GEOSYNTHETIC WALL
STANDARD PLAN D-3.09-00

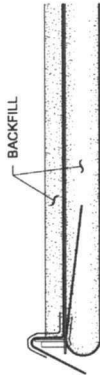
SHEET 3 OF 4 SHEETS
APPROVED FOR PUBLICATION
Pasco Bakotich III
STATE DESIGN ENGINEER
Washington State Department of Transportation
DATE: 05/17/12

SEE TEMPORARY FORM SYSTEM DETAIL, THIS SHEET

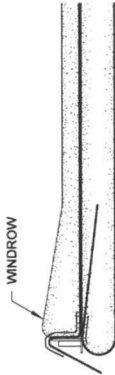


1. SET FORM ON COMPLETED LIFT.

2. UNROLL GEOSYNTHETIC AND POSITION IT SO THAT A 4" - 0" WIDE "TAIL" DRAPES OVER THE FORM. IF A GEOGRID IS USED FOR THE GEOSYNTHETIC REINFORCEMENT, POSITION GEOTEXTILE TO PREVENT BACKFILL FROM SPILLING THROUGH GEOGRID OPENINGS.



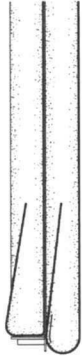
3. PLACE THE BACKFILL UNTIL THE BACKFILL IS UP TO HALF OF THE REQUIRED VERTICAL GEOSYNTHETIC LAYER SPACING.



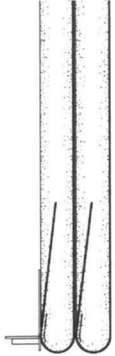
4. PLACE A WINDROW TO SLIGHTLY GREATER THAN FULL LIFT HEIGHT AGAINST THE FORM.



5. PLACE THE GEOSYNTHETIC "TAIL" OVER THE WINDROW AND LOCK INTO PLACE WITH BACKFILL.



6. COMPLETE BACKFILLING UNTIL THE COMPACTED BACKFILL LAYER THICKNESS IS EQUAL TO THE REQUIRED VERTICAL GEOSYNTHETIC LAYER SPACING.



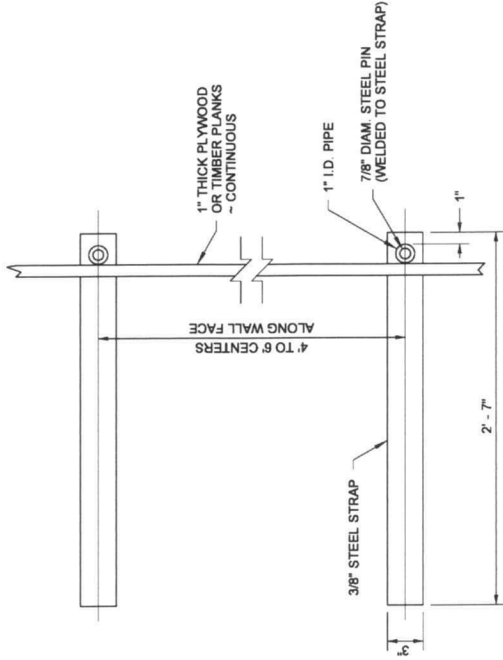
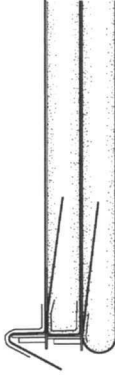
7. THE FORM MAY BE LEFT IN PLACE WHILE CONSTRUCTING THE NEXT LAYER (SEE NOTE 2) OTHERWISE, RESET THE FORM AND REPEAT THE SEQUENCE.

GEOSYNTHETIC WALL CONSTRUCTION SEQUENCE

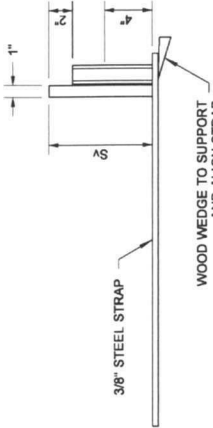
(SECTION VIEW)

NOTES(SHEET)

1. Use of the Temporary Form System, as detailed in this plan, is optional.
2. To help maintain the wall face batter, leave the form system for the preceding layer in place while constructing the next layer. When the upper layer is complete, remove the form system from the lower layer and reset it for the next layer. See below.



PLAN



ELEVATION

TEMPORARY FORM SYSTEM DETAIL



PERMANENT GEOSYNTHETIC WALL STANDARD PLAN D-3-09-00

SHEET 4 OF 4 SHEETS

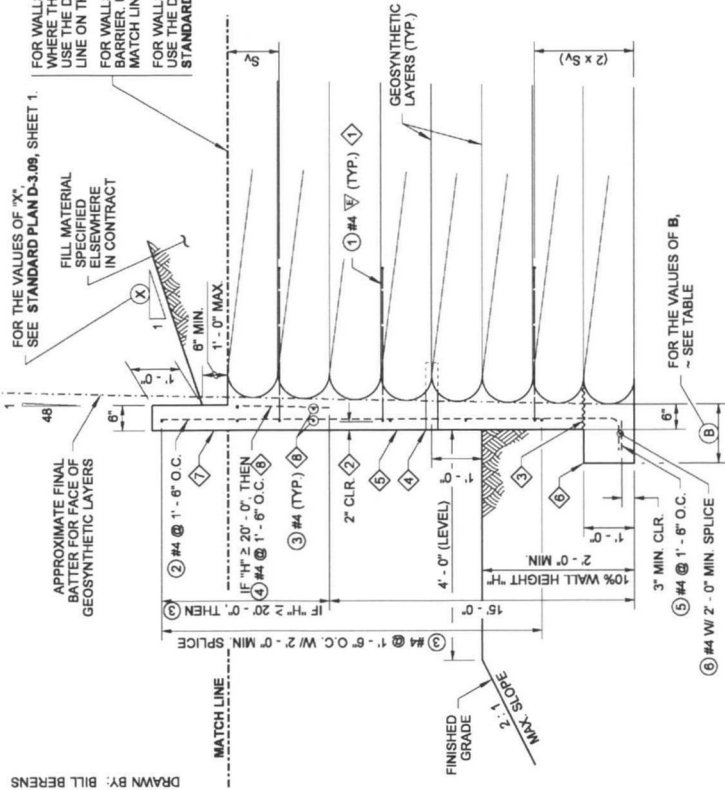
APPROVED FOR PUBLICATION

Pasco Bakotich III 05/17/12

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

DRAWN BY: BILL BERENS



FOR THE VALUES OF "X",
SEE STANDARD PLAN D-3.09, SHEET 1.

FILL MATERIAL
SPECIFIED
ELSEWHERE
IN CONTRACT

APPROXIMATE FINAL
BATTER FOR FACE OF
GEOSYNTHETIC LAYERS

FOR WALLS WITHOUT TRAFFIC BARRIER, OR
WHERE THE TRAFFIC BARRIER IS AT GRADE,
USE THE DETAILS SHOWN ABOVE THE MATCH
LINE ON THIS SHEET

FOR WALLS WITH SINGLE SLOPE TRAFFIC
BARRIER, USE THE DETAILS ABOVE THE
MATCH LINE ON STANDARD PLAN D-3.15

FOR WALLS WITH F-SHAPE TRAFFIC BARRIER,
USE THE DETAILS ABOVE THE MATCH LINE ON
STANDARD PLAN D-3.16

WELDED WIRE FABRIC FOR
CONCRETE REINFORCEMENT
4\"/>

~ COMPLY WITH AASHTO M55

SHOTCRETE FACING

EXCESS SHOTCRETE - REQUIRED
TO COMPENSATE FOR FACE
BULGING AND VARIATIONS WITHIN
FACING TOLERANCE

SHOTCRETE DETAIL

FOR THE VALUES OF "X",
SEE STANDARD PLAN D-3.09, SHEET 1.

APPROXIMATE FINAL BATTER FOR
FACE OF GEOSYNTHETIC LAYERS

FILL MATERIAL SPECIFIED
ELSEWHERE IN CONTRACT

WELDED WIRE FABRIC FOR
CONCRETE REINFORCEMENT
4\"/>

~ COMPLY WITH AASHTO M55

SHOTCRETE FACING

EXCESS SHOTCRETE - REQUIRED
TO COMPENSATE FOR FACE
BULGING AND VARIATIONS WITHIN
FACING TOLERANCE

SHOTCRETE DETAIL

FOR THE VALUES OF "X",
SEE STANDARD PLAN D-3.09, SHEET 1.

APPROXIMATE FINAL BATTER FOR
FACE OF GEOSYNTHETIC LAYERS

FILL MATERIAL SPECIFIED
ELSEWHERE IN CONTRACT

WELDED WIRE FABRIC FOR
CONCRETE REINFORCEMENT
4\"/>

~ COMPLY WITH AASHTO M55

SHOTCRETE FACING

EXCESS SHOTCRETE - REQUIRED
TO COMPENSATE FOR FACE
BULGING AND VARIATIONS WITHIN
FACING TOLERANCE

SHOTCRETE DETAIL

FOR THE VALUES OF "X",
SEE STANDARD PLAN D-3.09, SHEET 1.

APPROXIMATE FINAL BATTER FOR
FACE OF GEOSYNTHETIC LAYERS

FILL MATERIAL SPECIFIED
ELSEWHERE IN CONTRACT

WELDED WIRE FABRIC FOR
CONCRETE REINFORCEMENT
4\"/>

~ COMPLY WITH AASHTO M55

SHOTCRETE FACING

EXCESS SHOTCRETE - REQUIRED
TO COMPENSATE FOR FACE
BULGING AND VARIATIONS WITHIN
FACING TOLERANCE

SHOTCRETE DETAIL

NOTES

1. All bars shown on this plan shall be ASTM A706 unless otherwise specified in the Contract.
2. Safety cable or fence required when "H" $\geq 10'$ - 0".
3. All cast-in-place concrete shall be class 4000.

▽ = EPOXY COATED

DESIGN HEIGHT "H" (ft.)	ROWS OF #4 DOWEL BARS REQUIRED (no.)	FASCIA FOOTING WIDTH "B" (ft.-in.)
UP TO 5	2	1'-0"
6	3	1'-0"
7	3	1'-0"
8	3	1'-0"
9	3	1'-0"
10	4	1'-0"
11	4	1'-0 1/2"
12	4	1'-0 1/2"
13	4	1'-1"
14	4	1'-1"
15	6	1'-2"
16	6	1'-2"
17	8	1'-2 1/2"
18	8	1'-2 1/2"
19	8	1'-3"
20	10	1'-3"
21	10	1'-3 1/2"
22	10	1'-3 1/2"
23	10	1'-4"
24	10	1'-4"
25	10	1'-5"
26	10	1'-5 1/2"
27	10	1'-5 1/2"
28	10	1'-6"
29	10	1'-6"
30	10	1'-6 1/2"
31	10	1'-6 1/2"
32	10	1'-7"
33	10	1'-7"
34	10	1'-7"
35	10	1'-8"

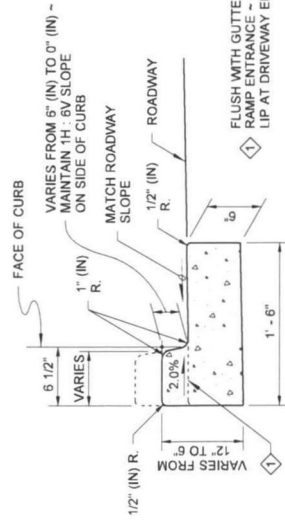
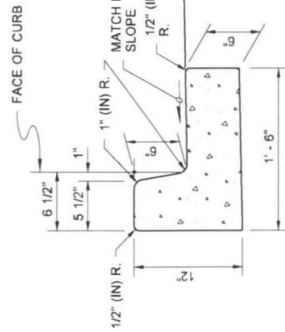
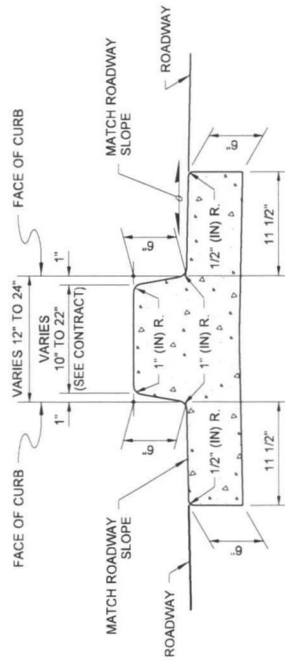


CAST-IN-PLACE PERMANENT GEOSYNTHETIC WALL FASCIA AND FACING STANDARD PLAN D-3.10-01

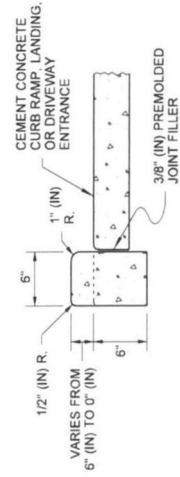
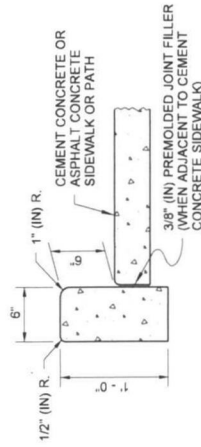
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Pasco Bakotich III
STATE DESIGN ENGINEER
Washington State Department of Transportation
DATE
5/29/13

TYPICAL SECTION PERMANENT GEOSYNTHETIC RETAINING WALL WITH SHOTCRETE FACING

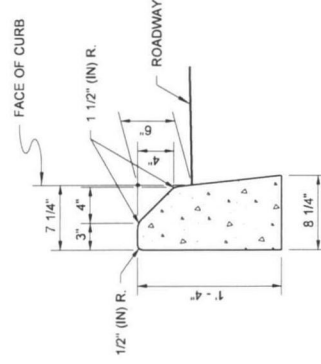
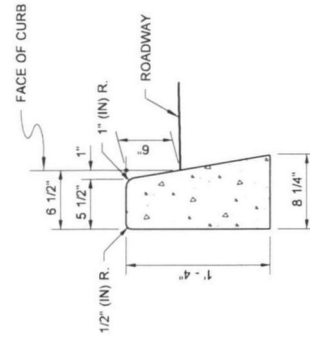
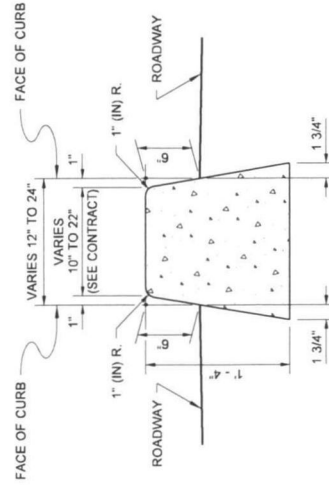


**DUAL-FACED CEMENT CONCRETE
TRAFFIC CURB AND GUTTER**



NOTE

1. See **Standard Plan F-30.10** for Curb Expansion and Contraction Joint spacing. See **Standard Specification, Sections 8-04 and 9-04** for additional requirements.

Michael S
Fleming

Digitally signed by Michael S Fleming
Date: 2020.09.24 07:39:38 -0

FLIGHTING

STANDARD PLAN F-10.12-04

SHEET 1 OF 1 SHEET

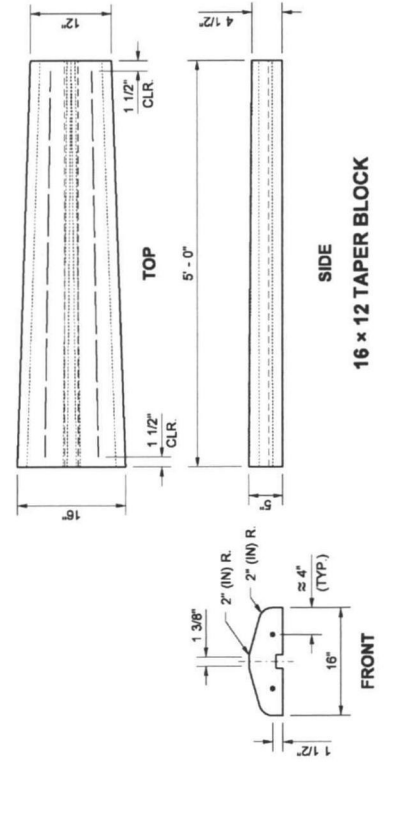
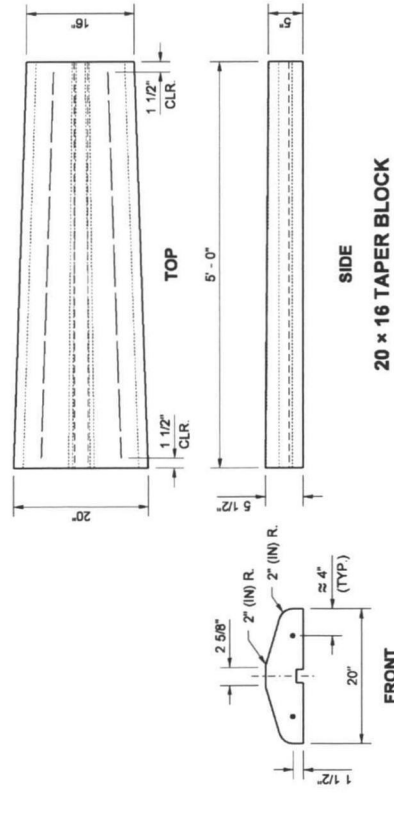
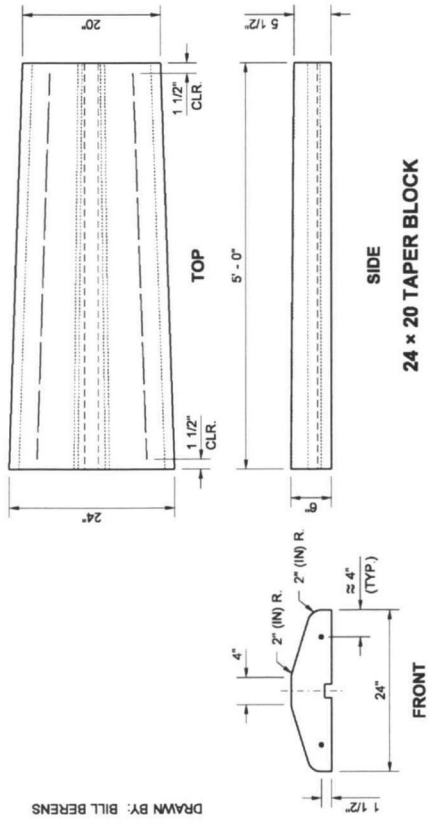
APPROVED FOR PUBLICATION

DATE OF PUBLICATION
Date: 2020.09.24

Date: 2020.09.24
07:57:43 -07'00'

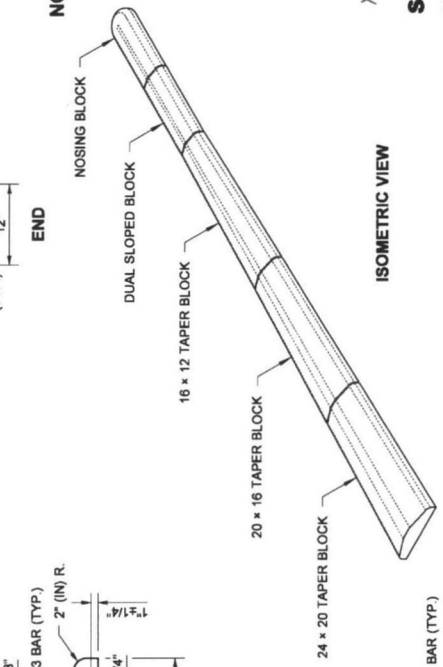
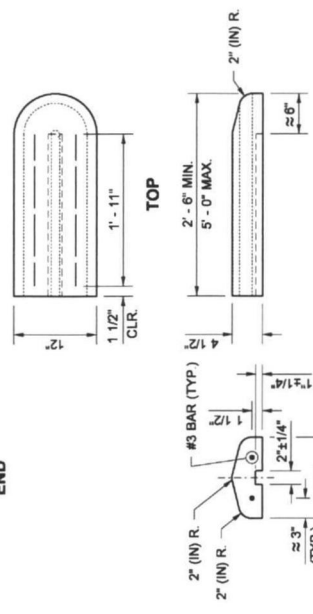
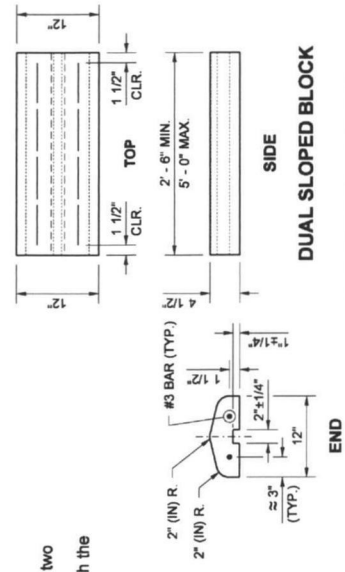
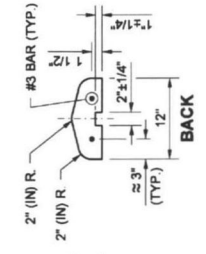
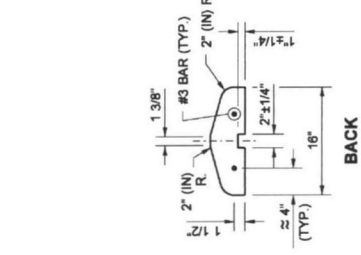
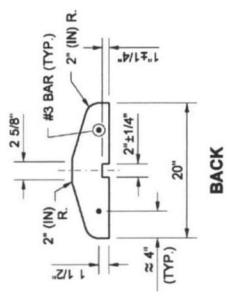
STATE OF DESIGN ENGINEER





NOTES

1. The dual faced curb may be constructed by using two precast sloped mountable curbs (longitudinal halves) so long as the installation is consistent with the dimensions shown in the plan.
2. Reinforcing steel shall conform to **Standard Specification 9-07**.



Bakotich, Pasco
Apr 22 2014 9:21 AM
**PRECAST DUAL FACED
SLOPED MOUNTABLE CURB
STANDARD PLAN F-10.64-03**

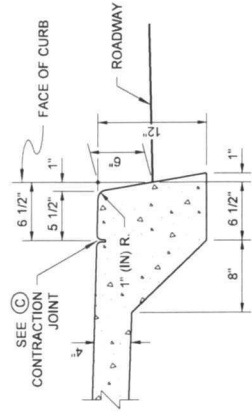
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Bill Berens
Apr 22 2014 1:11 AM

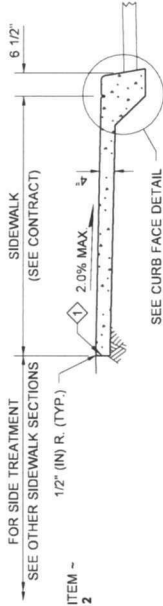
STATE DESIGN ENGINEER

Washington State Department of Transportation



CURB FACE DETAIL

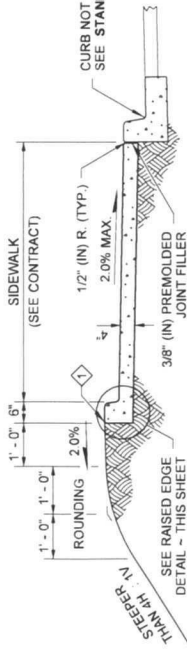
EXTEND SIDEWALK TRANSVERSE EXPANSION JOINTS TO INCLUDE CURB (FULL DEPTH)



MONOLITHIC CEMENT CONCRETE CURB AND SIDEWALK

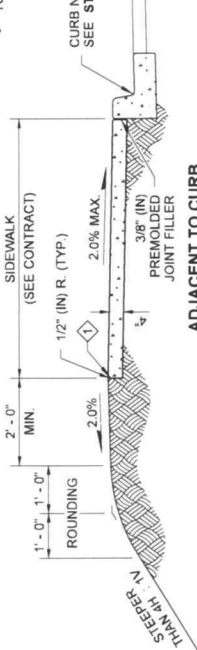
NOTE

- Gratings, Access Covers, Junction Boxes, Cable Vaults, Pull Boxes and other appurtenances within the sidewalk must have slip resistant surfaces, be flush with surface, and match grade of the sidewalk.

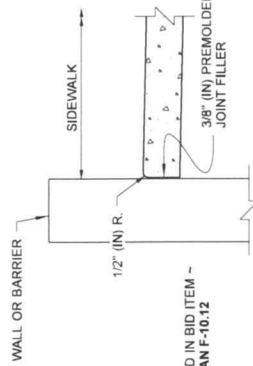


WITH RAISED EDGE

FINISHED GRADE 1" (IN) BELOW TOP OF CONCRETE SURFACE

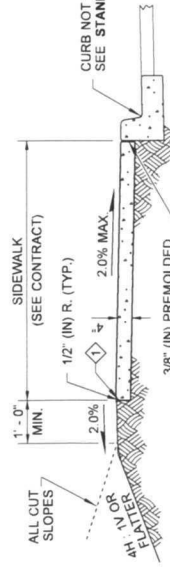


ADJACENT TO CURB (STEEP FILL SLOPES)

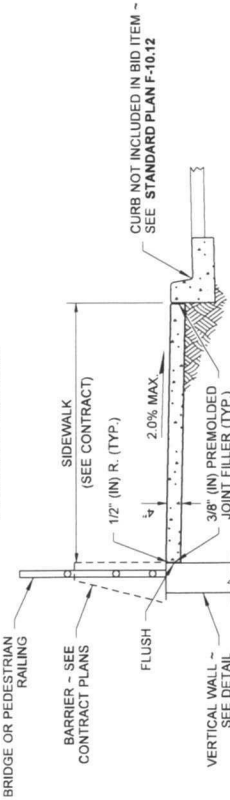


SIDEWALK ADJACENT TO WALL DETAIL

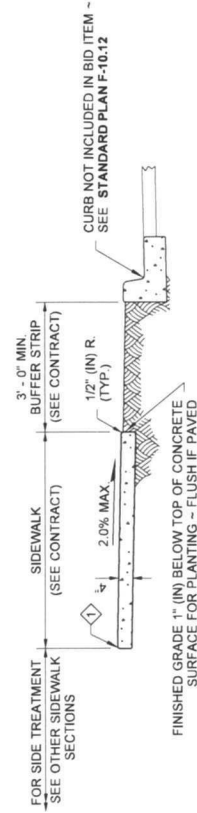
DRAWN BY: LISA CYFORD



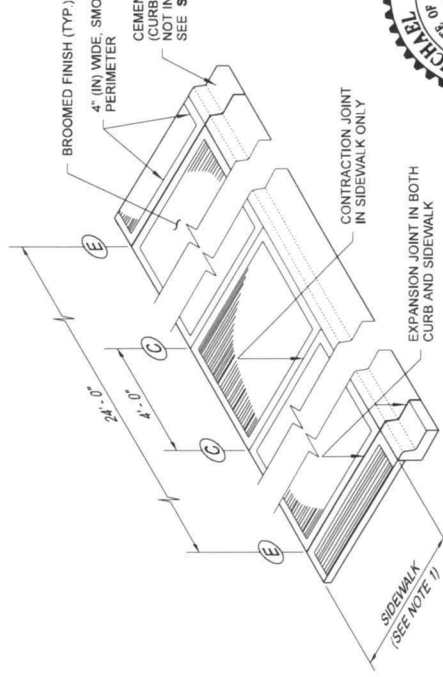
ADJACENT TO CURB



ADJACENT TO CURB AND RAILING OR WALL



ADJACENT TO BUFFER STRIP



ISOMETRIC VIEW JOINT AND FINISH DETAIL



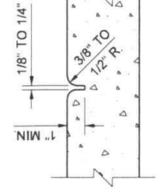
Michael S. Fleming
Fleming
Digitally signed by Michael S. Fleming
Date: 2020.09.24 07:45:16 -0700

CEMENT CONCRETE SIDEWALK

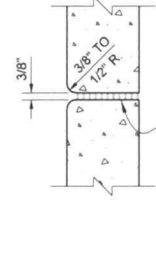
STANDARD PLAN F-30.10-04

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Date: 2020.09.25
15-43.50 -0700
STATE DESIGN ENGINEER
Washington State Department of Transportation



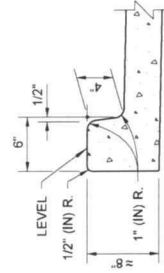
(C) CONTRACTION JOINT



(E) EXPANSION JOINT

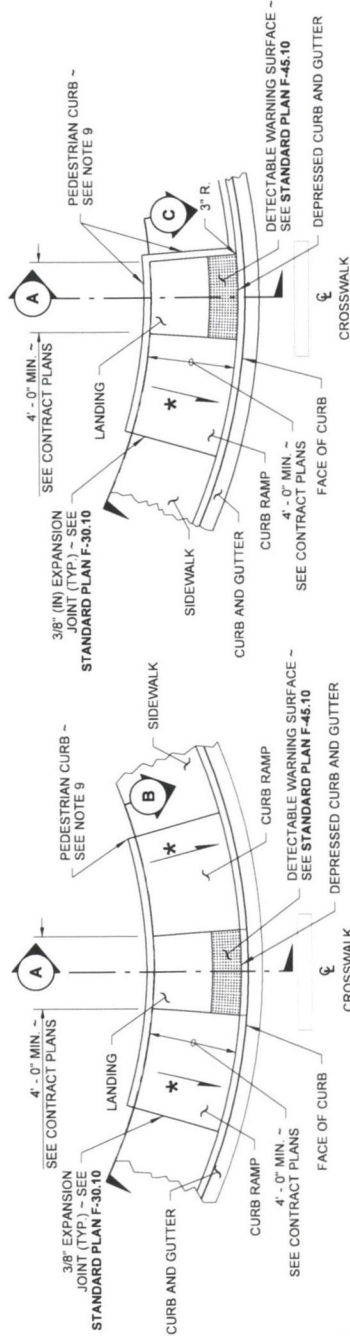
RAISED EDGE DETAIL

EXTEND SIDEWALK TRANSVERSE JOINTS TO INCLUDE RAISED EDGE



NOTES

- At marked crosswalks, the connection between the landing and the roadway must be contained within the width of the crosswalk markings.
- Where "GRADE BREAK" is called out, the entire length of the grade break between the two adjacent surface planes shall be flush.
- Do not place Gratings, Junction Boxes, Access Covers, or other appurtenances on any part of the Curb Ramp or Landing, or in the Depressed Curb and Gutter where the Landing connects to the roadway.
- See Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb, Curb and Gutter, Depressed Curb and Gutter, and Pedestrian Curb details.
- See **Standard Plan F-30.10** for Cement Concrete Sidewalk Details.
- See Contract Plans for width and placement of sidewalk.
- The Bid Item "Cement Concrete Curb Ramp Type ___" does not include the adjacent Curb, Curb and Gutter, Depressed Curb and Gutter, Pedestrian Curb, or Sidewalks.
- The Curb Ramp length is not required to exceed 15 feet (unless otherwise shown in the Contract Plans). When applying the 15-foot max. length, the running slope of the curb ramp is allowed to exceed 8.3%. Use a single constant slope from bottom of ramp to top of ramp to match into the sidewalk over a horizontal distance of 15 feet. Do not include abutting landing(s) in the 15-foot max. measurement. When a ramp is constructed on a radius, the 15-foot max. length is measured on the inside radius along the back of the walkway.
- Curb Ramps and Landings shall receive a broom finish. See **Standard Specifications 8-14**.
- Pedestrian Curb may be omitted if the ground surface at the back of the Curb Ramp and/or Landing will be at the same elevation as the Curb Ramp or Landing and there will be no material to retain.



PLAN VIEW TYPE PARALLEL B

PLAN VIEW TYPE PARALLEL A



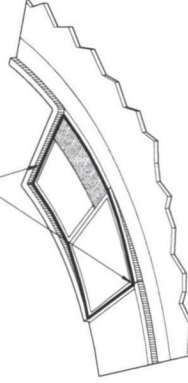
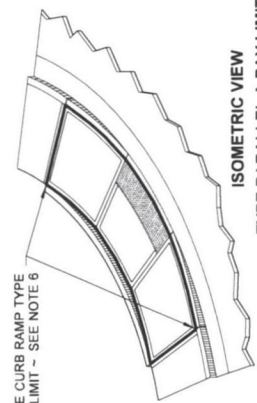
CONTRACTION JOINT (TYP.) - SEE STANDARD PLAN F-30.10 FOR CURB RAMP LENGTHS GREATER THAN 8'-0" PROVIDE CONTRACTION JOINT EQUALLY SPACED 4'-0" MIN. OC.



SECTION C

(ALONG INSIDE RADIUS AT BACK OF WALKWAY)

"CEMENT CONCRETE CURB RAMP TYPE PARALLEL B" PAY LIMIT - SEE NOTE 6



Zeller, Scott
Jun 24 2016 7:19 AM

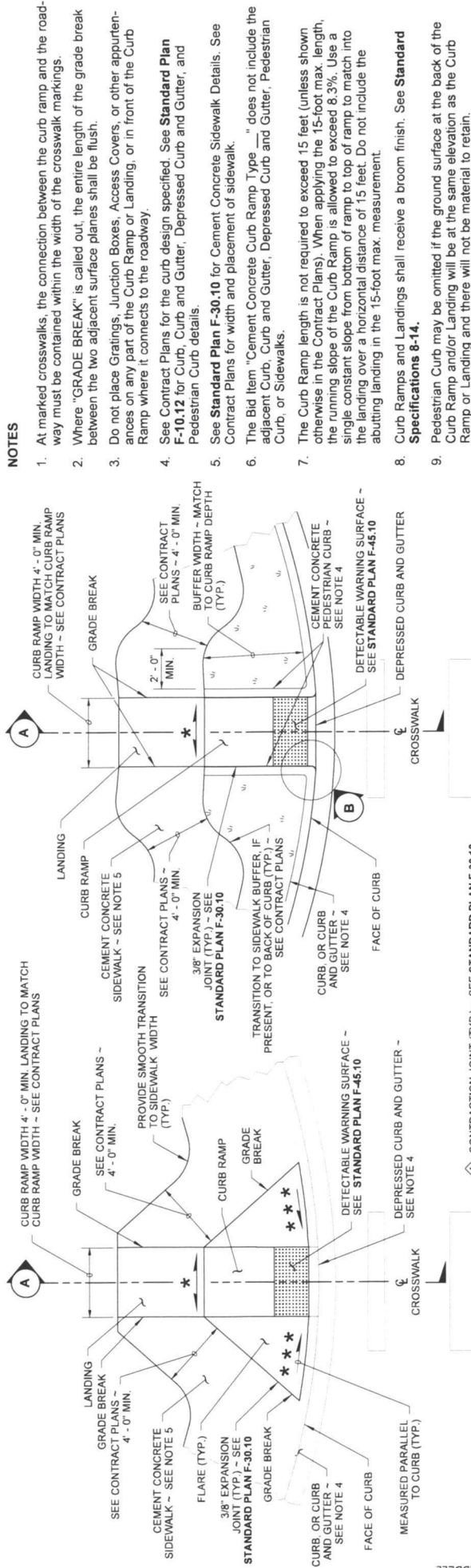
PARALLEL CURB RAMP

STANDARD PLAN F-40.12-03

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Carpeenter, Jeff
Jun 29 2016 2:27 PM

STATE DESIGN ENGINEER
Washington State Department of Transportation



DRAWN BY: FERN LIDDELL

- LEGEND**
- SLOPE IN EITHER DIRECTION
- * 1.5% OR FLATTER RECOMMENDED FOR DESIGNFORMWORK (2% MAX.)
 - ** 7.5% OR FLATTER RECOMMENDED FOR DESIGNFORMWORK (8.3% MAX.)
 - *** 9.5% OR FLATTER RECOMMENDED FOR DESIGNFORMWORK (10% MAX.)



Digitally signed by R. Scott Zeller
Date: 2020.09.22 13:23:53 -0700

PERPENDICULAR CURB RAMP

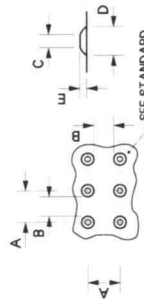
STANDARD PLAN F-40.15-04

SHEET 1 OF 1 SHEET

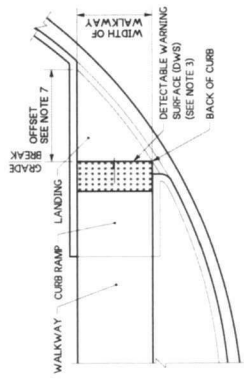
APPROVED FOR PUBLICATION
Date: 2020.09.25
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STATE DESIGN ENGINEER
Washington State Department of Transportation

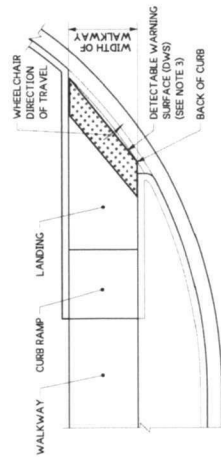
	MIN.	MAX.
A	160"	240"
B	0.65'	0.90'
C	0.45'	0.90'
D	0.90'	1.40'
E	0.20'	0.20'



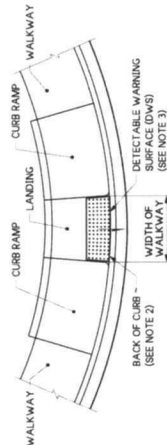
TRUNCATED DOME DETAILS
(SEE NOTE 3)



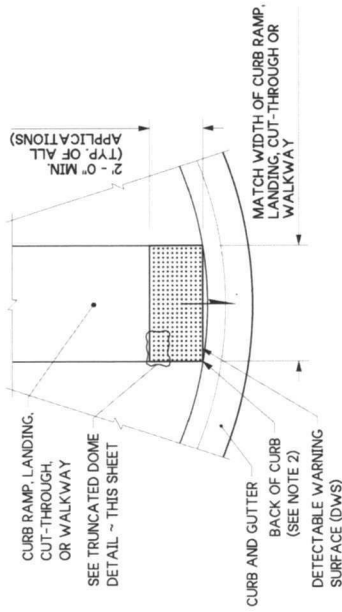
SINGLE DIRECTION CURB RAMP
(GRADE BREAK BETWEEN CURB AND LANDING < 5 FEET FROM BACK OF CURB)
(SEE NOTE 5)



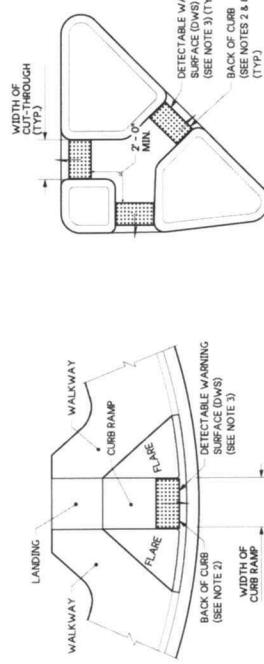
SINGLE DIRECTION CURB RAMP
(GRADE BREAK BETWEEN CURB AND LANDING > 5 FEET FROM BACK OF CURB)
(SEE NOTE 5)



PARALLEL CURB RAMP
(SEE NOTE 6)

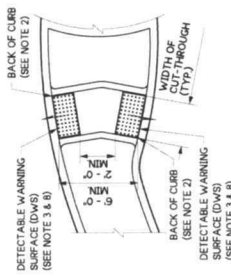


DETECTABLE WARNING SURFACE DETAIL

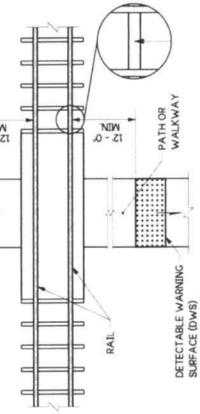


ISLAND CUT-THROUGH

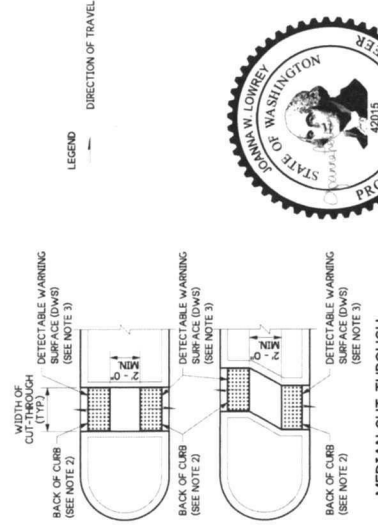
PERPENDICULAR CURB RAMP
(SEE NOTE 6)



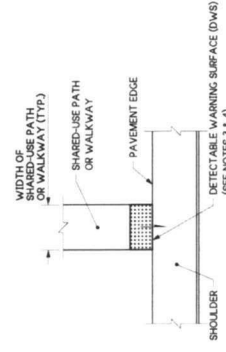
ROUNDABOUT SPLITTER ISLAND



PEDESTRIAN RAILROAD CROSSING



MEDIAN CUT-THROUGH



SHARED-USE PATH CONNECTION
(SEE NOTES 3 & 4)

NOTES:

- Permanent Detectable Warning Surfaces (DWS) shall extend the full width of the curb ramp, landing, or other roadway entrance as applicable. Exception: If the manufacturer of the DWS requires a concrete border around the DWS, a variance of up to 2' (in) on each side of the DWS is permitted.
- Permanent Detectable Warning Surfaces (DWS) shall be placed on a minimum 4" (in) thick concrete pad. The DWS panel shall be placed adjacent to the back of the curb and with no more than a 2' (in) gap between the DWS and the back of the curb measured at the center of the DWS panel. Exception: If the Manufacturer of the selected DWS requires a concrete border around the DWS, a variance of up to 2' (in) from the back of the curb is permitted (measured at the leading corners of the DWS panel).
- The rows of truncated domes shall be aligned to be parallel to the direction of travel and perpendicular to the grade break at the back of curb.
- If curb and gutter are not present, such as a shared-use path connection, the Detectable Warning Surface shall be placed at the pavement edge.
- See Standard Plans for sidewalk and curb ramp details.
- If a curb ramp is required, the location of the Detectable Warning Surface must be at the bottom of the ramp and within the required distance from the rail crossing.
- When the grade break between the curb ramp and the landing is less than or equal to 5 feet from the back of curb at all points, place the Detectable Warning Surface on the bottom of the curb ramp directly above the grade break.
- Glued or stick down Detectable Warning Surfaces are allowed only for temporary work zone applications.



Jun 4, 2024

DETECTABLE WARNING SURFACE

STANDARD PLAN F-45.10-05

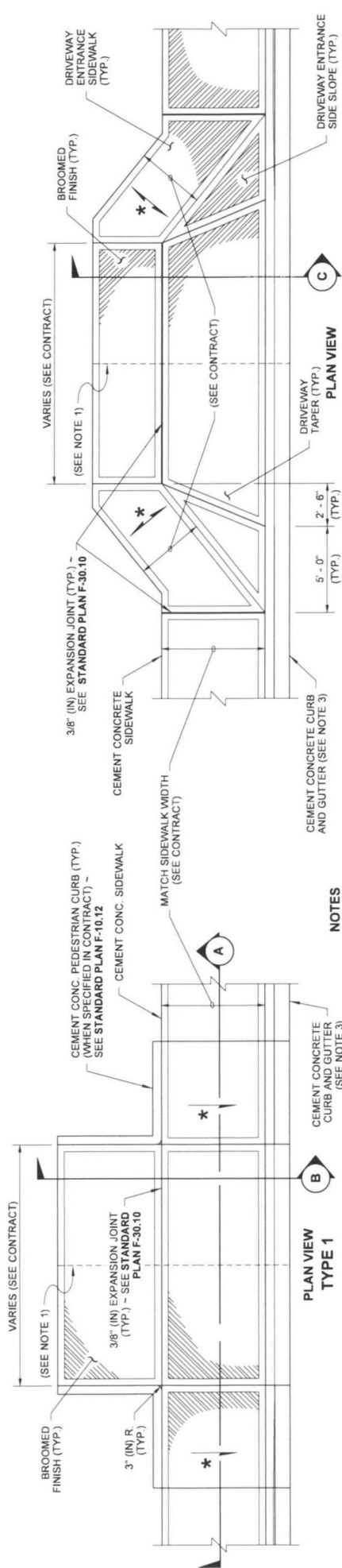
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Jun 4, 2024

STATE DESIGN ENGINEER

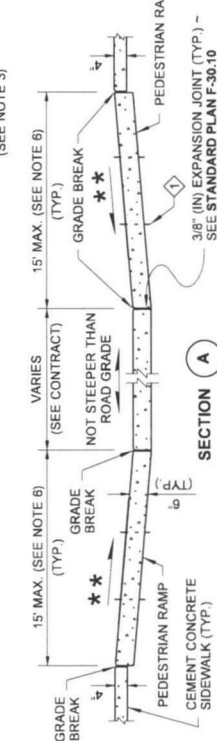
Washington State Department of Transportation



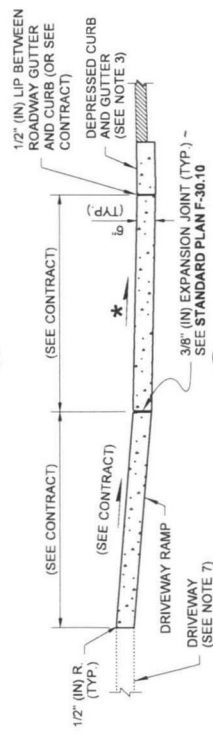
NOTES

1. When the driveway width exceeds 15' (ft), construct a full depth expansion joint with 3/8" (in) joint filler along the driveway centerline. See **Standard Plan F-30.10**. Construct expansion joints parallel with the centerline as required at 15' (ft) maximum spacing when driveway widths exceed 30' (ft).
2. See **Standard Plan F-30.10** for sidewalk details.
3. Curb and Gutter shown; see the Contract Plans for the curb design specified. See **Standard Plan F-10.12** for Curb Details.
4. Avoid placing drainage structures, junction boxes or other obstructions in front of driveway entrances.
5. Where "GRADE BREAK" is called out, the entire length of the line between the two adjacent surface planes shall be flush.
6. The Pedestrian Ramp length is not required to exceed 15 feet (unless otherwise shown in the Contract Plans). When applying the 15-foot max. length (measured from back of sidewalk) the running slope of the pedestrian ramp is allowed to exceed 8.3%. Use a single constant slope from bottom of ramp to top of ramp to match into the sidewalk over a horizontal distance of 15 feet.
7. Beyond limits shown. Pay item does not include driveway. See Contract Plans.

**PLAN VIEW
TYPE 1**



SECTION A

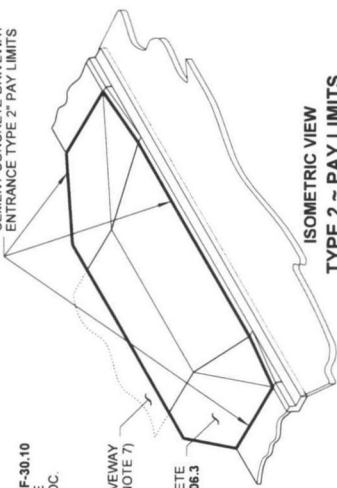


SECTION B

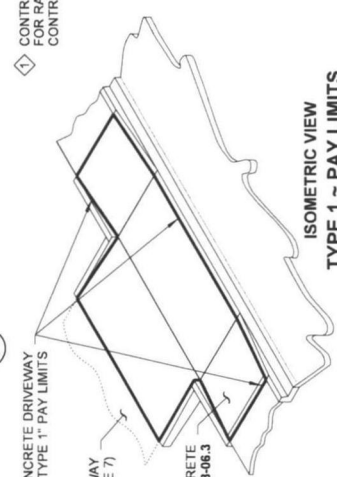
LEGEND

- SLOPE IN EITHER DIRECTION
- * 1.5% OR FLATTER RECOMMENDED FOR DESIGNFORMWORK (2% MAX.)
 - ** 7.5% OR FLATTER RECOMMENDED FOR DESIGNFORMWORK (8.3% MAX.) (SEE NOTE 6)

CONTRACTION JOINT (TYP.) - SEE **STANDARD PLAN F-30.10**
FOR RAMP LENGTHS GREATER THAN 8' - 0" PROVIDE
CONTRACTION JOINT EQUALLY SPACED 4' - 0" MIN. OC.



**ISOMETRIC VIEW
TYPE 2 - PAY LIMITS**



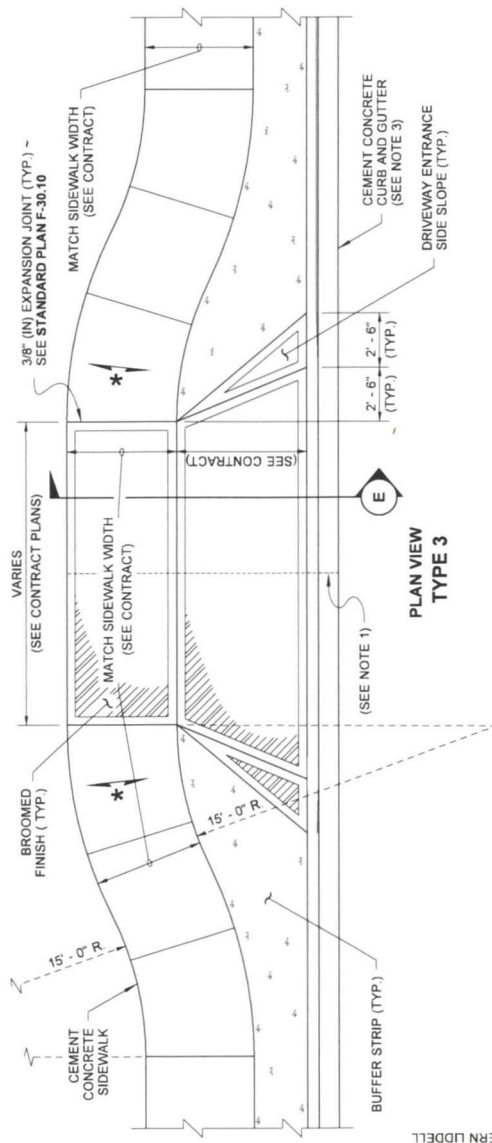
**ISOMETRIC VIEW
TYPE 1 - PAY LIMITS**



**CEMENT CONCRETE
DRIVEWAY ENTRANCE
TYPES 1, 2, 3, & 4
STANDARD PLAN F-80.10-04**

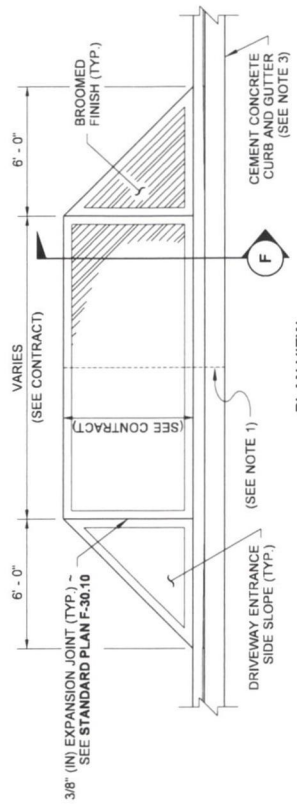
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION
Carpeenter, Jeff
 STATE DESIGN ENGINEER
 Washington State Department of Transportation



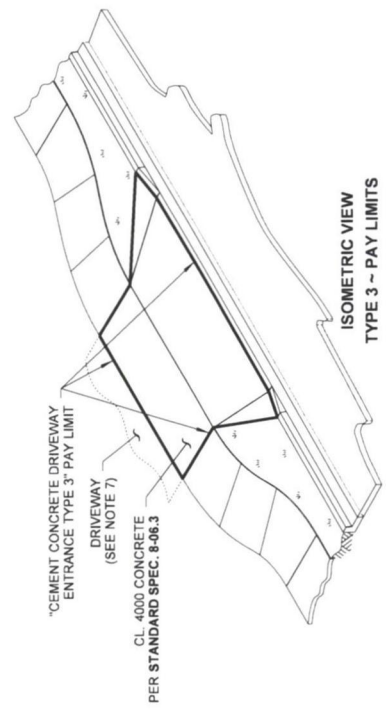
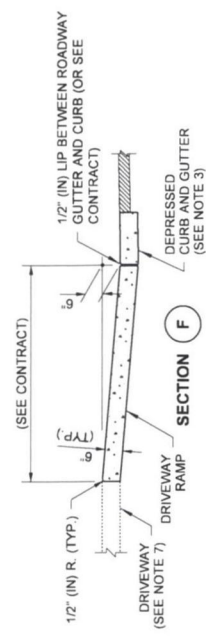
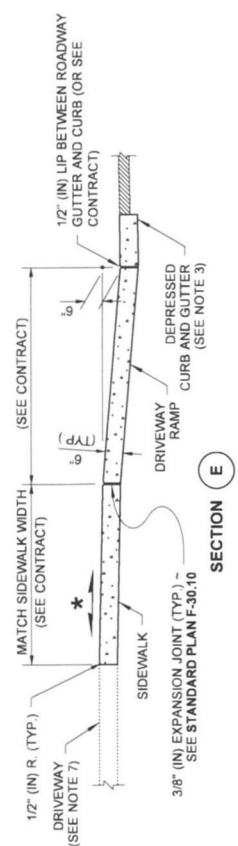
DRAWN BY: FERN LIDDELL

PLAN VIEW
TYPE 3

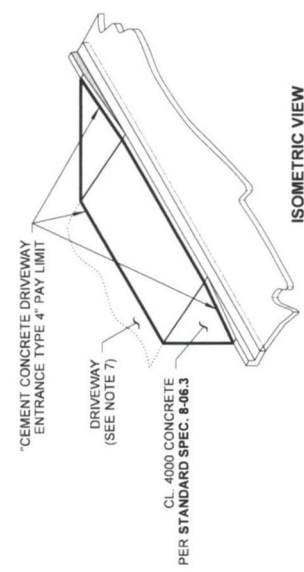


PLAN VIEW
TYPE 4 *

* THIS ENTRANCE TYPE SHALL NOT BE USED ALONG A PEDESTRIAN ROUTE



ISOMETRIC VIEW
TYPE 3 ~ PAY LIMITS



ISOMETRIC VIEW
TYPE 4 ~ PAY LIMITS

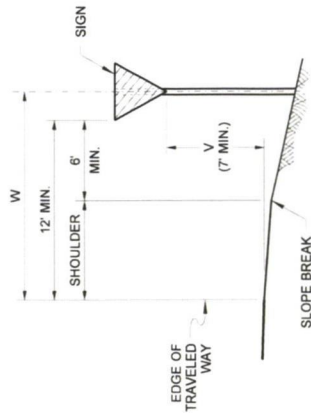


CEMENT CONCRETE DRIVEWAY ENTRANCE TYPES 1, 2, 3, & 4
STANDARD PLAN F-80.10-04
 SHEET 2 OF 2 SHEETS

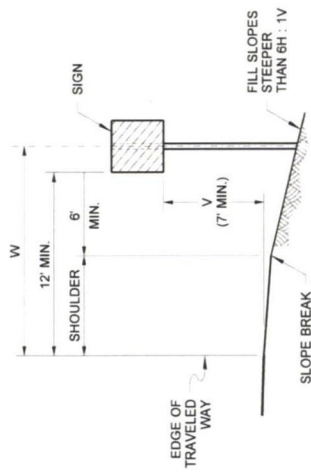
APPROVED FOR PUBLICATION
 Carpenter, Jeff
 Jul 18 2016 12:22 PM
 STATE DESIGN ENGINEER
 Washington State Department of Transportation

NOTES

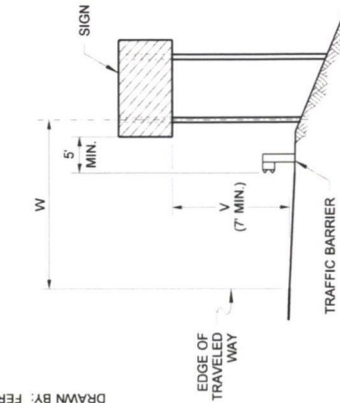
1. Refer to the Sign Specification Sheet of the Contract for the "V" and "W" distances.
2. The minimum vertical distance from the bottom of the sign to the ground shall not be less than 7' (ft) for signs located within the Design Clear Zone.



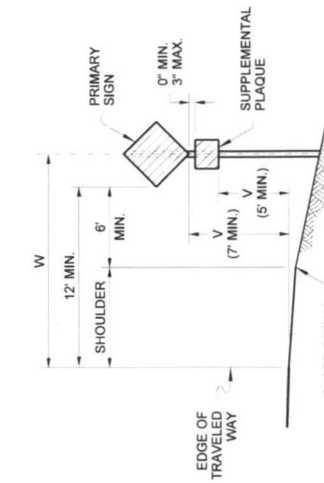
SIGN INSTALLATION
IN FILL SECTION



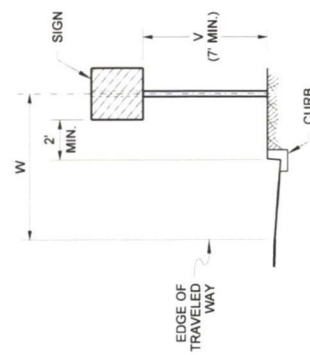
SIGN INSTALLATION
ON STEEP FILL SLOPES



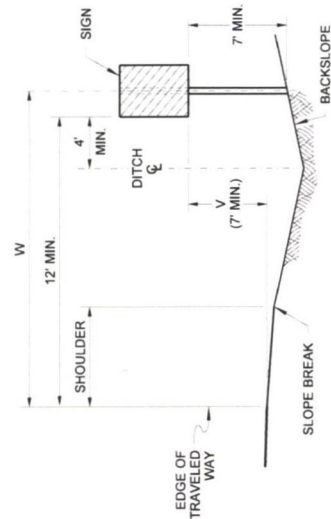
SIGN INSTALLATION
BEHIND TRAFFIC BARRIER



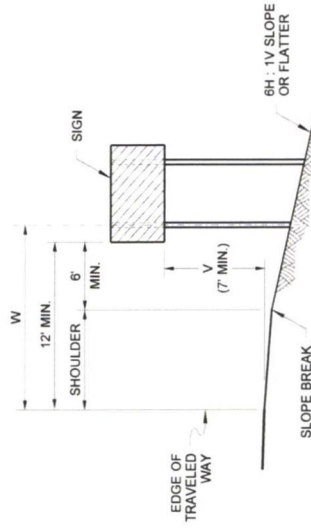
SIGN WITH SUPPLEMENTAL
PLAQUE INSTALLATION
IN FILL SECTION



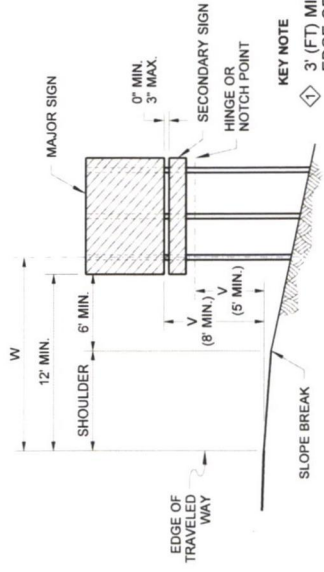
SIGN INSTALLATION
IN CURB SECTION



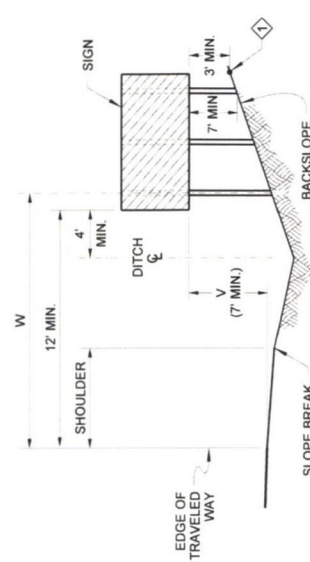
SIGN INSTALLATION
IN DITCH SECTION



MULTIPLE SIGN POST INSTALLATION
IN FILL SECTION



GUIDE OR DIRECTIONAL SIGN WITH
SECONDARY SIGN INSTALLATION ON
EXPRESSWAYS AND FREEWAYS



MULTIPLE SIGN POST INSTALLATION
IN DITCH SECTION



Aug 20, 2021

GROUND MOUNTED SIGN PLACEMENT STANDARD PLAN G-20.10-03

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Aug 20, 2021

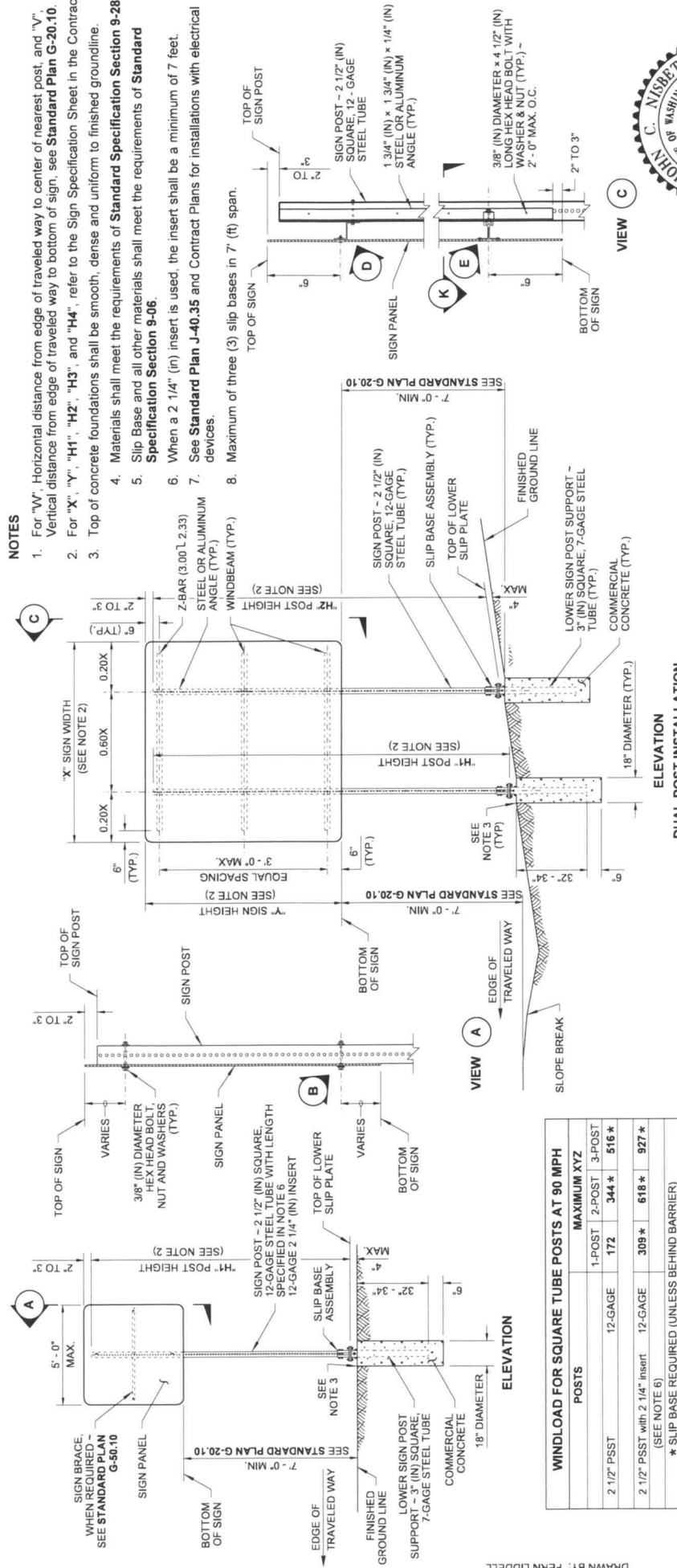
STATE DESIGN ENGINEER

Washington State Department of Transportation



NOTES

- For "W", Horizontal distance from edge of traveled way to center of nearest post, and "V", Vertical distance from edge of traveled way to bottom of sign, see **Standard Plan G-20.10**.
- For "X", "Y", "H1", "H2", "H3", and "H4", refer to the Sign Specification Sheet in the Contract.
- Top of concrete foundations shall be smooth, dense and uniform to finished groundline.
- Materials shall meet the requirements of **Standard Specification Section 9-28**.
- Slip Base and all other materials shall meet the requirements of **Standard Specification Section 9-06**.
- When a 2 1/4" (in) insert is used, the insert shall be a minimum of 7 feet.
- See **Standard Plan J-40.35** and Contract Plans for installations with electrical devices.
- Maximum of three (3) slip bases in 7' (ft) span.

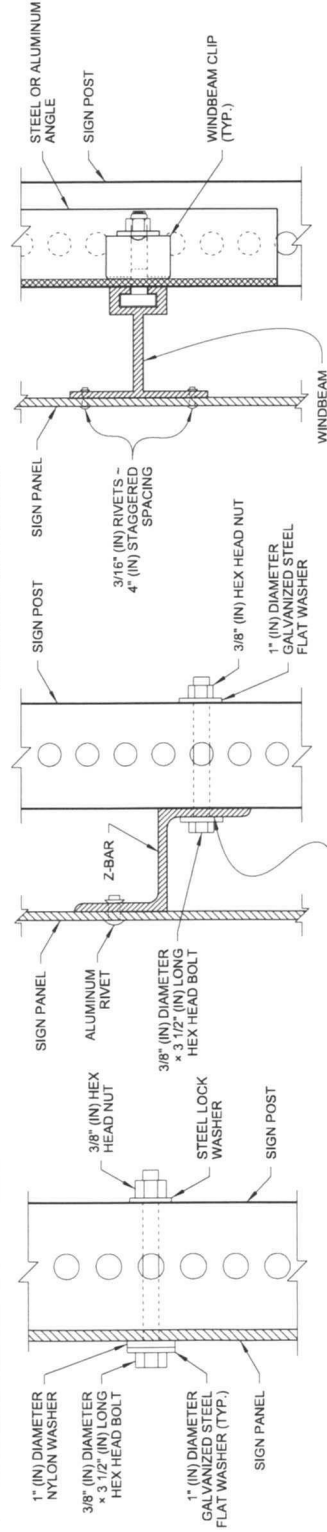


Nisbet, John
STEEL SIGN SUPPORT
TYPES SB-1, SB-2 & SB-3
INSTALLATION DETAILS
STANDARD PLAN G-24.40-07

SHEET 1 OF 6 SHEETS

APPROVED FOR PUBLICATION
 Carpenter, Jeff
 Jan 25, 2018 10:39 AM
 STATE DESIGN ENGINEER
 Washington State Department of Transportation

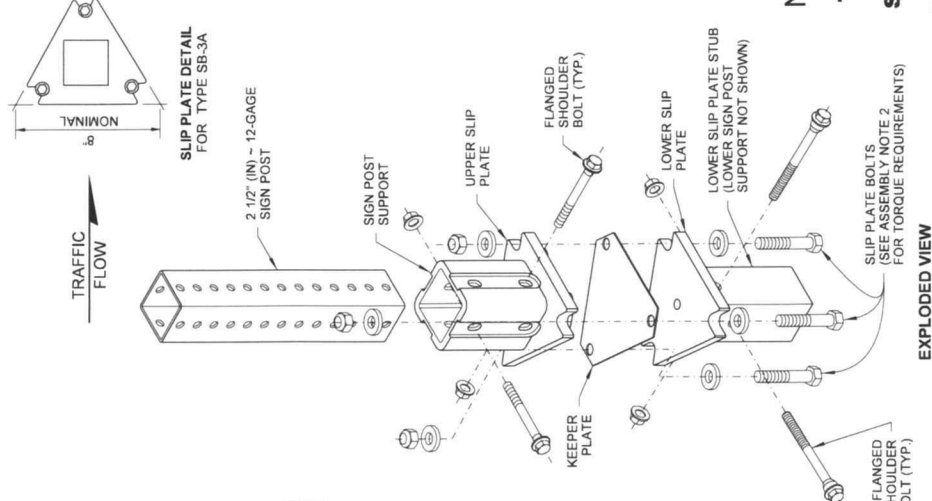
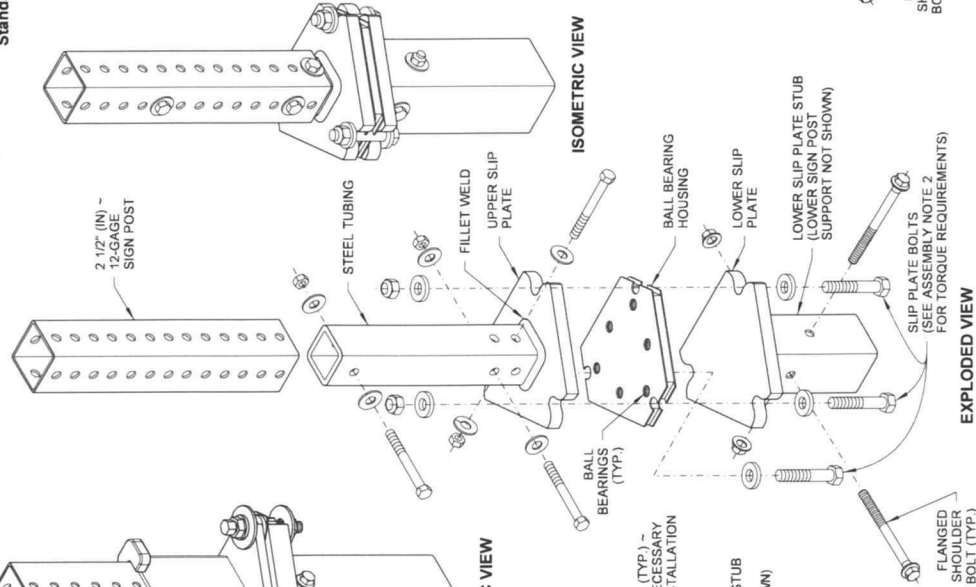
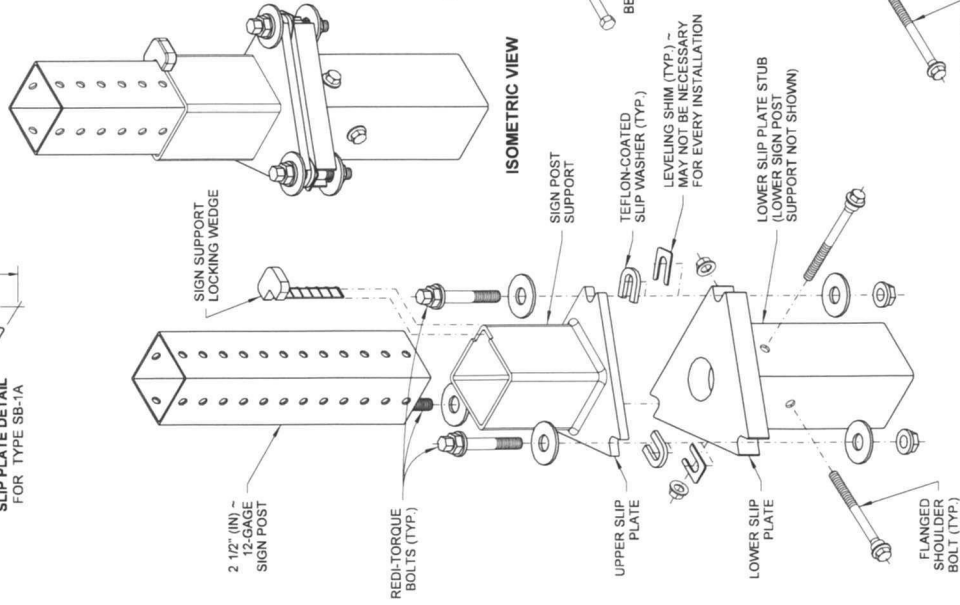
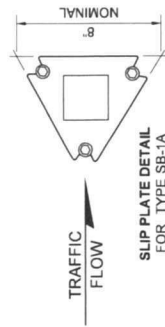
ELEVATION



STEEL SIGN SUPPORT TYPES SB-1, SB-2 & SB-3 ~ 8" (IN)

ASSEMBLY NOTES

1. Dimensions for the parts used to assemble the base connections are intentionally not shown. Base connections are patented, manufactured products that are in compliance with NCHRP 350 crash test criteria. The base connection details are shown on this plan only to illustrate how the parts are assembled.
2. Do not tighten any single Slip Plate Bolt to the recommended torque before pretightening the other bolts. Progressively tighten the three Slip Plate Bolts in 10 ft-lb increments, alternately, to a final torque of 40 ft-lbs on each.
3. Slip Base assembly and all other materials shall meet the requirements of **Standard Specification Sections 9-06 and 9-28.**



Nisbet, John
**STEEL SIGN SUPPORT
 TYPES SB-1, SB-2 & SB-3
 INSTALLATION DETAILS**
STANDARD PLAN G-24.40-07

SHEET 2 OF 6 SHEETS

APPROVED FOR PUBLICATION

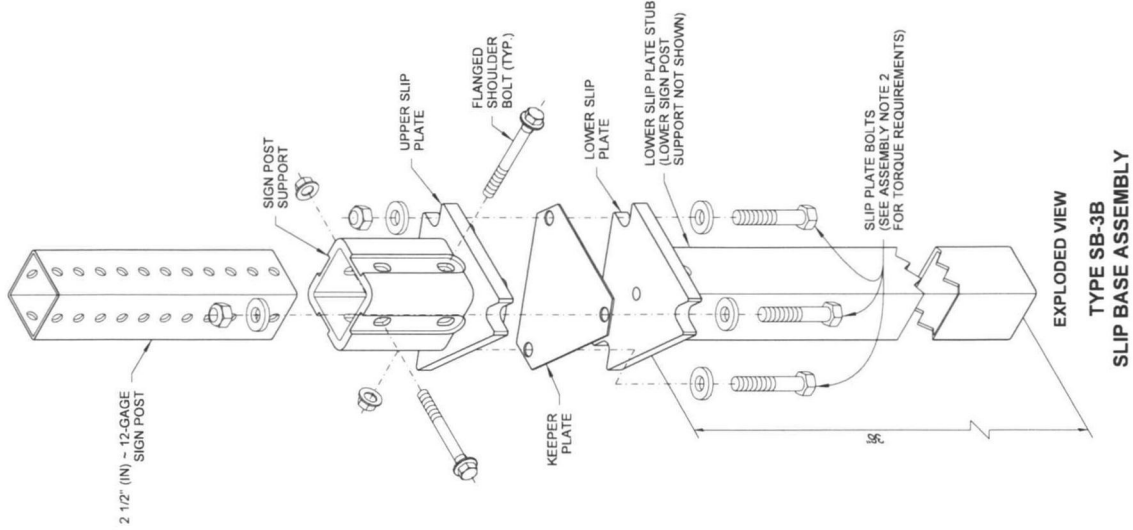
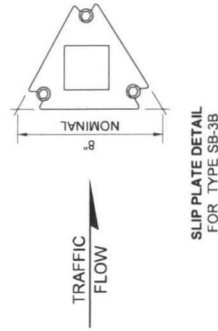
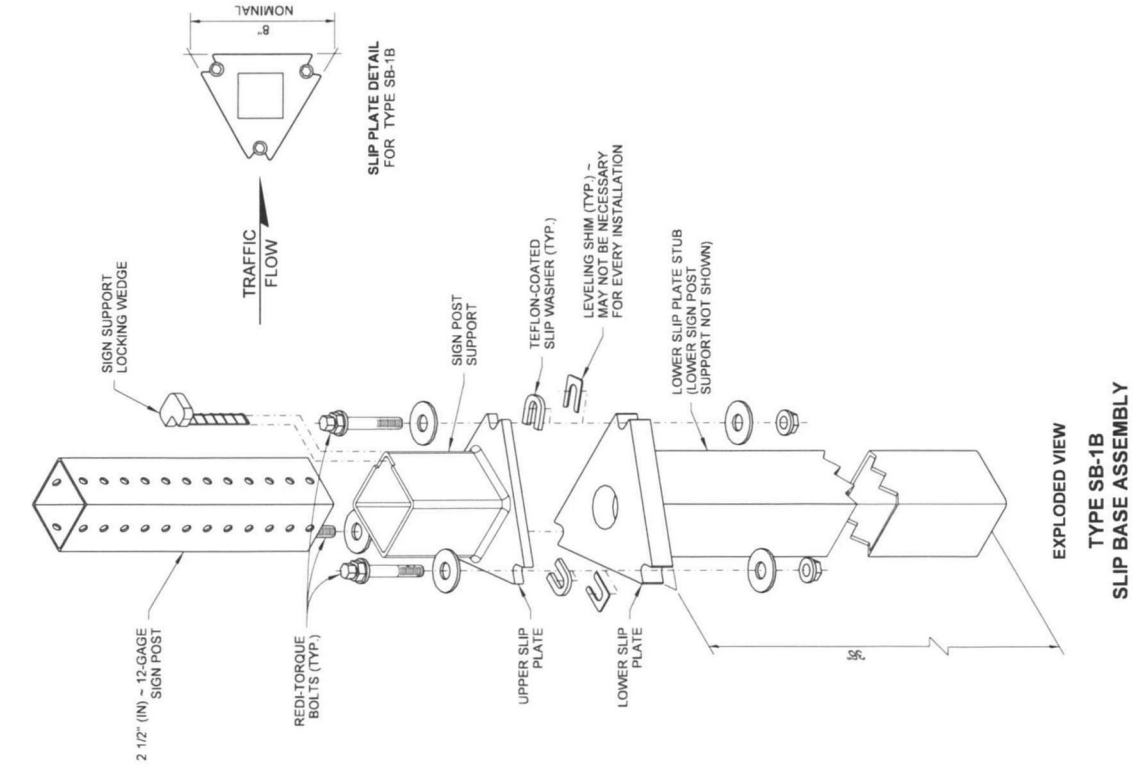
Engineer Jeff
 June 29, 2018 10:40 AM

STATE DESIGN ENGINEER

Washington State Department of Transportation

ASSEMBLY NOTES

1. Dimensions for the parts used to assemble the base connections are intentionally not shown. Base connections are patented, manufactured products that are in compliance with NCHRP 350 crash test criteria. The base connection details are shown on this plan only to illustrate how the parts are assembled.
2. Do not tighten any single Slip Plate Bolt to the recommended torque before pretightening the other bolts. Progressively tighten the three Slip Plate Bolts in 10 ft-lb increments, alternately, to a final torque of 40 ft-lbs on each.
3. Slip Base assembly and all other materials shall meet the requirements of **Standard Specification Sections 9-06 and 9-28.**



Nisbet, John
STEEL SIGN SUPPORT
TYPES SB-1, SB-2 & SB-3
INSTALLATION DETAILS
STANDARD PLAN G-24.40-07

SHEET 3 OF 6 SHEETS

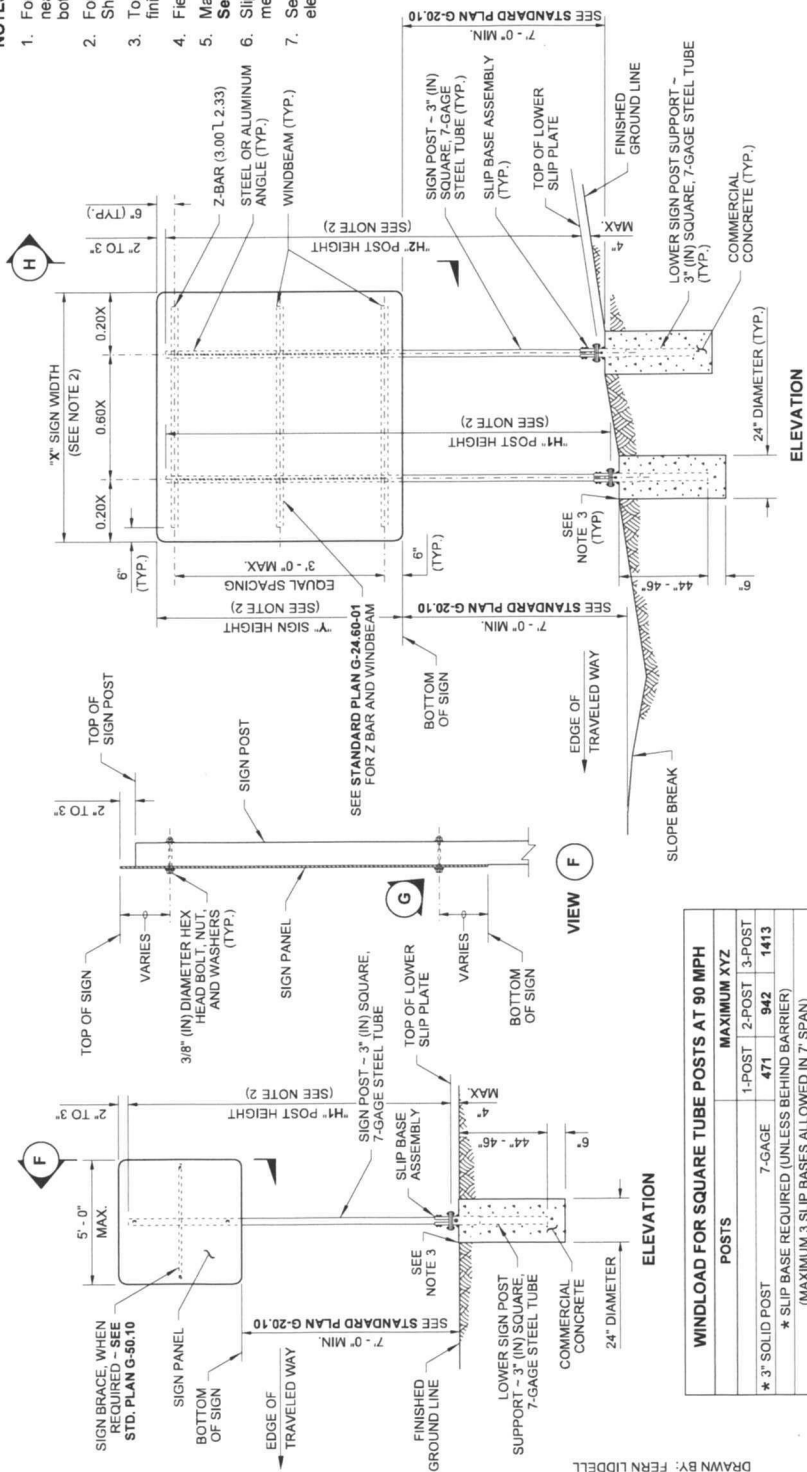
APPROVED FOR PUBLICATION
 L. Nisbet, J.E.
 Jun 25, 2018 10:40 AM

STATE DESIGN ENGINEER
 Washington State Department of Transportation

STEEL SIGN SUPPORT TYPES SB-1B, & SB-3B ~ 8" (IN)
(UNIBASE)

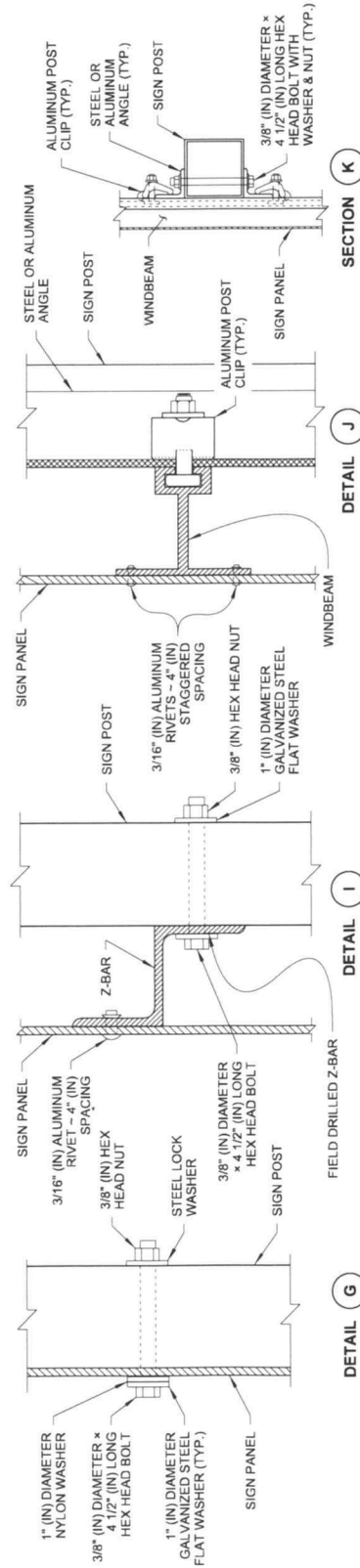
NOTES

- For "W", Horizontal distance from edge of traveled way to center of nearest post, and "V", Vertical distance from edge of traveled way to bottom of sign, see **Standard Plan G-20.10**.
- For "X", "Y", "H1", "H2", "H3", and "H4", refer to the Sign Specification Sheet in the Contract.
- Top of concrete foundation shall be smooth, dense, and uniform to finished ground line.
- Field drill posts to accept angle and cold galvanized holes.
- Materials shall meet the requirements of **Standard Specification Section 9-28**.
- Slip Base assembly and all other materials shall meet the requirements of **Standard Specification Sections 9-06 and 9-28**.
- See **Standard Plan J-40.35** and Contract Plans for installations with electrical devices.



Nisbet, John
STEEL SIGN SUPPORT
TYPES SB-1, SB-2 & SB-3
INSTALLATION DETAILS
STANDARD PLAN G-24.40-07

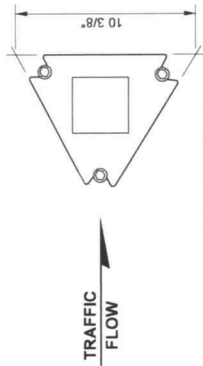
SHEET 4 OF 6 SHEETS
 APPROVED FOR PUBLICATION
 Carpenter, Jeff
 Jan 30, 2018 10:46 AM
 STATE DESIGN ENGINEER
 Washington State Department of Transportation



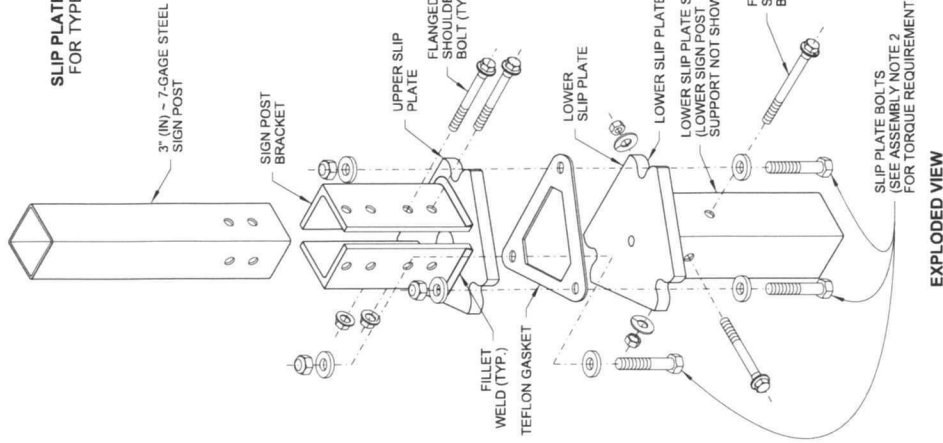
STEEL SIGN SUPPORT TYPES SB-1, SB-2 & SB-3 ~ 10" (IN)

ASSEMBLY NOTES

1. Dimensions for the parts used to assemble the base connections are intentionally not shown. Base connections are patented, manufactured products that are in compliance with NCHRP 350 crash test criteria. The base connection details are shown on this plan only to illustrate how the parts are assembled.
2. Do not tighten any single Slip Plate Bolt to the recommended torque before pretightening the other bolts. Progressively tighten the three Slip Plate Bolts in 10 ft-lb increments, alternately, to a final torque of 40 ft-lbs on each.
3. Use only Slip Base manufacturer supplied hardware that meets the requirements of Standard Specification Sections 9-06 and 9-28.

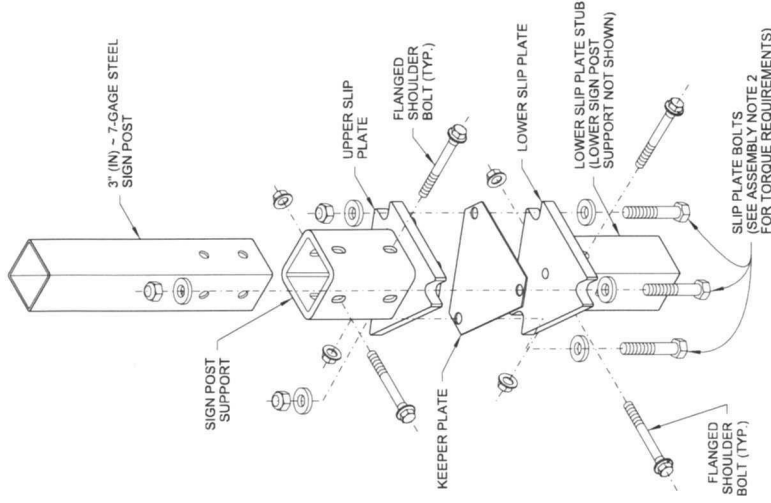


SLIP PLATE DETAIL
FOR TYPE SB-1A



EXPLODED VIEW

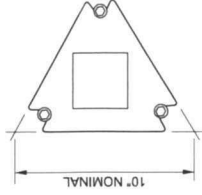
TYPE SB-1A
SLIP BASE ASSEMBLY



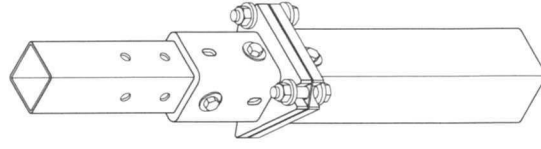
EXPLODED VIEW

TYPE SB-3A
SLIP BASE ASSEMBLY

TRAFFIC
FLOW



SLIP PLATE DETAIL
FOR TYPE SB-3A



ISOMETRIC VIEW



Nisbet, John
STEEL SIGN SUPPORT
TYPES SB-1, SB-2 & SB-3
INSTALLATION DETAILS
STANDARD PLAN G-24.40-07

SHEET 5 OF 6 SHEETS

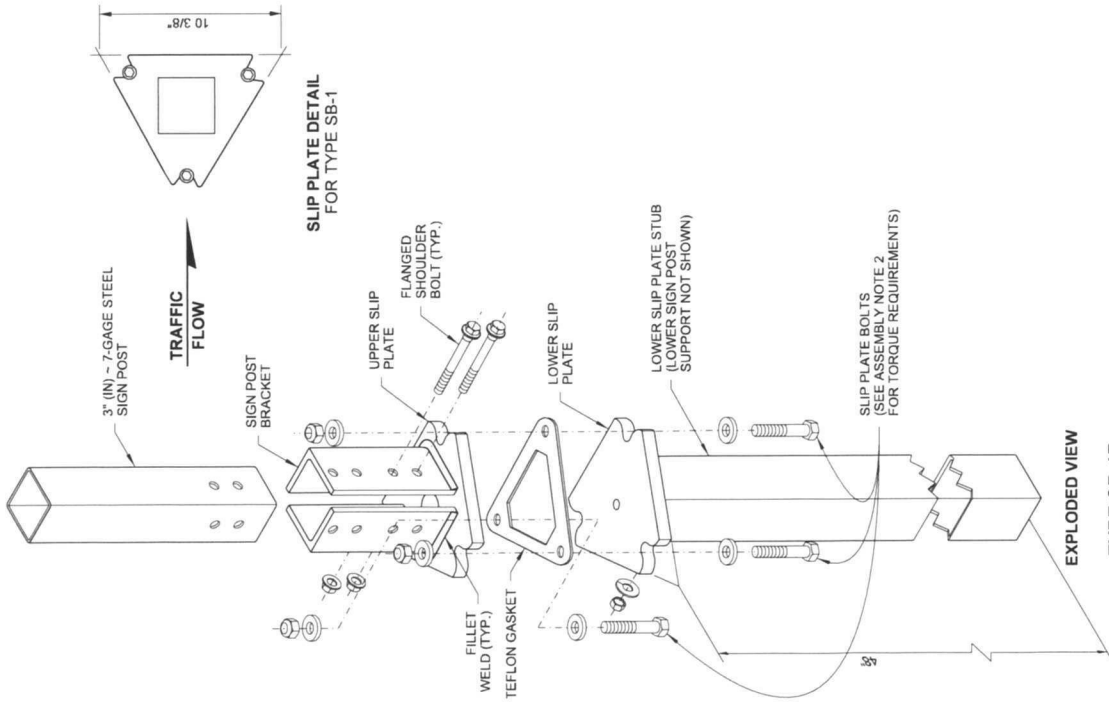
APPROVED FOR PUBLICATION
Carpenter, Jeff
Jun 25, 2018 10:40 AM



STEEL SIGN SUPPORT TYPES SB-1A & SB-3A ~ 10" (IN)

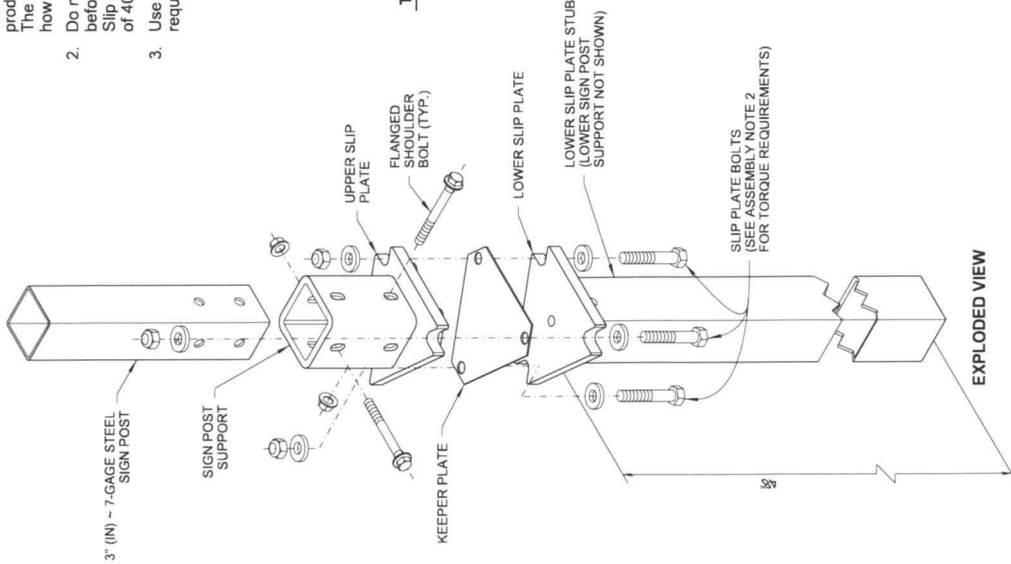
ASSEMBLY NOTES

1. Dimensions for the parts used to assemble the base connections are intentionally not shown. Base connections are patented, manufactured products that are in compliance with NCHRP 350 crash test criteria. The base connection details are shown on this plan only to illustrate how the parts are assembled.
2. Do not tighten any single Slip Plate Bolt to the recommended torque before pretightening the other bolts. Progressively tighten the three Slip Plate Bolts in 10 ft-lb increments, alternately, to a final torque of 40 ft-lbs on each.
3. Use only Slip Base manufacturer supplied hardware that meets the requirements of **Standard Specification Sections 9-06 and 9-28.**



SLIP PLATE DETAIL
FOR TYPE SB-1

SLIP PLATE DETAIL
FOR TYPE SB-3



TYPE SB-3B
SLIP BASE ASSEMBLY

STEEL SIGN SUPPORT TYPE SB-1B & SB-3B ~ 10" (IN)
(UNIBASE)

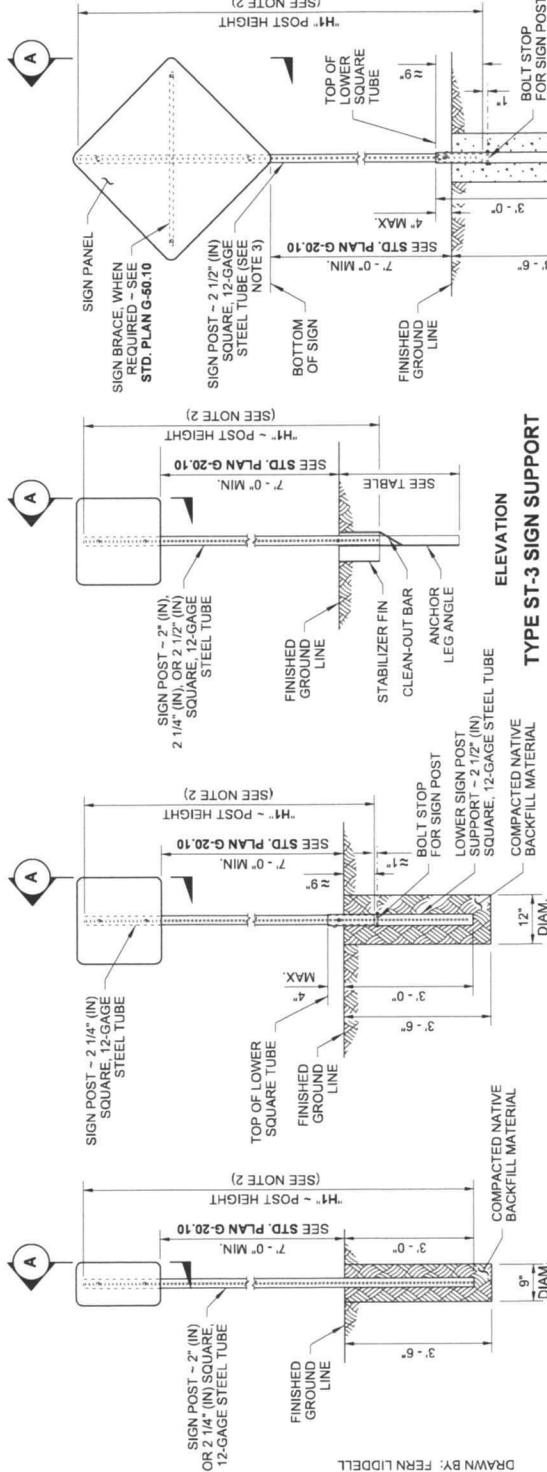


Nisbet, John
STEEL SIGN SUPPORT
TYPES SB-1, SB-2 & SB-3
INSTALLATION DETAILS
STANDARD PLAN G-24.40-07

SHEET 6 OF 6 SHEETS
APPROVED FOR PUBLICATION
Carpenter, Jeff
Jan 28, 2018 10:40 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation

NOTES

- Dimensions for the parts used to assemble the base connections are intentionally not shown. Base connections are patented, manufactured products that are in compliance with NCHRP 350 crash test criteria. The base connection details are shown on this plan only to illustrate how the parts are assembled.
- For "H1", refer to the Sign Specification Sheet in the Contract.
- A 2" (in) post with a 2 1/4" (in) PSST anchor or a 2 1/4" (in) post with a 2 1/2" (in) PSST anchor may be substituted. See Contract Plans.
- Perforated square steel post shall meet the requirements of **Standard Specification, Section 9-06**.
- Use only base connection manufacturer supplied hardware that meets the requirements of **Standard Specification, Sections 9-06 and 9-28**.

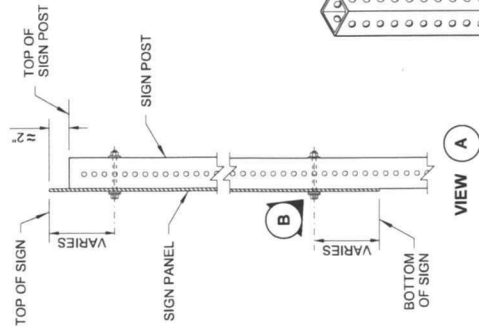


BURIED DEPTH	POST SIZE
2' - 6"	2" x 2 1/4"
3' - 0"	2 1/2"

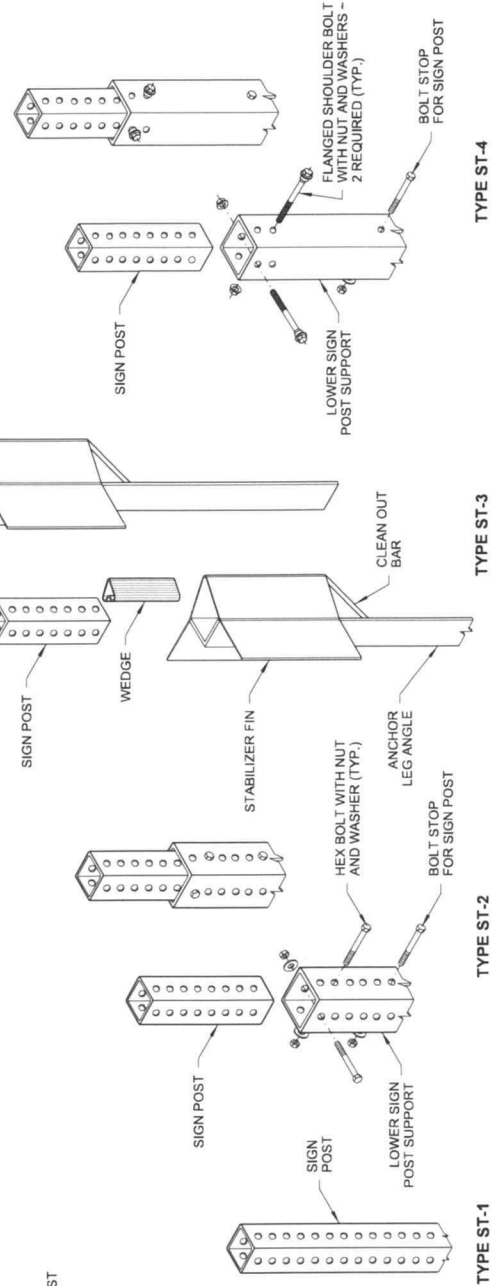
ELEVATION
TYPE ST-1 SIGN SUPPORT

ELEVATION
TYPE ST-2 SIGN SUPPORT

ELEVATION
TYPE ST-3 SIGN SUPPORT



ELEVATION
TYPE ST-4 SIGN SUPPORT



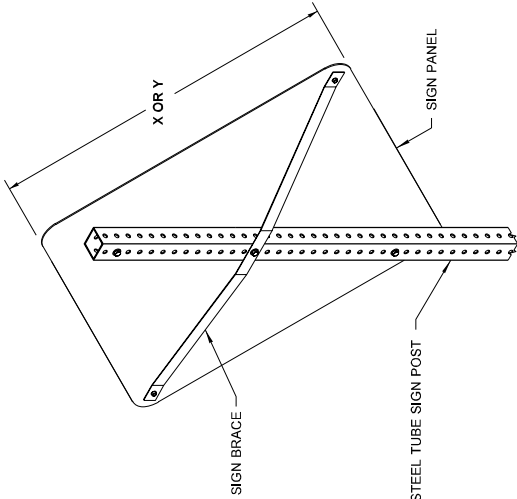
STEEL SIGN SUPPORT
TYPES ST-1 - ST-4
INSTALLATION DETAILS
STANDARD PLAN G-24.50-05

SHEET 1 OF 1 SHEET

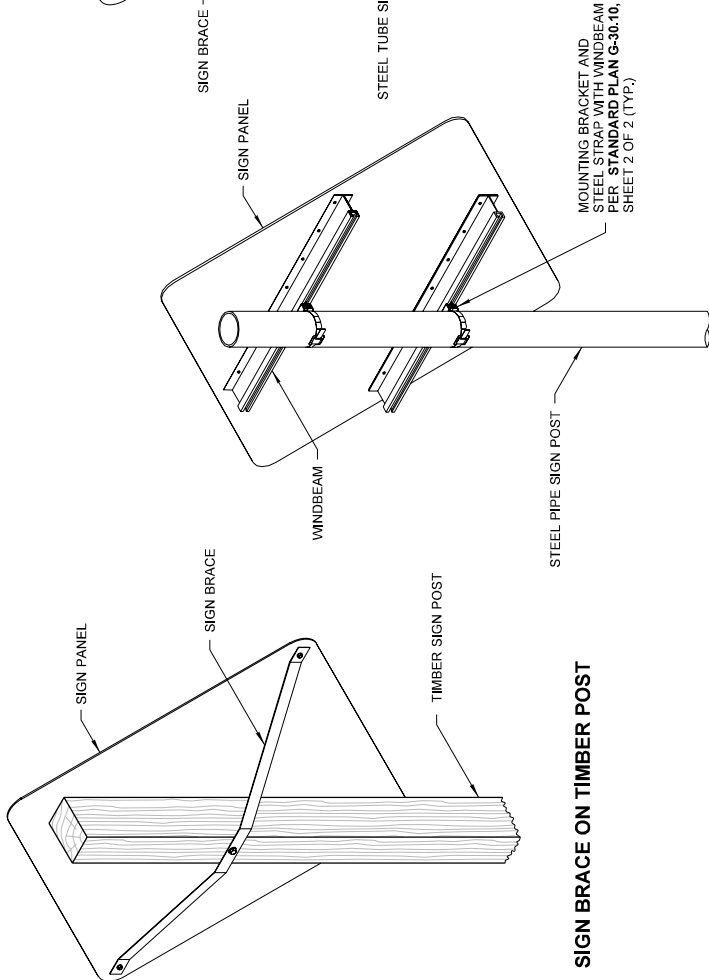
APPROVED FOR PUBLICATION
Rusk, Steve
Aug 7 2019 11:54 AM
STATE DESIGN ENGINEER
Washington State Department of Transportation

NOTES

1. Mounting brackets with steel straps shall be a stainless steel band and buckle system product or an approved equal. Mounting brackets shall be one bolt, flared leg; steel straps shall be 3/4" (in) wide and 0.030" (in) thick.
2. Sign braces are required for sign widths of 48" (in) or greater. For sign widths of 36" (in) or less, sign braces are only required when specified in the contract.
3. Sign braces are typically necessary on large sign panels that are exposed to high winds, traffic generated wind buffeting, or when snow thrown from plows might impact the sign.
4. A nylon washer shall be placed between the sign and the steel washer when the sign face has Type III, IV, VII or IX sheeting.
5. Signs 48" (in) or greater can be pinned together, back to back.
6. For signs installed back to back on a single post, no bracing is required.

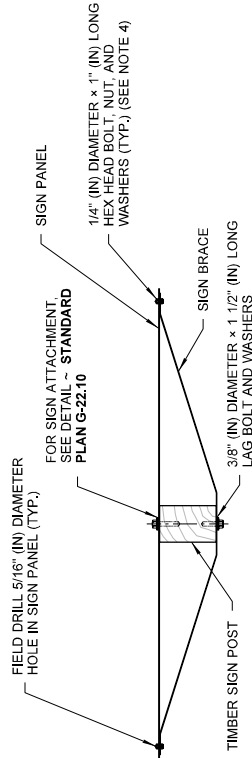


SIGN BRACE ON STEEL TUBE

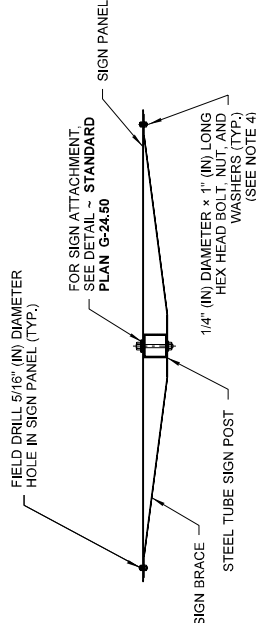


SIGN BRACE ON TIMBER POST

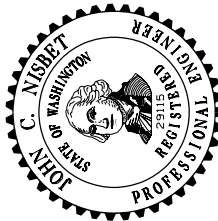
SIGN BRACE ON STEEL PIPE



PLAN



PLAN



Nisbet, John
 Digitally signed by Nisbet, John
 Date: 2016.06.27 11:42:32
 4700

SIGN BRACING

STANDARD PLAN G-50.10-03

SHEET 1 OF 2 SHEETS

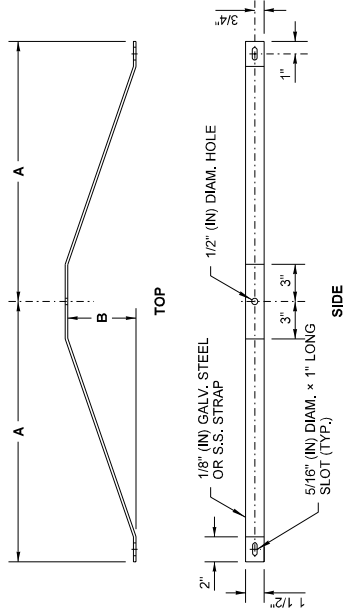
APPROVED FOR PUBLICATION
 Carpenter, Jeff
 Jun 28 2016 10:37 AM

STATE DESIGN ENGINEER
 Washington State Department of Transportation

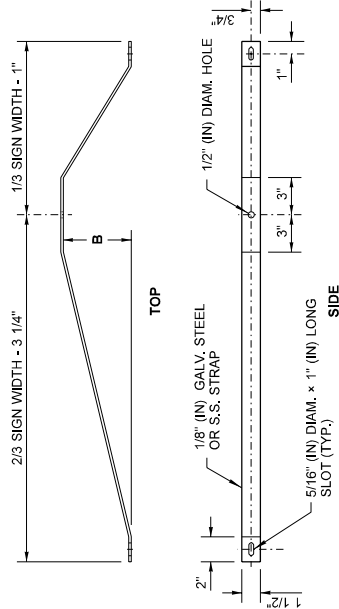
SIGN BRACE DIMENSIONS				
		SIGN TYPE		
		YIELD	DIAMOND-SHAPED	OTHERS
A	1/3 SIGN WIDTH - 1 3/4"	1/2 SIGN WIDTH - 2 1/4"	1/2 SIGN WIDTH - 1"	
SIGN POST TYPE				
	4x6 OR 6x6 TIMBER POST	6x8 TIMBER POST	3" DIAM. STEEL PIPE	2 1/2" SQUARE TUBE
B	5 1/2"	7 1/2"	4 3/4"	2 1/2"

NOTE

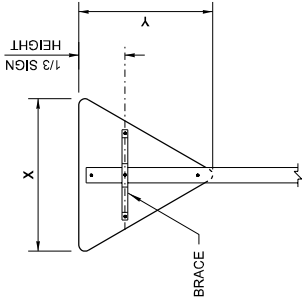
1. For sign installations on round steel posts, see **Standard Plan G-30.10, sheet 2 of 2.**



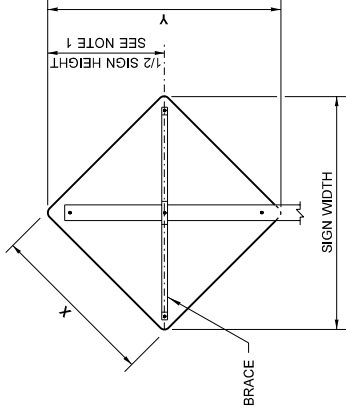
SIGN BRACE DETAIL



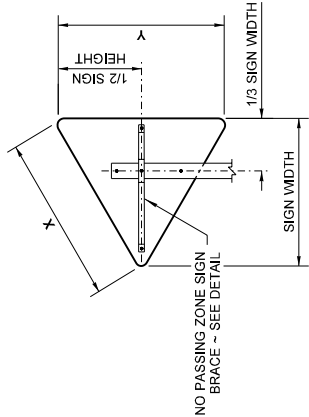
NO PASSING ZONE SIGN BRACE DETAIL



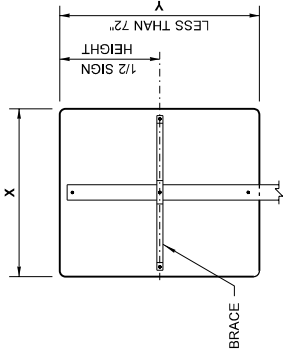
YIELD SIGN



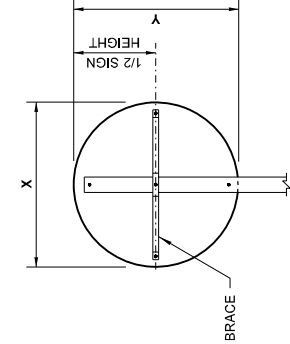
DIAMOND-SHAPED SIGN



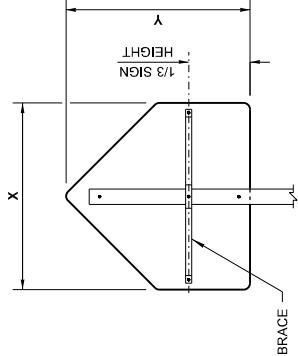
NO PASSING ZONE SIGN



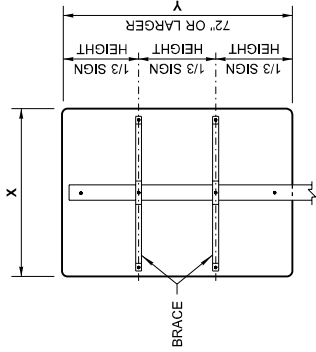
SMALL RECTANGULAR SIGN



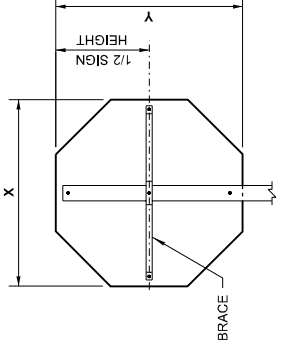
RAILROAD WARNING SIGN



SCHOOL ZONE SIGN



LARGE RECTANGULAR SIGN



STOP SIGN



Nisbet, John
Digitally signed by Nisbet, John
Date: 2016.06.27 11:42:51
-0700

SIGN BRACING

STANDARD PLAN G-50.10-03

SHEET 2 OF 2 SHEETS

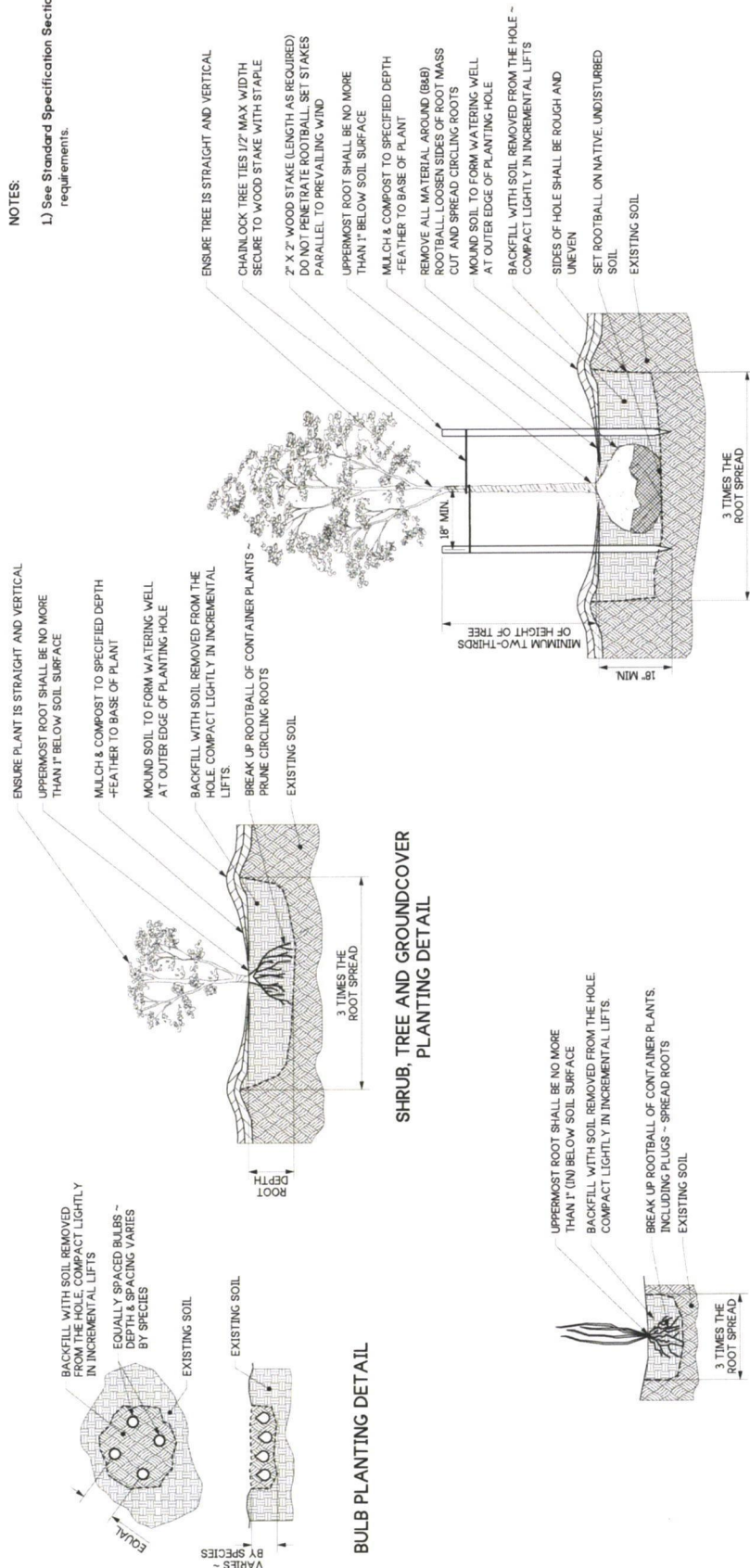
APPROVED FOR PUBLICATION
Carpenter, Jeff
Jun 28 2016 10:38 AM

STATE DESIGN ENGINEER
Washington State Department of Transportation

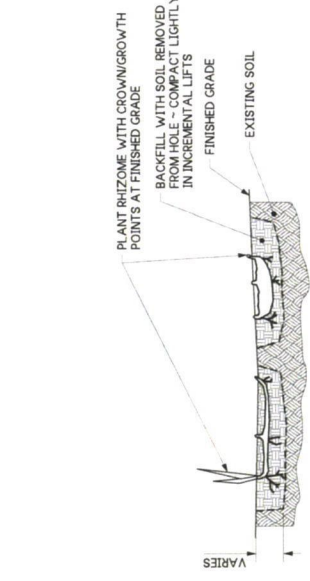
SIGN BRACE PLACEMENT

NOTES:

1.) See Standard Specification Section 8-02.3(8) and 9-14.7 for additional requirements.



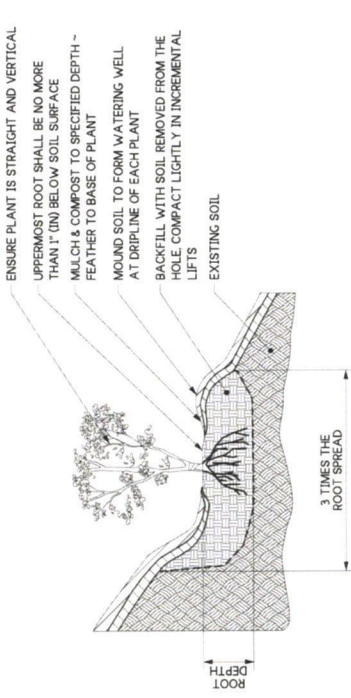
EMERGENT PLANTING DETAIL



TUBER OR RHIZOME PLANTING DETAIL



STREET TREE PLANTING DETAIL



SHRUB, TREE AND GROUNDCOVER SLOPE PLANTING DETAIL



May 31, 2024
**TREE, SHRUB AND GROUNDCOVER
 PLANTING DETAILS**
 STANDARD PLAN H-10.10-01

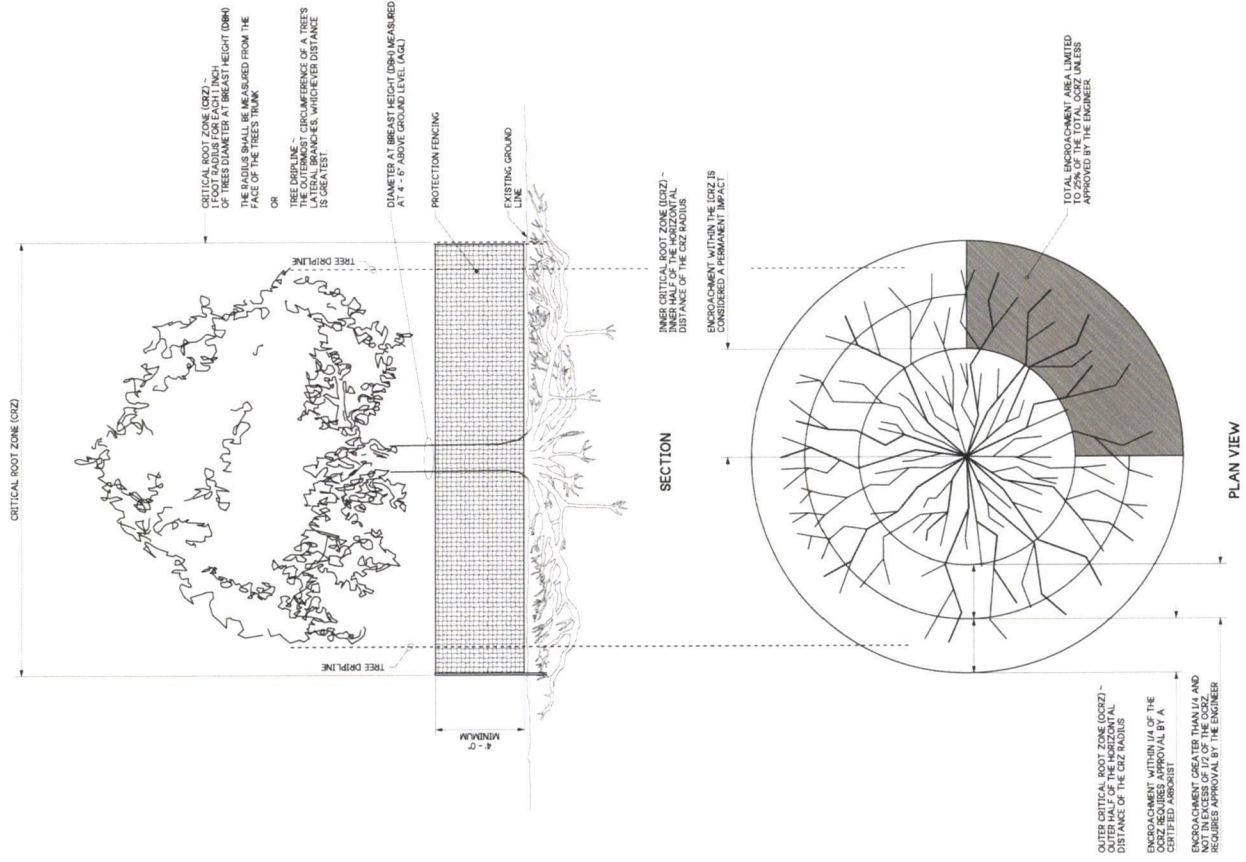
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
 Jun 2, 2024
Mark A. Flansburg
 STATE DESIGN ENGINEER

Washington State
 Department of Transportation

NOTES:

1. Limits of protection fencing shall extend to the greatest distance from protected trees trunk as needed to perform the work.
2. Adjustments to the critical root zone require certified arborist approval. Encroachments within the identified critical root zone requires review approval by a certified arborist.
3. Protection fencing shown on plans is diagrammatic. All protection fencing locations shall be field verified by the Engineer prior to installation.
4. Protection fencing shall be inspected by the Engineer after installation for final approval.
5. Protection measures shall remain intact at all times during construction unless directed otherwise by the Engineer.
6. See Section I-0716(2) for additional protection measures.



May 31, 2024

TREE PROTECTION DETAIL

STANDARD PLAN H-10.11-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

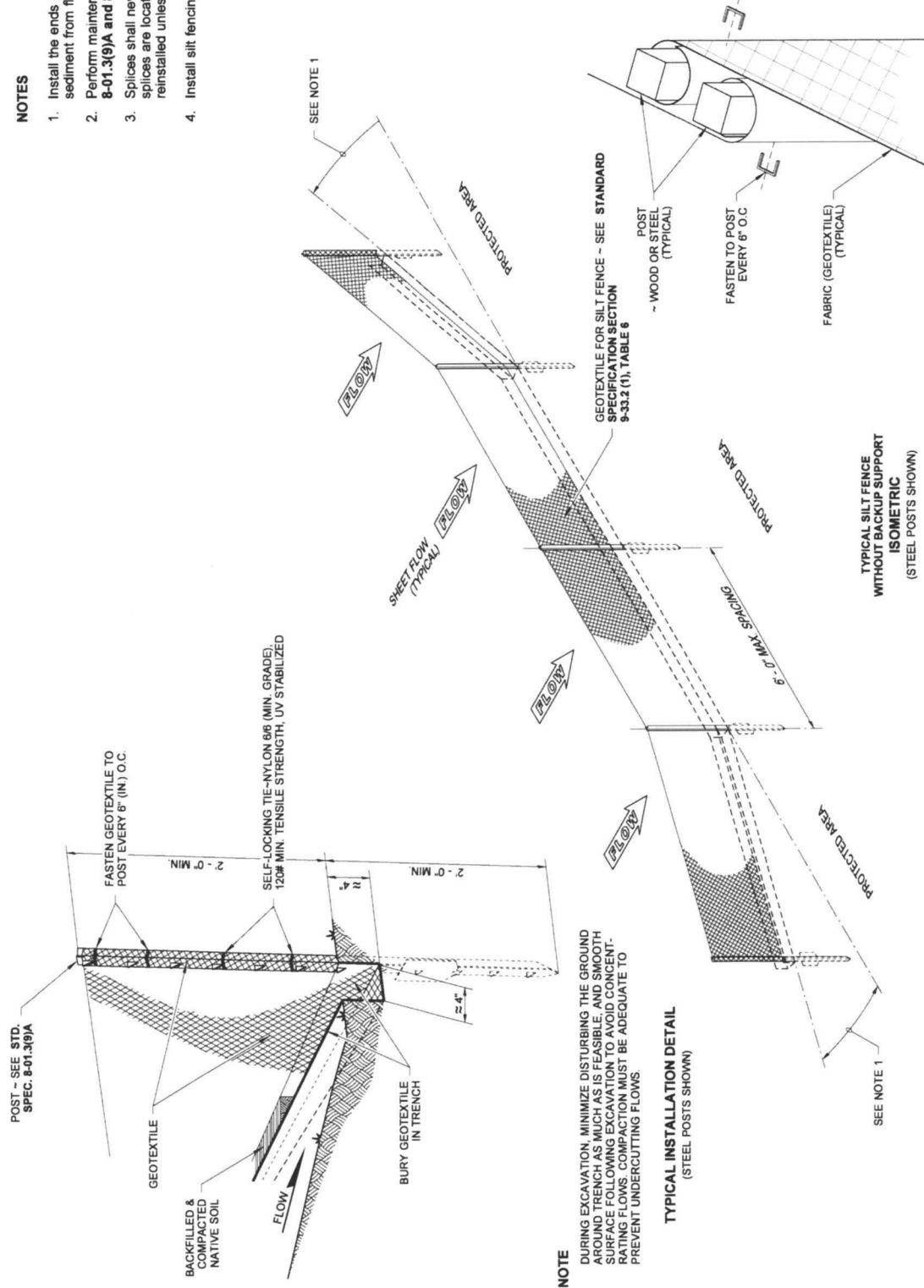
Jun 2, 2024

STATE DESIGN ENGINEER

Washington State
Department of Transportation

NOTES

1. Install the ends of the silt fence to point slightly upslope to prevent sediment from flowing around the ends of the fence.
2. Perform maintenance in accordance with **Standard Specifications 8-01.3(9)A and 8-01.3(15)**.
3. Splices shall never be placed in low spots or sump locations. If splices are located in low or sump areas, the fence may need to be reinstalled unless the Project Engineer approves the installation.
4. Install silt fencing parallel to mapped contour lines.



NOTE

DURING EXCAVATION, MINIMIZE DISTURBING THE GROUND AROUND TRENCH AS MUCH AS IS FEASIBLE, AND SMOOTH SURFACE FOLLOWING EXCAVATION TO AVOID CONCENTRATING FLOWS. COMPACTION MUST BE ADEQUATE TO PREVENT UNDERCUTTING FLOWS.

TYPICAL INSTALLATION DETAIL (STEEL POSTS SHOWN)



STATE OF
WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT

SANDRA L. SALISBURY
CERTIFICATE NO. 000860

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT. IT IS A DESIGN DOCUMENT. IT IS THE RESPONSIBILITY OF THE USER TO OBTAIN NECESSARY PERMITS AND APPROVALS FOR PUBLICATION, OR NOT TO PUBLISH AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

SILT FENCE

STANDARD PLAN I-30.15-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III 3/22/13

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

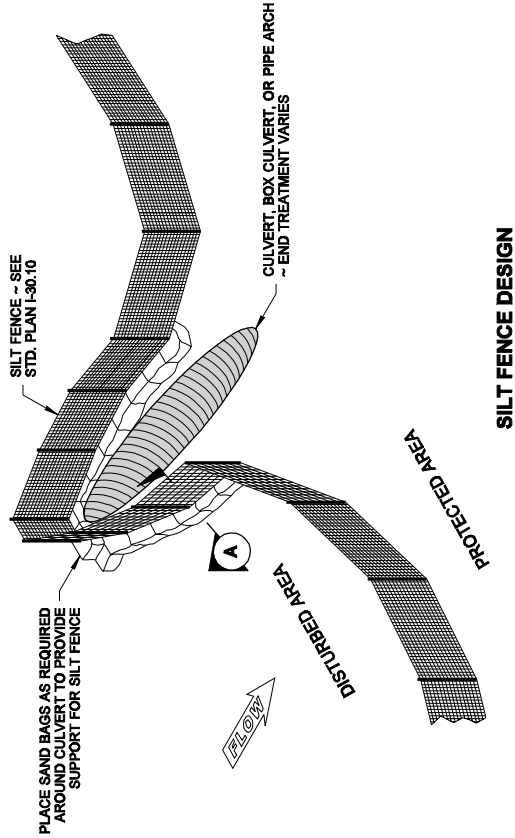
SPliced FENCE SECTIONS SHALL BE CLOSE ENOUGH TOGETHER TO PREVENT SILT LADEN WATER FROM ESCAPING THROUGH THE FENCE AT THE OVERLAP.

SPlice DETAIL (WOOD POSTS SHOWN)

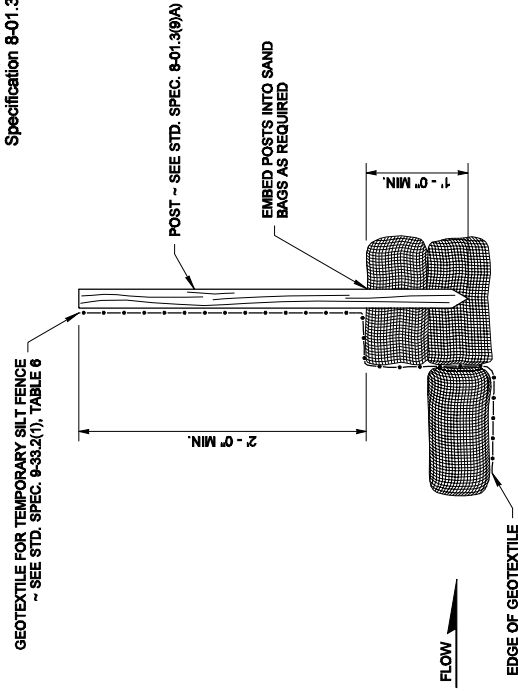
TYPICAL SILT FENCE
WITHOUT BACKUP SUPPORT
ISOMETRIC
(STEEL POSTS SHOWN)

NOTE

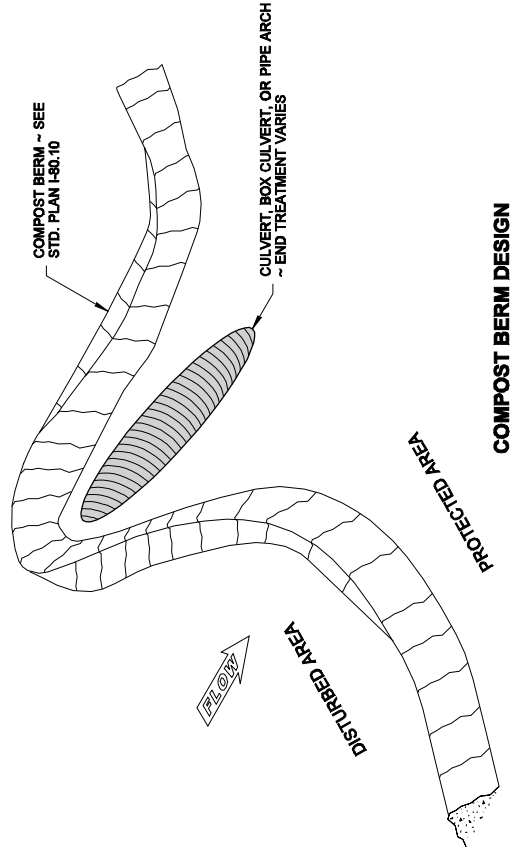
Perform maintenance in accordance with Standard Specification 8-01.3(9)(A) and 8-01.3(15).



SILT FENCE DESIGN



SECTION A



COMPOST BERM DESIGN



STATE OF
WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT

MARK W. MAURER
CERTIFICATE NO. 000598

NOTE: THIS PLAN IS NOT A LEGAL INSTRUMENT. IT IS NOT A CONTRACT. IT IS NOT A WARRANTY. IT IS NOT A GUARANTEE. IT IS NOT A REPRESENTATION. IT IS NOT A STATEMENT OF OPINION. IT IS NOT A STATEMENT OF FACT. IT IS NOT A STATEMENT OF LAW. IT IS NOT A STATEMENT OF POLICY. IT IS NOT A STATEMENT OF PROCEDURE. IT IS NOT A STATEMENT OF PRACTICE. IT IS NOT A STATEMENT OF RESULTS. IT IS NOT A STATEMENT OF PERFORMANCE. IT IS NOT A STATEMENT OF EFFICIENCY. IT IS NOT A STATEMENT OF EFFECTIVENESS. IT IS NOT A STATEMENT OF IMPACT. IT IS NOT A STATEMENT OF RISK. IT IS NOT A STATEMENT OF LIABILITY. IT IS NOT A STATEMENT OF DAMAGES. IT IS NOT A STATEMENT OF REMEDY. IT IS NOT A STATEMENT OF PREVENTION. IT IS NOT A STATEMENT OF CORRECTION. IT IS NOT A STATEMENT OF IMPROVEMENT. IT IS NOT A STATEMENT OF ENHANCEMENT. IT IS NOT A STATEMENT OF MAINTENANCE. IT IS NOT A STATEMENT OF REPAIR. IT IS NOT A STATEMENT OF REPLACEMENT. IT IS NOT A STATEMENT OF RESTORATION. IT IS NOT A STATEMENT OF PRESERVATION. IT IS NOT A STATEMENT OF PROTECTION. IT IS NOT A STATEMENT OF PROMOTION. IT IS NOT A STATEMENT OF PROSECUTION. IT IS NOT A STATEMENT OF PROSECUTOR. IT IS NOT A STATEMENT OF PROSECUTION. IT IS NOT A STATEMENT OF PROSECUTOR.

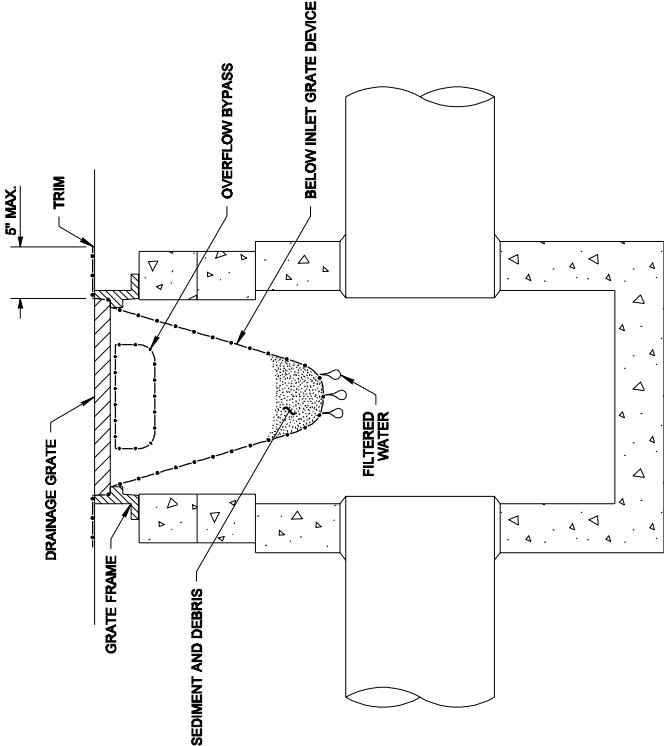
EROSION CONTROL
AT CULVERT ENDS
STANDARD PLAN I-30.20-00

SHEET 1 OF 1 SHEET

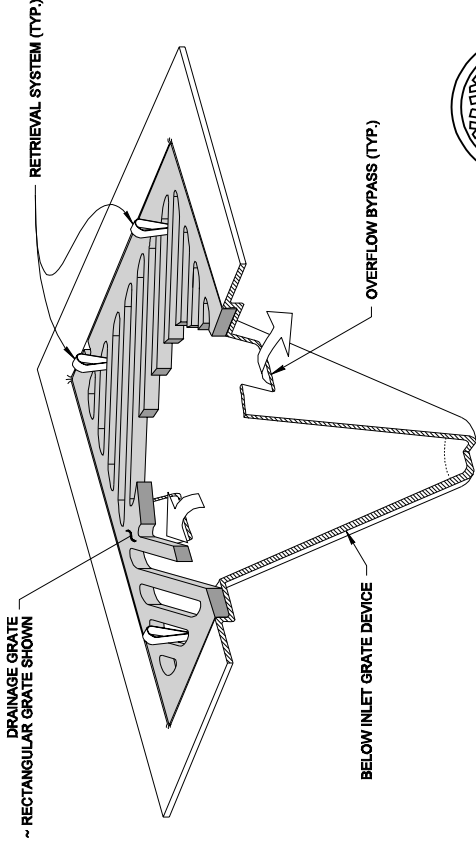
APPROVED FOR PUBLICATION
Pasco Bakotich III 09-20-07
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

NOTES

- 1. Size the Below Inlet Grate Device (BIGD) for the storm water structure it will service.
- 2. The BIGD shall have a built-in high-flow relief system (overflow bypass).
- 3. The retrieval system must allow removal of the BIGD without spilling the collected material.
- 4. Perform maintenance in accordance with Standard Specification 8-01.3(15).



SECTION VIEW
NOT TO SCALE



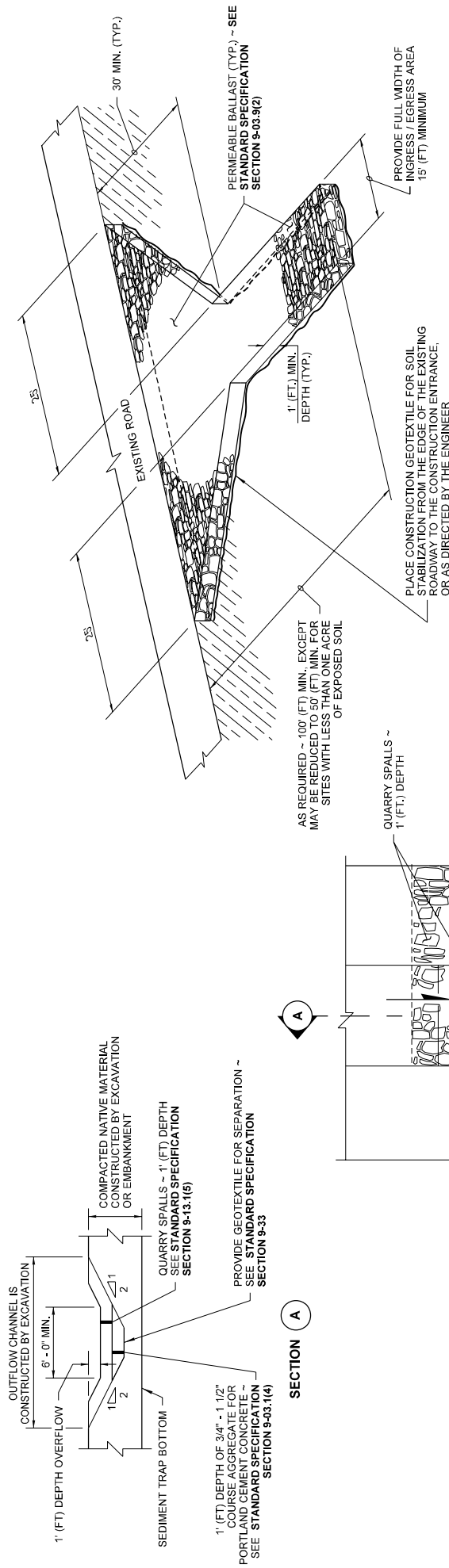
ISOMETRIC VIEW



NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCUMENT. IT IS NOT TO BE USED FOR ANY PURPOSES OTHER THAN THE DESIGN OF THE STORM DRAIN INLET GRATE DEVICE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION. A CERTAIN NUMBER OF COPIES MUST BE KEPT ON FILE.

**STORM DRAIN
INLET PROTECTION
STANDARD PLAN I-40.20-00**
SHEET 1 OF 1 SHEET

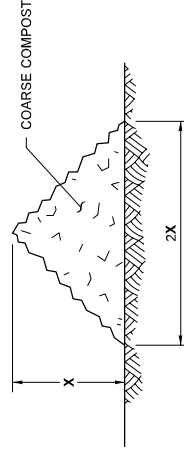
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Pasco Bakotich III 09-20-07
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation



ISOMETRIC VIEW

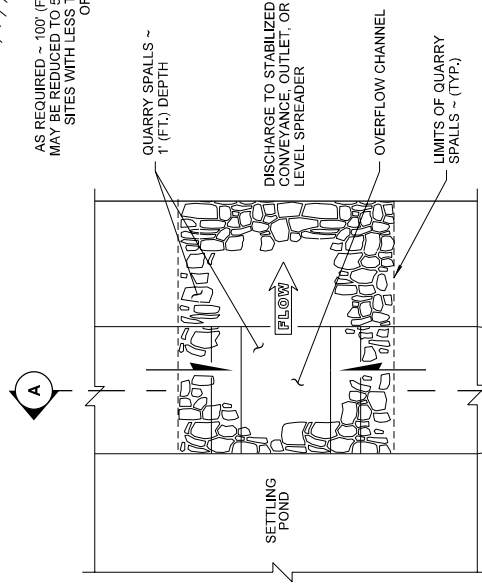
STABILIZED CONSTRUCTION ENTRANCE

STABILIZED CONSTRUCTION ENTRANCE SHALL MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 8-01.3(7).



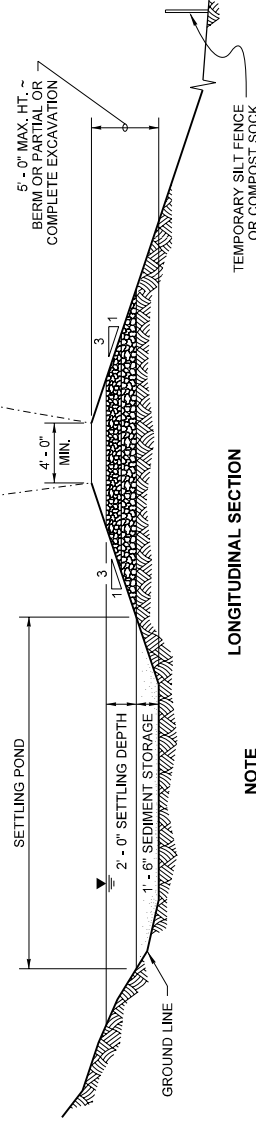
TYPICAL SECTION

COMPOST BERM DETAIL



PARTIAL PLAN VIEW OF BERM

SHOWN LARGER FOR CLARITY



LONGITUDINAL SECTION

TEMPORARY SEDIMENT TRAP



MISCELLANEOUS

EROSION CONTROL DETAILS

STANDARD PLAN I-80.10-02

SHEET 1 OF 1 SHEET

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Carpenter, Jeff
JUL 15 2016 2:28 PM
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NOTES

1. See **Standard Specification Section 9-29.24** (Service Cabinets).
2. Cabinet shall be rated NEMA 3R.
3. Dimensions shown are minimum and shall be adjusted to accommodate the various sizes of equipment installed. A 1" tolerance is allowed for all dimensions.
4. Door shall be pad-lockable and gasketed.
5. Hinges shall have stainless steel or brass pins. See **Standard Plan J-10.20** for door hinge details.
6. When using two piece hinge type on galvanized enclosure, remove hinge pin prior to welding hinge to cabinet and prior to hot-dip galvanizing. After galvanizing, replace pin with brass pin and solder in place. See **Standard Plan J-10.20** for alternate door hinge details.
7. Equipment identified by Key Numbers 2, 3, 4, 6, 7, and 8 shall have an appropriately engraved phenolic name plate attached with screws or rivets. The name plate for Key Number 4 shall read as follows:
"PHOTOCELL BYPASS TEST ON" AND "PHOTOCELL TEST OFF - AUTOMATIC."
See Test Switch Label Detail
8. All buswork shall be **ASTM B187** copper and shall have a minimum rating of 125 amps. All breakers shall bolt on to the buswork. Jumpering of breakers shall not be allowed. Buswork shall accommodate all future equipment as shown in the Breaker Schedule.
9. All internal wire runs shall be identified with "TO - FROM" coded tags labeled with the code letters and/or numbers shown on the Schedules. Approved PVC or polyolefin wire marking sleeves shall be used.
10. See Contract for Breaker and Contactor Schedule.
11. Buss bars shall be sized to accommodate up to #4 AWG wires.
12. See **Standard Plan J-10.14** for pole installation details.



Aug 18, 2021

**SERVICE CABINET TYPE A
(0 - 100 AMP TYPE 120 VOLT
SINGLE PHASE)**

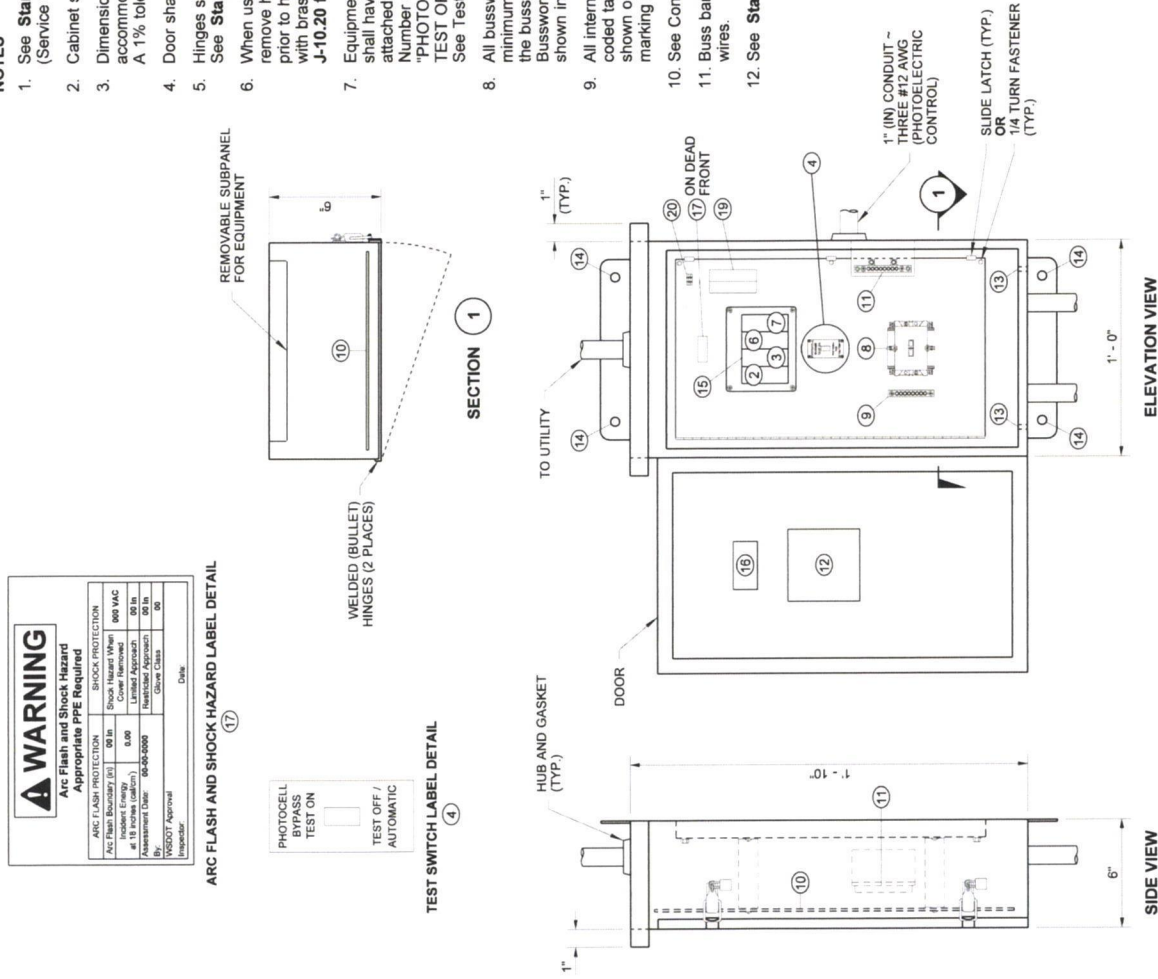
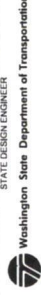
STANDARD PLAN J-10.16-02

SHEET 1 OF 1 SHEET

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TYPE A SERVICE CABINET

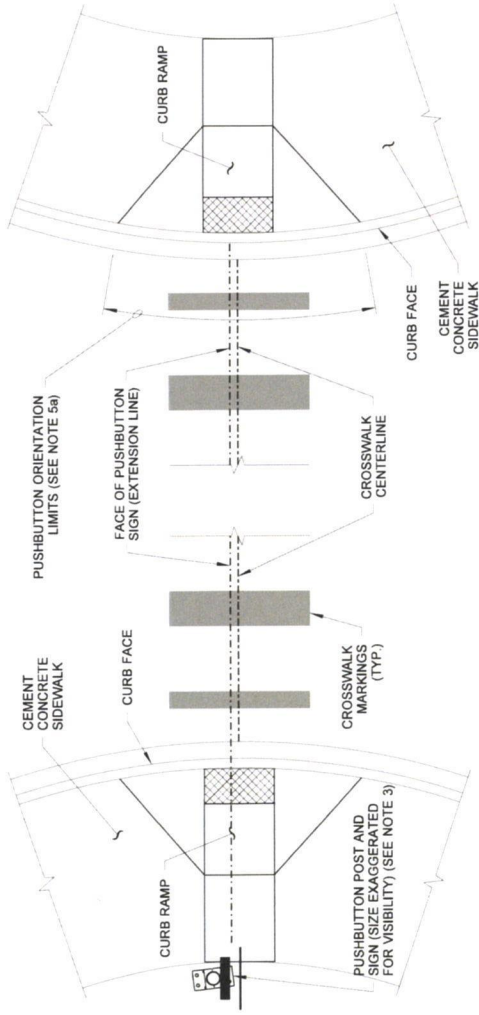
SIDE VIEW

- KEY**
- 1 METER BASE PER SERVING UTILITY REQUIREMENTS - SEE **STANDARD PLAN J-10.30**
 - 2 MAIN BREAKER (SPST - SIZE PER BREAKER SCHEDULE)
 - 3 PHOTOELECTRIC CONTROL BREAKER (SPST ~ 15 AMP - 120/240 VOLT)
 - 4 TEST SWITCH (SPDT ~ SNAP ACTION ~ POSITIVE CLOSE ~ 15 AMP ~ 120/277 VOLT ~ "T" RATED)
 - 5 PHOTOELECTRIC CONTROL UNIT ~ SEE **STANDARD SPECIFICATION 9-23.11(2)**
 - 6 BRANCH BREAKER ~ SEE BREAKER SCHEDULE (SPST ~ 120/240 VOLT)
 - 7 SPARE BRANCH BREAKER (SPST ~ 20 AMP ~ 120/240 VOLT)
 - 8 CONTACTOR ~ SEE BREAKER SCHEDULE
 - 9 ISOLATED NEUTRAL BUS ~ 8 LUG COPPER
 - 10 HINGED DEAD FRONT WITH 1/4 TURN FASTENERS OR SLIDE LATCHES ~ DEAD FRONT PANEL BOLTS SHALL NOT EXTEND INTO VERTICAL LIMITS OF THE BREAKER ARRAY(S)
 - 11 CABINET MAIN BONDING JUMPER ASSEMBLY - BUSS SHALL BE 8 LUG TINNED COPPER ~ SEE **STANDARD PLAN J-10.20** FOR CABINET MAIN BONDING JUMPER ASSEMBLY DETAILS
 - 12 METAL WIRING DIAGRAM HOLDER
 - 13 1/4" (IN) DIAMETER DRAIN HOLE - DRILL BEFORE GALVANIZING
 - 14 MOUNTING HOLE - SEE **STANDARD PLAN J-10.12** CABINET BRACKET MOUNTING DETAIL
 - 15 4-CIRCUIT PANEL BOARD - MINIMUM SIZE WITH BACK-FED MAIN BREAKER
 - 16 LABEL CABINET WITH BUSSWORK RATING
 - 17 ARC FLASH AND SHOCK HAZARD LABEL - SEE DETAIL
 - 18 CONNECTION TO GROUND ELECTRODE - SEE **STANDARD PLAN J-60.05**
 - 19 20 KA TYPE 1 OR TYPE 2 SURGE PROTECTION DEVICE - DIN RAIL MOUNT WITH PLUG-IN MODULE(S)
 - 20 THREE POSITION DIN RAIL MOUNTED TERMINAL BLOCK ~ TERMINAL BLOCK SECTIONS SHALL BE BLACK, WHITE, AND RED AS SHOWN IN CABINET WIRING DIAGRAM
- 120 VAC
- METER BASE (WHERE REQUIRED)
- PHOTOELECTRIC OR TIME CLOCK
- PHOTOCELL TEST OFF - AUTOMATIC
- PHOTOCELL BYPASS TEST ON
- ILL. CKT A
- ILL. CKT B
- SPARE CKT
- GROUND
- CABINET MAIN BONDING JUMPER ~ SIZE PER NEC ~ MINIMUM SIZE #4
- TYPE A WIRING DIAGRAM ~ 120 VOLT

DRAWN BY: FERN LIDDELL

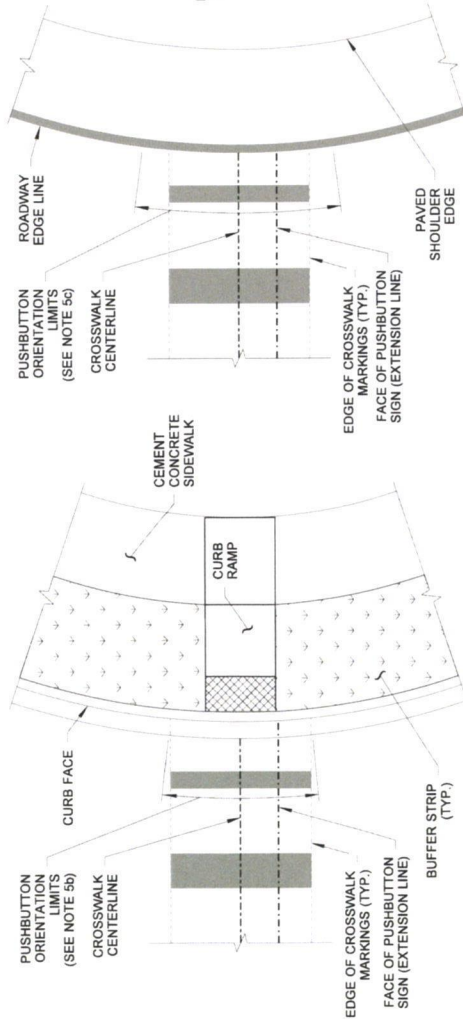
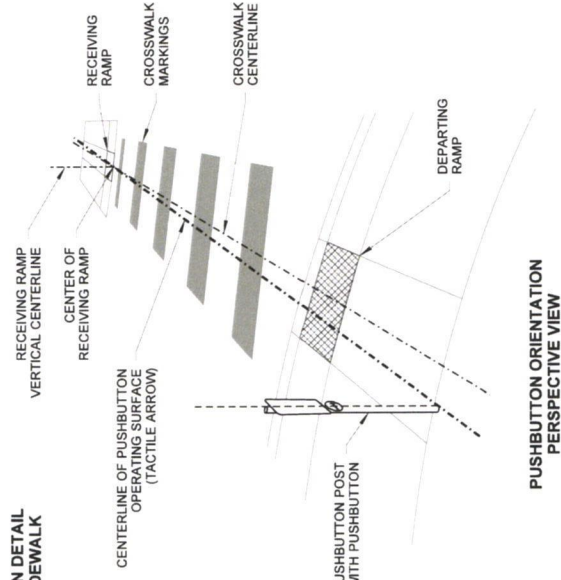
NOTES

1. All pushbuttons with tactile arrows have specific horizontal orientation requirements. Each pushbutton must be oriented relative to the crosswalk being served.
2. Pushbutton mounting height shall be in accordance with **Standard Plan J-20.15**
3. Each pushbutton shall be installed such that the face of the pushbutton is rotated generally towards the center of the intersection unless otherwise specified in the Contract Plans.
4. Each pushbutton shall be installed such that the face of the unit (the face of the sign and the face of the tactile arrow pushbutton) is oriented parallel to the crosswalk being served, unless the extension line of the pushbutton face will be outside of the limits defined in Note 5, in which case Note 5 takes precedence. The extension line of the pushbutton face shall intersect a curb face (including ramps), or roadway edge line when no curb and sidewalk are present.
5. The extension line of the pushbutton face shall intersect the receiving end of the crosswalk as follows:
 - a. Where there is a receiving sidewalk ramp and the sidewalk is directly adjacent to the curb, the pushbutton centerline shall be within the limits of the ramp flares (see **Standard Plan F-40.15**) or ramp side slopes (see **Standard Plan F-40.12**).
 - b. Where there is a receiving sidewalk ramp and there is a buffer strip between the sidewalk and the curb, the pushbutton centerline shall be no more than two feet outside the edge of the sidewalk ramp or the outer edge of the crosswalk markings - whichever is smaller.
 - c. Where there is no sidewalk and the crosswalk ends at a roadway shoulder, the pushbutton centerline shall be no more than two feet outside the edge of the crosswalk markings.



**SAMPLE DEPARTURE PUSHBUTTON LOCATION
(PERPENDICULAR RAMP SHOWN -
SEE CONTRACT FOR POST LOCATIONS)**

**PUSHBUTTON ORIENTATION DETAIL
RECEIVING RAMP WITH SIDEWALK**



**PUSHBUTTON ORIENTATION DETAIL
RECEIVING RAMP WITH BUFFER STRIP**

**PUSHBUTTON ORIENTATION DETAIL
NO RECEIVING RAMP (ROADWAY SHOULDER)**

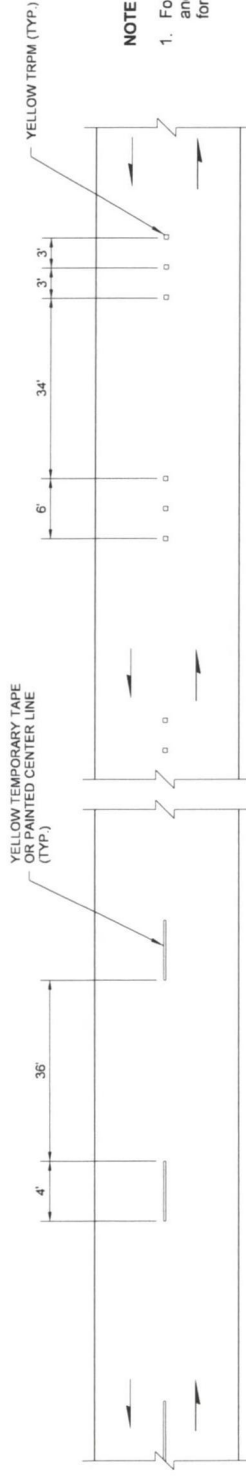


Jun 20, 2024

**PEDESTRIAN
PUSHBUTTON (PPB)
ORIENTATION
STANDARD PLAN J-20.05-00**

SHEET 1 OF 1 SHEET

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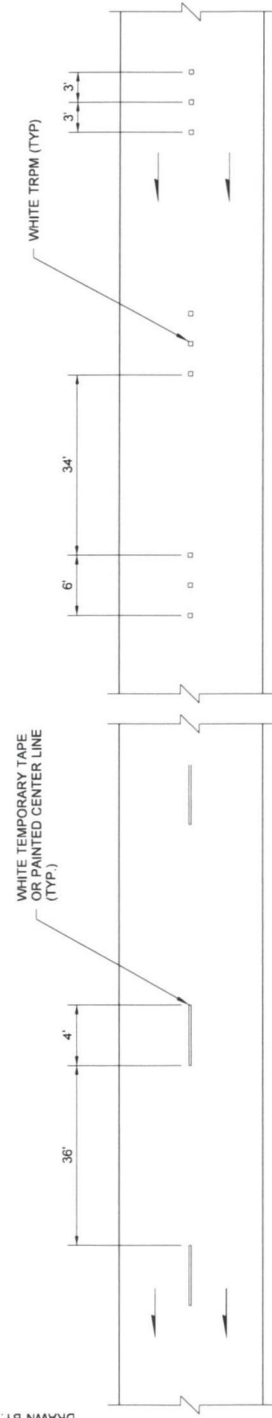
DRAWN BY: FERN LIDDELL

NOTE

1. For Hot Mix Asphalt Paving projects ~ "DO NOT PASS" and "PASS WITH CARE" signs shall be included for passing zones.

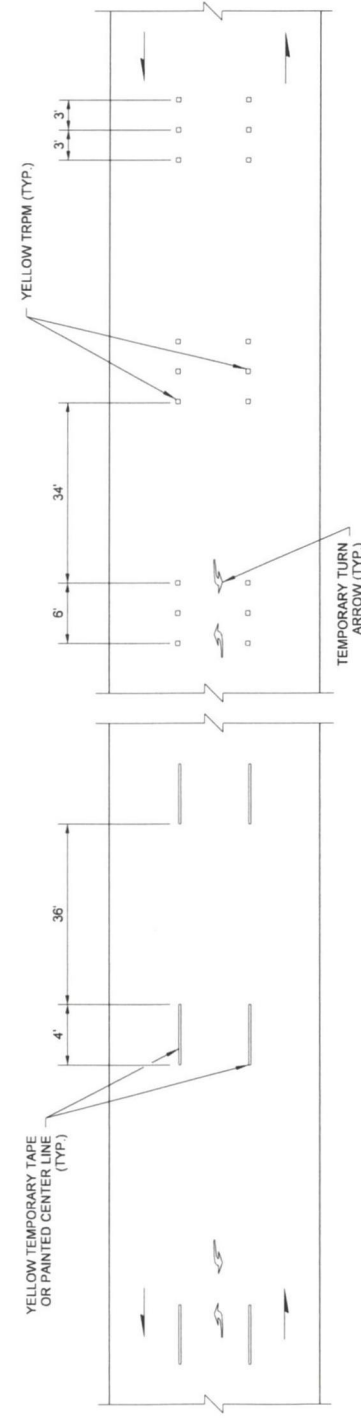
HOT MIX ASPHALT PAVEMENT

TWO-LANE ROADWAY



BITUMINOUS SURFACE TREATMENT

ONE-WAY TWO-LANE ROADWAY



BITUMINOUS SURFACE TREATMENT

TWO-WAY TWO-LANE LEFT TURN ROADWAY



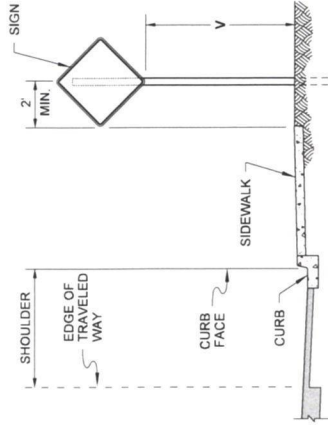
TEMPORARY PAVEMENT MARKING ~ SHORT DURATION STANDARD PLAN K-70.20-01

SHEET 1 OF 1 SHEET

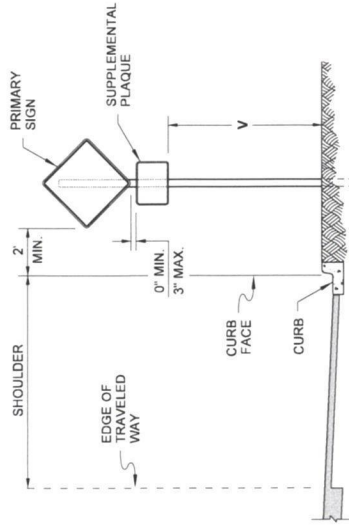
APPROVED FOR PUBLICATION
 Carpenter, Jeff
 Jan 1, 2016 4:19 PM
 STATE DESIGN ENGINEER
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NOTES

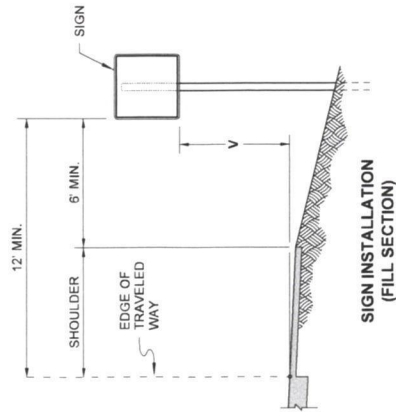
- For sign installation details, see **Standard Plan G - series**.
- Where it is impractical to locate a sign with the lateral offset, a minimum of 2'(ft) offset may be used. A 1'(ft) lateral offset may be used in business, commercial or residential areas.
- The "V" height for signs, with an area of more than 50 square feet and two or more sign supports, is 7 feet in both rural and urban areas.



SIGN INSTALLATION
(SIDEWALK AND CURB SECTION)



SIGN INSTALLATION
(CURB SECTION)



SIGN INSTALLATION
(FILL SECTION)

HEIGHT V	
TO BOTTOM OF SIGN (NO SUPPLEMENTAL PLAQUE)	TO BOTTOM OF SUPPLEMENTAL PLAQUE (WHEN REQUIRED)
RURAL 5' MINIMUM	4' MINIMUM
URBAN 7' MINIMUM	6' MINIMUM



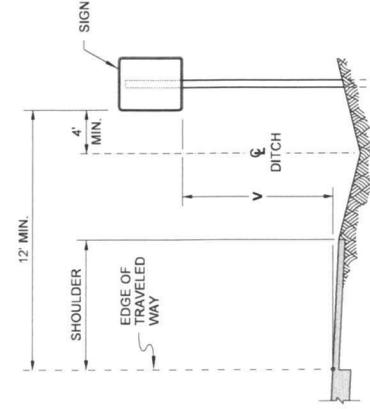
2020.09.23 13:48:58
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CLASS A CONSTRUCTION SIGNING INSTALLATION STANDARD PLAN K-80.10-02

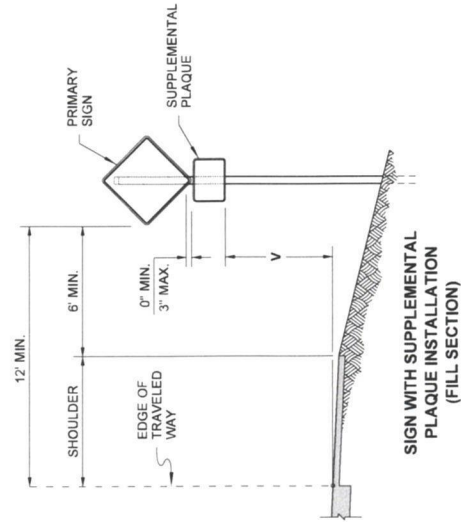
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Date: 2020.09.25
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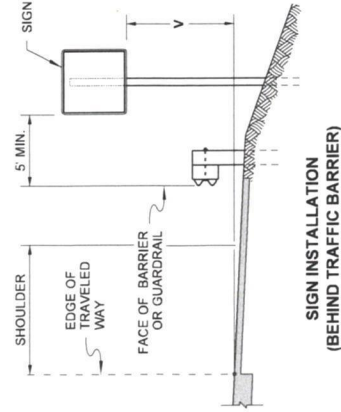
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SIGN INSTALLATION
(DITCH SECTION)



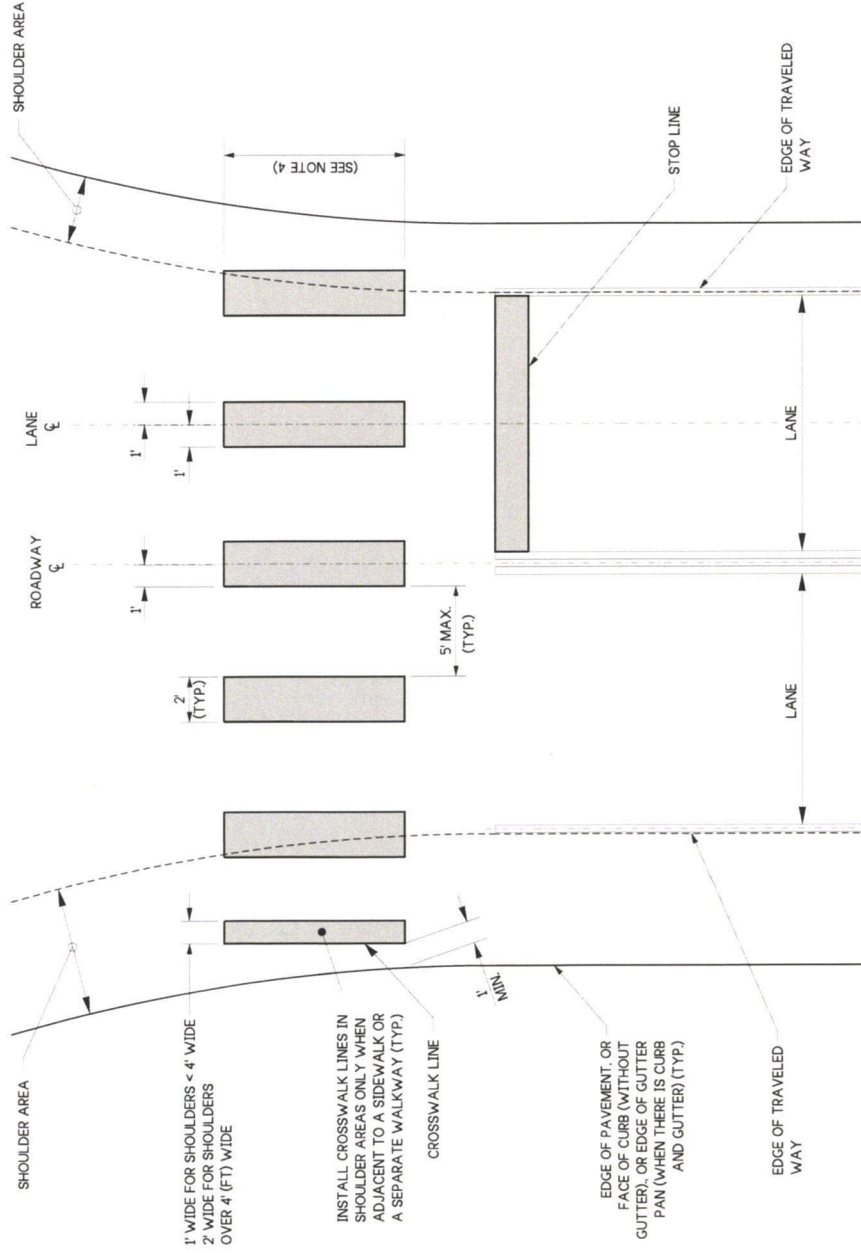
SIGN WITH SUPPLEMENTAL
PLAQUE INSTALLATION
(FILL SECTION)



SIGN INSTALLATION
(BEHIND TRAFFIC BARRIER)

NOTES:

1. See Contract Plans for crosswalk locations.
2. To the maximum extent possible, curb ramp centerline should be perpendicular to the crosswalk centerline.
3. To the maximum extent possible, crosswalks should be perpendicular to the traveled way centerline.
4. See Contract plans for crosswalk width.
5. To maximum extent possible, place crosswalk bars out of the wheel paths.



CROSSWALK DETAIL



Jul 17, 2023

CROSSWALK LAYOUT

STANDARD PLAN M-1510-02

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Jul 17, 2023

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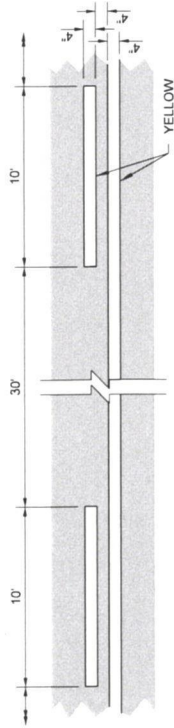
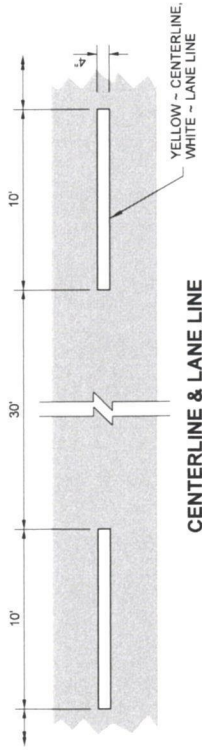
Washington State
Department of Transportation

Mark A. Davis

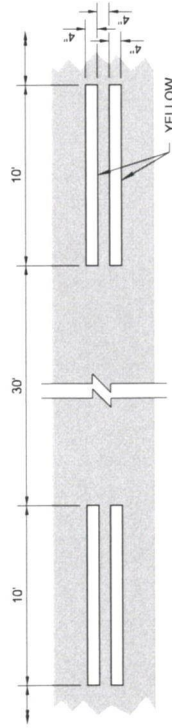
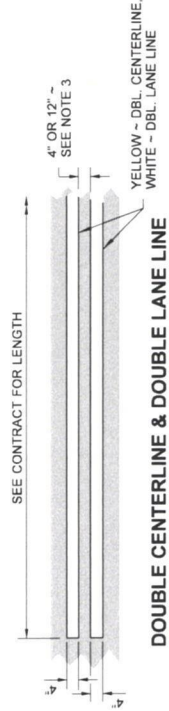


NOTES

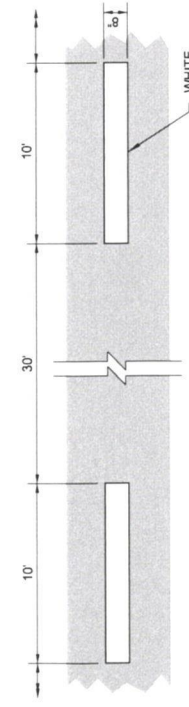
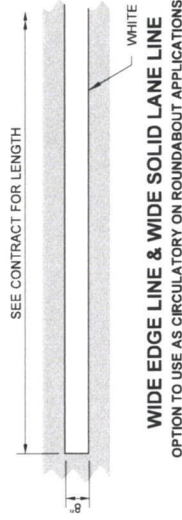
1. Dotted Extension Line shall be the same color as the line it is extending.
2. Edge Line shall be white on the right edge of traveled way, and yellow on the left edge of traveled way (on one-way roadways). Solid Lane Line shall be white.
3. The distance between the lines of the Double Centerline shall be 12" everywhere, except 4" for left-turn channelization and narrow roadways with lane widths of 10 feet or less. Local Agencies (on non-state routes) may specify a 4" distance for all locations.
The distance between the lines of the Double Lane Line shall be 4".



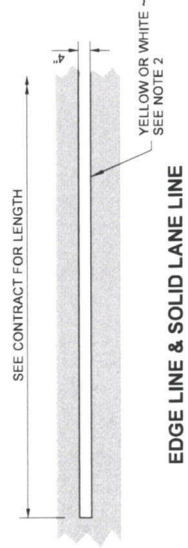
DOUBLE CENTERLINE & DOUBLE LANE LINE



WIDE EDGE LINE & WIDE SOLID LANE LINE



EDGE LINE & SOLID LANE LINE



Aug 1, 2022

LONGITUDINAL MARKING PATTERNS

STANDARD PLAN M-20.10-04

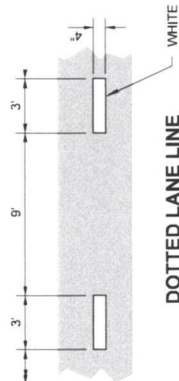
SHEET 1 OF 4 SHEETS

APPROVED FOR PUBLICATION

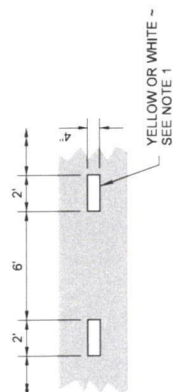
Aug 2, 2022

STATE DESIGN ENGINEER

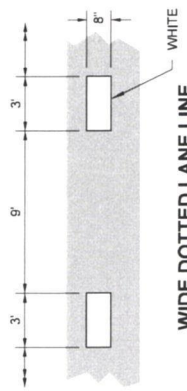
Washington State Department of Transportation



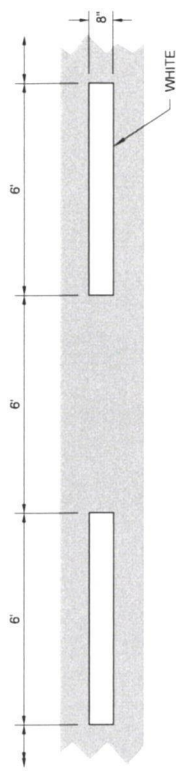
DOTTED LANE LINE



DOTTED EXTENSION LINE

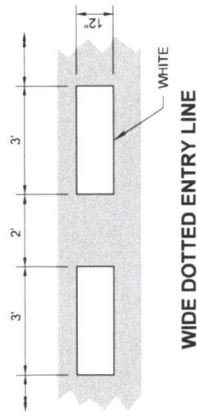


WIDE DOTTED LANE LINE

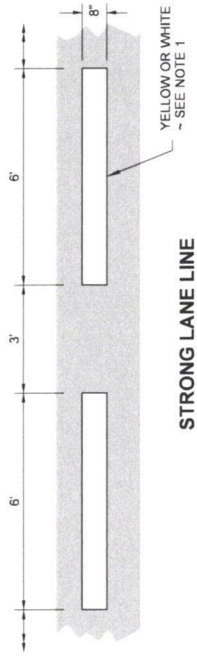


WIDE DOTTED EXTENSION LINE

ROUNDABOUT SPECIFIC LINES

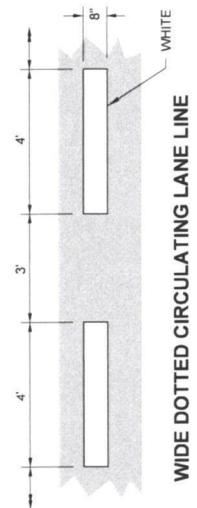


WIDE DOTTED ENTRY LINE



STRONG LANE LINE

OPTION TO USE AS CIRCULATORY ON ROUNDABOUT APPLICATIONS



WIDE DOTTED CIRCULATING LANE LINE



Aug 1, 2022

**LONGITUDINAL
MARKING PATTERNS
STANDARD PLAN M-20.10-04**

SHEET 2 OF 4 SHEETS

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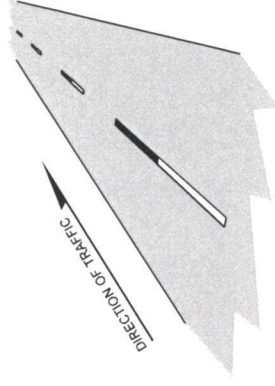
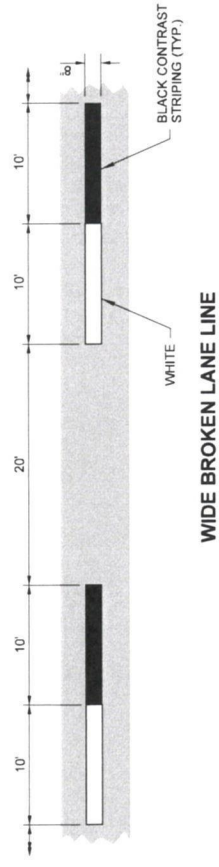
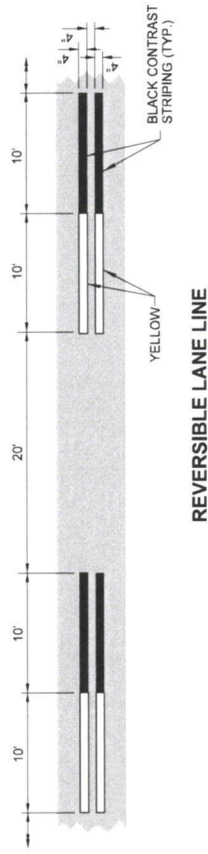
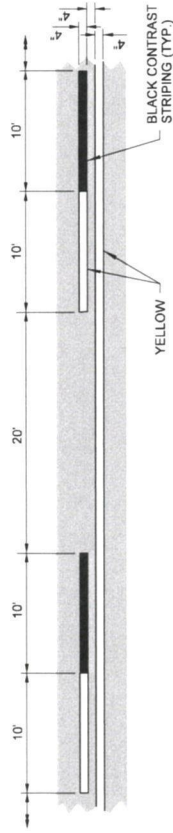
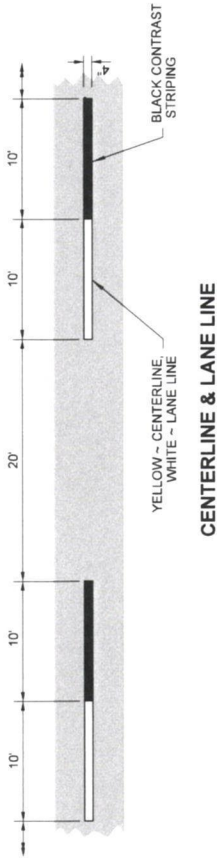
Mark Gaudier
STATE DESIGN ENGINEER

Washington State Department of Transportation

NOTE

1. Dotted Extension Line shall be the same color as the line it is extending.

DIRECTION OF TRAFFIC
(TYPICAL)



ISOMETRIC VIEW



Aug 1, 2022

**LONGITUDINAL
MARKING PATTERNS
STANDARD PLAN M-20.10-04**

SHEET 3 OF 4 SHEETS

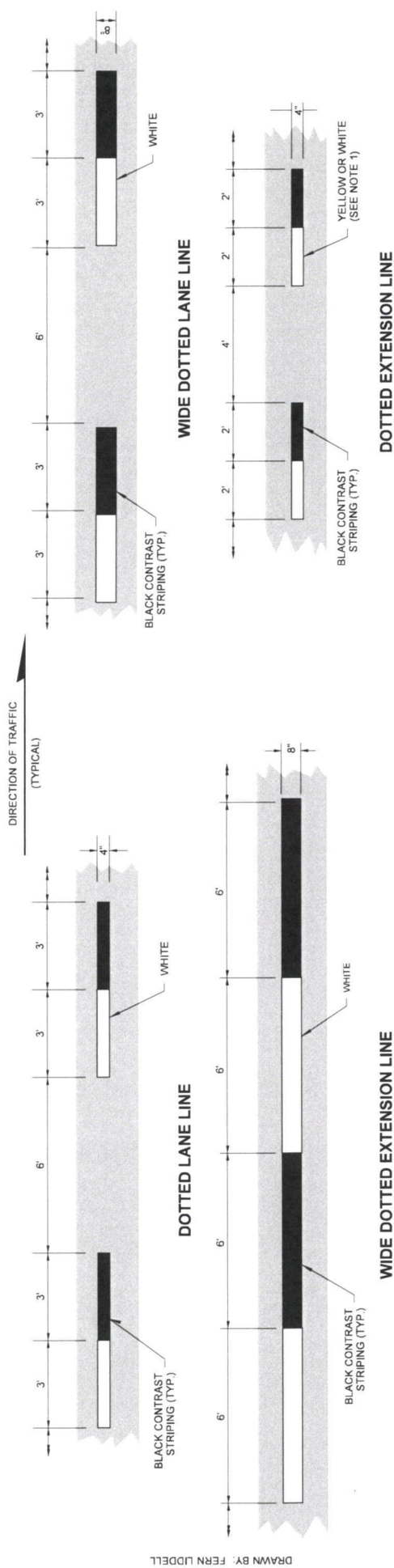
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Aug 2, 2022

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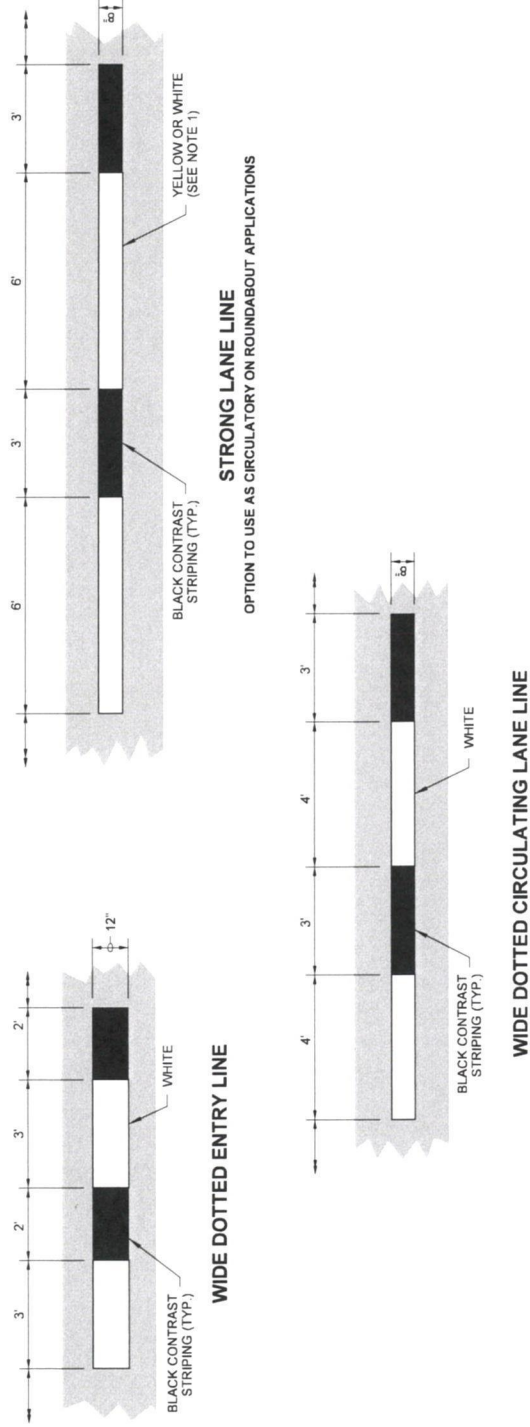
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DRAWN BY: FERN LIDDELL

ROUNDABOUT SPECIFIC LINES



Aug 1, 2022

LONGITUDINAL MARKING PATTERNS

STANDARD PLAN M-20.10-04

SHEET 4 OF 4 SHEETS

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NOTES:

1. Raised Pavement Markers Types 2YY and 2W, spaced at 80' (ft) intervals on tangents and on horizontal curves with a radius of 1500' (ft) or more, and at 40' (ft) intervals on horizontal curves having radii of less than 1500' (ft). Center the RPMs in the gaps between the pavement marking lines.
2. Type 2Y RPMs, when specified, placed outside the left Edge Line at 80' (ft) intervals. See "LEFT EDGE OF LANE PLACEMENT DETAIL."
3. Recessed pavement markers, when specified, installed at the locations shown for Type 2W RPMs multiline one-way roadways, and Type 2YY RPMs on two-lane two-way roadways.
4. The Type 2W RPMs placed on multiline one-way roadways and all RPMs set in recesses shall have an abrasion-resistant coating.
5. Do not recess side-to-side RPMs on Wide Dotted Lane Lines.

TYPE 2 RPM RAISED FACE COLORS	
TYPE 2YY	YELLOW AND YELLOW
TYPE 2W	WHITE ~ ONE SIDE ONLY
TYPE 2Y	YELLOW ~ ONE SIDE ONLY



Jun 28, 2024

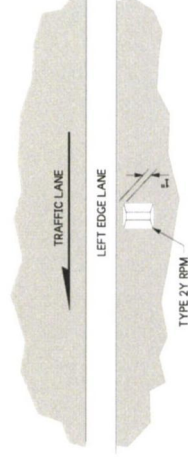
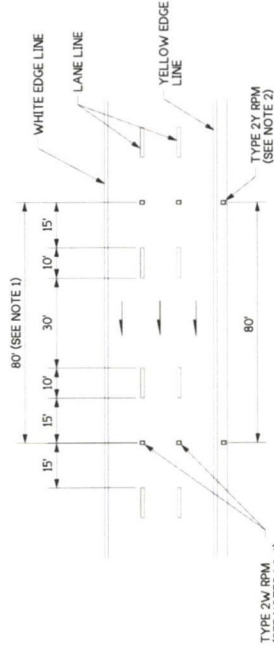
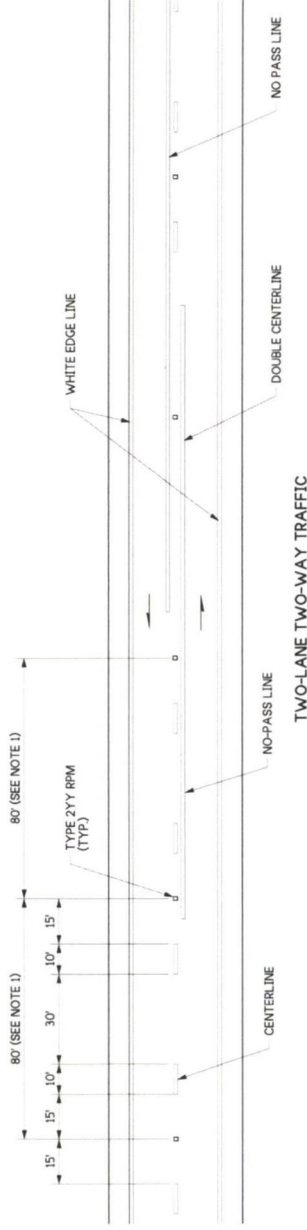
LONGITUDINAL MARKING
SUPPLEMENT WITH RAISED
PAVEMENT MARKERS
STANDARD PLAN M-20.30-05

SHEET 1 OF 2 SHEETS

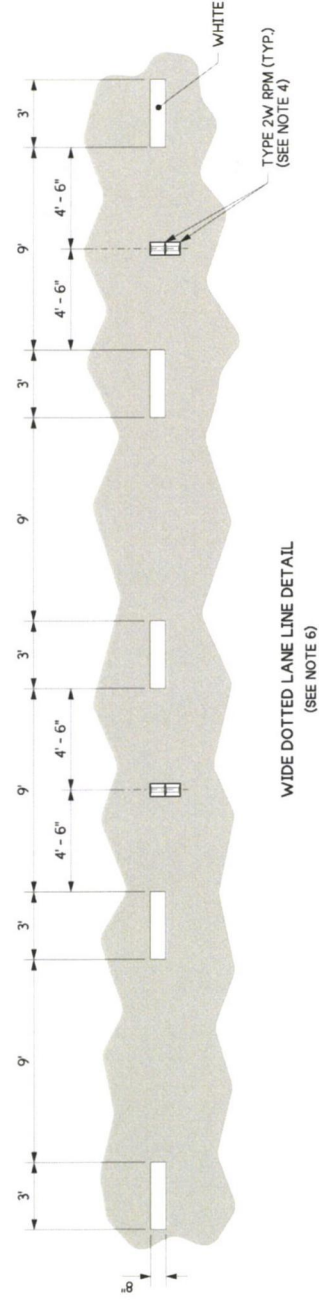
APPROVED FOR PUBLICATION
Jun 28, 2024

STATE DESIGN ENGINEER

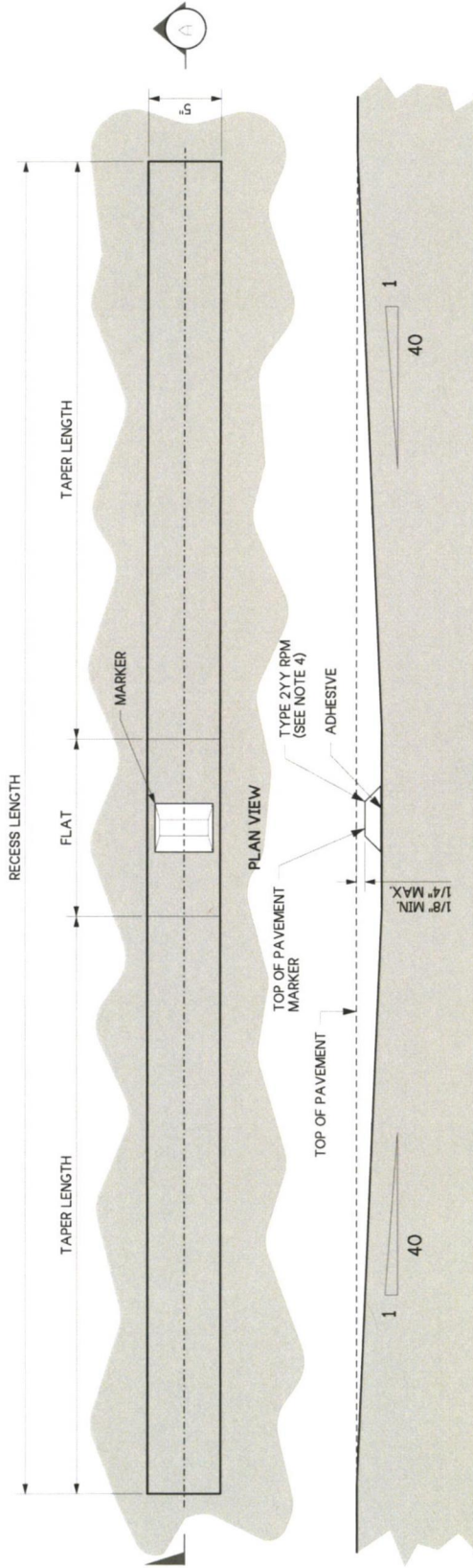
Washington State
Department of Transportation



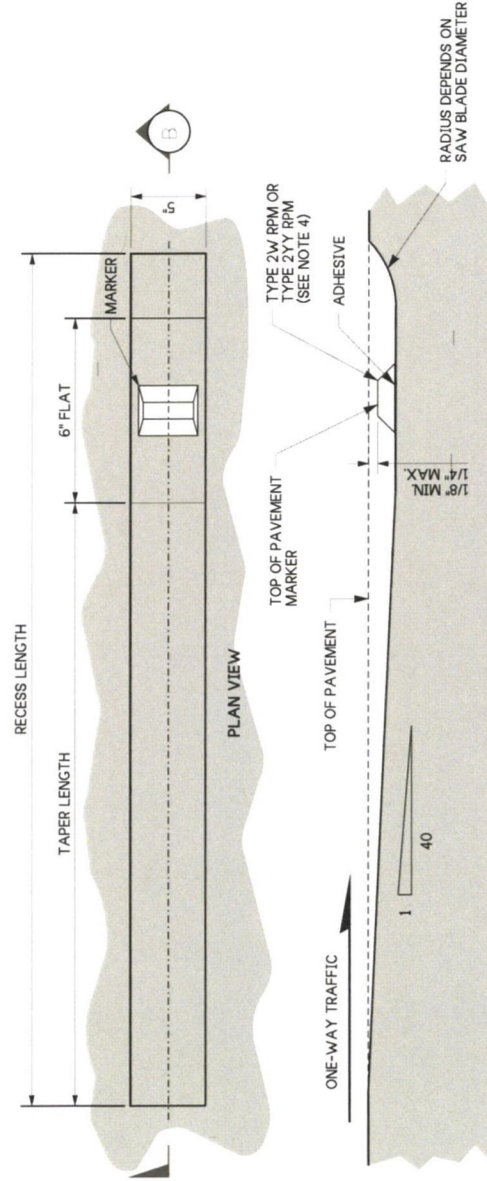
LEFT EDGE OF LANE PLACEMENT DETAIL
(SEE NOTE 2)



WIDE DOTTED LANE LINE DETAIL
(SEE NOTE 6)



TWO-WAY ROADWAY RESESSED
PAVEMENT MARKER DETAIL
(FOR USE WHERE SPECIFIED IN CONTRACT)



SECTION (B)
ONE-WAY ROADWAY RESESSED
PAVEMENT MARKER DETAIL
(FOR USE WHERE SPECIFIED IN CONTRACT)



Jun 28, 2024

LONGITUDINAL MARKING
SUPPLEMENT WITH RAISED
PAVEMENT MARKERS
STANDARD PLAN M-20.30-05

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Jun 28, 2024

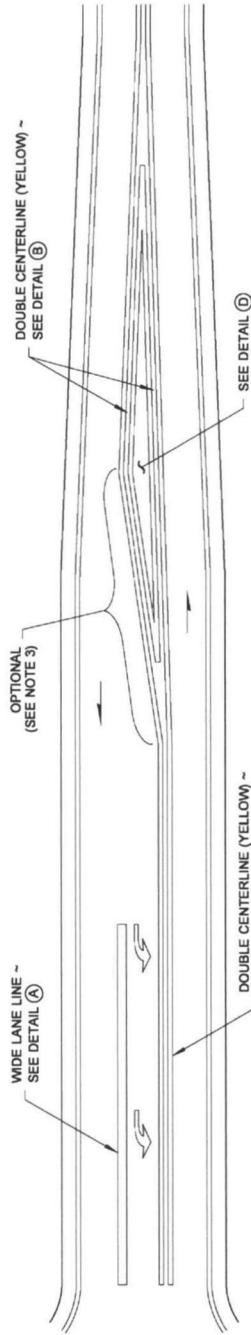
STATE DESIGN ENGINEER

Washington State
Department of Transportation

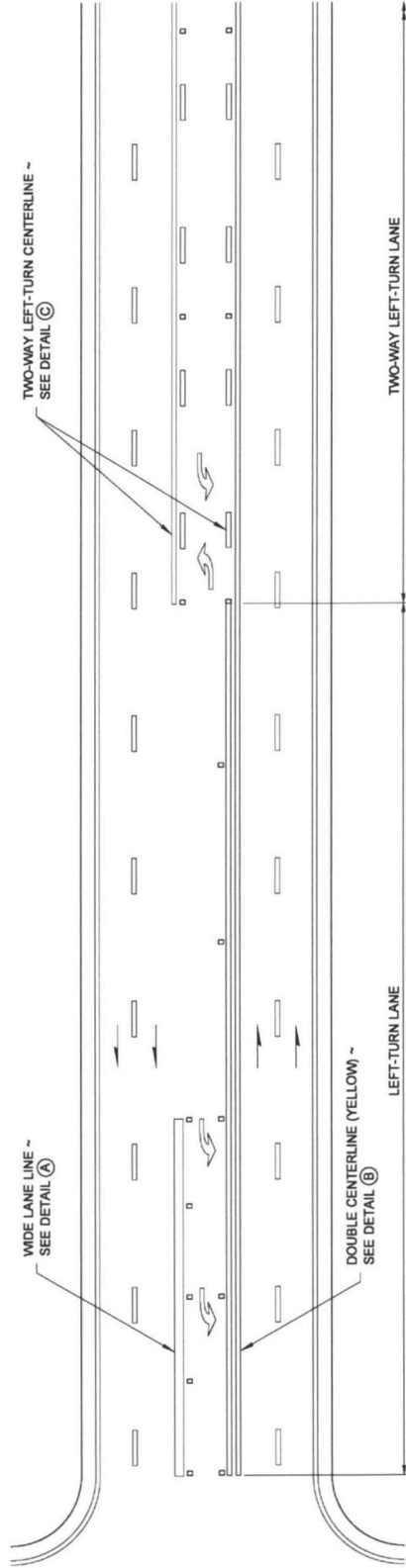
NOTES

1. Raised pavement markers shall be installed only when specified in the Contract Plans.
2. See the Standard Plans for marker designation.
3. The portion labeled "OPTIONAL" is used only when the Optional Marked Deceleration Taper (see **Standard Plans M-3.10 and M-3.20**) is specified in the Contract Plans.

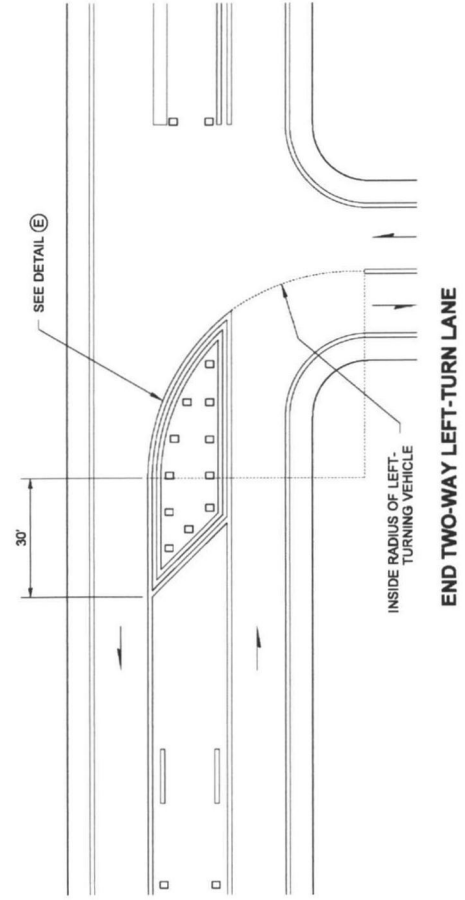
Type 2L (SL) Traffic Arrow



LEFT-TURN LANE (SEE NOTE 3)



TWO-WAY LEFT-TURN LANE



END TWO-WAY LEFT-TURN LANE



Long Mable
Walsh, Brian
Jun 24, 2014 2:13 PM
**LONGITUDINAL MARKING
SUPPLEMENT WITH RPMs ~
TURN LANES
STANDARD PLAN M-20.40-03**

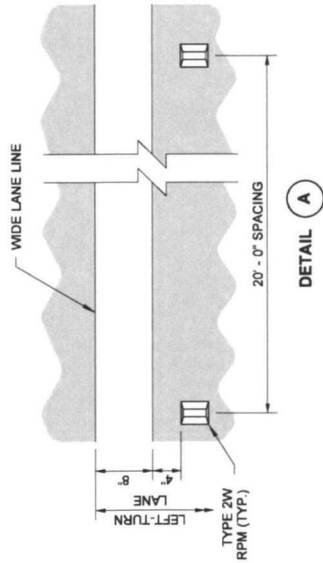
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

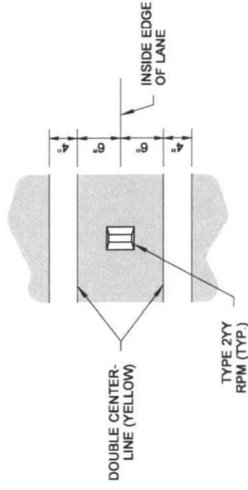
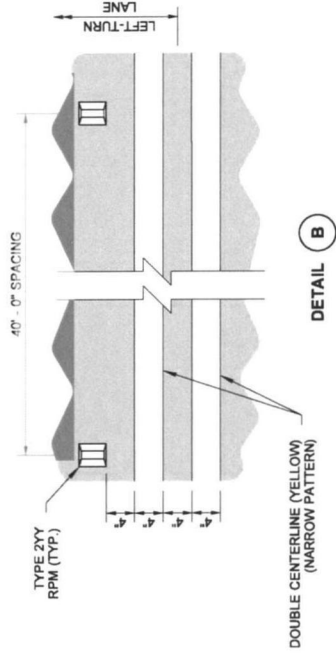
Hakatch, Peter
Jun 24, 2014 4:42 PM

Peter Hakatch
STATE DESIGN ENGINEER

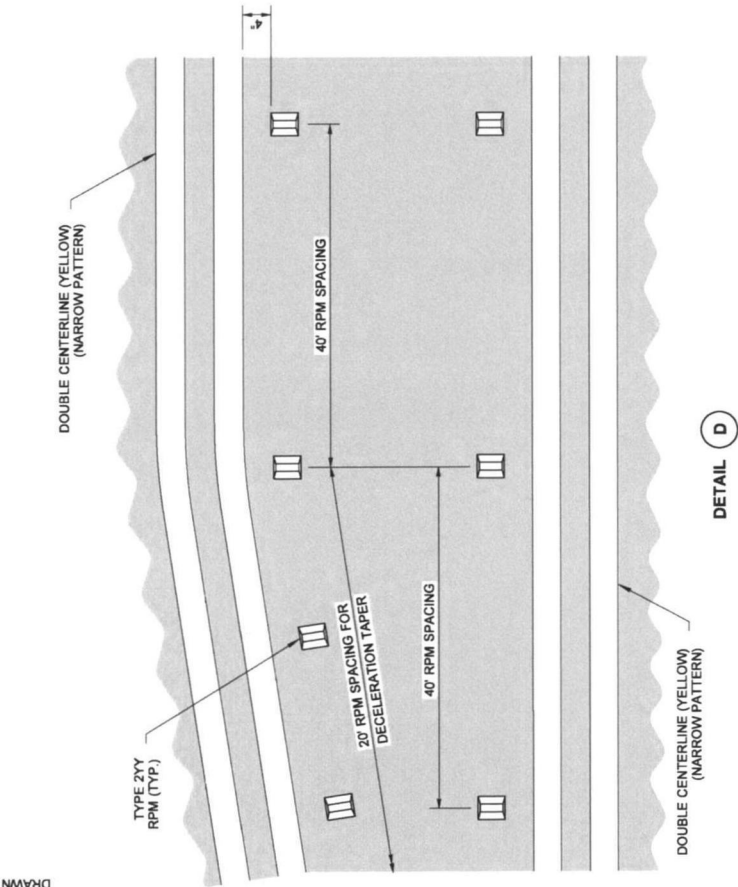
Washington State Department of Transportation



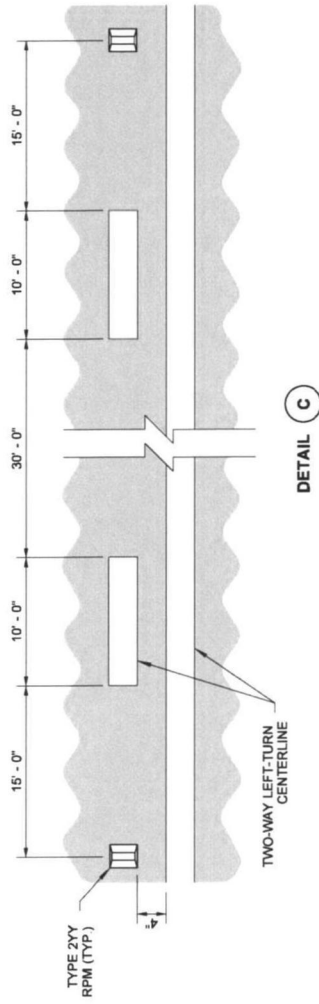
DRAWN BY: LISA CYFORD



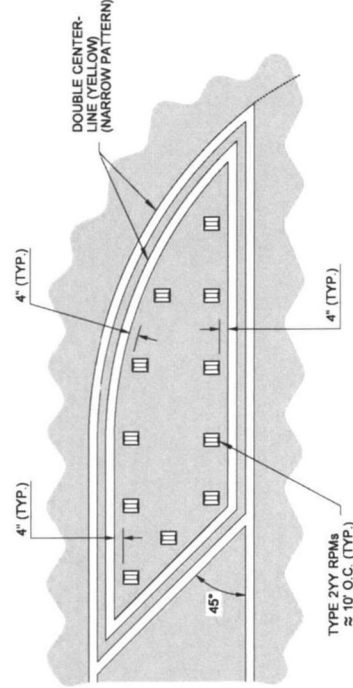
ALTERNATIVE LINE DETAIL



DETAIL D



DETAIL C



DETAIL E



WALSH, BRIAN
JUN 24 2014 2:33 PM
**LONGITUDINAL MARKING
SUPPLEMENT WITH RPMs ~
TURN LANES**
STANDARD PLAN M-20.40-03

SHEET 2 OF 2 SHEETS
APPROVED FOR PUBLICATION
BRIAN J. WALSH
JUN 24 2014 4:13 PM
STATE DESIGN ENGINEER
Washington State Department of Transportation

Diagram of a Right-of-Way (ROW) symbol. The symbol is a stylized arrow pointing right, with a total width of 8.0 feet. The height of the symbol is 1 foot 3 inches. The area of the symbol is 8.03 square feet. The symbol is labeled "SYMBOL & LANE" and "MARKING AREA 8.03 SQ. FT."

Technical drawing of a square marking area. The overall dimensions are 8'-0" by 8'-0". The drawing includes a central square area labeled "MARKING AREA 7/32 SQ. FT." and a surrounding area labeled "GRID IS 4" (IN) SQUARE". The central square is divided into four quadrants by a horizontal and vertical center line. The quadrants are labeled "ELIPSE 'A'", "ELIPSE 'B'", "ELIPSE 'A' AXIS", and "ELIPSE 'B' AXIS". The center point of the ellipses is marked with a circle and labeled "CENTER POINT OF ELLIPSES". Dimensions for the ellipses are provided: 1'-4" for the horizontal axis, 1'-2" for the vertical axis, 2'-0" for the horizontal axis, and 2'-8" for the vertical axis. The overall dimensions are 8'-0" by 8'-0".

Diagram illustrating the dimensions for a Type 4S Traffic Arrow marking. The arrow is 4' high and 12.86 sq. ft. in area. The diagram shows the overall dimensions and the dimensions of the two ellipses (A and B) that form the arrow's shape.

Overall dimensions:

- Height: 4' - 0"
- Width: 12' - 0"
- Area: 12.86 SQ. FT.

Dimensions of the ellipses:

- Ellipse "A": 1' - 0" x 2' - 0"
- Ellipse "B": 1' - 0" x 2' - 0"

Other dimensions:

- Symbol & Lane: 2' - 4"
- Center Point of Ellipses: 2' - 0"
- Grid is 4" (in) square



MARKING AREA
14.83 SQ. FT.

MIRROR IMAGE OF
TYPE 3SL TRAFFIC ARROW
(SHOWN AT REDUCED SCALE)

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Bakotich, Pasco
Apr 20 2015 10:11 AM

STATE DESIGN ENGINEER



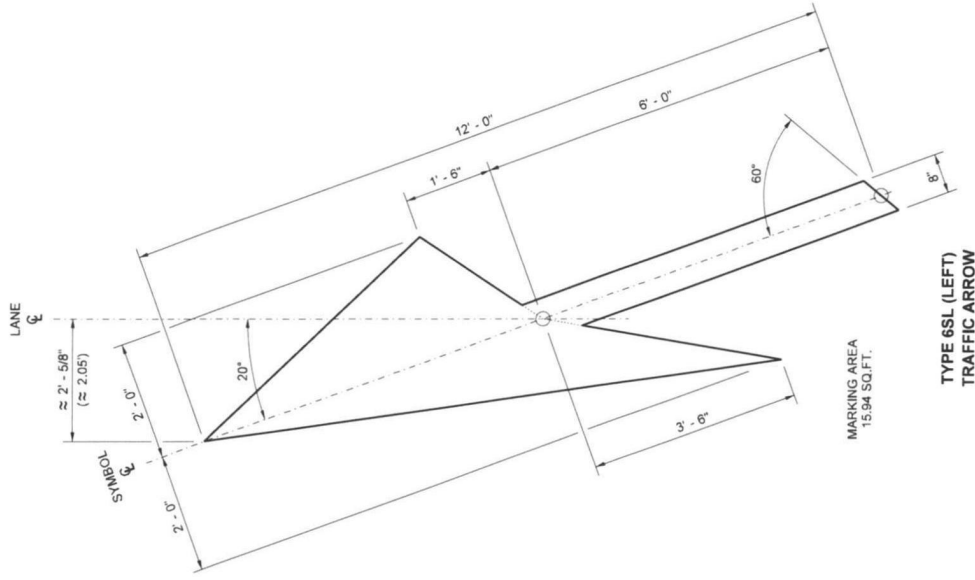
Washington State Department of Transportation
STATE DESIGN ENGINEER



Walsh, Brian
Apr 16 2015 2:21 PM

**SYMBOL MARKINGS ~
TRAFFIC ARROWS FOR
LOW-SPEED ROADWAYS
STANDARD PLAN M-24.40-02**

DRAWN BY: COLBY FLETCHER

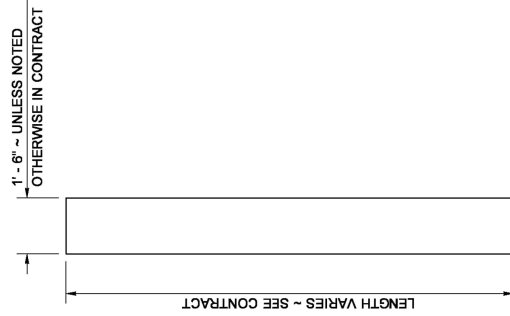


MIRROR IMAGE OF TYPE 6SL
(MIRRORED ABOUT LANE CENTERLINE)
(SHOWN AT REDUCED SCALE)

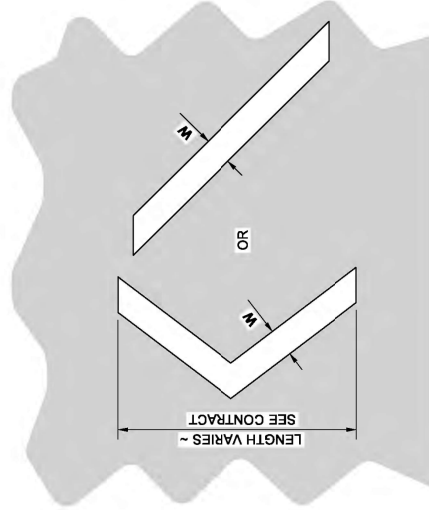


**SYMBOL MARKINGS ~
TRAFFIC ARROWS FOR
LOW-SPEED ROADWAYS
STANDARD PLAN M-24.40-02**

Washington State Department of Transportation



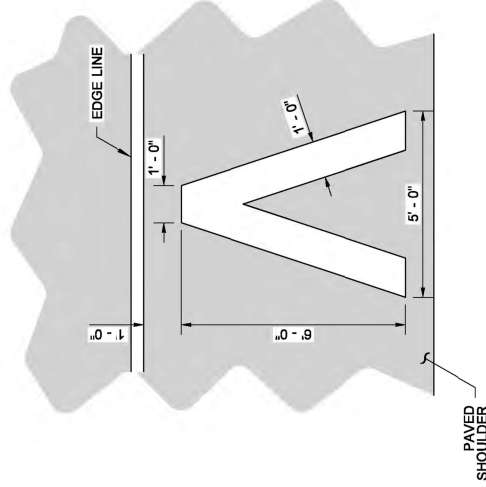
STOP LINE



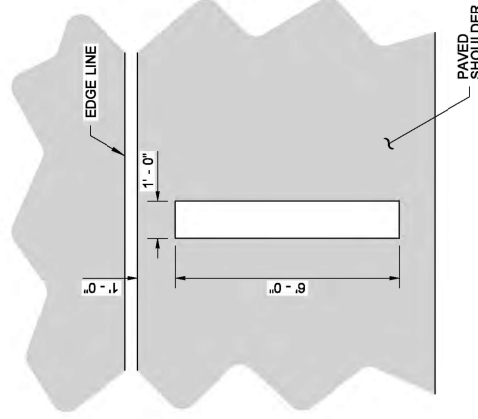
CROSSHATCH MARKING
WHITE OR YELLOW ~ SEE CONTRACT
CHEVRON OR DIAGONAL

CROSSHATCH MARKING

W = 8" (N) FOR POSTED SPEED LIMIT OF 40 MPH OR LOWER
W = 12" (N) FOR POSTED SPEED LIMIT OF 45 MPH OR HIGHER

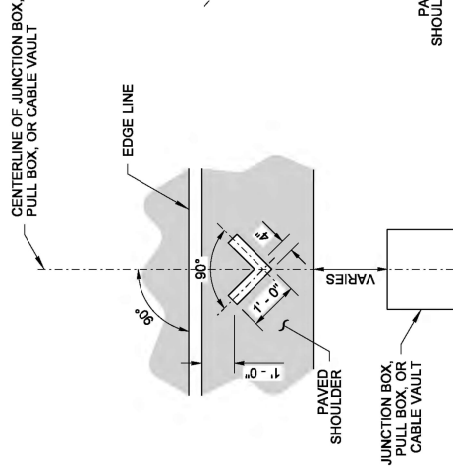


MARKING AREA = 11.73 SQ.FT.
HALF-MILE MARKER

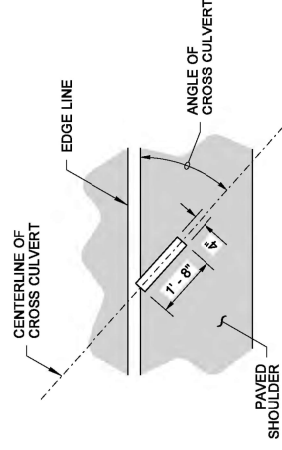


MARKING AREA = 6.00 SQ.FT.
FULL MILE MARKER

AERIAL SURVEILLANCE MARKERS

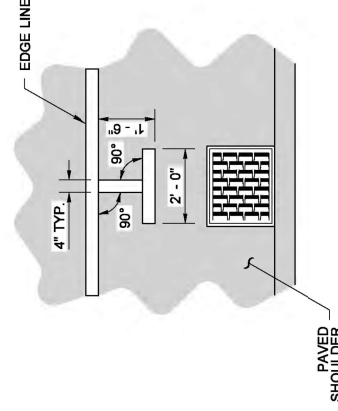


MARKING AREA = 0.56 SQ. FT.
JUNCTION BOX, PULL BOX,
OR CABLE VAULT MARKINGS



MARKING AREA = 0.56 SQ. FT.
CROSS CULVERT

DRAINAGE MARKING



MARKING AREA = 1.06 SQ.FT.
DRAINAGE STRUCTURE INLET

DRAINAGE MARKING

NOTE

1. If Rumble Strips are present, install marking outside of the Rumble Strip.



Brian J. Walsh
Walsh, Brian
Jun 24 2014 2:35 PM
C&G

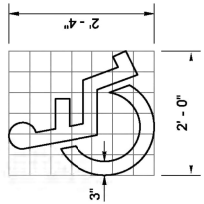
SYMBOL MARKINGS
MISCELLANEOUS

STANDARD PLAN M-24.60-04

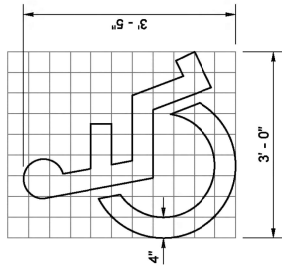
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION
Dakotah, Pasco
Jun 24 2014 4:43 PM

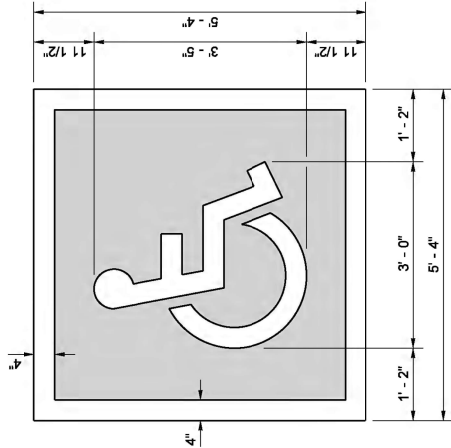
STATE DESIGN ENGINEER
Washington State Department of Transportation



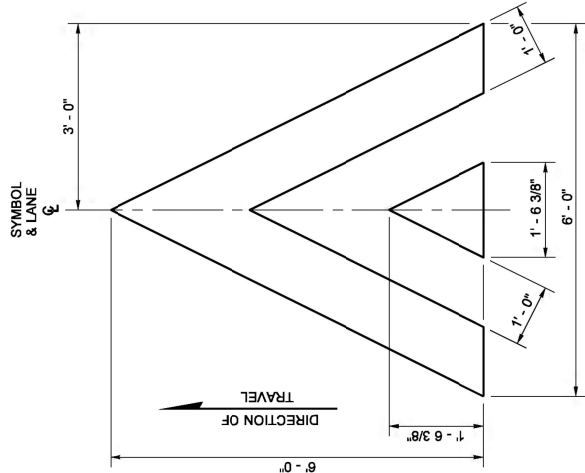
GRID IS 4" (IN) SQUARE MARKING AREA = 1.41 SQ.FT.
ACCESS PARKING SPACE SYMBOL (MINIMUM)



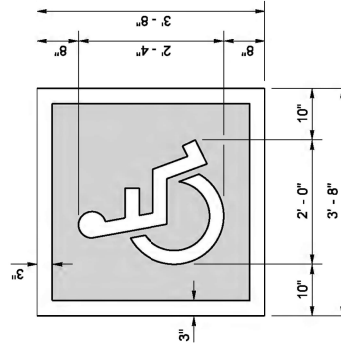
GRID IS 4" (IN) SQUARE MARKING AREA = 3.09 SQ.FT.
ACCESS PARKING SPACE SYMBOL (STANDARD)



TOTAL MARKING AREA = 28.44 SQ.FT.
WHITE = 9.76 SQ.FT. BLUE = 18.68 SQ.FT.
ACCESS PARKING SPACE SYMBOL (STANDARD)
WITH BLUE BACKGROUND AND WHITE BORDER
(REQUIRED FOR CEMENT CONCRETE SURFACES)



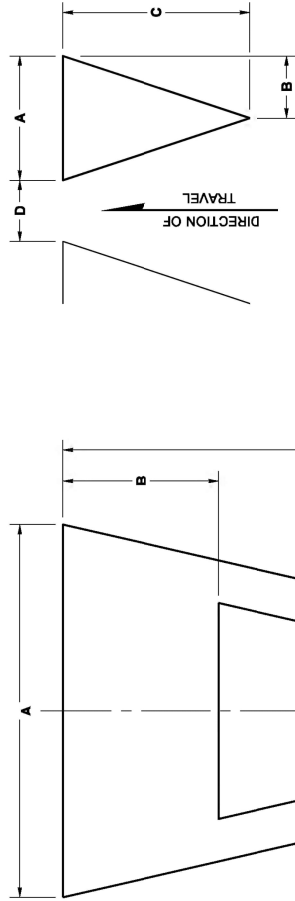
MARKING AREA = 12.08 SQ.FT.
SPEED BUMP SYMBOL



TOTAL MARKING AREA = 13.44 SQ.FT.
WHITE = 4.82 SQ.FT. BLUE = 8.62 SQ.FT.
ACCESS PARKING SPACE SYMBOL (MINIMUM)
WITH BLUE BACKGROUND AND WHITE BORDER
(REQUIRED FOR CEMENT CONCRETE SURFACES)

SYMBOL MARKING		A	B	C	D	USE	MARKING AREA
YIELD AHEAD SYMBOL	TYPE 1	6' - 0"	2' - 6"	13' - 0"	N/A	LESS THAN 45 MPH	25.80 SQ.FT.
	TYPE 2	6' - 0"	3' - 0"	20' - 0"	N/A	45 MPH OR GREATER	36.54 SQ.FT.
YIELD LINE SYMBOL	TYPE 1	1' - 0"	6"	1' - 6"	6"	LESS THAN 45 MPH	0.75 SQ.FT.
	TYPE 2	2' - 0"	1' - 0"	3' - 0"	1' - 0"	45 MPH OR GREATER	3.00 SQ.FT.
YIELD LINE SYMBOL	TYPE 1	1' - 0"	1' - 0"	3' - 0"	1' - 0"	ROUNDABOUT ENTRY	3.00 SQ.FT.
	TYPE 2	2' - 0"	1' - 0"	3' - 0"	1' - 0"	ROUNDABOUT ENTRY	3.00 SQ.FT.

★ MINIMUM OF 4 IN LANE



YIELD LINE SYMBOL
(MULTIPLE SYMBOLS REQUIRED
FOR TRANSVERSE YIELD LINE --
SEE CONTRACT)



Walsh, Brian
Jun 24 2014 2:37 PM

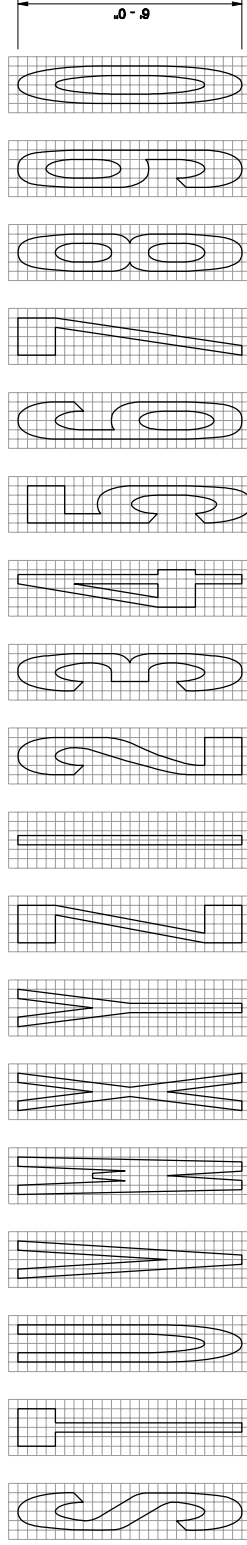
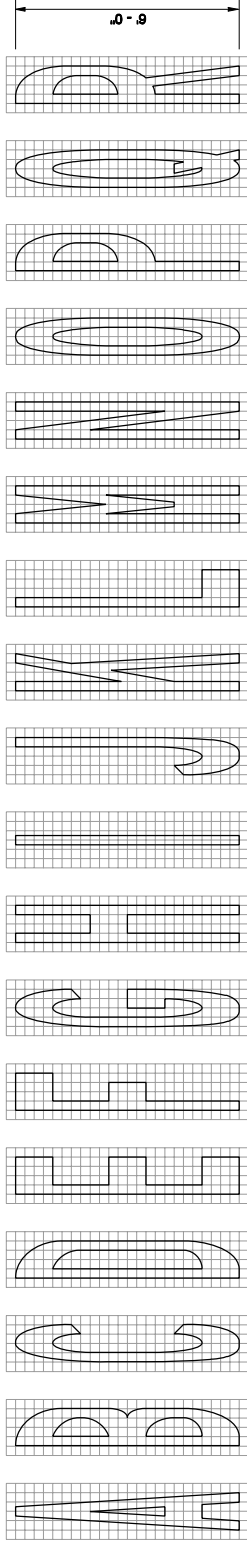
SYMBOL MARKINGS
MISCELLANEOUS

STANDARD PLAN M-24.60-04

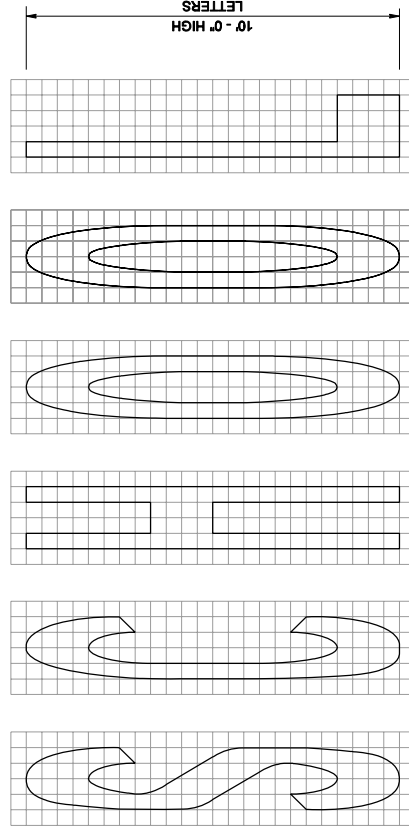
SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION
Dakotah, Pasco
Jun 24 2014 4:43 PM

STATE DESIGN ENGINEER
Washington State Department of Transportation



SIX FOOT HIGH LETTERS AND NUMERALS SHOWN ON A THREE- INCH SQUARE GRID



TEN FOOT HIGH LETTERS SHOWN ON A FIVE- INCH SQUARE GRID



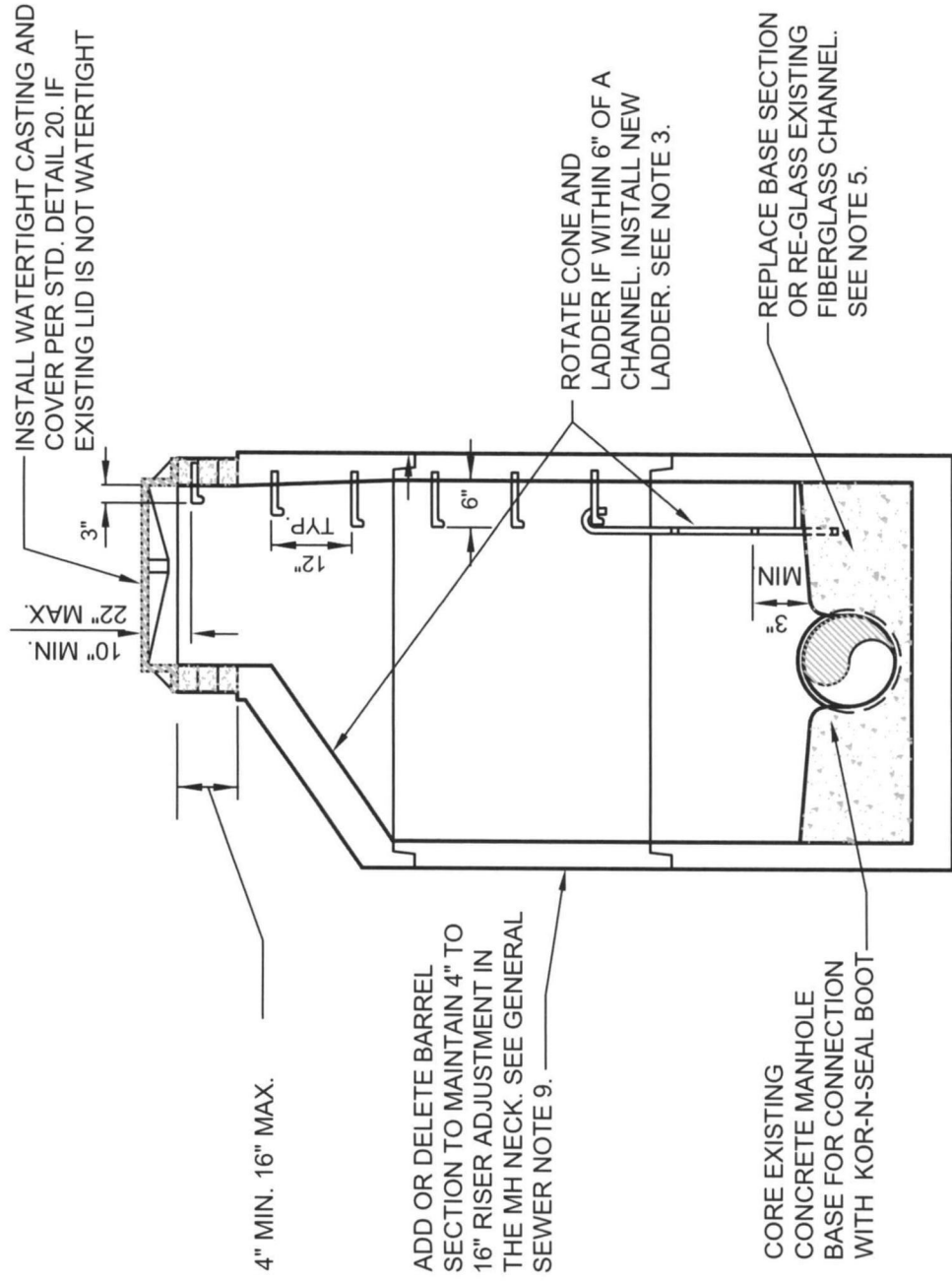
EXPIRES AUGUST 9, 2009

**TRAFFIC LETTERS AND
NUMERALS
(LOW SPEED ROADWAYS)
STANDARD PLAN M-80.30-00**

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION
Pasco Bakofich III 06-10-08
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

FOR USE ON ROADWAYS WITH A POSTED SPEED OF 40 MPH OR LESS



SECTION

NOTES:

1. NOTIFY THE DISTRICT AT LEAST 7 DAYS IN ADVANCE AND MAKE THE NECESSARY ARRANGEMENTS WITH THE WATER DISTRICT INSPECTOR FOR CONNECTION TO THE EXISTING MANHOLE.
2. CONTRACTOR SHALL SUBMIT A BYPASS PLAN FOR EXISTING FLOWS WHILE WORKING IN THE EXISTING MANHOLE UNLESS DEEMED UNNECESSARY BY THE DISTRICT.
3. ROTATE CONE AND INSTALL NEW LADDER PER STANDARD DETAIL 18 IF EXISTING LADDER IS WITHIN 6" OF THE EDGE OF ANY CHANNEL.
4. CORE EXISTING MH AND USE KOR-N-SEAL CONNECTION, UNLESS KNOCKOUTS EXIST ON THE BASE SECTION. IN THIS CASE, CORE STILL REQUIRED AND GPK SAND COLLAR SHALL BE USED INSTEAD OF THE KOR-N-SEAL BOOT.
5. CONNECTIONS INTO AN EXISTING FIBERGLASS BASE, CONTRACTOR SHALL REPLACE THE BASE SECTION OR HAVE THE CHANNEL RE-GLASSED BY A CERTIFIED SERVICE TECHNICIAN TO ACCOMMODATE THE NEW CONNECTION. (WWW.PREDLSYSTEMS.COM) FOR A LIST OF CERTIFIED TECHNICIANS THAT CAN PERFORM THE WORK.



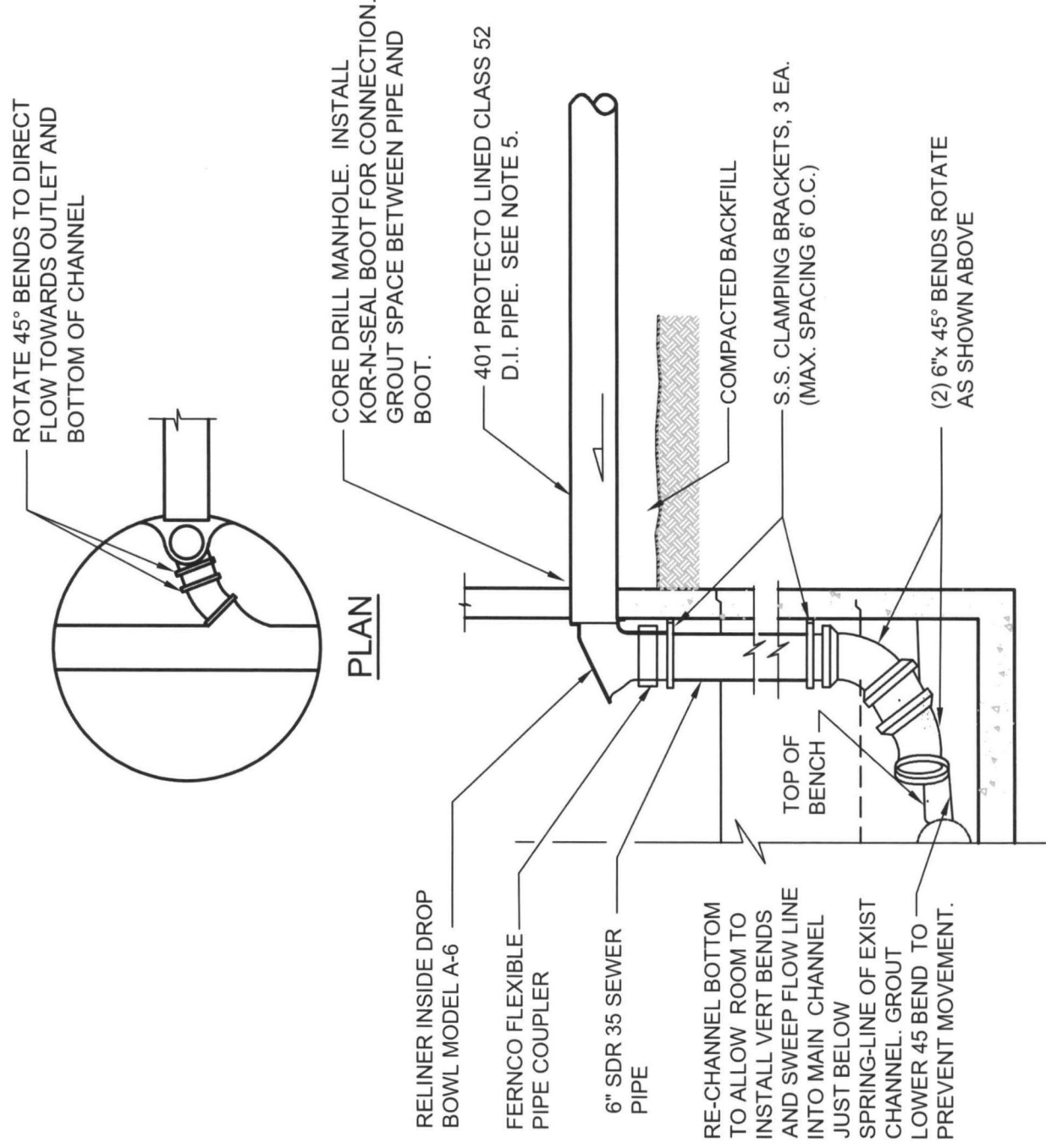
**Woodinville
Water District**

**CONNECTION TO
EXISTING MH**



**SEWER STD.
PLAN NO. 1**

REVISION DATE
12-20



ELEVATION

NOTES:

1. INSIDE DROP ALLOWED ONLY WITH SPECIFIC APPROVAL FROM THE DISTRICT.
2. 8" MAX. SIZE INLET. DEPENDING ON FLOWS THE DROP PIPE DROP AND BENDS MAY HAVE TO BE UPSIZED TO 8".
3. RELINER INSIDE DROP BOWL AND CLAMPING BRACKETS AS MANUFACTURED BY RELINER/DURAN INC. (860)434-0277.
4. MIN. SIZE MH FOR INSIRE DROP IS 60".
5. 401 PROTECTO LINED CLASS 52 DUCTILE IRON PIPE TO BE INSTALLED FROM DROP LOCATION TO THE NEXT UPSTREAM MANHOLE.

INSIDE DROP MANHOLE CONNECTION

NOT TO SCALE



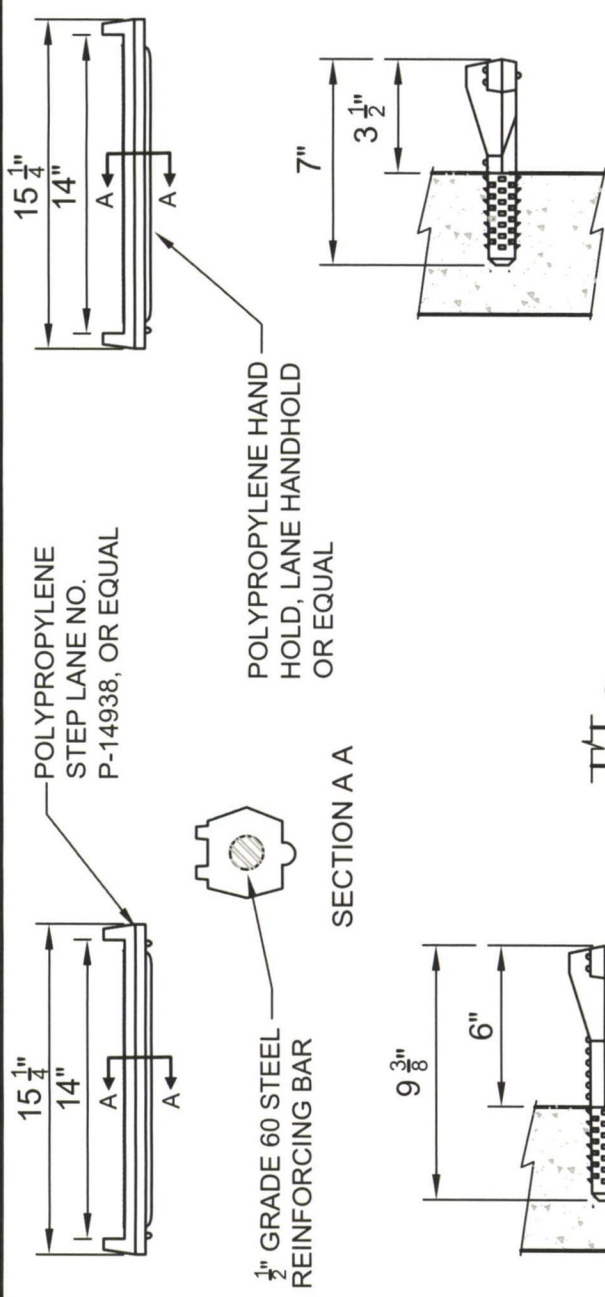
**Woodinville
Water District**



**INSIDE DROP
DETAIL**

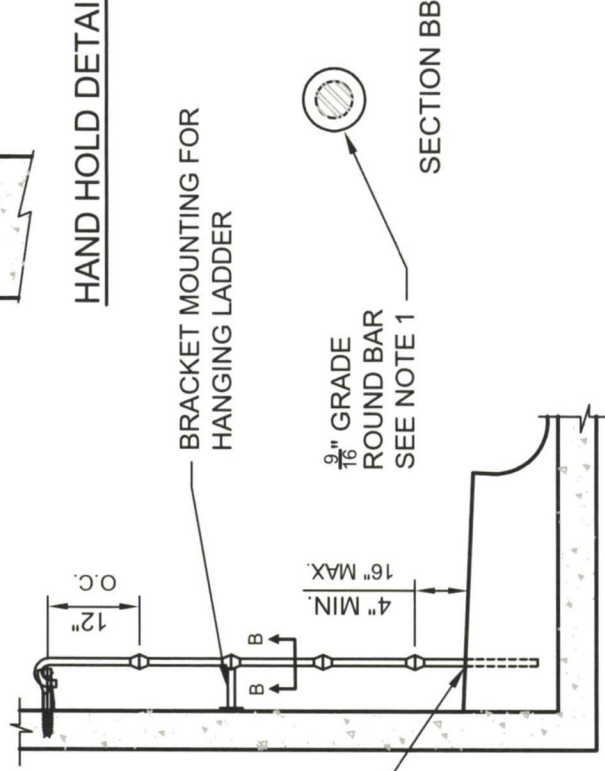
**SEWER STD.
PLAN NO. 7**

**REVISION DATE
12-20**



HAND HOLD DETAIL

MANHOLE STEP



NOTES:

1. POLYPROPYLENE TO CONFORM WITH ASTM-4101. STEPS SHALL MEET THE REQUIREMENTS OF ASTM C-478 AND AASHTO M-199. STEPS SHALL HAVE 1/2" GRADE 60 DEFORMED REINFORCING BAR THAT MEETS ASTM A-615. LADDERS TO MEET ASTM C-497 LOAD REQUIREMENTS. HANGING LADDERS SHALL USE 9/16" COLD DRAWN BARPER C-1018.
2. HANDHOLD OR RECESSED STEP TO BE USED AT TOP OF CONE. LADDER RUNGS AND HANDHOLD STEP SIDES SHALL BE IN A STRAIGHT VERTICAL LINE. SEE STANDARD PLAN 2.
3. POSITION LADDER PER STANDARD PLAN 19.
4. MAXIMUM HEIGHT FOR HANGING LADDER IS 4'.
5. MAXIMUM ALLOWABLE DISTANCE FROM TOP OF CASTING TO TOP OF CONE STEP IS 22". ADD HANDHOLD @ 12" O.C. IF GREATER THAN 22".
6. PROVIDE MOUNTING BRACKET AT BASE IF THE LADDER IS NOT EMBEDDED IN THE BENCH.



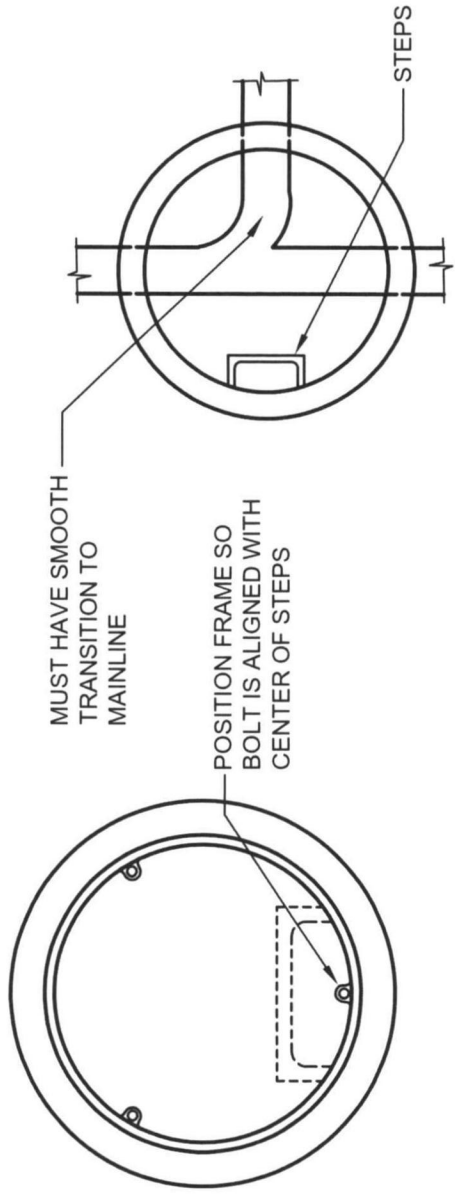
**Woodinville
Water District**



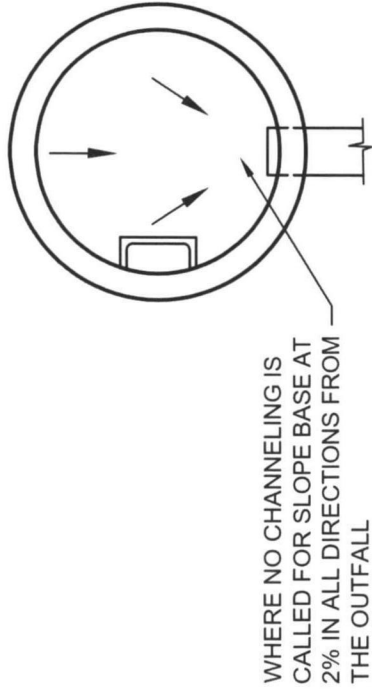
**STEP AND LADDER
DETAILS**

**SEWER STD.
PLAN NO. 18**

**REVISION DATE
12-20**



LOCKING LID POSITIONING DETAIL



CHANNELING DETAIL

FULL DEPTH CHANNELS SHALL BE MADE TO CONFORM TO THE SEWER GRADE AND SHALL BE BROUGHT TOGETHER WITH WELL-ROUNDED JUNCTIONS. CHANNEL SIDES SHALL BE CARRIED UP VERTICALLY $\frac{3}{4}$ OF THE LARGEST PIPE'S DIAMETER AND ROUNDED TO THE BENCHES. THE BENCHES SHALL BE SMOOTHLY FINISHED WITH 2% MINIMUM SLOPE TOWARD CHANNEL

1. MANHOLE CHANNELING OF EXISTING CONCRETE STRUCTURES SHALL BE PERFORMED BY DISTRICT APPROVED SUB-CONTRACTORS. SHOULD THE CONTRACTOR REQUEST DOING THE WORK THEMSELVES OR AN UNKNOWN SUB-CONTRACTOR, THE DISTRICT SHALL REQUIRE SAMPLE CHANNEL WORK ON ONE MANHOLE BEFORE GIVING APPROVAL TO PROCEED WITH THE REMAINDER OF THE WORK.
2. CHANNELS, BENCHES AND ENTIRE BASE SECTION SHALL BE FIBERGLASS LINED AND MANUFACTURED BY PREDL SYSTEMS OR APPROVED EQUAL.
3. EXISTING PREDL SYSTEM FIBERGLASS LINED MANHOLE BASES SHALL BE EITHER REPLACED OR RE-GLASSED BY A CERTIFIED SERVICE TECHNICIAN. (WWW.PREDLSYSTEMS.COM) FOR A LIST OF CERTIFIED TECHNICIANS THAT CAN PERFORM THE WORK.
4. SIDE SEWER CHANNEL I.E. TO BE .1' HIGHER (MIN) THAN MAIN CHANNEL AT POINT OF ENTRY.



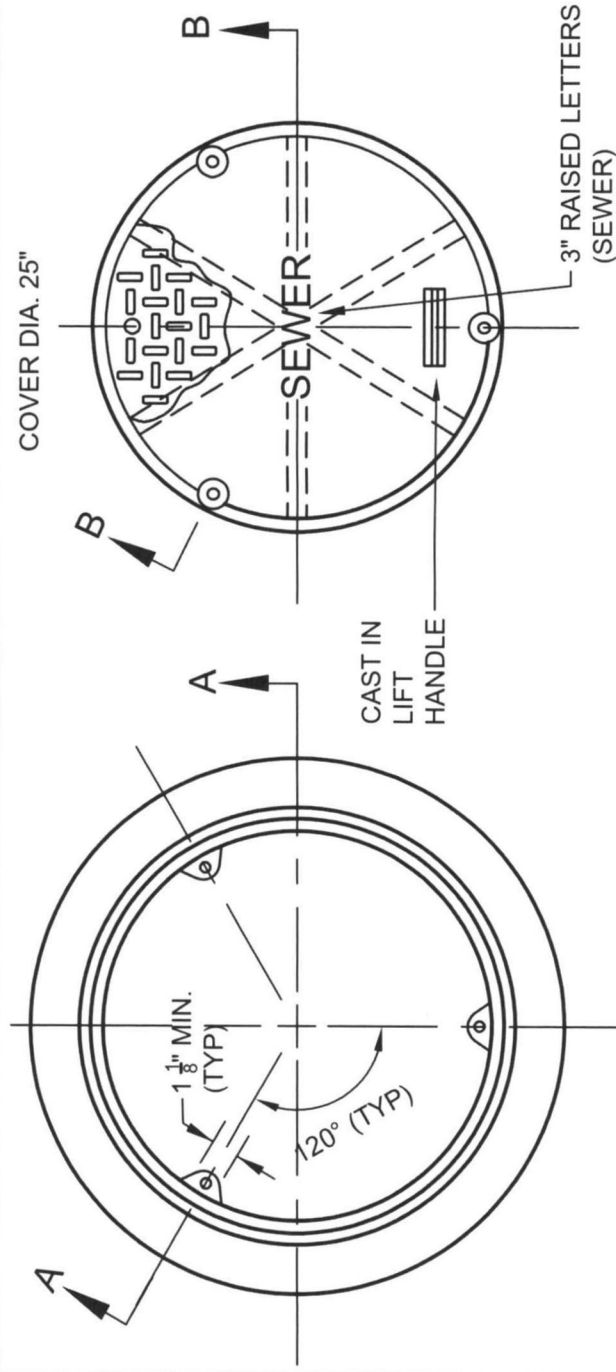
**Woodinville
Water District**

**CHANNEL & LADDER
LOCATION DETAILS**

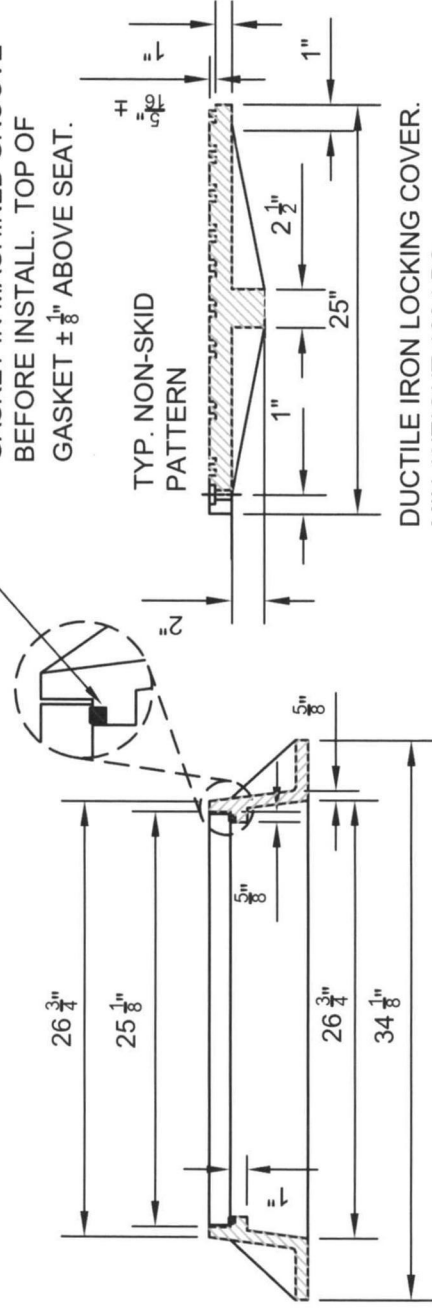


**SEWER STD.
PLAN NO. 19**

**REVISION DATE
12-20**



GLUE 1/4" RESILIENT RUBBER GASKET IN MACHINED GROOVE BEFORE INSTALL. TOP OF GASKET ± 1/8" ABOVE SEAT.



SECTION A-A

SECTION B-B

NOTES

1. MANHOLE COVER SHALL BE DUCTILE IRON (ASTM A 48 CLASS 30). MH CASTING CAN BE DUCTILE IRON OR CAST IRON AS MANUFACTURED BY EAST JORDAN IRON WORKS PRODUCT NO. 00370548W01 CATALOG NO. 3705APT DI 3715ZPT OR APPROVED EQUAL.
2. DRILL AND TAP (3) 3/8" HOLES THRU FRAME @ 120°. COVERS & CASTINGS THAT CANNOT BE BOLTED DOWN IN ANY ROTATION OF THE BOLTS WILL BE REJECTED.
3. MH COVERS NOT ALLOWED IN SIDEWALK, CURB & GUTTER, LOW AREAS THAT COLLECT RUNOFF AND WHENEVER POSSIBLE POSITION FRAME OUT OF WHEEL TRACKS.
4. MH LOCATIONS OUT OF PAVED AREAS REQUIRE A CONCRETE COLLAR. SEE STD. PLAN NO 21.
5. PROVIDE (3) 5/8" S.S. LOCKING BOLTS WITH RUBBER WASHERS PER COVER. ENSURE MH COVERS ARE BOLTED DOWN AFTER FINAL INSPECTION.



**Woodinville
Water District**

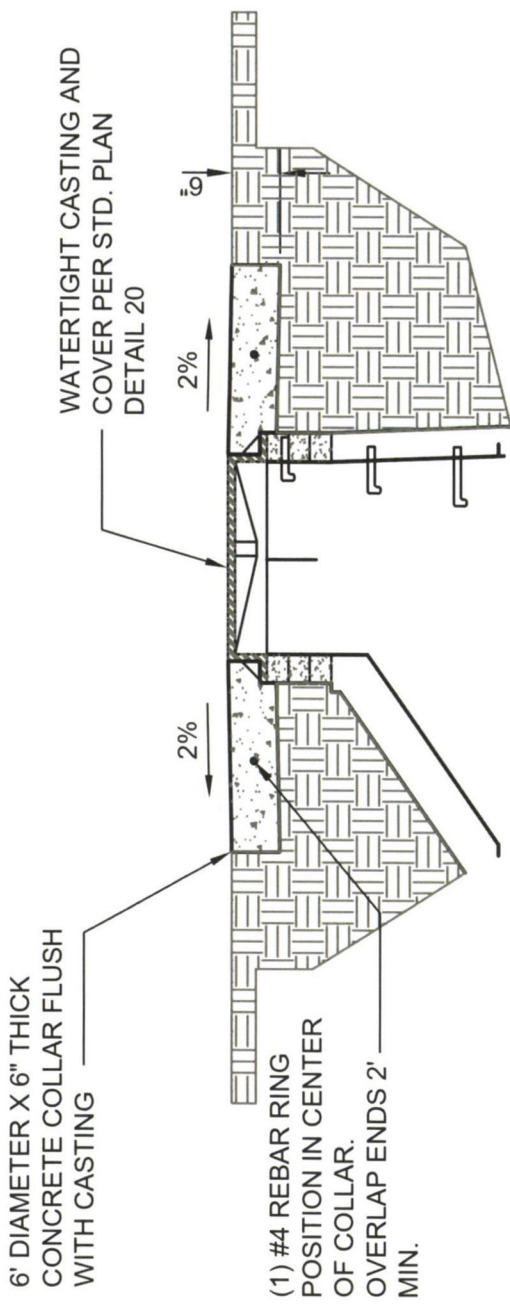


**WATERTIGHT MANHOLE
CASTING AND FRAME**

**SEWER STD.
PLAN NO. (20)**

REVISION DATE

12-20



NOTES:

1. NECK OF MH TO BE SEAL WRAPPED IN WET AREAS. SEE STANDARD PLAN 1 & 2 AND SEWER SPECIFICATIONS.
2. SLOPE CONCRETE COLLAR @ 2% AWAY FROM THE TOP OF THE MH LID.
3. APPLY A SMOOTH PROFESSIONAL BROOM FINISH TO CONCRETE SURFACE.
4. CLEAN CONCRETE SLURRY FROM THE MH LID.



**Woodinville
Water District**



**MANHOLE COLLAR
DETAIL**

**SEWER STD.
PLAN NO. 21**

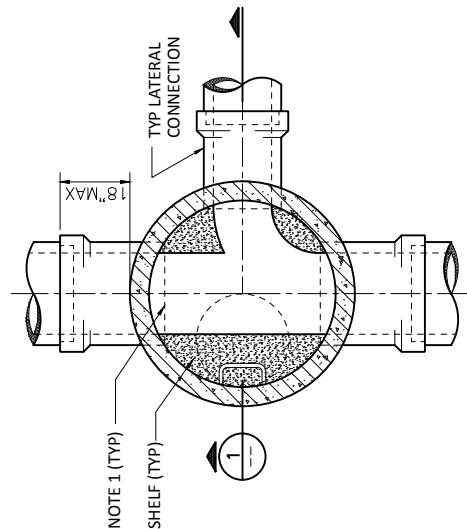
**REVISION DATE
12-20**



TYPICAL REDUCING SLAB

SCALE: 1/2" = 1'-0"

A



- 8" THRU 21" DIA PIPE



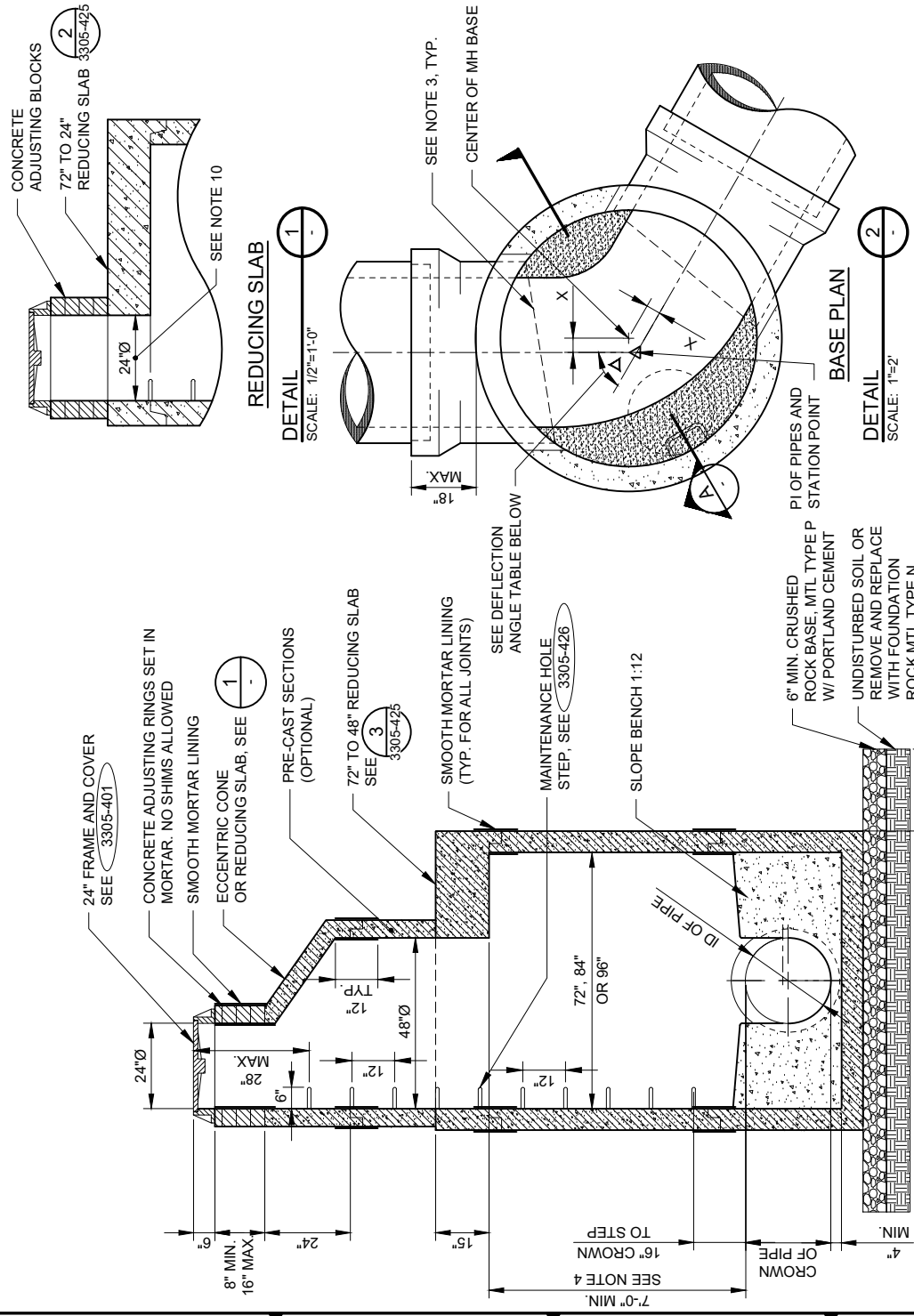
BASE - PLAN



TYPICAL CONNECTION DETAIL

MODIFIED NOTES 4 AND 5.		MAY 2017	RRB
MODIFIED MIN/MAX OF ADJUSTING BLOCKS		April 2013	GLH
DELETED NOTE SAYING TO GROUT AT PIPE		MAR 09	GLH
REDUCED MIN DEPTH OF ADJUSTING BLOCKS		JAN 07	GLH
DIS-ALLOWED LINE DRILLING OF EXISTING MH		JAN. 07	GLH
DATE: 12/9/96 DRAWN: DJB			
		DWG/FILE NO:	
HOLE 20002			

STANDARD TYPE-A MANHOLE



DEFLECTION ANGLE (Δ)	OFFSET X - 36" 42" 48" ID	
	DIP	RCP
LESS THAN 35°	0"	0"
35° TO < 55°	3"	2"
55° TO < 75°	6"	4"
75° & LARGER	10"	8"

USE 84" DIAMETER MAINTENANCE HOLE FOR 48" RCP > 75°

MAINTENANCE HOLE DIMENSION TABLE				
D/AMETER	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAX. KNOCKOUT SIZE	MIN. DISTANCE BETWEEN KNOCKOUTS
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"

NOTES:

1. REFER TO SPECIFICATION SECTION 33 05 61 UTILITY STRUCTURES FOR MAINTENANCE HOLE REQUIREMENTS.
2. BASE REINFORCING: 0.35 SQUARE INCHES/LINEAR FOOT IN BOTH DIRECTIONS. MINIMUM YIELD STRENGTH = 60,000 PSI.
3. TOP HALF OF PIPE TO BE REMOVED TO CONTOUR OF INSIDE OF MAINTENANCE HOLE. BROKEN EDGES TO BE PLASTERED SMOOTH WITH MORTAR. TYPICAL ALL MAINTENANCE HOLES.
4. PRECAST MAINTENANCE HOLE SECTIONS SHALL CONFORM TO SPECIFICATION 33 05 61, EXCEPT WHERE OTHERWISE NOTED.
5. ALL MAINTENANCE HOLE RISERS, JOINTS SHALL BE RUBBER GASKET TYPE, CONFORMING TO SPECIFICATION 33 05 61. JOINTS AT BASE, CONE AND ADJUSTING RINGS SHALL BE SEALED PER SPECIFICATION SECTION 33 05 61.
6. PENETRATIONS OF EXISTING MAINTENANCE HOLES SHALL BE MADE BY CORE DRILLING AND USE OF A FLEXIBLE WATERTIGHT RUBBER BOOT PER SPECIFICATION 33 05 61.
7. ALL CONNECTIONS OF NEW MAINTENANCE HOLES SHALL BE INSTALLED WITH A FLEXIBLE WATERTIGHT RUBBER BOOT PER SPECIFICATION 33 05 61.
8. ELIMINATE 2 FT BY 4 FT PRECAST CONE SECTION ON MAINTENANCE HOLES LESS THAN 11 FT DEEP TO CROWN OF SEWER. BEFORE REDUCING 7 FT DEPTH OF A 4 FT OR 6 FT CIRCULAR MAINTENANCE HOLE; USE REDUCING SLAB FOR SUPPORTING ADJUSTING RINGS.
9. SHALLOW MAINTENANCE HOLES REQUIRING THE MAINTENANCE HOLE FRAME TO BE PLACED DIRECTLY ON THE REDUCING SLAB, THIS DIMENSION SHALL BE 24"Ø.
10. BELLS SHALL BE CAST INTO PRECAST MAINTENANCE HOLE BASE BY MAINTENANCE HOLE MANUFACTURER.
11. BRING LOCATE WIRE INTO STRUCTURE 2 FEET BELOW GRADE ADJACENT TO MH STEP. HANG MINIMUM 4 FEET OF LOCATE WIRE ON NEAREST MH STEP.

DEPARTMENT OF NATURAL RESOURCES & PARKS
WASTEWATER TREATMENT DIVISION
DIVISION 33 - UTILITIES
33 05 61 MAINTENANCE HOLES

DESIGNED/DRAWN: N. KHAMPHOUKEO	CHECKED:
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King County

TYPE-B MAINTENANCE HOLE

DATE:	MARCH 2024
DETAIL NO:	

3305-416

SHT NO	/	TOTAL	REV NO:
#		#	0