JANUARY 7, 2008 TO AUGUST 3, 2008

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Standard Plans For Road, Bridge, and Municipal Construction

M 21-01







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ECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

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This manual contains standard engineering drawings used for road, bridge, and municipal construction. These drawings have been prepared under the direct supervision of a Washington State licensed professional engineer, who is knowledgeable in the specialized field of civil engineering depicted in each drawing. This manual standardizes fabrication, installation, and construction methods for specific items of work, and complements the contract documents and the *Standard Specifications for Road, Bridge, and Municipal Construction.*

Updating the manual is a continual process and revisions are issued periodically. Questions, comments, and recommendations for changes are welcome.

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Pasco Bakotich III State Design Engineer

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I-60.10-00	Erosion Control Blanket Placement On Slope	8/31/07	
I-60.20-00	Erosion Control Blanket Placement In Channel	8/31/07	
I-80.10-00	Miscellaneous Erosion Control Details	8/31/07	

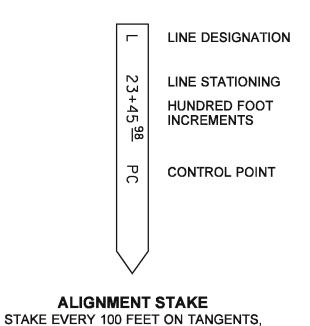
Contents

		Conte	FIILS
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Section J	Illumination, Signals, and ITS		
J-1f	Timber Light Standards	6/23/00	
J-3	Type A, B, and C Service Lighting Details	8/1/97	2 Sheets
J-3b	Service Cabinet Type B Modified (0 - 200 Amp Type,	3/4/05	2 Sheets
	120/240 Single Phase)		
J-3c	Service Cabinet Type D (0 - 200 Amp Type, 120/240 Single Phase)	6/24/02	
J-3d	Service Cabinet Type E (0 - 200 Amp Type, 240/480 Single Phase)	11/5/03	
J-5	Pedestrian Pushbutton Details	8/1/97	
J-6c	Cabinet Foundation Details	4/24/98	
J-6f	Signal Head Mounting Details, Pole & Post Top Mountings	4/24/98	
J-6g	Signal Head Mounting Details, Mast Arm and Span	12/12/02	
_	Wire Mountings		
J-6h	Miscellaneous Signal Details	4/24/98	
J-7a	Signal Standard Type Designations and	9/12/01	2 Sheets
	Types PPB, PS, I, RM, and FB Details		
J-7c	Strain Pole Standards Type IV and V	6/19/98	
J-7d	Span Wire Installation	4/24/98	
J-8a	Type 1 Induction Loop	5/20/04	
J-8b	Type 2 Induction Loop	5/20/04	2 Sheets
J-8c	Type 3 Induction Loop	5/20/04	3 Sheets
J-8d	Induction Loop Details	5/20/04	2 Sheets
J-9a	Typical Grounding Details	4/24/98	
J-10	Electrical Conduit Placement	7/18/97	
J-11a	Standard Junction Box, Types 1 & 2	10/12/07	
J-11b	Heavy Duty Junction Box, Types 4, 5, & 6	9/2/05	2 Sheets
J-11c	Standard Duty Junction Box, Types 7 & 8	6/21/06	2 Sheets
J-12	Sign Post-Mounted Junction Box	11/8/05	2 Sheets
J-15a	Pull Box	10/4/05	2 Sheets
J-15b	Cable Vault	10/4/05	2 Sheets
J-16a	Junction Box, Traffic Barrier Mounted	3/4/05	
J-16b	Conduit Installation in Traffic Barrier on Retaining Wall	9/20/07	
J-16c	Conduit Installation in Single Slope Conc. Barrier (Dual Face)	9/20/07	
J-18	Permanent Traffic Recorder Site Installations	9/2/05	2 Sheets
J-19	Weigh-In-Motion Site Installation	9/2/05	
J-20	Permanent Traffic Recorder and Weigh-In-Motion Details	9/2/05	3 Sheets
J-28.10-00	<u> </u>	8/7/07	2 Sheets
J-28.22-00	• • • • • • • • • • • • • • • • • • • •	8/7/07	2 Sheets
J-28.24-00	` ,	8/7/07	
J-28.26-00		8/7/07	
J-28.30-00	,,	8/7/07	2 Sheets
J-28.40-00	ŭ .	8/7/07	
J-28.42-00	, , ,	8/7/07	
J-28.45-00		8/7/07	
J-28.50-00	•	8/7/07	
J-28.60-00		8/7/07	
J-28.70-00	Steel Light Standard: Wiring Details	11/8/07	

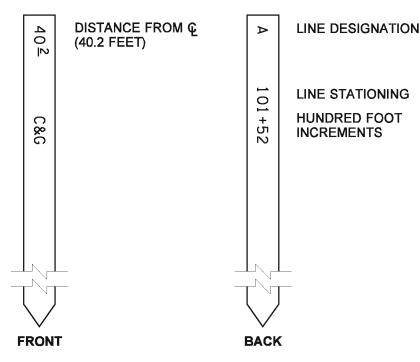
Standard Plans for Road, Bridge, and Municipal Construction EFFECTIVE: JANUARY 7, 2008 TO AUG 8002, 2 Augustian EFFECTIVE: JANUARY 1, 2008 TO AUG 8002, 2008 TO AUG 8002

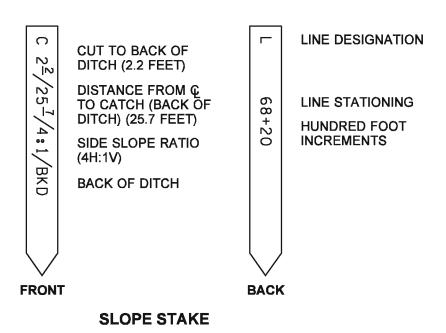
	Contents			
Plan No.	Plan Title	Publication Approv	al Date	
Section K	Work Zone Traffic Control			
K-10.20-01	Road Closure, with Diversion	10/12/07		
K-10.40-00	Road Closure, with Off-Site Detour	2/15/07		
K-20.20-01	Lane Closure, without Flaggers ~ Low Volume Road	10/12/07		
K-20.40-00	Lane Closure, with Flagger Control	2/15/07		
K-20.60-00	Lane Closure, with Pilot Car	2/15/07		
K-22.20-01	Lane Shift, onto Passing Lane	10/12/07		
K-24.20-00	Single Lane Closure, with Encroachment	2/15/07		
K-24.40-01	Double Lane Closure, on Multilane Roadway	10/12/07		
K-24.60-00	Single Lane Closure, on Multilane Roadway	2/15/07		
K-24.80-01	Single Lane Closure, with Temporary Concrete Barrier	10/12/07		
K-26.20-00	Lane Shift, onto Two-way Left Turn Lane	2/15/07		
K-26.40-01	Left and Center Lane Closure ~ Two-Way Left Turn Lane	10/12/07		
K-30.20-00	Intersection ~ Lane Shift on 3 Lane Two-Way Left Turn Land			
K-30.40-01	Intersection ~ Lane Shift on 5 Lane Two-Way Left Turn Lar			
K-32.20-00	Intersection ~ Right Lane Closure, Far Side	2/15/07		
K-32.40-00	Intersection ~ Left Lane Closure, Far Side	2/15/07		
K-32.60-00	Intersection ~ Multiple Lane Closure	2/15/07		
K-32.80-00	Intersection ~ Half Road Closure with Lane Shift	2/15/07		
K-34.20-00	Intersection ~ Pedestrian Detour	2/15/07		
K-36.20-00	Intersection ~ Shoulder Work	2/15/07 ner) 2/15/07		
K-40.20-00	Shoulder Closure ~ High Speed Roadway (45 MPH or High Shoulder Closure ~ Low Speed Roadway (40 MPH or Lowe	•		
K-40.40-00 K-40.60-00	Shoulder Closure ~ Short Duration	2/15/07 2/15/07		
K-40.80-00	Work Beyond the Shoulder	2/15/07		
K-55.20-00	Emergency ~ Passable Hazard	2/15/07		
K-60.20-01	Speed Zone, Supplemental Signing ~ Chip Seal Project	11/12/07		
K-60.40-00	Motorcycle, Supplemental Signing	2/15/07		
K-70.20-00	Temporary Channelization	2/15/07		
K-80.10-00	Class A Construction Signing Installation	2/21/07		
K-80.20-00	Type 3 Barricade	12/20/06	2 Sheets	
K-80.30-00	Alternative Temporary Conc. Barrier (F-Shape)	2/21/07		
K-80.35-00	Temporary Conc. Barrier Anchoring	2/21/07		
K-80.37-00	Temporary Conc. Barrier Anchoring ~ Narrow	2/21/07		
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L-10.10-00	Wire Fence Types 1 & 2, and Wire Gates	2/21/07	2 Sheets	
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L-40.15-00	Glare Screen Type 1, Design B	2/21/07	_ 300.0	
L-40.20-00	Glare Screen Type 2 (Chain Link with Slats)	2/21/07		
L-70.10-00	Access Control Gate	1/30/07		
L-70.20-00	Access Control Double Gate	1/30/07		
	-	,		

		Conte	ents
Plan No.	Plan Title F	Publication Approv	al Date
Section M	Roadway Delineation		
M-1.20-01	Ramp Channelization: Single Lane	1/30/07	
M-1.40-01	Ramp Channelization: Two Lane	1/30/07	
M-1.60-01	Ramp Channelization: Collector Distributor Road	1/30/07	
M-1.80-02	Ramp Channelization: Parallel On & Weaving Section	8/31/07	
M-2.20-01	Gore Area Marking Layouts	1/30/07	
M-2.40-01	Gore Area Supplement w/ Type 2 Raised Pavement Marke	ers 1/30/07	
M-2.60-01	Gore Area Substitution with Types 1 & 2 RPM's	1/30/07	
M-3.10-01	Left Turn Channelization	1/30/07	
M-3.20-01	Left Turn Channelization: Reduced Tapers	1/30/07	
M-3.30-01	Left Turn Channelization: Tee Intersection and	1/30/07	
	Back-to-back Turn Lanes		
M-3.40-01	Two-way Left-Turn and Median Channelization	1/30/07	
M-3.50-01	Double Left Turn Channelization	1/30/07	
M-5.10-01	Right Turn Channelization	1/30/07	
M-7.50-01	High Occupancy Vehicle (HOV) Lane Symbol Layout	1/30/07	
M-9.50-01	Bicycle Lane Symbol Layout	1/30/07	
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M-15.10-01	Crosswalk Layout	2/6/07	
M-17.10-01	Parking Space Layouts	1/30/07	
M-20.10-01	Longitudinal Marking Patterns	1/30/07	
M-20.20-01	Profiled and Embossed Plastic Lines	1/30/07	
M-20.30-01	Longitudinal Marking Supplement with	1/30/07	
	Raised Pavement Markers (RPM's)		
M-20.40-01	Longitudinal Marking Supplement with RPM's ~ Turn Lanes	s 1/30/07	2 Sheets
M-20.50-01	Longitudinal Marking Substitution with RPM's	1/30/07	
M-24.20-01	Symbol Markings: Traffic Arrows for High Speed Roadways	s 5/31/06	3 Sheets
M-24.40-01	Symbol Markings: Traffic Arrows for Low Speed Roadways	5/31/06	2 Sheets
M-24.60-02	Symbol Markings: Miscellaneous	2/6/07	2 Sheets
M-40.10-00	Guide Posts and Barrier Delineators	9/20/07	
M-40.20-00	Guide Post Placement: Interchanges	10/12/07	
M-40.30-00	Guide Post Placement: Grade Intersections	9/20/07	
M-40.40-00	Guide Post Placement: Horizontal Curves	9/20/07	
M-40.50-00	Guide Post Placement: Bridges	9/20/07	
M-40.60-00	Guide Post Placement: Miscellaneous	9/20/07	
M-60.10-00		9/5/07	4 Sheets
M-60.20-00	, ,,	9/5/07	2 Sheets
	for Undivided Highways		
M-65.10-00	, , , , , , , , , , , , , , , , , , ,	9/5/07	2 Sheets

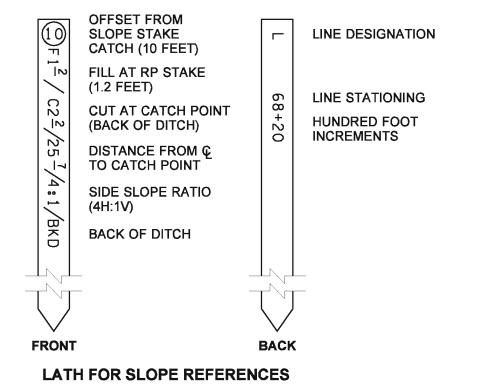


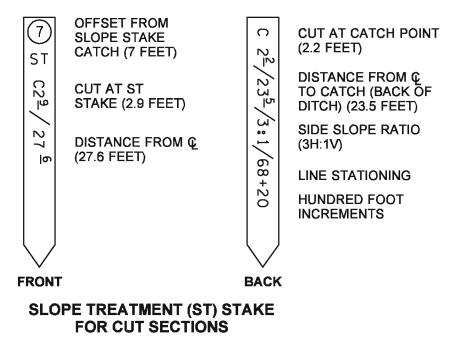
EVERY 25 FEET ON CURVES

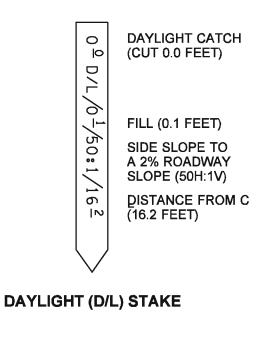


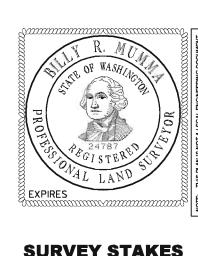














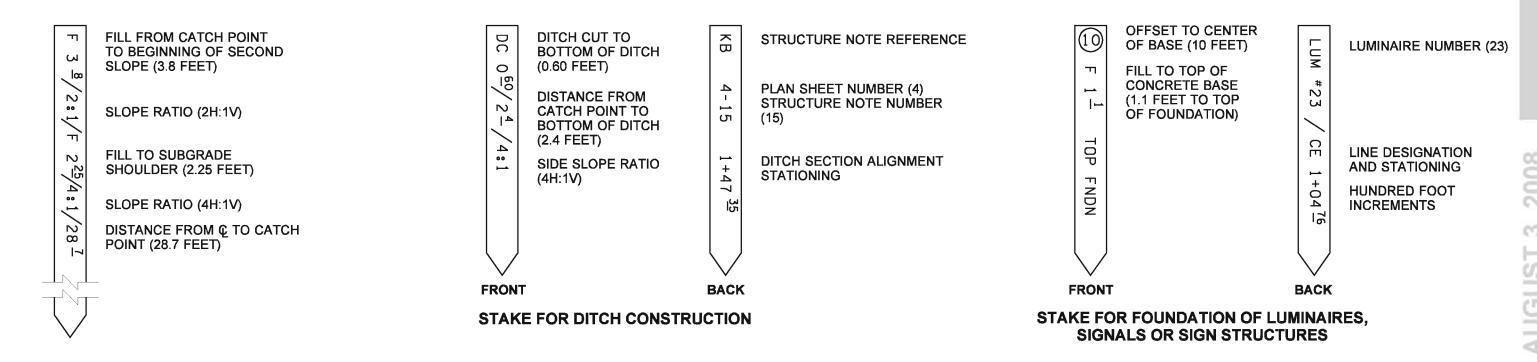
STANDARD PLAN A-10.10-00

SHEET 1 OF 2 SHEETS

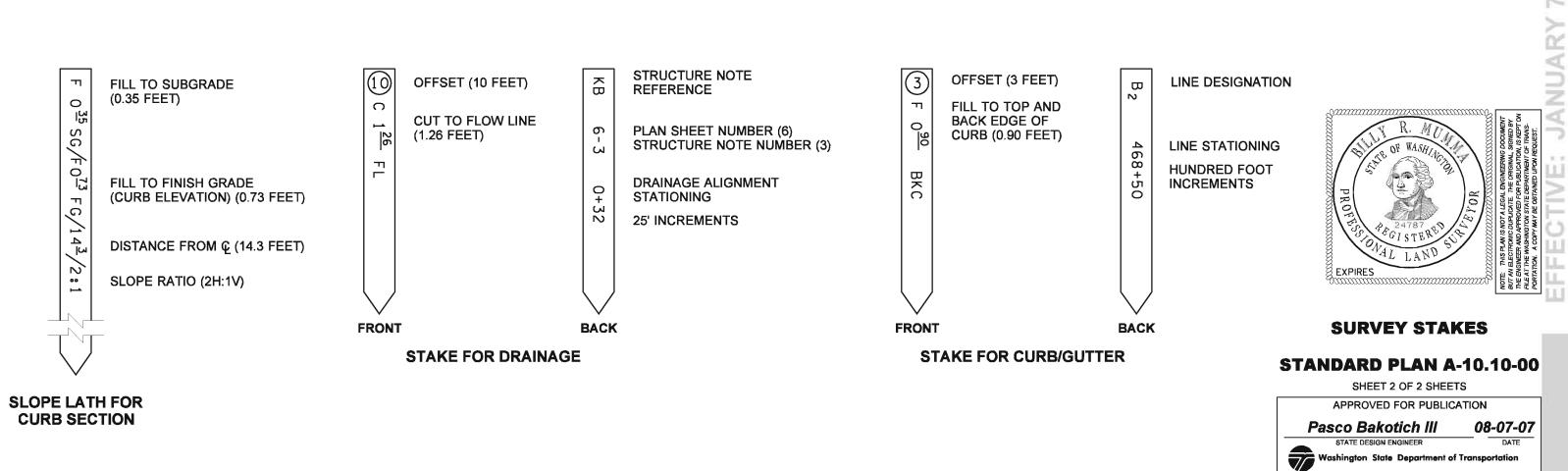
APPROVED FOR PUBLICATION Pasco Bakotich III



08-07-07



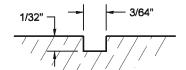
COMPOUND SLOPE LATH



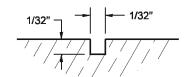
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 3/16" 1/8" DIAM. PUNCH MARK OR CHISELED "X" (TO BE PLACED AT ACTUAL POINT) 1/2" **TOP VIEW** TYPE 1 TYPE 2 **BRASS DISC** 3" 1/8" 6" R 3/16' SECTION (A SECTION (B) **SIDE VIEW** SECTION (C)

2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



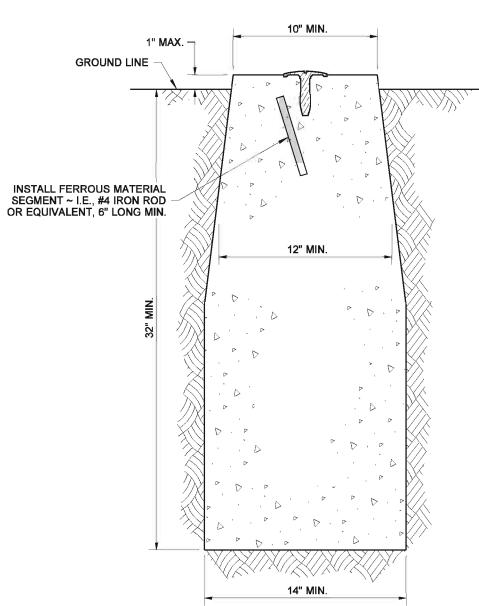
SECTION OF GROOVE FOR 1/4" LETTERS



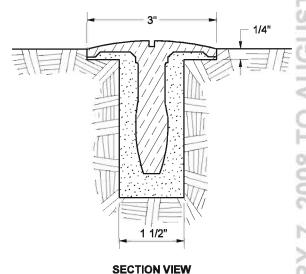
SECTION OF GROOVE FOR 3/16" LETTERS

NOTES

- 1. The Brass Disc will be furnished by the State.
- 2. The text in the shaded area (see TOP VIEW) shall be 3/16" high and will be stamped by WSDOT personnel prior to setting the cap. Only the assigned identification letters and numbers are to be placed on the Brass Disc.
- The hole shall be 32" minimum in depth or 6" below the deepest recorded frost line.
 All loose material shall be removed from the bottom of the hole so that the concrete is placed on firm undisturbed earth.
- 4. The top of the concrete shall be troweled smooth and the Brass Disc set in the center with top flush and level. The top of the monument may be recessed or protruding, depending on conditions.
- 5. The Brass Disc shall be rotated so it can be read while the observer is facing north.
- When the concrete is set, cover the entire monument with moist earth and leave for three days.
- To replace a Public Land Survey System (PLSS) corner, consult a licensed Professional Land Surveyor (PLS).

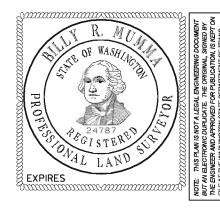


SECTION VIEW
GENERAL INSTALLATION



EDGE BOCK CONCDE

LEDGE ROCK, CONCRETE, OR ASPHALT INSTALLATION



SURVEY MONUMENT TYPES 1 AND 2

STANDARD PLAN A-10.20-00

SHEET 1 OF 1 SHEET



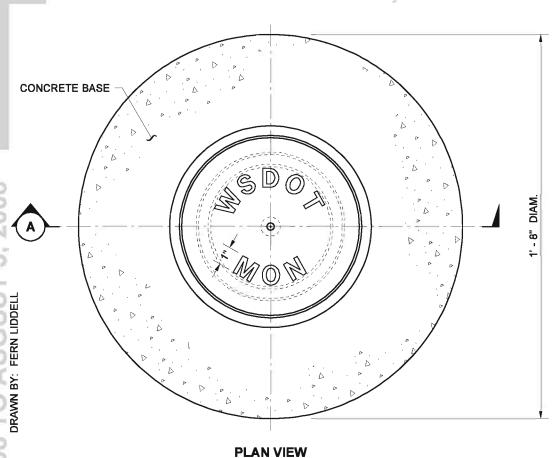
STATE DESIGN ENGINEER

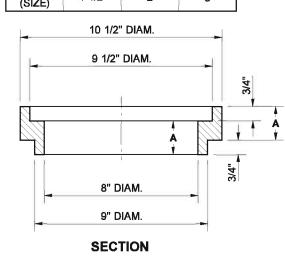
Washington State Department of Transporter

JANUARY 7 2008 TO AUGUST 3 2008 FEFECTIVE: JANUARY 7 2008 TO AUGUST

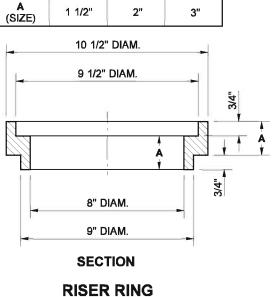
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

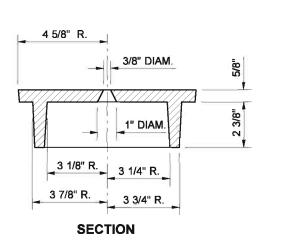
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008





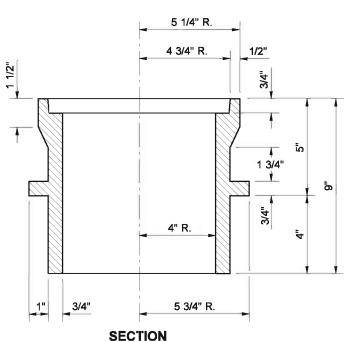
RISER RING DIMENSIONS

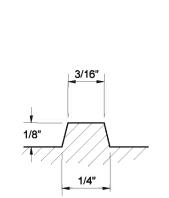




COVER

CASE

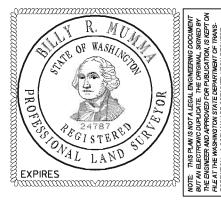




SECTION OF LETTER

- 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

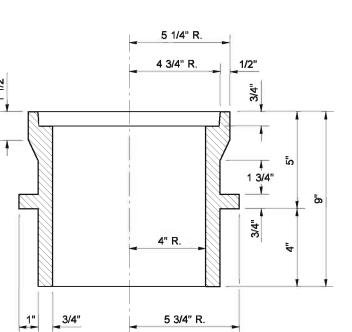


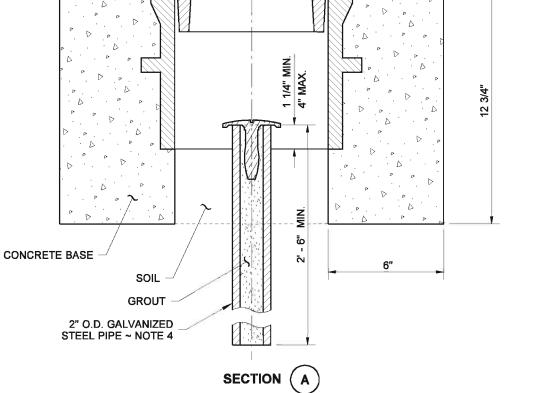
MONUMENT CASE AND COVER STANDARD PLAN A-10.30-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION





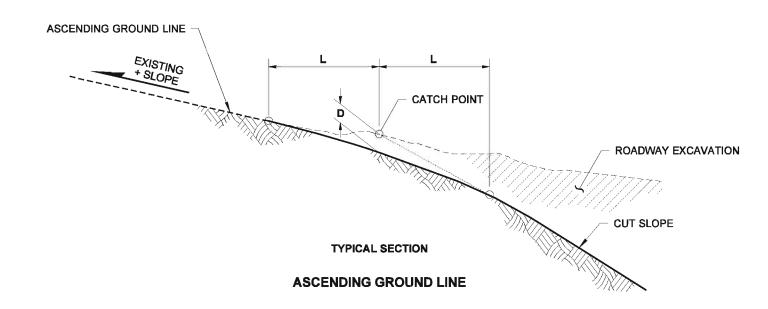


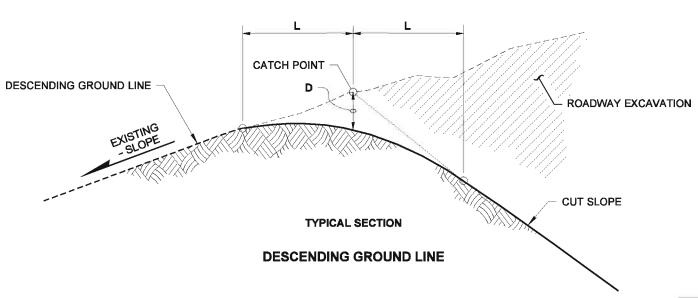
INSTALLATION

JANUARY

10" R.

ISOMETRIC





EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 1. Slope treatment shall be constructed simultaneously with the roadway excavation. Hand trimming will not be required if satisfactory results are obtained with mechanical equipment.
- 2. Slope treatment is used to provide a transition between the existing ground and the cut slope. The intended purpose is to eliminate the abrupt edge and give the area a more natural appearance. The dimensions shown are approximate and can vary to achieve this purpose.

		CLASS A	CLASS B
CUT SLOPE	GROUND LINE	L = 10.0'	L = 5.0'
(H:V)	(H:V)	D	D
	+2:1	0.5'	1>
	+3:1	1.0'	0.5'
	+4:1	1.0'	0.5'
1.5 : 1	+6:1	1.2'	0.8'
1.5 . 1	≈ LEVEL	2.0'	1.0'
	-6:1	2.2'	1.0'
	-4:1	2.0'	1.0'
	-3:1	3.0'	1.5'
	+3:1	0.5'	1
	+4:1	0.5'	1
	+6:1	1.2'	0.5'
2:1	≈ LEVEL	1.5'	0.8'
	-6:1	2.2'	1.0'
	-4:1	2.0'	1.0'
	-3:1	3.0'	1.5'
	+6:1	0.5'	1>
	≈ LEVEL	1.0'	0.5'
3:1	-6:1	1.2'	0.5'
	-4:1	1.5'	0.8'
	-3:1	2.0'	1.0'
	≈ LEVEL	0.5'	1>
4.4	-6:1	1.0'	0.5'
4 : 1	-4:1	1.2'	0.5'
	-3:1	1.5'	0.8'
	≈ LEVEL	0.5'	1>
E . 4	-6:1	1.0'	0.5'
5 : 1	-4:1	1.2'	0.5'
	-3:1	1.5'	0.8'

(1) SLOPE TREATMENT NOT REQUIRED



STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT

CERTIFICATE NO. 000598

NOTE: THIS PLAN IS NOT A LEGAL ENGINEERING DOCU-MENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL, SIGNED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT ON FILE AT THE WASHINGTON STATE DEPART-MENT OF TRANSPORTATION. A COPY MAY BE OBTAINED UPON REQUEST.

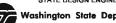
SLOPE TREATMENT

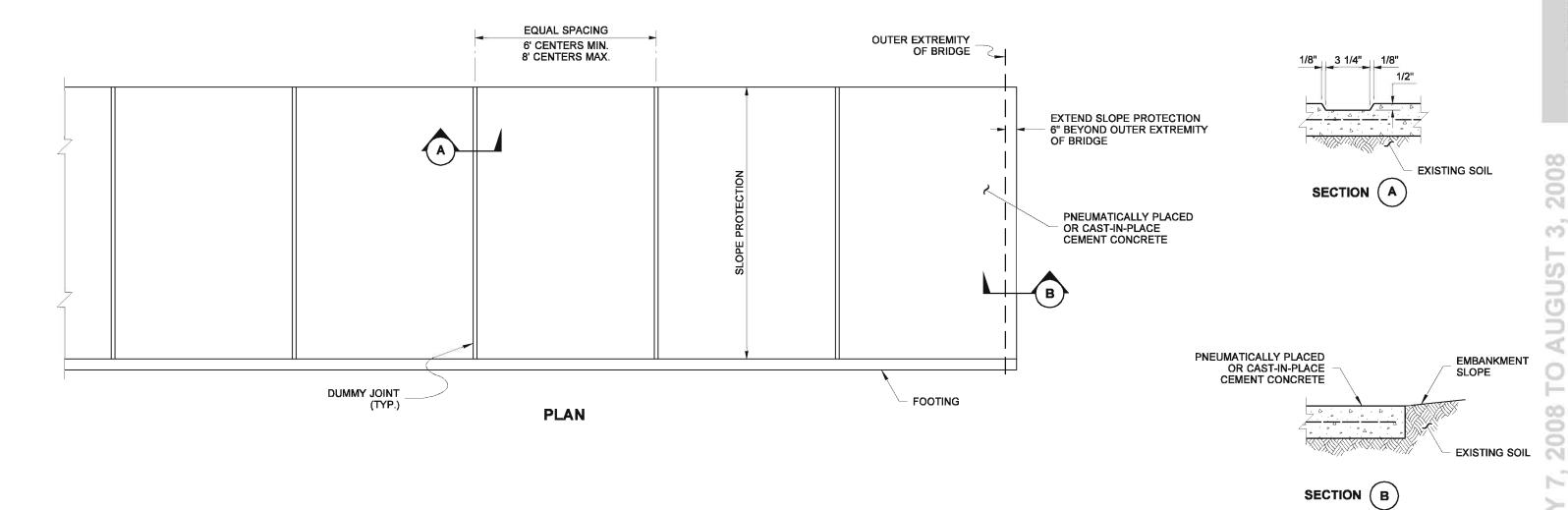
STANDARD PLAN A-20.10-00

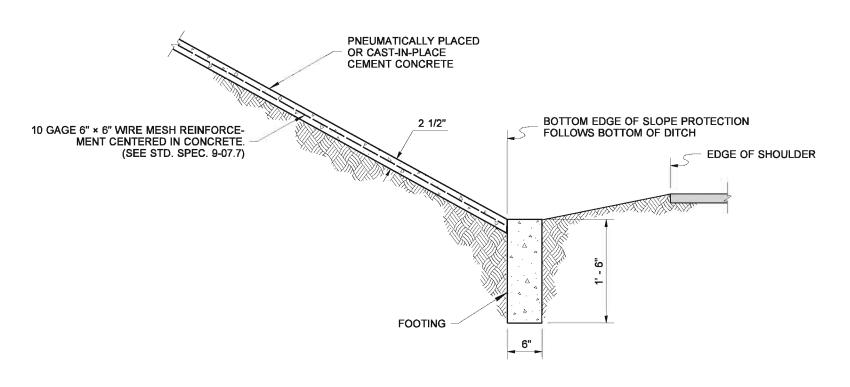
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION









TYPICAL SECTION
(SHOWN ON LOWER ROADWAY)



CONCRETE SLOPE PROTECTION

STANDARD PLAN A-30.10-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

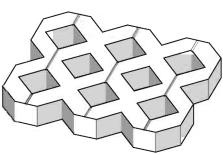




Washington State Department of Transportation

11-8-07

- 1. The design and shape of the semi-open concrete masonry unit shown is only one example of the
- only when the lower roadway cross section



AUGUS

ISOMETRIC VIEW

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STATE OF WASHINGTON REGISTERED

SEMI-OPEN CONCRETE MASONRY SLOPE PROTECTION STANDARD PLAN A-30.15-00

SHEET 1 OF 1 SHEET

11-8-07

2008

UGUST

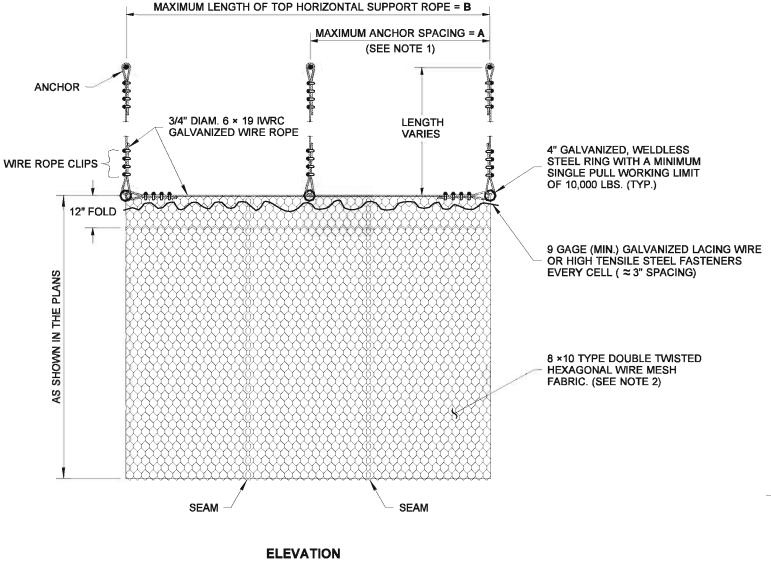
3" FABRIC

OVERLAP

SEAM

OVERLAPPED SEAM

WITH FASTENERS



3" FABRIC **OVERLAP**

SEAM

OVERLAPPED SEAM

WITH LACING

9 GAGE (MIN.) GALVANIZ-ED LACING WIRE WOVEN

THROUGH EACH CELL

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

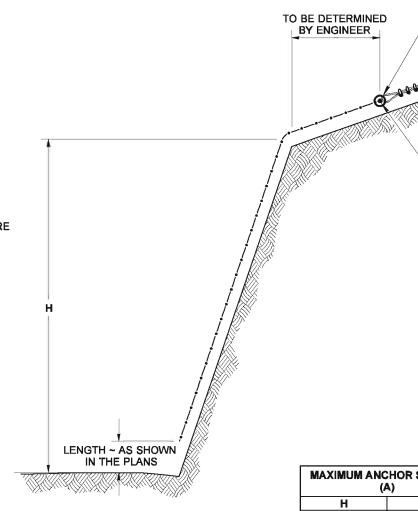
4" GALVANIZED, WELDLESS STEEL RING WITH A MINIMUM

OF 10,000 LBS. (TYP.)

SINGLE PULL WORKING LIMIT

3/4" DIAM. 6 ×19 IWRC GALVANIZED TOP

end of the rope as shown.



HORIZONTAL SUPPORT ROPE **NOTES** Maximum anchor spacing (A) for debris and impact loads required as per table for a minimum allowable anchor capacity of 20,000 lbs. Systems subjected to snow loads may require narrower maximum spacing. 2 Hexagonal mesh must meet minimum requirements of ASTM A 975 for gabions. 3 U- Section of wire rope clips must be applied to the dead

	MAXIMUM ANCHOR SPACING (A)				
	Н	Α			
	0' ~ 100'	50'			
١	100' ~ 200'	35'			
	200' ~ 300'	20'			

MAXIMUM LENGTH ~ TOP HORIZONTAL SUPPORT ROPE (B)				
Н	В			
50'	400'			
100'	200'			
200'	100'			
300'	75'			

WIRE ROPE CLIP (TYP.) DEAD END (SEE NOTE 3)

WIRE ROPE DETAIL DISTANCES X,Y,Z AND TORQUE TO COMPLY WITH MANUFACTURER'S SPECIFICATIONS

SECTION VIEW



EXPIRES NOVEMBER 8, 2007

11-8-07

WIRE MESH SLOPE PROTECTION

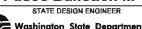
SLOPE PROTECTION ANCHOR

~ SEE STD. PLAN 30.35.00.

STANDARD PLAN A-30.30-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Pasco Bakotich III

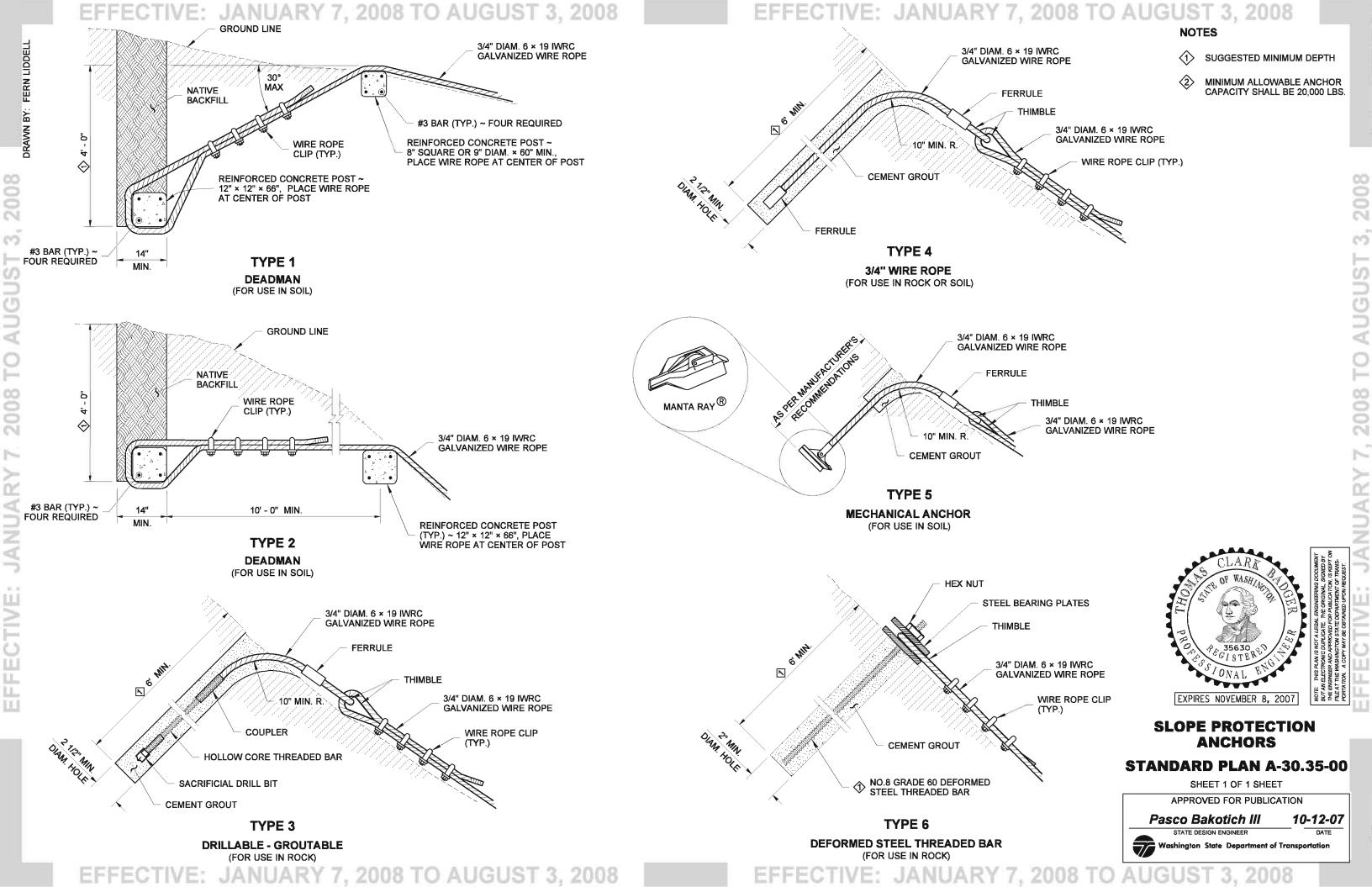


3" SPACING

HIGH TENSILE

STEEL FASTENERS

SEAM ALTERNATIVES



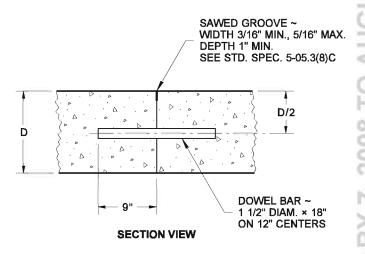
OVER MIDPOINT OF BAR SEE STD. SPEC. 5-05.3(8)B D/4 D/2 DOWEL BAR ~ 1 1/2" DIAM. × 18"

SAWED GROOVE ~

WIDTH 3/16" MIN., 5/16" MAX.

ON 12" CENTERS

SECTION VIEW TRANSVERSE CONTRACTION JOINT



TRANSVERSE CONSTRUCTION JOINT



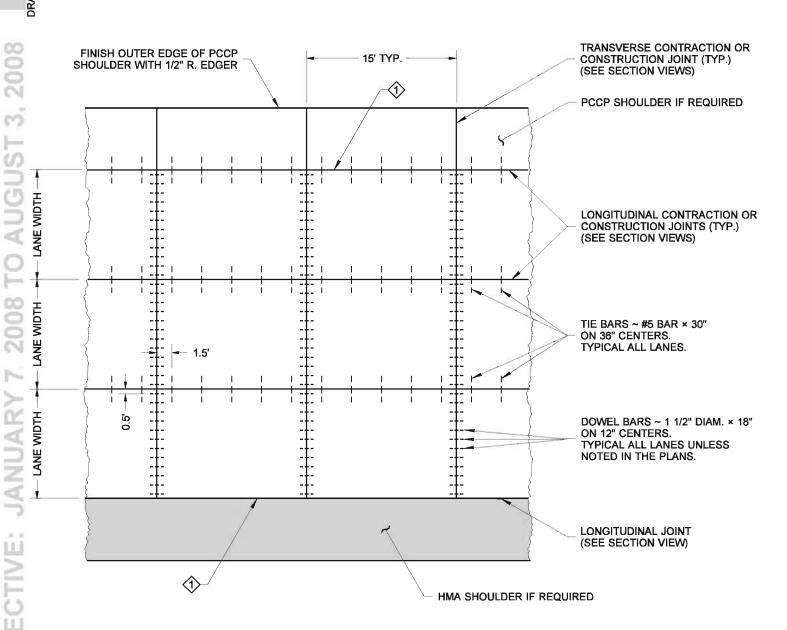
CEMENT CONCRETE PAVEMENT JOINTS STANDARD PLAN A-40.10-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION



10-05-07



PLAN VIEW

CEMENT CONCRETE PAVEMENT JOINTS

SAWED GROOVE ~ DRILL AND GROUT WHEN WIDTH 3/16" MIN., 5/16" MAX. **WIDENING EXISTING** DEPTH 1" MIN. PAVEMENT WITH PCCP SEE STD. SPEC. 5-05.3(8)C **EXISTING PCCP** PCCP D/2 TIE BAR ~ #5 BAR × 30" ON 36" CENTERS **SECTION VIEW**

PCCP TO PCCP LONGITUDINAL CONSTRUCTION JOINT

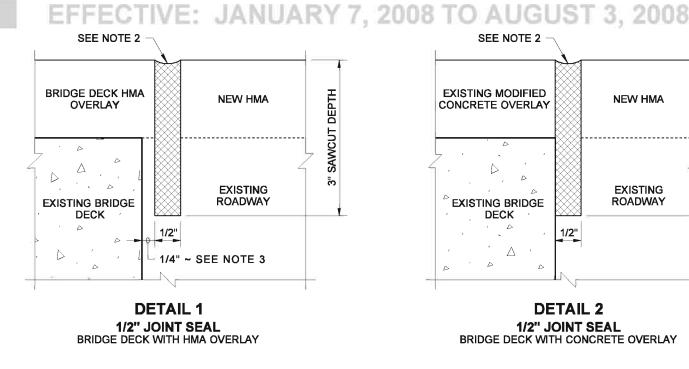
SAWED GROOVE ~ WIDTH 3/16" MIN., 5/16" MAX. DEPTH 1" MIN. SEE STD. SPEC. 5-04.3(12)B **EXISTING PCCP** HMA

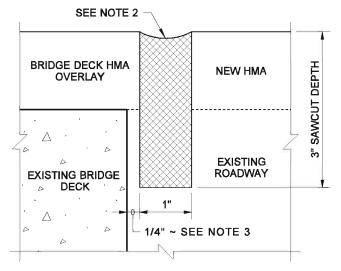
SECTION VIEW

PCCP TO HMA LONGITUDINAL JOINT

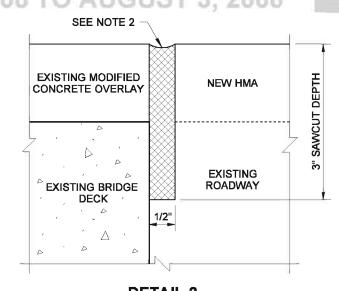
1 FINISH OUTER EDGE OF PCCP

LANE WITH 1/2" R. EDGER IF SHOULDER SHALL BE UNPAVED EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

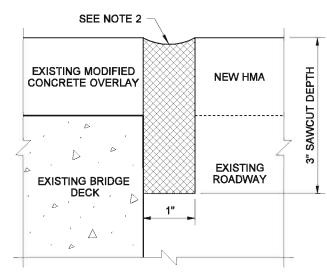




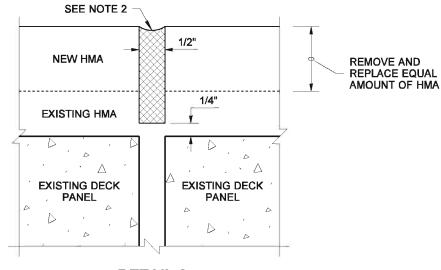
DETAIL 5 1" JOINT SEAL BRIDGE DECK WITH HMA OVERLAY



DETAIL 2 1/2" JOINT SEAL **BRIDGE DECK WITH CONCRETE OVERLAY**

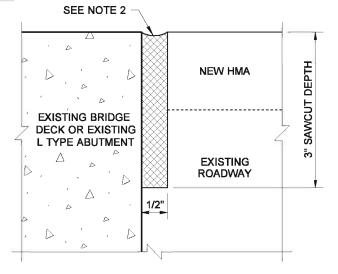


DETAIL 6 1" JOINT SEAL BRIDGE DECK WITH CONCRETE OVERLAY

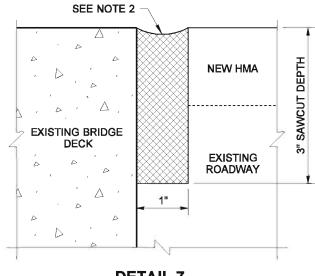


DETAIL 8 1/2" JOINT SEAL BRIDGE DECK PANELS WITH HMA OVERLAY

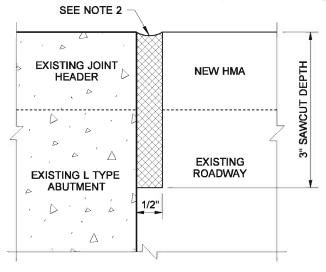
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



DETAIL 3 1/2" JOINT SEAL BRIDGE DECK OR L TYPE ABUTMENT



DETAIL 7 1" JOINT SEAL **BRIDGE DECK**



DETAIL 4 1/2" JOINT SEAL L TYPE ABUTMENT WITH HEADER

NOTES

- 1. Use the 1/2" joint details for bridges with a length less than 100' and for bridges with L type abutments. Use the 1" joint details for other applications. Use DETAIL 8 on steel trusses and timber bridges with concrete deck panels.
- 2. Sawcut shall be filled with hot-poured compound in accordance with Standard Specification 9-04.2(1) and sealed in accordance with Standard Specification 5-05.3(8)B.
- 3. The contractor shall avoid sawing existing concrete. The construction tolerance to locate the saw cut is ± 1/4" (0 min. to 1/2" max.) from the existing concrete (DETAILs 1 and 5).



BRIDGE TRANSVERSE JOINT SEALS FOR HMA

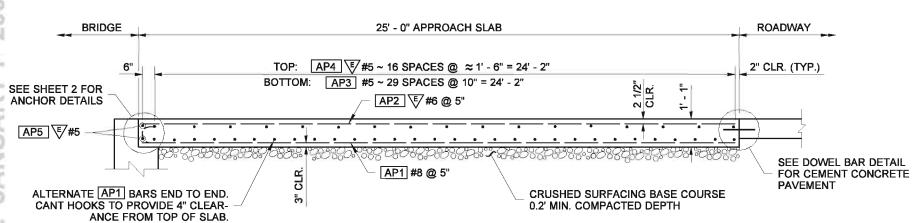
STANDARD PLAN A-40.20-00

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

Pasco Bakotich III 09-20-07



EFFECTIVE: JANUARY 7, 2008 TO AUGU BRIDGE 25' - 0" APPROACH SLAB **SKEW ANGLE** EXPANSION ANCHORS
- 0" CENTERS BACK OF **PAVEMENT SEAT** ດ້ີ ດີ **@ @** LONGITUDINAL JOINT \$ \$ ~ WHEN REQUIRED AP2 \(\frac{\pi}{4} \) (SEE NOTE 2) LANE LINE &-TOP: BOTTOM: AP6 ₹#5 TOP 2 AP5 F/#5 AP4 \ #5 @ 1' - 6" AP4 F/#5 @ 1' - 6" TOP: BOTTOM: AP3 #5 @ 10" AP3 #5 @ 10" TOP: 1' - 6" BOTTOM: 10" **PLAN**



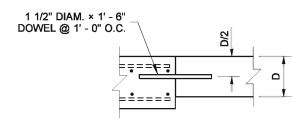
LONGITUDINAL SECTION

BAR LIST FOR STANDARD 10' x 25' APP. SLAB QUANTITY MODULE			MODULE	APPROXIMATE QUANTITIES (PER SY) FOR SLAB (BASED ON QUANTITY MODULE)		
MARK	LOCATION	SIZE	E LENGTH QTY.		SLAB EPOXY COATED REINFORCING BARS (TOP MAT)	38.52 LBS/SY
					SLAB REINFORCING BARS (BOTTOM MAT)	72.38 LBS/SY
AP1	LONGITUDINAL BOTTOM	#8	25' - 7"	24	CONCRETE (CU. YDS.)	0.361 CY/SY
AP2	LONGITUDINAL TOP	F#6	24' - 8"	24	APPROACH ANCHORS AND PCC ROADWAY DOWELS	AS REQUIRED
AP3	TRANSVERSE BOTTOM	#5	9' - 8"	30	10 - AP6 🕏 #5 (IF REQUIRED)	105 LBS.
AP4	TRANSVERSE TOP	₹/#5	9' - 8"	17	BENDING DETAIL FOR QUANTITIES	
AP5	TRANSVERSE END BAR	₹ /#5	9' - 8"	2		
				(ALL DIMENSIONS ARE OUT TO OUT)		
ALL REINFORCING BARS SHOWN ON THIS SHEET SHALL BE AASHTO M-31, UNLESS NOTED OTHERWISE. TEV = EPOXY COATED REINFORCING STEEL				HALL	24' - 8" AP1	

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

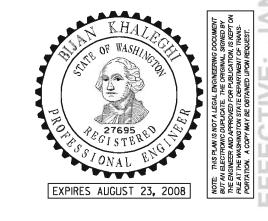
- 1. All edges of the approach slab shall have 1/2" radii except the longitudinal edge of the preceeding pour of a LONGITUDINAL CONSTRUCTION JOINT.
- 2. Longitudinal joints shall be placed on lane lines and shall be constructed and sealed in accordance with Standard Specification Section 5-05.3(8). Joints may be either a sawcut crack control joint or a construction joint. Sawcut joints shall terminate 1' 0" before reaching edge of slab and must be saw cut as soon as possible after placement of concrete.
 - (A) Approach slabs less than 40' wide -- no joint is required.
 - (B) Approach slabs wider than 40' one or more joints are required to divide the slab into approximately 24' wide sections.



INSERT DOWELS PARALLEL TO CENTER LINE ALONG TRANSVERSE CONSTRUCTION JOINT.

DOWEL BAR DETAIL FOR CEMENT CONCRETE PAVEMENT

FOR LOCAL AGENCY USE ONLY



BRIDGE APPROACH SLAB

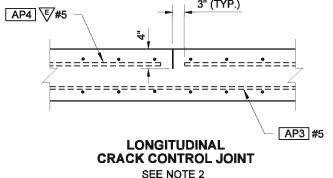
STANDARD PLAN A-40.50-00

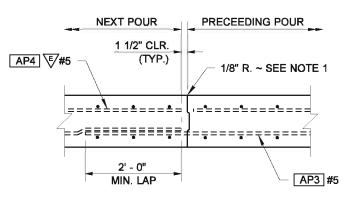
SHEET 1 OF 2 SHEETS





Washington State Department of Transportation





LONGITUDINAL
CONSTRUCTION JOINT
SEE NOTE 2

EFFECTIVE: JANUARY 7, 2008 TO AUG

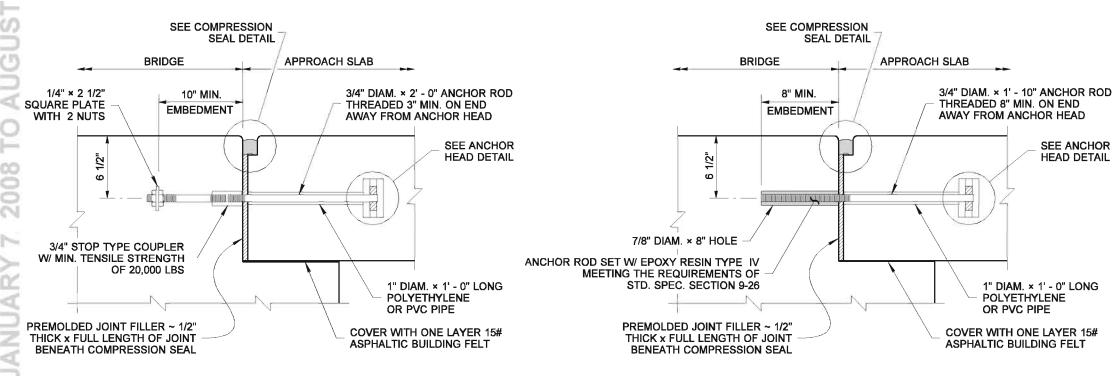
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTE

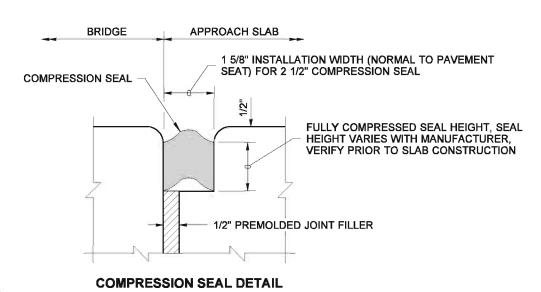
PAINT THE METAL COMPONENTS OF THE APPROACH EXPANSION ANCHOR WITH ONE COAT OF FORMULA A-11-99 MEETING THE REQUIREMENTS OF STD. SPEC. SECTION 9-08.2.

LONGITUDAL SECTION

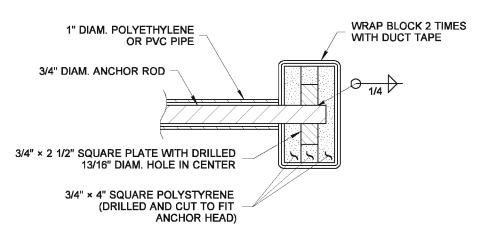
SEMI-INTEGRAL TYPE ABUTMENT



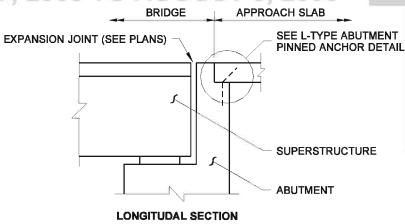
APPROACH EXPANSION ANCHOR ~ METHOD A **SEMI-INTEGRAL TYPE ONLY**



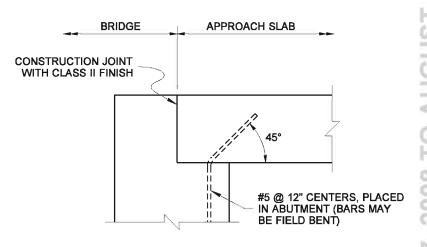
APPROACH EXPANSION ANCHOR ~ METHOD B **SEMI-INTEGRAL TYPE ONLY**



ANCHOR HEAD DETAIL



L-TYPE ABUTMENT



L - TYPE ABUTMENT PINNED ANCHOR DETAIL

FOR LOCAL AGENCY USE ONLY



BRIDGE APPROACH SLAB

STANDARD PLAN A-40.50-00

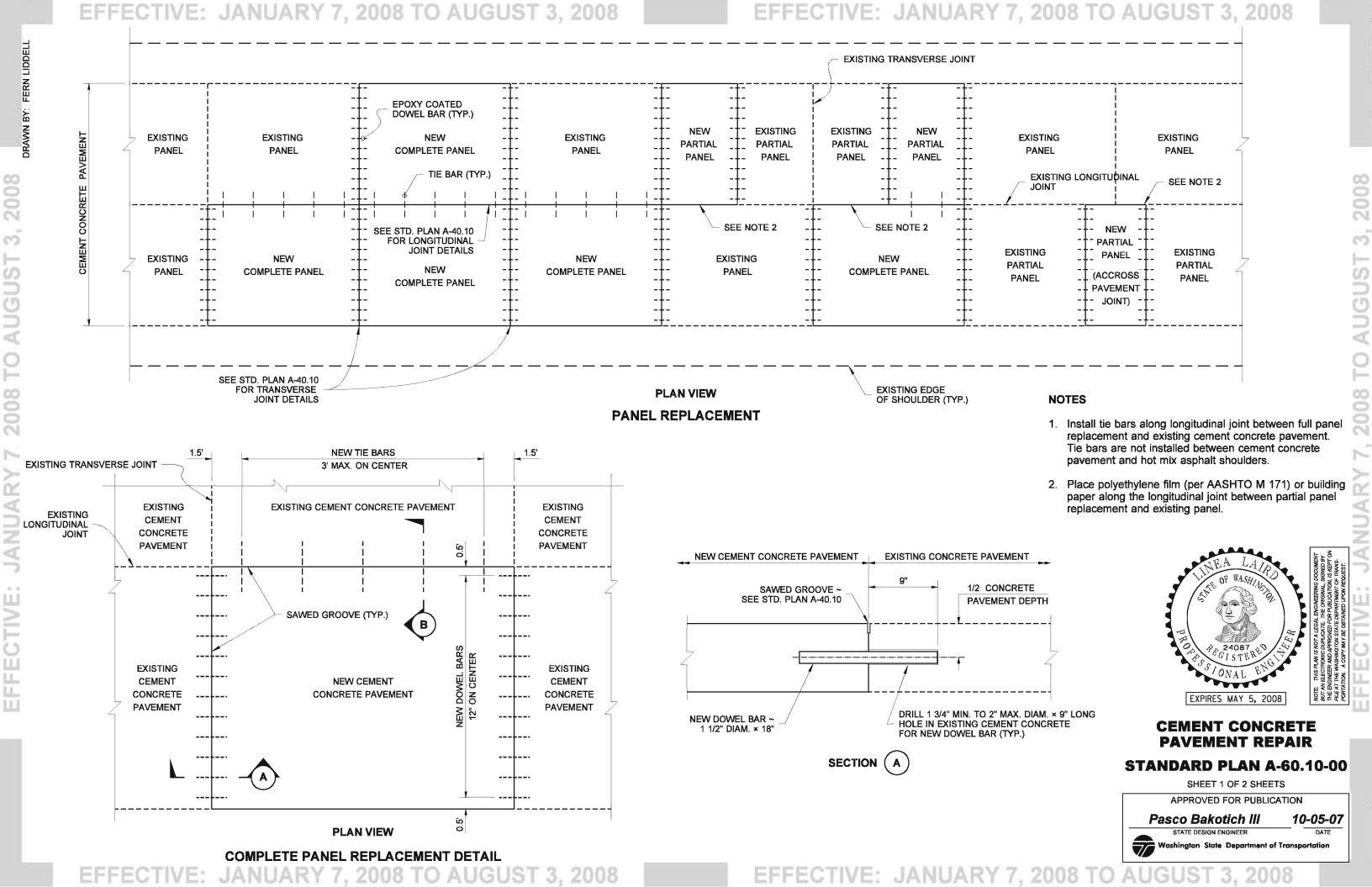
SHEET 2 OF 2 SHEETS

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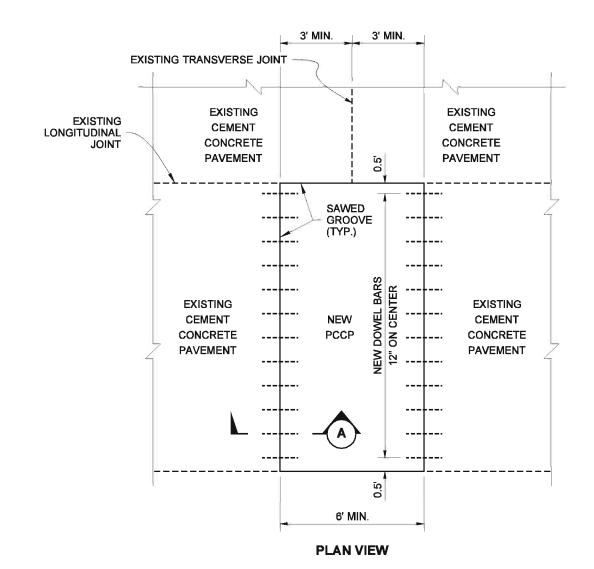
JANUARY 7. 2008 TO AUGUST 3. 2008

TIVE: JANUARY 7, 2008 TO AUGUS

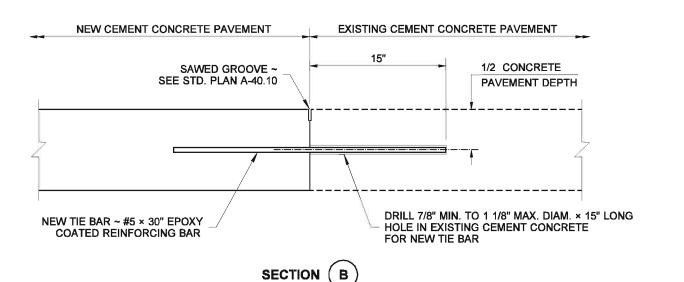


PLAN VIEW

PARTIAL PANEL REPLACEMENT **WITH TIE BARS**



PARTIAL PANEL REPLACEMENT WITHOUT TIE BARS





CEMENT CONCRETE PAVEMENT REPAIR

STANDARD PLAN A-60.10-00

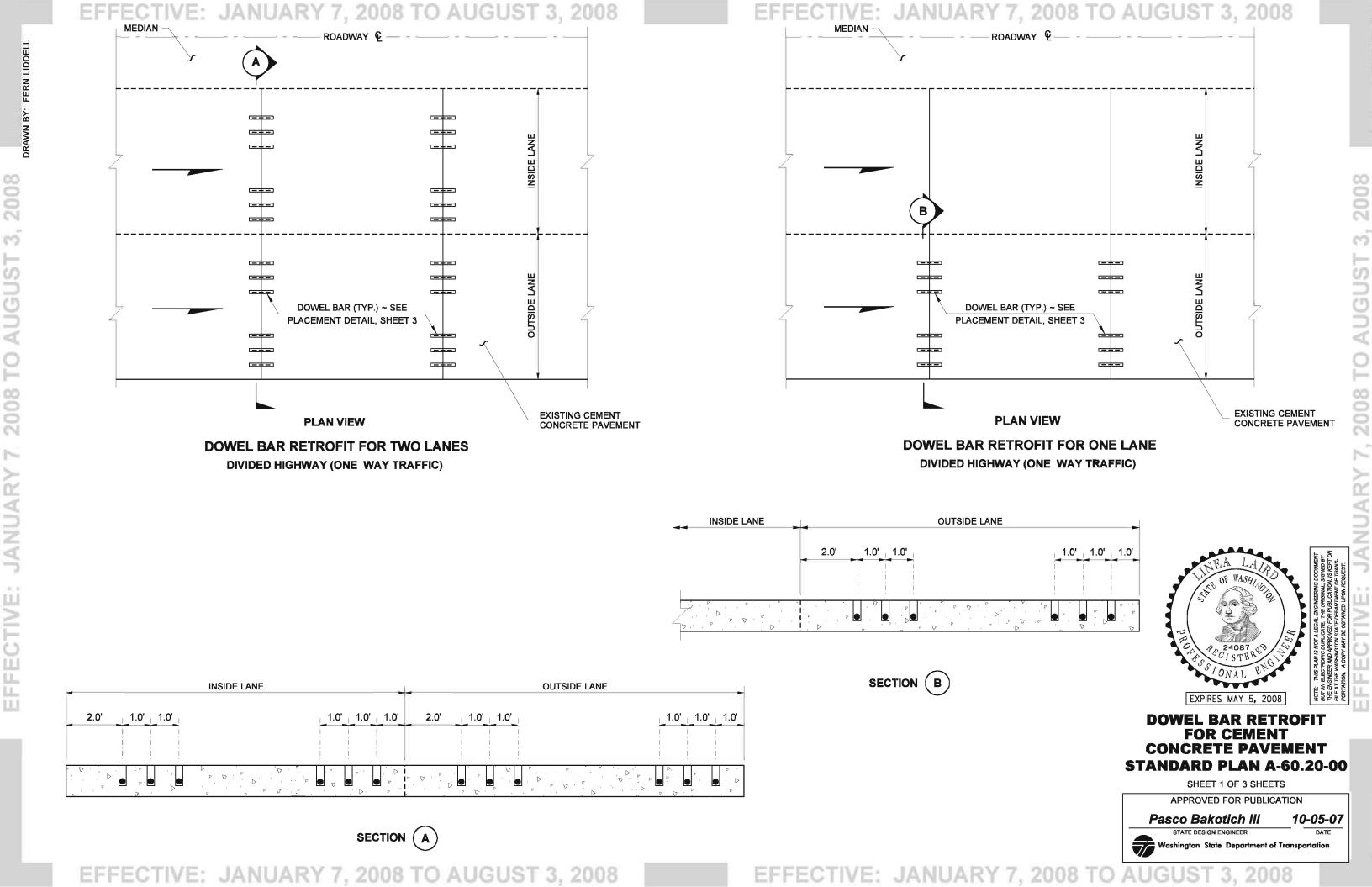
SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

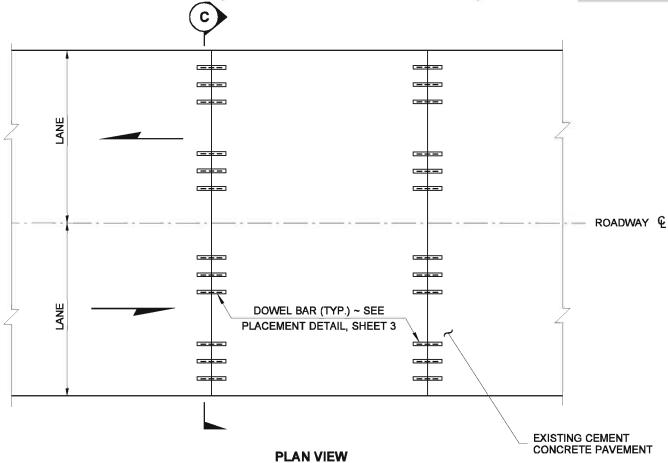
Pasco Bakotich III



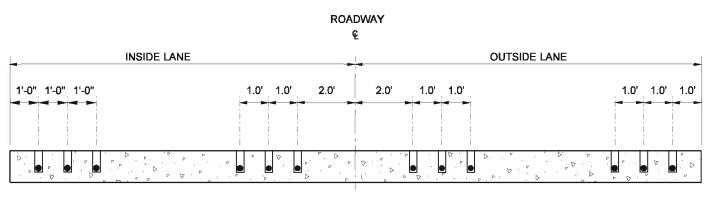
10-05-07



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

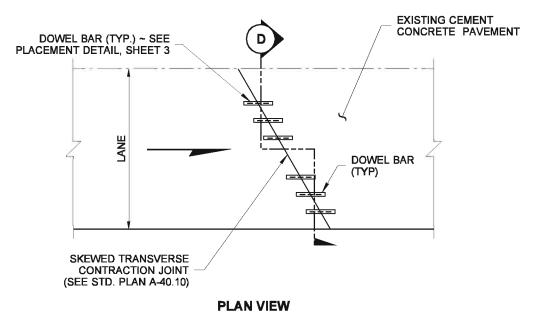


DOWEL BAR RETROFIT FOR EACH LANE UNDIVIDED HIGHWAY (TWO WAY TRAFFIC)

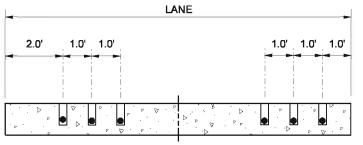


SECTION (C

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



SKEWED JOINT DETAIL



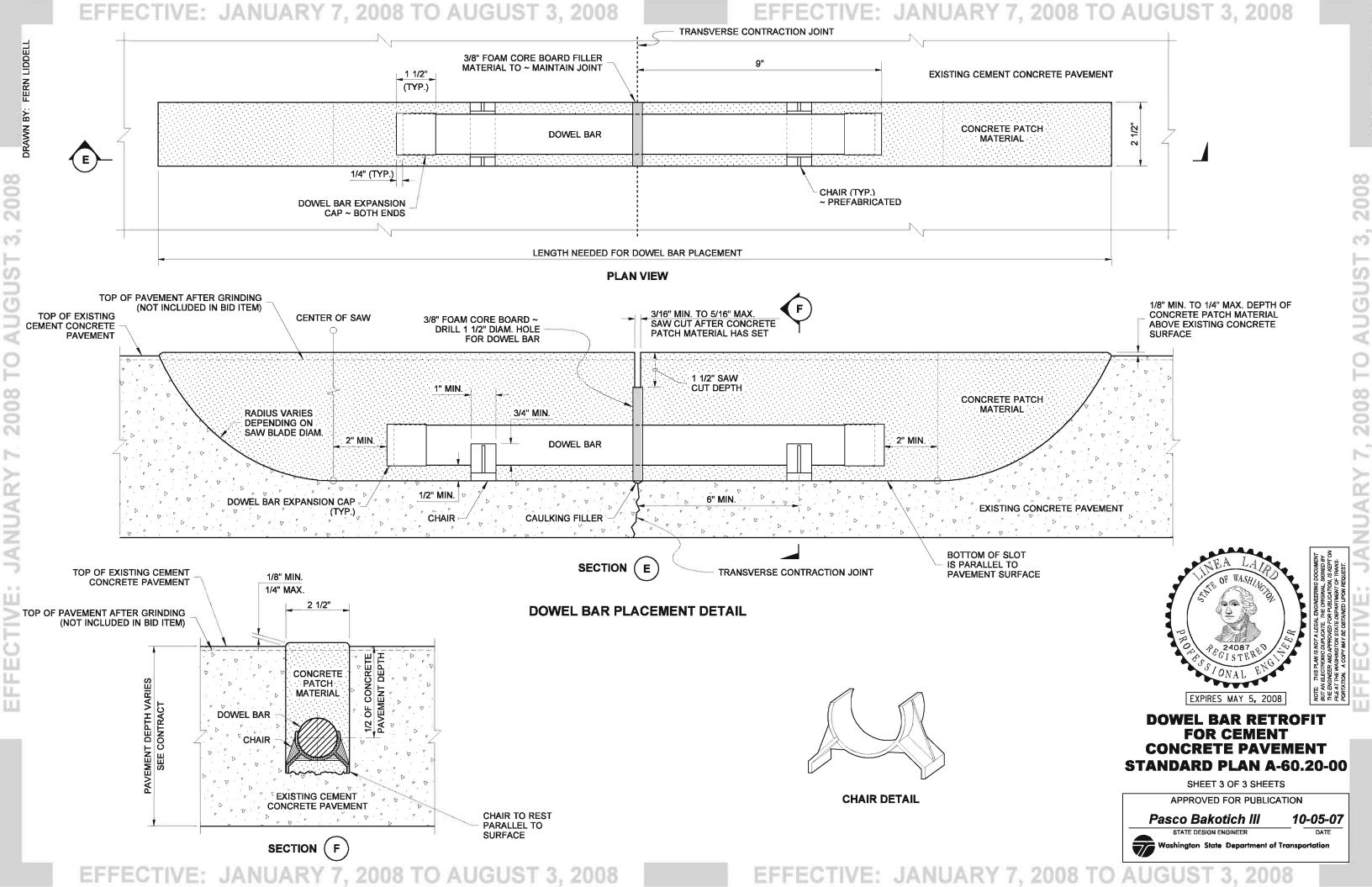
SECTION (D)



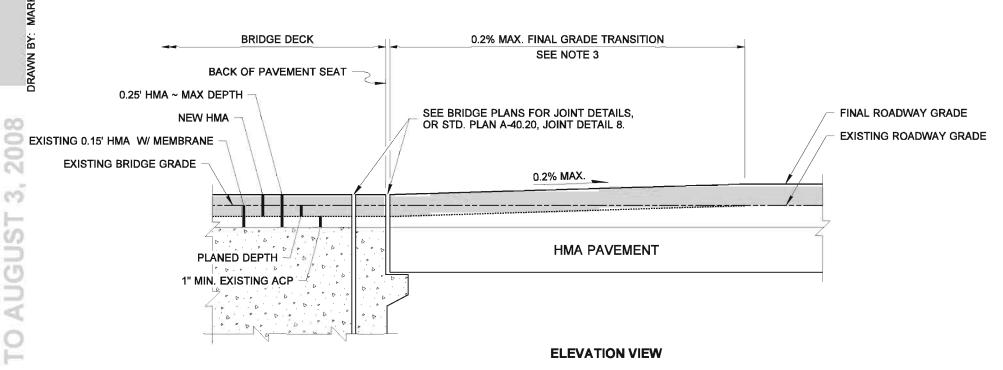
DOWEL BAR RETROFIT FOR CEMENT CONCRETE PAVEMENT STANDARD PLAN A-60.20-00

SHEET 2 OF 3 SHEETS

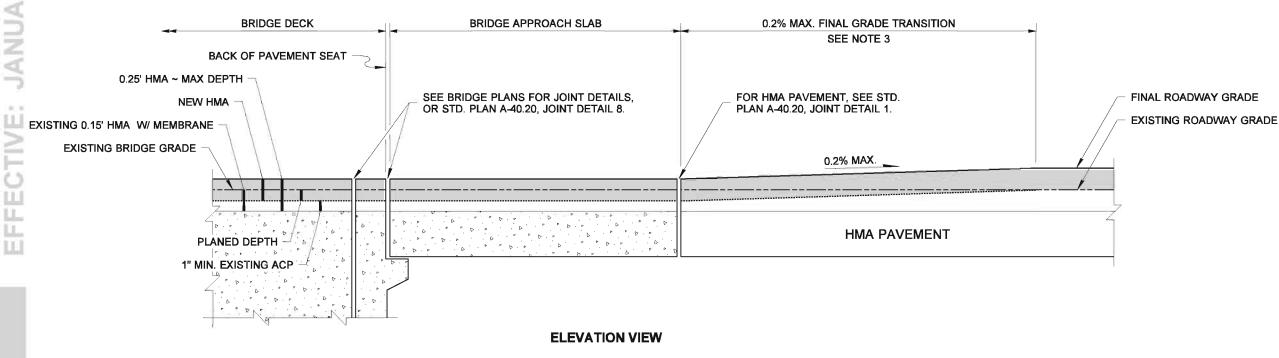




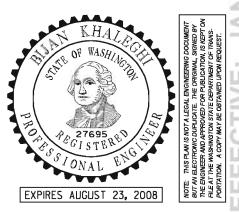
- 1. A typical bridge overlay will remove 0.07 feet of Asphaltic Concrete Pavement (ACP) and place 0.15 feet of new Hot Mixed Asphalt (HMA). Depth of removal and placement will vary for each bridge. Total depth of HMA on the bridge shall not exceed 0.25 feet, unless shown otherwise in the plans.
- 2. If the existing depth of asphalt on the bridge deck is 0.25 feet, then the overlay will remove 0.15 feet of ACP and place 0.15 feet of new HMA. The existing bridge grade will remain unchanged.
- 3. FINAL GRADE TRANSITION: The maximum longitudinal taper slope to transition an increase in roadway grade to the new or existing bridge grade will be at most 1 inch rise to 40 feet run (1V:480H or flatter) (0.2% maximum). If several overlays are present, extended taper lengths shall be required to maintain the transition slope (1V:480H or flatter) (0.2% maximum).
- 4. If the ACP and membrane is to be removed from the bridge deck, see GSP 023106 for deck preparation before placing new membrane.
- 5. In accordance with Standard Specification 5-05.3(12), when pavement abuts bridges, the finished pavement parallel to centerline shall be uniform to a degree that no variations greater than 1/8-inch are present when tested with a 10-foot straightedge.



HMA OVERLAY WITHOUT BRIDGE APPROACH SLAB



HMA OVERLAY WITH BRIDGE APPROACH SLAB



BRIDGE DECK TRANSITION FOR HMA OVERLAY

STANDARD PLAN A-60.30-00

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

Pasco Bakotich III

11-8-07

Z" MIN.
(TYP.)

CONCRETE REMOVAL AREA

TRANSVERSE REBAR (TYP.)

EXISTING DELAMINATION

A

B

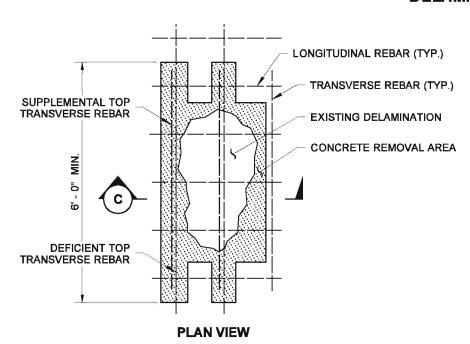
PLAN VIEW

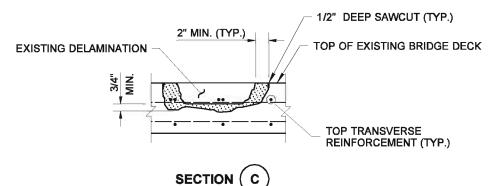
FOR DELAMINATION AND

FULL DEPTH REPAIR

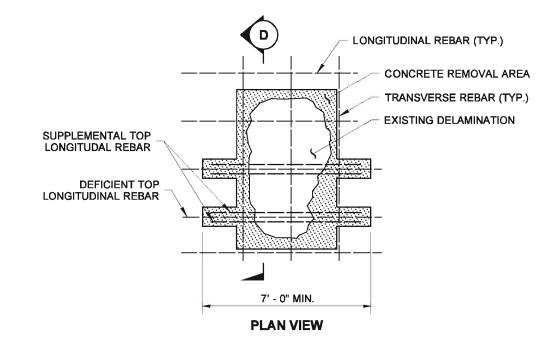
EXISTING DELAMINATION DELAMINATION SECTION 2" MIN. (TYP.) TOP OF EXISTING BRIDGE DECK DELAMINATION SECTION 1/2" DEEP SAWCUT (TYP.) TOP OF EXISTING BRIDGE DECK TOP TRANSVERSE REINFORCEMENT (TYP.) FULL DEPTH REPAIR SECTION B

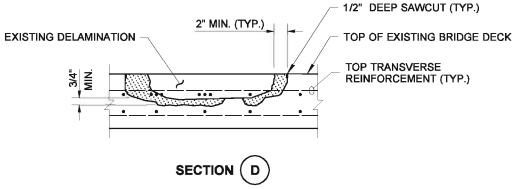
DELAMINATION AND FULL DEPTH REPAIR





TRANSVERSE REBAR REPAIR





LONGITUDINAL REBAR REPAIR
(FOR CONTINUOUS STRUCTURES)

NOTE

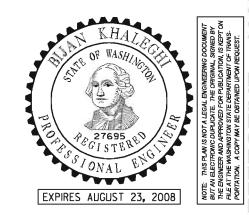
FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. If a zone has rebar section loss or full depth repairs, then the concrete deck repair in each zone shall achieve 3,000 PSI before progressing to the adjacent zone.
- 2. Remove all concrete 3/4" minimum clearance around all exposed reinforcement bars in accordance with Standard Specification 6-09.3(6).
- 3. For tension zones of continuous structures, when a longitudinal reinforcement bar has greater than 20% section loss (or damage), remove concrete a minimum of 3' 6" on each side of section loss and place 2 supplemental reinforcement bars, adjacent and parallel to the deficient bar, extending 3' 0" beyond each side having 20% section loss. Mechanical splices may be used to facilitate placement of #4 reinforcement bars.
- 4. For typical rebar repairs, when the reinforcement has greater than 20% section loss (or damage), remove concrete a minimum of 2' 6" on each side of section loss, and replace with new supplemental reinforcement, same diameter as original, adjacent and parallel to the deficient bar, extending 2' 3" beyond each end of section having 20% section loss.

LEGEND



CONCRETE REMOVAL AREA



HMA OVERLAY
FURTHER DECK
PREPARATION
STANDARD PLAN A-60.40.00

SHEET 1 OF 1 SHEET

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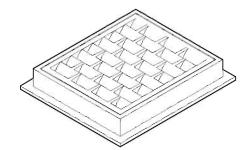
asco Bakotich III 08-31-07



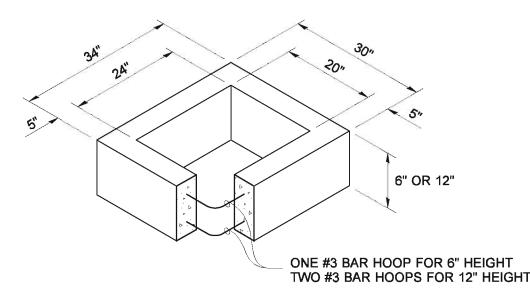
Washington State Department of Transportation

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



FRAME AND VANED GRATE



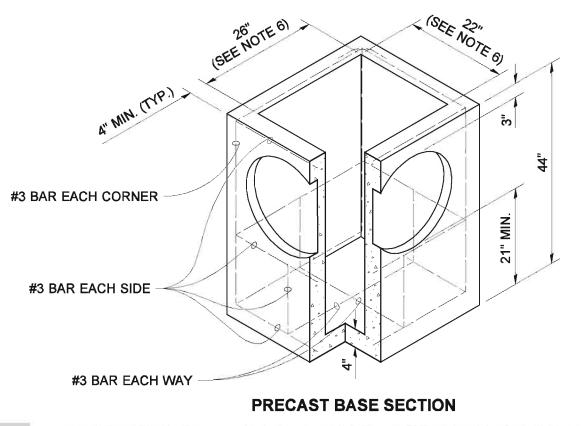
PIPE ALLOWANCES					
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER				
REINFORCED OR PLAIN CONCRETE	12"				
ALL METAL PIPE	15"				
CPSSP * (STD. SPEC. 9-05.20)	12"				
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	15"				
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	15"				

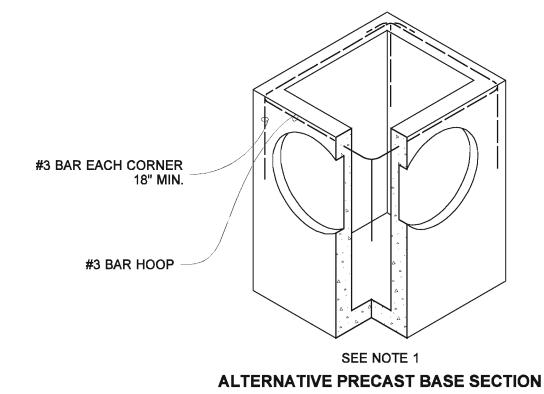
* CORRUGATED POLYETHYLENE STORM SEWER PIPE

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.
- 2. The knockout diameter shall not be greater than 20". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" 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 9-04.3.
- 3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
- 4. The frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
- 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







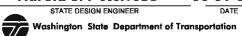
CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-00

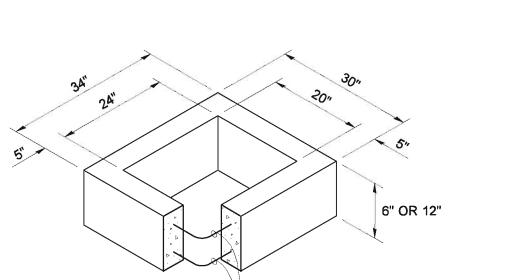
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 06-01-06



FRAME AND VANED GRATE

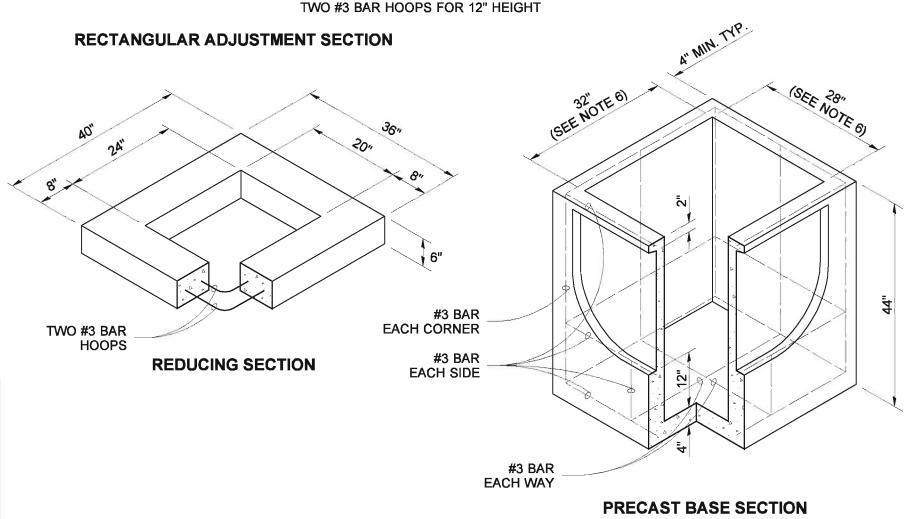


PIPE ALLOWANCES						
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER					
REINFORCED OR PLAIN CONCRETE	18"					
ALL METAL PIPE	21"					
CPSSP * (STD. SPEC. 9-05.20)	18"					
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	21"					
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	21"					

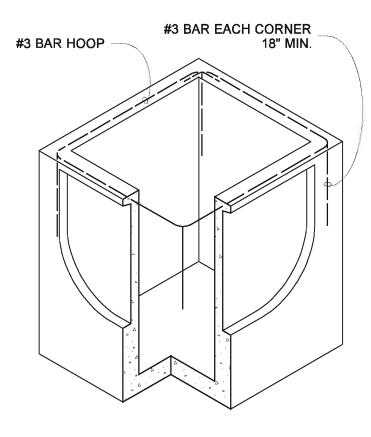
* CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

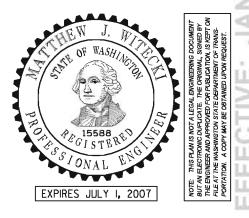
- 1. As acceptable alternatives to the rebar shown in the PRECAST BASE SECTION, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the ALTERNATIVE PRECAST BASE SECTION. Wire mesh shall not be placed in the knockouts.
- 2. The knockout diameter shall not be greater than 26". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" 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 9-04.3.
- 3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
- 4. The frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
- 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.



ONE #3 BAR HOOP FOR 6" HEIGHT



SEE NOTE 1 ALTERNATIVE PRECAST BASE SECTION



CATCH BASIN TYPE 1L

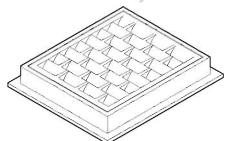
STANDARD PLAN B-5.40-00

SHEET 1 OF 1 SHEET

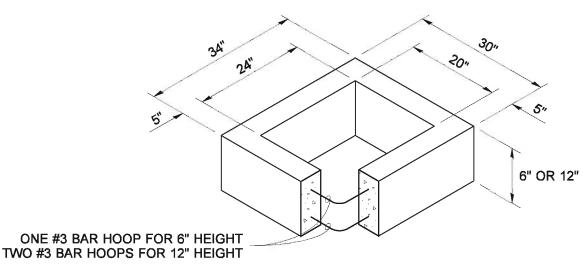
APPROVED FOR PUBLICATION

Harold J. Peterfeso 06-01-06

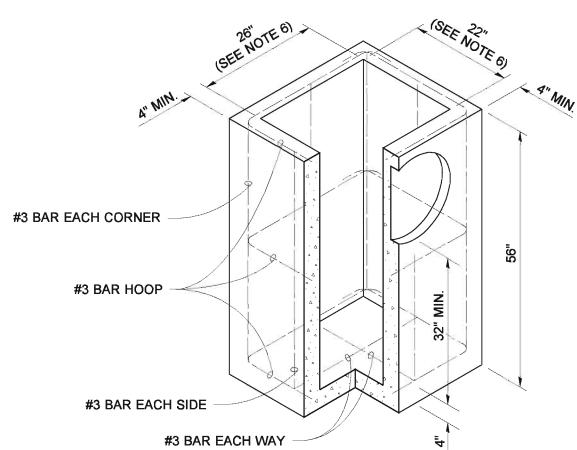
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3.



FRAME AND VANED GRATE



RECTANGULAR ADJUSTMENT SECTION

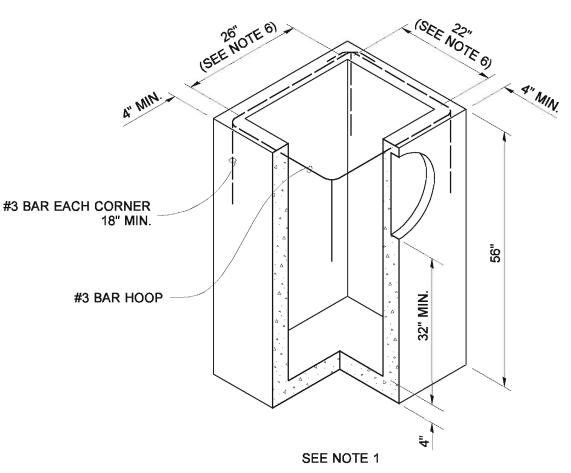


PRECAST BASE SECTION

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 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 diameter shall not be greater than 18". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" 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 9-04.3.
- 3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
- 4. The frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
- 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.





CATCH BASIN TYPE 1P (FOR PARKING LOT)

STANDARD PLAN B-5.60-00

SHEET 1 OF 1 SHEET

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ALTERNATIVE PRECAST BASE SECTION

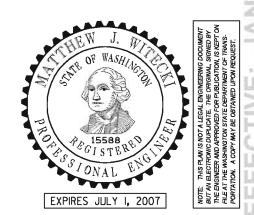
NOTES

- 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" minimum to 2.5" maximum. Provide a 1.5" 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 9-04.3.

	CATCH BASIN DIMENSIONS										
CATCH BASIN	WALL	BASE THICKNESS	MAXIMUM KNOCKOUT	MINIMUM DISTANCE BETWEEN	BASE REINFORCING STEEL in ² /ft. IN EACH DIRECTION						
DIAMETER	INICKIAESS	THICKNESS	SIZE		SEPARATE BASE	INTEGRAL BASE					
48"	4"	6"	36"	8"	0.23	0.15					
54"	4.5"	8"	42"	8"	0.19	0.19					
60"	5"	8"	48"	8"	0.25	0.25					
72"	6"	8"	60"	12"	0.35	0.24					
84"	8"	12"	72"	12"	0.39	0.29					
96"	8"	12"	84"	12"	0.39	0.29					

PIPE ALLOWANCES											
CATCH	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER										
BASIN DIAMETER	CONCRETE ALL META		CPSSP ①	SOLID WALL PVC②	PROFILE WALL PVC 3						
48"	24"	30"	24"	27"	30"						
54"	30"	36"	30"	27"	36"						
60"	36"	42"	36"	36"	42"						
72"	42"	54"	42"	36"	48"						
84"	54"	60"	54"	36"	48"						
96"	60"	72"	60"	36"	48"						

- 1 Corrugated Polyethylene Storm Sewer Pipe (Std. Spec. 9-05.20)
- ② (Std. Spec. 9-05.12(1))
- ③ (Std. Spec. 9-05.12(2))



CATCH BASIN TYPE 2

STANDARD PLAN B-10.20-00

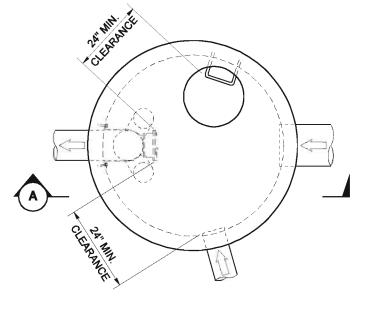
SHEET 1 OF 1 SHEET

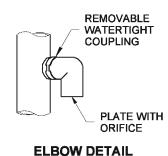
APPROVED FOR PUBLICATION



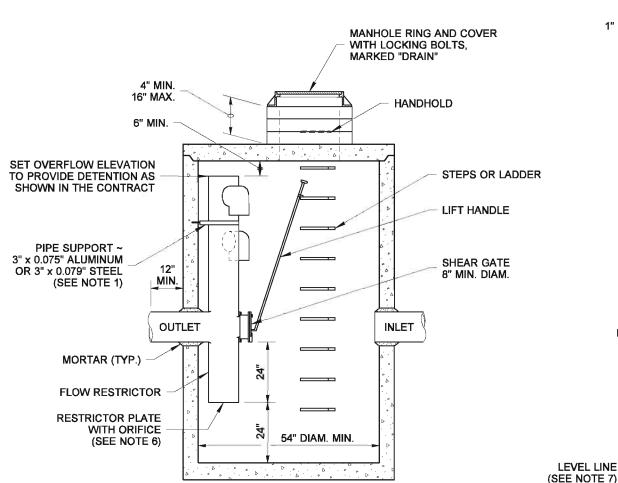
Washington State Department of Transportation

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

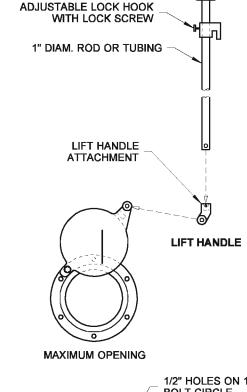


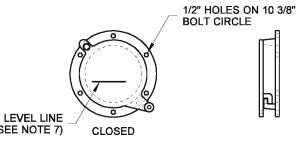


PLAN VIEW



VIEW





FRONT

SHEAR GATE DETAILS

SIDE

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOT

- 1. The pipe supports and the flow restrictor shall be constructed of the same material and be anchored at a maximum spacing of 36". Attach the pipe supports to the manhole with 5/8" stainless steel expansion bolts or embed the supports into the manhole wall 2".
- 2. The vertical riser stem of the flow restrictor shall be the same diameter as the horizontal outlet pipe with a minimum diameter of 8".
- 3. The flow restrictor shall be fabricated from one of the following materials:

0.060" Corrugated Aluminum Alloy Drain Pipe

0.064" Corrugated Galvanized Steel Drain Pipe with Treatment 1

0.064" Corrugated Aluminized Steel Drain Pipe

0.060" Aluminum alloy flat sheet, in accordance with ASTM B 209, 5052 H32 or EPS

High Density Polyethylene Storm Sewer Pipe

- 4. The frame and ladder or steps are to be offset so that: the shear gate is visible from the top; the climb-down space is clear of the riser and gate; the frame is clear of the curb.
- The multi-orifice elbows may be located as shown, or all placed on one side of the riser to assure ladder clearance. The size of the elbows and their placement shall be specified in the Contract.
- 6. Restrictor plate with orifice as specified in the Contract. The opening is to be cut round and smooth.
- 7. The shear gate shall be made of aluminum alloy in accordance with ASTM B 26 and ASTM B 275, designation ZG32A; or cast iron in accordance with ASTM A 48, Class 30B.

The lift handle shall be made of a similar metal to the gate (to prevent galvanic corrosion), it may be of solid rod or hollow tubing, with adjustable hook as required.

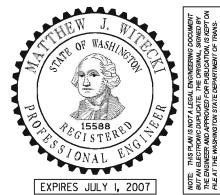
A neoprene rubber gasket is required between the riser mounting flange and the gate flange.

Install the gate so that the level-line mark is level when the gate is closed.

The mating surfaces of the lid and the body shall be machined for proper fit.

All shear gate bolts shall be stainless steel.

- 8. The shear gate maximum opening shall be controlled by limited hinge movement, a stop tab, or some other device.
- 9. Alternative shear gate designs are acceptable if material specifications are met and flange bolt pattern matches.



CATCH BASIN TYPE 2 WITH FLOW RESTRICTOR STANDARD PLAN B-10.40-00

SHEET 1 OF 1 SHEET

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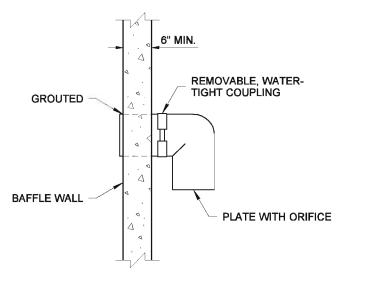
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EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

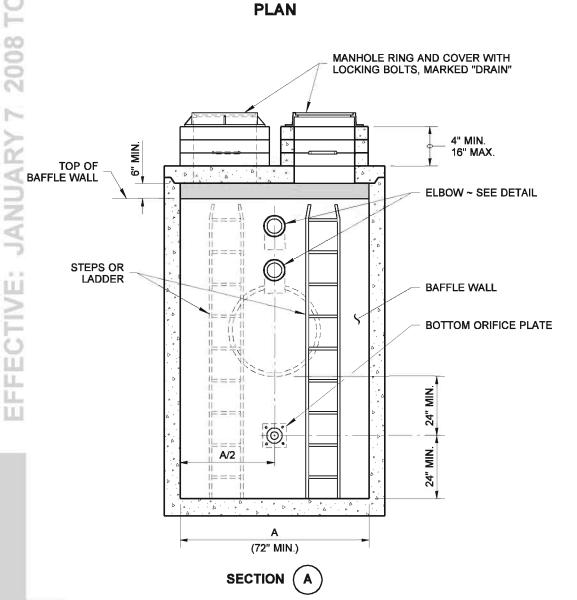
ELBOW ~ SEE DETAIL

BAFFLE WALL

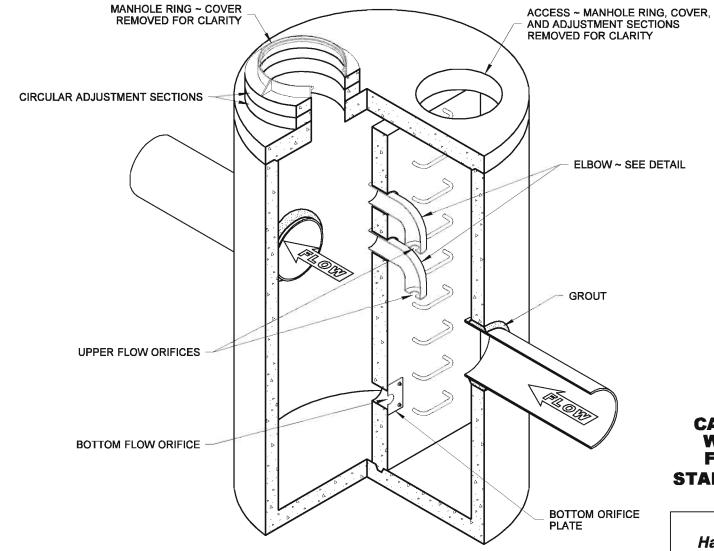
- 1. See Contract for size and location of all pipes and orifices.
- 2. Baffle wall shall have #4 Bar at 12" spacing each way.
- 3. Precast baffle shall be keyed and grouted in place.
- Bottom orifice plate shall be galvanized steel with a minimum thickness of 1/4". Attach orifice with 1/2" stainless steel bolts.
- Upper flow orifice plates and elbows shall be aluminum, aluminized steel or galvanized steel. Galvanized steel shall have Treatment 1.



ELBOW DETAIL



2008

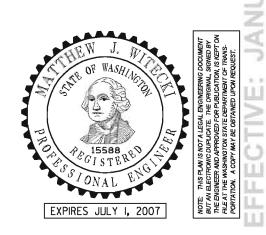


ISOMETRIC CUTAWAY



Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.

MANHOLE DIMENSION TABLE MINIMUM **BASE REINFORCING STEEL MAXIMUM** WALL **BASE** DISTANCE in²/ft. IN EACH DIRECTION DIAM. **KNOCKOUT THICKNESS THICKNESS BETWEEN** SIZE **KNOCKOUTS SEPARATE BASE INTEGRAL BASE** 48" 4" 6" 36" 8" 0.23 0.15 8" 8" 4.5" 42" 54" 0.19 0.19 5" 8" 48" 8" 0.25 0.25



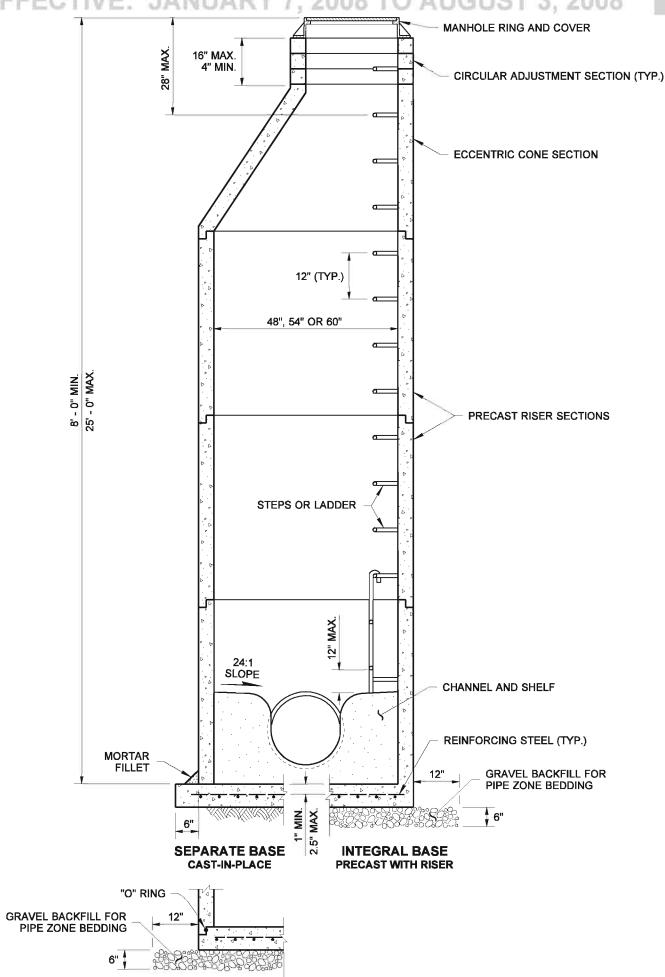
MANHOLE TYPE 1

STANDARD PLAN B-15.20-00

SHEET 1 OF 1 SHEET

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Harold J. Peterfeso 06-01-06

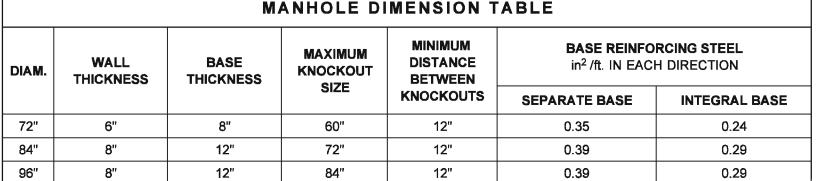


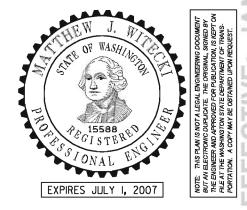
AUGUST

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTE

Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum.





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MANHOLE TYPE 2

STANDARD PLAN B-15.40-00

SHEET 1 OF 1 SHEET

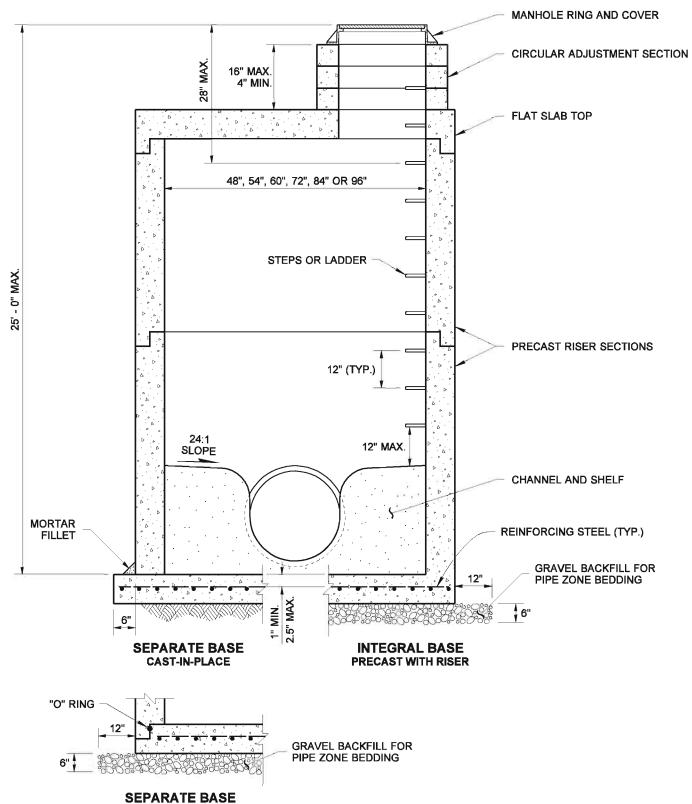
APPROVED FOR PUBLICATION

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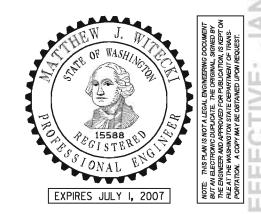


EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST



	MANHOLE DIMENSION TABLE											
DIAM.	WALL BASE THICKNESS THICKNES			THICKNESS THICKNESS KNOCKOUT BETWEEN		BASE REINFORCING STEEL in ² /ft. IN EACH DIRECTION						
			SIZE		SEPARATE BASE	INTEGRAL BASE						
48"	4"	6"	36"	8"	0.23	0.15						
54"	4.5"	8"	42"	8"	0.19	0.19						
60"	5"	8"	48"	8"	0.25	0.25						
72"	6"	8"	60"	12"	0.35	0.24						
84"	8"	12"	72"	12"	0.39	0.29						
96"	8"	12"	84"	12"	0.39	0.29						



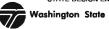
MANHOLE TYPE 3

STANDARD PLAN B-15.60-00

SHEET 1 OF 1 SHEET

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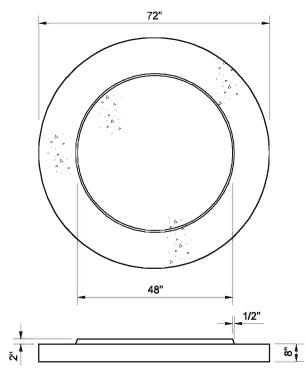


EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 CIRCULAR GRATE ~ SEE STD. PLAN B-30.80 TOE OF DRYWELL SLOPE / BOTTOM OF SWALE (TYP.) **GROUND LINE** TOE OF SWALE SLOPE / 1. Precast cone sections may be eccentric or concentric. CIRCULAR FRAME (RING) BOTTOM OF SWALE (TYP.) ~ SEE STD. PLAN B-30.70 2. Seepage port orientation varies among manufacturers. ADJUSTMENT SECTION (TYP.) 6H:1V 6H:1V UNDISTURBED SOIL CONE SECTION ~ SEE NOTE 1 TOE OF SWALE SLOPE / BOTTOM OF SWALE NATIVE BACKFILL **DISTANCE VARIES** SEE CONTRACT UNDERGROUND DRAINAGE GEOTEXTILE, MODERATE SURVIVABILITY, CLASS A ф ф TOE OF DRYWELL SLOPE / TOE OF SWALE SLOPE / BOTTOM OF SWALE **BOTTOM OF SWALE** GRAVEL BACKFILL FOR DRYWELL **PLAN VIEW** LIMIT OF EXCAVATION 1H:2V SLOPE (MAX.) 10" (TYP.) (TYP.) 5" (TYP.) 6" DIAM. DRAIN HOLE (TYP.) #4 BARS SEEPAGE PORT (TYP.) O ~ SEE NOTE 2 10" (TYP.) 0 EXPIRES JULY I, 2007 **DRYWELL TYPE 1** (FOR SWALE) STANDARD PLAN B-20.20-01 6" DIAM. DRAIN HOLE (TYP.) 48" I.D. SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION PRECAST FOOTING WITH **DRAIN HOLES** Kevin J. Dayton 11-21-06 **CUTAWAY ELEVATION VIEW** PRECAST FOOTING DETAIL **EFFECTIVE: JANUARY 7. 2008 TO AUGUST**

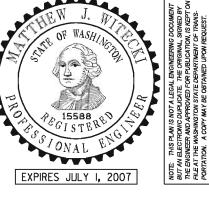
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NOTES

- 1. Precast concrete cone sections may be eccentric or concentric.
- 2. Seepage port orientation varies among manufacturers.
- 3. Connect inlet pipe to structure using precast hole or core drilled hole.
- 4. For depths over 15' use 72" x 8" Alternative Precast Footing.



ALTERNATIVE PRECAST FOOTING DETAIL



DRYWELL TYPE 2 (WITH PIPE INLET)

STANDARD PLAN B-20.40-01

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

11-21-06 Kevin J. Dayton

CIRCULAR FRAME (RING) & COVER ~ SEE STANDARD PLAN B-30.70 ADJUSTMENT SECTION (TYP.) FINISHED SURFACE **VARIES CONE SECTION CRUSHED SURFACING** BASE COURSE 4" CONCRETE SLAB ~ CLASS 3000 \bigoplus FLOW ĆŢ. INLET PIPE ~ SEE NOTE 3 LIMIT OF EXCAVATION 1H:2V SLOPE (MAX.) 国 UNDERGROUND DRAINAGE GEOTEXTILE, MODERATE SURVIVABILITY, CLASS A **GRAVEL BACKFILL** 10" (TYP.) FOR DRYWELL (TYP.) 5" (TYP.) 6" DIAM. DRAIN HOLE (TYP.) #4 BARS SEEPAGE PORT (TYP.)
~ SEE NOTE 2 Ø 0 6" DIAM. DRAIN HOLE (TYP.) 48" I.D.

> PRECAST FOOTING WITH **DRAIN HOLES ~ SEE NOTE 4**

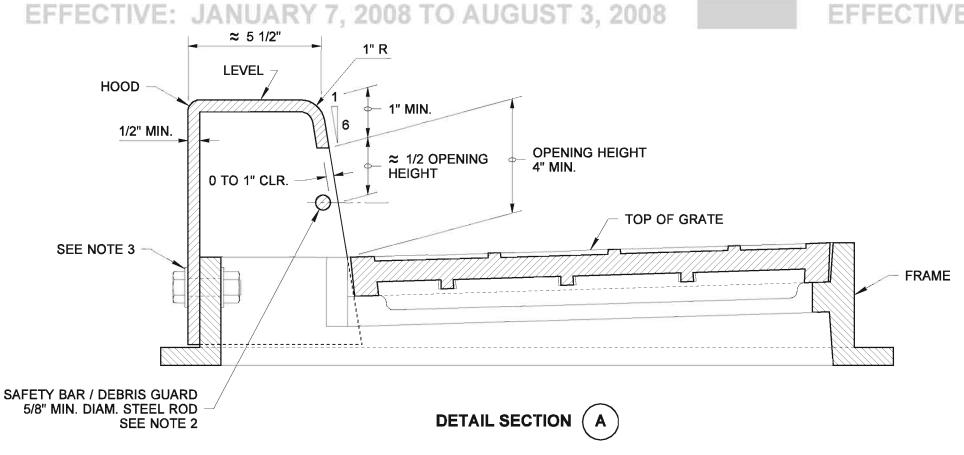
CUTAWAY ELEVATION VIEW

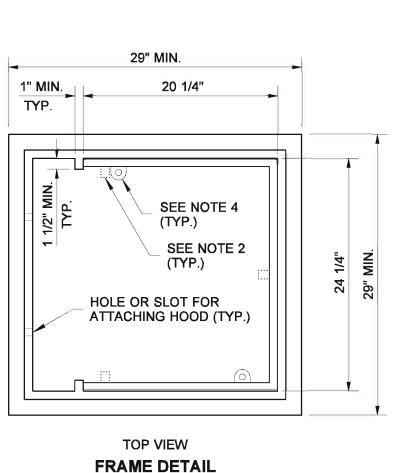
PRECAST FOOTING DETAIL

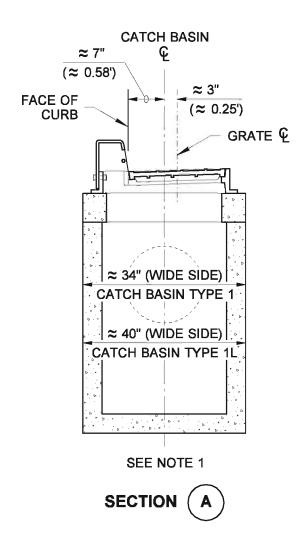
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** CIRCULAR FRAME (RING) ~ SEE STD. PLAN B-30.70 CIRCULAR GRATE ~ SEE STD. PLAN B-30.80 1. Precast concrete cone sections may be eccentric or concentric. FINISHED SURFACE 2. Seepage port orientation varies among manufacturers. 3. For depths over 15' use 72" x 8" Alternative Precast Footing. **VARIES** ADJUSTMENT SECTION (TYP.) CONE SECTION 72" 4" CONCRETE SLAB CRUSHED SURFACING ~ CLASS 3000 BASE COURSE \bigoplus UNDERGROUND DRAINAGE GEOTEXTILE, MODERATE ĆΨ. SURVIVABILITY, CLASS A 48" LIMIT OF EXCAVATION 1H:2V SLOPE (MAX.) 岡 **ALTERNATIVE PRECAST GRAVEL BACKFILL FOOTING DETAIL** 10" (TYP.) FOR DRYWELL (TYP.) 5" (TYP.) 6" DIAM. DRAIN HOLE (TYP.) #4 BARS SEEPAGE PORT ~ SEE NOTE 2 Ø 10" (TYP.) 0 EXPIRES JULY I, 2007 **DRYWELL TYPE 3** (WITH AT-GRADE INLET) STANDARD PLAN B-20.60-01 6" DIAM. DRAIN HOLE (TYP.) 48" I.D. SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION PRECAST FOOTING WITH DRAIN HOLES ~ SEE NOTE 3 11-21-06 Kevin J. Dayton **CUTAWAY ELEVATION VIEW** PRECAST FOOTING DETAIL

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

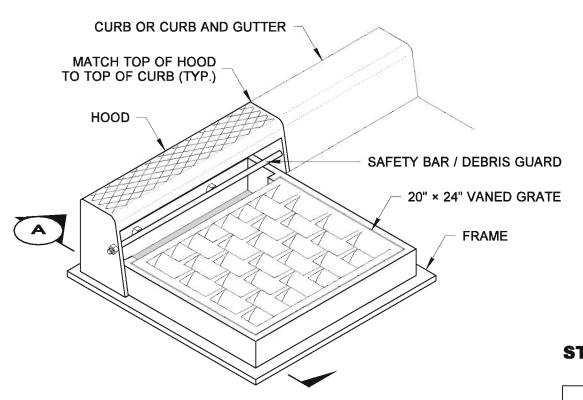






NOTES

- 1. The asymmetry of the Combination Inlet shall be considered when calculating the offset distance for the catch basin. See **SECTION A**.
- 2. The dimensions of the Frame and Hood may vary slightly among different manufacturers. The Frame may have cast features intended to support a grate guard. Hood units shall mount outside of the Frame. The methods for fastening the Safety Bar / Debris Guard Rod to the Hood may vary. The Hood may include casting lugs. The top of the Hood may be cast with a pattern.
- 3. Attach the Hood to the frame with two 3/4" × 2" hex head bolts, nuts, and oversize washers. The washers shall have diameters adequate to assure full bearing across the slots.
- 4. When bolt-down grates are specified in the contract, provide two holes in the frame that are vertically aligned with the grate slots. Tap each hole to accept a 5/8" × 11 NC × 2" allen head cap screw. Location of bolt-down holes varies among different manufacturers. See BOLT- DOWN DETAIL, Standard Plan B-30.10.
- 5. Only ductile iron Vaned Grates shall be used. See Standard Plans B-30.30 and B-30.40 for grate details. Refer to Standard Specification 9-05.15(2) for additional requirements.
- 6. This plan is intended to show the installation details of a manufactured product. It is not the intent of this plan to show the specific details necessary to fabricate the castings shown on this drawing.





2008

COMBINATION INLET

STANDARD PLAN B-25.20-00

SHEET 1 OF 1 SHEET

06-08-06

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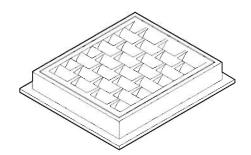
Harold J. Peterfeso 06



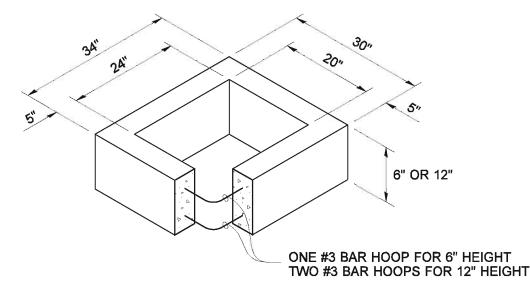
COMBINATION INLETFRAME, HOOD, AND VANED GRATE

ISOMETRIC VIEW

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200



FRAME AND VANED GRATE



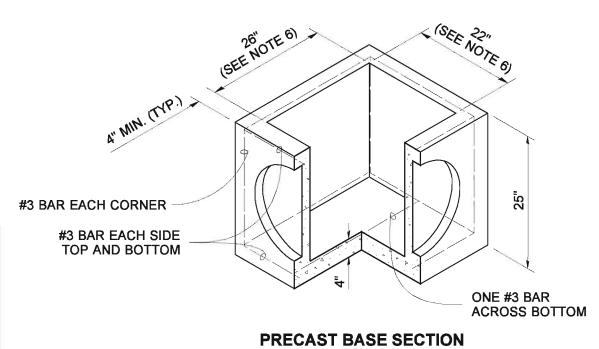
RECTANGULAR ADJUSTMENT SECTION

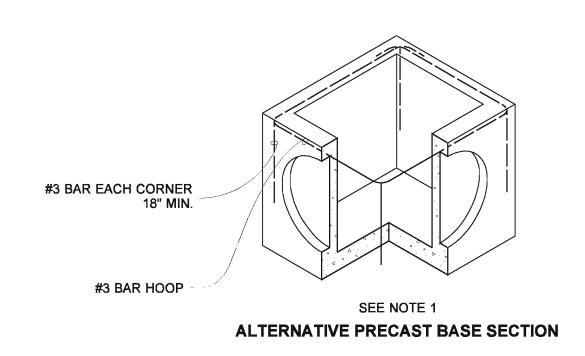
PIPE ALLOWANCES										
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER									
REINFORCED OR PLAIN CONCRETE	12"									
ALL METAL PIPE	15"									
CPSSP * (STD. SPEC. 9-05.20)	12"									
SOLID WALL PVC (STD. SPEC. 9-05.12(1))	15"									
PROFILE WALL PVC (STD. SPEC. 9-05.12(2))	15"									

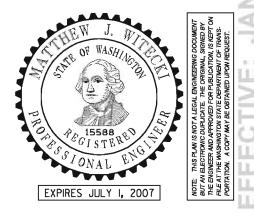
* CORRUGATED POLYETHYLENE STORM SEWER PIPE

NOTES

- 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 diameter shall not be greater than 18". Knockouts shall have a wall thickness of 2" minimum to 2.5" maximum. Provide a 1.5" 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 9-04.3.
- 3. The maximum depth from the finished grade to the lowest pipe invert shall be 5'.
- 4. The frame and grate may be installed with the flange up or down. The frame may be cast into the adjustment section.
- 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 inlet has been placed.







CONCRETE INLET

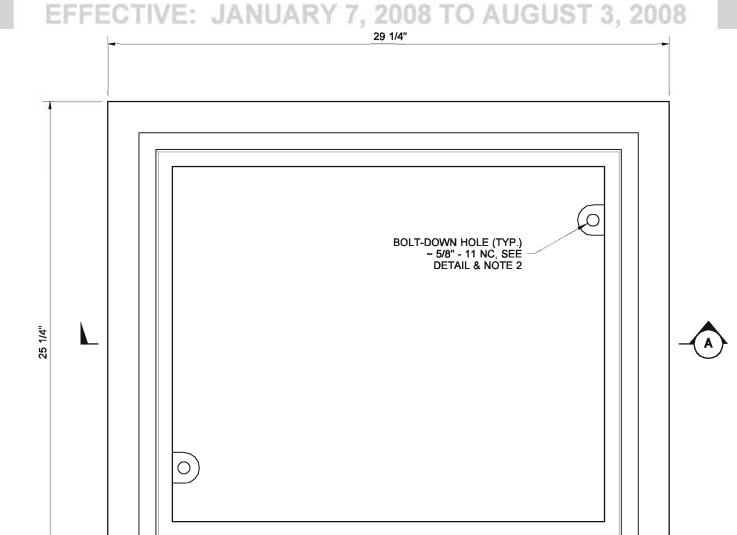
STANDARD PLAN B-25.60-00

SHEET 1 OF 1 SHEET

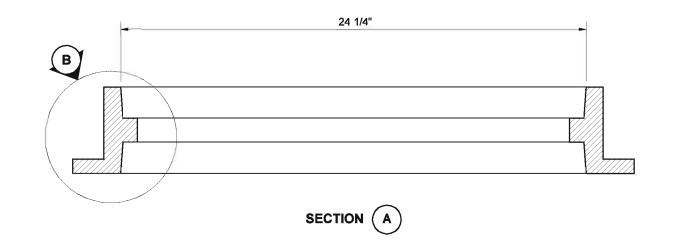
APPROVED FOR PUBLICATION Harold J. Peterfeso

06-01-06

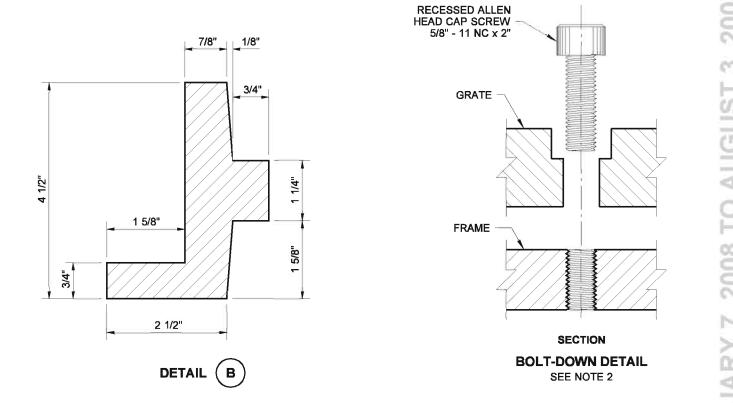


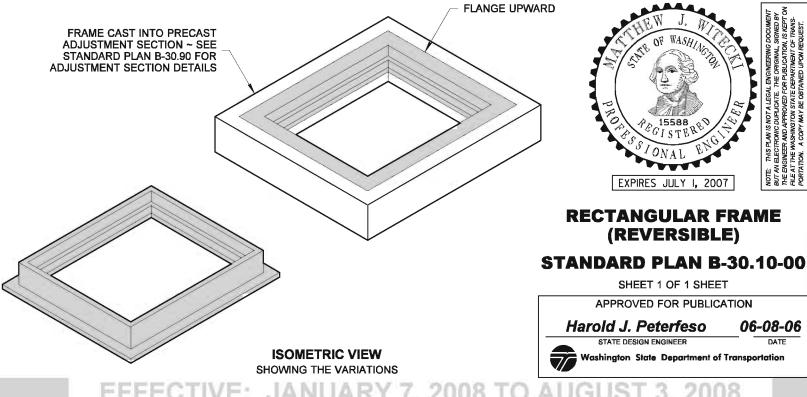






- 1. This frame is designed to accommodate 20" × 24" grates or covers as shown on Standard Plans B-30.20, B-30.30, B-30.40 and B-30.50.
- 2. When bolt-down grates or covers are specified in the Contract, provide two holes in the frame that are vertically aligned with the grate or cover slots. Tap each hole to accept a 5/8" - 11 NC × 2" allen head cap screw. Location of bolt down holes varies among different manufacturers.
- 3. Refer to Standard Specification 9-05.15(2) for additional requirements.



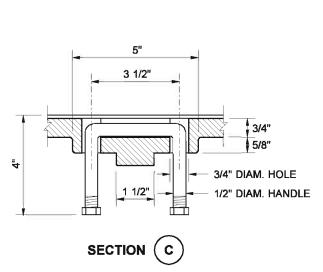


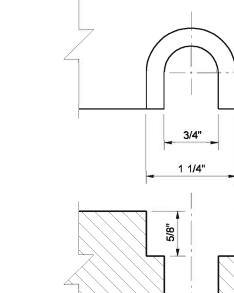
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



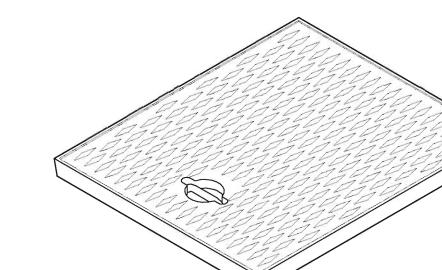
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. When bolt-down covers are specified in the Contract, provide two slots in the cover that are vertically aligned with the holes in the frame. Location of bolt-down slots varies among different manufacturers.
- 2. Alternative reinforcing designs are acceptable in lieu of the rib design.
- 3. Refer to Standard Specification 9-05.15(2) for additional requirements.
- 4. For frame details, see Standard Plan B-30.10.





BOLT-DOWN SLOT DETAIL SEE NOTE 1



METAL COVER

STANDARD PLAN B-30.20-01

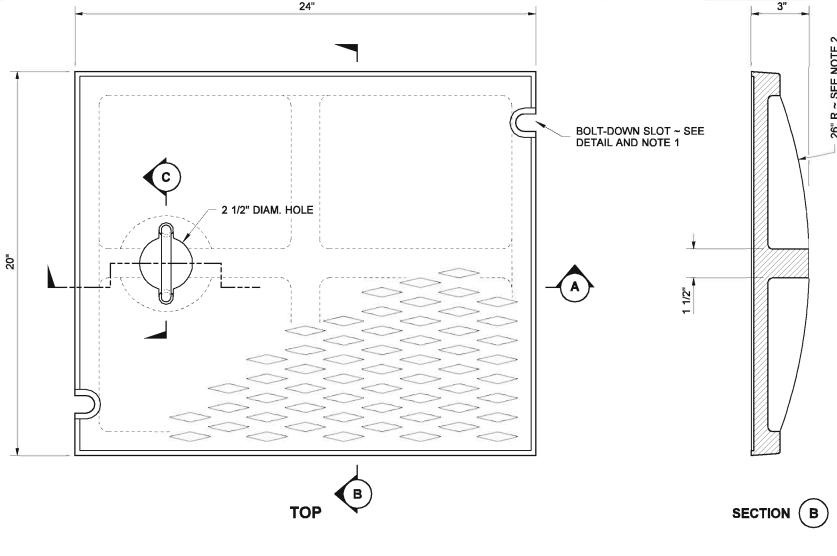
EXPIRES JULY I, 2007

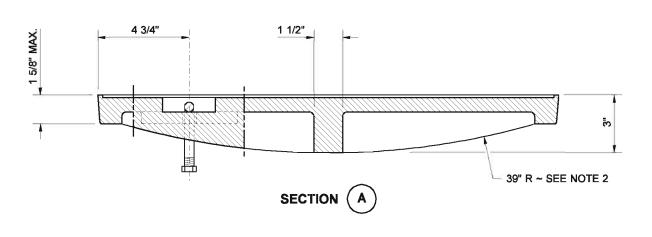
RECTANGULAR SOLID

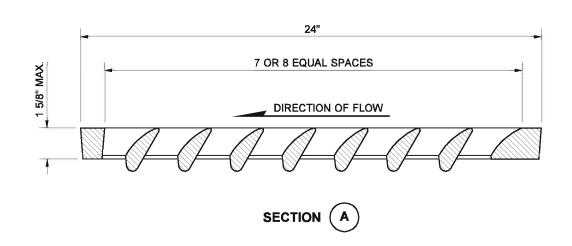
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Kevin J. Dayton

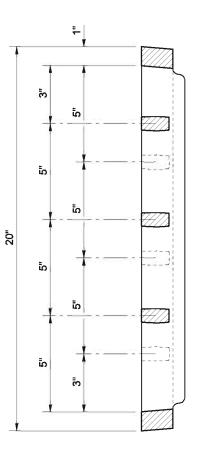






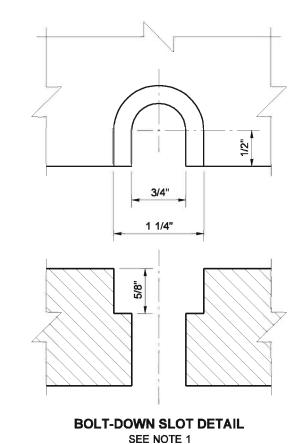


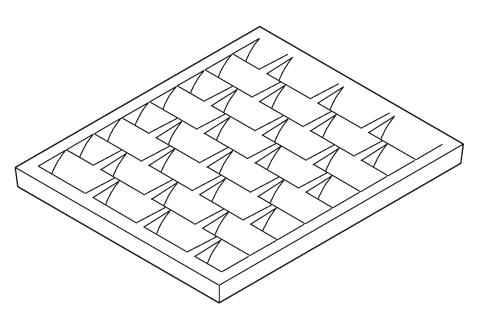
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 NOTES

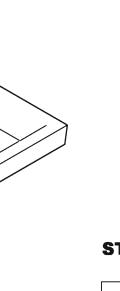


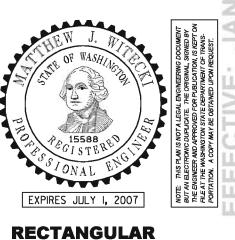


1. When bolt-down grates are specified in the Contract, provide two slots in the grate that are vertically aligned with the holes in the frame. Location of bolt-down slots varies among different manufacturers. 2. Refer to Standard Specification 9-05.15(2) for additional requirements. 3. For Frame details, see Standard Plan B-30.10.









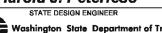
VANED GRATE

STANDARD PLAN B-30.30-00

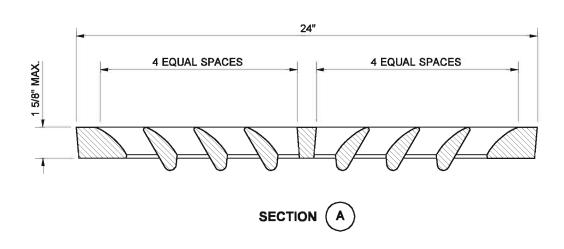
SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

06-01-06

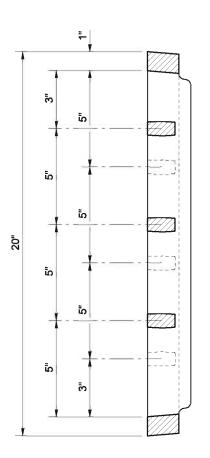
Harold J. Peterfeso



ISOMETRIC

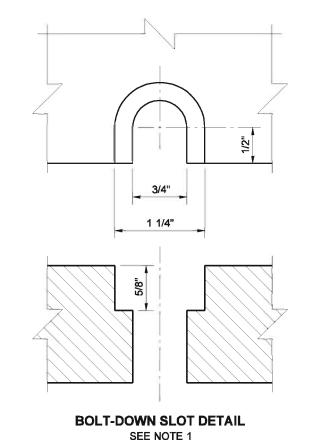


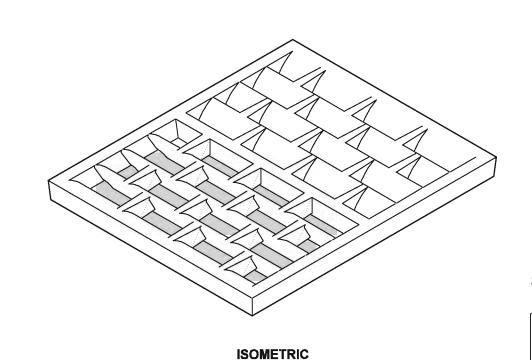
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 NOTES

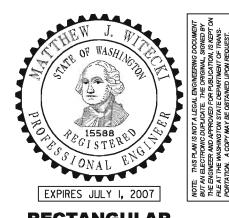


SECTION B

1. When bolt-down grates are specified in the Contract, provide two slots in the grate that are vertically aligned with the holes in the frame. Location of bolt-down slots varies among different manufacturers. 2. Refer to Standard Specification 9-05.15(2) for additional requirements. 3. For Frame details, see Standard Plan B-30.10.







RECTANGULAR **BI-DIRECTIONAL VANED GRATE** STANDARD PLAN B-30.40-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Harold J. Peterfeso 06-01-06



FOUNDRY NAME

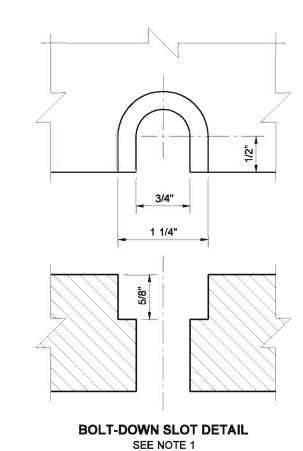
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 NOTES

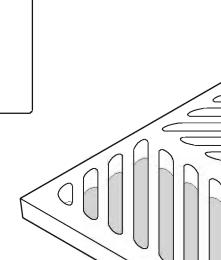
1. When bolt-down grates are specified in the Contract, provide two slots in the grate that are vertically aligned with the holes in the frame.

2. Refer to Standard Specification 9-05.15(2) for additional requirements.

Location of bolt-down slots varies among different manufacturers.

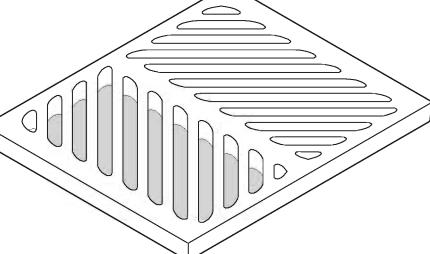
- 3. For Frame details, see Standard Plan B-30.10.
- 4. The thickness of the grate shall not exceed 1 5/8".





SLOT ~ SEE DETAIL AND NOTE 1

1" OPENING (TYP.)



ISOMETRIC

STANDARD PLAN B-30.50-00 SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

EXPIRES JULY I, 2007

RECTANGULAR HERRINGBONE GRATE

Harold J. Peterfeso



06-01-06

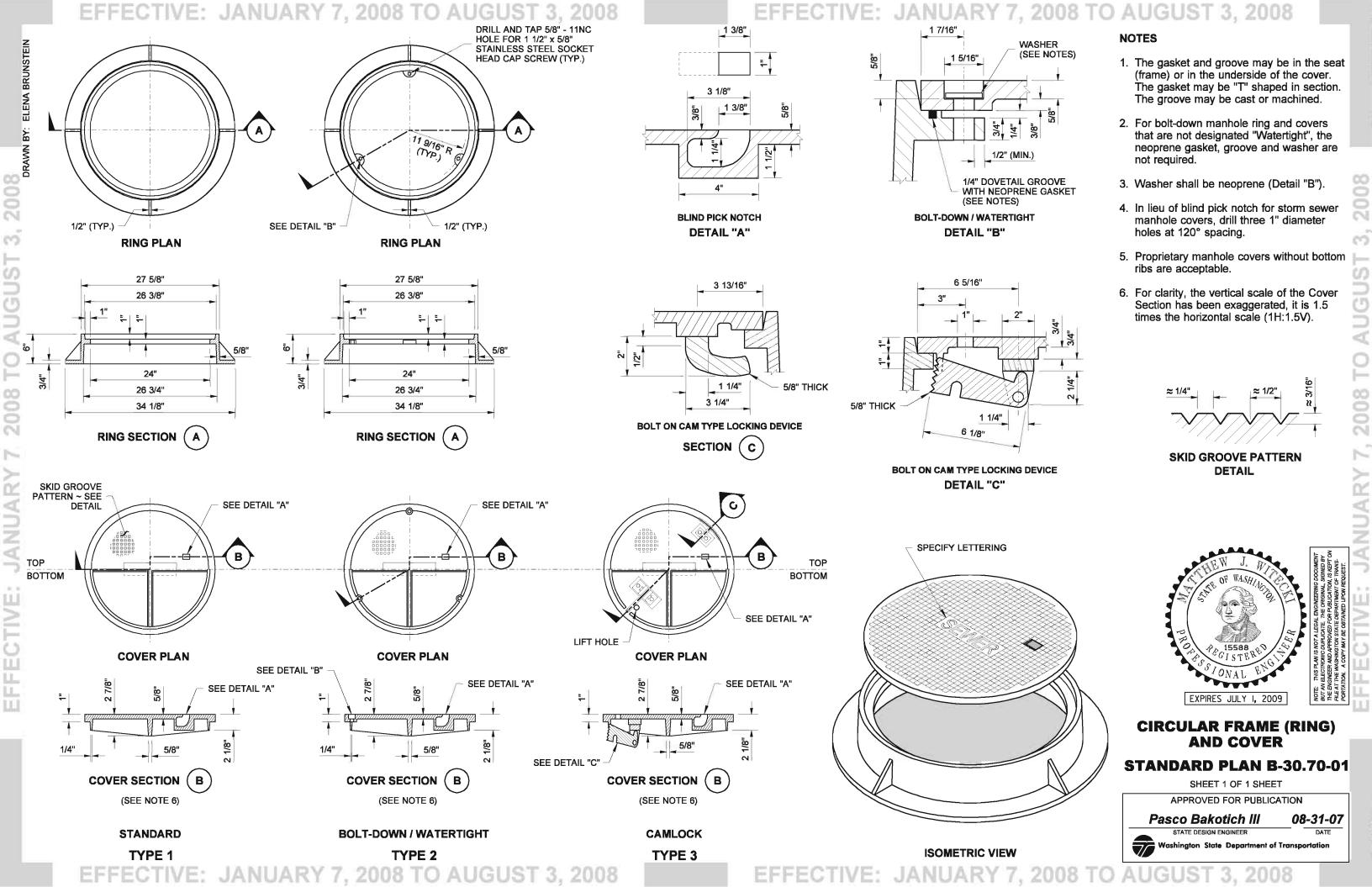
TOP

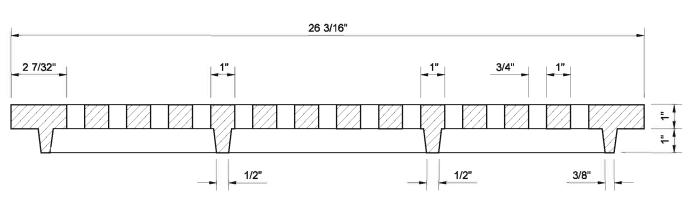
CURB

TOWARD

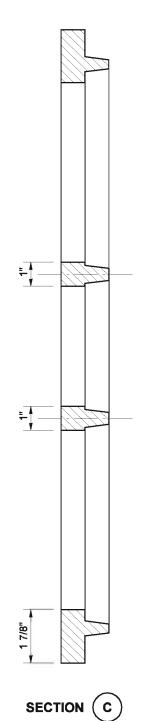
SIDE

THIS





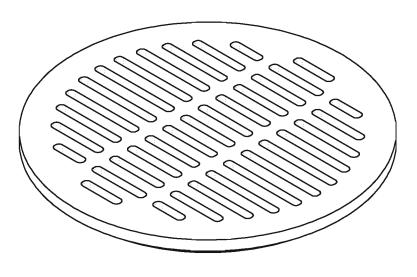
SECTION B



 $\overline{-B}$

NOTES

- 1. For use with Circular Frames (rings) detailed in Standard Plan B-30.70.
- 2. Slotted Manhole Covers are intended for use with Drywells only. See Standard Plans B-20.20 and B-20.60.



ISOMETRIC VIEW



AUGUST

CIRCULAR GRATE

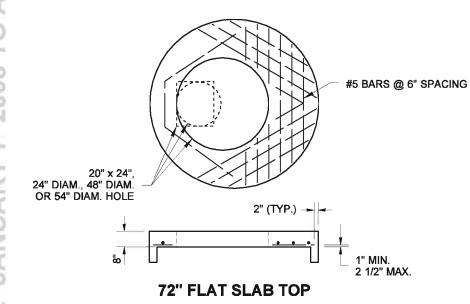
STANDARD PLAN B-30.80-00

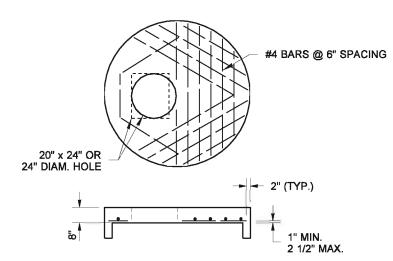
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

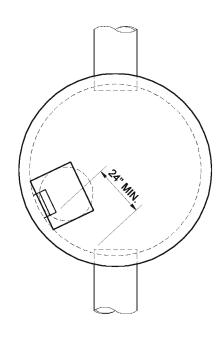




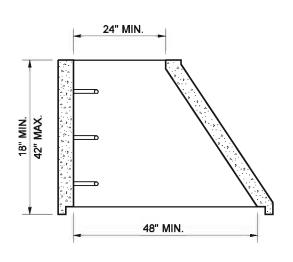




48", 54", or 60" FLAT SLAB TOP

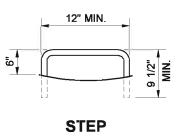


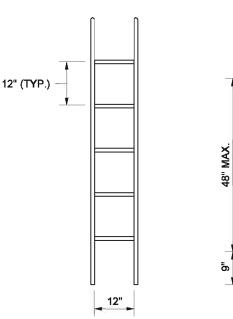
TYPICAL ORIENTATION FOR ACCESS AND STEPS

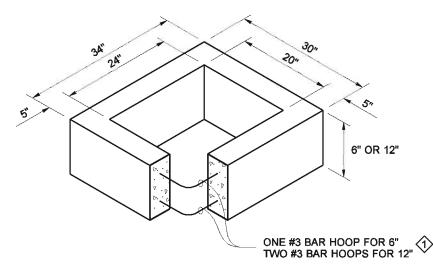


ECCENTRIC CONE SECTION

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

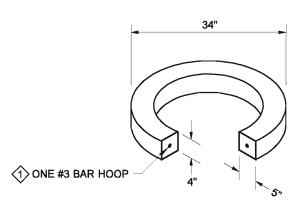




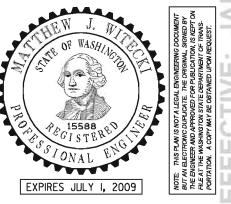


RECTANGULAR ADJUSTMENT SECTION

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.



CIRCULAR ADJUSTMENT SECTION

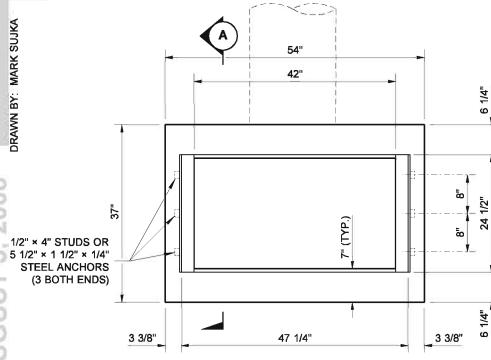


PREFABRICATED LADDER

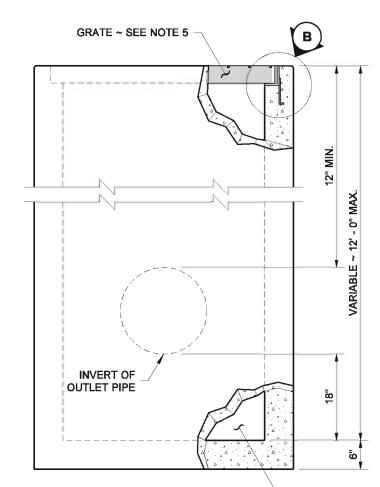
MISCELLANEOUS DETAILS FOR DRAINAGE STRUCTURES STANDARD PLAN B-30.90-01

SHEET 1 OF 1 SHEET

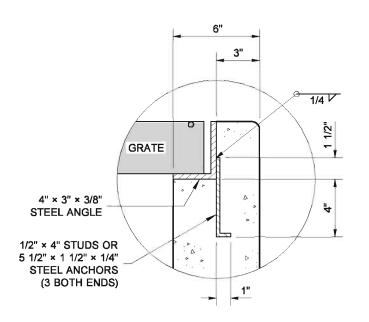
APPROVED FOR PUBLICATION 09-20-07 Pasco Bakotich III



TOP VIEW



SIDE VIEW

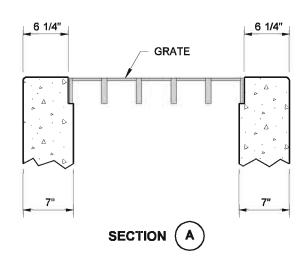


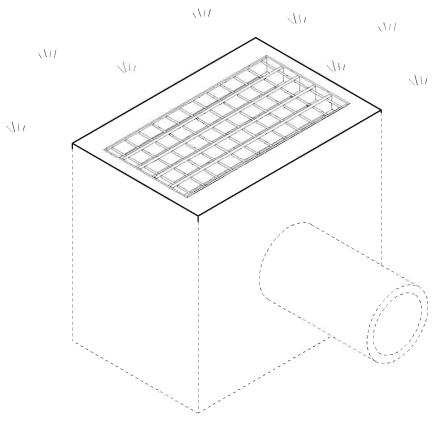
DETAIL (B)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 1. The Steel Angles shall be set so that each bearing bar of prefabricated grate shall have full bearing on both ends. The finished top of concrete shall be even with the grate surface.
- 2. All exposed concrete shall be finished with a 1/2" radius.
- 3. The grade line of the top inside of any pipe shall enter no lower than the grade line of the top inside of the outlet pipe.
- 4. Pipes may enter through the knockouts on any side at any reasonable angle, provided the outside of the pipe can be contained between two opposite walls.
- 5. See contract for type of grate specified. See Standard Plan B-40.20 and B-40.40 for grate details.







GRATE INLET TYPE 1 (CAST-IN-PLACE)

STANDARD PLAN B-35.20-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

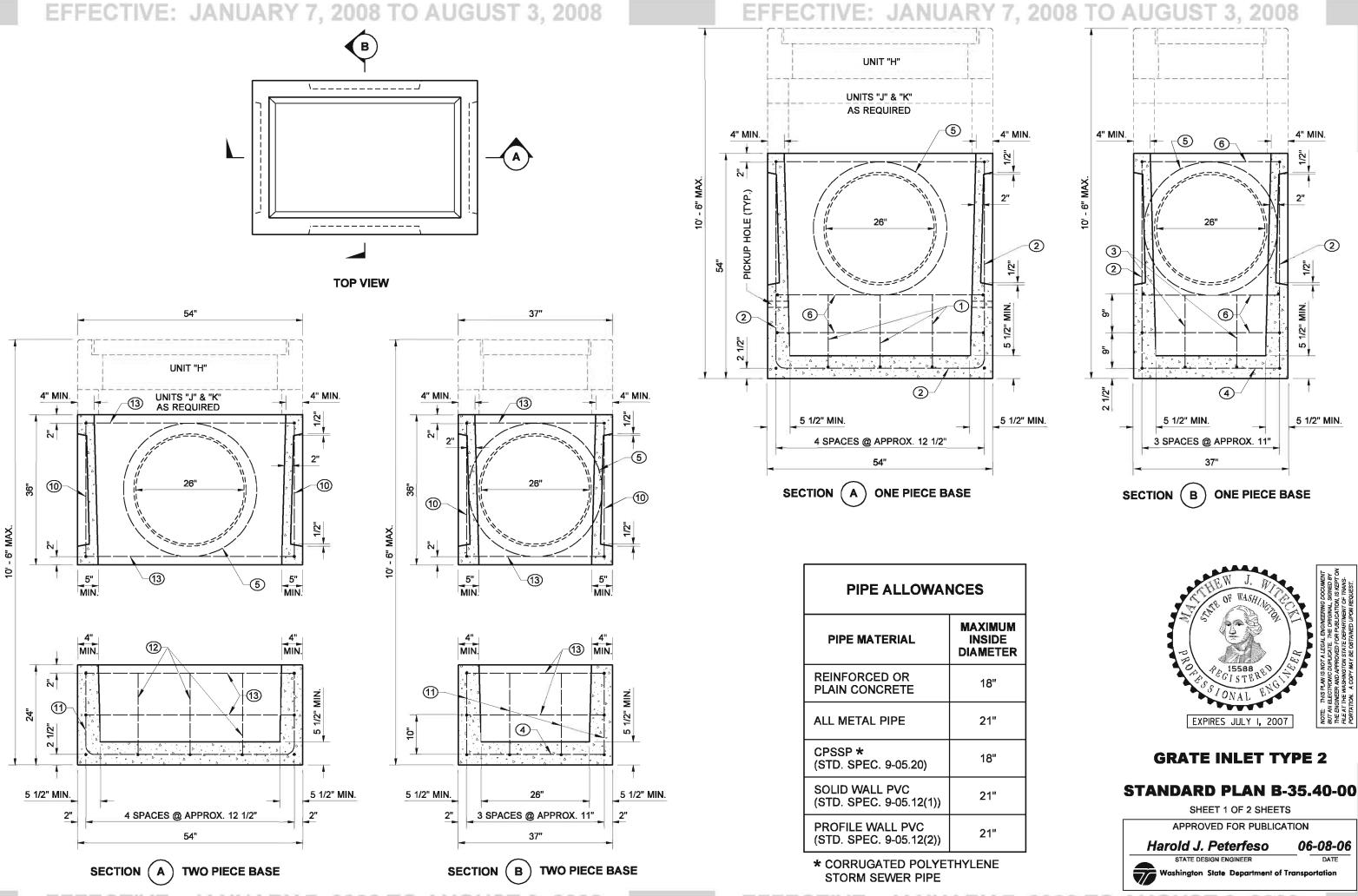
Harold J. Peterfeso 06



arold J. Peterfeso 06-08-06
STATE DESIGN ENGINEER DATE

ISOMETRIC VIEW

SILTING BASIN



JANUARY

5 1/2" MIN.

06-08-06

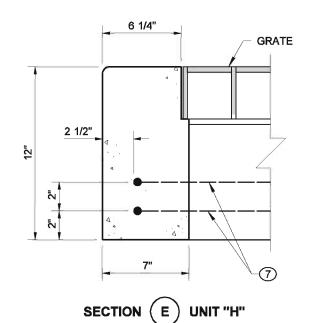
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 ູ້ດັ້ (C 2008 1/2" 1/4" x 5 1/2" x 1 1/2" STEEL ANGLES (3 BOTH ENDS) 3 3/8" 47 1/4" 3 3/8" **UNITS "J" & "K" UNIT "H" GRATE ~ SEE NOTE 9** (c ` UNIT "J" F (D) UNIT "H" SECTION SECTION (c) UNIT "K"

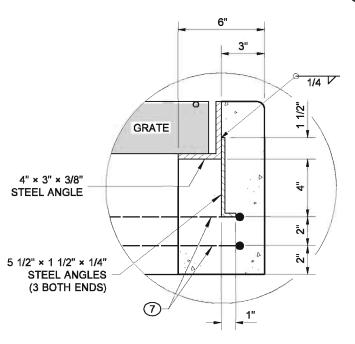
BENDING DIAGRAM BAR LIST (ALL DIMENSIONS ARE OUT TO OUT) MARK LOCATION QTY. SIZE **LENGTH** DESCRIPTION 1 1 1 1 1 1 1 1 1 1 1 1 1 **BOTTOM SLAB AND SIDE WALL** 3 5' - 9" 2 2 **BOTTOM SLAB AND SIDE WALL** 12' - 5" 3 **BOTTOM SLAB AND SIDE WALL** 2 7' - 2" 4 **BOTTOM SLAB AND SIDE WALL** 2 2' - 9" **STRAIGHT** 2' - 7 1/2" 1 2' - 9" 2 4' - 2" 3 4' - 2" 11 4' - 2" (5) 4 WALL 9' - 1" HOOP 6 4' - 2" 7 4' - 2" (5) 6 SIDE WALL 3 14' - 6" HOOP 7 2 8 4' - 1" **UNIT H** 14' - 2" HOOP 13 4' - 2" (8) 2 UNIT J 14' - 2" HOOP 12 2' - 9" (8) 3 **UNIT K** 14' - 2" HOOP 9 **UNIT K** 4 0' - 9" **STRAIGHT** (10) SIDE WALL 2' - 8" **STRAIGHT** @\\@\(\mathrea{3}\) . 9. . 7. . 9. ₽, (11) **BOTTOM SLAB AND SIDE WALL** 4 7' - 5" 5000 (12) @6@ **BOTTOM SLAB AND SIDE WALL** 3 6' - 0" SIDE WALL 14' - 6" HOOP

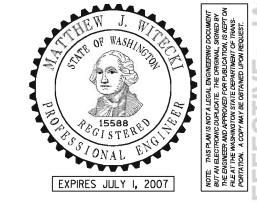
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 1. The Steel Angles shall be set so that each bearing bar of prefabricated grate shall have full bearing on both ends. The finished top of concrete shall be even with the grate surface.
- 2. Top of inlet grate shall be placed at ground level to present an unobstructed ditch or median section.
- 3. All exposed concrete edges shall be finished with a 1/2" radius.
- 4. Pipes may enter through the knockouts on any side at any reasonable angle, provided the outside of the pipe can be contained between two opposite walls.
- 5. The flow line of the outlet pipe shall be 18" minimum above the inside bottom of the inlet structure.
- 6. The grade line of the top inside of any inlet pipe shall enter no lower than the grade line of the top inside of the outlet pipe.
- 7. Unit "H" and optional extension units "J" and "K" shall be grouted in place to the satisfaction of the Engineer.
- 8. All pickup holes shall be grouted full after the basin has been placed.
- 9. See contract for type of grate specified. See Standard Plan B-40.20 and B-40.40 for grate details.







GRATE INLET TYPE 2

STANDARD PLAN B-35.40-00

SHEET 2 OF 2 SHEETS

06-08-06

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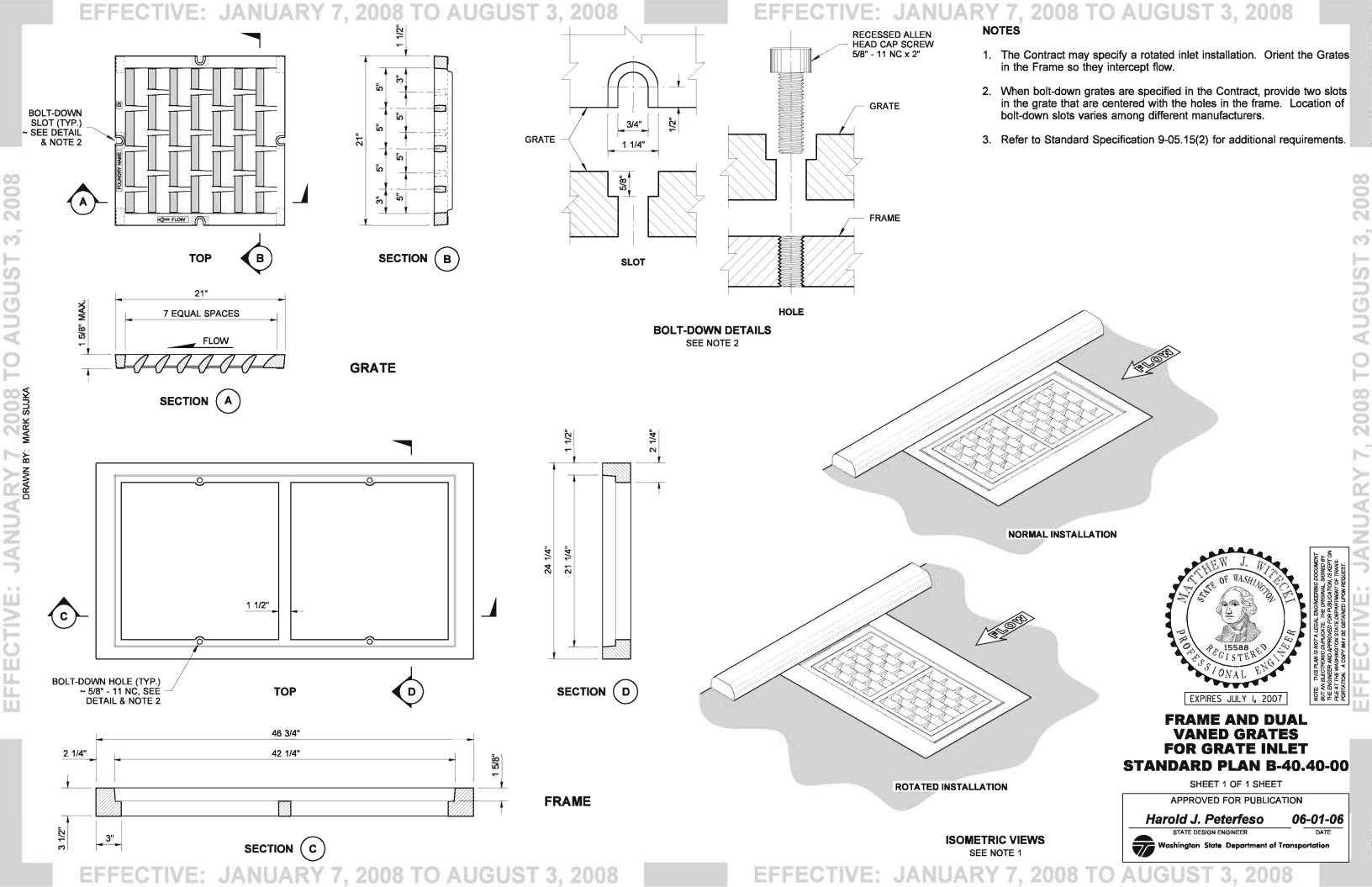
Harold J. Peterfeso 06



FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

ECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 3 1/2" × 3/8" STEEL PLATE (TYP.) 3 1/2" × 3/8" STEEL PLATE (BOTH SIDES) **ELEVEN EQUAL SPACES ELEVEN EQUAL SPACES** 1 3/8" 1 3/8" 1 3/8" 1 3/8" 3 1/2" × 3/4" STEEL PLATES GUS TOP CROSS BARS ~ 3/8" ROUND, OR RECTANGULAR OR HEXAGONAL BAR OF EQUIVALENT AREA. **END TOP** CROSS BARS ~ 3/8" ROUND, OR RECTANGULAR OR HEXAGONAL BAR OF EQUIVALENT AREA. **END** SIDE SIDE **GRATE "A" GRATE "B"** (APPROXIMATE WEIGHT 215 LBS) (APPROXIMATE WEIGHT 215 LBS) EXPIRES JULY I, 2007 **WELDED GRATES FOR GRATE INLET STANDARD PLAN B-40.20-00** SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION Harold J. Peterfeso 06-01-06 **ISOMETRIC ISOMETRIC** EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



(A)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

structed ditch or median section.

SEE CONTRACT FOR BACKSLOPE DETAILS MIN. TYPE 3 GRATE SHOWN **DITCH LINE** رممممم ممممم

SECTION ON DITCH LINE **DIKE INSTALLATION FOR PREFERRED SLOPE**

2. Bevel or round exposed concrete edges 1/2". 3. Pipes may enter through the knockouts at any reasonable angle provided

1. The top of the inlet shall be placed at ground level to present an unob-

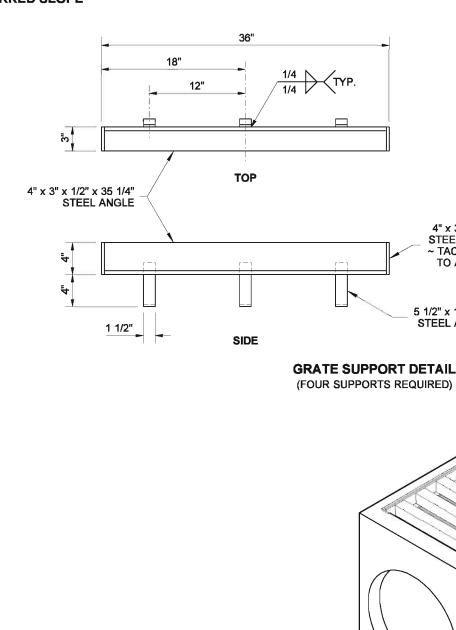
4. The grade line of the lowest inlet pipe shall enter the structure at an elevation equal to or higher than the grade line of the outlet pipe.

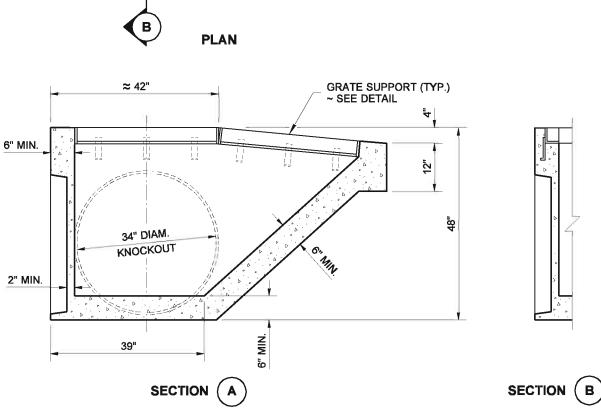
the outside of the pipe can be contained within the knockout provided.

- 5. All pickup holes shall be grouted full after the inlet has been placed.
- 6. The steel angles shall be set so that each bearing bar of the grate shall have full seating on both ends. The finished top of concrete shall be even with the grate surface. For grates, see Standard Plan B-50-20.
- 7. The amount, type, and grade of reinforcing steel is the responsibility of the manufacturer.
- 8. The inside wall taper for form removal shall not result in any wall section thinner than 6" except in pipe knockout areas.
- 9. Precast inlets shall be marked with the manufacturer's identification on the inside of the structure in some readily accessible location.

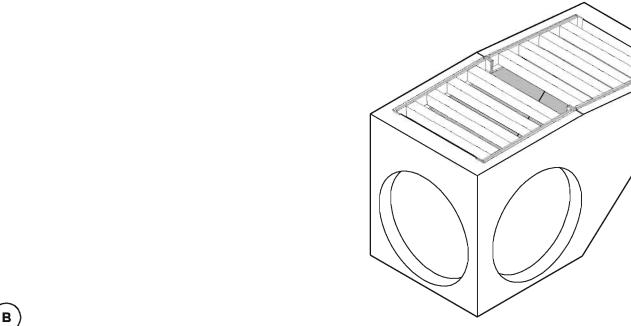
ANCHOR STUD OPTION

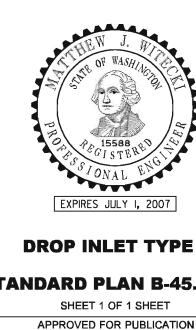
END





€ DITCH





1/2" DIAM. x 4" STEEL STUD ~ PLACE ALONG SUPPORT AS SHOWN FOR ANGLES

DROP INLET TYPE 1

STANDARD PLAN B-45.20-00

Harold J. Peterfeso

06-01-06

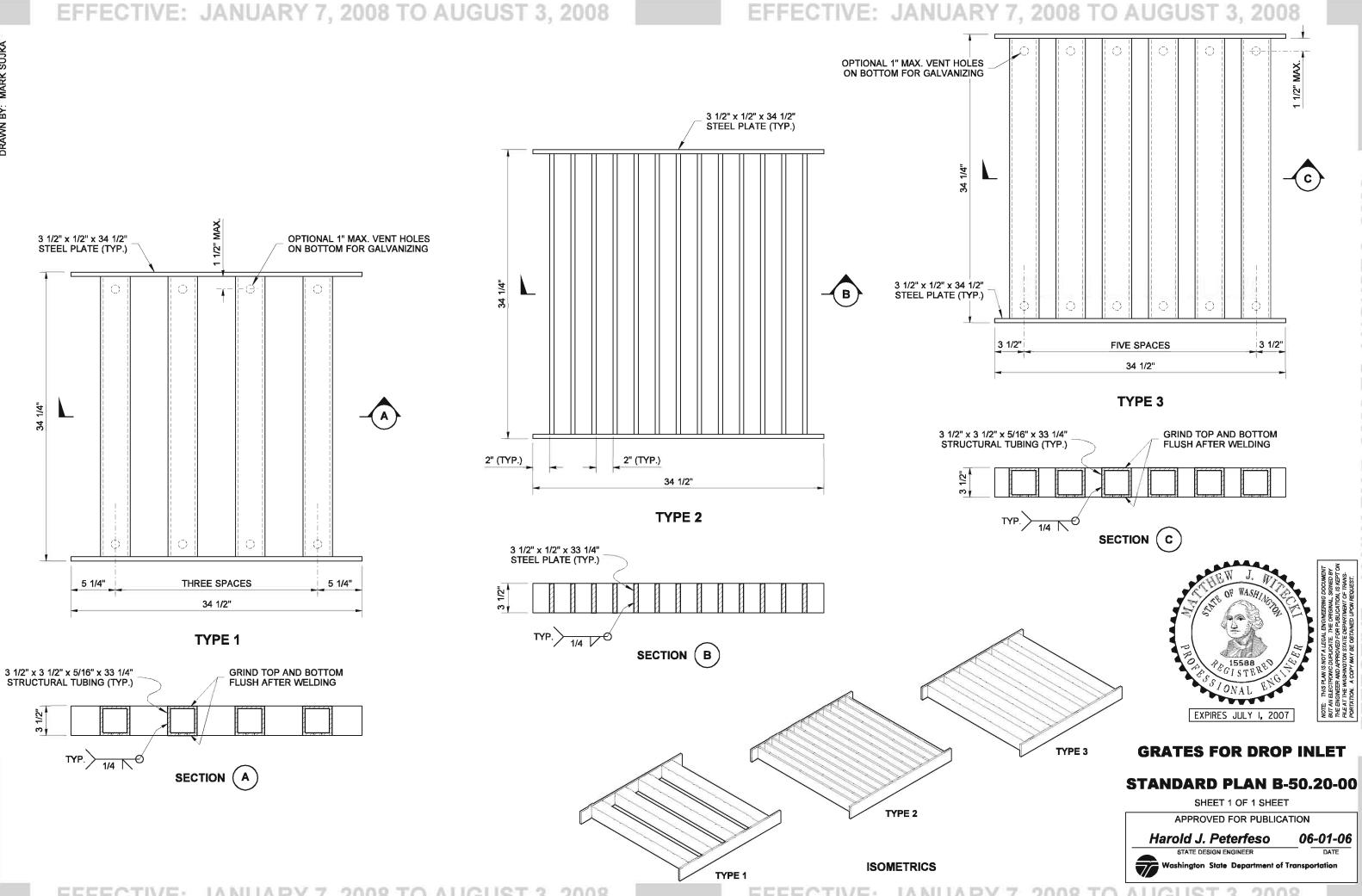
ISOMETRIC (SHOWN WITH TYPE 1 GRATE)

4" x 3" x 3/8" STEEL PLATE

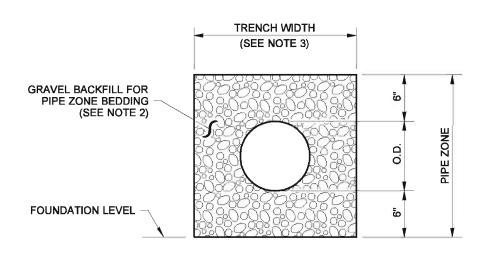
- TACK WELD TO ANGLE

END

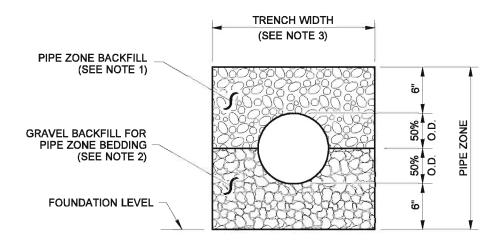
5 1/2" x 1" x 1/4" STEEL ANGLE



CONCRETE AND DUCTILE IRON PIPE



THERMOPLASTIC PIPE

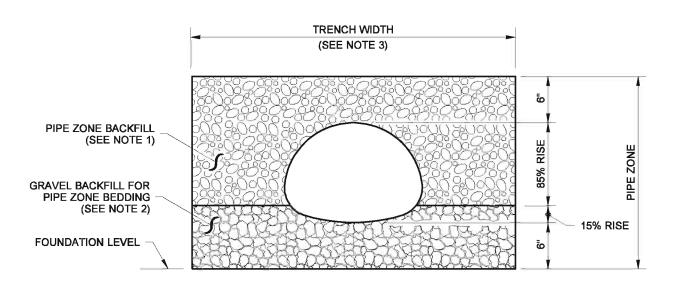


METAL PIPE

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

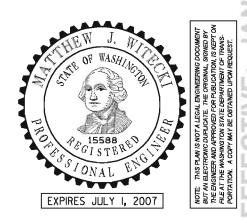
NOTES

- 1. See Standard Specifications Section 7-08.3(3) for Pipe Zone Backfill.
- 2. See Standard Specifications Section 9-03.12(3) for Gravel Backfill for Pipe Zone Bedding.
- 3. See Standard Specifications Section 2-09.4 for Measurement of Trench Width.
- 4. For sanitary sewer installation, concrete pipe shall be bedded to spring line.



PIPE ARCHES

CLEARANCE BETWEEN PIPES FOR MULTIPLE INSTALLATIONS									
PIPE	SIZE	MINIMUM DISTANCE BETWEEN BARRELS							
	12" to 24"	12"							
(DIAMETER)	30" to 96"	DIAM. /2							
(DIAMETER)	102" to 180"	48"							
PIPE ARCH	18" to 36"	12"							
(SPAN)	43" to 142"	SPAN /3							
METAL ONLY	148" to 200"	48"							



PIPE ZONE BEDDING AND BACKFILL

STANDARD PLAN B-55.20-00

SHEET 1 OF 1 SHEET

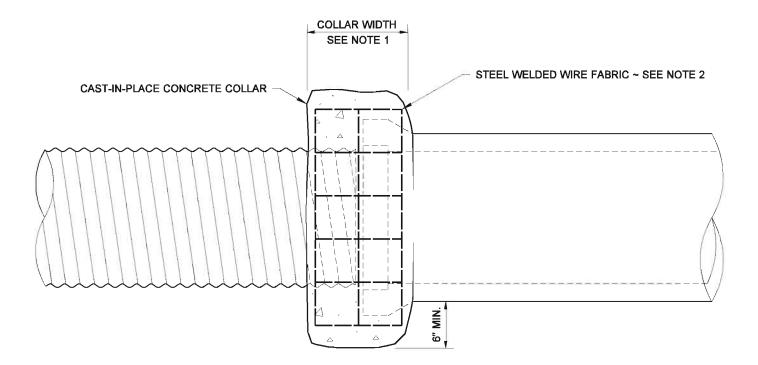
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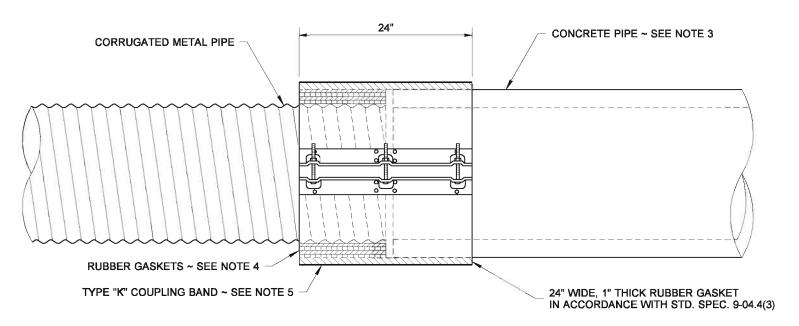


Washington State Department of Transportation

06-01-06



CONCRETE COLLAR OPTION



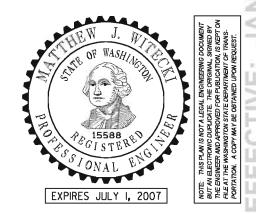
COUPLING BAND OPTION

NOTES

- 1. 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". Concrete Collars may be used with all pipe materials and diameters. The Concrete Collar option shall only be used to extend existing
- 2. Steel Welded Wire Fabric shall be in accordance with Standard Specification 9-07.7. Install two wraps for size 6 × 6 W1.4 × W1.4 (10 Gage) Steel Welded Wire Fabric or one wrap for any of the following sizes:

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

- 3. 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.
- 4. Increase the outside diameter of the metal pipe to match the outside diameter of the concrete pipe by installing 12" wide rubber gaskets, thickness as required (Coupling Band only). The rubber gaskets shall be in accordance with Standard Specification 9-04.4(3).
- 5. 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" or less.



CONNECTION DETAILS FOR DISSIMILAR CULVERT PIPE STANDARD PLAN B-60.20-00

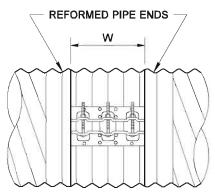
SHEET 1 OF 1 SHEET

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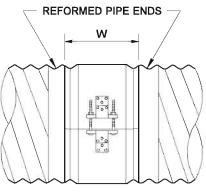
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06-08-06

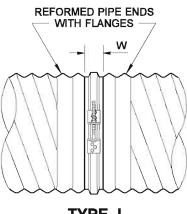




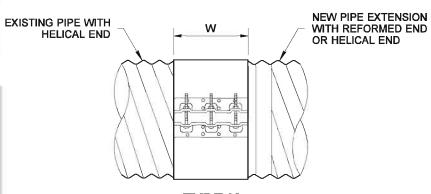
TYPE D
ANNULAR CORRUGATED BAND



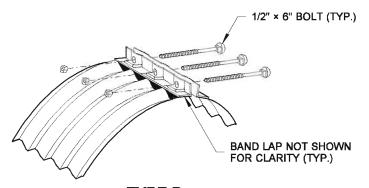
TYPE F
SEMI-CORRUGATED BAND



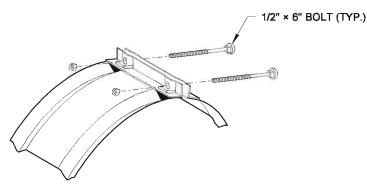
TYPE J FLANGE BAND



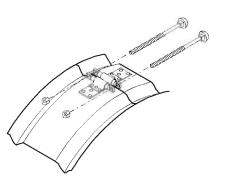
TYPE K
FLAT BAND OR DIMPLE BAND



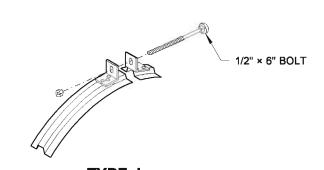
TYPE D
BAND ANGLE CONNECTOR DETAIL



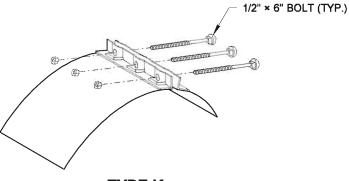
TYPE F
BAND ANGLE CONNECTOR DETAIL



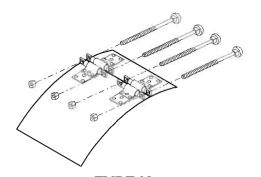
TYPE F
BAR & STRAP CONNECTOR DETAIL



TYPE J
BAND ANGLE CONNECTOR DETAIL



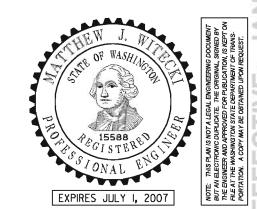
TYPE K
BAND ANGLE CONNECTOR DETAIL



TYPE K
DOUBLE BAR & STRAP CONNECTOR DETAIL

	CO	UPLING BAND (ALL DIMENSIONS			
1	ND PE	CORRUGATION PITCH × DEPTH	PIPE DIAM.	MIN. W	GASKET TYPE
	D	2 2/3 × 1/2 OR 3 × 1 REFORMED TO 2 2/3 × 1/2	12 ~ 84	12	SLEEVE
_ ا		3 × 1 REFORMED TO 2 2/3 × 1/2	90 ~ 144	24	SLEEVE
STEEL	F	2 2/3 × 1/2 OR 3 × 1 REFORMED TO 2 2/3 × 1/2	12 ~ 84	10 1/2	O-RING
	J	2 2/3 × 1/2	12 ~ 48	2 3/4	BUTYL
	К	2 2/3 × 1/2	12 ~ 48 54 ~ 84	12 24	SLEEVE
		* 3 × 1	54 ~ 144	24	
		2 2/3 × 1/2	12 ~ 72	12	
	D	3 × 1	36 ~ 60	12	SLEEVE
ALUMINUM		REFORMED TO 2 2/3 × 1/2	66 ~ 108	24	
IS	F	2 2/3 x 1/2	12 ~ 48	10 1/2	O-RING
4	K	2 2/3 x 1/2	12 ~ 48 54 ~ 84	12 24	SLEEVE
		* 3 × 1	54 ~ 96	24	

^{*} PIPE ARCH ONLY



COUPLING BANDS FOR CORRUGATED METAL PIPE STANDARD PLAN B-60.40-00

SHEET 1 OF 1 SHEET

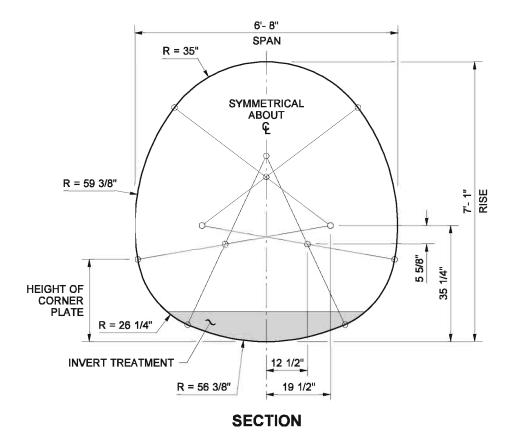
APPROVED FOR PUBLICATION

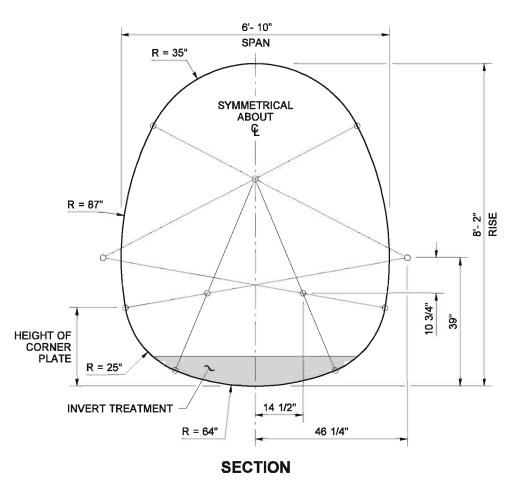
Harold J. Peterfeso 06-01-06



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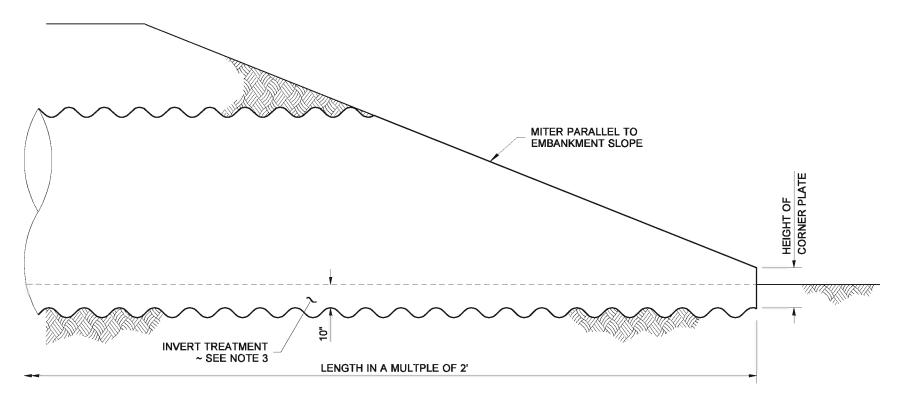
FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008





NOTES

- 1. Span and rise dimensions are nominal and are measured to the inside crests of corrugations.
- 2. Allowable heights of cover shall be within the limits indicated in the table included hereon. Minimums and maximums are shown.
- 3. Unless indicated otherwise a 10" depth (over the inside crests of corrugatons) of earth shall be placed in the invert of the Structural Plate Underpass, Design 1, for its full width and length. The earth shall consist of naturally occurring materials available in the vicinity of the structural plate underpass installation. See Standard Specification 7-03.3(4).
- 4. Designed for H-20 live load and maximum allowable soil pressure of 6 Kips per square foot.



SIDE VIEW ~ PLACEMENT

ALLOWABLE HEIGHTS OF COVER								
		12 GAGE THICK CORRUGATED METAL COVER						
SPAN	RISE							
		MIN.	MAX.					
6' - 8"	7' - 1"	4'	26'					
6' - 10"	8' - 2"	5'	25'					



ANIMAL/PEDESTRIAN UNDERPASS

STANDARD PLAN B-65.20-00

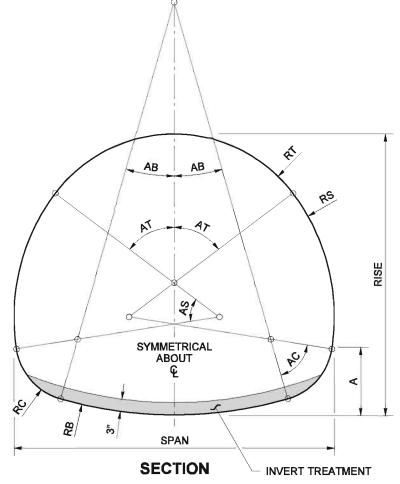
SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION

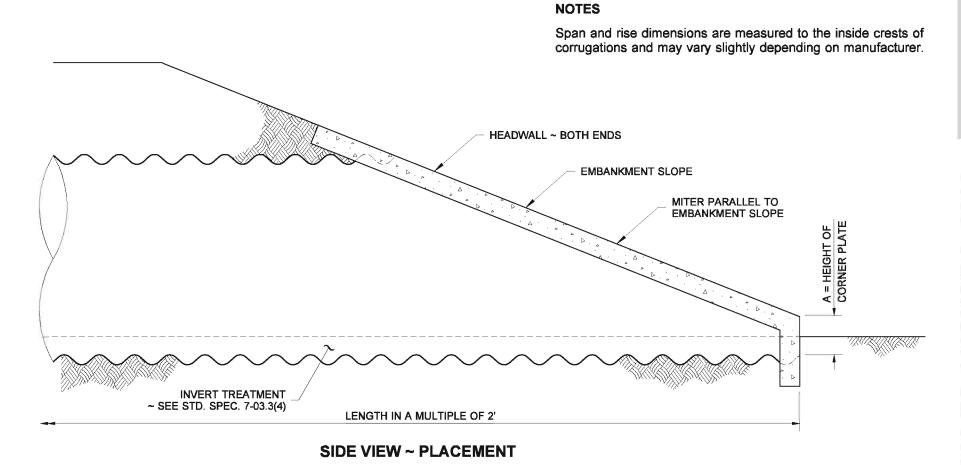
Harold J. Peterfeso



dd J. Peterfeso 06-01-06

TATE DESIGN ENGINEER DATE





	DIMENSIONS											ALLOW	ABLE HE	IGHTS OF	COVER	
												CORRUGATED METAL THICKNESS				
SPAN RISE	DIOF	ANGLES (DEGREES)			RADII (INCHES)			Α	12 GAGE		10 G	AGE	8 GAGE			
	RISE	AT	AS	AC	AB	RT	RS	RC	RB	(INCHES)	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
12' - 2"	11' - 0"	52	42	65	21	68	93	38	134	44	3'	14'	3'	20'	3'	26'
12' - 11"	11' - 3"	52	41	65	21	73	95	38	144	45	3'	13'	3'	19'	3'	25'
13' - 2"	11' - 11"	52	43	65	19	73	103	38	159	43	4'	13'	4'	19'	4'	24'
13' - 10"	12' - 3"	53	41	65	20	77	108	38	164	45	4'	12'	4'	18'	4'	23'
14' - 1"	12' - 10"	53	44	65	18	77	115	38	182	43	4'	12'	4'	18'	4'	23'
14' - 6"	13' - 6"	56	38	65	21	78	131	38	174	46	4'	11'	4'	17'	4'	22'
14' - 10"	14' - 0"	55	41	65	19	79	136	38	192	44	4'	11'	4'	17'	4'	21'
15' - 6"	14' - 4"	55	40	65	19	84	138	38	201	46	4'	11'	4'	16'	4'	20'
15' - 9"	15' - 1"	56	41	65	18	83	150	38	212	45	<u> </u>	_0_	4'	16'	4'	20'
16' - 4"	15' - 5"	57	39	65	19	86	157	38	215	47			4'	15'	4'	19'
16' - 5"	16' - 1"	58	42	65	14	88	158	38	271	41	<u> Vaa</u>	_8_	4'	15'	4'	19'
16' - 9"	16' - 3"	58	40	65	17	89	167	38	247	43			4'	15'	4'	19'
17' - 3"	17' - 0"	57	38	65	19	90	174	47	215	55	<u> v.a.</u>		4'	14'	4'	18'
18' - 4"	16' - 11"	55	42	65	18	99	157	47	249	53			4'	13'	4'	18'
19' - 2"	17' - 2"	54	43	65	18	105	156	47	264	53	<u> 444</u>	_0_			4'	17'
19' - 6"	17' - 7"	53	46	65	16	107	158	47	297	50					4'	17'
20' - 4"	17' - 10"	53	46	65	16	113	156	47	314	52	42				4'	16'



EQUIPMENT UNDERPASS

STANDARD PLAN B-65.40-00

SHEET 1 OF 1 SHEET

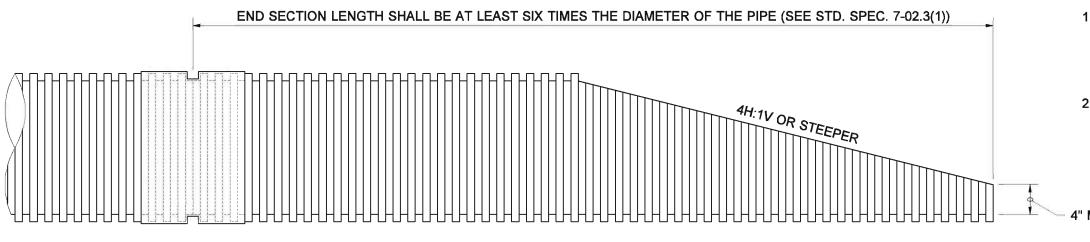
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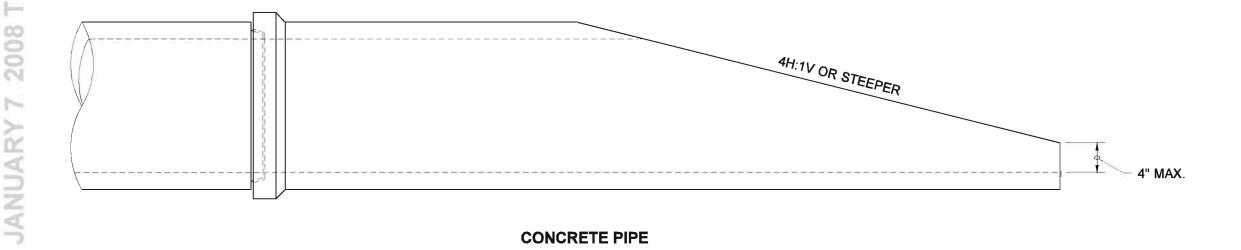


2008

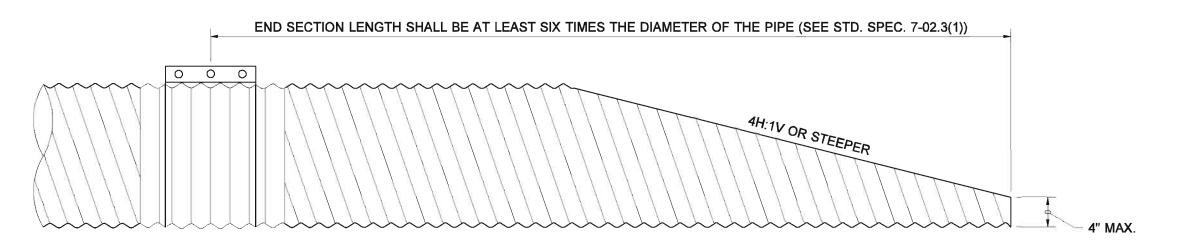
2. Field cutting of culvert ends is permitted when approved by the Engineer All field-cut culvert pipe shall be treated with treatment as shown in the Standard Specifications or General Special Provisions



THERMOPLASTIC PIPE

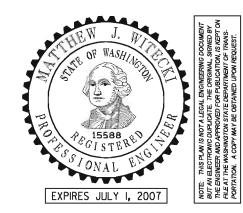


CONCRETE PIPE



METAL PIPE

FOR CULVERTS 30" DIAMETER OR LESS



BEVELED END SECTIONS

STANDARD PLAN B-70.20-00

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

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2008

9

PIPE ARCH

DIMENSION

(INCHES)

RISE

13

15

18

20

24

29

33

38

43

47

52

57

SPAN

17

21

24

28

35

42

49

57

64

71

77

83

PIPE

DIAM

(INCHES)

12

15

18

21

24

30

36

42

48

54

60

66

72

78

84

(A)

PIPE

PIPE ~ ELEVATION

THICKNESS

(INCHES)

ALUM

0.060

0.060

0.060

0.075

0.075

0.105

0.105

0.105

0.105

0.135

TOL.

± 1"

6

8

9

10

12

14

16

18

18

18

18

18

18

18

REINFORCED EDGE

GALVANIZED STEEL OR **ALUMINUM SKIRT**

(SEE NOTE 6)

TOE PLATE

EXTENSION

STEEL

0.064

0.064

0.064

0.064

0.079

0.079

0.109

0.109 0.138

0.138

0.138

0.138

0.138

ALUM.

0.060

0.060

0.060

0.060

0.075

0.075

0.105

0.105

0.105

0.109

0.109

0.109

0.109

THICKNESS

(INCHES)

STEEL

0.064

0.064

0.064

0.064

0.064

0.079

0.079

0.109

0.109

0.109

0.138

0.138

0.138

0.138

0.138

0.109

0.109

0.109

0.109

0.109

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 NOTES

FND

SECTION

SLOPE

(H:V)

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

1 3/4:1

1 1/2 : 1

1. The diameter of the end section of Design B shall match the inside diameter of the concrete pipe.

2. Skirt sections shall be made in one piece for round pipe with a diameter of 12" to 24" inclusive and for pipe arches with a rise of 13" to 20" inclusive. Skirt sections for larger sizes of pipes may be multiple pieces in conformance with the tabulated values shown.

Design A end sections for 42" thru 84" diameter and 49" x 33" thru 83" x 57" arch with annular corrugations and all helically corrugated pipe arch include one foot of pipe length as a connector section. The connector section shall be attached to the end section by welds, rivets or bolts and shall be the same thickness as the end section.

Design C may be used in lieu of Design A for all metal pipe sizes except as noted. Coupling bands may be any acceptable type for the pipe specified.

5. Multiple panel skirts shall have 2" lap seams tightly joined by 3/8" stainless steel rivets or galvanized bolts on 6" max. centers.

6. The reinforced edges of the following size End Sections shall be supplemented with galvanized steel stiffener angles:

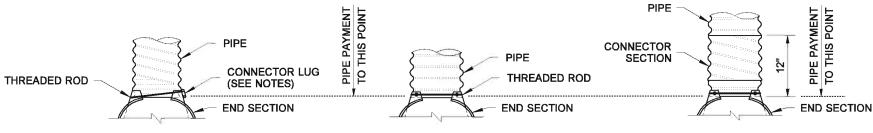
60" thru 72" diameter pipe 2" x 2" x 1/4" angle

78" and 84" diameter pipe, and 77" x 52" & 83" x 57" pipe arch 2 1/2" x 2 1/2" x 1/4" angle

The above galvanized angles shall be attached by 3/8" galvanized nuts and bolts.

7. Galvanized steel angle reinforcement will be placed under the center panel seams on the 72" thru 84" diam. pipe and 77" x 52" & 83" x 57" pipe arch End Sections.

As an alternative to the connector lug and threaded rod used on 12" thru 24" culvert pipe, the attachment may be made with a 1" wide strap, 16 gage galvanized steel fastened with a 1/2" diam. 6" long galvanized bolt and one squarehead nut.



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

FOR 12" THRU 24" PIPE AND 17" x 13" THRU 28" x 20" PIPE ARCH WITH ANNULAR END CORRUGATIONS

FOR 30" THRU 84" PIPE AND 35" x 24" THRU 83" x 57" PIPE ARCH WITH ANNULAR END CORRUGATIONS

FOR 42" THRU 84" PIPE AND 49" x 33" THRU 83" x 57" PIPE ARCH WITH ANNULAR END CORRUGATIONS, AND ALL HELICAL END CORRUGATED PIPE AND PIPE ARCH

TYPE 1

REINFORCED EDGE

(SEE NOTE 6)

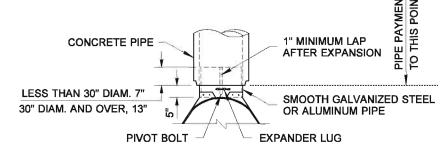
TOE PLATE

EXTENSION

TYPE 2

TYPE 3

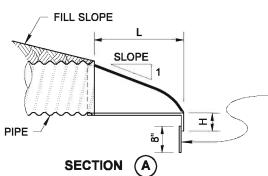
DESIGN A CONNECTION TO METAL PIPE



CONNECTION TO CONCRETE PIPE INLET END ONLY

EXPIRES JULY I, 2007

DESIGN B



PIPE ARCH

TOL.

± 1"

7

7

8

9

10

12

13

18

18

18

18

18

MAX.

6

8

10

12

13

16

19

22

27

30

33

36

39

42

45

PIPE

PIPE

В

MAX.

9

10

12

14

16

18

21

26

30

33

36

39

TOL.

± 1"

6

6

6

6

6

8

9

11

12

12

12

12

12

12

12

DIAM.

OR SPAN

W

PIPE & PIPE ARCH ~ PLAN

DIMENSIONS (INCHES)

DIMENSIONS (INCHES)

TOL.

± 1"

6

6

6

6

6

8

9

12

12

12

12

12

TOL.

± 1 1/2"

21

26

31

36

41

51

60

69

78

84

87

87

87

87

87

L

TOL.

± 1 1/2"

19

23

28

32

39

46

53

63

70

77

77

77

TOL

± 2"

24

30

36

42

48

60

72

84

90

102

114

120

126

132

138

PIPE PAYMENT TO THIS POINT

2

W

TOL.

± 2"

30

36

42

48

60

75

85

90

102

114

126

138

Т

TOL.

± 2"

34

40

46

52

58

70

106

112

122

134

142

146

152

158

Т

TOL. ± 2"

40

46

52

58

70

85

103

114

130

146

152

158

SKIRT

1 PC.

1 PC.

1 PC.

1 PC.

1 PC.

2 PC.

2 PC.

2 PC.

2 PC.

2 PC.

3 PC.

3 PC.

3 PC.

3 PC.

3 PC.

SKIRT

1 PC.

1 PC.

1 PC

1 PC.

1 PC

2 PC

2 PC

3 PC.

3 PC

3 PC

3 PC

3 PC.

END

SECTION

SLOPE

(H:V)

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

2 1/2 : 1

1 3/4:1

1 1/2 : 1

1 1/3 : 1

1 1/4 : 1

1 1/6 : 1

SPAN

PIPE ARCH ~ ELEVATION

TOE PLATE EXTENSION ~ WHEN REQUIRED; GALVANIZED STEEL OR ALUMINUM, SAME GAGE AS SKIRT, LAPPED 2", FASTENED W/ 3/8" S.S. OR AL. RIVETS OR GALVANIZED BOLTS ON 12" MAX. CENTERS.

PIPE COUPLING BAND. SHOP BOLTED TO FLARED END SECTION WITH 3/8" BOLTS AT 6" ON CENTER MAXIMUM OR EQUIVALENT RIVETED OR WELDED CONNECTION. FOR USE WITH ALL SIZES OF PIPE AND PIPE ARCH WITH ANNULAR ENDS. **END SECTION**

> **DESIGN C CONNECTION TO METAL OR CONCRETE PIPE OUTLET ONLY**

FLARED END SECTIONS

STANDARD PLAN B-70.60-00

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

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EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 FILL SLOPE ~ VARIABLE #4 BARS EQUALLY SPACED #4 BARS EQUALLY SPACED 16" MAX. CENTER TO CENTER **NOTES** 16" MAX. CENTER TO CENTER 1. The variable dimension indicated for the height of step for step mitered pipes shall conform to the manufacturers recommendations unless speci-CLASS 3000 CONCRETE fied differently on the plans or in the Special Provisions. 2. Reinforcing steel shall have 1 1/2" min. clear cover to all concrete surfaces. 3. Headwalls for concrete culvert pipe may omit anchor bolt attachment. 4. When steel pipe safety bars ar used, headwall thickness shall be increased ANCHOR BOLTS ~ EQUALLY SPACED, 24" MAX. CENTER TO CENTER (SEE NOTE 3) STRUCTURAL PLATE PIPE ARCHES AND UNDERPASSES FILL SLOPE ~ VARIABLE #4 BARS EQUALLY SPACED FILL SLOPE ~ VARIABLE 16" MAX. CENTER TO CENTER #4 BARS EQUALLY SPACED 16" MAX. CENTER TO CENTER #4 BARS EQUALLY SPACED 16" MAX. CENTER TO CENTER ANCHOR BOLTS ~ **EQUALLY SPACED, 24"** MAX. CENTER TO CENTER **CLASS 3000** (SEE NOTE 3) CONCRETE DIA CLASS 3000 CONCRETE Α ANCHOR BOLTS ~ EQUALLY SPACED, 24" MAX. CENTER TO CENTER (SEE NOTE 3) D/4 D/4 D+D/2 D+D/2 **FULL MITERED PIPE** STEP MITERED PIPE PIPES AND STRUCTURAL PLATE PIPES EXPIRES JULY I, 2007 D+D/2 OR S+S/2 FILL SLOPE **HEADWALLS FOR CULVERT PIPE AND UNDERPASS** STANDARD PLAN B-75.20-00 ANCHOR BOLT (TYP.) ~ SEE DETAIL & NOTE 3 SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION 2 1/2" Harold J. Peterfeso 06-01-06 SECTION (A) **ANCHOR BOLT DETAIL** JANUARY 7, 2008 TO AUGUST

2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** NUMBER OF BARS HEADWALL & SEE NOTE 5 **CULVERT DIAM.** REQUIRED NOTCH BOTTOM OF 1. Sockets shall be 3" extra strong steel pipe (3 1/2" O.D.). Sockets must be the **CULVERT PIPE TO ALLOW** UP TO 36" NONE proper angle and height so that safety bars are parallel with headwall and side ANCHOR/SOCKET slope, and are easily removable. 42" ~ 60" PLACEMENT (TYP.) 2 66" ~ 90" 2. Safety Bars shall be 4" extra strong steel pipe (4 1/2" O.D.), or 4 1/2" O.D. (.250" 96" ~ 120" 3 wall thickness) steel tubing. Length (20' maximum) shall be the minimum required to achieve Resin Bonded Anchor placement in full depth concrete. When **==**) multiple bars are required (see table) place bars at equal spacing (30" max.). 3. Bevel culvert pipe to match side slope. 4. Resin bonded anchors shall be 7" in length (5" embedment) STEEL PLATE ~ SEE DETAIL 5. Centerline of headwall shall be normal to roadway centerline. FIELD CUT CULVERT TO 3/4" RESIN BONDED MATCH BLOCKOUT IN HEADWALL ANCHOR (TYP.) ~ SEE NOTE 4 **TOP VIEW CULVERT IS PERPENDICULAR TO ROADWAY** 1" × 4" SLOT WITH 2" (TYP.) 2" HOLE AT BOTTOM (TYP.) HEADWALL & 4" (TYP.) **SEE NOTE 5** 4.5" DEEP 2" (TYP.) **BLOCKOUT** 8" × 24" × 5/8" SAFETY BAR STEEL PLATE PLACE RESIN BONDED ANCHORS IN FULL DEPTH CONCRETE (TYP.)
~ SEE NOTE 4 **⊯** SLOPE TO MATCH SIDE SLOPE **HEADWALL** ~ **CLASS 3000 CONCRETE** STEEL PLATE DETAIL STEEL PLATE ~ SEE DETAIL CULVERT PIPE OR PIPE ARCH ~ **TOP VIEW CULVERT IS SKEWED TO ROADWAY** SEE NOTE 3 SAFETY BAR ~ SEE NOTE 2 CUT AND WELD SOCKET ~ SEE NOTE 1 EXPIRES JULY I, 2007 **TYPE 1 SAFETY BARS FOR ISOMETRIC CUTAWAY STEPPED CULVERT PIPE ISOMETRIC VIEW** OR PIPE ARCH STANDARD PLAN B-75.50-00 SHEET 1 OF 1 SHEET 3/4" DIAM. × 16" THREADED ROD CENTERED SOCKET SHALL EXTEND THROUGH PIPE, SECURED WITH NUTS; OR 3/4" × 6" ANCHOR STUDS WELDED TO PIPE. INTO SAFETY BAR 4" APPROVED FOR PUBLICATION SPACING SHALL BE 8" FROM TOP AND 8" Harold J. Peterfeso 06-08-06 FROM BOTTOM OF CONCRETE (TYP.)

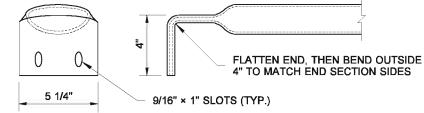
2008

NUAR

3/8" DIAM. HEX HEAD BOLTS (TYP.)

> TOE PLATE EXTENSION ~ WHEN REQUIRED

(SEE NOTE 2)



SAFETY BAR END TREATMENT DETAIL

48" MAX. (TYP.) REINFORCED EDGE ~ FULL LENGTH OF END SECTION SLOPE (SEE SECTION) Ŧ

1/2" DIAM. CARRIAGE HEAD BOLTS (TYP.)

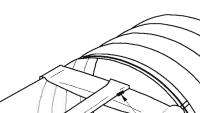
SECTION



CROSS DRAINAGE BAR DETAIL



SAFETY BAR END TREATMENT



CROSS DRAINAGE BAR ~ SEE DETAIL

SAFETY BARS (TYP.) ~ SEE NOTE 5

~ SEE DETAIL

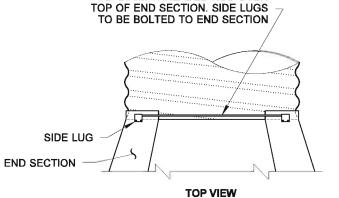
30" AND LARGER END SECTIONS MAY BE MULTIPLE PANELS. SEAMS SHALL BE LAPPED 2" AND JOINED W/ 3/8" × 3/4" BOLTS ON 6" MAX. CTRS.

- (TYP.)

REINFORCED EDGE (SEE SECTION)

1/2" DIAM. CARRIAGE HEAD BOLTS (TYP.)

ISOMETRIC VIEW **CROSS DRAINAGE STRUCTURE**



1/2" DIAM. THREADED ROD OVER

CONNECTOR DETAIL

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. All pipes or pipe arches shall be attached as shown in CONNECTOR DETAIL.
- 2. When a Toe Plate Extension is required, it shall be the same gage as the End Section. The dimensions shall be 8" high, and 6" less than the overall width. Install centered, and lapped 2"; fasten with 3/8" × 3/4" galvanized bolts on 12" maximum centers.
- 3. Cross Drainage Bar and Safety Bars shall be 3" Schedule 40 galvanized steel pipe. Cross Drainage Bars shall be placed a maximum 30" apart.
- 4. Slotted holes for safety bar attachment shall be provided on end sections.
- 5. Number of Safety Bars required will vary depending upon the length of the end section.

	METAL END SECTIONS FOR CIRCULAR PIPES									
PIPE DIAM.	MINII THICK		DIMENSIONS (INCHES)							
(INCHES)	INCHES	0405	_		н w	OVERALL	L	L		
()	INCHES	GAGE	A	Н	П 99	WIDTH	SLOPE 4:1	SLOPE 6:1		
36	0.109	12	12	9	42	66	104	156		
42	0.109	12	16	12	48	80	128	192		
48	0.109	12	16	12	54	86	152	228		
54	0.109	12	16	12	60	92	176	264		
60	0.109	12	16	12	66	98	200	300		

	METAL END SECTIONS FOR ARCHED PIPES											
EQUIV.			MINIM THICK!			DIMENSIONS (INCHES)						
(INCHES)	SPAN	RISE	INCHES	GAGE	A	н	w	OVERALL	L	┙		
()	(IN.)	(IN.)	INCHES	GAGE	ξ			WIDTH	SLOPE 4:1	SLOPE 6:1		
30	* 35	24	0.079	14	12	9	*41	65	56	84		
36	42	29	0.109	12	12	9	48	72	76	114		
42	49	33	0.109	12	16	12	55	87	92	138		
48	57	38	0.109	12	16	12	63	95	112	168		
54	64	43	0.109	12	16	12	70	102	132	198		
60	71	47	0.109	12	16	12	77	109	148	222		
72	83	57	0.109	12	16	12	89	121	188	282		

* SAFETY BARS ARE INSTALLED ON END SECTION WHEN SPAN IS GREATER THAN 36"

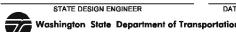


TAPERED END SECTION WITH TYPE 3 SAFETY BARS STANDARD PLAN B-80.20-00

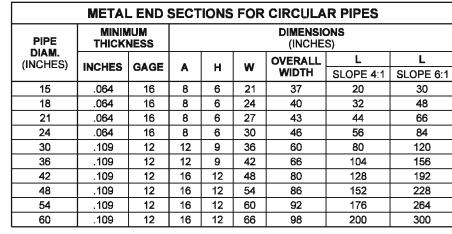
SHEET 1 OF 1 SHEET

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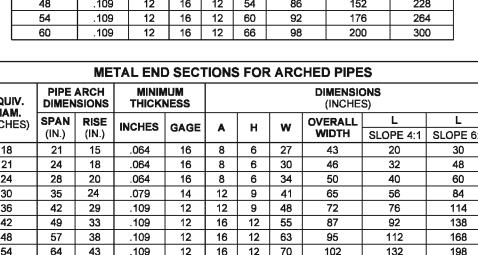
Harold J. Peterfeso 06-08-06

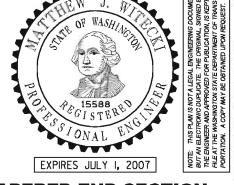


2. Number of safety bars required will vary depending upon the length of the end section.



	METAL END SECTIONS FOR ARCHED PIPES										
EQUIV. DIAM.		PE ARCH MINIMUM IENSIONS THICKNESS			DIMENSIONS (INCHES)						
(INCHES)	SPAN	RISE	INCHES	GAGE	A	н	w	OVERALL	┙	∟	
()	(IN.)	(IN.)	INCHES	GAGE	4	П	VV	WIDTH	SLOPE 4:1	SLOPE 6:1	
18	21	15	.064	16	8	6	27	43	20	30	
21	24	18	.064	16	8	6	30	46	32	48	
24	28	20	.064	16	8	6	34	50	40	60	
30	35	24	.079	14	12	9	41	65	56	84	
36	42	29	.109	12	12	9	48	72	76	114	
42	49	33	.109	12	16	12	55	87	92	138	
48	57	38	.109	12	16	12	63	95	112	168	
54	64	43	.109	12	16	12	70	102	132	198	
60	71	47	.109	12	16	12	77	109	148	222	
72	83	57	.109	12	16	12	89	121	188	282	





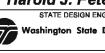
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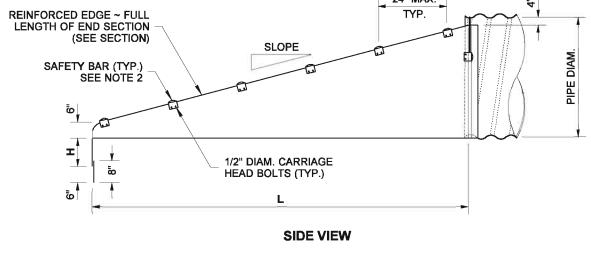
TAPERED END SECTION WITH TYPE 4 SAFETY BARS (ON CROSS ROAD) **STANDARD PLAN B-80.40-00**

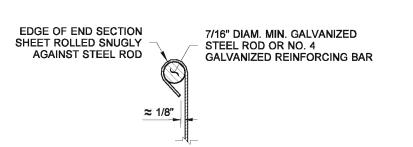
SHEET 1 OF 1 SHEET

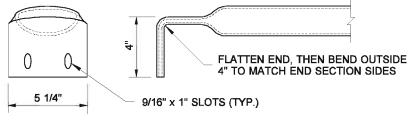
APPROVED FOR PUBLICATION Harold J. Peterfeso







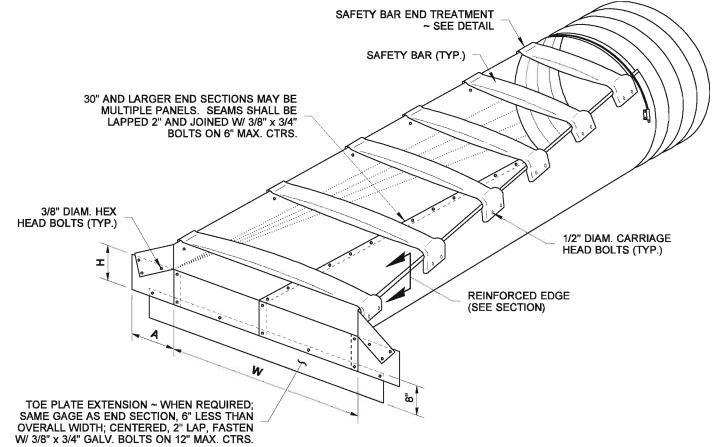




SAFETY BAR END TREATMENT DETAIL

REINFORCED EDGE SECTION

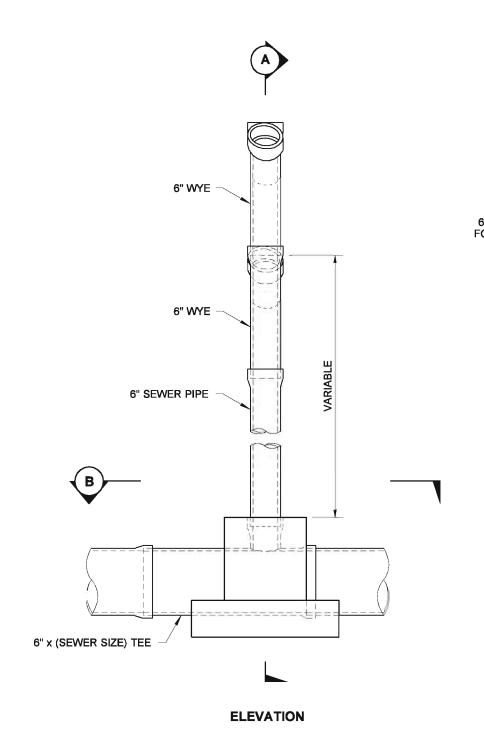
2008

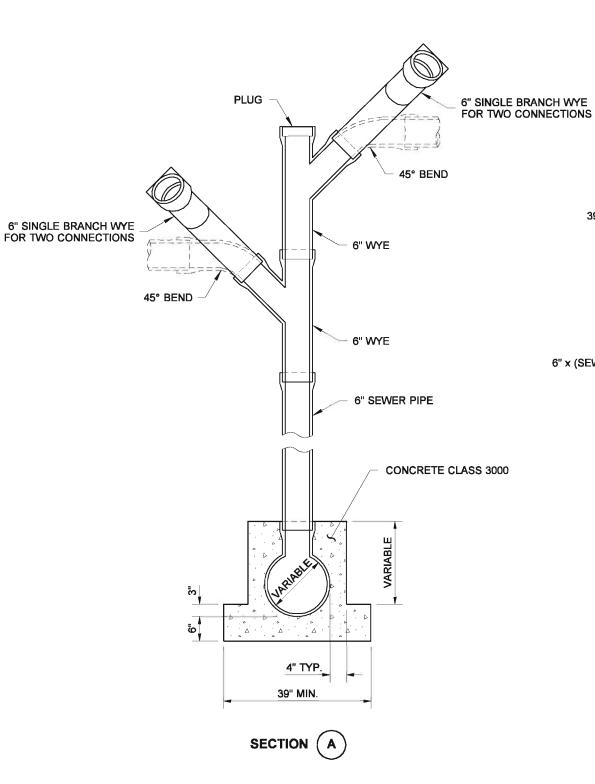


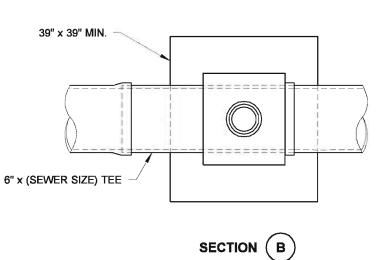
1/2" DIAM. THREADED ROD OVER TOP OF END SECTION. SIDE LUGS TO BE BOLTED TO END SECTION SIDE LUG **END SECTION TOP VIEW CONNECTOR DETAIL**

ISOMETRIC VIEW

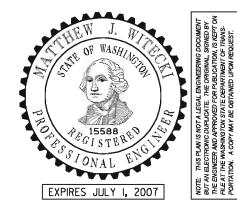
CROSS ROAD DRAINAGE STRUCTURE







FOR SANITARY SEWER USE





VERTICAL CONNECTION

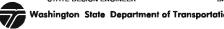
STANDARD PLAN B-85.10-00

SHEET 1 OF 1 SHEET

06-01-06

APPROVED FOR PUBLICATION





4" OR 6" DIAM. SEWER PIPE

LESS THAN 90°

45° ELBOW

PLAN VIEW

ELEVATION VIEW

WYE CONNECTION

WYE BRANCH

SEWER MAIN

2008

SEE NOTE 1

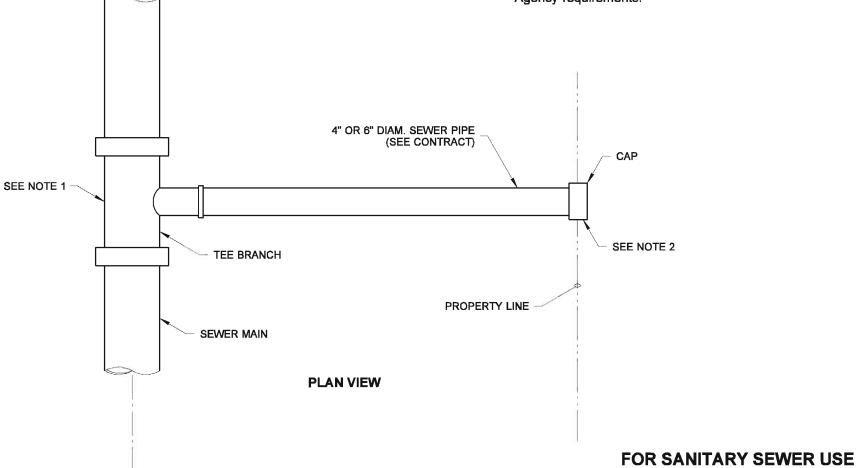
(SEE CONTRACT)

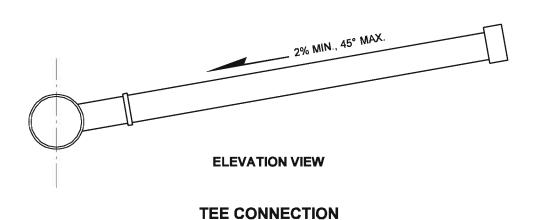
PROPERTY LINE

_ 2% MIN., 45° MAX.

- 1. Install sewer saddle with gasket and stainless steel clamps for connection to existing sewers. Install wye or tee sewer fitting with gaskets for new sewer installations.
- 2. Mark location of sewer stub in accordance with Contracting Agency requirements.









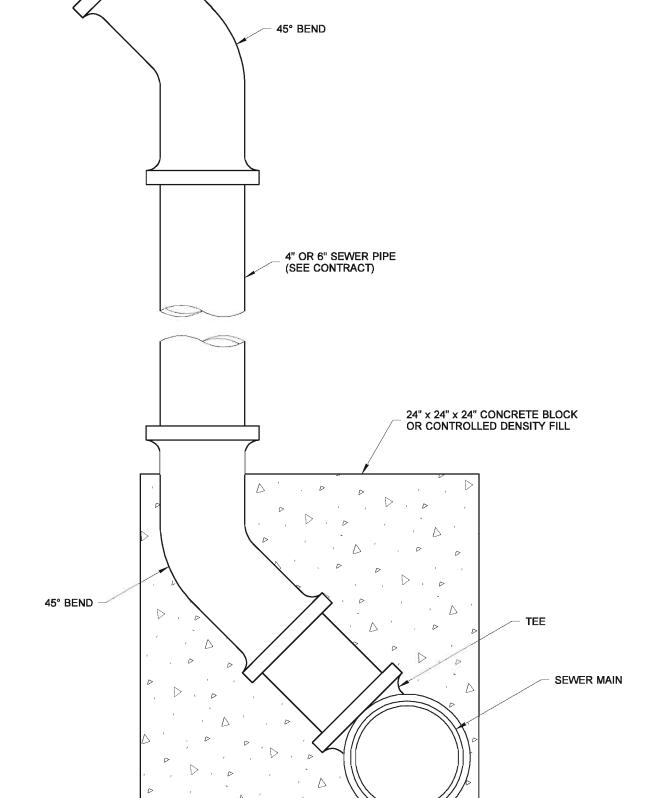
SIDE SEWER CONNECTION

STANDARD PLAN B-85.20-00

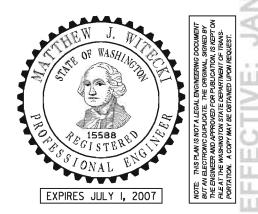
SHEET 1 OF 1 SHEET

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FOR SANITARY SEWER USE



STANDING SIDE SEWER CONNECTION

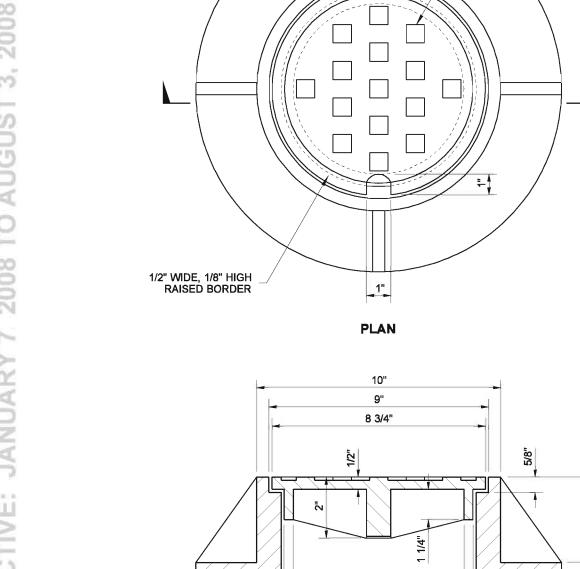
STANDARD PLAN B-85.30-00

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06-01-06

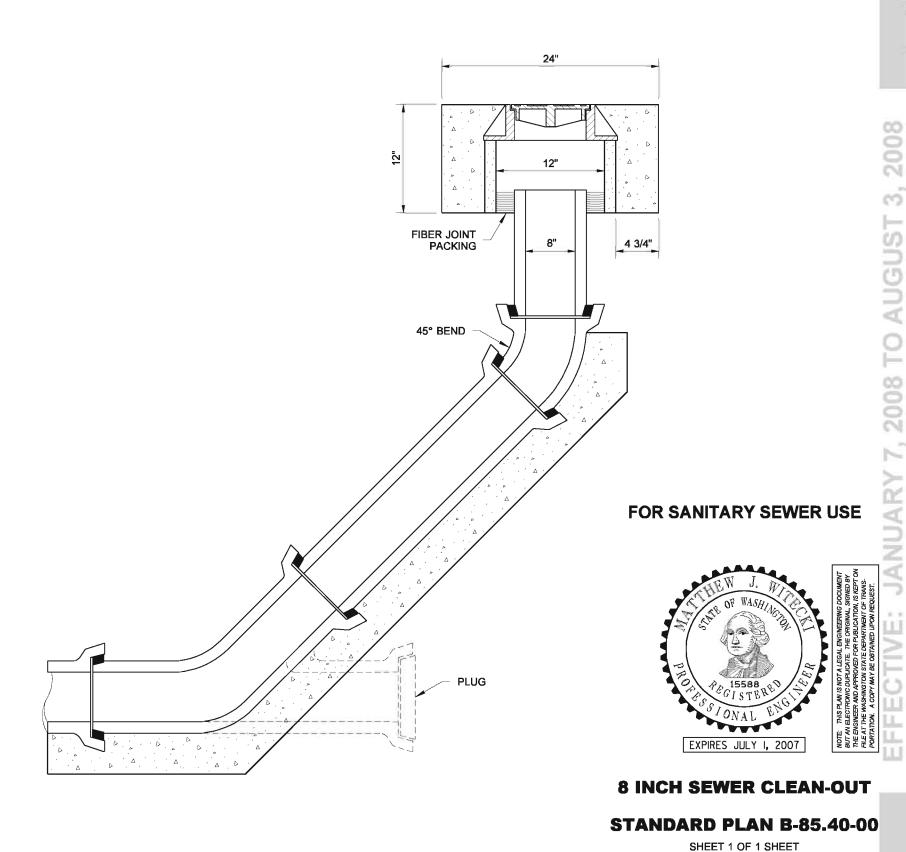
3/4" RAISED SQUARES, 3/4" APART, 1/8" HIGH



CAST IRON RING AND COVER

SECTION (A)

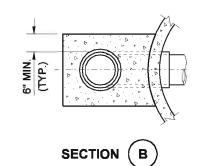
7 3/4"

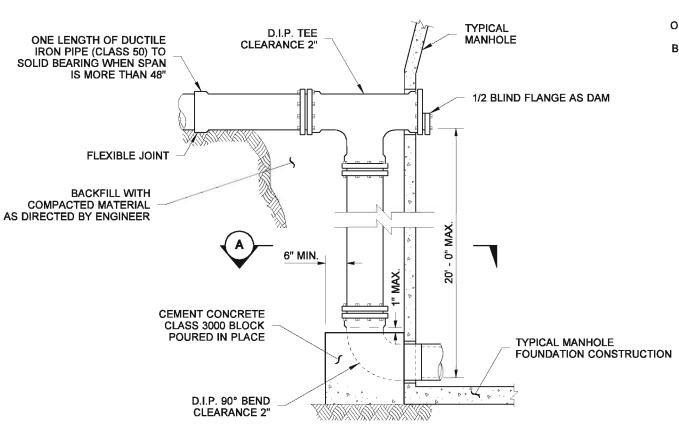


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06-08-06

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REQUIRED BY ENGINEER TEE ONE LENGTH OF DUCTILE IRON TYPICAL MANHOLE PIPE (CLASS 50) TO SOLID BEARING WHEN SPAN IS MORE MIN. **THAN 48"** اَٰٰٰ FLEXIBLE JOINT All pipe, except ductile iron pipe, shall be concrete encased. BACKFILL WITH COMPACTED MATERIAL AS DIRECTED BY ENGINEER 0" MAX CEMENT CONCRETE CLASS 3000 POURED IN PLACE TYPICAL MANHOLE FOUNDATION CONSTRUCTION 90° BEND

MORTAR DAM OR PLUG AS

CONCRETE ENCASED DROP CONNECTION

ELEVATION

FOR SANITARY SEWER USE



DROP CONNECTIONS

STANDARD PLAN B-85.50-00

SHEET 1 OF 1 SHEET

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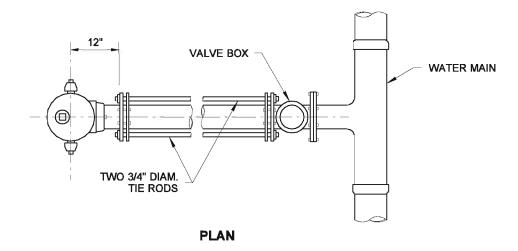


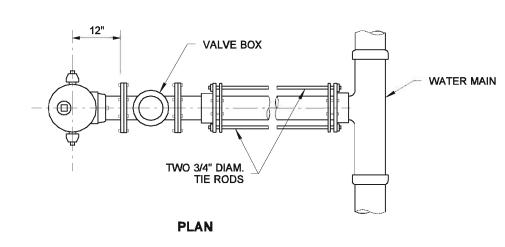
ELEVATION

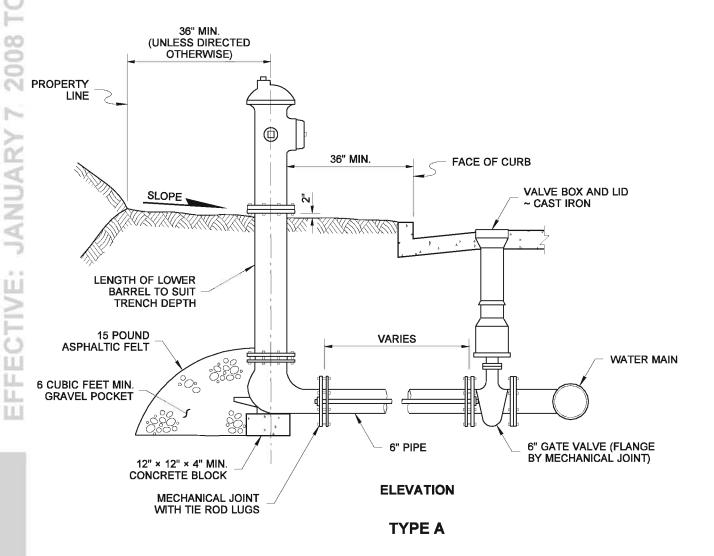
DUCTILE IRON

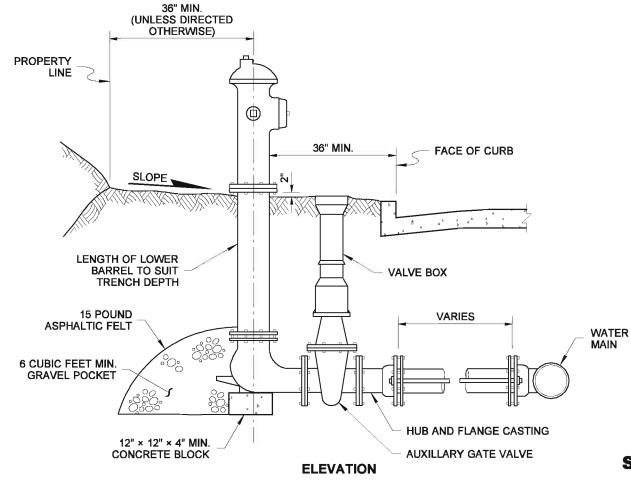
DROP CONNECTION

- 1. Steel tie rods to be heavily coated with asphalt after installation.
- 2. Restrained joints may be substituted for tie rods.
- 3. Surface of ground within 36" of hydrant shall be smooth.









TYPE B



HYDRANT SETTING TYPES A AND B

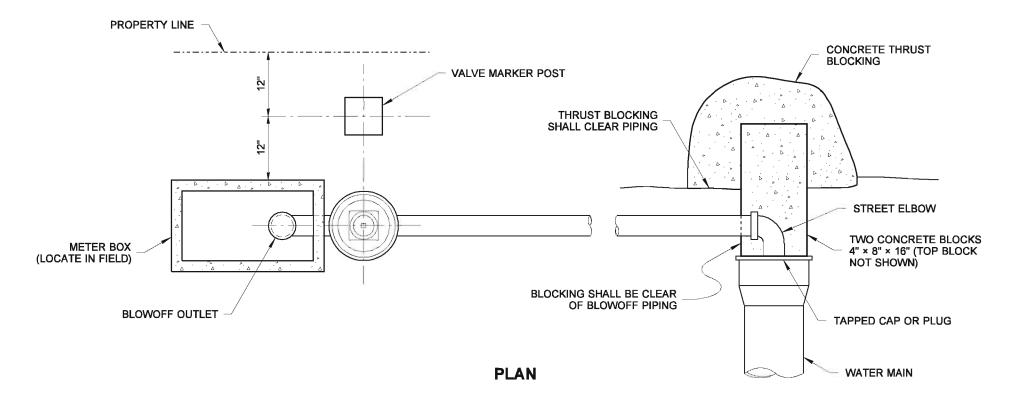
STANDARD PLAN B-90.10-00

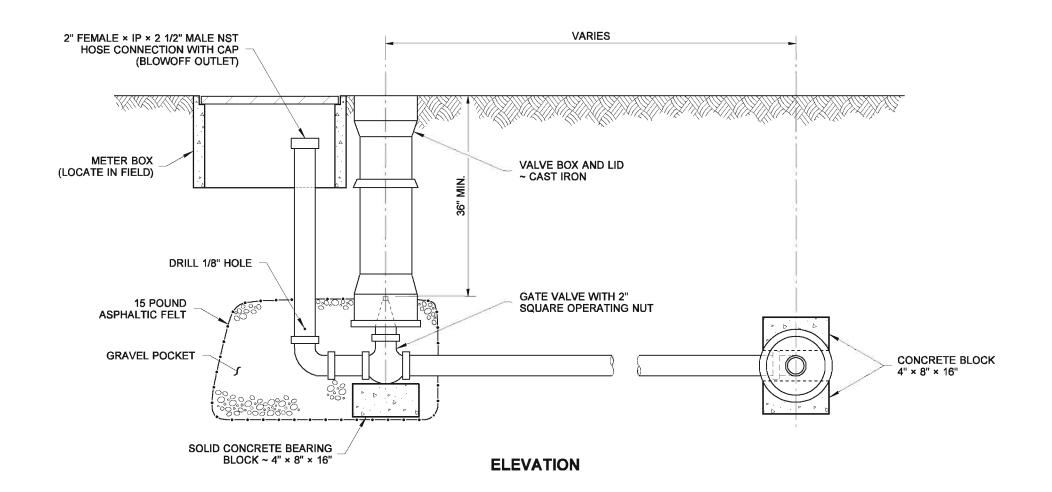
SHEET 1 OF 1 SHEET

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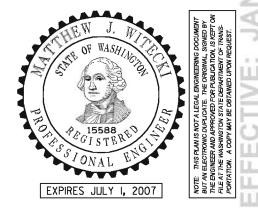
Washington State Department of Transportation





NOTES

- 1. Coat the pipe threads with asphalt after assembly.
- 2. All piping shall be galvanized steel.
- Valve and piping to valve shall be 2" unless otherwise noted in the Contract.
- 4. Locate blowoff outlet near property corner if possible.



2 INCH BLOWOFF ASSEMBLY STANDARD PLAN B-90.20-00

SHEET 1 OF 1 SHEET

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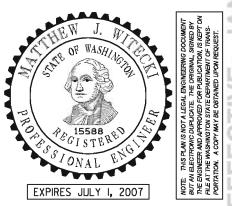
Harold J. Peterfeso 06-08-06



shington State Department of Transportation

NOTES

- 1. The size of the combination air release / air vacuum valve shall be specified in the Contract. The piping and valves shall be the same size as the combination air release / air vacuum valve.
- 2. Locate at the high point of the main, tap top of main.



COMBINATION **AIR RELEASE / AIR VACUUM VALVE ASSEMBLY STANDARD PLAN B-90.30-00**

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

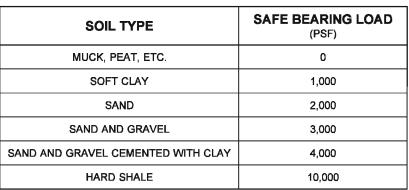
Harold J. Peterfeso

06-08-06



- 1. Contractor to provide blocking adequate to withstand full test pressure.
- 2. Divide thrust by safe bearing load to determine required area (in square feet) of concrete to distribute load.
- 3. Areas to be adjusted for other pressure conditions.
- 4. Provide two 1" minimum diameter rods on valves up through 10" diameter. Valves larger than 10" require special tie rod design.

		THRUST AT FITTINGS IN POUNDS									
SIZE	PRESSURE	Α	В	С	D	E					
SIZE	(PSI)	TEE AND DEAD ENDS	90° BEND	45° BEND	22.5° BEND	11.25° BEND					
4"	250	3,140	4,440	2,405	1,225	615					
6"	250	7,070	9,995	5,410	2,760	1,385					
8"	250	12,565	17,770	9,620	4,905	2,465					
10"	250	19,635	27,770	15,030	7,660	3,850					
12"	250	28,275	39,985	21,640	11,030	5,545					
14"	250	38,485	54,425	29,455	15,015	7,545					
16"	250	50,265	71,085	38,470	19,615	9,855					





00

2000

CONCRETE THRUST BLOCK

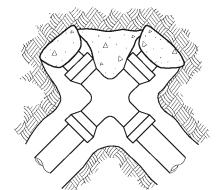
STANDARD PLAN B-90.40-00

SHEET 1 OF 1 SHEET

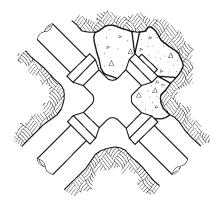
APPROVED FOR PUBLICATION



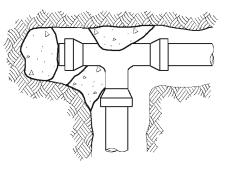




PLAN VIEW PLUGGED CROSS (USE COLUMN B)



PLUGGED CROSS (USE COLUMN A)

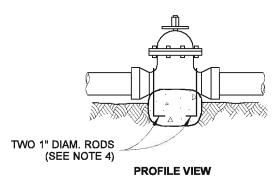


PLAN VIEW

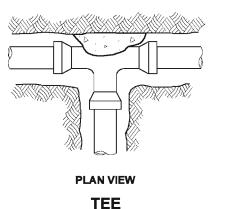
UNBALANCED CROSS

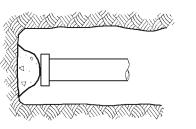
(USE COLUMN A)

PLAN VIEW PLUGGED TEE (USE COLUMN B)

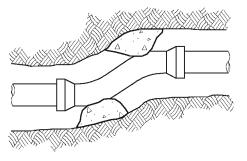


VALVE (USE COLUMN A)

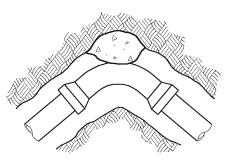




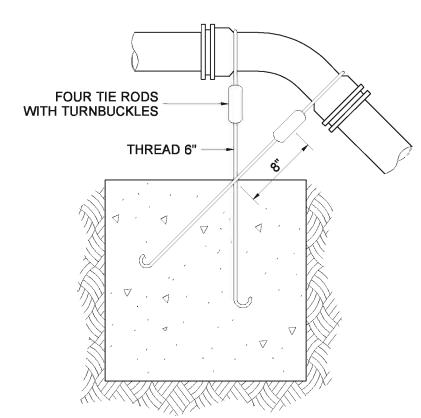
PLAN VIEW DEAD END



OFFSET (USE COLUMNS B ~ E)

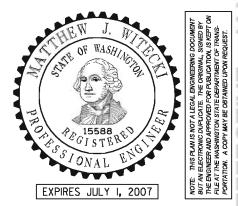


BEND



BLOCKING FOR 45° VERTICAL BENDS

		DII	MENSION T	ABLE			
PIPE DIAM.	TEST PRESSURE (PSI)	BEND ANGLE	CONCRETE VOLUME (Ft ³)	CUBE SIZE (Ft)	TIE ROD DIAM.	TIE ROD EMBEDMENT	
		11.25°	6	1.8			
4"	250	22.5°	12	2.3	5/8"	17"	
		45°	22	2.8			
		11.25°	14	2.4			
6"	250	22.5°	27	3.0	5/8"	17"	
		45°	50	3.7			
		11.25°	25	2.9			
8"	250	22.5°	48	3.6	5/8"	17"	
		45°	89	4.5			
		11.25°	38	3.4			
10"	250	22.5°	75	4.2	5/8"	17"	
		45°	139	5.2			
		11.25°	55	3.8			
12"	250	22.5°	108	4.8	5/8"	17"	
		45°	200	5.8	7/8"	24"	
		11.25°	75	4.2	5/8"	17"	
14"	250	22.5°	147	5.3	3/4"	20"	
		45°	272	6.5	1"	27"	
		11.25°	98	4.6	5/8"	17"	
16"	250	22.5°	192	5.8	7/8"	24"	
		45°	355	7.1	1 1/8"	30"	



CONCRETE THRUST BLOCK FOR CONVEX VERTICAL BENDS STANDARD PLAN B-90.50-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 06-08-06



- 1. When required by the Contract, a Snow Load Post Washer shall be used on the backside of the post (in lieu of the 1 3/4" Post Bolt Washer) and a Snow Load Rail Washer shall be placed on the face side of Beam Guardrail Types 1 and 2. Snow Load Rail Washers shall not be installed on terminals.
- 2. Rail Washers, also called "Snow Load Rail Washers" are not required on new installation except as called for in Note 1. Unnecessary Rail washers need not be removed from existing installations, except those on posts 2 through 8 of a BCT installation shall be removed.
- 3. Beam Guardrail post spacing for Types 1 through 4 shall be 6' - 3" on centers.
- 4. Timber blocks shall be toe-nailed to the post with a 16d galvanized nail to prevent block rotation.
- 5. For post and block details, see Standard Plan C-1b.
- 6. When "Beam Guardrail Type 1 ___ Ft. Long Post" is specified in the Contract, the post length shall be stamped with numbers, 1 1/2" min. high and 1/4" deep, at the location where the letter "H" is shown in the ASSEMBLY DETAIL. After installing a Long Post, it shall be the Contractor's responsibility to ensure that the stamped numbers are still legible and 1/4" deep.
- 7. Existing posts shall not be raised. Replace posts as necessary to achieve required guardrail height.

ADDED "BEAM GUARDRAIL RAISING FOR HMA OVER-02/2007 LAYS", REVISED WIDTH OF SNDW LOAD RAIL WASHER, SLOT DIMENSION ON EXPANSION SECTION REVISION



BEAM GUARDRAIL TYPES 1 ~ 4 (W-BEAM) STANDARD PLAN C-1

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Ken L. Smith

02-06-07

STATE DESIGN ENGINEER

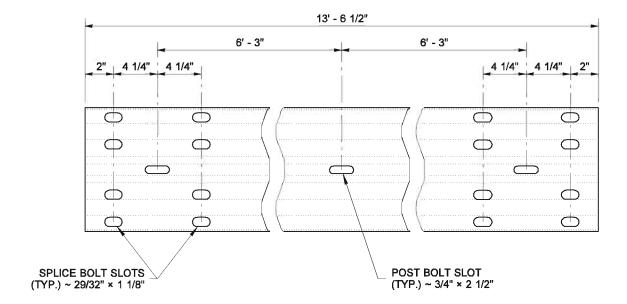
BEAM GUARDRAIL RAISING FOR HMA OVERLAYS

ASSEMBLY DETAIL

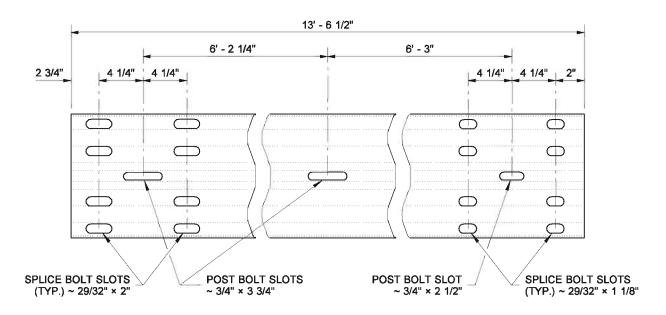
ALL MOUNTING AND SPLICE

HARDWARE SAME AS FOR TIMBER

POST EXCEPT AS NOTED

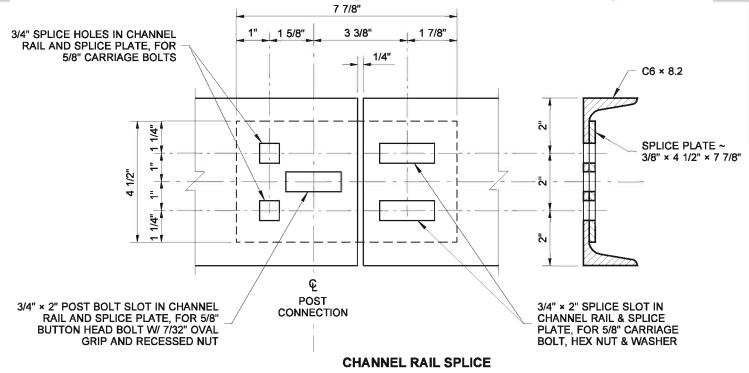


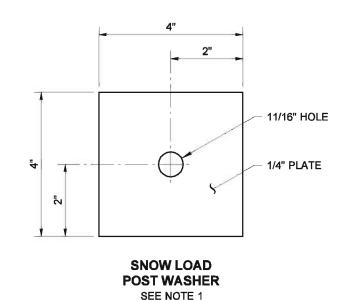
TYPICAL RAIL ELEMENT

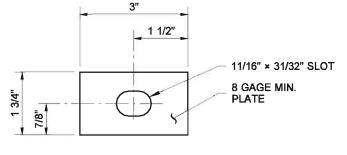


EXPANSION SECTION

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008







SNOW LOAD RAIL WASHER SEE NOTES 1 & 2



BEAM GUARDRAIL TYPES 1 ~ 4 (W-BEAM) STANDARD PLAN C-1

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Ken L. Smith
state design engineer

Washington State Department of Transportation

02-06-07

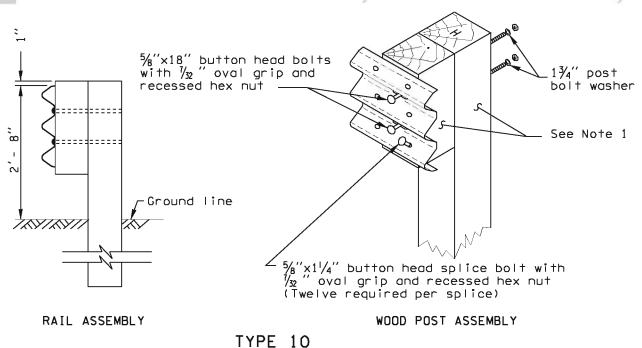
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

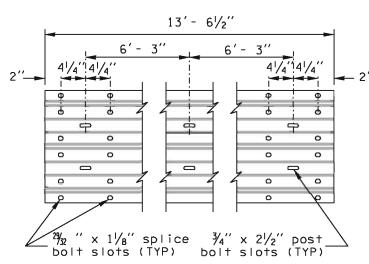
1. Type 10 posts shall be 6x8 timber or W6x9.

Type 11 posts shall be 10x10 timber or W6x15.

For details, see Standard Plan "Beam Guardrail Posts and Blocks."

2. Type 10 guardrail post spacing shall be 6'- 3" on center. Type 11 shall be a maximum of $3'-1\frac{1}{2}$ " on center.

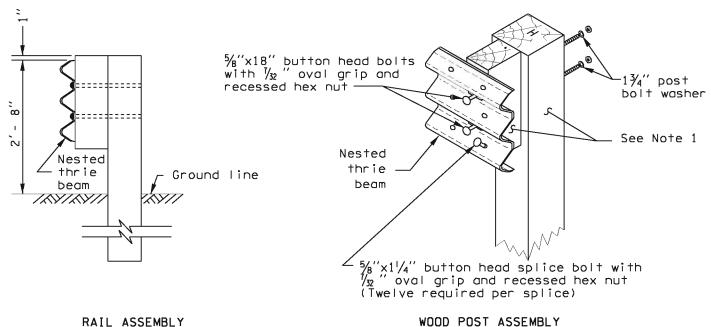




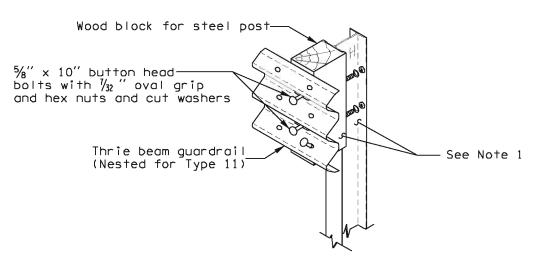
13' - 61/2" 6' - 21/4" 6' - 3" 23/4"- $-\frac{3}{4}$ " x $2\frac{1}{2}$ " post bolt slots (TYP) Ф 0 Ф 0 0 $\frac{3}{4}$ " x $\frac{3}{4}$ " post $\frac{2}{32}$ " × $1\frac{1}{8}$ " splice $_2$ " x 2 $\frac{1}{2}$ " splice bolt slots (TYP) bolt slots (TYP) bolt slots (TYP)

THRIE BEAM RAIL ELEMENT

THRIE BEAM EXPANSION SECTION

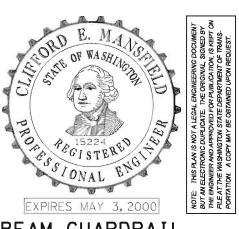






STEEL POST ASSEMBLY

TYPE 10 and 11



GUS

BEAM GUARDRAIL (THRIE BEAM) STANDARD PLAN C-1a

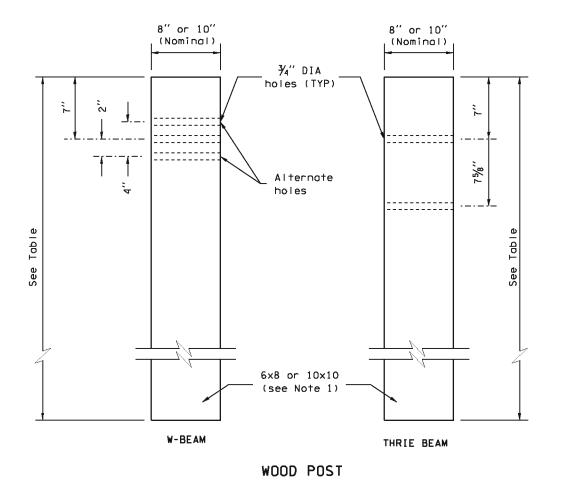
APPROVED FOR PUBLICATION

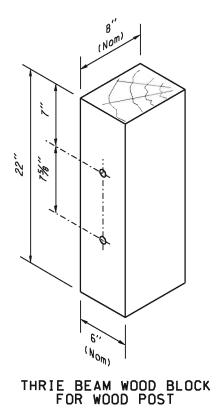
7/31/98

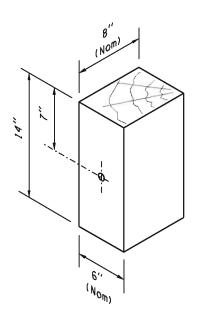
Clifford E. Mansfield

DEPUTY STATE DESIGN ENGINEER

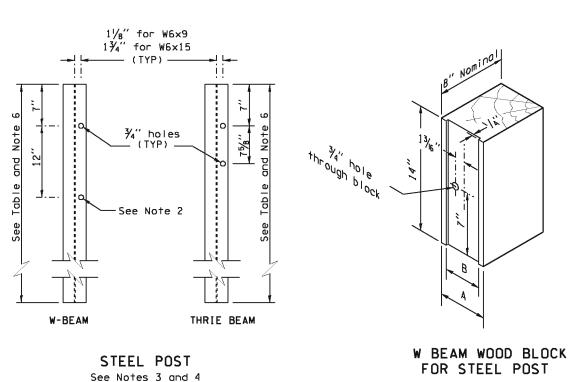
Added missing dimension on Type 11 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON DATE

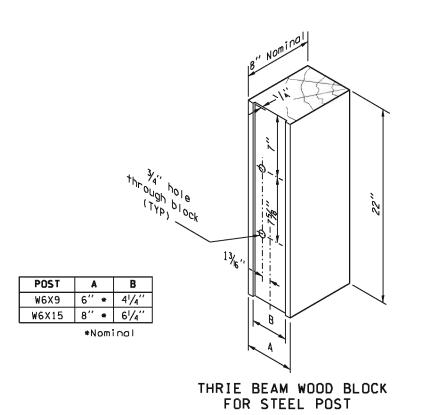


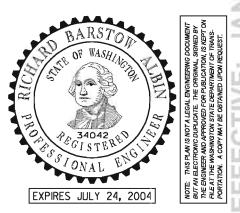




W BEAM WOOD BLOCK FOR WOOD POSTS







BEAM GUARDRAIL POSTS AND BLOCKS

STANDARD PLAN C-1b

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 10-31-03

D9/2003 REV. POST LENGTH TABLE

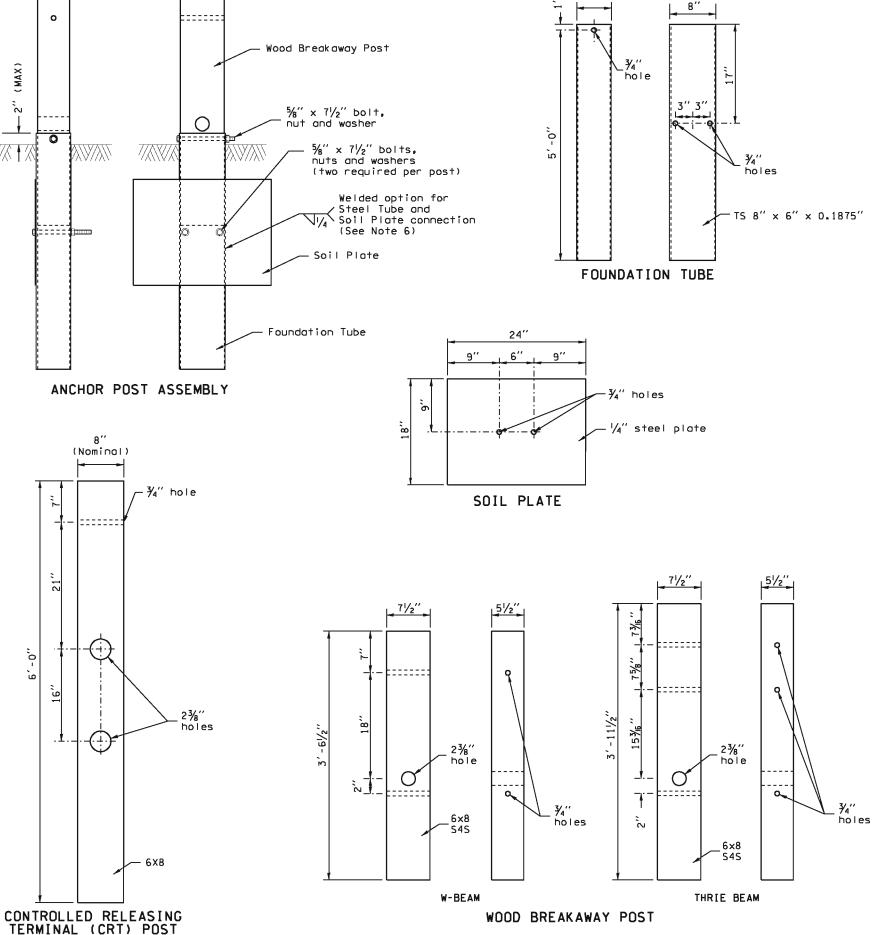
DATE

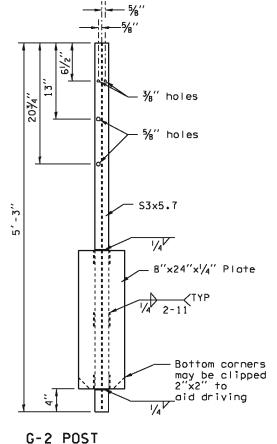
RC

STATE DESIGN

Washington Sto

- 3. W6x9 steel posts and timber blocks are alternates for 6x8 timber posts and blocks. W6x15 steel posts and timber blocks are alternates for 10x10 timber posts and blocks.
- 4. Holes shall be located on approaching traffic side of web.
- 5. When contract requires "Beam Guardrail Type 1, __ Foot Long Post," the steel post length shall be marked with numbers to ensure permanent identification at the location where the letter "H" is shown on the detail. The marking shall be $1\frac{1}{2}$ " MIN height.
- 6. Soil plate may be welded to foundation tube. If so, holes in soil plate and foundation tube may be omitted.







BEAM GUARDRAIL POSTS AND BLOCKS

STANDARD PLAN C-1b

SHEET 2 OF 2 SHEETS

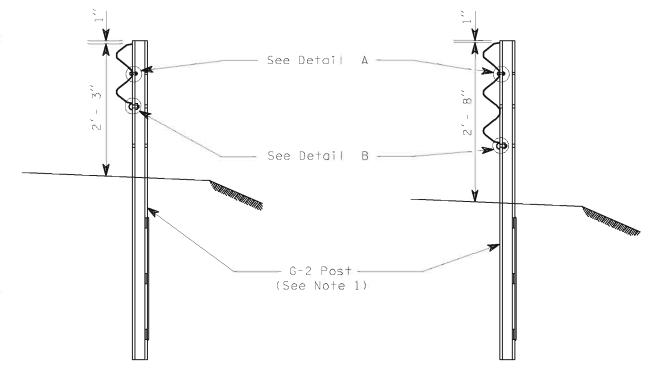
APPROVED FOR PUBLICATION Harold J. Peterfeso

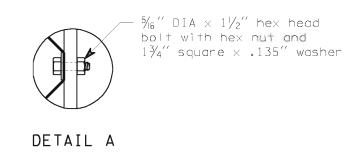
10-31-03 STATE DESIGN ENGINEER

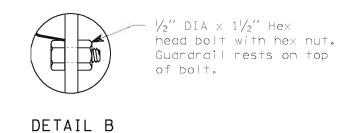
Washington State Department of Transportation

09/2003 REV. NOTES DATE REVISION BY

TYPE 20





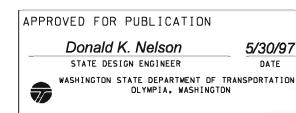


BEAM GUARDRAIL

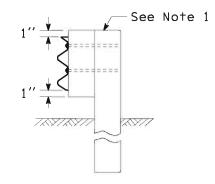




STANDARD PLAN C-1c



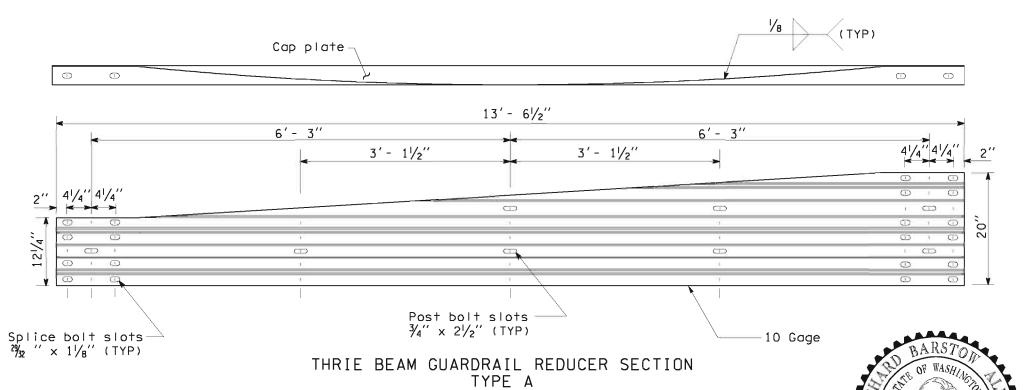
TYPE 21



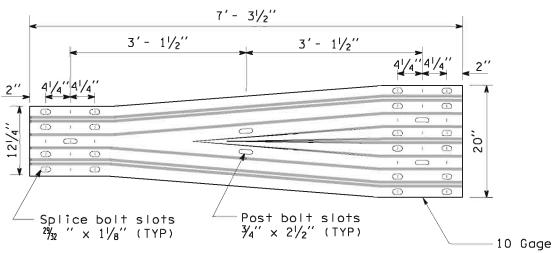
INTERMEDIATE GUARDRAIL POST CONNECTION DETAILS (Type A shown)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

1. For wood posts, saw top of post and block to 1" above thrie beam guardrail reducer section. For steel posts, drive post down to 1" maximum above the thrie beam quardrail reducer section.



(Left section shown, right section reversed)



THRIE BEAM GUARDRAIL REDUCER SECTION TYPE B

THRIE BEAM GUARDRAIL REDUCER SECTION

EXPIRES JULY 24, 2004

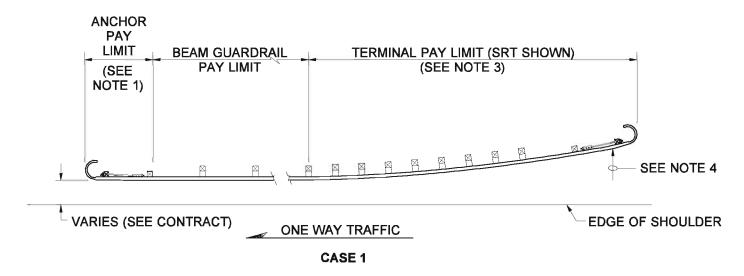
STANDARD PLAN C-1d

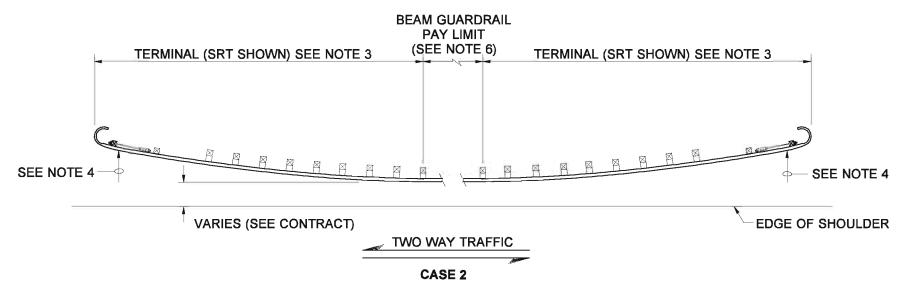
SHEET 1 OF 1 SHEET

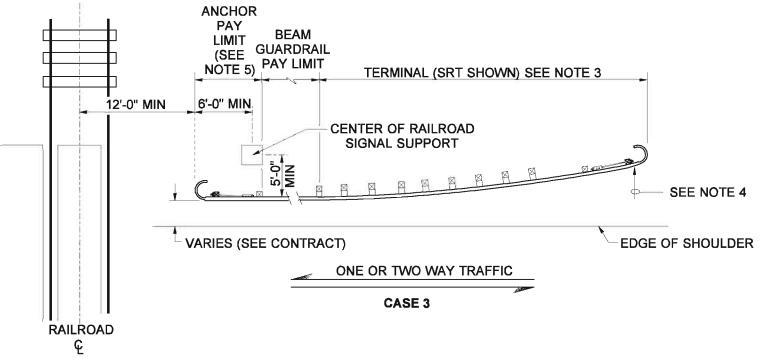
APPROVED FOR PUBLICATION Harold J. Peterfeso

10-31-03

ADDED 10 GAGE STEEL DESIGNATION, REV. NOTE 1 DATE REVISION

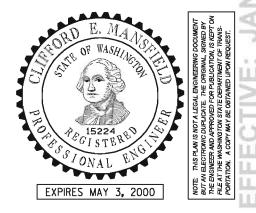






NOTES

- 1. Type 4 anchor required. For details, see Standard Plan C-6c.
- 2. Post spacing is 6'-3" unless otherwise shown.
- 3. For Terminal type and details, see Contract Plans and applicable Standard Plan(s).
- 4. The slope from the edge of the shoulder into the face of the guardrail should not exceed 10:1 when the face of the guardrail is less than 12'-0" from the edge of the shoulder.
- 5. For one-way traffic, use Type 4 anchor. For two-way traffic, use Type 1 anchor. See applicable Standard Plan(s) for details.
- When Beam Guardrail Flared Terminals are used on both ends a minimum of 25'-0" of Beam Guardrail shall be installed.



GUARDRAIL PLACEMENT STANDARD PLAN C-2

APPROVED FOR PUBLICATION

Clifford E. Mansfield 01-06-00

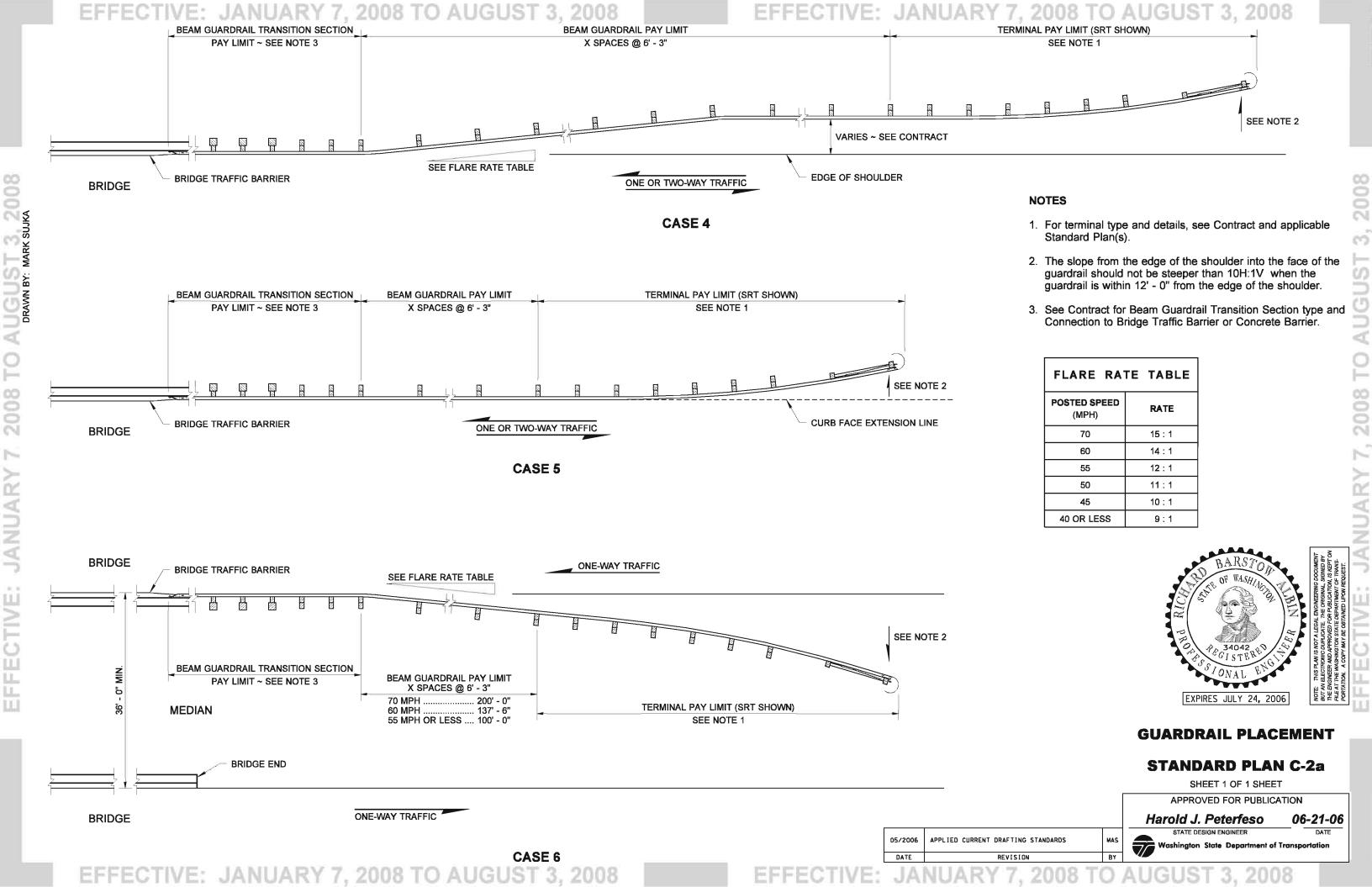
STATE DESIGN ENGINEER DATE

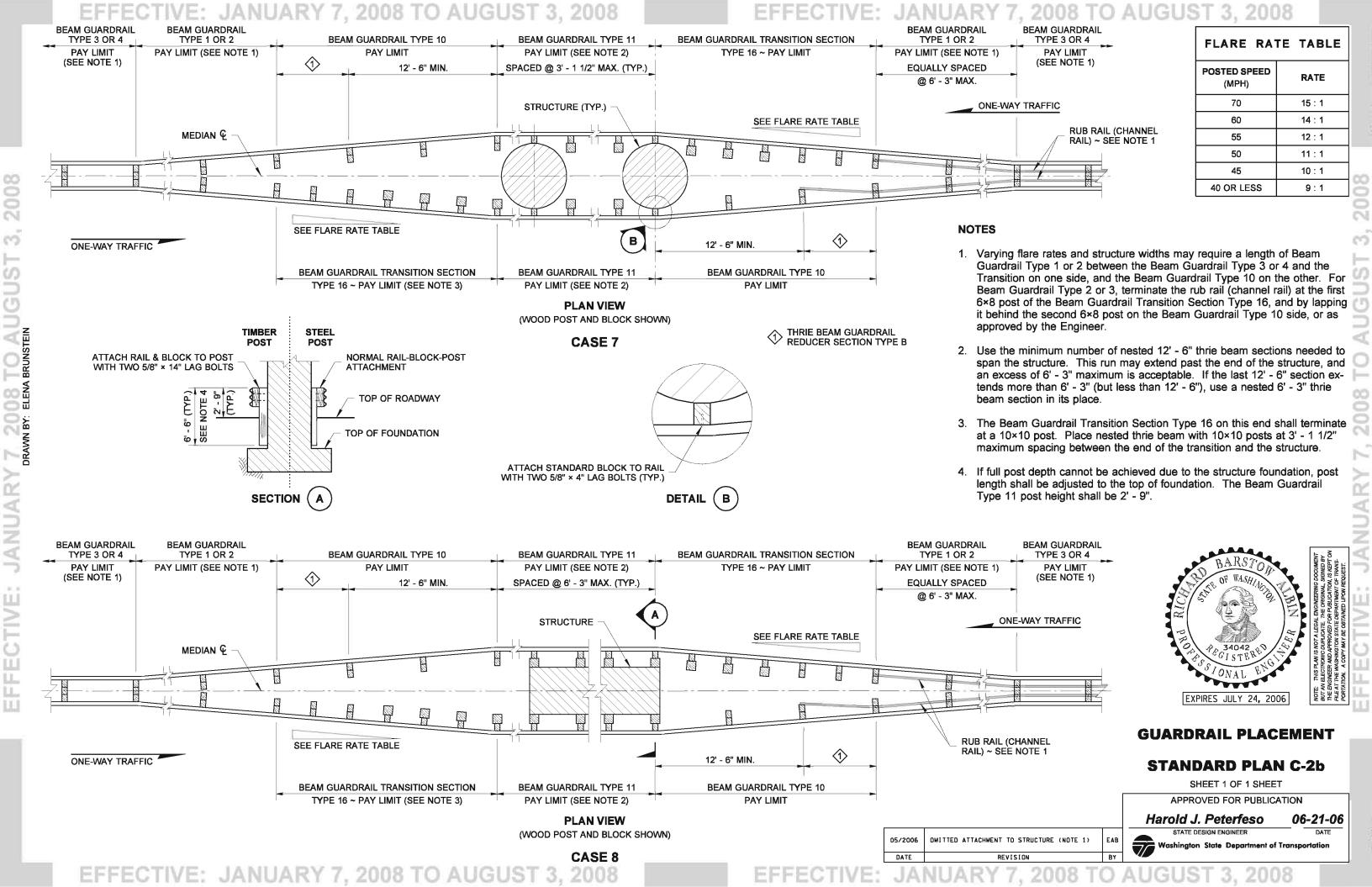
12/99 ADDED NOTE 6. MODIFIED THE END SECTIONS TO DESIGN "C".

TWS

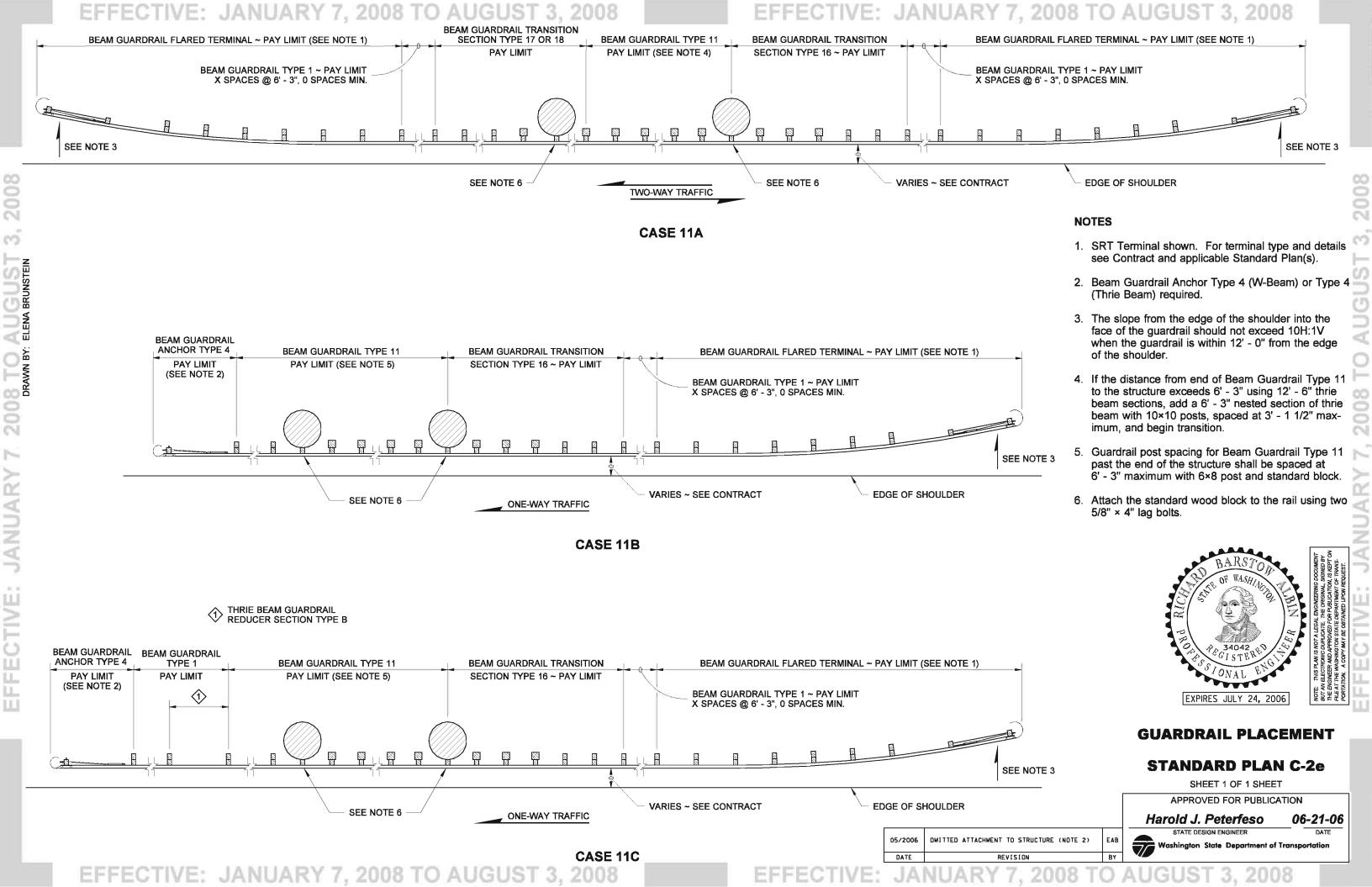
DATE REVISION BY

Washington State Department of Transportation



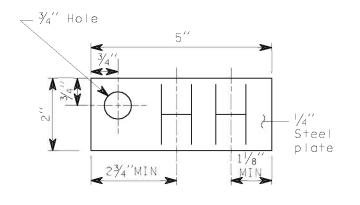


2008



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. See Contract for quardrail connection to bridge rail and concrete barrier.
- 2. The slope from the edge of the shoulder into the face of the quardrail should not be steeper than 10:1.
- 3. Attach to rail with $\frac{5}{16}$ × 9" long bolt, nut and $1\frac{1}{2}$ " washer on back of post.
- 4. For terminal type and details, see Contract and applicable Standard Plan(s).
- 5. Radius dimensions shall be etched into plate replacing the letters "HH", shown on the Identification Plate Detail. Digits shall be $1\frac{1}{2}$ MIN height and $\frac{3}{4}$ MAX width. The plate shall be galvanized after etching.
- 6. The quardrail radius Identification Plate shall be mounted on the back side of the Rail Element using the lowest splice bolt at the P.C. of the guardrail radius.
- 7. First letter of case designation placement indicates end treatment on side road. Second letter indicates end treatment on main road. For instance, a Type 5 Anchor on the side road and a bridge connection on the main road would be Case 12 AC.
- 8. For the 8'- 6" radius, five CRT posts are required including the CRT post at point B.
- 9. For CRT post details, see Standard Plan "Beam Guardrail Posts



IDENTIFICATION PLATE

(see Note 5)

GUARDRAIL PLACEMENT WEAK POST INTERSECTION DESIGN (8' - 6" MAX RADIUS)

EXPIRES MAY 3, 1998

STANDARD PLAN C-2f

APPROVED FOR PUBLICATION

Donald K. Nelson

STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

3/14/97

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3,

PAY LIMIT

CASE 13 A_

(SEE NOTE 7)

RADIUS NUMBER OF CLEAR AREA CRT POSTS (SEE NOTE 3) L W ANCHOR TYPE 7 X SPACES TERMINAL PAY LIMIT (SRT SHOWN) (SEE NOTE 4) CASE 13 _ D (SEE NOTE 7) (SEE NOTE 7) SEE NOTE 7 SPACING (TYP) SPACI							SEE NOTE 2	
NUMBER OF CLEAR AREA BEAM GUARDRAIL ANCHOR TYPE 7 X SPACES AT 6"-3" SEE NOTE 4 17'-0" 6 30" 15 25'-6" 8 40" 20" POINT B (SEE NOTE 7) 35'-0" 11 50" 20" POINT B (CRT POST WITH BLOCK) BEAM GUARDRAIL ANCHOR TYPE 7 X SPACES AT 6"-3" SEE NOTE 7 CASE 13 _D (SEE NOTE 7) BEAM GUARDRAIL TYPE 5 TRANSITION PAY LIMIT PAY LIMIT SEE NOTE 1 CASE 13 _D (SEE NOTE 7) SEE NOTE 1 SEE NOTE 1 CASE 13 _D (SEE NOTE 7) CASE 13 _D (SEE NOTE 7) CASE 13 _D (SEE NOTE 7) SEE NOTE 1 SEE NOTE 1 SEE NOTE 1 SEE NOTE 7) SEE NOTE 1 SHOULD SHOW SHOW SHOW SHOW SHOW SHOW SHOW SHOW	R	REQUIREMENT	гs			PT		
(SEE NOTE 3) L W 17-0" 6 30 159 25-6" 8 40 20 35-0" 11 50 20 CASE 13 D (SEE NOTE 4) CASE 13 D (SEE NOTE 7) CASE 13 D (SEE NOTE 7) SEAM GUARDRAIL PAY LIMIT (SRT SHOWN) (SEE NOTE 4) CASE 13 D (SEE NOTE 7) SEE NOTE 1 PAY LIMIT X SPACES AT 6-3" (SEE NOTE 7) SEE NOTE 1 PAY LIMIT X SPACES AT 6-3" (SEE NOTE 7) SEE NOTE 1 PAY LIMIT X SPACES AT 6-3" (SEE NOTE 7) SEE NOTE 1 SEE NOTE 1 ANCHOR TYPE 7 RADIUS = 35 MAX. CLEAR AREA CLEAR AREA CLEAR AREA CLEAR AREA L (SEE TABLE) L (SEE TABLE) NIIT		NUMBER OF	CLEA	R AREA	BEAM GUARDRAIL			
17-0" 6 30 15 25-6" 8 40 20 35-0" 11 50 20 BEAM GUARDRAIL ANCHOR TYPE 7 (1 SPACE MIN.) BEAM GUARDRAIL TYPE 5 TRANSITION PAY LIMIT SEE NOTE 1 SEE NOTE 1 CASE 13 _C (SEE NOTE 7) CASE 13 _C (SEE NOTE 7) CASE 13 _C (SEE NOTE 7) SHOULS = 35 MAX CLEAR AREA CLEAR AREA CLEAR AREA CLEAR AREA L (SEE TABLE) L (SEE TABLE)	RADIUS	1	L	w	ANCHOR TYPE 7	X SPACES	TERMINAL PAY LIMIT (SRT SHOWN	
SEE NOTE 7) CASE 13 _ C (SEE NOTE 7) CASE 13 _ C (SEE NOTE 7) SAGING (TYP) SAGING (TYP) L (SEE TABLE) SOLUTION TO SEE NOTE 7) SAGING (TYP) SAG	17'- 0"	6	30'	15'		(1 SPACE MIN.)		-
BEAM GUARDRAIL ANCHOR TYPE 7 RADIUS = 35 MAX CLEAR AREA DEAM GUARDRAIL ANCHOR TYPE 7 RADIUS = 35 MAX CLEAR AREA CLEAR AREA DEAM GUARDRAIL ANCHOR TYPE 7 (1 SPACE MIN.) REAM GUARDRAIL ANCHOR TYPE 7 (1 SPACE MIN.) BEAM GUARDRAIL ANCHOR TYPE 5 TRANSITION PAY LIMIT SEE NOTE 1 BRIDGE END CASE 13 _C (SEE NOTE 7) SPACING (TYP.) SPACING (TYP.) SPACING (TYP.) SPACING (TYP.) NIIT	25'- 6"	8	40'	20'				
BEAM GUARDRAIL PAY LIMIT X SPACES AT 6"-3" (1 SPACE MIN.) VARIES PT CASE 13 _C (SEE NOTE 7) SPACING (TYP.) CLEAR AREA CLEAR AREA CLEAR AREA CLEAR AREA L (SEE TABLE) DEAM GUARDRAIL PAY LIMIT X SPACES AT 6"-3" SEE NOTE 1 BRIDGE END CASE 13 _C (SEE NOTE 7) SNUG FITTING INSERT 3/6" I.D., 7 1/2" LONG 1 1/2" WASHER NIIT	35'- 0"	11	50'	20'	POINT B (CRT POST WITH BLOCK)		(022.10.12.)	•
		TO CAT POSTS	i so se	6'- 3" PO SPACING	ANCHOR TYPE 7 VARIES PT RADIUS = 35' MAX CLEAR AREA OST G (TYP.)	PAY LIMIT X SPACES AT 6'- 3" (1 SPACE MIN.)	PAY LIMIT SEE NOTE 1 BRIDGE END CASE 13 _C (SEE NOTE 7) 3/4" HC SNUG FITTING INSE 3/8" I.D., 7 1/2" LC 1 1/2" WASHER	5/16" X 9" BOLT OLE ERT ONG
(SEE NOTES 3 6 & 8)	BEAM GUARDRAIL PAY LIMIT 18'- 9"	(S)		/		-		(SEE NOTES 3, 6 & 8) VIEW A
WINCHES BY AND THE STEEL BIATE	BEAM GUARDRAI ANCHOR TYPE	L 5			TERMI		2 3/4" MIN. 1 1/8" MIN.	

(SEE NOTE 5) **GUARDRAIL RADIUS**

IDENTIFICATION PLATE

DETAIL

NOTES

- 1. See Contract Plans for guardrail connection to bridge rail and concrete barrier.
- 2. The slope from the edge of the shoulder into the face of the guardrail should not be steeper than 10:1.
- 3. Fewer CRT posts are required for smaller radii; include CRT Post at Point B. Attach guardrail to post with a 5/16" x 9" long bolt, a 3/8" I.D. x 7 1/2" snug fitting insert, and a 1 1/2" washer with nut on back of post.
- 4. For terminal type and details, see Contract and applicable Standard Plan(s).
- 5. Radius dimensions shall be etched into plate replacing the letters "HH", shown on the GUARDRAIL RADIUS IDENTIFICATION PLATE DETAIL. Digits shall be 1 1/2" minimum height and 3/4" maximum width. Plate shall be galvanized after etching.
- 6. The guardrail radius Identification Plate shall be mounted on the back side of the rail element using the lowest splice bolt nearest the PC of the guardrail radius (See View A).
- 7. The first letter of the Case Designation indicates the end treatment on the side road. The second letter indicates the end treatment on the main road. For example, a Type 5 Anchor on the side road with a bridge connection on the main road would be Case 13 AC, the combination shown.
- 8. For CRT post details, see Standard Plan C-1b.



EXPIRES MAY 3, 2002

07-27-01

GUARDRAIL PLACEMENT WEAK POST INTERSECTION DESIGN (35' MAX. RADIUS)

STANDARD PLAN C-2g

APPROVED FOR PUBLICATION Clifford E. Mansfield

STATE DESIGN ENGINEER

MAS BY

CASE 13 B_

(SEE NOTE 7)

SEE NOTE 2

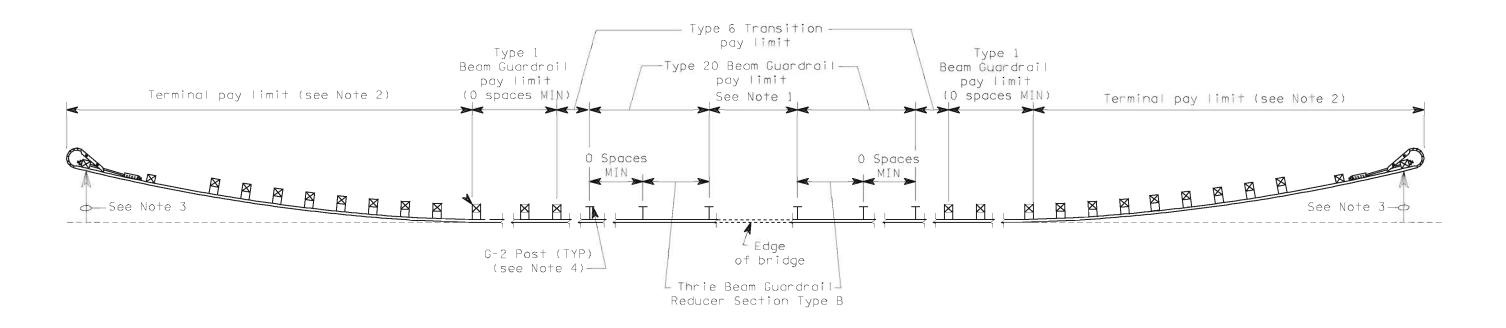
REVISION

CORRECTED NOTES: ADDED "VIEW A"

DATE

7, 2008 TO AUGUST

- 3. The slope from the edge of the shoulder into the face of the quardrail should not be steeper than 10:1.
- 4. See Standard Plan "Beam Guardrail Posts and Blocks".



Direction of Traffic CASE 14

GUARDRAIL PLACEMENT



STANDARD PLAN C-2h

APPROVED FOR PUBLICATION

Donald K. Nelson

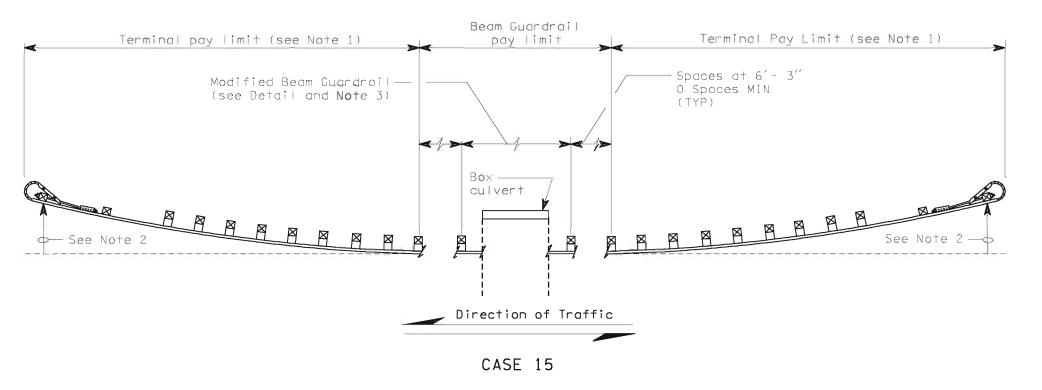
3/28/97 STATE DESIGN ENGINEER

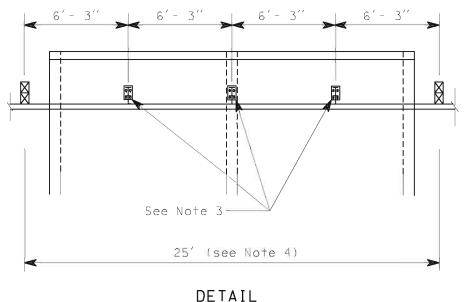
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGI

- 3. See Standard Plan for Box Culvert Guardrail Steel Post.
- 4. For spans up to 18'- 9", see Standard Plan for Guardrail Placement Cases 19, 20, and 21.





GUARDRAIL PLACEMENT



STANDARD PLAN C-2i

APPROVED FOR PUBLICATION

Donald K. Nelson STATE DESIGN ENGINEER

3/28/97

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

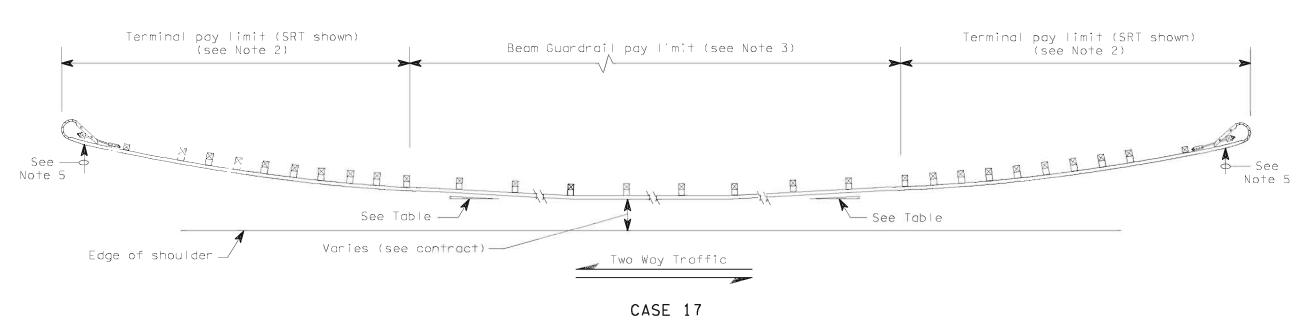
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 (see Note 1) Terminal pay limit (SRT shown) Beam Guardrail pay limit (see Note 2) See Table Edge of shoulder Varies (see contract) One Way Traffic

CASE 16

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

1. Type 4 anchor required. For details, see applicable Standard Plan(s).

- 2. For terminal type and details, see contract and applicable Standard Plan(s).
- 3. Post spacing is 6'-3'' except where noted.
- 4. For guardrail to bridge rail connection see applicable Standard Plan(s) or Contract.
- 5. The slope from the edge of the shoulder into the face of the guardrail should not be steeper than 10:1 when the guardrail is within 12'-0" from the edge of the shoulder. Beyond 12'-0'', the slope shall not be steeper than 6:1.

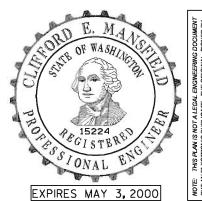


See Note 4

Bridge end

Beam Guardrail pay limit

Rate	Posted Speed					
	(MPH)					
15:1	70					
4:1	60					
2:1	55					
1:1	50					
0:1	45					
9:1	40 or less					



GUARDRAIL PLACEMENT STANDARD PLAN C-2;

APPROVED FOR PUBLICATION

Clifford E. Mansfield

6/12/98

DEPUTY STATE DESIGN ENGINEER WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

Revise Flair Rate Table. REVISION

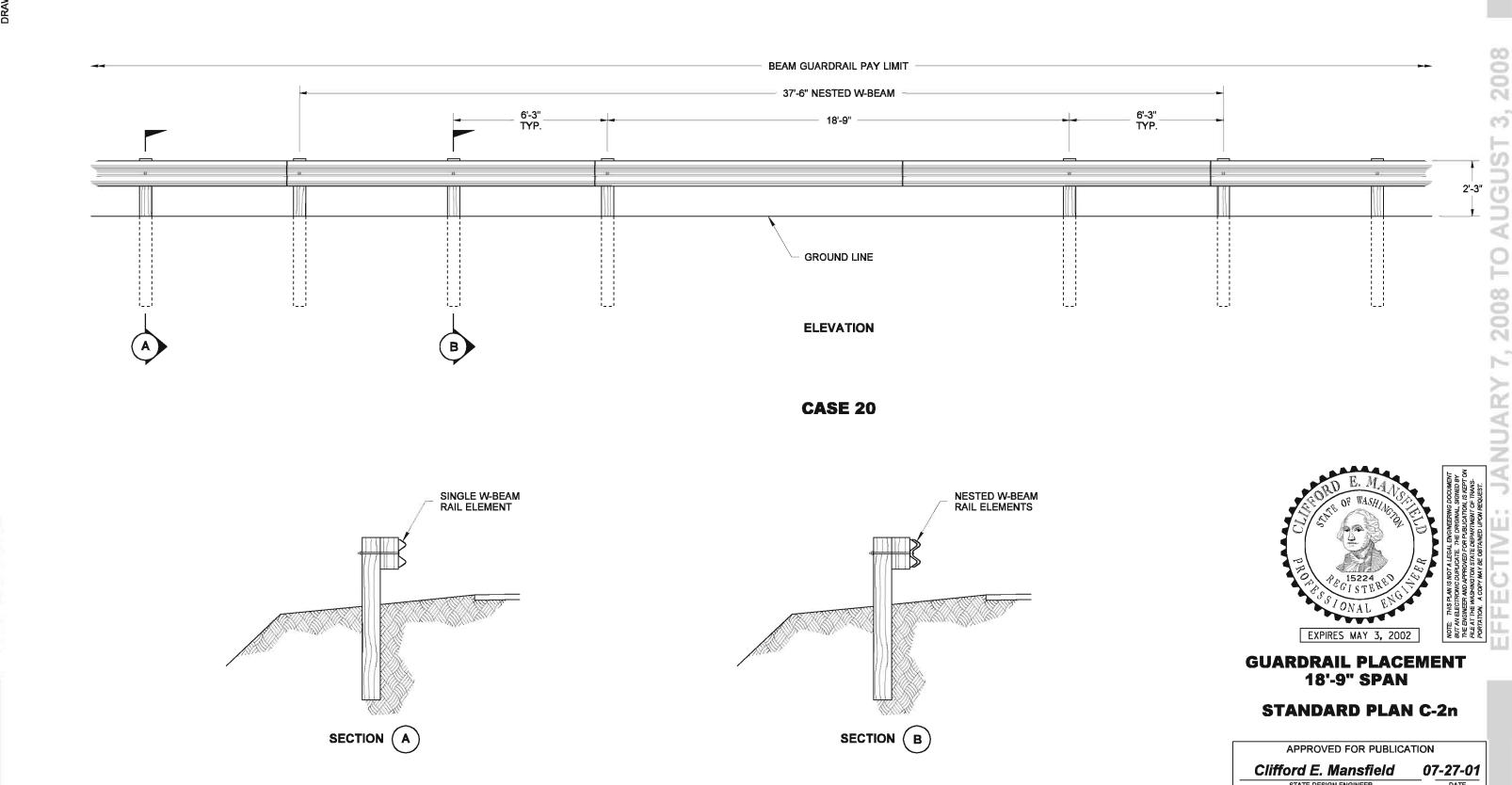
One Way Traffic

CASE 18

O K

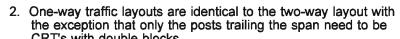
Anchor pay limit— (See Note 1)

Curb face extension line

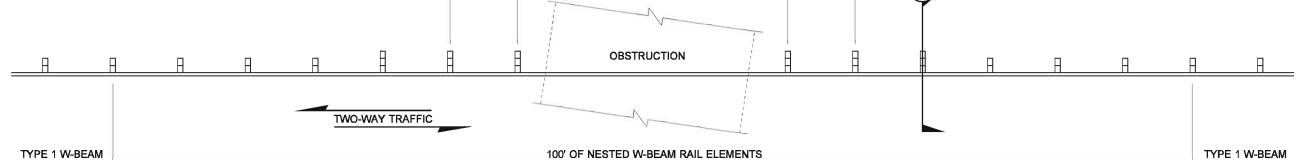


PAY LIMIT

PAY LIMIT



CRT's with double blocks.

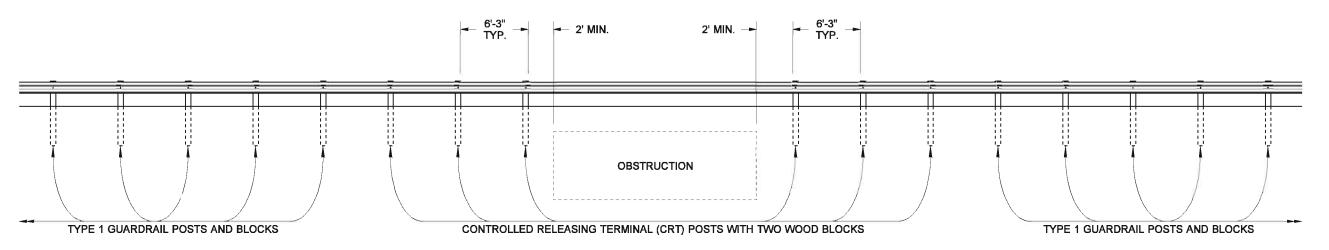


25' SPAN

6'-3" TYP.

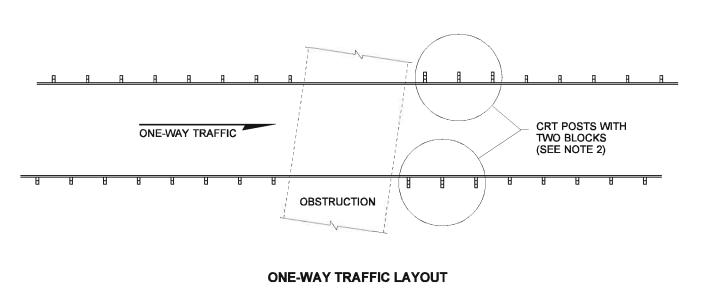
PLAN

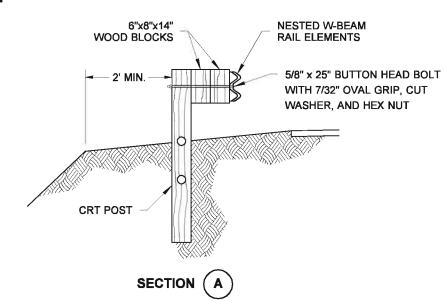
"BEAM GUARDRAIL PLACEMENT - 25' SPAN" PAY LIMIT

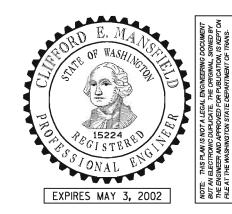


ELEVATION

CASE 21



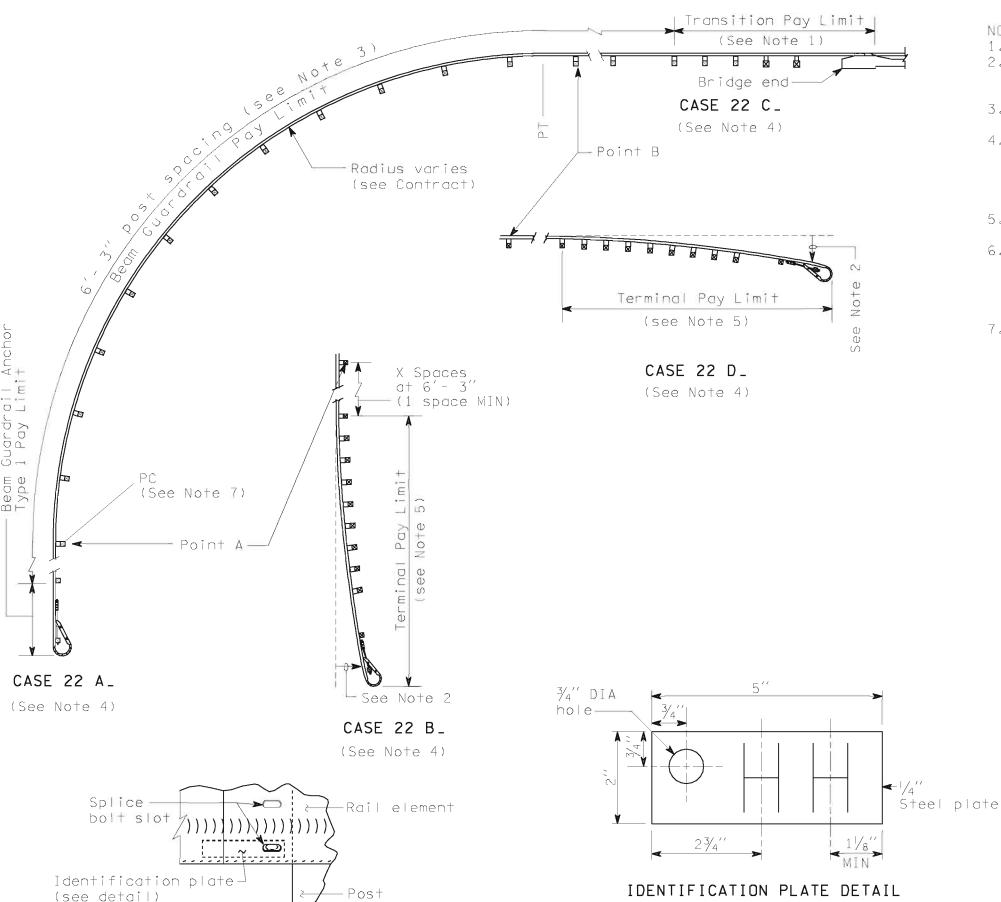




GUARDRAIL PLACEMENT 25' SPAN

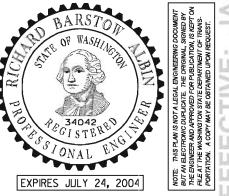
STANDARD PLAN C-20

APPROVED FOR PUBLICATION Clifford E. Mansfield 07-13-01



NOTES

- 1. See Contract for transition and connection type.
- 2. The slope from the edge of the shoulder into the face of the guardrail should not be steeper than
- 3. Guardrail installation shall be Beam Guardrail Type 1 with standard post and block.
- 4. First letter of case designation indicates end treatment on side road. Second letter indicates end treatment on main road. For instance a terminal on the side road and a bridge connection on the main road would be Case 22 BC.
- 5. For terminal type and details, see Contract and applicable Standard Plan(s).
- 6. Radius dimensions shall be etched into plate replacing the letters "HH" shown on the Identification Plate Detail. Digits shall be $1\frac{1}{2}$ MIN height and $\frac{3}{4}$ MAX width. Plate shall be galvanized after etching.
- 7. The guardrail Identification Plate shall be mounted at the lower splice bolt on the back side of the rail element at the PC of the guardrail radius.



GUARDRAIL PLACEMENT STRONG POST INTERSECTION DESIGN **STANDARD PLAN C-2p**

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso

10-31-03

(See Note 6)

IDENTIFICATION PLATE MOUNTING DETAIL

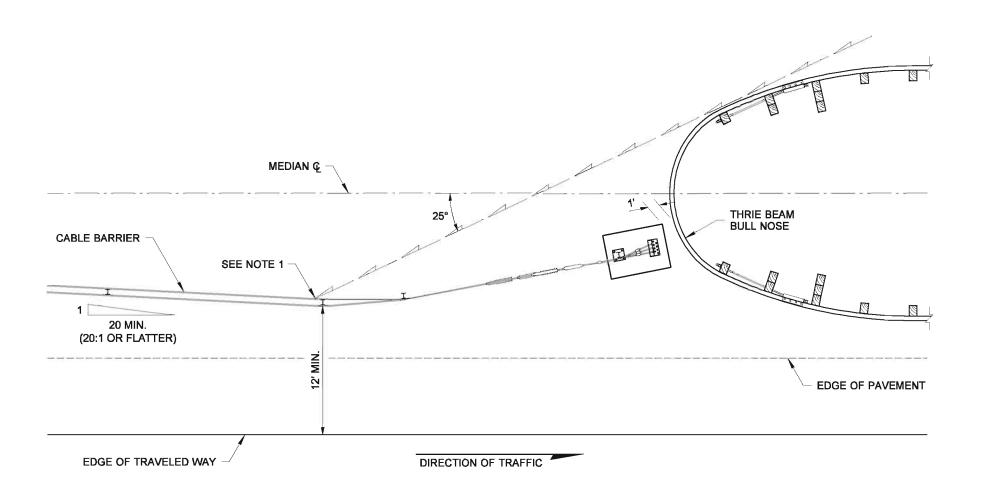
(See Note 7)

2008

2. A 20:1 or flatter taper shall be used when adjusting the alignment of the Cable Barrier, and is required when the W-Beam Guardrail face is less than 12 feet from the Edge of Traveled Way.

LEGEND

Design Layout Line



CASE 25



BARRIER PLACEMENT CABLE TO THRIE BEAM BULL NOSE CONNECTION STANDARD PLAN C-2r

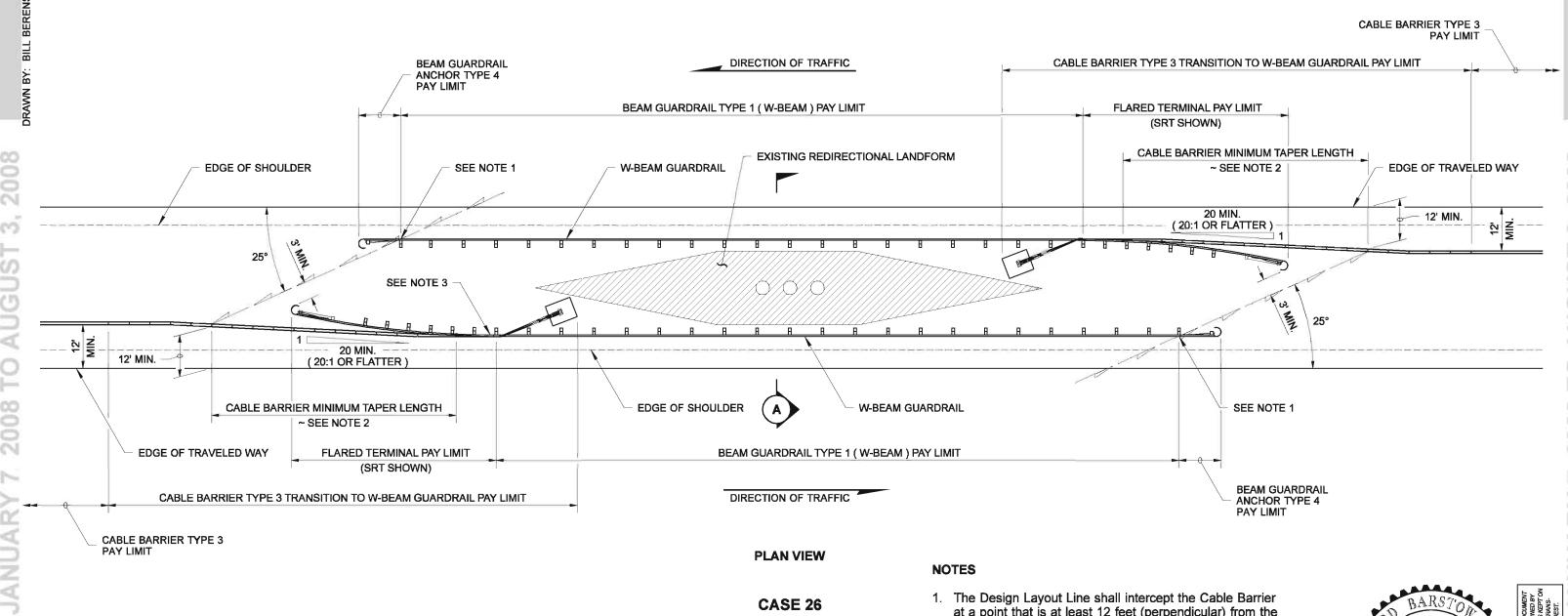
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso

03-03-05





CASE 26

- 1. The Design Layout Line shall intercept the Cable Barrier at a point that is at least 12 feet (perpendicular) from the opposite Edge of Traveled Way.
- 2. A 20:1 or flatter taper shall be used when adjusting the alignment of the Cable Barrier, and is required when the W-Beam Guardrail face is less than 12 feet from the Edge of Traveled Way.
- 3. For Cable Barrier Type 3 Transition to W-Beam Guardrail details, see Standard Plan C-3d.



LEGEND

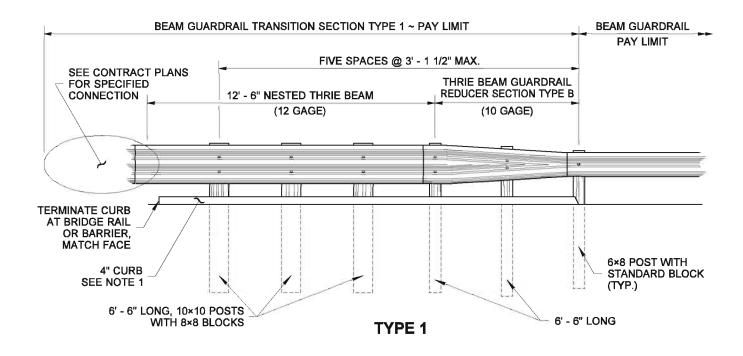
Design Layout Line

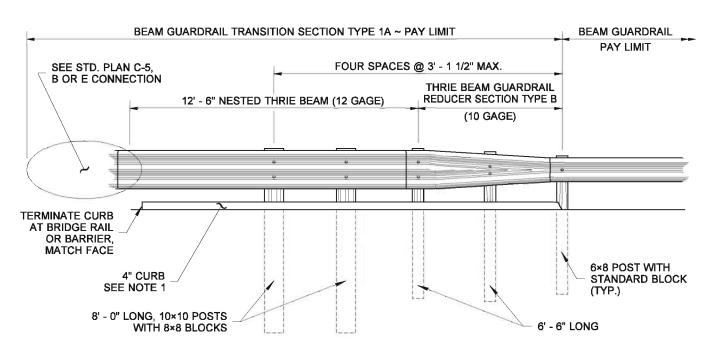
BARRIER PLACEMENT ~ CABLE TO W-BEAM SHIELDING FOR REDIRECTIONAL LANDFORM **STANDARD PLAN C-2s**

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION 03-03-05 Harold J. Peterfeso

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 TRANSITION FROM TYPE 3 TO TYPE 2 CABLE BARRIER CABLE BARRIER **TYPE 3 PAY LIMIT** CABLE BARRIER TERMINAL **CABLE BARRIER TYPE 2 PAY LIMIT** PAY LIMIT CABLE BARRIER MINIMUM TAPER LENGTH ~ SEE NOTE 2 **SEE NOTE 1 EDGE OF SHOULDER CABLE BARRIER TYPE 2 EDGE OF TRAVELED WAY** EXISTING REDIRECTIONAL LANDFORM DIRECTION OF TRAFFIC B 20 MIN. (20:1 OR FLATTER) CABLE BARRIER 25° 0/0/0 CABLE BARRIER 20 MIN. TYPE 3 (20:1 OR FLATTER) 25° 12 N M N N N DIRECTION OF TRAFFIC **CABLE BARRIER TYPE 2** 16' POST **EDGE OF SHOULDER** SEE NOTE 1 SPACING **EDGE OF TRAVELED WAY** CABLE BARRIER MINIMUM TAPER LENGTH ~ SEE NOTE 2 CABLE BARRIER **CABLE BARRIER TYPE 2 PAY LIMIT CABLE BARRIER TERMINAL** TYPE 3 PAY LIMIT PAY LIMIT TRANSITION FROM TYPE 3 TO TYPE 2 CABLE BARRIER **NOTES PLAN VIEW** 1. Extend the Cable Barrier Type 2 until the Design Layout Line clears the opposing Cable **CASE 27** Barrier Type 2 and intercepts the Cable Barrier Type 3 at a point that is at least 12 feet (perpendicular) from the opposite Edge of Traveled Way. **CABLE BARRIER TYPE 3** 2. A 20:1 or flatter taper shall be used when adjusting the alignment of the Cable Barrier. A minimum taper is required, when the Cable Barrier Type 2 is less than 12 feet from the Edge of Traveled Way, before transitioning to Cable Barrier Type 3. **LEGEND** Design Layout Line SECTION 12' MIN. **EXISTING BRIDGE PIER** EXPIRES JULY 24, 2006 CABLE BARRIER **EXISTING REDIRECTIONAL** MIN. LANDFORM **BARRIER PLACEMENT ~ CABLE EDGE OF SHOULDER BARRIER SHIELDING FOR** REDIRECTIONAL LANDFORM **EDGE OF TRAVELED WAY STANDARD PLAN C-2t** SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION 03-03-05 SECTION (B) Harold J. Peterfeso EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST



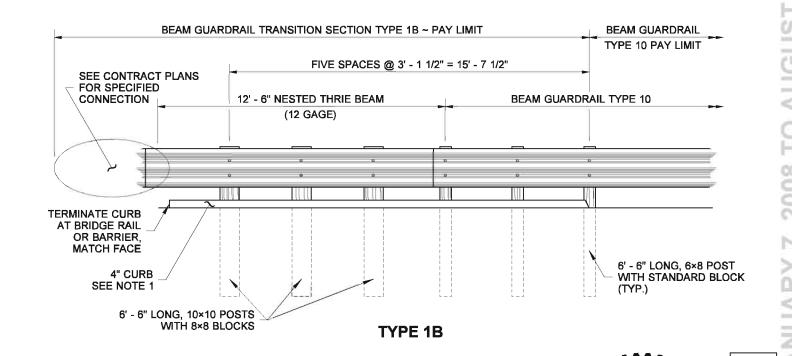


TYPE 1A

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTE

1. Install a Type 2 Extruded Asphalt Concrete Curb (see Standard Plan F-2b) at face of Guardrail.



BEAM GUARDRAIL TRANSITION SECTIONS **STANDARD PLAN C-3**

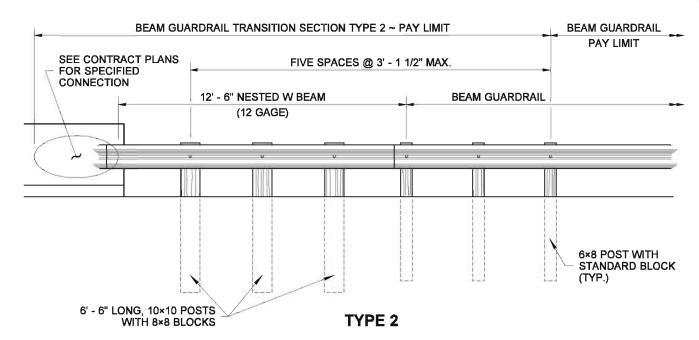
EXPIRES JULY 24, 2006

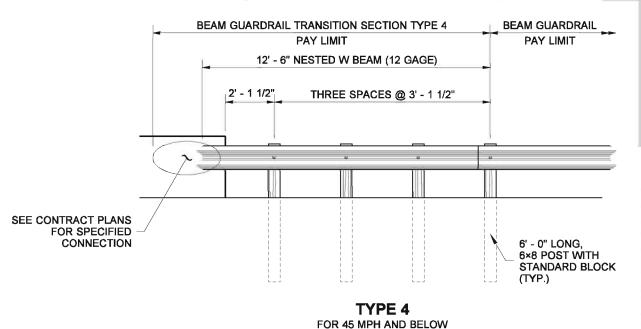
SHEET 1 OF 1 SHEET

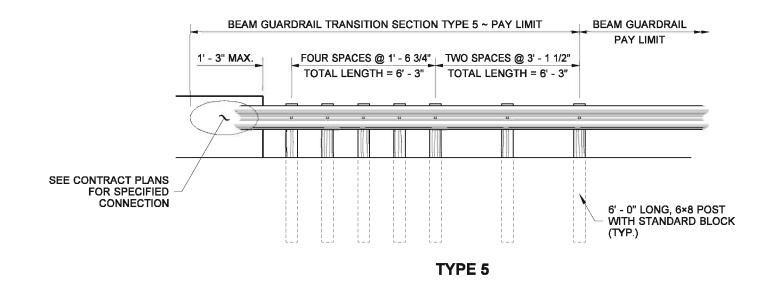


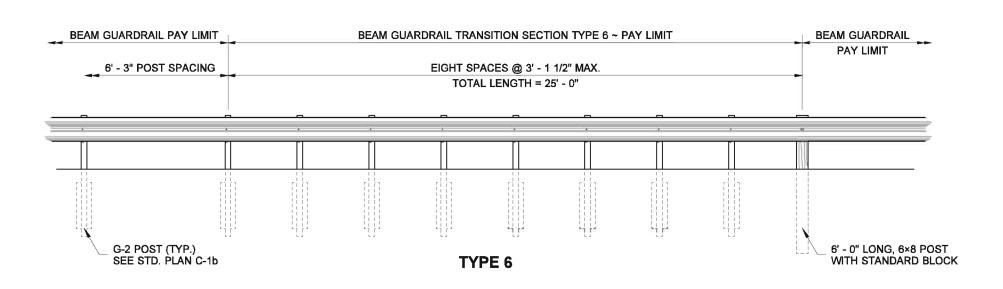


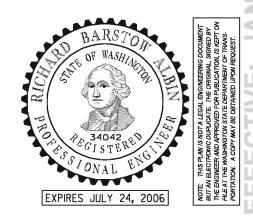
10-04-05











BEAM GUARDRAIL TRANSITION SECTIONS STANDARD PLAN C-3a

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 10-04-05

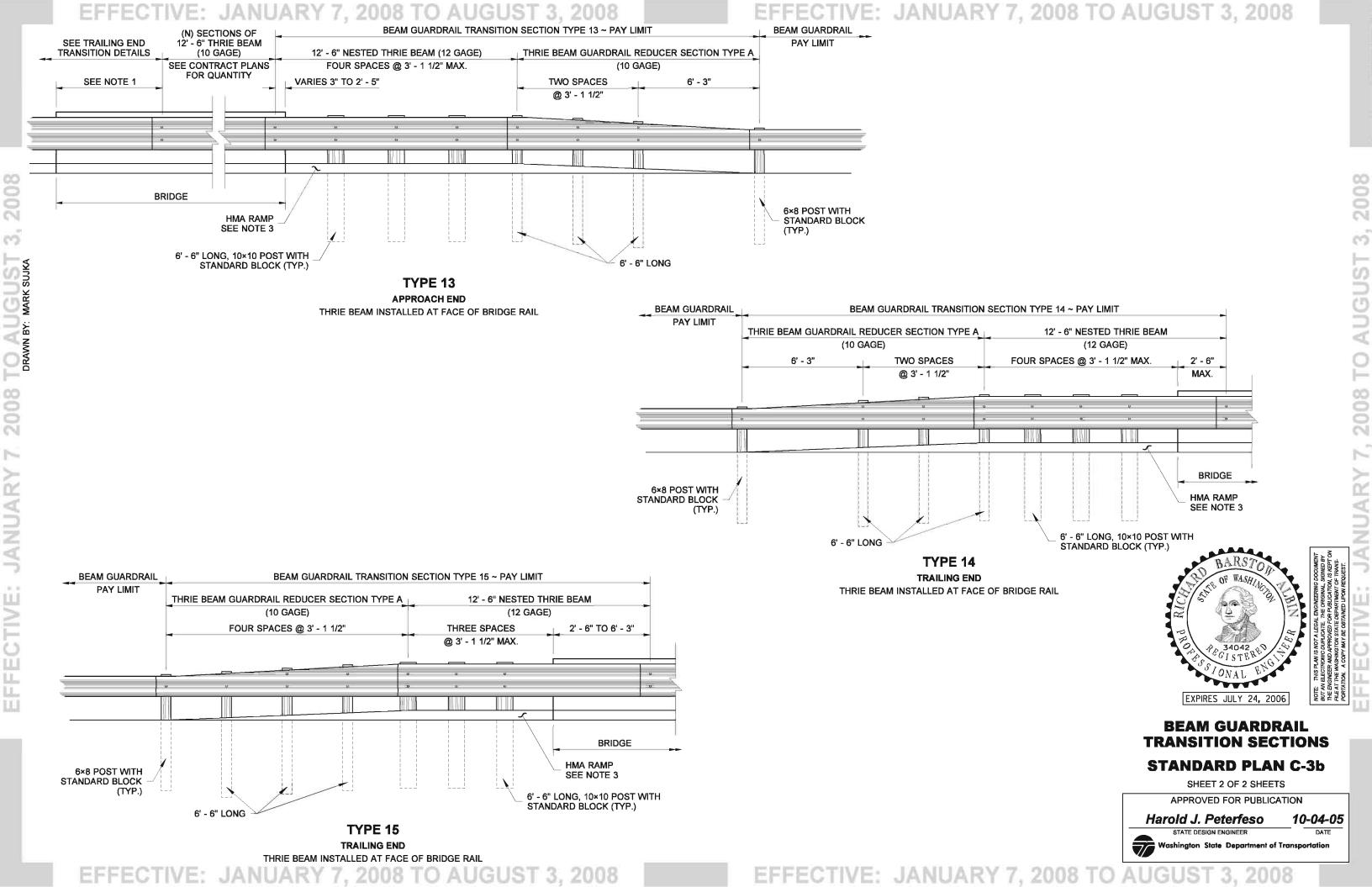


ington State Department of Transportation

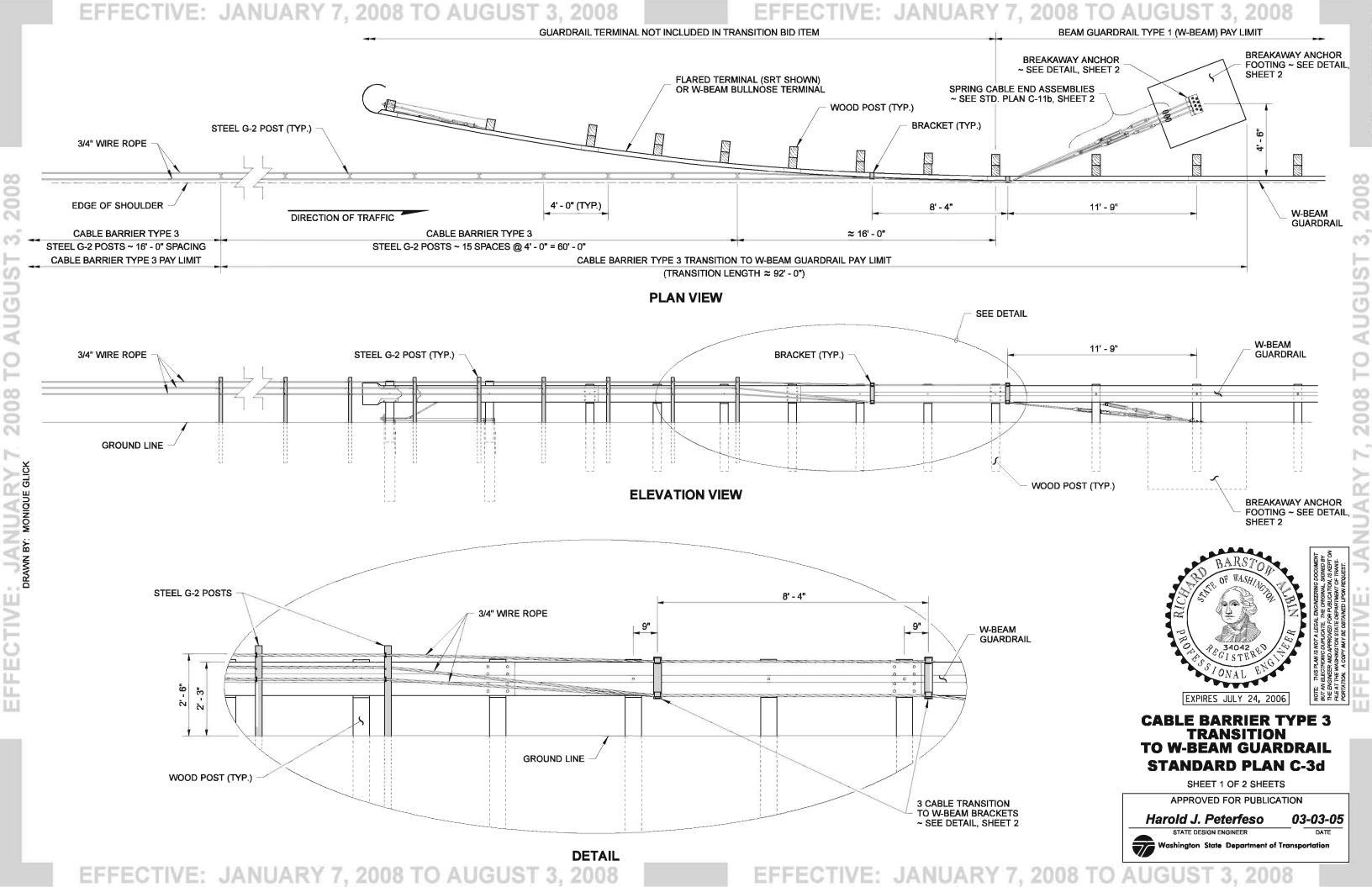
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 BEAM GUARDRAIL TRANSITION SECTION TYPE 10 ~ PAY LIMIT BEAM GUARDRAIL **NOTES** (N) SECTIONS OF PAY LIMIT THRIE BEAM GUARDRAIL SEE TRAILING END 12' - 6" THRIE BEAM REDUCER SECTION TYPE B TRANSITION DETAILS (10 GAGE) 12' - 6" NESTED THRIE BEAM (12 GAGE) 1. If the distance from the end of the bridge to the end of the SEE CONTRACT PLANS FOUR SPACES @ 3' - 1 1/2" MAX. (10 GAGE) thrie beam bridge rail section exceeds 6' - 3" using 12' - 6" thrie FOR QUANTITY beam sections, add a 6' - 3" section of thrie beam bridge rail **SEE NOTE 1** VARIES 3" TO 2' - 5" TWO SPACES to reduce the length to less than 6' - 3". @ 3' - 1 1/2" 2. When thrie beam is installed at the face of the bridge curb, install a Type 2 Extruded Asphalt Concrete Curb (see Standard Plan F-2b) at face of Guardrail. Match the height of existing bridge curb with a 20:1 transition. 3. When thrie beam is installed at the face of rigid bridge rail, an HMA ramp is required from the roadway surface to the top of **BRIDGE** the bridge curb or sidewalk. The slope of the ramp shall be 6×8 POST WITH 20:1 or flatter. 4" CURB STANDARD BLOCK SEE NOTE 2 6' - 6" LONG, 10×10 POST WITH 6' - 6" LONG STANDARD BLOCK (TYP.) **TYPE 10** APPROACH END THRIE BEAM INSTALLED AT FACE OF BRIDGE CURB BEAM GUARDRAIL BEAM GUARDRAIL TRANSITION SECTION TYPE 11 ~ PAY LIMIT **PAY LIMIT** THRIE BEAM GUARDRAIL REDUCER SECTION TYPE B 12' - 6" NESTED THRIE BEAM (10 GAGE) (12 GAGE) TWO SPACES FOUR SPACES MIN. @ 3' - 1 1/2" MAX. 2' - 6" @ 3' - 1 1/2" JANUAR **BRIDGE** 6×8 POST WITH STANDARD BLOCK 4" CURB (TYP.) SEE NOTE 2 6' - 6" LONG, 10×10 POST WITH BEAM GUARDRAIL BEAM GUARDRAIL TRANSITION SECTION TYPE 12 ~ PAY LIMIT 6' - 6" LONG STANDARD BLOCK (TYP.) **PAY LIMIT TYPE 11** FOUR SPACES @ 3' - 1 1/2" 12' - 6" NESTED THRIE BEAM **TRAILING END** (12 GAGE) THRIE BEAM INSTALLED AT FACE OF BRIDGE CURB THRIE BEAM GUARDRAIL REDUCER SECTION TYPE B **BEAM GUARDRAIL** THREE SPACES 2' - 6" TO 6' - 3" (10 GAGE) @ 3' - 1 1/2" MAX. EXPIRES JULY 24, 2006 **BEAM GUARDRAIL BRIDGE** TRANSITION SECTIONS **STANDARD PLAN C-3b** 4" CURB 6×8 POST WITH **SEE NOTE 2** STANDARD BLOCK SHEET 1 OF 2 SHEETS (TYP.) APPROVED FOR PUBLICATION 6' - 6" LONG 6' - 6" LONG, 10×10 POST WITH STANDARD BLOCK (TYP.) Harold J. Peterfeso 10-04-05 **TYPE 12 TRAILING END** THRIE BEAM INSTALLED AT FACE OF BRIDGE CURB

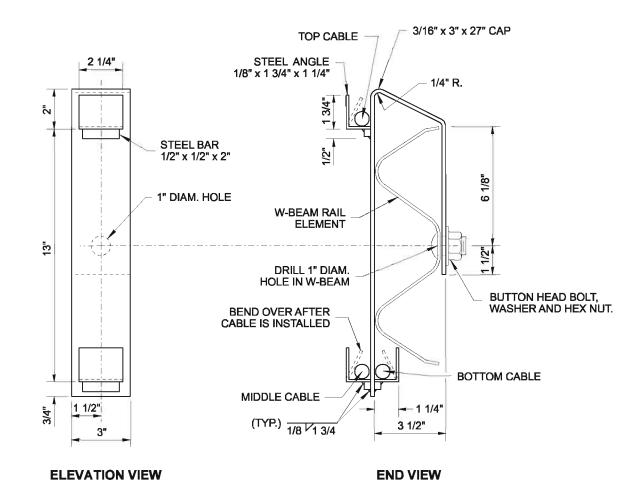
TIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFEC

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 1. See Contract for the number of thrie beam sections for Beam Guardrail Type 11. **BEAM GUARDRAIL** TYPE 11 BEAM GUARDRAIL TRANSITION SECTION TYPE 16 ~ PAY LIMIT **BEAM GUARDRAIL** 2. If the distance from the end of the Beam Guardrail Type 11 to the column/structure **PAY LIMIT** PAY LIMIT exceeds 6' - 3" using 12' - 6" thrie beam sections, add a 6' - 3" nested section of SEE NOTE 1 FOUR SPACES @ 3' - 1 1/2" MAX. TWO SPACES thrie beam to reduce the distance to less than 6' - 3". @ 3' - 1 1/2" MAX. 12' - 6" NESTED THRIE BEAM THRIE BEAM GUARDRAIL 3. Install a Type 2 Extruded Asphalt Concrete Curb (see Standard Plan F-2b) at face REDUCER SECTION TYPE B of Guardrail. 10 GAGE **SEE NOTE 4** 4. Attach the standard block to the rail using two 5/8" × 4" lag bolts. BRIDGE COLUMN **BEAM GUARDRAIL BEAM GUARDRAIL** BEAM GUARDRAIL TRANSITION SECTION TYPE 17 ~ PAY LIMIT **TYPE 11** 6×8 POST WITH **PAY LIMIT PAY LIMIT** STANDARD BLOCK TWO SPACES 12' - 6" NESTED THRIE BEAM SEE NOTES 1 & 2 @ 3' - 1 1/2" MAX. 6' - 6" LONG, 10×10 POST 4" CURB THRIE BEAM GUARDRAIL FOUR SPACES @ 3' - 1 1/2" MAX. 4' - 0" MAX. WITH STANDARD BLOCK SEE NOTE 3 6' - 6" LONG REDUCER SECTION TYPE B 10 GAGE SEE NOTE 4 **TYPE 16 APPROACH END** 6×8 POST WITH STANDARD BLOCK (TYP.) 4" CURB 6' - 6" LONG, 10×10 POST 6' - 6" LONG WITH STANDARD BLOCK SEE NOTE 3 BRIDGE COLUMN **BEAM GUARDRAIL TYPE 17 BEAM GUARDRAIL** BEAM GUARDRAIL TRANSITION SECTION TYPE 18 ~ PAY LIMIT TYPE 11 **TRAILING END** PAY LIMIT **PAY LIMIT** FOUR SPACES @ 3' - 1 1/2" MAX. 12' - 6" NESTED THRIE BEAM SEE NOTES 1 & 2 **BEAM GUARDRAIL** THRIE BEAM GUARDRAIL TWO SPACES 4' - 0" TO 6' - 3" REDUCER SECTION TYPE B @ 3' - 1 1/2" MAX 10 GAGE **SEE NOTE 4** EXPIRES JULY 24, 2006 **BEAM GUARDRAIL** 6×8 POST WITH TRANSITION SECTIONS STANDARD BLOCK (TYP.) **STANDARD PLAN C-3c** 4" CURB SEE NOTE 3 6' - 6" LONG, 10×10 POST WITH STANDARD BLOCK SHEET 1 OF 1 SHEET 6' - 6" LONG APPROVED FOR PUBLICATION Harold J. Peterfeso 06-21-06 **TYPE 18** OMITTED ATTACHMENT TO STRUCTURE **TRAILING END** DATE REVISION BY EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3,



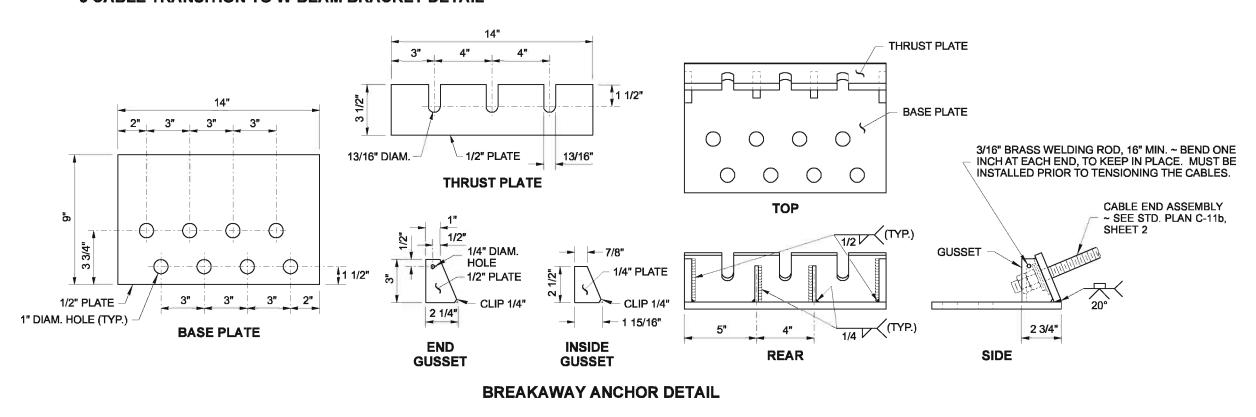


1'- 11 1/2", 9", 2' - 3 1/2" **BREAKAWAY ANCHOR** ALL DIMENSIONS **BOTTOM CABLE** ARE OUT TO OUT 0 2 ALL BENDS ARE 2" R. **TOP CABLE** 3/4" HEAVY HEX NUTS WITH PLAIN WASHERS (TYP.) **#3 HOOP PLAN VIEW** DIRECTION OF TRAFFIC 2' - 4 3/4" 1 1/2" CLR. $(2) #3 \sim 3' - 0"$ (TYP.) 2 1/2" #3 HOOPS -INSTALL (8) 3/4" × 24" (TYP.) HOOK BOLTS OR J-BOLTS 5' - 0" WITH TOP 2" THREADED

ELEVATION VIEW BREAKAWAY ANCHOR FOOTING DETAIL

STEEL USED IN THE FABRICATION OF THE BRACKET SHALL CONFORM TO ASTM A 36 AND THE BRACKET SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A 123.

3 CABLE TRANSITION TO W-BEAM BRACKET DETAIL





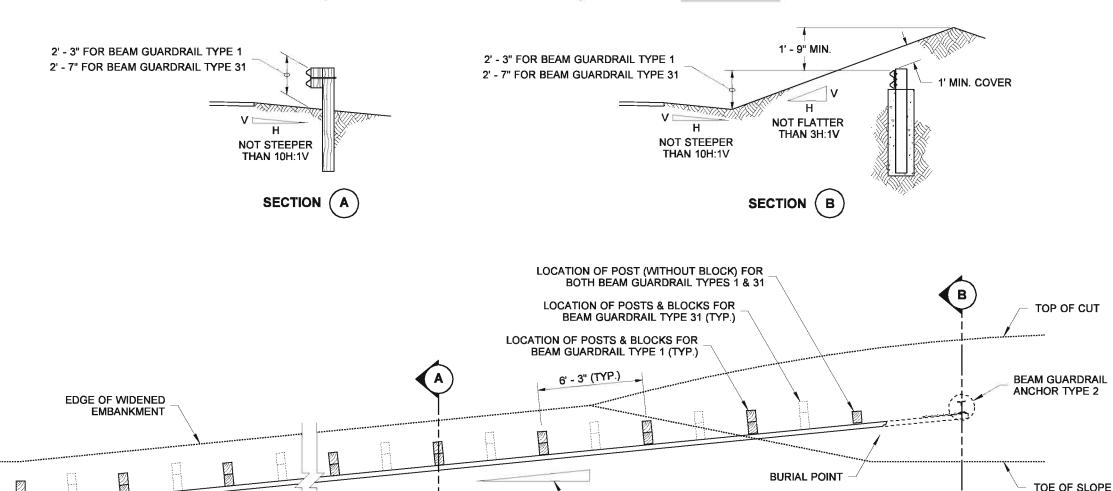
CABLE BARRIER TYPE 3 TRANSITION TO W-BEAM GUARDRAIL STANDARD PLAN C-3d

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION 03-03-05 Harold J. Peterfeso



VARIES (SEE CONTRACT)

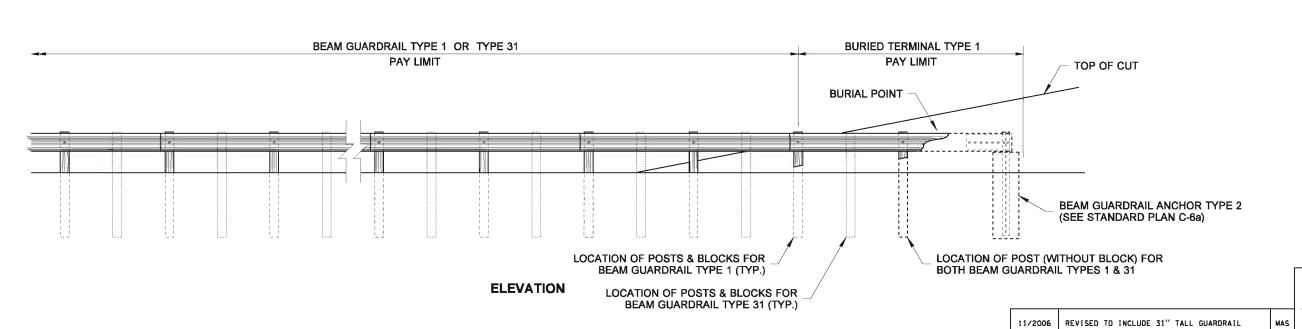


PLAN



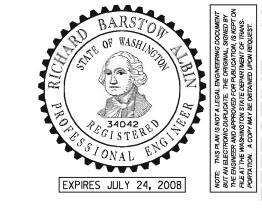
PERSPECTIVE

FLARE RATE TABLE	
RATE	POSTED SPEED (mph)
15 : 1	70
14 : 1	60
12 : 1	55
11 : 1	50
10 : 1	45
9 : 1	40 or less



FLARE RATE (SEE TABLE)

EDGE OF SHOULDER



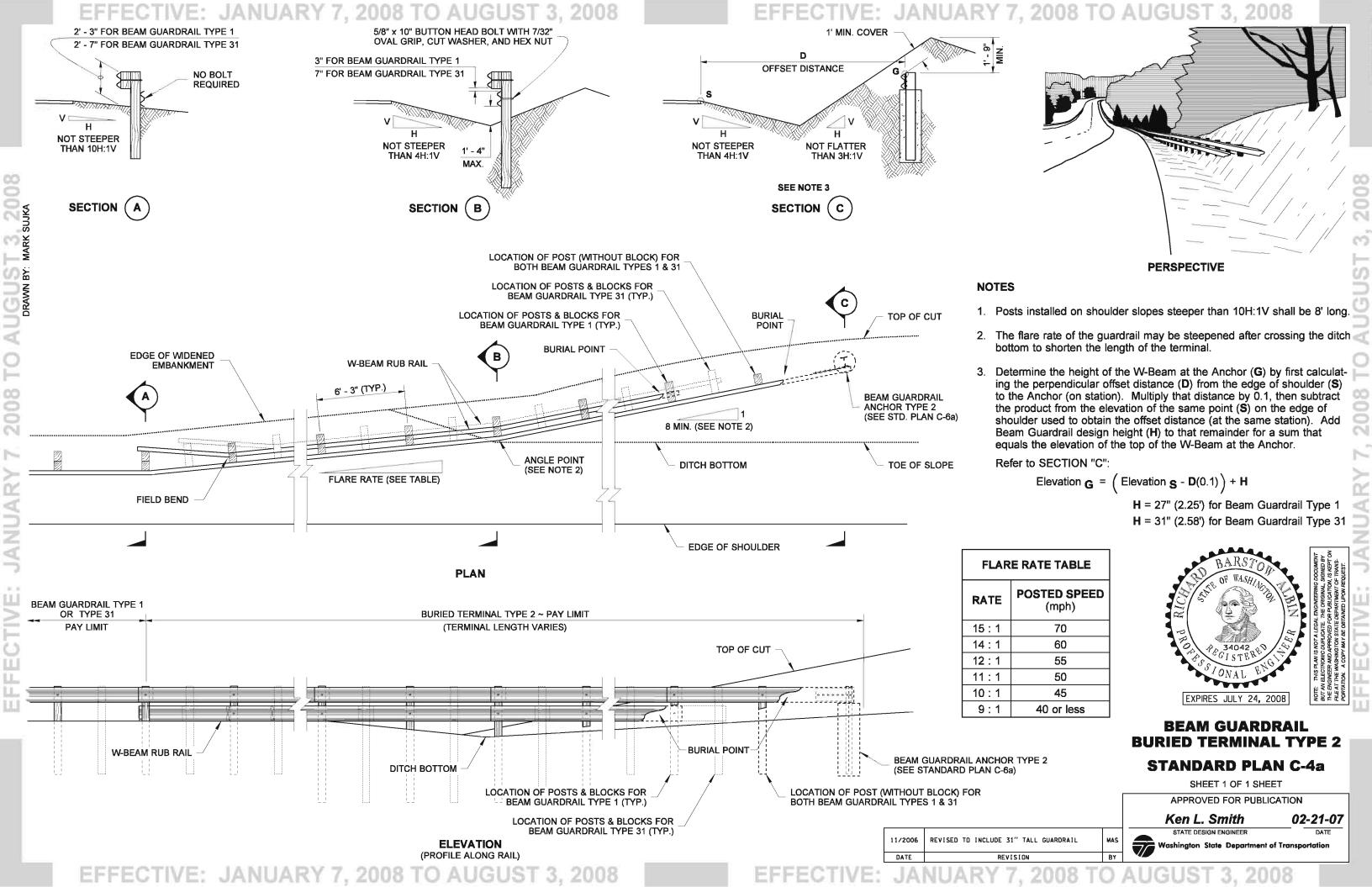
BEAM GUARDRAIL BURIED TERMINAL TYPE 1 STANDARD PLAN C-4

SHEET 1 OF 1 SHEET

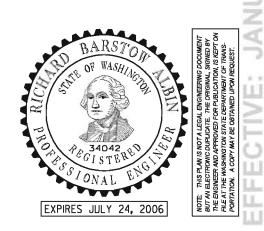
APPROVED FOR PUBLICATION

Ken L. Smith 02-21-07

REVISION



- Unless otherwise indicated in the contract, the SRT 350 (12.5, 8 Post)
 as manufactured by Trinity Industries, Inc., or a FLEAT 350 as
 manufactured by Road Systems Inc., shall be installed per manufacturer's
 recommendations. If specified in the Contract, the FLEAT TL2
 as manufactured by Road Systems, Inc. shall be installed per
 manufacturers recommendations.
- 2. Where terminal is placed on a curve, and post offsets would result in the rail encroaching onto the shoulder (e.g., the inside of a curve), the posts shall be installed so that the faceof the rail is at the edge of the shoulder.
- When snow load post washers and snow load rail washers are called for in the contract, the snow load rail washers must be omitted within the terminal limits.
- 4. Offset distances:





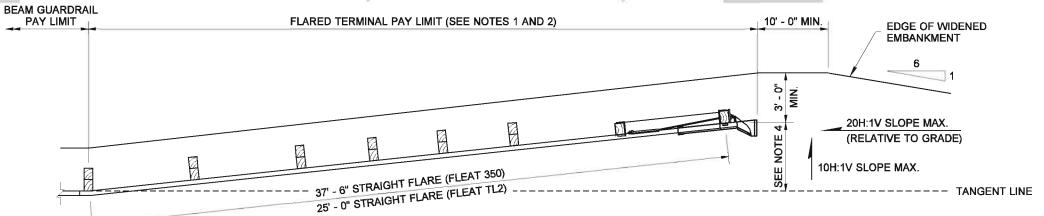
SHEET 1 OF 1 SHEET

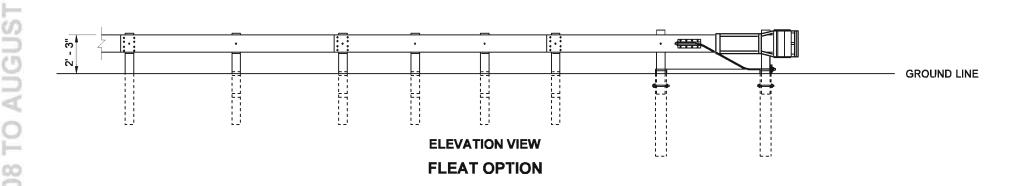
APPROVED FOR PUBLICATION

Harold J. Peterfeso

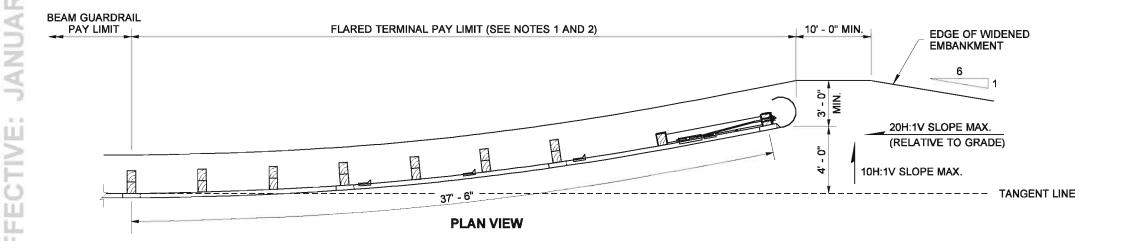
ld J. Peterfeso 06-08-06

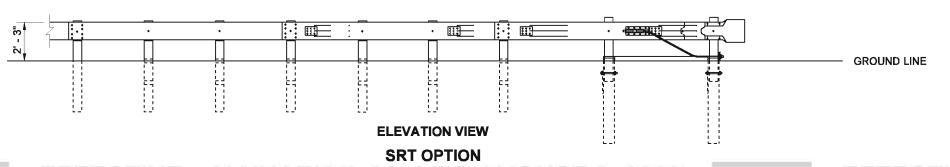
STATE DESIGN ENGINEER D.
Washington State Department of Transportation





PLAN VIEW





FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

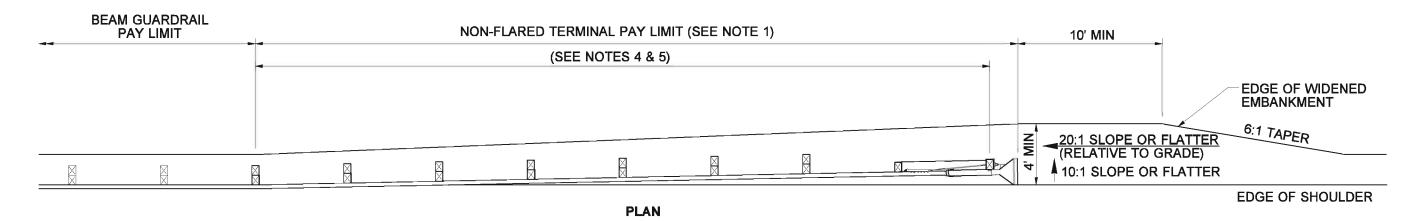
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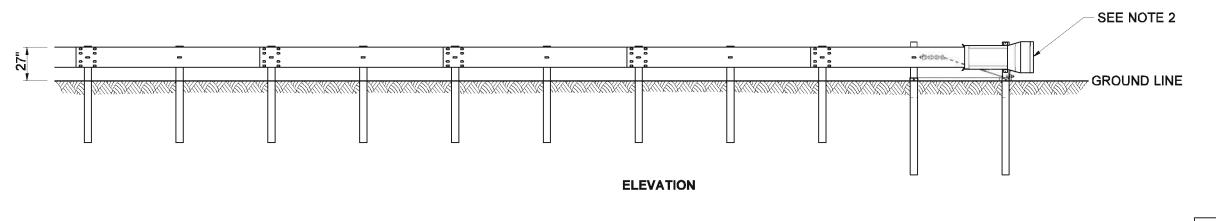
REVISION

Revised FLEAT Flore Lengths

2008 TO AUGUST

- 2. A reflectorized object marker shall be installed according to manufacturer's recommendations.
- 3. When snow load post washers and snow load rail washers are required by the contract, the snow load rail washers must not be installed within the terminal limits.
- 4. Terminal shall be installed at a taper, ensuring that end piece is entirely off shoulder.
- 5. Length for ET-PLUS (TL3) and SKT-350 is 50'. Length for ET-PLUS (TL2) and SKT-TL2 is 25'.







BEAM GUARDRAIL NON-FLARED TERMINAL STANDARD PLAN C-4e

SHEET 1 OF 1 SHEET

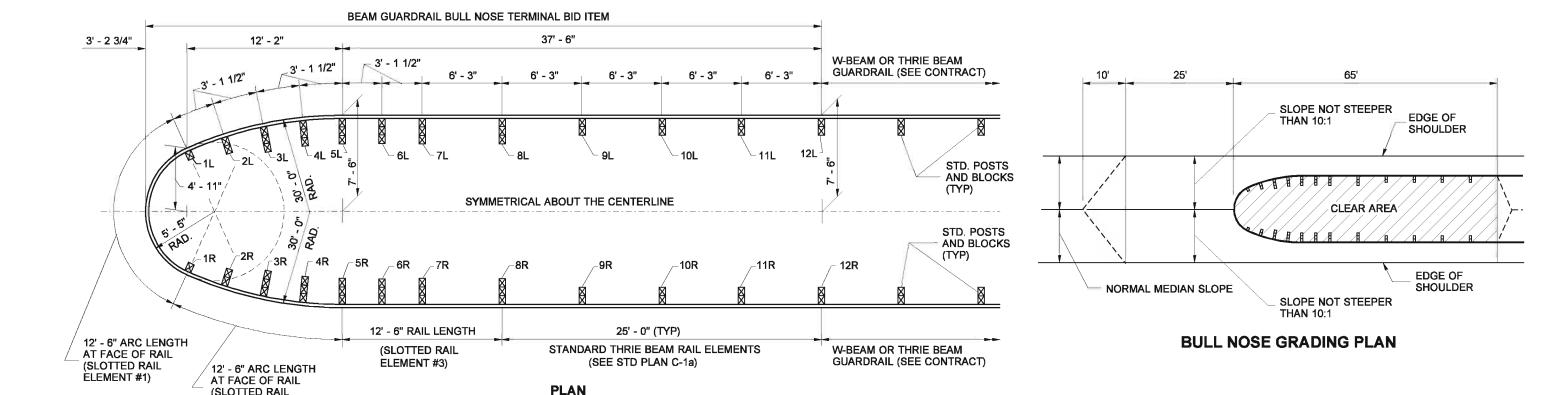
APPROVED FOR PUBLICATION Harold J. Peterfeso

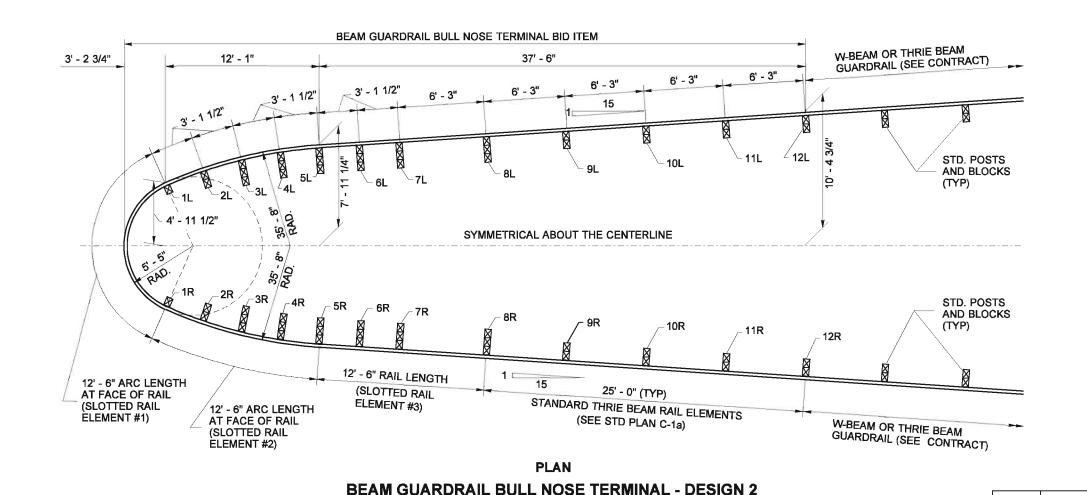
02-20-03

REVISED NOTES 1 & 5; ADDED SLOPES.

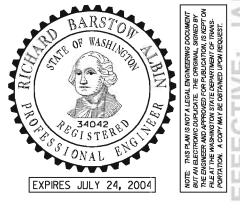
REVISION

(SLOTTED RAIL ELEMENT #2)





BEAM GUARDRAIL BULL NOSE TERMINAL - DESIGN 1



BEAM GUARDRAIL BULL NOSE TERMINAL STANDARD PLAN C-4f

SHEET 1 OF 4 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso
STATE DESIGN ENGINEER

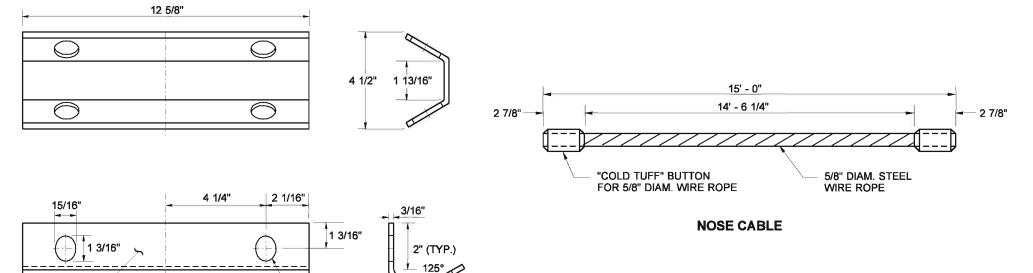
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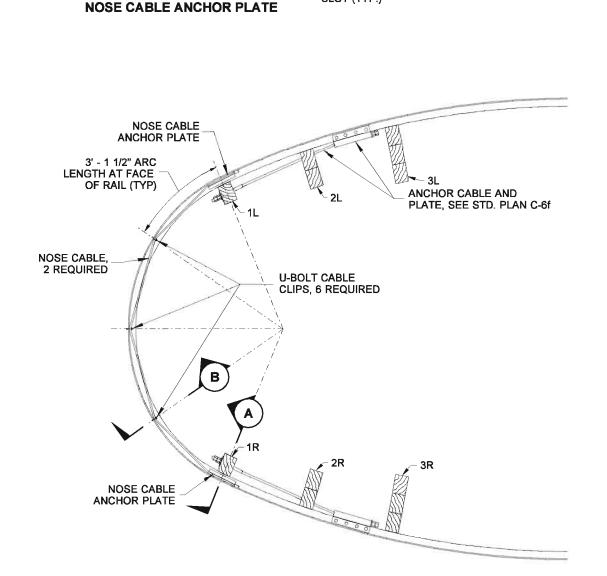
STATE DESIGN ENGINEER DAT

Washington State Department of Transportation

ADDED U-BOLT CABLE CLIPS AND SECTION FOR ASSEMBLY ON SHEET 3

15/16" x 1 3/16" SLOT (TYP.)

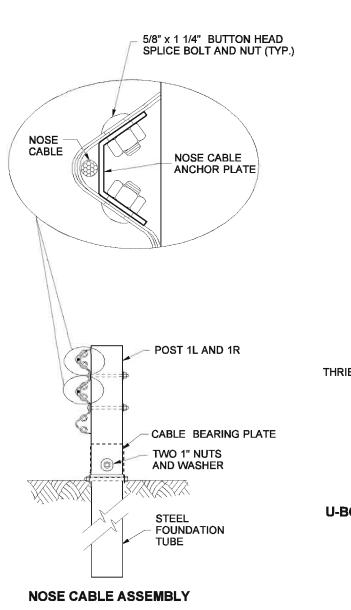




STEEL PLATE, ASTM A36

12 5/8" x 5 7/8" x 3/16"

PLAN - THRIE BEAM NOSE



SECTION (A

NOSE CABLE
ANCHOR PLATE

"COLD TUFF"
BUTTONS

NOSE CABLES

ANCHOR PLATE

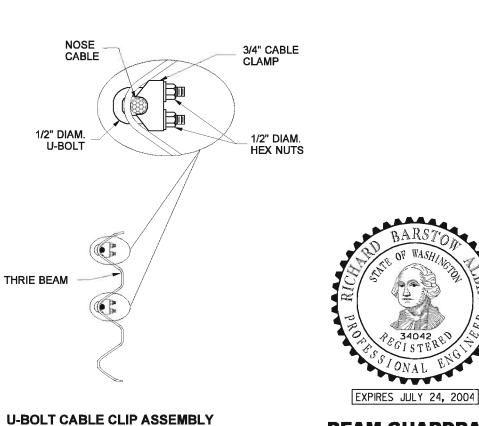
ANCHOR CABLE
PLATE

POST 1

POST 2

POST 3

CABLE ANCHOR & BRACKET ASSEMBLY
FOR ANCHOR PLATE, CABLE END PLATE, AND ANCHOR CABLE (SEE STD PLAN C-6f)



BEAM GUARDRAIL BULL NOSE TERMINAL STANDARD PLAN C-4f

SHEET 3 OF 4 SHEETS

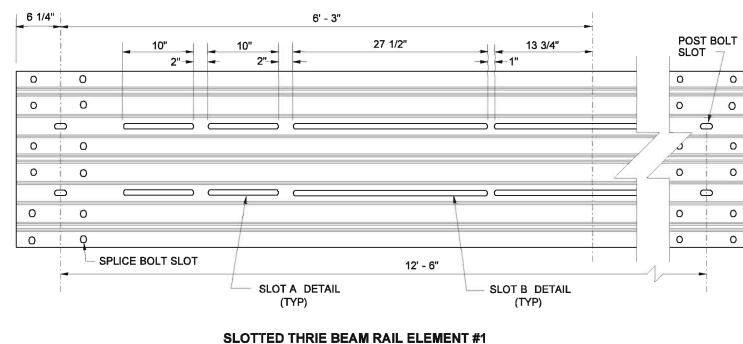
APPROVED FOR PUBLICATION

Harold J. Peterfeso 06-30-04

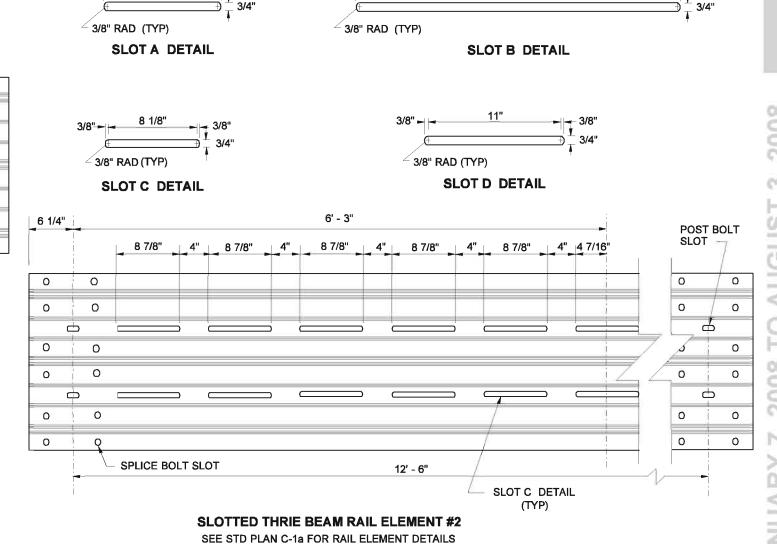
STATE DESIGN ENGINEER

Washington State Department of Transportation

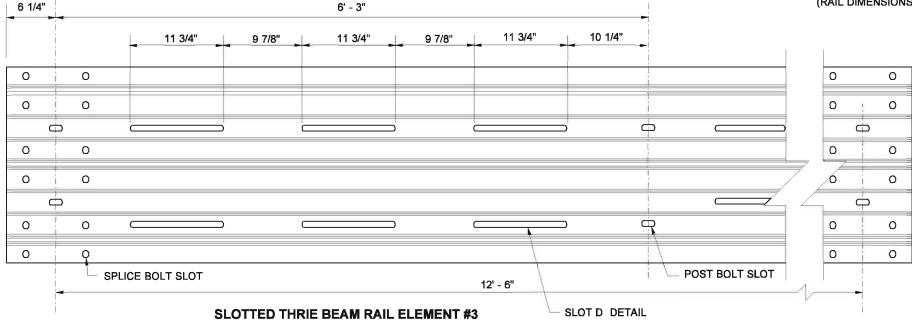
SECTION (B



SEE STD PLAN C-1a FOR RAIL ELEMENT DETAILS (RAIL DIMENSIONS SHOWN ARE BEFORE BENDING TO RADIUS SHOWN IN PLAN)



(RAIL DIMENSIONS SHOWN ARE BEFORE BENDING TO RADIUS SHOWN IN PLAN)



(TYP)



BEAM GUARDRAIL BULL NOSE TERMINAL

STANDARD PLAN C-4f

SHEET 4 OF 4 SHEETS APPROVED FOR PUBLICATION

06-30-04

Harold J. Peterfeso



SEE STD PLAN C-1a FOR RAIL ELEMENT DETAILS

Type 3 transition pay limit

6'-3"

W Beam end section

A CONNECTION

Design F

Unrestraïned

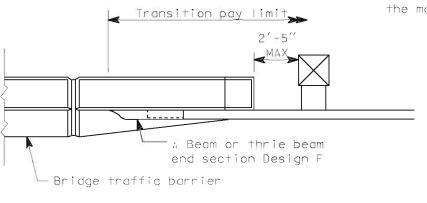
precast

barrier

2008 TO AUGUST

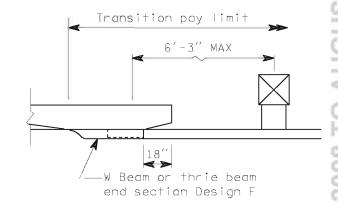
2. If the last guardrail post is 3" or less from the end of the bridge barrier, this attachment and blockout is not necessary.

- This case is also applicable for vertical faces with no curbs.
- 4. When B Connection is used with Type 1A Transition, the maximum spacing between bolts is 6'-3".

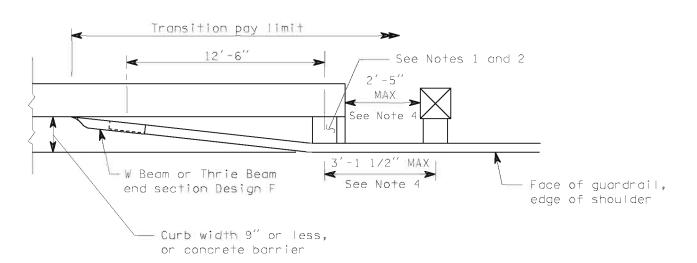




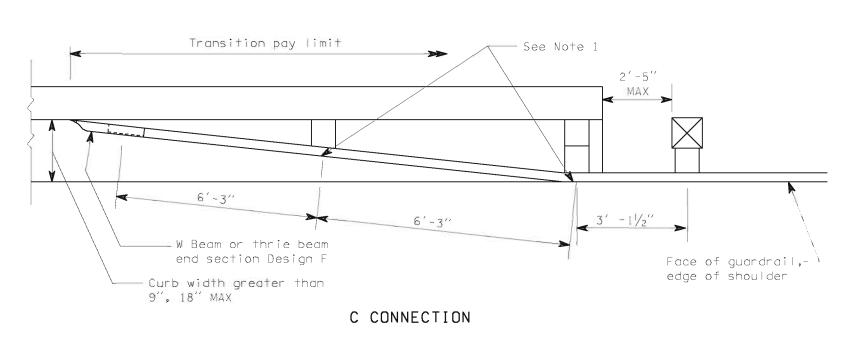
See Note 3



E CONNECTION



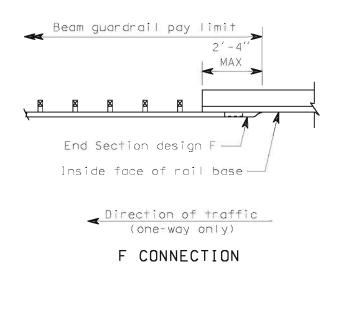
B CONNECTION



Face of quardrail.

edge of shoulder

See Note 1



DATE



GUARDRAIL CONNECTION TO BRIDGE RAIL OR CONCRETE BARRIER STANDARD PLAN C-5

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 10

STATE DESIGN ENGINEER

DATE

Washington State Department of Transportation

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

BY

REVISION

REVISED NOTE 1 ADDED NOTE 4

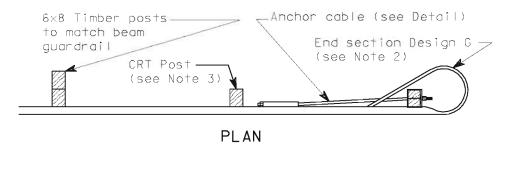
2008 TO AUGUST

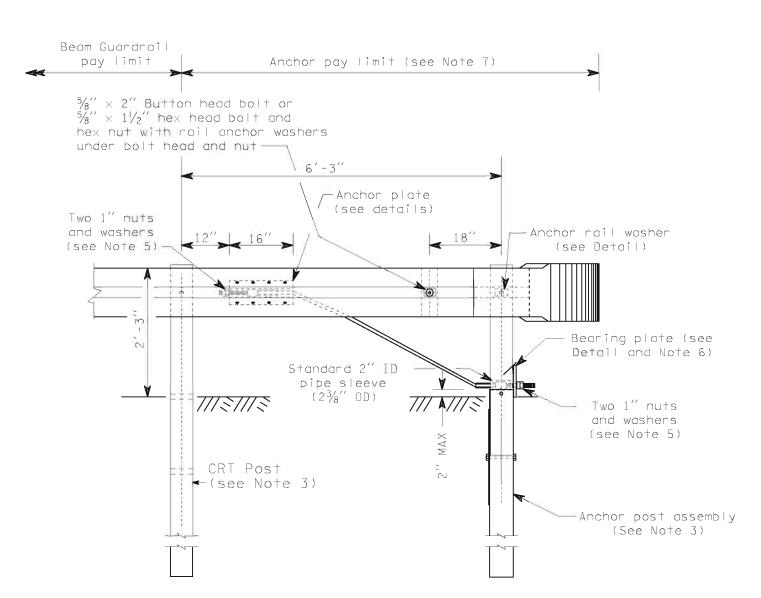
welded to equal strength and dimensions as shown. 2. For end section details see Standard Plan "Beam Guardrail End Sections".

3. For post details, see Standard Plan "Beam Guardrail Posts and Blocks".

1. Anchor plate may be constructed from $\frac{1}{4}$ plates

- 4. Eight $\frac{5}{8}$ " \times 1 $\frac{1}{2}$ " machine bolts with hex nut and washer. Place washer on face side of rail.
- 5. Outside nut shall be torqued against inside nut a minimum of 100 ft-lbs.
- 6. Toenail bearing plate with 10d nail at corners to prevent turning.
- 7. Anchor pay limit does not apply when anchor is included in a Beam Guardrail Terminal.





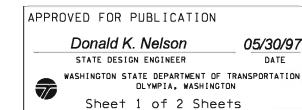
TYPE 1 ANCHOR

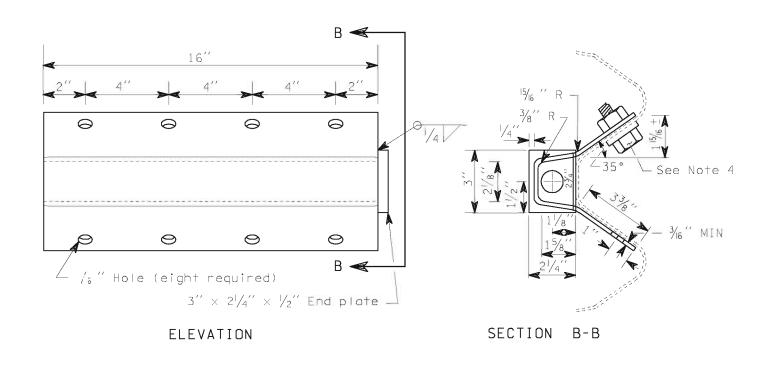
BEAM GUARDRAIL ANCHOR TYPE 1



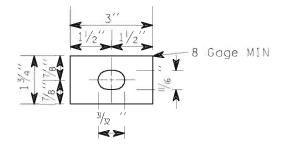


STANDARD PLAN C-6

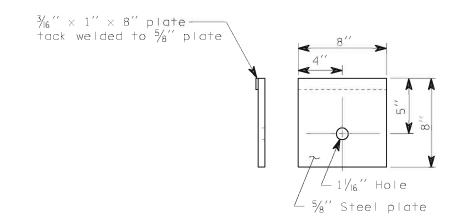




ANCHOR PLATE
(See Note 1)



ANCHOR RAIL WASHER



BEARING PLATE

6'-6"

5 1/16"

- Swage

1" × 7" Stud

threaded full

length (TYP)

ANCHOR CABLE

STANDARD PLAN C-6
APPROVED FOR PUBLICATION

Donald K. Nelson

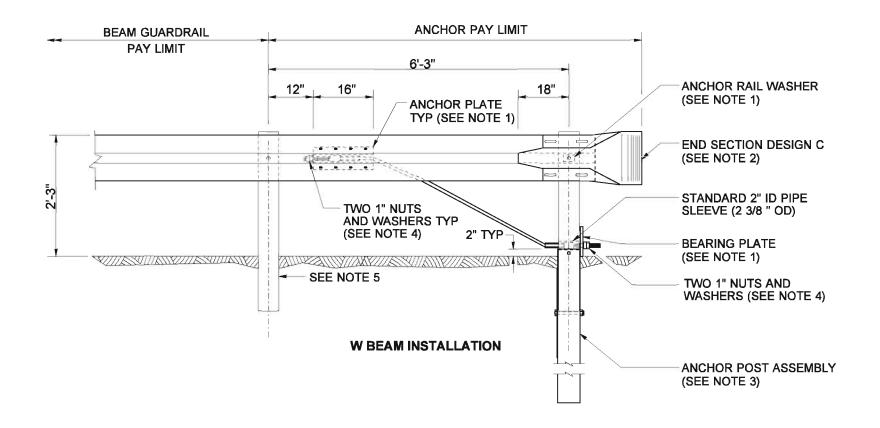
STATE DESIGN ENGINEER

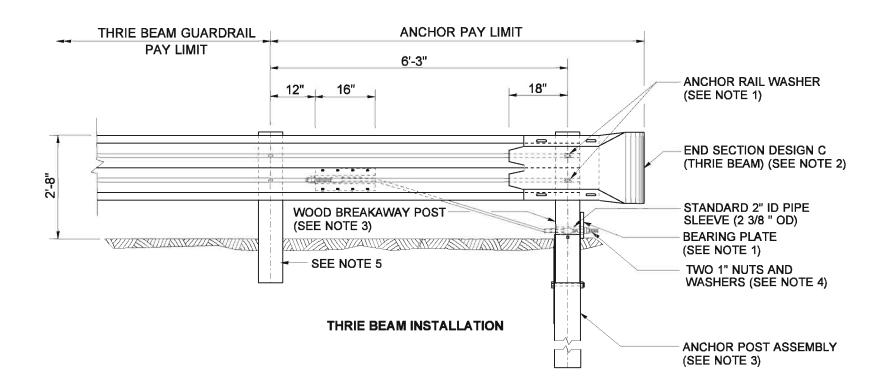
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

Sheet 2 of 2 Sheets

BEAM GUARDRAIL ANCHOR TYPE 1

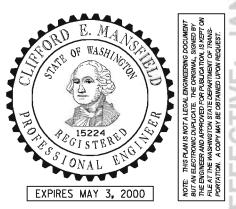
EXPIRES MAY 3, 1998





NOTES

- 1. For details, see Standard Plan C-6.
- 2. For end section details see Standard Plan C-7 or C-7a.
- 3. For details, see Standard Plan C-1b.
- 4. Outside nut shall be torqued against inside nut a minimum of
- 5. Post and block shall match beam guardrail posts.



BEAM GUARDRAIL ANCHOR TYPE 4

STANDARD PLAN C-6c

01/06/00

APPROVED FOR PUBLICATION

Clifford E. Mansfield

DEPUTY STATE DESIGN ENGINEER

NOTE 2 AND DETAIL TITLES.

MODIFIED "END SECTIONS" TO DESIGN "C", CHANGED TWS WASHINGTON STATE DEPARTMENT OF TRANSPORTATION PLAN

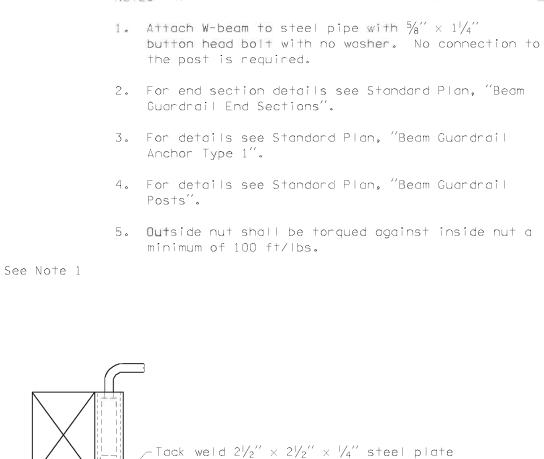
 $\frac{3}{4}$ \times 9'- 0" Cable with one swaged end —

See Detail B-

 $\frac{5}{8}$ " \times 2" Button head bolt

7, 2008 TO AUGUST 3, 2008





 $-1'' \times 4''$

DETAIL B

with $1/_{16}$ " hole to tubular steel

Slud Ihreaded full length

or $\frac{5}{8}$ " \times $1\frac{1}{2}$ " hex head bolt and hex nut with anchor rail washers under bolt head and nut (See Note 3). Beam guardrail Anchor pay limit pay limit 6'- 3" -Anchor plate Two 1" Nuts (see Note 3) and washers 18" (see Note 5) — End Section Design G (see Note 2) $\frac{3}{4}$ Cable clips (6 required) torque nuts to 50 ft/lbs. Bearing plate (see Note 3) Standard 2" ID pipe sleeve $(2\frac{3}{8}'' \text{ OD})$ $-2\frac{1}{2}$ × $2\frac{1}{2}$ × $\frac{1}{4}$ × 8" Two 1" Nuts and washer (see Note 5) Anchor Post Assemblies (see Note 4)

 $\frac{3}{8}$ " × 4" × 12"

Steel plate

 $-10'' \times 13''$ — Standard steel pipe

TYPE 5 ANCHOR

BEAM GUARDRAIL ANCHOR TYPE 5

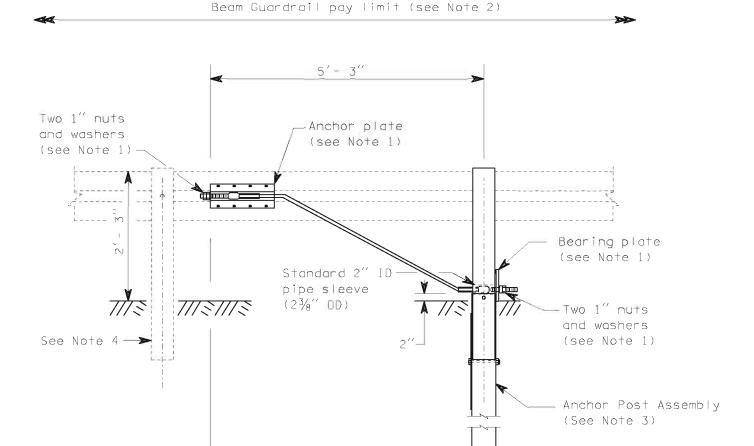
STANDARD PLAN C-6d

EXPIRES MAY 3, 1998

05/30/97 WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

, 2008 TO AUGUST 3, 2008

- 3. For details, see Standard Plan, "Beam Guardrail Posts and Blocks".
- 4. Post shall match beam guardrail posts.



TYPE 7 ANCHOR

Anchor pay limit (see Note 2)

BEAM GUARDRAIL ANCHOR TYPE 7





STANDARD PLAN C-6f

APPROVED FOR PUBLICATION

Donald K. Nelson

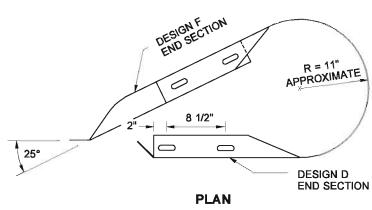
07/25/97 STATE DESIGN ENGINEER

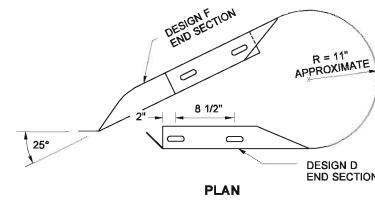
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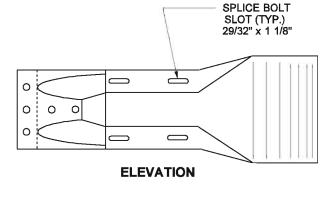
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

3. A single piece having similar dimensional shape to Design G and mating with the W-beam guardrail is an alternate.

4. In cases where Design "F" end section is lapped on the outside of the guardrail, a galvanized 1" ID, 2" OD, 0.134" thick, narrow Type A Plain Washer or a anchor rail washer shall be placed under the splice bolt heads.







DESIGN G

(SEE NOTE 3)



BEAM GUARDRAIL END SECTIONS STANDARD PLAN C-7

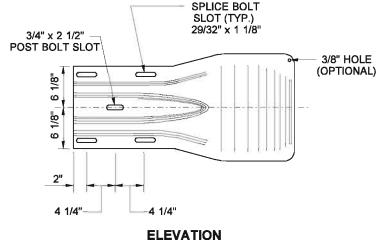
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso

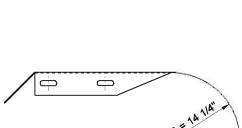
10-31-03



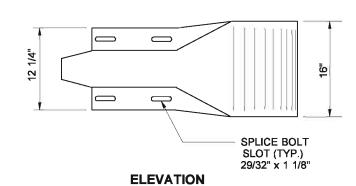


2008 TO AUGUST

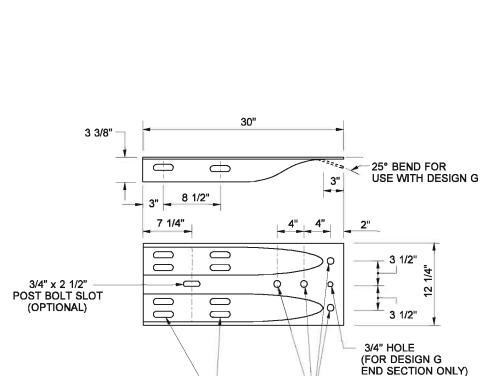
DESIGN A



8 1/2" 30" **PLAN**



DESIGN D



SPLICE BOLT

SLOT (TYP.) 29/32" x 1 1/8"

PLAN

ELEVATION

DESIGN C

SPLICE BOLT SLOT (TYP.) 29/32" x 1 1/8"

DESIGN F (SEE NOTE 4)

ELEVATION

1" HOLES

(SEE NOTE 2)

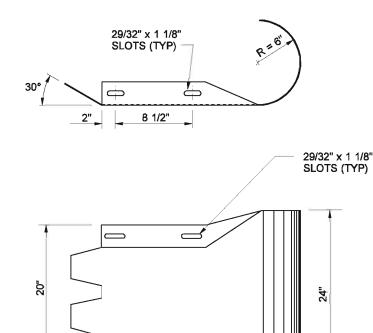
BY

REVISION

10/2003

DATE

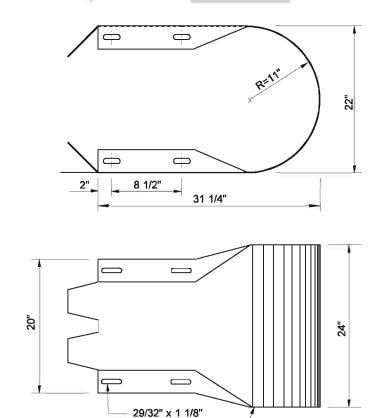
REV. NOTE 2.



DESIGN C (THRIE BEAM)

25" MIN

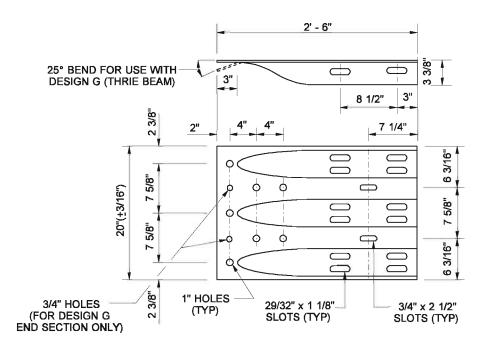
8 1/2"



DESIGN D (THRIE BEAM)

12 GAGE PLATE

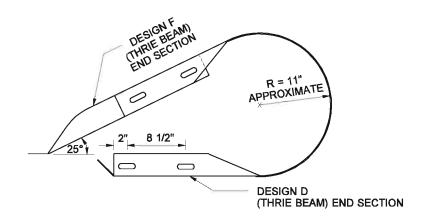
SLOTS (TYP)

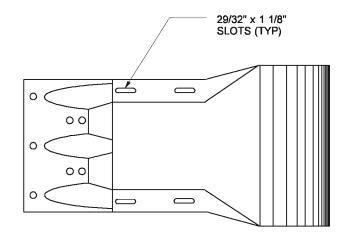


DESIGN F (THRIE BEAM)

NOTES

- Attach guardrail to bridge rail or concrete barrier with 7/8" diameter high strength bolts (Standard Specification 9-06.5(4)) with thin slab ferrule inserts or resin bonded anchors. See the Contract Plans.
- In cases where Design F End Section is lapped on the outside of the guardrail, a galvanized 1" ID, 2" OD, 0.134" thick, narrow Type A Plain Washer or an anchor rail washer will be placed under the splice bolt heads.





DESIGN G (THRIE BEAM)



END SECTIONS
STANDARD PLAN C-7a

THRIE BEAM

SHEET 1 OF 1 SHEET

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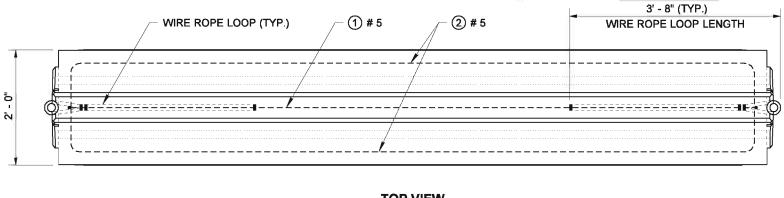
Harold J. Peterfeso 10-31-03

STATE DESIGN ENGINEER DATE

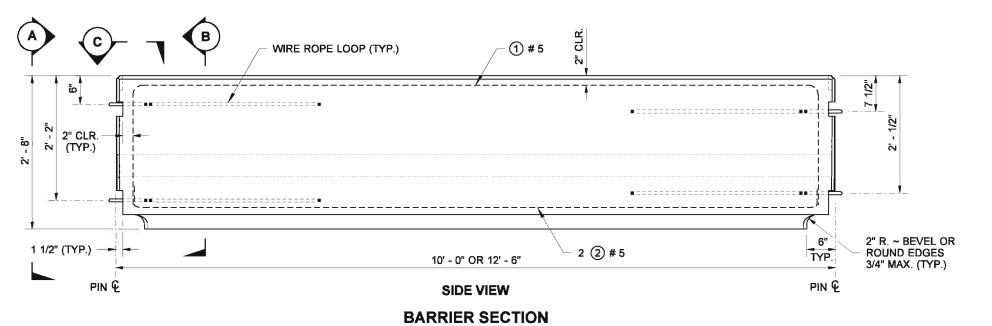
10/2003 REV. NOTE 1. MHG
DATE REVISION BY

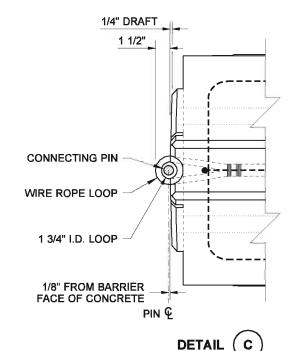
3. Connecting and Drift Pin head designs vary among different manufacturers. Pin designs that are shaped differently than those shown in the detail are acceptable, if the bearing surface is within the minimum and maximum widths specified.

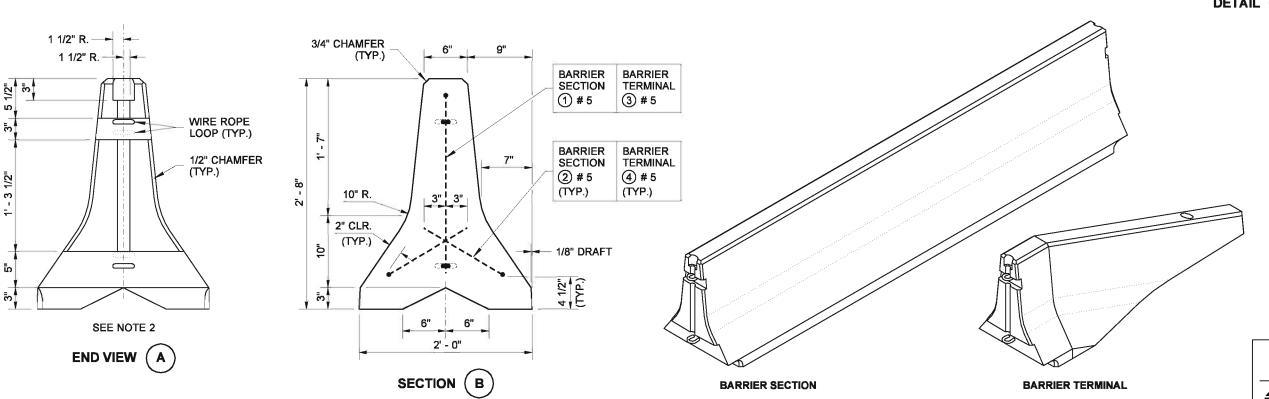
4. The vertical spacing of the Wire Rope Loops in a Barrier Terminal is determined by the end of the Barrier Segment to which it is being connected. See BARRIER CONNECTION DETAIL (Sheet 2).



TOP VIEW







BARSTON

OF WASHINGTON WASHINGTON WASHINGTON ON SUMPLEMENT AND A COLUMN SUMPLE

CONCRETE BARRIER TYPE 2 STANDARD PLAN C-8

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

04-27-04

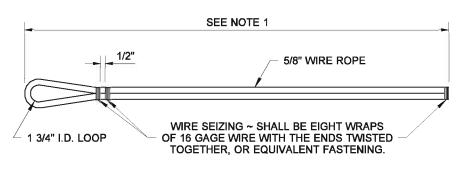
Harold J. Peterfeso



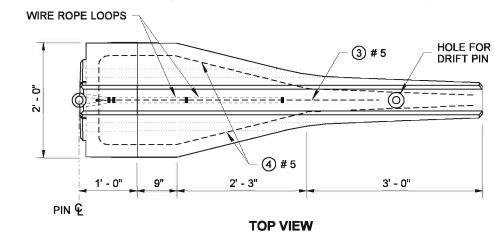
FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

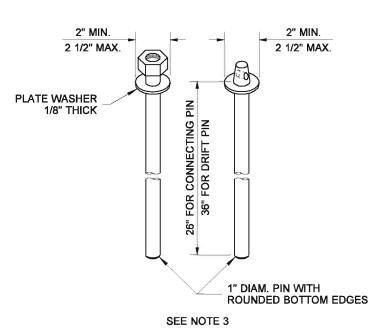
FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

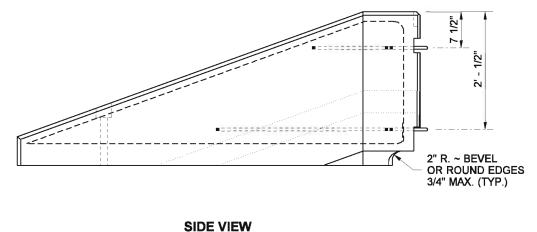
ISOMETRIC VIEWS



WIRE ROPE LOOP DETAIL







GES

1 1/2" (TYP.)

PIN ©

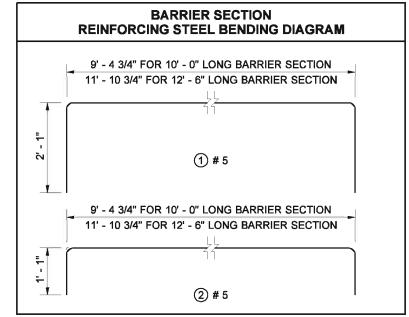
B

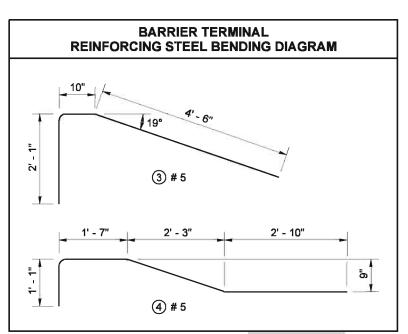
SIDE VIEW

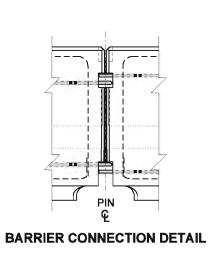
SEE NOTE 4

CONNECTING PINS AND DRIFT PINS

BARRIER TERMINAL









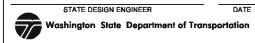
CONCRETE BARRIER TYPE 2

STANDARD PLAN C-8

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

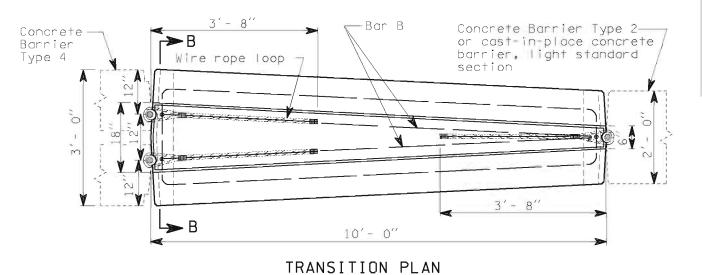
Harold J. Peterfeso 04-27-04



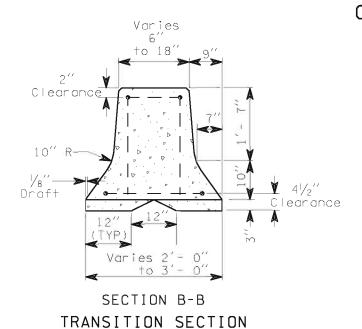
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 #Tre rope Toop (TYP) #5 Bars Clearance-Face of concrete at © of barrier 10'- 0" or 12'- 6" INTERMEDIATE PLAN (Bar B) (TYP) Clearance rope loop -== or alternate tbar loop (TYP) -2½" Clearance Two #5 Bars Lifting notches (Bar A) Clearance Bevel or round edges $(\sqrt[3]{4})''$ MAX) 10'- 0" or 12'- 6" INTERMEDIATE ELEVATION Draft Bridge Pier Clearance 41/2" Clearance SECTION A-A TYPE 4 TRANSITION END VIEW

EFFECTIVE: JANUGERY 7, 2008 TO AUGUST 3, 2008

end notches see Standard Plan "Concrete Barrier



Two #5 Bars (Bar B) 1 1/2" (TYP) → (TYP) Clearance $\frac{3}{4}$ Chamfer Wire rope loop or alternate bar ½″ R→ $\leftarrow 2\frac{1}{2}$ Clearance loop (TYP) _Two #5 Bars edges $(\frac{3}{4}^{"})$ MAX) Clearance 10'- 0" TRANSITION ELEVATION



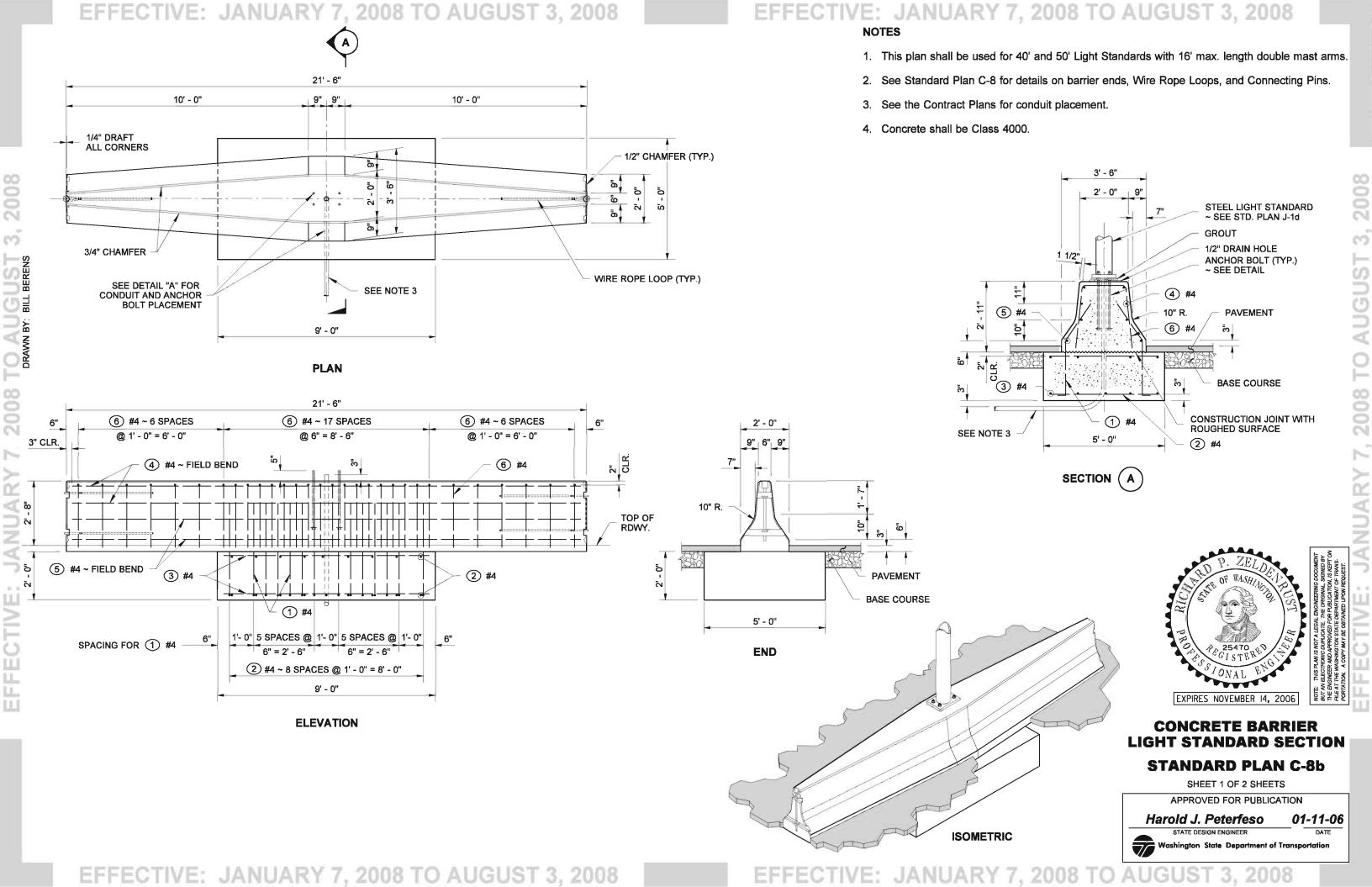
CONCRETE BARRIER TYPE 4 AND TRANSITION SECTION

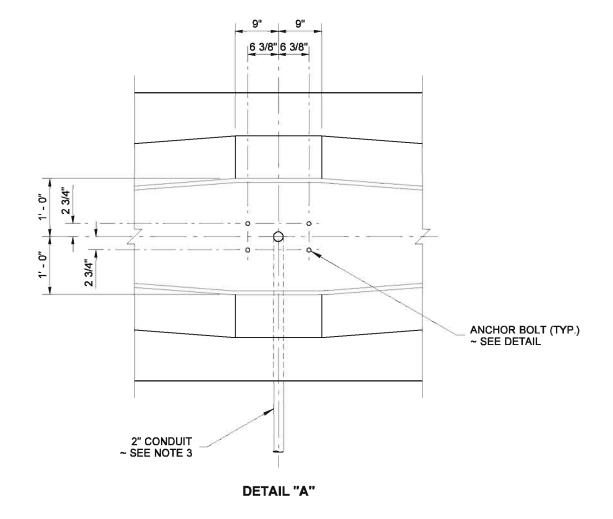


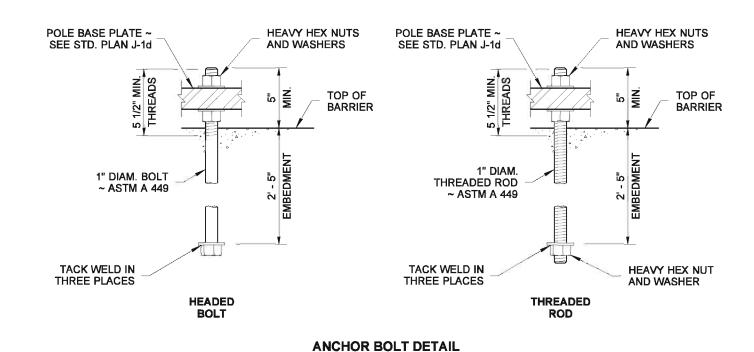
STANDARD PLAN C-8a

APPROVED FOR PUBLICATION Donald K. Nelson 07/25/97 STATE DESIGN ENGINEER WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

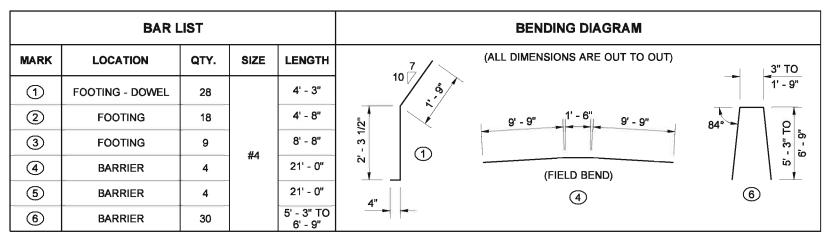
2008 TO AUGUST

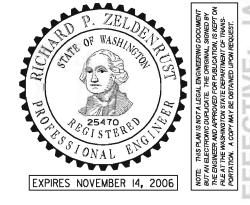






GALVANIZE EXPOSED ANCHOR ROD END 1' - 0" MIN.





CONCRETE BARRIER LIGHT STANDARD SECTION STANDARD PLAN C-8b

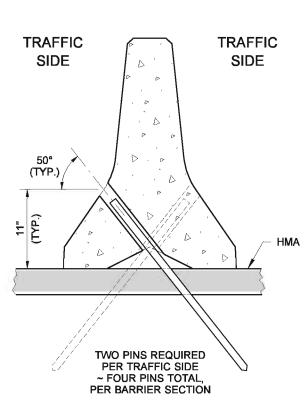
SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION





TRAFFIC SHOULDER SIDE **WIDENING** PRECAST CONC. BARRIER TYPE 2 2" DIAM. PINNING HOLE (TYP.) 1' - 0" MIN. **HMA** 1" DIAM. × 30" GALVANIZED STEEL PIN (TYP.) TWO PINS REQUIRED ON THE TRAFFIC SIDE ~ TWO PINS TOTAL, PER BARRIER SECTION **SECTION VIEWS**



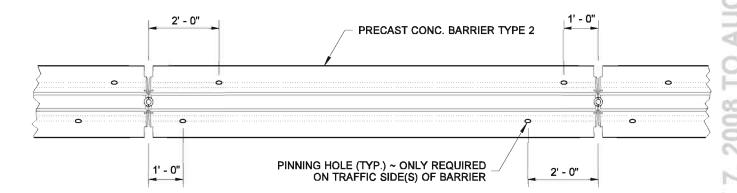
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

TYPE 3 ANCHOR PIN LOCATIONS

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

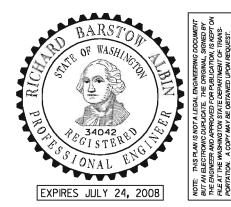
NOTES

- 1. The intended use of this plan is for the permanent anchoring of Precast Concrete Barrier Type 2 (see Standard Plan C-8) on hot mix asphalt pavement.
- 2. Remove the Type 3 Anchors by first driving the steel pins down through the barrier further into the pavement to allow lifting the barrier without interference, then remove the pins from the pavement.
- 3. After removing the Type 3 Anchors, clean the pin holes and fill them with sealant according to Standard Specification 9-04.2.



PLAN VIEW

TYPE 3 ANCHOR PIN LOCATIONS



PRECAST CONC. BARRIER **ANCHOR ~ TYPE 3** (PERMANENT) **STANDARD PLAN C-8e**

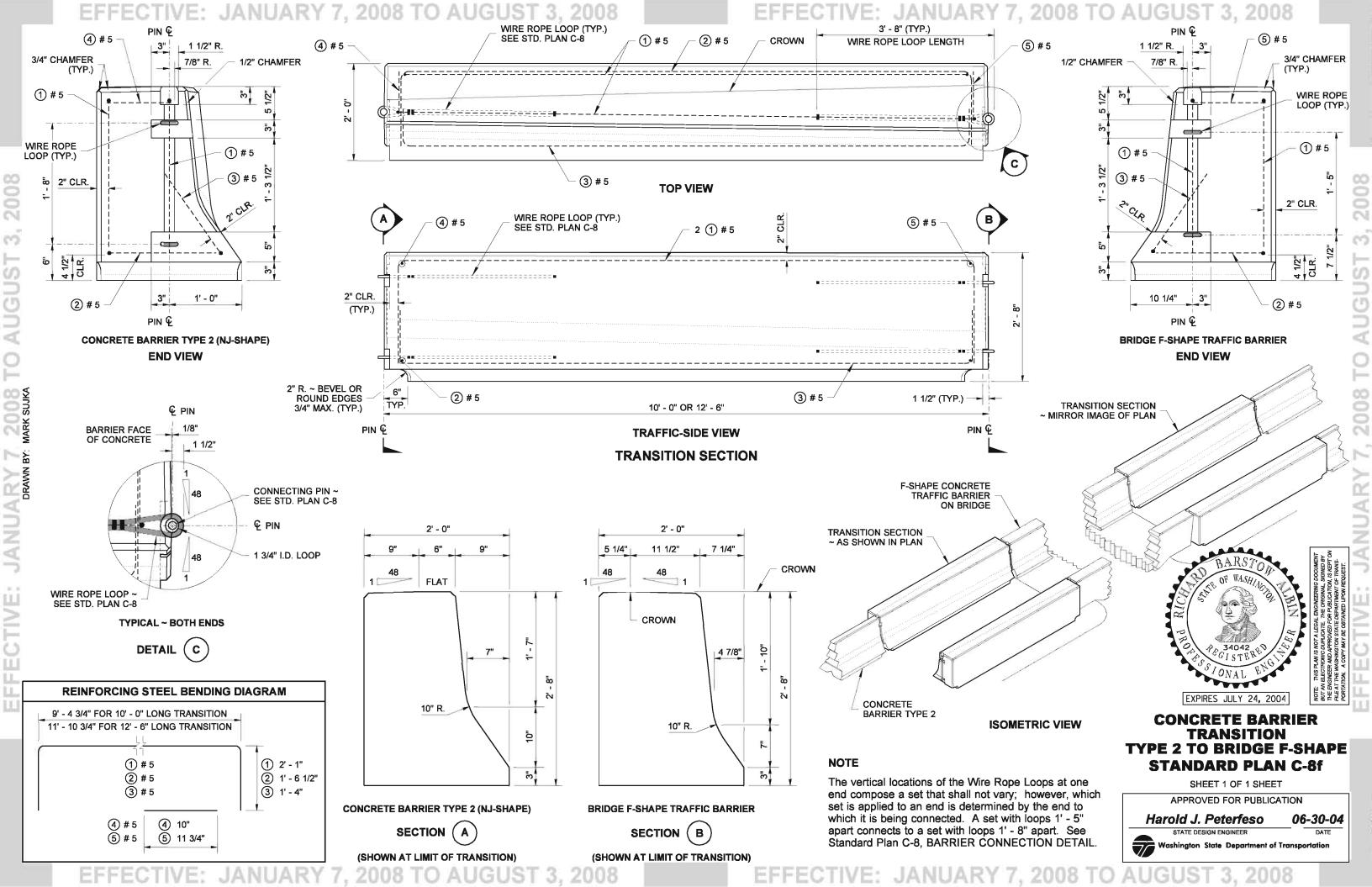
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Ken L. Smith 02-21-07

BY

REVISION

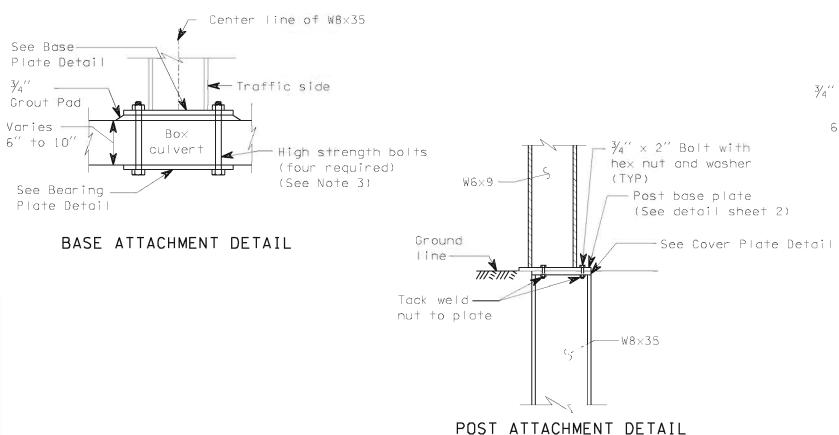
REMOVED TEMPORARY ANCHORS



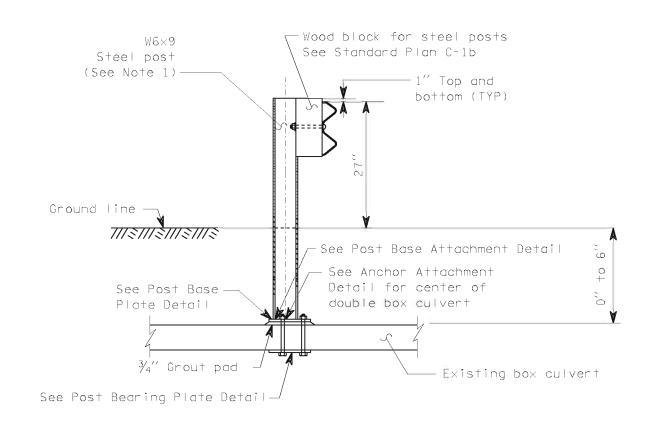
See Standard Plan C-1b Steel post 1" Top and bottom (TYP) See Post Attachment Detail See Post Base Plate Detail -Ground line -See Cover Plate Detail -W8×35 See Note 1 -See Base Attachment Detail See Anchor Attachment Detail for center of See Base Plate Detail double box culvert Existing box culvert $\frac{3}{4}$ Grout pad See Bearing Plate Detail—

BOX CULVERT GUARDRAIL STEEL POST TYPE 1

(6" to 36" ground cover)

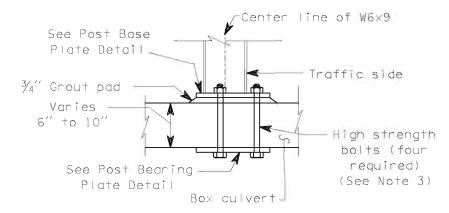


EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

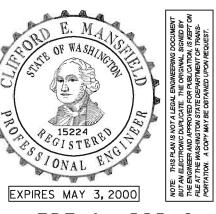


BOX CULVERT GUARDRAIL STEEL POST TYPE 2

(0" to 6" Ground cover)



POST BASE ATTACHMENT DETAIL



BOX CULVERT GUARDRAIL STEEL POST STANDARD PLAN C-10

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION Clifford E. Mansfield 07/31/98

DEPUTY STATE DESIGN ENGINEER WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

Added wood block for steel posts. DATE REVISION

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3.

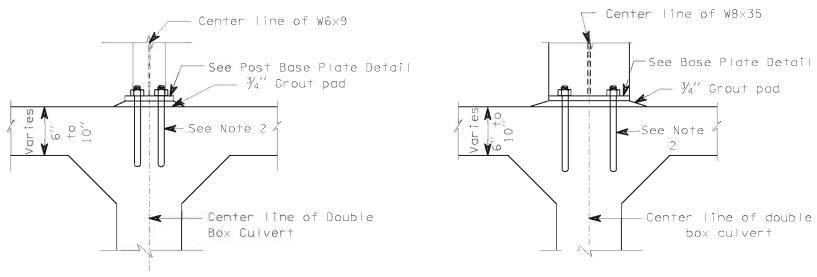
SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

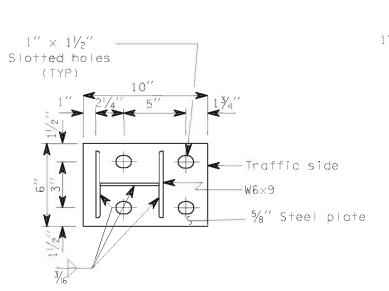
07/31/98

DEPUTY STATE DESIGN ENGINEER



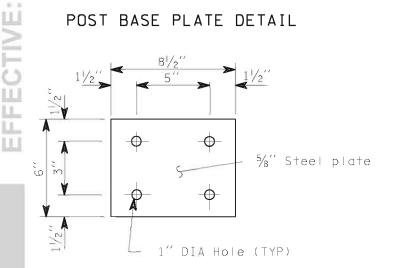


ANCHOR ATTACHMENT DETAIL (See Note 4)

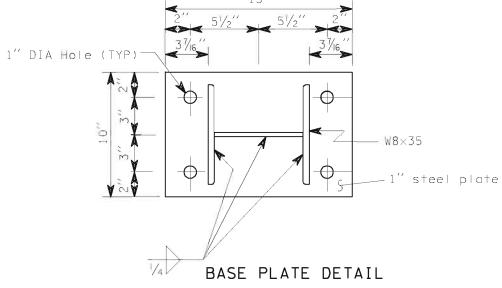


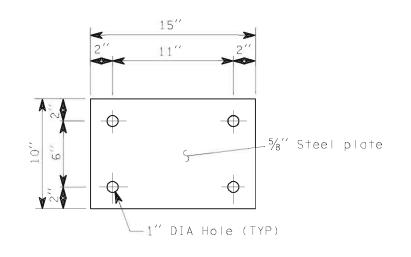
POST ANCHOR ATTACHMENT DETAIL (See Note 4)

POST BASE PLATE DETAIL



POST BEARING PLATE DETAIL





BEARING PLATE DETAIL

verified by the contractor. 4. For details of post attachment to double box culvert see Standard Plan "Guardrail Placement," Case 15.

1. Length of $W8\times35$ and $W6\times9$ shall be determined

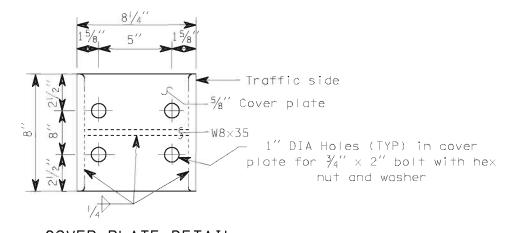
2. Attach guardrail post to box culvert with $\frac{3}{4}$ "

high strength bolts with resin bonded anchors.

3. Drill $1\frac{1}{4}$ diameter hole in concrete slab for $\frac{7}{8}$ "

by measurement from top of ground to top of grout pad. This distance shall be verified by the contractor.

high strength bolts. Length of bolt is determined by top slab of box culvert thickness which shall be



COVER PLATE DETAIL



BOX CULVERT GUARDRAIL STEEL POST STANDARD PLAN C-10

Clifford E. Mansfield

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

REVISION

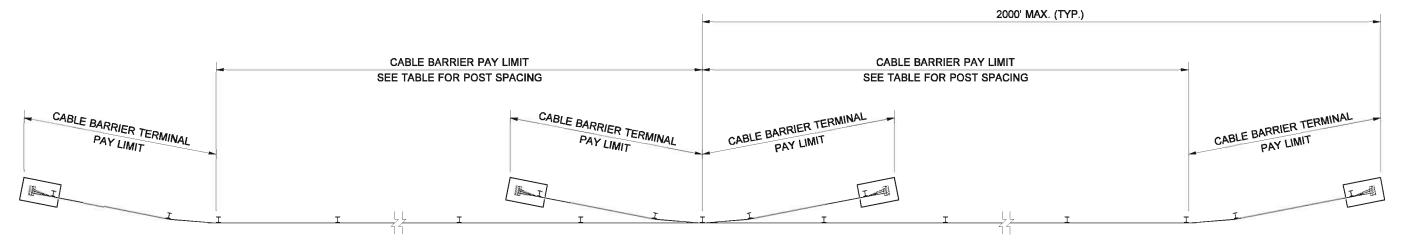
DATE

NOTES

TABLE						
CURVE RADIUS	POST SPACING					
LESS THAN 110'	USE NOT RECOMMENDED					
110' TO 219'	6'					
220' TO 699'	12'					
700' OR MORE AND TANGENT SECTIONS	16'					

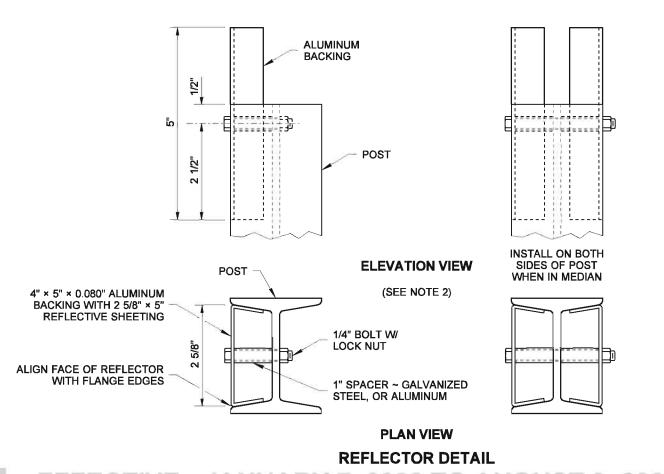
1.	When installed in front of slopes steeper than 6:1, the distance
	between posts and slope break point shall be 1' - 0" minimum

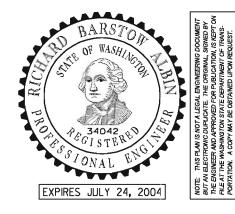
- 2. Where barrier is parallel to the edge of the travelled way, every sixth post shall have a reflector; see Reflector Detail. Reflectors shall be white when installed on the right side of traffic, and yellow when installed on the left side of traffic.
- 3. See Standard Plan C-11b for Cable Barrier Terminal details.



(MEASURE ALONG FACE OF CABLE BARRIER)

PLAN VIEW CABLE BARRIER PLACEMENT





CABLE BARRIER PLACEMENT

STANDARD PLAN C-11a

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Harold J. Peterfeso

05-20-04

REVISED TABLE, NOTE 1, & REFLECTOR DETAIL DATE REVISION

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

1. Stagger Spring Cable End assemblies for clearance between units. Installation of cable end assemblies shall be as follows:

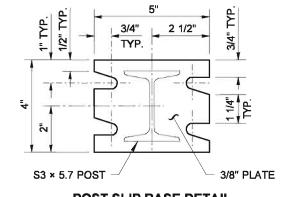
LENGTH OF CABLE RUNS:

Up to 500' ~ Use the Spring Cable End Assembly on one end, and turnbuckle only on the other end of each cable.

Over 500' to 2000' ~ Use the Spring Cable End Assembly on each end of each cable.

- 2. Distance from tangent of barrier run to notch for top cable on breakaway anchor angle shall be 4'
- Where the cable is connected to a cable socket with a wedge type connector, one wire of the wire rope shall be crimped over the base of the wedge to hold it firmly in place.

	TABL	E	
CABLE BARRIER	A TOP OF FOOTING TO TOP OF HIGHEST CABLE	B SLIP POST DIMENSIONS	C BETWEEN CABLES
TYPE 1	27"	S3 × 5.7 × 27 1/4"	3"
TYPE 2	30"	S3 × 5.7 × 30 1/4"	4 1/2"
TYPE 3	30"	S3 × 5.7 × 30 1/4"	4 1/2"



9/16" DIAM.
HOLES (TYP.)

28 GAGE GALVANIZED SHEET METAL

POST SLIP BASE DETAIL

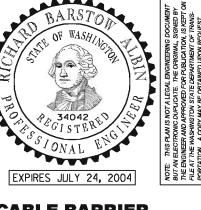
BRACKET DETAIL

ပ

DATE

B (SEE TABLE)

CUT A SLOT TO MAKE AN 1/8" THICK TAB APPROX. 1" LONG, BEND AROUND CABLE 1/2" PLATE STA



CABLE BARRIER TERMINAL STANDARD PLAN C-11b

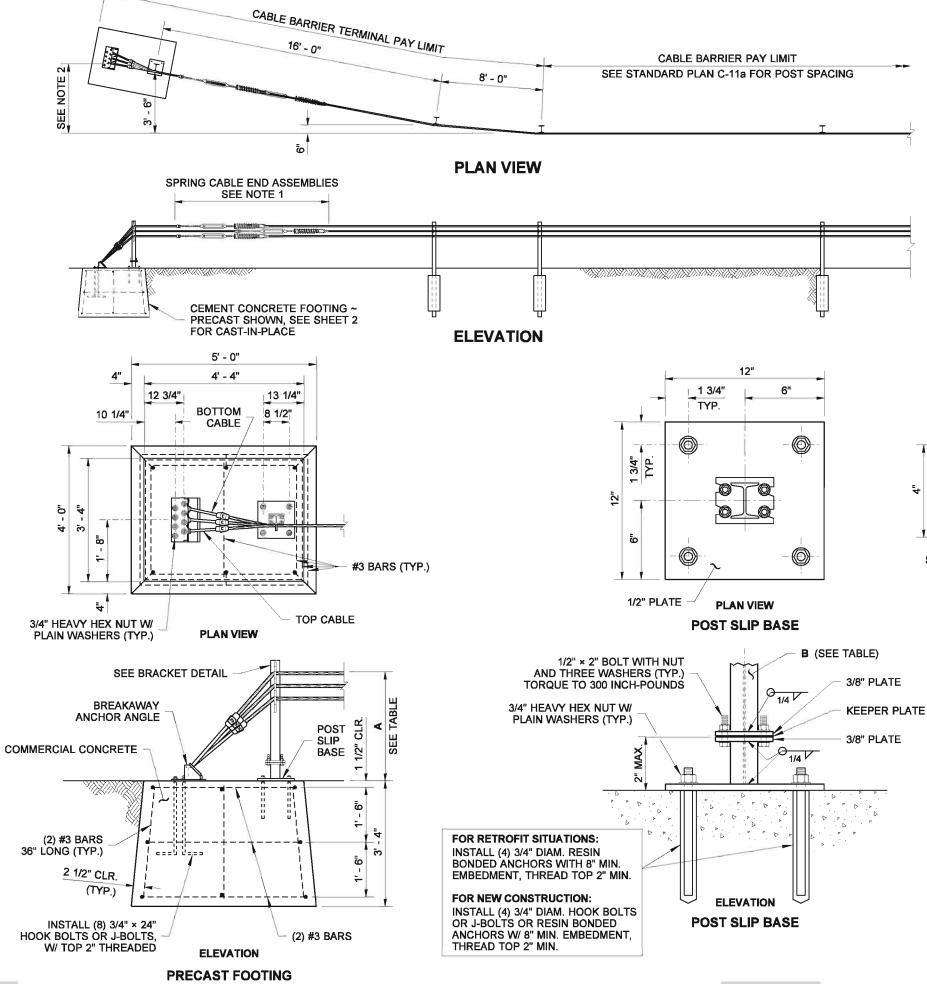
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 05-20-04

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

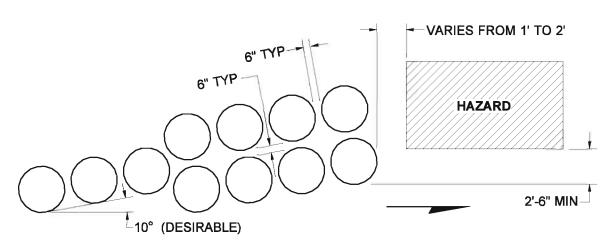


EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

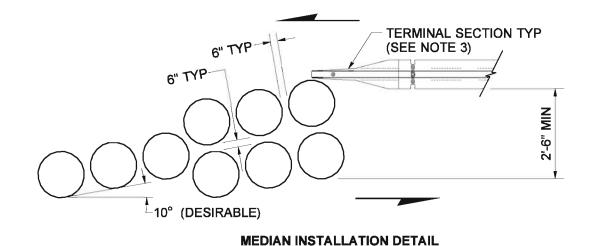
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

ECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

REV. FOUNDATION: REV. BOLT LENGTH FOR SLIP BASE.



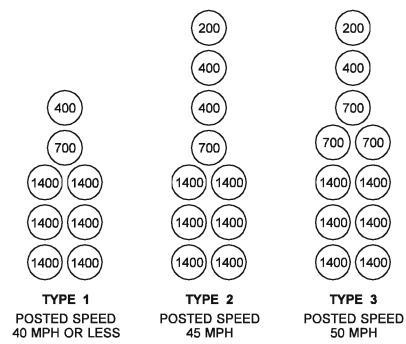
ROADSIDE INSTALLATION DETAIL

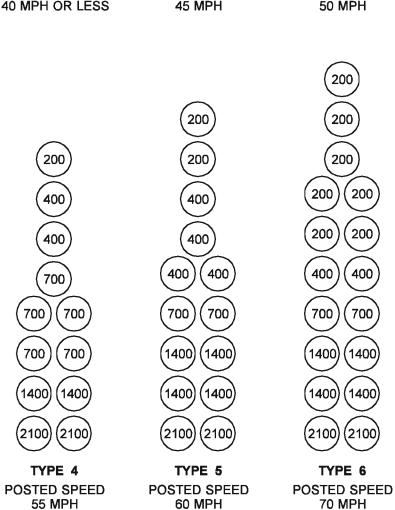


6" TYP 6" TYP→ VARIES FROM 1' TO 2' **CONCRETE BARRIER TYP** (SEE NOTE 3) 2'-6" MIN-

INSTALLATION DETAILS

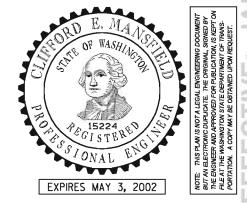
GORE INSTALLATION DETAIL





ATTENUATOR CONFIGURATIONS

ı	NOTES
1.	An Energite III System, fabricated by Energy Absorption Systems, Inc., a Fitch System as fabricated by Roadwa Safety Service, Inc., or a Traffix Sand Attenuator as fabricated by Traffix Devices, Inc. shall be installed in accordance with the manufacturer's recommendations.
2.	For temporary installations, the inertial barriers may be placed on wood pallets that are 4" or less in height.
3.	For Terminal Section or Concrete Barrier details see Standard Plan C-8.



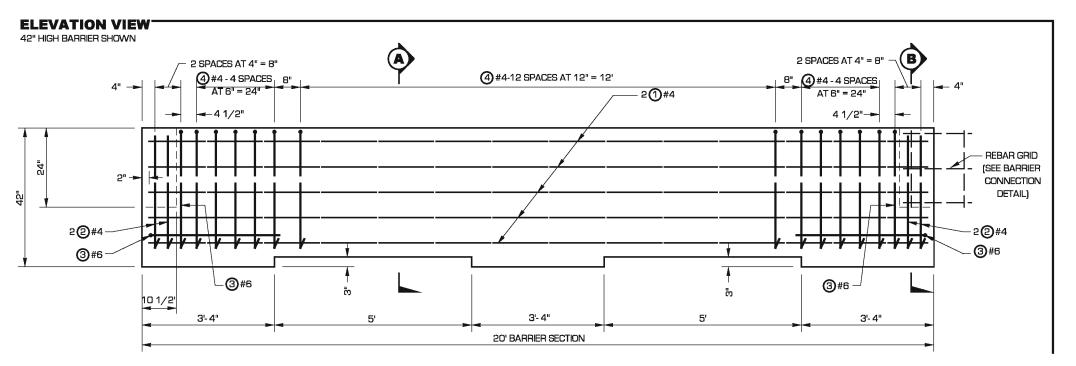
IMPACT ATTENUATOR INERTIAL BARRIER CONFIGURATIONS STANDARD PLAN C-12

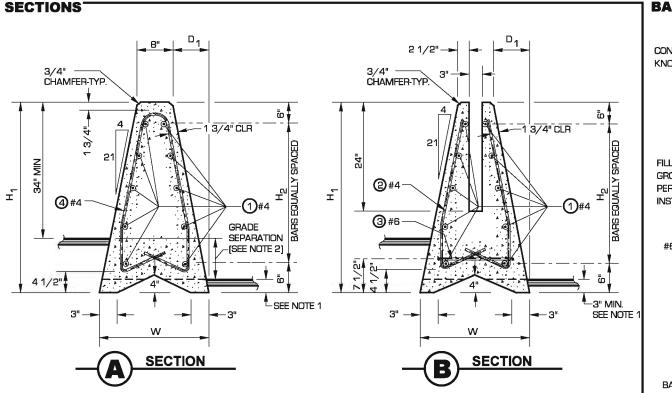
APPROVED FOR PUBLICATION 07-27-01

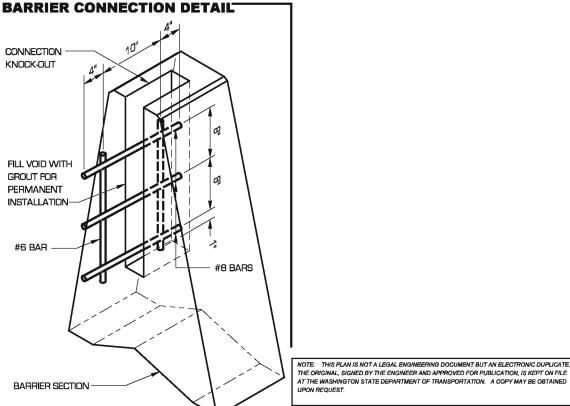
Clifford E. Mansfield

CORRECTED GORE INSTALLATION DETAIL DATE REVISION

20' BARRIER SECTION 10 1/2' 10 1/2' 21/2" 21/2" 21/2"







NOTES

- PERMANENT BARRIER SHALL BE PLACED INTO THE PAVEMENT A MINIMUM OF 3". NO EMBEDMENT REQUIRED FOR TEMPORARY BARRIER.
- 2. USE 42" BARRIER FOR GRADE SEPARATIONS UP TO 5".
 USE 48" BARRIER FOR GRADE SEPARATIONS UP TO 7".
 USE 54" BARRIER FOR GRADE SEPARATIONS UP TO 10".
- 3. USE ON A HORIZONTAL CURVE WITH RADII LESS THAN 2000' REQUIRES A MODIFIED END DESIGN.

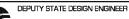


SINGLE SLOPE BARRIER PRE-CAST TYPE STANDARD PLAN C-13

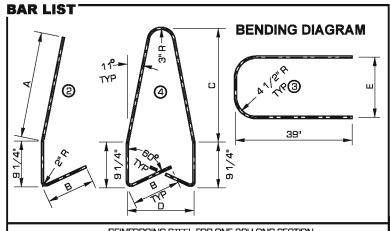
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

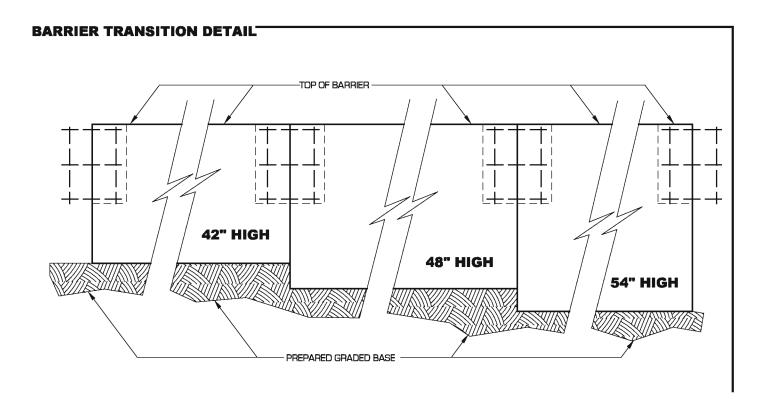




04-16-99 DATE



	REINFORCING STEEL FOR ONE 20' LONG SECTION										
H ₁	MARK	SIZE	No.	LENGTH	Α	В	C	D	Е		
	1	#4	10	19'-8"	-	-	-	-	-		
	2	#4	8	41.3"	24"	10"	-	-	-		
	3	#6	2	90.1"	-	-	-	-	16.1"		
₽	4	#4	25	67"	-	10"	26.8"	15"			
4	H1	-	-	42"	-	-	-	-			
	H2	-	-	30"	-	-	-	-			
	W	ı	-	24"	-	-	-	-	1		
	D1	-	-	8"	-	-	-	-			
	1	#4	12	19'-8"	-	-	-	-	-		
	2	#4	8	50.4"	31.1"	12"	-	-			
	3	#6	2	93.7"	-			-	17.7"		
48 ₁	4	#4	25	104"	-	12"	33.5"	17"			
4	H1	-	-	48"	-	-	-	-	-		
	H2	-	-	36"	-	-	-	-			
	W	-	-	26"	-	-	-	-	-		
	D1	-	-	9.1"	-	-	-	-			
	1	#4	14	19'-8"	-	-	-	-			
	2	#4	8	57.9"	37.6"	13"	ı	-	ı		
	3	#6	2	97.3"	-	-	-	-	21.1"		
54"	4	#4	25	119"	-	13"	40"	20.3":	ı		
ĽĎ	H1	-	-	54"	-	-	-	-	•		
	H2	-	-	42"	-	-	-	-			
	W	-	-	28.6"	-	-	-	-	-		
	ם1	-	-	10.3"	-	-	-	-	-		





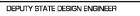
SINGLE SLOPE BARRIER PRE-CAST TYPE STANDARD PLAN C-13

SHEET 2 OF 2 SHEETS

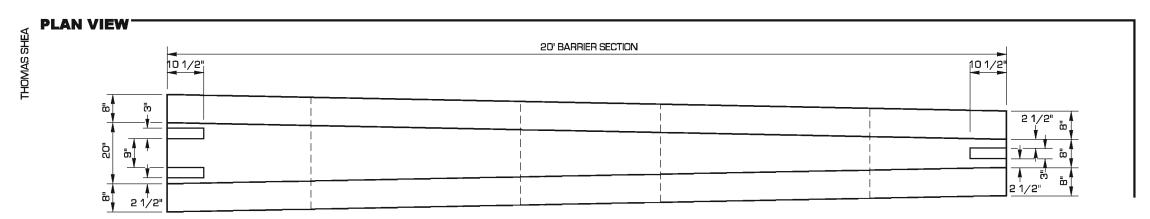
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APPROVED FOR PUBLICATION

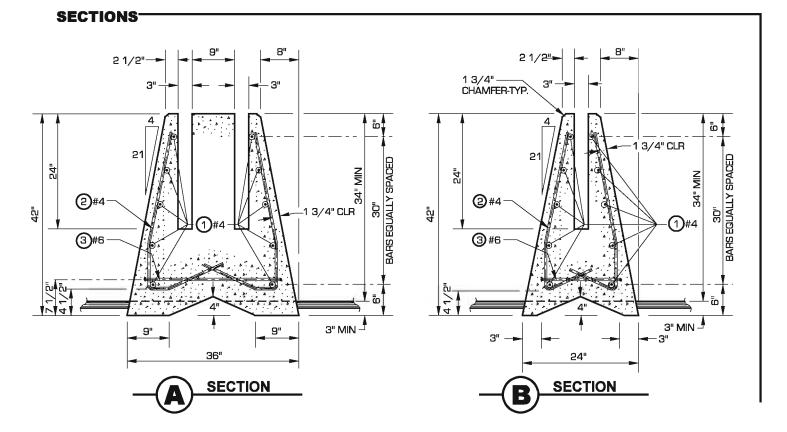


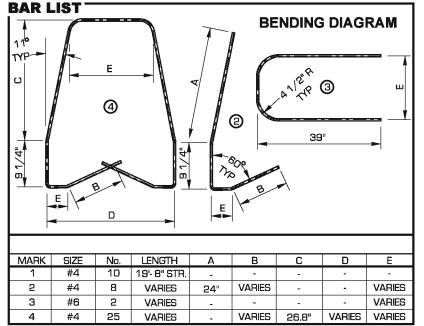


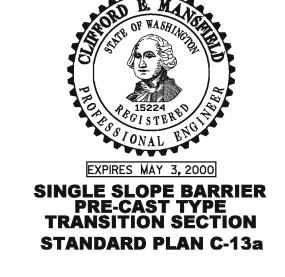
04-16-99 DATE



ELEVATION VIEW (B) 2 SPACES AT 4"=8" 2 SPACES AT 4"=8" #4-4 SPACES | 8" (4)#4-12 SPACES AT 12"=12" 8" 4#4-4 SPACES 4" -1)#4 AT 6"=24" ---- 4 1/2" 4 1/2"-> REBAR GRID (SEE BARRIER CONNECTION DETAIL] SEE STD. PLAN C-13 2@#4-2@#4 **3**#6 3#6-**3**#6 **3**#6 10 1/2" 3'- 4" 5'-0" 3'- 4" 5'- 0" 20' BARRIER SECTION





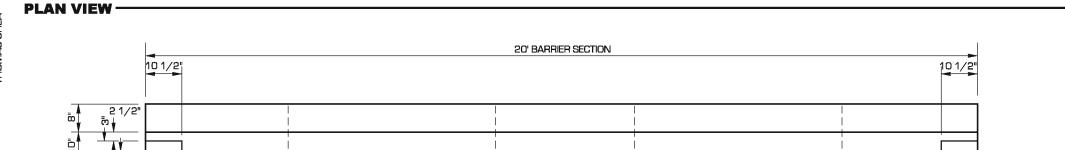


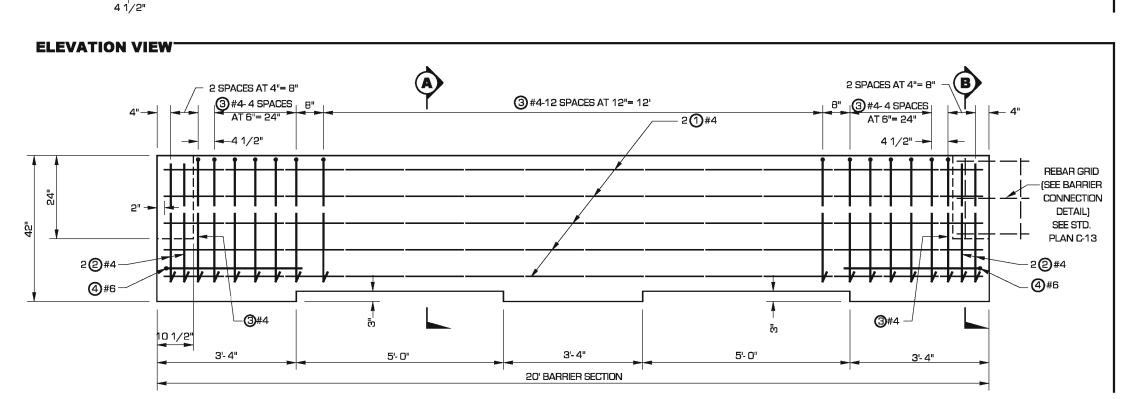
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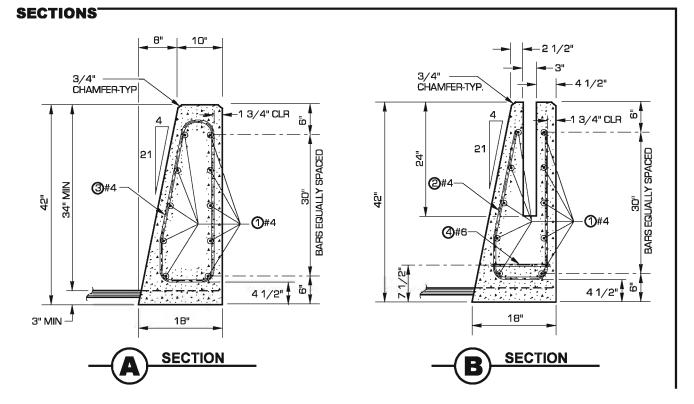


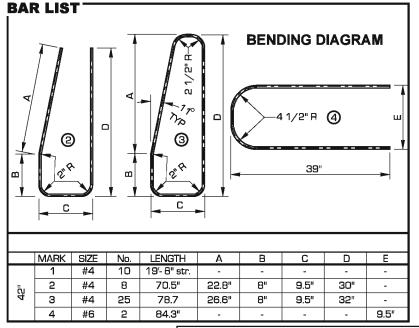


DATE









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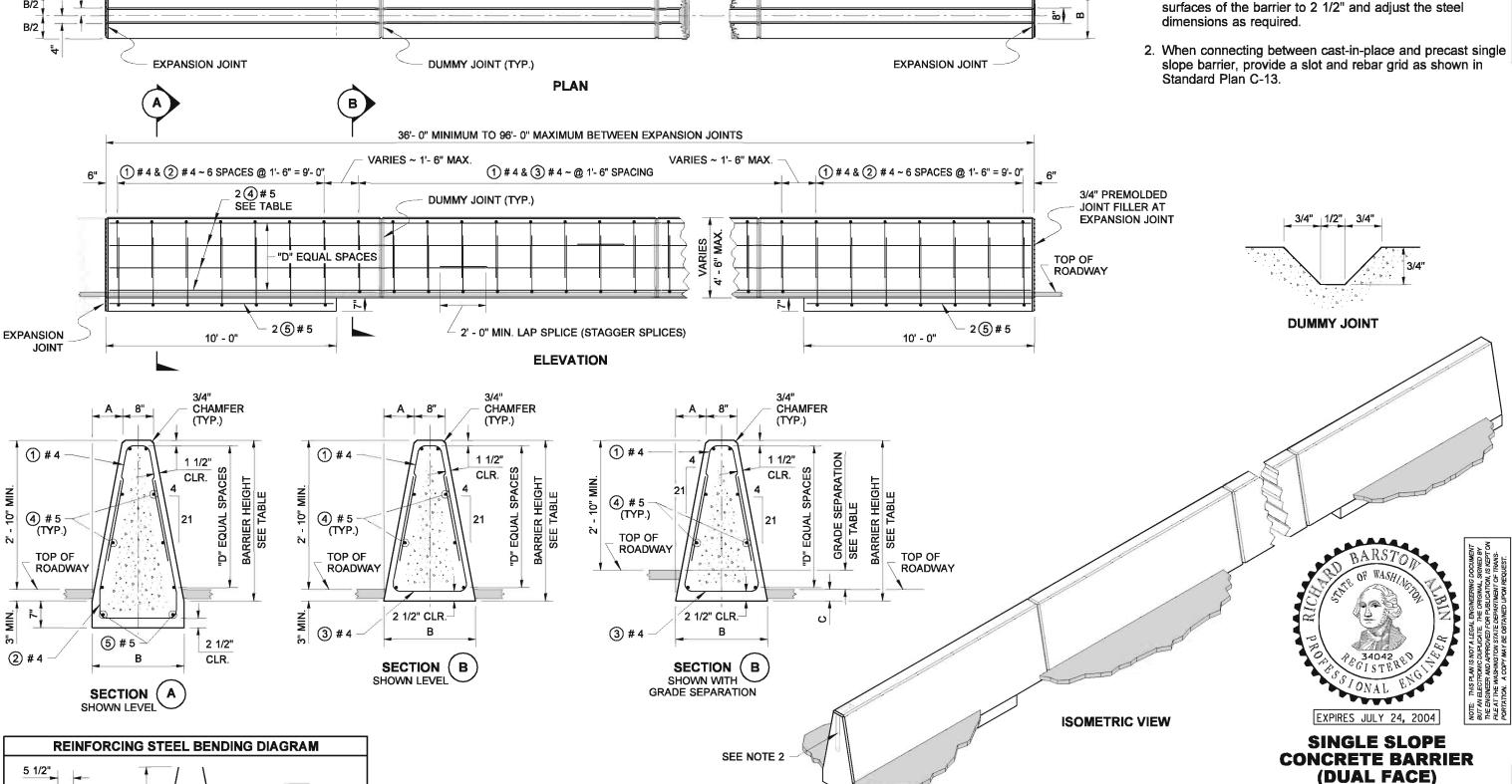


SINGLE SLOPE BARRIER PRE-CAST TYPE SINGLE SIDED SECTION **STANDARD PLAN C-13b**

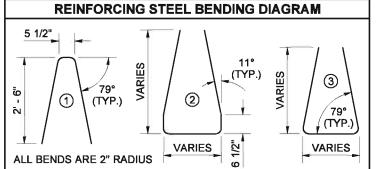
APPROVED FOR PUBLICATION

Clifford E. Mansfield 04-16-99





12'- 0" MAX.

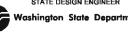


DIMENSION TABLE										
GRADE SEPARATION	BARRIER HEIGHT	A	В	С	D	HORIZONTAL BARS (QTY.)				
0 TO 5"	3' - 6"	8"	2' - 0"	3"	3	8				
UP TO 7"	4' - 0"	9 1/8"	2' - 2 1/4"	7"	4	10				
UP TO 10"	4' - 6"	10 1/4"	2' - 4 1/2"	10"	5	12				

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

STANDARD PLAN C-14a

Harold J. Peterfeso 07-26-02



SECTION (B

SECTION

SEE NOTE 1

NOTES

1. Field bend as required in transition.

2. All bends are 2" radius.

7

VARIES 1' - 7" TO 1' - 8"

2008

STANDARD PLAN C-14b

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso

07-26-02

3/4" CHAMFER (TYP.)

1 1/2"

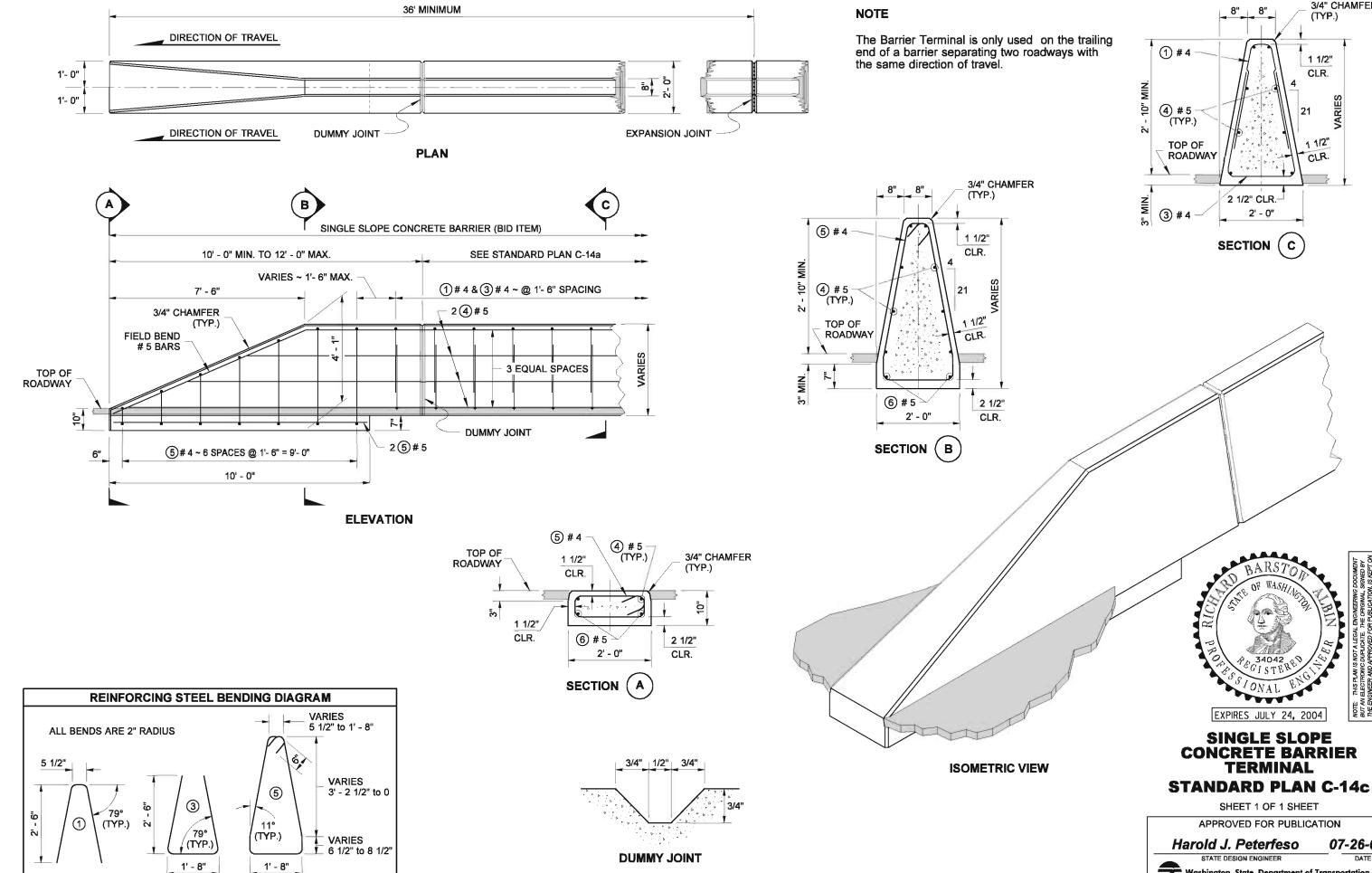
CLR.

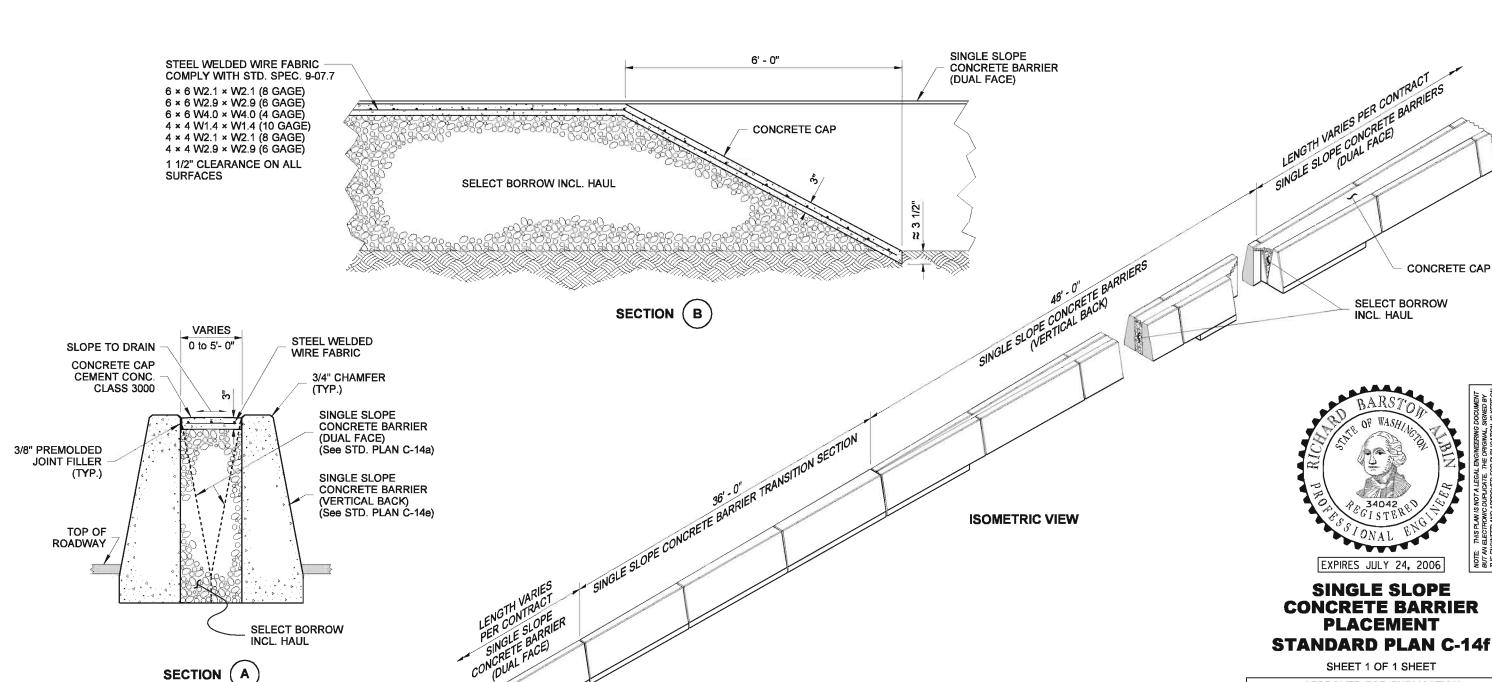
1 1/2"

CLR.

07-26-02

2' - 0"





APPROVED FOR PUBLICATION

BY

IN SECTION "A", REVISED REFERENCE TO STD. PLAN C-14e

REVISION

DATE

Harold J. Peterfeso 09-02-05

AUGUS

12' - 0" MAX. (TYP.)

EXPANSION JOINT

36' - 0"

SINGLE SLOPE CONCRETE BARRIER TRANSITION SECTION

(SEE STD. PLAN C-14d)

DUMMY JOINT (TYP.)

EXPANSION JOINT

LENGTH VARIES PER CONTRACT

SINGLE SLOPE

CONCRETE BARRIER

(DUAL FACE)

(SEE STD. PLAN C-14a)

LENGTH VARIES PER CONTRACT

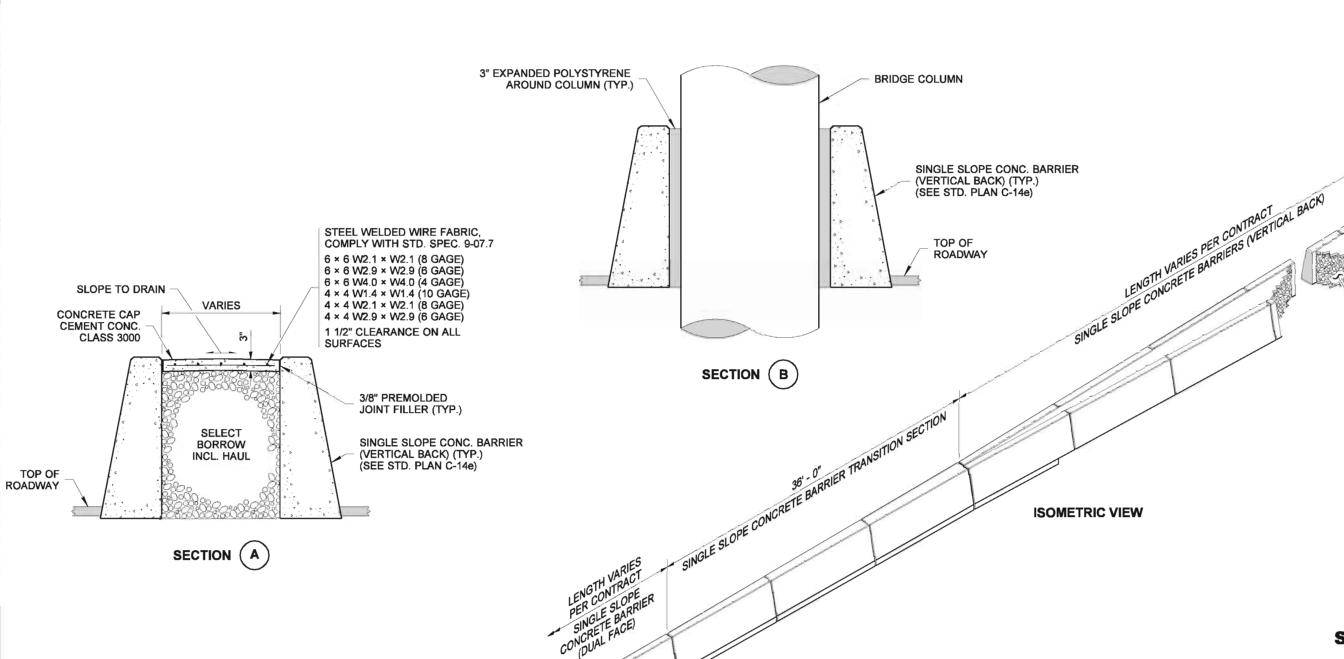
SINGLE SLOPE CONCRETE BARRIERS (VERTICAL BACK)

(SEE STD. PLAN C-14e)

CONCRETE CAP

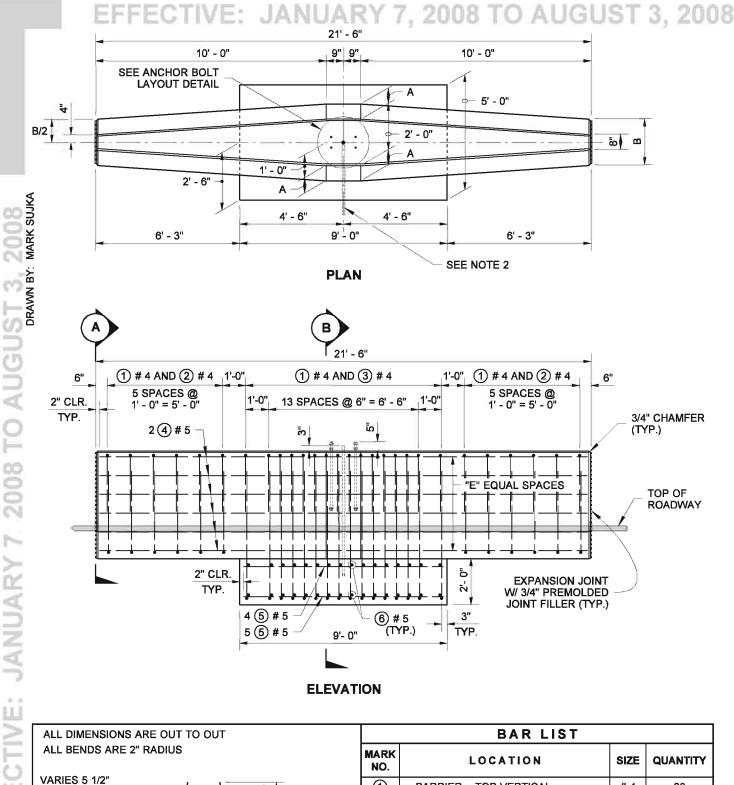
SEE CONTRACT FOR TAPER RATE

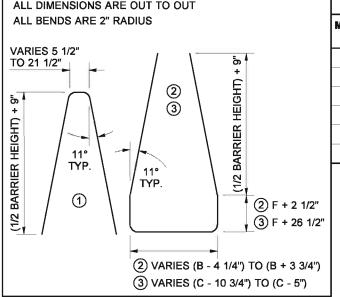
PLAN



BRIDGE COLUMN

00

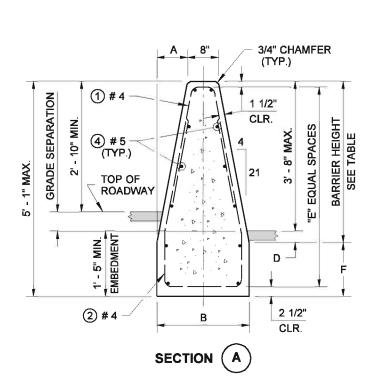


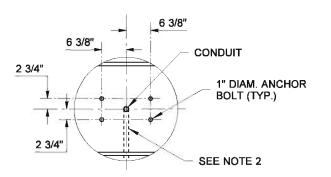


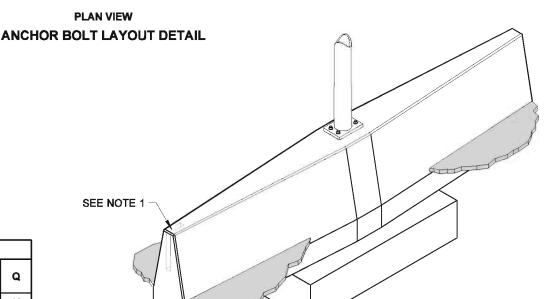
	BAR LIST		
MARK NO.	LOCATION	SIZE	QUANTITY
1	BARRIER ~ TOP VERTICAL	# 4	28
2	BARRIER ~ BOTTOM VERTICAL	# 4	12
3	FND. & BARRIER ~ VERTICAL	# 4	16
4	BARRIER ~ HORIZONTAL	# 5	"Q"
(5)	FOUNDATION	# 5	9
6	FOUNDATION	# 5	32
	·		· ·

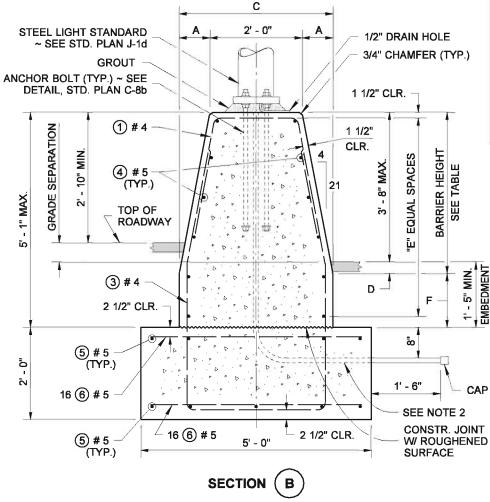
	TABLE								
GRADE SEPARATION	BARRIER HEIGHT	A	В	С	D	Е	F	ď	
0 TO 5"	3' - 6"	8"	2' - 0"	3' - 4"	3" MIN.	5	1' - 2"	12	
UP TO 7"	4' - 0"	9 1/8"	2' - 2 1/4"	3' - 6 1/4"	7" MIN.	5	10"	12	
UP TO 10"	4' - 6"	10 1/4"	2' - 4 1/2"	3' - 8 1/2"	10" MIN.	6	7"	14	

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008









NOTES

- When connecting between cast-in-place and precast Single Slope Barrier, provide a slot and rebar grid as shown on Standard Plan C-13.
- 2. See the Contract Plans for conduit placement.
- 3. Concrete shall be Class 4000.



SINGLE SLOPE CONCRETE BARRIER LIGHT STANDARD FOUNDATION STANDARD PLAN C-14h

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

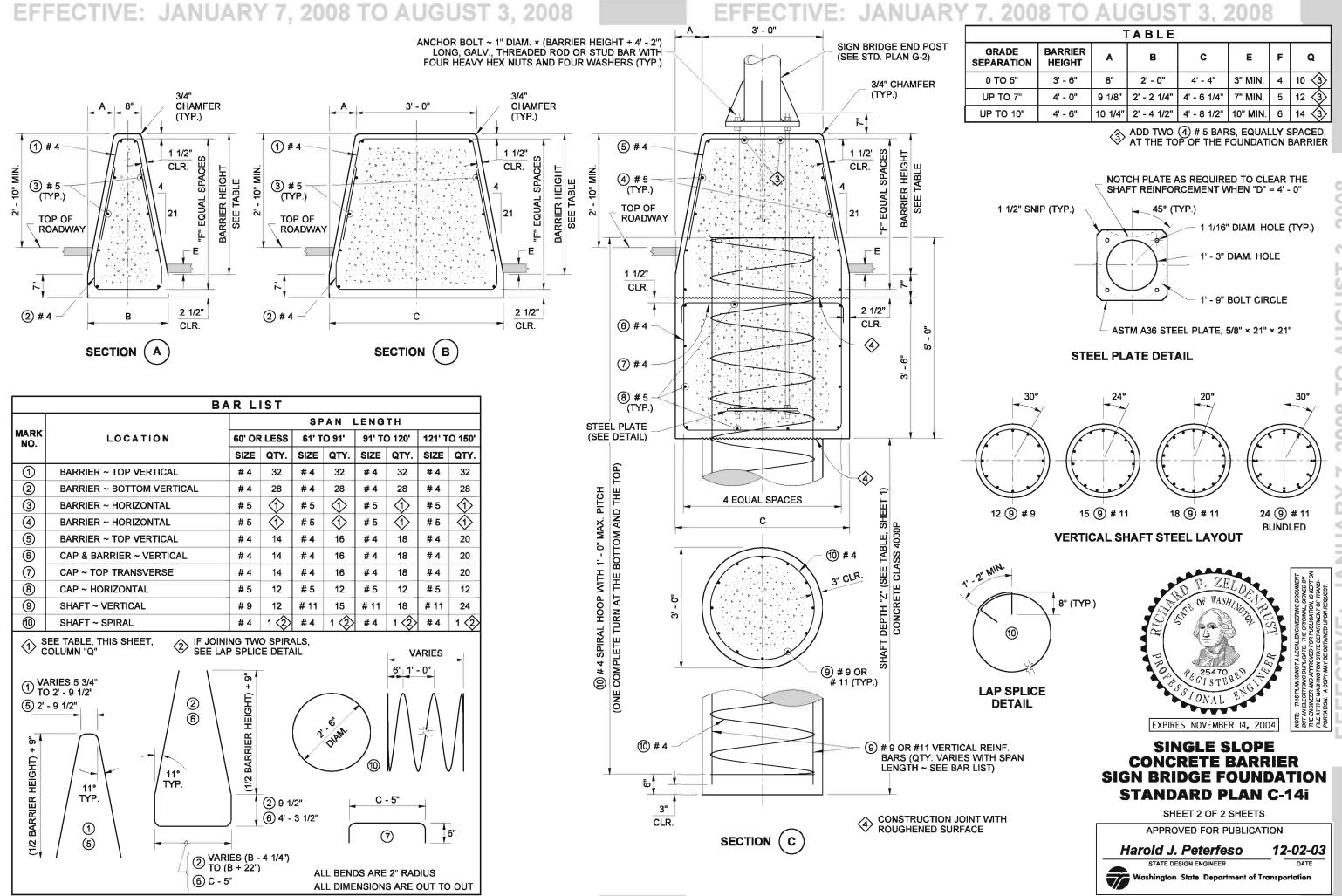
Harold J. Peterfeso 01-11-06



ISOMETRIC VIEW

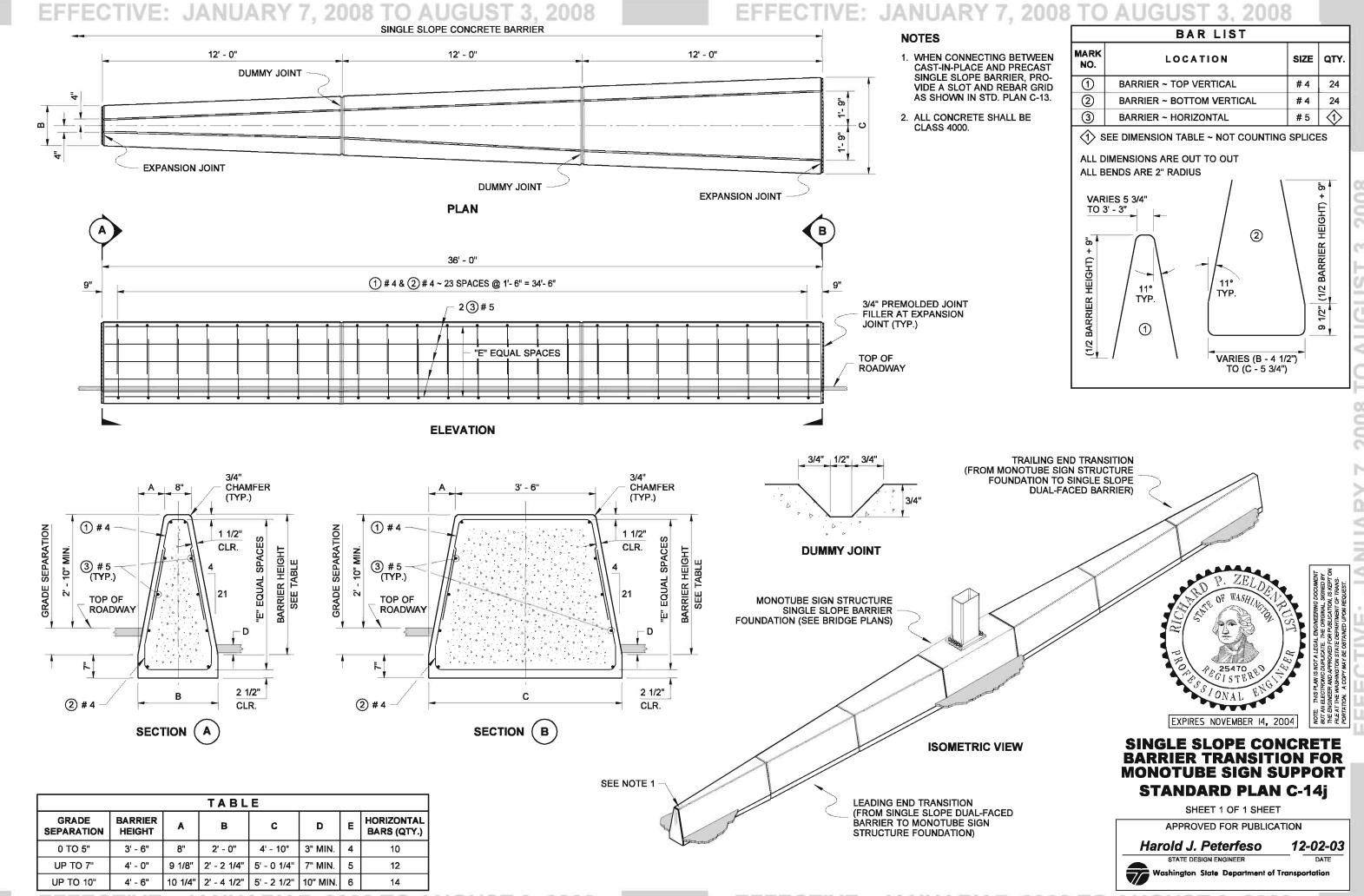
EFFECTIVE: JAN

JANUARY 7, 2008 TO



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



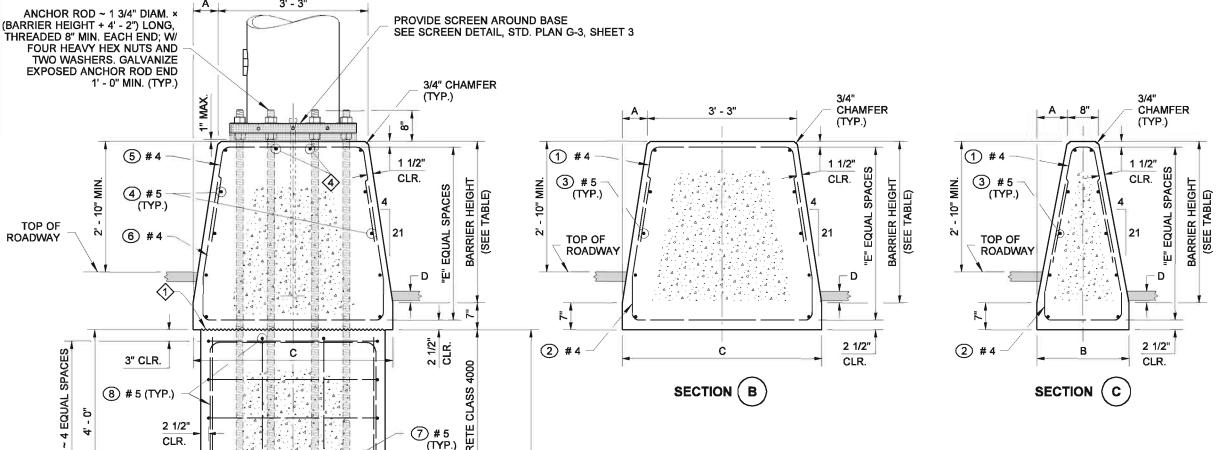


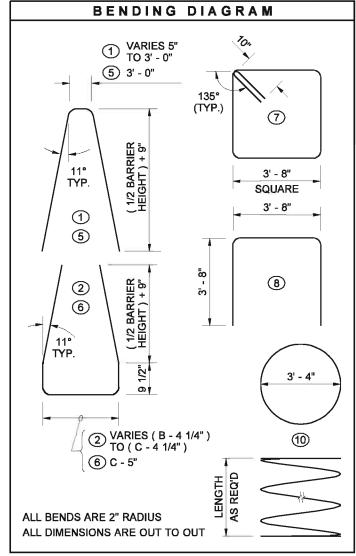
TABLE									
GRADE SEPARATION	BARRIER HEIGHT	A	В	С	D	E	Q		
0 TO 5"	3' - 6"	8"	2' - 0"	4' - 7"	3" MIN.	4	10 👍		
UP TO 7"	4' - 0"	9 1/8"	2' - 2 1/4"	4' - 9 1/4"	7" MIN.	5	12 🚯		
UP TO 10"	4' - 6"	10 1/4"	2' - 4 1/2"	4' - 11 1/2"	10" MIN.	6	14 4		

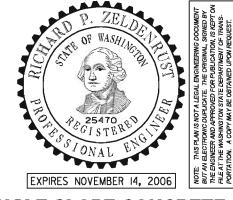
BAR LIST									
MARK NO.	LOCATION	QTY.	LENGTH	SIZE	TYPE				
1	BARRIER ~ TOP VERTICAL	32	VARIES	# 4					
2	BARRIER ~ BOTTOM VERTICAL	32	VARIES	#4					
3	BARRIER ~ HORIZONTAL	2	23' - 8"	#5	STR.				
4	BARRIER ~ HORIZONTAL	2	3' - 8"	# 5	STR.				
(5)	BARRIER ~ TOP VERTICAL	8	VARIES	# 4					
6	BARRIER ~ BOTTOM VERTICAL	8	VARIES	# 4					
7	CAP ~ HOOP	5	15' - 9"	#5					
8	CAP ~ TOP	4	10' - 10"	# 5					
9	CAP ~ VERTICAL, EACH CORNER	4	3' - 4"	# 4	STR.				
10	SHAFT ~ SPIRAL	1 ③	AS REQ'D	#4					
11)	SHAFT ~ VERTICAL	12	"Z" MINUS CLEARANCES	#9	STR.				

CONSTRUCTION JOINT WITH ROUGHENED SURFACE

SEE TABLE, THIS SHEET, COLUMN "Q"

- ③ IF JOINING TWO SPIRALS, SEE LAP SPLICE DETAIL, STD. PLAN G-3a SHEET 2
- ADD TWO 4 #5 BARS, EQUALLY SPACED, AT THE TOP OF THE FOUNDATION BARRIER





SINGLE SLOPE CONCRETE BARRIER CANTILEVER SIGN STRUCTURE FOUNDATION STANDARD PLAN C-14k

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 01-11-06

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

SECTION

(A

9 #4

(1) # 9 (TYP.)

10 # 4

3" CLR. CONCRETE (OR CASING, IF REQUIRED) SHALL DE PLACED DIRECTLY AGAINST UNDISTURBED EARTH DEPTH = Z ~ SEE TABLE

2008

TO AUGUS

2008

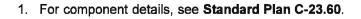
BILL BERENS

(7) # 5

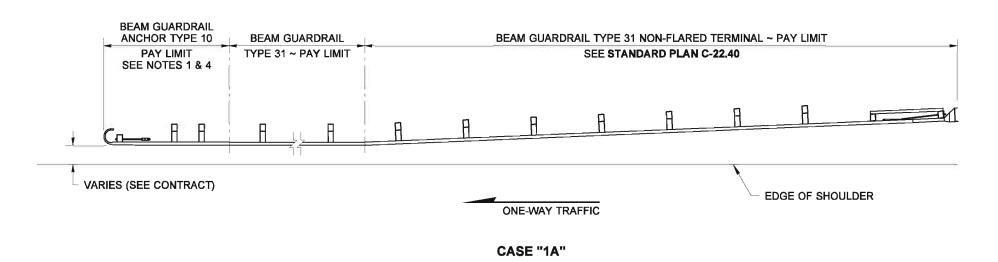
ANCHOR PLATE ~ SEE STD. PLAN G-3a

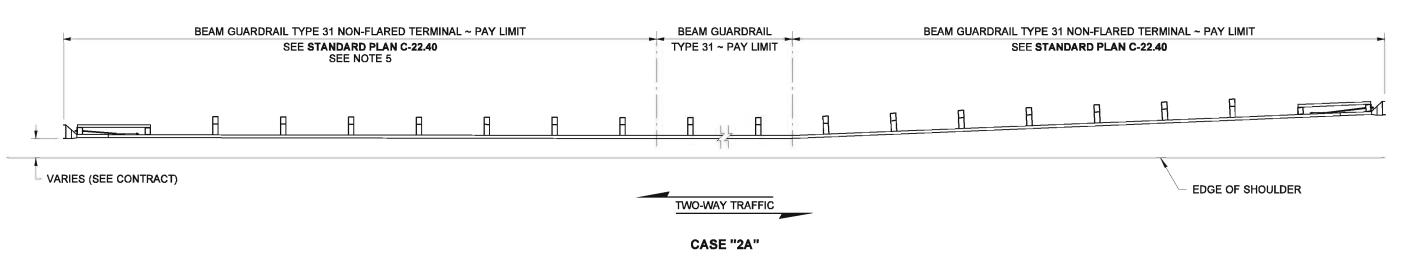
4 SPIRAL HOOP \sim 1' - 0" PITCH ETE TURN AT THE BOTTOM AND "

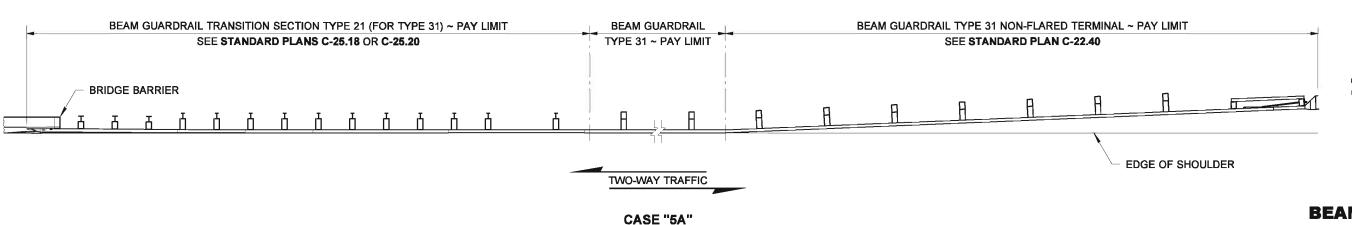
FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

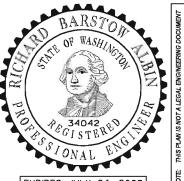


- 2. For terminal type and details, see Contract Plans and applicable drawings.
- 3. The slope from the edge of the shoulder into the face of the guardrail cannot exceed 10:1 when the face of the guardrail is less than 12'-0" from the edge of the shoulder.
- 4. For one-way traffic and where a crashworthy terminal is not required, use the Beam Guardrail Anchor Type 10, see Standard Plan C-23.60.
- 5. Where a crashworthy terminal is required use a Beam Guardrail Type 31 Non-Flared Terminal, see Standard Plan C-22.40.









EXPIRES JULY 24, 2008

2008

BEAM GUARDRAIL TYPE 31 PLACEMENT

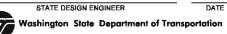
STANDARD PLAN C-20.14-00

SHEET 1 OF 1 SHEET

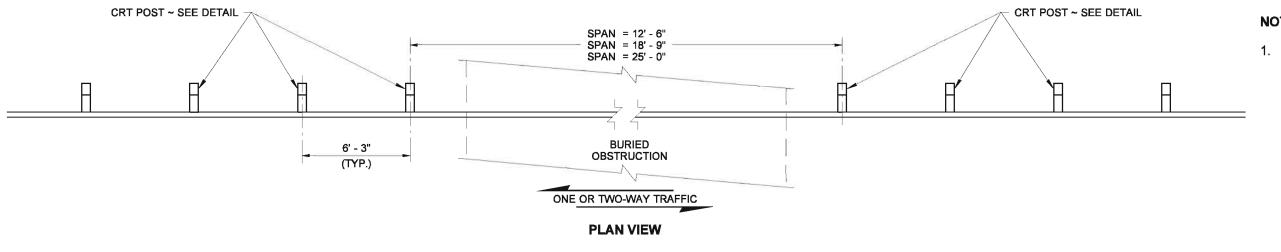
APPROVED FOR PUBLICATION

Ken L. Smith

02-06-07

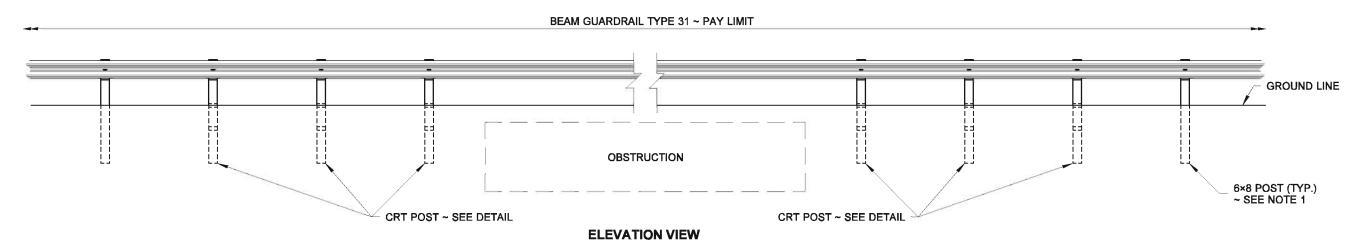


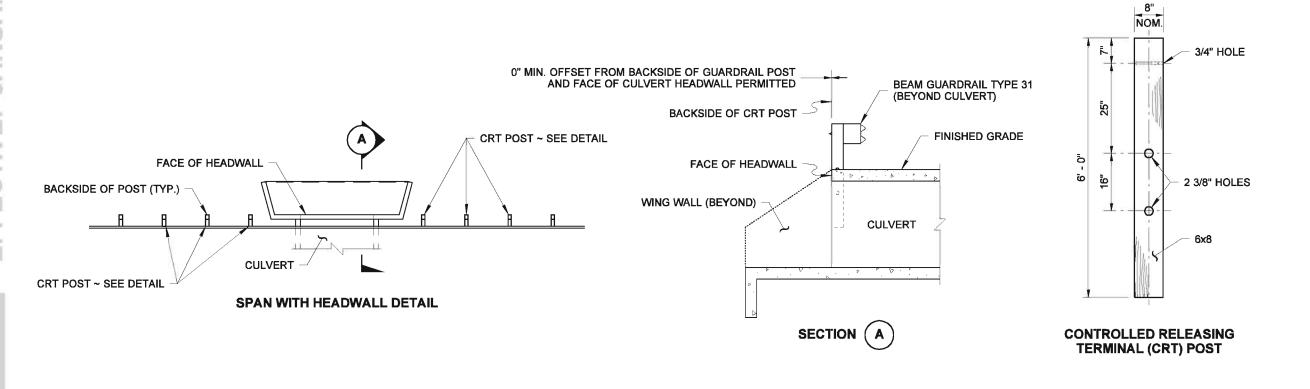
2008



NOTE

1. For additional details not shown, see Standard Plan C-1b.







BEAM GUARDRAIL TYPE 31 PLACEMENT 12'-6", 18'-9", OR 25'-0" SPAN **STANDARD PLAN C-20.40-00**

SHEET 1 OF 1 SHEET

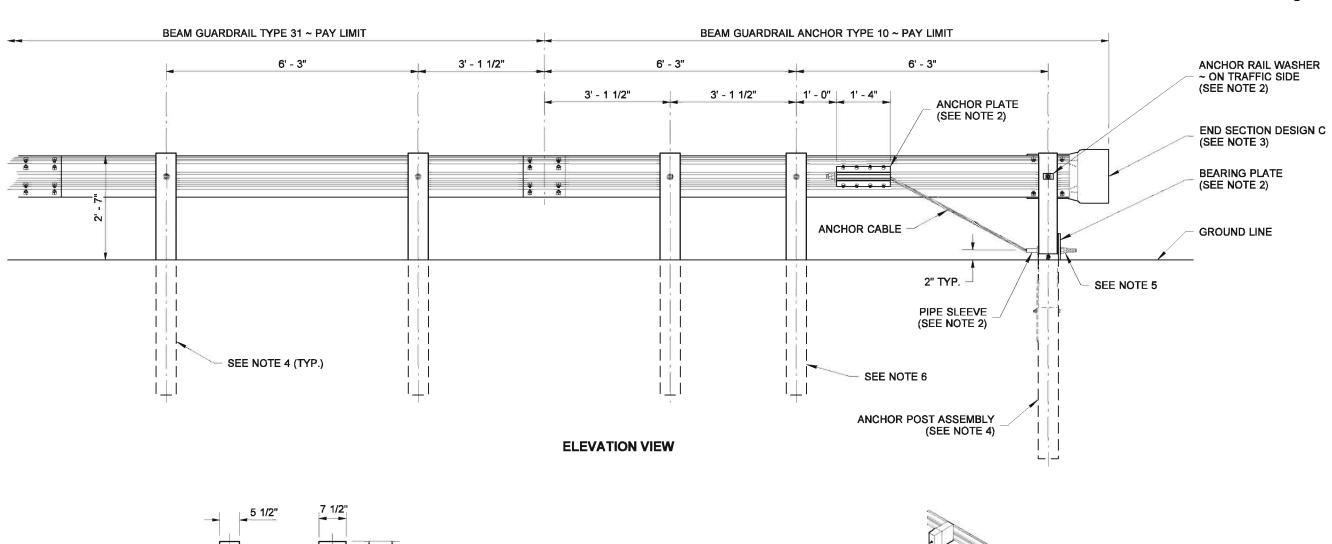
APPROVED FOR PUBLICATION Ken L. Smith 02-06-07

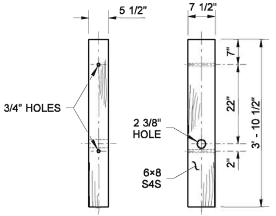


EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 1. An ET-PLUS 31 as manufactured by Trinity Industries, Inc. or an SKT-MGS as manufactured by Road Systems Inc. shall be installed according to manufacturer's recommendations. 2. A reflectorized object marker shall be installed according to manufacturer's recommendations. 3. When snow load post washers and snow load rail washers are required by the contract, the snow load rail washers shall not be installed within the terminal limits. 4. Terminal shall be installed at a widening, ensuring that the end piece is entirely off the shoulder. 5. While these terminals do not require an offset at the end, a flare is recommended so that the end piece does not protrude into the shoulder. A maximum flare of 25:1 over the system length of the terminal is allowed for either the ET-PLUS 31 or the SKT-MGS. **BEAM GUARDRAIL** TYPE 31 BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL (SKT-MGS SHOWN) (SEE NOTE 1) 10' - 0" MIN. **EDGE OF WIDENED** ~ PAY LIMIT **EMBANKMENT** 20H:1V SLOPE OR FLATTER (RELATIVE TO GRADE) 10H:1V SLOPE OR FLATTER SEE NOTE 5 **EDGE OF SHOULDER PLAN VIEW** (FOR BOTH SYSTEMS) **BEAM GUARDRAIL** TYPE 31 BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL ~ PAY LIMIT ~ PAY LIMIT 3' - 1 1/2" SKT-MGS (TL3) SYSTEM LENGTH = 50' - 0" (SEE NOTE 4) SEE NOTE 2 **GROUND LINE ELEVATION VIEW SKT-MGS BEAM GUARDRAIL** TYPE 31 BEAM GUARDRAIL TYPE 31 NON-FLARED TERMINAL ~ PAY LIMIT ~ PAY LIMIT ET-PLUS 31 (TL3) SYSTEM LENGTH = 40' - 7 1/2" 12' - 6" EXPIRES JULY 24, 2008 (SEE NOTE 4) **BEAM GUARDRAIL TYPE 31** SEE NOTE 2 **NON-FLARED TERMINAL GROUND LINE STANDARD PLAN C-22.40-01** SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION Pasco Bakotich III 10-05-07 REVISED LENGTH OF ET-PLUS 31 **ELEVATION VIEW** ET-PLUS 31 DATE REVISION EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3,

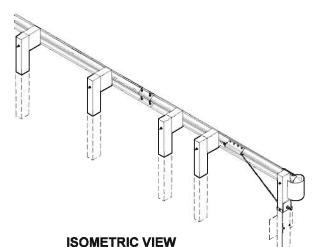
N

- 4. For Anchor Post Assembly details, see **Standard Plan C-1b**. Use detail on this plan for Wood Breakaway Post. (No Block on this post).
- 5. Fasten the Anchor Cable using two 1" nuts and washer, at both ends of cable. Outside nut shall be torqued against inside nut a minimum of 100 ft.-lbs.
- 6. Posts shall match those of connecting run: Timber or Steel.





WOOD BREAKAWAY
POST DETAIL





BEAM GUARDRAIL (TYPE 31) ANCHOR TYPE 10

STANDARD PLAN C-23.60-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

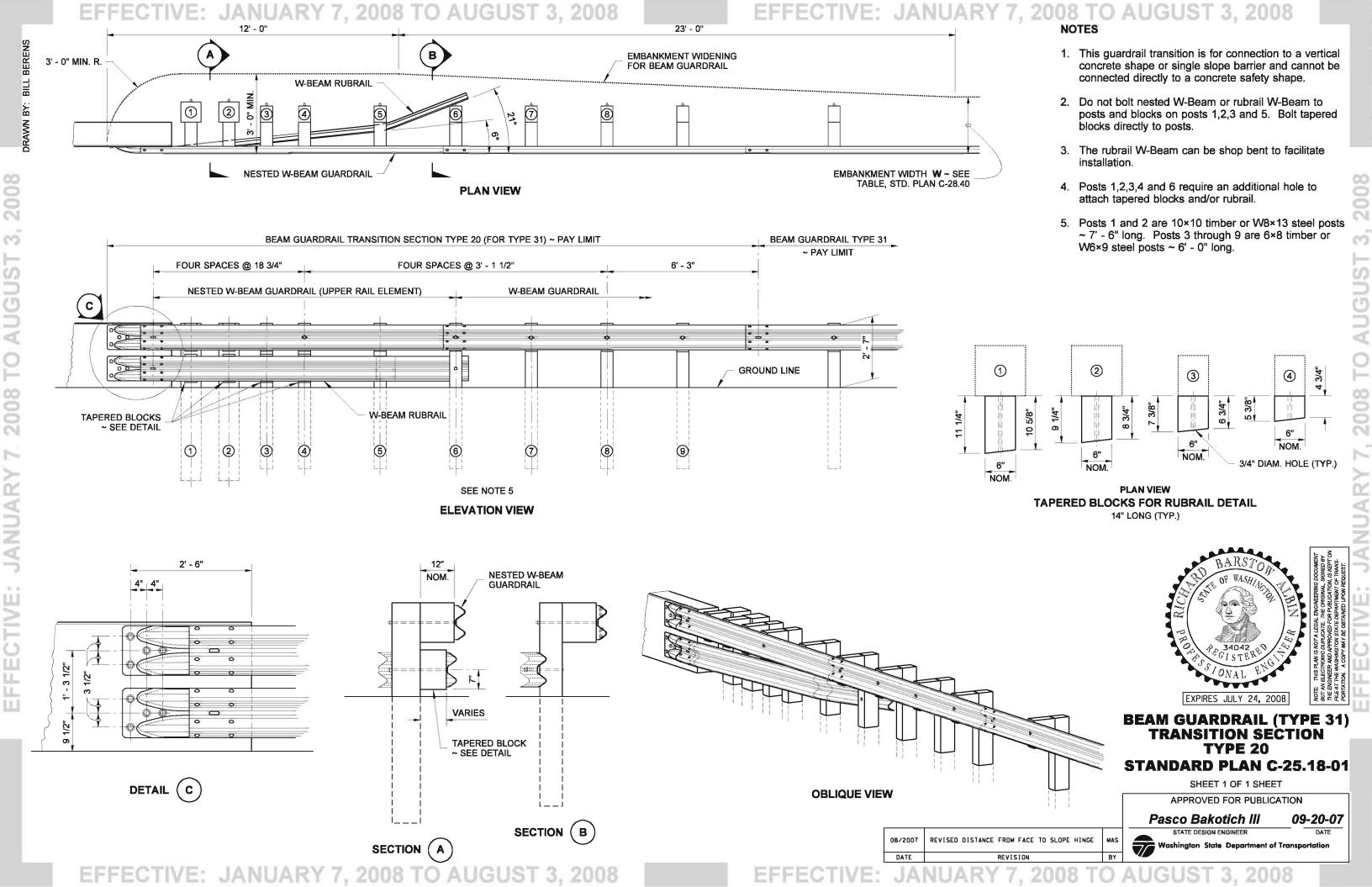
Ken L. Smith

02-06-07

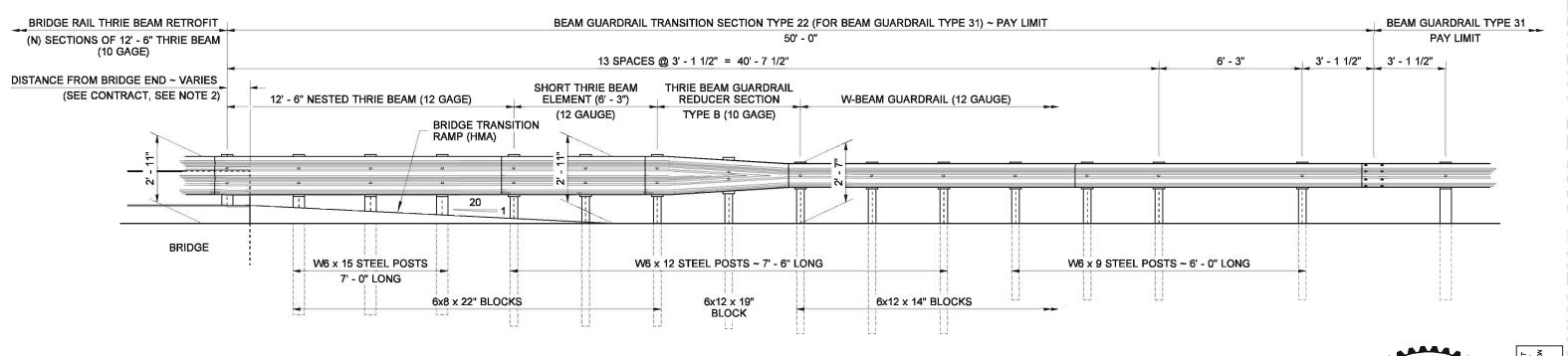
Washington State Department of Transportation

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



- 1. See Standard Plans C-1d and C-25.20 for rail elements and thrie beam block details.
- 2. If the distance from the end of the bridge to the end of the Bridge Rail Thrie Beam Retrofit section (10 gage) exceeds 6' - 3" using 12' - 6" thrie beam sections, add a 6' - 3" section of 10 gage thrie beam to reduce the length to less than 6' - 3".
- 3. When a transition is required on the trailing end of the bridge, use a mirror image of this plan.



TYPE 22

APPROACH END

THRIE BEAM INSTALLED AT FACE OF BRIDGE RAIL



BEAM GUARDRAIL (TYPE 31) TRANSITION SECTION **TYPE 22** STANDARD PLAN C-25.22-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III



10-05-07

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

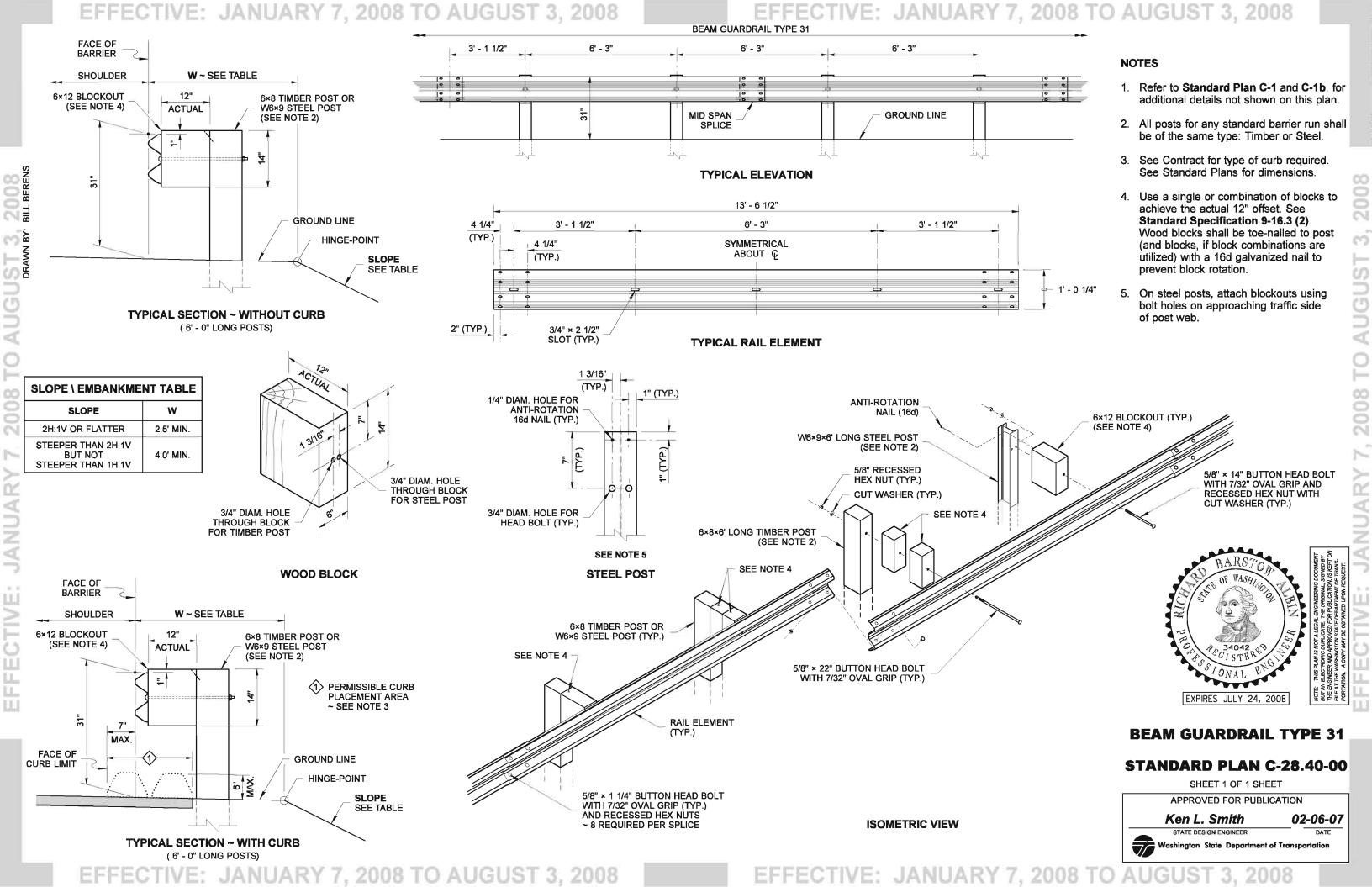
2008

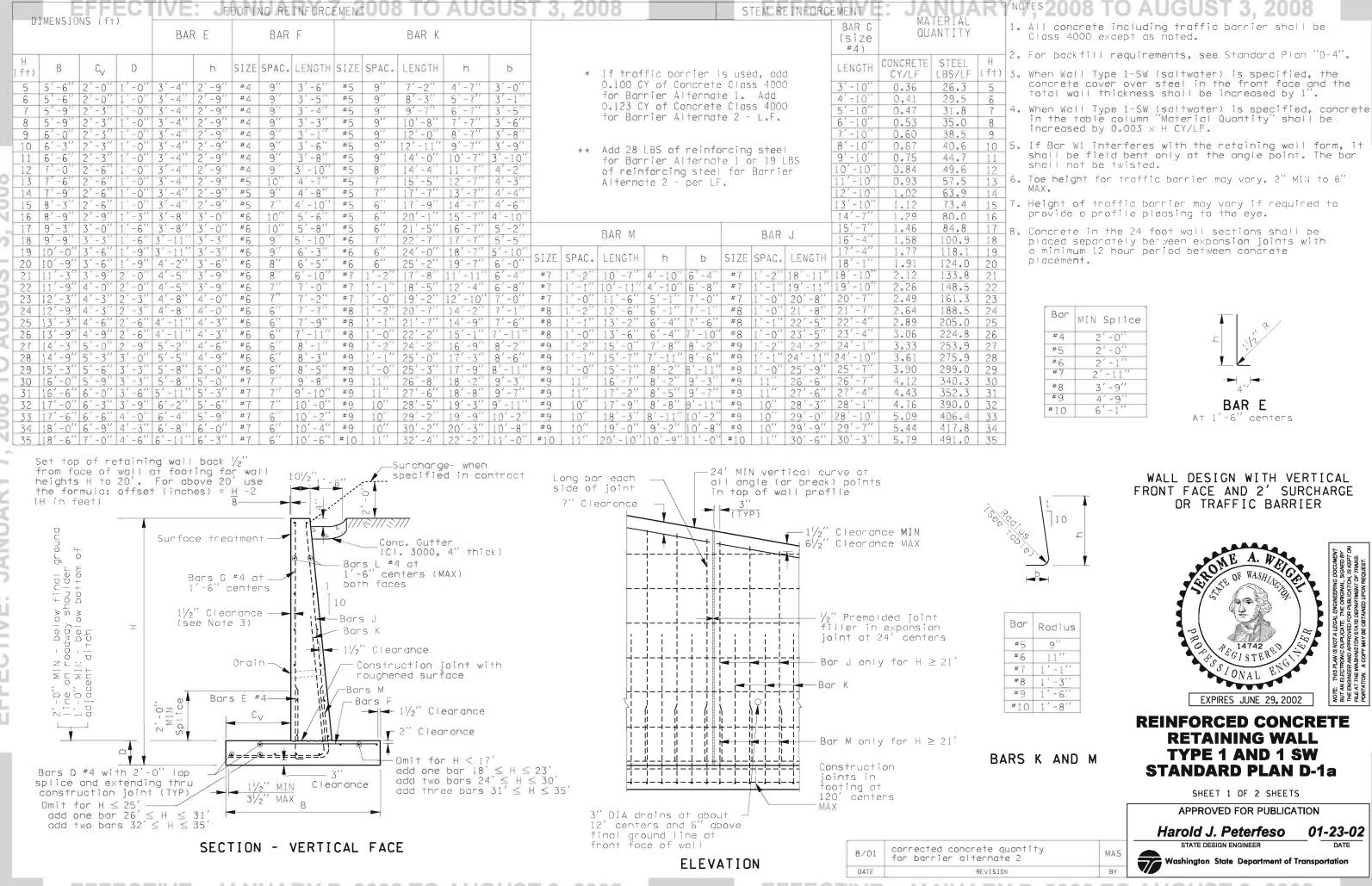
AUGUST

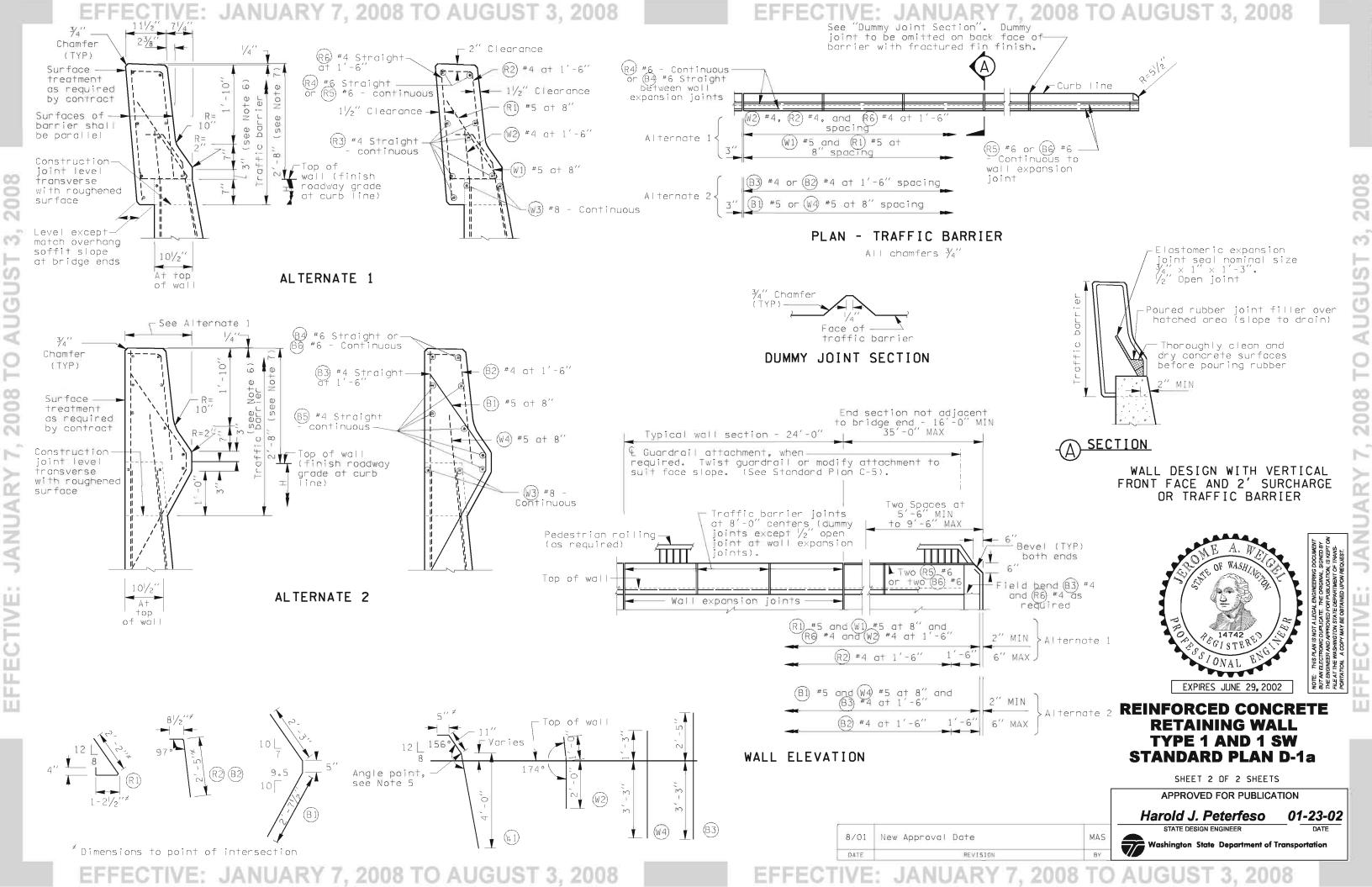
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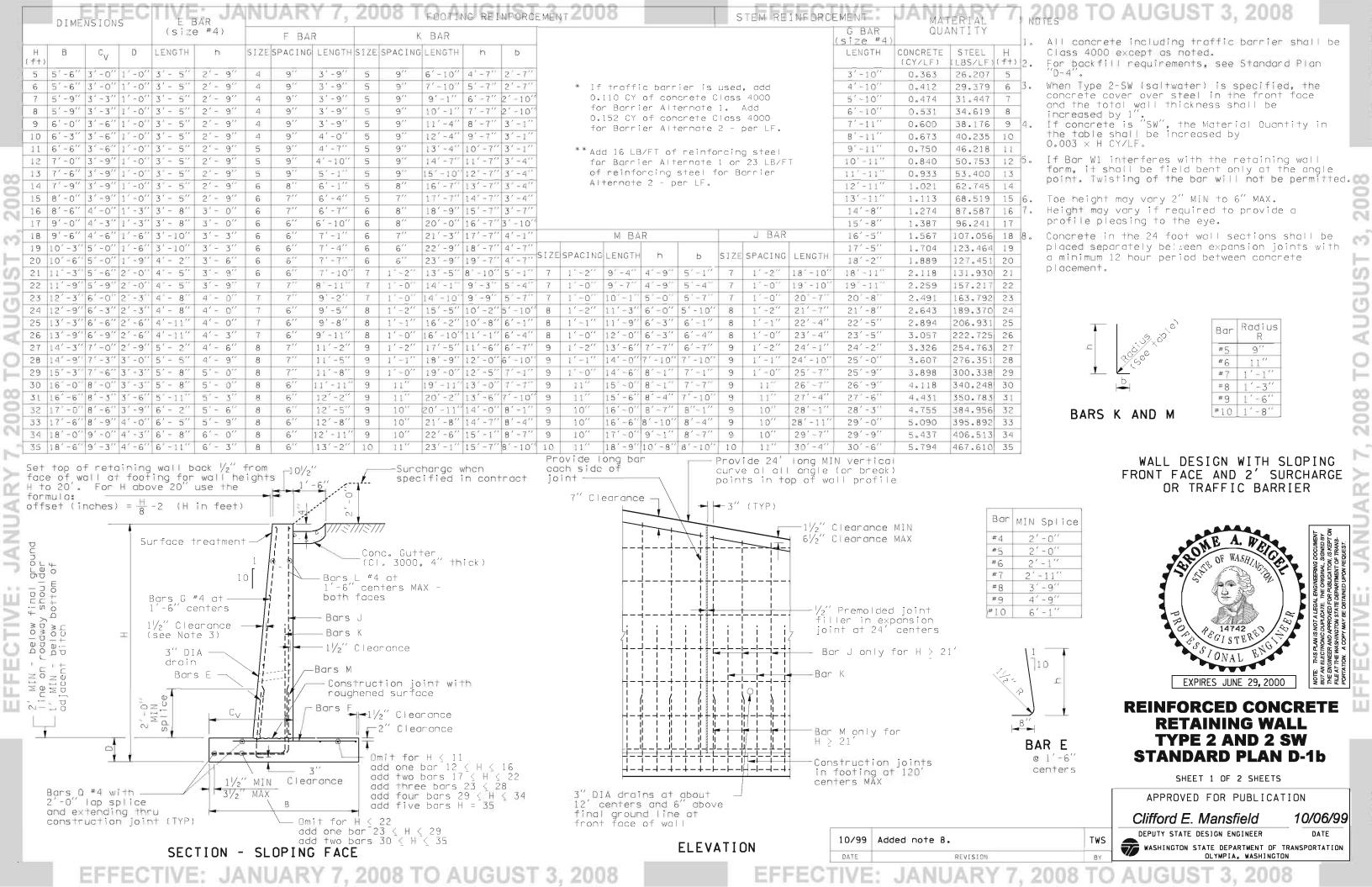
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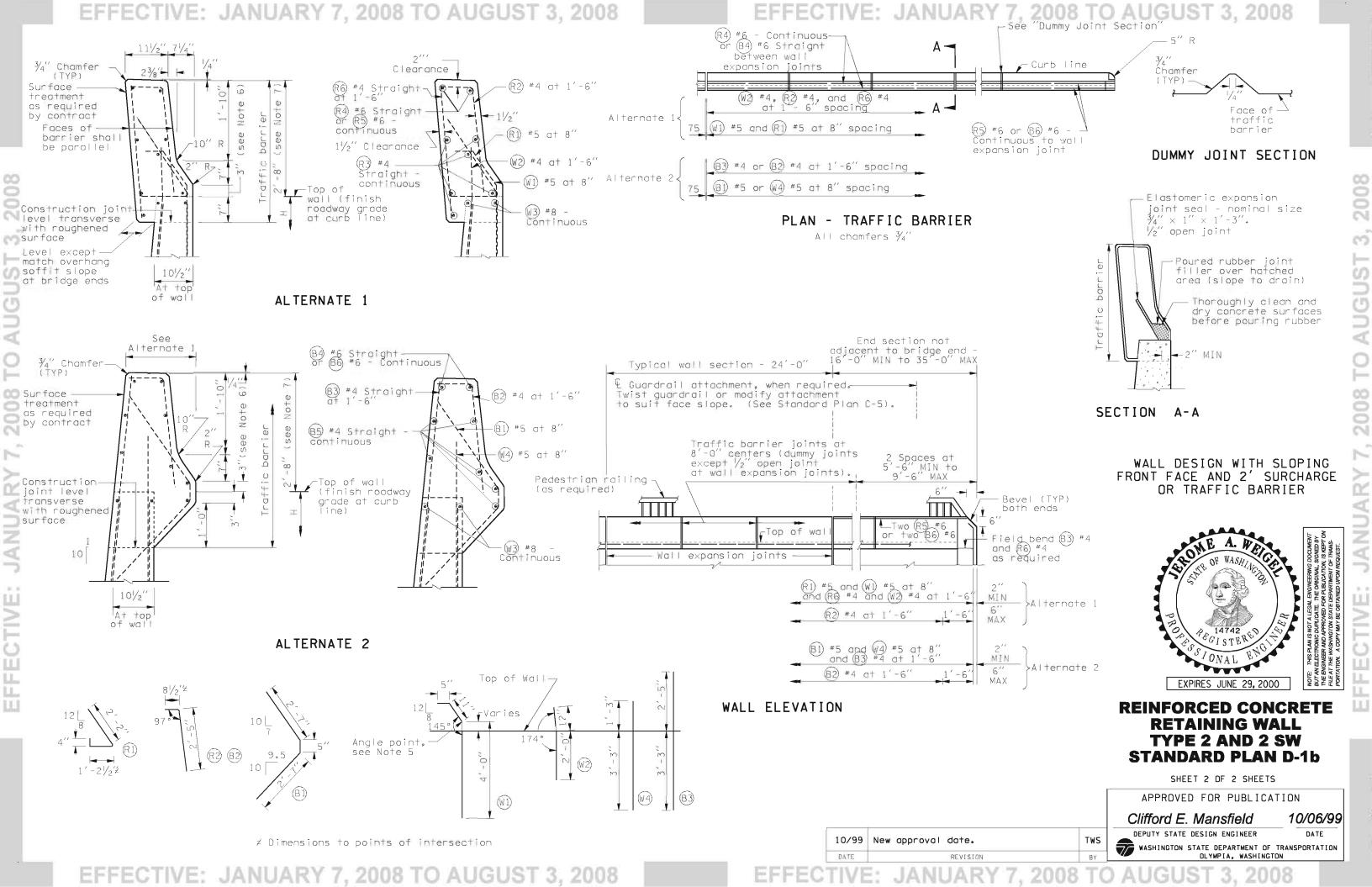
FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008











-Back face

of wall

total wall thickness shall be increased by 1".

5. Concrete in the 24 foot wall sections shall be placed separately between expansion joints with a minimum 12 hour period between concrete placement.

-Bars S are #5 and 1'-0" OC ► Bottom of Front face of wall-Clearance at top of footing

> Not required on walls H = 5' thru H = 12'

> > KEY DETAIL

WALL TOP DETAIL

Top of 1'-6" -Conc. Gutter (cl.3000, 4" Thick)

GUTTER DETAIL

Set top of retaining wall back - $\frac{1}{2}$ from face of wall at footing for wall heights H to 20'. For H above 20' use formula: offset (inches) = \underline{H} - 2 (h in feet) See Gutter-Detail

 $\frac{3}{4}$ Chamfer

Special wall-

in contract

UGUST

2008

JANUARY

face treatment

when specified

at 1'-6" centers Bars G #4 at -MAX - both faces 1'-6" centers 1/2" Clearance (see Note 3) gr → 1½″ Clearance

- Bars K — 3″ DIA drains Bars, 0 2'-0" | and ext constru (TYP) —Bars M — Bars F 2, 1, d: Bars = $1\frac{1}{2}$ " Clearance ′Clearance - Dmit on walls H = 14' and lower. -Bars S are used Add one bar 15′ ≤ H ≤ 18′ 3" Clearance Add two bars 19' \leq H \leq 22' Add three bars 23' \leq H \leq 26' Add five bars 27' \leq H \leq 30' 1/2" MIN, 3/2" MAX when $h_k > 12$ Key Detail Add six bars $H = 3\overline{1}$ Construction joint Omit on walls H = 12' and lower Add one bar 13' \leq H \leq 20' Add two bars 21' \leq H \leq 25' Add three bars 26' \leq H < 31' with roughened surface -

SECTION - VERTICAL FACE

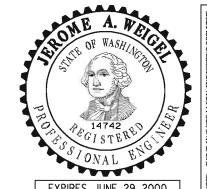
-Provide 24' long (MIN) vertical curve at all angle (or break) points in top of wall profile Clearance MIN Clearance MAX 3" (TYP) Bars J (TYP) only for $H \rightarrow 21$ -Bars K (TYP) 1/2" Premolded joint filler in expansion joints at 24' centers -Bars M (TYP) only for H > 21' \angle 3 $^{\prime\prime}$ Drains at Construction joints in about 12' centers footing at 120' center MAX and 6" above final grade line at

ELEVATION

front face of wall

10/99 Added note 5.

WALL DESIGN WITH VERTICAL FRONT FACE AND 2:1 BACKSLOPE



EXPIRES JUNE 29, 2000

REINFORCED CONCRETE RETAINING WALL TYPE 3 AND 3 SW STANDARD PLAN D-1c

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Clifford E. Mansfield

10/06/99

DEPUTY STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

	THENC	TONG					FOOTING REINFORCEMENT										ST	EM RE	INFORC	EMENT	MAIERIAL				
D	IMENS	IUNS		BAR		BAR F			В	AR K					BAR M	1			BAR	J	BAR G (size #4)	QUA	ANTITY		
H (ft) B	c _V	D	hk	LENGTH	h	SIZE	SPACING	LENGTH	SIZE	SPACING	LENGTH	h	Ь	SIZE	SPACING	LENGTH	h	Ь	SIZE	SPACING	LENGTH	LENGTH	CONCRETE (CY/LF)	STEEL (LBS/LF)	H (ft)
5 3'-		1'-0"	0	3'-5"	2'-9"	#4	1'-0"		#5	1'-0"	6'-6"	4'-7''	2'-4'	N/A	N/A	NZA	N/A	N/A	N/A	N/A	N/A	3'-10"	0.252	21.698	5
6 3'-	6" 1'-6"	1'-0"	0		2'-9"	#4	1'-0"	2'-6"	#5	1'-0"	7'-10"	5'-7"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4'-10"	0.315	24.870	6
7 3'-	9" 1'-9"	1'-0''	0	3'-5''	2'-9''	#4	1'-0"	2'-6"	#5	1'-0''	9'-2"	6'-7''	3'-0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5'-10"	0.372	26.706	7
8 4'-	3'1'-9'	1'-0"	0	3'-5"	2"-9"	#4	1,-0,,	2'-6"	#5	1'-0''	10'-2"	7'-7''	3'-0'	N/A	N/A	N/A	N/A	N/A	N/A:	N/A	N/A	6'-10''	0.443	29.531	8
9 4'-	9"2'-0"	1'-0"	0	3'-5"	2'-9"	#4	1'-0"	2'-6"	#5	1'-0"	11'-6"	8'-7"	3'-4"		N/A	NZA	NZA	NZA	N/A	N/A	NZA	7'-10"	0.517	32.703	9
10 5'-	3" 2'-3"	1'-0"	0	3'-5"	2'-9"	#4	1'-0"		#5	1'-0"	12'-11"	9'-7"		NZA	N/A	NZA	N/A	N/A	N/A	N/A	N/A	8'-10"	0.594	34.625	10
11 6'-	0" 2'-9'	1'-0''	0	3'-5''	2'-9"	#4	10"	2'-8"	#5	10"	14'-6''	10'-7"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9'-10"	0.685	41.550	11
12 6'-	6′′ 3′ - 0′	1'-0''	0	3'-5''	2'-9"	#4		2'-10'	-	8''	15'-4''	11'-7"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10'-10''	0.770	49.874	12
13 7′-	0" 3' - 3'	1'-0"	1 -0"	3′-5″	2'-9"	#5	10''	3'-4'	#5	7"	17'-2"	12'-7"	50"		N/A	N/A	N/A	N/A	N/A:	N/A	N/A	11 -10	0.933	62.676	13
14 7'-	9' 3'-6'	1'-0"	1'-0"	3'-5'	2'-9"	#5	7''	3'-8"	#6	7''	18'-7"	13'-7"		N/A	NZA	N/A	N/A	N/A	N/A	N/A	N/A	12'-10''	1.035	83.997	14
15 8'-	6′′ 3′ -9′	1'-0"	1'-0"	3'-6'	2'-9"	#5	6′′	4'-1"	#6	6′′	20'-0"	14'-7"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13'-10''	1.141	100.638	15
16 9'-	3′′4′-0′	1'-3'	1'-0"	3'-8'	2'-9"	#6	6′′	5'-0'	#6	6′′	21'-4"	15'-7"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14'-10''	1.315	111.591	16
17 10 <u>′</u> -	0'14'-3'	11'-3''	1'-0"	3'-8''	3'-0"	#6	6′′	5′-5′		5′′	22′-8″	16′-7″			N/A	N/A	N/A	N/A	N/A	N/A	N/A	15′-7″	1.434	118.632	17
18 10′-	6' 4' - 3'			3'-8"	3'-0"	#6	5″	5'-10		5″	23'-8"	17'-7"		N/A	N/A	N/A	N/A	N/A	N/A:	N/A	N/A	16 -7"	1.620	126.835	18
19 11'-	3 4 - 6	1'-6''	1'-6"	3'-11'	3'-3'	#7	6''	7'-1"	#6	6′′	26'-0"		6'-10		N/A	N/A	N/A	N/A	N/A	N/A	N/A	17'-4"	1.817	168.319	19
20 12'-	0'4'-6'	1'-9''	1'-6"	4'-2''	3'-6"	#7	5′′	7'-9'	#7	5′′	26'-2"	19'-7"		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18'-1"	2.040	203.989	20
21 12' -	6' 5' -0'	2'-0''	1'-6"	4'-5"		#8	8′′	8'-8'	#7	11"	19'-11"	12'-11'	7'-7"	#8	11"	12'-9"	5'-9"	7'-7''	#8	11"	18'-11'	18'-11''	2.261	225.015	21
22 13 -	0_0_	2'-3''	1'-6'	4'-8"	4'-0"	#8	7''	9'-1'	#8	11"	20′-9′′	13'-5"	7'-11	#8	11	13'-4"	6 - 1	7'-11'	#8	11"	19'-8"	19'-7"	2.514	239.973	22
23 14′-	0'5'-6'		1'-6"	4'-8'	4'-0"	#8	6"	9'-6"		10''	21'-6"	13'-10''	8'-3'		10''	13′-8″	6'-1''	8'-3''	#8	10''	20'-8"	20′-7″	2.679	272.571	23
24 14'-	9' 5' -9'	2'-6"	1'-6"	4'-11'	4'-3"	#8	6′′	9'-11'	#8	9"	22'-4"	14'-4'	8'-8"	#8	9"	14'-4"	6'-4''	8'-8"	#8	9''	21'-5"	21'-4"	2.958	304.464	24
25 15' -	6 6 -0	2'-9'	1 -6"	5'-2"	4'-6"	#8	6′′	4.00	_	10"	24'-4"	16'-0"	9'-0'	#9	10''	15'-10'	7'-8"	9'-0"	#9	10′′	22'-2"	22'-1"	3.252	335.260	25
26 16'-	3 6 - 3	3'-0"	1'-6"		4'-9"	#8	5′′	10'-9'		9''	25'-2"	16'-6"	9'-4"	#9	9"	16'-5"	7 -11	9'-4"	#9	9′′	22'-11'	22'-10"	3.563	386.608	26
27 16 -	9'6'-6'	3 - 3"	1 -6	5'-8'	5'-0"	#8	5"	10'-11	1#9	8′′	25 -11"	17'-0"	9'-8'	#9	8	17'-0"	8'-2"	9'-8"	#9	8 ′	23'-8"	237"	3.859	432.355	27
28 17'-	6 6 -9	3'-6"	1 -6	5 -11"	5 -3"	#8	5″	11'-5	#9		25'-10"	17'-7''	10'-0	#9	8"	17'-7'	8'-5"	10'-0'	#9	8''	24'-6"	24'-4"	4.200	448.327	28
29 18'-	3 7 -0"	3'-9"	1'-6"	6'-2"	5'-6"	#8	5″	11'-10	#9	9"	29'-0"	19'-5"		#10	9"	19'-5"	10'-0"	10'-4'	#1 <u>0</u>	9"	25′-3″	25'-1"	4.556	494.468	29
30 19′-		4'-0'	1 -6	6'-5"	5'-9"	#9	6′′		#10	8′′	30'-0"	20'-0"		#10		20'-1"	10'-3'	10'-9'	#10	8′′	26'-0"	25′-10′′	4.928	534.648	30
31 19' -	6' 7' - 6'	14'-3''	1'-6"	6'-8''	6'-0"	#9	5′′	13'-6'	#10	8′′	30'-10"	20'-6"	11 -1	1#10	8′′	20'-8"	11'-1"	11 -1	#10	8′′	26'-9"	26'-7"	5.277	559.628	31

Radius

9"

11' 1'-1' 1'-3'

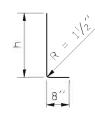
1'-6"

1'-8"

Bar

WALL DESIGN WITH VERTICAL FRONT FACE AND 2:1 BACKSLOPE

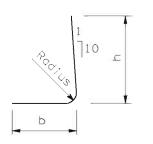
Bar	MIN Splice
#4	2'-0"
#5	2'-0''
#6	2'-1"
#7	2'-11"
#8	3'-9''
#9	4'-9''
#10	6'-1"



BAR E

at 1'-6" centers

#6 #8 #9 #10



BARS K AND M



REINFORCED CONCRETE RETAINING WALL TYPE 3 AND 3 SW

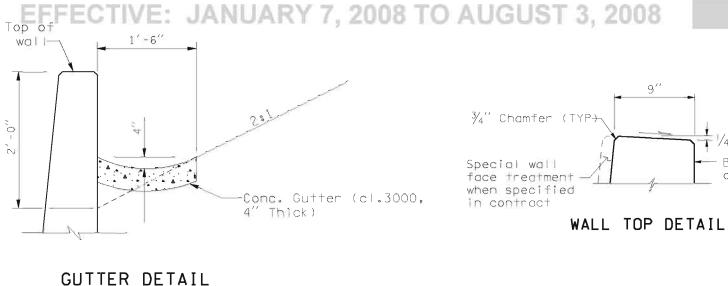
STANDARD PLAN D-1c SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

10/06/99 Clifford E. Mansfield

DEPUTY STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON



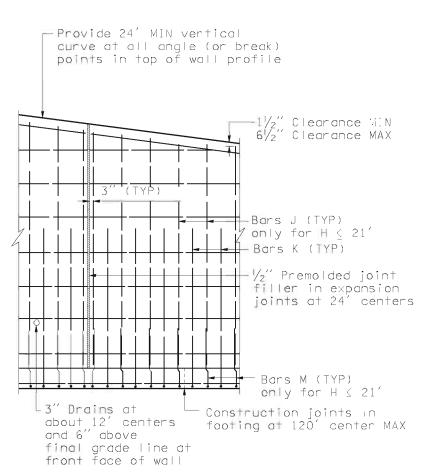
Set top of retaining wall back $\frac{1}{2}$ " from face of wall at footing for wall heights H to 20'. For H above 20' use formula: offset (inches) = $(\underline{H} - 2)$ (H in feet) See Gutter Detail at 1'-6" centers Bars G#4 at -MAX - both faces 1'-6" centers puno. -Bars K 1/2" Clearance (see Note 3) Bars J final 10 $1\frac{1}{2}$ Clearance zvz W 2'-0" MIN _3" DIA drains -Bars M Construction joint with roughened surface → Bars F -1/2" Clearance 2" Clearance 9 -<u>+</u> -*--*2-*--*2--*-*2-Omit on walls H = 14'and lower. Add one bar Bars Q #4 with See Key each layer for each 5' 2'-0" lap splice Detail increment of H = 20' and extended thru C_V and greater construction joints - Bars S are used when h_k > 0

a+ 1'-0" centers-Bottom of footing Back face of wall of footing

H = 5'' thru H = 14'

KEY DETAIL

Back face of wall at top 3,, Not required on walls



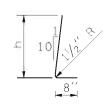
ELEVATION

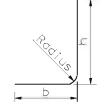
FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008
Bars S #5

- 1. All concrete shall be Class 4000 except as noted.
- 2. For backfill requirements, see Standard Plan "D-4".
- 3. When Wall Type 4-SW (saltwater) is specified, the concrete cover over steel in the front face and the total wall thickness shall be increased by
- 4. When Wall Type 4-SW (saltwater) is specified, concrete in the table column "Material Quantity" shall be increased by $0.003 \times H$ CY/LF.
- 5. Concrete in the 24 foot wall sections shall be placed separately between expansion joints with a minimum 12 hour period between concrete placement.

Bar	MIN Splice
#4	2'-0"
#5	2'-0''
#6	2'-1"
#7	2'-11''
#8	3'-9''
#9	4'-9"
#10	6'-1"

Bar	Radius
#5	9"
#6	11"
#7	1'-1"
#8	1'-3''
#9	1'-6"
#10	1'-8"





BAR E At 1'-6" centers

BARS K AND M

WALL DESIGN WITH SLOPING FRONT FACE AND 2:1 BACKSLOPE



REINFORCED CONCRETE **RETAINING WALL TYPE 4 AND 4 SW** STANDARD PLAN D-1d

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Clifford E. Mansfield

10/06/99

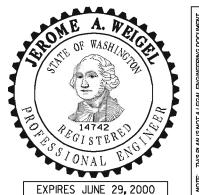
DEPUTY STATE DESIGN ENGINEER WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

└ 3″ Clearance

SECTION - SLOPING FACE

			FOO	TING R	EINFORCE	MENT							STE	EM REINFOR	RCEMENT	M.Z	TERIAL	
DIMENSIONS	BAR E (size #4)	BAR F		BAR	(BAR M			В	AR J	BAR G (size #4)		IANTITY	
$\begin{pmatrix} H \\ (f+) \end{pmatrix}$ B C_V D h_k	LENGTH h		ACE LENGTH S	IZE SPA	CE LENGTH	h	Ь	SIZE	SPACE	LENGTH	h	Ь	SIZES	SPACE LENGTH	LENGTH	CONCRETE (CY/LF)	STEEL (LBS/LF)	H (++)
5 2'-6" 1'-9" 1'-0" 0	3'-5" 2'-9		-0" 2'-0"		0" 5'-7"	4'-7"		N/A	N/A	N/A	N/A	N/A		N/A N/A	3'-10''	0.233	19.072	5
6 2'-9" 1'-9" 1'-0" 0	3'-5" 2'-9		-0" 2'-3"		0'' 6'-7''	5'-7'	1'-4"	N/A	N/A	N/A	N/A	N/A	1	N/A N/A	4_'-10''	0.287	22.063	6
7 3'-0" 2'-3" 1'-0" 0	3'-5" 2'-9		-0" 2'-3"		0" 8'-1"	6'-7"	1'-10"	N/A	N/A	N/A	N/A-	N/A	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	N/A N/A	5'-10''	0.344	23.906	7
8 3'-6" 2'-6" 1'-0" 0	3'-5" 2'-9		-0" 2'-3"		0" 9'-4"	7'-7'	2'-1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A N/A	6'-10''	0.415	27.158	8
9 4'-0" 3'-0" 1'-0" 0	3'-5" 2'-9		-0" 2'-3"		0" 10"-10"	8'-7"	2'-8"	N/A	N/A	N/A	N/A	N/A		N/A N/A	7'-10"	0.489	30.504	9
10 4'-6" 3'-6" 1'-0" 0	3'-5' 2'-9	1	-D" 2'-3"	#5 1'-	0'' 12'-4''	9'-7"	3'-1"	N/A	N/A	N/A	N/A	N/A		N/A N/A	8'-10"	0.567	33.182	10
11 5 -3" 3 -9" 1 -0" 0	3'-5'' 2'-9		-0" 2'-9"	#5 1'-	0'' 13'-7''	10'-7"	3 - 4"	N/A	N/A	N/A	N/A	N/A	N/A	N/A N/A	9'-11'	0.657	38.638	11
12 6'-0" 4'-0" 1'-0" 0	3'-5" 2'-9		- <u>0</u> " 3'-3"	#5 10	4 4 4	11'-7"	3'-8'	N/A	N/A	NZA	N/A	N/A	N/A	NZA NZA	10'-11"	0.752	43.820	12
13 6'-6" 4'-6" 1'-0" 0	3'-5'' 2'-9		0" 3'-3"	#5 9	10	12'-7"	4'-1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A N/A	11'-11"	0.841	48.848	13
14 7'-3" 4'-9" 1'-3" 0	3'-8' 3'-0	7	Man district district	#5 7	17'-7''	13'-7"	4 - 4	N/A	N/A	N/A	N/A	NZA	1000	N/A N/A	12'-8''	0.920	60.089	1.4
15 7'-6" 5'-0" 1'-3" 0	3'- <u>8''</u> 3 <u>'</u> -0	7	, , , , , , , , , , , , , , , , , , , ,	#6 8	18'-10'	14'-7"	4'-8"	N/A	N/A	N/A	N/A	NZA		N/A N/A	13'-8''	1.218	76.409	15
16 8'-3" 5'-3" 1'-3" 0	3'-8' 3'-0			#6 7	20'-0"	15'-7"	4'-10'	N/A	N/A	NZA	N/A	N/A		NZA NZA	14'-8'	1.333	89.333	16
17 9'-0" 5'-6" 1'-3" 0	3'-8'' 3'-0	4		#6 6	21'-3''	16′-7′′	5′-1′′	N/A	N/A	NZA	N/A	N/A	N/A	N/A N/A	15′-8″	1.452	104.903	17
18 9'-9" 5'-6" 1'-3" 0	3'-8'' 3'-0		6'-4'	#6 5	740 500 100	17'-7"	5'-1'	N/A	N/A	N/A	N/A	N/A	N/A	N/A N/A	16'-8''	1.575	132.792	18
19 10'-6'15'-9"1'-6"1'-6"	3'-11'' 3'-3	1 #6 5	6'-10''	#7 6		18'-7"	5'-4''	N/A	N/A	N/A	N/A	N/A	N/A	N/A N/A	17'-5"	1.775	157 <u>.</u> 038	19
20 11'-3'[6'-0'']1'-9'[1'-6'']	4'-2'' 3'-6		7'-4"	#7 5	Year Total	19'-7"	5′-8′′	N/A	N/A	N/A	N/A	NZA	13443	NZA NZA	18'-2"	1.992	184.972	20
21 12'-0'16'-3'' 2'-0'11'-6''	4'-4" 3'-9		5" 7'-10"	#8 11		8'-10"	5'-10'	#8	11"		5'-10'	5'-10'	#8	11" 18'-10'	18'-11''	2.224	195.265	21
22 12'-6'6'-6''2'-0'1'-6''	4'-4'' 3'-9	1 #7 5	6′ 8′-11′	#8 10		91-31	6'-2''	#8	10′′	11'-4"	5'-10'	6'-1"	#8	10" 19'-10'	19'-11'	2.405	231.507	22 23
23 13' - 0' 7' - 0' 2' - 0' 2' - 0'	4'-4' 3'-9	1 #7 5	8'-11''	#8 10		9'-7"	6'-8'	#8	10"	11'-11'	5'-10'	6'-8''	#8	10" 20'-10'	20'-11"	2,585	240.484	23
24 13' - 9' 7' - 3'' 2' - 3' 2' - 0''	4'-8'' 4'-0	<u></u>	9'-5"	#8 9		10'-1"	6'-10'	#8	9"	12'-4"	6'-1'	6'-10'	#8	9" 21'-7"	21'-8"	2.848	269.186	24 25 26
25 14'-3'7'-6" 2'-3" 2'-6"	4'-8' 4'-0	/1 #8 5	10'-8'	#9 10	" 16'-11'	10'-6"	7'-1"	#9	10"	13'-7"	7'-2"	7'-1"	#9	10" 22'-7"	22'-8"	3.102	331.336	25
26 15'-0'7'-9"2'-3"2'-6"	4'-8" 4'-0	1 #8 5	5" 11'-2"	#9 9	17'-6"	10'-10'	7'-4"	#9	9"	13'-10'	7'-2"	7'-4"	#9	9" 23'-7"	23'-8"	3.278	367.361	26
27 15 -6 8 -3 2 -6 2 -6	4'-11''4'-3	#8 5	11'-2"	#9 8	18'-7"	11'-5"	7'-10'	#9	877	14'-5"	77 - 57	7'-10'	#9	8" 24"-4"	24'-5"	3.551	414.105	27
28 16'-0'8'-9" 2'-6" 2'-6"	4'-11''4'-3	1 #9 5	11'-2"	#9 8	19'-5"	11'-9'	8'-4"	#9	8	15'-1"	77-57	8'-4"	#9	10" 25"-4"	25'-6"	3.718	426.488	28
29 16'-9'9'-0"2'-9'2'-6"	5'-2' 4'-6	7 #9 5	12'-9'	[#] 10 9	20'-3"	12'-4"	8'-8'	#10	9"	16'-11'	9'-0"	8'-8"	#10	9" 26'-1"	26'-3''	4.035	519.157	29
30 17'-6'19'-3" 3'-0'12'-6"	5'-5' 4'-9			# 10 8	20'-11'	12'-10'	8'-10"	#10	877	17'-4"	9'-3"	8'-10'	#10	8" 26'-10'	27'-0"	4.369	580.877	30
31 18'-0'9'-6" 3'-0" 3'-0"	5'-5" 4'-9	7 #9 5		# 10 8	21'-7"	13'-3"	9'-1"	#10	8′′	17'-7'	97-377	9'-1"	#10	8" 27'-10'	28'-0"	4.674	597.591	31
32 18 - 9 9 - 9 3 - 3 3 - 6	5'-8'' 5'-0	7 #9 5		±10 8	22'-2"	13'-9"	97-47	#10	8′′	19'-5"	117-01	97-47	#10	8" 28'-7"	28'-9"	5.170	730.715	32
33 19'-3'10'-0'3'-6'3'-6'	5'-11"5'-3	7 #10 5		[‡] 10 8	23'-0''	14'-3"	97-87	#10	8′′	20'-0"	11'-3'	9'-8"	#10	8" 29'-4"	29'-6"	5.510	751.136	33

WALL DESIGN WITH SLOPING FRONT FACE AND 2:1 BACKSLOPE



REINFORCED CONCRETE **RETAINING WALL TYPE 4 AND 4 SW STANDARD PLAN D-1d**

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Clifford E. Mansfield

10/06/99

DEPUTY STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

Top of Top of 1'-6" JANUARY 7, 2008 TO AUGUST 2, 2008 $\frac{3}{4}$ Chamfer (TYP) Back face Special wall of wall face treatment ,0 when specified in contract Conc. Gutter (cl.3000, 4" Thick) WALL TOP DETAIL **GUTTER DETAIL**

Set top of retaining wall back $\frac{1}{2}$ from face

of wall at footing for wall heights H to 20'.

offset (inches) = \underline{H} - 2 (H is in feet)

For H above 20' use formula:

Bars L #4

Bars K

Bar J

at 1'-6" centers

MAX - both faces

 $1\frac{1}{2}$ " Clearance

3" DIA drains

Construction joint

 $1\frac{1}{2}^{\prime\prime}$ Clearance

2" Clearance

with roughened surface

Omit on walls H = 14'

and lower. Add one bar

each layer for each 5'

Bars S are used when $h_{\nu} > 0$

increment of H = 20

-Bars S #5 at 1'-0" OC -Bottom of footing 3′′ ---

KEY DETAIL Not required on walls H = 5'thru H = 25'

Front face of $\frac{1}{1}$ '-0"

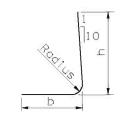
wall at top

of footing

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. All concrete shall be Class 4000 except as noted.
- 2. For backfill requirements, see Standard Plan "D-4".
- 3. When Wall Type 5-SW (saltwater) is specified, the concrete cover over steel in the front face and the total wall thickness shall be increased by
- 4. When Wall Type 5-SW (saltwater) is specified, concrete in the table column "Material Quantity" shall be increased by $0.003 \times H$ CY/LF.
- 5. Concrete in the 24 foot wall sections shall be placed separately between expansion joints with a minimum 12 hour period between concrete





BARS K AND M

Bar Radius

#5 9"

#6 11"

#8 1_-6"

BAR E At 1'-6" centers

WALL DESIGN WITH VERTICAL FRONT FACE AND 2:1 BACKSLOPE





REINFORCED CONCRETE **RETAINING WALL TYPE 5 AND 5 SW STANDARD PLAN D-1e**

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION



Washington State Department of Transportation

SECTION - VERTICAL FACE

3" Clearance

See Key

Detail

See gutterdetail

Bars G #4

2'-0"

splice.

Bars E

Bars F-

MIN

at 1'-6" centers

 $1\frac{1}{2}$ " Clearance (see Note 3)

D

ground

2'-0" MIN roadway shi

Bors Q #4 with

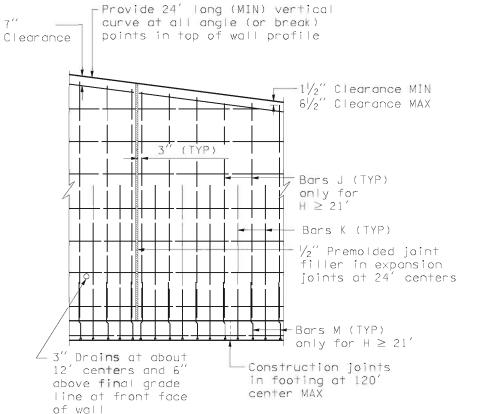
(TYP)

1'-6" lap splice

and extended thru

construction joints

1½" MIN 3½" MAX



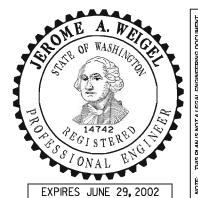
ELEVATION

8/01 New Approval Date DATE REVISION

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

	V .	FEGI		JAI	NUAL	KY /	, 20	UU8	IUA	UG	U5	FOOTING	REINFORCEM	1ENT		EFF	EGIIV	E: J/	ANUA	A IX Y	STEM	RE I NF ORCE	MENT	US 1 3,	ATERIAL	. ,
		DIMENSIO	INS		BAR (size			BAR	F			BAR	К				BAR M				BAR	J	BAR G (size #4)	a	UANTITY	
H (ft	, В	c _V	D	hk	LENGTH	h	SIZE	SPAC.	LENGTH	SIZE	SPAC.	LENGTH	h	Ь	SIZE	SPAC.	LENGTH	h	Ь	SIZE	SPAC.	LENGTH	LENGTH	CONCRETE (CY/LF)	STEEL (lbs/LF)	H (ft)
5	3'-0''	1 '-0''	1 '-0''	0	3'-5''	2'-9"	# 4	1'-0''	2'-0"	#5	1'-0''	6'-3''	4'-7''	2'-0''	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3'-10''	0.252	21.017	5
6	3'-0''	1'-0"	1'-0''	0	3'-5''	2'-9"	#4	1'-0"	2'-0"	#5	1'-0"	7'-3''	5'-7''	2'-1"	N/A	N/A	NZA	N/A	N/A	N/A	N/A	N/A	4'-10''	0.296	23.928	6
7	3'-3''	1 -0"	1'-0"	0	3'-5"	2'-9"	#4	1'-0"	2'-1"	#5	1'-0"	8'-4''	6'-7"	2'-2"	N/A	N/A	NZA	N/A	N/A	NZA	N/A	N/A	5'-10''	0.354	25.554	7
8	3'-6"	1'-0''	1 -0"	0		2'-9"	#4	1'-0"	2 -2"	#5		9'-5"	7'-7''	2'-3"	N/A	N/A	NZA	N/A	N/A	N/A	N/A	N/A	6'-10''	0.415	28.526	8
9	4'-0''	1'- 3''	1'-0"	0		2'-9"	# 4	1'-0"	2'-4"	#5		10'-10''	8'-7"	2'-8"	NZA	NZA	NZA	NZA	NZA	NZA	N/A	N/A	7'-10"	0.489	31.896	9
10		1'- 3''	1'-0"	0		2'-9"	#4	10"	2'-9"	#5		11'-11"	9'-7"	2'-9"	NZA	NZA	NZA	N/A	N/A	N/A	NZA	NZA	8'-10"	0.567	34.117	10
3 11	5'-0"	1'- 6"	1'-0''	0		2'-9"	#5	1'-0"	3'-3''	#5	1'-0''	13'-3"	10'-7''	3'-1"	NZA	N/A	NZA	ANA	N/A	N/A	NZA	N/A	9'-10''	0.648	38.474	11
12		1'- 6''	1'-0"	0		2'-9"	#5	9"		#5	11'	14'-4"	11'-7'	3'-2"	NZĀ	N/A	N/A	N/A	NZA	N/A	NZA	N/A	10'-10''	0.733	44.454	12
13		1'- 9"	1'-0''	0		2'-9"	#5	7''	4'-1"	#5	9''	15′-8′′	12'-7''	3'-6"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11'-10''	0.831	58.247	13
14		1'- 9''	1'-0''	0		2'-9"	#6	7''	4'-11"	#5	7"	16'-10"	13'-7''	3'-8''	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12'-10''	0.924	68.698	14
15		2'-0"	1'-3''	0		3'-0"	#6	7''	5'-4"	#5	6'′	18'-3"	14'-7''	4'-0"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	137-57	1.079	78.188	15
16		2'-3"	1'-3''	0		3'-0''	#6	5''	5'-9''	#5	6′′	19'-6''	15'-7''	4'-4''	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14'-5''	1.195	89.572	16
1.7		2'-3"	1'-6''	0		3'-3"	#6	5′′		#5	5"	20'-8''	16'-7''	4'-5''	NZA	N/A	NZA	N/A	N/A	N/A	NZA	N/A	15'-4''	1.362	104.579	17
18		2'- 3"	1'-6''	0		3'-3"	#7	6"	7'-5"	#6	6′′	21'-8"	17'-7"	4'-6''	NZA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16'-4''	1.490	126.468	18
19		2' = 6"	1'-9''	0		3'-6"	#7	6′′	7'-4"	#6	5′′	23'-0"	18'-7''	4'-10"	NZA	N/A	NZA	N/A	N/A	N/A	N/A	N/A	17'=1"	1.646	145.732	19
20	10'-0''	3'-0"	2'-0"	0		3'-9''	#7	6′′	7'-3''	#6	5′′	24'-8''	19'-7''	5′-6′′	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17'-10''	1.841	151.845	20
21		3'-6''	2'-0"	0		3'-9''	#7	6′′	7'-2"	#7	1'-0"	17'-5"	11'-11"	6′-1′′	#7	1'-0''	10'-3''	4'-10''	6'-1''	#7	1'-0"	18'-11''	18'-10"	1.974	166.668	21
22		3'-9''	2'-0"	0		3'-9''	#7	6''	7'-4"	# 7	1.1	18'-2"	12'-4''	6'-5''	#7	11"	10'-7"	4'-10''	6'-5''	#7	11"	19'-11''	19'-10''	2.111	188.243	22
23		3'-9"	2'-3"	0		4'-0''	#7	6"	7'-9"	#8	1'-0"	19'-9''	13'-11''	6'-6''	#8	1'-0''	11'-11'	6'-1''	6'-6''	#8	1'-0"	20'-8''	20'-7''	2.332	209.377	23
24		4'-0"	2'-3"	0	4'-8"	4'-0"	#8	7"	9'-2"	#8	11"	20'-6"	14'-4''	6'-10''	#8	11"	12'-3"	6′ 1′′	6'-8''	#8	11"	21'-8"	21'-7"	2.501	240.204	24
25		4'-0"	2'-6"	0	4'-11"	4'-3"	#8	6"	9'-7"	#8	10"	21'-2"	14'-10"	7'-0"	#8	10"	12'-6"	6'-4"	7'-0"	#8	10"	22'-5"	22'-4"	2.743	282.675	25
26		4'-6''	2'-6"	2'-0"	4'-11"	4'-3"	#8	6′′	9'-3"	#8	10"	22'-1"	15'-2"	7'-7"	# 8	10"	13'-1"	6'=4''	7'-7"	#8	10"	23'-5"	23'-4"	3.101	295.370	26
27		4'-9''	2'-6"	2'-0''	4'-11"	4'-3''	#8	6′′	9′-5′′	#9	11"	23' -10''	16'-8''	7'-11''	#9	11"	14'-6''	7′-5′′	7'-11''	#9	11	24′-5′′	24'-4''	3.264	332.292	27
28		5'-0"	2'-9"	2'-0"	5′-2′′	4'-6'	#8	6′′	9'-7"	#9	10′′	24'-8''	17'-2"	8'-3"	#9	10′′	15′-1′′	7′-8′′	8'-3''	#9	10"	25′-2′′	25′-1′′	3.530	365.742	28
29		5'- 6"	2'-9"	2'-0''	5'-2''	4'-6"	#8	6''	9'-5"	#9	10"	25'-8''	17'-7''	8'-10"	#9	10"	15'-7''	7′-8′′	8'-10"	#.9	10"	26'-2"	26′-1′′	3.704	393.720	29
30		6'-0"	2'-9"	2 - 0"	5'-2"	4'-6''	#8	6''	9'-4"	#9	9"	26'-8"	17'-11''	9'-6'	#9	9′′	16'-3''	7'-8''	9'-6''	#9	9''	27'-2"	27'-1"	3.882	440.386	30
31		6'-3"	3'-0"	2'-0"	5'-5"	4'-9"	#8	6''	9'-6"	#10	10"	28'-9"	19'-9''	9'-10"	#10	10"	18'-2"	9'-3''	9'-10"	#10	10''	27'-11''	27'-11''	4.174	491.523	31
32		6'-6"	3'-0"	2'-0"	5'-5"	4'-9"	#8	6′′	9'-8"	#10	9"	29'-6"	20'-2''	10'-2"	#10	9''	18'-6''	9'-3"	10'-2"	#10	9''	28'-11''	28'-11''	4.363	549.081	32
33		6'-9"	3'-3"	2'-0"		5'-0"	#9	7''	11'=2"	#10	9′′	30'-4"	20'-8''	10'-6"	#10	10"	19'-1''	9'-6''	10'-6"	#10	9"	29'-8"	29′-5″	4.704	575.423	33
34		7'-3"	3'-6''	2'-0"		5'-3"	#9	7''	11'-1"	#10	9"	31'-5"	21'-3''	11'-1"	#10	9′′	19'-11''	9'-9''	11'-1"	#10	9''	30'-5"	30'-4''	5.028	592.018	34
35	17'-9''	7'-6''	3'-6''	2'-0''	5'-11''	5'-3''	#9	7''	11'-3''	#10	8′′	32'-3''	21'-7''	11'-6''	#10	8′′	20'-4''	9'-9''	11'-6''	#10	8′′	31'-5''	31'-4''	5.236	666.586	35

WALL DESIGN WITH VERTICAL FRONT FACE AND 2:1 BACKSLOPE



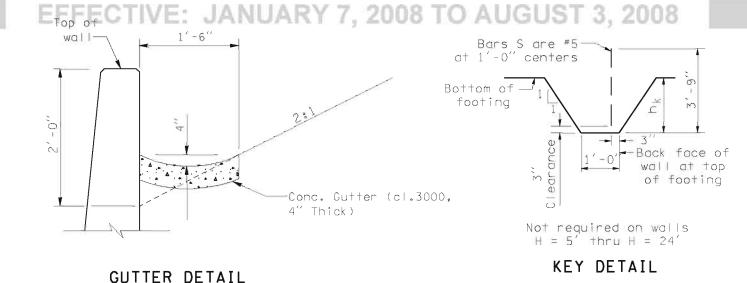
REINFORCED CONCRETE RETAINING WALL TYPE 5 AND 5 SW STANDARD PLAN D-1e

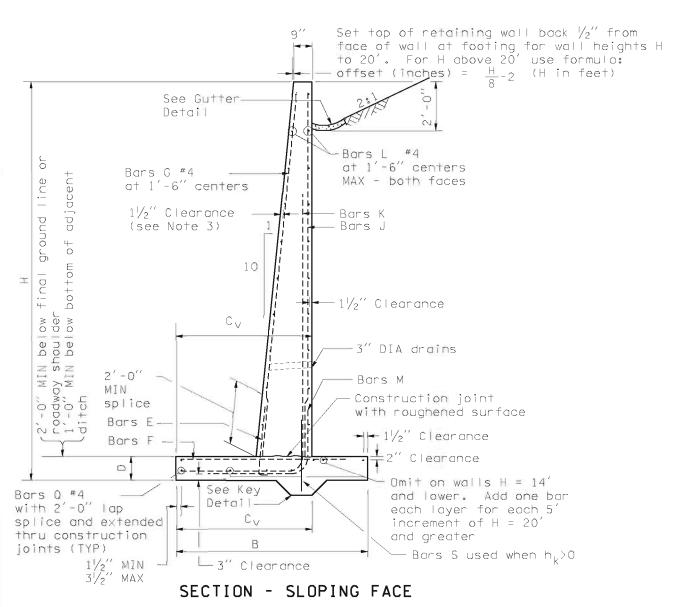
SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 01-23-02

CORRECTED TABLE 8/01 DATE REVISION





EFFECTIVE: JANUAR NOTES 2008 TO AUGUST 3, 2008

-Back face

1/2" Clearance MIN

Bars J (TYP)

only for H > 21'

Bars K (TYP)

Bars M (TYP)

Construction joints

only for

H ≥ 21′

120' centers MAX

in footing at

Clearance MAX

1/2" Premolded joint

filler in expansion

joints at 24' centers

of wall

WALL TOP DETAIL

3/4" Chamfer

(TYP)

Special wall -

face treatment when specified

=24′ (MIN) vertical

TI 3" (TYP)

43" Drains at about

12' centers and 6'

above final grade line

ELEVATION

at front face of wall

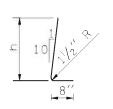
curve at all angle (or break) points in top of wall profile

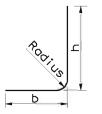
in contract

- 1. All concrete shall be Class 4000 except as noted.
 - 2. For backfill requirements, see Standard Plan "D-4".
 - 3. When Wall Type 6-SW (saltwater) is specified, the concrete cover over steel in the front face and the total wall thickness shall be increased by 1".
 - 4. When Hall Type 6-SW (saltwater) is specified, concrete in the table column "Material Quantity" shall be increased by $0.003 \times H$ CY/LF.
 - 5. Concrete in the 24 foot wall sections shall be placed separately between expansion joints with a minimum 12 hour period between concrete



Bar	Ro	i bt	US
#5		9"	
#6	1,3	11'	1
#7	1	=	1"
#8	1'	Ξ	3''
#9	1'	=	6′′
#10	1'	-	8′′



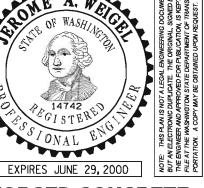


BAR E At 1'-6" centers

BARS K AND M

WALL DESIGN WITH SLOPING FRONT FACE AND 2:1 BACKSLOPE





REINFORCED CONCRETE **RETAINING WALL TYPE 6 AND 6 SW** STANDARD PLAN D-1f

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION Clifford E. Mansfield

10/06/99

DEPUTY STATE DESIGN ENGINEER WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

10/99 Added note 5. DATE REVISION

					1						FOOTING	G REINFOR	CEMENT								STEM REI	NFORCEME	NT	маті	ERIAL	
		DIMENSI	ONS		BAR (size			BAR	F			BAR K					BAR M				BAR J		BAR G (size #4)		NTITY	
H (ft)	В	Cv	D	h k	LENGTH	h	SIZE	SPACING	LENGTH	SIZE	SPACING	LENGTH	h	ь	SIZE	SPACING	LENGTH	h	b	SIZE	SPACING	LENGTH	LENGTH	CONCRETE (CY/LF)	STEEL (LBS/LF)	H (ft)
5	2'-6'	2'- 0"	1'-0"	0	3'- 5"	2'- 9"	# 4	1'-0"	1'- 9''	#5	1'- 0"	5'-11''	4'- 7"	1'- 8"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3'-10"	0.233	19.253	5
6	2'-9'	2'-0"	1'-0"	0	3' - 5"	2'- 9"	ts 4	1'-0"	2'- 0''	#5	1'- 0"	6'-11"	5' - 7"	1'-8"	N/A	N/A	NZA	N/A	N/A	N/A	N/A	N/A	4'-10''	0.287	22.244	6
7	3'-0'	2'- 3"	1"-0"	0	3'-5"	2"- 9"	# Z	1 -0"	2'- 0"	#5	1'- 0"	8'- 1"	6 - 7"	1 -10"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5'-10''	0,349	23.906	7
В	3'-0'	2'- 3"	1'-0"	0	3' - 5"	2'- 9"	ts 🗸	1'=0''	2'- 0"	#5	1'- 0"	9' - 1''	7'- 7"	1'-10"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6'-10''	0.396	26.731	8
9	3'-6'	' 2' - 3"	1'-0"	0	3'- 5"	2'- 9"	# 4	1'-0"	2'- 6"	#5	1'- 0"	10' - 1''	8'- 7"	1'-10"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7'-10''	0.470	29.889	9
10	3''-9'	2'- 9"	1'-0"	0	3' - 5"	2'- 9"	# 4	1'-0"	2'- 3"	#5	1'- 0"	11'- 6''	9' - 7"	2'- 4"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8'-11''	0.539	31.682	10
1.1	4'-3'	' 3'- 0''	1'-0"	0	3' - 5''	2'- 9"	# 4	1'-0"	2' - 6''	#5	1'- 0"	12'-11"	10' - 7''	2'- 8"	N/A	N/A	N/A	N/A	NZA	N/A	N/A	N/A	9'-11''	0.620	35.108	1.1
12	5 -0'	′ 3′ - 3′′	1'-0"	0	3'-5"	2'- 9"	15 Z	1'-0"	3'- 0"	#5	1'- 0"	14' - 1"	11' - 7"	2"-11"	N/A	N/A	NZA	N/A	N/A	N/A	NZA	N/A	10'-11"	0.715	39.108	12
13	5'-9'	3'-6"	1'-0"	0	3' = 5"	2'- 9"	# 4	9"	3' - 6"	#5	9"	15' - 4''	12' - 7''	3'- 1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11'-11"	0.813	47.301	13
14	6'-3'	3'-6"	1'-0"	0	3' - 5"	2'- 9"	#5	9"	4' - 4''	#5	9′′	16' - 4''	13' - 7''	3'- 1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12'-11"	0.906	53.382	14
15	7'-0'	3'-9"	1'-0"	0	3'-5"	2'- 9"	#6	8"	5' - 4''	#6	9"	17' - 6"	14' - 7''	3'- 4"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13'-11"	1.011	74.154	15
16	7'-6'	' 3'- 9"	1'-0''	0	3' - 5"	2'- 9"	#6	6′′	5'-10"	#6	8''	18' - 6"	15' - 7''	3'- 4"	N/A	N/A	NZA	N/A	N/A	NZA	NZA	N/A	14'-11"	1.111	86.742	16
17	8'-0'	4'-0"	1'-3''	0	3'-8''	3'- 0"	#6	6′′	6'-1"	#6	7.''	19'-10"	16' - 7''	3'-8"	N/A	NZA	N/A	N/A	N/A:	N/A	N/A	N/A	15' - 8''	1.267	99.328	17
18	8'-9'	4'-3"	1'-3"	0	3'- 8"	3'- 0"	#6	5′′	6' - 7''	#6	6′′	21'- 0''	17' - 7''	3'-10"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16'- 8''	1.390	117.247	18
19	9'-0'	4'-6"	1'-6"	0	3'-11"	3'- 3''	#7	7''	7' - 5''	#6	6′′	22' - 3"	18' - 7''	4'- 1"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	17'- 5"	1.553	125.039	19
20	9'-3'	4'-9"	1'-6"	0	3'-11"	3'- 3"	#7	7''	7' - 5"	#7	7''	23' - 5"	19' - 7''	4'- 4"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	18' - 5"	1.662	142.034	20
21	9'-9'	5'-0"	1'-6"	0	3'-11"	3'- 3"	# 7	6"	7'- 8"	#7	1'- 0"	12'- 8"	8'- 6"	4'-8"	#7	1'- 0"	8'-6''	4'- 4''	4'- 8"	#7	1'- 0"	19' - 4"	19'- 5"	1.788	149.230	21
22	10'-3	" 5' - 3"	1'-9"	0	4' - 2"	3'- 6"	#7	6"	7′-11′′	#7	11"	13'- 5"	9'- 1"	4'-10"	# 7	11"	8'-11''	4'- 7"	4'-10"	#7	11"	20' - 1"	20' - 2"	1.986	160.101	22
23	10'-9	'' 5' - 6''	1'-9"	0	4' - 2"	3'-6"	#7	6′′	8' - 2"	#7	10"	14'- 0"	9'-5"	5'-1"	# 7	1'-10"	9'- 2"	4'- 7"	5'- 1"	# 7	10"	21'- 1"	21'- 2"	2.123	171.973	23
24	11'-3	5'-9''	2'-0"	0	4' - 5''	3'- 9"	#7	6''	8' - 5''	#7	10''	14'-10"	10' - 0''	5' - 4"	#7	1'-10"	9'-8"	4'-10"	5' - 4''	#7	10"	21'-10"	21'-11"	2.341	181.868	24
25.	11*-6	" 6" - 3"	2"-0"	2"-0"	4'-5'	3* - 9"	#7	6′′	8' - 5"	#7	9''	15" - 8"	10' - 4'	5 -10"	#7	9"	10' - 2"	4'-10"	5'-10''	# 7	9''	22'-10''	22'-11"	2.693	192.607	25
26	12'-0	· 6' - 6''	2'-3''	2'-0"	4'-8"	4'- 0"	#7	6′′	8'-5"	#7	9''	16' - 5''	10'-10"	6'-1"	# 7	9′′	10' - 8"	5'- 1"	6'- 1"	#7	9"	23' - 7''	23' - 8"	2.927	202.605	26
27	12'-6	' 7'- 0''	2'-3"	2'-0"	4'-8''	4'- 0"	#7	6′′	8'-5''	#7	8''	17'- 5"	11' - 3''	6'-8"	#7	8''	11' - 3''	5'- 1"	6'-8"	#7	8′′	24' - 7"	24' - 8''	3.086	213.332	27
28	13'-0	7'-3"	2'-6"	2'-0"	4'-11"	4' - 3''	#7	6"	8'- 8''	#8	9"	18'- 0"	11'- 9''	6'-10"	#8	9"	12' - 7"	6' - 4"	6'-10"	# 8	9′′	25' - 4"	25' - 6"	3.338	255.188	28
29	13'-6	7' - 6"	2'-6"	2'-0"	4'-11"	4'- 3"	#8	6′′	9'-11"	#8	8''	18'- 8"	12' - 2"	7'- 1"	#8	877	12'-10"	6' - 4"	7'- 1"	#8	8"	26' - 4''	26' - 6"	3.509	299.649	29
30	14'-0	" 8' - 0"	2'-9"	2'-0"	5' - 2"	4'- 6"	#8	6"	9'-11"	#8	8''	19'- 9"	12' - 8"	7'- 8"	#8	8''	13' = 8"	6'- 7"	7' - 8"	#8	8"	27'- 1"	27'- 3"	3.780	317.688	30
31	14'-6	" 8' - 3"	2'-9"	2'-0"	5'-2"	4'- 6"	#8	6′′	10'- 2"	#8	8′′	20' - 4"	13' - 1''	7'-10"	#8	8''	13'-10"	6' - 7''	7'-10"	#8	8"	28' - 1"	28' - 3"	3.962	326.716	31
32	15'-0	8'- 6"	3'-0"	2'-0"	5'-5"	4'- 9"	#8	6′′	10'- 5"	#9	9"	21'- 0"	13' - 5''	8'-1"	#9	9''	15' - 4"	7'-11"	8'-1"	#9	9′′	28'-11"	29'- 0"	4.252	393.547	32
33	15'-6	. 8 9	3'-0"	2'-0"	5' - 5"	4'- 9"	#8	6"	10' - 8"	#9	8"	21'- 8"	14' - 0''	8'- 4"	#9	8'''	15' = 7"		8' - 4"	#9	8′′	29'-11"	30' - 0''	4.444	424.671	33
34	16'-3	" 9' - 3"	3'-3"	2'-0"	5' - 8"	5'- 0"	#8	6''	10'-11"	#9	8''	22' - 8''	14' - 6"	8'-10"	#9	8"	16' - 4''	8' - 2"	8'-10"	#9	8"	30' - 7''	30' - 9"	4.783	440.218	34
35	16'-9	" 9' - 6"	3'-6"	2'-0"	5'-11"	5'- 3"	#8	5"	11'- 2"	#10	8′′	23' - 4"	15' - 0"	9' - 1"	#10	8′′	18' - 1"	9'- 9"	9' - 1"	#10	8′′	31' - 4''	31' - 6"	5.106	544.207	35

WALL DESIGN WITH SLOPING FRONT FACE AND 2:1 BACKSLOPE



REINFORCED CONCRETE RETAINING WALL TYPE 6 AND 6 SW STANDARD PLAN D-1f

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Clifford E. Mansfield

10/06/99

DEPUTY STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

10/99 New approval date. TWS

JANUARY 7, 2008 TO AUGUST 3, 2008 7, 2008 TO AUGUST 3. **NOTES TYPE 1A** TYPE 1B TYPE 1C TYPE 1D WALL HT **WALL HT** DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH BAR "D" BAR "D" BAR "D" BAR "D" Н 1. Wall to be designated Noise Barrier Wall Type 1A, 1B, 1C, or 1D. D1 D2 D2 D1 D2 D2 The Contract specifies actual wall designations. 6' - 0" 5" 3' - 6" 3' - 3" #3 @ 15" 5" 3' - 9' 3' - 6' #3 @ 15" 5" 4' - 0" 3' - 6" #3 @ 15" 6' - 0" 3' - 6" #3 @ 15" 3' - 3" 5" 5" 2. For intermediate wall heights, use the next higher H. 8' - 0" 3' - 3" #3 @ 15" 3' - 9' #3 @ 12" 5" 3' - 9" 3' - 6" #3 @ 15" 4' - 3" #3 @ 10" 8' - 0" 5" 10' - 0" 4' - 0" 3' - 6" #3 @ 13" 5" 4' - 6" 4' - 0" #4 @ 15" 5" 4' - 3" #3 @ 10" 5" 4' - 6" 4' - 0" #4 @ 12" 10' - 0" 3. Panels shall have at least 3 feet of level ground on each side. 5" 5" 12' - 0" 5" 4' - 3" 3' - 9" #3 @ 9" 4' - 9" 4' - 3" #4 @ 10" 5" 4' - 6" #4 @ 12" 5' - 0" 4' - 6" #4 @ 10" 12' - 0" 4' - 0" 4. Construction joints in the trench footing shall be spaced at 5" 5" 14' - 0" 14' - 0" 4' - 6" 4' - 0" #4 @ 12" 5' - 0" 4' - 6' #4@9" 5" 4' - 9" 4' - 3" #4 @ 10" 5' - 3" 4' - 9" #5 @ 11" 120 feet maximum. 5" 5" 5" 16' - 0" 4' - 9" 4' - 3" #4 @ 10" 5' - 3" 4' - 9' 5' - 9" 5' - 0" #5 @ 8" 16' - 0" #5 @ 11" 5' - 0" 4' - 6" #4 @ 9" 5" 4' - 6" 5" 18' - 0" 18' - 0" 5' - 0" #4 @ 9" 5' - 6" 5' - 0' #5 @ 8" 5" 5' - 3" 4' - 9" #5 @ 11" 6' - 0" #6@9" 5. The Contract specifies actual foundation requirements D1 or D2. 5" 20' - 0" 4' - 9" #4 @ 7" 5" 5' - 3" 6" 20' - 0" 5' - 3" 5' - 9" #5 @ 7" 5' - 6" #5 @ 7" 6' - 3" 5' - 6" #6@9" 22' - 0" 5" 5' - 6" 5' - 0" 6" 6' - 0" 5' - 6" 5" 6" 6' - 6" 5' - 9" 22' - 0" #4 @ 6" #5 @ 6" #6 @ 7" 5' - 9" 5' - 3" #5 @ 6" 5' - 9" 5' - 3" #5 @ 8" 6" #6 @ 7" 6" 6' - 0" #6 @ 6" 24' - 0" 6' - 0" 5' - 6" #6 @ 7" t = WALL THICKNESS WIND EXPOSURE & VELOCITY **SOIL TYPE** 3/4" CHAMFER (TYP.) SEALER (TYP.) WIND NOISE ANGLE POINT **WIND** SOIL **ANGLE OF INTERNAL** BARRIER /ELOCITY **EXPOSURE** FRICTION (DEGREES) **TYPE** (MPH) t₂ -2 **RIGHT-OF-WAY** WALL & TRENCH 2 2 80 32 38 1B В1 90 D2 1C B2 80 SEE CONTRACT B2 1D 90 t₂ 2 3/4" CHAMFER 3" (TYP.) REINFORCED PER SURFACE TREATMENT CORNER LISTED WALL HEIGHT **PANEL** TRAFFIC SIDE REINFORCEMENT TABLE BAR "D" JOINT AND CORNER DETAIL ALTERNATE AS SHOWN **CAST-IN-PLACE CONCRETE** 1/2" PREMOLDED JOINT WALL ON TRENCH FOOTING 429 FILLER IN EXPANSION 2' - 0" MAX. REINFORCING STEEL JOINTS (TYP.) @ 24' - 0" νον νον BAR "D" ~ CENTERED CENTER'S MAX. ON WALL BAR "A" #4 (TYP.) 3"_ ~ CONTINÙOUS BAR "D" (TYP.) 3' - 0" MIN. FINAL GROUND LINE 15, (6) ٧ BAR GISTER FINAL GROUND LINE CONSTRUCTION JOINT WITH EXPIRES AUGUST 23, 2006 ROUGHENED SURFACE **NOISE BARRIER WALL** TYPE 1 CAST AGAINST UNDISTURBED EARTH STANDARD PLAN D-2.02-00 SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION TOP OF FOOTING 1'- 0" MIN. Harold J. Peterfeso 11-10-05 STATE DESIGN ENGINEER **CONSTRUCTION JOINT** Washington State Department of Transportation TYPICAL SECTION **ELEVATION** (SEE NOTE 4) JANUARY 7, 2008 TO AUGUST 3,

nens

<

NUA

TYPE 2A TYPE 2B TYPE 2D TYPE 2C WALL HT WALL HT **BARS BARS BARS** BARS BARS BARS **BARS** BARS BAR "B" BAR "B" BAR "B" W BAR "B" Н "A"&"F "D"&"E" "A"&"F "D"&"E" 'A"&"F "D"&"E" "D"&"E" #4 @ 18" #3 @ 11" 6' - 0" 5" 3 ~ #4 #3 @ 15" 2' - 3" 5" 3 ~ #4 #3 @ 12" 5" #3 @ 15" 2' - 6" 5" 3 ~ #4 6' - 0" 2' - 0" #4 @ 18" #4 @ 18" 2' - 0" 3 ~ #4 #4 @ 18" 5" 5" 5" 8' - 0" 2' - 3" 3~#4 #3 @ 12" 2' - 9" 3~#4 #4 @ 18" #4 @ 15" 2' - 6" 3~#4 #4 @ 18" #3 @ 10" 3' - 3" 5" 5 ~ #4 #4 @ 18" #4 @ 12" 8' - 0" 5" 10' - 0" #3 @ 9" 3' - 3" #4 @ 10" #4 @ 12" 3' - 6" 10' - 0" 12' - 0" 5" 5" 4' - 3" 12' - 0" 3' - 0" #4 @ 12' 3' - 9" #4 @ 10" 3' - 3" #4 @ 10" #4 @ 18" |#5 @ 12" 3 ~ #4 #4 @ 18" 5 ~ #4 3~#4 5 ~ #4 #4 @ 10" 14' - 0" 3' - 3" 5" 3~#4 #4 @ 18" 5" #4 @ 18" #5 @ 11' 3' - 9" 5" 3~#4 #4@9" 4' - 9" #4 @ 18" #5 @ 8" 14' - 0" 5" 5" 16' - 0" 16' - 0" 3' - 9" #4 @ 9" 4' - 9" #6 @ 12" 5" 5' - 6" #4 @ 18" #5 @ 11 18' - 0" 4' - 0" 5" #5 @ 11' 5' - 3" 5" #6 @ 9" 5" 6' - 0" 5 ~ #4 18' - 0" 5 ~ #4 5 ~ #4 5~#4 #6 @ 12" 20' - 0" 5' - 0" #5 @ 9" 6' - 0" 6" 20' - 0" 22' - 0" 5' - 6" 6" 6" 7' - 0" 22' - 0" #5 @ 7" 6' - 3" #6 @ 8" 5' - 9" #6@9" 24' - 0" 6' - 0" 5" #4 @ 15" #5 @ 6" 6' - 3" 7' - 6" #6 @ 6 1/4" 24' - 0"

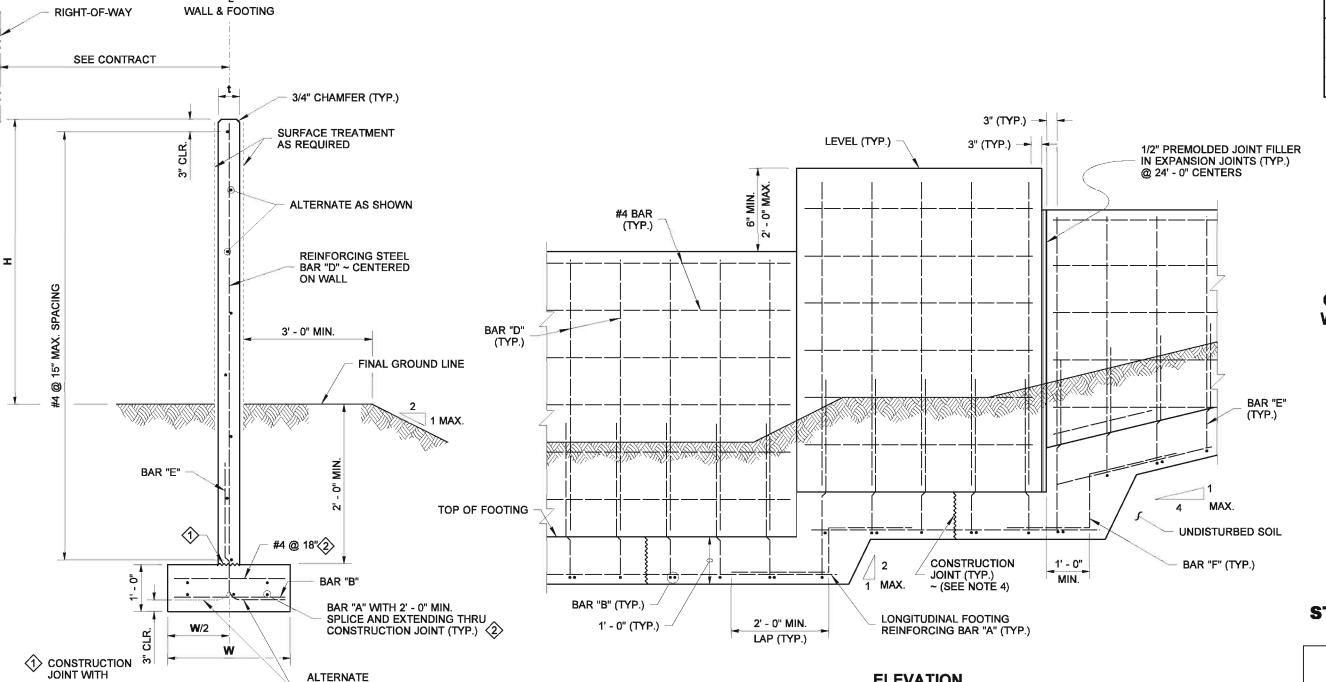
NOTES

1. Wall to be designated Noise Barrier Wall Type 2A, 2B, 2C or 2D. The Contract specifies actual wall designations.

2008 TO AUGUST 3, 2008

- 2. For intermediate wall heights not listed, use the next higher H.
- 3. Panels shall have at least 3 feet of level ground
- 4. Construction joints in the footing shall be spaced at 120 feet maximum.

WIND EX	POSURE & VI	ELOCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)
2A	B1	80
2B	B1	90
2C	B2	80
2D	B2	90



CAST-IN-PLACE CONCRETE WALL ON SPREAD FOOTING



NOISE BARRIER WALL TYPE 2

STANDARD PLAN D-2.04-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 11-10-05

Washington State Department of Transportation

REQUIRED FOR WALLS 24' - 0" ~ TYPE 2C,

WALL HEIGHT 22' - 0" & 24' - 0" ~ TYPE 2B &

WALLS 20' - 0", 22' - 0" & 24' - 0" ~ TYPE 2D

ALTERNATE

PLACEMENT

OF HOOKS

TYPICAL SECTION

2008

2008

NUAR

4

ROUGHENED

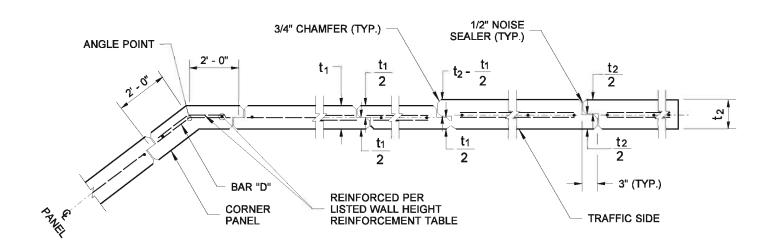
t = WALL THICKNESS

EFFECTIVE: JANUARY 7, 2008 TO AUGUST

ELEVATION

1' - 0" MIN. (TYP.) **C FOOTING** BAR "A" (TYP. (TRANSVERSE BARS NOT SHOWN)

FOOTING WIDTH TRANSITION DETAIL FOR LOCATIONS WITHOUT FOOTING STEP



JOINT AND CORNER DETAIL

CAST-IN-PLACE CONCRETE WALL ON SPREAD FOOTING



NOISE BARRIER WALL TYPE 2

STANDARD PLAN D-2.04-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION



Harold J. Peterfeso 11-10-05 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

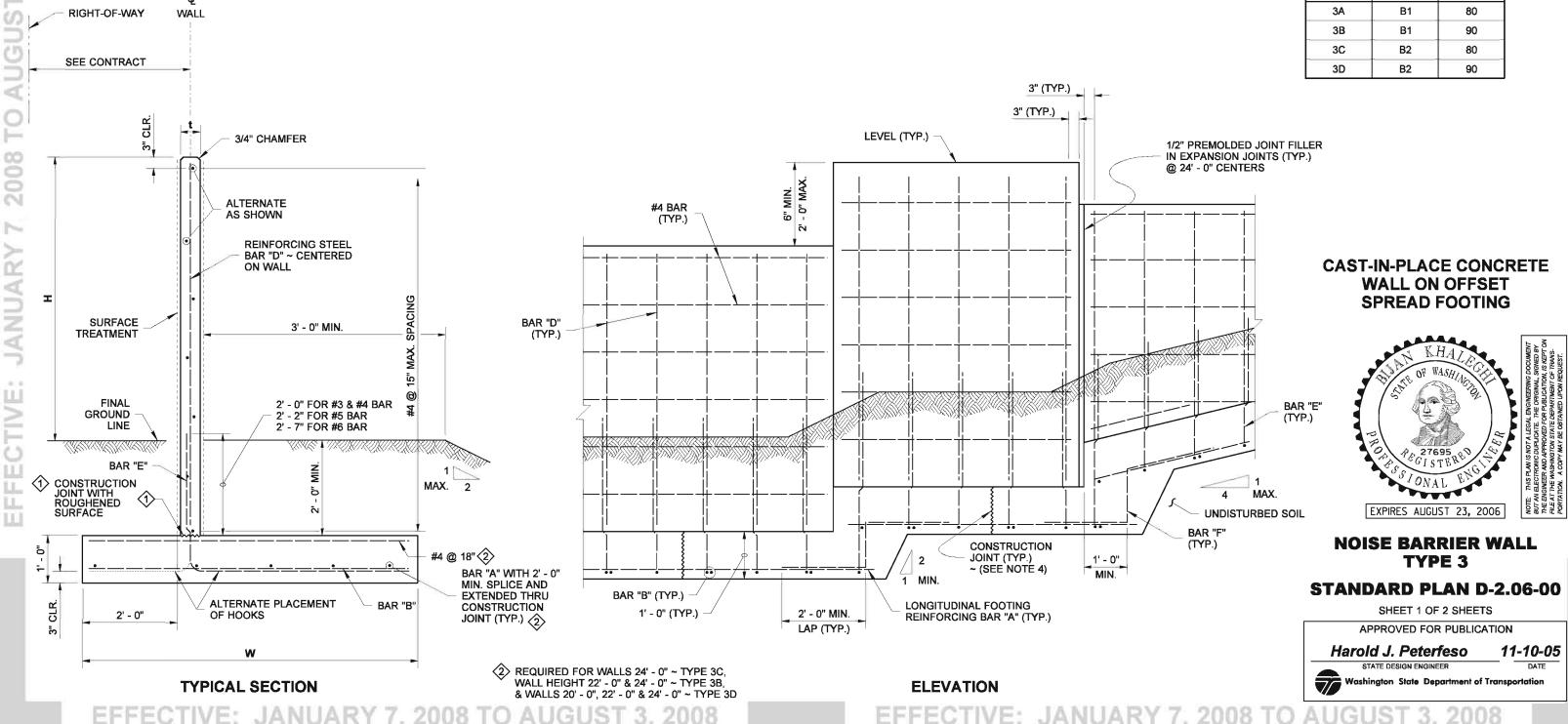
\A/A11_11T			TYPE	3A				TYPE	3B				TYPE	3C				TYPE	3D		WALL HT
WALL HT	w	t	BARS "A"&"F"	BAR "B"	BARS "D"&"E"	w	t	BARS "A"&"F"	BAR "B"	BARS "D"&"E"	w	t	BARS "A"&"F"	BAR "B"	BARS "D"&"E"	w	t	BARS "A"&"F"	BAR "B"	BARS "D"&"E"	H
6′ - 0"	2' - 0"	5"	3 ~ #4	#4 @ 18"	#3 @ 15"	2' - 3"	5"	3 ~ #4	#4 @ 18"	#3 @ 12"	2' - 0"	5"	3 ~ #4	#4 @ 18"	#3 @ 15"	2' - 6"	5"	3 ~ #4	#4 @ 18"	#3 @ 11"	6' - 0"
8' - 0"	2' - 3"	5"	3 ~ #4	#4 @ 18"	#3 @ 12"	2' - 9"	5"	3 ~ #4	#4 @ 18"	#4 @ 15"	2' - 6"	5"	3 ~ #4	#4 @ 18"	#3 @ 10"	3' - 3"	5"	5 ~ #4	#4 @ 18"	#4 @ 12"	8' - 0"
10' - 0"	2' - 6"	5"	3 ~ #4	#4 @ 18"	#3 @ 9"	3' - 3"	5"	5 ~ #4	#4 @ 18"	#4 @ 10"	2' - 9"	5"	3 ~ #4	#4 @ 18"	#4 @ 12"	3' - 6"	5"	5 ~ #4	#4 @ 18"	#4 @ 10"	10' - 0"
12' - 0"	3' - 0"	5"	3 ~ #4	#4 @ 18"	#4 @ 12"	3' - 9"	5"	5 ~ #4	#4 @ 18"	#4 @ 10"	3' - 3"	5"	3 ~ #4	#4 @ 18"	#4 @ 10"	4' - 3"	5"	5 ~ #4	#4 @ 18"	#5 @ 12"	12' - 0"
14' - 0"	3' - 3"	5"	3 ~ #4	#4 @ 18"	#4 @ 10"	4' - 3"	5"	5 ~ #4	#4 @ 18"	#5 @ 11"	3' - 9"	5"	5 ~ #4	#4 @ 18"	#4 @ 9"	5' - 3"	5"	5~#4	#4 @ 18"	#5 @ 8"	14' - 0"
16' - 0"	3' - 9"	5"	5 ~ #4	#4 @ 18"	#4 @ 9"	5' - 3"	5"	5 ~ #4	#4 @ 18"	#6 @ 12"	4' - 3"	5"	5 ~ #4	#4 @ 18"	#5 @ 11"	6' - 3"	5"	5 ~ #4	#4 @ 18"	#6 @ 9"	16' - 0"
18' - 0"	4' - 0"	5"	5 ~ #4	#4 @ 18"	#5 @ 11"	6' - 0"	5"	5 ~ #4	#4 @ 18"	#6 @ 9"	5' - 0"	5"	5 ~ #4	#4 @ 18"	#6 @ 12"	7' - 0"	6"	5 ~ #4	#4 @ 18"	#6 @ 9"	18' - 0"
20' - 0"	5' - 0"	5"	5 ~ #4	#4 @ 18"	#6 @ 12"	7' - 0"	6"	5 ~ #4	#4 @ 18"	#6 @ 9"	5' - 9"	5"	5 ~ #4	#4 @ 18"	#6 @ 9"	8' - 0"	6"	6~#4	#4 @ 12"	#6 @ 6"	20' - 0"
22' - 0"	5' - 6"	5"	5 ~ #4	#4 @ 18"	#6 @ 9"	7' - 9"	6"	6 ~ #4	#4 @ 12"	#6 @ 6"	6' - 6"	6"	5 ~ #4	#4 @ 18"	#6 @ 9"	9' - 0"	7"	7~#4	#4 @ 12"	#6 @ 6"	22' - 0"
24' - 0"	6' - 3"	5"	5 ~ #4	#4 @ 18"	#6 @ 9"	8' - 6"	7"	6 ~ #4	#4 @ 12"	#6 @ 6"	7' - 6"	6"	6 ~ #4	#4 @ 12"	#6 @ 6"	9' - 9"	7"	7 ~ #4	#4 @ 15"	#6 @ 6"	24' - 0"

t = WALL THICKNESS

2008

- 1. Wall to be designated Noise Barrier Wall Type 3A, 3B, 3C or 3D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights not listed, use the next higher H.
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. Construction joints in the footing shall be spaced at 120 feet maximum.

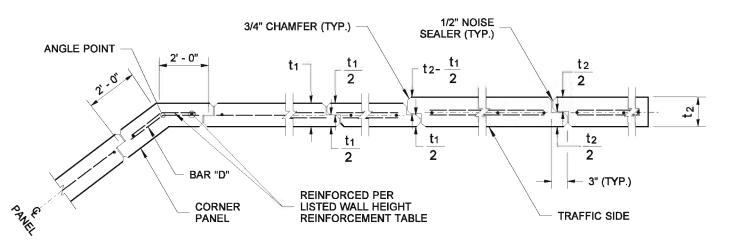
WIND EX	POSURE & V	ELOCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)
3A	B1	80
3B	B1	90
3C	B2	80
3D	B2	90



(TRANSVERSE BARS NOT SHOWN)

FOOTING WIDTH TRANSITION DETAIL

FOR LOCATIONS WITHOUT FOOTING STEP



JOINT AND CORNER DETAIL

CAST-IN-PLACE CONCRETE WALL ON OFFSET SPREAD FOOTING



NOISE BARRIER WALL TYPE 3

STANDARD PLAN D-2.06-00

SHEET 2 OF 2 SHEETS

11-10-05

APPROVED FOR PUBLICATION

Harold J. Peterfeso



BARS

"C"&"D"

#3 @ 15" #3 @ 15"

#3 @ 13" #3 @ 9" #4 @ 12" #4 @ 10" #4 @ 9" #4 @ 7"

AUGUS

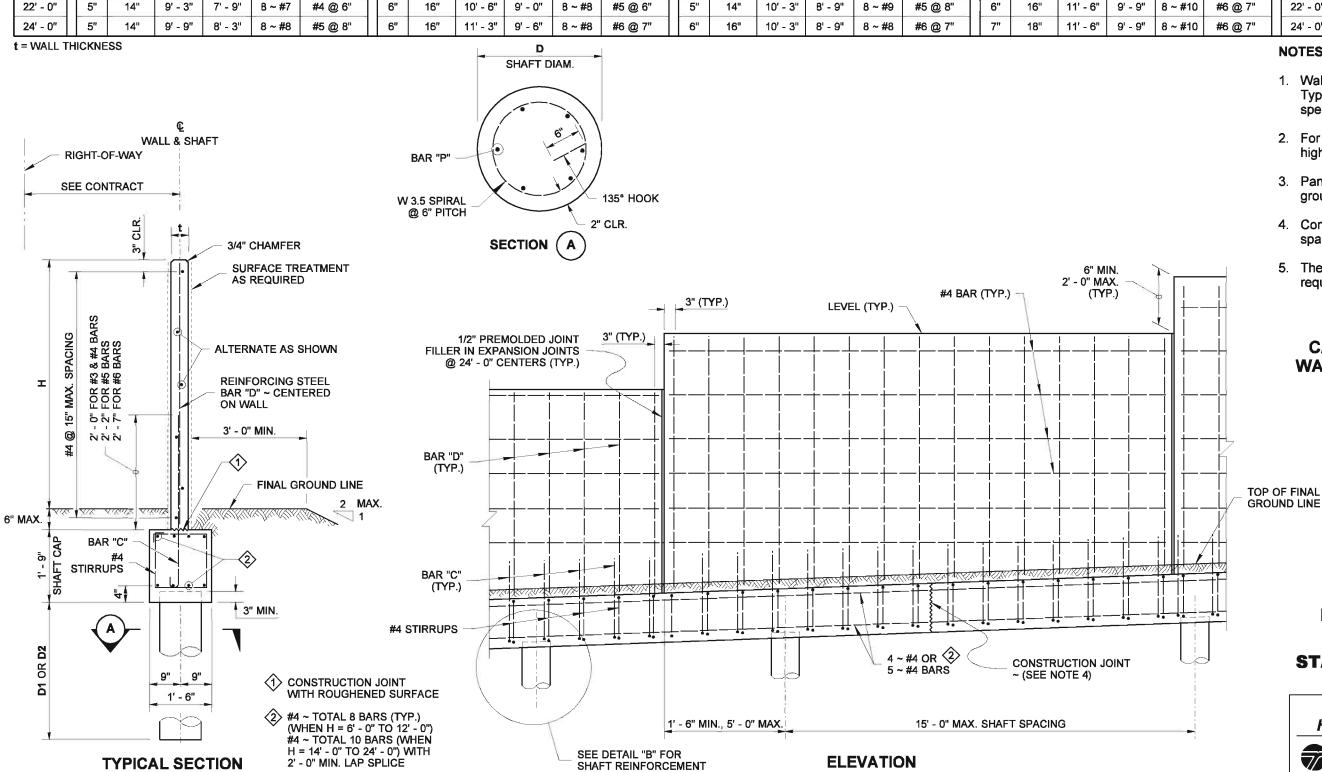
JANUARY

			•	TYPE 4A	
WALL HT H	t	SHAFT DIAM. D	DEPTH D1	DEPTH D2	SHAFT REINF. BAR"P"
6' - 0"	5"	12"	5' - 3"	4' - 9"	6 ~ #5
8' - 0"	5"	12"	6' - 0"	5' - 3"	6 ~ #5
10' - 0"	5"	12"	6' - 9"	5' - 9"	6 ~ #5
12' - 0"	5"	12"	7' - 3"	6' - 3"	6 ~ #5
14' - 0"	5"	12"	7' - 9"	6' - 9"	6 ~ #6
16' - 0"	5"	12"	8' - 6"	7' - 3"	6 ~ #7
18' - 0"	5"	12"	9' - 0"	7' - 9"	6 ~ #8
20' - 0"	5"	12"	9' - 3"	7' - 9"	6 ~ #9
22' - 0"	5"	14"	9' - 3"	7' - 9"	B ~ #7
24' - 0"	5"	14"	9' - 9"	8' - 3"	8 ~ #8

ij	20	08 7	O A	UGI	UST	3, 200	8(EFF	ECTI\	/E:	JAI	NUA	RY	7, 20	08 TC	AUG	JUST 3	, 2008	3
Т			i	TYPE 4B					i	TYPE 4C						TYPE 4D				WIND E	XPOSURE & V	ELC
	t	SHAFT DIAM. D	DEPTH D1	DEPTH D2	SHAFT REINF. BAR"P"	BARS "C"&"D"	t	SHAFT DIAM. D	DEPTH D1	DEPTH D2	SHAFT REINF. BAR"P"	BARS "C"&"D"	t	SHAFT DIAM. D	DEPTH D1	DEPTH D2	SHAFT REINF. BAR"P"	BARS "C"&"D"	WALL HT	NOISE BARRIER TYPE	WIND EXPOSURE	V
	5"	12"	6' - 0"	5' - 3"	6 ~ #5	#3 @ 15"	5"	12"	5' - 9"	5' - 0"	6 ~ #5	#3 @ 15"	5"	12"	6' - 6"	5' - 9"	6 ~ #5	#3 @ 15"	6' - 0"	4A	B1	
	5"	12"	7' - 0"	6' - 0"	6 ~ #5	#3 @ 12"	5"	12"	6' - 6"	5' - 6"	6 ~ #5	#3 @ 15"	5"	12"	7' - 6"	6' - 6"	6 ~ #6	#3 @ 10"	8' - 0"	4B	B1	
	5"	12"	7' - 9"	6' - 9"	6 ~ #6	#4 @ 15"	5"	12"	7' - 3"	6' - 3"	6 ~ #5	#3 @ 10"	5"	12"	8' - 3"	7' - 0"	6 ~ #7	#4 @ 12"	10' - 0"	4C	B2	
	5"	12"	8' - 6"	7' - 3"	6 ~ #7	#4 @ 10"	5"	12"	7' - 9"	6' - 9"	6 ~ #6	#4 @ 12"	5"	14"	8' - 6"	7' - 3"	8 ~ #7	#4 @ 10"	12' - 0"	4D	B2	
	5"	14"	8' - 6"	7' - 3"	8 ~ #7	#4 @ 9"	5"	12"	8' - 6"	7' - 3"	6 ~ #7	#4 @ 10"	5"	14"	9' - 3"	8' - 0"	8 ~ #7	#5 @ 11"	14' - 0"		•	
	5"	16"	9' - 3"	8' - 0"	8 ~ #7	#5 @ 11"	5"	14"	8' - 6"	7' - 3"	8 ~ #6	#4 @ 9"	5"	16"	9' - 6"	8' - 0"	8 ~ #8	#5 @ 8"	16' - 0"		SOIL TYPE	_
	5"	16"	9' - 3"	8' - 0"	6 ~ #8	#5 @ 8"	5"	14"	9' - 0"	7' - 9"	8 ~ #7	#5 @ 11"	5"	16"	10' - 0"	8' - 6"	8 ~ #8	#6 @ 9"	18' - 0"	SOIL	ANGLE OF	IN ¹
	5"	16"	10' - 0"	8' - 6"	8 ~ #7	#5 @ 7"	5"	14"	9' - 9"	8' - 3"	8 ~ #8	#5 @ 8"	6"	16"	10' - 9"	9' - 3"	8 ~ #9	#6 @ 9"	20' - 0"	TYPE	FRICTION 0	
	6"	16"	10' - 6"	9' - 0"	8 ~ #8	#5 @ 6"	5"	14"	10' - 3"	B' - 9"	8 ~ #9	#5 @ 8"	6"	16"	11' - 6"	9' - 9"	8 ~ #10	#6 @ 7"	22' - 0"	D1	3	32
7	6"	16"	11' - 3"	9' - 6"	8 ~ #8	#6 @ 7"	6"	16"	10' - 3"	8' - 9"	8 ~ #8	#6 @ 7"	7"	18"	11' - 6"	9' - 9"	8 ~ #10	#6 @ 7"	24' - 0"	D2	3	38

WIND EX	POSURE & VI	ELOCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)
4A	B1	80
4B	B1	90
4C	B2	80
4D	B2	90

	SOIL TYPE
SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)
D1	32
D2	38



NOTES

- Wall to be designated Noise Barrier Wall Type 4A, 4B, 4C or 4D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, see next higher H.
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. Construction joints in the shaft cap shall be spaced at 120 feet maximum.
- 5. The Contract specifies actual foundation requirements D1 or D2.

CAST-IN-PLACE CONCRETE WALL ON SHAFT FOUNDATION



NOISE BARRIER WALL TYPE 4

STANDARD PLAN D-2.08-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso



11-10-05

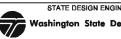
NOISE BARRIER WALL TYPE 4

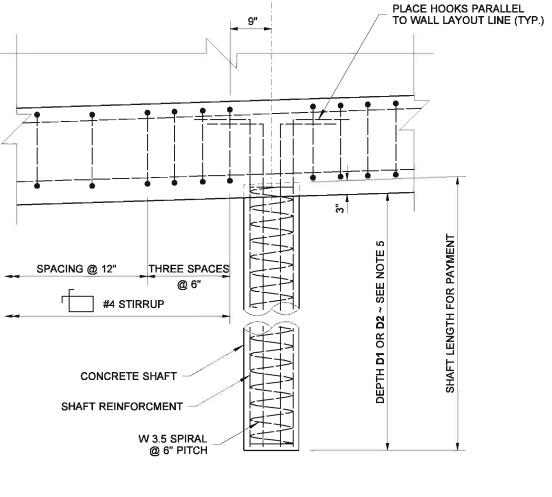
STANDARD PLAN D-2.08-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION Harold J. Peterfeso

11-10-05





€ SHAFT

DETAIL "B"

1/2" NOISE SEALER (TYP.) ANGLE POINT 3/4" CHAMFER (TYP.) <u>t</u>₂ 2' - 0" t₂ BAR "D" REINFORCED PER LISTED WALL HEIGHT REINFORCEMENT TABLE 3" (TYP.) CORNER PANEL TRAFFIC SIDE **JOINT AND CORNER DETAIL**

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

VAVALL LIT	TYP	E 5A	П	TYP	E 5B	T	TYP	E 5C	TYP	E 5D	Т	VAVALL LIT
WALL HT	BAR "B"&"C"	BAR "D"&"E"		BAR "B"&"C"	BAR "D"&"E"		BAR "B"&"C"	BAR "D"&"E"	BAR "B"&"C"	BAR "D"&"E"		WALL HT
6' - 0"	#4 @ 15"	#4 @ 15"	$\ $	#4 @ 15"	#4 @ 15"		#4 @ 15"	#4 @ 15"	#4 @ 15"	#4 @ 15"		6' - 0"
8' - 0"	#4 @ 15"	#4 @ 15"		#4 @ 15"	#4 @ 15"		#4 @ 15"	#4 @ 15"	#4 @ 15"	#4 @ 15"		8' - 0"
10' - 0"	#4 @ 15"	#4 @ 15"		#4 @ 15"	#4 @ 15"		#4 @ 15"	#4 @ 15"	#4 @ 15"	#4 @ 15"		10' - 0"
12' - 0"	#4 @ 15"	#4 @ 15"	П	#4 @ 15"	#4 @ 15"	Ī	#4 @ 15"	#4 @ 15"	#4 @ 12"	#4 @ 15"		12' - 0"
14' - 0"	#4 @ 15"	#4 @ 15"		#4 @ 11"	#4 @ 11"		#4 @ 11"	#4 @ 11"	#4 @ 10"	#4 @ 11"		14' - 0"
16' - 0"	#4 @ 14"	#4 @ 14"		#4 @ 10"	#4 @ 10"		#4 @ 10"	#4 @ 10"	#4 @ 12"	#4 @ 10"		16' - 0"
18' - 0"	#4 @ 10"	#4 @ 12"		#4 @ 10"	#5 @ 12"		#4 @ 10"	#4 @ 10"	#4 @ 9"	#4 @ 10"		18' - 0"
20' - 0"	#4 @ 10"	#4 @ 10"		#4 @ 9"	#5 @ 9"	Ī	#4 @ 10"	#4 @ 7 1/2"	#4 @ 9"	#4 @ 7 1/2"		20' - 0"
22' - 0"	#4 @ 10"	#4 @ 8"		#4 @ 9"	#5 @ 6 1/2"	Ī	#4 @ 10"	#4 @ 6"	#4 @ 9"	#4 @ 6"		22' - 0"
24' - 0"	#4 @ 10"	#4 @ 6"		#4 @ 9"	#5 @ 6"		#4 @ 10"	#4 @ 4"	#4 @ 9"	#4 @ 4"		24' - 0"

2008

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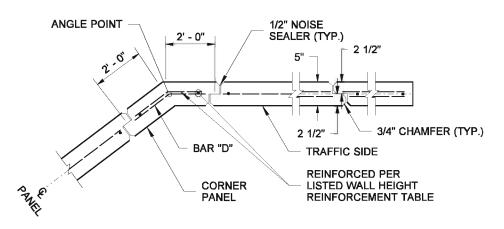
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	EF	FECT	IVE: JANUARY 7, 2008 TO AUGUST 3, 2008
WIND E	XPOSURE & V	ELOCITY	NOTES
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)	Wall to be designated Noise Barrier Wall Type 5A, 5B, 5C The Contract specifies actual wall designations.
5A	B1	80	·
5B	B1	90	For intermediate wall heights, use the next higher H.
5C	B2	80	3. Panels shall have at least 3 feet min. of level ground on e
5D	B2	90	4. Construction joints in the footing shall be spaced at 120 fe

	SOIL TYPE
SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)
D1	32
D2	38

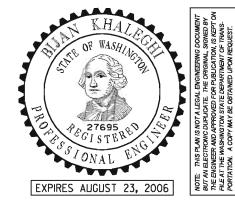
NOTES

- 1. Wall to be designated Noise Barrier Wall Type 5A, 5B, 5C or 5D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. Panels shall have at least 3 feet min. of level ground on each side
- 4. Construction joints in the footing shall be spaced at 120 feet max.
- 5. The Contract specifies actual foundation requirements D1 or D2.



JOINT AND CORNER DETAIL

CAST-IN-PLACE W/ TRAFFIC BARRIER ON TRENCH FOOTING



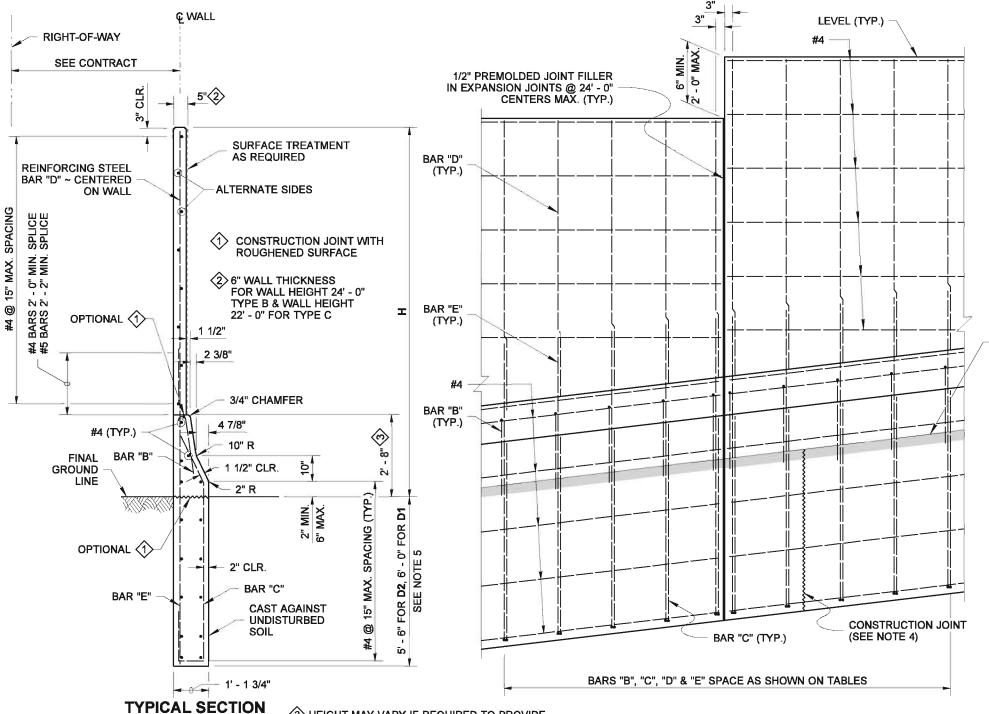
NOISE BARRIER WALL TYPE 5

STANDARD PLAN D-2.10-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Harold J. Peterfeso





ELEVATION

BAR "B" BAR "C"

BENDING DIAGRAM

TOP OF **ROADWAY**

(3) HEIGHT MAY VARY IF REQUIRED TO PROVIDE A SMOOTH PROFILE CONSISTENT WITH THE

TYPE 5SSC TYPE 5SSD **TYPE 5SSA TYPE 5SSB** WALL HT WALL HT BAR BAR BAR BAR BAR BAR BAR BAR "D"&"E" "B"&"C" "D"&"E" "B"&"C" "D"&"E" "B"&"C" "B"&"C" "D"&"E" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 6' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 6' - 0" 8' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 8' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 10' - 0" 10' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 12' - 0" #4 @ 15" 12' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15' #4 @ 12" #4 @ 15" 14' - 0" #4 @ 15" #4 @ 11" #4 @ 11' #4 @ 11" 14' - 0" #4 @ 15" #4 @ 11" #4 @ 11' #4 @ 10" #4 @ 14" #4 @ 14" #4 @ 10" #4 @ 10' #4 @ 10" #4 @ 10' #4 @ 12" #4 @ 10" 16' - 0" 18' - 0" 18' - 0" #4 @ 10" #4 @ 12" #4 @ 10" #5 @ 12" #4 @ 10" #4 @ 10" #4@9" #4 @ 10" 20' - 0" #4 @ 10" #4 @ 10" #4 @ 7 1/2 #4 @ 7 1/2 20' - 0" #4 @ 10" #4 @ 9" #5 @ 9" #4 @ 9" 22' - 0" #4 @ 10" #4@8" #5 @ 6 1/2' #4 @ 6" #4 @ 6" 22' - 0" 24' - 0" #4 @ 9" #4 @ 4" 24' - 0"

2008

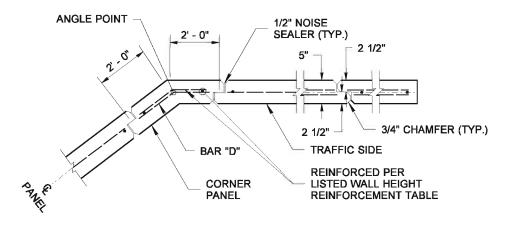
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		E	FFEC	TIVE: JANUARY 7, 2008 TO AUGUST 3, 2008
	WIND EX	(POSURE & V	ELOCITY	NOTES
	NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)	Wall to be designated Noise Barrier Wall Type 5SSA, 5SS 5SSC or 5SSD. The Contract specifies actual wall design
	5SSA	B1	80	The contract specifies data! Wall design
	5SSB	B1	90	For intermediate wall heights, use the next higher H.
	5SSC	B2	80	3. Panels shall have at least 3 feet min. of level ground on e
	5SSD	B2	90	5 S S S S S S S
'		1		4. Construction joints in the facting shall be spaced at 120 fe

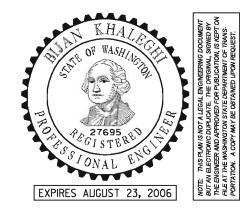
П		SOIL TYPE
	SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)
	D1	32
	D2	38

- 1. Wall to be designated Noise Barrier Wall Type 5SSA, 5SSB, 5SSC or 5SSD. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. Panels shall have at least 3 feet min. of level ground on each side
- 4. Construction joints in the footing shall be spaced at 120 feet max.
- 5. The Contract specifies actual foundation requirements D1 or D2.



JOINT AND CORNER DETAIL

CAST-IN-PLACE W/ SINGLE SLOPE TRAFFIC BARRIER ON TRENCH FOOTING



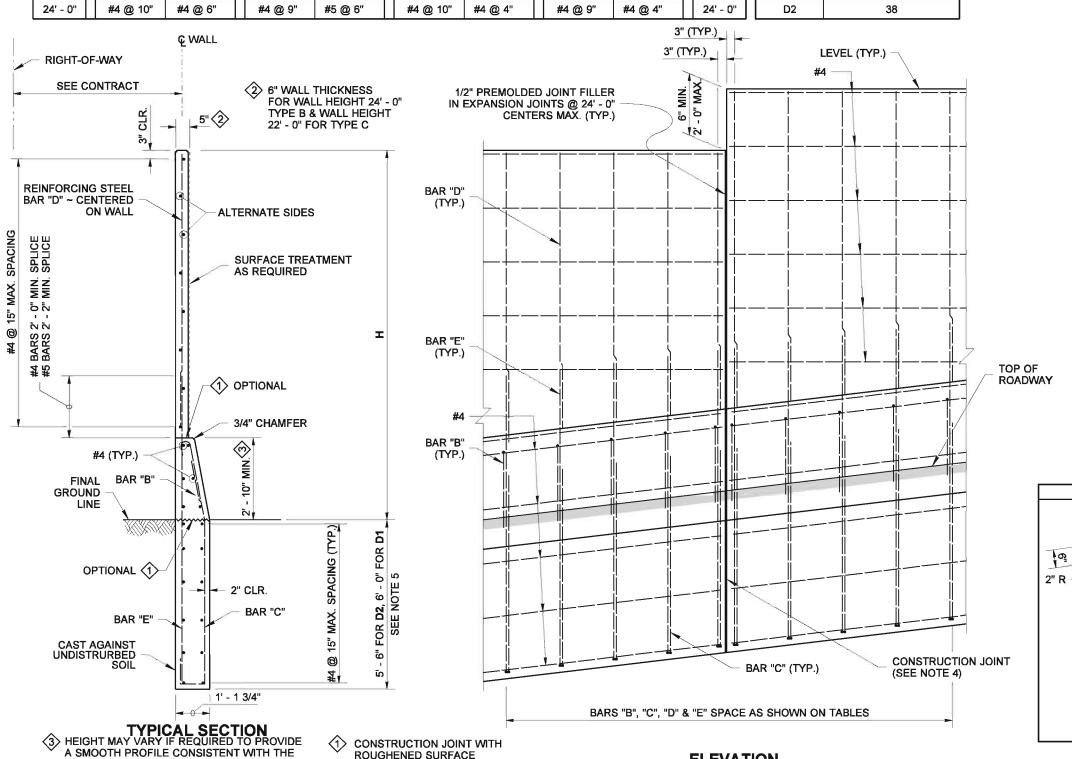
NOISE BARRIER WALL TYPE 5SS

STANDARD PLAN D-2.12-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 11-10-05



CONSTRUCTION JOINT WITH ROUGHENED SURFACE

ELEVATION

BENDING DIAGRAM

BAR "B"

2,2

FOR

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8 3/4"

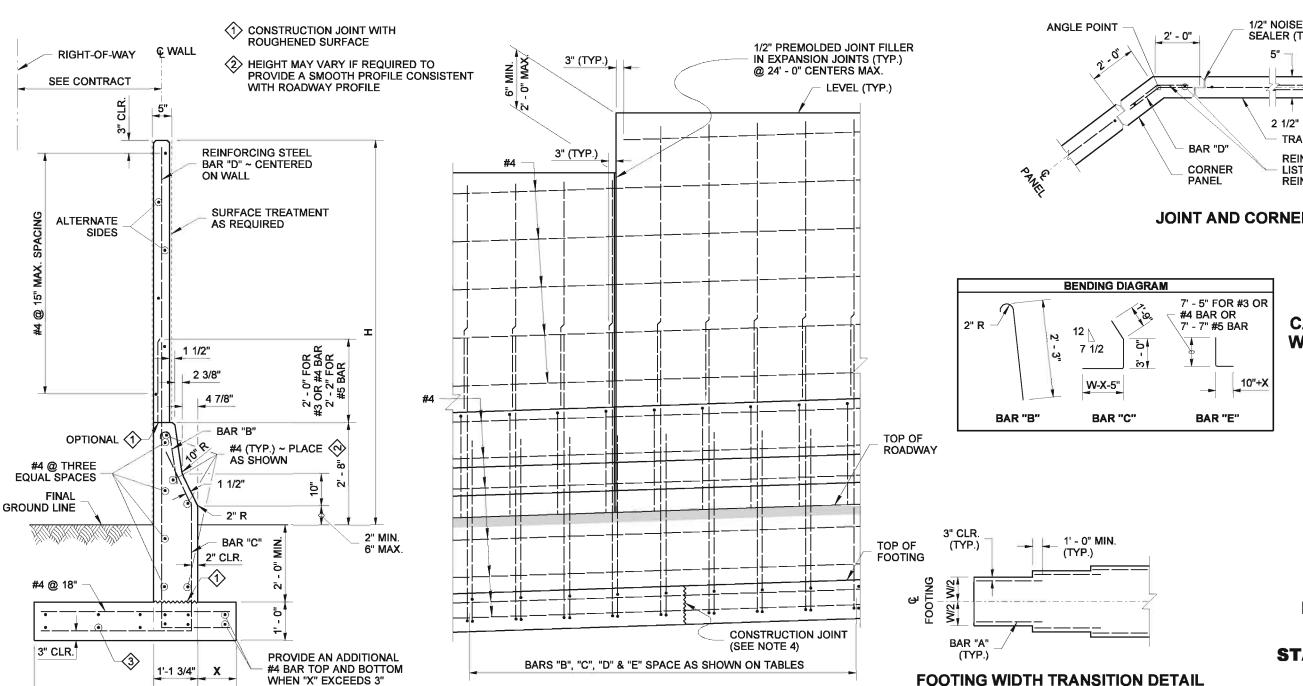
BAR "C"

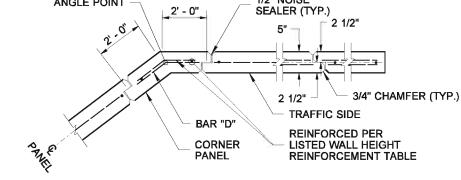
			TYPE 6A			•	TYPE 6B				TYPE 6C			SA/ALL LIT			
WALL HT	w	x	BARS "B"&"C"	BARS "D"&"E"	w	x	BARS "B"&"C"	BAR\$ "D"&"E"	w	x	BARS "B"&"C"	BARS "D"&"E"	w	x	BARS "B"&"C"	BARS "D"&"E"	WALL HT
6' - 0"	5' - 6"	3"	#4 @ 12"	#4 @ 12"	5' - 6"	3"	#4 @ 12"	#4 @ 12"	5' - 6	3"	#4 @ 12"	#4 @ 12"	5' - 6"	3"	#4 @ 12"	#4 @ 12"	6' - 0"
8' - 0"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	8' - 0"
10' - 0"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	10' - 0"
12' - 0"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	5' - 0	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	12' - 0"
14' - 0"	4' - 9"	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 11"	#4 @ 11"	4' - 9	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 10"	#4 @ 10"	14' - 0"
16' - 0"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 10"	#4 @ 10"	5' - 0	3"	#4 @ 10"	#4 @ 10"	5' - 6"	3"	#4 @ 12"	#5 @ 12"	16' - 0"
18' - 0"	5' - 0"	3"	#4 @ 10"	#4 @ 10"	5' - 3"	3' - 0"	#4 @ 12"	#5 @ 12"	5' - 0	3' - 0	" #4 @ 10"	#4 @ 10"	5' - 9"	3"	#4 @ 9"	#5 @ 9"	18' - 0"

	WIND EX	POSURE & V	ELOCITY			
	NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)			
	6A	B1	80			
	6B	B1	90			
l	6C	B2	80			
	6D	B2	90			

NOTES

- 1. Wall to be designated Noise Barrier Wall Type 6A, 6B, 6C or 6D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. Construction joints in the foundation shall be spaced at 120 feet maximum.





JOINT AND CORNER DETAIL

CAST-IN-PLACE CONCRETE WALL W/ TRAFFIC BARRIER ON SPREAD FOOTING



NOISE BARRIER WALL TYPE 6

STANDARD PLAN D-2.14-00

SHEET 1 OF 1 SHEET

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ELEVATION

(FOR LOCATIONS WITHOUT FOOTING STEP)

CONSTRUCTION JOINTS

TYPICAL SECTION

(3) #4 (TYP.) PLACE AS SHOWN WITH

2' - 0" SPLICE AND EXTENDING THRU

2008

(1) CONSTRUCTION

JOINT WITH

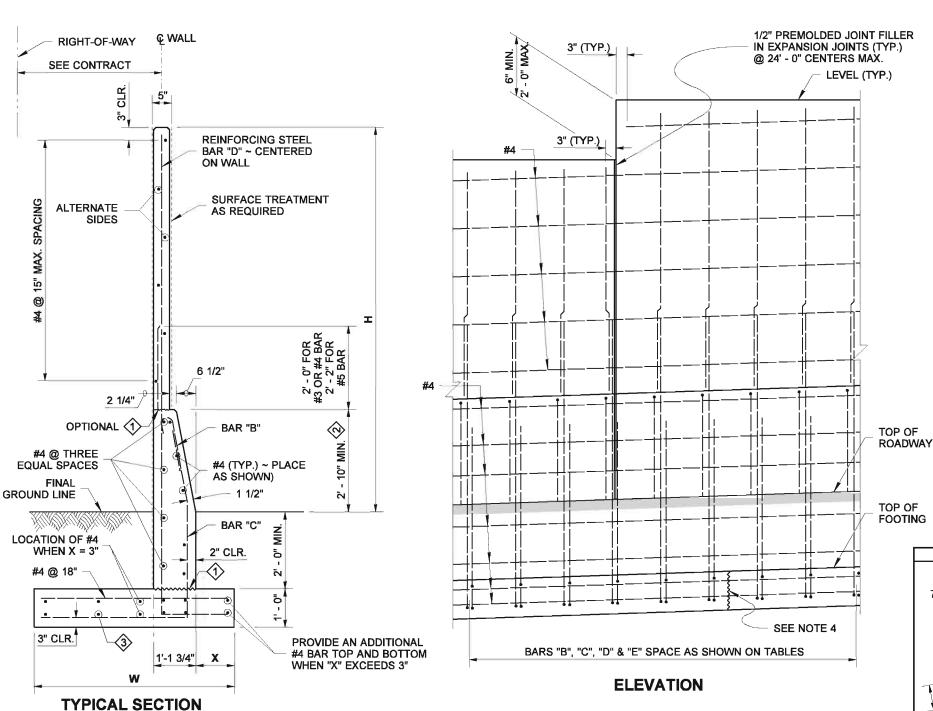
ROUGHENED SURFACE

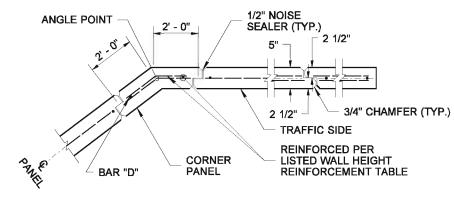
EF	FEC	TI	VE:	JANL	IAR'	Y 7	, 200	OT 8	AUG	iU:	ST 3,	2008				EFF	ECT	VE:	JANU	ARY 7	, 2008 TO	AUGUST 3, 2008
		Т	YPE 6SSA		1	Т	YPE 6SSB		TYPE 6SSC				TYPE 6SSD				WIND EXPOSURE & VELOCITY			NOTES		
WALL HT	w	х	BARS "B"&"C"	BARS "D"&"E"	w	x	BARS "B"&"C"	BARS "D"&"E"	w	x	BARS "B"&"C"	BARS "D"&"E"	w	x	BARS "B"&"C"	BARS "D"&"E"	WALL HT	NOIS BARR TYP	IER EVENEUE	WIND VELOCITY (MPH)	1.	Wall to be designated Noise Barrier Type 6SSA, 6SSB, 6SSC or 6SSD.
6' - 0"	5' - 6"	3"	#4 @ 12"	#4 @ 12"	5' - 6"	3"	#4 @ 12"	#4 @ 12"	5' - 6"	3"	#4 @ 12"	#4 @ 12"	5' - 6"	3"	#4 @ 12"	#4 @ 12"	6' - 0"	688	_	(MPH) 80		Contract specifies actual wall design
8' - 0"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	8' - 0"	688		90		
10' - 0"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	5' - 3"	3"	#4 @ 12"	#4 @ 12"	10' - 0"	_			2.	For intermediate wall heights, use th
12' - 0"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	12' - 0"	6SS	-	80		higher H.
14' - 0"	4' - 9"	3"		#4 @ 12"	5' - 0"	+	+	#4 @ 11"	4' - 9"	2"	+	#4 @ 12"	5' - 3"	2"	#4 @ 10"		14' - 0"	6SS	D B2	90	3	Panels shall have at least 3 feet of le
14 - 0	4-9		-	_	3-0	3	#4 (2) 11	#4 (2) 11	4 - 9		+		3-3	3	+	+	14 - 0				3.	ground on each side.
16' - 0"	5' - 0"	3"	#4 @ 12"	#4 @ 12"	5' - 0"	3"	#4 @ 10"	#4 @ 10"	5' - 0"	3"	#4 @ 10"	#4 @ 10"	5' - 6"	3"	#4 @ 12"	#5 @ 12"	16' - 0"					ground on each side.
18' - 0"	5' - 0"	3"	#4 @ 10"	#4 @ 10"	5' - 3"	3' - 0	" #4 @ 12"	#5 @ 12"	5' - 0"	3' - 0	" #4 @ 10"	#4 @ 10"	5' - 9"	3"	#4 @ 9"	#5 @ 9"	18' - 0"				4.	Construction joints in the foundation spaced at 120 feet maximum.

WIND EX	POSURE & V	ELOCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)
6SSA	B1	80
6SSB	B1	90
6SSC	B2	80
6SSD	B2	90

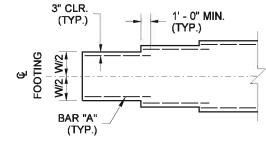
NOTES

- 1. Wall to be designated Noise Barrier Wall Type 6SSA, 6SSB, 6SSC or 6SSD. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. Construction joints in the foundation shall be spaced at 120 feet maximum.





JOINT AND CORNER DETAIL



CAST-IN-PLACE CONC. WALL W/ SINGLE SLOPE TRAFFIC **BARRIER ON SPREAD FOOTING**

FOOTING WIDTH TRANSITION DETAIL

(FOR LOCATIONS WITHOUT FOOTING STEP)

TATION OF THE PARTY OF THE PART EXPIRES AUGUST 23, 2006

NOISE BARRIER WALL TYPE 6SS

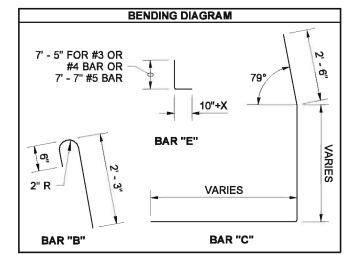
STANDARD PLAN D-2.16-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Harold J. Peterfeso



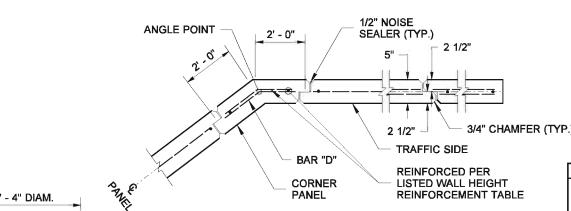
3 #4 (TYP.) PLACE AS SHOWN WITH 2' - 0" SPLICE AND EXTENDING THRU CONSTRUCTION JOINTS



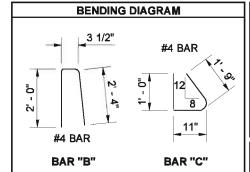
HEIGHT MAY VARY IF REQUIRED TO

WITH ROADWAY PROFILE

PROVIDE A SMOOTH PROFILE CONSISTENT



- 1. Wall to be designated Noise Barrier Wall Type 7A, 7B, 7C or 7D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. The Contract specifies actual foundation requirements D1 or D2.



WIND EXPOSURE & VELOCITY											
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)									
7 A	B1	80									
7B	B1	90									
7C	B2	80									
7D	B2	90									

l		SOIL TYPE
	SOIL TYPE	ANGLE OF INTERNAL FRICTION () (DEGREES)
1	D1	32
	D2	38

CAST-IN-PLACE CONCRETE WALL W/ TRAFFIC BARRIER ON **SHAFT FOUNDATION**



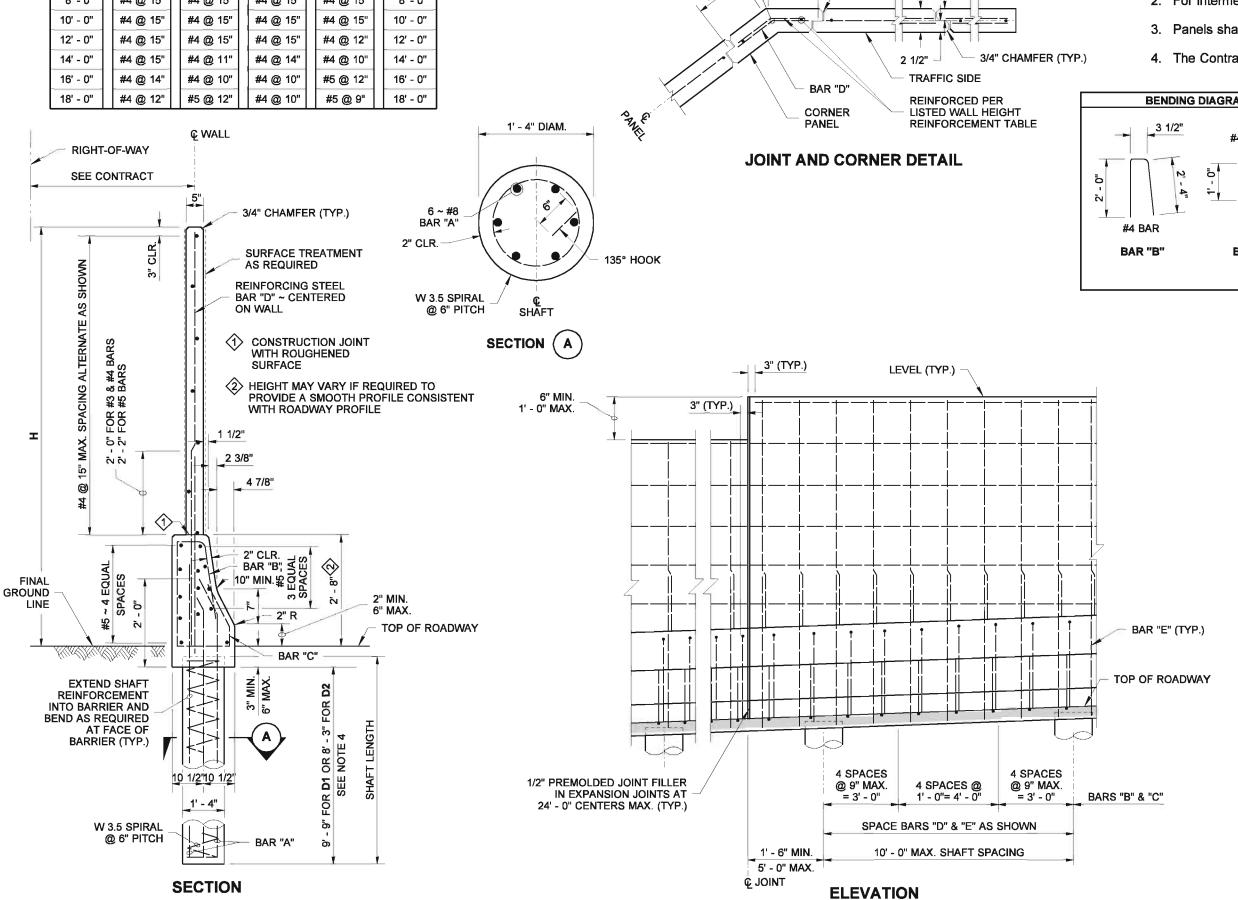
NOISE BARRIER WALL TYPE 7

STANDARD PLAN D-2.18-00

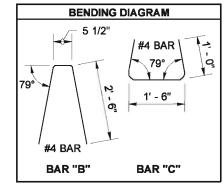
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 11-10-05



VAVALL LIT	TYPE 7SSA	TYPE 7SSB	TYPE 7SSC	TYPE 7SSD	VA/ALL LIT
WALL HT	BARS "B"&"C"	BARS "B"&"C"	BARS "B"&"C"	BARS "B"&"C"	WALL HT
6' - 0"	#4 @ 15"	#4 @ 15"	#4 @ 15"	#4 @ 15"	6' - 0"
8' - 0"	#4 @ 15"	#4 @ 15"	#4 @ 15"	#4 @ 15"	8' - 0"
10' - 0"	#4 @ 15"	#4 @ 15"	#4 @ 15"	#4 @ 15"	10' - 0"
12' - 0"	#4 @ 15"	#4 @ 15"	#4 @ 15"	#4 @ 12"	12' - 0"
14' - 0"	#4 @ 15"	#4 @ 11"	#4 @ 14"	#4 @ 10"	14' - 0"
16' - 0"	#4 @ 14"	#4 @ 10"	#4 @ 10"	#5 @ 12"	16' - 0"
18' - 0"	#4 @ 12"	#5 @ 12"	#4 @ 10"	#5 @ 9"	18' - 0"

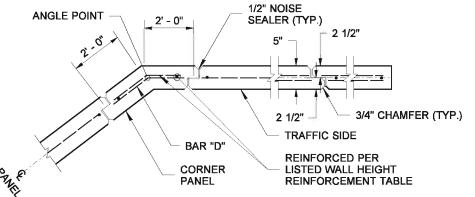


WIND EX	WIND EXPOSURE & VELOCITY											
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)										
7SSA	B1	80										
7SSB	B1	90										
7SSC	B2	80										
7SSD	B2	90										

	SOIL TYPE
SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)
D1	32
D2	38

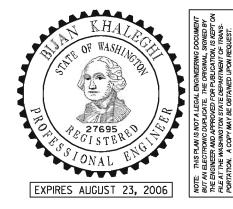
NOTE

- 1. Wall to be designated Noise Barrier Wall Type 7SSA, 7SSB, 7SSC or 7SSD. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. The Contract specifies actual foundation requirements D1 or D2.



JOINT AND CORNER DETAIL

CAST-IN-PLACE CONC. WALL W/ SINGLE SLOPE TRAFFIC BARRIER ON SHAFT FOUNDATION



NOISE BARRIER WALL TYPE 7SS

STANDARD PLAN D-2.20-00

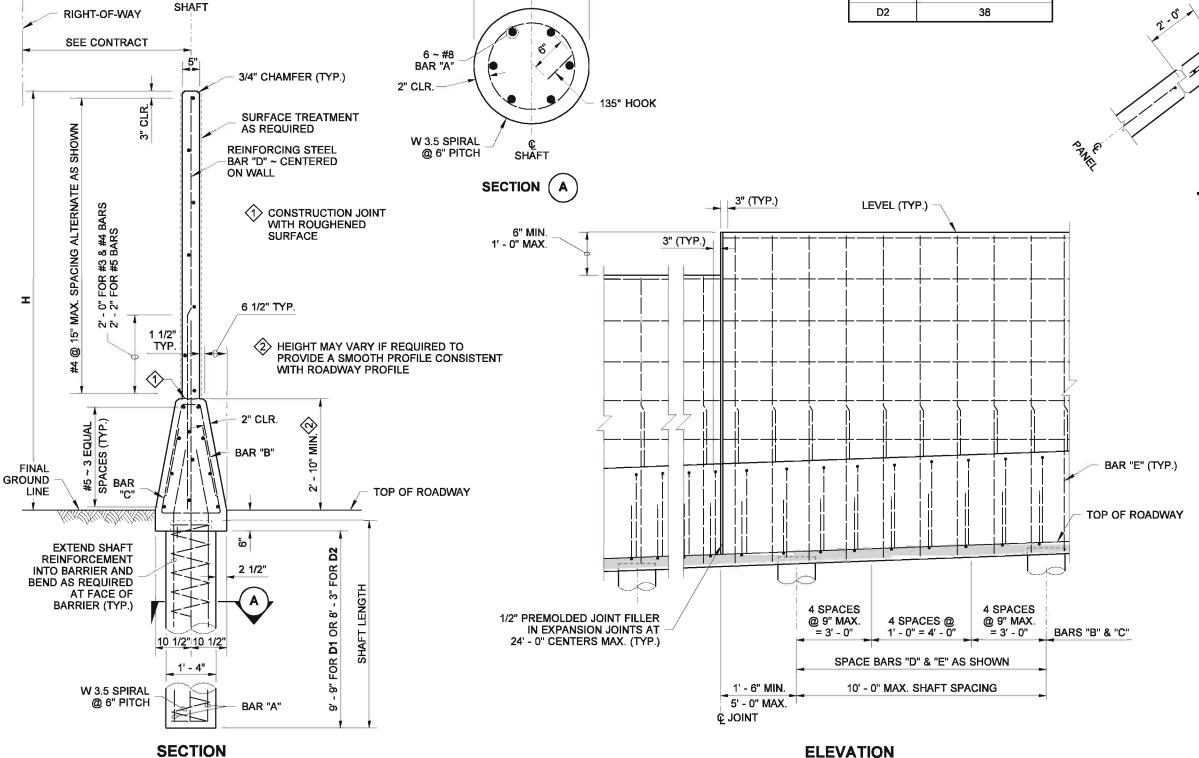
SHEET 1 OF 1 SHEET

11-10-05

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1' - 4" DIAM.

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

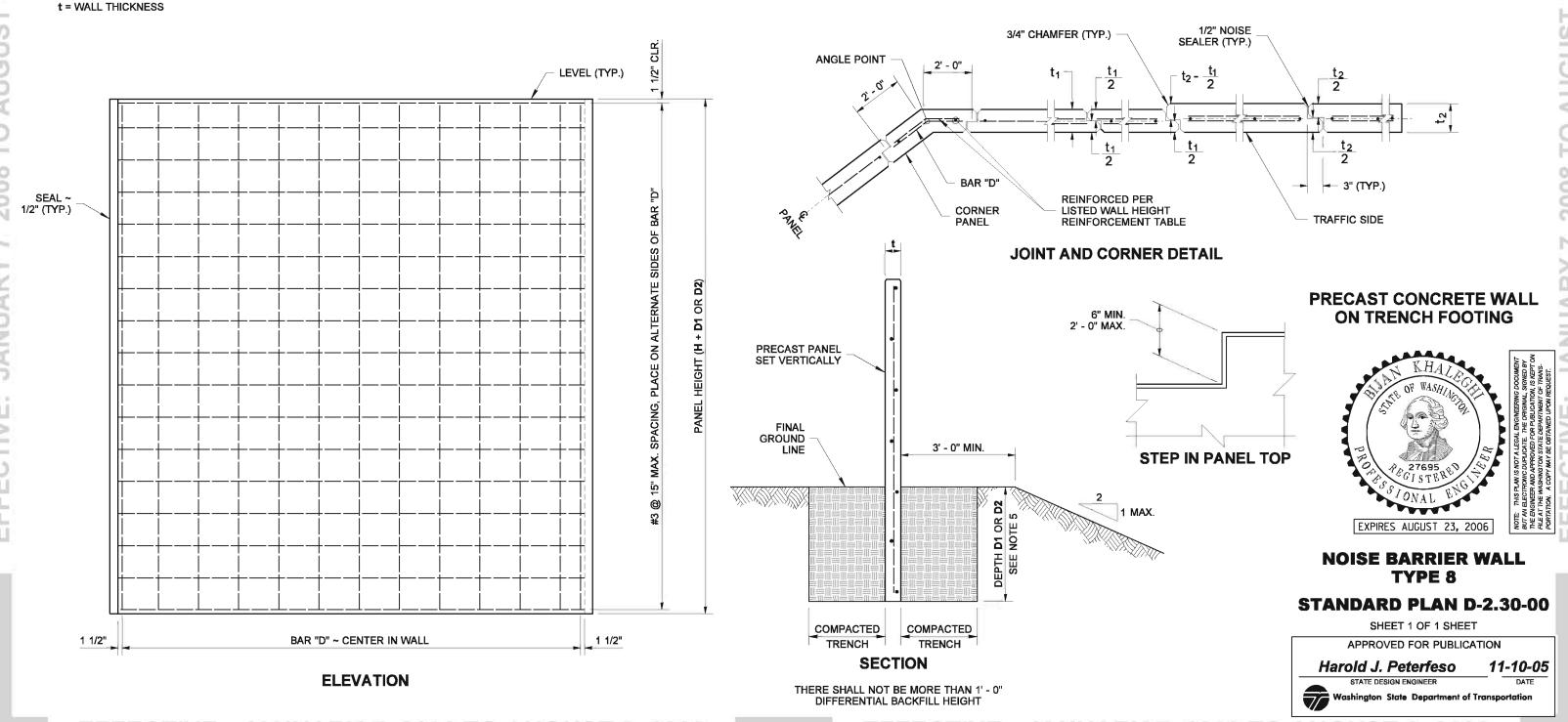
WALL HT	TYPE 8A						TYPE 8B			•	TYPE 8C			•	TYPE 8D		WALL H
H	t	DEPTH D1	DEPTH D2	BAR "D"	t	DEPTH D1	DEPTH D2	BAR "D"	t	DEPTH D1	DEPTH D2	BAR "D"	t	DEPTH D1	DEPTH D2	BAR "D"	H
6' - 0"	5"	3' - 6"	3' - 3"	#3 @ 15"	5"	3' - 9"	3' - 6"	#3 @ 13 1/2"	5"	3' - 6"	3' - 3"	#3 @ 15"	5"	3' - 9"	3' - 6"	#3 @ 11"	6' - 0"
8' - 0"	5"	3' - 9"	3' - 3"	#3 @ 13"	5"	4' - 0"	3' - 9"	#3 @ 8 1/2"	5"	3' - 9"	3' - 6"	#3 @ 11"	5"	4' - 3"	3' - 9"	#4 @ 12"	8' - 0"
10' - 0"	5"	4' - 0"	3' - 6"	#3 @ 8 1/2"	5"	4' - 3"	4' - 0"	#4 @ 10 1/2"	5"	4' - 0"	3' - 9"	#3 @ 12 1/2"	5"	4' - 6"	4' - 0"	#4 @ 11"	10' - 0"
12' - 0"	5"	4' - 3"	3' - 9"	#4 @ 12"	5"	4' - 9"	4' - 3"	#4 @ 10"	5"	4' - 6"	4' - 0"	#4 @ 10 1/2"	5"	5' - 0"	4' - 6"	#5 @ 12"	12' - 0"
14' - 0"	5"	4' - 6"	4' - 0"	#4 @ 10 1/2"	5"	5' - 0"	4' - 6"	#5 @ 11"	5"	4' - 9"	4' - 3"	#4 @ 9 1/2"	5"	5' - 3"	4' - 9"	#5 @ 8 3/4"	14' - 0"
16' - 0"	5"	4' - 9"	4' - 3"	#5 @ 14"	5"	5' - 3"	4' - 9"	#5 @ 8 1/2"	5"	5' - 0"	4' - 6"	#5 @ 11"	5"	5' - 9"	5' - 0"	#6 @ 9 1/2"	16' - 0"
18' - 0"	5"	5' - 0"	4' - 6"	#5 @ 11"	5"	5' - 6"	5' - 0"	#6 @ 9 1/2"	5"	5' - 3"	4' - 9"	#5 @ 8 1/2"	6"	6' - 0"	5' - 3"	#6 @ 9"	18' - 0"
20' - 0"	5"	5' - 3"	4' - 9"	#5 @ 6"	6"	5' - 9"	5' - 3"	#6 @ 9 1/2"	5"	5' - 6"	5' - 0"	#5 @ 6"	6"	6' - 3"	5' - 6"	#6 @ 7 1/2"	20' - 0"
22' - 0"	5"	5' - 6"	5' - 0"	#5 @ 7"	6"	6' - 0"	5' - 6"	#6 @ 8"	6"	5' - 9"	5' - 3"	#5 @ 8"	7"	6' - 6"	5' - 9"	#6 @ 7"	22' - 0"
24' - 0"	5"	5' - 9"	5' - 3"	#6 @ 8"	7"	6' - 3"	5' - 9"	#6 @ 6 1/2"	6"	6' - 0"	5' - 6"	#5 @ 6"	7"	6' - 9"	6' - 0"	#6 @ 6"	24' - 0"

WIND EX	POSURE & VI	ELOCITY		
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)		
8A	B1	80		
8B	B1	90		
8C	B2	80		
8D	B2	90		

1											
ı		SOIL TYPE									
	SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)									
	D1	32									
1	D2	38									

NOTE

- Wall to be designated Noise Barrier Wall Type 8A, 8B, 8C or 8D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. Panels shall have at least 3' 0" of level ground on each side.
- 4. All joints shall be in full contact and sealed.
- The Contract specifies actual foundation requirements D1 or D2.



5" | #4 @ 18" | W3.0 @ 1 1/2"| #5 @ 9"

W3.0 @ 1 1/2" #5 @ 7"

W3.0 @ 1 1/2" #5 @ 6"

/ E		JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE												CTIVE	: JAN	JUA	RY 7	2 2	2008	TO AU	GUS	T 3, 20	
		TYPE 9A	PE 9A TYPE 9B						TYPE 9C						TYPE 9D					14441111			
-"	t	BAR "B"	SPIRAL BAR "G"	BARS "D"&"H"	w	BARS "A"&"F"	t	BAR "B"	SPIRAL BAR "G"	BARS "D"&"H"	w	BARS "A"&"F"	t	BAR "B"	SPIRAL BAR "G"	BARS "D"&"H"	w	BARS "A"&"F"	t	BAR "B"	SPIRAL BAR "G"	BARS D & H	WALL HT
	5"	#4 @ 18"	W2.0 @ 2"	#3 @ 15"	2' - 3"	3 ~ #4	5"	#4 @ 18"	W2.0 @ 2"	#3 @ 12"	2' - 0"	3 ~ #4	5"	#4 @ 18"	W2.0 @ 2"	#3 @ 15"	2' - 6"	3 ~ #4	5"	#4 @ 18"	W2.0 @ 2"	#3 @ 11"	6' - 0"
	5"	#4 @ 18"	W2.0 @ 2"	#3 @ 12"	2' - 9"	3 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 15"	2' - 6"	3 ~ #4	5"	#4 @ 18"	W2.0 @ 2"	#3 @ 10"	3' - 3"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 12"	8' - 0"
	5"	#4 @ 18"	W2.0 @ 2"	#3 @ 9"	3' - 3"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 10"	2' - 9"	3 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 12"	3' - 6"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 10"	10' - 0"
	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 12"	3' - 9"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 10"	3' - 3"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 10"	4' - 3"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 1 3/4"	#5 @ 12"	12' - 0"
100	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 10"	4' - 3"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 1 3/4"	#5 @ 11"	3' - 9"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 9"	4' - 9"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 1 3/4"	#5 @ 8"	14' - 0"
	5"	#4 @ 18"	W3.0 @ 2"	#4 @ 9"	4' - 9"	5 ~ #4	5"	#4 @ 18"	W4.0 @ 2"	#6 @ 12"	4' - 3"	5 ~ #4	5"	#4 @ 18"	W3.0 @ 1 3/4"	#5 @ 11"	5' - 6"	5 ~ #4	5"	#4 @ 18"	W4.0 @ 2"	#6 @ 9"	16' - 0"
	5"	#4 @ 18"	W3.0 @ 1 3/4"	#5 @ 11"	5' - 3"	5 ~ #4	5"	#4 @ 18"	W4.0 @ 2"	#6 @ 9"	4' - 6"	5 ~ #4	5"	#4 @ 18"	W4.0 @ 2"	#6 @ 12"	6' - 0"	5 ~ #4	6"	#4 @ 18"	W4.0 @ 2"	#6 @ 9"	18' - 0"
+				 		t	_											+			-		

W4.0 @ 2"

W4.0 @ 1 3/4" #6 @ 8"

7' - 6"

t =	WALL	THICKNESS

2' - 0"

2' - 3"

2' - 6"

3' - 3"

3' - 9"

4' - 0"

5' - 0"

6' - 0"

8' - 0"

10' - 0"

14' - 0"

16' - 0"

18' - 0"

20' - 0"

24' - 0"

2008

3~#4

3 ~ #4

3~#4 5 ~ #4

5 ~ #4

5~#4

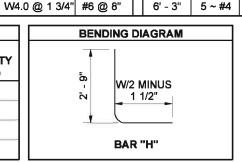
5~#4

WIND EX	POSURE & V	ELOCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)
9A	B1	80
9B	B1	90
9C	B2	80
9D	B2	90

5 ~ #4

6' - 0"

6' - 9"



W4.0 @ 1 3/4" #6 @ 8"

ှင့ WALL **RIGHT-OF-WAY** SEE CONTRACT PANEL WIDTH 12' - 0" MAX. 3/4" CHAMFER LEVEL (TYP.) 6" MIN **ALTERNATE** 2' - 0" MAX. #3 BAR AS SHOWN PRECAST PANEL ~ TO BE (TYP.) PLACED VERTICALLY **SEE JOINT DETAIL** REINFORCING STEEL BAR "D" ~ CENTERED **NOISE SEALER** ON WALL 1/2" (TYP.) BAR "D" 3' - 0" MIN. (TYP.) SURFACE TREATMENT AS REQUIRED 2" x 2' - 1" HOLE FOR DOWEL BAR GROUND LINE 1' - 0" 1 MAX. (TYP.) BAR UNDISTURBED SOIL SEE DETAIL (A) (2) **GROUT PAD ~ SET PANEL** 2 MAX. "G" **IMMEDIATELY AFTER** PLACING GROUT BAR "F" BAR "A" (TYP.) BAR "A" WITH 2' - 0" MIN. SPLICE EXTENDING THRU 2 MAX. CONSTRUCTION JOINT (TYP.)(1) BAR "H" 3" CLR. #4 @ 18" 2' - 0" MIN. **CONSTRUCTION JOINT** SEE DETAIL (A) (2) LAP (TYP.) BAR "H" ALTERNATE (SEE NOTE 4) PLACEMENT OF HOOKS BAR "B" **TYPICAL SECTION ELEVATION** REQUIRED FOR WALL HEIGHT 24' - 0" ~ TYPE 9C,

NOTES

#4 @ 15"

W4.0 @ 1 1/2" #6 @ 6"

- 1. Wall to be designated Noise Barrier Wall Type 9A, 9B, 9C or 9D. The Contract specifies actual wall designation.
- For intermediate wall heights, use the next higher H.

20' - 0"

24' - 0"

- Panels shall have at least 3' 0" of level ground on each side.
- 4. Construction joints in the footing shall be spaced at 120 feet maximum.
- 5. All joints shall be in full contact and sealed.

PRECAST CONCRETE WALL ON SPREAD FOOTING



NOISE BARRIER WALL TYPE 9

STANDARD PLAN D-2.32-00

SHEET 1 OF 2 SHEETS

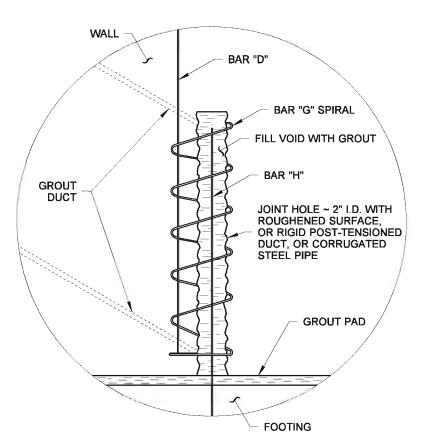
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WALLS 22' - 0" & 24' - 0" ~ TYPE 9B & WALLS 20' - 0", 22' - 0" & 24' - 0" ~ TYPE 9D.

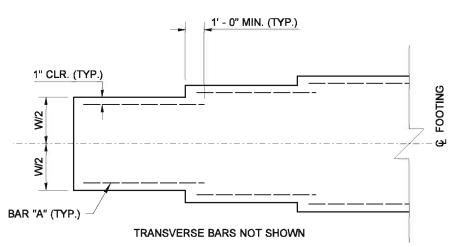
3/4" CHAMFER (TYP.)

JOINT AND CORNER DETAIL



FILL THE JOINT HOLE WITH GROUT USING DUCTS.
DUCTS SHALL BE LOCATED ON PANEL FACE
OPPOSITE TRAFFIC

DETAIL (A)



FOOTING WIDTH TRANSITION DETAIL

FOR LOCATIONS WITHOUT FOOTING STEP

PRECAST CONCRETE WALL ON SPREAD FOOTING



NOISE BARRIER WALL TYPE 9

STANDARD PLAN D-2.32-00

SHEET 2 OF 2 SHEETS

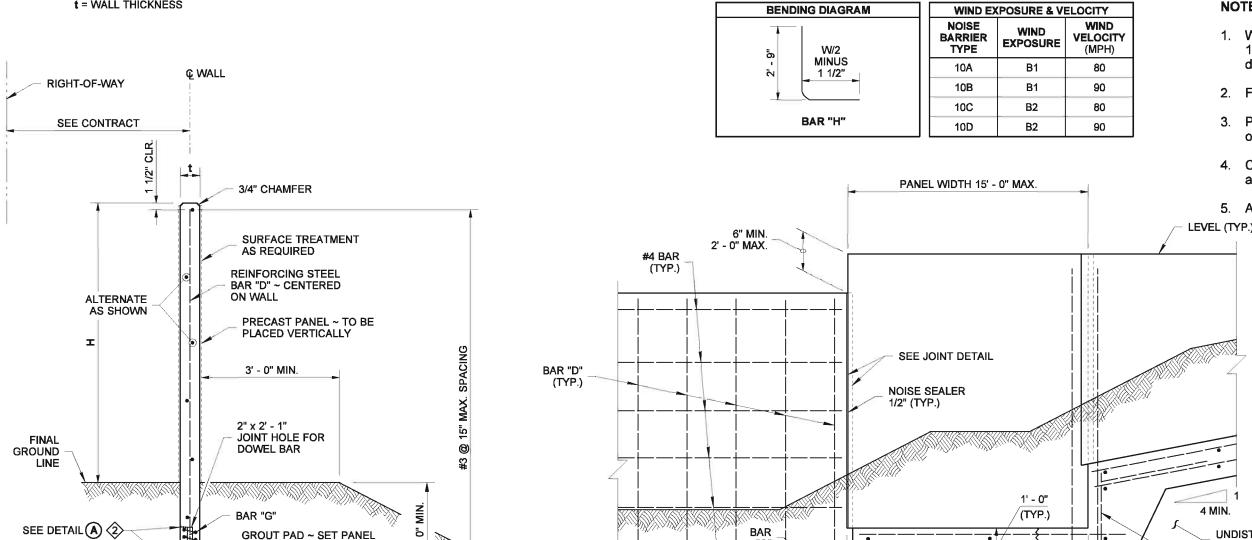
11-10-05

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EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



2 MAX.

REQUIRED FOR WALL HEIGHT 24' - 0" ~ TYPE 10C, WALLS 22' - 0" & 24' - 0" ~ TYPE 10B & WALLS

20' - 0", 22' - 0" & 24' - 0" ~ TYPE 10D.

BAR "H'

CONSTRUCTION JOINT

(SEE NOTE 4)

BAR "B"

- 10B, 10C or 10D. The Contract specifies actual wall
- Panels shall have at least 3' 0" of level ground on each side.
- Construction joints in the footing shall be spaced at 120 feet maximum.
- 5. All joints shall be in full contact and sealed.

PRECAST CONCRETE WALL ON OFFSET SPREAD FOOTING



NOISE BARRIER WALL TYPE 10

STANDARD PLAN D-2.34-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 11-10-05

#4 @ 18"<1>

BAR "A" WITH 2' - 0" MIN.

SPLICE EXTENDING THRU CONSTRUCTION JOINT (TYP.) (1)

IMMEDIATELY AFTER

PLACING GROUT

BAR "B"

TYPICAL SECTION

(1)

2008

ò

BAR "H" ~

ALTERNATE

PLACEMENT OF HOOKS CLR.

2' - 0"

BAR "A" (TYP.)

2 MAX.

2' - 0" MIN.

LAP (TYP.)

SEE DETAIL (A) (2)

ELEVATION

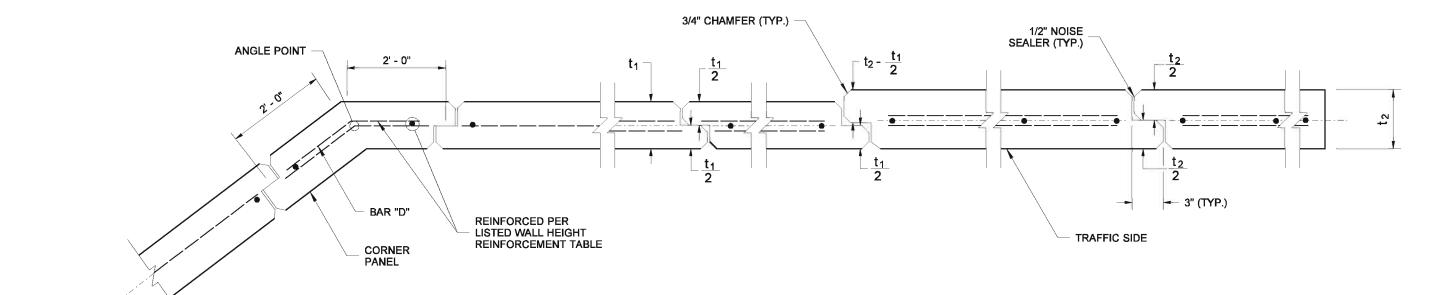
1' - 0"

MIN.

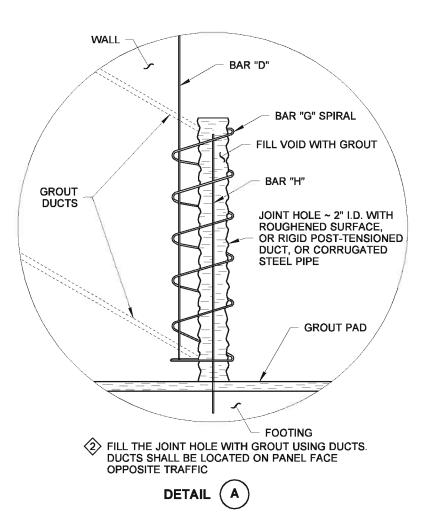
UNDISTURBED

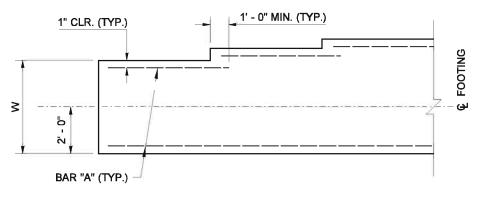
BAR "F"

SOIL



JOINT AND CORNER DETAIL





(TRANSVERSE BARS NOT SHOWN)

FOOTING WIDTH TRANSITION DETAIL

FOR LOCATIONS WITHOUT FOOTING STEP

PRECAST CONCRETE WALL ON OFFSET SPREAD FOOTING



NOISE BARRIER WALL TYPE 10

STANDARD PLAN D-2.34-00

SHEET 2 OF 2 SHEETS

11-10-05

APPROVED FOR PUBLICATION Harold J. Peterfeso



			TYPE	11A					TYPE	11B		
WALL HT	DEPTH D1	DEPTH D2	BAR "A"	BAR "B"	Y	ANCHOR BOLT DIAM.	DEPTH D1	DEPTH D2	BAR "A"	BAR "B"	Y	ANCHOR BOLT DIAM.
6' - 0"	5' - 0"	4' - 6"	4 ~ #3	4 ~ #7	3' - 4"	3/4"	5' - 9"	5' - 0"	4 ~ #3	4 ~ #7	3' - 4"	3/4"
8' - 0"	5' - 6"	5' - 0"	4 ~ #3	4 ~ #7	3' - 4"	3/4"	6' - 6"	5' - 9"	4 ~ #3	4 ~ #7	3' - 4"	3/4"
10' - 0"	6' - 3"	5' - 3"	4 ~ #3	4 ~ #7	3' - 4"	3/4"	7' - 3"	6' - 3"	4 ~ #4	4 ~ #7	3' - 4"	3/4"
12' - 0"	6' - 9"	5' - 9"	4 ~ #3	4 ~ #7	3' - 4"	3/4"	8' - 0"	6' - 9"	4 ~ #4	4 ~ #7	3' - 4"	3/4"
14' - 0"	7' - 3"	6' - 3"	4 ~ #4	4 ~ #7	3' - 4"	3/4"	8' - 9"	7' - 6"	4 ~ #5	4 ~ #7	3' - 4"	3/4"
16' - 0"	7' - 9"	6' - 9"	4 ~ #4	4 ~ #7	3' - 4"	1"	9' - 6"	8' - 0"	4 ~ #6	4 ~ #7	3' - 4"	1"
18' - 0"	8' - 6"	7' - 0"	4 ~ #5	4 ~ #9	5' - 6"	1"	10' - 3"	8' - 6"	4 ~ #6	4 ~ #9	5' - 6"	1"
20' - 0"	9' - 0"	7' - 6"	4 ~ #5	4 ~ #9	5' - 6"	1"	10' - 9"	9' - 0"	4 ~ #7	4 ~ #9	5' - 6"	1"
22' - 0"	9' - 6"	8' - 0"	4 ~ #6	4 ~ #11	8' - 5"	1 1/8"	11' - 6"	9' - 6"	4 ~ #8	4 ~ #11	8' - 5"	1 1/8"
24' - 0"	10' - 0"	8' - 3"	4 ~ #6	SPECIAL	DESIGN R	EQUIRED	12' - 0"	10' - 0"	4 ~ #8	SPECIAL	DESIGN F	REQUIRED

BAR "B" (TYP.)

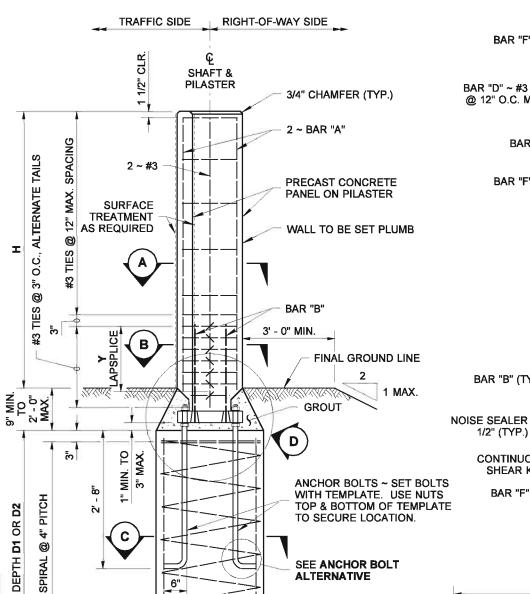
1/2" (TYP.)

CONTINUOUS SHEAR KEY

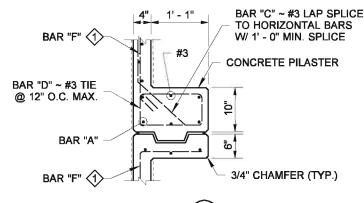
BAR "F" (1)

			TYPE	11C		TYPE 11D									
DR I	DEPTH D1	DEPTH D2	BAR "A"	BAR "B"	Ÿ	ANCHOR BOLT DIAM.	DEPTH D1	DEPTH D2	BAR "A"	BAR "B"	Y	ANCHOR BOLT DIAM.			
	5' - 3"	4' - 9"	4 ~ #3	4 ~ #7	3' - 4"	1"	6' - 3"	5' - 3"	4 ~ #3	4 ~ #7	3' - 4"	3/4"			
	6' - 0"	5' - 3"	4 ~ #3	4 ~ #7	3' - 4"	1"	7' - 0"	6' - 0"	4 ~ #3	4 ~ #7	3' - 4"	3/4"			
	6' - 9"	5' - 9"	4 ~ #3	4 ~ #7	3' - 4"	1"	8' - 0"	6' - 9"	4 ~ #4	4 ~ #7	3' - 4"	3/4"			
	7' - 6"	6' - 3"	4 ~ #4	4 ~ #7	3' - 4"	1"	8' - 9"	7' - 3"	4 ~ #5	4 ~ #7	3' - 4"	3/4"			
	8' - 0"	6' - 9"	4 ~ #4	4 ~ #7	3' - 4"	1"	9' - 6"	8' - 0"	4 ~ #5	4 ~ #9	5' - 6"	1"			
	8' - 9"	7' - 3"	4 ~ #5	4 ~ #9	5' - 6"	1"	10' - 3"	8' - 6"	4 ~ #6	4 ~ #9	5' - 6"	1"			
	9' - 3"	7' - 9"	4 ~ #6	4 ~ #9	5' - 6"	1"	11' - 0"	9' - 3"	4 ~ #7	4 ~ #11	8' - 5"	1"			
	10' - 0"	8' - 3"	4 ~ #6	4 ~ #11	6' - 3"	1"	11' - 9"	9' - 9"	4 ~ #8	SPECIAL	DESIGN F	REQUIRED			
ļ"	10' - 6"	8' - 9"	4 ~ #7	4 ~ #11	6' - 3"	1"	12' - 6"	10' - 3"	4 ~ #8	SPECIAL	DESIGN F	REQUIRED			
ED	11' - 3"	9' - 3"	4 ~ #7	SPECIAL	DESIGN F	REQUIRED	13' - 3"	11' - 0"	4 ~ #9	SPECIAL DESIGN REQUIRED					

	<i>a</i> .						
			TYPE	11D			WALL
OR .T VI.	DEPTH D1	DEPTH D2	BAR "A"	BAR "B"	Y	ANCHOR BOLT DIAM.	HEIGHT H
	6' - 3"	5' - 3"	4 ~ #3	4 ~ #7	3' - 4"	3/4"	6' - 0"
	7' - 0"	6' - 0"	4 ~ #3	4 ~ #7	3' - 4"	3/4"	8' - 0"
	8' - 0"	6' - 9"	4 ~ #4	4 ~ #7	3' - 4"	3/4"	10' - 0"
	8' - 9"	7' - 3"	4 ~ #5	4 ~ #7	3' - 4"	3/4"	12' - 0"
	9' - 6"	8' - 0"	4 ~ #5	4 ~ #9	5' - 6"	1"	14' - 0"
	10' - 3"	8' - 6"	4 ~ #6	4 ~ #9	5' - 6"	1"	16' - 0"
	11' - 0"	9' - 3"	4 ~ #7	4 ~ #11	8' - 5"	1"	18' - 0"
	11' - 9"	9' - 9"	4 ~ #8	SPECIAL	DESIGN R	EQUIRED	20' - 0"
	12' - 6"	10' - 3"	4 ~ #8	SPECIAL	DESIGN R	EQUIRED	22' - 0"
ED	13' - 3"	11' - 0"	4 ~ #9	SPECIAL	DESIGN R	EQUIRED	24' - 0"



TYPICAL SECTION



Q PILASTER

ĀND SHAFT

1' - 5"

SECTION (B

BAR "C" ~ #3 LAP SPLICE

TO HORIZONTAL BARS W/ 1' - 0" MIN. SPLICE

BAR "E" ~ #3 TIE @ 3" O.C. MAX.

1 1/2" MAX.

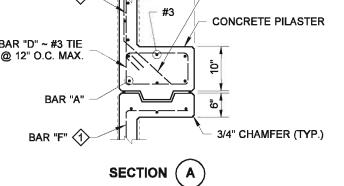
PANEL LENGTH ~ 12' - 0" MAX

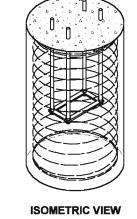
PLAN VIEW

TYPICAL PANEL

BAR "A" (TYP.)

© PILASTER AND SHAFT







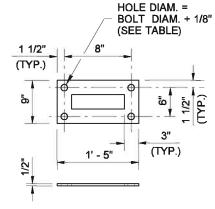
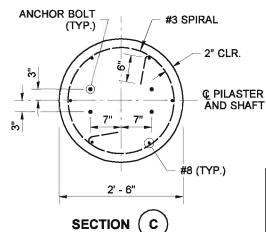


PLATE DETAIL

ANCHOR BOLT ALTERNATIVE THREADED ROD WITH NUTS TOP AND BOTTOM



(1) BAR "F" ~ #3 @ 12" BOTH DIRECTIONS. OR 6 × 6-W5.5 × W5.5, OR 12 × 12-W9.5 × W6.5, OR W9.5 (D10) HORIZONTAL @ 12" O.C. WITH W6 (D6) VERTICAL @ 12" O.C. OR EQUIVALENT. CENTER HORIZ-ONTAL BAR ON WALL. ALTERNATE VERTICAL BARS AS SHOWN.

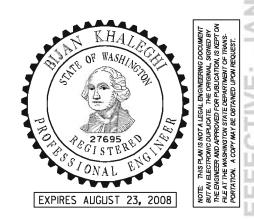
WIND EXPOSURE & VELOCITY								
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)						
11 A	B1	80						
11B	B1	90						
11C	B2	80						
11D	B2	90						

SOIL TYPE								
SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)							
D1	32							
D2	38							

NOTES

- Wall to be designated Noise Barrier Wall Type 11A, 11B, 11C or 11D. The Contract specifies actual wall dimensions.
- 2. For intermediate wall heights, use the next
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. The Contract specifies actual foundation requirements D1 or D2.
- 5. Maximum Panel length shall be 12 feet.

PRECAST CONCRETE WALL ON SHAFT FOUNDATION



NOISE BARRIER WALL TYPE 11

STANDARD PLAN D-2.36-01

SHEET 1 OF 3 SHEETS

APPROVED FOR PUBLICATION

Pasco Bakotich III



11-8-07

ANCHOR SPIRAL

WITH TWO TURNS TOP AND BOTTOM

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

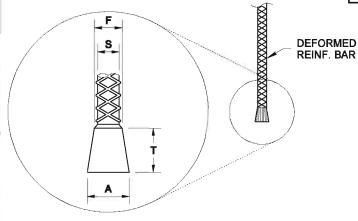
NOTE

SOSO

ANUARY

THE BOTTOM 9" OF **BAR "B"** SHALL BE PAINTED WITH ONE COAT OF FORMULA A-6-86 ZINC DUST OXIDE PRIMER OR, ONE COAT OF FORMULA A-11-99 PRIMER.

DIMENSION TABLE									
s	A (1)	F (1)	Т						
#7	1 21/32"	1 1/8"	1 1/2"						
#9	2"	1 3/8"	1 3/4"						
#11	2 15/32"	1 21/32"	2 1/4"						



THREADED REINF. BAR LOCK NUT

HEX NUT HARDENED WASHER

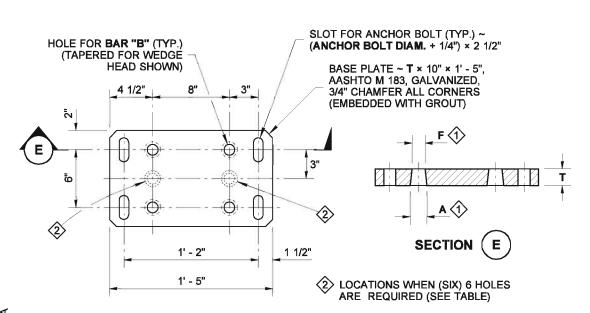
BAR "B"

BAR "B'

THE WEDGE HEAD SHALL BEAR FIRMLY AND UNIFORMLY AGAINST THE BASE PLATE. BAR "B" SHALL BE HELD SECURE DURING CONCRETE PLACEMENT TO PREVENT GAPS BETWEEN THE WEDGE HEAD AND THE BASE PLATE.

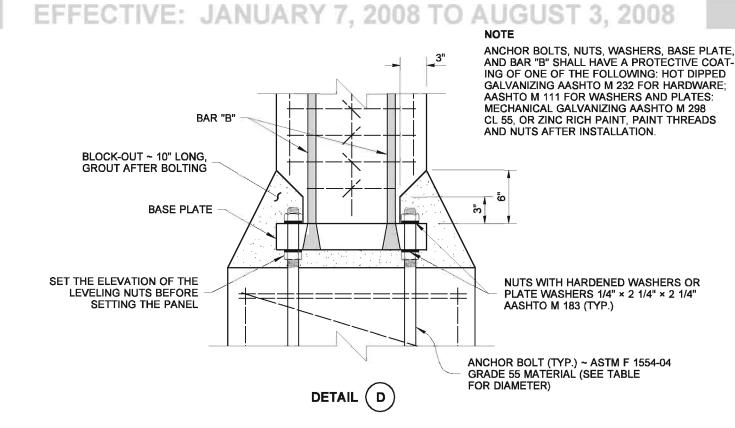
NO TAPER IS REQUIRED ON THE BASE PLATE WHEN USING THE THREADED BAR OPTION, USE DIAM. F HOLES

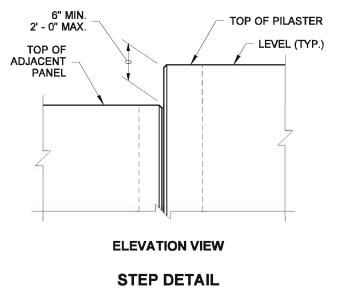
THREADED BAR OPTION

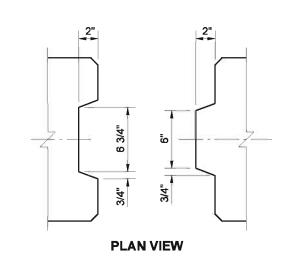


BASE PLATE

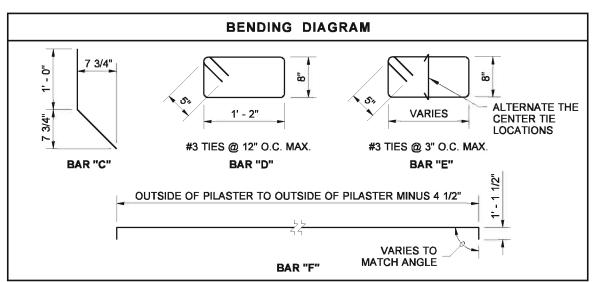
BAR "B" AND BASE PLATE DETAILS







SHEAR-KEY DETAIL



PRECAST CONCRETE WALL ON SHAFT FOUNDATION



NOISE BARRIER WALL TYPE 11

STANDARD PLAN D-2.36-01

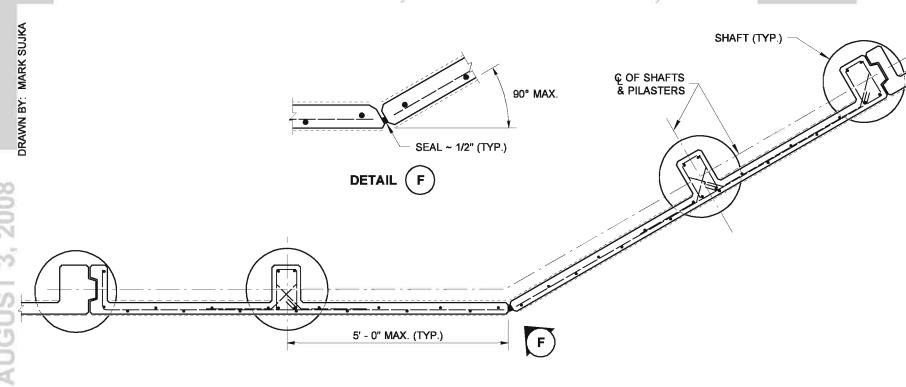
SHEET 2 OF 3 SHEETS

APPROVED FOR PUBLICATION

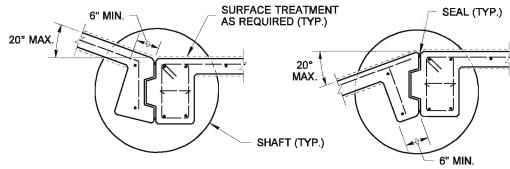




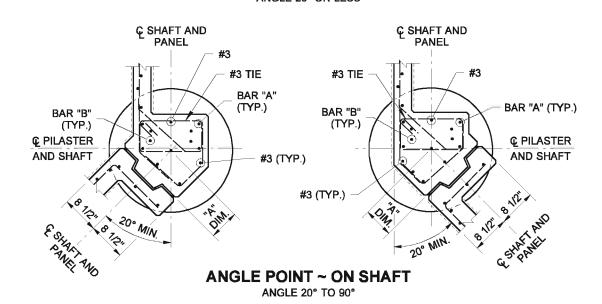
11-8-07



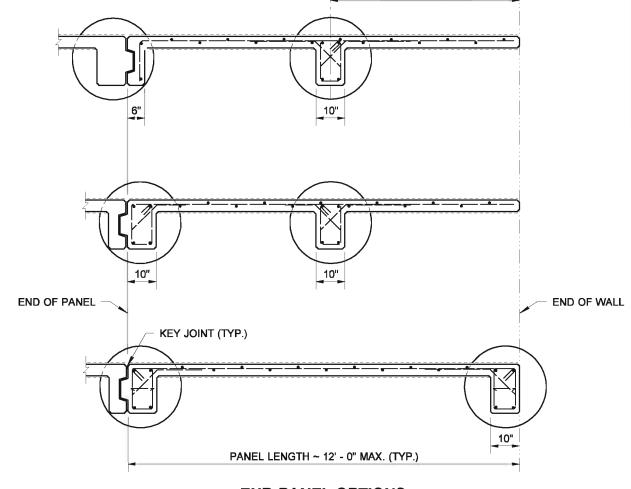
ANGLE POINT ~ CANTILEVERED



ANGLE POINT ~ ON SHAFT
ANGLE 20° OR LESS



ANGLE	"A" DIMENSION
30°	4 1/2"
40°	5 1/2"
50°	6 1/2"
60°	7 1/4"
70°	7 3/4"
80°	8"
90°	9 1/4"



5' - 0" MAX. (TYP.)

END-PANEL OPTIONS

PRECAST CONCRETE WALL ON SHAFT FOUNDATION



NOISE BARRIER WALL TYPE 11

STANDARD PLAN D-2.36-01

SHEET 3 OF 3 SHEETS

11-8-07

APPROVED FOR PUBLICATION

Pasco Bakotich III 11



AUGUS

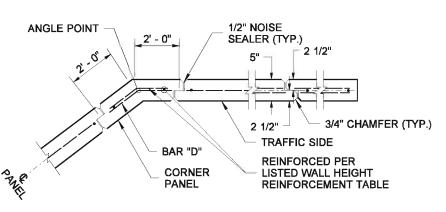
2008

SOIL TYPE							
SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)						
D1	32						
D2	38						

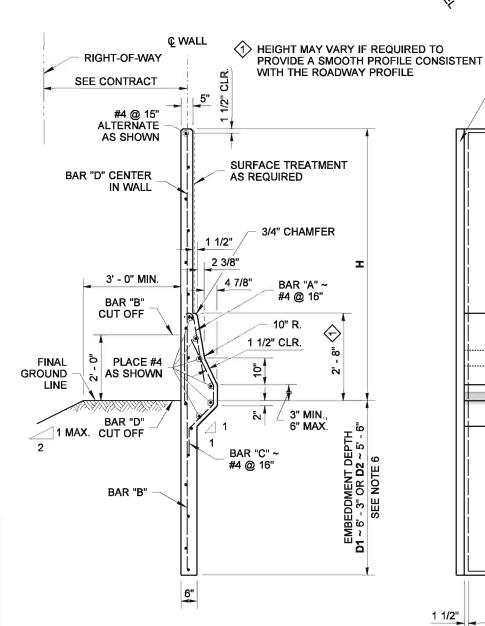
WIND EXPOSURE & VELOCITY									
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)							
12A	B1	80							
12B	B1	90							
12C	B2	80							
12D	B2	90							

- 1. Wall to be designated Noise Barrier Wall Type 12A, 12B, 12C and 12D. The Contract specifies actual wall designation.
- 2. For intermediate wall heights, use the next higher H.
- 3. Compaction of trench height differential shall not exceed 1 foot.
- 4. Panels shall have at least 3 feet of level ground on each side.
- 5. All joints shall be in full contact and sealed.
- 6. The Contract specifies actual foundation requirements D1 or D2.

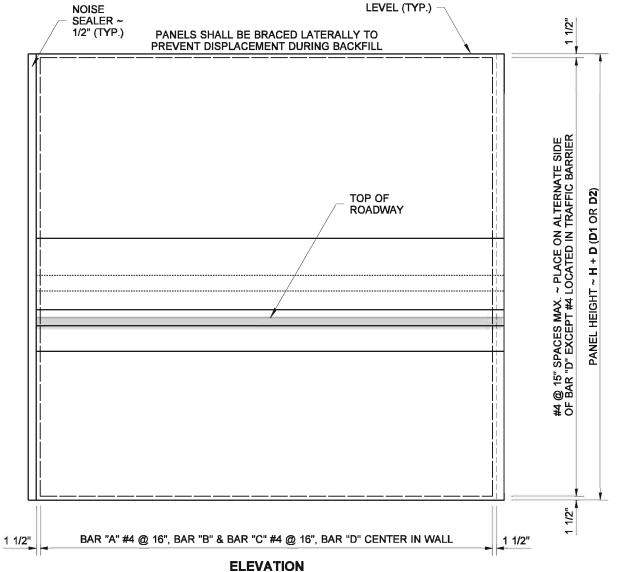
WALL HT	TYPE	12A	TYPE	12B	TYPE	12C	I	TYPE	≣ 12D	WALL HT
H	BAR "B"	BAR "D"	BAR "B"	BAR "D"	BAR "B"	BAR "D"		BAR "B"	BAR "D"	H
6' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"		#6 @ 12"	#4 @ 15"	6' - 0"
8' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"		#6 @ 12"	#4 @ 15"	8' - 0"
10' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"		#6 @ 12"	#4 @ 15"	10' - 0"
12' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"		#6 @ 12"	#4 @ 12"	12' - 0"
14' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 11"	#6 @ 12"	#4 @ 11"		#6 @ 12"	#4 @ 15"	14' - 0"
16' - 0"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#4 @ 10"		#6 @ 12"	#5 @ 12"	16' - 0"
18' - 0"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#5 @ 12"		#6 @ 9"	#5 @ 9"	18' - 0"

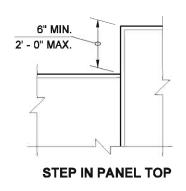


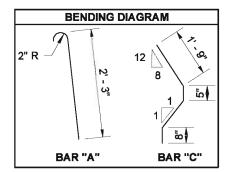
JOINT AND CORNER DETAIL



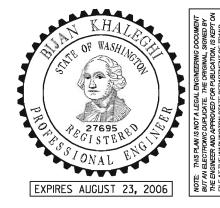
TYPICAL SECTION







PRECAST CONCRETE WALL W/ TRAFFIC BARRIER ON TRENCH FOOTING



NOISE BARRIER WALL TYPE 12

STANDARD PLAN D-2.38-00

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

11-10-05

Harold J. Peterfeso



TRENCH

2008

2008

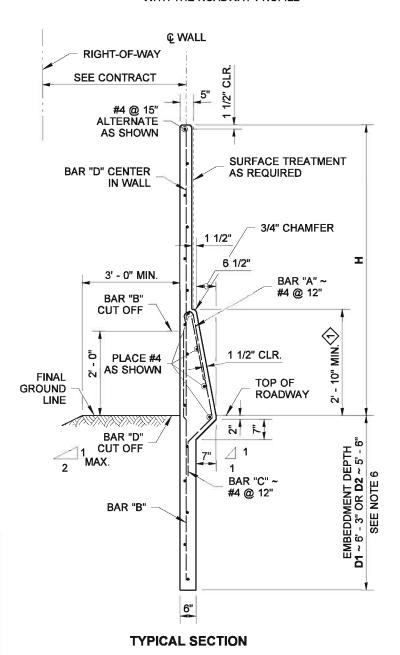
TRENCH FOOTING SEE NOTE 3

1 HEIGHT MAY VARY IF REQUIRED TO PROVIDE A SMOOTH PROFILE CONSISTENT WITH THE ROADWAY PROFILE

COMPACTED

TOP OF

PAVEMENT



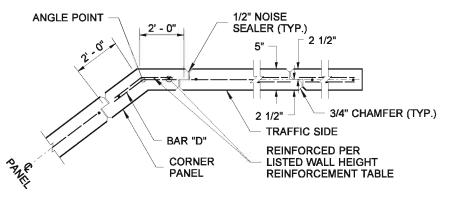
SOIL TYPE								
SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)							
D1	32							
D2	38							

WIND EXPOSURE & VELOCITY									
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)							
12SSA	B1	80							
12SSB	B1	90							
12SSC	B2	80							
12SSD	B2	90							

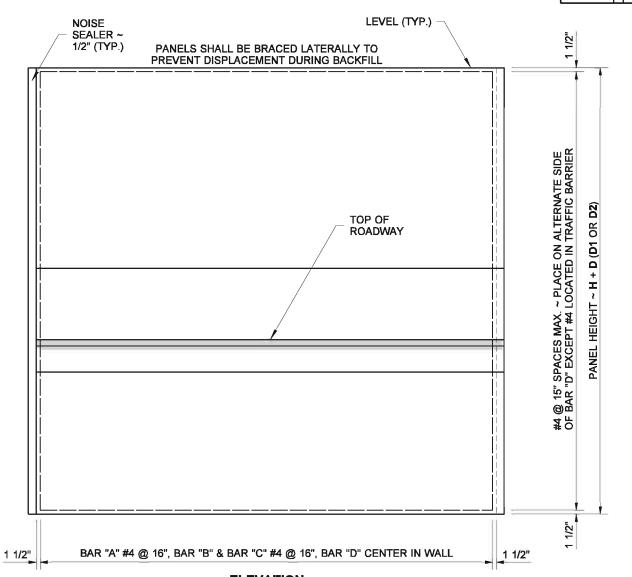
1. Wall to be designated Noise Barrier Wall Type 12SSA, 12SSB, 12SSC

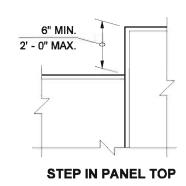
- and 12SSD. The Contract specifies actual wall designation.
- 2. For intermediate wall heights, use the next higher H
- 3. Compaction of trench height differential shall not exceed 1 foot.
- Panels shall have at least 3 feet of level ground on each side.
- 5. All joints shall be in full contact and sealed.
- 6. The Contract specifies actual foundation requirements D1 or D2.

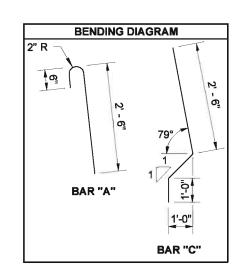
WALL HT	TYPE	12SSA	TYPE	12SSB	TYPE	12SSC	TYPE	12SSD		WALL HT
H	BAR "B"	BAR "D"		H						
6' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	_	6' - 0"
8' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"		8' - 0"
10' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"		10' - 0"
12' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 12"		12' - 0"
14' - 0"	#6 @ 12"	#4 @ 15"	#6 @ 12"	#4 @ 11"	#6 @ 12"	#4 @ 11"	#6 @ 12"	#4 @ 15"		14' - 0"
16' - 0"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#5 @ 12"		16' - 0"
18' - 0"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#4 @ 10"	#6 @ 12"	#5 @ 12"	#6 @ 9"	#5 @ 9"		18' - 0"



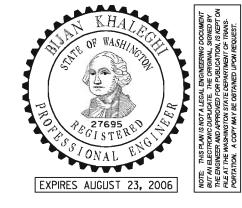
JOINT AND CORNER DETAIL







PRECAST CONCRETE WALL W/ SINGLE SLOPE TRAFFIC **BARRIER ON TRENCH FOOTING**



NOISE BARRIER WALL TYPE 12SS

STANDARD PLAN D-2.40-00

SHEET 1 OF 1 SHEET

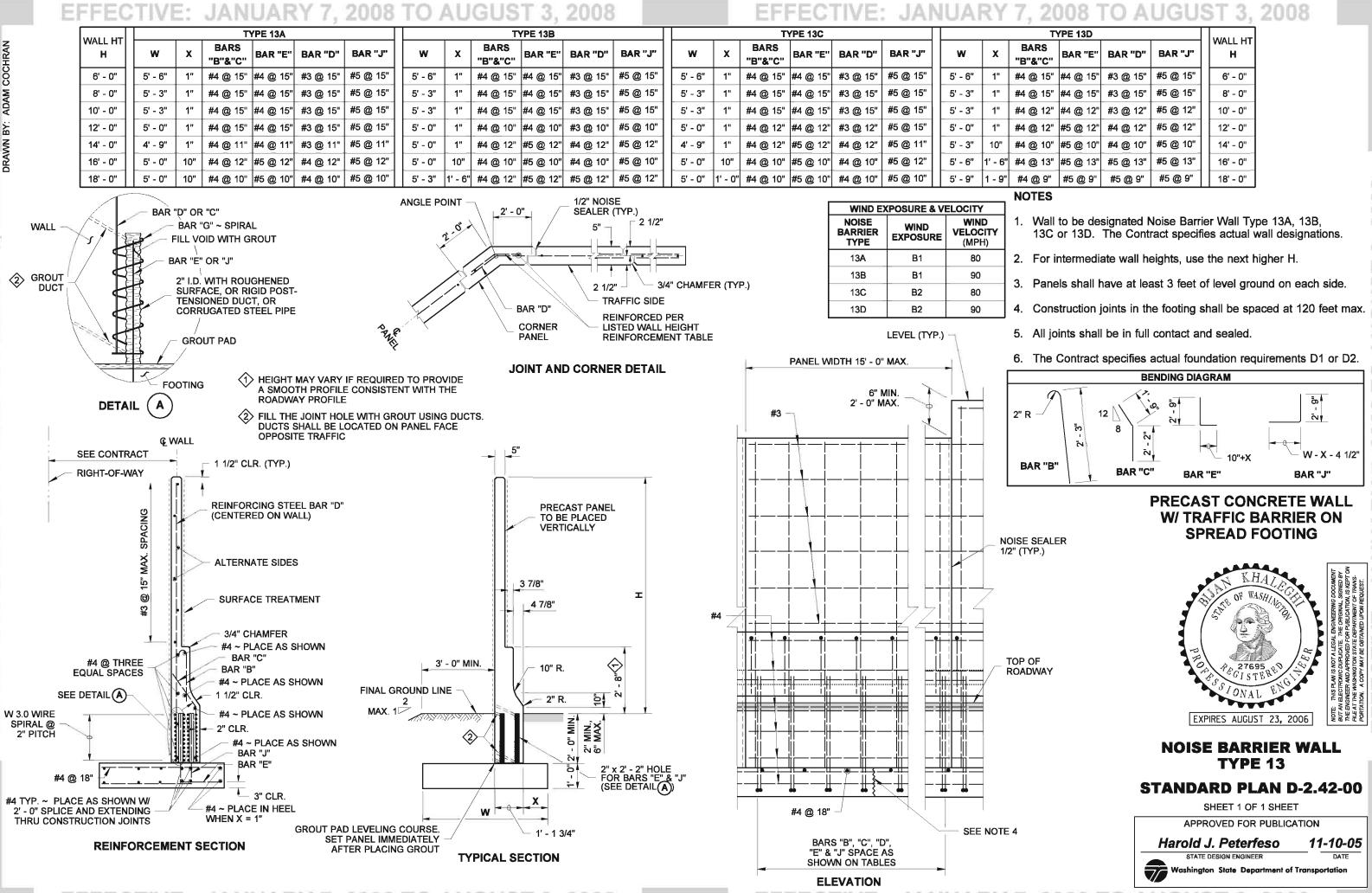
Harold J. Peterfeso



APPROVED FOR PUBLICATION 11-10-05

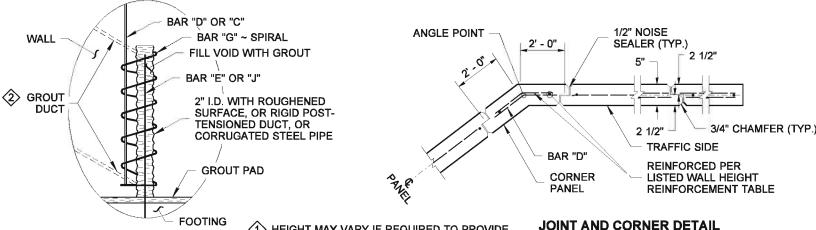
ELEVATION

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3



2008

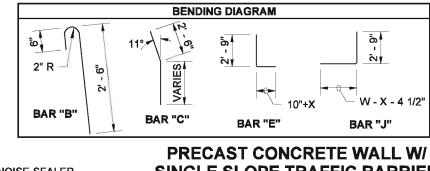
VAVALL LIT			TY	PE 13SSA					TYI	PE 13SSB					TYI	PE 13SSC					TY	PE 13SSD			I VAVALLE LIT
WALL HT	w	x	BARS "B"&"C"	BAR "E"	BAR "D"	BAR "J"	w	х	BARS "B"&"C"	BAR "E"	BAR "D"	BAR "J"	w	X	BARS "B"&"C"	BAR "E"	BAR "D"	BAR "J"	w	x	BARS "B"&"C"	BAR "E"	BAR "D"	BAR "J"	WALL HT H
6' - 0"	5' - 6"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 6"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 6"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 6"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	6' - 0"
8' - 0"	5' - 3"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 3"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 3"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 3"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	8' - 0"
10' - 0"	5' - 3"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 3"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 3"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 3"	1"	#4 @ 12"	#4 @ 12"	#3 @ 12"	#5 @ 12"	10' - 0"
12' - 0"	5' - 0"	1"	#4 @ 15"	#4 @ 15"	#3 @ 15"	#5 @ 15"	5' - 0"	1"	#4 @ 10"	#4 @ 10"	#3 @ 10"	#5 @ 10"	5' - 0"	1"	#4 @ 12"	#4 @ 12"	#3 @ 12"	#5 @ 15"	5' - 0"	1"	#4 @ 12"	#5 @ 12"	#4 @ 12"	#5 @ 12"	12' - 0"
14' - 0"	4' - 9"	1"	#4 @ 11"	#4 @ 11"	#3 @ 11"	#5 @ 11"	5' - 0"	1"	#4 @ 12"	#5 @ 12"	#4 @ 12"	#5 @ 12"	4' - 9"	1"	#4 @ 12"	#5 @ 12"	#4 @ 12"	#5 @ 11"	5' - 3"	10"	#4 @ 10"	#5 @ 10"	#4 @ 10"	#5 @ 10"	14' - 0"
16' - 0"	5' - 0"	10"	#4 @ 12"	#5 @ 12"	#4 @ 12"	#5 @ 12"	5' - 0"	10"	#4 @ 10"	#5 @ 10"	#4 @ 10"	#5 @ 10"	5' - 0"	10"	#4 @ 10"	#5 @ 10"	#4 @ 10"	#5 @ 12"	5' - 6"	1' - 6"	#4 @ 13"	#5 @ 13"	#5 @ 13"	#5 @ 13"	16' - 0"
18' - 0"	5' - 0"	10"	#4 @ 10"	#5 @ 10"	#4 @ 10"	#5 @ 10"	5' - 3"	1' - 6"	#4 @ 12"	#5 @ 12"	#5 @ 12"	#5 @ 12"	5' - 0"	1' - 0"	#4 @ 10"	#5 @ 10"	#4 @ 10"	#5 @ 10"	5' - 9"	1 - 9"	#4 @ 9"	#5 @ 9"	#5 @ 9"	#5 @ 9"	18' - 0"



WAND EX	(POSURE & V	EL OCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)
13SSA	B1	80
13SSB	B1	90
13SSC	B2	80
13SSD	B2	90

NOTES

- 1. Wall to be designated Noise Barrier Wall Type 13SSA, 13SSB, 13SSC or 13SSD. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- Panels shall have at least 3 feet of level ground on each side.
- Construction joints in the footing shall be spaced at 120 feet maximum.
- 5. All joints shall be in full contact and sealed.
- 6. The Contract specifies actual foundation requirements D1 or D2.



NOISE SEALER 1/2" (TYP.)

LEVEL (TYP.)

PANEL WIDTH 15' - 0" MAX.

#3

2' - 0" MAX.

PRECAST CONCRETE WALL WI SINGLE SLOPE TRAFFIC BARRIER ON SPREAD FOOTING



NOISE BARRIER WALL TYPE 13SS STANDARD PLAN D-2.44-00

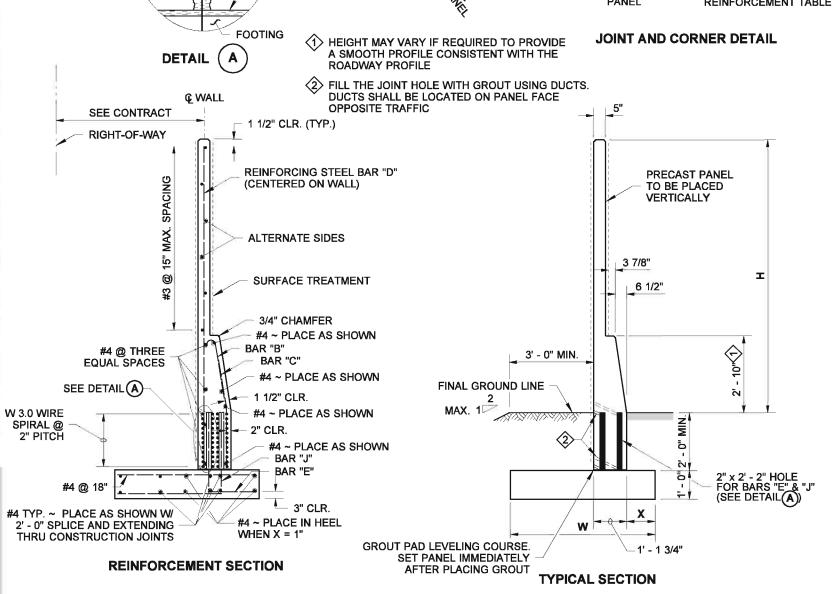
SHEET 1 OF 1 SHEET

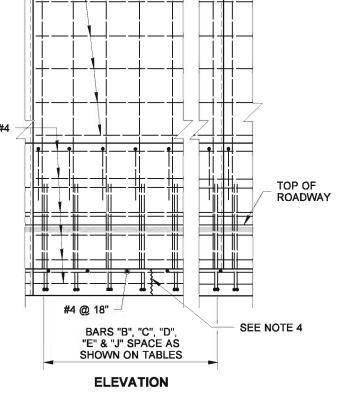
APPROVED FOR PUBLICATION

Harold J. Peterfeso 11-10-05

STATE DESIGN ENGINEER

Washington State Department of Transporter





EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 TIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** BENDING DIAGRAM **TYPE 14A** TYPE 14B TYPE 14C TYPE 14D WIND EXPOSURE & VELOCITY WALL HT WALL HT NOISE 1. Wall to be designated Noise Barrier Wall Type 14A, 14B, 14C BAR "A" BAR "A" BAR "A" BAR "A" **BARRIER** VELOCITY **EXPOSURE** or 14D. The Contract specifies actual wall designations. TYPE (MPH) 6' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 6' - 0" 14A В1 80 2. For intermediate wall heights, use the next higher H. 8' - 0" #4 @ 15" #4 @ 15" #4 @ 15" 8' - 0" #4 @ 15" ් ල් 14B **B1** 90 8 8 10' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 10' - 0" 3. Panels shall have at least 3 feet level ground on each side. *™* 80 14C **B2** 2 #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 12' - 0" 1' - 4 1/4" 4 14D В2 90 1 4. All joints shall be in full contact and sealed. 14' - 0" #4 @ 15" #4 @ 11' #4 @ 15" #4 @ 10" 14' - 0" 1' - 4 1/4" 3 16' - 0" #4 @ 10" #4 @ 10" #4 @ 10" #5 @ 12" 16' - 0" 5. Anchor Bolts, Nuts, Washers, Base Plate, and Bar "B" shall have a Protective Coating of one of the following: Hot Dipped 18' - 0" #4 @ 10" #5 @ 12" #4 @ 10" #5 @ 12" 18' - 0" Galvanizing AASHTO M 232 for Hardware, AASHTO M 111 Œ for Washers and Plates: Mechanical Galvanizing AASHTO M 298 1 1/4" THREADED ROD WALL CL 55, or Zinc Rich Paint, Paint threads and nuts after installation. RIGHT-OF-WAY WITH NUTS TOP & BOTTOM (TYP.) WALL SEE CONTRACT 6. The bottom 9" of Bar "B" shall be painted with one coat of Formula A-6-86 Zinc Dust Oxide Primer OR, one coat of Formula A-11-99 3/4" CHAMFER (TYP.) Primer. RIGHT-OF-WAY SIDE | TRAFFIC SIDE 7. The Contract specifies actual foundation requirements D1 or D2. 1/2" SEAL FULL BAR "A" CENTERED ON HEIGHT (TYP.) WALL SEE CHART FOR **BAR SIZE AND** WALL TO BE SET 1' - 8" SPACING (TYP.) PLUMB (TYP.) 3" (TYP.) 1 1/2" (TYP.) SURFACE TREATMENT PLATE AS REQUIRED #3 @ 1' - 3" O.C. ALTERNATE SIDES (TYP.) OPTIONAL 2' - 0" MIN. SPLICE 1 3/8" DIAM. (TYP.) - 7 1/4" **ISOMETRIC VIEW** SHOWN FOR INSTALLATION OPTIONAL 2' - 0" MIN. SPLICE **PLATE** PRECAST CONCRETE WALL 1~#4@END OF BARRIER **ANCHOR PLATE DETAIL** OPTIONAL (1) W/ TRAFFIC BARRIER ON CONSTRUCTION JOINT W/ ROUGHENED SURFACE SHAFT FOUNDATION (1) 2 HEIGHT MAY VARY IF REQUIRED TO 1 ~ #4 @ END PROVIDE A SMOOTH PROFILE CONSISTENT **C** BARRIER OF BARRIER AND SHAFT WITH THE ROADWAY PROFILE 2' - 0" MIN. SPLICE **BLOCKOUT FOR SHEAR KEY** (4) ~ #4 @ END OF BARRIER 3" MIN. **ANCHOR BOLTS** OPTIONAL (1) 6" MAX SEE DETAIL (C) #3 SPIRAL @ 4" PITCH FOR D2 12 ~ #5 (TYP.) **C** SHAFT 4 ~ #8 BAR "B" PITCH 8 1/2" (TYP.) ō 1 1/4" ANCHOR BOLT. SET EXPIRES AUGUST 23, 2006 **BOLTS WITH TEMPLATE. USE** 1 NUTS TOP AND BOTTOM OF R (9) TEMPLATE TO SECURE **NOISE BARRIER WALL** 2 LOCATION. SPIRAL **TYPE 14** FOR ALTERNATIVE ANCHOR TOP OF SEE ANCHOR PLATE DETAIL STANDARD PLAN D-2.46-00 **ROADWAY** #8 (TYP.) 1 1/2" CLR. (TYP.) SHEET 1 OF 2 SHEETS APPROVED FOR PUBLICATION 3" MIN. ANCHOR SPIRAL WITH TWO 9" MAX. Harold J. Peterfeso 11-10-05 **ور** TURNS TOP AND BOTTOM SECTION (A) **SECTION AT SHAFT SUPPORT TYPICAL SECTION**

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EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** TYPE 14SSA TYPE 14SSB TYPE 14SSC TYPE 14SSD BENDING DIAGRAM WALL H WALL HT 1. Wall to be designated Noise Barrier Wall Type 14SSA, 14SSB, BAR "A" BAR "A" BAR "A" BAR "A" 14SSC or 14SSD. The Contract specifies actual wall designations. 4 6' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 6' - 0" 2. For intermediate wall heights, use the next higher H. 8' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 8' - 0" 9 1/2" 10' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 10' - 0" 3. Panels shall have at least 3 feet level ground on each side. 11° 12' - 0" #4 @ 15" #4 @ 15" #4 @ 15" #4 @ 15" 12' - 0" 2 4. All joints shall be in full contact and sealed. 14' - 0" #4 @ 15" #4 @ 11" #4 @ 15" #4 @ 10" 14' - 0" 1' - 3 1/2" (1) 1' - 0" 16' - 0" #4 @ 10" #4 @ 10" #4 @ 10" #5 @ 12" 16' - 0" 1' - 3 1/2" 5. Anchor Bolts, Nuts, Washers, Base Plate, and Bar B shall have (5) a Protective Coating of one of the following: Hot Dipped 18' - 0" #4 @ 10" #5 @ 12" #4 @ 10" #5 @ 12" 18' - 0" Galvanizing AASHTO M 232 for Hardware; AASHTO M 111 1 1/4" THREADED ROD for Washers and Plates: Mechanical Galvanizing AASHTO M 298 WITH NUTS TOP RIGHT-OF-WAY & BOTTOM (TYP.) CL 55, or Zinc Rich Paint, Paint threads and nuts after installation. **Ç WALL** SEE CONTRACT **Q WALL** 6. The bottom 9" of Bar "B" shall be painted with one coat of Formula A-6-86 Zinc Dust Oxide Primer OR, one coat of Formula A-11-99 3/4" CHAMFER (TYP.) RIGHT-OF-WAY SIDE | TRAFFIC SIDE 7. The Contract specifies actual foundation requirements D1 or D2. 1/2" SEAL FULL HEIGHT (TYP.) BAR "A" CENTERED ON WALL 3" (TYP.) WALL TO BE SET 1 1/2" (TYP.) WIND EXPOSURE & VELOCITY SEE CHART FOR BAR SIZE PLUMB (TYP.) PLATE AND SPACING (TYP.) NOISE WIND **WIND** BARRIER VELOCITY **EXPOSURE** SURFACE TREATMENT **TYPE** (MPH) #3 @ 1' - 3" O.C. ALTERNATE AS REQUIRED 14SSA **B**1 SIDES (TYP.) CONSTRUCTION JOINT W/ ROUGHENED SURFACE 14SSB **B**1 90 OPTIONAL 2' - 0" DIAM MIN. SPLICE 14SSC **B2** 80 (TYP.) (2) HEIGHT MAY VARY IF REQUIRED TO ISOMETRIC VIEW PROVIDE A SMOOTH PROFILE CONSISTENT 14SSD B2 90 WITH THE ROADWAY PROFILE SHOWN FOR INSTALLATION **PLATE** OPTIONAL 2' - 0" **ALTERNATE ANCHOR DETAIL** MIN. SPLICE THREADED ROD WITH NUTS TOP AND BOTTOM OPTIONAL (1) PRECAST CONCRETE WALL W/ SINGLE SLOPE TRAFFIC BARRIER **C** BARRIER ON SHAFT FOUNDATION 1 AND SHAFT **ANCHOR BOLTS** BLOCKOUT FOR SHEAR KEY TOP OF ROADWAY 7 3/4" | 6 1/2" OPTIONAL (1) 5 3/8" 2" CLR. #3 SPIRAL 6" MAX. SEE DETAIL (C) 1 € SHAFT #4 @ 12" 8 1/2" (TYP.) 0" FOR D2 #8 BAR "B" PITCH EXPIRES AUGUST 23, 2006 1 1/4" ANCHOR BOLT. SET BOLTS WITH OR 9' TEMPLATE. USE NUTS TOP AND BOTTOM OF TEMPLATE TO SECURE **NOISE BARRIER WALL** LOCATION. **TYPE 14SS** #8 (TYP.) (1/2" CLR. (TYP.) FOR ALTERNATIVE ANCHOR SEE ANCHOR PLATE DETAIL TOP OF STANDARD PLAN D-2.48-00 **ROADWAY** £ SHEET 1 OF 2 SHEETS 3" MIN. APPROVED FOR PUBLICATION SECTION (A 9" MAX. ANCHOR SPIRAL WITH TWO Harold J. Peterfeso 11-10-05 TURNS TOP AND BOTTOM **SECTION AT SHAFT SUPPORT TYPICAL SECTION**

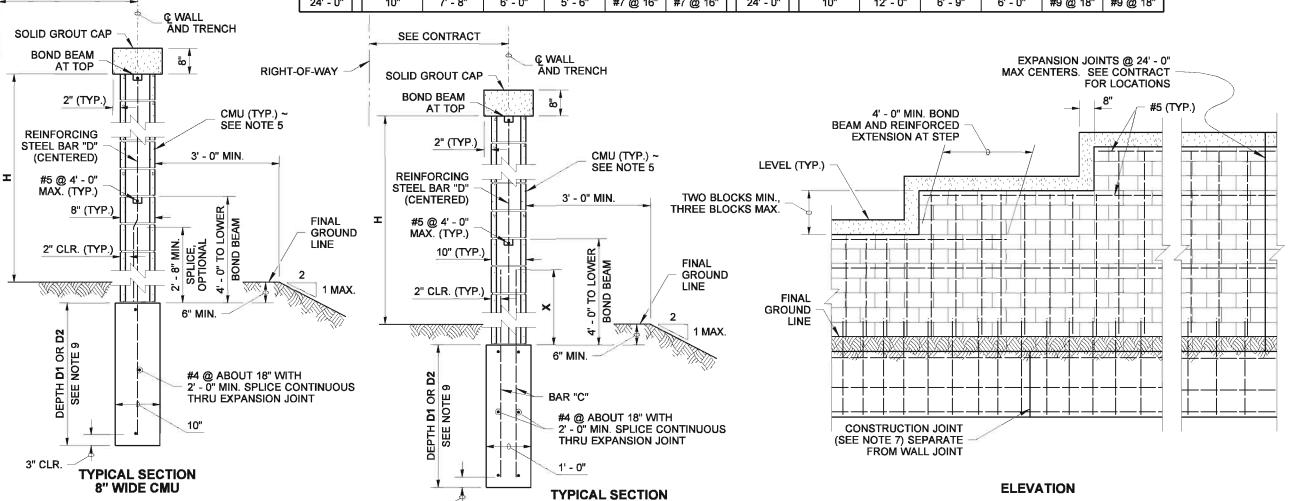
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		TYPE	16A			MALL HT			TYPE	∃ 16B		
CMU WIDTH	X	DEPTH D1	DEPTH D2	BAR "C"	BAR "D"	H	CMU WIDTH	x	DEPTH D1	DEPTH D2	BAR "C"	BAR "D"
8"		3' - 3"	3' - 0"	_	#6 @ 48"	6' - 0"	8"	_	3' - 8"	3' - 4"	_	#6 @ 48"
8"	_	3' - 6"	3' - 4"	_	#6 @ 48"	8' - 0"	8"		4' - 0"	3' - 8"		#6 @ 48"
8"	_	3' - 10"	3' - 6"	_	#6 @ 48"	10' - 0"	8"	_	4' - 4"	3' - 10"	_	#6 @ 48"
8"	_	4' - 7"	3' - 8"	_	#6 @ 48"	12' - 0"	8"	_	4' - 8"	4' - 2"	_	#6 @ 40"
8"	_	4' - 4"	3' - 10"	_	#6 @ 32"	14' - 0"	10"	4' - 0"	4' - 11"	4' - 5"	#6 @ 40"	#6 @ 40"
8"	_	4' - 7"	4' - 1"	_	#6 @ 24"	16' - 0"	10"	4' - 8"	5' - 3"	4' - 8"	#6 @ 32"	#6 @ 32"
10"	5' - 4"	4' - 10"	4' - 3"	#6 @ 48"	#6 @ 48"	18' - 0"	10"	5' - 4"	5' - 6"	4' - 10"	#6 @ 24"	#6 @ 24"
10"	6' - 0"	5' - 3"	4' - 9"	#6 @ 32"	#6 @ 32"	20' - 0"	10"	6' - 0"	4' - 9"	5' - 3"	#7 @ 24"	#7 @ 24"
10"	6' - 8"	5' - 6"	5' - 0"	#6 @ 24"	#6 @ 24"	22' - 0"	10"	8' - 0"	6' - 0"	5' - 6"	#7 @ 16"	#7 @ 16"
10"	7' - 4"	5' - 9"	5' - 3"	#6 @ 18"	#6 @ 18"	24' - 0"	10"	10' - 0"	6' - 3"	5' - 9"	#8 @ 16"	#8 @ 16"
		TYPE	16C			WALL HT			TYPE	16D		
CMU WIDTH	X	DEPTH D1	DEPTH D2	BAR "C"	BAR "D"	H	CMU WIDTH	x	DEPTH D1	DEPTH D2	BAR "C"	BAR "D"
8"	_	3' - 6"	3' - 3"	_	#6 @ 48"	6' - 0"	8"	_	3' - 10"	3' - 5"	_	#6 @ 48"
8"	_	3' - 9"	3' - 5"	_	#6 @ 48"	8' - 0"	8"	_	4' - 2"	3' - 9"	_	#6 @ 48"
8"	_	4' - 7"	3' - 8"	_	#6 @ 48"	10' - 0"	8"		4' - 5"	4' - 0"	_	#6 @ 32"
8"		4' - 4"	3' - 11"	_	#6 @ 32"	12' - 0"	10"	4' - 0"	4' - 10"	4' - 4"	#6 @ 48"	#6 @ 48"
8"	_	4' - 8"	4' - 2"	_	#6 @ 24"	14' - 0"	10"	4' - 0"	5' - 3"	4' - 7"	#6 @ 32"	#6 @ 32"
10"	4' - 0"	4' - 11"	4' - 5"	#6 @ 40"	#6 @ 40"	16' - 0"	10"	4' - 8"	5' - 7"	4' - 11"	#6 @ 24"	#6 @ 24"
10"	4' - 8"	5' - 3"	4' - 8"	#6 @ 32"	#6 @ 32"	18' - 0"	10"	5' - 4"	5' - 10"	5' - 1"	#6 @ 18"	#6 @ 18"
10"	5' - 4"	5' - 6"	5' - 0"	#6 @ 24"	#6 @ 24"	20' - 0"	10"	7' - 4"	6' - 0"	5' - 6"	#7 @ 18"	#7 @ 18"
10"	6' - 0"	5' - 9"	5' - 3"	#6 @ 16"	#6 @ 16"	22' - 0"	10"	9' - 8"	6' - 6"	5' - 9"	#8 @ 18"	#8 @ 18"
10"	7' - 8"	6' - 0"	5' - 6"	#7 @ 16"	#7 @ 16"	24' - 0"	10"	12' - 0"	6' - 9"	6' - 0"	#9 @ 18"	#9 @ 18"
	8" 8" 8" 8" 8" 10" 10" 10" CMU WIDTH 8" 8" 8" 10" 10" 10" 10" 10"	WIDTH X 8" — 8" — 8" — 8" — 8" — 10" 5' - 4" 10" 6' - 0" 10" 6' - 8" 10" 7' - 4" CMU X 8" — 8" — 8" — 8" — 8" — 10" 4' - 0" 10" 4' - 8" 10" 5' - 4" 10" 6' - 0"	CMU WIDTH X DEPTH D1 8" — 3' - 3" 8" — 3' - 6" 8" — 3' - 10" 8" — 4' - 7" 8" — 4' - 4" 8" — 4' - 7" 10" 5' - 4" 4' - 10" 10" 6' - 8" 5' - 6" 10" 6' - 8" 5' - 6" 10" 7' - 4" 5' - 9" TYPE CMU WIDTH X DEPTH D1 8" — 3' - 6" 8" — 3' - 9" 8" — 3' - 9" 8" — 4' - 7" 8" — 4' - 7" 8" — 4' - 7" 8" — 4' - 7" 8" — 4' - 7" 8" — 4' - 7" 8" — 4' - 7" 8" — 4' - 7" 8"	WIDTH X D1 D2 8" — 3' - 3" 3' - 0" 8" — 3' - 10" 3' - 4" 8" — 4' - 7" 3' - 6" 8" — 4' - 4" 3' - 10" 8" — 4' - 4" 3' - 10" 8" — 4' - 7" 4' - 1" 10" 5' - 4" 4' - 10" 4' - 3" 10" 6' - 8" 5' - 6" 5' - 0" 10" 6' - 8" 5' - 6" 5' - 0" 10" 7' - 4" 5' - 9" 5' - 3" TYPE 16C CMU X DEPTH D1 DEPTH D2 8" — 3' - 6" 3' - 3" 8" — 3' - 9" 3' - 5" 8" — 4' - 7" 3' - 8" 8" — 4' - 7" 3' - 8" 8" — 4' - 4" 3' - 11" 8" — 4' - 4" 3' - 11" <	CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" 8" — 3' - 3" 3' - 0" — 8" — 3' - 6" 3' - 4" — 8" — 3' - 10" 3' - 6" — 8" — 4' - 7" 3' - 8" — 8" — 4' - 4" 3' - 10" — 8" — 4' - 7" 4' - 1" — 10" 5' - 4" 4' - 10" 4' - 3" #6 @ 48" 10" 6' - 0" 5' - 3" 4' - 9" #6 @ 32" 10" 6' - 8" 5' - 6" 5' - 0" #6 @ 24" 10" 7' - 4" 5' - 9" 5' - 3" #6 @ 18" CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" 8" — 3' - 6" 3' - 3" — 8" — 3' - 6" 3' - 5" — 8" — 3' - 6" 3' - 3" — 8" <	CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" 8" — 3' - 3" 3' - 0" — #6 @ 48" 8" — 3' - 6" 3' - 4" — #6 @ 48" 8" — 3' - 10" 3' - 6" — #6 @ 48" 8" — 4' - 7" 3' - 10" — #6 @ 32" 8" — 4' - 7" 4' - 1" — #6 @ 24" 10" 5' - 4" 4' - 10" 4' - 3" #6 @ 48" #6 @ 24" 10" 6' - 0" 5' - 3" 4' - 9" #6 @ 32" #6 @ 32" 10" 6' - 8" 5' - 6" 5' - 0" #6 @ 24" #6 @ 24" 10" 7' - 4" 5' - 9" 5' - 3" #6 @ 18" #6 @ 18" TYPE 16C CMU WIDTH X DEPTH D2 BAR "C" BAR "D" 8" — 3' - 6" 3' - 3" — #6 @ 48" 8" — 3' - 6" 3' -	CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H 8" — 3' - 3" 3' - 0" — #6 @ 48" 6' - 0" 8" — 3' - 6" 3' - 4" — #6 @ 48" 8' - 0" 8" — 4' - 7" 3' - 6" — #6 @ 48" 10' - 0" 8" — 4' - 4" 3' - 10" — #6 @ 48" 12' - 0" 8" — 4' - 4" 3' - 10" — #6 @ 24" 16' - 0" 8" — 4' - 7" 4' - 1" — #6 @ 24" 16' - 0" 8" — 4' - 10" 4' - 3" #6 @ 48" #6 @ 24" 16' - 0" 10" 6' - 6" 5' - 6" 5' - 0" #6 @ 24" #6 @ 24" 22' - 0" 10" 7' - 4" 5' - 9" 5' - 3" #6 @ 18" #6 @ 18" WALL HT WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" 24' - 0"	CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H CMU WIDTH 8" — 3' - 3" 3' - 0" — #6 @ 48" 6' - 0" 8" 8" — 3' - 6" 3' - 4" — #6 @ 48" 8' - 0" 8" 8" — 3' - 10" 3' - 6" — #6 @ 48" 10' - 0" 8" 8" — 4' - 7" 3' - 8" — #6 @ 48" 12' - 0" 8" 8" — 4' - 4" 3' - 10" — #6 @ 32" 14' - 0" 10" 8" — 4' - 7" 4' - 1" — #6 @ 24" 16' - 0" 10" 10" 5' - 4" 4' - 10" 4' - 3" #6 @ 32" #6 @ 32" 20' - 0" 10" 10" 6' - 6" 5' - 6" 5' - 6" #6 @ 18" #6 @ 24" 22' - 0" 10" 10" 7' - 4" 5' - 9" 5' - 3" #6 @ 18" #6 @ 48" 6' - 0" 8" </td <td>CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H G" X 8" — 3' - 3" 3' - 0" — #6 @ 48" 6' - 0" 8" — 8" — 3' - 6" 3' - 4" — #6 @ 48" 8' - 0" 8" — 8" — 4' - 7" 3' - 8" — #6 @ 48" 10' - 0" 8" — 8" — 4' - 4" 3' - 10" — #6 @ 48" 12' - 0" 8" — 8" — 4' - 4" 3' - 10" — #6 @ 32" 14' - 0" 10" 4' - 0" 4' - 0" 10" 4' - 0" 10" 4' - 8" — 10" 4' - 0" 10" 4' - 8" 10" 5' - 4" 10" 4' - 8" 10" 5' - 4" 10" 4' - 8" 10" 5' - 4" 10" 5' - 4" 10" 5' - 4" 20' - 0" 10" 5' - 4" 20' - 0" 10" 5' - 4" 20' - 0" 10"</td> <td>CMU WIDTH X DEPTH D2 BAR "C" BAR "D" WALL HT H D1 X DEPTH D1 8" — 3' - 3" 3' - 0" — #6@ 48" 6' - 0" 8" — 3' - 6" 3' - 4" — #6@ 48" 8' - 0" 8" — 4' - 0" 4' - 0" 8" — 4' - 0" 8" — 4' - 4" 4' - 4" 3' - 10" — #6@ 48" 10' - 0" 8" — 4' - 4" 4' - 4" 3' - 10" — #6@ 48" 12' - 0" 8" — 4' - 6" 4' - 4" 4' - 1" — #6@ 32" 14' - 0" 10" 4' - 0" 4' - 1" — #6@ 24" 16' - 0" 10" 4' - 6" 5' - 3" 10" 4' - 8" 5' - 6" 5' - 6" 5' - 6" 18'' - 0" 10" 4' - 8" 5' - 6" 5' - 6" 5' - 6" 48'' - 8" 32" 18'' - 0" 10" 6' - 0" 4' - 9" 6'' - 0" 4' - 9" 10" 6' - 0" 8'' - 0" 6'' - 0" 10"</td> <td>CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H D1 X DEPTH D2 DEPTH D2 8" — 3'-3" 3'-0" — #6@ 48" 6'-0" 8" — 3'-8" 3'-4" — #6@ 48" 8'-0" 8" — 4'-0" 3'-8" — #6@ 48" 10'-0" 8" — 4'-0" 3'-8" — #6@ 48" 10'-0" 8" — 4'-4" 3'-10" 3'-8" — #6@ 48" 10'-0" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 4'-2" 16'-0" 10" 8" — 4'-4" 3'-10" 4'-2" 16'-0" 10" 4'-6" 5'-6" 5'-6" 5'-0" #6@ 48" 46@ 48" 18'-0" 10" 5'-4" 5'-6" <</td> <td>CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H D1 X DEPTH D2 BAR "C" BAR "C" 8" — 3' - 3" 3' - 0" — #6@ 48" 6' - 0" 8" — 3' - 6" 3' - 4" — 8' - 0" 8" — 3' - 6" 3' - 4" — #6@ 48" 8' 0" 8" 0" 4' - 0" 3' - 6" 3' - 8" — #6@ 48" 8' 0" 8" 0" 4' - 0" 3' - 6" 3' - 8" — 4' - 0" 3' - 10" — #6@ 48" 10' - 0" 8" 0" 4' - 4" 3' - 10" — #6@ 48" 10' - 0" 8" 0" 4' - 4" 0" 4' - 2" 0" 4' - 2" 0" 4' - 2" 0" 4' - 8" 0' 10" 4' - 2" 0" 4' - 2" 0" 4' - 5" 0" 4' - 2" 0" 4' - 8" 0' 0' 0' 5' - 3" 0' 0' 0' 4' - 2" 0" 8" 0" 0 4' - 6" 0' 0' 0' 4' - 8" 0' 0' 0' 4' - 2" 0" 4' - 2" 0" 4' - 2" 0" 4' - 2" 0" 4' - 8" 0' 0' 0' 5' - 6" 0' 0' 5' - 6" 0' 4' - 2" 0' 4' - 2" 0' 4' - 2"</td>	CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H G" X 8" — 3' - 3" 3' - 0" — #6 @ 48" 6' - 0" 8" — 8" — 3' - 6" 3' - 4" — #6 @ 48" 8' - 0" 8" — 8" — 4' - 7" 3' - 8" — #6 @ 48" 10' - 0" 8" — 8" — 4' - 4" 3' - 10" — #6 @ 48" 12' - 0" 8" — 8" — 4' - 4" 3' - 10" — #6 @ 32" 14' - 0" 10" 4' - 0" 4' - 0" 10" 4' - 0" 10" 4' - 8" — 10" 4' - 0" 10" 4' - 8" 10" 5' - 4" 10" 4' - 8" 10" 5' - 4" 10" 4' - 8" 10" 5' - 4" 10" 5' - 4" 10" 5' - 4" 20' - 0" 10" 5' - 4" 20' - 0" 10" 5' - 4" 20' - 0" 10"	CMU WIDTH X DEPTH D2 BAR "C" BAR "D" WALL HT H D1 X DEPTH D1 8" — 3' - 3" 3' - 0" — #6@ 48" 6' - 0" 8" — 3' - 6" 3' - 4" — #6@ 48" 8' - 0" 8" — 4' - 0" 4' - 0" 8" — 4' - 0" 8" — 4' - 4" 4' - 4" 3' - 10" — #6@ 48" 10' - 0" 8" — 4' - 4" 4' - 4" 3' - 10" — #6@ 48" 12' - 0" 8" — 4' - 6" 4' - 4" 4' - 1" — #6@ 32" 14' - 0" 10" 4' - 0" 4' - 1" — #6@ 24" 16' - 0" 10" 4' - 6" 5' - 3" 10" 4' - 8" 5' - 6" 5' - 6" 5' - 6" 18'' - 0" 10" 4' - 8" 5' - 6" 5' - 6" 5' - 6" 48'' - 8" 32" 18'' - 0" 10" 6' - 0" 4' - 9" 6'' - 0" 4' - 9" 10" 6' - 0" 8'' - 0" 6'' - 0" 10"	CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H D1 X DEPTH D2 DEPTH D2 8" — 3'-3" 3'-0" — #6@ 48" 6'-0" 8" — 3'-8" 3'-4" — #6@ 48" 8'-0" 8" — 4'-0" 3'-8" — #6@ 48" 10'-0" 8" — 4'-0" 3'-8" — #6@ 48" 10'-0" 8" — 4'-4" 3'-10" 3'-8" — #6@ 48" 10'-0" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 8" — 4'-4" 3'-10" 4'-2" 16'-0" 10" 8" — 4'-4" 3'-10" 4'-2" 16'-0" 10" 4'-6" 5'-6" 5'-6" 5'-0" #6@ 48" 46@ 48" 18'-0" 10" 5'-4" 5'-6" <	CMU WIDTH X DEPTH D1 DEPTH D2 BAR "C" BAR "D" WALL HT H D1 X DEPTH D2 BAR "C" BAR "C" 8" — 3' - 3" 3' - 0" — #6@ 48" 6' - 0" 8" — 3' - 6" 3' - 4" — 8' - 0" 8" — 3' - 6" 3' - 4" — #6@ 48" 8' 0" 8" 0" 4' - 0" 3' - 6" 3' - 8" — #6@ 48" 8' 0" 8" 0" 4' - 0" 3' - 6" 3' - 8" — 4' - 0" 3' - 10" — #6@ 48" 10' - 0" 8" 0" 4' - 4" 3' - 10" — #6@ 48" 10' - 0" 8" 0" 4' - 4" 0" 4' - 2" 0" 4' - 2" 0" 4' - 2" 0" 4' - 8" 0' 10" 4' - 2" 0" 4' - 2" 0" 4' - 5" 0" 4' - 2" 0" 4' - 8" 0' 0' 0' 5' - 3" 0' 0' 0' 4' - 2" 0" 8" 0" 0 4' - 6" 0' 0' 0' 4' - 8" 0' 0' 0' 4' - 2" 0" 4' - 2" 0" 4' - 2" 0" 4' - 2" 0" 4' - 8" 0' 0' 0' 5' - 6" 0' 0' 5' - 6" 0' 4' - 2" 0' 4' - 2" 0' 4' - 2"

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 NOTES

- 1. Wall to be designated Noise Barrier Wall Type 16A, 16B, 16C or 16D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. All masonry shall be hollow unit and installed as running bond.
- 4. All masonry is to be specially inspected.
- 5. All Concrete Masonry Unit (CMU) cells that have vertical steel reinforcing bars or bond beam units shall be filled with grout.
- 6. Panels shall have at least 3 feet of level ground on each side.
- 7. Construction joints in the trench footing shall be spaced at 120 feet maximum.
- 8. See "Masonry Wall Finishes and Details" sheet for masonry block finishes, special shapes, sizes and layouts.
- 9. The Contract specifies actual foundation requirements D1 or D2.



10" WIDE CMU

MASONRY WALL ON TRENCH FOOTING



NOISE BARRIER WALL TYPE 16

STANDARD PLAN D-2.60-00

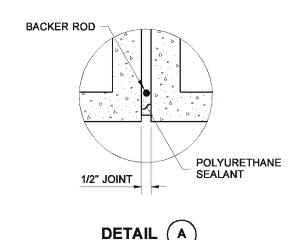
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

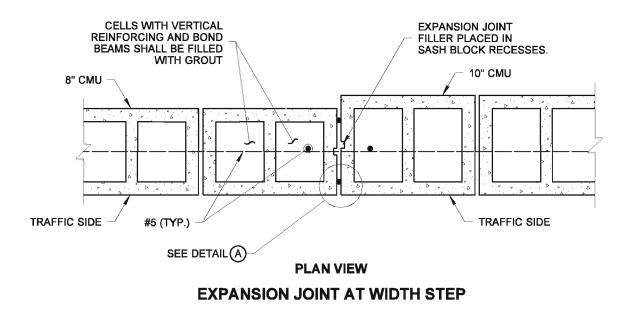
Harold J. Peterfeso 11-10-05

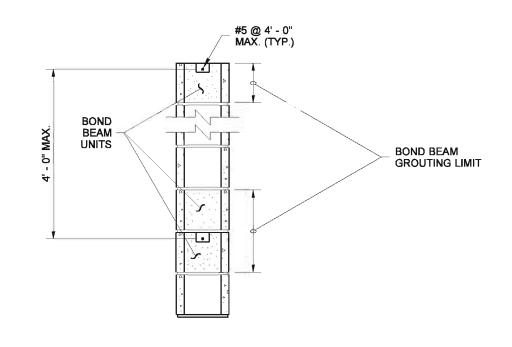
Washington State Department of Transportation

TYPICAL EXPANSION JOINT



TYPICAL BOTH SIDES OF WALL





BOND BEAM DETAIL

MASONRY WALL ON TRENCH FOOTING



NOISE BARRIER WALL TYPE 16

STANDARD PLAN D-2.60-00

SHEET 2 OF 2 SHEETS

11-10-05

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•

20' - 0"

22' - 0" 24' - 0"

RIGHT-OF-WAY

SEE CONTRACT

SOLID GROUT CAP

BOND BEAM AT TOP

AUGUST

2008

JANUARY

WIND EX	POSURE & V	ELOCIT
NOISE BARRIER TYPE	WIND EXPOSURE	WIN VELOC (MP
17A	B1	80
17B	B1	90
17C	B2	80
17D	B2	90
CMU = CON	CRETE MASO	NRY UN

WIND EX	POSURE & V	ELOCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)
17A	B1	80
17B	B1	90
17C	B2	80
17D	B2	90
CMU = CON	CRETE MASO	NRY UNIT

<u>ፍ</u> WALL AND

FOOTING

TYPICAL SECTION

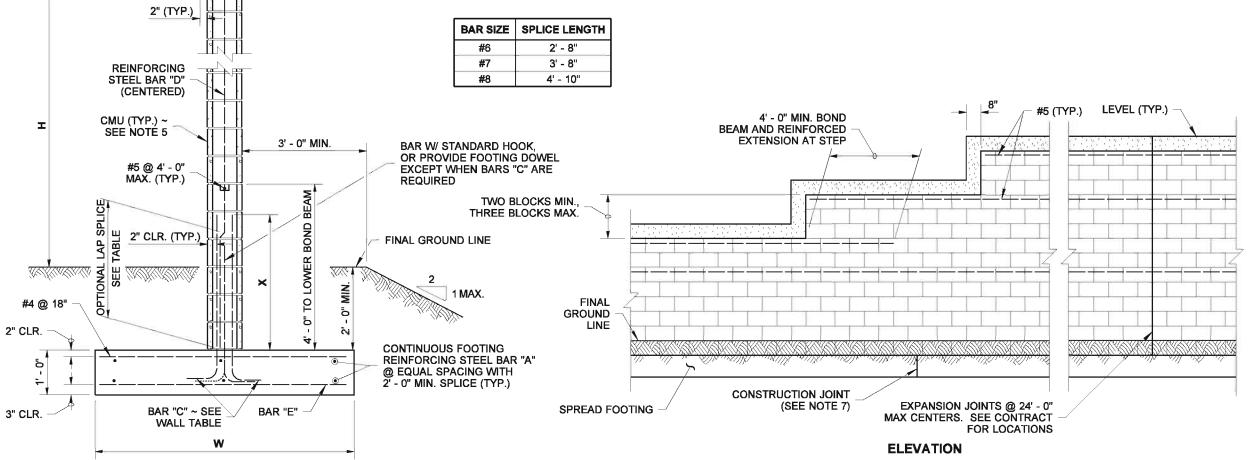
INVALL LITE				TIFETIA				I SAZATI I
WALL HT	CMU WIDTH	x	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"	WALL F
6' - 0''	8"	_	2' - 0"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	6' - 0
8' - 0"	8"	_	2' - 3"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	8' - 0
10' - 0"	8"		2' - 6"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	10' - 0
12' - 0"	8"	_	3' - 0"	4 ~ #4	_	#6 @ 48"	#4 @ 18"	12' - 0
14' - 0"	8"	_	3' - 3"	4 ~ #4	_	#6 @ 32"	#4 @ 18"	14' - 0
16' - 0"	10"	5' - 4"	3' - 9"	5 ~ #4	_	#6 @ 32"	#4 @ 18"	16' - 0
18' - 0"	10"	6' - 0"	4' - 0"	5 ~ #4	#6 @ 48"	#6 @ 48"	#4 @ 18"	18' - 0
20' - 0"	10"	6' - 8"	5' - 0"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"	20' - 0
22' - 0"	10"	7' - 4"	5' - 6"	5 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"	22' - 0
24' - 0"	10"	8' - 0"	6' - 0"	5 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"	24' - 0
VA/ALL LIT		•	•	TYPE 17C	•	•	•	\A/A
WALL HT	CMU WIDTH	x	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"	WALL H
6' - 0"	8"	_	2' - 0"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	6' - 0
8' - 0"	8"		2' - 6"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	8' - 0
10' - 0"	8"	_	2' - 9"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	10' - 0
12' - 0"	8"	_	3' - 3"	3 ~ #4		#6 @ 40"	#4 @ 18"	12' - 0
14' - 0"	10"	4' - 0"	3' - 9"	5 ~ #4	_	#6 @ 16"	#4 @ 18"	14' - 0
16' - 0"	10"	4' - 8"	4' - 3"	5 ~ #4	#6 @ 40"	#6 @ 40"	#4 @ 18"	16' - 0
18' - 0"	10"	5' - 4"	4' - 6"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"	18' - 0

			TYPE 17A				34/411 117				TYPE 17B			
CMU WIDTH	x	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"	WALL HT	CMU WIDTH	х	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"
8"		2' - 0"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	6' - 0"	8"	_	12' - 3"	3 ~ #4	_	#6 @ 48"	#4 @ 18"
8"	_	2' - 3"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	8' - 0"	8"		2' - 9"	4 ~ #4	_	#6 @ 48"	#4 @ 18"
8"	_	2' - 6"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	10' - 0"	8"		3' - 3"	4 ~ #4	_	#6 @ 48"	#4 @ 18"
8"	_	3' - 0"	4 ~ #4	_	#6 @ 48"	#4 @ 18"	12' - 0"	10"	4' - 0"	3' - 9"	4 ~ #4	_	#6 @ 40"	#4 @ 18"
8"	_	3' - 3"	4 ~ #4	_	#6 @ 32"	#4 @ 18"	14' - 0"	10"	4' - 8"	4' - 3"	5 ~ #4	#6 @ 40"	#6 @ 40"	#4 @ 18"
10"	5' - 4"	3' - 9"	5 ~ #4	_	#6 @ 32"	#4 @ 18"	16' - 0"	10"	5' - 4"	4' - 9"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"
10"	6' - 0"	4' - 0"	5 ~ #4	#6 @ 48"	#6 @ 48"	#4 @ 18"	18' - 0"	10"	6' - 0"	5' - 3"	6 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"
10"	6' - 8"	5' - 0"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"	20' - 0"	10"	8' - 0"	6' - 0"	5 ~ #4	#7 @ 24"	#7 @ 24"	#4 @ 18"
10"	7' - 4"	5' - 6"	5 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"	22' - 0"	10"	10' - 0"	6' - 3"	5 ~ #4	#7 @ 16"	#7 @ 16"	#4 @ 12"
10"	8' - 0"	6' - 0"	5 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"	24' - 0"	10"	12' - 0"	6' - 9"	5 ~ #4	#8 @ 16"	#8 @ 16"	#4 @ 12"
			TYPE 17C				WALL HT				TYPE 17D			
CMU WIDTH	x	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"	H	CMU WIDTH	x	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"
8"	_	2' - 0"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	6' - 0"	8"		2' - 6"	3 ~ #4	_	#6 @ 48"	#4 @ 18"
8"	_	2' - 6"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	8' - 0"	8"	—	3' - 3"	5 ~ #4	_	#6 @ 48"	#4 @ 18"
8"	_	2' - 9"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	10' - 0"	10"	4' - 0"	3' - 6"	5 ~ #4	_	#6 @ 24"	#4 @ 18"
8"	_	3' - 3"	3 ~ #4		#6 @ 40"	#4 @ 18"	12' - 0"	10"	4' - 0"	4' - 3"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"
10"	4' - 0"	3' - 9"	5 ~ #4	_	#6 @ 16"	#4 @ 18"	14' - 0"	10"	4' - 8"	4' - 9"	5 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"
10"	4' - 8"	4' - 3"	5 ~ #4	#6 @ 40"	#6 @ 40"	#4 @ 18"	16' - 0"	10"	5' - 4"	5' - 6"	5 ~ #4	#6 @ 16"	#7 @ 16"	#4 @ 18"
10"	5' - 4"	4' - 6"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"	18' - 0"	10"	7' - 4"	6' - 0"	5 ~ #4	#7 @ 24"	#7 @ 16"	#4 @ 18"
10"	6' - 0"	5' - 3"	5 ~ #4	#6 @ 24"	#6 @ 16"	#4 @ 18"	20' - 0"	10"	9' - 8"	6' - 6"	5 ~ #4	#7 @ 16"	#8 @ 16"	#4 @ 12"
10"	7' - 0"	5' - 9"	5 ~ #4	#6 @ 16"	#6 @ 16"	#4 @ 18"	22' - 0"	10"	12' - 0"	7' - 0"	5 ~ #4	#7 @ 16"	#8 @ 16"	#4 @ 12"
10"	8' - 0"	6' - 3"	5 ~ #4	#7 @ 16"	#7 @ 16"	#4 @ 12"	24' - 0"	10"	15' - 0"	7' - 6"	6 ~ #4	#7 @ 16"	#8 @ 16"	#4 @ 12"

NOTES

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

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- 6. Panels shall have at least 3 feet of level ground on each side.
- 7. Construction joints in the footing shall be spaced at 120 feet maximum.
- 8. See "Masonry Wall Finishes and Details" sheets for masonry block finishes, special shapes, sizes and layout.



MASONRY WALL ON SPREAD FOOTING



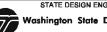
NOISE BARRIER WALL TYPE 17

STANDARD PLAN D-2.62-00

SHEET 1 OF 2 SHEETS

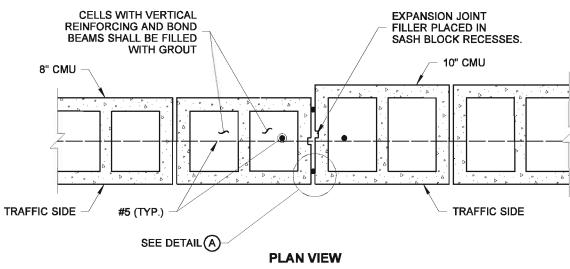
APPROVED FOR PUBLICATION

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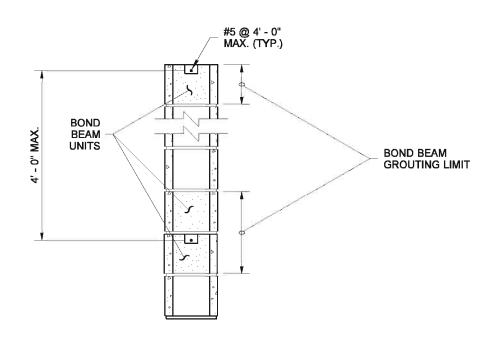
11-10-05

TYPICAL EXPANSION JOINT



EXPANSION JOINT AT WIDTH STEP

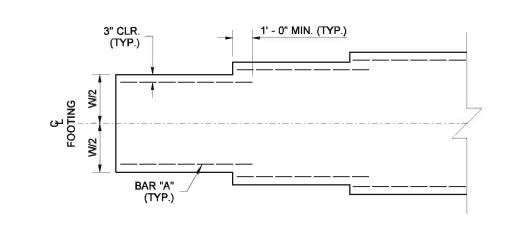
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



BACKER ROD POLYURETHANE SEALANT 1/2" JOINT

DETAIL TYPICAL BOTH SIDES OF WALL

BOND BEAM DETAIL



FOOTING WIDTH TRANSITION DETAIL (FOR LOCATIONS WITHOUT FOOTING STEP) NOTE: TRANSVERSE BARS NOT SHOWN

MASONRY WALL ON SPREAD FOOTING



NOISE BARRIER WALL TYPE 17 STANDARD PLAN D-2.62-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION Harold J. Peterfeso 11-10-05

WIND EX	POSURE & V	ELOCITY
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCI [*] (MPH)
18A	B1	80
18B	B1	90
18C	B2	80
18D	B2	90

RIGHT-OF-WAY

SEE CONTRACT

SOLID GROUT CAP

BOND BEAM AT TOP

2" (TYP.)

<u>ር</u> WALL AND

TYPICAL SECTION

						190		
POSURE & V	ELOCITY	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				TYPE 18A		_
WIND EXPOSURE	WIND VELOCITY (MPH)	WALL HT	CMU WIDTH	x	w	BAR "A"	BAR "C"	
B1	80	6' - 0"	8"		2' - 0"	3 ~ #4	_	
B1	90	8' - 0"	8"	_	2' - 3"	3 ~ #4	_	
- 112		10' - 0"	8"	T	2' - 6"	3 ~ #4		
B2	80			 			-	-
B2	90	12' - 0"	8"		3' - 0"	4 ~ #4		
		J 14' - 0"	8"	_	3' - 3"	4 ~ #4	_	
		16' - 0"	10"	5' - 4"	3' - 9"	5 ~ #4		
		18' - 0"	10"	6' - 0"	4' - 0"	5 ~ #4	#6 @ 48"	

VAVALL LIT				TYPE 18A				MALL LIT				TYPE 18B			
WALL HT	CMU WIDTH	x	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"	WALL HT	CMU WIDTH	x	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"
6' - 0"	8"	_	2' - 0"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	6' - 0"	8"	_	2' - 3"	3 ~ #4	_	#6 @ 48"	#4 @ 18"
8' - 0"	8"	_	2' - 3"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	8' - 0"	8"	_	2' - 9"	4 ~ #4	_	#6 @ 48"	#4 @ 18"
10' - 0"	8"		2' - 6"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	10' - 0"	8"	_	3' - 3"	4 ~ #4	_	#6 @ 48"	#4 @ 18"
12' - 0"	8"		3' - 0"	4 ~ #4	_	#6 @ 48"	#4 @ 18"	12' - 0"	10"	4' - 0"	3' - 9"	4 ~ #4	_	#6 @ 40"	#4 @ 18"
14' - 0"	8"	_	3' - 3"	4 ~ #4	_	#6 @ 36"	#4 @ 18"	14' - 0"	10"	4' - 8"	4' - 3"	5 ~ #4	#6 @ 40"	#6 @ 40"	#4 @ 18"
16' - 0"	10"	5' - 4"	3' - 9"	5 ~ #4		#6 @ 16"	#4 @ 18"	16' - 0"	10"	5' - 4"	5' - 3"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"
18' - 0"	10"	6' - 0"	4' - 0"	5 ~ #4	#6 @ 48"	#6 @ 48"	#4 @ 18"	18' - 0"	10"	6' - 0"	6' - 0"	6 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"
20' - 0"	10"	6' - 8"	5' - 0"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"	20' - 0"	10"	8' - 0"	7' - 0"	5 ~ #4	#7 @ 24"	#7 @ 24"	#4 @ 18"
22' - 0"	10"	7' - 4"	5' - 6"	5 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"	22' - 0"	10"	10' - 0"	7' - 9"	5 ~ #4	#7 @ 16"	#7 @ 16"	#4 @ 12"
24' - 0"	10"	8' - 0"	6' - 3"	5 ~ #4	#6 @ 16"	#6 @ 16"	#4 @ 18"	24' - 0"	10"	12' - 0"	8' - 6"	5 ~ #4	#8 @ 16"	#8 @ 16"	#4 @ 12"

I											
24' - 0"	10"	8' - 0"	6' - 3"	5 ~ #4	#6 @ 16"	#6 @ 16"	#4 @ 18"	24' - 0"	10"	12' - 0"	8' - 6"
				TYPE 18C							
WALL HT	CMU WIDTH	х	w	BAR "A"	BAR "C"	BAR "D"	BAR "E"	WALL HT	CMU WIDTH	x	w
6' - 0"	8"	_	2' - 0"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	6' - 0"	8"	_	2' - 6"
8' - 0"	8"	_	2' - 6"	3 ~ #4	_	#6 @ 48"	#4 @ 18"	8' - 0"	8"	_	3' - 3"
10' - 0"	8"	_	2' - 9"	3 ~ #4		#6 @ 48"	#4 @ 18"	10' - 0"	10"	4' - 0"	3' - 6"
12' - 0"	8"		3' - 3"	3 ~ #4	_	#6 @ 40"	#4 @ 18"	12' - 0"	10"	4' - 0"	4' - 3"
14' - 0"	10"	4' - 0"	3' - 9"	5 ~ #4	_	#6 @ 16"	#4 @ 18"	14' - 0"	10"	4' - 8"	5' - 3"
16' - 0"	10"	4' - 8"	4' - 3"	5 ~ #4	#6 @ 40"	#6 @ 40"	#4 @ 18"	16' - 0"	10"	5' - 4"	6' - 3"
18' - 0"	10"	5' - 4"	5' - 0"	5 ~ #4	#6 @ 32"	#6 @ 32"	#4 @ 18"	18' - 0"	10"	7' - 4"	7' - 0"
20' - 0"	10"	6' - 0"	5' - 9"	5 ~ #4	#6 @ 24"	#6 @ 24"	#4 @ 18"	20' - 0"	10"	9' - 8"	8' - 0"
22' - 0"	10"	7' - 0"	6' - 6"	5 ~ #4	#6 @ 16"	#6 @ 16"	#4 @ 18"	22' - 0"	10"	12' - 0"	9' - 0"
24' - 0"	10"	8' - 0"	7' - 6"	5 ~ #4	#7 @ 16"	#7 @ 16"	#4 @ 12"	24' - 0"	10"	15' - 0"	9' - 9"

NOTES

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

TYPE 18D

BAR "A"

3 ~ #4

5 ~ #4

5 ~ #4

5 ~ #4

5 ~ #4

5 ~ #4

6 ~ #4

BAR "C"

#6 @ 48"

#6 @ 32"

#6 @ 24"

#6 @ 16"

#7 @ 16"

#8 @ 16"

#9 @ 16"

BAR "D"

#6 @ 48"

#6 @ 48"

#6 @ 24"

#6 @ 32"

#6 @ 24"

#7 @ 16"

#7 @ 16"

#8 @ 16"

#8 @ 16"

#8 @ 16"

BAR "E"

#4 @ 18"

#4 @ 18"

#4 @ 18"

#4 @ 18'

#4 @ 18'

#4 @ 18"

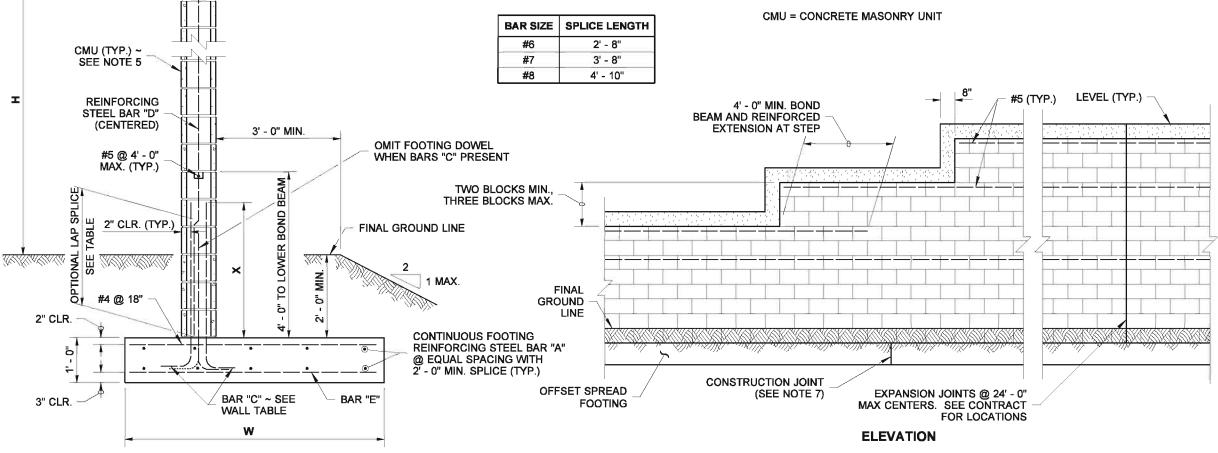
#4 @ 18"

#4 @ 12"

#4 @ 12"

#4 @ 12"

- 1. Wall to be designated Noise Barrier Wall Type 18A, 18B, 18C or 18D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. All masonry shall be hollow unit and installed as running bond.
- 4. All masonry is to be specially
- 5. All Concrete Masonry Unit (CMU) cells that have vertical steel reinforcing bars or bond beam units shall be filled with grout.
- 6. Panels shall have at least 3 feet of level ground on each side.
- Construction joints in the footing shall be spaced at 120 feet maximum.
- See "Masonry Wall Finishes and Details" sheets for masonry block finishes, special shapes, sizes and layout.



MASONRY WALL ON OFFSET SPREAD FOOTING



NOISE BARRIER WALL TYPE 18

STANDARD PLAN D-2.64-00

SHEET 1 OF 2 SHEETS

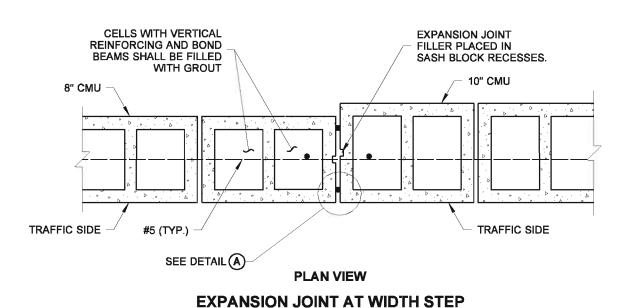
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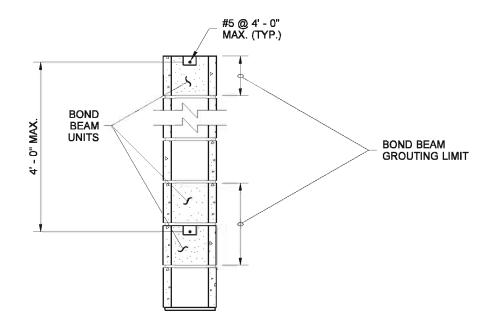
Harold J. Peterfeso



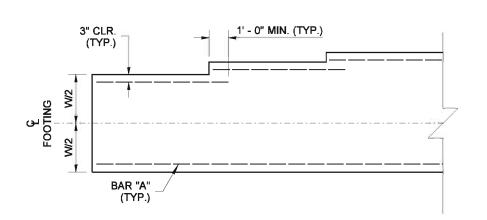
11-10-05

TYPICAL EXPANSION JOINT

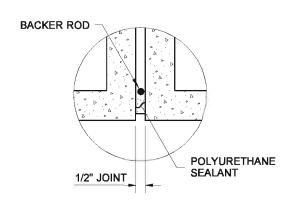




BOND BEAM DETAIL



FOOTING WIDTH TRANSITION DETAIL (FOR LOCATIONS WITHOUT FOOTING STEP) NOTE: TRANSVERSE BARS NOT SHOWN



DETAIL (A)

TYPICAL BOTH SIDES OF WALL

MASONRY WALL ON OFFSET SPREAD FOOTING



NOISE BARRIER WALL TYPE 18

STANDARD PLAN D-2.64-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 11-10-05



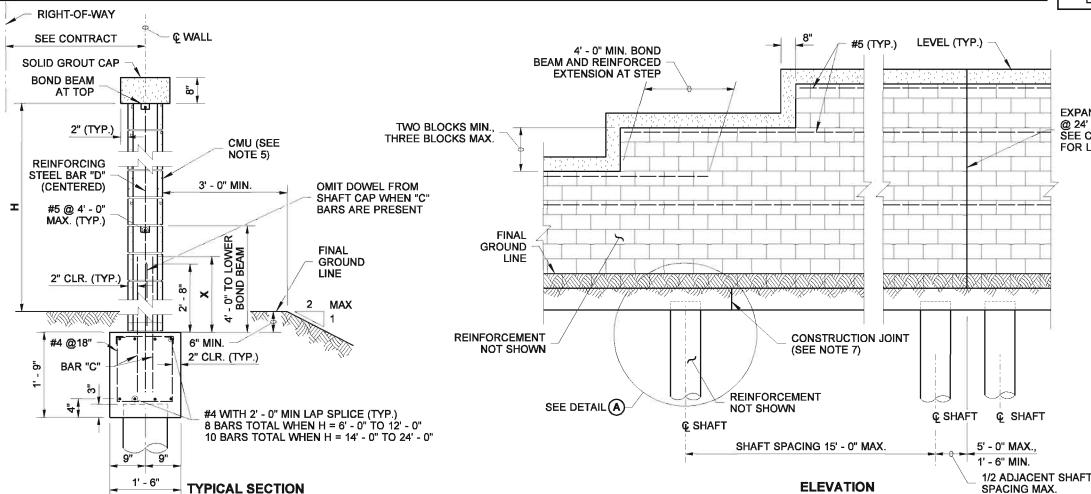
				TYPE	19A			
VALL HT	CMU WIDTH	х	BAR "D"	BAR "C"	DIAM.	BAR "P"	DEPTH D1	DEPTH D2
6' - 0"	8"		#6 @ 48"		12"	6 ~ #5	5' - 3"	4' - 9"
8' - 0"	8"		#6 @ 48"	_	12"	6 ~ #5	6' - 0"	5' - 3"
10' - 0"	8"		#6 @ 48"		12"	6 ~ #5	6' - 9"	5' - 9"
12' - 0"	8"		#6 @ 48"	_	12"	6 ~ #5	7' - 3"	6' - 3"
4' - 0"	8"		#6 @ 32"		12"	6 ~ #6	7' - 9"	6' - 9"
6' - 0"	10"	5' - 4"	#6 @ 32"	_	12"	6 ~ #7	8' - 3"	7' - 0"
8' - 0"	10"	6' - 0"	#6 @ 48"	#6 @ 48"	12"	6 ~ #8	8' - 9"	7' - 6"
20' - 0"	10"	6' - 8"	#6 @ 32"	#6 @ 32"	12"	6 ~ #9	9' - 3"	7' - 9"
22' - 0"	10"	7' - 4"	#6 @ 24"	#6 @ 24"	14"	8 ~ #7	9' - 3"	7' - 9"
24' - 0"	10"	8' - 0"	#6 @ 24"	#6 @ 24"	14"	8 ~ #8	9' - 9"	8' - 3"

EFFECTIVE: JANUARY 7, 2008 TO AUGUST

3, 2	2008			EF	FEC.	ΠVE:	JAN	UAR'	Y 7, 20	08 TO AUGUST 3, 2008
				TYPE	19B				NO.	TES
L HT	CMU WIDTH	х	BAR "D"	BAR "C"	DIAM.	BAR "P"	DEPTH D1	DEPTH D2		Wall to be designated Noise Barrier Wall Type 19/
- 0"	8"	_	#6 @ 48"		12"	6 ~ #5	6' - 0"	5' - 3"		19C, or 19D. The Contract specifies actual wall designations.
0"	8"	10-20-	#6 @ 48"	· · ·	12"	6 ~ #5	7' - 0"	6' - 0"		designations.
- 0"	8"		#6 @ 48"	_	12"	6 ~ #6	7' - 9"	6' - 9"	2.	For intermediate wall heights, use the next higher
· 0"	10"	4' - 0"	#6 @ 40"	_	12"	6 ~ #7	8' - 6"	7' - 3"	3.	All masonry shall be hollow unit and installed as
- 0"	10"	4' - 8"	#6 @ 32"	#6 @ 32"	14"	8 ~ #7	8' - 6"	7' - 3"		running bond.
- 0"	10"	5' - 4"	#6 @ 24"	#6 @ 24"	14"	8 ~ #7	9' - 3"	8' - 0"	_	
· 0"	10"	6' - 0"	#6 @ 16"	#6 @ 16"	16"	6 ~ #8	9' - 3"	8' - 0"	4.	All masonry is to be specially inspected.
- 0"	10"	8' - 0"	#7 @ 16"	#7 @ 32"	16"	8 ~ #7	10' - 0"	8' - 6"		All Concrete Masonry Unit (CMU) cells the have ve
0"	10"	10' - 0"	#7 @ 16"	#7 @ 24"	16"	8 ~ #8	10' - 6"	9' - 0"		steel reinforcing bars or bond beam units shall be
- 0"	10"	12' - 0"	#8 @ 16"	#7 @ 16"	16"	8 ~ #8	11' - 3"	9' - 6"		filled with grout.
\equiv				TVDE	400	1			6.	Panels shall have at least 3 feet of level ground or

SAZALI LIT				TYPE	19C				\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.\.
WALL HT	CMU WIDTH	x	BAR "D" BAR "C"		DIAM.	BAR "P"	DEPTH D1	DEPTH D2	WALL H
6' - 0"	8"		#6 @ 48"	_	12"	6 ~ #5	5' - 9"	5' - 0"	6' - 0"
8' - 0"	8"	_	#6 @ 48"	_	12"	6 ~ #5	6' - 6"	5' - 6"	8' - 0"
10' - 0"	8"	<u> </u>	#6 @ 48"	_	12"	6 ~ #5	7' - 3"	6' - 3"	10' - 0"
12' - 0"	8"		#6 @ 40"		12"	6 ~ #6	7' - 9"	6' - 9"	12' - 0"
14' - 0"	8"	5' - 4"	#6 @ 40"	_	12"	6 ~ #7	8' - 6"	7' - 3"	14' - 0"
16' - 0"	10"	5' - 4"	#6 @ 32"	#6 @ 32"	14"	8 ~ #6	8' - 6"	7' - 3"	16' - 0"
18' - 0"	10"	6' - 0"	#6 @ 24"	#6 @ 24"	14"	8 ~ #7	9' - 0"	7' - 9"	18' - 0"
20' - 0"	10"	6' - 8"	#6 @ 24"	#6 @ 16"	14"	8 ~ #8	9' - 9"	8' - 3"	20' - 0"
22' - 0"	10"	7' - 4"	#6 @ 16"	#6 @ 16"	14"	8 ~ #9	10' - 3"	8' - 9"	22' - 0"
24' - 0"	10"	8' - 0"	#6 @ 16"	#6 @ 16"	16"	8 ~ #8	10' - 3"	8' - 9"	24' - 0"

		12 - 0	#0 @ 10	#1 W 10	10	0 - #0	11 - 3	3 - 0
1				TYPE	E 19D			
	CMU WIDTH	x	BAR "D"	BAR "C"	DIAM.	BAR "P"	DEPTH D1	DEPTH D2
	8"	_	#6 @ 48"	_	12"	6 ~ #5	6' - 6"	5' - 9"
	8"		#6 @ 48"	_	12"	6 ~ #6	7' - 6"	6' - 6"
	10"	4' - 0"	#6 @ 24"	_	12"	6 ~ #7	8' - 3"	7' - 0"
	10"	4' - 8"	#6 @ 32"	#6 @ 32"	14"	8 ~ #7	8' - 6"	7' - 3"
	10"	4' - 8"	#6 @ 24"	#6 @ 24"	14"	8 ~ #7	9' - 3"	8' - 0"
	10"	5' - 4"	#6 @ 16"	#6 @ 16"	16"	6 ~ #8	9' - 6"	8' - 0"
	10"	7' - 4"	#7 @ 16"	#7 @ 24"	16"	8 ~ #8	10' - 0"	8' - 6"
	10"	9' - 8"	#8 @ 16"	#7 @ 16"	16"	8 ~ #9	10' - 9"	9' - 3"
	10"	12' - 0"	#8 @ 16"	#7 @ 16"	16"	B ~ #10	11' - 6"	9' - 9"
	10"	15' - 0"	#8 @ 16"	#7 @ 16"	18"	8 ~ #10	11' - 6"	9' - 9"



NOTES

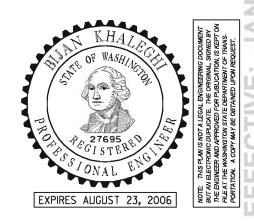
- 1. Wall to be designated Noise Barrier Wall Type 19A, 19B, 19C, or 19D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- 3. All masonry shall be hollow unit and installed as running bond.
- 4. All masonry is to be specially inspected.
- 5. All Concrete Masonry Unit (CMU) cells the have vertical steel reinforcing bars or bond beam units shall be filled with grout.
- 6. Panels shall have at least 3 feet of level ground on
- 7. Construction joints in the shaft cap shall be spaced 120 feet maximum.
- 8. See "Masonry Wall Finishes and Details" sheet for masonry block finishes, special shapes, sizes and layouts.
- 9. The Contract specifies actual foundation requirements D1 or D2.

1	SOIL TYPE								
_	SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)							
-	D1	32							
┚╽	D2	38							

WIND EX	WIND EXPOSURE & VELOCITY								
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)							
19A	B1	80							
19B	B1	90							
19C	B2	80							
19D	B2	90							

MASONRY WALL ON SHAFT W/ GRADE BEAM FOUNDATION

EXPANSION JOINTS @ 24' - 0" MAX. CENTERS. SEE CONTRACT FOR LOCATIONS



NOISE BARRIER WALL TYPE 19

STANDARD PLAN D-2.66-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION 11-10-05

Harold J. Peterfeso

DEPTH

D1

6' - 3"

7' - 0"

7' - 9"

8' - 6"

9' - 3"

10' - 0"

DEPTH

D2

5' - 3"

6' - 0"

6' - 6"

7' - 3"

7' - 9"

8' - 3"

2008

TIE SPACING							
SPACING							
6" O.C.							
6" O.C.							
5" O.C.							
4" O.C.							

RIGHT-OF-WAY

SEE CONTRACT

SOLID GROUT CAP

ANCHOR SPIRALS

TOP AND BOTTOM

W/ TWO TURNS

90

			TYPE	20A			
VALL HT	DEPTH D1	DEPTH D2	BAR "A"	BAR "B"	BAR "C"	PILASTER SPACING L	WALL H
6' - 0"	5' - 6"	5' - 0"	6 ~ #6	4 ~ #4	#5 @ 32"	16' - 0"	6' - 6
8' - 0"	6' - 6"	5' - 6"	6 ~ #6	4 ~ #4	#5 @ 32"	16' - 0"	8' - (
10' - 0"	7' - 0"	6' - 0"	6 ~ #6	4 ~ #4	#5 @ 32"	16' - 0"	10' - (
12' - 0"	7' - 9"	6' - 6"	6 ~ #6	4 ~ #5	#5 @ 32"	16' - 0"	12' - (
14' - 0"	8' - 3"	7' - 0"	6 ~ #6	4 ~ #5	#5 @ 32"	16' - 0"	14' - (
16' - 0"	9' - 0"	7' - 6"	6 ~ #6	4 ~ #6	#5 @ 32"	16' - 0"	16' - (
18' - 0"	9' - 6"	8' - 0"	6 ~ #6	4 ~ #7	#5 @ 32"	16' - 0"	18' - (
20' - 0"	10' - 3"	8' - 6"	6 ~ #6	6 ~ #7	#5 @ 32"	16' - 0"	20' - (
22' - 0"	10' - 9"	9' - 0"	6 ~ #6	6 ~ #8	#5 @ 32"	16' - 0"	22' - (
24' - 0"	11' - 3"	9' - 6"	6 ~ #6	6 ~ #9	#5 @ 32"	16' - 0"	24' - (

TYPE 20C

BAR "B"

4 ~ #4

4 ~ #4

4~#5

4 ~ #5

4 ~ #6

4~#7

BAR "C"

#6 @ 32'

#6 @ 32'

#6 @ 32"

#6 @ 32"

#6 @ 32"

#6 @ 32'

BAR "A"

6~#6

6~#6

6~#6

6~#6

6~#6

		L	H	D1	D2			
~ #4	#5 @ 32"	16' - 0"	6' - 0"	6' - 6"	5' - 9"	6 ~ #6	4 ~ #4	#5 @ 32"
~ #4	#5 @ 32"	16' - 0"	8' - 0"	7' - 6"	6' - 6"	6 ~ #6	4 ~ #4	#5 @ 32"
~ #4	#5 @ 32"	16' - 0"	10' - 0"	8' - 6"	7' - 0"	6 ~ #6	4 ~ #5	#5 @ 32"
~ #5	#5 @ 32"	16' - 0"	12' - 0"	9' - 3"	7' - 9"	6 ~ #6	4 ~ #6	#5 @ 32"
~ #5	#5 @ 32"	16' - 0"	14' - 0"	10' - 0"	8' - 6"	6 ~ #6	4 ~ #7	#5 @ 32"
~ #6	#5 @ 32"	16' - 0"	16' - 0"	11' - 0"	9' - 0"	6 ~ #6	6 ~ #8	#5 @ 32"
~ #7	#5 @ 32"	16' - 0"	18' - 0"	11' - 9"	9' - 9"	6 ~ #6	6 ~ #9	#5 @ 32"
~ #7	#5 @ 32"	16' - 0"	20' - 0"	12' - 6"	10' - 3"	6 ~ #7	6 ~ #10	#5 @ 32"
~ #8	#5 @ 32"	16' - 0"	22' - 0"	12' - 6"	10' - 3"	6 ~ #7	6 ~ #10	#5 @ 32"
~ #9	#5 @ 32"	16' - 0"	24' - 0"	12' - 6"	10' - 3"	6 ~ #7	6 ~ #10	#5 @ 32"
						TVD	E 20D	

DEPTH

DEPTH

			TYPE	20D		
WALL HT	DEPTH D1	DEPTH D2	BAR "A"	BAR "B"	BAR "C"	PILASTER SPACING L
6' - 0"	7' - 0"	6' - 0"	6 ~ #6	4 ~ #4	#6 @ 32"	16' - 0"
8' - 0"	8' - 3"	7' - 0"	6 ~ #6	4 ~ #5	#6 @ 32"	16' - 0"
10' - 0"	9' - 3"	7' - 9"	6 ~ #6	4 ~ #6	#6 @ 32"	16' - 0"
12' - 0"	10' - 3"	8' - 6"	6 ~ #6	4 ~ #7	#6 @ 32"	16' - 0"
14' - 0"	11' - 0"	9' - 3"	6 ~ #6	6 ~ #8	#6 @ 32"	16' - 0"
16' - 0"	12' - 0"	9' - 9"	6 ~ #6	6 ~ #9	#6 @ 32"	16' - 0"
18' - 0"	12' - 9"	10' - 6"	6 ~ #7	6 ~ #10	#6 @ 32"	16' - 0"
20' - 0"	13' - 0"	10' - 6"	6 ~ #7	6 ~ #10	#6 @ 32"	14' - 0"
22' - 0"	13' - 0"	10' - 6"	6 ~ #8	6 ~ #10	#6 @ 32"	12' - 0"
24' - 0"	13' - 6"	11' - 3"	6 ~ #8	6 ~ #10	#6 @ 32"	12' - 0"

TYPE 20B

BAR "A" | BAR "B" | BAR "C"

NOTES

PILASTER

SPACING

16' - 0"

16' - 0"

16' - 0"

16' - 0"

16' - 0"

16' - 0"

16' - 0"

16' - 0"

16' - 0" 12' - 0"

JANUARY 7, 2008 TO AUGUST 3, 2008

- Wall to be designated Noise Barrier Wall Type 20A, 20B, 20C, or 20D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights, use the next higher H.
- All masonry shall be hollow unit and installed as running bond.
- 4. All masonry is to be specially inspected.
- All Concrete Masonry Unit (CMU) cells that have vertical steel reinforcing bars or bond beam units shall be filled with grout.
- Panels shall have at least 3 feet of level ground on each side
- 7. See "Masonry Wall Finishes and Details" sheet for masonry block finishes, special shapes, sizes and layouts.
- 8. The Contract specifies actual foundation requirements D1 or D2.

MASONRY WALL ON SHAFT FOUNDATION



NOISE BARRIER WALL TYPE 20

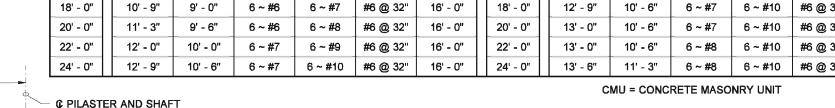
STANDARD PLAN D-2.68-00

SHEET 1 OF 2 SHEETS

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STATE DESIGN ENGINEER DATE

Washington State Department of Transportation



PILASTER

SPACING

16' - 0"

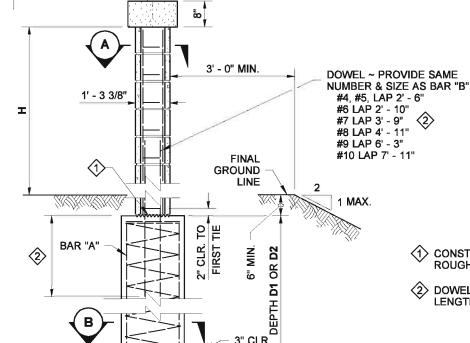
16' - 0"

16' - 0"

16' - 0"

16' - 0"

16' - 0"



2' - 0"

SECTION AT PILASTER AND SHAFT

WALL HT

Н

6' - 0"

8' - 0"

10' - 0"

12' - 0"

14' - 0"

16' - 0"

TWO BLOCKS MIN.,
THREE BLOCKS MAX.

CONSTRUCTION JOINT WITH ROUGHENED SURFACE

DOWEL EMBEDMENT LENGTH = 40 x BAR "B" DIAM.

BOTTOM OF WALL

Q PILASTER

TOP OF WALL

ELEVATION

32' - 0" MAX. EXPANSION JOINT SPACING

PILASTER SPACING L

CMU

PILASTER

FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

CPILASTER

LEVEL (TYP.)

EXPANSION

JOINT

FINAL

GROUND

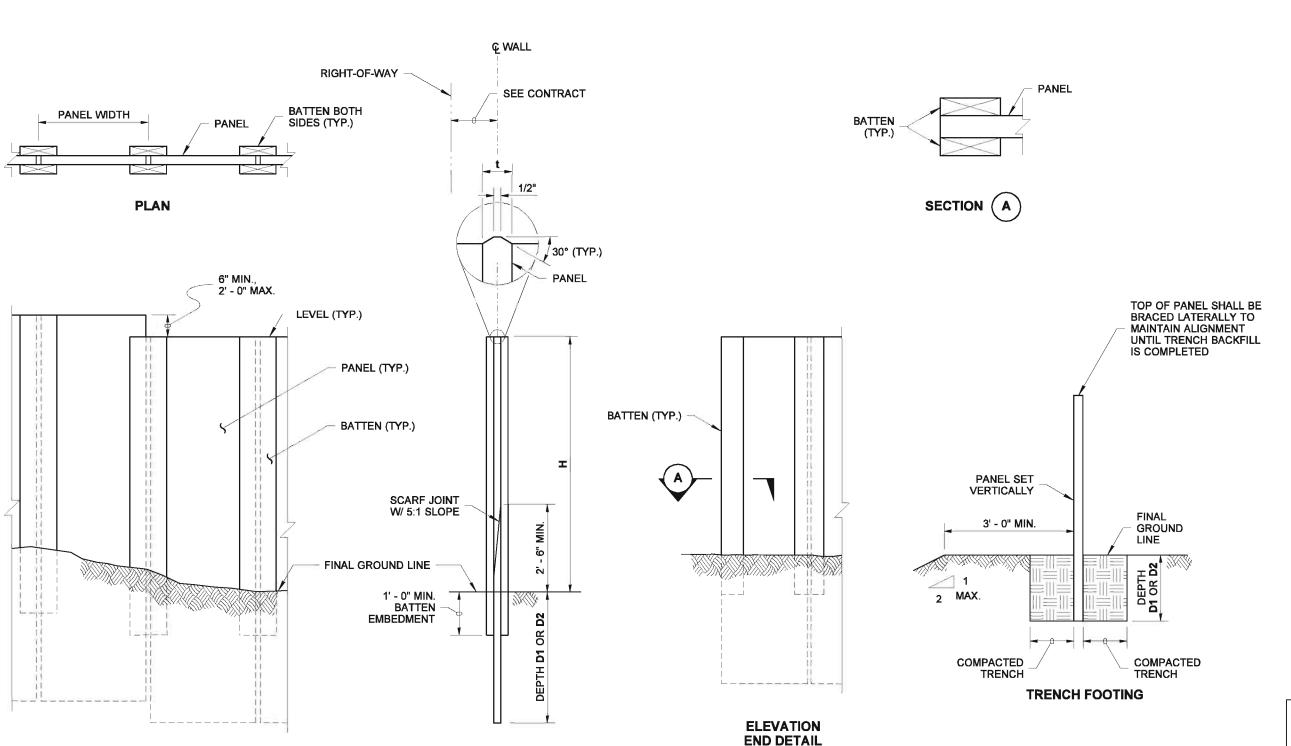
ANGLE POINT PLAN

SECTION (C

		TYPI	E 15A		TYPE 15B			TYPE 15C				TYPE 15D				
WALL HT	DEPTH	DEPTH	GLULAM	PLYWOOD	DEPTH	DEPTH	GLULAM	PLYWOOD	DEPTH	DEPTH	GLULAM	PLYWOOD	DEPTH	DEPTH	GLULAM	PLYWOOD
н	D1	D2	t	t	D1	D2	t	t	D1	D2	t	t	D1	D2	t	t
6' - 0"	3' - 3"	3' - 0"	1"	1 1/4"	3' - 9"	3' - 6"	1 1/4"	1 1/2"	3' - 6"	3' - 3"	1 1/8"	1 3/8"	4' - 0"	3' - 6"	1 1/2"	1 5/8"
8' - 0"	3' - 6"	3' - 3"	1 1/4"	1 3/8"	4' - 0"	3' - 9"	1 5/8"	1 7/8"	3' - 9"	3' - 6"	1 3/8"	1 5/8"	4' - 3"	3' - 9"	1 7/8"	2 1/8"
10' - 0"	4' - 0"	3' - 6"	1 1/2"	1 5/8"	4' - 6"	4' - 0"	1 7/8"	2 1/4"	4' - 0"	3' - 9"	1 5/8"	2"	4' - 6"	4' - 0"	2 1/4"	2 1/2"
12' - 0"	4' - 3"	3' - 9"	1 5/8"	2"	4' - 9"	4' - 3"	2 1/4"	2 5/8"	4' - 6"	4' - 0"	2"	2 1/4"	4' - 9"	4' - 3"	2 1/2"	3"
14' - 0"	4' - 6"	4' - 0"	2"	2 1/4"	5' - 0"	4' - 6"	2 1/2"	3"	4' - 9"	4' - 3"	2 1/4"	2 5/8"	5' - 3"	4' - 9"	2 7/8"	3 3/8"
16' - 0"	4' - 9"	4' - 0"	2 1/4"	2 1/2"	5' - 3"	4' - 9"	2 7/8"	3 1/4"	5' - 0"	4' - 6"	2 1/2"	3"	5' - 6"	5' - 0"	3 1/4"	3 3/4"
18' - 0"	5' - 0"	4' - 3"	2 1/2"	2 7/8"	5' - 6"	5' - 0"	3 1/4"	3 5/8"	5' - 3"	4' - 9"	2 7/8"	3 1/4"	6' - 0"	5' - 3"	3 5/8"	4 1/4"

NOTES

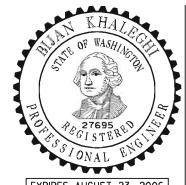
- 1. Wall to be designated Noise Barrier Wall Type 15A, 15B, 15C or 15D. The Contract specifies actual wall designations.
- 2. For intermediate wall heights not listed use the next higher H.
- 3. Panels shall have at least 3 feet of level ground on each side.
- 4. Plywood and Glulam panels and all lumber shall be pressure preservative
- 5. The Contract shall specify actual foundation requirements D1 or D2.



WIND EXPOSURE & VELOCITY								
NOISE BARRIER TYPE	WIND EXPOSURE	WIND VELOCITY (MPH)						
15A	B1	80						
15B	B1	90						
15C	B2	80						
15D	B2	90						

SOIL TYPE					
SOIL TYPE	ANGLE OF INTERNAL FRICTION (DEGREES)				
D1	32				
D2	38				

TIMBER PANEL WALL ON TRENCH FOOTING



EXPIRES AUGUST 23, 2006

NOISE BARRIER WALL TYPE 15

STANDARD PLAN D-2.78-00

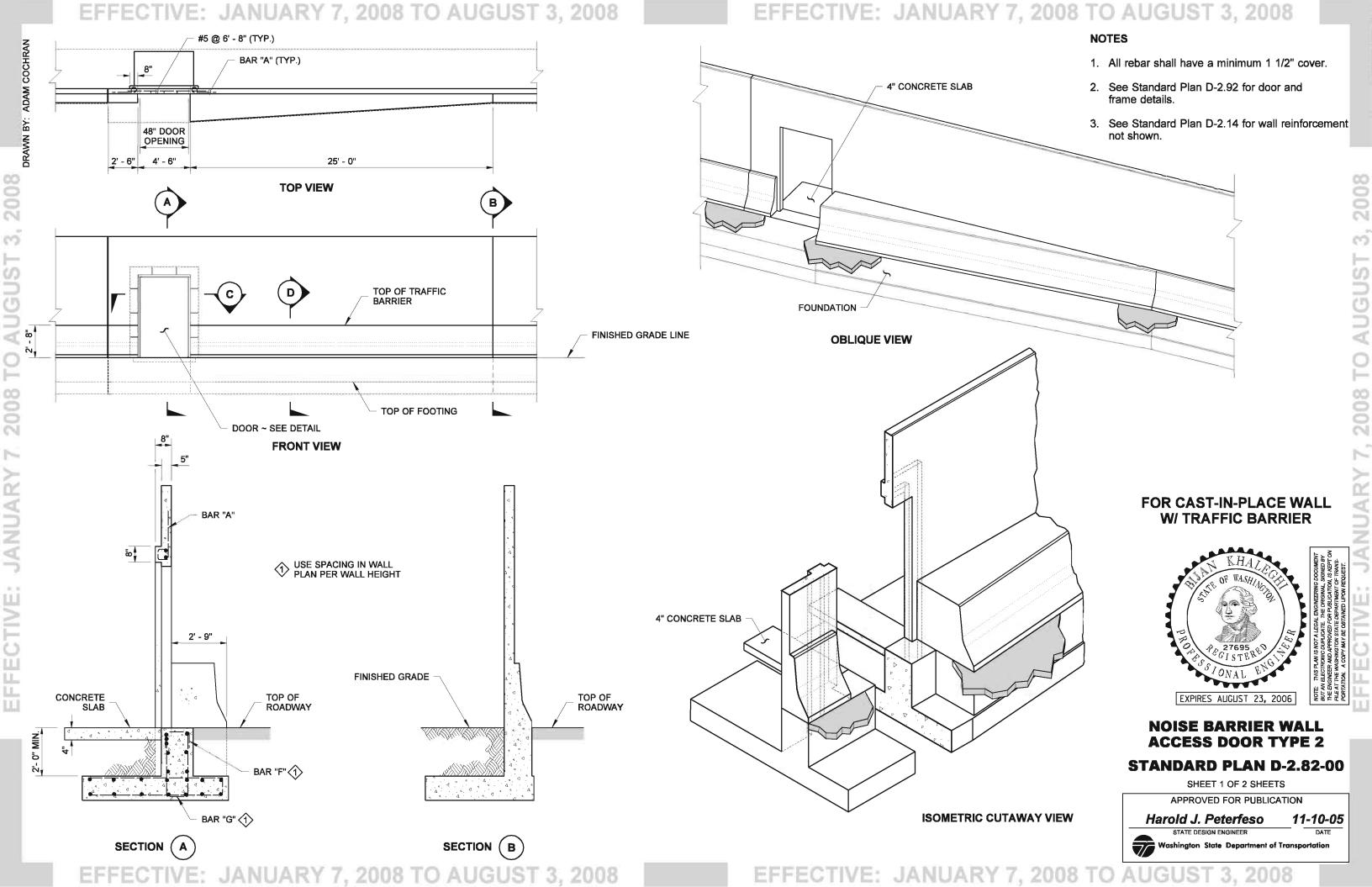
SHEET 1 OF 1 SHEET

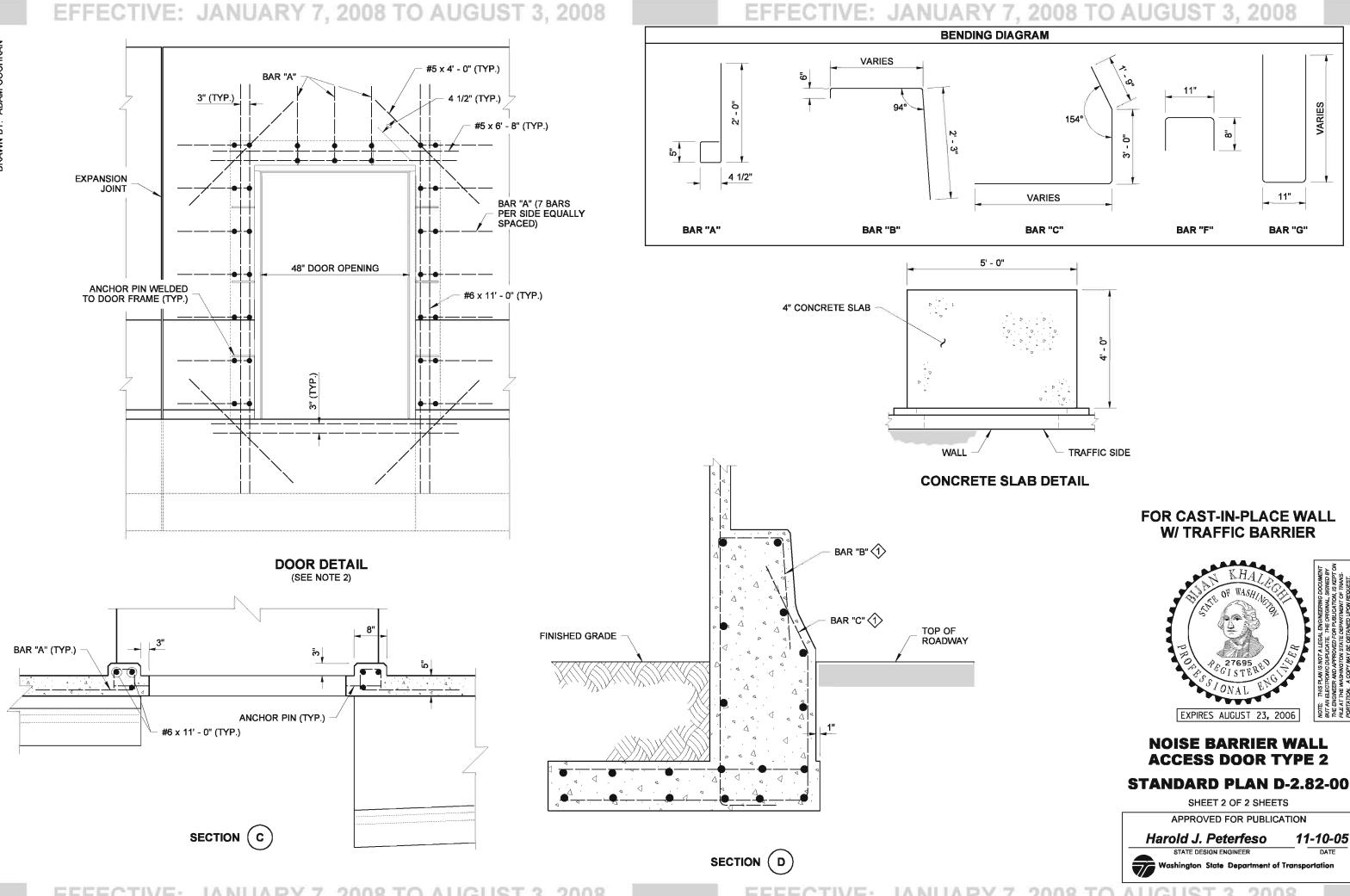
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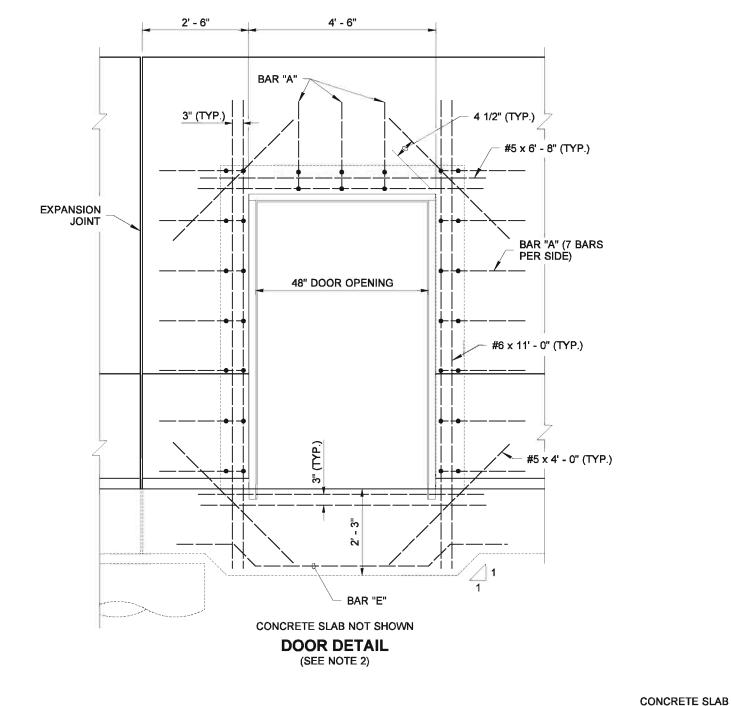
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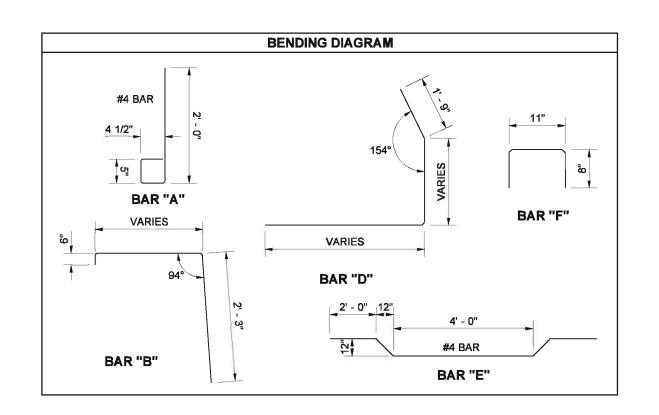
TYPICAL SECTION

ELEVATION

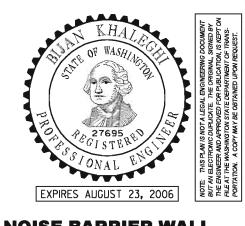








FOR PRECAST WALL W/ TRAFFIC BARRIER ON SHAFT FOUNDATION



NOISE BARRIER WALL ACCESS DOOR TYPE 4

STANDARD PLAN D-2.86-00

SHEET 2 OF 2 SHEETS

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WALL

GROUND LINE

5' - 0"

APPROXIMATE FINAL

BATTER FOR FACE OF

GEOSYNTHETIC LAYERS

 Θ

Р

SS

1' - 0'

Z

S

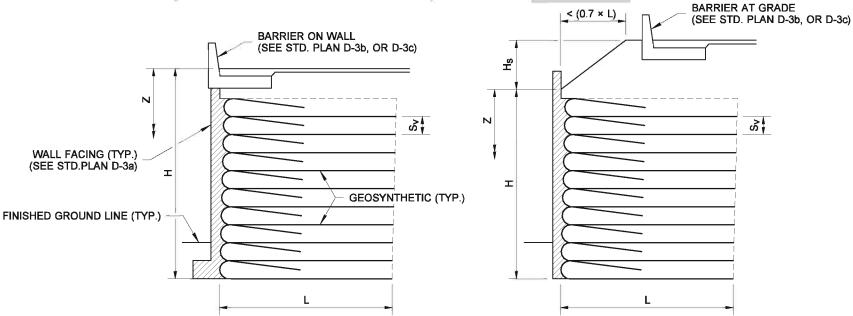
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10% WALL H 2' - 0"

FINISHED GRADE

OF WALL FACING

AFTER CONSTRUCTION



GEOSYNTHETIC WALL, TYPE 1

INCLUDES SEISMIC DESIGN

GROUND ACCELERATION COEFFICIENT, A=0.16g TO 0.30g. HORIZONTAL BACKSLOPE WITH 2 FT. TRAFFIC SURCHARGE

GEOSYNTHETIC WALL, TYPE 4 STATIC DESIGN ONLY

GROUND ACCELERATION COEFFICIENT, A=0.15g OR LESS. HORIZONTAL BACKSLOPE WITH 2 FT. TRAFFIC SURCHARGE

PERMANENT GEOSYNTHETIC WALLS **TYPICAL CROSS SECTIONS**

TYPE 2 & TYPE 5: X = 2 TYPE 3 & TYPE 6: X = 1.75 ŝ

GEOSYNTHETIC WALL, TYPES 2 & 3

INCLUDES SEISMIC DESIGN

GROUND ACCELERATION COEFFICIENT, A=0.16g TO 0.30g.

GEOSYNTHETIC WALL. TYPES 5 & 6 STATIC DESIGN ONLY

GROUND ACCELERATION COEFFICIENT, A=0.15g OR LESS.

NOTES

FOR THE VALUES OF "L", "N", AND "SV", SEE SHEET 2.

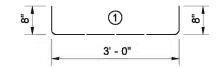
FOR GEOSYNTHETIC WALL CONSTRUCTION SEQUENCE, SEE SHEET 3.

▼ = EPOXY COATED

GEOSYNTHETIC LAYERS (TYP.) **GRAVEL BORROW** BACKFILL 4' - 0" MIN. (TYP.)

KEY NOTES

(1) "N" ROWS OF (1) #4 ♥ DOWEL REINFORCEMENT PLACED BETWEEN GEOSYNTHETIC LAYERS @ 5' - 0" O.C. HORIZONTAL SPACING, SEE TABLE, SHEET 2. VERTICAL SPACING BETWEEN ROWS TO BE EQUAL, AS MULTIPLES OF "Sv" ALLOW. ROWS MAY BE STAGGERED.



- GEOTEXTILE FOR UNDERGROUND DRAINAGE CLASS A, LOW SURVIVABILITY (ONLY NEEDED IF A GEOGRID IS USED FOR GEOSYNTHETIC REINFORCEMENT)
- 1' 0" MIN. GEOTEXTILE OVERLAP, TOP & BOTTOM
- 3" I.D. PVC PIPE FOR WEEP HOLE IN WALL FACING ~ PLACE BETWEEN GEOSYNTHETIC LAYERS APPROX. 9" DEEP AT 10' 0" HORIZONTAL SPACING, LENGTH TO EXTEND TO OUTER SURFACE OF SPECIFIED WALL FACING.



PERMANENT GEOSYNTHETIC WALL TYPES 1 ~ 6 STANDARD PLAN D-3

SHEET 1 OF 3 SHEETS

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SECTION DETAIL

GEOSYNTHETIC REINFORCEMENT LENGTH AND

LIMITS OF STRUCTURE EXCAVATION CLASS B INCL. HAUL, WALL BACKFILL AND COMPACTION.

TOP GEOSYNTHETIC LAYER

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST

GEOSYNTHETIC REINFORCEMENT LENGTH AND DOWELS

TOTAL WALL HEIGHT H+H _S	FASCIA FOOTING WIDTH B	GEOSYNTHETIC REINFORCEMENT LENGTH L (ft)						ROWS OF #4 (E) DOWEL BARS REQUIRED N
(ft)	(ft - in)	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6	(No.)
≤ 5'	1' - 0"	6.0	6.0	6.5	6.0	6.0	6.0	2
6'	1' - 0"	6.0	6.0	7.9	6.0	6.0	6.0	3
7'	1' - 0"	6.4	6.9	9.3	6.4	6.4	6.4	3
8'	1' - 0"	6.9	7.9	10.7	6.9	6.9	7.1	3
9'	1' - 0"	7.4	8.9	12.1	7.4	7.4	8.1	3
10'	1' - 0"	7.9	10.0	13.5	7.9	7.9	9.0	4
'11'	1' - 0 1/2"	8.4	11.0	14.7	8.4	8.4	10.0	4
12'	1' - 0 1/2"	8.8	12.0	16.1	8.8	8.8	10.9	4
13'	1' - 1"	9.3	13.0	17.5	9.3	9.3	11.9	4
14'	1' - 1"	9.8	13.9	18.9	9.8	9.8	12.8	4
15'	1' - 2"	10.5	14.9	20.3	10.5	10.5	13.7	6
16'	1' - 2"	11.2	16.0	21.7	11.2	11.2	14.7	6
17'	1' - 2 1/2"	11.9	17.0	22.9	11.9	11.9	15.6	8
18'	1' - 2 1/2"	12.6	18.0	24.3	12.6	12.6	16.6	8
19'	1' - 3"	13.3	19.0	25.7	13.3	13.4	17.5	8
20'	1' - 3"	14.0	20.1	27.1	14.0	14.1	18.5	10
21'	1' - 3 1/2"	14.7	21.1	28.5	14.7	14.8	19.4	10
22'	1' - 3 1/2"	15.4	22.2	29.9	15.4	15.5	20.4	10
23'	1' - 4"	16.1	23.2	31.1	16.1	16.2	21.3	10
24'	1' - 4"	16.8	24.2	32.5	16.8	16.9	22.3	10
25'	1' - 5"	17.5	25.2	33.9	17.5	17.7	23.2	10
26'	1' - 5"	18.2	26.3	35.3	18.2	18.4	24.2	10
27'	1' - 5 1/2"	18.9	27.3	36.7	18.9	19.1	25.1	10
28'	1' - 5 1/2"	19.6	28.2	38.1	19.6	19.9	26.1	10
29'	1' - 6"	20.3	29.2	39.5	20.3	20.6	27.0	10
30'	1' - 6"	21.0	30.3	40.7	21.0	21.3	28.0	10
31'	1' - 6 1/2"	21.7	31.4	42.1	21.7	22.0	28.9	10
32'	1' - 6 1/2"	22.4	32.3	43.5	22.4	22.8	29.9	10
33'	1' - 7"	23.1	33.3	44.9	23.1	23.4	30.8	10
34'	1' - 7"	23.8	34.3	46.3	23.8	24.2	31.8	10
35'	1' - 8"	24.5	35.4	47.7	24.5	24.9	32.7	10

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 GEOSYNTHETIC REINFORCEMENT SPACING AND STRENGTH

TOTAL BELOW TOP OF SURCHARGE SPACING H+Hs DEPTH BELOW REINFORCEMENT VERTICAL SPACING LONG-TERM GEOSYNTHETIC REINFORCE Tal (lb/ft)				al	CEMENT STRENGTH REQUIRED			
(ft)	Z+H _S (ft)	S _V (ft)	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
	5	0.75	244	220	228	244	220	228
UP TO 5	5	1.00	325	294	305	325	294	305
	5	1.25	406	367	380	406	367	380
	0 to 10	0.75	418	415	438	418	415	438
5 < H+H _S ≤ 10	0 to 10	1.00	557	553	584	557	553	584
	0 to 10	1.25	696	691	731	696	691	731
	0 to 10	0.75	418	498	580	418	467	534
	10.1 to 20	0.75	766	815	882	766	815	882
10 - 11.11 - 20	0 to 10	1.00	557	665	774	557	623	712
10 < H+H _S ≤ 20	10.1 to 20	1.00	1020	1087	1176	1020	1087	1176
	0 to 10	1.25	696	830	967	696	779	889
	10.1 to 20	1.25	1272	1356	1464	1272	1356	1464
	0 to 10	0.75	442	620	744	418	528	629
	10.1 to 20	0.75	766	876	1000	766	876	977
	20.1 to 30	0.75	1114	1224	1320	1114	1224	1320
	0 to 10	1.00	589	828	991	557	704	839
20 < H+H _S ≤ 30	10.1 to 20	1.00	1020	1169	1332	1020	1168	1308
	20.1 to 30	1.00	1488	1632	1764	1488	1632	1764
	0 to 10	1.25	736	1034	1236	696	881	1048
	10.1 to 20	1.25	1272	1464	1668	1272	1464	1632
	20.1 to 30	1.25	1860	2040	2208	1860	2040	2208
	0 to 10	0.75	464	683	826	418	559	677
	10.1 to 20	0.75	766	937	1081	766	907	1025
	20.1 to 30	0.75	1114	1254	1368	1114	1254	1368
	30.1 to 35	0.75	1284	1428	1548	1284	1428	1548
	0 to 10	1.00	619	910	1102	557	745	902
30 < H+H _S ≤ 35	10.1 to 20	1.00	1020	1248	1440	1020	1212	1368
	20.1 to 30	1.00	1488	1668	1824	1488	1668	1824
	30.1 to 35	1.00	1716	1908	2064	1716	1908	2064
	0 to 10	1.25	773	1138	1380	696	931	1127
	10.1 to 20	1.25	1272	1560	1800	1272	1512	1704
	20.1 to 30	1.25	1860	2088	2292	1860	2088	2292
	30.1 to 35	1.25	2148	2376	2580	2148	2376	2580

THE LONG-TERM GEOSYNTHETIC DESIGN STRENGTH "Tal" SHALL BE DETERMINED IN ACCORDANCE WITH WSDOT STANDARD PRACTICE T925. SEE QUALIFIED PRODUCTS LIST FOR PRODUCTS IN WHICH "Tal" HAS BEEN DETERMINED.

"H", " H_S ", "L", AND "Z" ARE GRAPHICALLY DEFINED ON SHEET 1.

"Z" IS THE DISTANCE FROM THE TOP OF WALL (AS SHOWN) TO A GEOSYNTHETIC LAYER, AND IS USED TO DETERMINE "Tai" FOR THAT LAYER.

COLUMN "B" IS A REFERENCE FOR STANDARD PLAN D-3a.



PERMANENT **GEOSYNTHETIC WALL TYPES 1 ~ 6** STANDARD PLAN D-3

SHEET 2 OF 3 SHEETS

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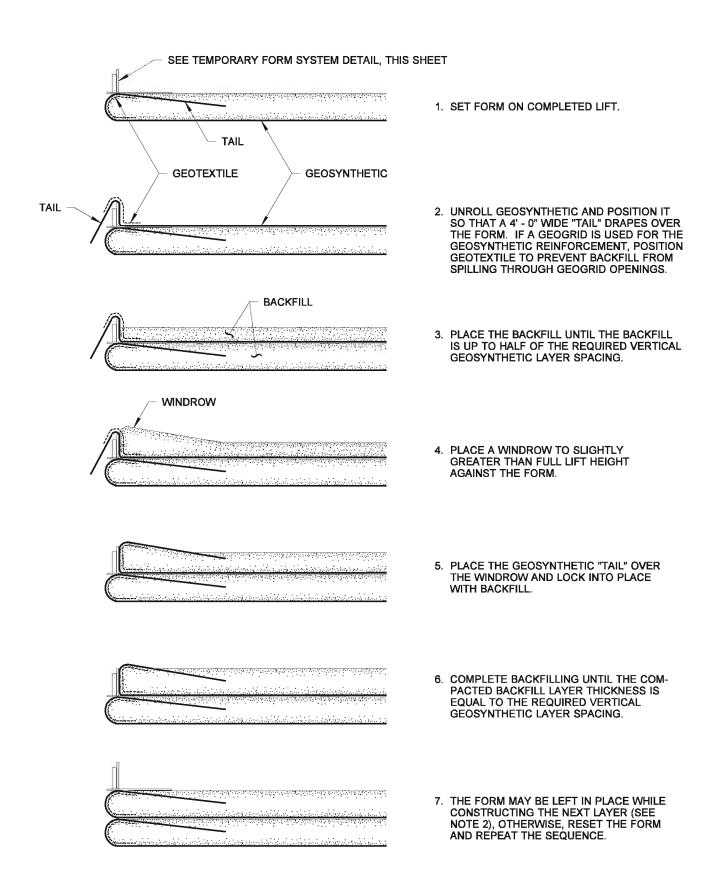
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EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

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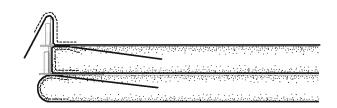
GEOSYNTHETIC WALL CONSTRUCTION SEQUENCE

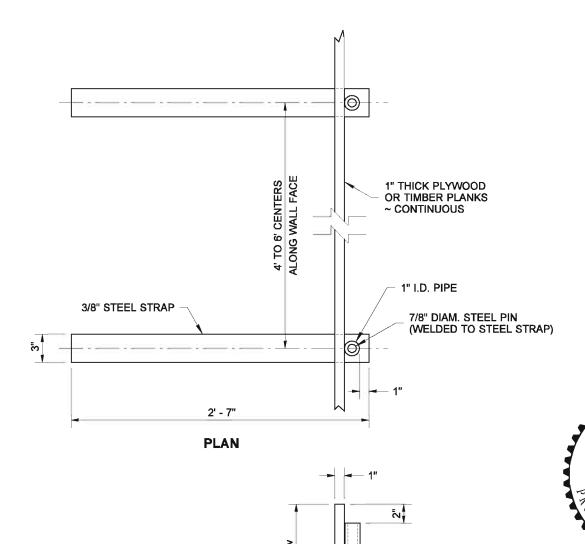
(SECTION VIEW)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 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 PRE-CEDING 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.





ELEVATION

WOOD WEDGE TO SUPPORT

AND ALIGN STRAP

3/8" STEEL STRAP

TEMPORARY FORM SYSTEM DETAIL

PERMANENT GEOSYNTHETIC WALL TYPES 1 ~ 6 STANDARD PLAN D-3

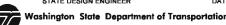
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EXPIRES JULY I, 2007

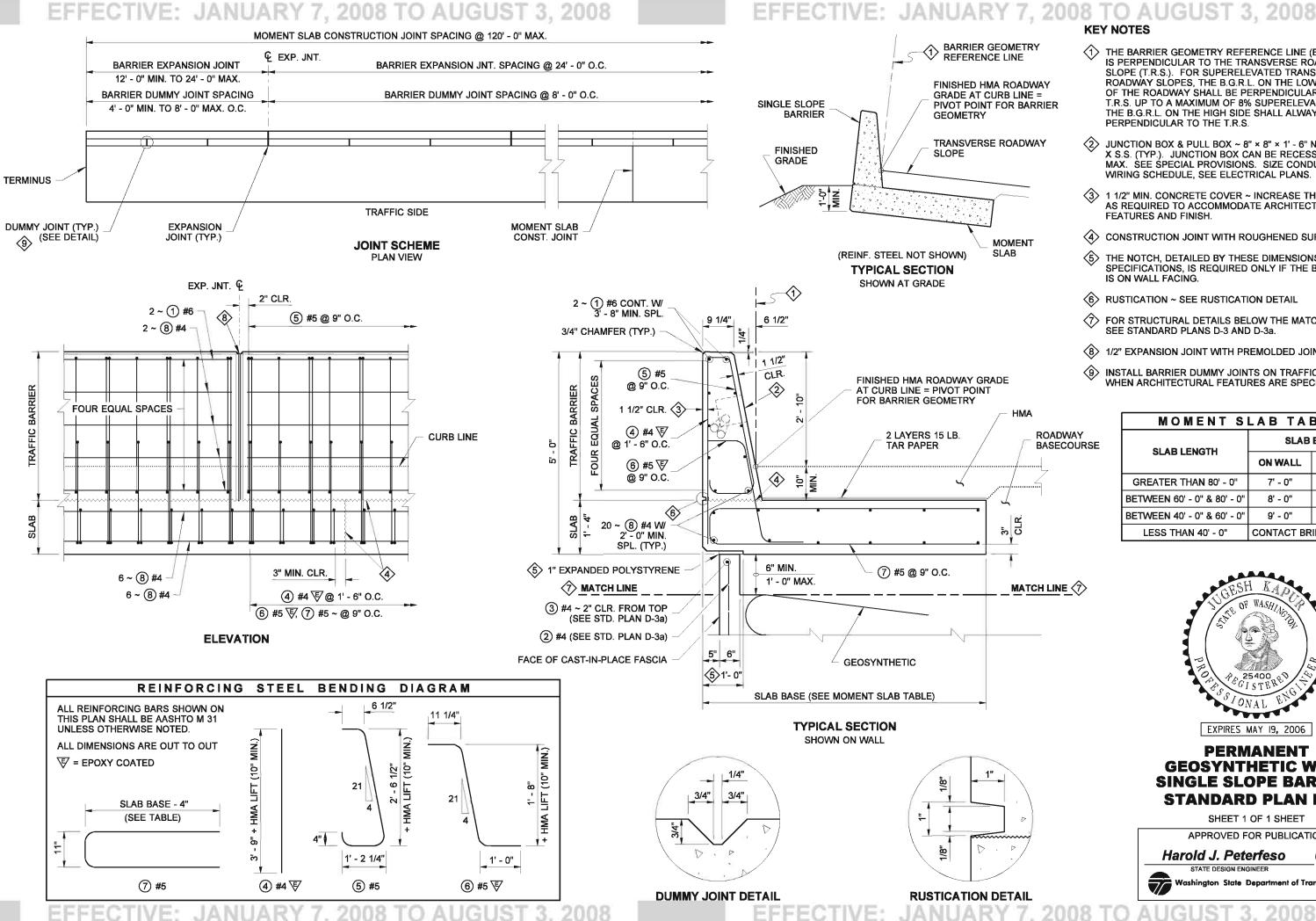
SHEET 3 OF 3 SHEETS

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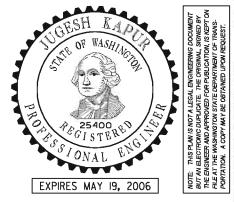


EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



- 1> THE BARRIER GEOMETRY REFERENCE LINE (B.G.R.L.) IS PERPENDICULAR TO THE TRANSVERSE ROADWAY SLOPE (T.R.S.). FOR SUPERELEVATED TRANSVERSE ROADWAY SLOPES, THE B.G.R.L. ON THE LOW SIDE OF THE ROADWAY SHALL BE PERPENDICULAR TO THE T.R.S. UP TO A MAXIMUM OF 8% SUPERELEVATION; THE B.G.R.L. ON THE HIGH SIDE SHALL ALWAYS BE PERPENDICULAR TO THE T.R.S.
- 2 JUNCTION BOX & PULL BOX ~ 8" × 8" × 1' 6" NEMA 4 X S.S. (TYP.). JUNCTION BOX CAN BE RECESSED 1/2" MAX. SEE SPECIAL PROVISIONS. SIZE CONDUIT PER WIRING SCHEDULE, SEE ELECTRICAL PLANS.
- 3 1 1/2" MIN. CONCRETE COVER ~ INCREASE THE COVER AS REQUIRED TO ACCOMMODATE ARCHITECTURAL FEATURES AND FINISH.
- (4) CONSTRUCTION JOINT WITH ROUGHENED SURFACE
- 5 THE NOTCH, DETAILED BY THESE DIMENSIONS AND SPECIFICATIONS, IS REQUIRED ONLY IF THE BARRIER IS ON WALL FACING.
- 6 RUSTICATION ~ SEE RUSTICATION DETAIL
- FOR STRUCTURAL DETAILS BELOW THE MATCH LINE, SEE STANDARD PLANS D-3 AND D-3a.
- (8) 1/2" EXPANSION JOINT WITH PREMOLDED JOINT FILLER
- INSTALL BARRIER DUMMY JOINTS ON TRAFFIC SIDE ONLY WHEN ARCHITECTURAL FEATURES ARE SPECIFIED.

MOMENT SLAB TABLE				
SLAB LENGTH	SLAB BASE			
SLAB LENGIH	ON WALL	AT GRADE		
GREATER THAN 80' - 0"	7' - 0"	5' - 0"		
BETWEEN 60' - 0" & 80' - 0"	8' - 0"	6' - 0"		
BETWEEN 40' - 0" & 60' - 0"	9' - 0"	7' - 0"		
LESS THAN 40' - 0"	CONTACT BRIDGE OFFICE			



PERMANENT GEOSYNTHETIC WALL SINGLE SLOPE BARRIER STANDARD PLAN D-3b

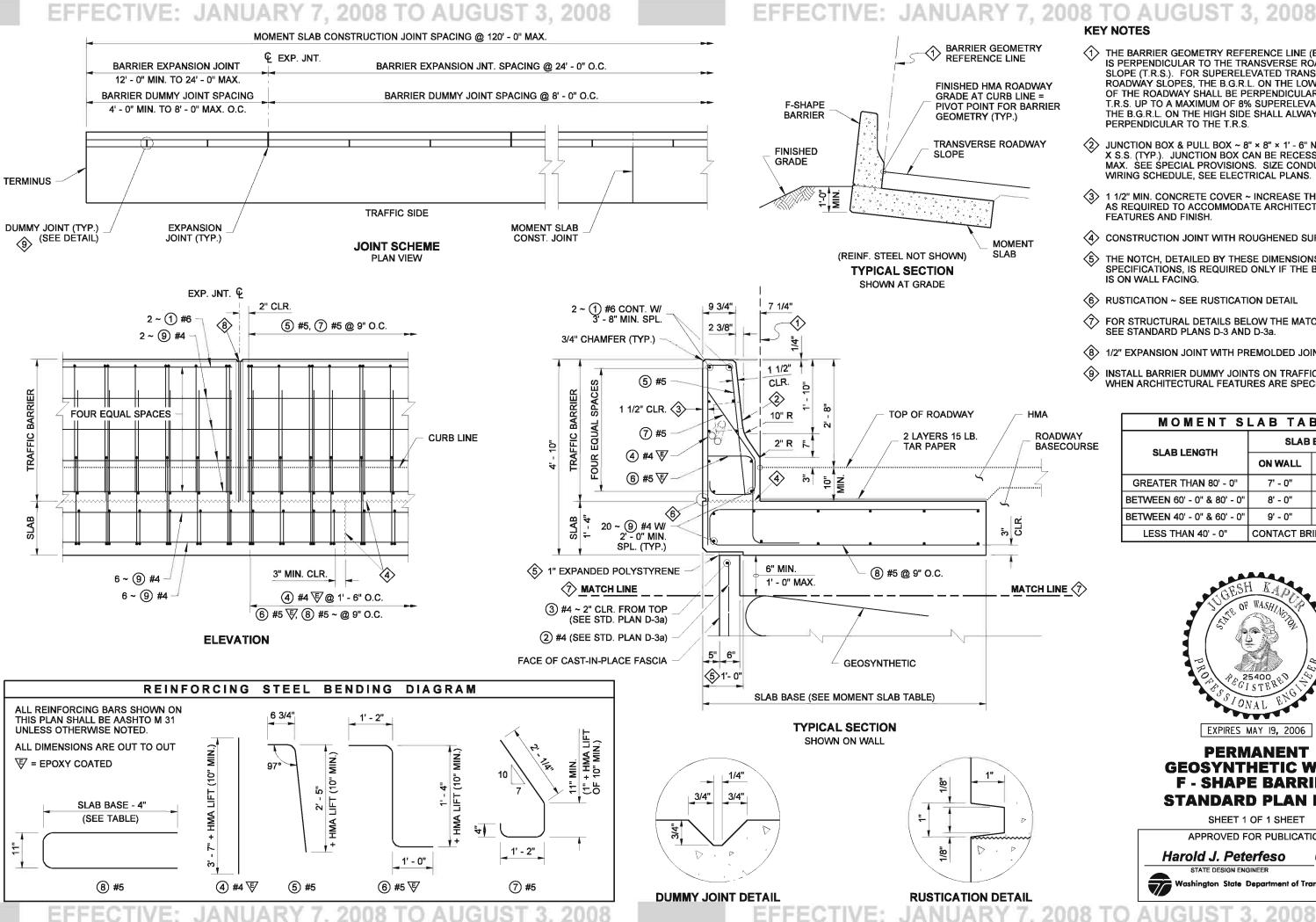
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso

06-30-04





- 1> THE BARRIER GEOMETRY REFERENCE LINE (B.G.R.L.) IS PERPENDICULAR TO THE TRANSVERSE ROADWAY SLOPE (T.R.S.). FOR SUPERELEVATED TRANSVERSE ROADWAY SLOPES, THE B.G.R.L. ON THE LOW SIDE OF THE ROADWAY SHALL BE PERPENDICULAR TO THE T.R.S. UP TO A MAXIMUM OF 8% SUPERELEVATION; THE B.G.R.L. ON THE HIGH SIDE SHALL ALWAYS BE PERPENDICULAR TO THE T.R.S.
- 2 JUNCTION BOX & PULL BOX ~ 8" × 8" × 1' 6" NEMA 4 X S.S. (TYP.). JUNCTION BOX CAN BE RECESSED 1/2" MAX. SEE SPECIAL PROVISIONS. SIZE CONDUIT PER WIRING SCHEDULE, SEE ELECTRICAL PLANS.
- 3 1 1/2" MIN. CONCRETE COVER ~ INCREASE THE COVER AS REQUIRED TO ACCOMMODATE ARCHITECTURAL FEATURES AND FINISH.
- (4) CONSTRUCTION JOINT WITH ROUGHENED SURFACE
- 5 THE NOTCH, DETAILED BY THESE DIMENSIONS AND SPECIFICATIONS, IS REQUIRED ONLY IF THE BARRIER IS ON WALL FACING.
- 6 RUSTICATION ~ SEE RUSTICATION DETAIL
- FOR STRUCTURAL DETAILS BELOW THE MATCH LINE, SEE STANDARD PLANS D-3 AND D-3a.
- (8) 1/2" EXPANSION JOINT WITH PREMOLDED JOINT FILLER
- (9) INSTALL BARRIER DUMMY JOINTS ON TRAFFIC SIDE ONLY WHEN ARCHITECTURAL FEATURES ARE SPECIFIED.

MOMENT SLAB TABLE				
SLAB LENGTH	SLAB BASE			
SLAB LENGIH	ON WALL	AT GRADE		
GREATER THAN 80' - 0"	7' - 0"	5' - 0"		
BETWEEN 60' - 0" & 80' - 0"	8' - 0"	6' - 0"		
BETWEEN 40' - 0" & 60' - 0"	9' - 0"	7' - 0"		
LESS THAN 40' - 0"	CONTACT BRIDGE OFFICE			



PERMANENT GEOSYNTHETIC WALL F - SHAPE BARRIER **STANDARD PLAN D-3c**

SHEET 1 OF 1 SHEET

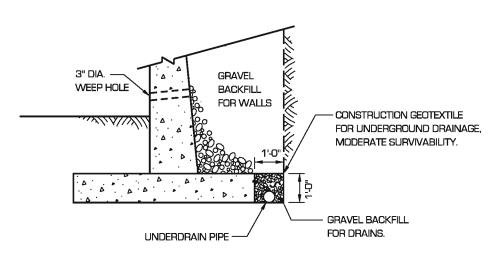
APPROVED FOR PUBLICATION

Harold J. Peterfeso

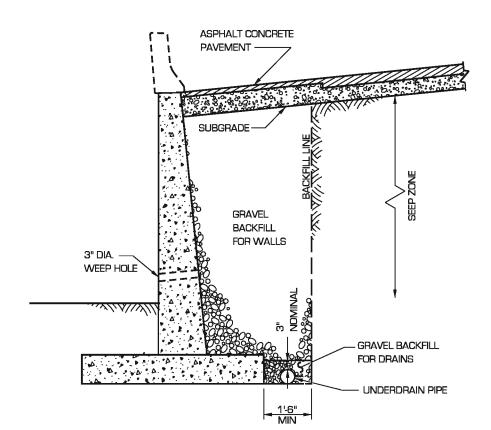
06-30-04



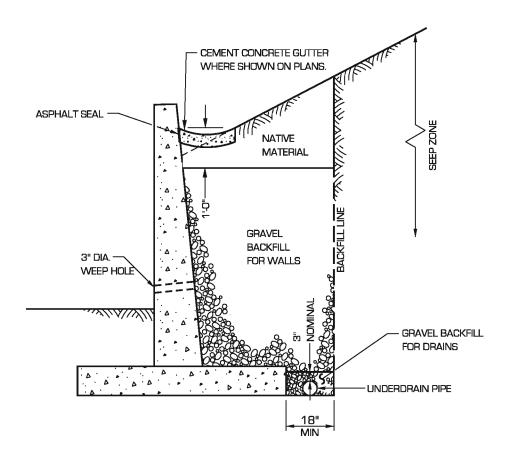
1. SEE CONTRACT FOR BACKFILL LIMITS AND GEOTEXTILE CLASS.



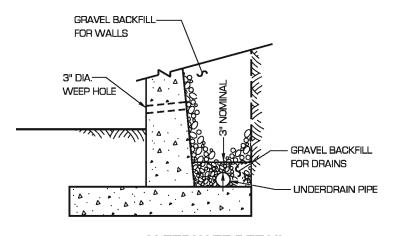
CONDITION A OR CONDITION B
WITH GEOTEXTILE



CONDITION A



CONDITION B



ALTERNATE DETAIL

TYPICAL FOR CONSTRUCTION WITH SHORING.

DATE



BACKFILL AND DRAINAGE FOR RETAINING WALLS STANDARD PLAN D-4

THE ORIGINAL, S	IN IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUP (BINED BY THE ENGINEER AND APPROVED FOR PUBLICATION, IS KEPT O DITON STATE DEPARTMENT OF TRANSPORTATION. A COPY MAY BE OBT.	N FILE
10/98	REMOVED GURADRAIL, CURB & METAL CRIB WALLS.	MT

REVISION

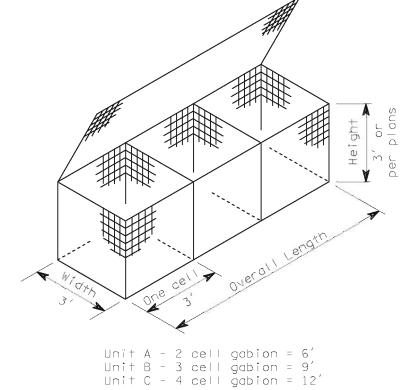
APPROVED FOR PUBLICATION

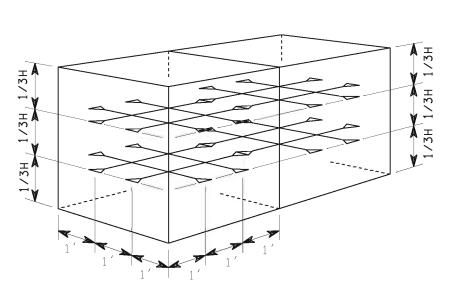
Clifford E. Mansfield

DEPUTY STATE DESIGN ENGINEER

__ 1<u>2/11/98</u>

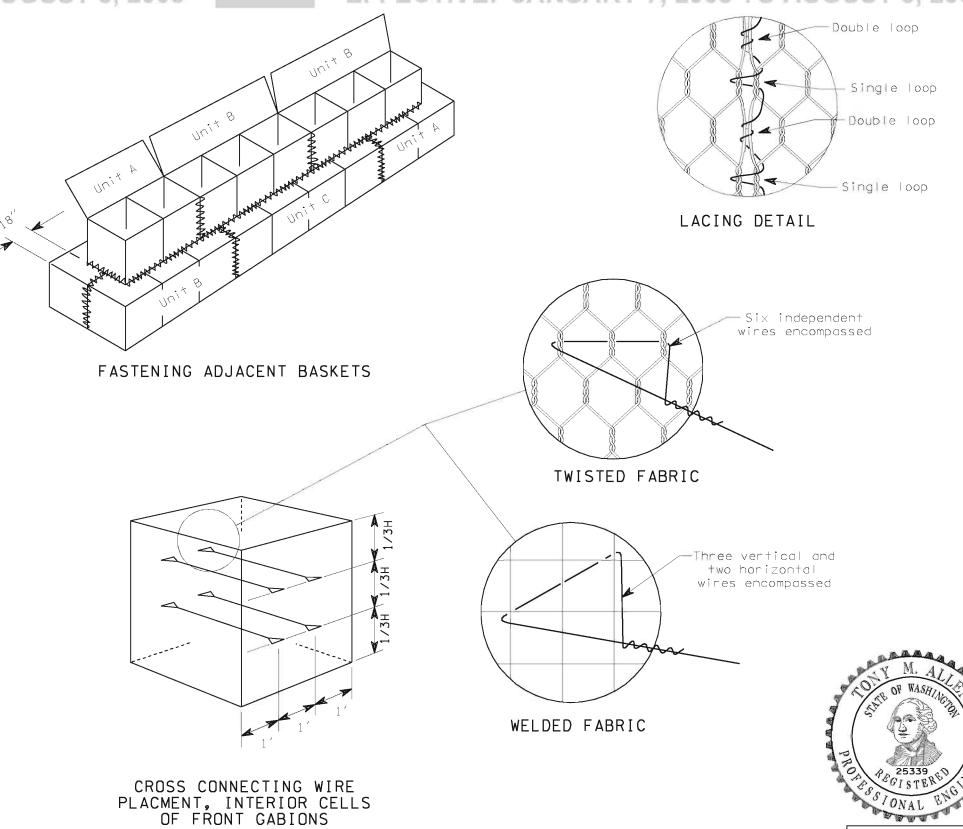
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON





TYPICAL GABION

CROSS-CONNECTING WIRE PLACEMENT, END CELLS



GABIONS STANDARD PLAN D-6

EXPIRES JULY I, 1999

NOTE: THIS
BUT AN ELEC
THE ENGINEE
FILE AT THE V

6/19/98

APPROVED FOR PUBLICATION

Clifford E. Mansfield

DEPUTY STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

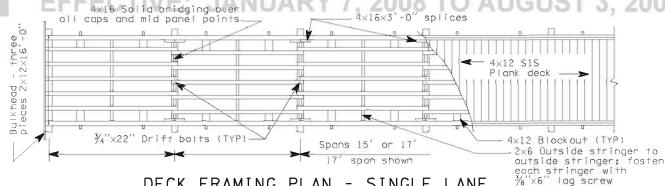
PERSPECTIVE VIEW

SHEET 1 OF 1 SHEET

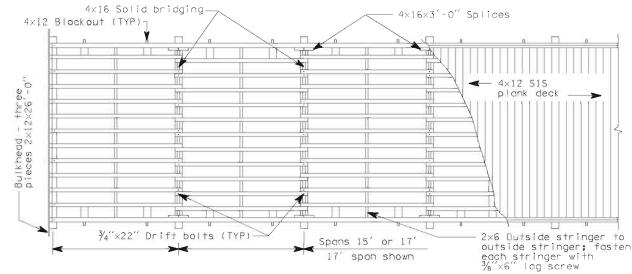
APPROVED FOR PUBLICATION

Ken L. Smith

02-21-07



DECK FRAMING PLAN - SINGLE LANE



DECK FRAMING PLAN - TWO LANE

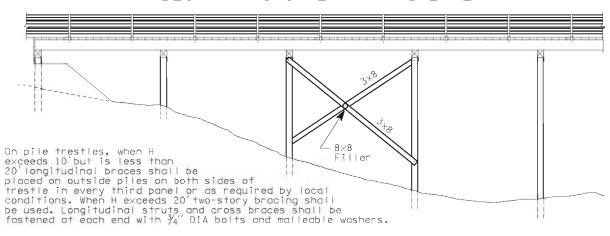
TS 3"×6"×1/4" Steel post -

3/8" DIA ×1' Bolt with 13/4'

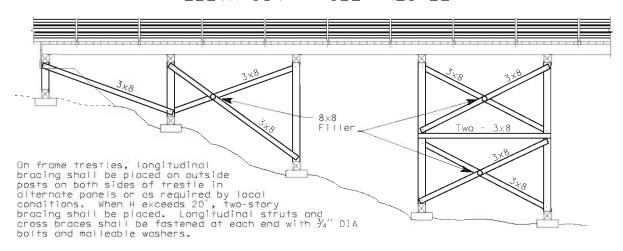
square washer /2" DIA×5"

Log bolts

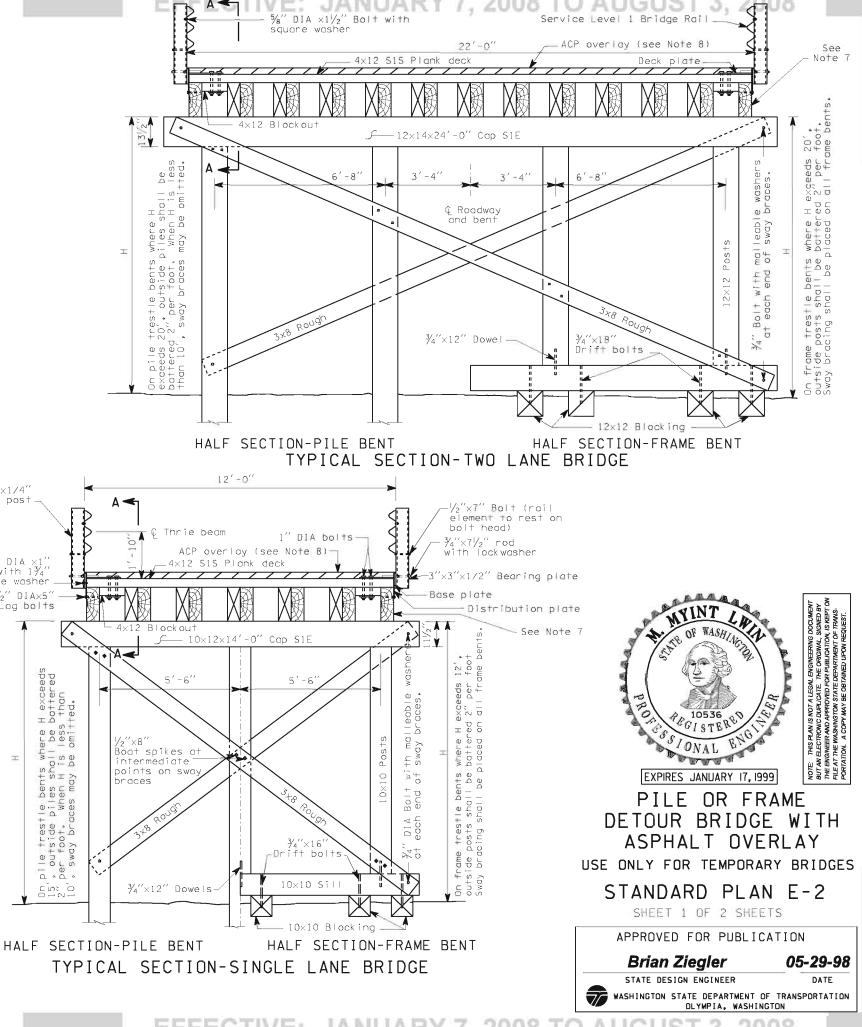
T 0 + d



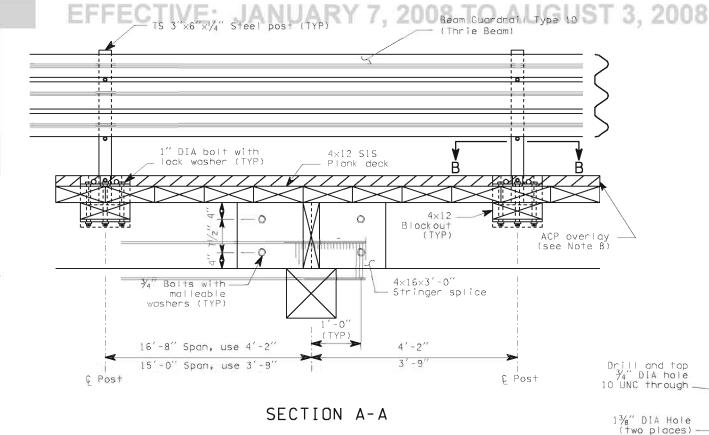
ELEVATION - PILE TRESTLE



ELEVATION - FRAME TRESTLE



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3,

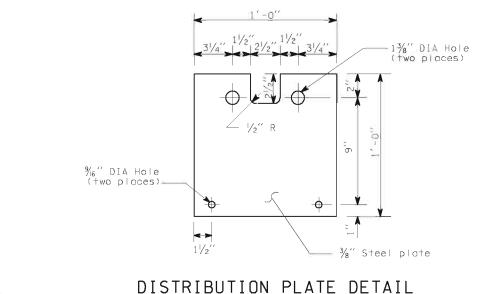


- 3. All piling shall be untreated Douglas fir and shall be driven to develop a minimum load bearing capacity of 15 tons.
- 4. Blocking for frame bents shall be proportioned to carry a minimum load of 15 tons per post.
- 5. All hardware shall be black, ungalvanized.

1" Steel plate

3/8" Steel plate

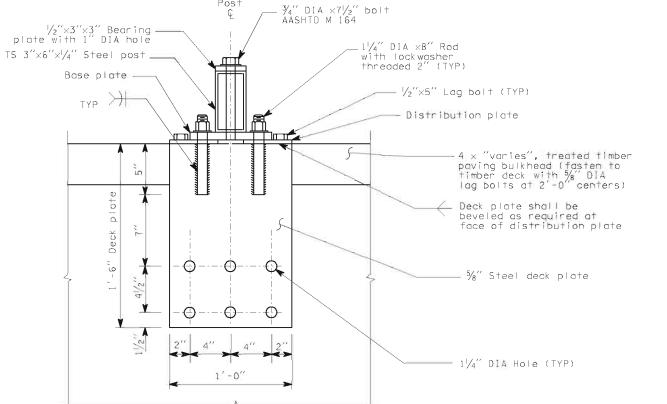
- 6. Each deck plank shall be nailed to each stringer with two 7" spikes, number 1 or larger.
- On 17'spans, stringers shall be 6×16 SIE. On 15' spans, stringers shall be 5×16 SIE. Two-lane bridges shall use thirteen lines of stringers, one-lane bridges shall use seven lines of stringers.
- 8. Overlay thickness must be sufficient to cover bolts.



BASE PLATE DETAIL

Drill and tap 34" DIA hole 16 UNC through

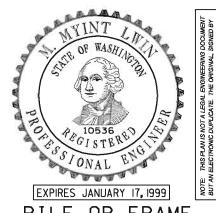
1/2,"



SECTION B-B

BACKING PLATE DETAIL

-11/4" DIA (TYP)



PILE OR FRAME DETOUR BRIDGE WITH ASPHALT OVERLAY USE ONLY FOR TEMPORARY BRIDGES

STANDARD PLAN E-2

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION Brian Ziegler *05-29-98*



STATE DESIGN ENGINEER WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

PILE	D	PERIMETER	UNIT	AREA	MOMENT OF	RADIUS OF	NUMBER O	F STRANDS
TYPE	(in.)	(in.)	WEIGHT (lbs./ft.)	(in.²)	(in.4)	GYRATION (in.)	MINIMUM	MAXIMUM
	12	48.0	158	144	1728	3.5	4	7
SQUARE	14	56.0	215	196	3201	4.0	6	10
	16	64.0	281	256	5461	4.6	7	13
	14	46.4	178	162	2103	3.6	5	8
	16 1/2	54.7	247	226	4057	4.2	7	11
OCTAGONAL	18	59.6	295	268	5746	4.6	8	13
	20	66.3	364	331	8758	5.1	9	16
-	24	79.5	524	477	18161	6.2	13	22

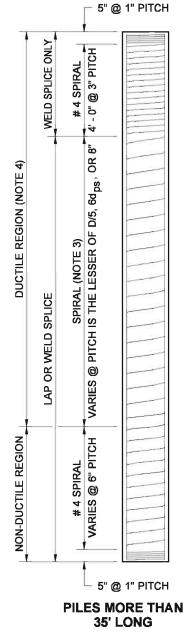
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

5" @ 1" PITCH # 4 SPIRAL - 0" @ 3" PITC edps SPIRAL (IS THE LI PITCH (8) VARIES

5" @ 1" PITCH

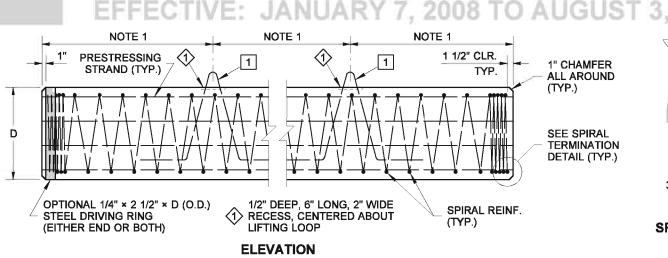
PILES LESS THAN

35' LONG



SPIRAL REINFORCEMENT

DEFORMED BAR	PLAIN STEEL BAR	COLD DRAWN WIRE	DEFORMED WIRE	WE	ELD	DIMENSIONS
AASHTO M 31 GR. 60	AASHTO M 31 GR. 60	AASHTO M 32	AASHTO M225	S	Е	LENGTH (L)
# 4	1/2" DIAM.	W 20	D 20	6	3	4"
# 5	5/8" DIAM.	W 31	D 31	8	5	6"



PILE DETAILS

NOTES

1" CHAMFER (TYP.)

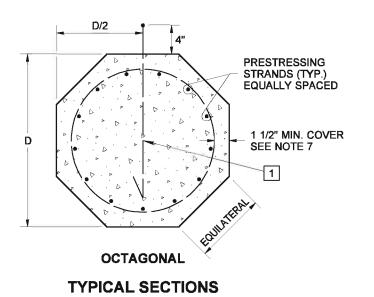
PRESTRESSING STRANDS (TYP.) EQUALLY SPACED

1 1/2" MIN. COVER

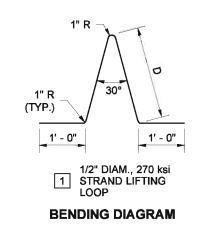
SEE NOTE 7

1

- 1. Place lifting loops at the lifting points shown in the PILE HANDLING DIAGRAM, Standard Plan E-4a, for the case stated in the contract.
- 2. Spirals shall be spliced either by lapping one full turn and bending the end of the spiral to a 135° seismic hook, by welding, or by the use of a mechanical connector that develops 125% of the minimum yield strenth of the spiral. Welding shall meet the requirements of Standard Specification 6-02.3(24)E.
- 3. All prestressing strands are 1/2" or 0.6" diameter (d_{ps}), Grade 270, uncoated strands, AASHTO M203, jack to 0.75 Fpu maximum.
- 4. Strength of concrete shall be 5.0 ksi at release and 7.0 ksi at final.
- 5. 2 1/2" cover if pile is exposed to salt water.



SQUARE





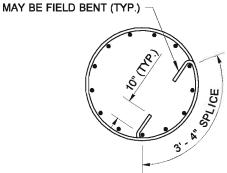
SEE TABLE FOR WELD DIMENSIONS

OR

SPIRAL

SHOP WELD S(E) L/2

SPIRAL WELDED LAP SPLICE DETAIL



SPIRAL LAP SPLICE DETAIL



PRESTRESSING STRAND

3 WRAPS OF SPIRAL WITH WELDED LAP

SPLICE AT END

SPIRAL TERMINATION DETAIL

PRECAST PRESTRESSED **CONCRETE PILES STANDARD PLAN E-4**

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Harold J. Peterfeso 08-27-03

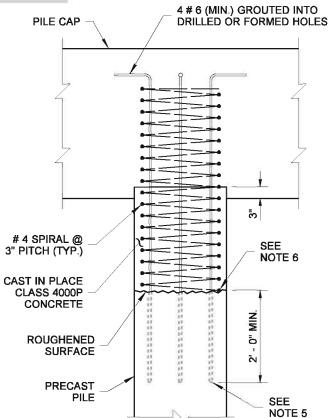


S(E) J L SHOP WELD OR

4 SPIRAL @ 3" PITCH (TYP.) 4 # 6 (MIN.) GROUTED INTO DRILLED OR FORMED HOLES PILE CAP PILE CAP STRAND (TYP.) ĘD. # 4 SPIRAL @ 3" PITCH (TYP.) **PRECAST PRECAST** PILE NOTE 5 **PILE CUTOFF WITH STRANDS** PILE CUTOFF WITH STRANDS **EXTENDING 2' - 0" MINIMUM EXTENDING LESS THAN 2' - 0"**

EFFECTIVE: JANUARY 7, 2008 TO AUGUST

EFFECTIVE JANUARY 7, 2008 TO AUGUST 3, 2008 4 # 6 (MIN.) GROUTED INTO DRILLED OR FORMED HOLES



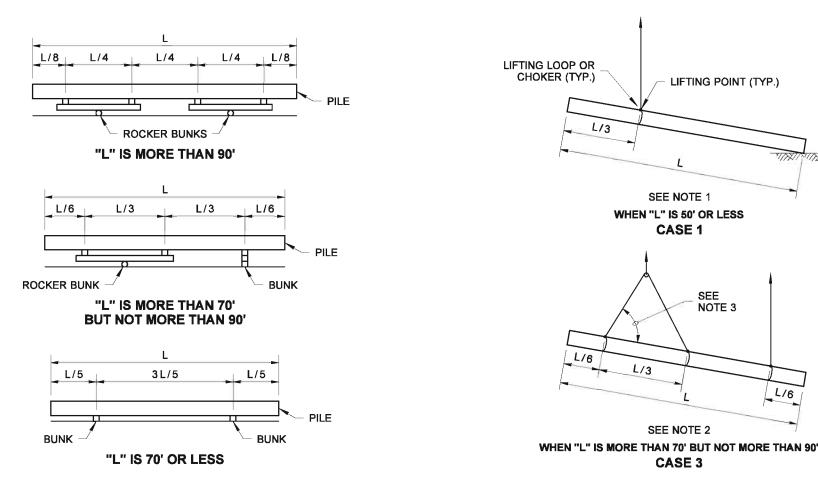
BUILD-UP ON PILE

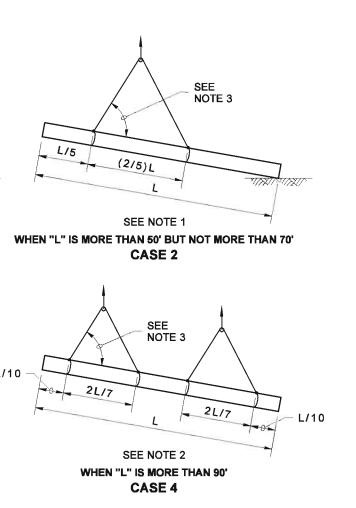
DRIVEN BELOW CUTOFF

PRECAST PILES, HANDLING NOTES

- 1. For pile lifting Cases 1 and 2, do not allow pile tip to bear on other piling stored in a lower layer.
- 2. For pile lifting Cases 3 and 4, tilt the pile in the air, do not allow the pile to touch the ground.
- The minimum angle between the pile and the lifting strap is 60° when the pile is in the horizontal position.
- 4. When directed to remove a lifting loop, cut it off at the bottom of the recess and patch the recess by filling it with 1:2 mortar, finishing it to the level of the pile face. The patch shall be allowed to cure at least 24 hours prior to driving the pile.
- The length of the formed or drilled hole shall allow for potential cutoff and full development length of the steel reinforcement. The holes must be roughened and filled with epoxy resin.
- 6. Expose the spiral reinforcement at the pile head and splice with new spiral in accordance with Standard Plan E-4, Note 2.
- 7. For handling and bunking, the Prestressed piles shall have at least the minimum number of strands shown on Std Plan E4.
- 8. Piles stored on the ground should be bunked on level dunnage at no more than 20' on center, with a maximum overhang of 10'.

PILE TO PILE-CAP CONNECTIONS





ECAST PRESTRESSED

PRECAST PRESTRESSED CONCRETE PILES HANDLING AND CAPPING STANDARD PLAN E-4a

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso 08

Harold J. Peterfeso 08-27-03
STATE DESIGN ENGINEER DATE
Washington State Department of Transportation

PILE HANDLING DIAGRAMS

PILE BUNKING AND SHIPPING SUPPORT DIAGRAMS

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 TIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **GENERAL NOTE** CENTRAL ISLAND **APRON** 5 1/2" See Standard Plan F-3 for Curb Expansion and Contraction Joint spacing 1/2" R. FACE OF CURB ROUNDABOUT LANE ROUNDABOUT LANE TRUCK TRUCK 12" **APRON** APRON FACE OF CURB **FACE OF CURB** 1/2" R. 1/2" R. 1/2" R. 1/2" R. TOP OF TOP OF TOP OF **APRON APRON APRON** 1/2" R. TOP OF TOP OF **ROADWAY ROADWAY** ROUNDABOUT LANE ROUNDABOUT LANE CROSS SLOPE **CROSS SLOPE** 1' - 10" **CEMENT CONCRETE** 9 1/2" **PEDESTRIAN CURB** ROUNDABOUT TRUCK APRON **ROUNDABOUT CENTRAL ISLAND ROUNDABOUT TRUCK APRON CEMENT CONCRETE CEMENT CONCRETE CURB CEMENT CONCRETE CURB CURB AND GUTTER VARIES** FROM VARIES 12" TO 24" FACE OF CURB FACE OF CURB 6" TO 0 **VARIES** 6 1/2" 6 1/2" VARIES FROM 6" TO 0. 10" TO 22" MAINTAIN 1H:6V SLOPE FACE OF CURB FACE OF CURB 5 1/2" (SEE CONTRACT) **VARIES** ON SIDE OF CURB LEVEL MATCH ROADWAY MATCH LEVEL MATCH 1/2" R. MATCH ROADWAY **ROADWAY** ROADWAY SLOPE SLOPE SLOPE 1/2" R. SLOPE TOP OF TOP OF TOP OF TOP OF **CEMENT CONCRETE** ROADWAY ROADWAY ROADWAY **ROADWAY** 1/2" R. 1/2" R. **PEDESTRIAN CURB** AT SIDEWALK RAMPS & LANDINGS, **AND DRIVEWAY ENTRANCES** FLUSH WITH GUTTER 11 1/2" 11 1/2" 1' - 6" PAN AT SIDEWALK RAMP ENTRANCE **DUAL-FACED CEMENT CONCRETE CEMENT CONCRETE DEPRESSED CURB SECTION** TRAFFIC CURB AND GUTTER TRAFFIC CURB AND GUTTER AT SIDEWALK RAMPS AND **DRIVEWAY ENTRANCES** VARIES 12" TO 24" **FACE OF CURB** VARIES 6 1/2" 7 1/4" FACE OF CURB 10" TO 22" FACE OF CURB (SEE CONTRACT) FACE OF CURB 5 1/2" TOP OF TOP OF TOP OF TOP OF **ROADWAY** ROADWAY **ROADWAY ROADWAY CEMENT CONCRETE CURBS** STANDARD PLAN F-10.12-00 _1 3/4" 1 3/4" 8 1/4" 8 1/4" Kevin J. Dayton **DUAL-FACED CEMENT CEMENT CONCRETE MOUNTABLE CEMENT CONCRETE TRAFFIC CURB** TRAFFIC CURB **CONCRETE TRAFFIC CURB**

CEMENT CONCRETE

SIDEWALK OR ASPHALT CONCRETE

CEMENT CONCRETE SIDEWALK RAMP, LANDING, OR DRIVE-WAY ENTRANCE

PASSAGEWAY

1/4" PREMOLDED JOINT FILLER (WHEN ADJACENT TO CEMENT

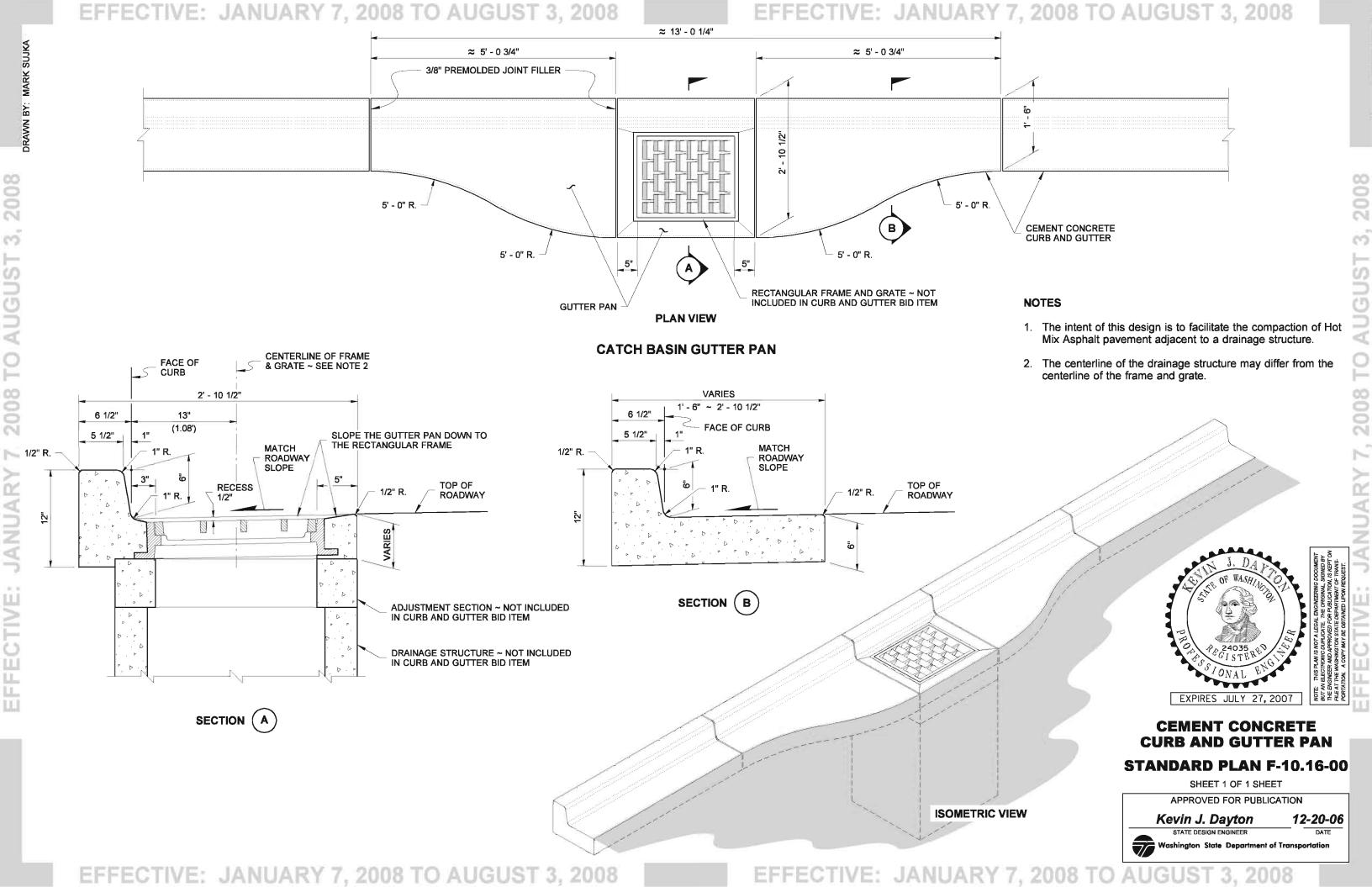
CONCRETE SIDEWALK)

1/4" PREMOLDED JOINT FILLER

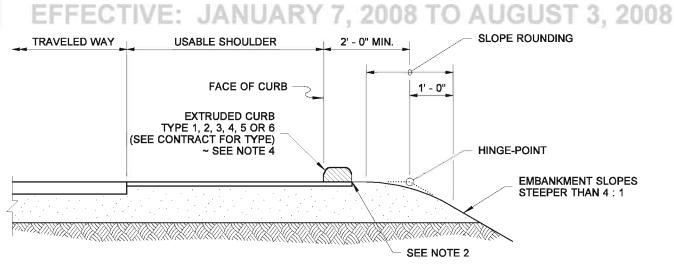
EXPIRES JULY 27, 2007

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

12-20-06



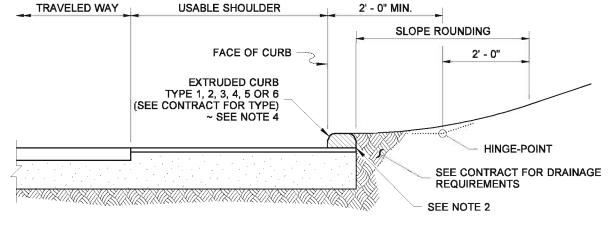
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



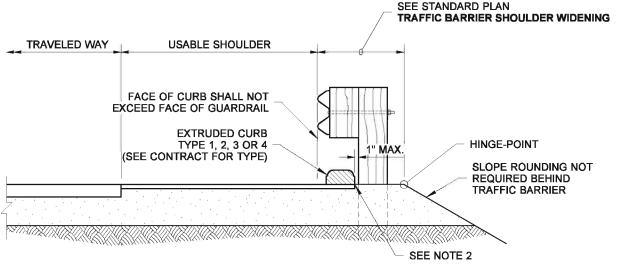
EXTRUDED CURB WITH SLOPE ROUNDING

TRAVELED WAY **USABLE SHOULDER** 1' - 0" MIN. FACE OF CURB EXTRUDED CURB TYPE 1, 2, 3, 4, 5 OR 6 HINGE-POINT (SEE CONTRACT FOR TYPE) ~ SEE NOTE 4 **EMBANKMENT SLOPES** 4:1 OR FLATTER SEE NOTE 2

EXTRUDED CURB WITHOUT SLOPE ROUNDING



EXTRUDED CURB AT CUT SLOPE



EXTRUDED CURB AT BEAM GUARDRAIL TYPE 1

A1417 P EXPIRES AUGUST 26,2007

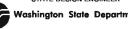
EXTRUDED CURB PLACEMENT

STANDARD PLAN F-10.40-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

01-23-07 Ken L. Smith STATE DESIGN ENGINEER



1. The installation of curb in areas with existing guardrail

2. Extend shoulder pavement to provide a base for the

4. Type 3 and 6 curbs are not used on roadways with a

3. See Contract for exception to distances shown.

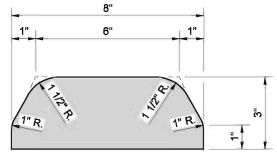
posted speed greater than 40 mph.

or its components.

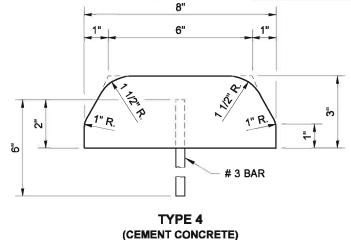
extruded curb.

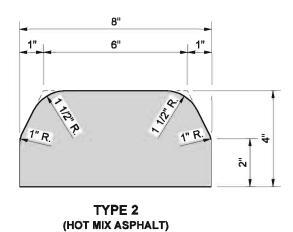
could require the removal and resetting of the guardrail

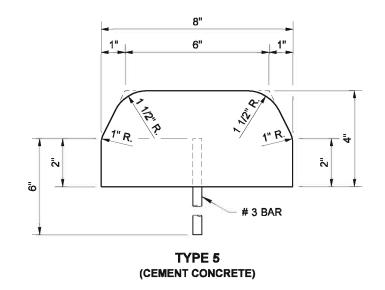
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

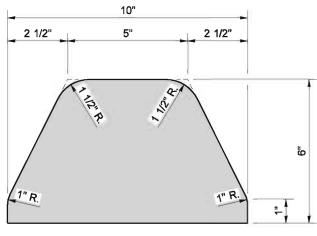


TYPE 1 (HOT MIX ASPHALT)

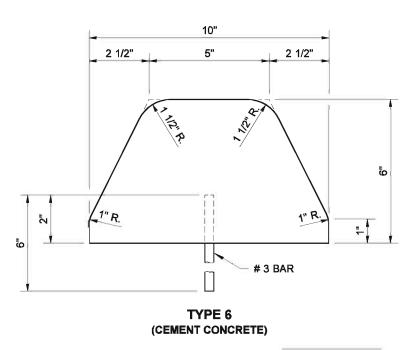




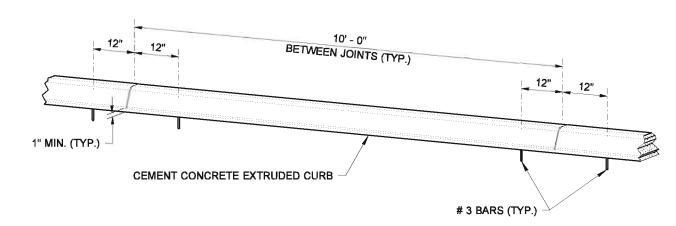




TYPE 3 (HOT MIX ASPHALT)



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



SPACING OF ANCHOR BARS (FOR TYPES 4, 5, AND 6)

NOTE

JOINTS MAY BE FORMED DURING INSTALLATION USING A RIGID DIVIDER OR SAWCUT AFTER CONCRETE CURES TO MINIMUM STRENGTH.



EXTRUDED CURB

STANDARD PLAN F-10.42-00

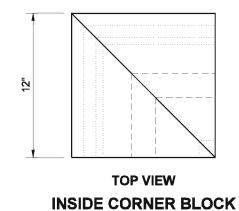
SHEET 1 OF 1 SHEET

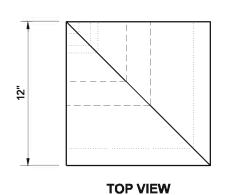
APPROVED FOR PUBLICATION

Ken L. Smith 01-23-07

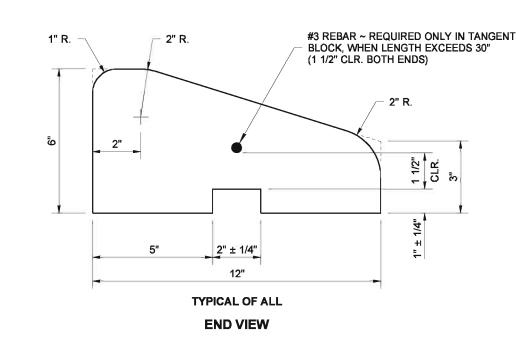


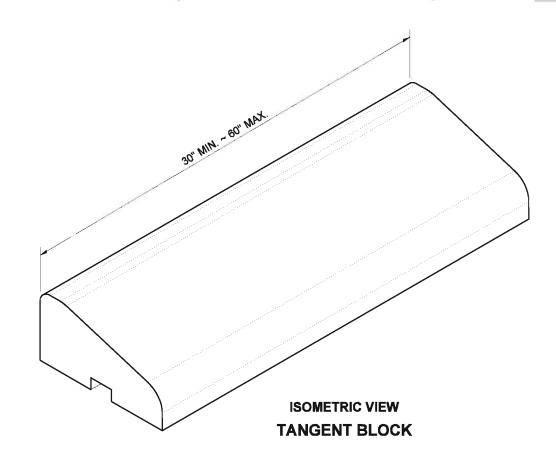
shington State Department of Transportation

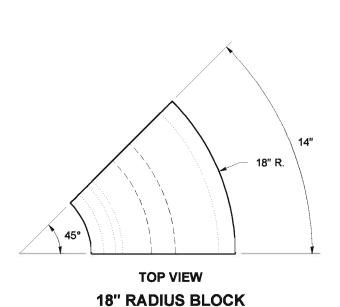


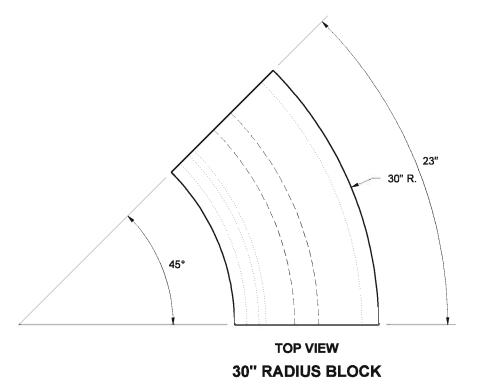


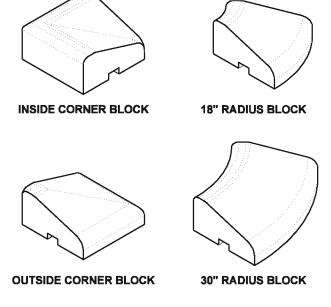
OUTSIDE CORNER BLOCK











ISOMETRIC VIEWS



SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

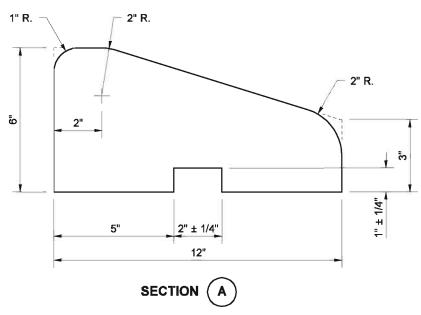
Pasco Bakotich III 09-05-07

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

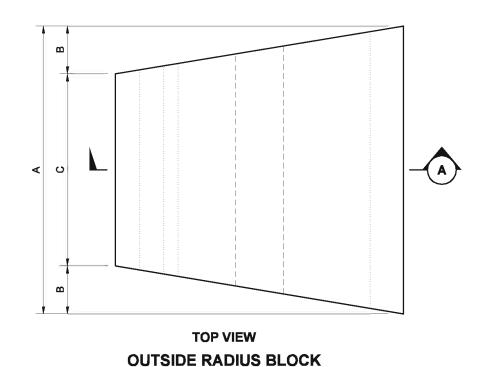
2008

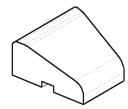
INSIDE RADIUS BLOCK



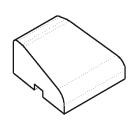
SECTION (A)								
cu	CURB RADIUS TABLE							
CURB DIMENSION DIMENSION DIMENSION C								
3'	12"	2"	8"					
4' TO 5'	12"	1 1/2"	9"					
6'	12"	1"	10"					
7'	12"	7/8"	10 1/4"					
8'	18"	1 1/8"	15 3/4"					
9'	18"	1"	16"					
10'	18"	7/8"	16 1/4"					
11' TO 13'	18"	3/4"	16 1/2"					
14' TO 15'	18"	5/8"	16 3/4"					
16' TO 17'	24"	3/4"	22 1/2"					
18' TO 22'	24"	5/8"	22 3/4"					
23' TO 29'	24"	1/2"	23"					
30' TO 34'	30"	1/2"	29"					
35' TO 48'	30"	3/8"	29 1/4"					
49' TO 60'	30"	1/4"	29 1/2"					
OVER 60'	USE TANG	ENT BLOCK, S	EE SHEET 1					

THIS TABLE LISTS THE CALCULATED DIMENSIONS FOR CASTING BLOCKS SUITABLE FOR CONSTRUCTING VARIOUS CURB RADII. CURVED BLOCKS, OR BLOCKS WITH DIFFERENT DIMENSIONS MAY BE ACCEPTABLE WITH PRIOR APPROVAL OF THE ENGINEER.





INSIDE RADIUS BLOCK



OUTSIDE RADIUS BLOCK

ISOMETRIC VIEWS



PRECAST CONCRETE SLOPED MOUNTABLE CURB STANDARD PLAN F-10.62-01

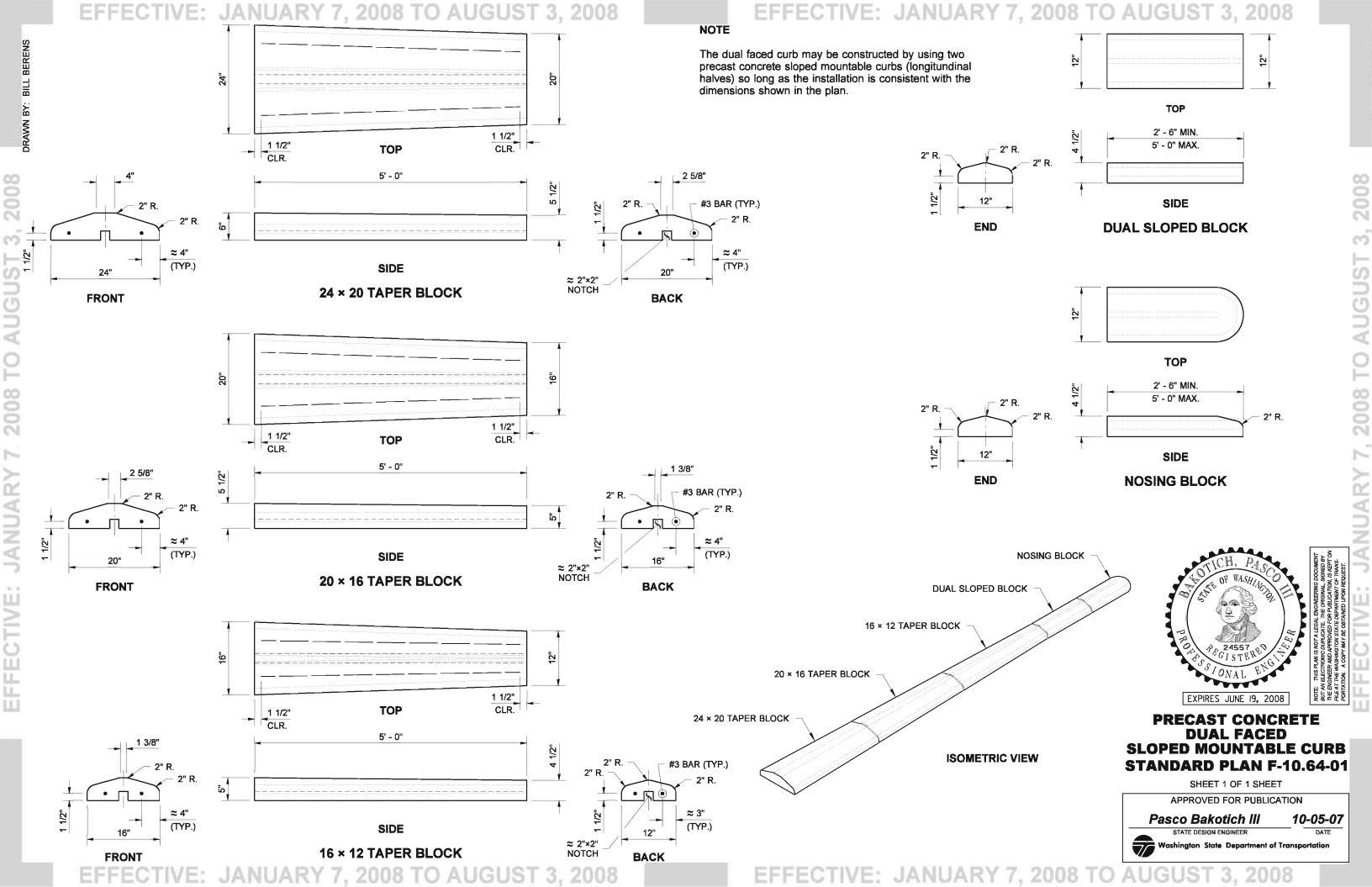
SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION





09-05-07



1/2" R. LEVEL 1" R. SIDEWALK VARIES: 6' - 0" MIN. (SEE CONTRACT) 1/2" R. (TYP.) CURB NOT INCLUDED IN BID ITEM

SEE RAISED

EDGE DETAIL

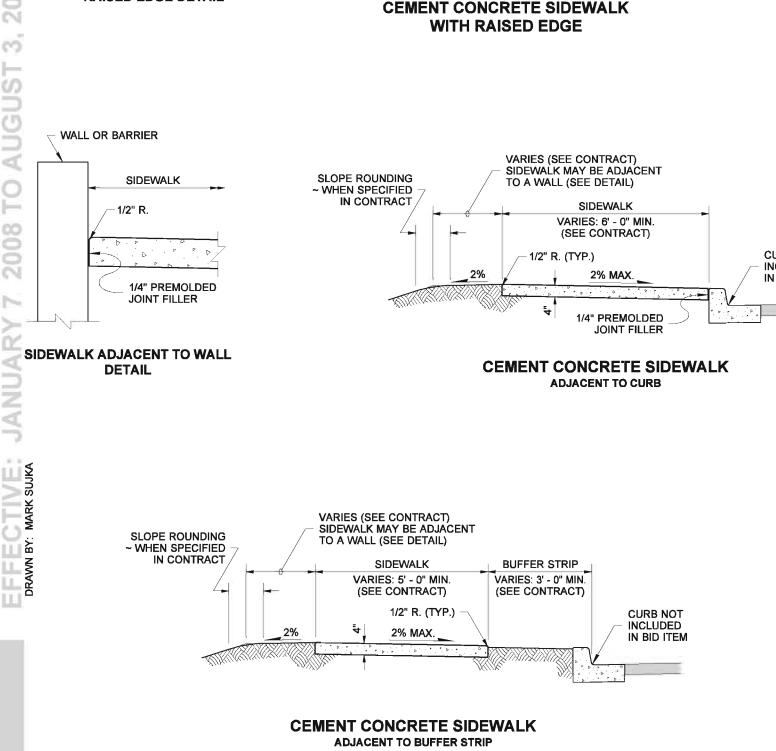
1/4" PREMOLDED

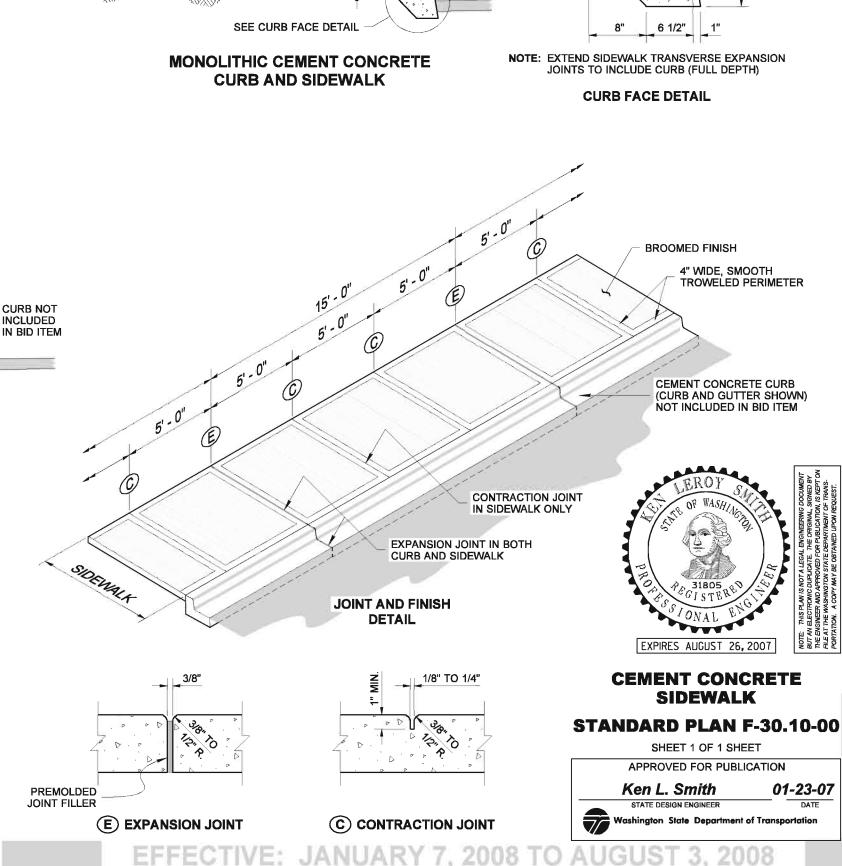
JOINT FILLER

NOTE: EXTEND SIDEWALK TRANSVERSE

JOINTS TO INCLUDE RAISED EDGE

RAISED EDGE DETAIL





EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

6 1/2"

SEE © CONTRACTION

JOINT

5 1/2"

FACE OF CURB

TOP OF ROADWAY

VARIES (SEE CONTRACT) SIDEWALK MAY BE ADJACENT TO A WALL (SEE DETAIL)

1/2" R. (TYP.)

2% MAX.

SIDEWALK

VARIES: 6' - 0" MIN

(SEE CONTRACT)

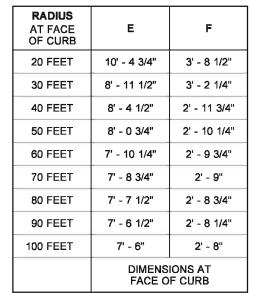
SLOPE ROUNDING ~ WHEN SPECIFIED

IN CONTRACT

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** RADIUS POINT OF SIDEWALK RAMP AND CURB RETURN (TYP.) 1. The bottom of the ramp shall have a level area (not in excess of 2% in BACK EDGE OF SIDEWALK IS PARALLEL TO APPROACH ROADWAY (TYP.) any direction), 4' × 4'. 2. Layouts 1, 2, & 3 require two (2) of this bid item: "Cement Conc. Sidewalk Ramp Type 1". The bid item does not include the adjacent Curb CEMENT CONC. SIDEWALK (or Curb & Gutter), or Sidewalk. RAMP TYPE 1 (TYP.) 3. Ramp slopes shall not be steeper than 12H:1V. (c) 4. To the maximum extent feasible, ramp cross slopes shall not exceed 2%. В SIDEWALK В **SIDEWALK SIDEWALK** 5. Avoid placing drainage structures, junction boxes or other obstructions in front of ramp access areas. 6. Curb & Gutter is shown, see the Contract Plans for the curb design CEMENT CONC. SIDEWALK RAMP CEMENT CONC. specified. See Standard Plan F-10.12 for curb details. SIDEWALK RAMP TYPE 1 TYPE 1 7. See Standard Plan F-30.10 for sidewalk joint placement and details. RAMP **PLAN VIEW PLAN VIEW PLAN VIEW LAYOUT 1 LAYOUT 2 LAYOUT 3 SEE NOTE 2 SEE NOTE 2 SEE NOTE 2** MIN. MAX. 1 5/8" 2 3/8" 2' - 0" ~ DETECTABLE WARNING PATTERN (SEE DETAIL) В 5/8" 1 1/2" 8' - 0" MIN. 4' - 0" MIN. 7/16" 3/4" LANDING RAMP 7/8" 1 7/16" TOP OF **FLUSH** 2% MAX. **ROADWAY** D 墨 0 THIS PATTERN AREA SHALL CEMENT BE YELLOW IN COLOR **ELEVATION** CONCRETE **DEPRESSED** SIDEWALK **SIDEWALK CURB & GUTTER** SECTION (A (SEE NOTE 6) **DETECTABLE WARNING PATTERN DETAIL** MIN. DETECTABLE WARNING **PATTERN** 3/8" EXPANSION (SEE DETAIL) JOINT (TYP.) (SEE STD. PLAN F-30.10) **FACE OF CURB** 6' - 0" MIN. 1 AT FACE OF CURB TOP OF CURB, OR CURB 2% MAX **ROADWAY** AND GUTTER 1 **CEMENT CONCRETE** SIDEWALK RAMP TYPE 1 **CEMENT CONCRETE CROSSWALK** CEMENT CONCRETE SIDEWALK **CURB & GUTTER PLAN VIEW** SECTION (B (SEE NOTE 6) **SIDEWALK RAMP TYPE 1** EXPIRES JUNE 19, 2008 FOR LAYOUTS 1, 2, & 3 **SIDEWALK RAMP TYPE 1** 12' - 0" MIN. **WITH LAYOUTS** STANDARD PLAN F-40.10-01 TOP OF 2% MAX. SHEET 1 OF 1 SHEET **ROADWAY** APPROVED FOR PUBLICATION **CEMENT CONCRETE** Pasco Bakotich III 10-05-07 SIDEWALK **CEMENT CONCRETE** ISOMETRIC VIEW STATE DESIGN ENGINEER **CURB & GUTTER** SECTION (C (SEE NOTE 6)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 RADIUS POINT OF SIDEWALK RAMP AND CURB RETURN \sim SEE CONTRACT FOR RADIUS

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



3/8" EXPANSION JOINT (TYP.)

(SEE STD. PLAN F-30.10)

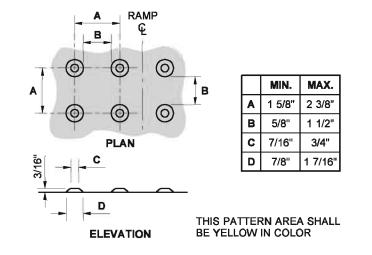
INTERMEDIATE RADII CAN BE INTERPOLATED

VARIES: 7' - 0" to E

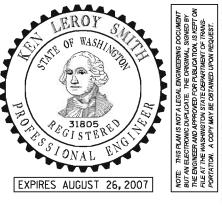
RAMP

NOTES

- 1. The bottom of the ramp shall have a level area (not in excess of 2% in any direction), $4' \times 4'$.
- 2. The Type 2 Ramp Layout requires two (2) of this bid item: "Cement Conc. Sidewalk Ramp Type 2". The bid item does not include the adjacent Curb (or Curb & Gutter), the Sidewalk between Ramps, or the Cement Conc. Pedestrian Curb.
- 3. Ramp slopes shall not be steeper than 12H:1V.
- 4. Avoid placing drainage structures, junction boxes or other obstructions in front of ramp access areas.
- 5. Curb & Gutter is shown, see the Contract Plans for the curb design specified. See Standard Plan F-10.12 for curb details.
- 6. See Std. Plan F-30.10 for sidewalk joint placement and details



DETECTABLE WARNING PATTERN DETAIL



SIDEWALK RAMP TYPE 2 WITH LAYOUT

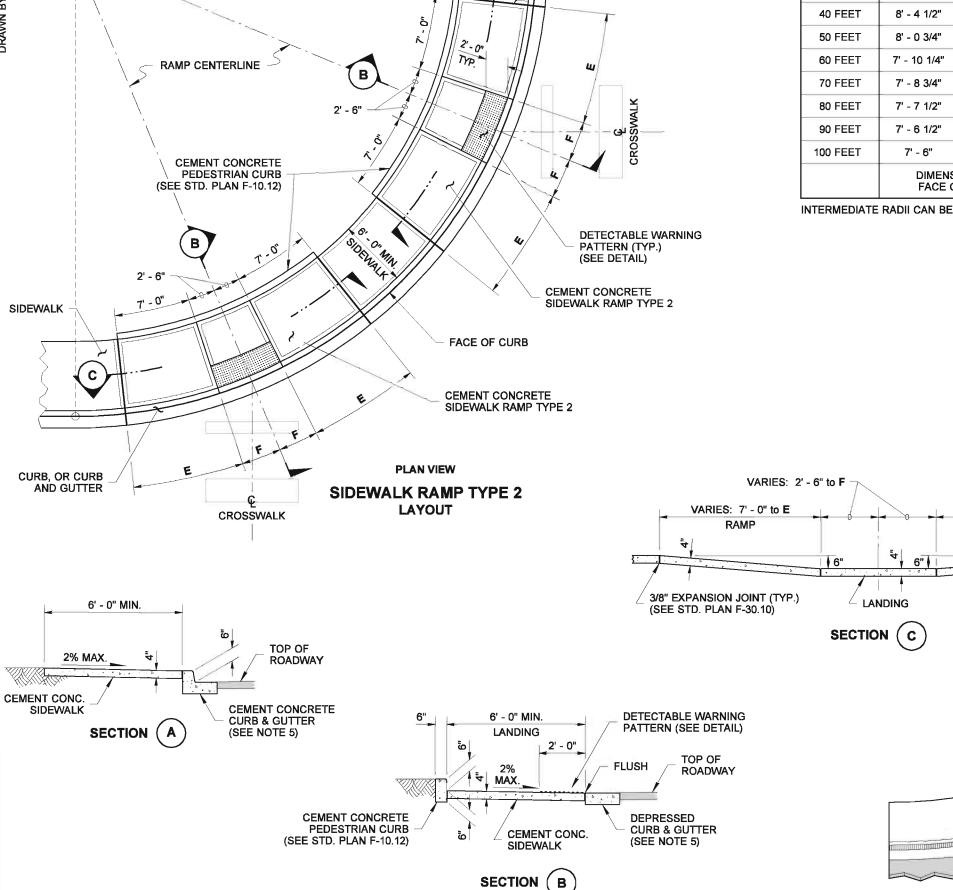
STANDARD PLAN F-40.12-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith 02-07-07





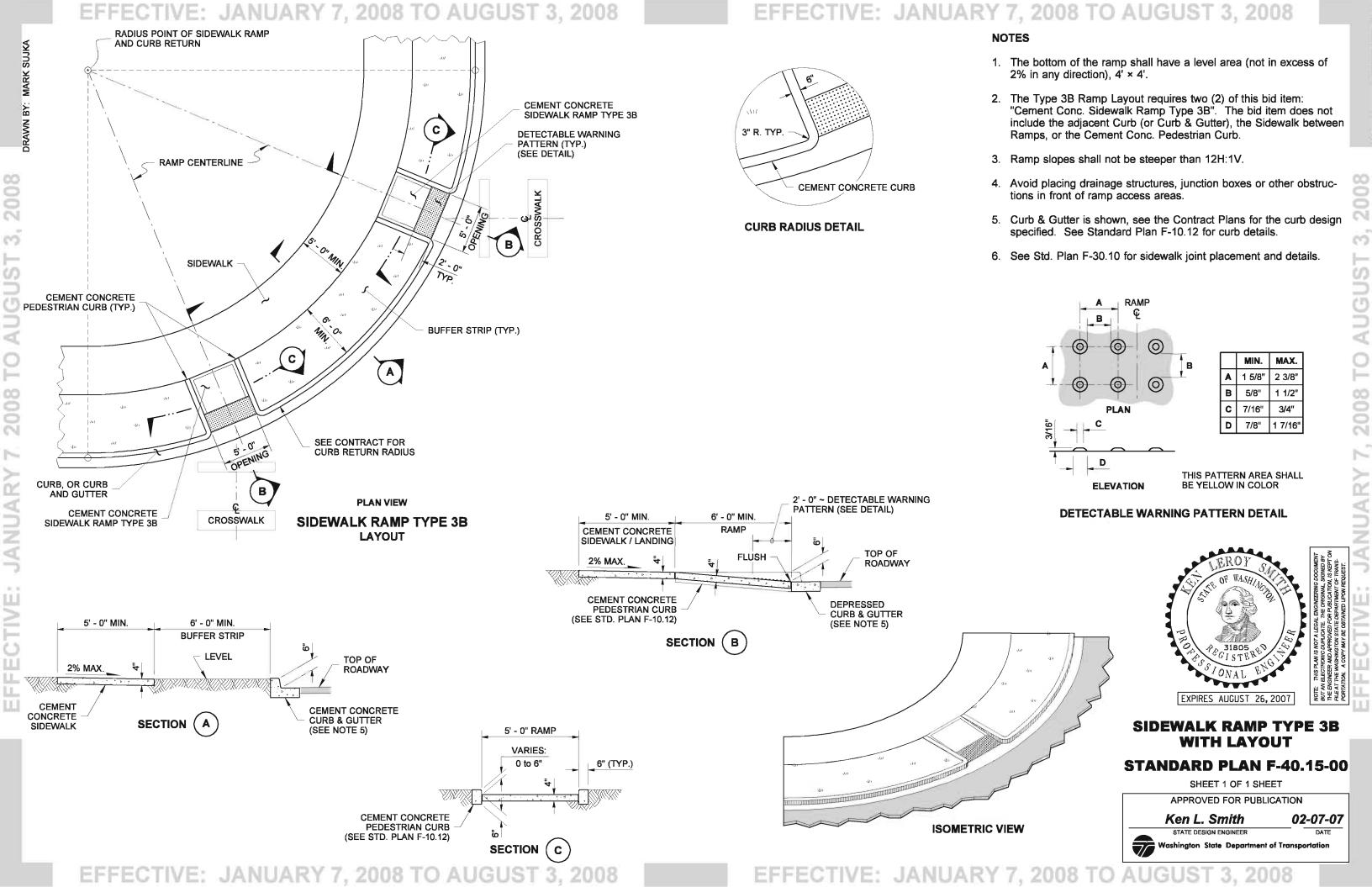
EFFECTIVE: JANUARY 7, 2008 TO AUGUS

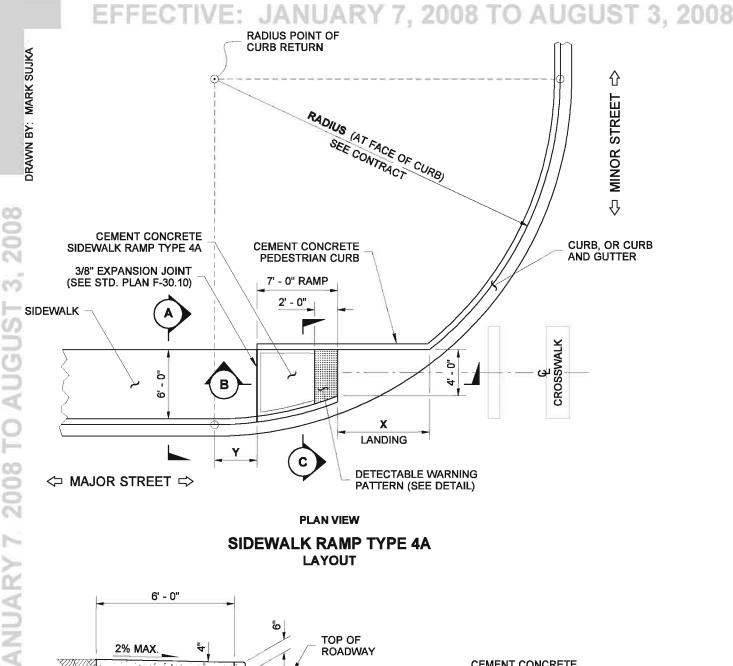
N

c)

ISOMETRIC VIEW

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 RADIUS POINT OF SIDEWALK RAMP AND CURB RETURN 5' - 0" MIN. SIDEWALK 1. The bottom of the ramp shall have a level area (not in excess of 2% in any direction), $4' \times 4'$. 2. The Type 3A Ramp Layout requires two (2) of this bid item: CEMENT CONCRETE SIDEWALK RAMP TYPE 3A "Cement Conc. Sidewalk Ramp Type 3A". The bid item does not C include the adjacent Curb (or Curb & Gutter), the Sidewalk between 3' - 0" MIN. 3" R. TYP. DETECTABLE WARNING Ramps, or the Cement Conc. Pedestrian Curb. PATTERN (TYP.) (SEE DETAIL) 3. Ramp slopes shall not be steeper than 12H:1V. RAMP CENTERLINE 4. Avoid placing drainage structures, junction boxes or other obstruc-CEMENT CONCRETE CURB tions in front of ramp access areas. 5. Curb & Gutter is shown, see the Contract Plans for the curb design CEMENT CONCRETE PEDESTRIAN CURB **CURB RADIUS DETAIL** specified. See Standard Plan F-10.12 for curb details. В 6. See Std. Plan F-30.10 for sidewalk joint placement and details. SIDEWALK 3' - 0" MIN 5' - 0" MIN. 3' - 0" MIN. **RAMP** CEMENT CONCRETE BUFFER 3/8" EXPANSION SIDEWALK JOINT (SEE STD. PLAN F-30.10) □ LEVEL TOP OF D **ROADWAY** 1 5/8" MAX. 2 3/8" 5/8" 1 1/2" 7/16" 3/4" **BUFFER STRIP (TYP.)** CEMENT CONCRETE **CEMENT CONCRETE** PEDESTRIAN CURB **CURB & GUTTER** 7/8" 1 7/16 (SEE STD. PLAN F-10.12) (SEE NOTE 5) SECTION (D 5'-0" SEE CONTRACT FOR OPENING CURB RETURN RADIUS D THIS PATTERN AREA SHALL CURB, OR CURB BE YELLOW IN COLOR **ELEVATION** В AND GUTTER **PLAN VIEW** CEMENT CONCRETE **DETECTABLE WARNING PATTERN DETAIL CROSSWALK** SIDEWALK RAMP TYPE 3A 5' - 0" MIN. SIDEWALK SIDEWALK RAMP TYPE 3A 3' - 0" MIN. RAMP LAYOUT LANDING 4" (TYP.) 5' - 0" MIN. 3' - 0" MIN. 3/8" EXPANSION JOINT (TYP.) **BUFFER** (SEE STD. PLAN F-30.10) STRIP **SECTION** LEVEL TOP OF ROADWAY 2% MAX. CEMENT **CEMENT CONCRETE** EXPIRES AUGUST 26,2007 CONCRETE **CURB & GUTTER** 5' - 0" MIN 3' - 0" MIN. **SIDEWALK** SECTION (A 2' - 0" ~ DETECTABLE WARNING (SEE NOTE 5) LANDING RAMP **SIDEWALK RAMP TYPE 3A** PATTERN (SEE DETAIL) **WITH LAYOUT** TOP OF FLUSH **ROADWAY** STANDARD PLAN F-40.14-00 MAX. SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION DEPRESSED CEMENT CONCRETE **CURB & GUTTER** PEDESTRIAN CURB 02-07-07 Ken L. Smith (SEE STD. PLAN F-10.12) (SEE NOTE 5) **ISOMETRIC VIEW** STATE DESIGN ENGINEER SECTION (B



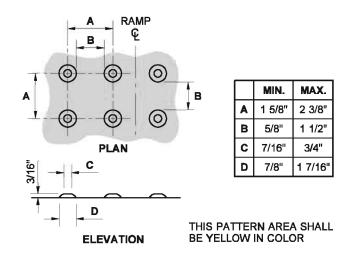


RADIUS LANDING DISTANCE AT FACE OF CURB FROM P.C. 20 FEET 6' - 2 1/2" 1' - 7" 30 FEET 8' - 0 1/4" 3' - 8" 40 FEET 9' - 6 1/4" 5' - 4 3/4" 50 FEET 10' - 9 3/4' 60 FEET 11' - 11 1/2" 8' - 3 1/2" 70 FEET 13' - 0" 9' - 6 1/2" 13' - 11 1/2" 80 FEET 10' - 8 1/2" 90 FEET 14' - 10 1/2" 11' - 9 3/4" **100 FEET** 15' - 8 3/4" 12' - 10 1/4'

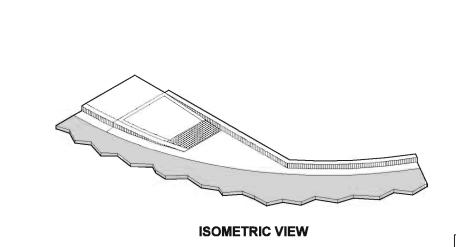
INTERMEDIATE RADII CAN BE INTERPOLATED

JANUARY 7, 2008 TO AUGUST 3, 2008

- This layout is used to provide access to a single crosswalk parallel to the major street. The bid item "Cement Conc. Sidewalk Ramp Type 4A" does not include the adjacent Curb (or Curb & Gutter), the Sidewalk, or the Cement Conc. Pedestrian Curb.
- 2. Ramp slopes shall not be steeper than 12H:1V.
- Avoid placing drainage structures, junction boxes or other obstructions in front of ramp access areas.
- Curb & Gutter is shown, see the Contract Plans for the curb design specified. See Standard Plan F-10.12 for curb details.
- 5. See Std. Plan F-30.10 for sidewalk joint placement and details.
- 6. The bottom of the ramp shall have a level area (not in excess of 2% in any direction), 4' × 4'.



DETECTABLE WARNING PATTERN DETAIL





SIDEWALK RAMP TYPE 4A WITH LAYOUT

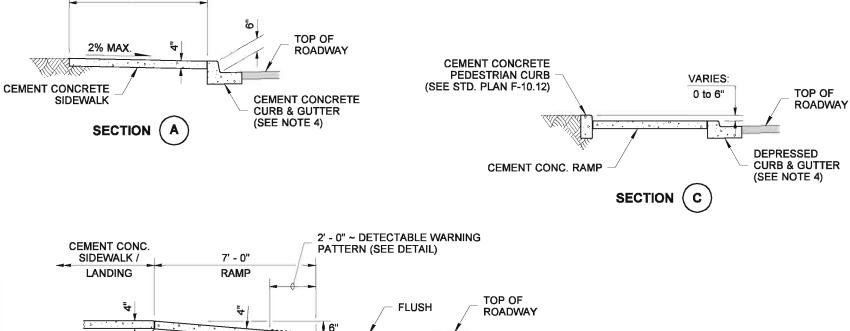
STANDARD PLAN F-40.16-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION







DEPRESSED

(SEE NOTE 4)

CURB & GUTTER

LANDING

SECTION (B

3/8" EXPANSION JOINT

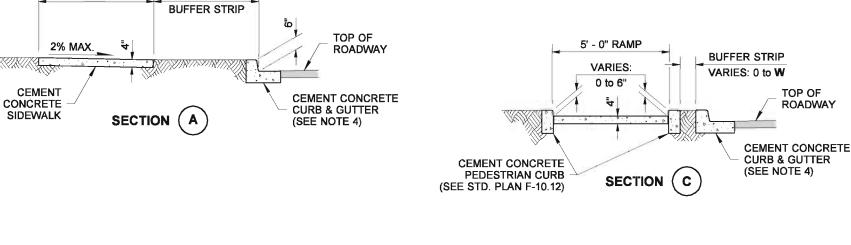
(SEE STD. PLAN F-30.10)

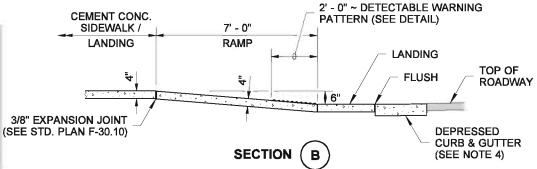
2008

AUGUS

2008

ANUARY

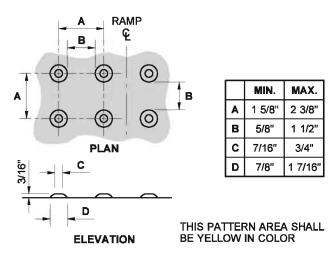




EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

RADIUS	W = 3	3' - 0"	W = 4	4' - 0"	0" W = 5' - 0" W = 6' - 0"		W = 7' - 0"			
AT FACE OF CURB	X	Y	X	Y	x	X Y		Y	X	Y
20 FEET	5' - 5 1/2"	3' - 6 1/2"	4' - 8 1/2"	5' - 0"	4' - 1"	6' - 2 3/4"	3' - 7"	7' - 3 1/2"	3' - 1 1/2"	8' - 2 1/2"
30 FEET	7' - 3 3/4"	6' - 1"	6' - 5 1/2"	7' - 11 1/2"	5' - 9 1/4"	9' - 7"	5' - 2 1/2"	11' - 0"	4' - 8 3/4"	12' - 3 1/4"
40 FEET	8' - 9 1/2"	8' - 2 1/2"	7' - 10"	10' - 5 1/4"	7' - 1"	12' - 4 1/2"	6' - 5 3/4"	14' - 3/4"	5' - 11 1/2"	15' - 7 1/4"
50 FEET	10' - 3/4"	10' - 3/4"	9' - 1/4"	12' - 7 1/4"	8' - 2 1/2"	14' - 9 1/2"	7' - 6 1/2"	16' - 9"	6' - 11 3/4"	18' - 6 1/4"
60 FEET	11' - 2 1/2"	11' - 8 3/4"	10' - 3/4"	14' - 6 1/2"	9' - 2 1/4"	16' - 11 3/4"	8' - 5 3/4"	19' - 1 3/4"	7' - 10 1/2"	21' - 1 1/2"
70 FEET	12' - 2 3/4"	13' - 3 1/4"	11' - 1/4"	16' - 4"	10' - 1"	18' - 11 3/4"	9' - 3 3/4"	21' - 4 1/4"	8' - 8 1/4"	23' - 6 1/4"
80 FEET	13' - 2"	14' - 8 1/2"	11' - 10 1/2"	17' - 11 3/4"	10' - 10 3/4"	20' - 10"	10' - 1"	23' - 4 3/4"	9' - 5"	25' - 8 3/4"
90 FEET	14' - 1/2"	16' - 1/2"	12' - 8 1/4"	19' - 6 1/2"	11' - 7 3/4"	22' - 7"	10' - 9 3/4"	25' - 3 3/4"	10' - 1 1/4"	27' - 9 1/2"
100 FEET	14' - 10 1/2"	17' - 3 3/4"	13' - 5 1/2"	21' - 0"	12' - 4 1/4"	24' - 2 3/4"	11' - 5 3/4"	27' - 1 1/2"	10' - 9"	29' - 9"

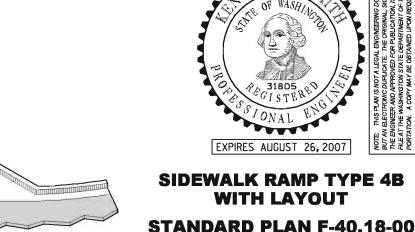
INTERMEDIATE RADII CAN BE INTERPOLATED



DETECTABLE WARNING PATTERN DETAIL

NOTES

- 1. This layout is used to provide access to a single crosswalk parallel to the major street. The bid item "Cement Conc. Sidewalk Ramp Type 4B" does not include the adjacent Curb (or Curb & Gutter), the Sidewalk, or the Cement Conc. Pedestrian Curb.
- 2. Ramp slopes shall not be steeper than 12H:1V.
- 3. Avoid placing drainage structures, junction boxes or other obstructions in front of ramp access areas.
- 4. Curb & Gutter is shown, see the Contract Plans for the curb design specified. See Standard Plan F-10.12 for curb details.
- 5. See Std. Plan F-30.10 for sidewalk joint placement and details.
- 6. The bottom of the ramp shall have a level area (not in excess of 2% in any direction), 4' × 4'.



SIDEWALK RAMP TYPE 4B WITH LAYOUT

SHEET 1 OF 1 SHEET

02-07-07

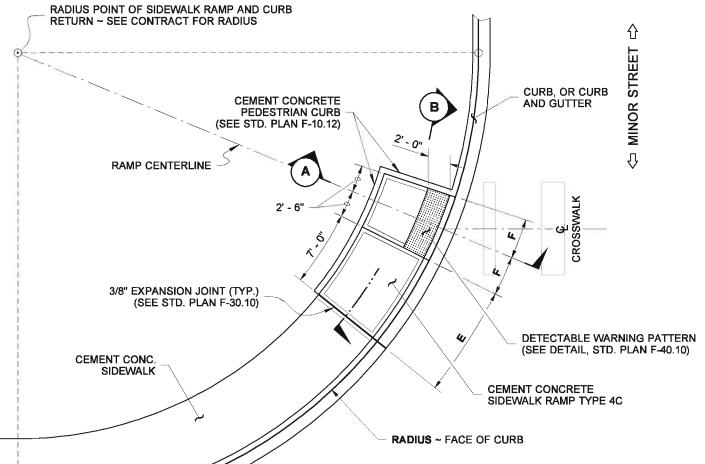
APPROVED FOR PUBLICATION

Ken L. Smith



ISOMETRIC VIEW

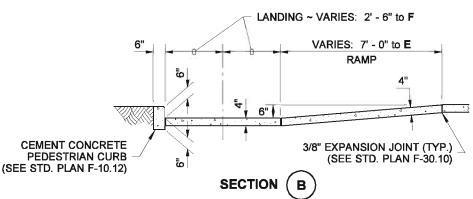
2008



PLAN VIEW SIDEWALK RAMP TYPE 4C LAYOUT 1

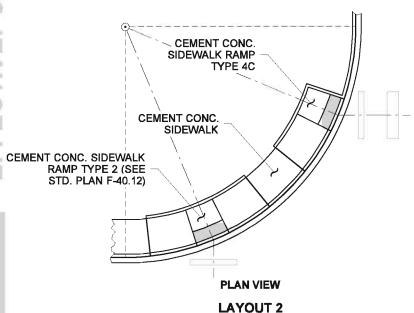
RADIUS AT FACE OF CURB	E	F		
20 FEET	10' - 4 3/4"	3' - 8 1/2"		
30 FEET	8' - 11 1/2"	3' - 2 1/4"		
40 FEET	8' - 4 1/2"	2' - 11 3/4"		
50 FEET	8' - 0 3/4"	2' - 10 1/4"		
60 FEET	7' - 10 1/4"	2' - 9 3/4"		
70 FEET	7' - 8 3/4"	2' - 9"		
80 FEET	7' - 7 1/2"	2' - 8 3/4"		
90 FEET	7' - 6 1/2"	2' - 8 1/4"		
100 FEET	7' - 6"	2' - 8"		
	DIMENSIONS AT FACE OF CURB			

INTERMEDIATE RADII CAN BE INTERPOLATED

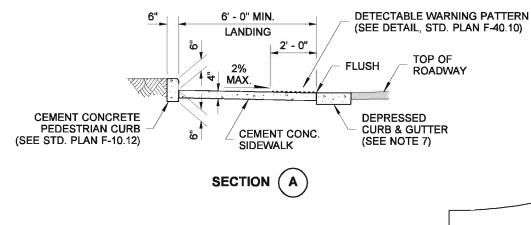


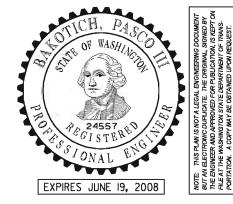
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. The ramp shown on this plan is ideal and assumes optimal roadway geometric design. It assumes a curb height of 6". Adjustments must be made for conditions in the field such as roadway grade, actual curb height, etc.
- 2. The maximum allowable ramp slope is 12H:1V (8.34% grade). The Federal Highway Administration (FHWA) does not accept sidewalk ramps with slopes steeper than 12H:1V. Flatter ramp slopes are permissable. Field verify the forms before pouring concrete.
- 3. To the maximum extent feasible, the ramp cross slope shall not exceed 2%
- 4. The bottom of the ramp shall have a level area (not in excess of 2% in any direction), 4' × 4'.
- 5. Avoid placing drainage structures, junction boxes or other obstructions in front of ramp access areas.
- 6. Layout 1 is used to provide access to a single crosswalk parallel to the major street. The bid item "Cement Conc. Sidewalk Ramp Type 4C" does not include the adjacent Curb (or Curb & Gutter), the Sidewalk, or the Cement Conc. Pedestrian Curb.
- 7. Curb & Gutter is shown, see the Contract Plans for the curb design specified. See Standard Plan F-10.12 for curb details.
- 8. See Standard Plan F-30.10 for Cement Concrete Sidewalk details, sections, etc.



SEE NOTE 6





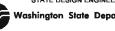
SIDEWALK RAMP TYPE 4C WITH LAYOUTS

STANDARD PLAN F-40.20-00

SHEET 1 OF 1 SHEET

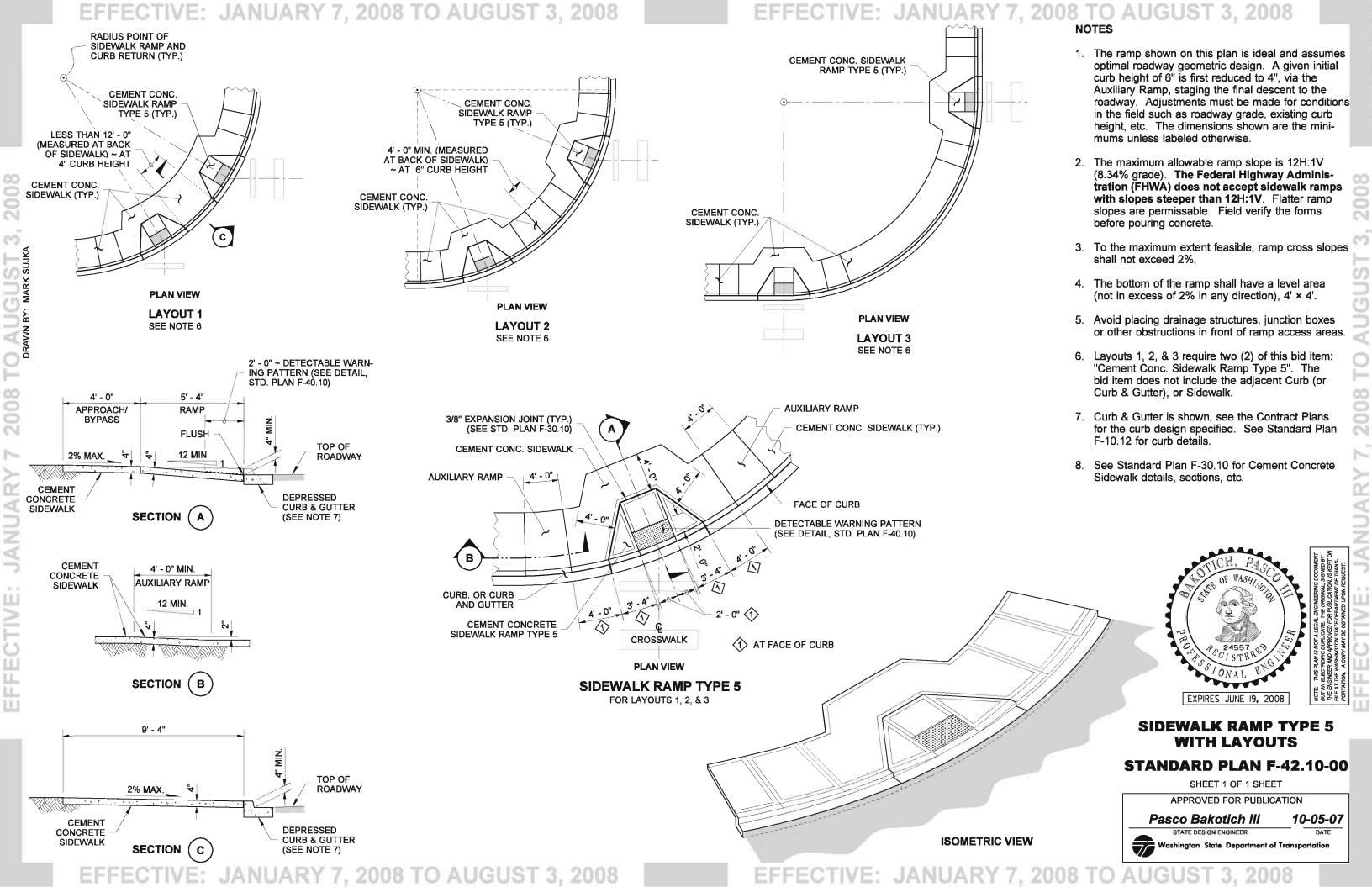
APPROVED FOR PUBLICATION

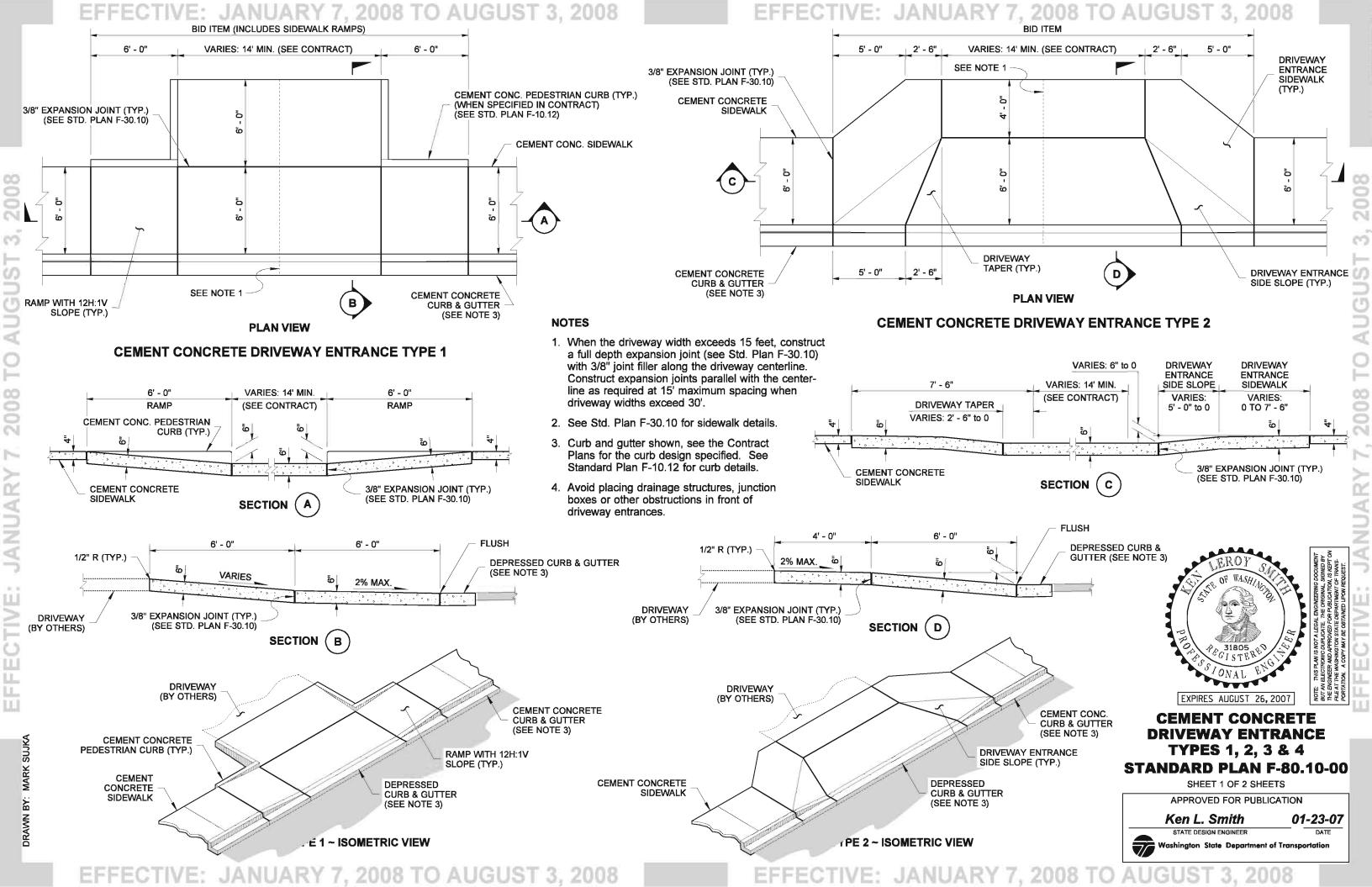


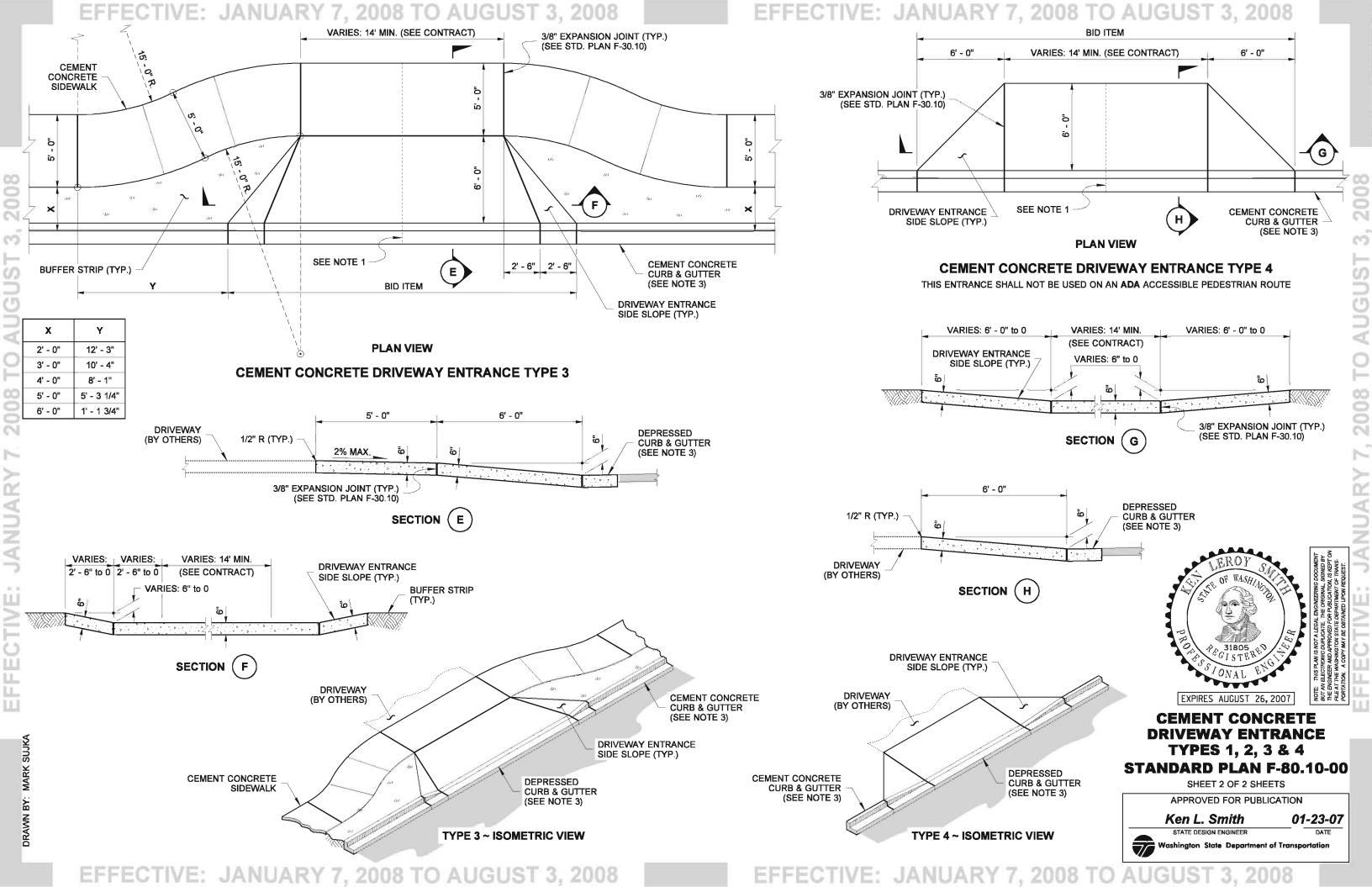


10-05-07

ISOMETRIC VIEW







SIGN WITH ONE SIGN LIGHTING LUMINAIRE

SIGN PANEL

LUMINAIRE

BRACKET

SIGN PANEL

Α	В	С
8'-0"	6"	3'-6"
10'-0"	6"	4'-6"
12'-0"	6"	5'-6"
14'-0"	1'-0"	6'-0"
16'-0"	2'-0"	6'-0"

SIGN WITH TWO SIGN LIGHTING LUMINAIRES

LUMINAIRE

BRACKETS

Α	В	С	D	Α	В	С	D
18'-0"	6"	3'-6"	5'-0"	26'-0"	6"	4'-6"	5'-4"
20'-0"	6"	3'-6"	6'-0"	28'-0"	6"	5'-6"	5'-4"
22'-0"	6"	3'-6"	4'-8"	30'-0"	1'-0"	6'-0"	5'-4"
24'-0"	6"	3'-6"	5'-4"	32'-0"	2'-0"	6'-0"	5'-4"

SIGN WITH THREE SIGN LIGHTING LUMINAIRES

Α	В	С	D	
34'-0"	6"	3'-6"	4'-4"	
36'-0"	6"	3'-6"	4'-8"	

SIGN PANEL

LUMINAIRE

BRACKETS

OVERHEAD SIGN MOUNTING DETAILS STANDARD PLAN G-9a

EXPIRES JUNE 29, 2004

EQUAL SPACES (2'-6" MIN. TO

3'-6" MAX.)

VERTICAL BRACES

3

4

4

EQUAL SPACES (2'-6" MIN. TO 3'-6" MAX.)

W4 X 13 (TYP.)

24'-0" 3'-0"

26'-0" 1'-0"

28'-0" 2'-0"

30'-0" 3'-0"

32'-0" 1'-0" 5 34'-0" 2'-0" 5 36'-0" 3'-0" 5

SHEET 1 OF 4 SHEETS

06-25-02

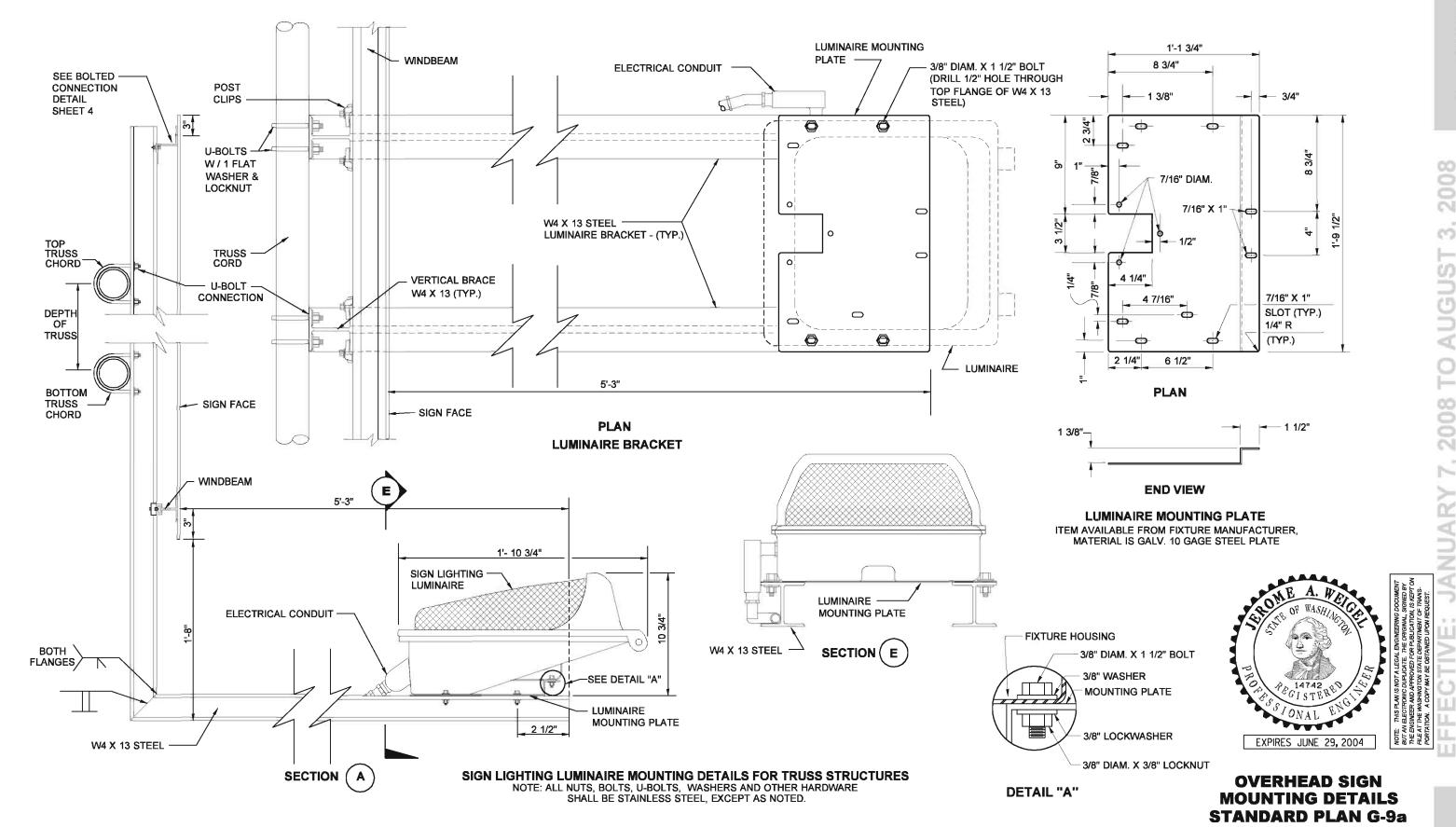
APPROVED FOR PUBLICATION

Harold J. Peterfeso



VERTICAL BRACE

W4 X 13 (TYP.)

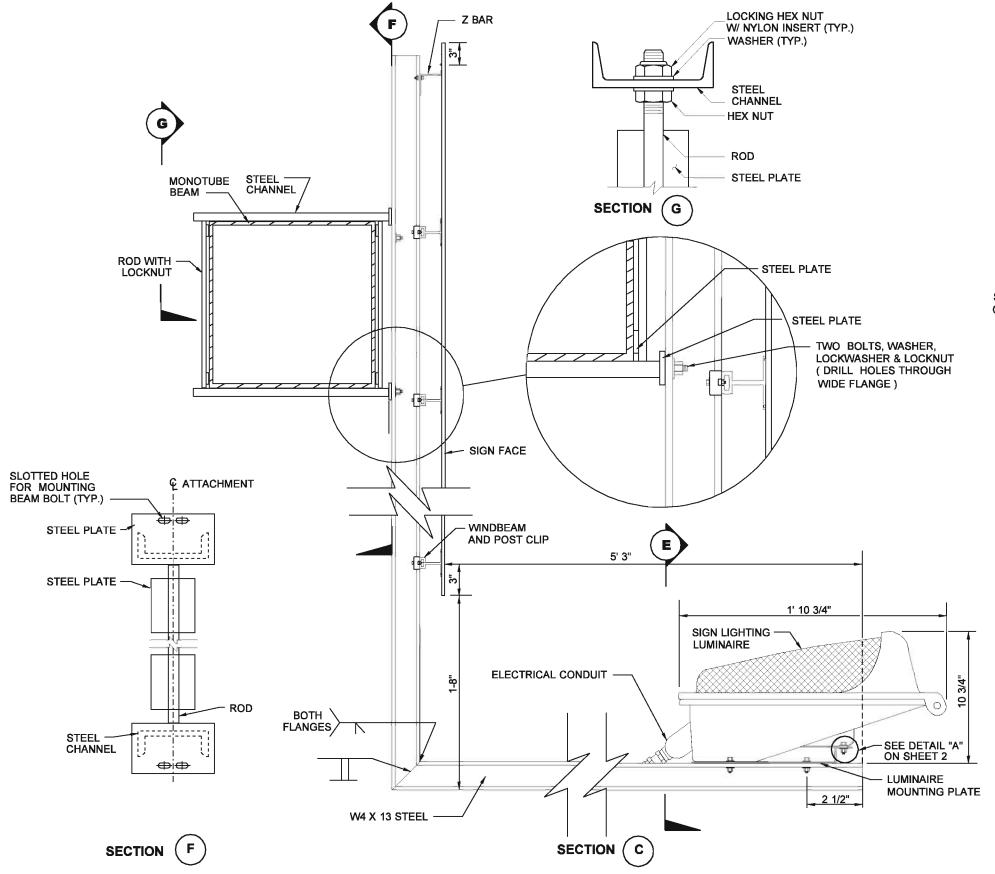


SHEET 2 OF 4 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 06-25-02

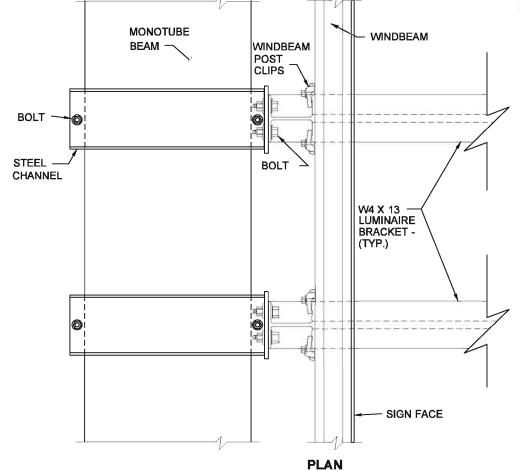




SIGN LIGHTING LUMINAIRE MOUNTING DETAILS FOR MONOTUBE STRUCTURES

NOTES

 Refer to Contract Plans for Monotube Beam Bracket element sizes, dimensions and weld symbols.



OVERHEAD SIGN MOUNTING DETAILS STANDARD PLAN G-9a

EXPIRES JUNE 29, 2004

8

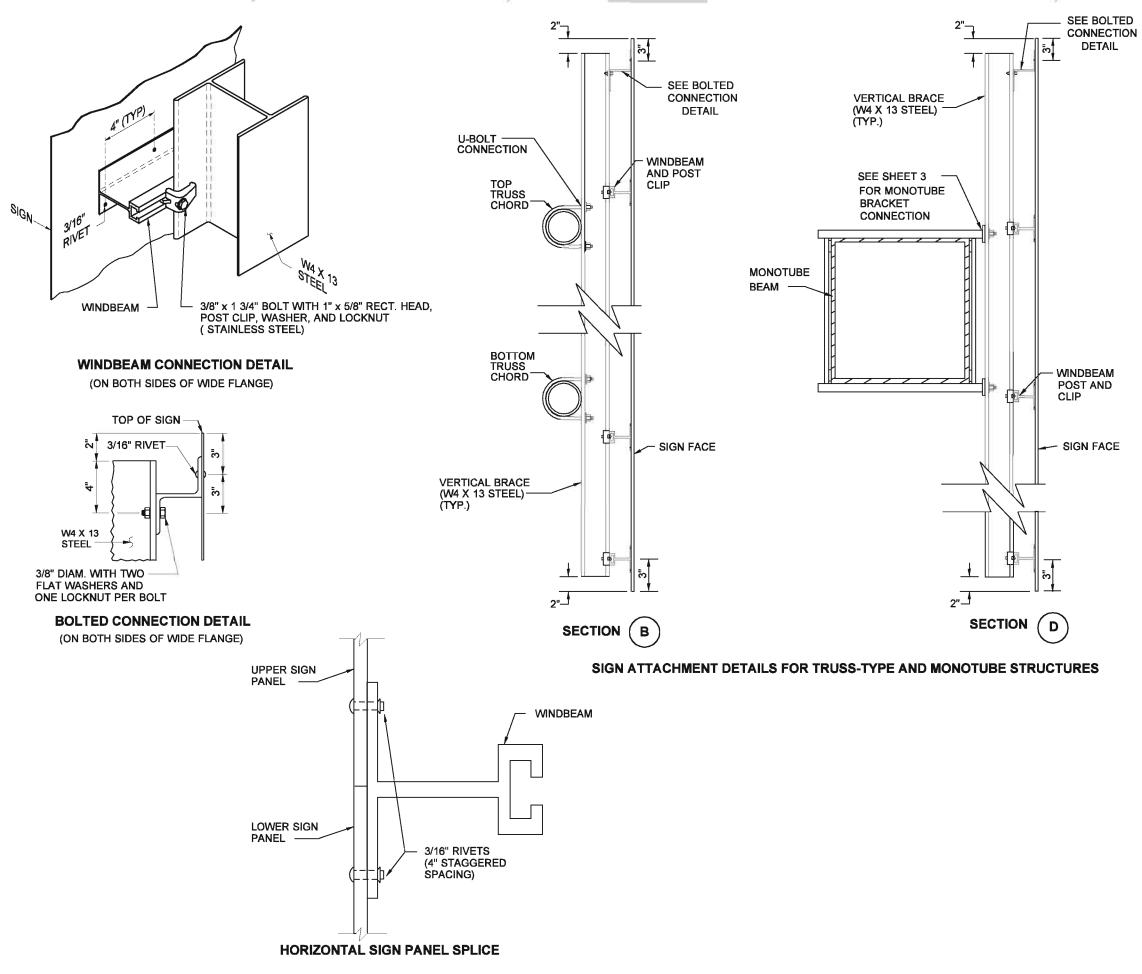
SHEET 3 OF 4 SHEETS

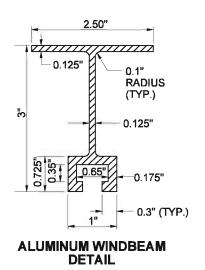
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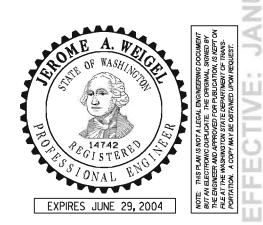
Harold J. Peterfeso 06-25-02

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

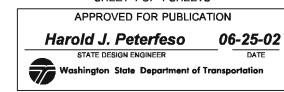


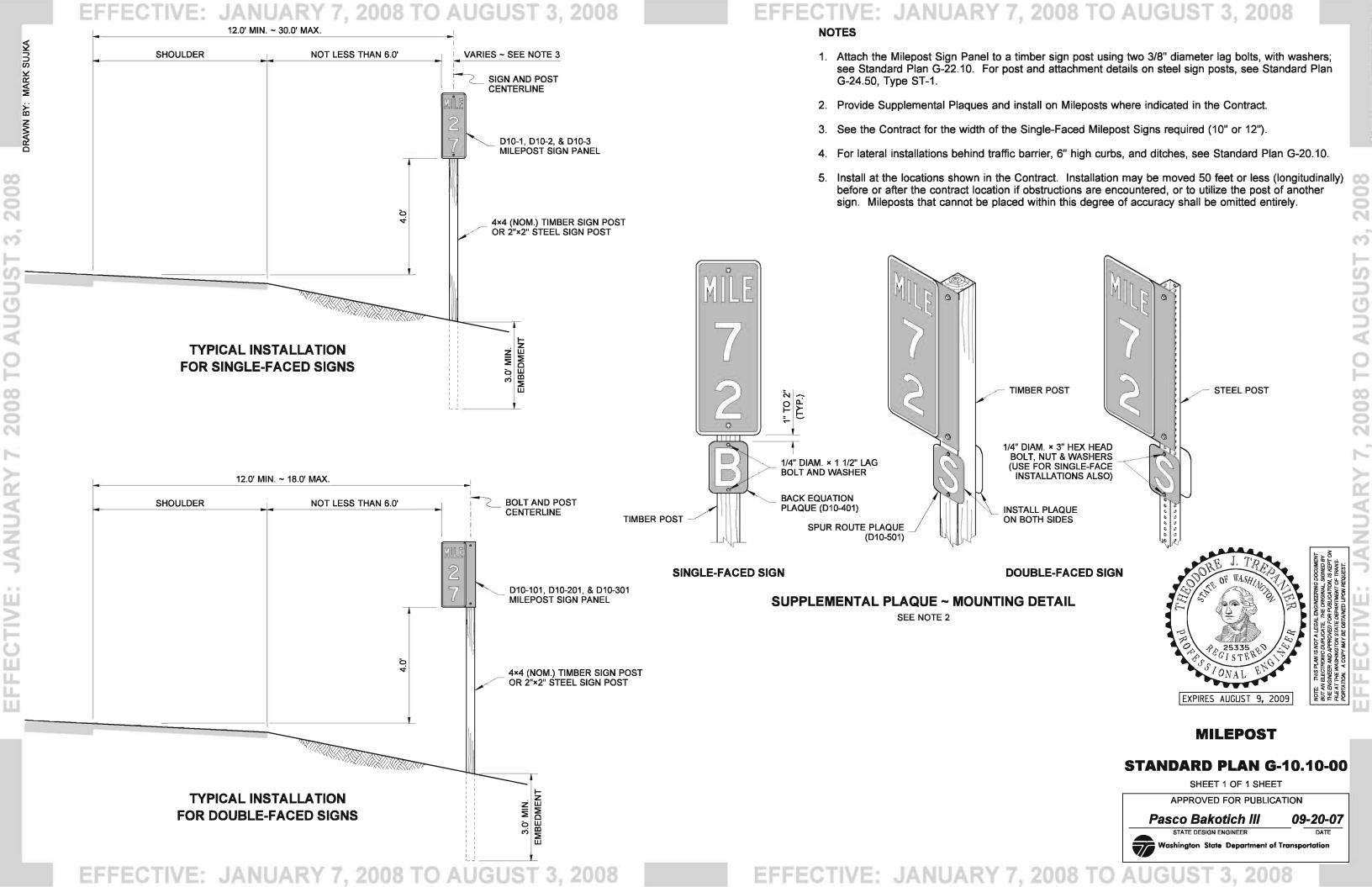


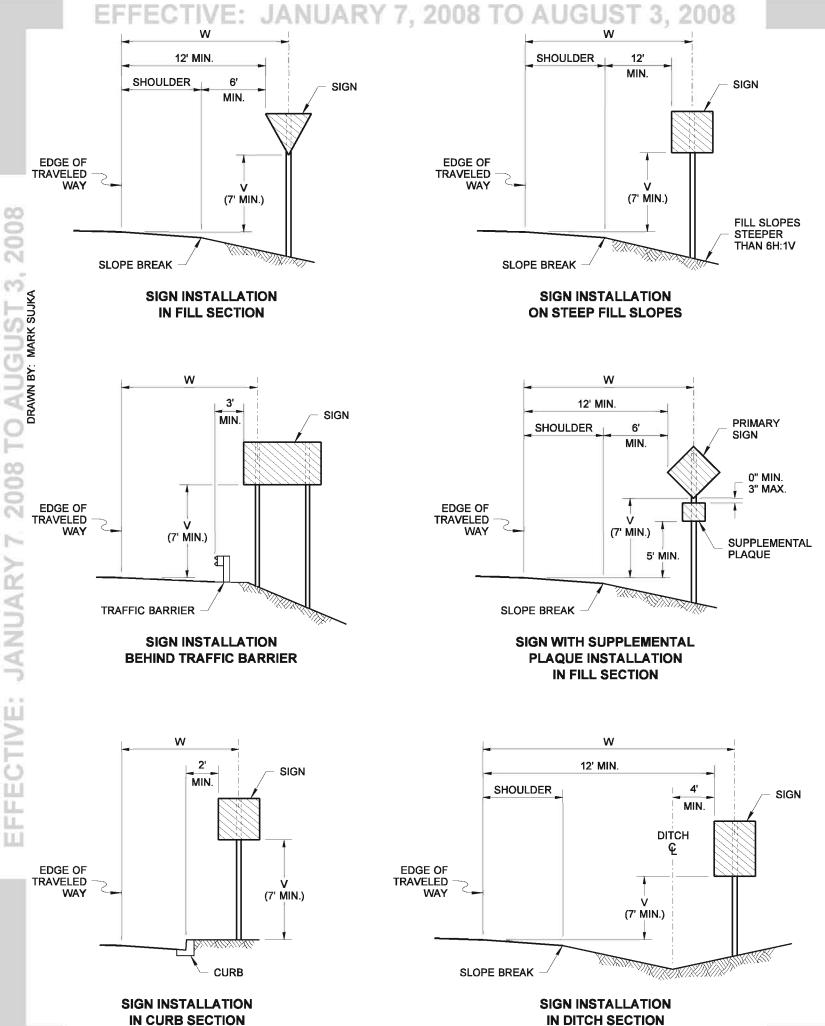


OVERHEAD SIGN MOUNTING DETAILS STANDARD PLAN G-9a

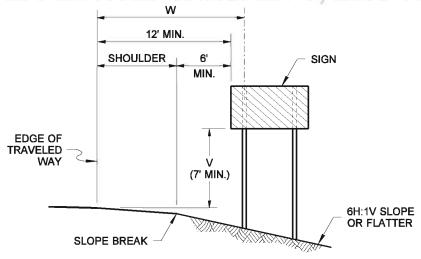
SHEET 4 OF 4 SHEETS



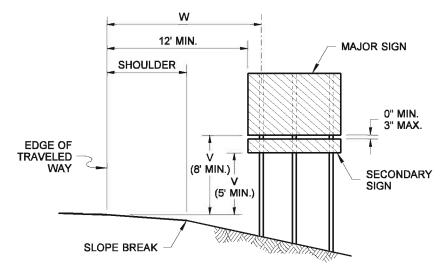




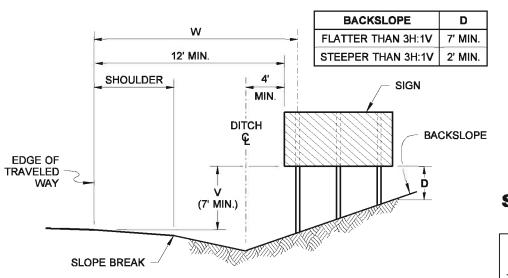
JANUARY 7, 2008 TO AUGUST 3, 2008



MULTIPLE SIGN POST INSTALLATION IN FILL SECTION



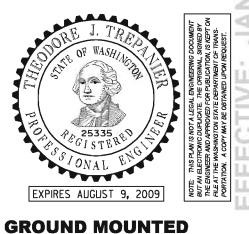
GUIDE OR DIRECTIONAL SIGN WITH SECONDARY SIGN INSTALLATION ON EXPRESSWAYS AND FREEWAYS



MULTIPLE SIGN POST INSTALLATION IN DITCH SECTION

NOTES

- 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' for signs located within the Design Clear Zone.



SIGN PLACEMENT STANDARD PLAN G-20.10-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION



2. 6×10, 8×10, and 6×12 Timber Sign Posts cannot be made breakaway and do not have holes or notches. These posts shall not be installed within the Design Clear Zone. They may be installed behind traffic barrier.

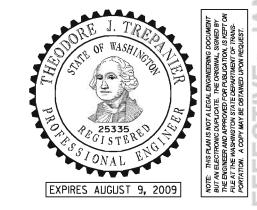
3. Signs with a width less than 12 feet and supported on three 6×6 or 6×8 posts shall not be installed within the Design Clear Zone. They may be installed behind traffic barrier.

4. Signs with a width less than 17 feet and supported on four 6×6 or 6×8 posts shall not be installed within the Design Clear Zone. They may be installed behind traffic barrier.

5. For "X", "Y", "H1", "H2", "H3", and "H4" refer to the Sign Specification Sheet in the Contract.

6. For 6×6 posts and larger, 7 feet minimum spacing is required between posts.

POST INSTALLATION TABLE						
POST SIZE (NOM.)	DEPTH	HOLE DIAMETER	NOTCH DEPTH (SEE NOTE 1)			
4×4	3' - 0"	NOT REQ'D	NOT REQ'D			
4×6	4' - 0"	1 1/2"	1 1/2"			
6×6	4' - 0"	2" SEE NOTE 3 & 4	2" SEE NOTE 3 & 4			
6×8	5' - 0"	3" SEE NOTE 3 & 4	3" SEE NOTE 3 & 4			
6×10	6' - 0"	SEE NOTE 2	SEE NOTE 2			
8×10	6' - 0"	SEE NOTE 2	SEE NOTE 2			
6×12	7' - 0"	SEE NOTE 2	SEE NOTE 2			



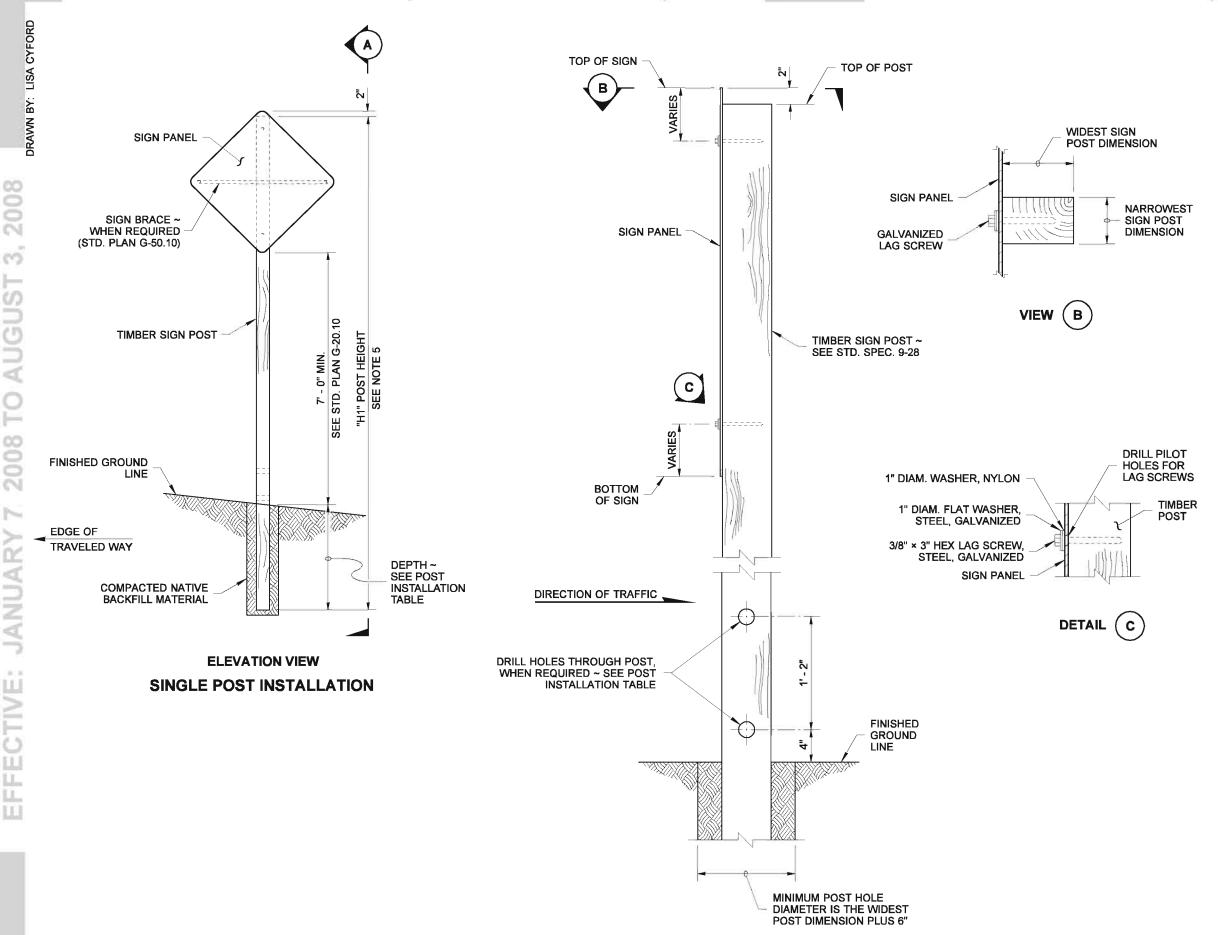
TIMBER SIGN SUPPORT

STANDARD PLAN G-22.10-00

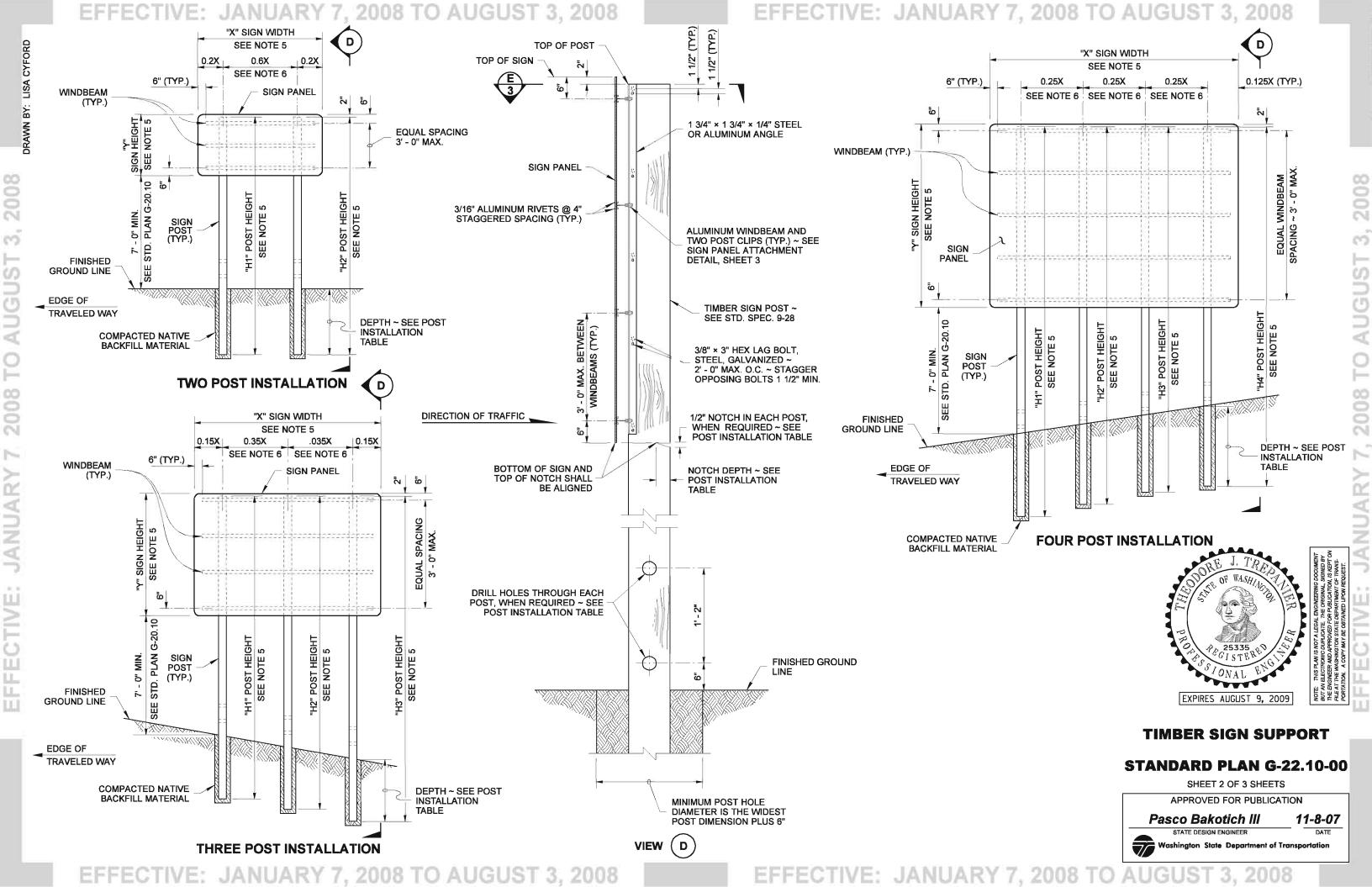
SHEET 1 OF 3 SHEETS

APPROVED FOR PUBLICATION





VIEW

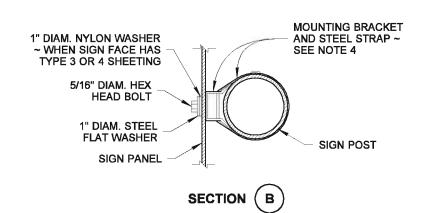


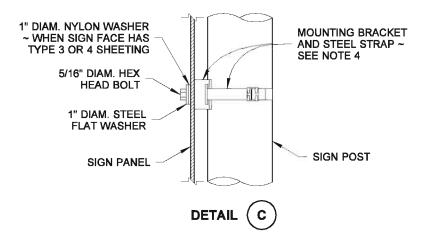
2008

TOP OF SIGN SIGN PANEL TOP OF SIGN POST SIGN BRACE ~ WHEN REQUIRED ITI SIGN PANEL SIGN POST В воттом OF SIGN 7' - 0" MIN. STD. PLAN G-20.10 C STEEL PIPE SIGN POST, DIAM. VARIES ~ SEE CONTRACT воттом OF SIGN **BREAKAWAY** SIGN POST **FINISHED** GROUND LINE

BOTTOM OF SIGN POST BRACKET

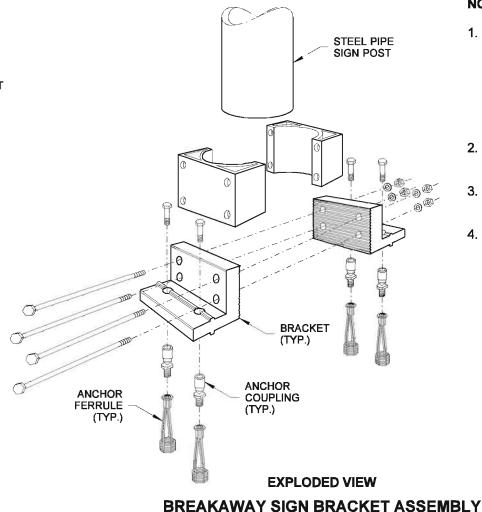




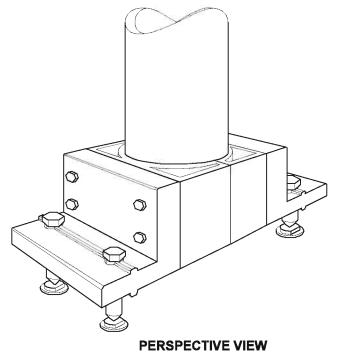


VIEW (A)

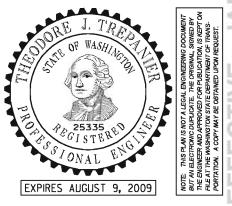
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



- 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 only shown on this plan to illustrate how the parts are assembled.
- 2. For Steel Sign Support Foundation, see Standard Plan G-25.10.
- 3. For "H1" refer to the Sign Specification Sheet in the Contract.
- 4. Mounting brackets with steel straps shall be the stainless steel one bolt, flared leg bracket and 3/4" wide, 0.030" thick strap "Band-it" products or an approved equal.



BREAKAWAY SIGN BRACKET ASSEMBLY



STEEL SIGN SUPPORT TYPE AP INSTALLATION DETAILS STANDARD PLAN G-24.10-00

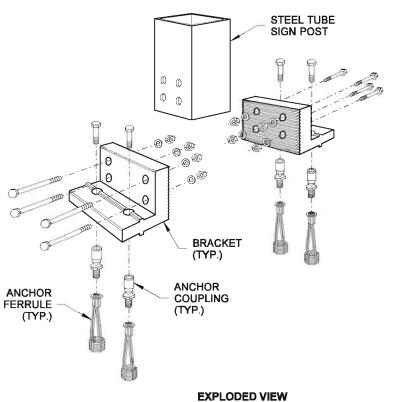
SHEET 1 OF 1 SHEET

11-8-07

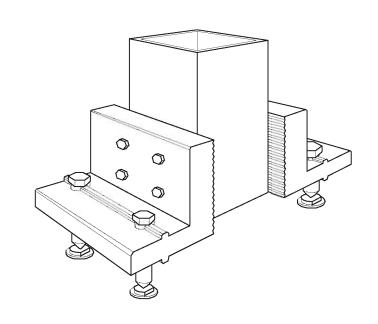
APPROVED FOR PUBLICATION



- 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 only shown on this plan to illustrate how the parts are assembled.
- 2. For Steel Sign Support Foundations, see Standard Plan G-25.10.
- 3. For "H1" refer to the Sign Specification Sheet in the Contract.







PERSPECTIVE VIEW **BREAKAWAY SIGN BRACKET ASSEMBLY**

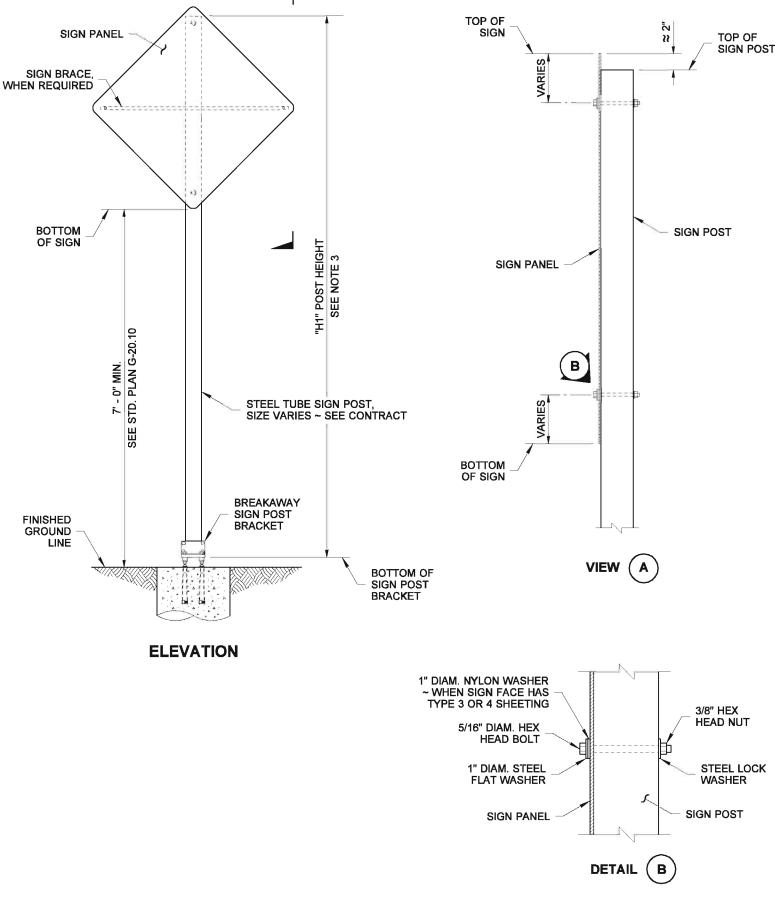


STEEL SIGN SUPPORT TYPE AS INSTALLATION DETAILS STANDARD PLAN G-24.20-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

11-8-07 Pasco Bakotich III



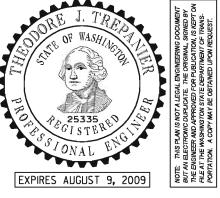
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** В TOP OF SIGN TOP OF SIGN "X" SIGN WIDTH TOP OF SIGN POST SEE NOTE 3 6" MAX. PIPE CLAMP PIPE CLAMP (TYP.) T-BAR SIGN ™AX MAX SUPPORT SIGN PANEL T-BAR SIGN STEEL PIPE CAP SIGN HEIGHT SUPPORT assembled. STEEL PIPE 3" (TYP.) CAP (TYP.) 1/2" DIAM. × 5 1/2" HEX BOLT, NUT SIGN BRACE ~ WHEN REQUIRED 2008 **AND 2 WASHERS** 1" POST HEIGHT SEE NOTE 3 SIGN SIGN PANEL SIGN PANEL воттом PIPE CLAMP воттом PANEL OF SIGN OF SIGN (TYP.) C 7' - 0" MIN. STD. PLAN G-20.10) AUGUST C

> FINISHED GROUND

> > LINE

- 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 only shown on this plan to illustrate how the parts are
- 2. For Steel Sign Support Foundations, see Standard Plan G-25.10.
- 3. For "X", "Y", "H1", and "H2", refer to the Sign Specification Sheet in the Contract.
- 4. Sign post shall be 2 1/2" nominal I.D. galvanized schedule 80 steel pipe.
- 5. Do not tighten any slip plate bolt to the recommended torque before pre-tightening the other bolts. Progressively tighten the three slip plate bolts in 10 ft-lbs increments, alternately, to a final torque of 38 ft-lbs on each

SLIP BASE **DIRECTION OF TRAFFIC**



STEEL SIGN SUPPORT TYPES PL, PL-T, & PL-U **INSTALLATION DETAILS** STANDARD PLAN G-24.30-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

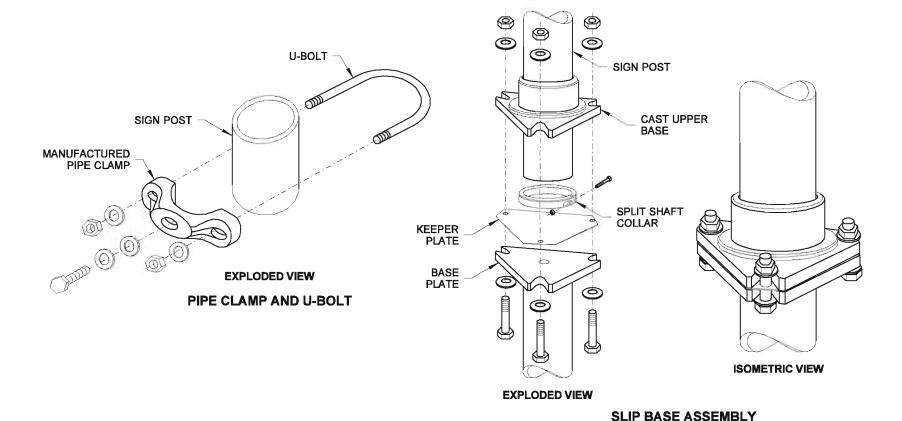
11-8-07 Pasco Bakotich III

STATE DESIGN ENGINEER



VIEW (A

SIGN POST



SIGN POST ~ SEE NOTE 4

SLIP BASE **ASSEMBLY**

JANUARY 7, 2008 TO AUGUST

SIGN POST ~

SEE NOTE 4

SLIP BASE

ASSEMBLY

воттом

OF SIGN

BOTTOM OF

UPPER SLIP

5/16" DIAM. HEX **NUT & WASHER**

MANUFACTURED

SIGN POST

(c)

DETAIL

5/16" U-BOLT

PIPE CLAMP

PLATE

(SEE

FINISHED

GROUND LINE

NYLON WASHER ~ WHEN SIGN FACE HAS TYPE

STEEL FLAT WASHER

5/16" DIAM. HEX

HEAD BOLT

SIGN PANEL

3 OR 4 SHEETING

SIGN POST ~

SEE NOTE 4

(B)

VIEW

BOTTOM

OF SIGN

BOTTOM OF

UPPER SLIP

PLATE

A, B, C, & F, MAY BE INTERPOLATED FOR INTERMEDIATE SIGN SIZES

DETAIL (E)

2008

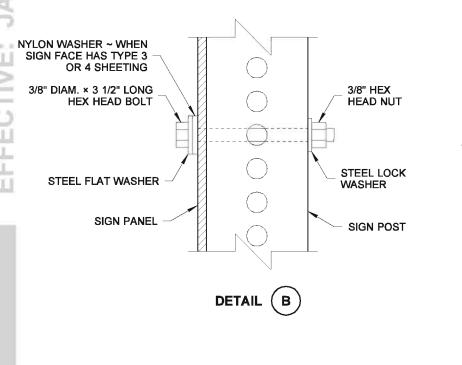
Pasco Bakotich III

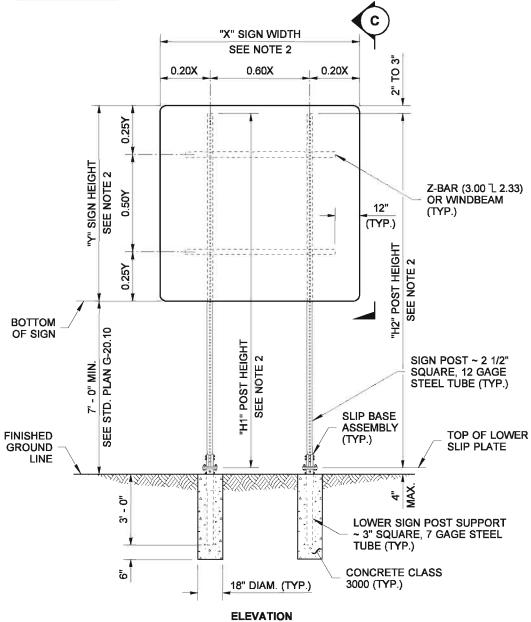
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

TOP OF SIGN SIGN PANEL TOP OF SIGN POST SIGN BRACE ~ WHEN REQUIRED **VARIES** " POST HEIGH SEE NOTE 2 3/8" DIAM. HEX HEAD BOLT, NUT AND WASHERS (TYP.) SIGN POST воттом OF SIGN SIGN PANEL SIGN POST ~ 2 1/2" SQUARE, 12 GAGE STEEL TUBE SLIP BASE ASSEMBLY В **FINISHED** TOP OF LOWER SLIP PLATE GROUND LINE VARIES-LOWER SIGN POST SUPPORT ~ 3" SQUARE, BOTTOM 7 GAGE STEEL TUBE OF SIGN **CONCRETE CLASS 3000** 18" DIAM. (A)VIEW **ELEVATION**

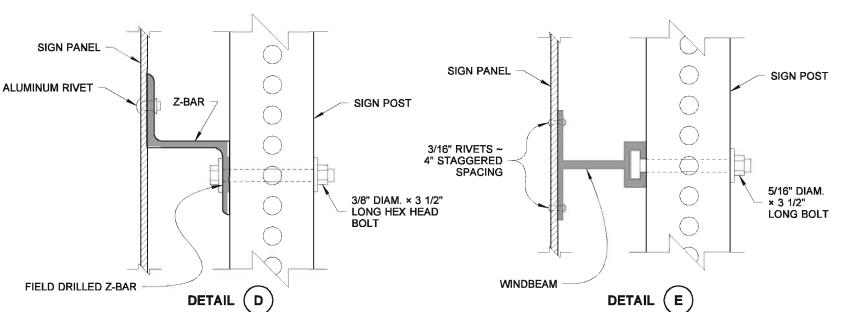
TYPE SB-1 & SB-2 SIGN SUPPORT

2008





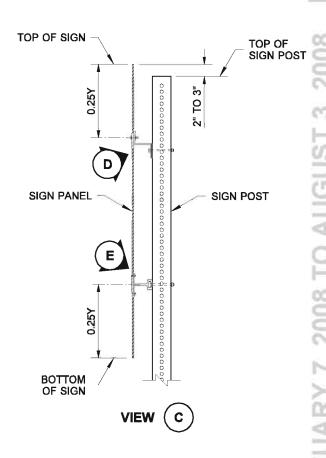
TYPE SB-1 & SB-2 SIGN SUPPORT DUAL POST INSTALLATION

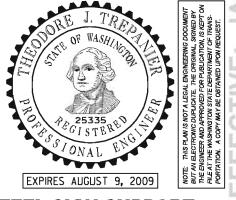


NOTES

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

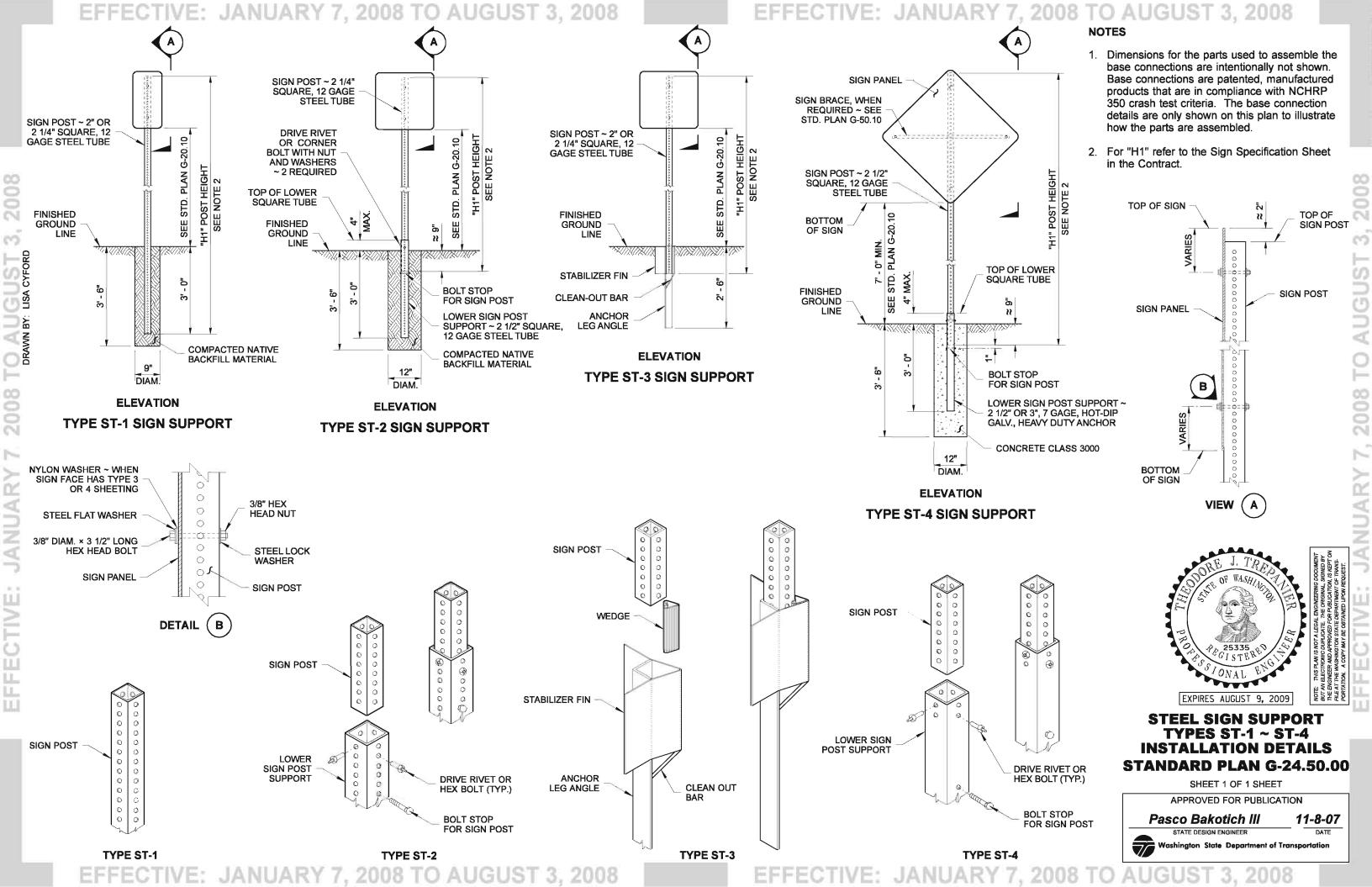
- 1. For "W", Horizontal distance from edge of traveled way to center of nearest post, and "V", Vertical distance from edge of traveled way to bottom of sign, see Standard Plan G-20.10.
- 2. For "X", "Y", "H1", "H2", "H3", and "H4" refer to the Sign Specification Sheet in the Contract.





STEEL SIGN SUPPORT TYPES SB-1 & SB-2 **INSTALLATION DETAILS STANDARD PLAN G-24.40-00**





EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 "X" SIGN WIDTH "X" SIGN WIDTH SEE NOTE 3 SEE NOTE 3 1. Dimensions for the parts used to assemble the base connections 0.20X 0.60X 0.20X are intentionally not shown. Base connections are patented, 0.35X 0.35X Z-BAR ~ 3.00 L 2.33 Z-BAR ~ 3.00 \(\mathbb{2}\).33 manufactured products that are in compliance with NCHRP 350 6" (TYP.) 6" (TYP.) crash test criteria. The base connection details are only shown 6" (TYP.) 6" (TYP.) SIGN on this plan to illustrate how the parts are assembled. PANEL **PANEL** SEE NOTE 3 2. For Steel Sign Support Foundations, see Standard Plan G-25.10. 3. For "X", "Y", "H1", "H2", and "H3", refer to the Sign Specification **EQUAL SPACING** @ 3' - 0" MAX. Sheet in the Contract. WINDBEAM HINGE WIDE FLANGE PLATE (TYP.) STEEL SIGN POST I" POST HEIGHT SEE NOTE 3 **WINDBEAM** W6 × 12 STEEL SIGN POST (TYP.) **PLATE EDGE OF** (A (TYP.) POST HEIGHT SEE NOTE 3 TRAVELED WAY POST HEIC SIGN POST STEEL SIGN POST ~ BRACKET (TYP.) (W6 x 12 THROUGH **ELEVATION** EDGE OF W10 x 26 ~ SEE TRAVELED WAY CONTRACT) TYPE TP-A OR TP-B SIGN SUPPORT **BRACKET ANCHOR** COUPLING **BOTTOM OF** SIGN POST TOP OF SIGN **ANCHOR** BRACKET (TYP.) TOP OF FERRULE **ELEVATION EXPLODED VIEW** (TYP.) **TYPE TP-B SIGN SUPPORT TYPE TP-B BASE** (c` ALUMINUM WIND BEAM AND TWO POST CLIPS (TYP.)
~ SEE WINDBEAM AND SIGN SIGN PANEL WIDE FLANGE POST CONNECTION STEEL SIGN POST 3/16" ALUMINUM RIVETS @ 4" STAGGERED SPACING (TYP.) SPACING 0" MAX. WIDE FLANGE STEEL SIGN POST ~ SEE CONTRACT FOR SIZE EXPIRES AUGUST 9, 2009 EQUAL @ 3'-**3** 0 STEEL SIGN SUPPORT **3** 0 **TYPES TP-A AND TP-B** 0 **INSTALLATION DETAILS BRACKET STANDARD PLAN G-24.60-00** ANCHOR COUPLING воттом OF SIGN **BREAKAWAY** SHEET 1 OF 2 SHEETS (TYP.) HINGE PLATES APPROVED FOR PUBLICATION **EXPLODED VIEW** 11-8-07 Pasco Bakotich III **ANCHOR VIEW** Α PERSPECTIVE VIEW **PERSPECTIVE VIEW FERRULE TYPE TP-A BASE TYPE TP-A BASE TYPE TP-B BASE**

WIDE FLANGE STEEL SIGN POST

EXPIRES AUGUST 9, 2009

STEEL SIGN SUPPORT

TYPES TP-A AND TP-B INSTALLATION DETAILS

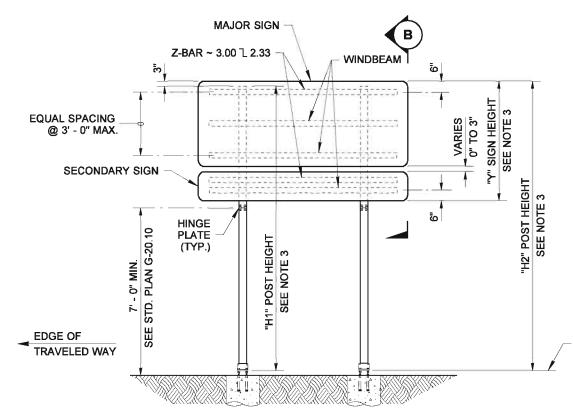
STANDARD PLAN G-24.60-00

SHEET 2 OF 2 SHEETS

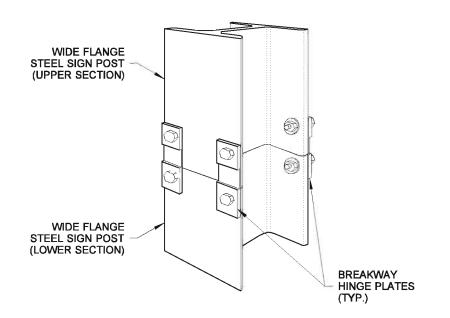
APPROVED FOR PUBLICATION

Pasco Bakotich III

11-8-07

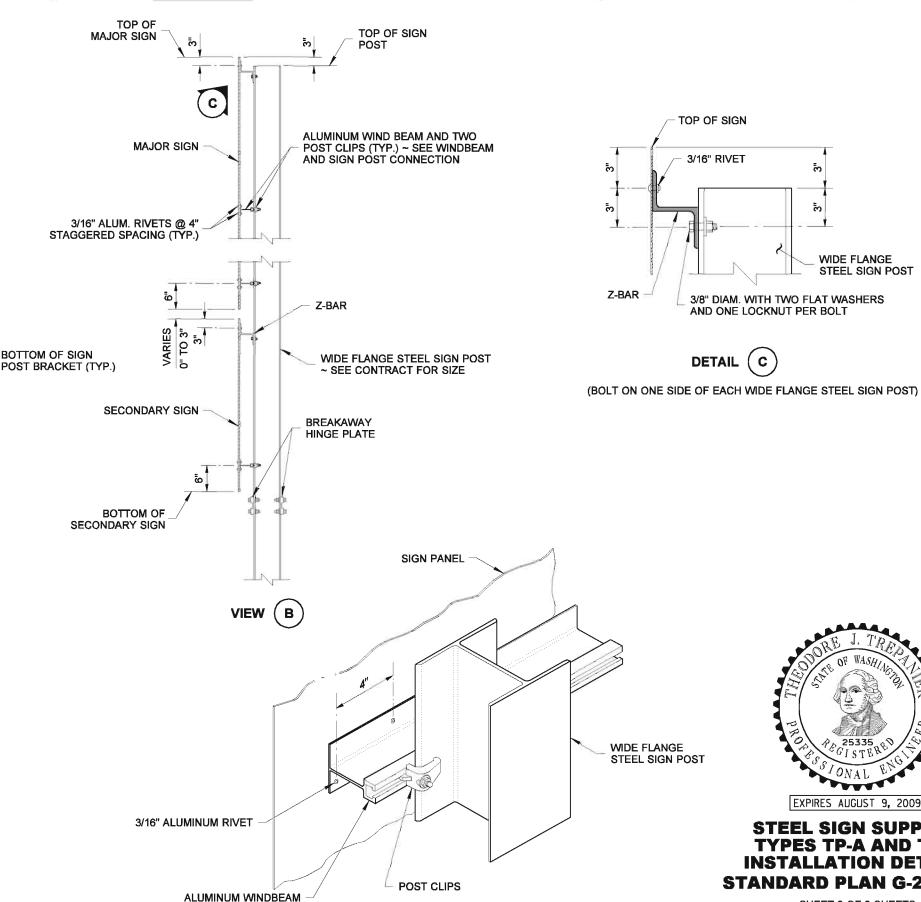


ELEVATION MAJOR AND SECONDARY SIGN SUPPORT INSTALLATION



PERSPECTIVE VIEW

BREAKAWAY HINGE PLATE CONNECTION



ISOMETRIC VIEW

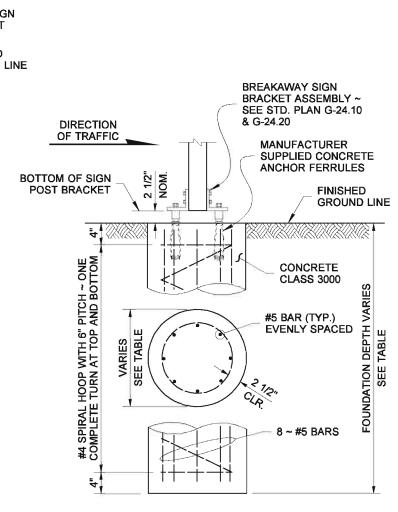
WINDBEAM AND SIGN

POST CONNECTION (ATTACH POST CLIPS ON BOTH SIDES OF WIDE FLANGE STEEL SIGN POST)

ELEVATION VIEW

TYPE TP-A & TYPE TP-B FOUNDATION

TYPE TP-A & TP-B FOUNDATION TABLE						
POST	SIZE	MAX	. XYZ	VERTICAL	FDN. (1)	
ASTM A 36	ASTM A 992	2 POST	3 POST	REBAR	DEPTH ₩	
W6 x 12	W6 x 9	1570	2355	8~#5	4' - 0"	
W6 x 16	W6 x 12	2340	3510	8~#5	5' - 0"	
W8 x 21	W8 x 18	4120	6180	8~#6	7' - 0"	
W10 x 26	W10 x 22	6320	9480	8~#7	8' - 0"	
W12 x 30	W12 x 26	8700		8~#7	9' - 0"	



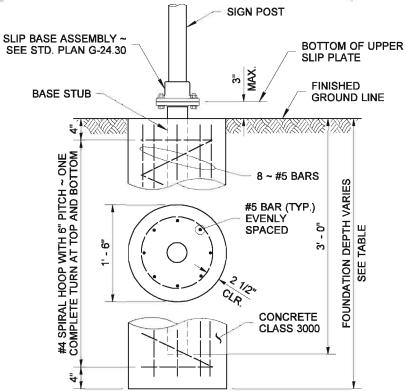
ELEVATION VIEW

TYPE AS & TYPE AP FOUNDATION

TYPE AS FOUNDATION TABLE (SEE NOTE 1)					
POST SIZE	MAX. XYZ	FDN. DIAM.	FDN. DEPTH 🕦		
4" SQ.	250	18"	4' - 0"		
· · · · · · · · · · · · · · · · · · ·					

TYPE AP FOUNDATION TABLE					
POST SIZE	MAX. XYZ	FDN. DIAM.	FDN. DEPTH (1)		
3" O.D.	225	18"	3' - 6"		
3 1/2" O.D.	250	18"	4' - 0"		
4" O.D.	275	24"	4' - 0"		
4 1/2" O.D.	300	24"	4' - 0"		

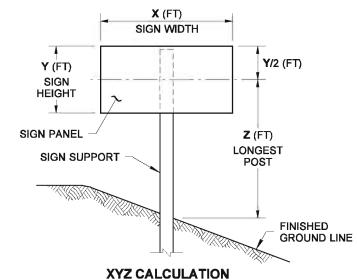
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



ELEVATION VIEW

TYPE PL, TYPE PL-T & TYPE PL-U FOUNDATION

TYPE PL, TYPE PL-T & TYPE PL-U FOUNDATION TABLE				
MAX. XYZ	FDN. DEPTH			
225	3' - 6"			
265	4' - 0"			
300	4' - 6"			
600 ②	4' - 6"			



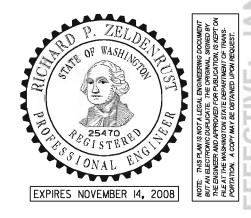
XYZ (FT³) = X × Y × Z
USED TO DETERMINE POST SIZE
~ SEE FOUNDATION TABLES

NOTES

- Per TRANSPO: 5" to 8" square posts require TP-B foundations. Foundation diameter and depth shall be verified with the Bridge office.
- Install conduit for post-mounted Junction Box in the concrete foundation, when required. See Standard Plan J-12, Sheet 2.

KEY NOTES

- Foundation depths based on allowable lateral bearing pressure in excess of 2500 PSF.
- Two post installation.



STEEL SIGN SUPPORT FOUNDATIN DETAILS

STANDARD PLAN G-25.10-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III 1

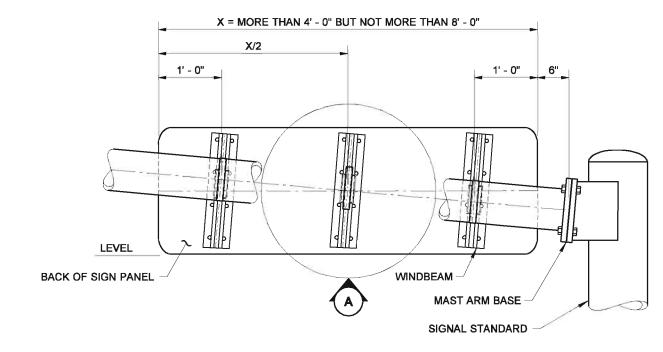


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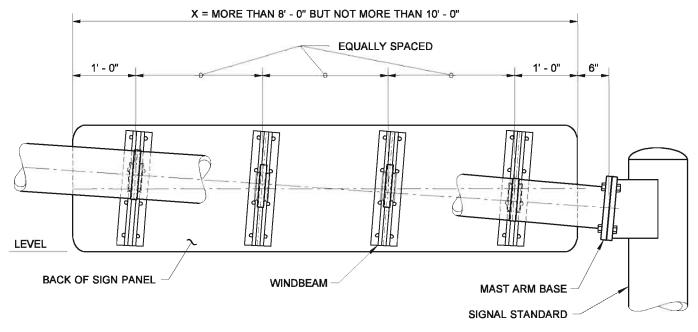
11-8-07

X = 4' - 0" OR LESS X/4 X/4 LEVEL **BACK OF SIGN PANEL** MAST ARM BASE WINDBEAM

SIGNAL STANDARD



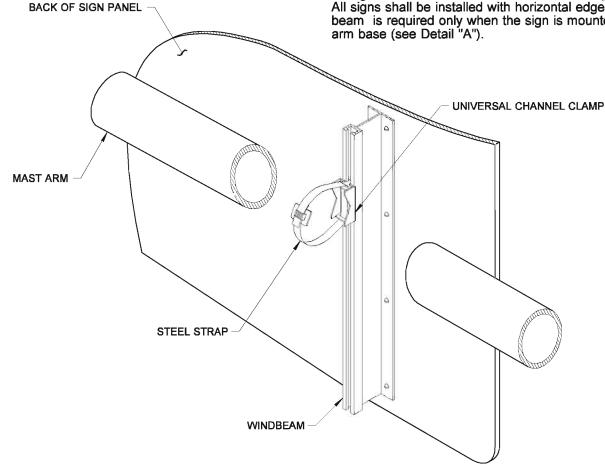
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



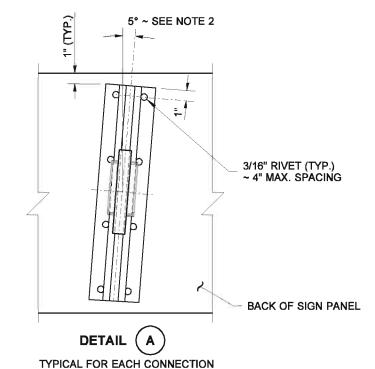
MAST ARM MOUNTED STREET NAME SIGNS

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- Mounting brackets with steel straps shall be a stainless steel band and buckle system product or an approved equal. Mounting brackets shall be universal channel clamps; steel straps shall be 3/4" wide and 0.030" thick.
- All signs installed on mast arms or standards (poles) require windbeams.
 All signs shall be installed with horizontal edges level. A skewed windbeam is required only when the sign is mounted within 12" of the mast arm base (see Detail "A").



TYPICAL MAST ARM INSTALLATION





SIGN INSTALLATION ON SIGNAL AND LIGHT STANDARDS STANDARD PLAN G-30.10-00

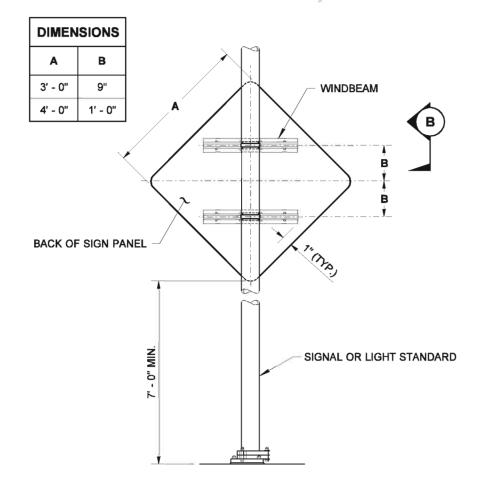
SHEET 1 OF 2 SHEETS

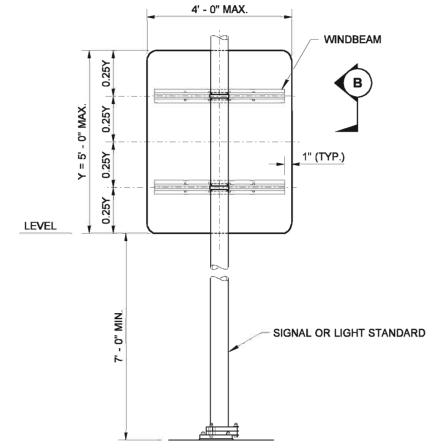
APPROVED FOR PUBLICATION

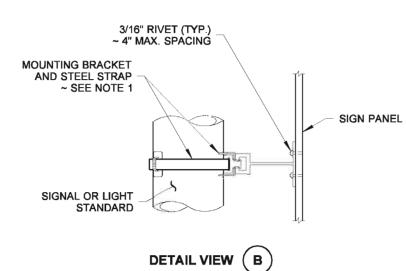


11-8-07

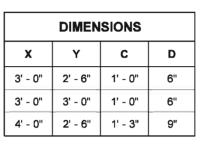
Pasco Bakotich III

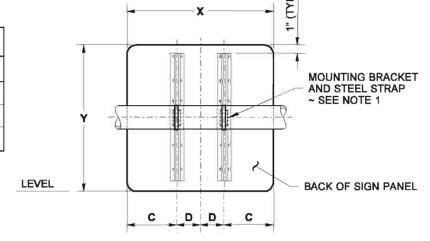




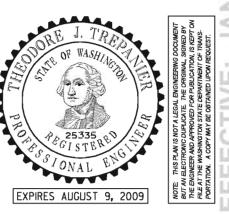


SIGN INSTALLATION ON SIGNAL OR LIGHT STANDARD





MAST ARM MOUNTED LANE USE SIGNS



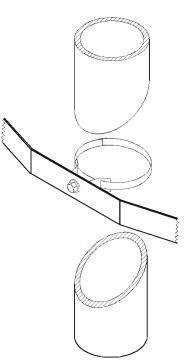
SIGN INSTALLATION ON SIGNAL AND LIGHT STANDARDS STANDARD PLAN G-30.10-00

SHEET 2 OF 2 SHEETS



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 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" wide and 0.030" thick.
- 2. Sign braces are only installed 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 3 or 4 sheeting.



MOUNTING BRACKET AND STEEL STRAP DETAIL





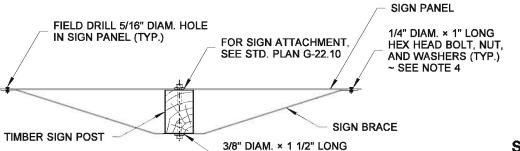
SIGN BRACING

STANDARD PLAN G-50.10-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION Pasco Bakotich III

11-8-07



PLAN

LAG SCREW AND WASHERS

œ

NUA

SIGN BRACE ON STEEL PIPE

SIGN BRACE HEX HEAD BOLT, NUT, AND WASHERS (TYP.) STEEL TUBE SIGN POST

FIELD DRILL 5/16" DIAM. HOLE

IN SIGN PANEL (TYP.)

PLAN

SIGN PANEL 1/4" DIAM. × 1" LONG FOR SIGN ATTACHMENT, FIELD DRILL 5/16" DIAM. HOLE HEX HEAD BOLT, NUT, STEEL PIPE SEE STD. PLAN G-30.10 IN SIGN PANEL (TYP.) AND WASHERS (TYP.) SIGN POST ~ SEE NÒTE 4 SIGN BRACE 5/16" DIAM. HEX HEAD MOUNTING BRACKET **BOLT AND WASHERS** AND STEEL STRAP ~ SEE NOTE 1

PLAN

SIGN

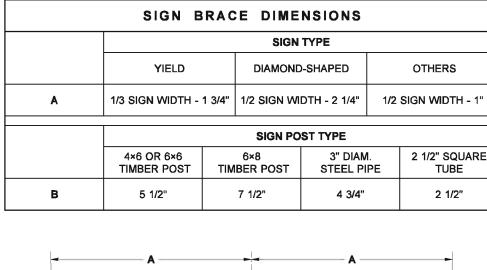
FOR SIGN ATTACHMENT,

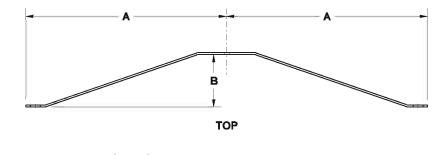
1/4" DIAM. × 1" LONG

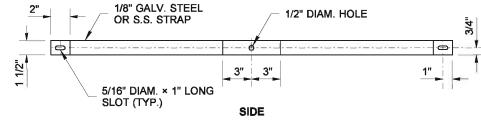
~ SEE NOTE 4

SEE STD. PLAN G-24.50

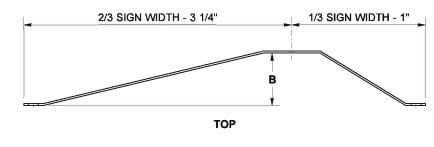
PANEL

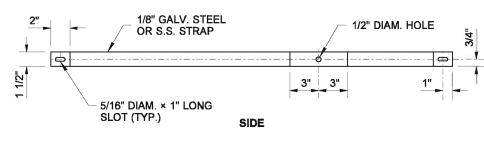




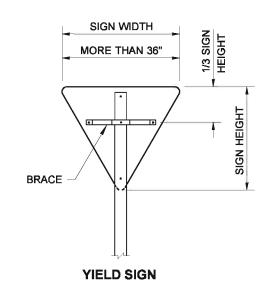


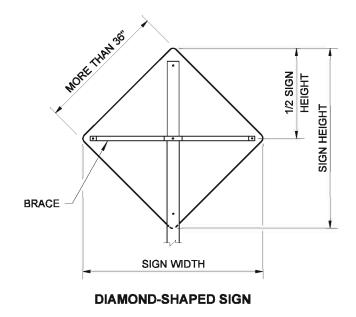
SIGN BRACE DETAIL

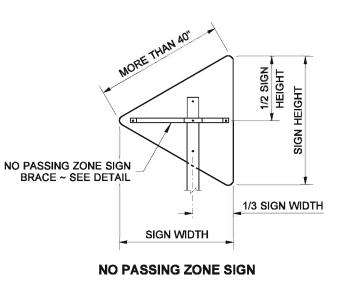


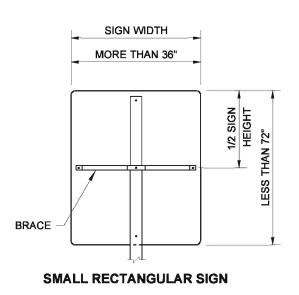


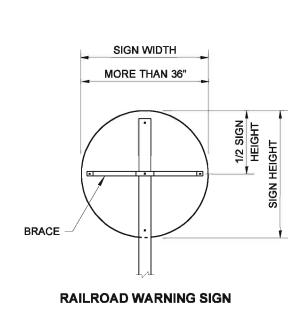
NO PASSING ZONE SIGN BRACE DETAIL

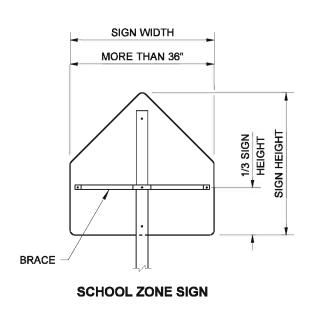




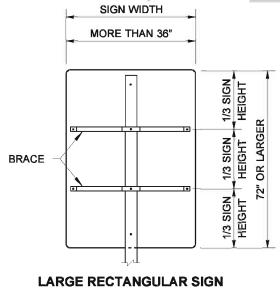




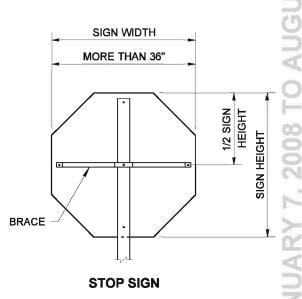


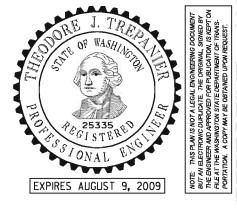






2008





STANDARD PLAN G-50.10-00

SIGN BRACING

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Pasco Bakotich III 11-8-07

STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

FECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

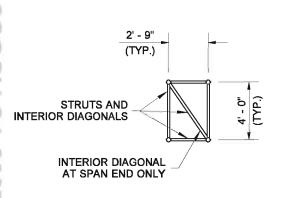
0 MIN. TO

POST SELECTION				
TOTAL SIGN AREA	POST	SIZE		
Σ (X TIMES Y) (FT²)	O.D.	WALL		
50 OR LESS	18"	0.438"		
50+ to 100	18"	0.438"		
100+ to 150	24"	0.375"		
150+ to 200	24"	0.375"		
200+ to 250	24"	0.375"		
250+ to 300	24"	0.375"		
300+ to 350	24"	0.438"		
350+ to 400	24"	0.500"		

CHORDS TRUSS "LOWER" HORIZONTAL DIAGONAL (TYP.) HORIZONTAL STRUTS AT SPAN END ONLY TRUSS "UPPER" HORIZONTAL TOP DIAGONAL (TYP.)

1 SUM OF SIGN FOR DOUBLE CANTILEVER

2008



END

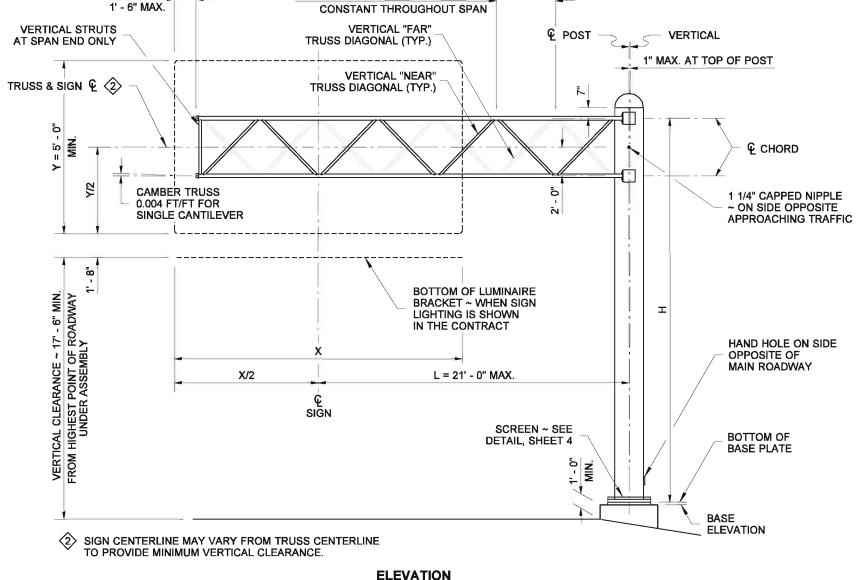
ALL TRUSS DIAGONALS AND STRUTS SHALL BE 1 1/2" PIPE (0.145" WALL)

MATERIAL SPECIFICATIONS ASTM A 36 (CHORDS, OR ASTM A 53 GRADE B, DIAGONALS STRUTS AND TYPE E OR S, OR POSTS) A 500 GRADE B **PLATES** ASTM A 36 ASTM A 36 **SHAPES ASTM A 992** STD. SPEC. BOLTS, NUTS. 9-06.5(3) & WASHERS PIPE, PLATE & SHAPE AASHTO M 111 **GALVANIZING**

AASHTO M 232

FASTENER

GALVANIZING

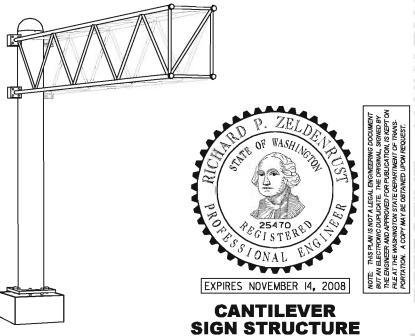


SINGLE CANTILEVER SIGN STRUCTURE

PANEL LENGTH (4' - 3" MAX.) TO BE

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES**

- 1. Vertical and horizontal clearance requirements shall be as shown on the contract plans.
- 2. No post splices permitted in lower third of height, nor closer than 3' - 0" to bottom chord, except as otherwise noted. No chord shop splices permitted in first two-thirds of the span, except as otherwise noted. A maximum of two splices are permitted in the post. For post or chord shop splice details, see Standard Plan G-70.10.
- 3. The back-up plates or rings for all full penetration welds shall be welded continuously to the joined pieces. This can be done by either a continuous fillet weld on the back side of the piece, or by a continuous weld in the root of the full penetration weld.
- 4. All bolt holes shall be drilled, and the diameter shall be 1/16" larger than the nominal bolt diameter, except as noted.
- 5. The design and analysis of the structures has been done in accordance with AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires and Traffic Signals Dated 2001, using 90 MPH wind velocity and fatigue category - I.
- 6. Adjust post alignment in plane normal to roadway center line by means of leveling nuts located below base plate to maintain upward slope in cantilever arm(s). Tighten anchor nuts above base plate in accordance with Standard Specification 6-03.3(33).
- 7. Variable Message Signs (VMS) exceeding 700 lbs. and/or 200 sg. ft. shall not be installed on cantilever structure.



(TRUSS-TYPE) STANDARD PLAN G-60.10-00

SHEET 1 OF 4 SHEETS

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08-31-07

WALL

0.154"

0.218"

0.203"

CHORD SIZE

NOM.

DIAM

2"

2"

2 1/2"

3"

CHORD SELECTION

SIGN AREA

(X TIMES Y)

(FT²)

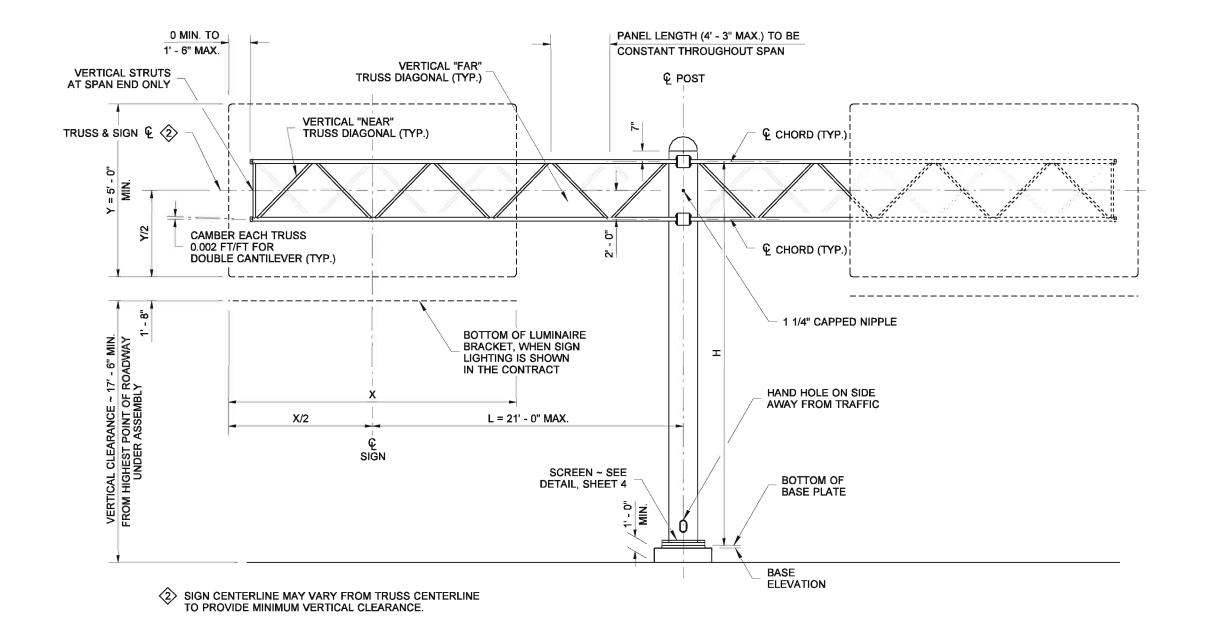
50 OR LESS

50+ TO 100

100+ TO 150

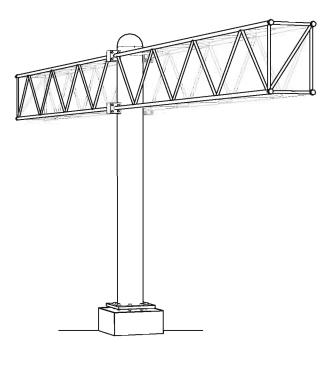
150+ TO 200

PERSPECTIVE



ELEVATION

DOUBLE CANTILEVER SIGN STRUCTURE



PERSPECTIVE



08-31-07

CANTILEVER SIGN STRUCTURE (TRUSS-TYPE) STANDARD PLAN G-60.10-00

SHEET 2 OF 4 SHEETS

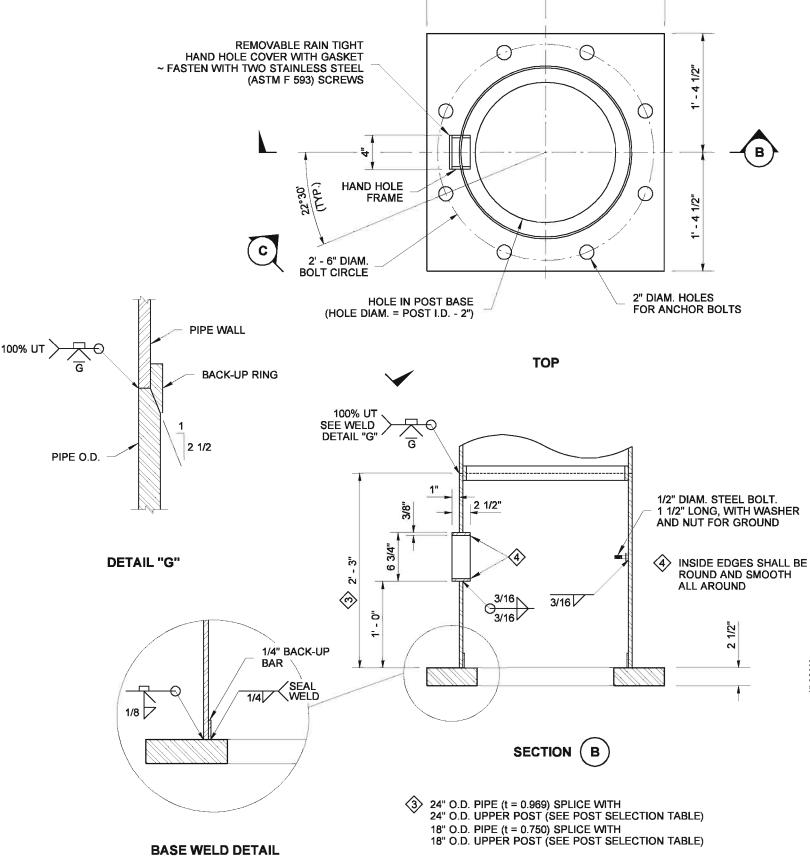
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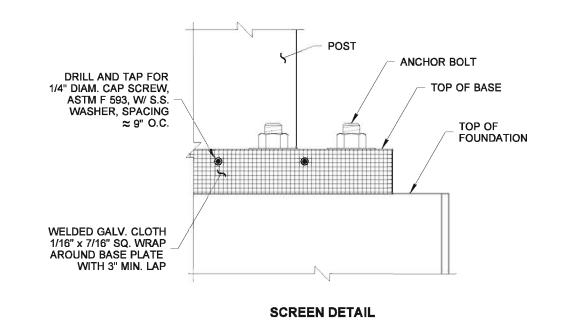
Pasco Bakotich III

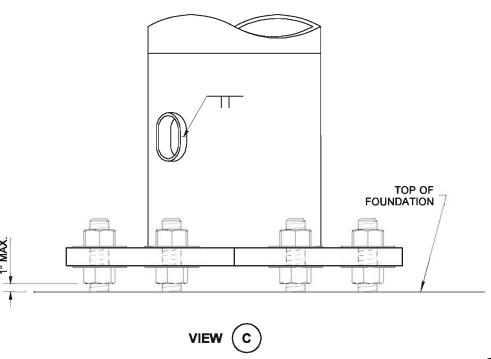


1' - 4 1/2"

1' - 4 1/2"









CANTILEVER SIGN STRUCTURE (TRUSS-TYPE)
STANDARD PLAN G-60.10-00

SHEET 4 OF 4 SHEETS

APPROVED FOR PUBLICATION

Pasco Bakotich III 08



co Bakotich III 08-31-07
STATE DESIGN ENGINEER DATE

POST BASE DETAILS

4' - 0"

1' - 4"

TOP

NOTES

1' - 4"

(3) #9 TYP.

(5) #5 TYP.

(4) #4 SPIRAL

(1) #4 TYP.

ANCHOR PLATE

1. See Standard Specification Section 8-21.3(9)

2. Use a template to locate and secure bolts in

EXPIRES NOVEMBER 14, 2008 **CANTILEVER SIGN STRUCTURE (TRUSS-TYPE)**

FOUNDATION TYPE 1 STANDARD PLAN G-60.20-00 SHEET 1 OF 2 SHEETS APPROVED FOR PUBLICATION

Pasco Bakotich III

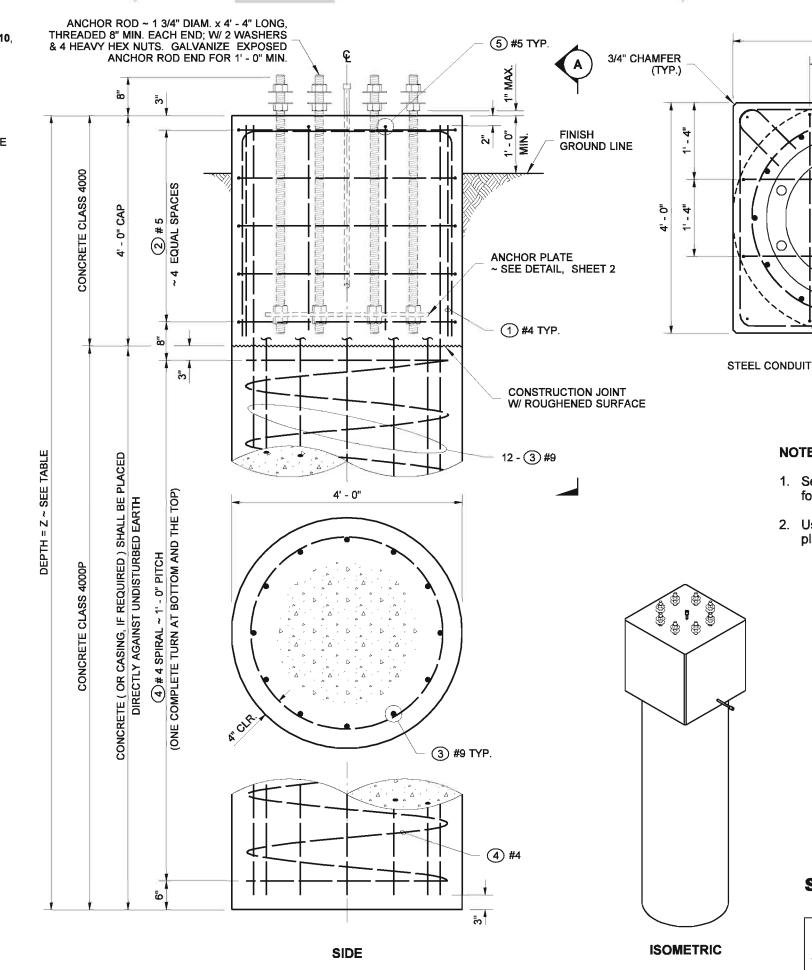
08-31-07

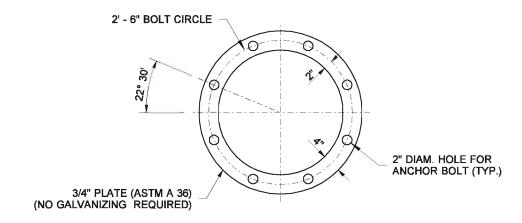
place during foundation installation.

for construction requirements.

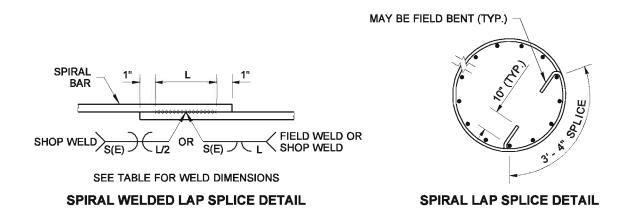
2008

VALUES OF Z					
		GN AREA	ALLOWABLE LATERAL		
FOUNDATION TYPE	200 SF OR LESS	200 SF ~ 400 SF	BEARING PRESSURE		
	Z	Z	(PSF)		
1	13' - 0"	18' - 0"	1500 AND UP		
1	16' - 0"	22' - 0"	1000 ~ 1499		





ANCHOR PLATE DETAIL

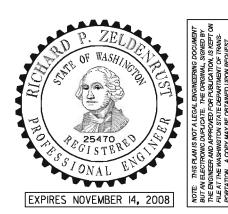


WELDING SHALL MEET THE REQUIREMENTS OF STD. SPEC. 6-02.3(24)E FOR WELD DIMENSIONS, SEE TABLE BELOW

COLUMN AND SHAFT SPIRAL OPTIONS						
DEFORMED BAR AASHTO M 31	PLAIN STEEL BAR AASHTO M 31 COLD DRAWN WIRE DEFORME					IONS (INCHES)
GRADE 60	GRADE 60	AASHTO M 32	2 AASHTO M 225	s	Е	L
# 4	1/2" DIAM.	W20	D20	1/4	1/8	4
# 5	5/8" DIAM.	W31	D31	5/16	3/16	6
# 6	3/4" DIAM.	W44	D44	3/8	3/16	6

	BAR LIST								
MARK	LOCATION	QTY.	LENGTH	SIZE	TYPE				
1	CAP VERTICAL	4	3' - 10"	#4	STR.				
2	CAP HOOPS	5	15' - 9"	#5					
3	SHAFT VERTICAL	12	"Z" MINUS CLEARANCES	#9	STR.				
4	SHAFT SPIRAL	1	AS REQUIRED	#4					
(5)	CAP TOP	4	10' - 10"	#5					
BENDING DIAGRAM (ALL DIMENSIONS ARE OUT TO OUT) 135° TYP. 3'-8" LENGTH 3'-8"									
	SQUARE			RE					
	2	4)	(5)	② ④ ⑤				

MATERIAL SPECIFICATIONS				
SHAFT CONCRETE	CLASS 4000P			
ALL OTHER CONCRETE	CLASS 4000			
STEEL REINF. BAR	AASHTO M 31 GRADE 60			
ANCHOR RODS	ASTM F 1554 GRADE 105			
ANCHOR NUTS	AASHTO M 291			
ANCHOR WASHERS	AASHTO M 293			
ANCHORAGE GALVANIZING	AASHTO M 232			
ANCHOR PLATE	ASTM A 36			



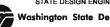
CANTILEVER SIGN STRUCTURE (TRUSS-TYPE) FOUNDATION TYPE 1 STANDARD PLAN G-60.20-00

SHEET 2 OF 2 SHEETS

08-31-07

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			TOTAL CI	ON ADEA		
		TOTAL SIGN AREA +200 SF				
MARK	LOCATION	OR LESS		+200 SF -400 SF		
		QTY.	SIZE	QTY.	SIZE	
1	PEDESTAL HOOP	5	#4	5	#4	
2	FOUNDATION WALL TIES	6	#5	6	#5	
3	FOUNDATION VERTICALS	14	#6	14	#6	
4	PEDESTAL VERTICALS	16	#10	16	#10	
(5)	FOUNDATION WALL HORIZONTALS AT SLOPE	2	#5	2	#5	
6	FOUNDATION WALL HORIZONTALS	VARIES SEE PLANS	#5	VARIES SEE PLANS	#5	
	BENDI	NG DIAGRAM				
3'-2" SQUARE VARIES VARIES (6) (7) (7) (8) (9) (1) (2'-6") (4) (5) (6) (7) (7) (8) (8) (9) (9) (1) (1) (1) (2) (4) (5) (6) (6) (7) (7) (7) (8) (9) (1) (1) (2) (4) (5) (6) (7) (7) (8) (9) (9) (1) (1) (1) (2) (4) (5) (6) (7) (7) (8) (9) (9) (1) (1) (1) (1) (2) (4) (4) (5) (6) (7) (7) (8) (9) (9) (9) (9) (9) (9) (9						

BAR LIST ~ TYPES 2 AND 3

VALUES OF Z						
	TOTAL SI	GN AREA	411.014/4.01.51.4.750.41			
FOUNDATION TYPE 200 SF OR LESS		200 SF ~ 400 SF	ALLOWABLE LATERAL BEARING PRESSURE (PSF)			
	Z	Z	(1 51)			
TYPE 2	9' - 0"	11' - 0"	2500 OR GREATER			
TYPE 3	11' - 0"	13' - 6"	NOT LESS THAN 1500			

MATERIAL S	PECIFICATIONS
CONCRETE	CLASS 4000
STEEL REINF. BAR	AASHTO M 31 GRADE 60
ANCHOR RODS	ASTM F 1554 GRADE 105
ANCHOR NUTS	AASHTO M 291
ANCHOR WASHERS	AASHTO M 293
ANCHORAGE GALVANIZING	AASHTO M 232
ANCHOR PLATE	ASTM A 36



CANTILEVER SIGN STRUCTURE (TRUSS-TYPE) FOUNDATION TYPES 2 & 3 STANDARD PLAN G-60.30-00

SHEET 2 OF 2 SHEETS

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"UPPER" HORIZONTAL

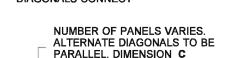
DIAGONAL (TYP.)

2008

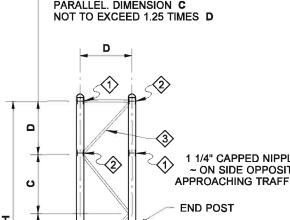
AUGUS

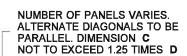
2008

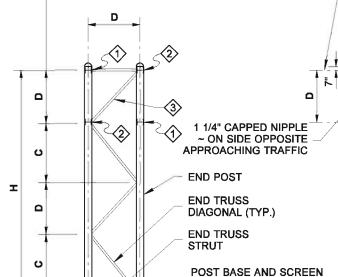
- (1) SEE CHORD TO END POST CONNECTION TYPE Q
- 2 SEE CHORD TO END POST CONNECTION TYPE R
- 3 TOP END TRUSS DIAGONAL JOINS END POSTS AT CHORDS WHERE VERTICAL AND HORIZONTAL



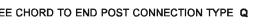
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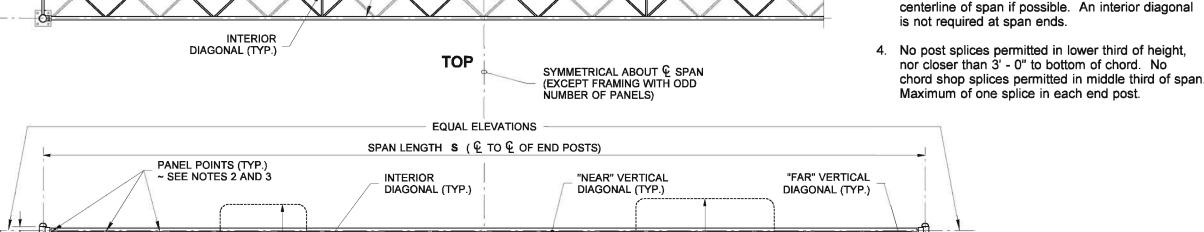




~ SEE DETAILS, SHEET 4



DIAGONALS CONNECT



CHORDS

Y1 = HEIGHT OF SHALLOWEST SIGN ON STRUCTURE, D + 1' - 0" MIN.

BOTTOM OF LUMINAIRE BRACKET

~ WHEN SIGN LIGHTING IS SHOWN

IN THE CONTRACT

Y2 = HEIGHT OF ANY SIGN WITH HEIGHT GREATER THAN Y4.

ELEVATION

MATERIAL SPECIFICATIONS ASTM A 36 (CHORDS. OR ASTM A 53 GRADE B, DIAGONALS TYPE E OR S, OR STRUTS AND POSTS) A 500 GRADE B **PLATES** ASTM A 36 ASTM A 36 **SHAPES ASTM A 992** STD. SPEC. BOLTS, NUTS, & WASHERS 9-06.5(3) PIPE, PLATE & SHAPE AASHTO M 111 **GALVANIZING**

AASHTO M 232

FASTENER

GALVANIZING

STRUCTURE DIMENSIONS TOP AND SPAN LENGTH DIMENSION **DIAGONALS END TRUSS** END TRUSS **TOTAL SIGN** воттом STRUTS AND AREA (MAX.) **CHORDS** DIAGONALS (SQ. FT.) 60' OR LESS 4' - 0" 1 1/4" x .140" 2 1/2" x .203" 384 3" x .216" 10" x 279" 61' to 90' 5' - 0" 4" x .237" 2" x .154" 10" x .279" 2 1/2" x .203" 624 91' to 120' 5" x .258" 2" x .154" 10" x .307" 3" x .216" 864 6' - 0" 121' to 150' 7' - 0" 6" x .280" 2 1/2" x .203" 10" x .365" 3 1/2" x .226" 1104

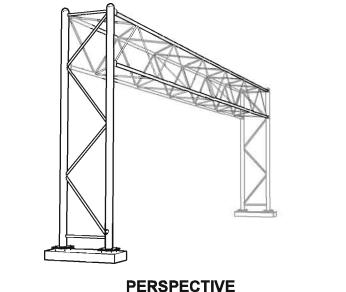
PANEL LENGTH P TO BE CONSTANT THROUGHOUT

SPAN AND NOT TO EXCEED D + 2".

"LOWER" HORIZONTAL

DIAGONAL (TYP.)

ALL MEMBERS ARE PIPE. VALUES SHOWN ARE NOMINAL PIPE SIZE AND WALL THICKNESS.



SIGN BRIDGE (TRUSS-TYPE)

STANDARD PLAN G-70.10-00

EXPIRES NOVEMBER 14, 2008

SHEET 1 OF 4 SHEETS

APPROVED FOR PUBLICATION Pasco Bakotich III 10-05-07



1. Horizontal and vertical clearance requirements shall

2. Horizontal diagonals must join chords where vertical

3. Interior diagonals shall be placed at panel points, 40' maximum spacing. Locate symmetrically about

be as shown in Contract Plans.

diagonals connect (panel points).

€ OF SIGNS

SIGN BRIDGE FOUNDATION ~ SEE STD. PLAN G-70.20 & G-70.30

BASE ELEVATION

(TYP.)

HEMISPHERICAL POST FINIAL, 1/8" MIN. THICKNESS. INSTALL AFTER GALVANIZING

3/8" ALLEN HOLLOW SET SCREW

WITH DOG POINT (TYP.)
(CORROSION RESISTANT METAL
OR COATING) AT 90° INTERVALS

ELEVATION

2008

DRAWN BY: BILL BERENS

JANUARY

SECTION THROUGH FINIAL AND POST

BEND FOR

DRILL AND TAP

WALL FOR 3/8" ALLEN SET SCREW

SNUG FIT

FINIAL BRACKET

PLATE ~

1/8" MIN.

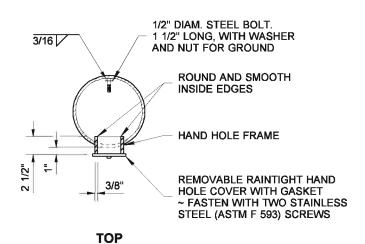
5/16" x 1/2"

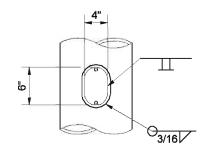
SLOT FOR

3/8" ALLEN

SET SCREW

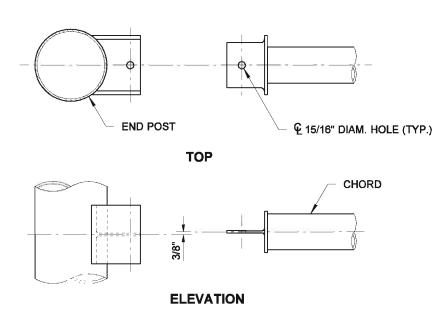
FINIAL DETAIL





ELEVATION (COVER NOT SHOWN FOR CLARITY)

HANDHOLE DETAIL

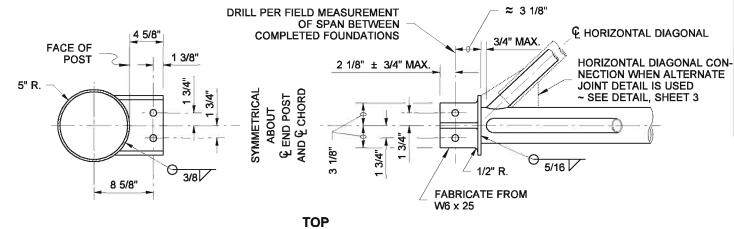


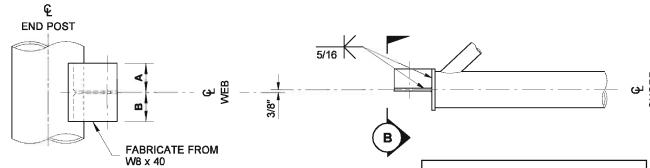
CHORD TO END POST CONNECTION TYPE Q

USED WHERE NO DIAGONALS CONNECT

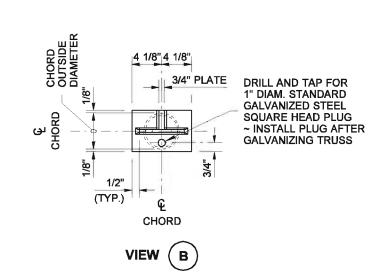
DETAILS NOT SHOWN ARE SAME AS CHORD TO END POST CONNECTION TYPE R, OMITTING THE 3/4" PLATE STIFFENER ON THE TEE MEMBER.

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



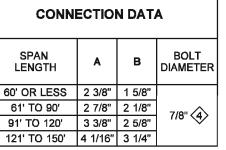


ELEVATION



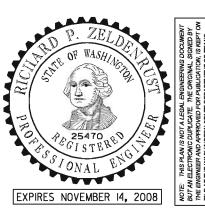
CHORD TO END POST CONNECTION TYPE R

USED WHERE DIAGONALS CONNECT



2008

INSTALL BOLTS WITH HEAD UPWARD. EXCLUDE BOLT THREADING FROM GRIP.



SIGN BRIDGE (TRUSS-TYPE)

STANDARD PLAN G-70.10-00

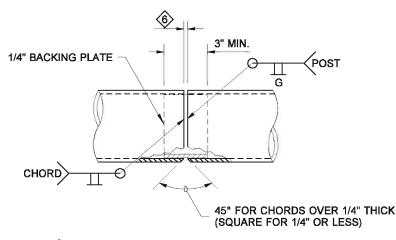
SHEET 2 OF 4 SHEETS



(5) ENDS OF DIAGONALS SHALL BE CUT TO FIT NEATLY AGAINST CHORD OR POST. FILLET WELD SIZE TO BE DIAGONAL TUBE OR PIPE THICKNESS PLUS 1/16".

TYPICAL JOINT DETAIL

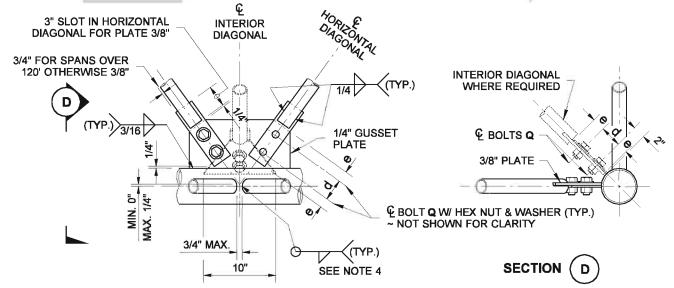
CHORD SHOWN ~ END POST SIMILAR



(6) DIMENSION SHALL EQUAL CHORD THICKNESS OR 1/4". WHICHEVER IS LESS.

END POST OR CHORD SHOP SPLICE

NO POST SPLICES PERMITTED IN LOWER THIRD OF HEIGHT, NOR CLOSER THAN 3' - 0" TO BOTTOM OF CHORD, NO CHORD SHOP SPLICES PERMITTED IN MIDDLE THIRD OF SPAN. MAXIMUM OF ONE SPLICE IN EACH END POST.

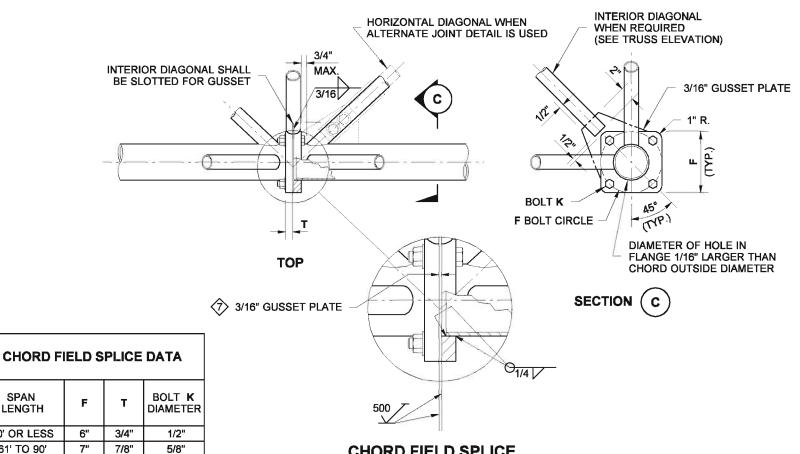


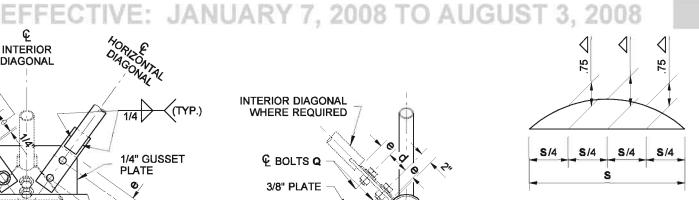
ALTERN	ALTERNATE JOINT DATA						
SPAN LENGTH	d e		BOLT Q DIAMETER				
60' OR LESS	2 1/2"	1 1/4"	3/4"				
61' TO 90'	3"	1 1/2"	7/8"				
91' TO 120'	3"	1 1/2"	7/8"				
121' TO 150'	3 1/2"	1 3/4"	1"				

TOP

ALTERNATE JOINT DETAIL

NOT FOR CONNECTIONS BETWEEN VERTICAL DIAGONALS AND CHORDS



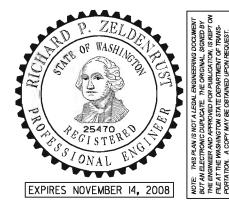


	SPAN LENGTH S (FT.)	(IN.)
	40	1/2
	50	3/4
	60	7/8
	61	7/8
	70	1
	80	1 1/4
	90	1 1/2
	91	1 3/8
	100	1 5/8
[110	2
	120	2 3/8
	121	2 1/8
[130	2 1/2
[140	2 7/8
[150	3 3/8

FOR SPAN LENGTHS NOT LISTED, INTERPOLATE VALUES OF ...

FABRICATE TRUSS WITH CHORDS CURVED TO PROVIDE CAMBER. DO NOT CAMBER BY USING SHIMS BE-TWEEN CHORDS AT SPLICES.

DEAD LOAD CAMBER



SIGN BRIDGE (TRUSS-TYPE)

STANDARD PLAN G-70.10-00

SHEET 3 OF 4 SHEETS

APPROVED FOR PUBLICATION Pasco Bakotich III 10-05-07



CHORD FIELD SPLICE

(NO CHORD FIELD SPLICE PERMITTED IN MIDDLE THIRD OF SPAN LENGTH)

→ 3/16" SHIMS ARE REQUIRED AT THE REMAINING TWO CHORD JOINTS WHEN INTERIOR DIAGONAL IS INSTALLED.

LENGTH

60' OR LESS

61' TO 90'

91' TO 120'

121' TO 150'

6"

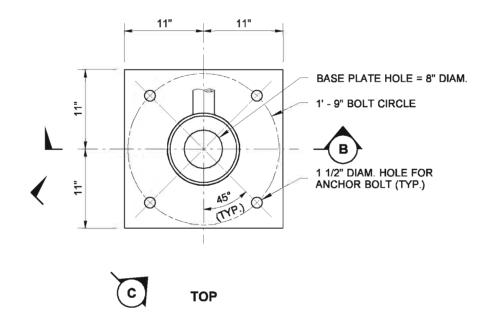
8 1/2"

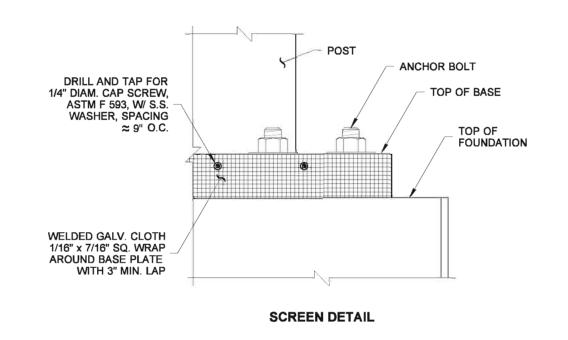
9 1/2"

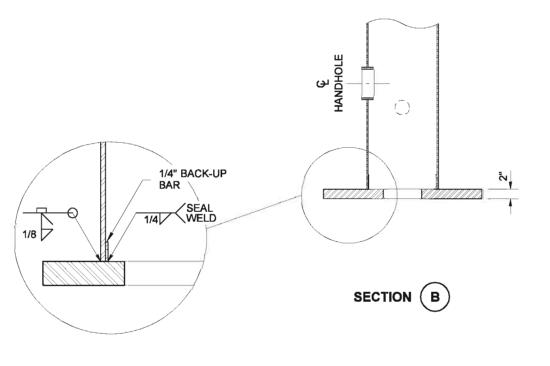
1 1/4"

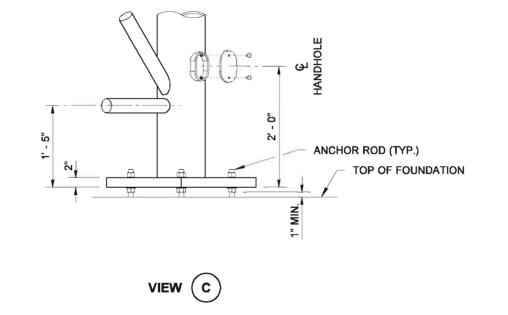
3/4"

7/8"



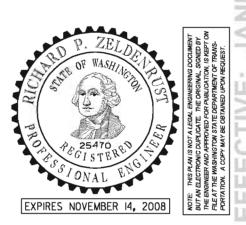






BASE WELD DETAIL

POST BASE DETAILS



SIGN BRIDGE (TRUSS-TYPE)

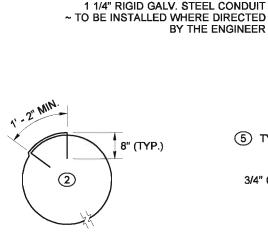
STANDARD PLAN G-70.10-00

SHEET 4 OF 4 SHEETS



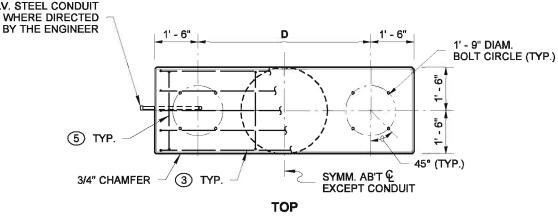
MATERIAL SPECIFICATIONS				
CLASS 4000P				
CLASS 4000				
AASHTO M 31 GRADE 60				
ASTM F 1554 GRADE 105				
AASHTO M 291				
AASHTO M 293				
AASHTO M 232				
ASTM A 36				

(1) CASE THE EXCAVATION AND PLACE USING TREMIE METHOD WHEN WATER IS PRESENT



LAP SPLICE

DETAIL

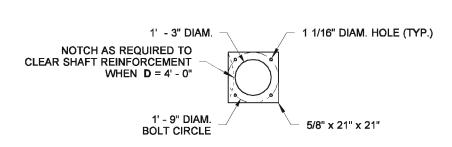


SPIRAL

(2)

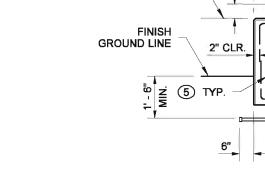
ELEVATION

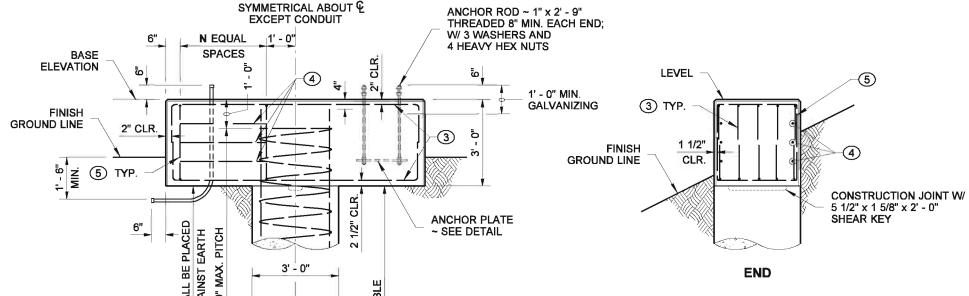
FOUNDATION TYPE 1

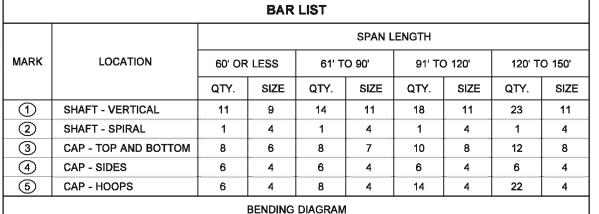


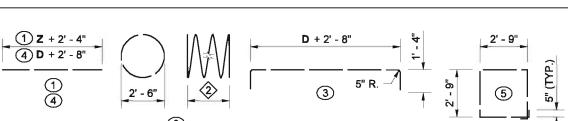
ANCHOR PLATE DETAIL

71									
)	TABLE								
1	VARIABLES	SPAN LENGTH							
		60' TO 90'	61' TO 90'	91' TO 120'	120' TO 150'				
N.	DIMENSION ~ D	4' - 0"	5' - 0"	6' - 0"	7' - 0"				
Ñ,	BAR SPACES ~ N	2	3	6	10				
g R	SHAFT DEPTH ~ Z	11' - 6"	13' - 6"	15' - 0"	16' - 6"				

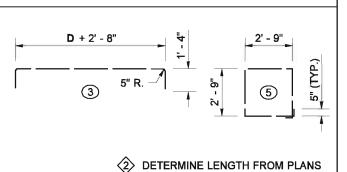


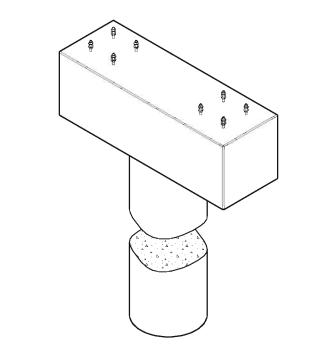




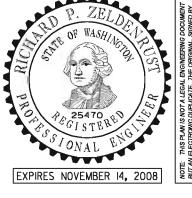


(ALL DIMENSIONS ARE OUT TO OUT) 2" RADIUS, UNLESS OTHERWISE NOTED





ISOMETRIC



SIGN BRIDGE (TRUSS-TYPE) FOUNDATION TYPE 1

STANDARD PLAN G-70.20-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Pasco Bakotich III



10-05-07

8

2008

(ALL DIMENSIONS ARE OUT TO OUT)
2" RADIUS, UNLESS OTHERWISE NOTED

SHEET 1 OF 1 SHEET
APPROVED FOR PUBLICATION

10-05-07

Pasco Bakotich III

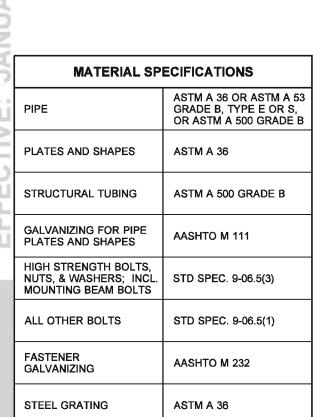
STATE DESIGN ENGINEER

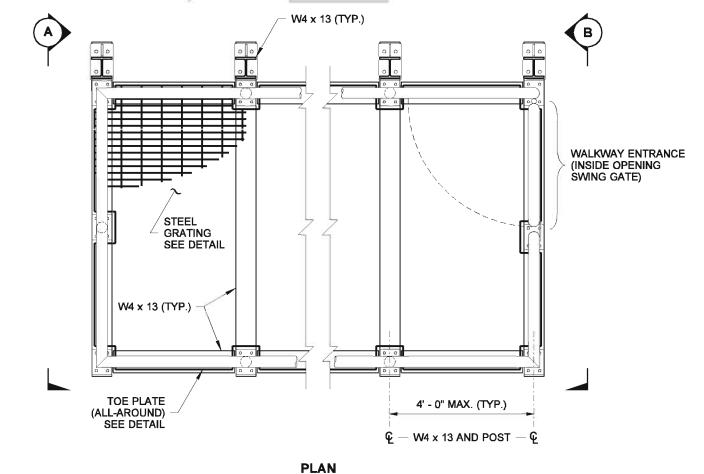
FOUNDATION TYPES 2 & 3

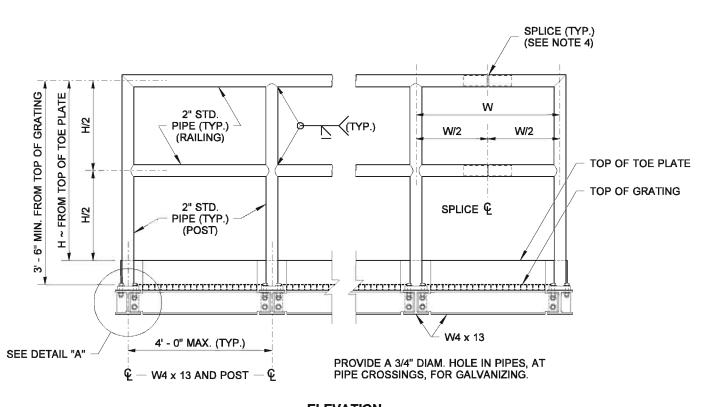
0

W4 x 13 AND RAILING POST

END VIEW





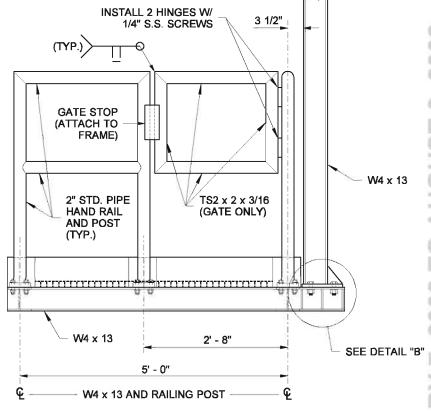


MAINTENANCE WALKWAY

ELEVATION
MAINTENANCE WALKWAY

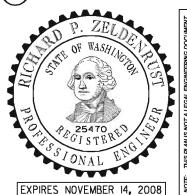
NOTES

- 1. NOT INTENDED FOR USE IN FRONT OF STATIC SIGNS.
- 2. FOR MOUNTING THE MAINTENANCE WALKWAY TO A MONOTUBE SIGN BRIDGE, SEE STANDARD PLAN G-95.20.
- 3. FOR MOUNTING THE MAINTENANCE WALKWAY TO A TRUSS-TYPE SIGN BRIDGE, SEE STANDARD PLAN G-95.30.
- LOCATION OF RAILING SPLICES TO BE DETERMINED BY FABRICATOR. SEE "RAILING SPLICE DETAIL".



MAINTENANCE WALKWAY GATE

END VIEW (



MAINTENANCE WALKWAY FOR SIGN BRIDGES

STANDARD PLAN G-95.10-00

SHEET 1 OF 3 SHEETS

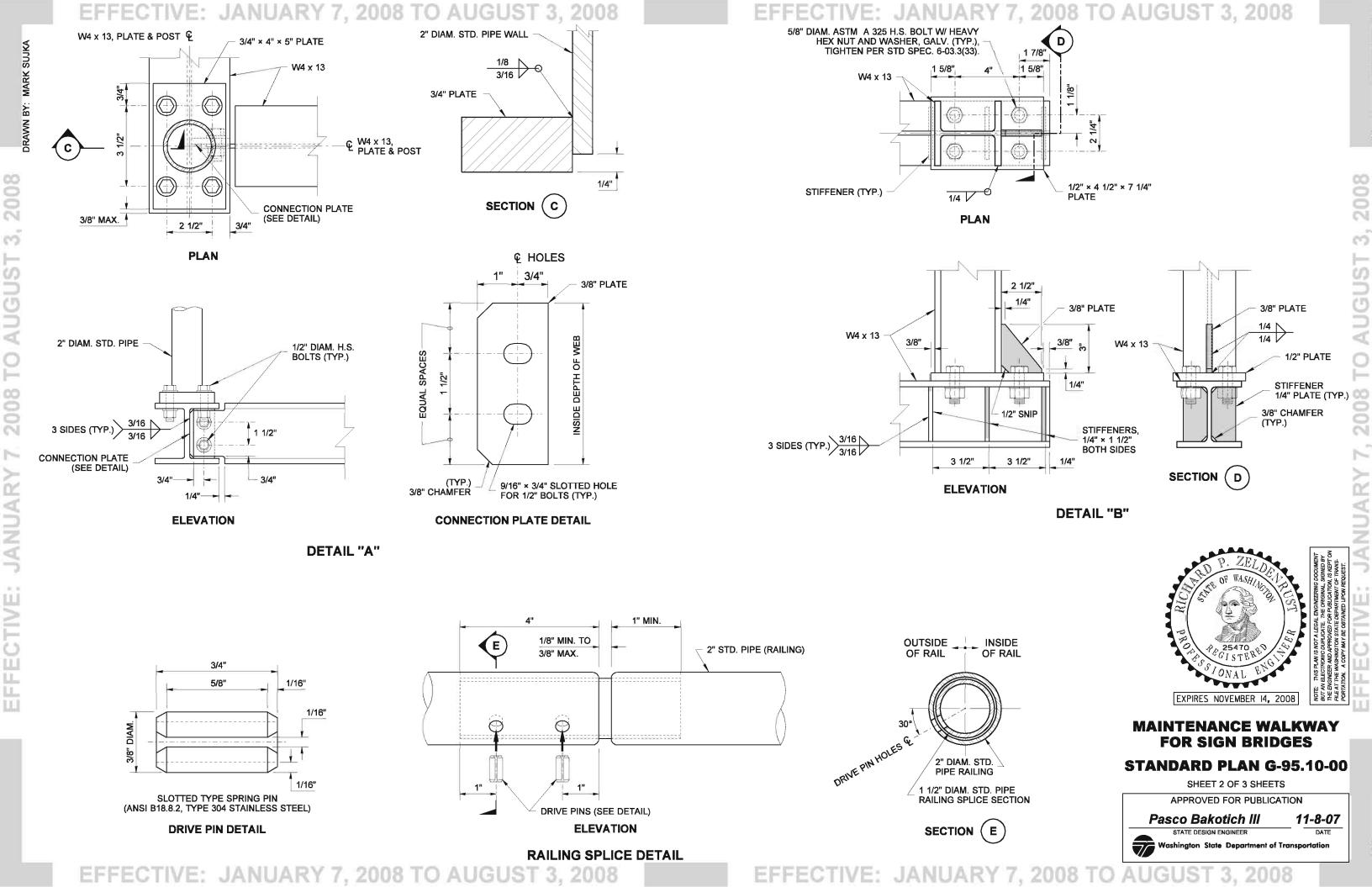
APPROVED FOR PUBLICATION

Pasco Bakotich III 1

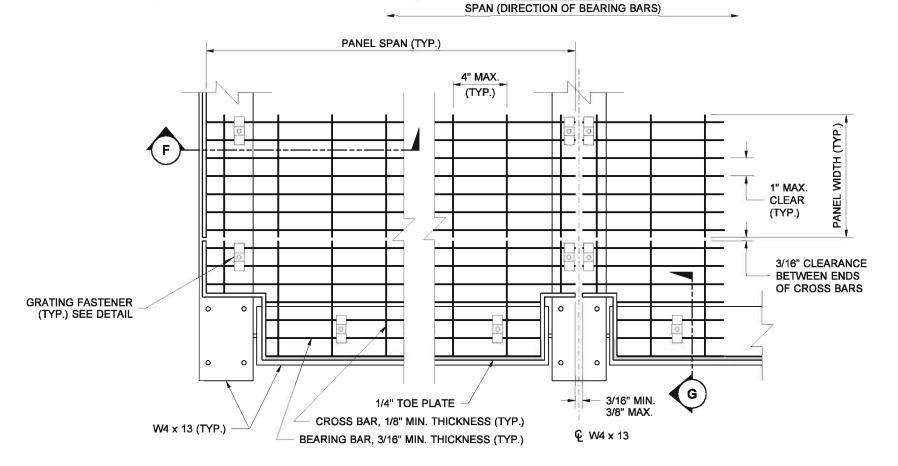


Washington State Department of Transportation

11-8-07



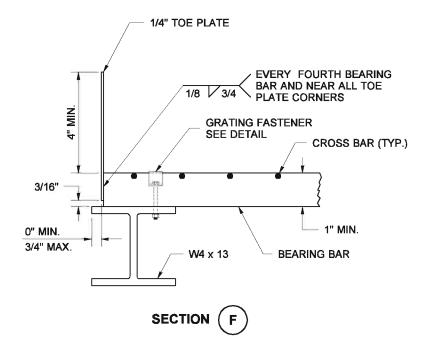
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

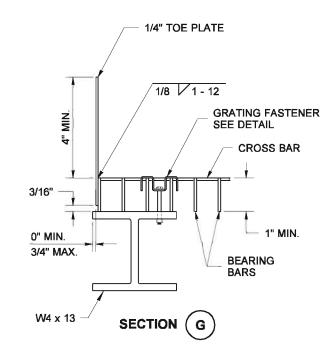


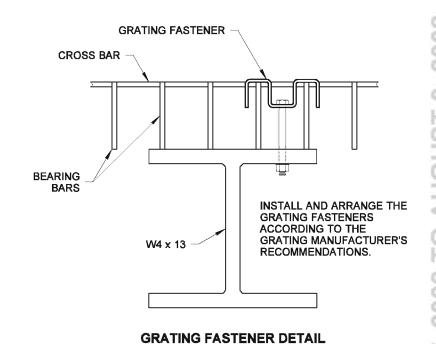
PLAN

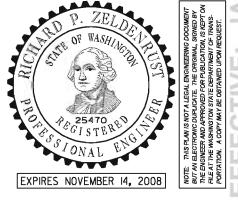
STEEL GRATING DETAIL

(RAILING NOT SHOWN FOR CLARITY)









MAINTENANCE WALKWAY FOR SIGN BRIDGES

STANDARD PLAN G-95.10-00

SHEET 3 OF 3 SHEETS

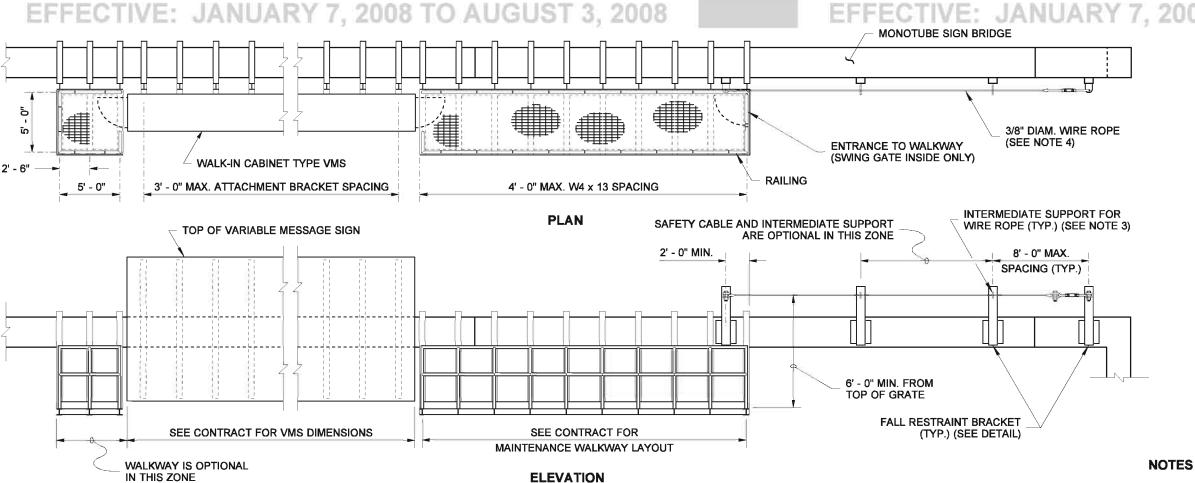
APPROVED FOR PUBLICATION

Pasco Bakotich III 11-8-07



Washington State Department of Transportation





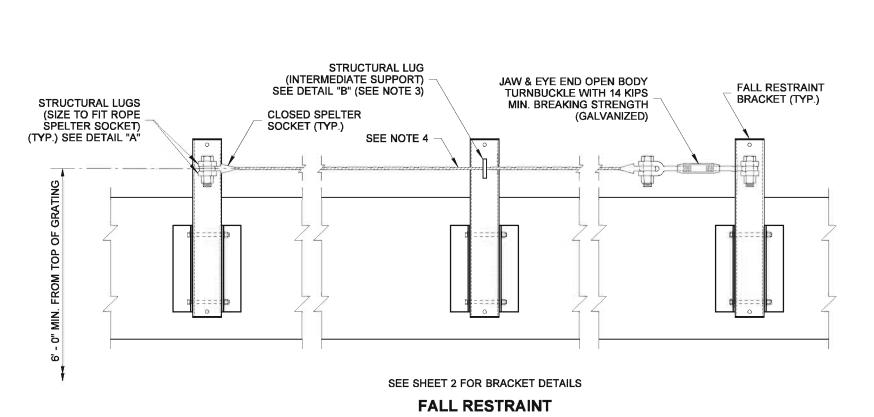
ASTM A 36 OR ASTM A 53 PIPE GRADE B, TYPE E OR S, OR ASTM A 500 GRADE B PLATES AND SHAPES ASTM A 36 STRUCTURAL TUBING ASTM A 500 GRADE B **GALVANIZING FOR PIPE** AASHTO M 111 **PLATES AND SHAPES** HIGH STRENGTH BOLTS NUTS, & WASHERS; INCL STD SPEC. 9-06.5(3) MOUNTING BEAM BOLTS ALL OTHER BOLTS STD SPEC. 9-06.5(1) **FASTENER** AASHTO M 232 GALVANIZING STEEL GRATING ASTM A 36 ASTM A 603 W/ CLASS A WEIGHT ZINC COATED WIRE ROPE WIRES THROUGHOUT

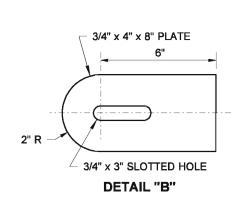
MATERIAL SPECIFICATIONS

- 1. NOT INTENDED FOR USE IN FRONT OF STATIC SIGNS.
- 2. FOR MAINTENANCE WALKWAY, RAILING, GRATING, AND TOE PLATE DETAILS, SEE STANDARD PLAN G-95.10.
- 3. USE TWO LANYARDS THROUGH INTERMEDIATE WIRE ROPE SUPPORT.
- 4. 3/8" DIAM. WIRE ROPE WITH 14 KIPS MIN. BREAKING STRENGTH. THE WIRE ROPE SHALL BE INSTALLED WITH 450 LBS. OF TENSION, AND WITH 6" OF TAKE UP ADJUSTMENT AVAILABLE IN THE TURNBUCKLE.

MAINTENANCE WALKWAY INSTALLED ON MONOTUBE SIGN BRIDGE

(WALKWAYS MAY BE USED WITH OTHER LAYOUTS THAN THAT SHOWN ABOVE)





① 5" WHEN AN INTERMEDIATE SUPPORT IS USED **DETAIL "A"**

3"(1)

1 1/2" R



MAINTENANCE WALKWAY MOUNTING FOR MONOTUBE SIGN BRIDGE STANDARD PLAN G-95.20-00

SHEET 1 OF 3 SHEETS

APPROVED FOR PUBLICATION

11-8-07

Pasco Bakotich III

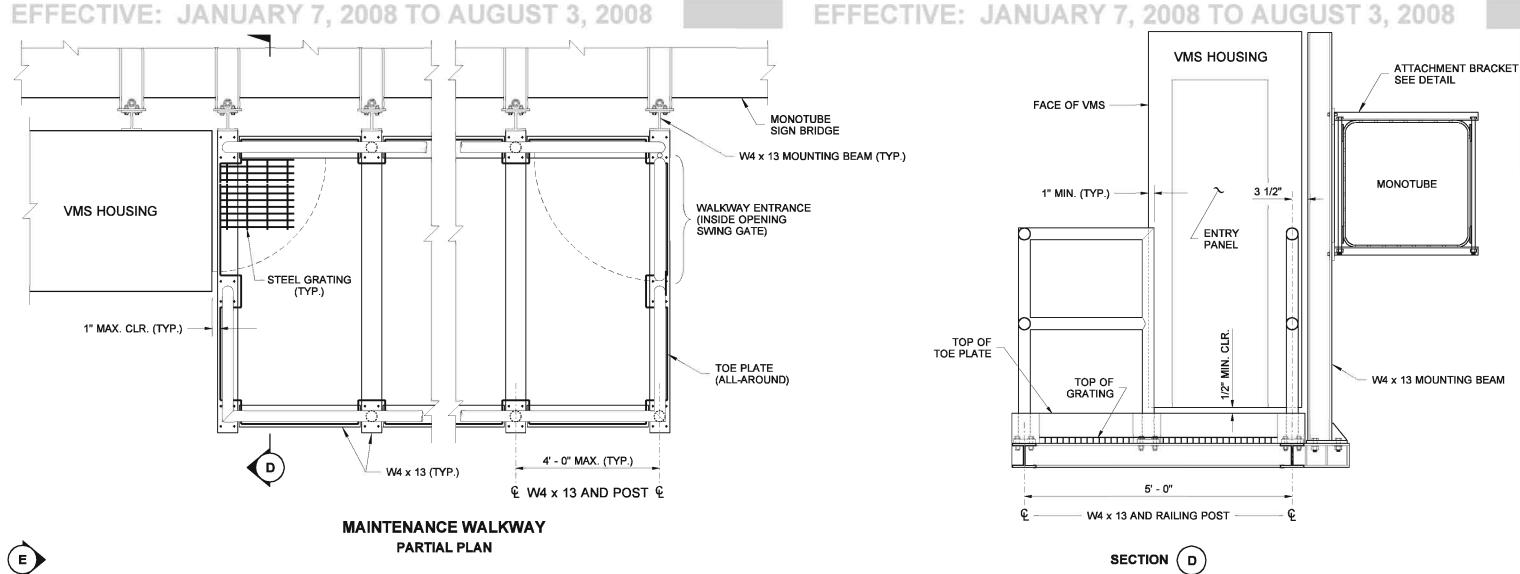


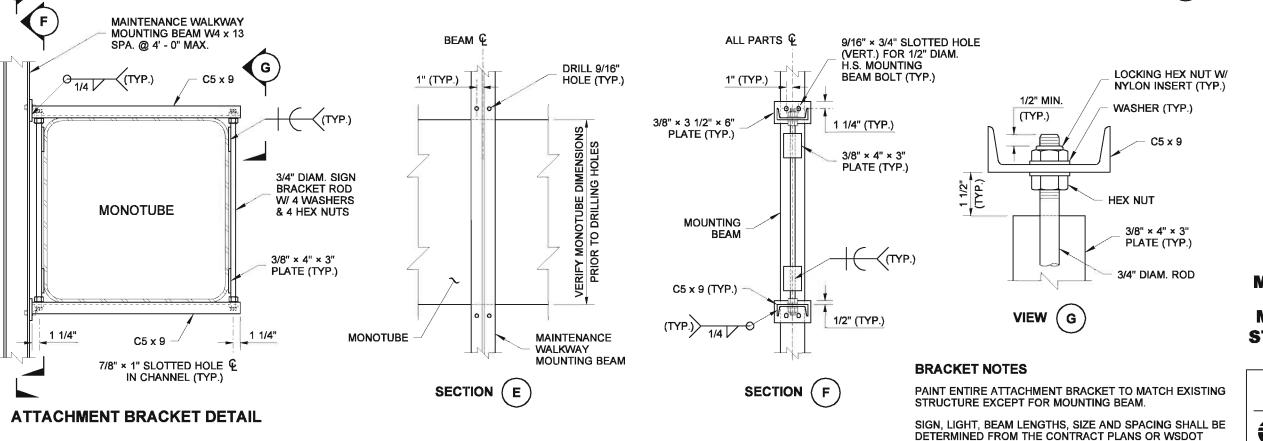
5/8" PLATE

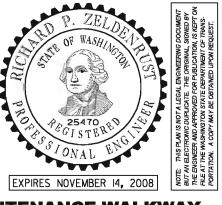
HOLE DIAM. =

BOLT DIAM. + 1/16"

SOON







MAINTENANCE WALKWAY MOUNTING FOR MONOTUBE SIGN BRIDGE STANDARD PLAN G-95.20-00

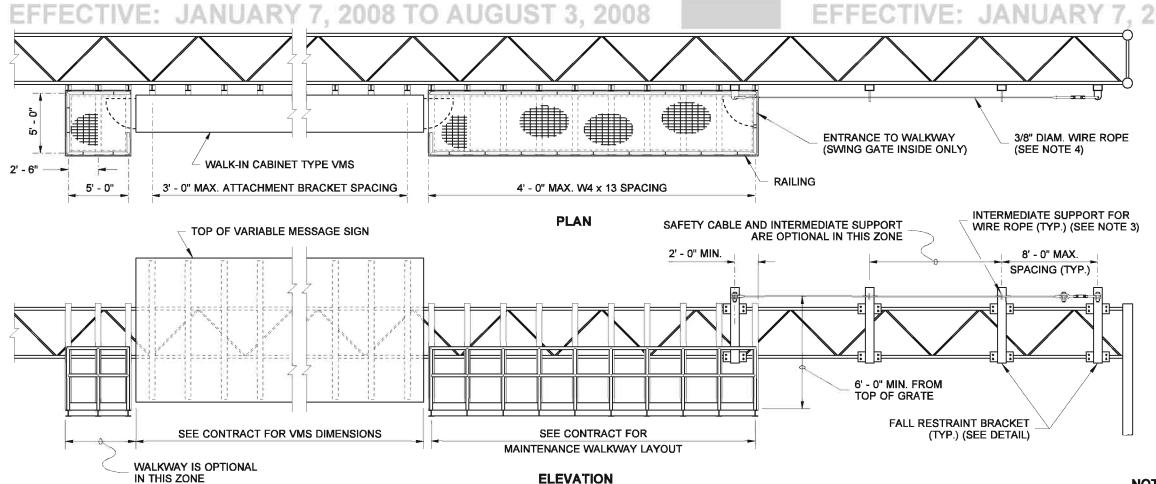
SHEET 3 OF 3 SHEETS

APPROVED FOR PUBLICATION

Pasco Bakotich III 11-8-07



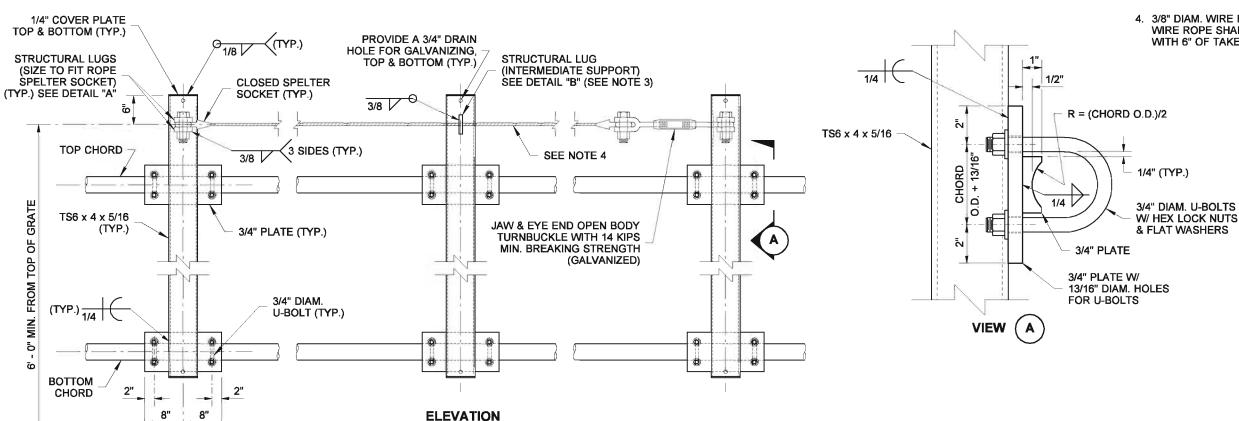
Washington State Department of Transportation



MATERIAL SPECIFICATIONS ASTM A 36 OR ASTM A 53 GRADE B, TYPE E OR S, OR ASTM A 500 GRADE B PIPE PLATES AND SHAPES ASTM A 36 STRUCTURAL TUBING ASTM A 500 GRADE B **GALVANIZING FOR PIPE** AASHTO M 111 PLATES AND SHAPES HIGH STRENGTH BOLTS NUTS. & WASHERS: INCL STD SPEC. 9-06.5(3) MOUNTING BEAM BOLTS ALL OTHER BOLTS STD SPEC. 9-06.5(1) **FASTENER** AASHTO M 232 **GALVANIZING** STEEL GRATING ASTM A 36 ASTM A 603 W/ CLASS A **WIRE ROPE** WEIGHT ZINC COATED WIRES THROUGHOUT ASTM F 593 AND U-BOLTS, NUTS, AND WASHERS **ASTM F 594, TYPE 304**

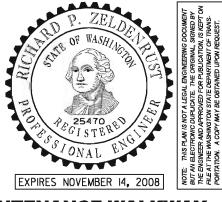
MAINTENANCE WALKWAY INSTALLED ON TRUSS-TYPE SIGN BRIDGE

(WALKWAYS MAY BE USED WITH OTHER LAYOUTS THAN THAT SHOWN ABOVE)



NOTES

- 1. NOT INTENDED FOR USE IN FRONT OF STATIC SIGNS.
- 2. FOR MAINTENANCE WALKWAY, RAILING, GRATING, AND TOE PLATE DETAILS, SEE STANDARD PLAN G-95.10.
- 3. USE TWO LANYARDS THROUGH INTERMEDIATE WIRE ROPE SUPPORT
- 4. 3/8" DIAM. WIRE ROPE WITH 14 KIPS MIN. BREAKING STRENGTH. THE WIRE ROPE SHALL BE INSTALLED WITH 450 LBS. OF TENSION, AND WITH 6" OF TAKE UP ADJUSTMENT AVAILABLE IN THE TURNBUCKLE.



MAINTENANCE WALKWAY MOUNTING FOR TRUSS-TYPE SIGN BRIDGE STANDARD PLAN G-95.30-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

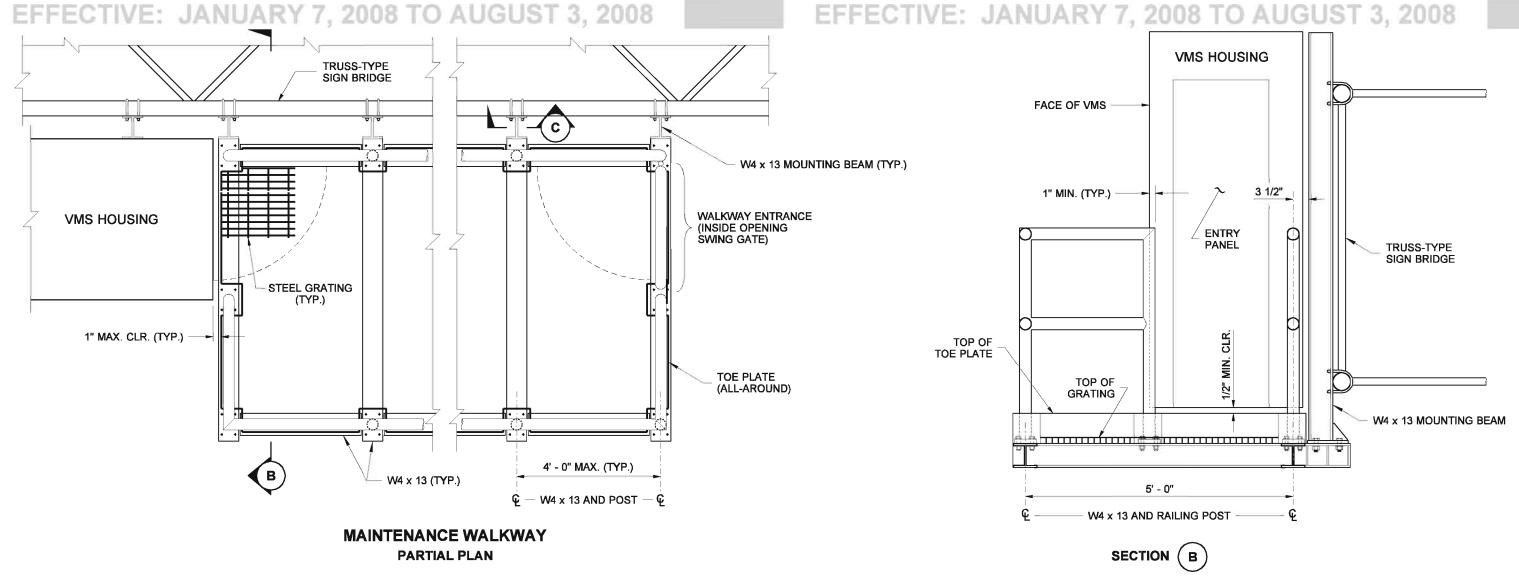
Pasco Bakotich III

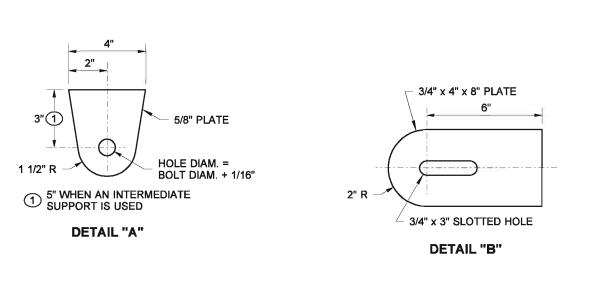


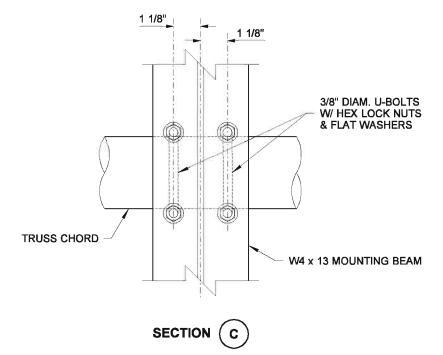
11-8-07

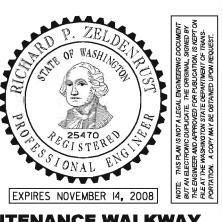
FALL RESTRAINT DETAIL

EFFECTIVE: JANUARY 7, 2008 TO AUGI





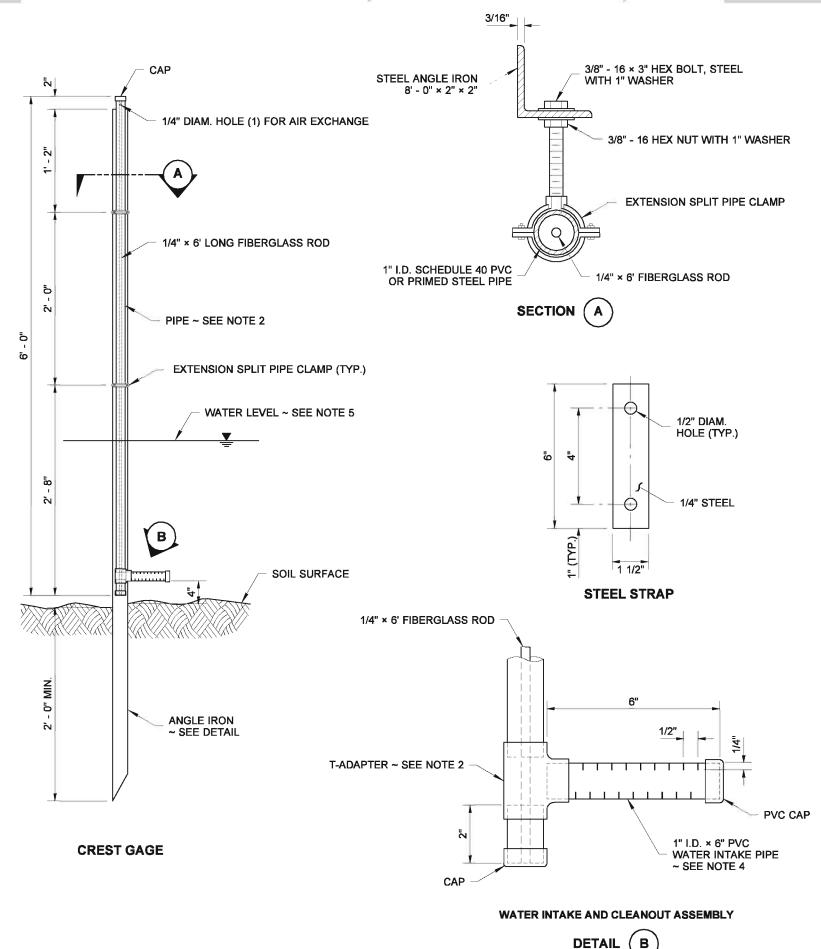




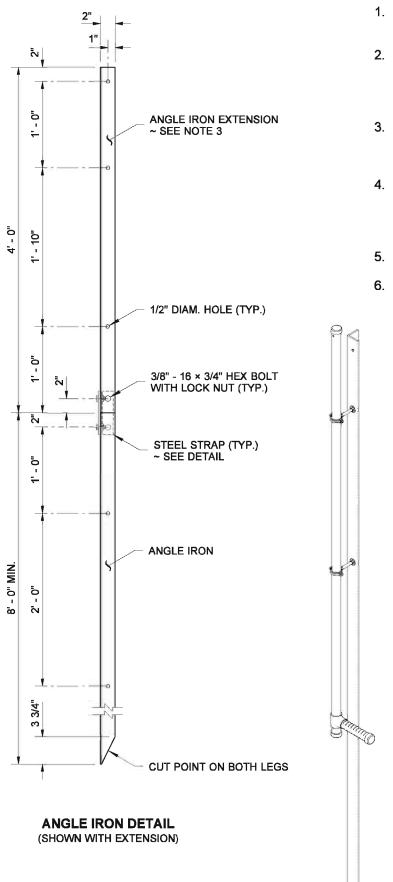
MAINTENANCE WALKWAY MOUNTING FOR TRUSS-TYPE SIGN BRIDGE STANDARD PLAN G-95.30-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION 11-8-07 Pasco Bakotich III



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



- 1. All Angle Irons and Steel Straps shall be galvanized in accordance with AASHTO M 232.
- 2. Pipe, Caps, and T-Adapter shall be 1" I.D. white PVC, or Primed Steel, except the water intake pipe shall be white PVC. Pipe shall be Sch. 40. All pipe joints shall be threaded.
- 3. Gage assembly pipe, fiberglass rod, and angle iron can be extended as needed to fit site requirements. Extra Pipe Clamps shall be added for security.
- 4. Score the water intake pipe 1/4" deep, 1/32" wide (width of saw blade), every 1/2", alternating cuts on top and bottom for drainage. Place at lowest water level.
- 5. Water level may vary, depending on season.
- 6. Pour in approximately 1 tablespoon of cork dust at installation, and after each reading.



CREST GAGE

STANDARD PLAN H-30.10-00

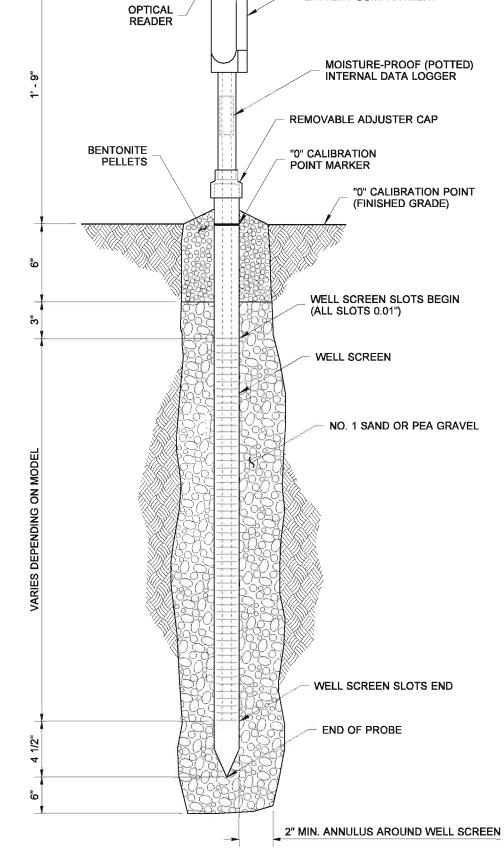
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III 10-12-07

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

ISOMETRIC VIEW



WEATHER RESISTANT BATTERY COMPARTMENT



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AUTOMATED GROUND WATER MONITORING WELL STANDARD PLAN H-32.10-00

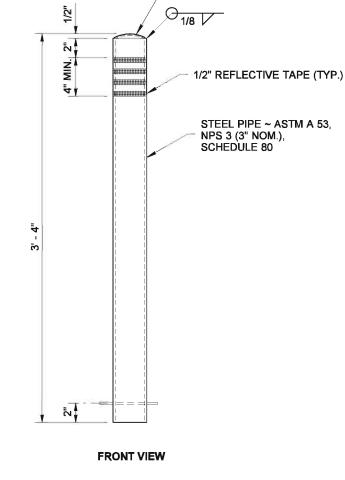
SHEET 1 OF 1 SHEET

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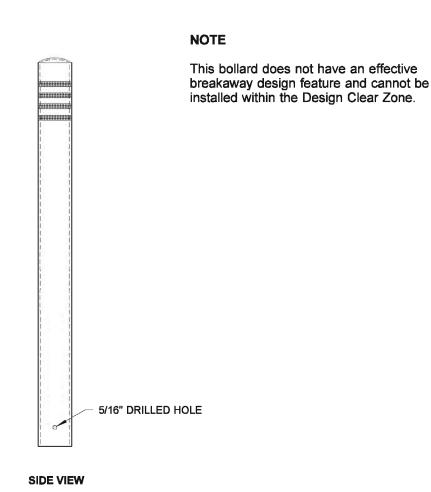
Pasco Bakotich III



09-20-07

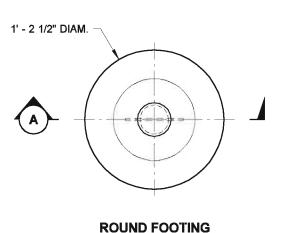


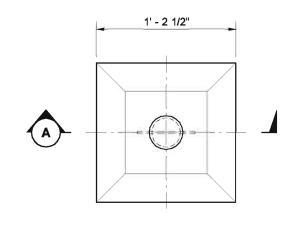
STEEL CAP PLATE



POST

SECTION (A)





SQUARE FOOTING

PLAN VIEW

EXPIRES JUNE 19, 2008

BOLLARD TYPE 2

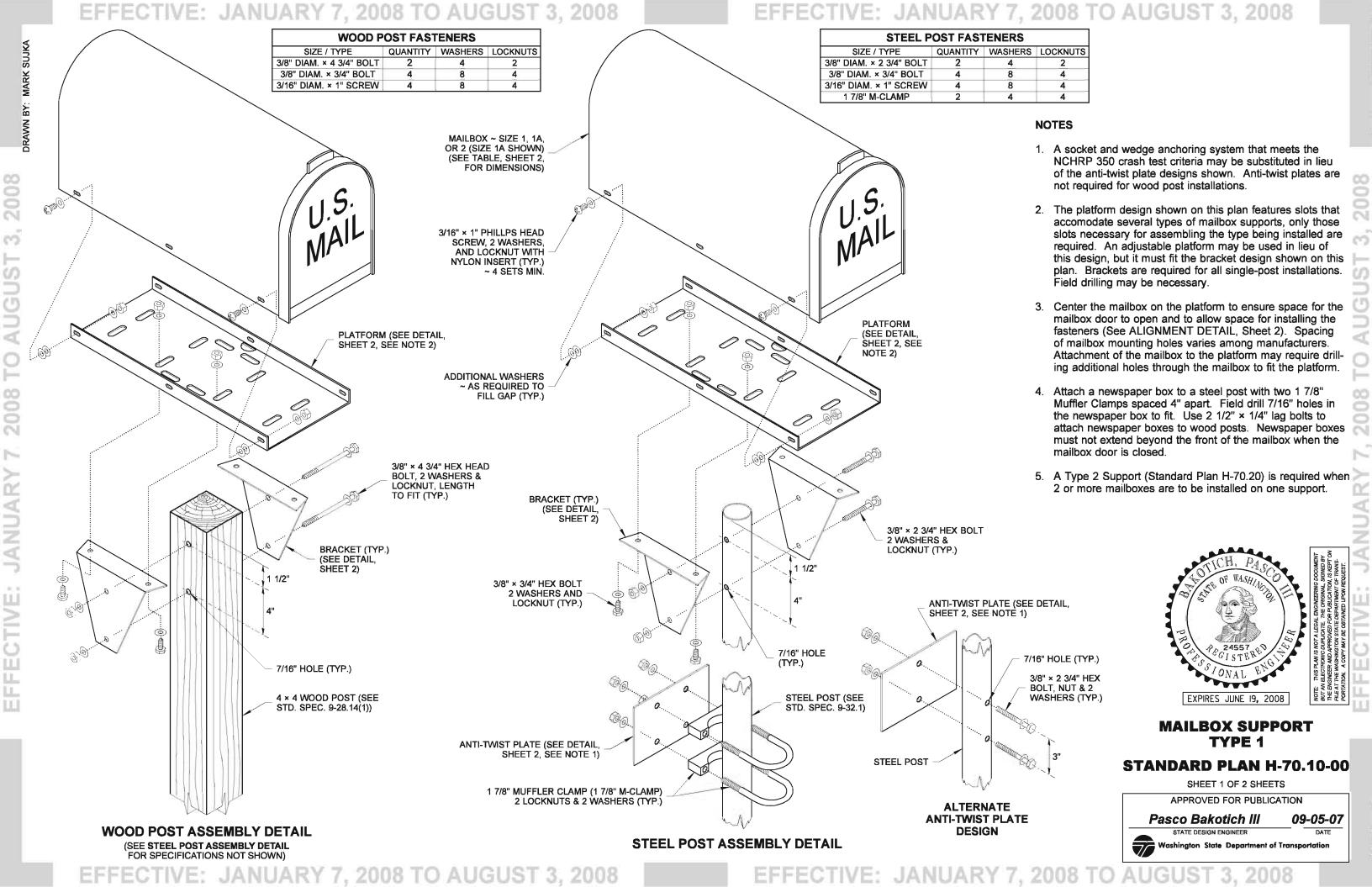
STANDARD PLAN H-60.20-00

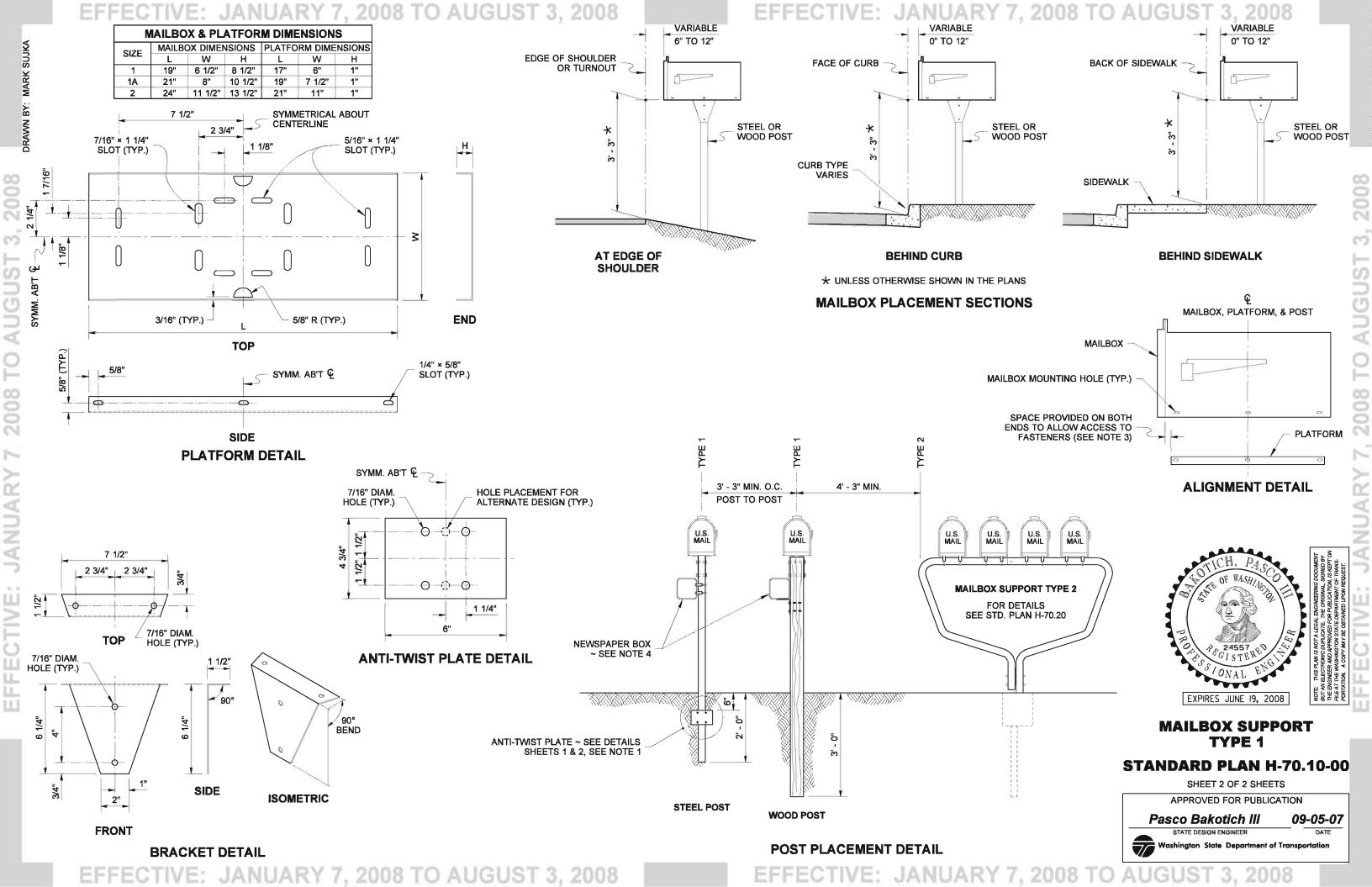
SHEET 1 OF 1 SHEET

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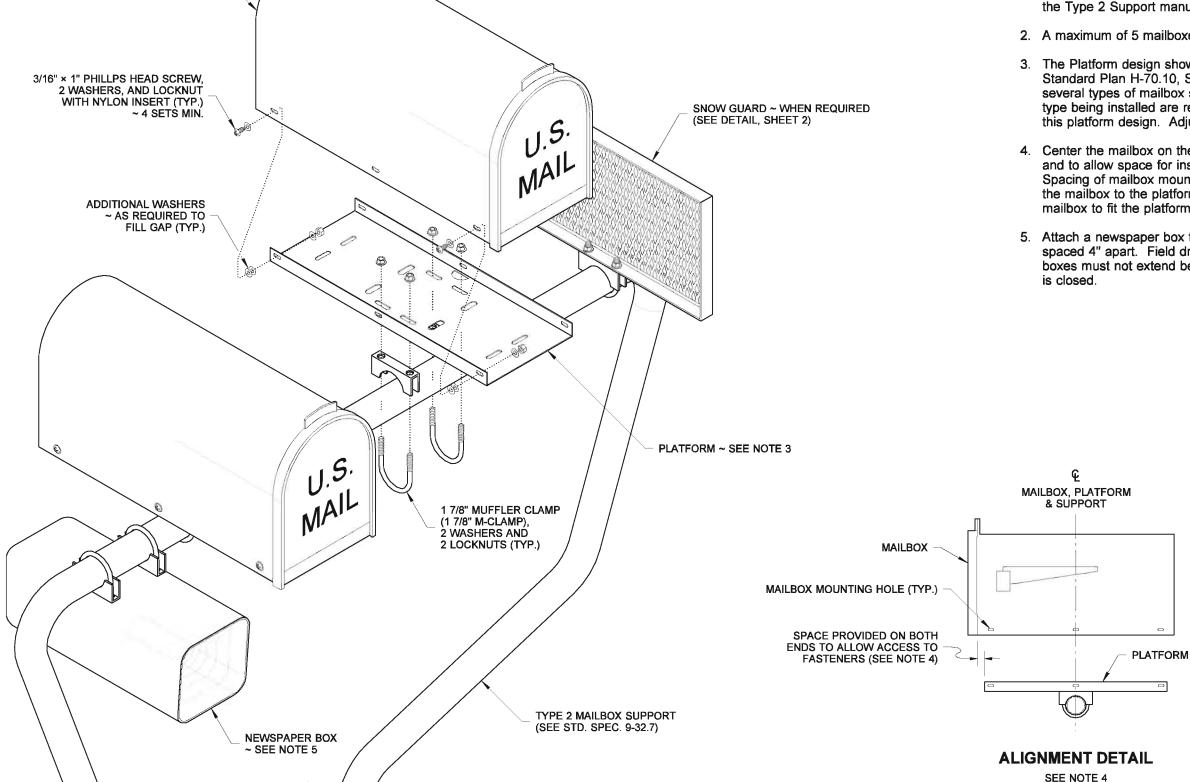


MAILBOX ~ SIZE 1, 1A, OR 2 (SIZE 1A SHOWN) (SEE TABLE, STD. PLAN H-70.10, SHEET 2,

FOR DIMENSIONS)

NO

- 1. The anchoring system shall meet NCHRP 350 crash test criteria. Use a socket and wedge system, or the anchoring system supplied by or recommended by the Type 2 Support manufacturer.
- 2. A maximum of 5 mailboxes may be installed on a Type 2 Support.
- 3. The Platform design shown in this plan is detailed in the PLATFORM DETAIL, Standard Plan H-70.10, Sheet 2. The design features slots that accommodate several types of mailbox supports; only those slots necessary for assembling the type being installed are required. An adjustable platform may be used in lieu of this platform design. Adjustable platforms must fit the 1 7/8" M-Clamp.
- 4. Center the mailbox on the platform to ensure space for the mailbox door to open and to allow space for installing the fasteners (See ALIGNMENT DETAIL). Spacing of mailbox mounting holes varies among manufacturers. Attachment of the mailbox to the platform may require drilling additional holes through the mailbox to fit the platform.
- Attach a newspaper box to a Type 2 Support with two 1 7/8" Muffler Clamps spaced 4" apart. Field drill 7/16" holes in the newspaper box to fit. Newspaper boxes must not extend beyond the front of the mailbox when the mailbox door is closed.



ASSEMBLY DETAIL

TEXPORA MAIN SUCCESS OF THE SECOND STATES OF THE SE

MAILBOX SUPPORT TYPE 2

STANDARD PLAN H-70.20-00

SHEET 1 OF 2 SHEETS

09-05-07

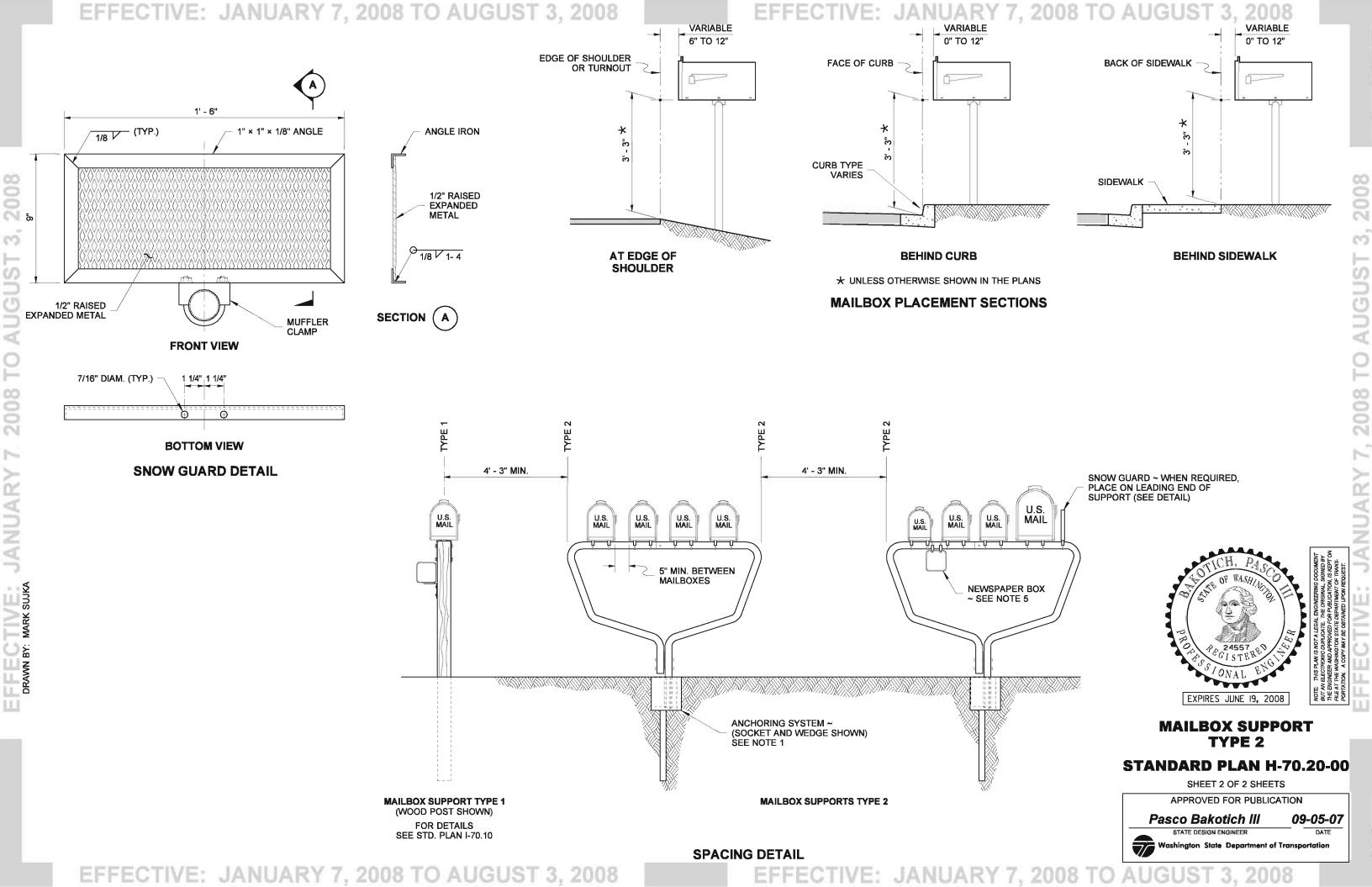
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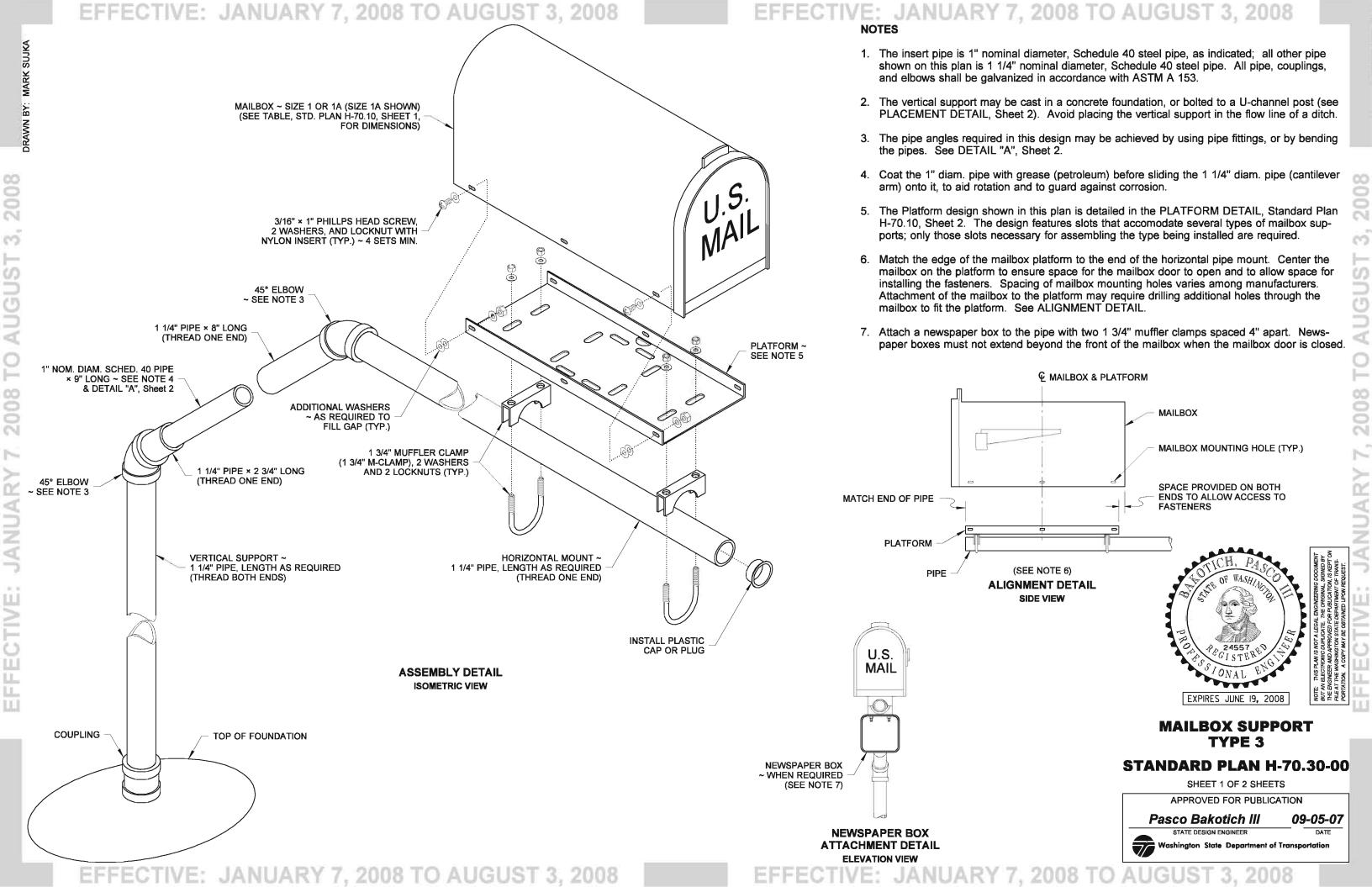
Pasco Bakotich III



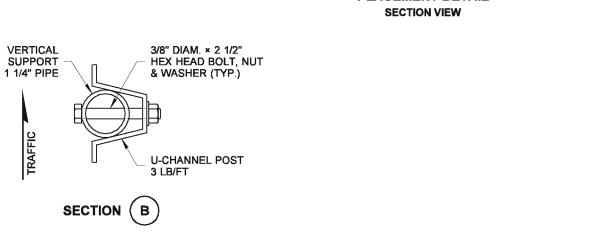
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

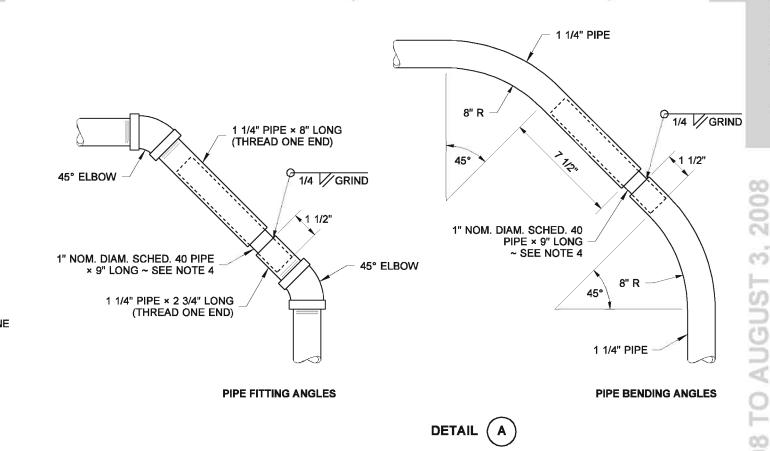


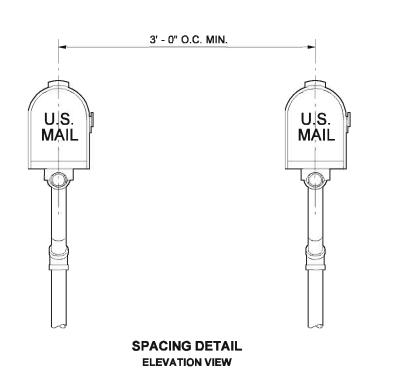


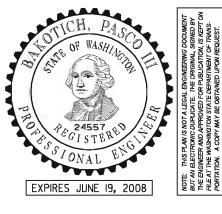
VARIABLE



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008







MAILBOX SUPPORT TYPE 3

STANDARD PLAN H-70.30-00

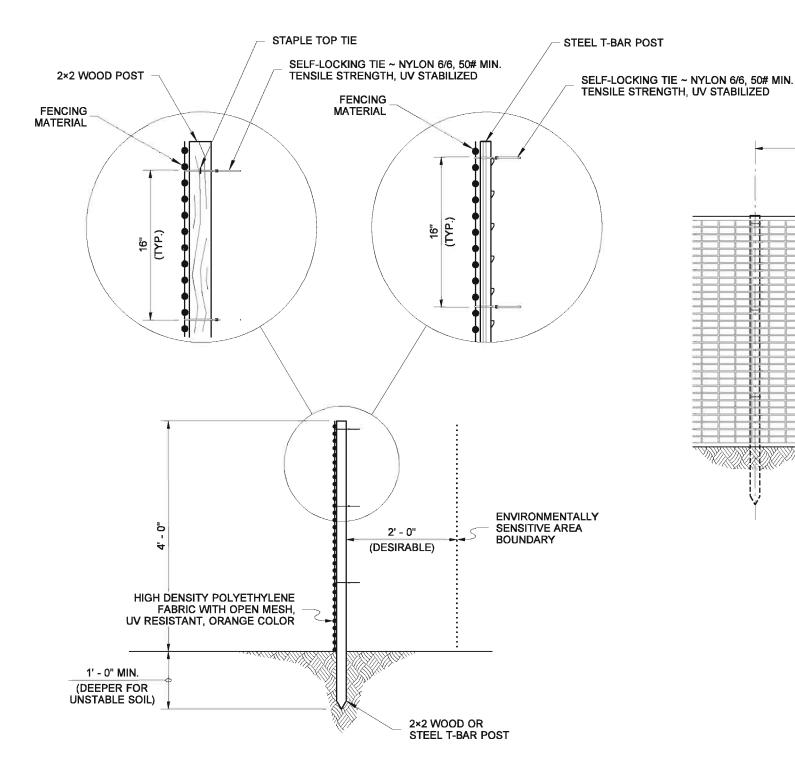
SHEET 2 OF 2 SHEETS

Pasco Bakotich III 09-05-07

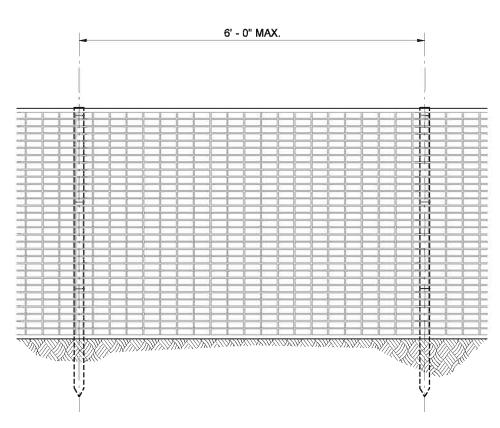
Washington State Department

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

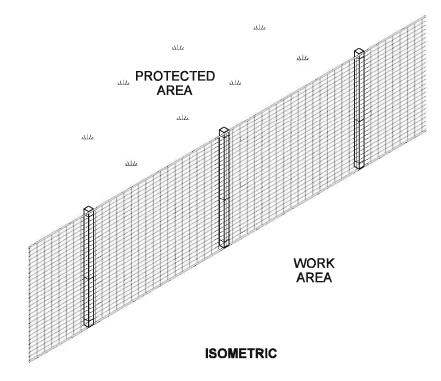
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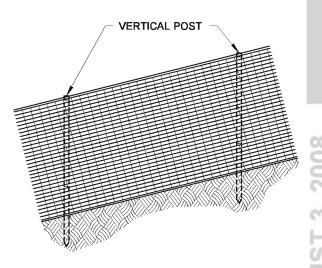


TYPICAL SECTION



ELEVATION





ELEVATION
FENCE ON SLOPE



STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT

MARK W. MAURER
CERTIFICATE NO. 000598

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HIGH VISIBILITY FENCE

STANDARD PLAN I-10.10-00

SHEET 1 OF 1 SHEET

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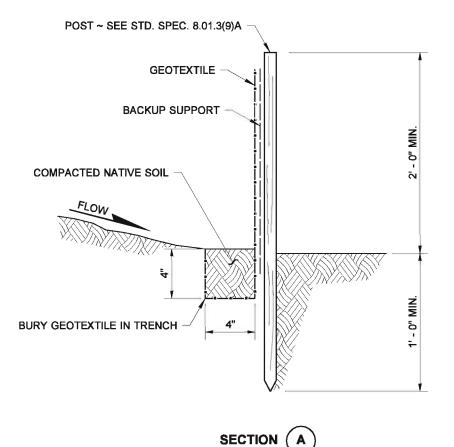
hington State Department of Transportation

08-31-07

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 1. Maximize detention of stormwater by placing fence as far away from toe of slope as possible without encroaching on sensitive areas or outside of the clearing boundaries.
- 2. Install silt fencing along contours whenever possible.
- 3. Install the ends of the silt fence to point slightly up-slope to prevent sediment from flowing around the ends of the fence.
- Perform maintenance in accordance with Standard Specifications 8.01.3(9)A and 8.01.3(15).





STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT

MARK W. MAURER CERTIFICATE NO. 000598

09-20-07

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SILT FENCE

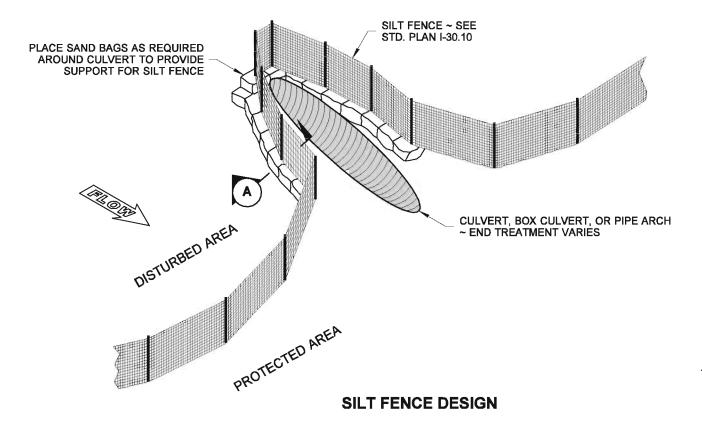
STANDARD PLAN I-30.10-00

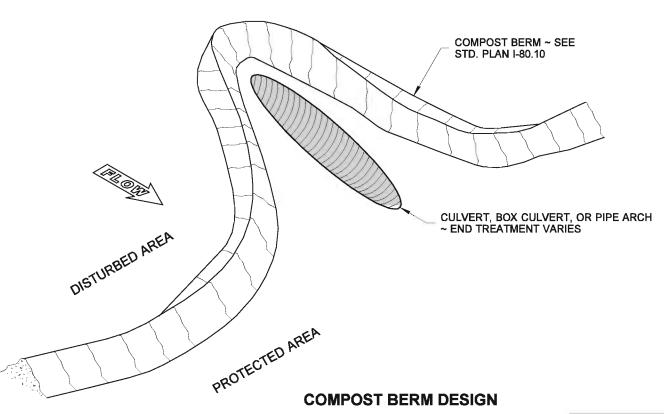
SHEET 1 OF 1 SHEET

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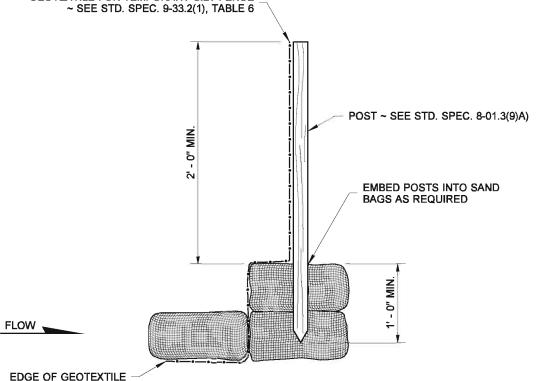




EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

Perform maintenance in accordance with Standard Specification 8-01.3(9)A and 8-01.3(15). GEOTEXTILE FOR TEMPORARY SILT FENCE ~ SEE STD. SPEC. 9-33.2(1), TABLE 6

NOTE



SECTION (A)



STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT

CERTIFICATE NO. 000598

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

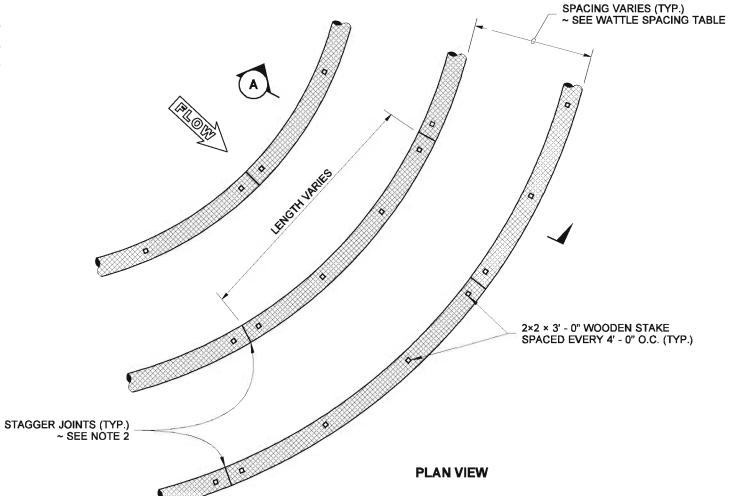
SHEET 1 OF 1 SHEET

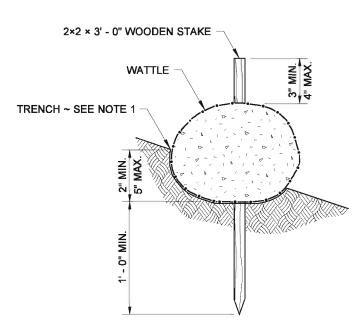
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SPACING VARIES (TYP.)

TYPICAL SECTION

WATTLE DETAIL

~ SEE WATTLE SPACING TABLE **WATTLE SPACING TABLE** SLOPE **MAXIMUM SPACING** 1:1 10' - 0" 2:1 20' - 0" 3:1 30' - 0" 4:1 40' - 0" SECTION (A

SEDIMENT TRAPPING

AREA (TYP.)

NOTES

- 1. Wattles shall be in accordance with Standard Specification 9-14.5(5). Install Wattles along contours. Installation shall be in accordance with Standard Specification 8-01.3(10).
- 2. Securely knot each end of Wattle. Abut adjacent Wattles tightly, end to end, without overlapping the ends.
- 3. Pilot holes may be driven through the Wattles and into the soil when soil conditions require.
- 4. Live stakes may be used for permanent installation and shall be in accordance with Standard Specification 9-14.5(6).
- 5. Wattles shall be inspected regularly, and immediately after a rainfall produces runoff, to ensure they remain thoroughly entrenched and in contact with the soil.
- 6. Perform maintenance in accordance with Standard Specification 8-01.3(15).



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WATTLE INSTALLATION ON SLOPE STANDARD PLAN I-30.30-00

SHEET 1 OF 1 SHEET

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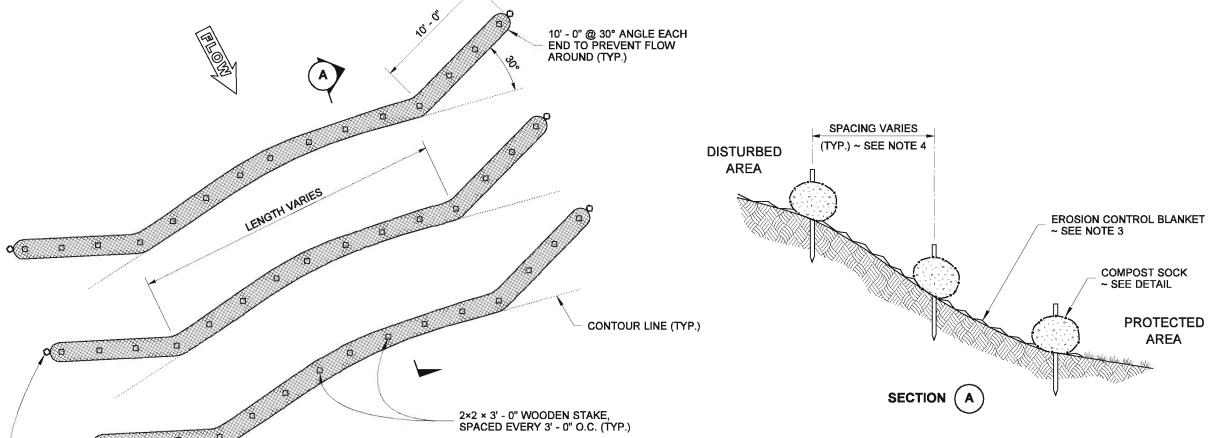
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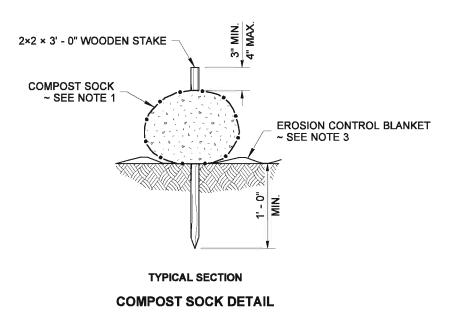


WATTLE ~ SEE DETAIL

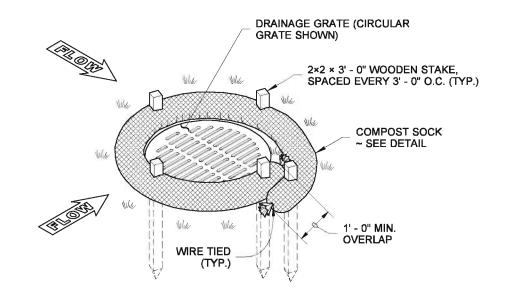
EXCESS SOCK MATERIAL, DRAWN IN AND TIED OFF AT STAKE (TYP.)



SLOPE INSTALLATION



PLAN VIEW



ISOMETRIC VIEW CATCH BASIN INSTALLATION NOTES

- 1. Compost Sock shall be in accordance with Standard Specification 9-14.5(6). Compost Sock shall be a minimum of 8" in diameter or sized to suit conditions as specified by the Engineer or Contract.
- 2. Compost material to be dispersed on site, as determined by the Engineer.
- 3. When placing Compost Sock on slopes, use Erosion Control Blanket if specified by the Engineer and in accordance with Standard Specification 9-14.5(2). See Standard Pian I-60.10.
- 4. Always install Compost Sock perpendicular to slope and along contour lines.
- 5. Remove sediment from the up slope side of the Compost Sock when accumulation has reached 1/2 of the effective height of the Compost Sock.
- 6. Live stakes can be used in addition to wooden stakes and shall be in accordance with Standard Specification 9-14.6(1). See plans for species selection and spacing.



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COMPOST SOCK

STANDARD PLAN I-30.40-00

SHEET 1 OF 1 SHEET

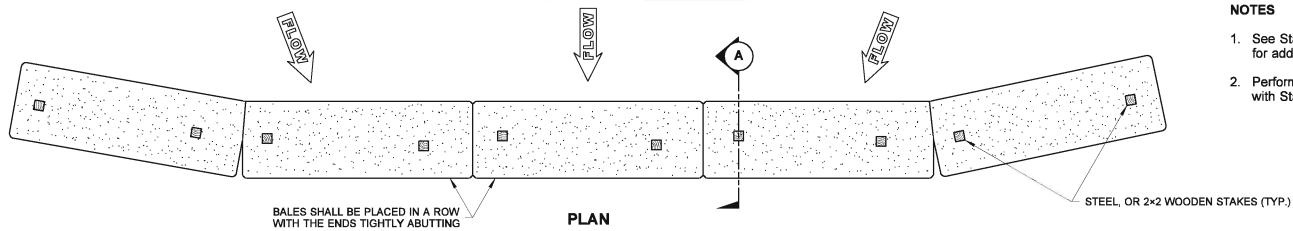
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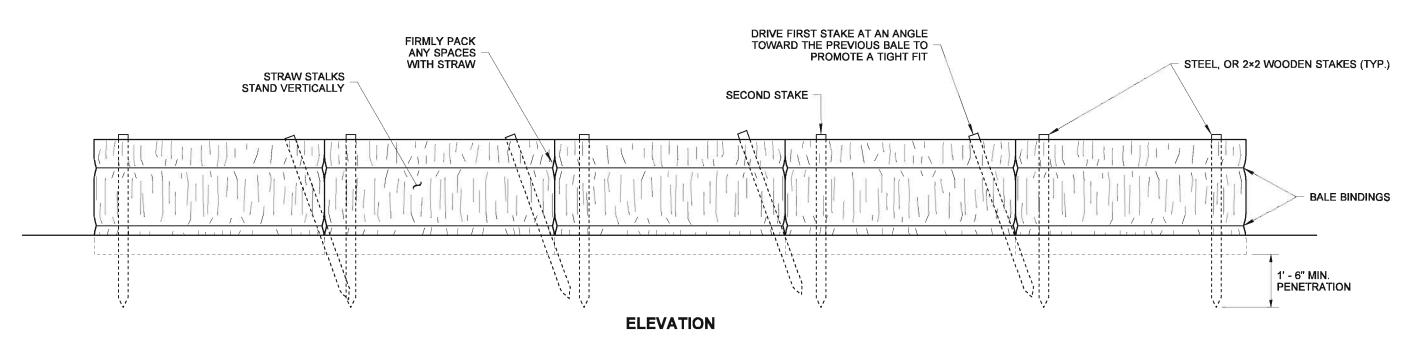
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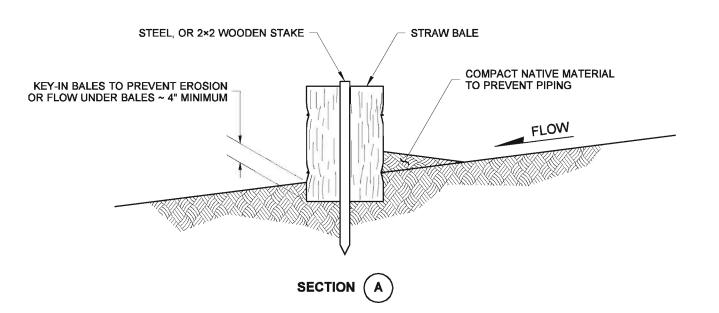
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES**



1. See Standard Specification 8-01.3(9)C, for additional information.

- 2. Perform maintenance in accordance with Standard Specification 8-01.3(15).







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STRAW BALE BARRIER

STANDARD PLAN I-30.50-00

SHEET 1 OF 1 SHEET

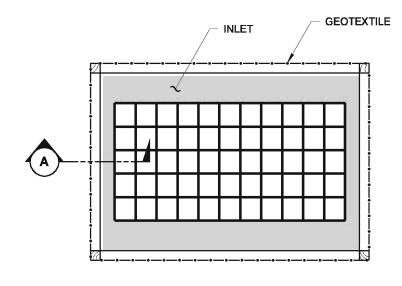
11-14-07

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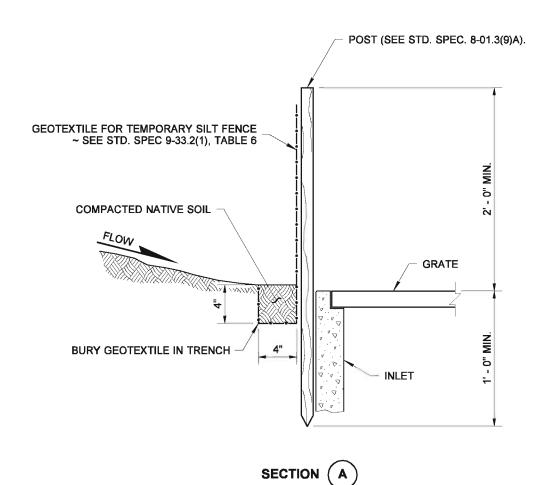
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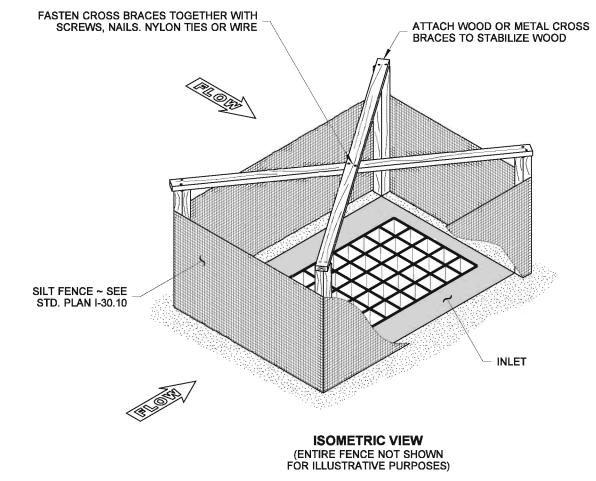


STATE DESIGN ENGINEER



PLAN VIEW (CROSS BRACES NOT SHOWN)





material shall be fastened to posts creating a seamless joint. 3. Ensure that ponding height of water does not cause flooding on adjacent roadways or private property. 4. Perform maintenance in accordance with Standard Specification 8-01.3(15).

1. Prefabricated units may be used in lieu of the design

2. Structure shall be constructed such that geotextile

shown on this plan upon approval of the Engineer.



STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT

MARK W. MAURER CERTIFICATE NO. 000598

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TEMPORARY SILT FENCE FOR INLET PROTECTION IN UNPAVED AREAS STANDARD PLAN I-40.10-00

SHEET 1 OF 1 SHEET

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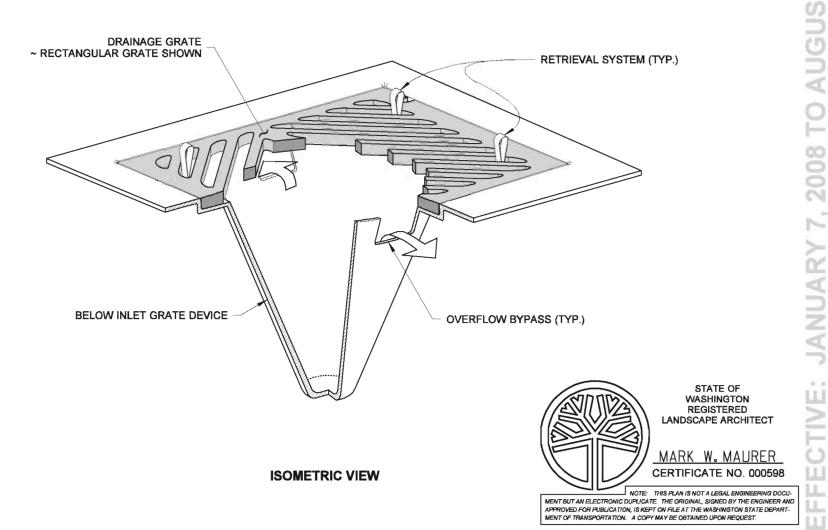
Pasco Bakotich III

09-20-07 STATE DESIGN ENGINEER



SECTION VIEW NOT TO SCALE

- 1. Size the Below Inlet Grate Device (BIGD) for the storm water structure it
- 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).



STORM DRAIN **INLET PROTECTION** STANDARD PLAN I-40.20-00

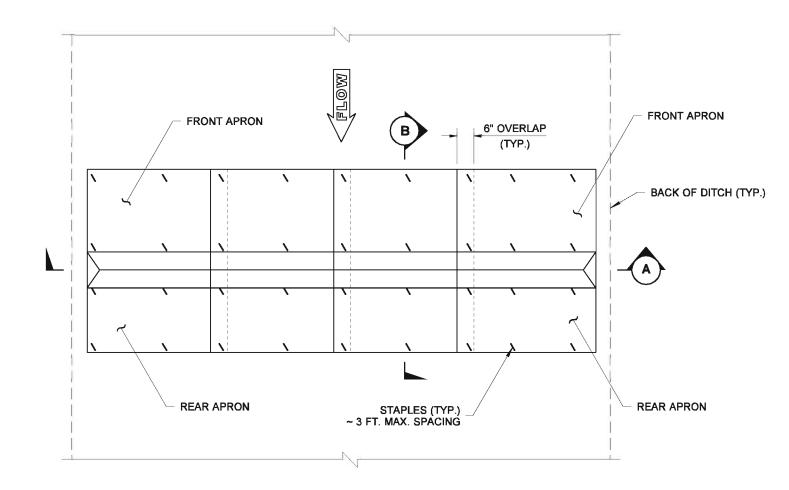
SHEET 1 OF 1 SHEET

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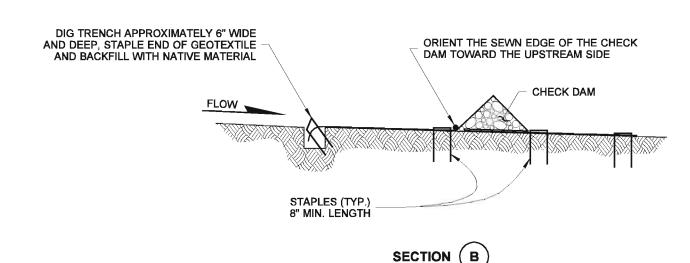
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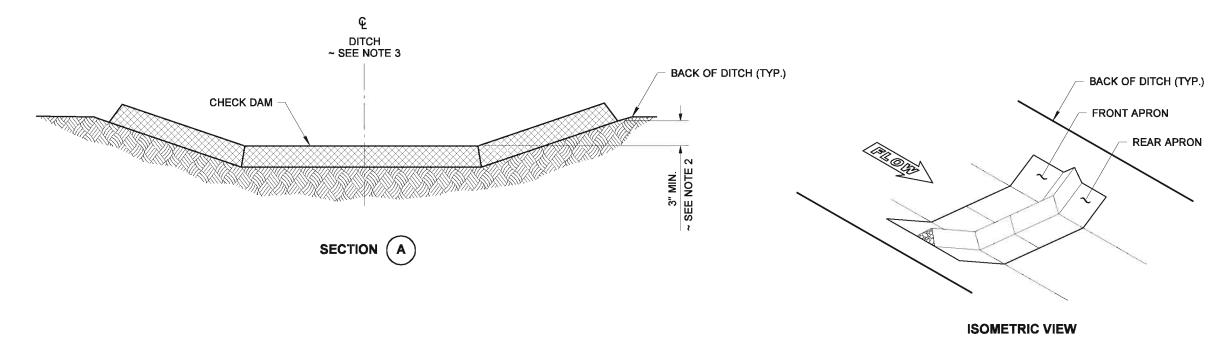




Geotextile encased Check Dams shall meet the requirements of Standard Specifications 8-01.3(6)A and 9-14.5(4).

- Install the sloped ends of the Check Dam a minimum of 3" higher than the top of the check dam in the channel to ensure that water flows over the dam and not around it.
- 3. Flat bottom ditch design shown, Check Dam installation details are similar for "V" bottom ditches.
- 4. Perform maintenance in accordance with Standard Specifications 8-01.3(15).







GEOTEXTILE ENCASED CHECK DAM INSTALLATION

STANDARD PLAN I-50.10-00

SHEET 1 OF 1 SHEET

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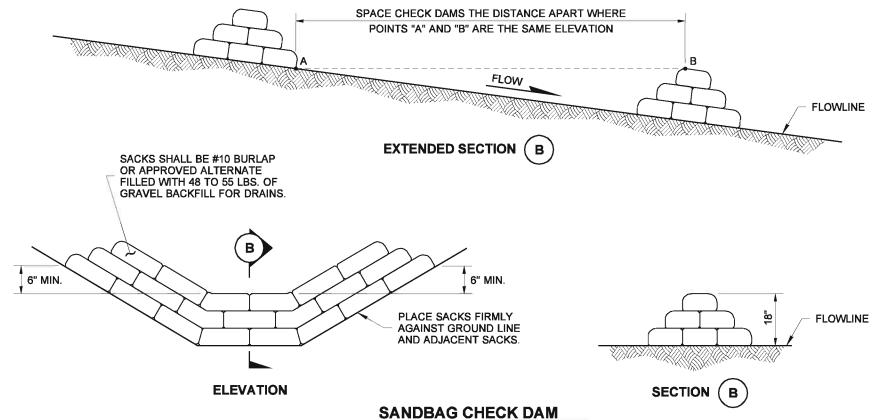
PLAN VIEW

SECTION (A

FLOWLINE

WATTLE OR COMPOST SOCK FLOWLINE WATTLE OR 3/4" × 3/4" WOODEN COMPOST SOCK STAKE (TYP.) 6" MIN. 6" MIN. 1' - 6" MIN. **PENETRATION ELEVATION**







CHECK DAMS

STANDARD PLAN I-50.20-00

SHEET 1 OF 1 SHEET

08-31-07

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EFFECTIVE 16"

ROCK CHECK DAMS SHALL BE PLACED

OUTSIDE OF THE CLEAR ZONE, OR BEHIND TRAFFIC BARRIER.

ROCK CHECK DAM

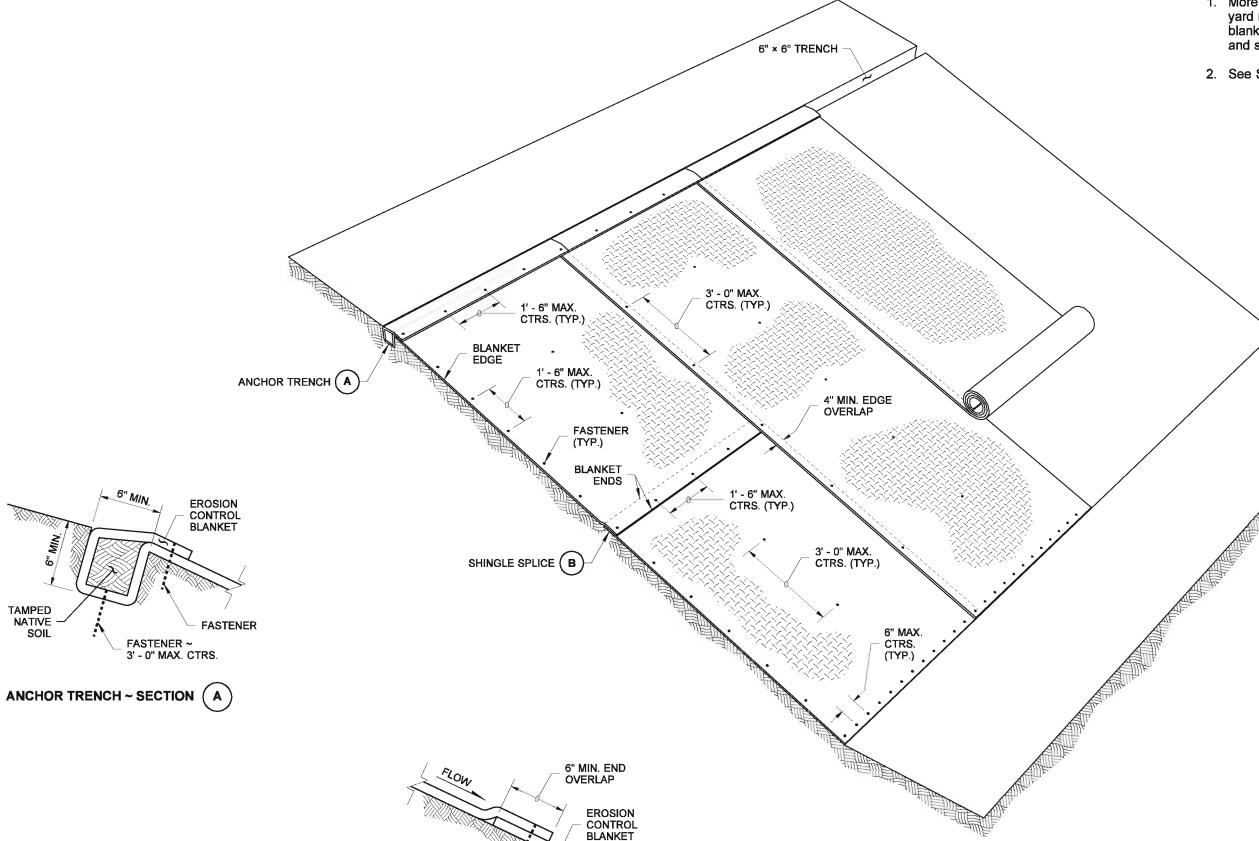
DAM HEIGHT

ELEVATION

2008

JANUARY

2. See Standard Specification 8-01.3(3).



STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT MARK W. MAURER

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CERTIFICATE NO. 000598

EROSION CONTROL BLANKET PLACEMENT ON SLOPE

STANDARD PLAN I-60.10-00

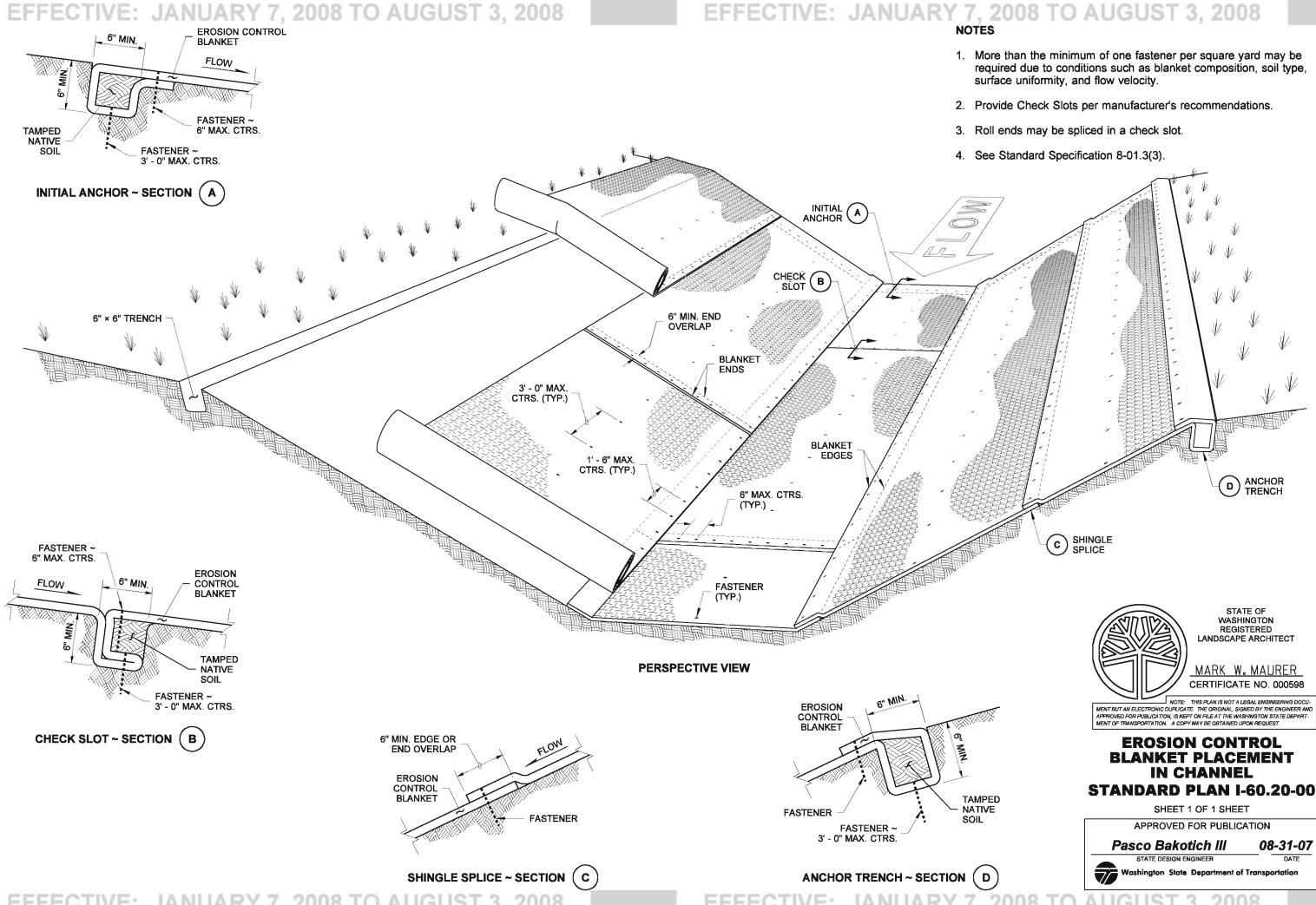
SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

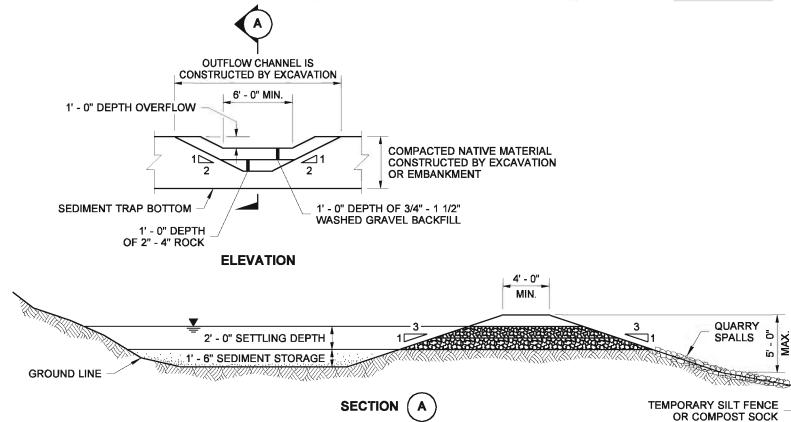
08-31-07 Pasco Bakotich III

FASTENER

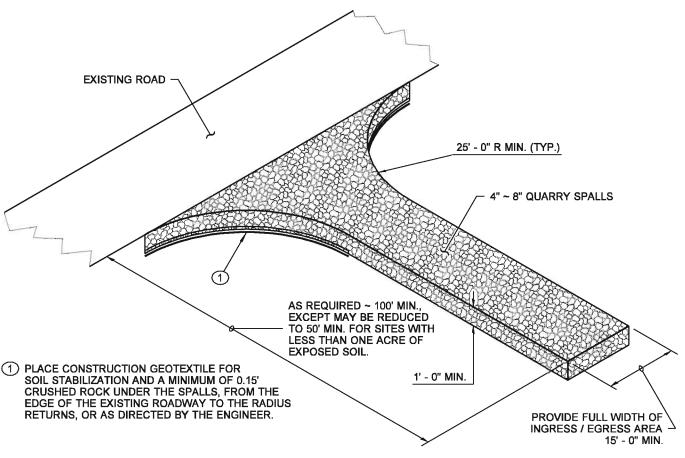
SHINGLE SPLICE ~ SECTION (B

PERSPECTIVE VIEW

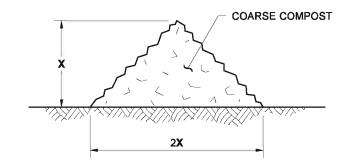




TEMPORARY SEDIMENT TRAP



ISOMETRIC VIEW
STABILIZED CONSTRUCTION ENTRANCE



X = 1' - 0" FOR SLOPES 4H:1V OR FLATTER X = 1' - 6" FOR SLOPES STEEPER THAN 4H:1V

TYPICAL SECTION

COMPOST BERM DETAIL



STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT

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CERTIFICATE NO. 000598

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MISCELLANEOUS EROSION CONTROL DETAILS STANDARD PLAN I-80.10-00

SHEET 1 OF 1 SHEET

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Washington State Department of Transportation

LUMINAIRE SUPPORT

Shown for 480 VAC power feed. Increase conductor and fuse size as required for 240 VAC power feed.

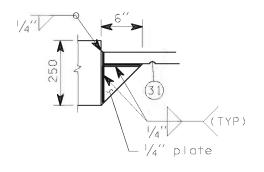
60°(TYP)

-See Gusset Detail

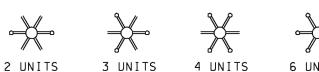
PLAN VIEW

LUMINAIRE SUPPORT BRACKET

- Galvanized steel mast arm configuration varies with manufacturer Luminaire - see Contract for type and number
- Mounting height roadway to luminaire elevation difference ± 2%, see Contract
- Mast arm length see Contract
- 5%" galvanized thimble eyebolt (single or double) with washers and nuts or eyenut
- Bonding jumper
- Pole and bracket cable
- Equipment grounding conductor see Standard Plan J-9a.
- From ground line to 10' above ground, enclose equipment grounding conductor in galvanized steel conduit, code sized. Above 10' from ground, staple equipment grounding conductor to pole. Connect to supplemental ground per Standard Plan J-9a.
- Service wedge clamp
 - ACSR triplex or fourplex conductors see Contract
- Copper split bolt connector
 - Messenger cable
- Insulating tape for waterproof connection
- Fused quick disconnect use 30 amp fuses for high mast supports
- Weatherhead size as required
 - Steel conduit
- $8^{\prime\prime}$ \times $8^{\prime\prime}$ \times $4^{\prime\prime}$ NEMA 3R junction box with raintight hubs and removable cover
 - Grounding lug
- 12 pole terminal block
- Direct burial conductors or galvanized steel conduits with conductors see Contract
- Grounding bushing
- Supplemental ground see Standard Plan J-9a.
- Class 5 timber pole length sufficient for mounting height and burial depth
- Class 2 timber pole length sufficient for mounting height and burial depth.
- $\frac{5}{8}$ " \times 9" step bolt
- $\frac{1}{4}$ × 10" plate collar bent to fit pole diameter (8" 10")
- $\frac{3}{8}$ " \times 4" machine bolts (four required) with washers and nuts
- $\frac{1}{2}$ lag bolts (six required) drill $\frac{9}{16}$ hole in plate
- 2" pipe
- $\frac{3}{4}$ " wire hole 2" from gusset plate, smooth hole edges
- 1" nonmetallic conduit with $\frac{3}{4}$ " straps at code spacing
- Distance varies, 35' MIN, 50' MAX, depending on line clearance requirements



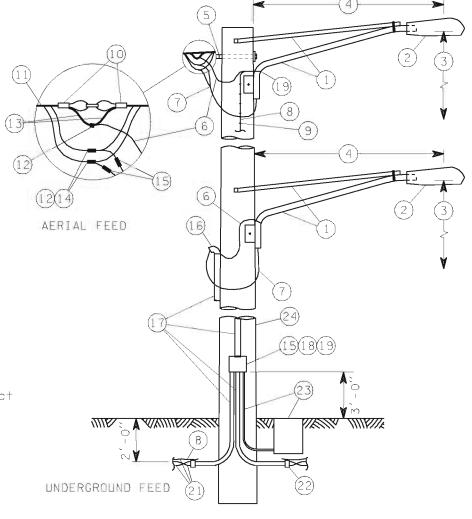
GUSSET DETAIL



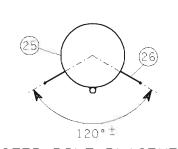
PLAN VIEW TYPICAL LUMINAIRE MOUNTING CONFIGURATIONS

> REPLACED PLAN TITLE REFERENCES WITH PLAN NUMBERS CORRECTED KEY NOTE 5.

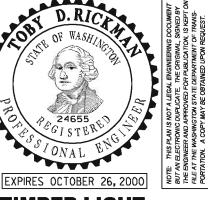
- installations where breakaway or slip bases are not required.
- 2. When down guys are required, See Standard Plan J-7d.



TIMBER LUMINAIRE SUPPORT



STEP BOLT PLACEMENT



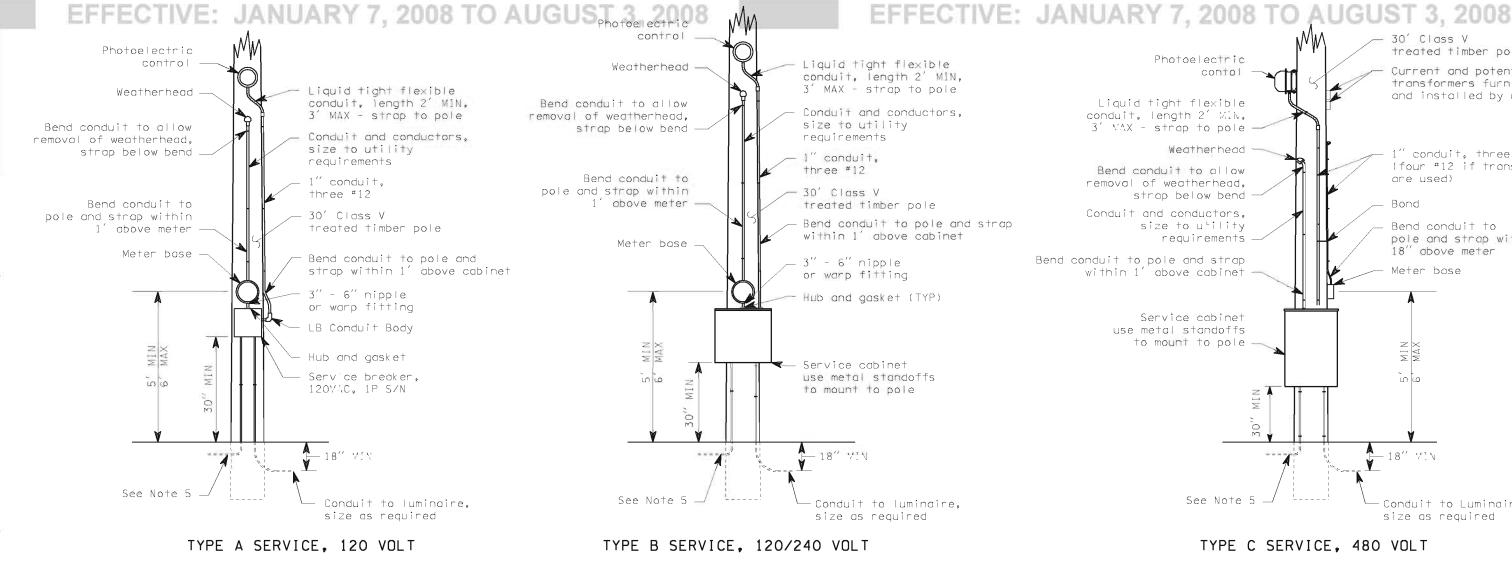
TIMBER LIGHT **STANDARDS STANDARD PLAN J-1f**

APPROVED FOR PUBLICATION

Clifford E. Mansfield 6/23/00

DEPUTY STATE DESIGN ENGINEER WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

GALVANIZE AFTER FABRICATION EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



transformers furnished and installed by utility Liquid tight flexible conduit, length 2' MIN, 3' MAX - strap to pole Weatherhead conduit, three #12 (four #12 if transformers Bend conduit to allow are used) removal of weatherhead, strap below bend Conduit and conductors, size to u'ility Bend conduit to requirements pole and strap within 18" above meter Bend conduit to pole and strap within 1' above cabinet Meter base Service cabinet use metal standoffs to mount to pole -M X X - 18" YIN See Note 5 -Conduit to Luminaire, size as required TYPE C SERVICE, 480 VOLT

Photoelectric

contol

galvanized bolts Timber pole Photoelectric control oriented to north sky Two $\frac{5}{16}'' \times 3''$ galvanized lag screws Two $\frac{1}{4}$ × $\frac{1}{2}$ brass bolts; drill bracket to fit meter base Threadless couplings (TYP) Conduit body -

PHOTOELECTRIC CONTROL DETAILS

TYPE A, B AND C SERVICE LIGHTING DETAILS

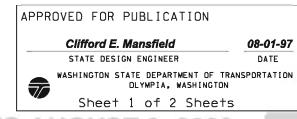
30' Class V

treated timber pole

Current and potential



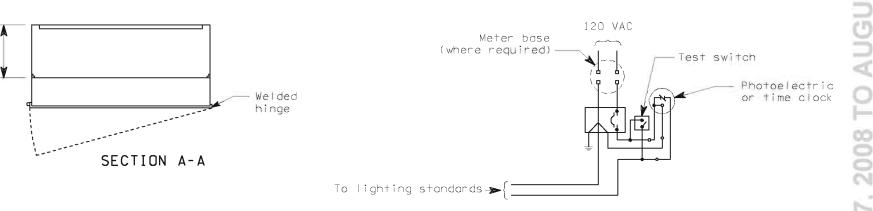




EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

MESFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. Metering arrangements may vary with different serving utilities. The contractor shall verify the requirements of the utility prior to installing the service equipment.
- 2. All service pole conduit shall be secured to the pole with conduit strap at 5' centers.
- 3. All risers and service equipment shall be installed on side of pole that is away from traffic.
- 4. Where required by the serving utility, service breakers shall be installed above the meter socket in a separate raintight enclosure.
- 5. Bend and attach to pole within 1^\prime of enclosure. See Standard Plan "Typical Grounding Details."
- 6. For Type B service wiring diagram, use Standard Plan "Modified Type B Service".
 For Type C service wiring diagram, use Standard Plan, "Type E Service."
- 7. See breaker schedule in contract for breaker and contactor sizes.



TYPE A, B AND C SERVICE LIGHTING DETAILS

TYPE A WIRING DIAGRAM

120 VOLT



STANDARD PLAN J-3

APPROVED FOR PUBLICATION

Clifford E. Mansfield

STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

Sheet 2 of 2 Sheets

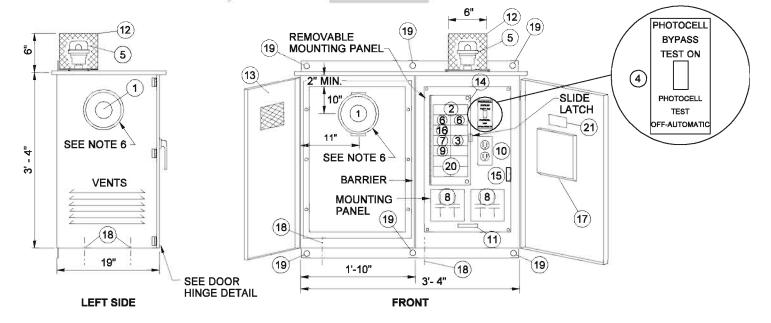
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

GENERAL NOTES

200 AMP TYPE 120/240 1ø SERVICE CABINET

- SEE STANDARD SPECIFICATION 9-29.24, SERVICE CABINETS.
- 2. HINGES SHALL HAVE STAINLESS STEEL OR BRASS PINS.
- CABINETS SHALL BE RATED NEMA 3R AND SHALL INCLUDE TWO RAIN TIGHT VENTS.
- 4. METERING EQUIPMENT DOOR SHALL BE PAD LOCKABLE. EACH DOOR SHALL BE GASKETED. INSTALL BEST CX CONSTRUCTION CORE ON RIGHT DOOR. SEE DOOR HINGE DETAIL, SHEET 1 OF 2.
- THE FOLLOWING EQUIPMENT WITHIN THE SERVICE ENCLOSURE SHALL HAVE AN APPROPRIATELY ENGRAVED PHENOLIC NAME PLATE ATTACHED WITH SCREWS OR RIVETS: KEY NUMBERS 2, 3, 4, 6, 7, 8, 9 AND 16. KEY NUMBER 4 NAME PLATE SHALL READ: "PHOTOCELL BYPASS TEST ON" AND "PHOTOCELL TEST OFF- AUTOMATIC". SEE SERVICE CABINET DETAIL.
- METERING ARRANGEMENTS VARY WITH DIFFERENT SERVING UTILITIES. THE UTILITY MAY REQUIRE METER BASE MOUNTING IN THE ENCLOSURE. ON THE SIDE OR ON THE BACK OF THE ENCLOSURE. THE UTILITY MAY REQUIRE THE DIMENSION BETWEEN THE DOOR AND THE FRONT OF THE SAFETY SOCKET BOX TO BE LESS THAN THE 11 INCHES SHOWN IN THE LEFT SIDE- SAFETY SOCKET BOX MOUNTING DETAIL. THE CONTRACTOR SHALL VERIFY THE SERVING UTILITY'S REQUIREMENTS PRIOR TO FABRICATION OF AND INSTALLING THE SERVICE EQUIPMENT.
- DIMENSIONS SHOWN ARE MINIMUM AND SHALL BE ADJUSTED TO ACCOMMODATE THE VARIOUS SIZES OF EQUIPMENT INSTALLED.
- ALL BUSSWORK SHALL BE HIGH GRADE COPPER AND SHALL EQUAL OR EXCEED THE MAIN BREAKER RATING. ALL BREAKERS SHALL BOLT ONTO THE BUSSWORK. JUMPERING OF BREAKERS SHALL NOT BE ALLOWED. BUSSWORK SHALL ACCOMMODATE ALL FUTURE EQUIPMENT AS SHOWN IN THE BREAKER SCHEDULE
- THE PHOTOCELL UNIT SHALL BE CENTERED IN THE PHOTOCELL ENCLOSURE TO PERMIT 360 DEGREE ROTATION OF THE PHOTOCELL WITHOUT REMOVAL OF THE PHOTOCELL UNIT OR THE PHOTOCELL ENCLOSURE.
- 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.
- ALL NUTS, BOLTS AND WASHERS USED FOR MOUNTING THE PHOTOCELL ENCLOSURE SHALL BE STAINLESS STEEL.
- 12. A 1% TOLERANCE IS ALLOWED FOR ALL DIMENSIONS.
- UNISTRUT TYPE CHANNEL AND MOUNTING HARDWARE COMPONENTS SHALL BE STAINLESS STEEL. CONDUIT CLAMPS SHALL BE HOT DIPPED, GALVANIZED STEEL OR STAINLESS STEEL.
- INSTALL CONDUIT COUPLINGS ON ALL CONDUITS. PLACE COUPLINGS FLUSH WITH TOP OF CONCRETE FOUNDATION.
- NOTE 15 HAS BEEN DELETED.
- THE METER BASE PORTION OF THIS SERVICE WAS DESIGNED TO MEET METERING PORTION OF EUSERC DRAWING 309 REQUIREMENTS.
- WHEN USING ALTERNATE DOOR HINGE: REMOVE HINGE PIN PRIOR TO WELDING HINGE TO CABINET AND PRIOR TO HOT DIP GALVANIZING CABINET AFTER GALVANIZING, REPLACE PIN WITH BRASS PIN AND SOLDER IN PLACE.
- 18. VERIFY THE SERVICE UTILITY STAND-OFF DIMENSION ADJUST THE REMOVABLE PANEL TO THE MEASUREMENT PROVIDED BY THE UTILITY COMPANY. AFTER ADJUSTMENT. CUT OFF ALL-THREAD BOLTS SO THAT NO LESS THAN 2 AND NO MORE THAN 3 FULL THREADS EXTEND PAST THE **FACE OF THE NUTS**



SERVICE CABINET DETAIL

STAND-OFF DIMENSION

LEFT SIDE- SAFETY SOCKET BOX MOUNTING DETAIL

- DOOR

DOOR

2" HIGH x 2" OPEN

3/8" BARREI

~ SEE NOTE 18

PIANO

HINGE

TYP.

1 1/2" (TYP.)

DOOR HINGE DETAIL

ALTERNATE FOR TYPE B MODIFIED CABINET

SEE NOTE 17

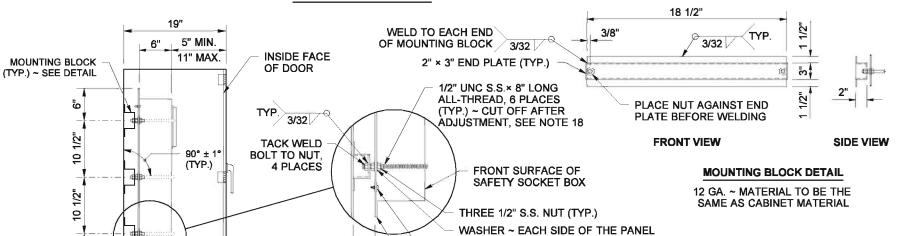
VIEW B-B

1/4" x 1 1/4" CLOSED CELL

NEOPRENE GASKET

CABINET

LAP WELD



OUR 1/4-20 S.S. PANHEAD PHILLIPS

~ TOP AND BUTTOM, SPACED EVENLY

1/2" RETURN ~ WELD AT CORNERS

12 GA REMOVABLE PANEL

CABINET OR

PANEL WALL

1/4" x 5/8"

GASKET

DOOR HINGE DETAIL

NEOPRENE

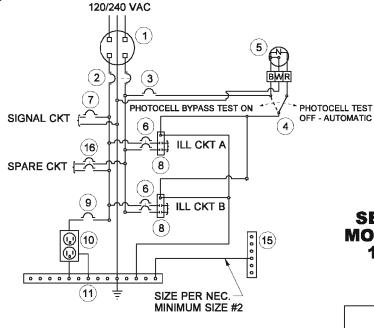
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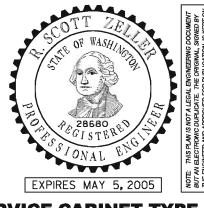
PANEL DOOR

MACHINE SCREWS, WASHERS, AND NUTS

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- METER BASE PER SERVING UTILITY REQUIREMENTS AS A MINIMUM. THE METER BASE SHALL BE SAFETY SOCKET BOX WITH FACTORY INSTALLED TEST BYPASS FACILITY THAT MEETS THE REQUIREMENTS OF EUSERC DRAWING 305.
- (2) MAIN BREAKER (SEE BREAKER SCHEDULE)
- PHOTOCELL BREAKER (SPST 15 AMP 120/240 VOLT)
- TEST SWITCH (SPDT SNAP ACTION, POSITIVE CLOSE 15 AMP - 120/277 VOLT - "T" RATED)
- PHOTOELECTRIC CONTROL, STD. SPEC. 9 29.11(2)
- BRANCH BREAKER (SEE BREAKER SCHEDULE)
- SIGNAL BREAKER (SEE BREAKER SCHEDULE)
- (8) CONTACTOR (SEE BREAKER SCHEDULE)
- RECEPTACLE BREAKER (SPST 20 AMP 120/240 VOLT)
- RECEPTACLE, GROUNDED (GFCI 20 AMP 125 VOLT)
- **NEUTRAL BUSS, 14 LUG COPPER**
- PHOTOCELL ENCLOSURE ENCLOSURE TO BE FABRICATED FROM 5/8" EXPANDED STEEL MESH WITH WELDED SEAMS AND MOUNTING FLANGES. HOT DIP GALVANIZED AFTER FABRICATION. TYPE 5052 - H32 ALUMINUM WITH 5/8" x 5/8" OPENINGS EQUIVALENT TO 5/8" EXPANDED STEEL MESH MAY BE USED AS ALTERNATIVE MATERIAL. SEE PHOTOCELL ENCLOSURE MOUNTING DETAIL, SHEET 2 OF 2.
- HINGED FRONT FACING DOOR WITH 4" x 4" MIN. POLISHED WIRE GLASS WINDOW.
- HINGED DEAD FRONT WITH 1/4 TURN FASTENERS OR SLIDE
- (15) CABINET MAIN BONDING JUMPER. BUSS SHALL BE 4 LUG TINNED COPPER. SEE CABINET MAIN BONDING JUMPER DETAIL ON SHEET 2 OF 2.
- SPARE BRANCH BREAKER (DPST 20AMP- 120/240 VOLT)
- METAL WIRING DIAGRAM HOLDER
- 1/4" DIAMETER DRAIN HOLE. DRILL BEFORE GALVANIZING
- MOUNTING HOLE. SEE SERVICE CABINET MOUNTING DETAILS
- 18 CIRCUIT PANEL BOARD MINIMUM SIZE WITH SEPARATE MAIN BREAKER.
- LABEL CABINET WITH BUSSWORK RATING.





SERVICE CABINET TYPE B MODIFIED (0 - 200 AMP TYPE 120/240 SINGLE PHASE) STANDARD PLAN J-3b

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

03-04-05

Harold J. Peterfeso STATE DESIGN ENGINEER

WIRING SCHEMATIC

REVISED SAFETY SOCKET BOX MOUNTING DETAIL DATE REVISION

DRAWN BY: MARK SUJKA

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

3/8" BOLT (TWO FOR EACH CHANNEL) NOT REQUIRED SEE STRAP DETAIL **SEE NOTE 6** FOR STRUT MOUNT SPRING NUT SERVICE **CABINET** TIMBER POST SLOTTED STEEL **CHANNEL BRACKET BOLT SIZED FOR SLOTTED STEEL** CHANNEL BRACKET, WITH LOCK **WASHER & SPRING NUT** (3 FOR EACH CHANNEL) TO UTILITY -**CABINET BRACKET MOUNTING DETAIL**

TO SLOTTED STEEL CHANNEL **BRACKET (SEE SERVICE** CABINET MOUNTING DETAILS AND STRAP DETAIL) **BEVEL 1/2"** PLUMB CONDUIT ± 1° 1 5/8" x 2 7/16" 12 GA. TO LUMINAIRES— Z= TOTT ─ TO CONTROLLER CABINET 6 x 8 TREATED TIMBER POST, 10' LONG **RIGHT SIDE OF SERVICE CABINET** FRONT OF SERVICE CABINET

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

1 5/8" x 1 5/8" 12 GA. SLOTTED STEEL CHANNEL BRACKETS BOLTED TO POST USE TWO - 3/8" BOLTS, WASHERS AND NUTS FOR EACH CHANNEL PEEN BOLT THREADS (SEE SERVICE MOUNTING **DETAILS AND STRAP DETAIL)**

SERVICE CABINET BOLTED

SLOTTED STEEL CHANNEL BRACKETS BOLTED TO POST USE TWO - 3/8" BOLTS, WASHERS AND NUTS FOR EACH CHANNEL. PEEN BOLT THREADS.

2" x 1/8" HOT DIPPED GALVANIZED STRAP

SERVICE CABINET MOUNTING DETAILS

METAL WASHERS

RUBBER WASHER (APPLY SILICONE

WASHER PRIOR TO INSTALLATION)

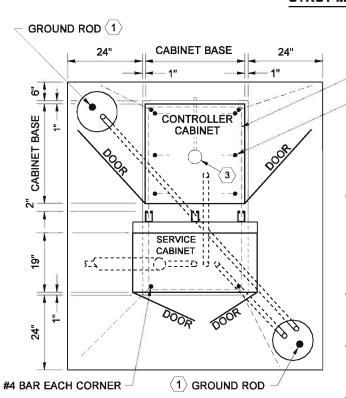
SEALER TO BOTH SIDES OF RUBBER

POST MOUNT

3/8" ø x 1" BOLT, LOCK WASHER AND NUT. (TYP.)

POST MOUNT STRAP DETAIL

STRUT MOUNT



PLAN VIEW OF SERVICE CABINET

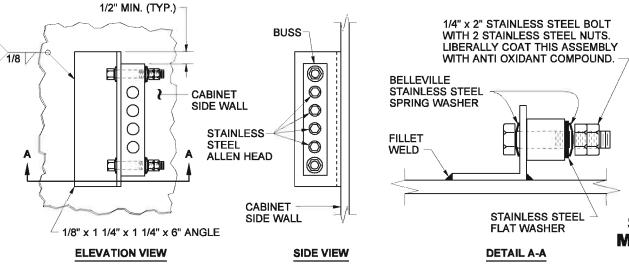
TWO #4 HOOPS

ANCHOR BOLT (TYP.)

SEE STANDARD PLAN J-6c "CABINET FOUNDATION DETAILS", FOR DETAILS NOT SHOWN.

- DRIVE GROUND RODS BEFORE PLACING CONCRETE. MOVE ROD(S) AND DRAIN TILE(S) WITH COVER(S) ÀS REQUIRED TO ACHIEVE FULL GROUND PENETRATION. MAINTAIN A 6' MINIMUM CLEARANCE BETWEEN GROUND RODS AS DETAILED ON STD. PLAN J-9a "TYPICAL GROUNDING DETAILS".
- ALL CONDUITS PENETRATING CABINET SHALL BE TERMINATED WITH GROUNDING END BUSHING AND BONDED TO THE CABINET GROUNDING BUS.
- 4" DIAM. x 1/2" DEEP SUMP. SLOPE FOUNDATION TOWARDS SUMP. 3/8" DIAM. POLYETHYLENE OR COPPER DRAIN PIPE. SLOPE TO DRAIN OUTSIDE FOUNDATION.
- TO SERVICE GROUND PER STD. PLAN J-9a TYPICAL GROUNDING DETAILS"

PHOTOCELL ENCLOSURE MOUNTING DETAIL



PHOTOCELL

ENCLOSURE

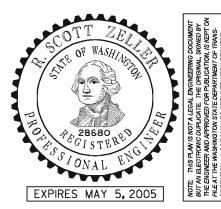
SERVICE

CABINET

FLANGE

1/4" x 1" MACHINE BOLT

CABINET MAIN BONDING JUMPER DETAIL



SERVICE CABINET TYPE B MODIFIED (0 - 200 AMP TYPE 120/240 SINGLE PHASE) **STANDARD PLAN J-3b**

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION Harold J. Peterfeso 03-04-05 STATE DESIGN ENGINEER

SIDE VIEW

NOTE 4

PHOTOCELL

BYPASS TEST ON

PHOTOCELL

OFF-AUTOMATIC

CONDUIT COUPLING

(TYP.) SEE NOTE 14

1/2" x 12" BOLT

WITH 4" HOOK

TO SERVICE GROUND PER STD. PLAN

J-9a "TYPICAL GROUNDING DETAIL"

ASPHALT OR CONCRETE

SERVICE CABINET

1'-7"

(5)

(12)

6"

(20)

SIDE VIEW

(MINUS FOUNDATION)

200 AMP TYPE 120/240 1ø SERVICE CABINET

INSTALLATION DETAIL

2" MIN

10"

SLIDE

LATCH

"= »TO LUMINAIRES

(6)

FRONT VIEW

13)

(25)

(17)

(19)

SEE NOTE 6

18 4 22 10

(8) (8)

DRAIN !!

FRONT VIEW

TO UTILITY *===2

TO CONTROLLER CABINET

14"

2"-

1. SEE STD. SPECIFICATION 9-29.24, SERVICE CABINETS.

- 2. HINGES SHALL HAVE STAINLESS STEEL OR BRASS PINS.
- CABINETS SHALL BE RATED NEMA 3R AND SHALL INCLUDE TWO RAIN TIGHT VENTS.
- METERING EQUIPMENT DOOR SHALL BE PAD LOCKABLE. EACH DOOR SHALL BE GASKETED. INSTALL BEST CX CONSTRUCTION CORE ON BOTTOM DOOR. SEE DOOR HINGE DETAIL, STANDARD PLAN J-3b. CONCEALED HEAVY DUTY STAINLESS STEEL LIFT OFF HINGES ARE ALLOWED AS AN ALTERNATIVE TO DOOR HINGE DETAIL SHOWN ON STANDARD PLAN J-3b. UPPER DOOR SHALL HAVE 2 HINGES AND LOWER DOOR SHALL HAVE 3 HINGES. THE LOWER DOOR SHALL HAVE A TWO POSITION DOOR STOP ASSEMBLY.
- THE FOLLOWING EQUIPMENT WITHIN THE SERVICE **ENCLOSURE SHALL HAVE AN APPROPRIATELY ENGRAVED PHENOLIC NAME PLATE ATTACHED** WITH SCREWS OR RIVETS: KEY NUMBERS 2, 3, 4, 6, 7, 8, 9, 16 AND 21 **KEY NUMBER 4 NAME PLATE SHALL READ:** "PHOTOCELL BYPASS TEST ON" AND "PHOTOCELL TEST OFF- AUTOMATIC". SEE SERVICE CABINET DETAIL.
- METERING ARRANGEMENTS VARY WITH DIFFERENT SERVING UTILITIES. THE UTILITY MAY REQUIRE METER BASE MOUNTING IN THE ENCLOSURE, ON THE SIDE OR ON THE BACK OF THE ENCLOSURE. THE UTILITY MAY REQUIRE THE DIMENSION BETWEEN THE DOOR AND THE FRONT OF THE SAFETY SOCKET BOX TO BE LESS THAN THE 11 INCHES SHOWN IN THE LEFT SIDE- SAFETY SOCKET BOX MOUNTING DETAIL. SEE STANDARD PLAN J-3b FOR SAFETY SOCKET BOX DETAIL. THE CONTRACTOR SHALL VERIFY THE SERVING UTILITY'S REQUIREMENTS PRIOR TO FABRICATION OF AND INSTALLING THE SERVICE EQUIPMENT.
- DIMENSIONS SHOWN ARE MINIMUM AND SHALL BE ADJUSTED TO ACCOMMODATE THE VARIOUS SIZES OF EQUIPMENT INSTALLED.

8. ALL BUSSWORK SHALL BE HIGH GRADE COPPER AND SHALL EQUAL OR EXCEED THE MAIN BREAKER RATING. ALL BREAKERS SHALL BOLT ONTO THE BUSSWORK. JUMPERING OF BREAKERS SHALL NOT BE ALLOWED. BUSSWORK SHALL ACCOMMODATE ALL FUTURE EQUIPMENT AS SHOWN IN THE BREAKER SCHEDULE.

- 9. THE PHOTOCELL UNIT SHALL BE CENTERED IN THE PHOTOCELL ENCLOSURE TO PERMIT 360 DEGREE ROTATION OF THE PHOTOCELL WITHOUT REMOVAL OF THE PHOTOCELL UNIT OR PHOTOCELL ENCLOSURE
- 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.
- 11. ALL NUTS, BOLTS AND WASHERS USED FOR MOUNTING THE PHOTOCELL ENCLOSURE SHALL BE STAINLESS STEEL.
- 12. A 1% TOLERANCE IS ALLOWED FOR ALL DIMENSIONS.
- THE PHOTOCELL CIRCUIT SHALL BE INSTALLED IN FLEX CONDUIT WITHIN THE METER COMPARTMENT.
- INSTALL CONDUIT COUPLINGS ON ALL CONDUITS. PLACE COUPLINGS FLUSH WITH TOP OF CONCRETE FOUNDATION.
- SEE PLANS FOR BREAKER SCHEDULE.
- SEAL CABINET TO FOUNDATION WITH A 1/2" BEAD OF SILICONE. APPLY SILICONE TO DRY SURFACE ONLY.
- 17. THE METER BASE PORTION OF THIS SERVICE WAS DESIGNED TO MEET METERING PORTION OF EUSERC DRAWING 309 REQUIREMENTS.

120/240 VAC PHOTOCELL BYPASS TEST ON PHOTOCELL TEST OFF - AUTOMATIC SIGNAL CKT ‡∰ILL CKT A SPARE CKT SPARE CKT <u>-</u>∰іш скт в (16)

⊒:#⊪і∟∟ скт с

~‡‡;і∟С СКТ D

<u>--</u>7--‡∰ ILL CKT Ε

SIZE PER NEC.

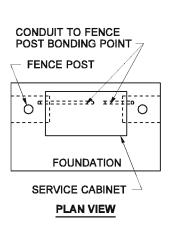
MINIMUM SIZE #2

(6)

WIRING SCHEMATIC

KEY (1) METER BASE PER SERVING UTILITY REQUIREMENTS. AS A MINIMUM, THE METER BASE SHALL BE SAFETY SOCKET BOX WITH FACTORY INSTALLED TEST BYPASS FACILITY THAT MEETS THE REQUIREMENTS OF EUSERC DRAWING 305.

- MAIN BREAKER (SEE BREAKER SCHEDULE)
- (3) PHOTOCELL BREAKER (SPST 15 AMP 120/240 VOLT)
- (f 4) Test switch (SPDT) snap action, positive close, 15 amp - 120/277 VOLT`"T" RATED)
- (5) PHOTOELECTRIC CONTROL, STD. SPEC. 9 29.11(2)
- 6) BRANCH BREAKER (SEE BREAKER SCHEDULE)
- (7) SIGNAL BREAKER (SEE BREAKER SCHEDULE)
- (8) CONTACTOR (SEE BREAKER SCHEDULE)
- (9) RECEPTACLE BREAKER (SPST 20 AMP 120/240 VOLT)
- (10) RECEPTACLE, GROUNDED (GFCI 20 AMP 125 VOLT)
- NEUTRAL BUSS, 14 LUG COPPER
- (12) PHOTOCELL ENCLOSURE ENCLOSURE TO BE FABRICATED FROM 5/8" EXPANDED STEEL MESH WITH WELDED SEAMS AND MOUNTING FLANGES. HOT DIP GALVANIZED AFTER FABRICATION. TYPE 5052 - H32 ALUMINUM WITH 5/8" x 5/8" OPENINGS EQUIVALENT TO 5/8" EXPANDED STEEL MESH MAY BE USED AS ALTERNATIVE MATERIAL. SEE PHOTOCELL ENCLOSURE MOUNTING DETAILS, STANDARD PLAN J-3b.
- HINGED FRONT FACING DOOR WITH 4" x 4" MIN. POLISHED WIRE GLASS WINDOW.
- (14) HINGED DEAD FRONT WITH 1/4 TURN FASTENERS OR SLIDE LATCH.
- (15) CABINET MAIN BONDING JUMPER. BUSS SHALL BE 4 LUG TINNED COPPER. SEE CABINET MAIN BONDING JUMPER DETAIL, STANDARD PLAN J-3b.
- (16) SPARE BRANCH BREAKER (DPST 20AMP- 120/240 VOLT)
- (17) METAL WIRING DIAGRAM HOLDER
- (18) REMOVABLE EQUIPMENT MOUNTING PAN
- (19) 6" x 6" MIN. UNDERGROUND FEED SERVICE WIREWAY (LEFT REAR CORNER)
- (20) SCREENED VENTS, 2 REQUIRED, 1 EACH SIDE, LOUVERED PLATES.
- (21) HEATER BREAKER (SPST 15 AMP 120/240 VOLT)
- (22) THERMOSTAT, 40°F CLOSURE 3 DIFFERENTIAL
- (23) STRIP HEATER (100 WATT NOMINAL), WITH TERMINAL STRIP COVER.
- (24) 24 CIRCUIT PANEL BOARD MINIMUM SIZE WITH SEPARATE MAIN BREAKER.
- (25) LABEL CABINET WITH BUSSWORK RATING.



(21)(

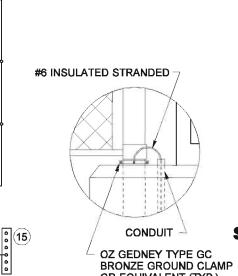
(9)

(T)(22)

(23)

0000000000000

(11)



DETAIL A

OR EQUIVALENT (TYP.)

28680 GISTE ONAL PARA EXPIRES MAY 5, 2003

SERVICE CABINET TYPE D (0 - 200 AMP TYPE 120/240 SINGLE PHASE) STANDARD PLAN J-3c

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION





06-24-02 STATE DESIGN ENGINEER

N 17

TO UTILITY of

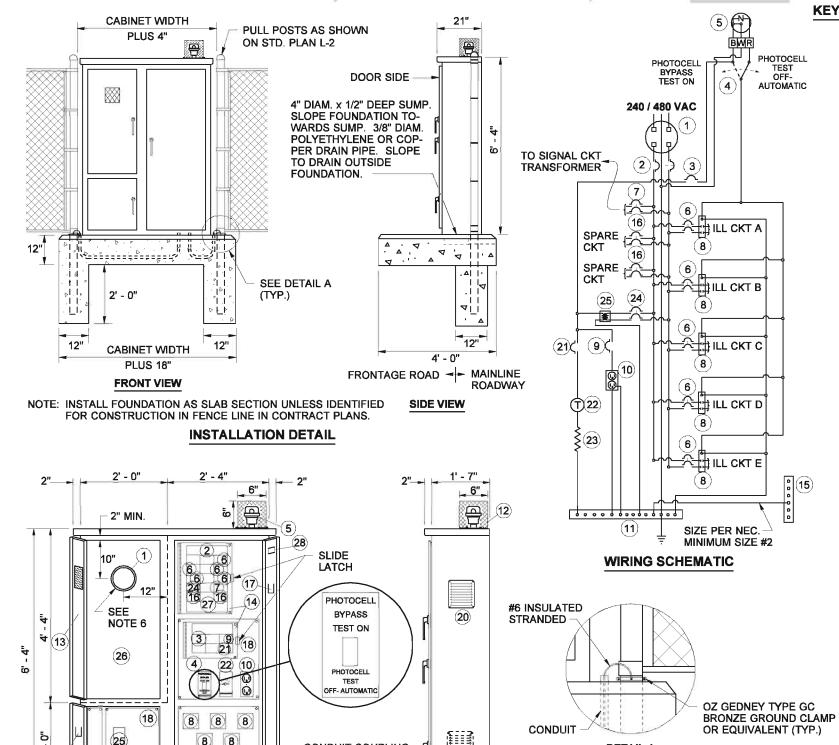
(23)

CABINET

DRÁIN

TO CONTROLLER •="

FRONT VIEW



KEY (1) METER BASE PER SERVING UTILITY REQUIREMENTS. AS A MINIMUM, THE METER BASE SHALL BE SAFETY SOCKET BOX WITH FACTORY INSTALLED TEST BYPASS FACILITY THAT MEETS THE REQUIREMENTS OF EUSERC DRAWING 305. MAIN BREAKER (SEE BREAKER SCHEDULE)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- (3) PHOTOCELL BREAKER (SPST 15 AMP 120/240 VOLT)
- TEST SWITCH (SPDT SNAP ACTION, POSITIVE CLOSE 15 AMP - 120/277 VOLT "T" RATED)
- (5) PHOTOELECTRIC CONTROL, STD. SPEC. 9 29.11(2)
- 6) BRANCH BREAKER (SEE BREAKER SCHEDULE)
- SIGNAL TRANSFORMER BREAKER (SEE BREAKER SCHEDULE)
- (8) CONTACTOR (SEE BREAKER SCHEDULE)
- 9) RECEPTACLE BREAKER (SPST 20 AMP 120/240 VOLT)
- (10) RECEPTACLE, GROUNDED (GFCI 20 AMP 125 VOLT)
- (11) NEUTRAL BUSS, 14 LUG COPPER
- (12) PHOTOCELL ENCLOSURE ENCLOSURE TO BE FABRICATED FROM 5/8" EXPANDED STEEL MESH WITH WELDED SEAMS AND MOUNTING FLANGES. HOT DIP GALVANIZED AFTER FABRICATION. TYPE 5052 - H32 ALUMINUM WITH 5/8" x 5/8" OPENINGS EQUIVALENT TO 5/8" EXPANDED STEEL MESH MAY BE USED AS ALTERNATIVE MATERIAL. SEE PHOTOCELL ENCLOSURE MOUNTING DETAILS, STANDARD PLAN J-3b.
- (13) HINGED FRONT FACING DOOR WITH 4" x 4" MIN. POLISHED WIRE GLASS WINDOW.
- (14) HINGED DEAD FRONT WITH 1/4 TURN FASTENERS OR SLIDE
- (15) CABINET MAIN BONDING JUMPER. BUSS SHALL BE 4 LUG TINNED COPPER. SEE CABINET MAIN BONDING JUMPER DETAIL, STANDARD PLAN J-3b.
- (16) SPARE BRANCH BREAKER (DPST 20AMP- 240/480 VOLT)
- (17) METAL WIRING DIAGRAM HOLDER
- (18) REMOVABLE EQUIPMENT MOUNTING PAN
- (19) 6" x 6" MIN. UNDERGROUND FEED SERVICE WIREWAY (LEFT REAR CORNER)
- (20) SCREENED VENTS, 2 REQUIRED, 1 EACH SIDE, LOUVERED
- (21) HEATER BREAKER (SPST 15 AMP 120/240 VOLT)
- (22) THERMOSTAT, 40°F CLOSURE 3 DIFFERENTIAL
- STRIP HEATER (100 WATT NOMINAL), WITH TERMINAL STRIP
- (24) TRANSFORMER BREAKER (DPST 15 AMP 480 VOLT)
- DRY TRANSFORMER (480/120 VOLT) 3 KVA COPPER BUSSED AND COPPER WOUND
- (26) RESERVED FOR METER. CURRENT TRANSFORMER AND/OR DISCONNECT SWITCH AS REQUIRED BY THE UTILITY
- 24 CIRCUIT PANEL BOARD MINIMUM SIZE WITH SEPARATE MAIN BREAKER.
- (28) LABEL CABINET WITH BUSSWORK RATING

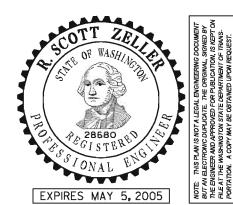
GENERAL NOTES

200 AMP TYPE 240/480 1ø SERVICE CABINET

- 1. SEE STD. SPECIFICATION 9-29.24, SERVICE CABINETS.
- 2. HINGES SHALL HAVE STAINLESS STEEL OR BRASS PINS.
- CABINETS SHALL BE RATED NEMA 3R AND SHALL INCLUDE TWO RAIN TIGHT VENTS.
- METERING EQUIPMENT DOORS SHALL BE PAD LOCKABLE. EACH DOOR SHALL BE GASKETED. INSTALL BEST CX CONSTRUCTION CORE ON BOTTOM LEFT AND RIGHT DOORS. SEE DOOR HINGE DETAIL, STD. PLAN J-3b; CONCEALED HEAVY DUTY STAINLESS STEEL LIFT OFF HINGES ARE ALLOWED AS AN ALTERNATIVE. UPPER LEFT DOOR SHALL HAVE 3 HINGES. LOWER LEFT DOOR SHALL HAVE 2 HINGES. AND RIGHT DOOR SHALL HAVE 3 HINGES LOWER DOOR SHALL HAVE A TWO POSITION DOOR STOP ASSEMBLY.

5.	THE FOLLOWING EQUIPMENT WITHIN THE SERVICE
	ENCLOSURE SHALL HAVE AN APPROPRIATELY ENGRAV
	PHENOLIC NAME PLATE ATTACHED WITH SCREWS OR
	RIVETS: KEY NUMBERS 2, 3, 4, 6, 7, 8, 9, 16, 21 AND 25.
	KEY NUMBER 4 NAME PLATE SHALL READ:
	"PHOTOCELL BYPASS TEST ON" AND "PHOTOCELL TES"
	OFF_ALITOMATIC" SEE SERVICE CARINET DETAIL

- METERING ARRANGEMENTS VARY WITH DIFFERENT SERVING UTILITIES. THE UTILITY MAY REQUIRE METER BASE MOUNTING IN THE ENCLOSURE. ON THE SIDE. OR ON THE BACK OF THE ENCLOSURE. THE UTILITY MAY REQUIRE THE DIMENSION BETWEEN THE DOOR AND THE FRONT OF THE SAFETY SOCKET BOX TO BE LESS THAN THE 11 INCHES SHOWN IN THE LEFT SIDE- SAFETY SOCKET BOX MOUNTING DETAIL, SEE STD. PLAN J-3b THE CONTRACTOR SHALL VERIFY THE SERVING UTILITY'S REQUIREMENTS PRIOR TO FABRICATION OF AND INSTALLING THE SERVICE EQUIPMENT.
- THE DIMENSIONS SHOWN ARE MINIMUM AND SHALL BE ADJUSTED TO ACCOMMODATE THE VARIOUS SIZES OF EQUIPMENT INSTALLED.
- 8. ALL BUSSWORK SHALL BE HIGH GRADE COPPER AND SHALL EQUAL OR EXCEED THE MAIN BREAKER RATING. ALL BREAKERS SHALL BOLT ONTO THE BUSSWORK. JUMPERING OF BREAKERS SHALL NOT BE ALLOWED. BUSSWORK SHALL ACCOMMODATE ALL FUTURE EQUIPMENT AS SHOWN IN THE BREAKER SCHEDULE.
- THE PHOTOCELL UNIT SHALL BE CENTERED IN THE PHOTOCELL ENCLOSURE TO PERMIT 360 DEGREE ROTATION OF THE PHOTOCELL WITHOUT REMOVAL OF THE PHOTOCELL UNIT OR THE PHOTOCELL ENCLOSURE.
- 10. 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**
- ALL NUTS, BOLTS, AND WASHERS USED FOR MOUNTING PHOTOCELL ENCLOSURE SHALL BE STAINLESS STEEL.
- 12. A 1% TOLERANCE IS ALLOWED FOR ALL DIMENSIONS
- 13. SEE PLANS FOR BREAKER SCHEDULE.
- INSTALL CONDUIT COUPLINGS ON ALL CONDUITS. PLACE COUPLINGS FLUSH WITH TOP OF CONCRETE FOUNDATION.
- SEAL CABINET TO FOUNDATION WITH A 1/2" BEAD OF SILICONE. APPLY SILICONE TO DRY SURFACE ONLY.
- THE METER BASE PORTION OF THIS SERVICE WAS DESIGNED TO MEET METERING PORTION OF EUSERC DRAWING 309 REQUIREMENTS.



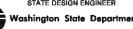
SERVICE CABINET TYPE E (0 - 200 AMP TYPE 240/480 SINGLE PHASE) STANDARD PLAN J-3d

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Harold J. Peterfeso

11-05-03 STATE DESIGN ENGINEER



REVISED KEY NOTE 16 DATE BY

CONDUIT COUPLING

(TYP.) SEE NOTE 14

ASPHALT OR CONCRETE

1/2" x 12" BOLT

WITH 4" HOOK

"TYPICAL GROUNDING DETAILS"

SERVICE CABINET

"== " TO SERVICE GROUND

PER STD. PLAN J-9a

(20)

SIDE VIEW

(MINUS FOUNDATION)

(18) (11)_{c==5}

TO •="

LUMINAIRES

DETAIL A

FOUNDATION

PLAN VIEW

SERVICE

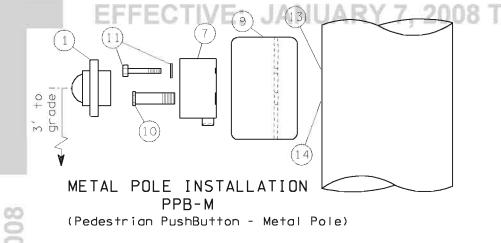
CABINET

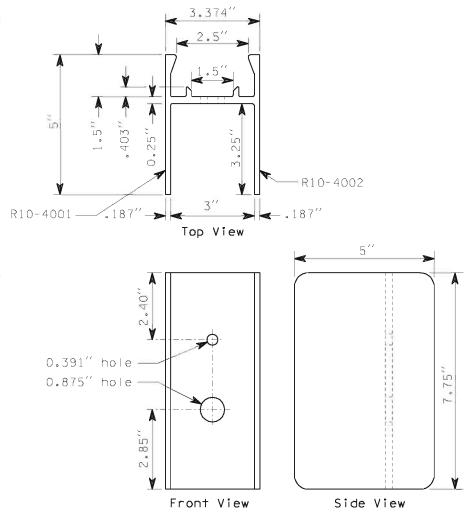
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CONDUIT TO

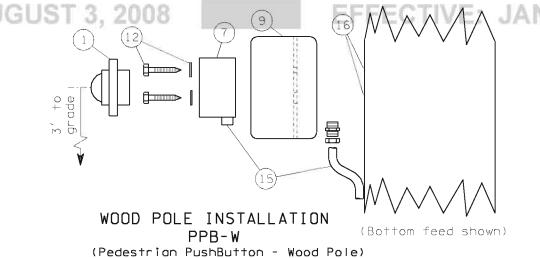
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BONDING POINT





ALUMINUM 'H' EXTRUSION





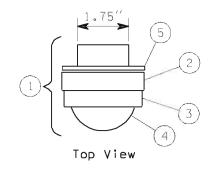


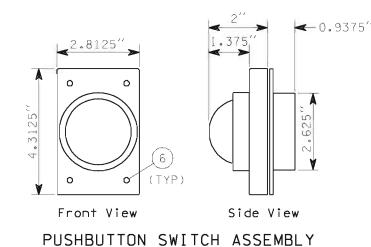
R10-4001

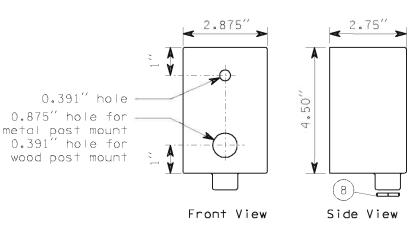
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NOTE:

When "PPB-MR" or "PPB-WR" are specified in the contract, the arrow shall be installed in the opposite direction than as shown for "PPB-M" or "PPB-W"







CAST ALUMINUM CONDULET

KEY

- l) Pushbutton switch assembly
- (2) Cast metal housing(3) Protective collar
- (4) Pushbutton switch
- (5) Gasket
- (6) Stainless steel fastener
- (7) Cast aluminum condulet
- 8 Aluminum plug with $\frac{1}{8}$ " drilled weep hole. On timber pole installation, remove plug for wire entrance and drill weep hole in condulet.

- Aluminum 'H' extrusion
- O) Chase nipple $\frac{7}{8}$ " hex head x $\frac{1}{2}$ " pipe thread x $\frac{2}{2}$ " long
- 11) $^{3}\!\!\!/_{8}$ " 16 X 2 $^{1}\!\!\!/_{2}$ " stainless steel bolt with washer
- (12) $\frac{3}{8}$ " X 4"lag bolt with washer
- (13) Drill and tap shaft for $\frac{3}{8}$ " bolt
- $\overline{14}$ Drill and tap shaft for $\frac{1}{2}$ nipple
 - Conduit and fittings as required for timber pole installation; reverse condulet and conduit for top feed
- 6) Drill pilot hole for $\frac{3}{8}$ " lag bolt

PEDESTRIAN PUSHBUTTON DETAILS



STANDARD PLAN J-5

08-01-97

APPROVED FOR PUBLICATION

Clifford E. Mansfield

STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

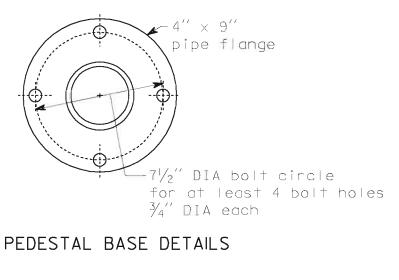
PAD MOUNT

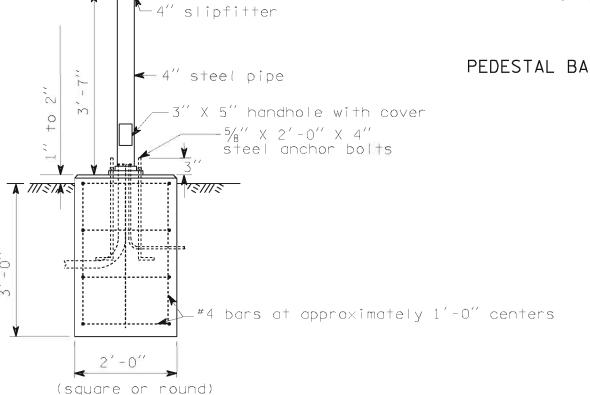
2" conduit and cap;

others as required.

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. Where pad or pedestal mounts are located in a sidewalk, construct mount top flush with sidewalk grade, omitting chamfer where top and sidewalk abut.
- 2. Pad mount design is typical.
- 3. Place a silicone seal beixeen the cabinet foundation and the cabinet for the pad mount design.





PEDESTAL MOUNT

EXPIRES JUNE 4, 1999 CABINET

FOUNDATION DETAILS STANDARD PLAN J-6c

APPROVED FOR PUBLICATION

Clifford E. Mansfield 04-24-98

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WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

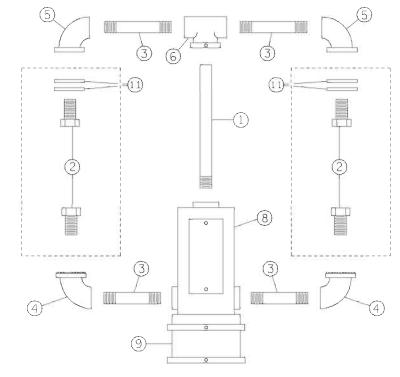
centrally in foundation

(NEDN GRID OR SIMILAR SIZE

INCANDESCENT PEDESTRIAN HEAD)

EFFECTIVE: JAN NOTES: Y 7, 2008 TO AUGUST 3, 2008

- 1. SEE CONTRACT FOR HEAD TYPE, MOUNTING HEIGHT AND ORIENTATION.
- 2. ALL NIPPLES, FITTINGS AND CENTER PIPES SHALL BE 11/2" DIA NOMINAL TRADE SIZE (NEC).
- 3. INSTALL NEOPRENE GASKET OUTSIDE HEAD WHEN FLANGED ELBOWS ARE SUPPLIED.



TOP MOUNT TYPE C - PED.

TYPE F - VEHICLE

KEY

(1) CENTER PIPE

SIDE MOUNT

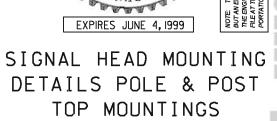
TYPE B - PED.

TYPE K - VEHICLE

- (2) LOCKNIPPLE
- (3) NIPPLE
- SERRATED ELBOW
- SERRATED OR FLANGED ELBOW

-(1)

- REAMED TEE WITH SET SCREW
- REAMED ELBOW WITH SET SCREW
- (8) BRONZE TERMINAL COMPARTMENT WITH:
 - GASKETED COVER
 - FASTENERS
 - WIRE LEADS
 - MOUNTING SADDLE FOR SIDE MOUNTS
 - 1/4" DIA DRAIN HOLE
 - 12 POSITION TERMINAL STRIP
 - WIREWAY FOR SIDE MOUNTS
- BRONZE COLLAR, 41/4' I.D. WITH SET SCREWS
- (10) ORNAMENT CAP
- GASKET AND WASHER
- (12) CONDUIT LOCKNUT
- (13) TYPE E HINGE MOUNTING
- (14) FASTENER WITH SPACER
- -1/2" LAG SCREWS ON WOOD POLE -1/2" BOLTS TAPPED TO METAL POLE
- (15) FLATHEAD SOCKET BOLT
- (16) 1/2" INSERT HOLE FOR EXTERNAL WIRE ENTRANCE REQUIRED ON TIMBER POLE MOUNTINGS ONLY.



STANDARD PLAN J-6f

APPROVED FOR PUBLICATION

Clifford E. Mansfield 04-24-98

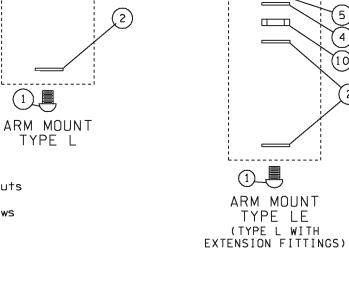
DEPUTY STATE DESIGN ENGINEER

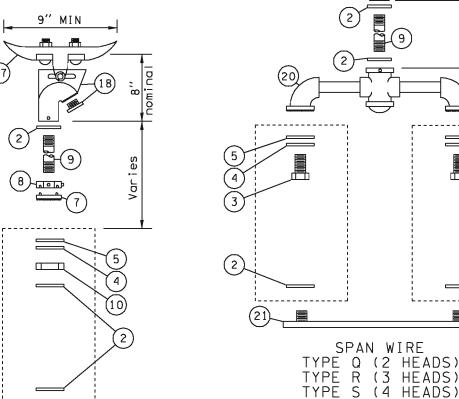
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

- 1. Type M mounting shall have "O" ring groove and seal top and bottom at signal attachment.
- 2. Type M mounting for conventional heads shall have a 2" diameter opening at the signal attachment.
- 3. Type M mounting for optically programmed heads shall have a $3\frac{1}{2}$ " DIA opening at the signal attachment.
- 4. Type N mounting with optically programmed heads shall be installed with 14" nominal arms.
- 5. See Standard Plan J-6h for tether wire, and backplate requirements.

KEY:

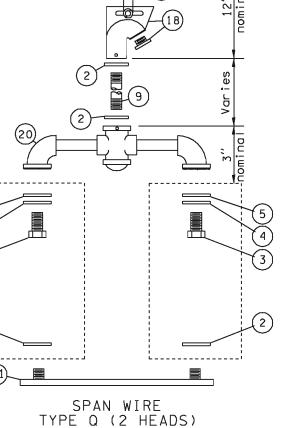
- (1) End cap
- Conduit locknut, 1/2" DIA
- Locknipple, 1/2" DIA
- Steel washer
- Neoprene gasket
- Bronze serrated ell fitting with:
 - 3/8 " stainless steel through bolt and nuts
 - Three set screws at slipfitter connection
 - Three allen head stainless steel set screws at conduit nipple connection
- Serrated ring with pins
- Hex locknut with:
 - Two allen head stainless steel set screws
 - Pin receptacles
- Conduit nipple, 1 1/2 " DIA
- Hex locknut, 1/2" DIA
- Mounting assembly
- Bronze elevator plumbizer with $rac{3}{6}$ " stainless steel through bolt, washers, and two nuts
- Aluminum arm with set screw
- Slotted tube with closure strip
- Tube clamp, $2\frac{1}{2}$ " ID, MIN
- Internally threaded clamp assembly with:
 - Two set screws
 - 1/2 " x 0.045" stainless steel bands
 - Screw buckles, 7/16 " with swivels, nuts, and washers
 - Band clips with allen head stainless steel set screws
- (17) Bronze messenger hanger with: - 1/2" DIA J bolts
 - Cable lock bar
 - Rivet
 - Cotter key
- Bronze internally threaded wire entrance with:
 - Bushing insert
 - Allen head stainless steel set screw
- Bronze balance adjuster
- Multi-head mounting assembly
- Spider assembly
- Serrated ring with no pins





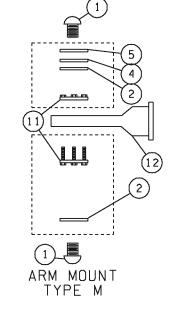
SPAN WIRE

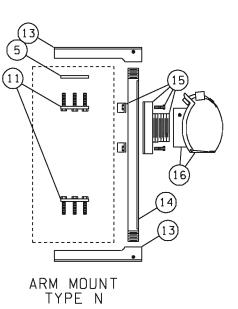
TYPE P (1 HEAD)

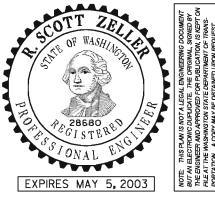


TYPE R (3 HEADS)

9" MIN







SIGNAL HEAD MOUNTING **DETAILS MAST ARM & SPAN WIRE MOUNTINGS** STANDARD PLAN J-6g

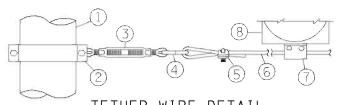
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

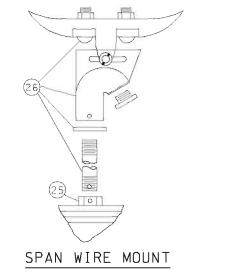
Harold J. Peterfeso 12-12-02 STATE DESIGN ENGINEER

REV. KEY NOTES 6, 9, 16 & 18; REV. NOTE 5; REV. SPAN WIRE TYPE P DETAIL DATE

Washington State Department of Transportation



TETHER WIRE DETAIL

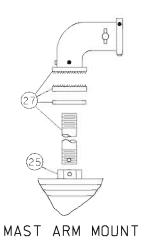


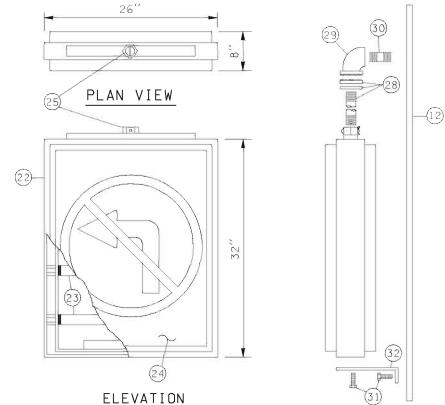
2008

AUGUST

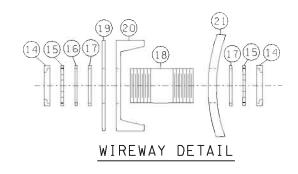
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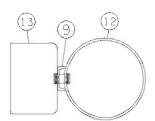
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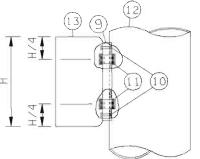


INTERNALLY ILLUMINATED SIGN DETAILS





PLAN VIEW

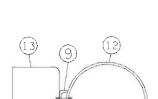


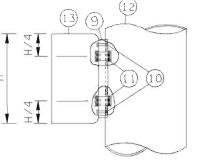
ELEVATION

8" OR 12" SECTIONS 8" SECTION X = 8" $\pm \frac{1}{2}$ " 12" SECTION $X = 5\frac{1}{2}$ " $\pm \frac{1}{2}$

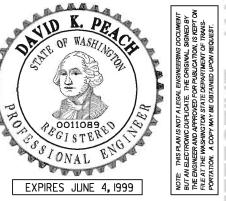
BACKPLATE DETAIL

CABINET MOUNTING DETAIL









MISCELLANEOUS SIGNAL DETAILS STANDARD PLAN J-6h

APPROVED FOR PUBLICATION

Clifford E. Mansfield 04-24-98

DEPUTY STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

SIDE POLE MOUNT

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3,

KEY:

(1) METAL OR TIMBER POLE

2" \times %" S.S. BAND WITH 2 EACH, %-16NC \times %4" STAINLESS STEEL HEX HEAD BOLT,

LOCK WASHERS AND NUTS

5/6", EYE AND EYE, TURNBUCKLE

S HOOK, 3/8" MILD STEEL

1/8" WIRE ROPE CLAMP (U BOLT TYPE)

6 1/8" STAINLESS STEEL TETHER WIRE

(7) WIRE CLAMP WITH LEAD WIRE WRAP

8 SIGNAL HEAD

9 6 X 8.2 LB/FT CHANNEL

10 2 EACH, 1/2-20 NF X 21/2' HEX HEAD BOLT, LOCK WASHER (DRILL AND TAP POLE TO ACCEPT)

(1) WIREWAY (SEE DETAIL THIS SHEET)

12 METAL POLE

(13) CABINET

14) END BUSHING

(15) CONDUIT LOCKNUT

16 STEEL WASHER 1 WEATHERPROOF SEAL

(18) 2" DIA × 4" NIPPLE UNLESS OTHERWISE NOTED

(9) CABINET WALL DRILLED 1/8" OVERSIZE OF NIPPLE

20 CHANNEL DRILLED 1/8" OVERSIZE OF NIPPLE

2) POLE DRILLED 1/8" OVERSIZE OF NIPPLE

(2) 6063 EXTRUDED ALUMINUM FRAME

23 4 EACH, F24T12/CW FLDURESCENT TUBES

24 TRANSLUCENT PLEXIGLASS SIGN FACE

(25) 11/2" CAST IRON HUB WITH 5/6" PIN AND COTTER KEY

26 SEE KEY 2,9,17, AND 18, STANDARD PLAN "SIGNAL HEAD MOUNTING DETAILS MAST ARM AND SPAN WIRE MOUNTINGS" .

27 SEE KEY 2,6,9 AND 22, STANDARD PLAN "SIGNAL HEAD MOUNTING DETAILS MAST ARM AND SPAN WIRE MOUNTINGS".

28 SEE KEY 2,9 AND 22, STANDARD PLAN "SIGNAL HEAD MOUNTING DETAILS MAST ARM AND SPAN WIRE MOUNTINGS" .

② SERRATED 11/2" ELBOW
③ 1/2" DIA NIPPLE (DRILL AND TAP POLE TO ACCEPT)

31) 2 EACH, $\frac{1}{2}$ -20NF × $\frac{3}{4}$ " STAINLESS STEEL HEX HEAD BOLT AND LOCK WASHERS (DRILL AND TAP POLE TO ACCEPT

(32) MOUNTING BRACKET

SIGNAL STANDARD TYPE DESIGNATIONS

TYPE PPB, PS, & I STANDARD DETAILS ELEVATION

PLAN

TWO THREADS MIN

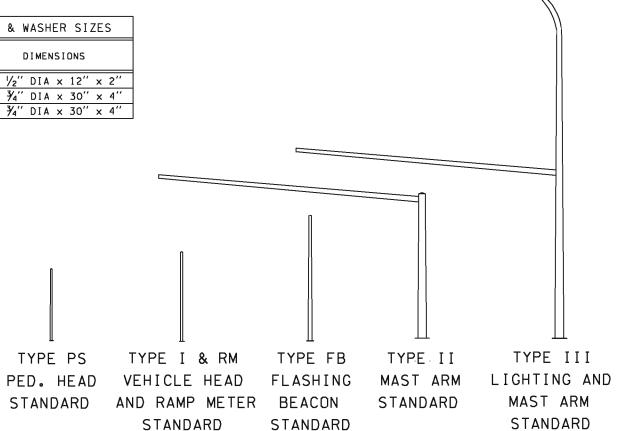
	ANCHO	R B	0L	Τ, Ν	TUN	,	& V	NASH	ER	SIZ	ZE	S
STANDARD				DIMENSIONS								
S	TYPE	PPE	3		4	-	1/2"	DIA	×	12"	×	2"
S	TYPE	PS	&	I	4	-	₹4′′	DIA	х	30''	×	4"
S	TYPE	FB	&	RM	3	-	₹4′′	DIA	×	30''	×	4"

TYPE PPB

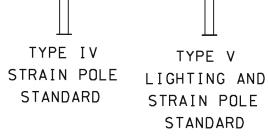
PED. PUSH

BUTTON

POST



STANDARD



5/8" MAX	<u>S</u> 2" C	LEARANCE
3/4'' CHAMFER	K PAV	ED AREA
UNPAVED AREA	##\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	<i>*</i>
1" TO 2"		9
21/2" CLEARANCE		
2" CLEARANCE	H1 (SQUARE)	<u>N</u> '

TYPE PPB, PS, I, RM & FB STANDARD DIMENSION CHART									
MARK	ITEM	TYPE PPB	TYPE PS	TYPE I	TYPE RM	TYPE FB			
Α	HEIGHT	4''-6''	8'-0"	10'-0"	SEE SHEET 2	SEE SHEET 2			
В	POLE BASE DIA	21/2''	*	*	*	*			
С	PLATE THICKNESS	½''	½′′	1/2"	SEE SHEET 2	SEE SHEET 2			
D	PLATE WIDTH	5′′	9''	9′′	SEE SHEET 2	SEE SHEET 2			
Ε	HOLE DIA	5⁄8′′	1"	1''	SEE SHEET 2	SEE SHEET 2			
F	BOLT CIRCLE	41/2''	81/2"	81/2''	SEE SHEET 2	SEE SHEET 2			
G	FOUNDATION DEPTH	1'-6"	3'-0"	3'-0"	3'-0"	3'-0''			
Н1	FOUNDATION WIDTH	1'-6''	2'-0''	2'-0"	2'-0"	2'-0''			
Н2	FOUNDATION DIA	2'-0''	2'-3"	2'-3''	2'-3''	2'-3"			
J	NUT & WASHER	Four ½"	3/4′′	3/4′′	3/4′′	3/4′′			
К	GROUT PAD THICKNESS	NONE	**	**		SEE SHEET 2			
L	PLASTIC DRAIN TUBE DIA	NONE	3/8′′	3∕8′′	3/8′′	³%''			
М	VERTICAL RE-BAR	NONE	Eight #4	Eight #4	Eight #4	Eight #4			
N	HORIZ. RE-BAR HOOP	NONE	Three #4	Three #4	Three #4	Three #4			
Р	HANDHOLE SIZE	NONE	3½" x 4"	3½" × 4"	3½" × 4"	31/2" × 4"			
a	SLIPFITTER DIA (I.D.)	NONE	4''	4′′	4''	4''			
R	CAP DIA	21/2′′	NONE	NONE	NONE	NONE			
TAPERED ROUND OR OCTAGONAL SHAFT, 11 GAGE, 4" OD AT SLIPFITTER WELD. TAPER = 0.14 INCHES/FT.									

STANDARD

** LEVELING NUT HEIGHT 1" MAXIMUM.

LEVELING NUTS NOT REQUIRED FOR TYPE PPB STANDARD

EXPIRES OCTOBER 26, 2002 **SIGNAL STANDARD TYPE DESIGNATIONS AND TYPE**

PPB, PS, I, RM, & FB DETAILS **STANDARD PLAN J-7a**

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

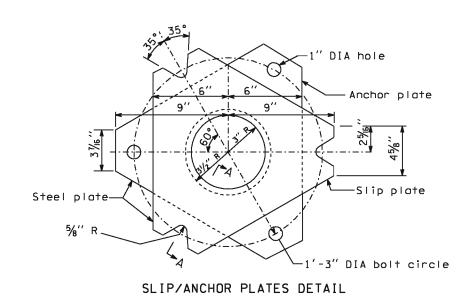
Harold J. Peterfeso

09-12-01

мнс DATE

H2 (ROUND)

FOUNDATION DETAILS

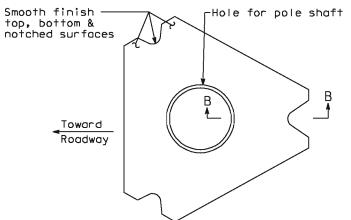


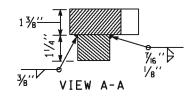
Flashing Warning Beacon

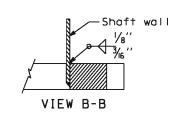
(B"amber lens)

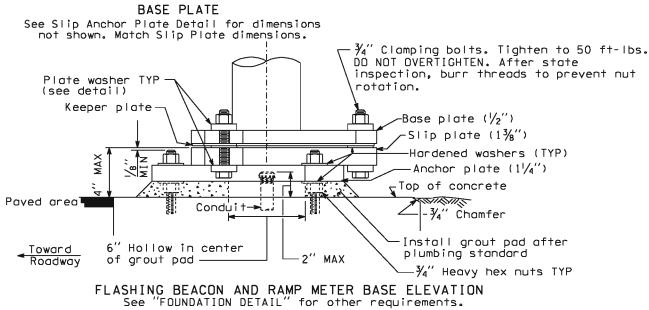
1'-3" DIA bolt circle 6" DIA hole

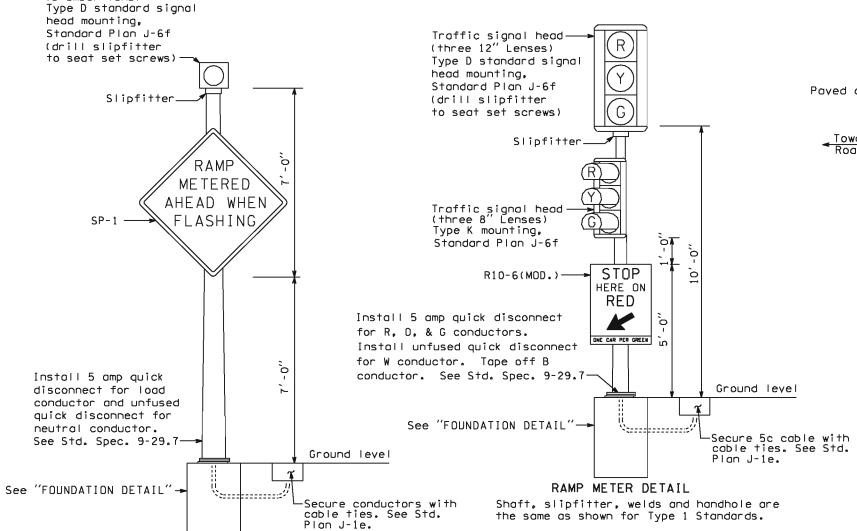
KEEPER PLATE Place between pole base plate and slip plate on top of middle washers.

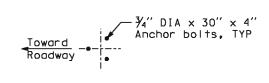




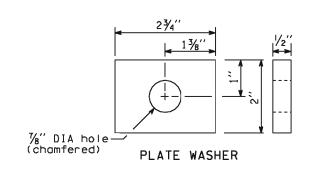


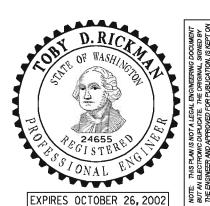






ANCHOR BOLT LAYOUT





SIGNAL STANDARD TYPE **DESIGNATIONS AND TYPE** PPB, PS, I, RM, & FB DETAILS

STANDARD PLAN J-7a

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION Harold J. Peterfeso 09-12-01 STATE DESIGN ENGINEER **CORRECTED - FLASHING BEACON DETAIL** MHG Washington State Department of Transportation DATE REVISION

FLASHING BEACON DETAIL Shaft, slipfitter, welds and handhole are the same as shown for Type 1 Standards, except shaft length is 14'.

Strain insulator

2

9

⋖

JANUAR

-0,,

(See Detail)

W/w

Guy standoff

Saddle casting

Galyanized steel bar

6'-0"

8'-0" yellow reflective

plastic

guy guard

Strandvise

Power installed helical

ALTERNATE DOWN GUY DETAIL

screw anchor (See Notes)

2" DIA, 12 gauge

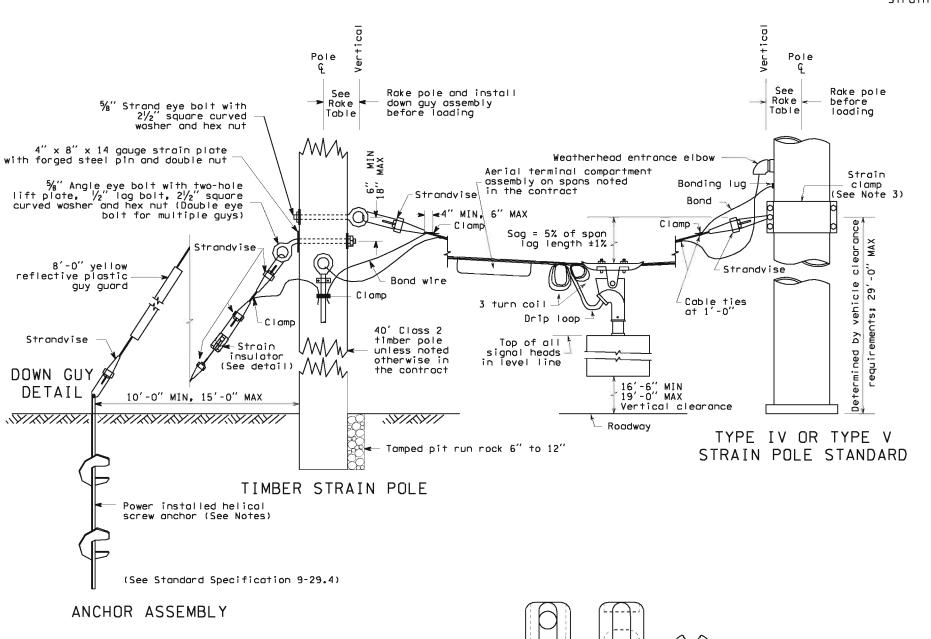
 $M_{\rm M}$

r Strain Pol

Timber detail

See for

- 1. An eight-way expanding anchor may be used as an acceptable alternate to power installed helical screw anchor.
- 2. If anchor hole diameter is greater than nominal diameter of folded anchors, a 5 cover of 6" to 12" size rock shall be tamped in to replace the disturbed soil immediately above the anchor.
- 3. See "Strain Clamp Detail" on Standard Plan 'Strain Pole Standards: Type IV and Type V''.



STRAIN INSULATOR DETAIL

Elevation Side View

PEGISTERED EXPIRES JUNE 4, 1999

RAKE TABLE

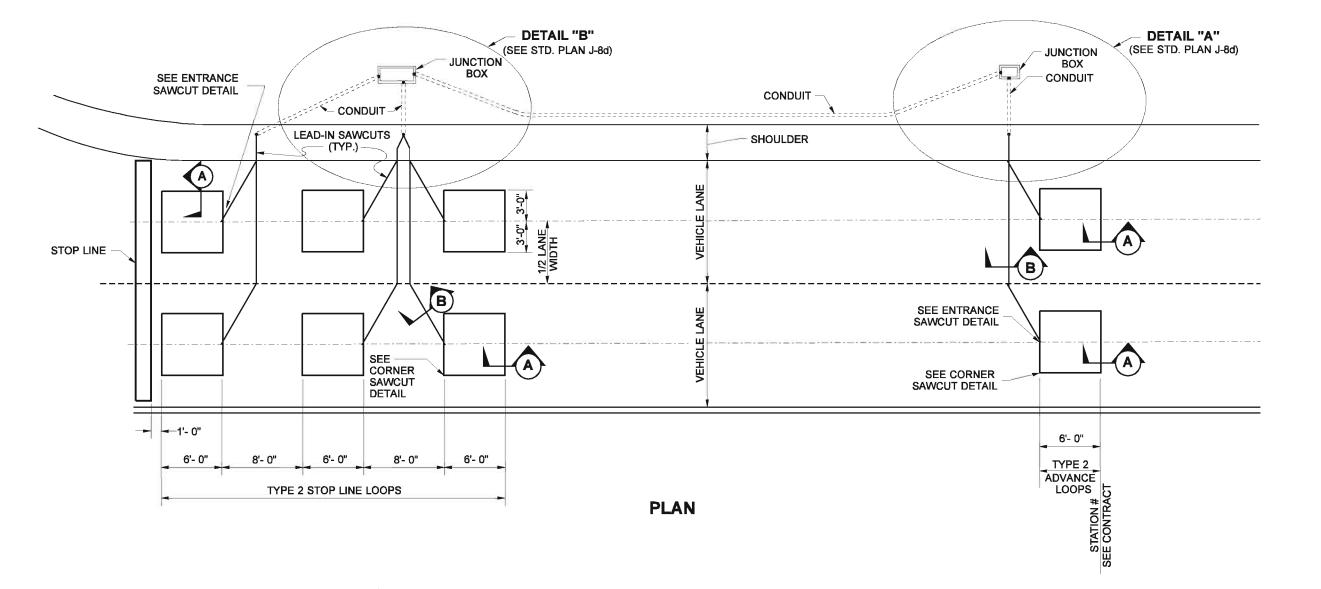
POLE CLASS RAKE

SPAN WIRE INSTALLATION

STANDARD PLAN J-7d

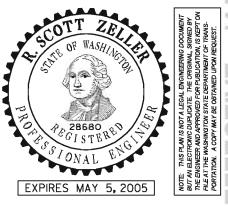
APPROVED FOR PUBLICATION Clifford E. Mansfield 04-24-98 DEPUTY STATE DESIGN ENGINEER Delete bury depth of pole. WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

JANUAR



NOTE

1. For Sections A and B, see Standard Plan J-8d.



TYPE 2 INDUCTION LOOP

STANDARD PLAN J-8b

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION Harold J. Peterfeso

05-20-04

ENTRANCE SAWCUT DETAIL

VARIES-

CENTER OF LOOP

REMOVE PAVEMENT TO SAWCUT DEPTH AND FILL WITH SEALANT

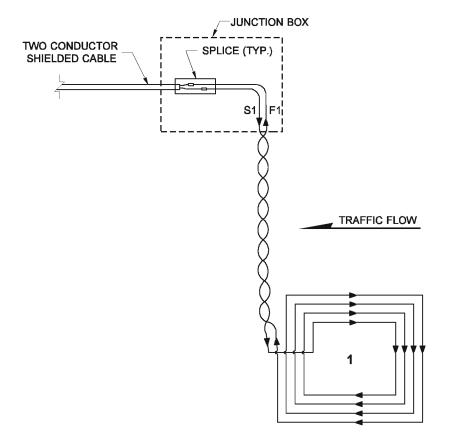
AND VEHICLE LANE

LOOP SAWCUT REMOVE PAVEMENT TO SAWCUT DEPTH AND FILL WITH SEALANT CORNER LOOP SAWCUT SAWCUT **CORNER SAWCUT DETAIL**

LEAD-IN SAWCUT

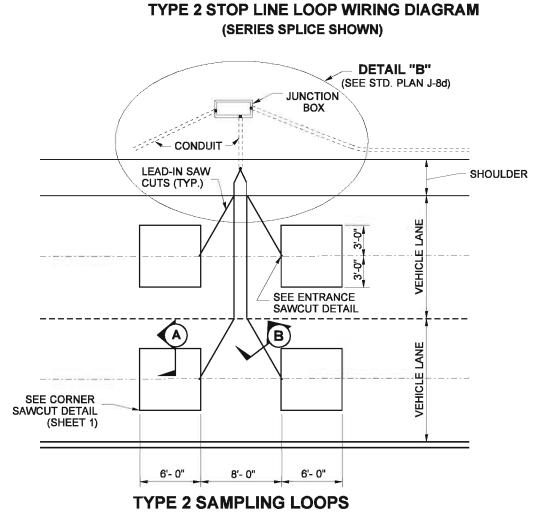
SAWCUT

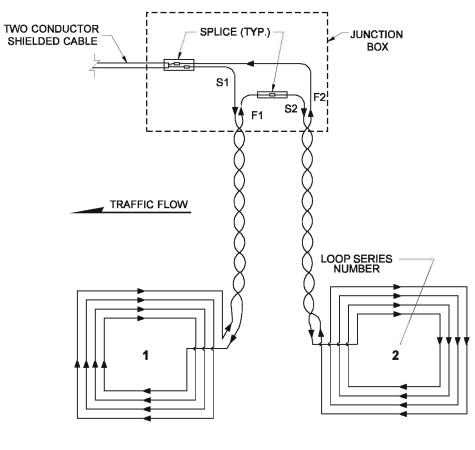
LOOP SAWCUT



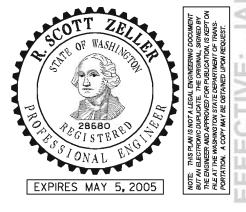
- All of the loop lead-in wires shall return to the Junction Box.
- For Splice Detail, see Standard Plan J-8d.

TYPE 2 ADVANCE LOOP WIRING DIAGRAM





TYPE 2 SAMPLING LOOP WIRING DIAGRAM (SERIES SPLICE SHOWN)



TYPE 2 INDUCTION LOOP

STANDARD PLAN J-8b

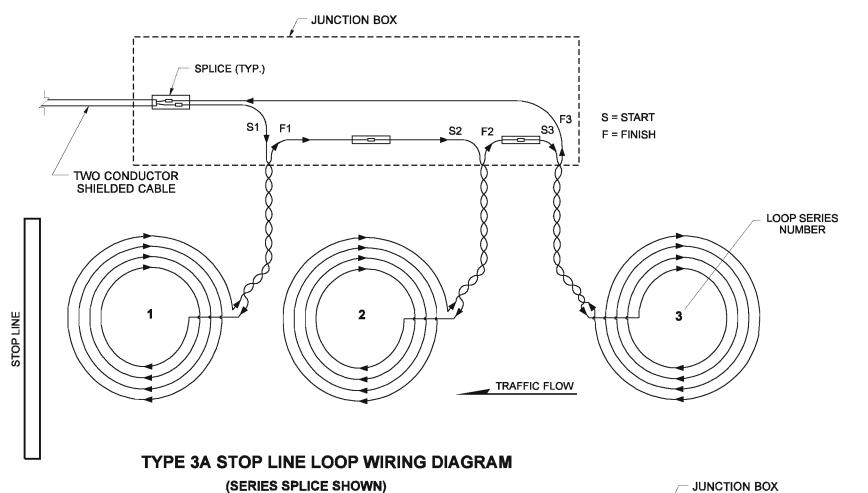
SHEET 2 OF 2 SHEETS

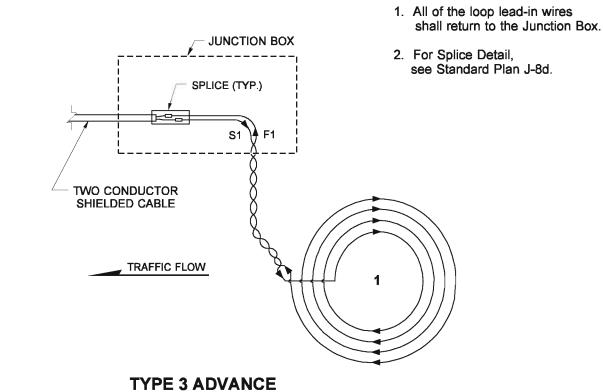
APPROVED FOR PUBLICATION

Harold I Peterfeso 05









LOOP WIRING DIAGRAM

JUNCTION BOX SPLICE (TYP.) TWO CONDUCTOR SHIELDED CABLE S = START F = FINISH LOOP SERIES NUMBER TRAFFIC FLOW

TYPE 3 SAMPLING LOOP WIRING DIAGRAM (SERIES SPLICE SHOWN)



EXPIRES MAY 5, 2005

STANDARD PLAN J-8c

SHEET 2 OF 3 SHEETS

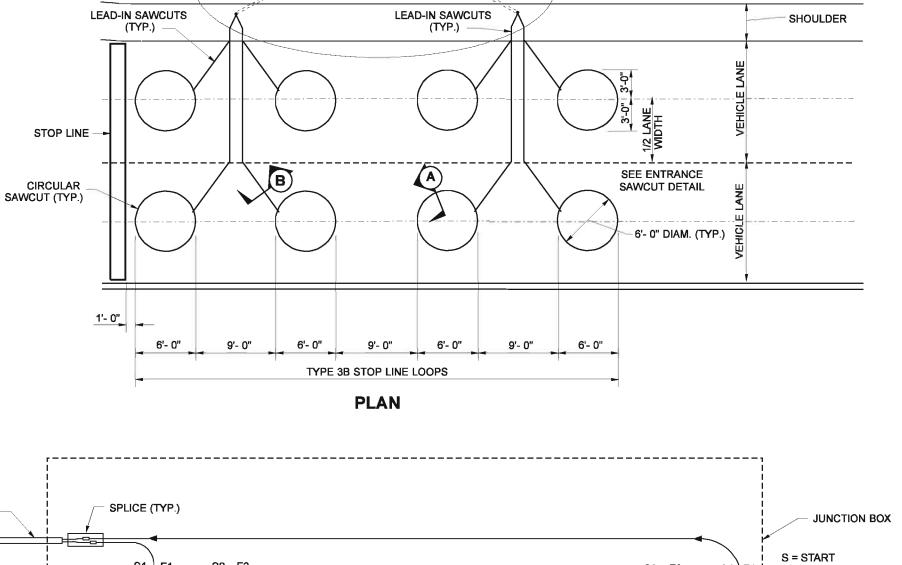
APPROVED FOR PUBLICATION

Harold J. Peterfeso

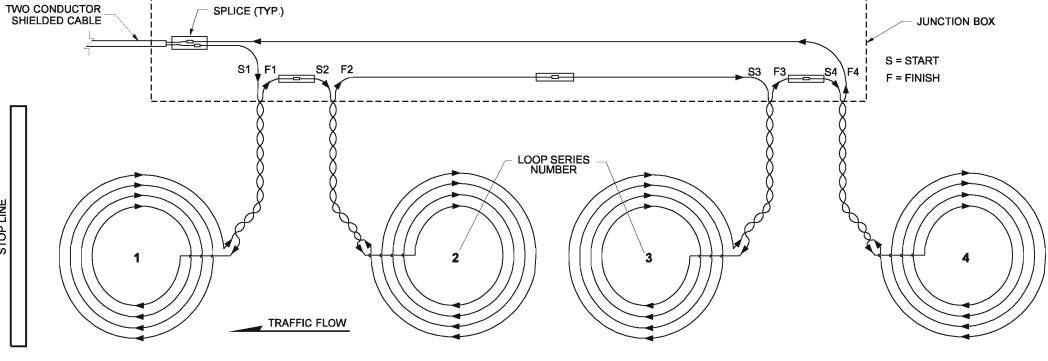


NOTES

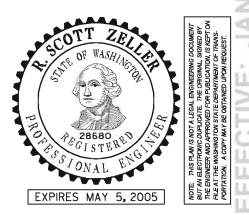
05-20-04



DETAIL "B" (SEE STD. PLAN J-8d)



TYPE 3B STOP LINE LOOP WIRING DIAGRAM
(SERIES SPLICE SHOWN)



TYPE 3 INDUCTION LOOP

STANDARD PLAN J-8c

SHEET 3 OF 3 SHEETS

APPROVED FOR PUBLICATION

Harold J. Peterfeso 05-20-04



Washington State Department of Transportation

DEPTH OF ASPHALT CEMENT CONCRET

HIGH TEMP.

LOOP LEAD-IN

TWISTED PAIR

WIRE, ONE

(#14 AWG)

SECTION

В

BACKER

ROD @ 24" CTRS

ROD @ 24" CTRS.

LOOP WIRE

SECTION

(#14 AWG) MAX. 4 WIRES

2008

JANUARY

1/2" WIDE 2" LONG SAWCUT **NOTES** HIGH TEMP. BACKER ROD @ 24" CTRS. DEPTH OF SAWCUT 2 5/8" MIN. 3" MAX. DEPTH OF ASPHALT CEMENT CONCRET LOOP LEAD-IN

(PER CONTRACT OR

AS APPROVED BY

THE ENGINEER)

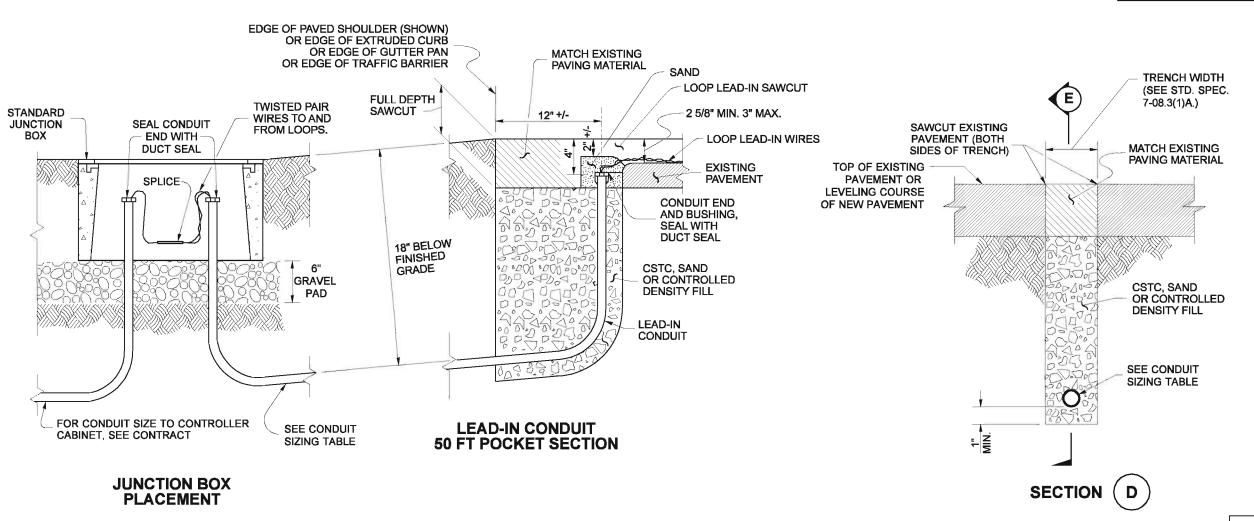
••

C

SECTION

- Fill the conduit trench to the top of the existing or new surfacing with CSTC, sand or controlled density fill. See "Standard Specifications" Section 2-09.3(1)E.
- 2. Minor Regional variation is allowed in the soft pocket closure. Consult with the Engineer or see the Contract for additional requirements.
- 3. Conductors shall be snug to the bottom of the sawcut. High temperature backer rod shall be snug to the conductors.

CONDUIT SIZING TABLE					
LOOP LEAD PAIRS	1-2	3	4-5	6-8	9-12
CONDUIT SIZE (MIN)	1"	1 1/4"	1 1/2"	2"	3"



SAWCUT 3" MAX.

1/2" MIN.

DEPTH OF ASPHALT CEMENT CONCRET

TOP OF EXISTING

LEVELING COURSE

OF NEW PAVEMENT

WIRES, TWISTED

PAIRS (#14 AWG)

OR (#12 AWG)

(MAX. 3 PAIRS.)

PAVEMENT OR



<

INDUCTION **LOOP DETAILS**

STANDARD PLAN J-8d

05-20-04

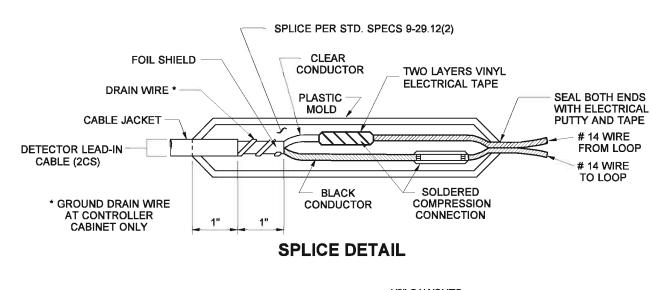
SHEET 1 OF 2 SHEETS

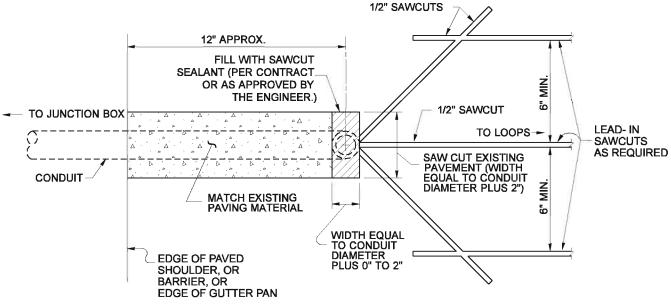
APPROVED FOR PUBLICATION

Harold J. Peterfeso

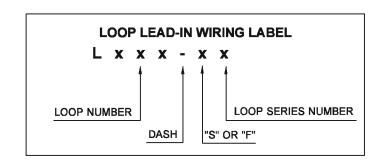
STATE DESIGN ENGINEER

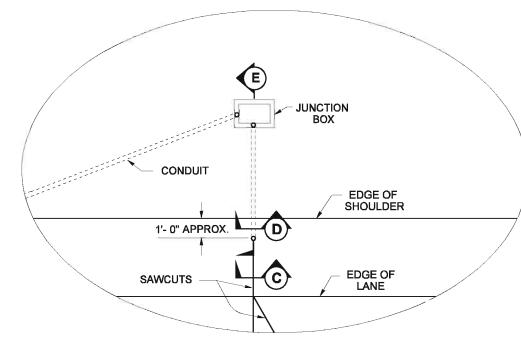
SECTION (E



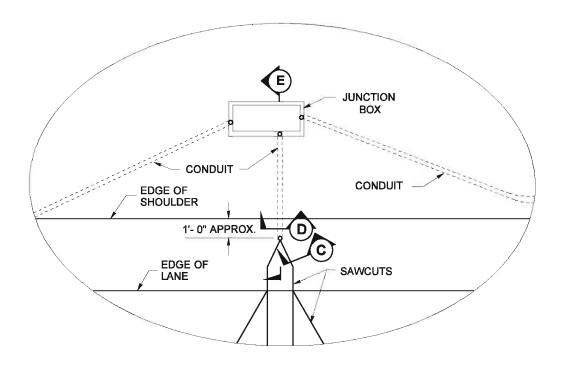


SAWCUT AND CONDUIT CONNECTION **PLAN**





DETAIL "A"



DETAIL "B"

LOOP INSTALLATION NOTES

- 1. Install the Junction Box and the lead-in conduit.
- 2. Sawcut the loop slots and the lead-in slots.
- 3. Lay out the loop wire starting at the Junction Box, allowing 5' minimum slack.
- 4. Install the wire in the loop slot as shown.
- 5. Finish laying out the wire at the Junction Box and identify the leads with the loop number, the "S" for start and the "F" for the finish, and the loop series number.
- 6. Twist each pair of the lead wires two times per foot from the loop to the Junction Box. Reverse the direction of the twist for each successive pair installed.
- 7. Construct a supplemental splice containing any series loop connections required in the plans. Supplemental splices are subject to the same requirements shown for the loop lead and the shielded cable splice.
- 8. Splice the loop leads of supplemental splice leads to the shielded cable as noted in the Contract.
- 9. Complete installation and test loop circuits or combination loop circuits. See Standard Specifications 8-20.3(14)D.
- 10. Conduit for the loop stubout shall be as required in the Contract.

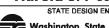


INDUCTION LOOP DETAILS

STANDARD PLAN J-8d

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION



Harold J. Peterfeso 05-20-04

2008

2008 TO AUGUST

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TIVE:

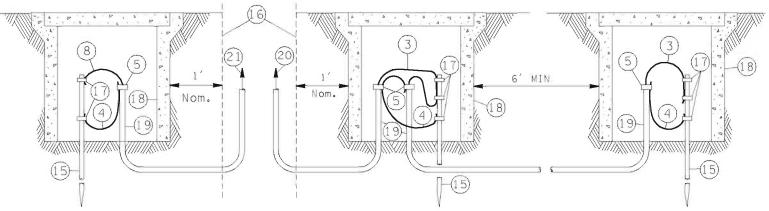
- Service Ground
- Grounding Electrode Conductor
- (4) Bonding Jumper
- (5) Grounding Bushing (typ. all conduit terminations)
- (6) Service Neutral Bus (Copper)
- (7) Service Enclosure
- (8) Equipment Grounding Conductor
- (9) Junction Box
- (10) Electrical Load Support (luminaire pole)
- (11) Copper Split Bolt Clamp
- (12) Galvanized Steel Conduit (GSC)
- (13) Non-metallic Conduit (NMC)
- Option A = 10' GSC with Field Bend
 - Approved Adapter Fitting
 - Grounding Bushing
 - Option B 10' GSC
 - GS Factory Elbows
 - Approved Adapter Fitting
 - GS Coupling
 - Grounding Bushing
- (15) Ground Rod
- (16) Edge of Foundation, Pole or Service Support
- (18) Junction Box or 8" Drain Tile with Approved Cover
- (19) Code Sized GSC
- (20) To Service Neutral Bus
- (21) To Grounding Terminal or Connection to Equipment Grounding System

EFFECTIVES JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. If parallel circuits of different sizes are contained in one conduit, the size of the grounding conductor shall be determined on the basis of the largest conductor. Only one grounding conductor is required for each conduit regardless of the number of circuits contained.
- 2. Service ground per serving utility requirement. If the utility uses aluminum service conductors, an approved Al-Cu pressure type ground connector shall be used to secure the service neutral to the copper neutral bar in the service enclosure. Except for the above, all grounding conductors shall be copper.
- 3. Equipment grounding conductors and grounding electrode conductors shall be sized in accordance with the National Electric Code (No. 8 minimum) .

SUPPLEMENTAL GROUND

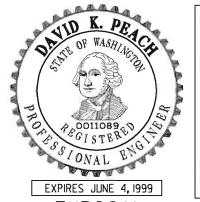
SERVICE GROUND



Required to supplement equipment grounding for luminaire standards with direct burial, aerial feeds, or where required in plans.

Required at all services and separately derived systems.

GROUND ROD DETAILS



TYPICAL GROUNDING DETAILS

04-24-98

STANDARD PLAN J-9a

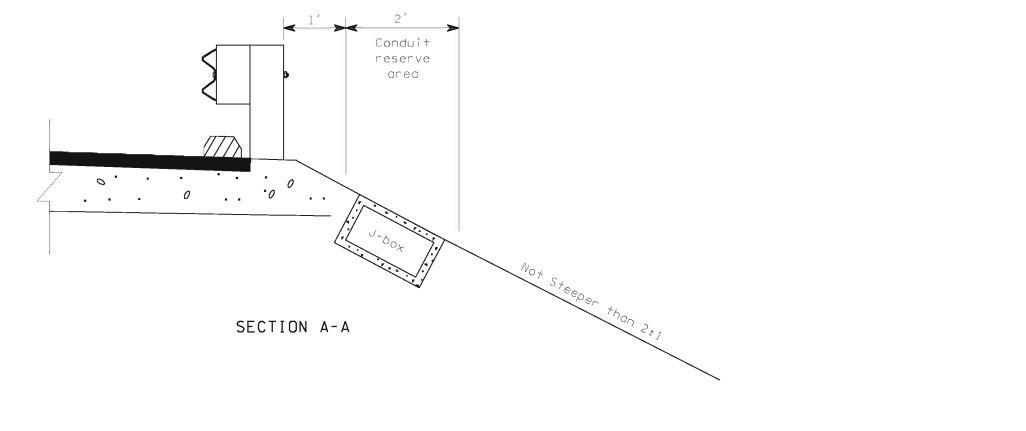
APPROVED FOR PUBLICATION

Clifford E. Mansfield

DEPUTY STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION DLYMPIA, WASHINGTON

Note 3, change "connectors" to "conductors".



ELECTRICAL CONDUIT
PLACEMENT



STANDARD PLAN J-10

APPROVED FOR PUBLICATION

Clifford E. Mansfield

STATE DESIGN ENGINEER

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION OLYMPIA, WASHINGTON

07-18-97

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

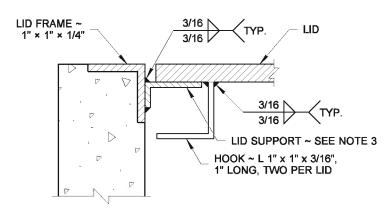
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

A C E INW SEE NOTE 7 DIAMOND PATTERN SEE NOTE 2 DIAMOND PATTERN SEE NOTE 2

TOP VIEW

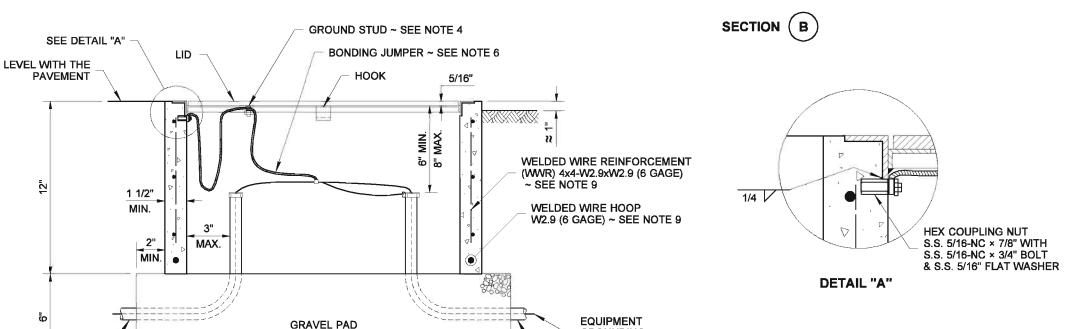
PVC CONDUIT

JUNCTION BOX DIMENSION TABLE				
R	ITEM	BOX TYPE		
MARK	ITEM	TYPE 1	TYPE 2	
Α	OUTSIDE LENGTH OF JUNCTION BOX	22"	33"	
В	OUTSIDE WIDTH OF JUNCTION BOX	17"	22 1/2"	
С	INSIDE LENGTH OF JUNCTION BOX	18" ~ 19"	29" ~ 30"	
D	INSIDE WIDTH OF JUNCTION BOX	13" ~ 14"	18 1/2" ~ 19 1/2"	
Е	LID LENGTH	17 5/8"	28 5/8"	
F	LID WIDTH	12 5/8"	18 1/8"	
	CAPACITY ~ CONDUIT DIAMETER	6"	12"	



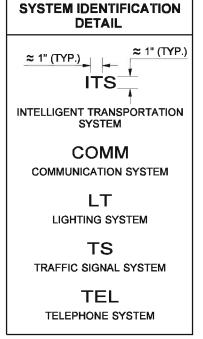
NOTES

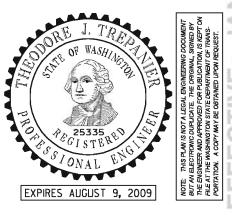
- All box dimensions are approximate. Exact configurations vary among manufacturers.
- The lid thicknesses are minimum. The diamond pattern shall be 28% minimum of overall thickness.
- 3. Lid support members shall be 3/16" minimum thick steel C, L, or T shape, welded to the frame.
- A 1/4-20NC × 3/4" S.S. ground stud shall be welded to the bottom of the lid; include S.S. nut and flat washer.
- 5. Bolts and nuts shall be liberally coated with anti-seize compound.
- 6. Connect a bonding jumper to steel conduit bushing for GRS conduit; connect to equipment grounding conductor for PVC conduit. Bonding Jumper shall be #8 min. × 4' of tinned braided copper.
- 7. The System Identification letters shall be 1/8" line thickness formed by engraving, stamping, or with a S.S. weld bead. Grind off diamond pattern before forming letters. See System Identification Detail.
- 8. When required in the Contract, Type 2 boxes shall be provided with a 10" x 27 1/2", 10 gage divider plate complete with fasteners.
- The Junction Box Type 2 shall be provided with a 12" deep extension when specified in the Contract.
- 10. See the Standard Specifications for alternative reinforcement and class of concrete.



GROUNDING CONDUCTOR

GRS CONDUIT





STANDARD JUNCTION BOX TYPES 1 & 2

STANDARD PLAN J-11a

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION



FRAME SLOT MARK ① LID HOOK MARK ②

LID SUPPORT

~ CENTER ON THE SLOT

LID FRAME

1/8" WELD BEAD

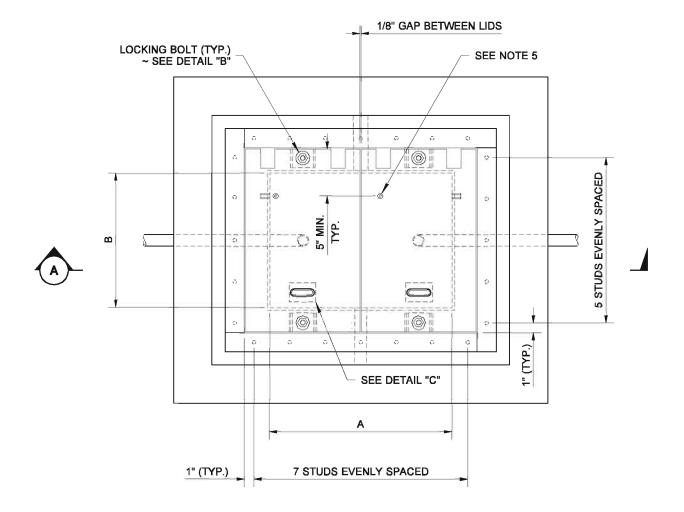
HOOK

LID FRAME

1/8" WELD BEAD

~ CENTER AT THE HOOK

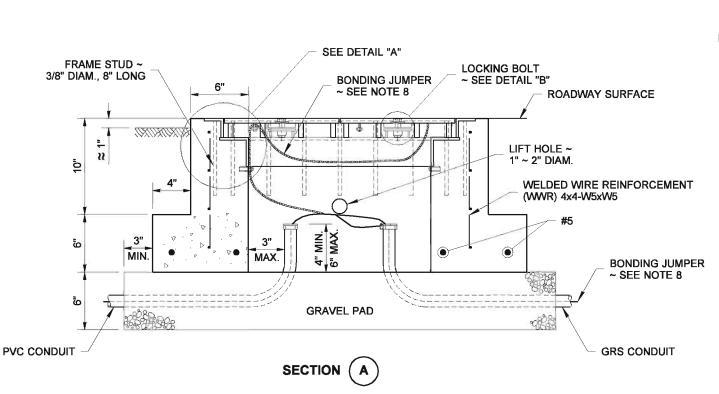
SECTION

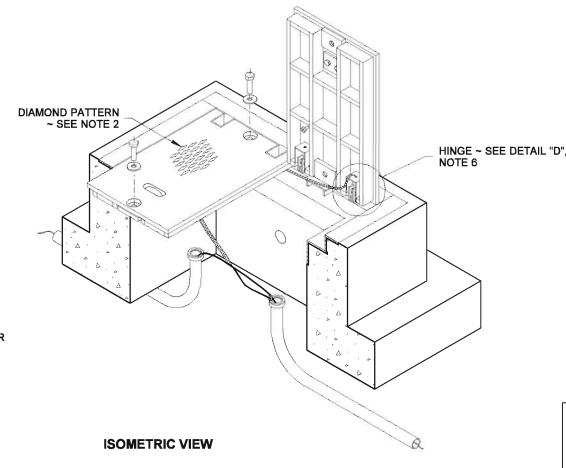


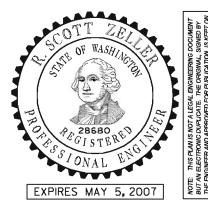
TOP VIEW

	JUNCTION BOX DIMENSION TABLE				
RK	ITCM	BOX TYPE			
MARK	ITEM	TYPE 4	TYPE 5	TYPE 6	
Α	BOX INSIDE LENGTH	19"	28"	36"	
В	BOX INSIDE WIDTH	14"	17"	24"	
С	LID LENGTH	19"	22"	29"	
D	LID WIDTH	11 15/16"	16 7/16"	20 7/16"	
w	STIFFENER SPACING	4"	5 1/2"	6 3/4"	
Х	STIFFENER LENGTH	3 1/16"	4 9/16"	5 43/48"	
Υ	STIFFENER SPACING	6"	7"	9 1/2"	
Z	STIFFENER LENGTH	18 1/4"	21 1/4"	28 1/4"	
CA	APACITY ~ CONDUIT DIAM.	6"	12"	24"	

- 1. All box dimensions are approximate. Exact configurations vary among manufacturers.
- 2. All lid thicknesses are minimum. The diamond pattern shall be 3/32" minimum thick.
- 3. Lid stiffener plates shall bear on frame. Mill to bearing seat and perimeter bar for full even contact after fabrication of frame and lid. Lid and frame units with uneven bearing will be rejected.
- 4. The installed lid and frame shall fit with full even contact around the perimeter of a junction box after installation. Care shall be taken to prevent debris accumulation on the contact surfaces.
- 5. A 1/4-20NC × 3/4" S.S. ground stud shall be welded to the bottom of each lid; include S.S. nut and flat washer.
- 6. The hinges shall allow the lids to open 180°.
- 7. Bolts and nuts shall be liberally coated with anti-seize compound.
- 8. Connect a bonding jumper to steel conduit bushing for GRS conduit; connect to equipment grounding conductor for PVC conduit. As an alternative, the bonding jumper shall be attached to the front face of the hinge pocket with a 5/16-20NC × 3/4" bolt, S.S. nut, and flat washer. Bonding Jumper shall be #8 min. × 4' of tinned braided copper.
- 9. The System Identification letters shall be 1/8" line thickness formed by engraving, stamping, or with a S.S. weld bead. Grind off diamond pattern before forming letters. See System Identification Detail.
- 10. A 1% tolerance is allowed for all dimensions.
- 11. See the Standard Specifications for class of concrete.







HEAVY DUTY JUNCTION BOX TYPES 4, 5, & 6 STANDARD PLAN J-11b

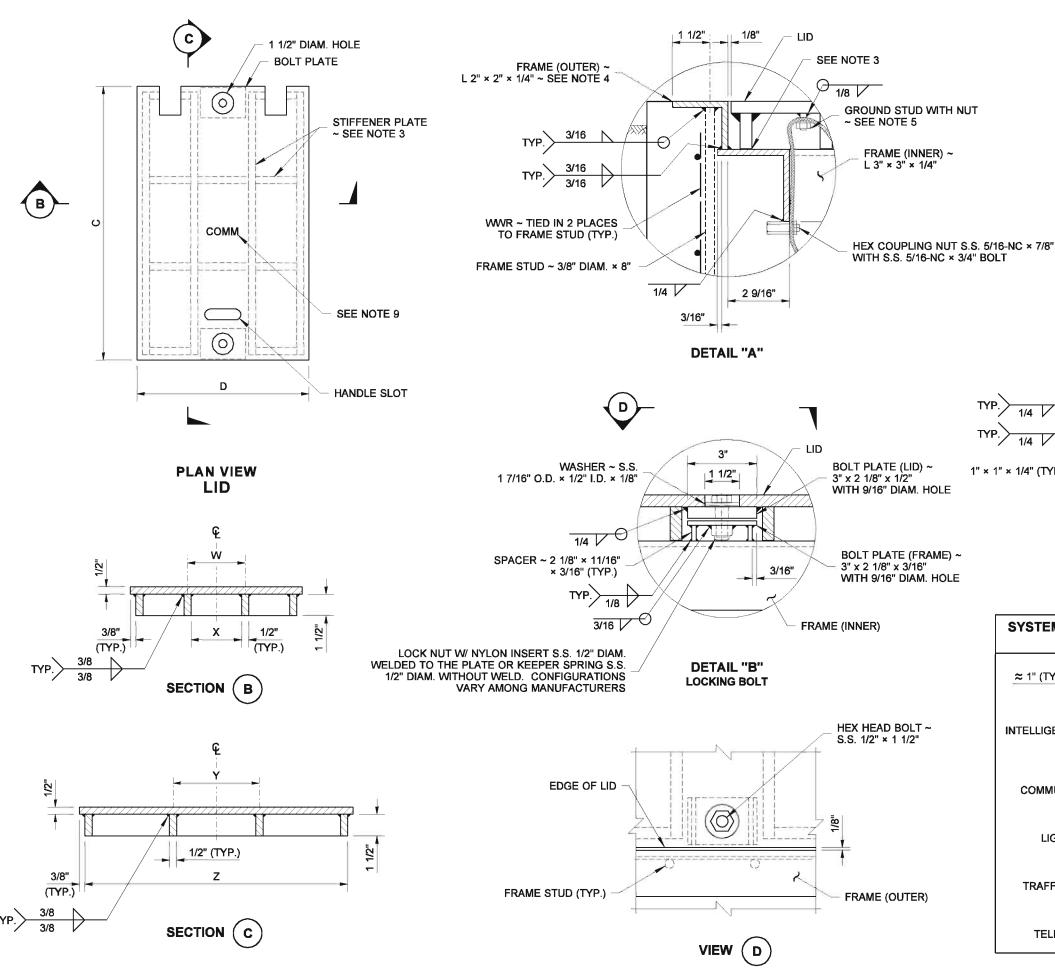
SHEET 1 OF 2 SHEETS

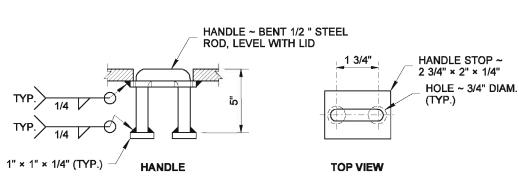
APPROVED FOR PUBLICATION

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09-02-05

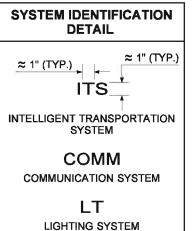
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3.





DETAIL "C"

DETAIL "D" HINGE



TS

TEL

TELEPHONE SYSTEM



EXPIRES MAY 5, 2007

S.S. PIN W/ SNAP RING GROOVE

SNAP RING

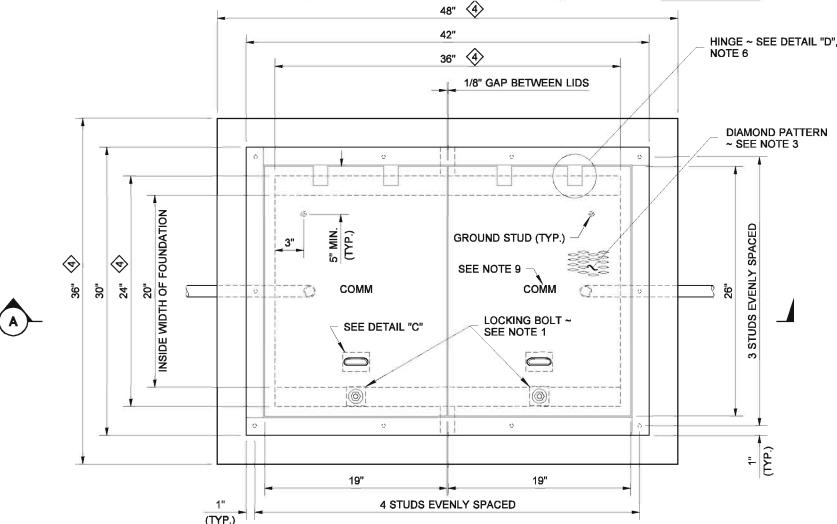
HEAVY DUTY JUNCTION BOX TYPES 4, 5, & 6 STANDARD PLAN J-11b

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION 09-02-05

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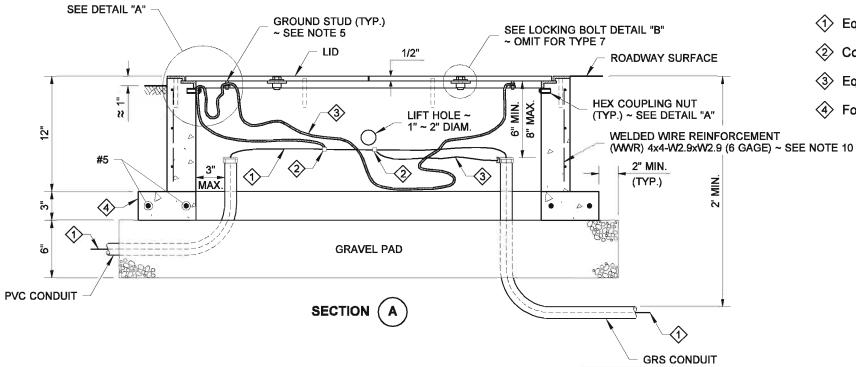




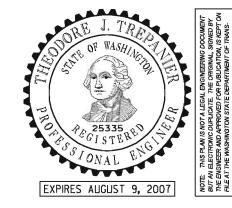
TOP VIEW USE LOCKING BOLTS ONLY FOR TYPE 8

NOTES

- 1. Junction boxes type 7 and type 8 are identical except for the addition of locking bolts
- 2. All box dimensions are approximate. Exact configurations vary among manufacturers.
- 3. All lid thicknesses are minimum. The diamond pattern shall be 3/32" minimum thick.
- 4. Lid support members shall be 3/16" min. thick steel C, L, or T shape, welded to the frame. Exact configurations vary among manufacturers.
- 5. A 1/4-20NC × 3/4" S.S. ground stud shall be welded to the bottom of each lid; include S.S. nut and flat washer.
- 6. The hinges shall allow the lids to open 180°.
- 7. Bolts and nuts shall be liberally coated with anti-seize compound
- 8. Connect an equipment bonding jumper to steel conduit bushing for GRS conduit; connect to equipment grounding conductor for PVC conduit. As an alternative to the ground stud connection, the equipment bonding jumper shall be attached to the front face of the hinge pocket with a 5/16-20NC × 3/4" S.S. bolt, nut, and flat washer. Equipment Bonding Jumper shall be #8 min. × 4' of tinned braided copper.
- 9. The System Identification letters shall be 1/8" line thickness formed by engraving, stamping, or with a S.S. weld bead. Grind off diamond pattern before forming letters. See System Identification Detail.
- 10. See the Standard Specifications for alternative reinforcement and class of concrete.
- 11. Capacity ~ conduit diameter = 24"



- Equipment grounding conductor
- Copper split bolt clamp
- Equipment bonding jumper ~ see note 8
- Foundation



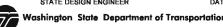
STANDARD DUTY JUNCTION **BOX TYPES 7 & 8**

STANDARD PLAN J-11c

SHEET 1 OF 2 SHEET

APPROVED FOR PUBLICATION

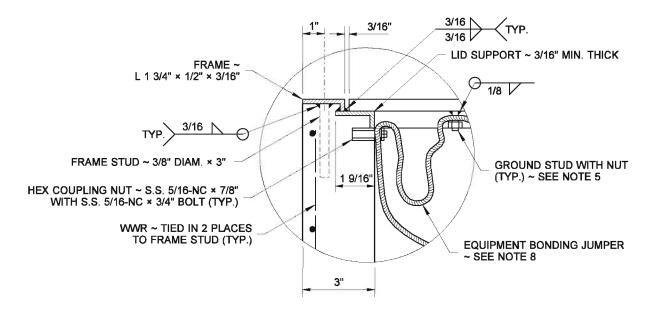
Harold J. Peterfeso



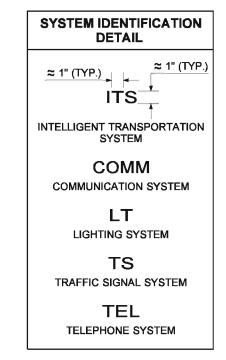
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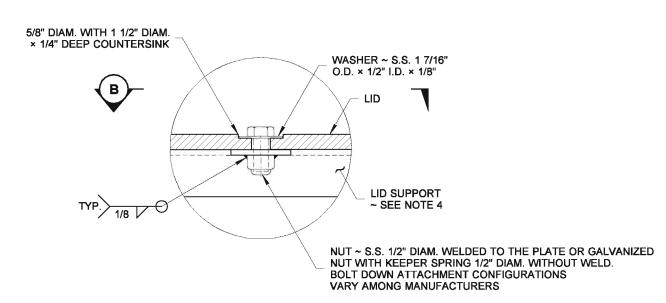
DETAIL "A"

DETAIL "B" LOCKING BOLT OMIT FOR TYPE 7



ALTERNATE LOCATION FOR ATTACHMENT OF EQUIPMENT BONDING JUMPER ~ SEE NOTE 8 **`** S.S. PIN W/ SNAP RING GROOVE **SNAP RING DETAIL "D"** HINGE

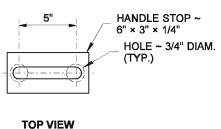


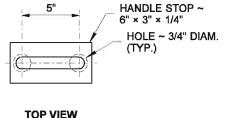


BOLT PLATE ~ 2" x 2" x 3/16" WITH 1 1/2" DIAM, HOLE WELD TO THE LID SUPPORT HEX HEAD BOLT ~ S.S. 1/2" × 1 1/2" EDGE OF LID LID SUPPORT FRAME ~ L 1 3/4" × 1/2" × 3/16"



HANDLE ~ BENT 1/2" STEEL ROD, LEVEL WITH LID 1" × 1" × 1/4" (TYP.) **HANDLE**





STANDARD DUTY JUNCTION **BOX TYPES 7 & 8**

EXPIRES AUGUST 9, 2007

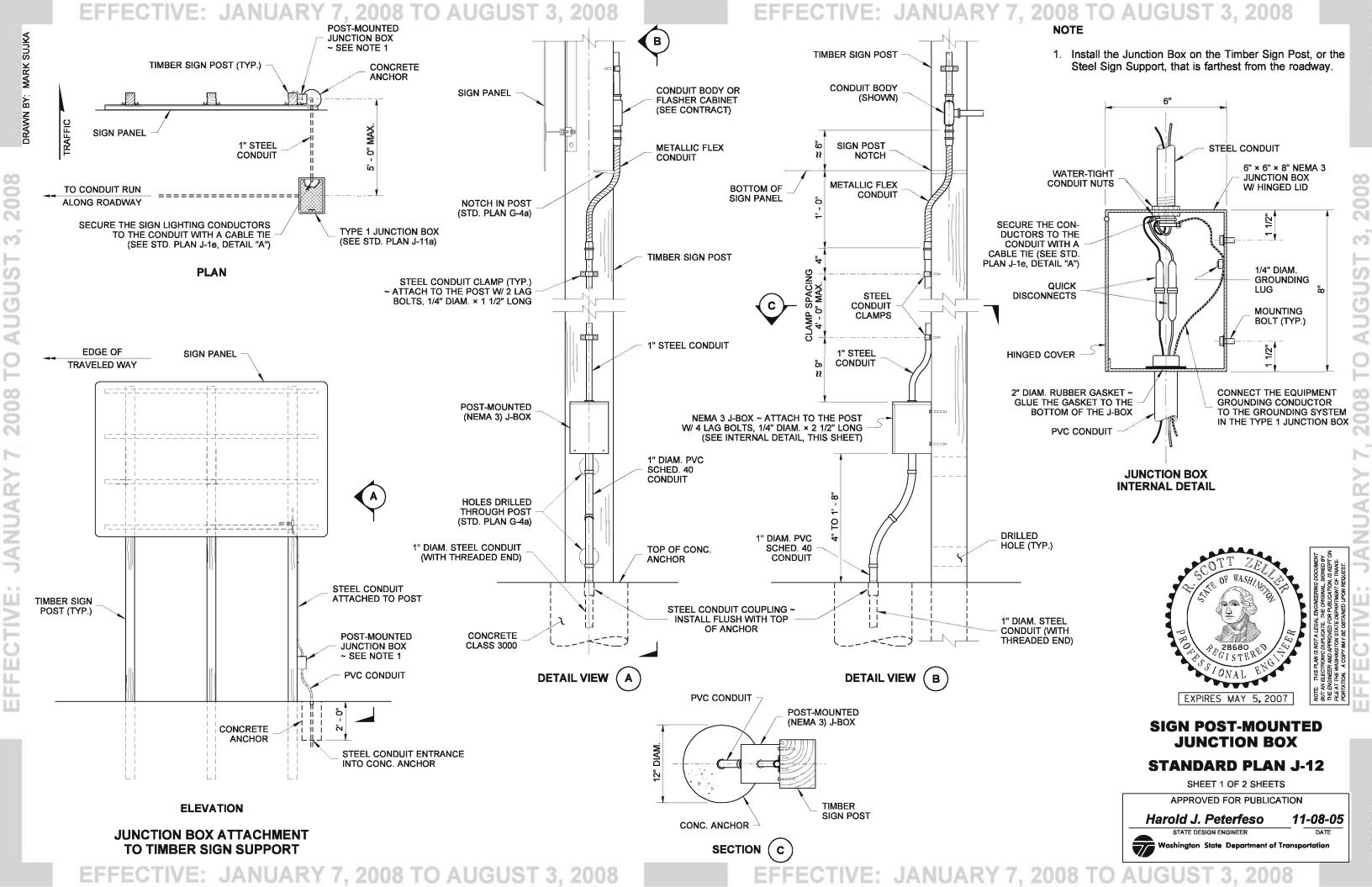
STANDARD PLAN J-11c

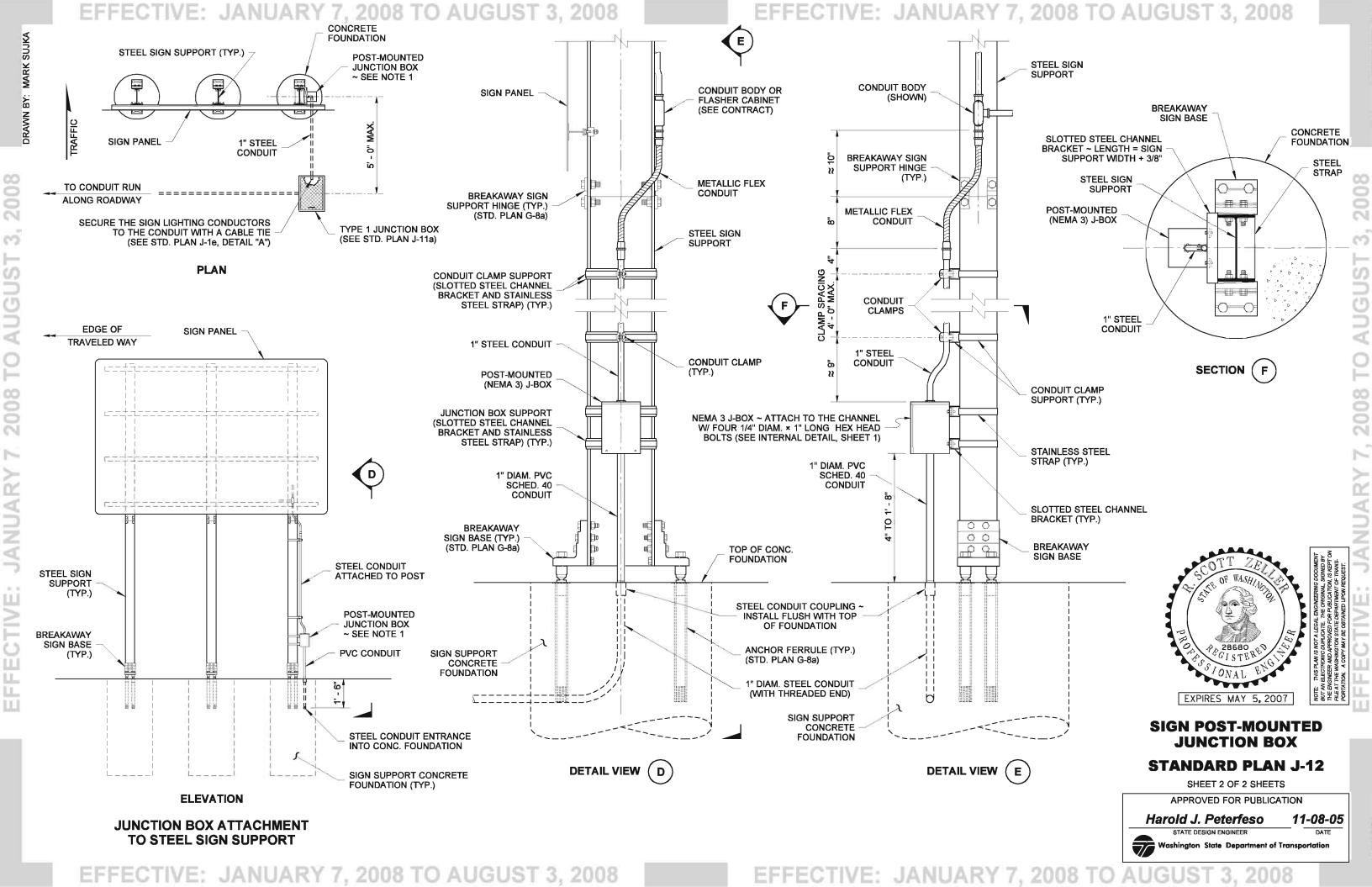
SHEET 2 OF 2 SHEETS

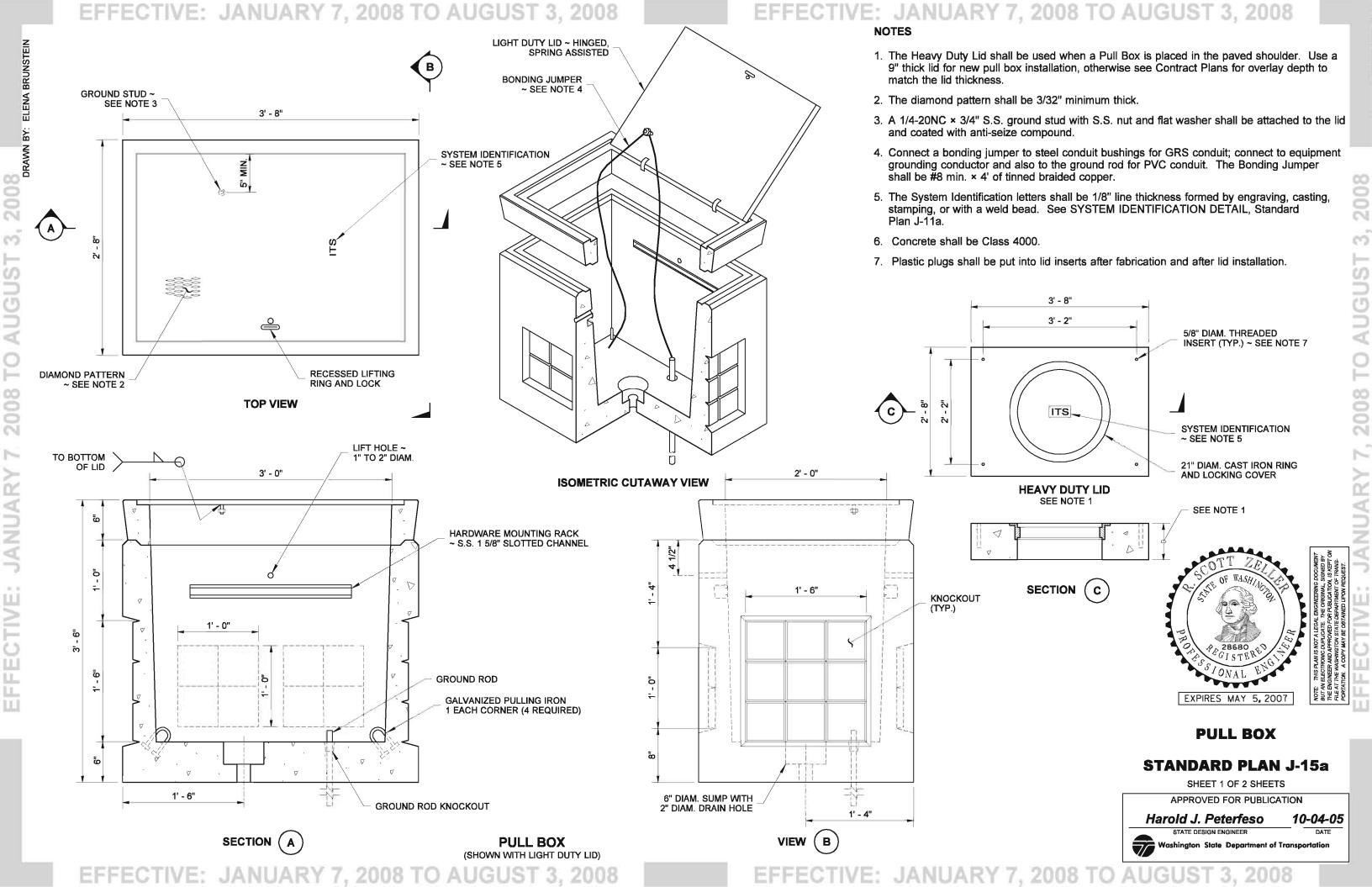
APPROVED FOR PUBLICATION



Harold J. Peterfeso 06-21-06







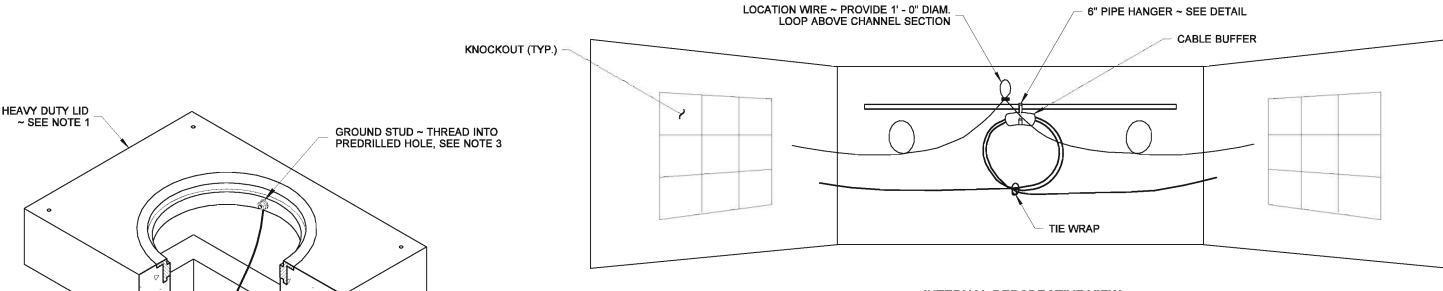
6" PIPE HANGER ~ SEE DETAIL

CHANNEL NUT WITH SPRING

PIPE HANGER

HEX HEAD BOLT 1/2-13NC × 15/16"

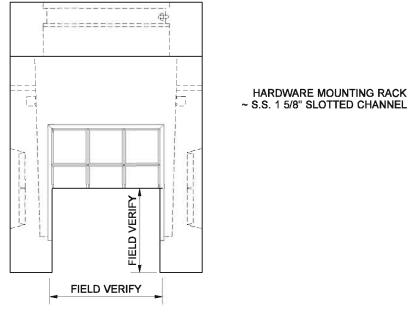
HEX BOLT 3/8-16NC × 12"



INTERNAL PERSPECTIVE VIEW

CABLE RACKING SCHEME

COIL THE CABLE BY USING A "FIGURE 8" FOLDED IN THE MIDDLE TO MAKE A LOOP



END VIEW (D)

SIDE VIEW CABLE BUFFER ~ CORRUGATED PVC PIPE, 6" DIAM., 1' - 0" LONG, SPLIT PIPE HANGER ~ S.S.,

PULL BOX

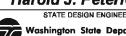
10-04-05

EXPIRES MAY 5, 2007

STANDARD PLAN J-15a

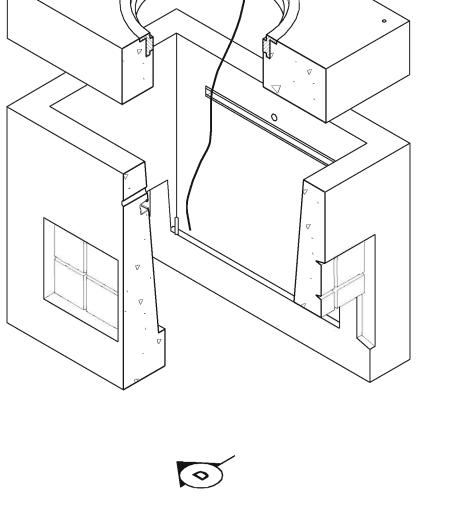
SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION Harold J. Peterfeso



ISOMETRIC VIEW **6" PIPE HANGER DETAIL** FABRICATE IF NOT AVAILABLE COMMERCIALLY

12 GAGE, 1" WIDE



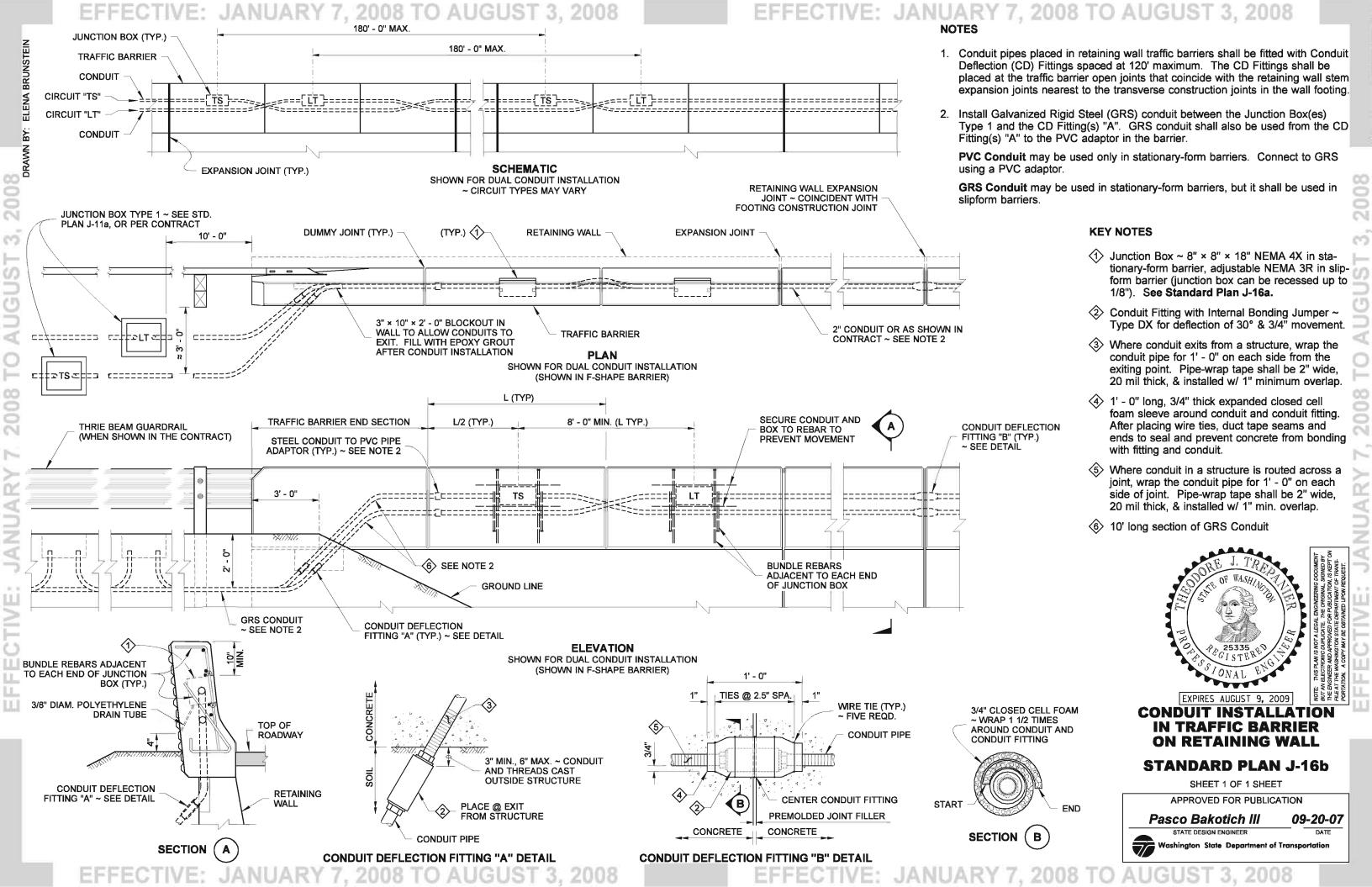
ISOMETRIC CUTAWAY VIEW

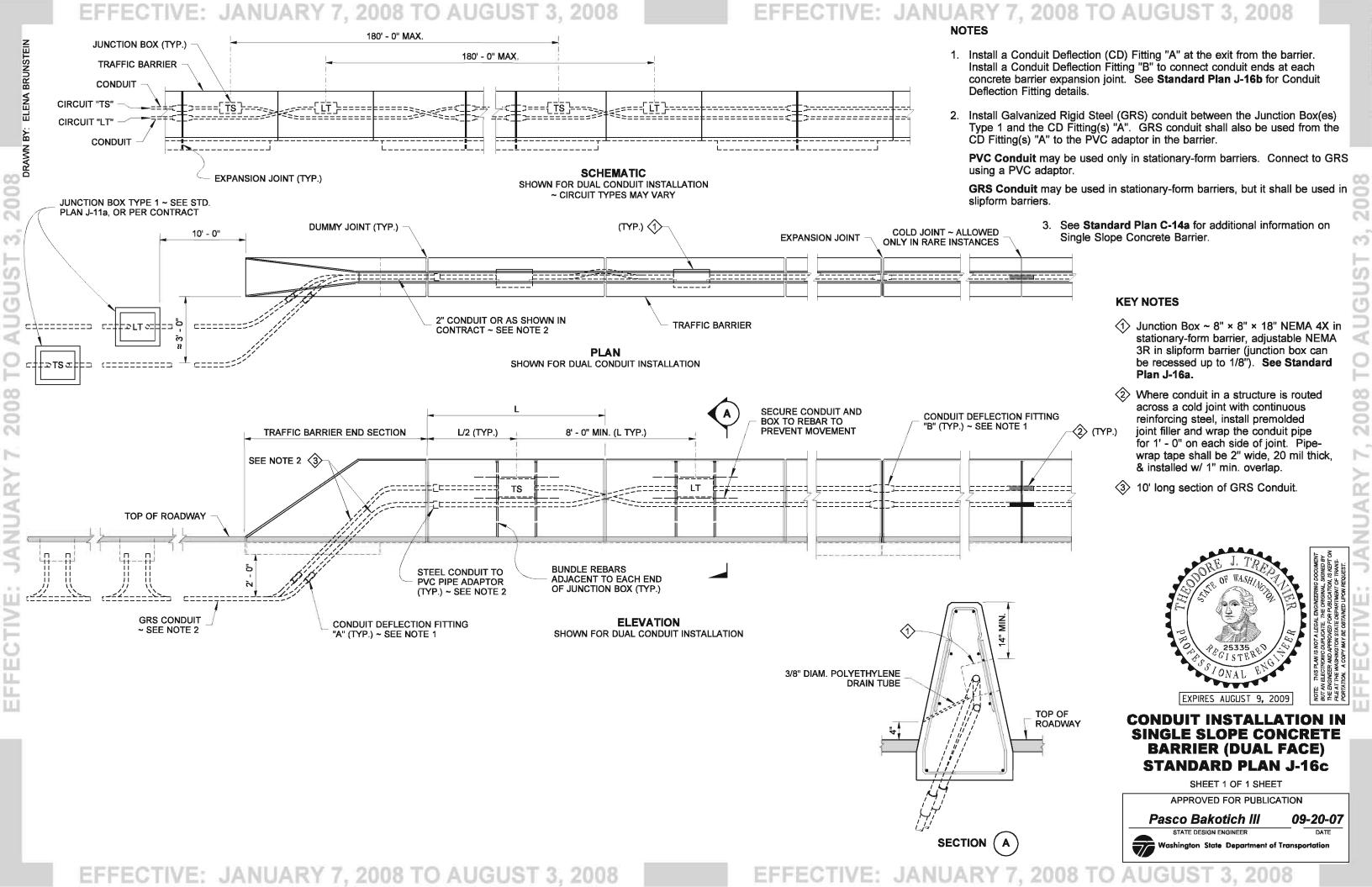
SPLIT PULL BOX

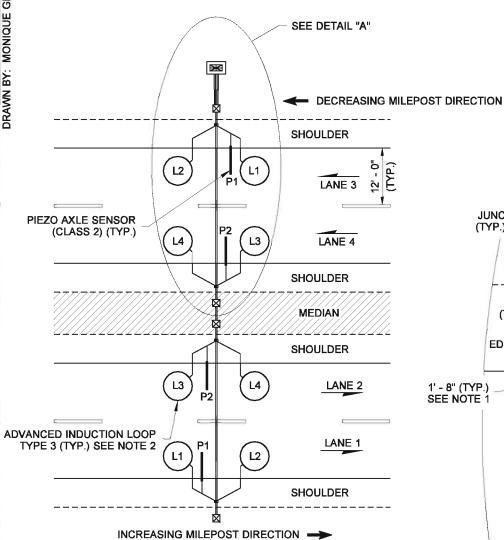
(SHOWN WITH HEAVY DUTY LID) SEE PULL BOX, SHEET 1, FOR DIMENSIONS NOT SHOWN TO AUGUST

2008

JANUARY







PLAN VIEW

INDUCTION LOOP / PIEZO AXLE SENSOR **NUMBER IDENTIFICATION**

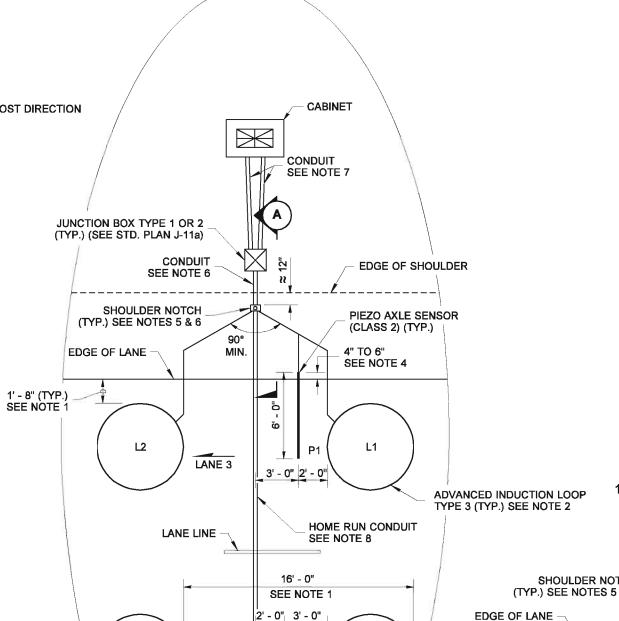
Lane 1 - (drive lane) ~ Loop L1, Piezo P1, Loop L2

Lane 2 - (pass lane) ~ Loop L3, Piezo P2, Loop L4

Lane 3 - (drive lane) ~ Loop L1, Piezo P1, Loop L2

Lane 4 - (pass lane) ~ Loop L3, Piezo P2, Loop L4

TYPICAL 4 LANE FREEWAY WITH MEDIAN



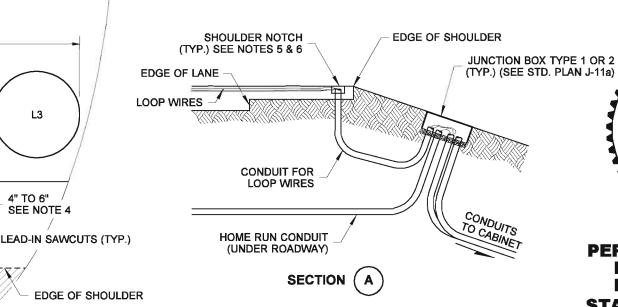
P2

4" TO 6"

SEE NOTE 4

NOTES

- 1. The Traffic Data Collection Loop spacing shall be 16' 0" from leading edge to leading edge. The loops shall be centered inside lanes without an adjacent shoulder; the loops in lanes adjacent to shoulders, including the median shoulder, shall be located 1' - 8" from the edge of lane, see Detail "A".
- 2. Type 2 Advanced Induction Loops may also be used, see Standard Plan J-8b.
- 3. The loops and axle sensors shall be cut in the final lift of asphalt.
- 4. For concrete pavement lanes with asphalt shoulders, install all of the Piezo sensor and splice in the concrete lane. Also for concrete pavement lanes install the loops 4" to 6" away from the expansion joints.
- 5. The shoulder notch length along the roadway shall be 4" or the conduit size plus 2", whichever is larger. The shoulder notch width perpendicular to the roadway shall be the conduit size plus 1/4".
- 6. After all the wire leads are installed, seal the end of the conduit with Conduit Sealant. See the Special Provisions in the contract for the material used to fill the notch in the shoulder, or use an asphalt cold-patch.
- 7. Use Schedule 40 PVC conduit from the junction box to the cabinet. When there are four or more total lanes, use one conduit for each direction of travel. For conduit installation, see Standard Specification 8-20.
- 8. Use Schedule 80 PVC, HDPE, or Steel Conduit under the roadway. For conduit installation, see Standard Specification 8-20.
- 9. An inspector from the Traffic Data Office (TDO) shall be on site during all phases of the Traffic Recorder installation. The Contractor shall alert the Engineer 10 days prior to the beginning of any installation activity.
- 10. See Standard Plan J-20 for Piezo Axle Sensor General Installation Instructions.





PERMANENT TRAFFIC **RECORDER SITE INSTALLATIONS** STANDARD PLAN J-18

SHEET 1 OF 2 SHEETS

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DETAIL "A"

LANE 4

1' - 8" (TYP.)

SEE NOTE 1

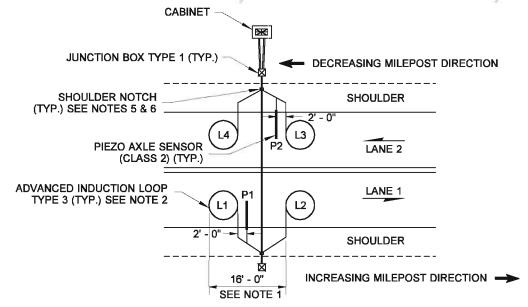
EDGE OF LANE

MEDIAN

2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 JUNCTION BOX TYPE 1 OR 2 (TYP.) ← DECREASING MILEPOST DIRECTION 4" TO 6" **SEE NOTE 4 SHOULDER** L2) L1 LANE 5 2' - 0" MIN. 2' - 0" ADVANCED INDUCTION LOOP L3 L4 LANE 6 TYPE 3 (TYP.) SEE NOTE 2 PIEZO AXLE SENSOR **HOME RUN CONDUIT** (CLASS 2) (TYP.) LANE 7 (L6) L5 SHOULDER **MEDIAN** SHOULDER L7 L8 SEE DETAIL "B" LANE 4 LANE 3 L5) LANE 2 L4 2' - 0" MIN. -LANE 1 L2 SHOULDER INCREASING MILEPOST DIRECTION -> **CABINET PLAN VIEW INDUCTION LOOP / PIEZO AXLE SENSOR NUMBER IDENTIFICATION** Lane 1 - (drive lane) ~ Loop L1, Piezo P1, Loop L2 Lane 2 - (drive lane) ~ Loop L3, Piezo P2, Loop L4 Lane 3 - (drive lane) ~ Loop L5, Piezo P3, Loop L6 Lane 4 - (pass lane) ~ Loop L7, Piezo P4, Loop L8 Lane 5 - (drive lane) ~ Loop L1, Piezo P1, Loop L2 Lane 6 - (drive lane) ~ Loop L3, Piezo P2, Loop L4 Lane 7 - (pass lane) ~ Loop L5, Piezo P3, Loop L6 **TYPICAL 7 LANE FREEWAY WITH MEDIAN**

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



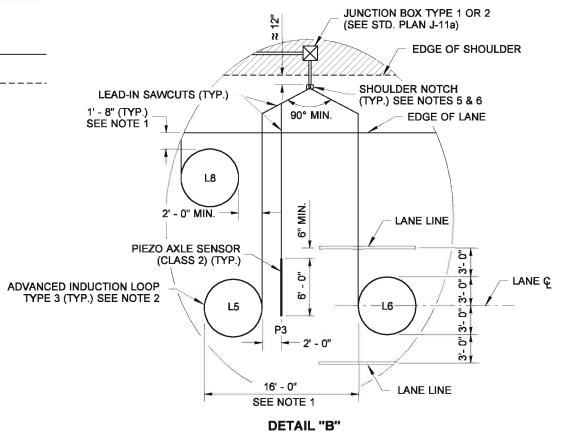
PLAN VIEW

INDUCTION LOOP / PIEZO AXLE SENSOR NUMBER IDENTIFICATION

Lane 1 - (drive lane) ~ Loop L1, Piezo P1, Loop L2

Lane 2 - (drive lane) ~ Loop L3, Piezo P2, Loop L4

TYPICAL 2 WAY ROADWAY





PERMANENT TRAFFIC **RECORDER SITE INSTALLATIONS STANDARD PLAN J-18**

SHEET 2 OF 2 SHEETS

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09-02-05

SHOULDER

SEE DETAIL "A"

INCREASING MILEPOST DIRECTION

ADVANCED INDUCTION LOOP

12" (TYP.)

SEE NOTE 1

TYPE 2 (TYP.) SEE NOTE 2

INDUCTION LOOP TO PIEZO AXLE SPACING В RURAL 6' 12' URBAN 2' 10'

PIEZO AXLE SENSOR (CLASS 1)

INDUCTION LOOP / PIEZO AXLE SENSOR NUMBER IDENTIFICATION

PLAN VIEW

Р3

L2

CABINET

L1

CONDUIT SEE NOTE 7

12" (TYP. SEE NOTE

LANE 2

LANE 1

Lane 1 - (drive lane) ~ Loop L1, Piezo P1, Piezo P2, Loop L2

Lane 2 - (pass lane) ~ Loop L3, Piezo P3, Piezo P4, Loop L4

Lane 3 - (drive lane) ~ Loop L1, Piezo P1, Piezo P2, Loop L2 Lane 4 - (drive lane) ~ Loop L3, Piezo P3, Piezo P4, Loop L4

Lane 5 - (pass lane) ~ Loop L5, Piezo P5, Piezo P6, Loop L6

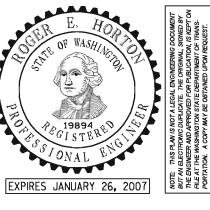
TYPICAL 5 LANE FREEWAY WITH MEDIAN

LANE LINE 0" MIN ADVANCED INDUCTION LOOP ñ TYPE 2 (TYP.) SEE NOTE 2 **EDGE OF LANE** 4" TO 6' **EDGE OF SHOULDER TEMPERATURE SENSOR** SEE NOTE 10 SHOULDER NOTCH (TYP.) SEE NOTES 5 & 6 JUNCTION BOX TYPE 1 OR 2 (SEE STD. PLAN J-11a) **EDGE OF SHOULDER** JUNCTION BOX TYPE 1 OR 2 SHOULDER NOTCH (TYP.) (SEE STD. PLAN J-11a) (TYP.) SEE NOTES 5 & 6 **DETAIL "A" EDGE OF LANE** LOOP WIRES CONDUIT FOR LOOP WIRES HOME RUN CONDUIT (UNDER ROADWAY)

- 1. The Traffic Data Collection Loops shall be centered inside lanes without an adjacent shoulder; the loops in lanes adjacent to shoulders, including the median shoulder, shall be located 12" from the edge of lane, see Detail "A".
- 2. Type 3 Advanced Induction Loops may also be used, see Standard Plan J-8b.
- 3. The loops and axle sensors shall be cut in the final lift of asphalt.

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 4. For concrete pavement lanes with asphalt shoulders, install all of the Piezo sensor and splice in the concrete lane. Also for concrete pavement lanes install the loops 4" to 6" away from the expansion joints.
- 5. The shoulder notch length along the roadway shall be 4" or the conduit size plus 2", whichever is larger. The shoulder notch width perpendicular to the roadway shall be the conduit size plus 1/4".
- 6. After all the wire leads are installed, seal the end of the conduit with Conduit Sealant. See the Special Provisions in the contract for the material used to fill the notch in the shoulder, or use an asphalt cold-patch.
- 7. Use Schedule 40 PVC conduit from the junction box to the cabinet. When there are four or more total lanes, use one conduit for each direction of travel See Standard Specification 8-20 for conduit installation.
- 8. Use Schedule 80 PVC, HDPE, or steel conduit under the roadway. See Standard Specification 8-20 for conduit installation.
- 9. An inspector from the Traffic Data Office (TDO) shall be on site during all phases of the Traffic Recorder installation. The Contractor shall alert the Engineer 10 days prior to the beginning of any installation activity.
- 10. See Standard Plan J-20 for Piezo Axle Sensor General installation instructions. See the Special Provisions in the contract for Temperature Sensor installation instructions.



WEIGH-IN-MOTION SITE INSTALLATION

STANDARD PLAN J-19

SHEET 1 OF 1 SHEETS APPROVED FOR PUBLICATION

Harold J. Peterfeso 09-02-05



Α

SAWCUT LAYOUT

JUNCTION BOX TYPE 1 OR 2

HOME RUN CONDUIT UNDER THE ROADWAY (TYP.)

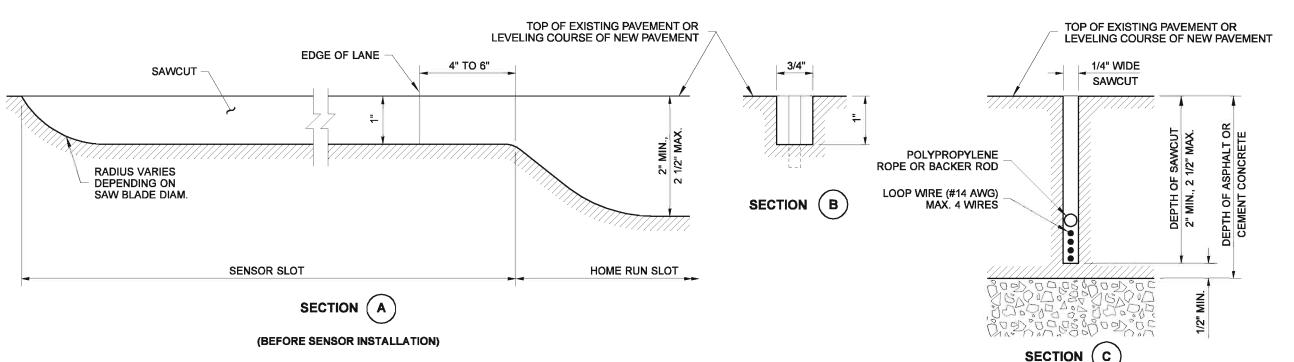
EDGE OF SHOULDER

SHOULDER NOTCH 3/8" HOME RUN SLOT (TYP.) 1/4" HOME RUN SENSOR SLOT ~ SEE NOTE 3 LEAD-INS OR HOME RUN CUTS JUNCTION BOX (TYP.) MIN. SHALL NOT EXCEED SHOULDER DEPTH EDGE OF LANE VARIES SPLICE (TYP.) 3/4" SLOT ~ SEE NOTE 2 1/4" SLOT (TYP.) TWO CONDUCTOR CABLE 6' - 0" В

THESE ARE GENERAL INSTALLATION INSTRUCTIONS

SEE SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS IN THE SPECIAL PROVISIONS OF THE CONTRACT

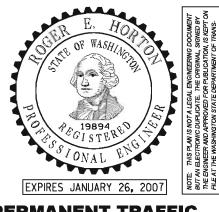
- 1. Using pavement crayons, paint, tape measure and cord, carefully mark the layout of the sensor installation. Ensure sensors are placed exactly perpendicular to the flow of traffic and that all lines are straight. Verify that the passive cable length is enough to reach the cabinet. DO NOT SPLICE CABLE. Leave a 4' minimum cable length inside of the cabinet.
- 2. Using a wet-cutting pavement saw with a 3/4" diamond blade, wet-cut the slot for the sensor. The slot must be 3/4" wide, +/- 1/16", by 1" minimum deep. Cut the slot 8" longer than the sensor length, (including the lead attachment).
- 3. Cut home run slots for Piezo sensors. Center the home run slot on the sensor slot. Cut the home run slots 2" minimum to 2 1/2" maximum deep and 1/4" minimum wide. Cut the slots wider if installing conduit.
- 4. Using a power washer with water, remove and collect all the slurry and loose material from the slots. Sweep the slots with a stiff wire bristled brush. Dry all of the slots with a large capacity air compressor (150 CFM minimum). All of the slots and the pavement 1' on either side must be completely dry.



SEE STANDARD SPEC. 9-29

TYPE 3 ADVANCE LOOP WIRING DIAGRAM

SEE SPECIAL PROVISIONS IN THE CONTRACT FOR THE ROADWAY LOOP CABLE TYPE.



PERMANENT TRAFFIC RECORDER AND **WEIGH-IN-MOTION DETAILS STANDARD PLAN J-20**

SHEET 1 OF 3 SHEETS

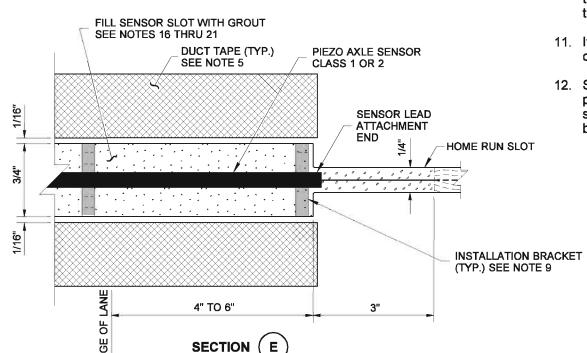
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09-02-05

2"

SENSOR



~ SEE NOTES 12 & 13

PIEZO AXLE SENSOR

FILL SENSOR SLOT WITH GROUT

SEE NOTES 16 THRU 21

CLASS 1 OR 2

THESE ARE GENERAL INSTALLATION INSTRUCTIONS

SEE SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS IN THE SPECIAL PROVISIONS OF THE CONTRACT

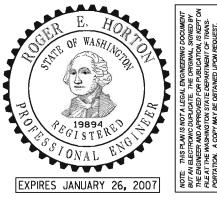
- 5. Place 2" duct tape along length of both sides of the sensor slot. Tape 1/16" away from the slot.
- 6. Visually inspect sensor to ensure it is straight without any twists or curls. Check passive cable for bare wire. Check lead attachment for cracks or gaps. Check the data sheet to ensure the correct sensor is being installed: Class 1 Piezo Axle sensor for Weigh-in-Motion, and Class 2 Piezo Axle sensor for Permanent Traffic Recorder.
- 7. Place the sensor on the tape next to the slot. Handle the sensor with clean latex (or equivalent) gloves.
- 8. Clean the sensor with the grit of a steel wool or emery pad. Wipe it down with isopropyl alcohol and a clean, lint free cloth.
- 9. Place the installation brackets on the sensor every 6" for the length of the sensor. Use the 3/4" brackets.
- 10. Place the sensor in the slot in the road. The end of the sensor should be at least 2" from the end of the slot, and should not touch the bottom of the slot. The lead attachment end should also not touch the bottom or the sides of the slot.
- 11. If any of the 3/4" brackets do not fit snugly against the sides of the slot or are loose, replace them with a 1" bracket.

LOOP SEALANT

SEE NOTE 22

12. Starting at the lead attachment end, position the sensor so that it is parallel to the surface of the road, approximately 3/8" below the surface of the road. At this depth, the installation brackets are 1/8" below the surface of the road.

- 13. Visually inspect the length of the sensor to ensure that it is at a uniform depth along its length and that it is level (not twisted, canted or bent).
- 14. Run the passive wire the length of the home run slot. Place the polypropylene rope under and over the passive cable (inside the slot). This will keep the grout from running out into the deeper home run slot.
- 15. Place all of the induction loops to the site specifications.
- 16. See the Special Provisions in the contract for the grout type used for Weigh-in-Motion Peizo Sensors and Permanent Traffic recorder Peizo sensors.
- 17. Using a low speed mixing drill (450 rpm) and a mixing paddle, premix the grout for 2 minutes or until smooth. Add hardener to the grout and mix according to the manufacturer's instructions.
- 18. Pour the grout into the slot using a small bead. Make sure that the grout flows under the sensor slowly, eliminating air pockets. Start at the end and pour towards the lead attachment. Repeat until the slot is completely full of grout, at least in 2 passes, (approximately 1/2" thick each).
- 19. Using a putty knife or a trowel lightly spread the grout smooth along the length of the slot. The resin should be slightly higher (1/16") than the tape as it will shrink while curing.
- Remove the tape as soon as the final grout pour is complete.
- 21. Once the grout for the Weigh in Motion Peizo Sensors is cured, (approximately 35 minutes, depending on grout type and ambient temperature), use a belt sander to sand the top of the grout flush with the surface.
- 22. Allow the loop sealant and the grout for both sensor installations to fully cure (45-60 minutes) before opening to traffic.



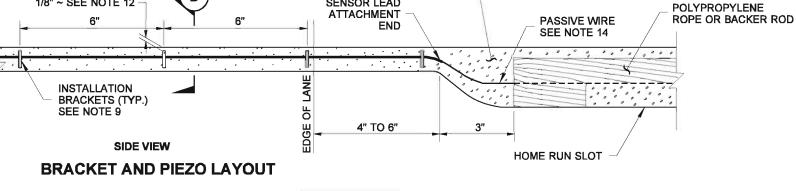
2008

PERMANENT TRAFFIC RECORDER AND WEIGH-IN-MOTION DETAILS STANDARD PLAN J-20

SHEET 2 OF 3 SHEETS

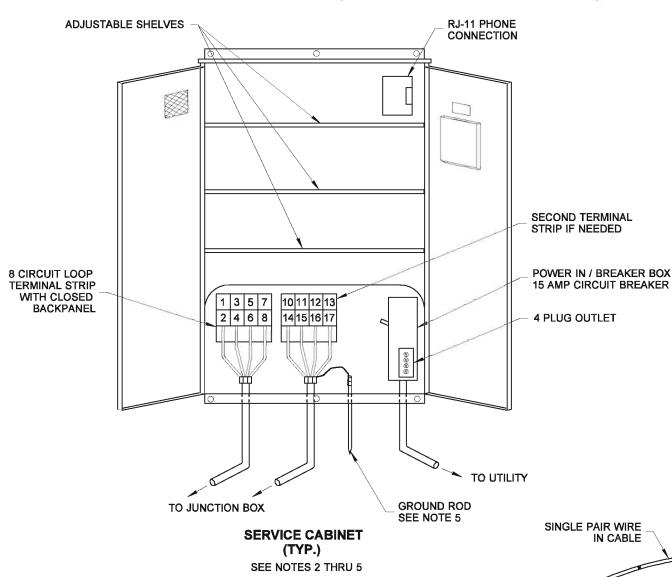
APPROVED FOR PUBLICATION 09-02-05





SENSOR LEAD

1/8" ~ SEE NOTE 12



COLOR	CIRCUIT NO.
BLACK	0
BROWN	1
RED	2
ORANGE	3
YELLOW	4
GREEN	5
BLUE	6
VIOLET	7
GRAY	8
BROWN & BLACK	10
BROWN & BROWN	11
BROWN & RED	12
BROWN & ORANGE	13
BROWN & YELLOW	14
BROWN & GREEN	15
BROWN & BLUE	16
BROWN & VIOLET	17

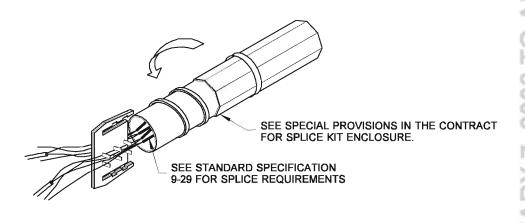
SOLDERED COMPRESSION CONNECTION

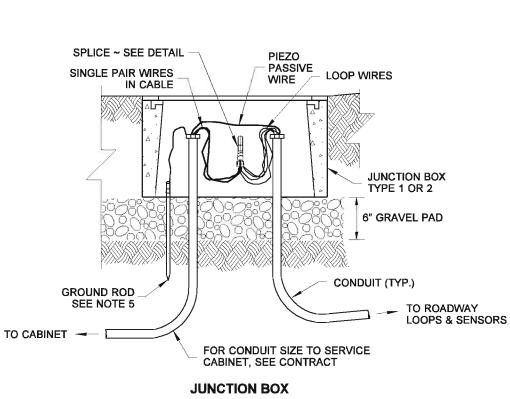
SPLICE DETAIL

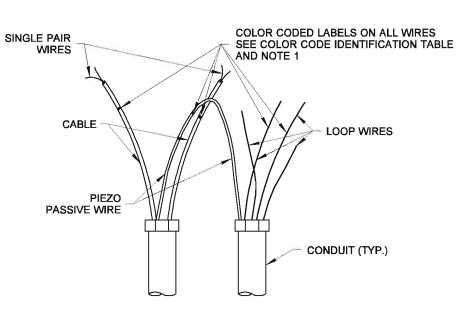
LOOP WIRES

NOTES

- 1. The Loop and Piezo leads in all Junction Boxes and Cabinets are to be color-coded. Use colored tape on each specific wire, see table. Wrap the tape on the wires approximately 6" beyond conduit in all Junction Boxes.
- 2. The maximum load in the Cabinet is 5 Amps.
- The Cabinet may be pedestal or pad mount, see Standard Plan J-6c for details.
- 4. See Special Provisions in the contract for the Cabinet dimensions. See Standard Specification 9-29 for other requirements.
- 5. For Grounding Details, See Standard Plan J-9a. See Standard Specification 8-20 for other requirements.









SHEET 3 OF 3 SHEETS

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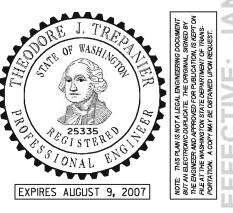
09-02-05

JUNCTION BOX WIRING (SHOWN PRIOR TO SPLICING)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 NOTES MAST ARM LENGTH MAST ARM LENGTH **GUSSET PLATE POLE** POLE MAST ARM LENGTH MAST ARM LENGTH LUMINAIRE LUMINAIRE HEAD HEAD ≈ 6.0' R. (TYP.) ≈ 6.0' R. MAST ARM **BOLT CONNECTION** MAST ARM ≈ 6.0' R. VARIES 4 1.0' TO 2.0' R. **DOUBLE TYPE 1 MAST ARM BOLT CONNECTION BOLT CONNECTION POLE** MAST ARM LENGTH MAST ARM LENGTH MOUNTING HEIGHT **GUSSET PLATE** LUMINAIRE POLE LUMINAIRE POLE **VARIES** ~ 1.0' TO 2.0' R. (TYP.) **BOLT CONNECTION** EDGE OF **EDGE OF** TRAVELED WAY TRAVELED WAY VARIES WITH VARIES WITH OFFSET DISTANCE OFFSET DISTANCE **DOUBLE TYPE 2 MAST ARM** SHOULDER SHOULDER HAND HOLE HAND HOLE POLE BASE POLE BASE ^>(\Z(\Z(\X(\Z(\X(\Z)\X(\Z\X\X)\X)\X **BOTTOM OF BOTTOM OF** POLE BASE POLE BASE STEEL LIGHT STANDARD FOUNDATION STEEL LIGHT STANDARD FOUNDATION ~ SEE STANDARD PLAN J-28.30 ~ SEE STANDARD PLAN J-28.30 LIGHT STANDARD LIGHT STANDARD WITH TYPE 2 (ELBOW) MAST ARM WITH TYPE 1 (DAVIT) MAST ARM (SLIP BASE SHOWN) (SLIP BASE SHOWN)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. This plan depicts the Steel Light Standard types and terms commonly referred to in the contract. All Steel Light Standards are fabricated in accordance with the Standard Specifications and the Contract Provisions.
- 2. The Luminaire Pole height shall not exceed 50' (H1).
- 3. Slip Bases shall not be installed on 50' (H1) poles with Double Mast Arms, nor on poles weighing more than 1000 lbs.
- 4. The optimal location of the Luminaire head is over the edge of the traveled way. Based on the placement of the Steel Light Standard foundation, the position of the Luminaire head may vary. See Standard Plan J-28.22.
- 5. Light Standard mast arm orientation is typically perpendicular to roadway centerline.
- 6. See Standard Plan J-28.50 for Hand Hole Details.



STEEL LIGHT STANDARD

STANDARD PLAN J-28.10-00

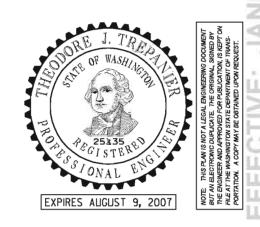
SHEET 1 OF 2 SHEETS

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08-07-07



STEEL LIGHT STANDARD

STANDARD PLAN J-28.10-00

SHEET 2 OF 2 SHEETS

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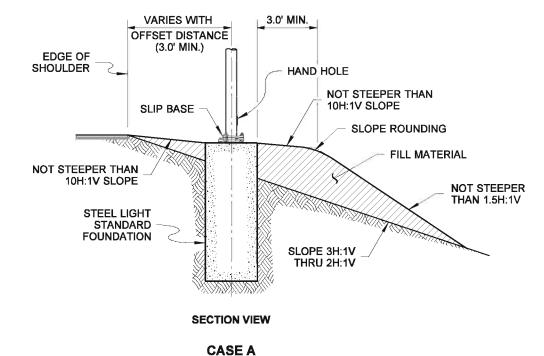
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

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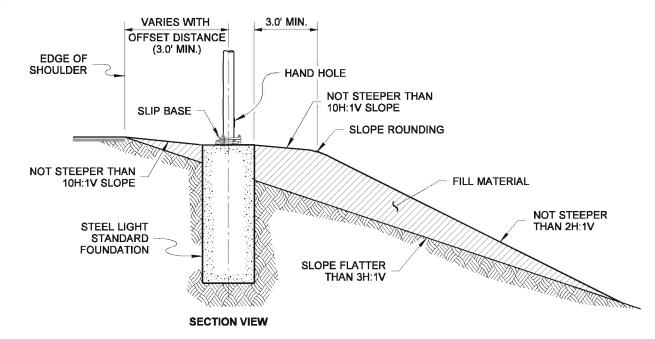
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EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



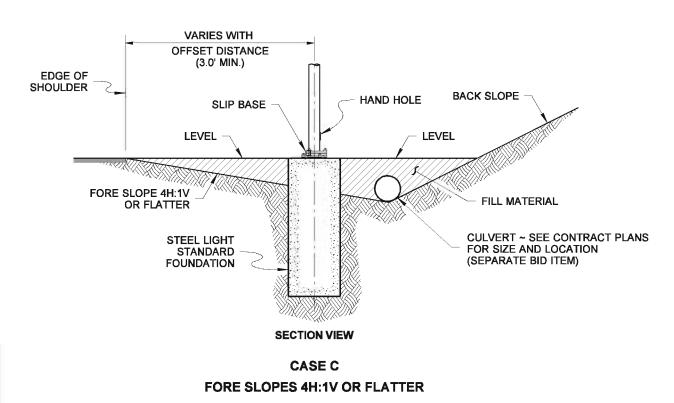
SLOPES 3H:1V THRU 2H:1V (MAX.)

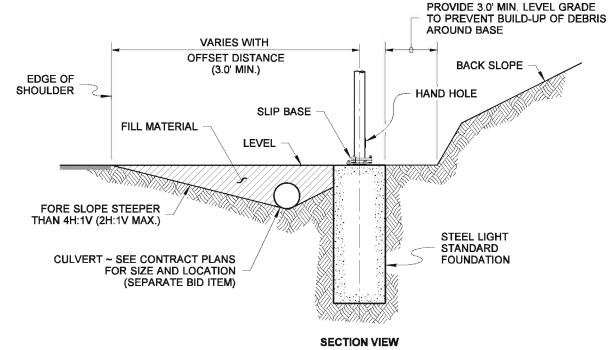
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



CASE B **SLOPES FLATTER THAN 3H:1V**

EMBANKMENTS





CASE D FORE SLOPES STEEPER THAN 4H:1V (2H:1V MAX.)

STEEL LIGHT STANDARD PLACEMENT (SLIP BASE)

EXPIRES AUGUST 9, 2007

STANDARD PLAN J-28.22-00

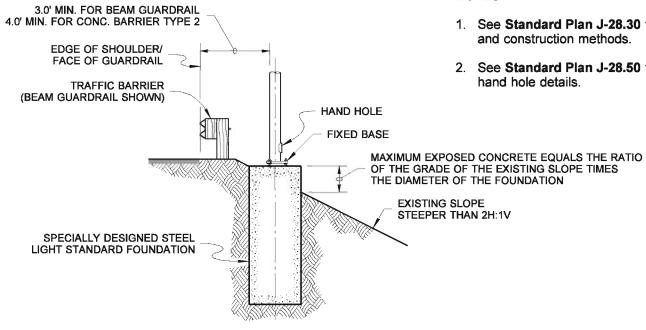
SHEET 2 OF 2 SHEETS

08-07-07



DITCH SECTIONS

- 1. See Standard Plan J-28.30 for foundation details and construction methods.
- 2. See Standard Plan J-28.50 for pole base and hand hole details.



CASE F

SECTION VIEW

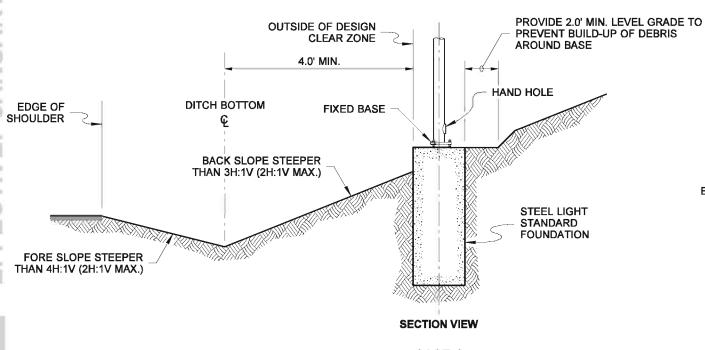
SLOPES STEEPER THAN 2H:1V BEHIND TRAFFIC BARRIER (SPECIAL DESIGN FOUNDATION)

3.0' MIN. FOR BEAM GUARDRAIL 4.0' MIN. FOR CONC. BARRIER TYPE 2 EDGE OF SHOULDER/ FACE OF GUARDRAIL TRAFFIC BARRIER (BEAM GUARDRAIL SHOWN) HAND HOLE **FIXED BASE** VARIES (1.5' MAX.) **NOT STEEPER** THAN 2H:1V STEEL LIGHT STANDARD **FOUNDATION**

CASE E **SLOPES 2H:1V OR FLATTER BEHIND TRAFFIC BARRIER**

SECTION VIEW

EMBANKMENTS



CASE G ROADSIDE DITCH WITH FORE SLOPE STEEPER THAN 4H:1V (2H:1V MAX.)

PROVIDE 2.0' MIN. LEVEL GRADE TO **OUTSIDE OF DESIGN** PREVENT BUILD-UP OF DEBRIS **CLEAR ZONE** AROUND BASE 4.0' MIN. TOE OF HAND HOLE BACK SLOPE FIXED BASE **BACK SLOPE STEEPER** THAN 3H:1V (2H:1V MAX.) **EDGE OF SHOULDER** / FACE OF CURB STEEL LIGHT STANDARD **FOUNDATION CEMENT CONCRETE** TRAFFIC CURB **SECTION VIEW**

CASE H

CUT SECTION WITH BACK SLOPE STEEPER THAN 3H:1V (2H:1V MAX.)



STEEL LIGHT STANDARD **PLACEMENT (FIXED BASE)**

STANDARD PLAN J-28.24-00

SHEET 1 OF 1 SHEET

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08-07-07

BACK SLOPES

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

TRAVELED WAY

SHOULDER

3.0' MIN.

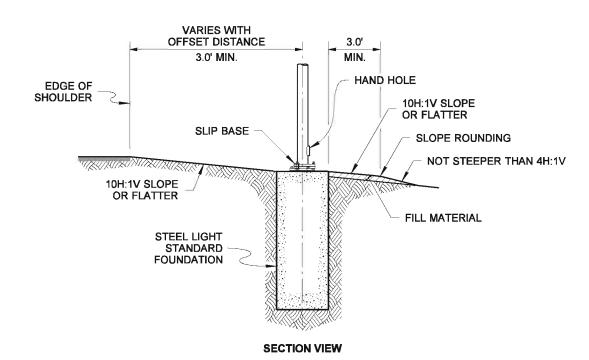
HAND HOLE

VARIES (1.5' MAX.)

NOT STEEPER
THAN 2H:1V

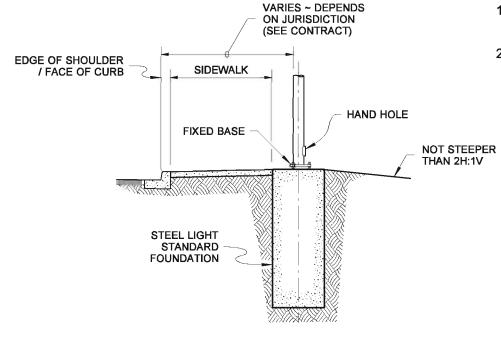
SECTION VIEW

CASE I
POSTED SPEED LIMIT 35 MPH OR LESS



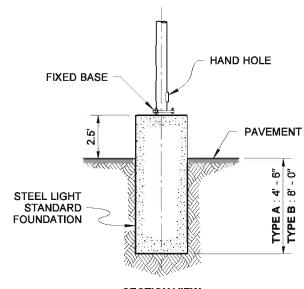
CASE K
ROADWAYS WITH 10H:1V
OR FLATTER SIDE SLOPES

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



SECTION VIEW

CASE J ROADWAY WITHIN CITY LIMITS POSTED SPEED LIMIT 35 MPH OR LESS

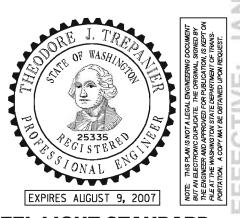


SECTION VIEW

CASE L
PARKING LOTS

NOTES

- See Standard Plan J-28.30 for foundation details and construction methods.
- See Standard Plan J-28.50 for pole base and hand hole details.



STEEL LIGHT STANDARD PLACEMENT MISCELLANEOUS STANDARD PLAN J-28.26-00

SHEET 1 OF 1 SHEET

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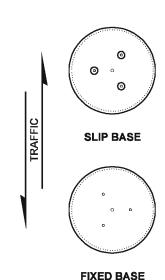
STATE DESIGN ENGINEER DATE

Westington State Department of Temporation

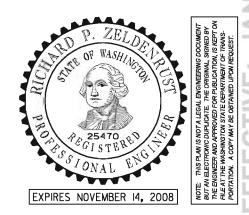
GROUNDING CONDUCTOR (TYP.) ~ NON-INSULATED #4 AWG STRANDED COPPER, PROVIDE 3' MIN. SLACK ROUTE CONDUCTOR TO LUMINAIRE GROUNDING STUD 3" DIAM. GROUT WELL (TYP.) 36" EIGHT #7 BARS. ≈ 1" R. **EVENLY SPACED** CENTER THE CONDUIT 3/4" (TYP.) IN THE FOUNDATION **#7 REINFORCING** STEEL BAR #4 REINFORCING ANCHOR BOLT (TYP.) STEEL HOOP 1' - 3" DIAM. BOLT CLAMP CONDUCTOR TO STEEL CIRCLE (TYP.) REINFORCING BAR WITH LISTED CONNECTOR SUITABLE FOR USE **EMBEDDED IN CONCRETE** #4 HOOP (TYP.) **TOP VIEW** <1>1" DIAM. CONDUIT ~ CAP EACH SEE FIXED BASE FOR DETAILS NOT SHOWN END. PROVIDE ADDITIONAL CON-**FIXED BASE DUIT FOR COMMUNICATION OR PARTIAL ELEVATION VIEW HEAVY HEX** SIGNAL CABLE WHERE SHOWN NUT (TYP.) ~ IN THE CONTRACT. SIZE TO MATCH **SLIP BASE** ANCHOR BOLT (SEE TABLE) **ROUND WASHER SIZE TO** MATCH ANCHOR BOLT (TYP.) ~ SEE TABLE 1' - 6" MIN. BELOW GROUND 2' - 0" MIN. UNDER PAVEMENT STRAP TEMPLATE ASSEMBLY (TYP.) ~ SEE DETAIL SPACING 'SPACING ANCHOR BOLT (TYP.) EXTEND THE CONDUIT ~ SEE TABLE A:5-#4 HOOPS @ ≈9"; B:8-#4 HOOPS @ ≈11" 6" MIN. BEYOND THE FOUNDATION OR တ် တီ THE CONTROLLED TYPE A:4'-6 TYPE B:8'-0 SEE NOTES 38 DENSITY BACKFILL HEAVY HEX NUT (TYP.) ~ SIZE TO MATCH **ANCHOR BOLT** #4 HOOP (TYP.) (SEE TABLE) (D + 1/16") DIAM 2 1/2" CLR. HOLÉ (TYP.) ~ SEE TABLE **ISOMETRIC VIEW** #7 (TYP.) **ANCHOR BOLT ASSEMBLY** 1/4" STEEL BAR (TYP.) ~ 2" WIDE × 1' - 3" LONG (SLIP BASE SHOWN) **ANCHOR BOLT TABLE** LUMINAIRE MAST MAST ANCHOR BOLT **ARM** DIAMETER **HEIGHT** ARM **TYPE LENGTH** " D " (H1) 1" 20' TO 50' SINGLE 6' TO 16' SEE SLIP BASE FOR DETAILS NOT SHOWN 1' - 1" (TYP.) 20' TO 50' DOUBLE 6' TO 8' 1" **ELEVATION VIEW** 20' TO 45' DOUBLE 10' TO 16' 1" **FIXED BASE TOP VIEW** 10' TO 16' 46' TO 50' DOUBLE 1 1/8" STRAP TEMPLATE ASSEMBLY

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- See Standard Plan J-28.40 for luminaire pole base mounting details.
- 2. The Strap Templates shall be held in place by nuts, 6" from the top of the foundation and 3" from the bottom of the anchor bolts. 18 heavy duty hex nuts and 6 round washers are required for a Slip Base assembly. 18 heavy duty hex nuts and 6 plate washers are required for a Fixed Base assembly.
- 3. Use Steel Light Standard Foundation Type A on level ground or slopes not exceeding 4H:1V. Use Type B for slopes steeper than 4H:1V, but not exceeding 2H:1V. Slopes steeper than 2H:1V shall require a special design.
- 4. These foundations are designed for a minimum of 2,000 PSF (TYPE A) or 1,500 PSF (TYPE B) allowable lateral bearing pressure for the soil. A special foundation shall be required for soil with lower allowable lateral bearing pressure than 1,500 PSF.
- 5. The Luminaire Pole height shall not exceed 50' (H1).
- Slip Bases shall not be installed on 50' (H1) poles with Double Mast Arms, nor on poles weighing more than 1000 lbs.
- 7. Slip Bases are not required on poles placed outside of the Design Clear Zone, nor on poles installed behind traffic barrier.
- 8. Foundations constructed within Ecology Embankments shall be increased in depth by the depth of the Ecology Embankment.
- 9. Exposed portions of the foundation shall be formed to create a smooth finished surface. All forming shall be removed upon completion of foundation construction
- 10. For excavation, concrete placement, and backfill options, see METHOD 1 and METHOD 2 on Sheet 2 of 2.
- 11. The Anchor Bolts shall be high strength steel, manufactured from ASTM A449, with heavy hex nuts and hardened washers. Galvanize the Anchor Bolts according to AASHTO M232.
- 12. The foundation shall meet the requirements of Standard Specification Sect. 8-20.3(9)
- 13. See Standard Plan C-8b and C-14h for steel light standards on traffic barrier.



ANCHOR BOLT LAYOUT



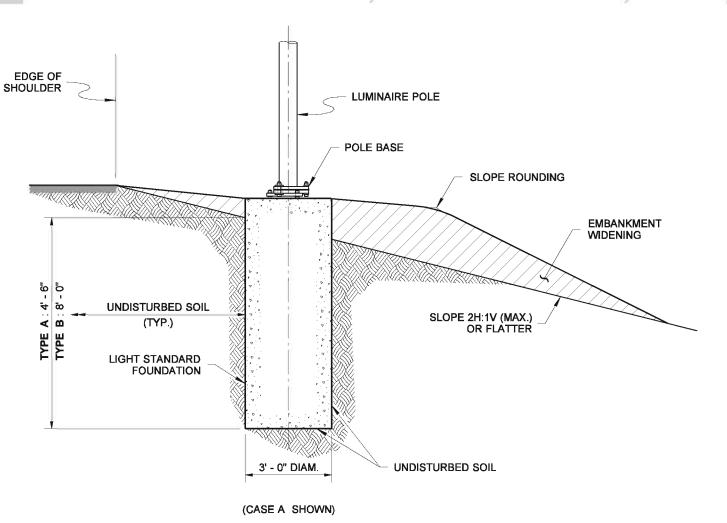
STEEL LIGHT STANDARD **FOUNDATION TYPES A & B** STANDARD PLAN J-28.30-00

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION







METHOD 1

NO SUBSURFACE FORM

This option is only used when the existing soil in the hole will remain standing and the cement concrete can be placed without causing the soil to collapse. Concrete shall be cast directly against undisturbed soil.

Auger the hole for the foundation. Use paper or cardboard form to achieve a smooth finish on the final exposed cement concrete. Support the form as necessary to remain plumb.

See Standard Plans J-28.24 and J-28.26 for maximum heights of exposed foundation when no embankment widening is to be installed.

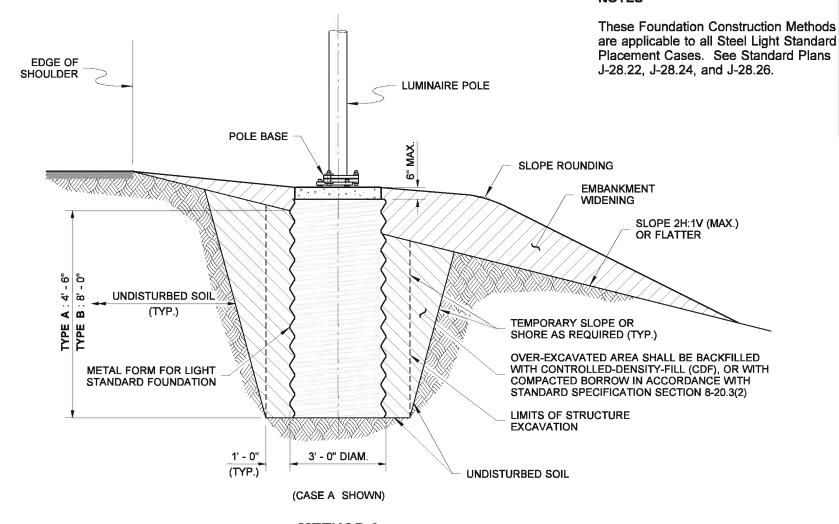
Place the concrete foundation.

After concrete has cured, remove the paper or cardboard form portion.

Construct the embankment widening (if required)

CONSTRUCTION METHODS

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



METHOD 2

METAL (SUBSURFACE) FORM REQUIRED

When the existing soil will not retain a vertical face, over-excavate the foundation area and install a 36" diameter, corrugated metal (pipe) form. The corrugated metal form shall not extend more than 6" below any portion of the foundation that will remain exposed upon final grading. Continue forming to full height using paper or cardboard form to achieve a smooth finish on final exposed cement concrete. Support the form as necessary to remain plumb.

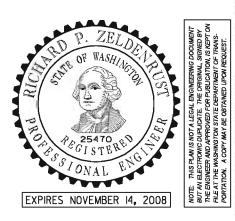
See Standard Plans J-28.24 and J-28.26 for maximum heights of exposed foundation when no embankment widening is to be installed.

Place the concrete foundation.

After concrete has cured, remove the paper or cardboard form portion.

Backfill with controlled-density fill or compacted borrow in accordance with Standard Specification 8-20.3(2).

Construct the embankment widening (if required).



STEEL LIGHT STANDARD **FOUNDATION TYPES A & B** STANDARD PLAN J-28.30-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION





08-07-07

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HEAVY HEX NUT (TYP.) ~ SIZE TO MATCH ANCHOR BOLT (SEE TABLE, STD. PLAN J-28.30) ROUND WASHER (TYP.) SIZE TO MATCH ANCHOR BOLT LUMINAIRE POLE POLE BASE PLATE **KEEPER PLATE** ANCHOR/SLIP PLATE ASSEMBLY ~ SEE STANDARD PLAN J-28.42 3/8" DIAM. DRAIN TUBE IN GROUT PAD **CAPPED CONDUIT** SLIP BASE FOUNDATION ~ SEE STD. PLAN J-28.30 ▟ **EXPLODED** ANCHOR/SLIP PLATE **ASSEMBLY** SLIP BASE FOUNDATION

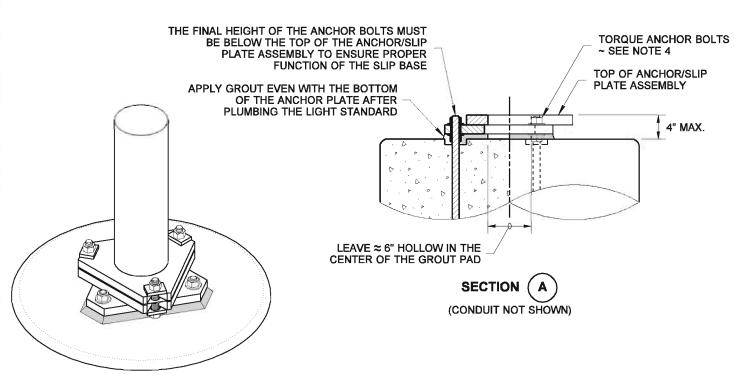
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

(D+1/16") DIAM. HOLE W/ SMOOTH CHAMFERED LUMINAIRE POLE EDGES ~ SEE TABLE, STD. PLAN J-28.30 HEAVY HEX NUT (TYP.) ~ SIZE TO MATCH ANCHOR BOLT (SEE TABLE, STD. PLAN J-28.30) 1/2" THICK × 2" WIDE × POLE BASE PLATE 2 3/4" LONG STEEL BAR **PLATE WASHER DETAIL** PLATE WASHER (TYP.) ~ SEE DETAIL FIXED BASE FOUNDATION ~ SEE STD. PLAN J-28.30 **CAPPED CONDUIT**

EXPLODED

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 NOTES

- 1. 50' (H1) poles with double mast arms or poles weighing in excess of 1000 LBS shall not be installed on a slip base.
- 2. Galvanizing shall be in accordance with AASHTO M 111.
- 3. See Standard Plans C-8b, C-14h, and J-28.60 for foundation and base plate requirements when light standards are mounted on cement concrete traffic barrier.
- 4. See Standard Specification Section 6-03.3 (33) and 8-20.3 (4) for the torque requirements for all of the Anchor Bolt installations. Install 1-inch diameter Clamping Bolts in all Slip Bases to a torque of 95 Foot-Pounds - See Standard Specification Section 8-20.3 (13)A.
- 5. For Anchor Bolt Diameter " D ", See Table, Standard Plan J-28.30.



~ SEE STD. PLAN J-28.30

PLAN VIEW

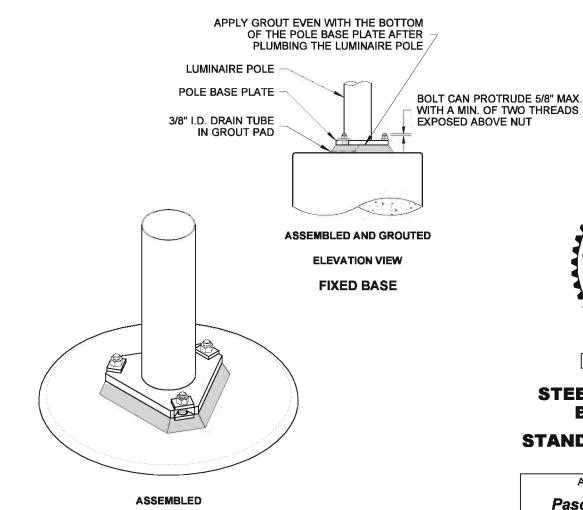
SLIP BASE

ASSEMBLED

ISOMETRIC VIEW

SLIP BASE

ISOMETRIC VIEW **FIXED BASE**



BASE MOUNTING STANDARD PLAN J-28.40-00

SHEET 1 OF 1 SHEET

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EXPIRES NOVEMBER 14, 2008

STEEL LIGHT STANDARD

Pasco Bakotich III 08-07-07 STATE DESIGN ENGINEER



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

LUMINAIRE POLE

HEAVY HEX NUT (TYP.) ~ SIZE

TO MATCH CLAMPING BOLT

11/4" DIAM. HOLE W/ SMOOTH **CHAMFERED EDGES** 1/2" THICK × 2" WIDE × 2 3/4" LONG STEEL BAR

PLATE WASHER DETAIL

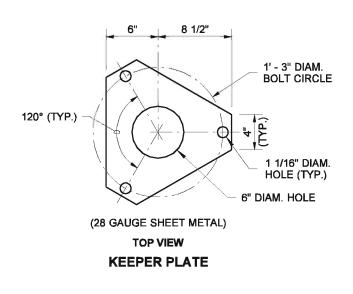
CLAMPING BOLT TABLE				
LUMINAIRE HEIGHT (H1)	MAST ARM TYPE	MAST ARM LENGTH	CLAMPING BOLT DIAMETER " D "	
20' TO 50'	SINGLE	6' TO 16'	1"	
20' TO 45'	DOUBLE	6' TO 8'	1"	
46' TO 50'	DOUBLE	6' TO 8'	(1)	
20' TO 45'	DOUBLE	10' TO 16'		
46' TO 50'	DOUBLE	10' TO 16'		
		_		

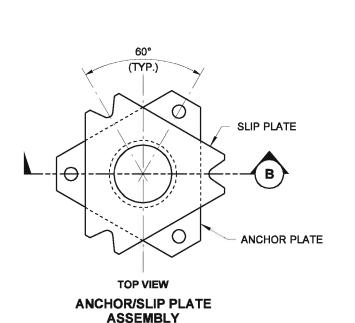
(1) SLIP BASE NOT ALLOWED

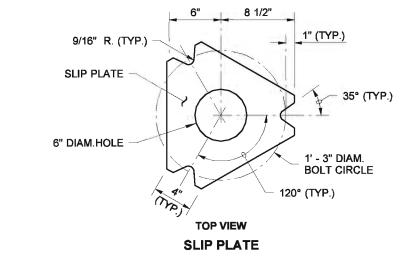
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. 50' (H1) poles with double mast arms or poles weighing in excess of 1000 lbs. shall not be installed on a Slip Base.
- 2. The Slip and Anchor Plates shall be manufactured from ASTM A572 GR.50 or ASTM A588. All Slip Plate notched surfaces shall be finished smooth.
- 3. The Clamping Bolts shall be high strength steel, manufactured from AASHTO M164, with heavy hex nut and hardened washer. Galvanize the Clamping Bolts according to AASHTO M232.
- 4. Round and smooth all edges along wire-way to protect the conductors. See Standard Plan J-28.70 for wiring details.
- 5. Galvanize the Anchor/Slip Plate after fabrication according to AASHTO M 111.
- 6. Clamping Bolt diameters may vary on existing installations. Replace them with the same size as the originals when repairing or reusing a luminaire pole.

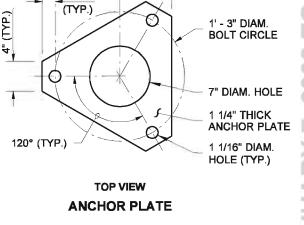
1 1/2"

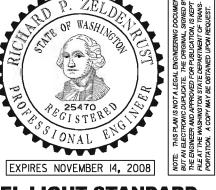










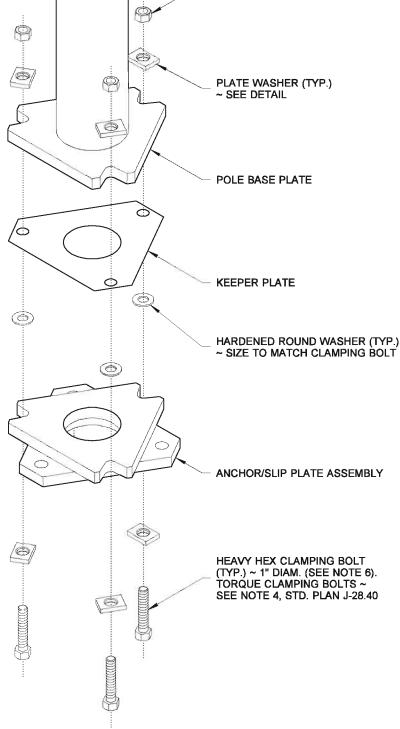


STEEL LIGHT STANDARD **ANCHOR/SLIP PLATE FOR SLIP BASE** STANDARD PLAN J-28.42-00

SHEET 1 OF 1 SHEET

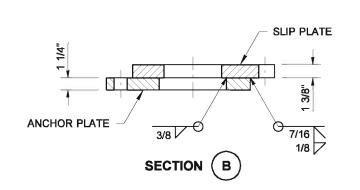


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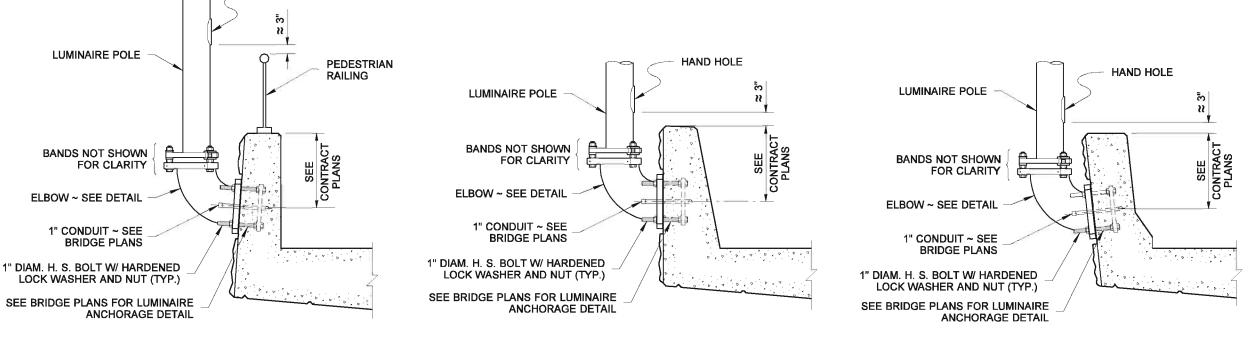
ISOMETRIC VIEW



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 CTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** LUMINAIRE POLE 1.00 - 8 UNC × 8" LONG BOLT THREADED FULL LUMINAIRE POLE LENGTH (ASTM A 325) WITH TWO HEAVY HEX NUTS, TWO PLATE WASHERS AND A ROUND 1. Galvanize the Elbow Assembly after fabrication according to AASHTO M 111. WASHER (TYP.) (GALVANIZED AASHTO M232) 1" HEAVY HEX NUT (TYP.) 2 POLE BASE PLATE 2. See Standard Plan J-28.50 for Pole Base and Hand Hole details. 3/16" THICK PREFORMED "FABREEKA" PLATE WASHER (TYP.) ~ FABRIC PAD WITH 5" DIAM. HOLE. SEE STD. PLAN J-28.42 CEMENT TO FLANGE PLATE AND TRIM OUTSIDE EDGE FLUSH. 1' - 3" 120° (TYP.) 5" В 5" DIAM. (TYP.) 2 POLE BASE PLATE **ACCESS HOLE** 1 1/4" DIAM. 2008 (ITYP.) Α HOLE (TYP.) 1' - 3" DIAM. BAND (TYP.) **BOLT CIRCLE** TAP FOR 5/16 **BOLT (TYP.)** 1/4 5/16" × 1/2" FLAT HEAD MACHINE 9_{5/16} SCREW W/ LOCK **LOCK WASHER** 10" DIAM. STD. SHORT 3 1/2" × 3/16" WASHER (TYP.) (TYP.) **RADIUS ELBOW** (17" MIN. LONG) (STAINLESS STEEL) THICK STEEL 1" (Drp.) 1/2" DIAM. WEEP HOLE BAND (TYP.) 5/16" × 1/2" FLAT ~ BEND TO FIT HEAD MACHINE TAP FOR BOLT (TYP.) 1" DIAM. HEAVY 7/16 V SCREW (TYP.) HEX BOLT (TYP.) 5" DIAM. HOLE **FABREEKA PAD SECTION** В **VIEW** 0 **ELBOW** ⟨1⟩ SEE CONTRACT PLAN FOR SLOPE (3) THE FACE SHALL BE PLANE AFTER FABRICATION, OF PARAPET FACE. TO PROVIDE A SEAL BETWEEN THE BARRIER AND THE ELBOW SEE STANDARD PLAN J-28.50 FOR POLE BASE PLATE REQUIREMENTS. **EXPLODED ISOMETRIC VIEW**

STEEL LIGHT STANDARD ELBOW DETAIL

FOR LUMINAIRE POLES WITH SINGLE MAST ARM 12' OR LESS, AND DOUBLE MAST ARMS 8' OR LESS, MOUNTED ON BRIDGE OR RETAINING WALLS.



WHEN TRAFFIC BARRIER HEIGHT IS 42", MAINTAIN APPROX. HEIGHT FROM TOP OF BARRIER TO HAND HOLE SHOWN.

SINGLE SLOPE BRIDGE TRAFFIC BARRIER

F-SHAPE BRIDGE TRAFFIC BARRIER

PANA A EXPIRES NOVEMBER 14, 2008

STEEL LIGHT STANDARD ELBOW MOUNTING ON BRIDGE & RETAINING WALL STANDARD PLAN J-28.45-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Pasco Bakotich III 08-07-07



BRIDGE PEDESTRIAN BARRIER

HAND HOLE

TYPICAL SECTIONS

NUAR

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

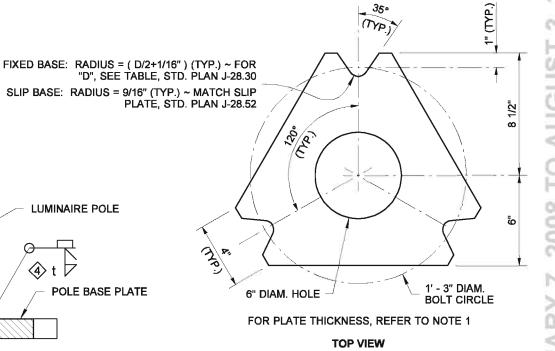
NOTES

SECTION (D

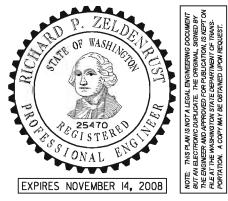
- 1. Pole Base Plate for a Slip Base design shall be 1 1/4" steel manufactured from ASTM A572 GR. 50 or ASTM A588. Pole Base Plate for a Fixed Base design shall be either 1 1/4" steel manufactured from ASTM A572 GR. 50, ASTM A588, or 1 1/2" manufactured from ASTM A36. All Pole Base Plate notched surfaces shall be finished smooth.
- 2. Round and smooth all edges along wire-way to protect conductors. See Standard Plan J-28.70 for
- 3. Galvanizing shall be in accordance with AASHTO M 111.

LUMINAIRE POLE

- See Standard Plan C-8b, C-14h and J-28.60 for foundation and base plate requirements when steel light standards are mounted on concrete traffic barrier.
- 5. See Standard Plan J-28.52 for details when Slip Base is required.



POLE BASE PLATE DETAIL



STEEL LIGHT STANDARD **POLE BASE AND** HAND HOLE DETAILS STANDARD PLAN J-28.50-00

SHEET 1 OF 1 SHEET

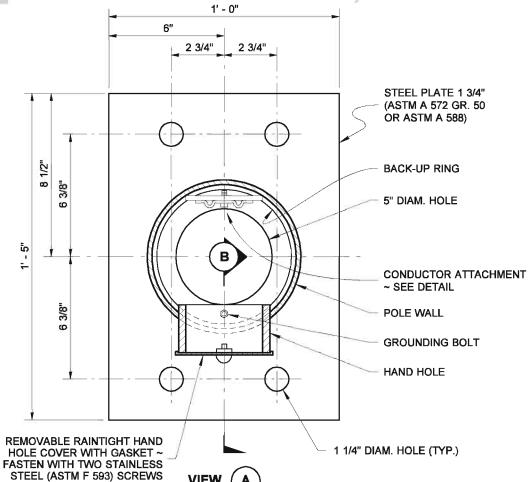
APPROVED FOR PUBLICATION Pasco Bakotich III 08-07-07 STATE DESIGN ENGINEER

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3

(COVER NOT SHOWN FOR CLARITY) ISOMETRIC VIEW

3/8" DRAIN TUBE

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

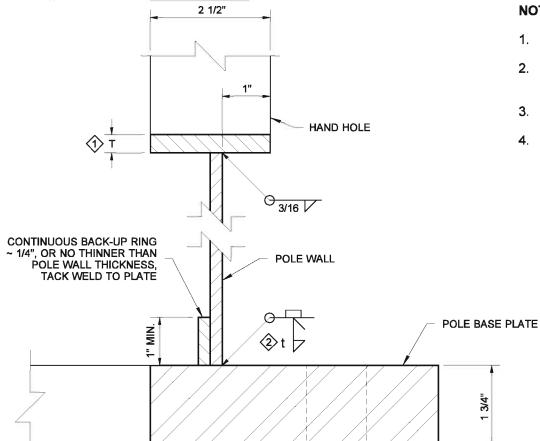


VIEW (A

SEE NOTE 4

PLACEMENT DETAIL

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** 2 1/2"

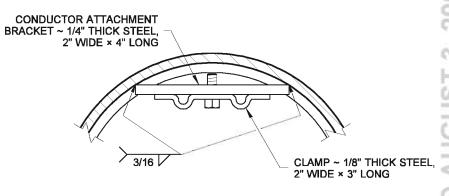


- 1 T = RIM PLATE THICKNESS BY LUMINAIRE POLE FABRICATOR
- 2 t = SIZE OF FILLET WELD BY LUMINAIRE POLE FABRICATOR

SECTION (B)

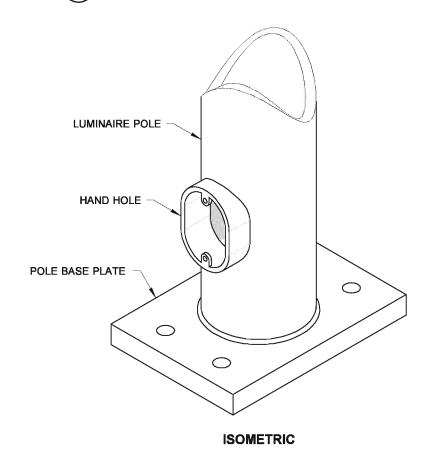


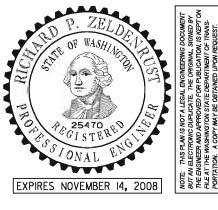
- 1. See Standard Plans C-8b and C-14h for foundation and anchor bolt details
- 2. Round and smooth all edges around hand hole and along the wire-way to protect the conductors.
- 3. See Standard Plan J-28.70 for wiring details.
- 4. Install grout after plumbing the pole.



CONDUCTOR ATTACHMENT DETAIL

CONFIGURATIONS VARY AMONG DIFFERENT MANUFACTURERS





STEEL LIGHT STANDARD BARRIER MOUNTED BASE

STANDARD PLAN J-28.60-00

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

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08-07-07 STATE DESIGN ENGINEER

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

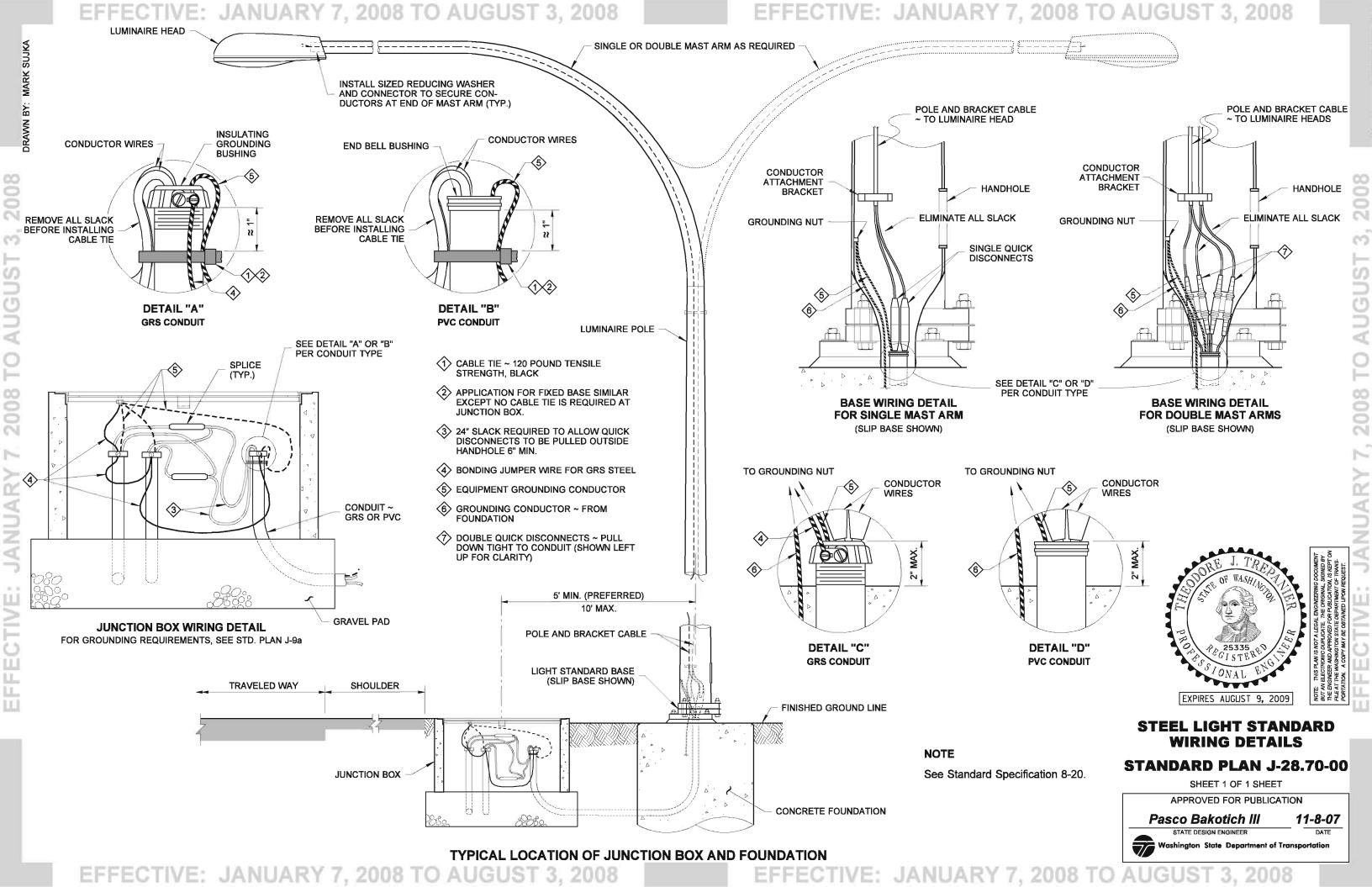
LUMINAIRE POLE

ANCHOR BOLT (TYP.) ~ SEE NOTE 1

TOP OF POLE BASE PLATE **GROUT**

HAND HOLE ~ CONFIGURATIONS VARY AMONG DIFFERENT MANUFACTURERS

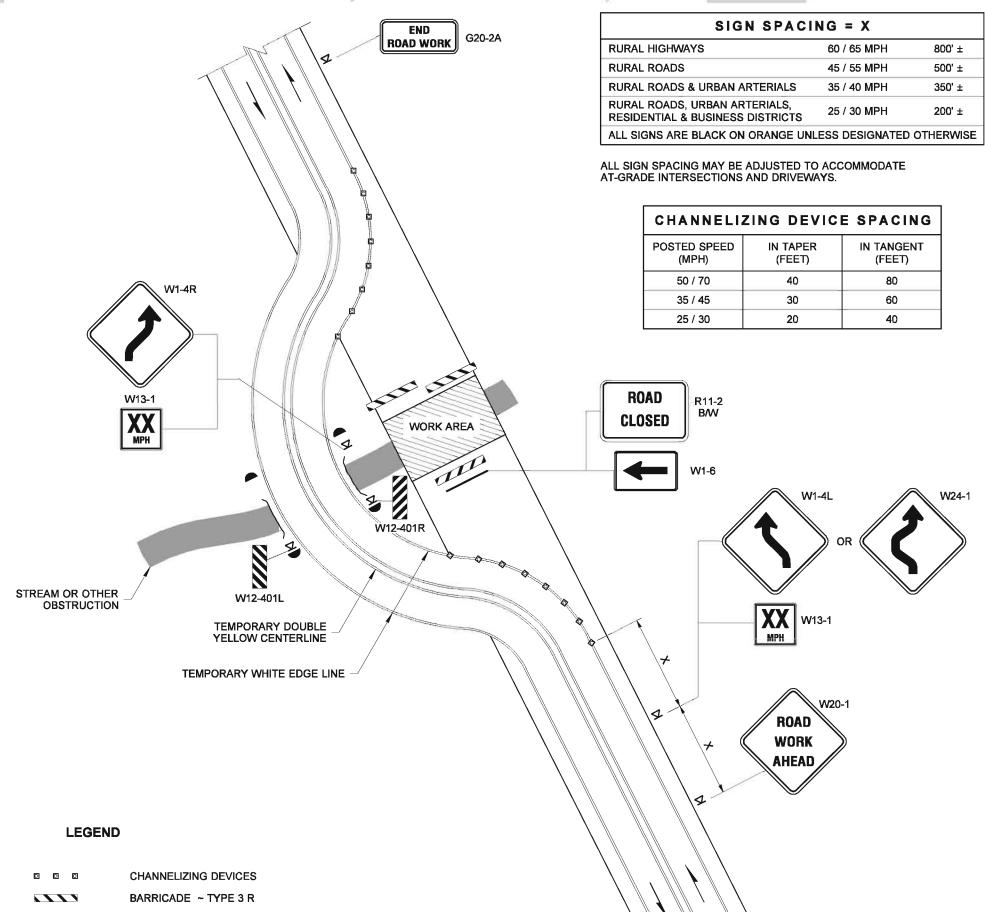
FOUNDATION / BARRIER



BARRICADE ~ TYPE 3 L

SIGN LOCATION

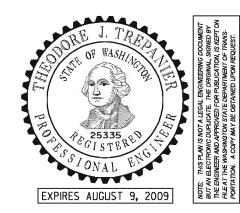
TEMPORARY IMPACT ATTENUATOR



NOTES

- Sign sequence is the same for both directions of travel. Adjust for the direction of roadway curves.
- Flashing Warning Lights (Type B per MUTCD) and/or flags may be used to call attention to the advance Warning Signs.
- Existing conflicting pavement markings and signs that are no longer applicable shall be removed or obliterated. Temporary pavement markings shall be used to delineate bypass detour.
- 4. Raised pavement markers and/or temporary guideposts may be used on bypass as directed by the Engineer.
- 5. Steady Burning Warning Light (Type C per MUTCD) shall be used to mark Channelizing Devices at night.
- Where advisory speed is 30 mph or less, reverse turn signs should be used. Other curve or turn Warning Signs may be substituted to depict roadway alignment.
- 7. Temporary barriers and end treatments shall be crashworthy.
- 8. To improve visibility, consider use of temporary illumination at closure points.
- For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.
- 10. Consider using a PCMS for additional advance warning.

FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



ROAD CLOSURE WITH DIVERSION

STANDARD PLAN K-10.20-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

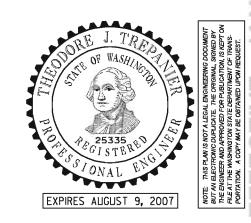
Pasco Bakotich III



STATE DESIGN ENGINEER

10-12-07

FOR LOCAL AGENCY USE ONLY



ROAD CLOSURE WITH OFF-SITE DETOUR STANDARD PLAN K-10.40-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

02-15-07 Ken L. Smith

LONGITUDINAL E	BUFF	ER	SPA	CE	= B
POSTED SPEED (MPH)	25	30	35	40	45
LENGTH B (FEET)	55	85	120	170	270

CHANNELIZING DEVICE SPACING							
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)					
35 / 45	30	60					
25 / 30	20	40					

SIGN SPACING = X							
RURAL ROADS	45 / 55 MPH	500' ±					
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±					
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200′ ±					
URBAN STREETS	25 MPH OR LESS	100' ±					
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE							

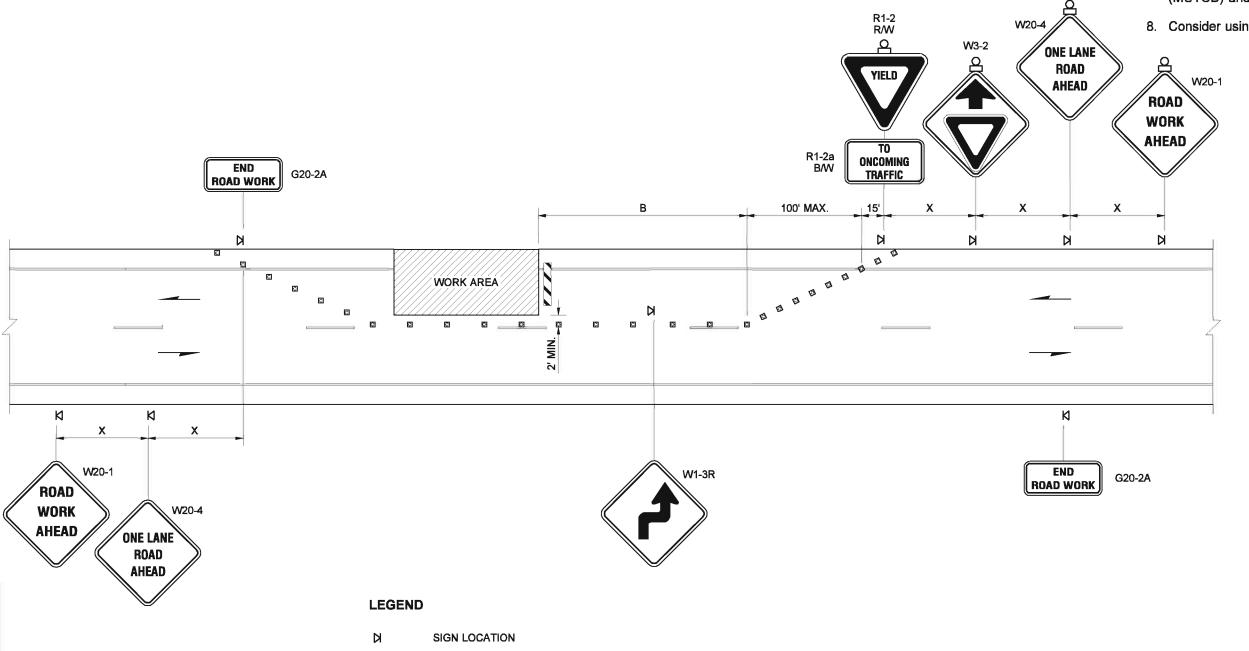
ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE AT-GRADE INTERSECTIONS AND DRIVEWAYS.

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

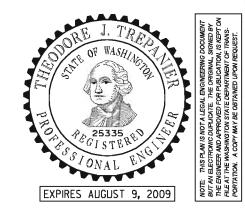
NOTES

- 1. This plan is intended for use on roadways when traffic volumes create sufficient gaps for motor vehicles to yield.
- 2. Steady Burning Warning Lights (Type C per MUTCD) shall be used to mark Channelizing Devices at night.
- 3. Adequate sight distance shall be provided for drivers to see opposing traffic, otherwise use flaggers and/or Temporary Signal.
- 4. Extend Channelizing Device taper across shoulder ~ recommended.
- 5. Post mount signs when in place for 3 days or longer.
- 6. For speed limit 35 mph or higher replace W1-3R with W1-4R.
- 7. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.





FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**



LANE CLOSURE WITHOUT FLAGGERS ~ LOW VOLUME ROAD STANDARD PLAN K-20.20-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Pasco Bakotich III



10-12-07

CHANNELIZING DEVICES

BARRICADE ~ TYPE 3 L FLASHING WARNING LIGHT

LONGITUDINAL BUFFER SPACE = B									
POSTED SPEED (MPH)	25	30	35	40	45	50	55	60	65
LENGTH B (FEET)	155	200	250	305	360	425	495	570	645

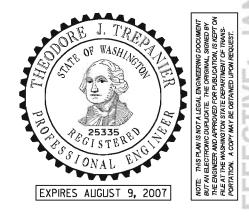
		BUF	FER DATA
END	G20-2A	TYPICAL PROTECTIVE	VEHICLE WITH TMA (SEE NOTE 1)
ROAD WORK	OR DOWNSTREAM TAPER	VEHICLE TYPE	LOADED WEIGHT
	TO SHOW END OF WORK AREA ~ SEE NOTE 5	4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)
100 to 10		ORY PAVEMENT AS	PPING DISTANCE = 30 FEET MIN. SSUMED)
G20-2A END ROAD WORK BE PREPARED TO GETEN	D-7A TIONAL IF POSTED	BE PREPAR TO STO	<i>1</i> 3
AHEAD W20-1	LEGEND		y
	FLAGGING STATION	ON	
	☐ SIGN LOCATION ☐ ☐ ☐ CHANNELIZING DE	EVICES	
		IICLE ~ RECOMMENDED	

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Night work requires additional roadway lighting at flagging stations. See WSDOT Standard Specifications for additional details.
- 3. Extend Channelizing Device taper across shoulder ~ recommended.
- Sign sequence is the same for both directions of travel on the roadway.
- 5. Channelizing Device spacing for the downstream taper option shall be 20' O.C.
- 6. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

SIGN SPACING = X (1)						
RURAL HIGHWAYS	60 / 65 MPH	800' ±				
RURAL ROADS	45 / 55 MPH	500' ±				
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±				
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)				
URBAN STREETS	25 MPH OR LESS	100' ± (2)				
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE						

- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



LANE CLOSURE WITH FLAGGER CONTROL STANDARD PLAN K-20.40-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION



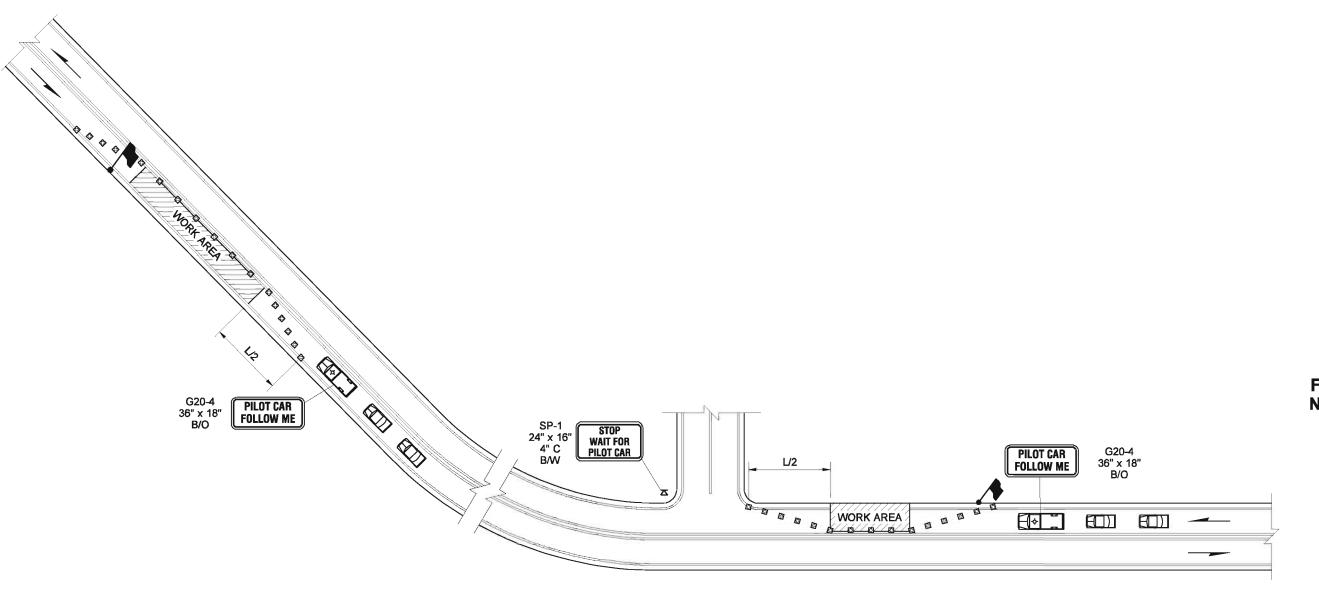
02-15-07 Ken L. Smith

MINIMUM	TA	PER	R LE	NG	ТН	= L	(FEE	Γ)
LANE WIDTH	POSTED SPEED (MPH)							
(FEET)	25	30	35	40	45	50	55	60
10	105	150	205	270	450	500	550	-
11	115	165	225	294	495	550	605	660
12	125	180	245	320	540	600	660	720

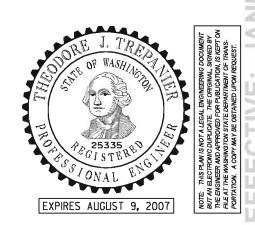
CHANNELI	ZING DEVIC	E SPACING
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)
50 / 65	40	80
35 / 45	30	60
25 / 30	20	40

NOTES

- 1. Channelizing Devices are recommended along centerline to separate traffic from work operation. Devices are required at tapers to shift traffic movement between lanes and to protect all flagging stations.
- 2. Night work requires additional roadway lighting at flagging stations. See WSDOT Standard Specifications for additional details.
- 3. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.
- 4. See Standard Plan K-20.40 for additional details.



FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**

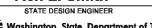


LANE CLOSURE WITH PILOT CAR

STANDARD PLAN K-20.60-00

SHEET 1 OF 1 SHEET

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Ken L. Smith 02-15-07

LEGEND



2008 TO AUGUST

FLAGGING STATION

SIGN LOCATION

PILOT VEHICLE

0 0

CHANNELIZING DEVICES

MOTORIST VEHICLE

2008

AHEAD

LEFT LANE

CLOSED

AHEAD

W20-5L

MINIMU	јМ Т.	APE	R L	EN	GTH	=	L (FE	ET)
LANE WIDTH		POSTED SPEED (MPH)						
(FEET)	25	30	35	40	45	50	55	60
10	105	150	205	270	450	500	550	-
11	115	165	225	294	495	550	605	660
12	125	180	245	320	540	600	660	720

CHANNELIZING DEVICE SPACING							
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)					
50 / 60	40	80					
35 / 45	30	60					
25 / 30	20	40					

SIGN SPACING = X (1)						
RURAL HIGHWAYS	60 / 65 MPH	800' ±				
RURAL ROADS	45 / 55 MPH	500' ±				
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±				
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)				
URBAN STREETS	25 MPH OR LESS	100' ± (2)				
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE						

(1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, DRIVEWAYS.

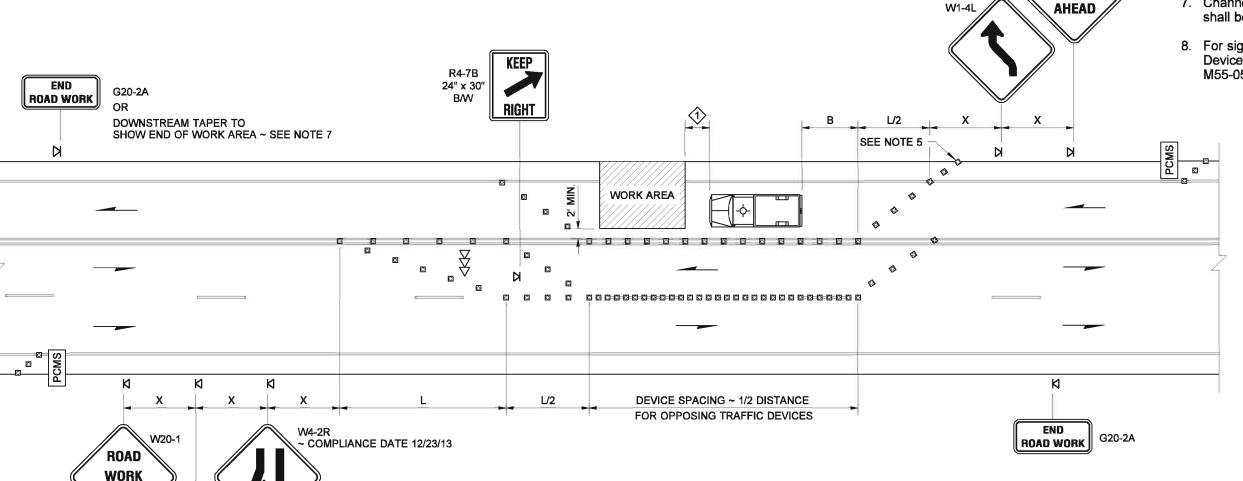
ROAD

WORK

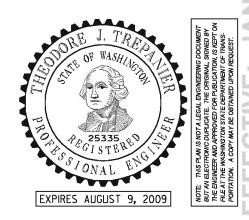
(2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Existing conflicting pavement markings that are no longer applicable shall be removed or obliterated. Temporary markings shall be used as necessary, and signs shall be post mounted for long term projects.
- 3. Steady-Burn Warning Lights (Type C, MUTCD) shall be used to mark Channelizing Devices at night.
- 4. For speed limits of 30 mph or less, sign W1-3 shall be used in lieu of sign W1-4.
- 5. Extend device taper (L/3) across shoulder ~ recommended.
- 6. Portable Changeable Message Sign (PCMS) ~ recommended.
- 7. Channelizing Device spacing for the downstream taper option shall be 20' O.C.
- 8. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual



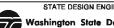
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LANE SHIFT ONTO PASSING LANE STANDARD PLAN K-22.20-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION



Pasco Bakotich III 10-12-07

PROTECTIVE VEHICLE ~ RECOMMENDED

PORTABLE CHANGEABLE MESSAGE SIGN

LEGEND

, **(**

PCMS

SIGN LOCATION

CHANNELIZING DEVICES

PCMS SAMPLE MESSAGE

FIELD LOCATE IN ADVANCE OF LANE CLOSURE SIGNING

LANE

CLOSED

1.5 SEC

2

MILE

AHEAD

1.5 SEC

ARROW PANEL

LONGITUDINAL BUFFER SPACE = B								
POSTED SPEED (MPH)	25	30	35	40	45	50	55	60
LENGTH B (FEET)	155	200	250	305	360	425	495	570

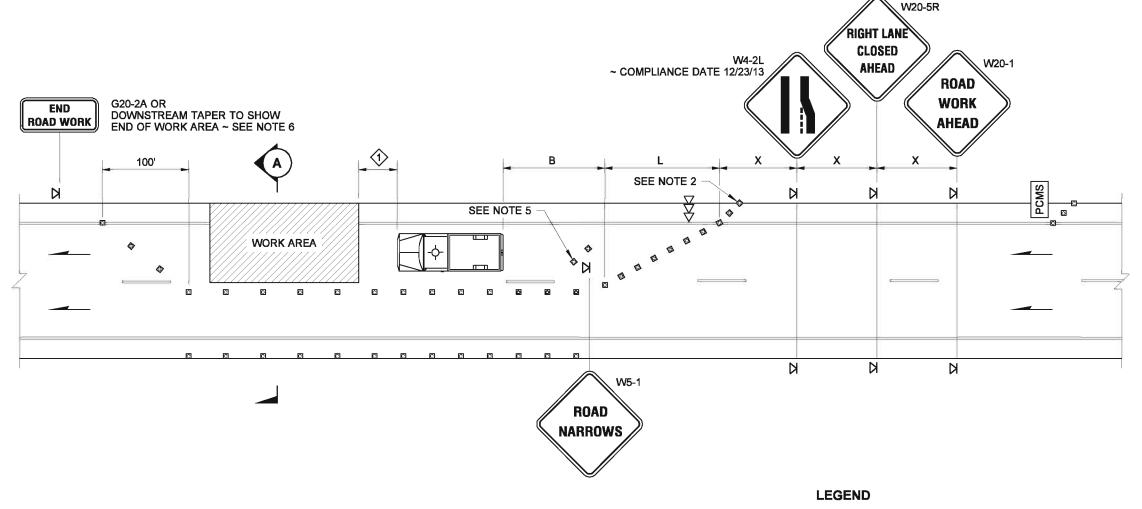
BUFFER DATA				
TYPICAL PROTECTIVE VEHICLE WITH TMA (SEE NOTE 1)				
VEHICLE TYPE	LOADED WEIGHT			
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)			
ROLL AHEAD STOPPING DISTANCE = 30 FEET MIN. (DRY PAVEMENT ASSUMED)				

MINIMUM TAPER LENGTH = L (FEET)										
LANE WIDTH				POST	ED SF	PEED	(MPH)	+		
(FEET)	25	30	35	40	45	50	55	60	65	70
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	294	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	840

CHANNELIZING DEVICE SPACING							
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)					
50 / 70	40	80					
35 / 45	30	60					
25 / 30	20	40					

	SIGN SPACING = X (1)							
1	RURAL HIGHWAYS	60 / 65 MPH	800' ±					
	RURAL ROADS	45 / 55 M PH	500' ±					
	RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±					
	RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)					
J	URBAN STREETS	25 MPH OR LESS	100' ± (2)					
	ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE							

- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE AT-GRADE INTERSECTIONS, AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.



LATERAL BUFFER ~ 4' TEMPORARY LANE ~ 12' MIN. **WORK AREA EXISTING LANE EXISTING LANE EXISTING EXISTING** SHOULDER **SHOULDER**

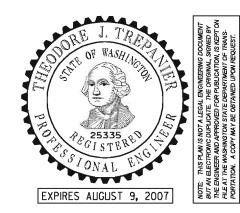
SECTION (A

SIGN LOCATION CHANNELIZING DEVICES PROTECTIVE VEHICLE ~ RECOMMENDED PCMS PORTABLE CHANGEABLE MESSAGE SIGN **ARROW PANEL EXISTING EDGE STRIPE EXISTING LANE STRIPE** TEMPORARY TRAFFIC CONTROL DEVICE

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead Stopping Distance.
- 2. Extend device taper (L/3) across shoulder ~ recommended.
- 3. Portable Changeable Message Sign (PCMS) recommended.
- 4. Traffic Safety Drums for all tapers on high speed roadway recommended.
- 5. Transverse Devices in closed lane every 1000' ± ~ recommended.
- 6. Channelizing Device spacing for the downstream taper option shall be 20' O.C.
- 7. Use advanced notice for any overwidth loads prior to lane closure for altenative routes if applicable ~ recommended.
- 8. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**



SINGLE LANE CLOSURE WITH ENCROACHMENT

STANDARD PLAN K-24.20-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION



G20-2A

DOWNSTREAM TAPER TO SHOW END OF WORK AREA ~ SEE NOTE 7 **ROAD WORK**

LONGITUDINAL BUFFER SPACE = B								
POSTED SPEED (MPH)	25	30	35	40	45	50	55	60
LENGTH B (FEET)	155	200	250	305	360	425	495	570

BUFFER DATA				
TYPICAL PROTECTIVE VEHICLE WITH TMA (SEE NOTE 1)				
VEHICLE TYPE	LOADED WEIGHT			
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)			
ROLL AHEAD STOPPING DISTANCE = 30 FEET MIN. (DRY PAVEMENT ASSUMED)				

MINIMUM TAPER LENGTH = L (FEET)								
LANE WIDTH (FEET)	25	30	POST 35	ED SF 40	PEED 45	(MPH) 50	55	60
10	-	-	-	270	450	500	550	-
11	-	-	-	294	495	550	605	660
12	-	-	-	320	540	600	660	720

SIGN SPACING = X (1)							
RURAL HIGHWAYS	60 / 65 M PH	800' ±					
RURAL ROADS	45 / 55 M PH	500' ±					
RURAL ROADS & URBAN ARTERIALS	35 / 40 M PH	350' ±					
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS 25 / 30 MPH 200' ± (2)							
URBAN STREETS	25 MPH OR LESS	100' ± (2)					
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE							

- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

CHANNELIZING DEVICE SPACING							
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)					
50 / 70	40	80					
40 / 45	30	60					

PCMS SAMPLE MESSAGE				
1	2			
2 LANES CLOSED	ONE MILE AHEAD			
1.5 SEC	1.5 SEC			

FIELD LOCATE IN ADVANCE OF LANE CLOSURE SIGNING

JANUARY 7, 2008 TO AUGUST 3, 2008

LEGEND

SIGN LOCATION

8 8 CHANNELIZING DEVICES

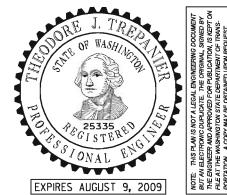
PROTECTIVE VEHICLE ~ RECOMMENDED PCMS PORTABLE CHANGEABLE MESSAGE SIGN

ARROW PANEL

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Devices shall not encroach into adjacent lanes.
- 3. Extend device taper (L/3) across shoulder ~ recommended.
- 4. Portable Changeable Message Sign (PCMS) ~ recommended.
- 5. Use Transverse Devices in closed lane every 1000' ± ~ recommended.
- 6. Traffic Safety Drums for all tapers on high speed roadway ~ recommended.
- 7. Channelizing Device spacing for the downstream taper option shall be 20' O.C.
- 8. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual

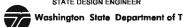
FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**

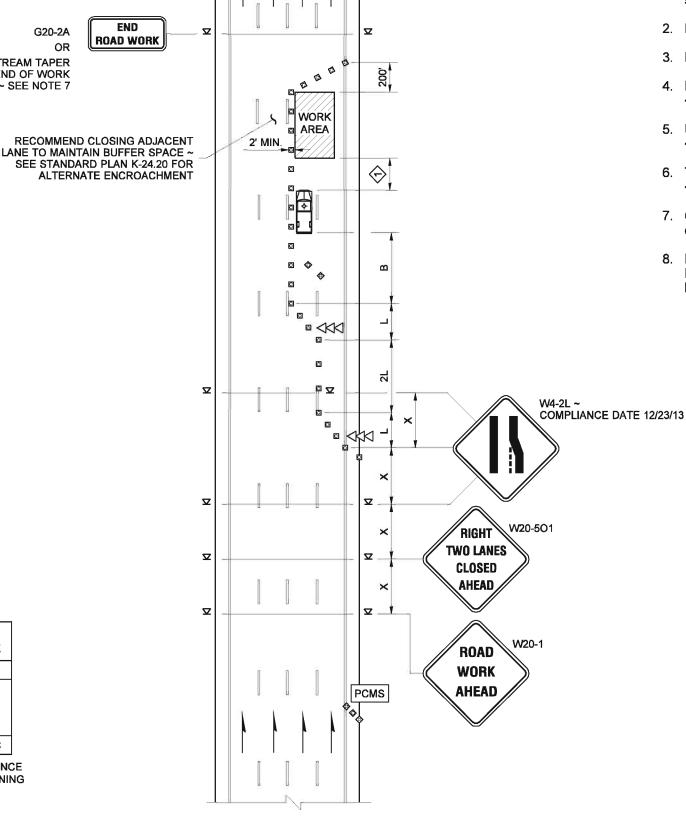


DOUBLE LANE CLOSURE ON MULTILANE ROADWAY STANDARD PLAN K-24.40-01

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION







EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

LONGITUDINAL BUFFER SPACE = B								
POSTED SPEED (MPH)	25	30	35	40	45	50	55	60
LENGTH B (FEET)	155	200	250	305	360	425	495	570

BUFFER DATA					
TYPICAL PROTECTIVE	TYPICAL PROTECTIVE VEHICLE WITH TMA (SEE NOTE 1)				
VEHICLE TYPE	LOADED WEIGHT				
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)				
ROLL AHEAD STOPPING DISTANCE = 30 FEET MIN. (DRY PAVEMENT ASSUMED)					

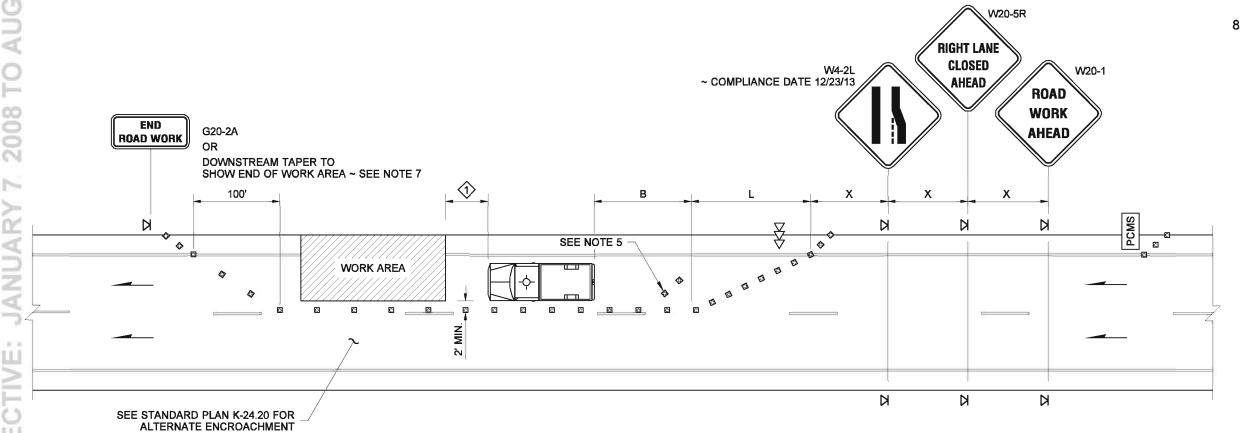
2008 DRAWN E

MINIMUM TAPER LENGTH = L (FEET)								
LANE WIDTH	POSTED SPEED (MPH)							
(FEET)	25	30	35	40	45	50	55	60
10	105	150	205	270	450	500	550	-
11	115	165	225	294	495	550	605	660
12	125	180	245	320	540	600	660	720

CHANNELIZING DEVICE SPACING							
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)					
50 / 70	40	80					
35 / 45	30	60					
25 / 30	20	40					

SIGN SPACING = X (1)					
RURAL HIGHWAYS	60 / 65 MPH	800' ±			
RURAL ROADS	45 / 55 MPH	500' ±			
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±			
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)			
URBAN STREETS	25 MPH OR LESS	100' ± (2)			
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE					

- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS



LEGEND

ĸ SIGN LOCATION

CHANNELIZING DEVICES

- |

PROTECTIVE VEHICLE ~ RECOMMENDED

PCMS

PORTABLE CHANGEABLE MESSAGE SIGN

ARROW PANEL

PCMS SAMPLE MESSAGE 2 ONE LANE MILE **CLOSED** AHEAD 1.5 SEC 1.5 SEC

FIELD LOCATE 1 MILE ±, IN ADVANCE OF LANE CLOSURE EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Devices shall not encroach into adjacent lanes.
- 3. Extend device taper (L/3) across shoulder ~ recommended.
- 4. Portable Changeable Message Sign (PCMS) ~ recommended.
- 5. Use Transverse Devices in closed lane every 1000' ± ~ recommended.
- 6. Traffic Safety Drums for all tapers on high speed roadway ~ recommended.
- 7. Channelizing Device spacing for the downstream taper option shall be 20' O.C.
- 8. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual

FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**



SINGLE LANE CLOSURE **ON MULTILANE ROADWAY** STANDARD PLAN K-24.60-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith

02-15-07

LONGITU	ווסנ	NAL	ВU	FFE	ER S	PA	CE	= B		
POSTED SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH B (FEET)	155	200	250	305	360	425	495	570	645	730

SIGN SPACIN	IG = X (1)	
RURAL HIGHWAYS	60 / 65 M PH	800' ±
RURAL ROADS	45 / 55 M PH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)
ALL SIGNS ARE BLACK ON ORANGE UNI	ESS DESIGNATED O	THERWISE

- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

MINI	MINIMUM TAPER LENGTH = L (FEET)									
LANE WIDTH (FEET)	25	POSTED SPEED (MPH) 25 30 35 40 45 50 55 60 65 70								
10	105	150	205	270	450	500	550	-	-	-
11	115	165	225	294	495	550	605	660	-	-
12	125	180	245	320	540	600	660	720	780	840

CHANNELIZING DEVICE SPACING							
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)					
50 / 65	40	80					
35 / 45	30	60					
25 / 30	20	40					

LEGEND

И SIGN LOCATION

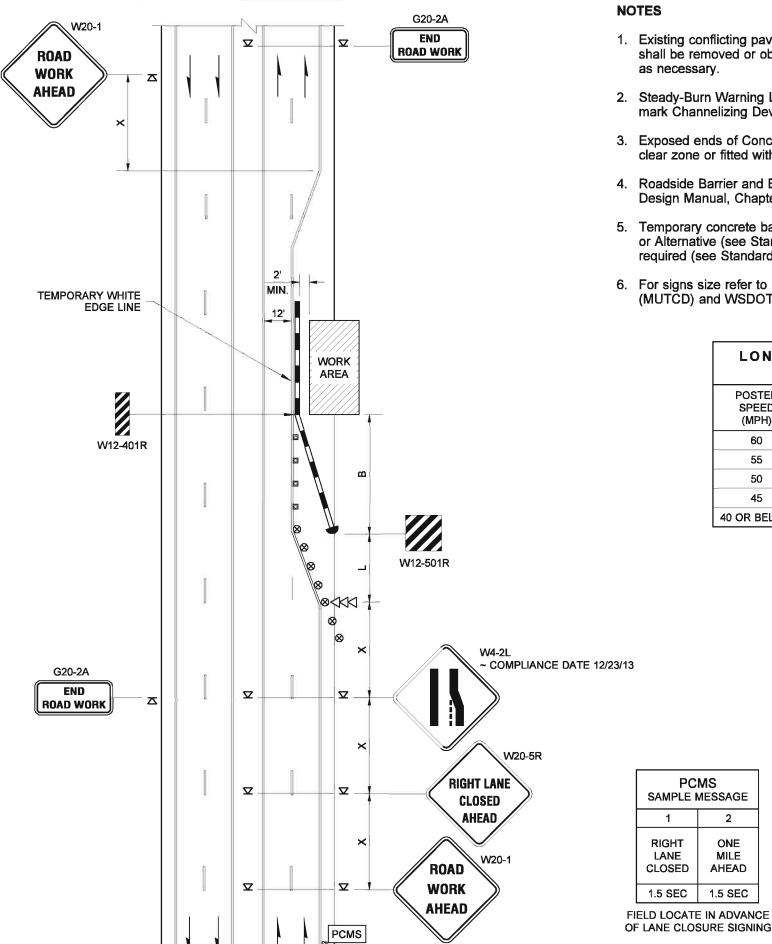
CHANNELIZING DEVICES

TEMPORARY CONCRETE BARRIER WITH REFLECTORS PCMS PORTABLE CHANGEABLE MESSAGE SIGN

ARROW PANEL

 \otimes TRAFFIC SAFETY DRUM

TEMPORARY IMPACT ATTENUATOR

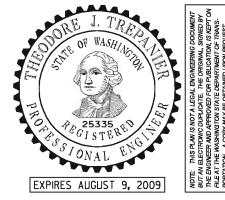


NOTES

- 1. Existing conflicting pavement markings that are no longer applicable shall be removed or obliterated. Temporary markings shall be used
- 2. Steady-Burn Warning Lights (Type C, MUTCD) shall be used to mark Channelizing Devices at night.
- 3. Exposed ends of Concrete Barriers shall be tapered outside the clear zone or fitted with impact attenuators.
- 4. Roadside Barrier and End Treatment shall be crashworthy. Refer to Design Manual, Chapter 710 & 720, for barrier and attenuator information.
- 5. Temporary concrete barrier may be Type 2 (see Standard Plan C-8) or Alternative (see Standard Plan K-80.30). Anchoring may be required (see Standard Plans K-80.35 and K-80.37).
- 6. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

LONGITUDINAL BARRIER FLARE RATES							
POSTED SPEED (MPH)	UNANCHORED BARRIER						
60	18 : 1	16 : 1					
55	16 : 1	14 : 1					
50	14 : 1	12 : 1					
45	12 : 1	11 : 1					
40 OR BELOW	11 : 1	10 : 1					

FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



SINGLE LANE CLOSURE WITH TEMPORARY CONCRETE BARRIER STANDARD PLAN K-24.80-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION





STATE DESIGN ENGINEER

PCMS SAMPLE MESSAGE

RIGHT

LANE

CLOSED

1.5 SEC

2

ONE

MILE

AHEAD

1.5 SEC

LONGITUDINAL	ВU	FFE	R S	PA	CE	= B
POSTED SPEED (MPH)	25	30	35	40	45	50
LENGTH B (FEET)	155	200	250	305	360	425

BUFFER DATA					
TYPICAL PROTECTIVE VEHICLE WITH TMA (SEE NOTE 1)					
VEHICLE TYPE	LOADED WEIGHT				
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)				
A POLL AHEAD STOPPING DISTANCE = 30 FEET MIN					

ROAD WORK

AHEAD

SIGN SPACING = X					
RURAL ROADS	45 / 55 MPH	500' ±			
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±			
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ±			
ALL SIGNS ARE BLACK ON ORANGE UNL	ESS DESIGNATED	OTHERWISE			

ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE AT-GRADE INTERSECTIONS AND DRIVEWAYS

MINIMUM TAPER LENGTH = L (FEET)							
LANE WIDTH POSTED SPEED (MPH) (FEET) 25 30 35 40 45 50							
10	105	150	205	270	450	500	
11	115	165	225	294	495	550	
12	125	180	245	320	540	600	

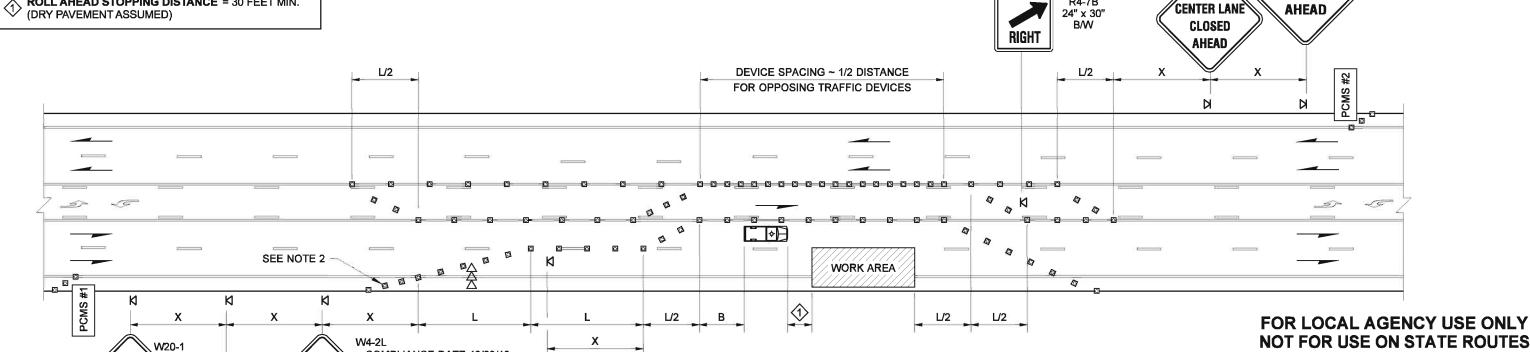
KEEP

R4-7B

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

CHANNELIZING DEVICE SPACING						
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)				
50	40	80				
35 / 45	30	60				
25 / 30	20	40				

W20-1



NOTES

PCMS SAMPLE MESSAGE #1			
1 2			
LANES CLOSED AHEAD	NO LEFT TURN		
1.5 SEC	1.5 SEC		

FIELD LOCATE IN ADVANCE OF LANE CLOSURE SIGNING

PCMS SAMPLE MESSAGE #2			
1 2			
CENTER LANE CLOSED	NO LEFT TURN		
1.5 SEC	1.5 SEC		

W20-5R

RIGHT LANE

CLOSED

FIELD LOCATE IN ADVANCE OF LANE CLOSURE SIGNING

LEGEND

COMPLIANCE DATE 12/23/13

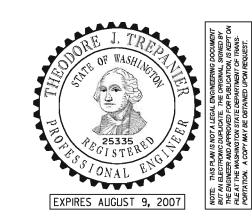
PCMS

SIGN LOCATION **CHANNELIZING DEVICES**

> PROTECTIVE VEHICLE ~ RECOMMENDED PORTABLE CHANGEABLE MESSAGE SIGN

ARROW PANEL

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Extend device taper (L/3) across shoulder ~ recommended.
- 3. Portable Changeable Message Sign (PCMS) ~ recommended.
- 4. If the lane shift is short and has minimal radius curve (30mph or less) use sign W1-3 in lieu of sign W1-4.
- 5. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.



LANE SHIFT ONTO TWO-WAY LEFT TURN LANE STANDARD PLAN K-26.20-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith

02-15-07



BUFFER DATA				
EHICLE WITH TMA (SEE NOTE 1)				
LOADED WEIGHT				
MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)				
1				

ROLL AHEAD STOPPING DISTANCE = 30 FEET MIN.

W20-1

ROAD

WORK

AHEAD

2008

SIGN SPACING = X				
RURAL ROADS	45 / 55 MPH	500' ±		
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350′ ±		
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ±		
ALL SIGNS ARE BLACK ON ORANGE UNI	LESS DESIGNATED	OTHERWISE		

ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.

MINIMUM TAPER LENGTH = L (FEET)						
LANE WIDTH POSTED SPEED (MPH)						
(FEET)	25	30	35	40	45	50
10	105	150	205	270	450	500
11	115	165	225	294	495	550
12	125	180	245	320	540	600

CHANNELIZING DEVICE SPACING						
POSTED SPEED (MPH)						
50	40	80				
35 / 45	30	60				
25 / 30	20	40				

ROAD

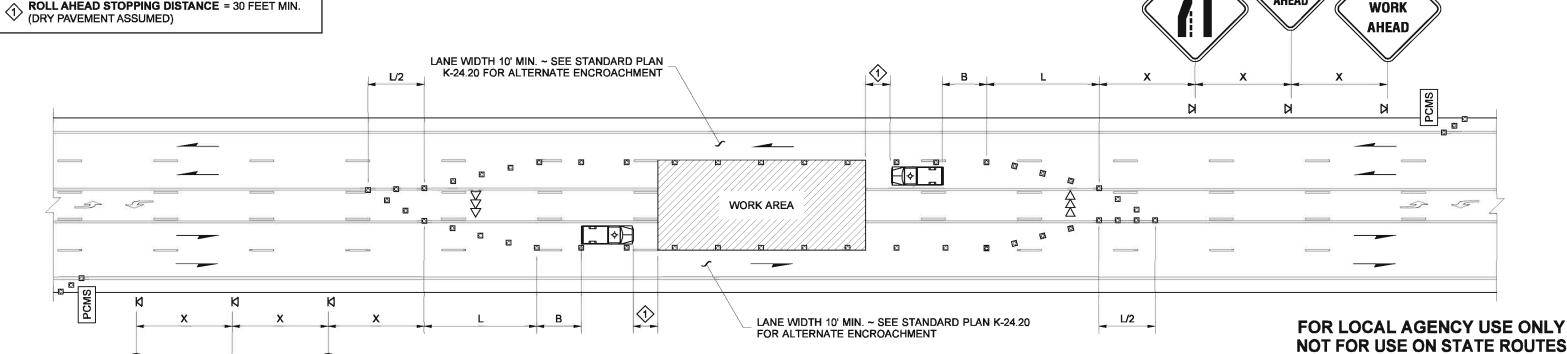
WORK

W20-5L

CLOSED

AHEAD

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



PCMS SAMPLE MESSAGE 2 LEFT NO LANE LEFT CLOSED TURN

FIELD LOCATE IN ADVANCE OF LANE CLOSURE SIGNING

1.5 SEC

1.5 SEC

LEGEND

ĸ **a a a** PCMS

W20-5I

LEFT LANE

CLOSED AHEAD

> SIGN LOCATION **CHANNELIZING DEVICES**

W4-2R ~

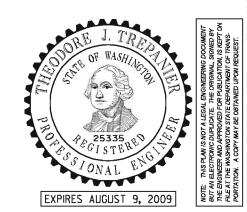
COMPLIANCE DATE 12/22/13

PROTECTIVE VEHICLE ~ RECOMMENDED

PORTABLE CHANGEABLE MESSAGE SIGN **ARROW PANEL**

NOTES

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Portable Changeable Message Sign (PCMS) ~ recommended.
- 3. Prohibit turns as necessary for traffic conditions.
- 4. For signs size refer to Manual on Uniform Traffic Control Device (MUTCD) and WSDOT Sign Fabrication Manual M55-05.



LEFT AND CENTER LANE CLOSURE ~ TWO-WAY LEFT TURN LANE STANDARD PLAN K-26.40-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Pasco Bakotich III



10-12-07

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

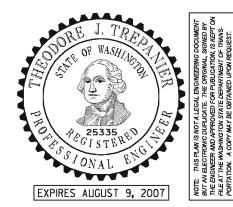
EFFECTIVE: JANUARY 7, 2008 TO AUGUST

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** SIGN SPACING = X (1)LONGITUDINAL BUFFER SPACE = B 60 / 65 MPH **RURAL HIGHWAYS** 800' ± POSTED SPEED (MPH) 25 30 35 40 45 155 200 250 305 360 425 495 570 **RURAL ROADS** 45 / 55 MPH 500' ± LENGTH B (FEET) **RURAL ROADS & URBAN ARTERIALS** 35 / 40 MPH 350' ± RURAL ROADS, URBAN ARTERIALS, 25 / 30 MPH 200' ± (2) **RESIDENTIAL & BUSINESS DISTRICTS URBAN STREETS** 25 MPH OR LESS 100' ± (2) W20-ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE WORK **AHEAD** W20-4 ~ OPTIONAL (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE AT-GRADE INTERSECTIONS AND DRIVEWAYS. IF POSTED SPEED 40 MPH OR LESS (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ONE LANE ROADWAY CONDITIONS. **BUFFER DATA** ROAD AHEAD TYPICAL PROTECTIVE VEHICLE WITH TMA (SEE NOTE 1) **VEHICLE TYPE LOADED WEIGHT** W20-7B **PREPARED** MINIMUM WEIGHT 15,000 LBS 4 YARD DUMP TRUCK, \mathbf{Z} W20-7B ~ OPTIONAL IF POSTED TO STOP (MAXIMUM WEIGHT SHALL BE SERVICE TRUCK, SPEED 40 MPH OR LESS IN ACCORDANCE WITH MANU-FLAT BED, ETC. FACTURER RECOMMENDATION) W20-7A **ROLL AHEAD STOPPING DISTANCE** = 30 FEET MIN. W20-7A W20-PREPARED (DRY PAVEMENT ASSUMED) W20-5C ROAD WORK CENTER LANE AHEAD CLOSED AHEAD 2> L/2 L/2 N 00000 WORK AREA N И X L/2В L/2 KEEP R4-7B 24" x 30" W20-1 B/W **SEE NOTE 3** RIGHT ⋖ (TYP.) ROAD WORK W20-7A AHEAD **DEVICE SPACING ~ 1/2 DISTANCE** PREPARED FOR OPPOSING TRAFFIC DEVICES TO STOP W20-7B ~ OPTIONAL IF POSTED SPEED 40 MPH OR LESS W20-7B ~ OPTIONAL IF POSTED PREPARED ┰ **LEGEND** SPEED 40 MPH OR LESS TO STOP W20-4 **FLAGGING STATION** ONE LANE MINIMUM TAPER LENGTH = L (FEET) N SIGN LOCATION 又 ROAD POSTED SPEED (MPH) **CHANNELIZING DEVICES** AHEAD LANE WIDTH (FEET) 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 \Rightarrow PROTECTIVE VEHICLE ~ RECOMMENDED 10 150 205 270 450 500 550 W20-1 ROAD 11 115 165 225 294 495 550 605 660 WORK 125 180 245 320 540 600 660 720

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. If an existing signal is present, the signal shall be set to "red flash mode" or turned off during flagging operations.
- 3. Extend device taper (L/3) across shoulder ~ recommended.
- 4. Law enforcement officer may be used in lieu of flaggers to control intersection traffic.
- 5. For speed limit of 30 mph or less use sign W1-3 in lieu of sign W1-4.
- 6. Maintain a minimum of one access point for each business within the Work Area limits.
- 7. Portable Changeable Message Sign (PCMS) ~ recommended.
- 8. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

CHANNELIZING DEVICE SPACING						
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)				
50 / 70	40	80				
35 / 45	30	60				
25 / 30	20	40				

FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



INTERSECTION ~ LANE SHIFT ON THREE LANE TWO-WAY LEFT TURN LANE STANDARD PLAN K-30.20-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith STATE DESIGN ENGINEER 02-15-07

Vashington State Department of Transportation

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3,

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G20-2A

END **ROAD WORK** WORK

AHEAD

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NOTES

G20-2A

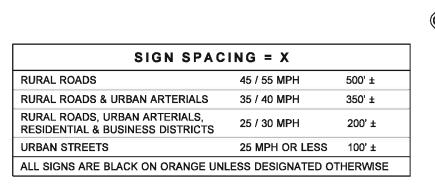
END

ROAD WORK

ROAD WORK

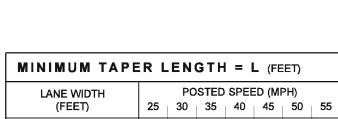
AHEAD

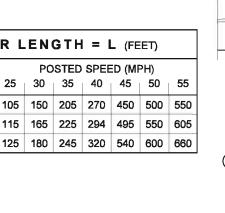
- 1. If the work space extends across a crosswalk, the crosswalk should be closed (see Standard Plan K-34.20).
- 2. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a right lane having significant right turning movements, then the right lane may be restricted to right turn only, as shown. This procedure increases the through capacity by eliminating right turns from the open through lane.
- 3. Prohibit turns as necessary for traffic conditions.
- 4. Flashing Warning Lights (Type A per MUTCD) should be used as needed, to mark barricades at night.
- 5. Steady Burning Warning Lights (Type C per MUTCD) shall be used to mark channelizing devices at night.
- 6. For long term projects, conflicting pavement markings that are no longer applicable shall be removed or obliterated. Temporary markings shall be used as necessary.
- 7. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.



ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE AT-GRADE INTERSECTIONS AND DRIVEWAYS.

CHANNELIZING DEVICE SPACING					
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)			
50 / 70	40	80			
35 / 45	30	60			
25 / 30	20	40			





LEGEND

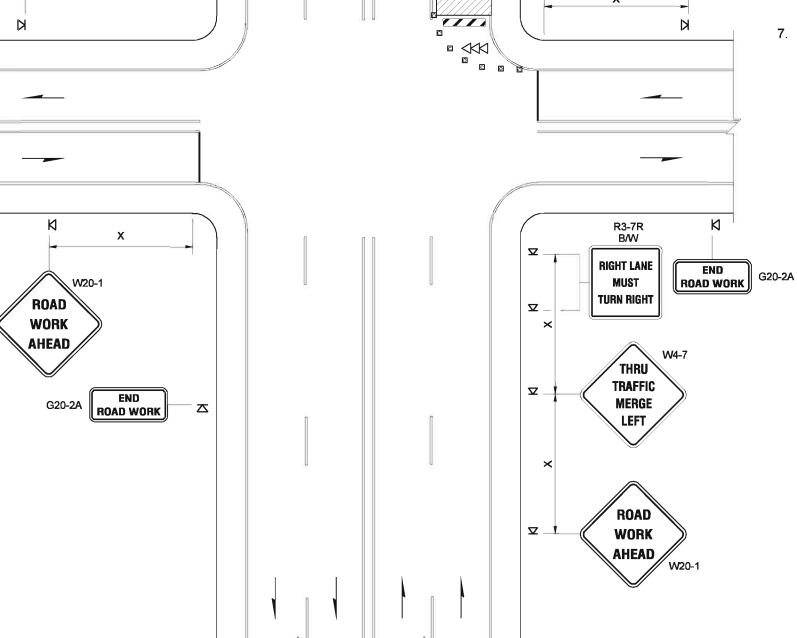
11

SIGN LOCATION

0 0 0 CHANNELIZING DEVICES

BARRICADE ~ TYPE 3 L

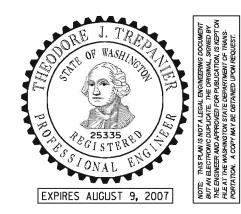
 \triangleleft ARROW PANEL



WORK

AREA

FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



INTERSECTION ~ RIGHT LANE CLOSURE **FAR SIDE** STANDARD PLAN K-32.20-00

SHEET 1 OF 1 SHEET

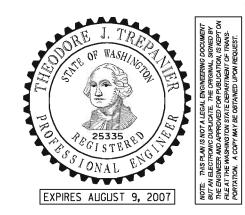
APPROVED FOR PUBLICATION

02-15-07 Ken L. Smith



- 1. If the work space extends across a crosswalk, the crosswalk should be closed (see Standard Plan K-34.20).
- 2. The normal procedure is to close on the near side of the intersection any lane that is not carried through the intersection. However, when this results in the closure of a left lane having significant left-turning movements, then the left lane may be reopened as a turn bay for left turns only, as shown.
- Prohibit turns as necessary for traffic conditions.
- 4. Flashing Warning Lights (Type A per MUTCD) should be used, as needed, to mark barricades at night.
- 5. Steady Burning Warning Lights (Type C per MUTCD) shall be used to mark channelizing devices at night.
- 6. For long term projects, conflicting pavement markings that are no longer applicable shall be removed or obliterated. Temporary markings shall be used as necessary.
- 7. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



INTERSECTION ~ LEFT LANE CLOSURE **FAR SIDE** STANDARD PLAN K-32.40-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith

02-15-07



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

0608

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N

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

G20-2A

END

ROAD WORK

K

ROAD

WORK

AHEAD

R3-2 R/W

 \mathbf{Z}

SEE NOTE 1

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

W20-1

ROAD

WORK

AHEAD

G20-2A

END

ROAD WORK

SEE NOTE 4

WORK

AREA

- 1. Prohibit turns as necessary for traffic conditions.
- 2. Flashing Warning Lights (Type A per MUTCD) should be used, as needed, to mark barricades at night.
- 3. Steady Burning Warning Lights (Type C per MUTCD) shall be used to mark channelizing devices at night.
- 4. For long term projects, conflicting pavement markings that are no longer applicable shall be removed or obliterated. Temporary markings shall be used as necessary.
- For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

SIGN SPACING = X				
RURAL ROADS 45 / 55 MPH 500':				
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±		
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ±		
URBAN STREETS 25 MPH OR LESS 100' ±				
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE				

ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE AT-GRADE INTERSECTIONS AND DRIVEWAYS.

MINIMUM TAPER LENGTH = L (FEET)							
LANE WIDTH	POSTED SPEED (MPH)						
(FEET)	25	30	35	40	45	50	55
10	105	150	205	270	450	500	550
11	115	165	225	294	495	550	605
12	125	180	245	320	540	600	660

1								
	CHANNELIZING DEVICE SPACING							
	POSTED SPEED (MPH)							
	50 / 70	40	80					
	35 / 45	30	60					
	25 / 30	20	40					

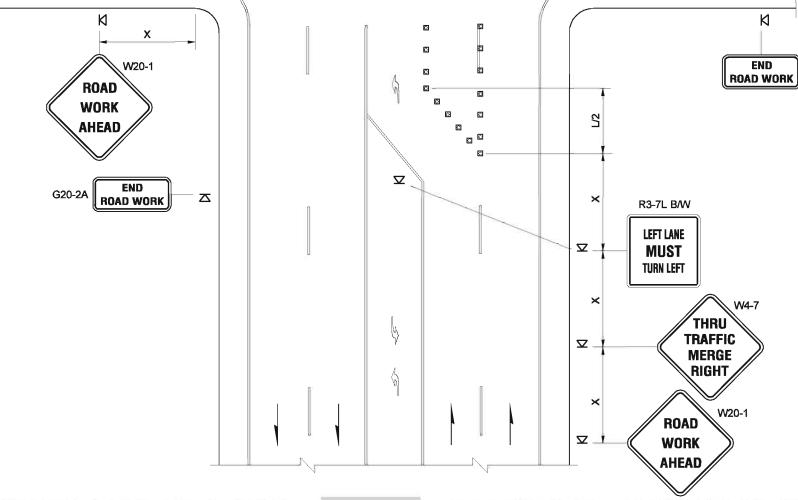
LEGEND

SIGN LOCATION

8 8 6 **CHANNELIZING DEVICES**

TEMPORARY TRAFFIC ARROW ~ OPTIONAL 5

1111 BARRICADE ~ TYPE 3 R



FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**



INTERSECTION ~ MULTIPLE LANE CLOSURE STANDARD PLAN K-32.60-00

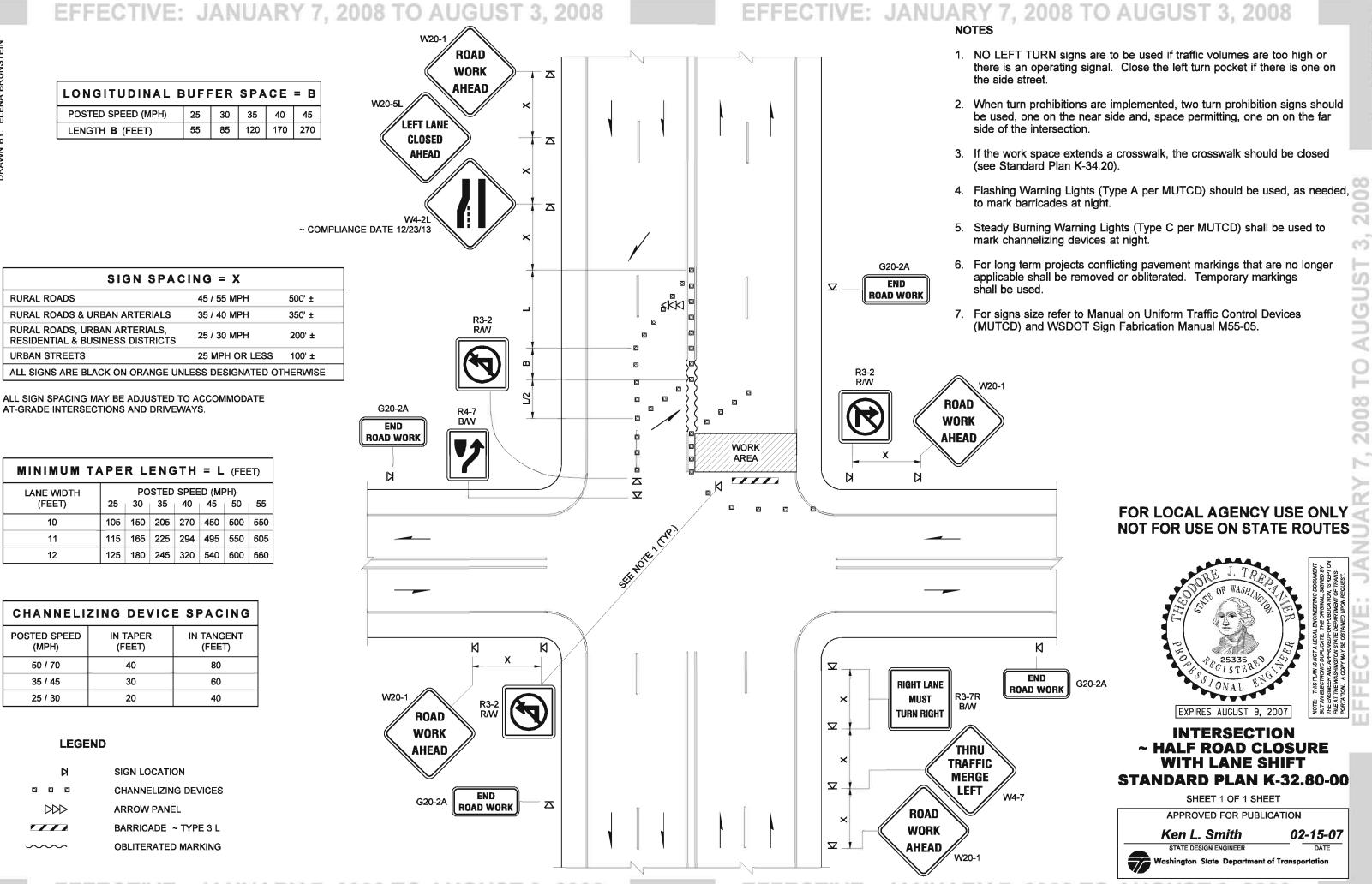
SHEET 1 OF 1 SHEET

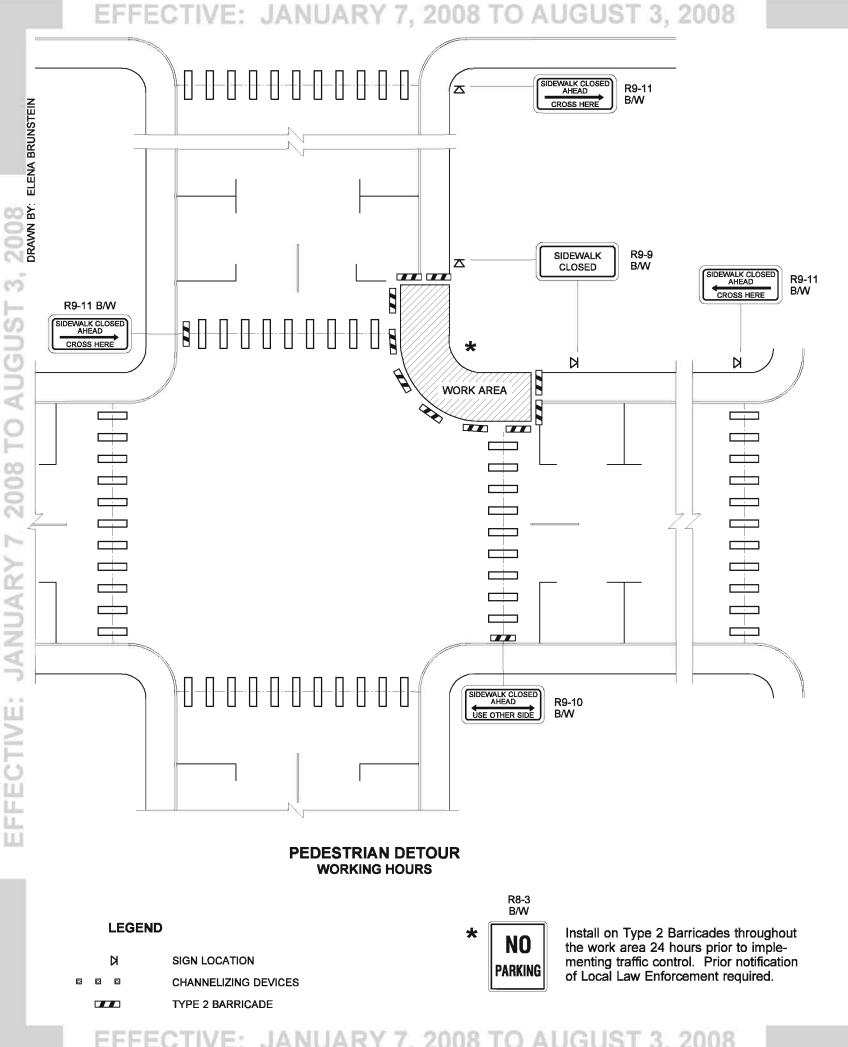
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Ken L. Smith 02-15-07



G20-2A





EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 MIN. IDEWALK DETOUR R9-11A MOD R9-11A MOD SIDEWALK DETOUR **PEDESTRIAN** WORK AREA WALKWAY ~ 5' MIN. **SEE NOTE 2** -0-0-0-0-0-0-0-0-0-0-0-0-0 FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**

PEDESTRIAN DETOUR NON-WORKING HOURS

NOTES

- 1. When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility.
- 2. Controls shown are for pedestrian traffic only.
- 3. Use Warning Lights on barricades.
- 4. Maintain a minimum width of 3 feet for pedestrian path.
- 5. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

INTERSECTION ~ PEDESTRIAN DETOUR STANDARD PLAN K-34.20-00

EXPIRES AUGUST 9, 2007

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Ken L. Smith 02-15-07

BUF	FER DATA	MINIMU
TYPICAL PROTECTIVE	LANE WIDT	
VEHICLE TYPE	LOADED WEIGHT	(FEET)
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)	11 12

FLAT BED, ETC.	FACTURER RECOMMENDATION)
> ROLL AHEAD STOR	PPING DISTANCE = 30 FEET MIN.

2008

Q

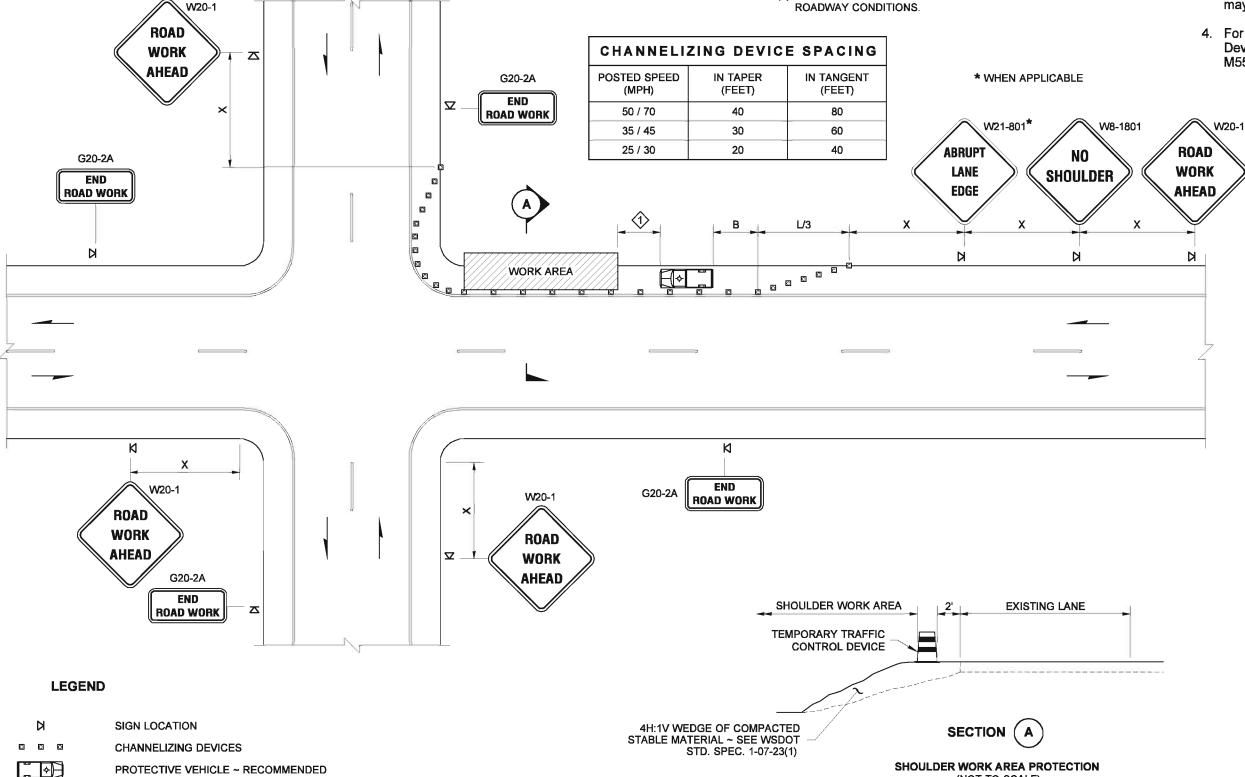
MINIMUM TAPER LENGTH = L (FEET)											
LANE WIDTH (FEET)	POSTED SPEED (MPH) 25 30 35 40 45 50 55										
10	105	150	205	270	450	500	550				
11	115	165	225	294	495	550	605				
12	125	180	245	320	540	600	660				

SIGN SPACING = X (1)									
RURAL ROADS 45 / 55 MPH 500' ±									
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±							
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)							
URBAN STREETS	25 MPH OR LESS	100' ± (2)							
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE									

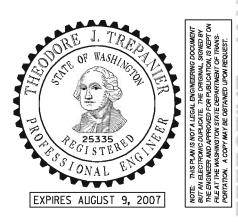
- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE AT-GRADE INTERSECTIONS AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES**

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. For long term projects conflicting pavement markings that are no longer applicable shall be removed. Temporary markings shall be used as necessary and signs shall be post mounted.
- 3. The sign MOTORCYCLES USE EXTREME CAUTION may be used.
- 4. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual



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INTERSECTION ~ SHOULDER WORK STANDARD PLAN K-36.20-00

SHEET 1 OF 1 SHEET

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(NOT TO SCALE)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3.

PROTECTIVE VEHICLE ~ RECOMMENDED

LONGITUDINAL BUFFER SPACE = B										
POSTED SPEED (MPH)	25	30	35	40	45	50	55	60	65	70
LENGTH B (FEET)	SEE	SEE STD. PLAN K-40.40				425	495	570	645	730

BUFFER DATA									
TYPICAL PROTECTIVE VEHICLE WITH TMA (SEE NOTE 1)									
VEHICLE TYPE	LOADED WEIGHT								
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)								
ROLL AHEAD STOPPING DISTANCE = 30 FEET MIN. (DRY PAVEMENT ASSUMED)									

MINIMUM TAPER LENGTH = L (FEET)										
SHOULDER WIDTH POSTED SPEED (MPH)										
(FEET)	25	30	35	40	45	50	55	60	65	70
6	SE	E ST	D. PL	AN	270	300	330	360	390	420
8		K-4	0.40		360	400	440	480	520	560
10					450	500	550	600	650	700
LESS THAN 6	3 DEVICES MINIMUM, SPACED 10' O.C.									

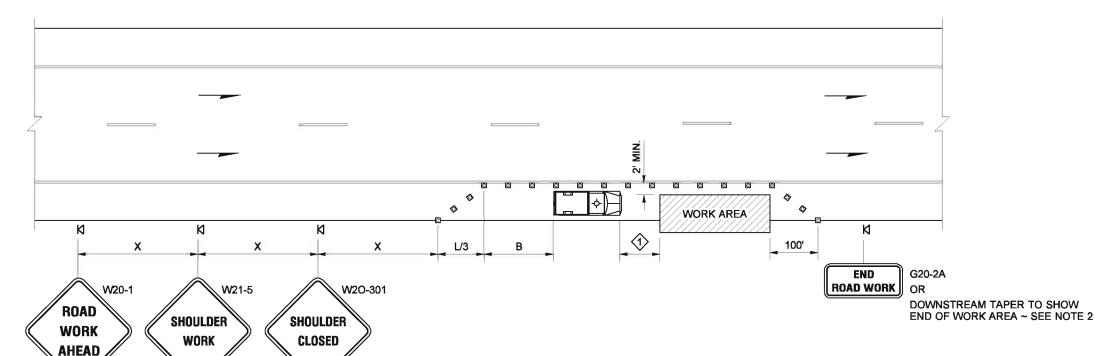
CHANNELIZING DEVICE SPACING											
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)									
50 / 70	40	80									
45 / 50	30	60									

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. A Protective Vehicle is recommended regardless if a TMA is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Channelizing Device spacing for the downstream taper option shall be 20' O.C.
- 3. No Encroachment on the traveled lane is permitted. If Encroachment is necessary, the lane shall be closed (see Standard Plan K-24.20).
- 4. Signs to be post mounted for long term projects.
- 5. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

SIGN SPA	ACING = X						
RURAL HIGHWAYS	60 / 65 MPH	800' ±					
RURAL ROADS	45 / 55 MPH	500' ±					
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE							

ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.



LEGEND

SIGN LOCATION

CHANNELIZING DEVICES

PROTECTIVE VEHICLE ~ RECOMMENDED

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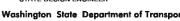
SHOULDER CLOSURE ~ HIGH SPEED ROADWAY (45 MPH OR HIGHER) STANDARD PLAN K-40.20-00

SHEET 1 OF 1 SHEET

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02-15-07



LONGITUDINAL BUFFER SPACE = B											
POSTED SPEED (MPH)	25	30	35	40	45	50	55	60	65	70	
LENGTH B (FEET)	155	200	250	305	SEE STD. PLAN K-40.20						

BUFFER DATA										
TYPICAL PROTECTIVE VEHICLE WITH TMA (SEE NOTE 1)										
VEHICLE TYPE	LOADED WEIGHT									
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)									
(DRY PAVEMENT AS	PPING DISTANCE = 30 FEET MIN. SUMED)									

MINIMUM TAPER LENGTH = L (FEET)											
SHOULDER WIDTH POSTED SPEED (MPH)											
(FEET)	25	30	35	40	45	50	55	60	65	70	
6	63	90	123	160							
8	84	120	164	214	SEE STD. PLAN K-40.20						
10	105	150	204	267							
LESS THAN 6	3 DE	3 DEVICES MINIMUM, SPACED 10' O.C.									

CHANNELIZING DEVICE SPACING		
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)
35 / 40	30	60
25 / 30	20	40

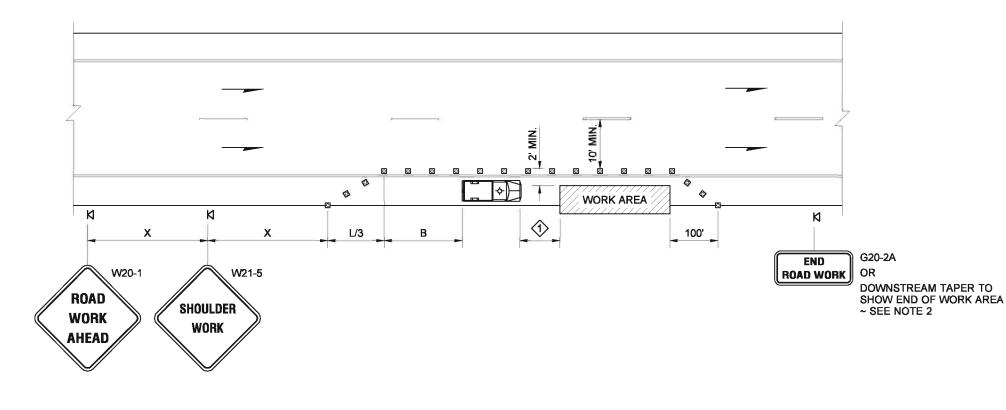
NOTES

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

- 1. A Protective Vehicle is recommended regardless if a Truck Mounted Attenuator (TMA) is available; a work vehicle may be used. When no TMA is used, the Protective Vehicle shall be strategically located to shield workers, with no specific Roll-Ahead distance.
- 2. Channelizing Device spacing for the downstream taper option shall be 20' O.C.
- 3. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

SIGN SPACING = X (1)		
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)
ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE		

- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.



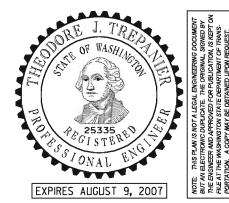
LEGEND

SIGN LOCATION

CHANNELIZING DEVICES

PROTECTIVE VEHICLE ~ RECOMMENDED

FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**



SHOULDER CLOSURE ~ LOW SPEED ROADWAY (40 MPH OR LESS) STANDARD PLAN K-40.40-00

SHEET 1 OF 1 SHEET

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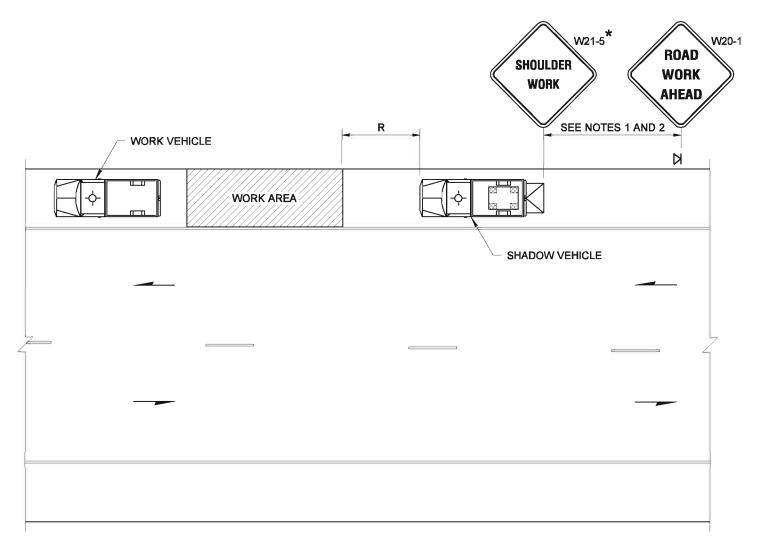
Ken L. Smith

02-15-07



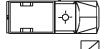
PROTECTIVE VEHICLE ROLL AHEAD DISTANCE = R		
TYPICAL PROTECTIVE VEHICLE WITH TMA		
VEHICLE TYPE	LOADED WEIGHT	STATIONARY OPERATION
4 YARD DUMP TRUCK, SERVICE TRUCK, FLAT BED, ETC.	MINIMUM WEIGHT 15,000 LBS. (MAXIMUM WEIGHT SHALL BE IN ACCORDANCE WITH MANU- FACTURER RECOMMENDATION)	30 FEET
ROLL AHEAD DISTANCES VARY AND SHALL BE DETERMINED IN FIELD BASED ON WORK OPERATION AND SITE SPECIFIC CONDITIONS		

* PROTECTIVE VEHICLE MOUNTED



LEGEND

SIGN LOCATION



PROTECTIVE VEHICLE



TRUCK MOUNTED ATTENUATOR ~ RECOMMENDED



SEQUENTIAL ARROW PANEL TYPE "B" ~ CAUTION MODE

-φ-

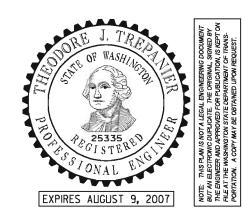
WARNING BEACON ~ REQUIRED

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOT

- 1. In those situations where multiple work locations within a limited distance make it practical to place stationary signs, the distance between the advance Warning Sign and the Work Area should not exceed 5 miles.
- 2. In those situations where the distance between the advance signs and the Work Area is 2 to 5 miles, a Supplemental Distance plaque should be used with the ROAD WORK AHEAD sign.
- 3. No encroachment into traffic lane is permitted with this plan.
- 4. Work vehicle and Shadow vehicle shall use Warning Beacons.
- 5. Shadow vehicle shall maintain 500' to 1000' of sight distance to approaching traffic.
- 6. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



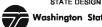
SHOULDER CLOSURE ~ SHORT DURATION STANDARD PLAN K-40.60-00

SHEET 1 OF 1 SHEET

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th 02-15-07



STATE DESIGN ENGINEER DA

45 / 55 MPH

35 / 40 MPH

25 / 30 MPH

25 MPH OR LESS

500' ±

350' ±

200' ± (2)

100' ± (2)

SIGN SPACING = X(1)

ALL SIGNS ARE BLACK ON ORANGE UNLESS DESIGNATED OTHERWISE

(1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE

(2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT

AT-GRADE INTERSECTIONS AND DRIVEWAYS.

WORK AREA

RURAL ROADS

URBAN STREETS

ROADWAY CONDITIONS.

RURAL ROADS & URBAN ARTERIALS

RESIDENTIAL & BUSINESS DISTRICTS

RURAL ROADS, URBAN ARTERIALS,

SEE NOTE 1 W20-1 ROAD **WORK AHEAD**

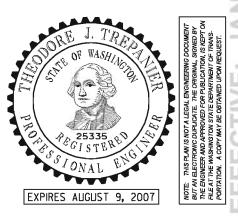
LEGEND

SIGN LOCATION

NOTES

- 1. The sign shown is not required in the following cases: the work space is behind a barrier, or more than 2' behind the curb, or more than 15' from the edge of a roadway.
- 2. For sign size, refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

FOR LOCAL AGENCY USE ONLY **NOT FOR USE ON STATE ROUTES**



WORK BEYOND THE SHOULDER

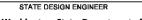
STANDARD PLAN K-40.80-00

SHEET 1 OF 1 SHEET

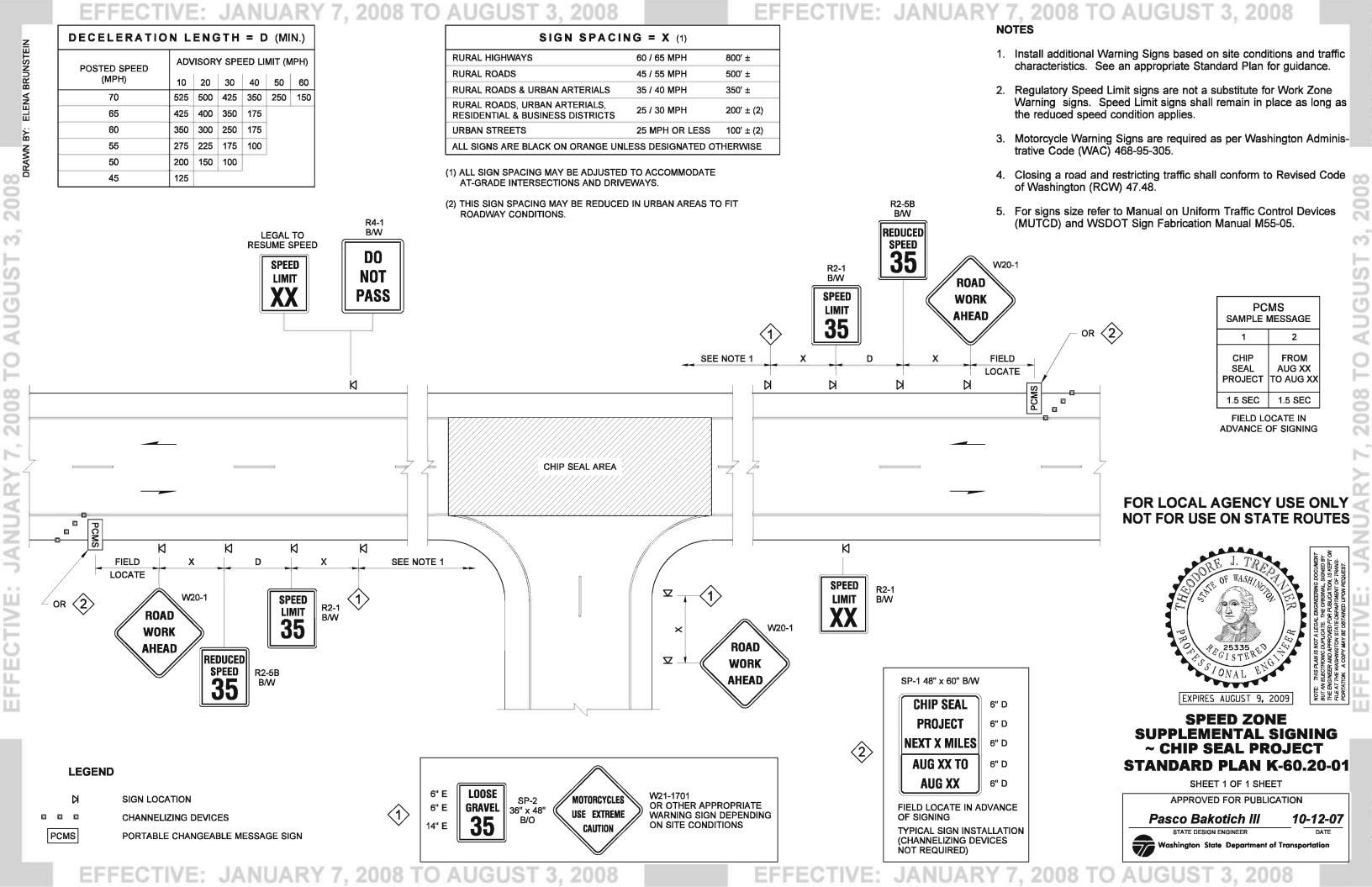
APPROVED FOR PUBLICATION

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02-15-07



AUGUST



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

SIGN SPACING = X (1)		
RURAL HIGHWAYS	60 / 65 MPH	800' ±
RURAL ROADS	45 / 55 MPH	500' ±
RURAL ROADS & URBAN ARTERIALS	35 / 40 MPH	350' ±
RURAL ROADS, URBAN ARTERIALS, RESIDENTIAL & BUSINESS DISTRICTS	25 / 30 MPH	200' ± (2)
URBAN STREETS	25 MPH OR LESS	100' ± (2)
ALL SIGNS ARE BLACK ON ORANGE UNI	I ESS DESIGNATED OF	THERWISE

CHANNELIZING DEVICE SPACING		
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)
50 / 70	40	80
35 / 45	30	60
25 / 30	20	40

- (1) ALL SIGN SPACING MAY BE ADJUSTED TO ACCOMMODATE INTERCHANGE RAMPS, AT-GRADE INTERSECTIONS, AND DRIVEWAYS.
- (2) THIS SIGN SPACING MAY BE REDUCED IN URBAN AREAS TO FIT ROADWAY CONDITIONS.

CHANNELIZING DEVICE SPACING		
POSTED SPEED (MPH)	IN TAPER (FEET)	IN TANGENT (FEET)
50 / 70	40	80
35 / 45	30	60
25 / 30	20	40

installed when the following roadway conditions exist: grooved pavement

1. See Standard Plan K-24.60 for typical lane closure signing details, device spacing requirements, and lane closure taper length.

2. MOTOCYCLES USE EXTREME CAUTION signs shall be

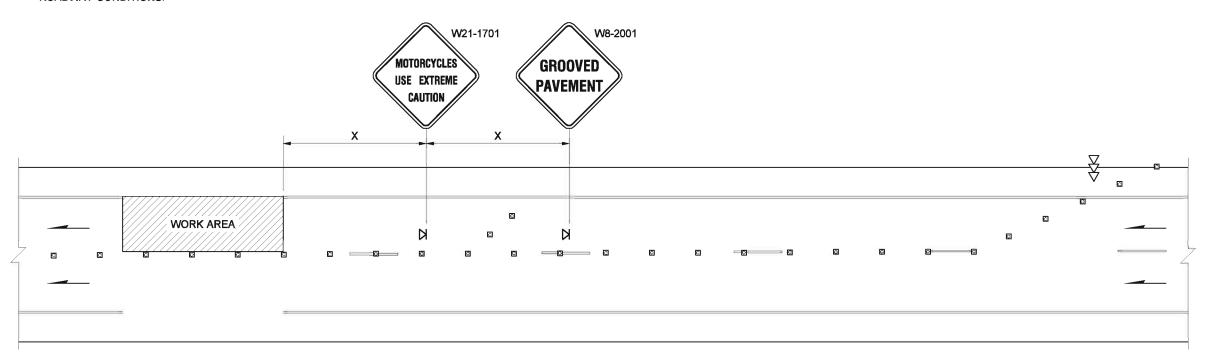
- abrupt lane edge
- steel plates

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES**

loose gravel of earth

Specific signs for each of the conditions noted shall be installed along with MOTORCYCLES USE EXTREME CAUTION signs.

3. For signs size refer to Manual on Uniform Traffic Control Devices (MUTCD) and WSDOT Sign Fabrication Manual M55-05.

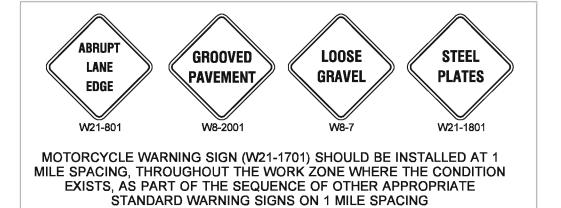


LEGEND

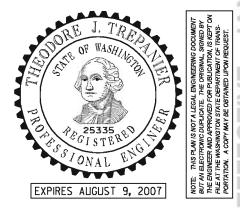
И SIGN LOCATION

CHANNELIZING DEVICES

ARROW PANEL



FOR LOCAL AGENCY USE ONLY NOT FOR USE ON STATE ROUTES



MOTORCYCLE SUPPLEMENTAL SIGNING STANDARD PLAN K-60.40-00

SHEET 1 OF 1 SHEET

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02-15-07



TWO-LANE ROADWAY

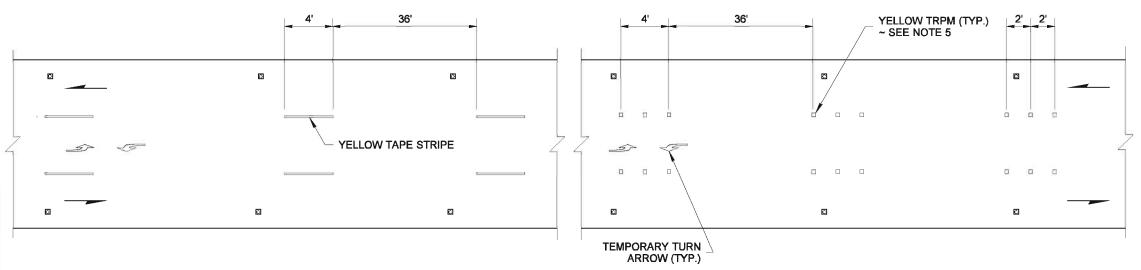
WHITE TRPM WHITE TAPE ~ SEE NOTE 5 (OR PAINT) STRIPE

HOT MIXED ASPHALT PAVEMENT

2008

BITUMINOUS SURFACE TREATMENT

ONE-WAY TWO-LANE ROADWAY



HOT MIXED ASPHALT PAVEMENT

BITUMINOUS SURFACE TREATMENT

TWO-WAY TWO-LANE LEFT TURN ROADWAY

CARE" sign locations. 3. Temporary roadside delineation with Channelization Devices is

> 4. For long term projects a channelization/pavement marking plan should be implemented.

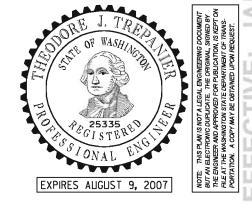
1. For long term projects conflicting pavement markings that are no longer applicable shall be removed or obliterated. Temporary

2. For Hot Mixed Asphalt Pavement, a temporary striping tape shall be installed in conjunction with DO NOT PASS and "PASS WITH

optional. The appropriate taper length shall be L/2. See Standard Plan K-24.20 for minimum taper length (L).

markings shall be used as necessary.

5. Temporary Raised Pavement Marker (TRPM) may be used on a pattern spacing 5' O.C. to simulate a solid line.



TEMPORARY CHANNELIZATION STANDARD PLAN K-70.20-00

SHEET 1 OF 1 SHEET

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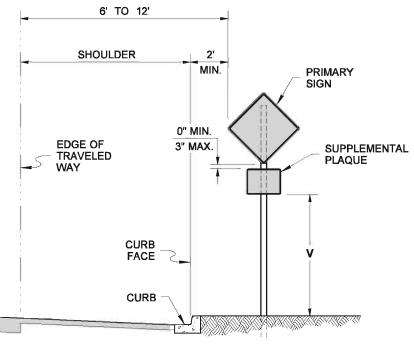


NOTES

. 2008 TO AUGUST 3, 2008

2008

AUGUST



SIGN INSTALLATION (CURB SECTION)

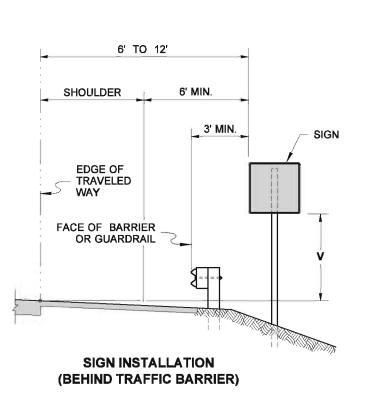
6' TO 12' SHOULDER SIGN **EDGE OF TRAVELED** WAY **EDGE OF SIGN SHALL** NOT INTRUDE ON EDGE OF SIDEWALK **CURB** FACE **SIDEWALK** CURB

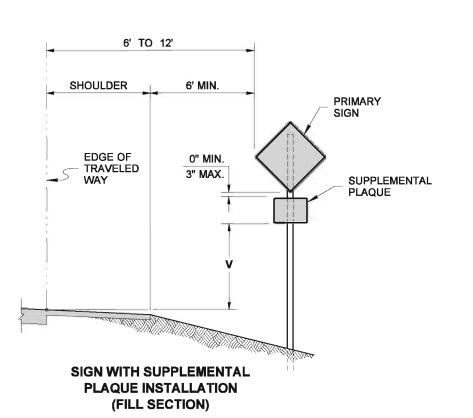
SIGN INSTALLATION (SIDEWALK AND CURB SECTION)

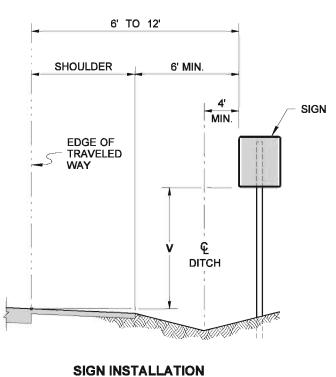
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES**

- 1. For sign installation details, see Std. Plan G series.
- 2. In rural areas, the "V" Height can be a minimum of 7 feet for primary signs and 6 feet for the supplemental plaques for greater visibility, as directed by the engineer.
- 3. 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.

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







(DITCH SECTION)

SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION

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TATAL EXPIRES AUGUST 9, 2007

CLASS A

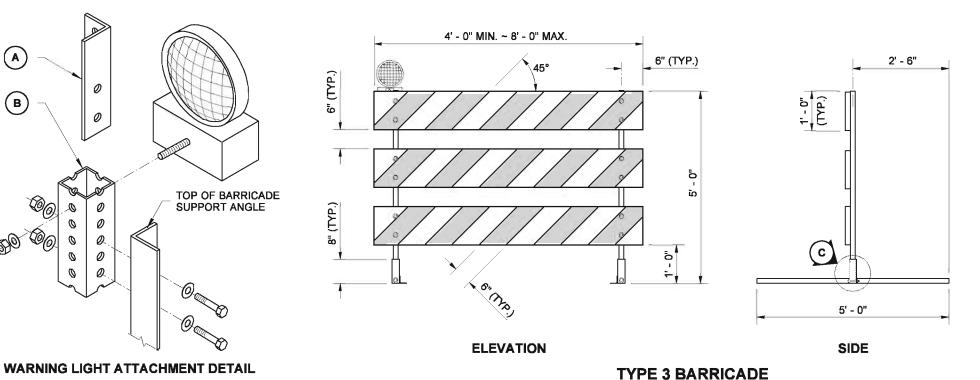
CONSTRUCTION SIGNING INSTALLATION STANDARD PLAN K-80.10-00

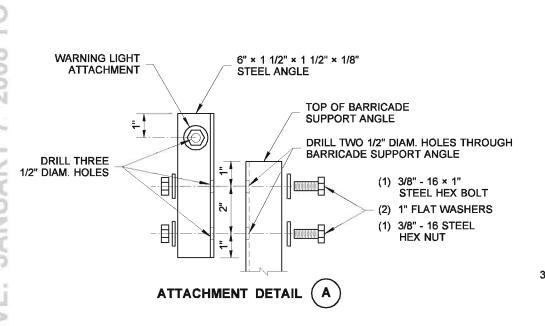
> 02-21-07 STATE DESIGN ENGINEER

Washington State Department of Transportation

EFFECTIVE: JANUARY 7. 2008 TO AUGUST

- 1. All fasteners may be zinc plated, galvanized or stainless steel. All steel angle and tubular steel shall be hot-rolled, high carbon steel, painted or galvanized.
- 2. Install one lightweight Type A Low-Intensity flashing warning light on the traffic side of the barricade. Install two Type A Low-Intensity flashing warning lights per barricade when the barricades are used to close a roadway. Attach the light to the barricade according to the light manufacturer's recommendations or use the details shown on this plan.
- 3. Stripes on barricade rails shall be alternating orange and white retroreflective stripes (sloping downward at an angle of 45 degrees in the direction traffic is to pass).
- 4. The Type 3 barricade design shown on this plan meets the crash test requirements of NCHRP 350. Alternative designs may be approved if they conform to the NCHRP 350 crash test criteria and the MUTCD.
- 5. When a sign is mounted on the barricade, it shall be securely bolted to at least two plywood panels. The top of the sign shall not be higher than the top panel of the barricade.
- 6. When sandbags are used in freezing weather, Urea fertilizer shall be mixed with the sand in a quantity to prevent the sand from freezing.





6" × 2" × 2" × 1/8" TUBULAR

STEEL WITH PRE-DRILLED

TOP OF BARRICADE SUPPORT ANGLE

0

0

0

0

0

0

0

0

USE ATTACHMENT DETAIL (A)

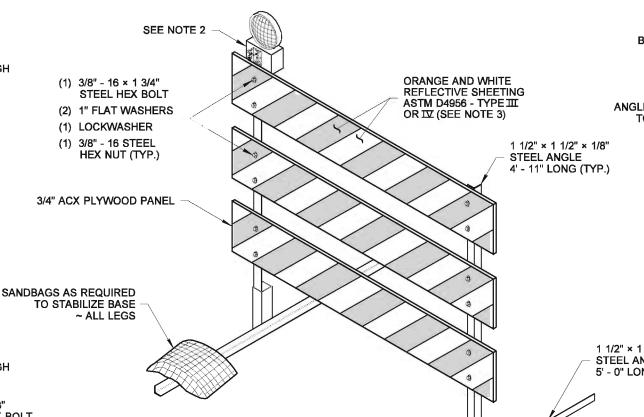
WARNING LIGHT

ATTACHMENT

 \bigcirc

ATTACHMENT DETAIL (B

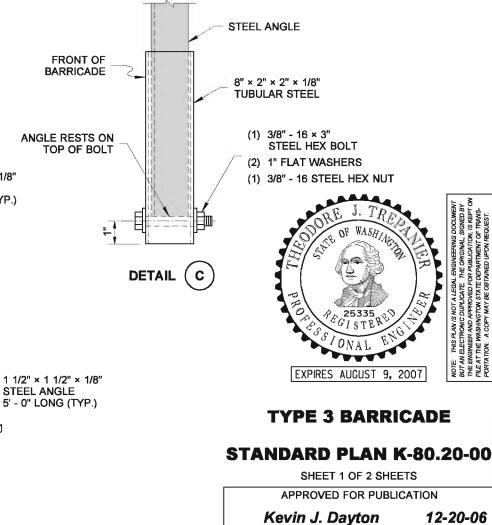
ATTACHMENT DETAIL B



8" × 2" × 2" × 1/8" TUBULAR STEEL

1/8 (TYP.)

ISOMETRIC VIEW



DRILL TWO 1/2" DIAM. HOLES THROUGH

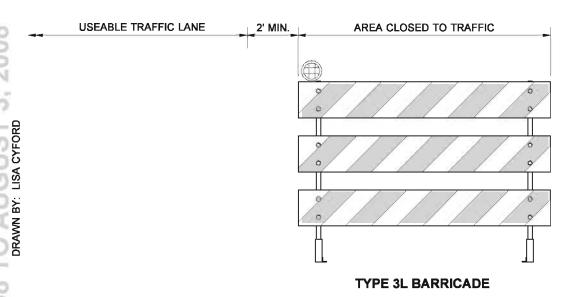
(1) 3/8" - 16 × 3" STEEL HEX BOLT

(2) 1" FLAT WASHERS

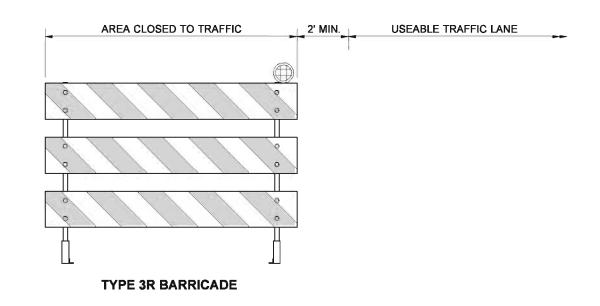
(1) 3/8" - 16 STEEL **HEX NUT**

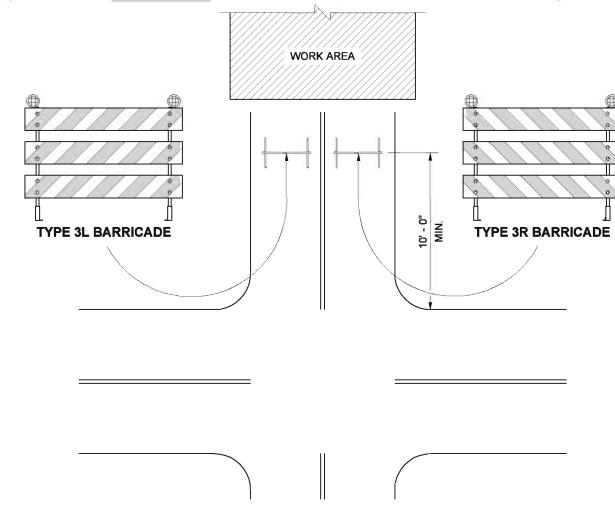
BARRICADE SUPPORT ANGLE

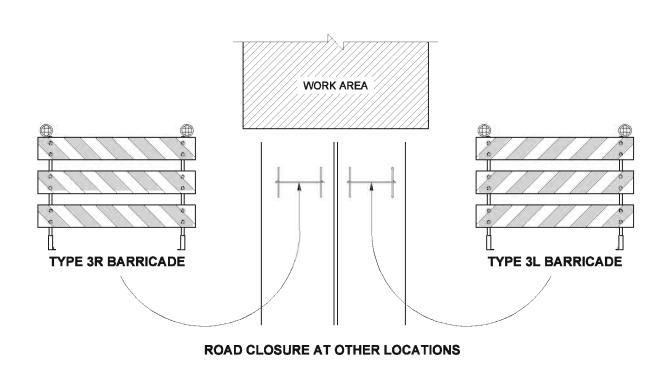
2008 TO AUGU



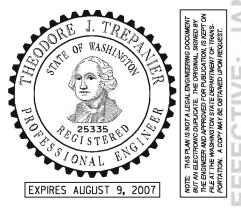
STRIPES ON THE BARRICADES SHALL SLOPE DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS







ROAD CLOSURE AT INTERSECTION



TYPE 3 BARRICADE

STANDARD PLAN K-80.20-00

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Kevin J. Dayton

STATE DESIGN ENGINEER

DATE

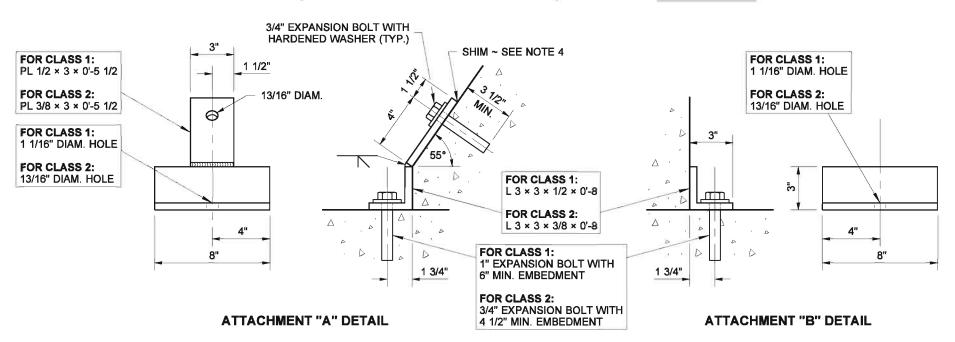
BARRICADE PLACEMENT

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

2008

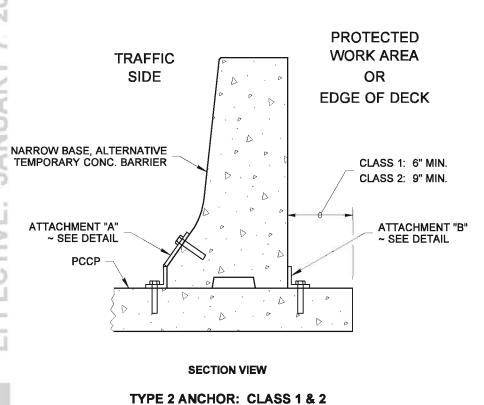
FFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

CTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 JANUARY 7, 2008 TO AUGUST 3, 2008 **NOTES** 3/4" EXPANSION BOLT SHIM ~ SEE NOTE 3 1 1/2" 1. Use Type 1 Anchors when the concrete pavement or bridge deck is 6" or thicker with 2' wide concrete barrier only. Use Type 2 Anchors (Standard Plan K-80.37) 13/16" DIAM. with narrow base barrier. PL 3/8 × 3 × 0'-5 1/2 0 13/16" DIAM. HOLE 2. Adjust the location of the Type 1 Anchors to avoid the main reinforcing in the deck when drilling holes. 13/16" DIAM. HOLE L 3 × 3 × 3/8 × 0'-8 3. Use shims to properly fit the Type 1 Anchors to the barrier and roadway surfaces. Щ 4. Upon removal of the Type 1 Anchors, clean the bolt holes and fill them with grout according to Standard Specification 6.02.3(20). 5. Remove the Type 3 Anchors by first driving the steel pins down through the barrier 3/4" EXPANSION BOLT W/ HARDENED WASHER (TYP.) further into the pavement to allow lifting the barrier without interference, then re-1 3/4" 1 3/4" ~ 4 1/2" MIN. EMBEDMENT move the pins from the pavement. 6. After removing the Type 3 Anchors, clean the pin holes and fill them with sealant **ATTACHMENT "A" DETAIL ATTACHMENT "B" DETAIL** according to Standard Specification 9-04.2. **PROTECTED WORK AREA TRAFFIC** OR **TRAFFIC TRAFFIC** 1/2 SEGMENT LENGTH SIDE SIDE SIDE **EDGE OF DECK** 2' - 1" 2' - 1" (TYP.) (TYP.) ATTACHMENT "A" ATTACHMENT "A" ATTACHMENT "A" ~ SEE DETAIL - SEE DETAIL - SEE DETAIL ATTACHMENT "B" SEE DETAIL PCCP PCCP ATTACHMENT LOCATION PRECAST CONCRETE **PLAN VIEW** BARRIER SECTION (TYP.) (TYP.) ~ SEE NOTE 2 **TYPE 1 ANCHOR ATTACHMENT LOCATIONS SECTION VIEWS** (F-SHAPE SHOWN) **TYPE 1 ANCHOR TYPE 1 ANCHOR** TEMPORARY INSTALLATION OF ATTACHMENT LOCATIONS PRECAST CONC. BARRIER TYPE 2 (STD. PLAN C-8) AND TEMPORARY CONC. BARRIER (F-SHAPE) (STD. PLAN K-80.30) ON CEMENT CONC. PAVÈMENT OR BRIDGE DECK **TRAFFIC PROTECTED TRAFFIC TRAFFIC** PRECAST CONCRETE 2' - 0" 1' - 0" SIDE **WORK AREA** SIDE SIDE BARRIER SECTION (TYP.) 2" DIAM. PINNING HOLE (TYP.) (TYP.) 🖋 EXPIRES JULY 24, 2008 1' - 0" ۰ **TEMPORARY CONC. BARRIER** 2' - 0" PINNING HOLE (TYP.) ~ ONLY REQUIRED **ANCHORING** ON TRAFFIC SIDE(S) OF BARRIER **PLAN VIEW** STANDARD PLAN K-80.35-00 1" DIAM. × 30" **GALVANIZED STEEL PIN** SHEET 1 OF 1 SHEET **TYPE 3 ANCHOR PIN LOCATIONS** APPROVED FOR PUBLICATION TWO PINS REQUIRED TWO PINS REQUIRED ON THE TRAFFIC SIDE **SECTION VIEWS** PER TRAFFIC SIDE **TYPE 3 ANCHOR** Ken L. Smith 02-21-07 ~ TWO PINS TOTAL. (F-SHAPE SHOWN) ~ FOUR PINS TOTAL TEMPORARY INSTALLATION OF PER BARRIER SECTION PER BARRIER SECTION PRECAST CONC. BARRIER TYPE 2 (STD. PLAN C-8) AND TEMPORARY CONC. BARRIER (F-SHAPE) (STD. PLAN K-80.30) **TYPE 3 ANCHOR PIN LOCATIONS** ON HOT MIX ASPHALT PAVEMENT

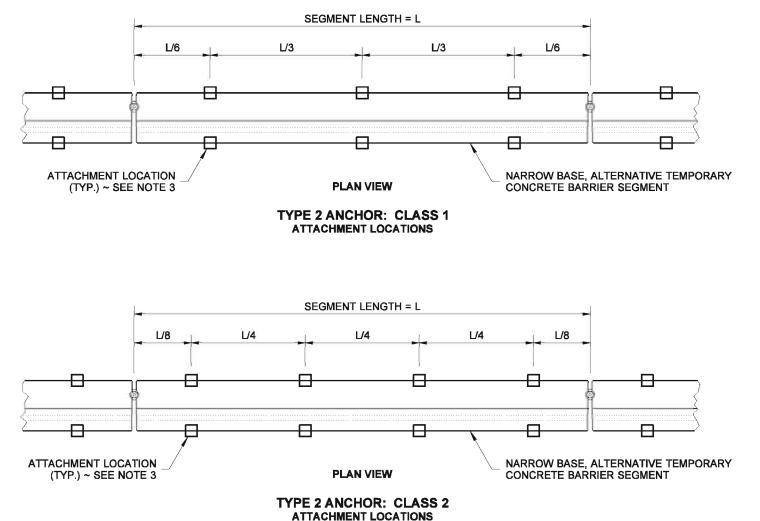


NOTES

- 1. The intended use of this plan is for the temporary installation of Alternative Temporary Concrete Barrier (F-Shape), Narrow Base (see Standard Plan K-80.30) on cement concrete pavement or bridge deck.
- 2. Use Class 1 when the concrete pavement or bridge deck is 9" or thicker; use Class 2 when it is 6" or thicker.
- 3. Adjust the location of the anchors to avoid the main reinforcing in the deck when drilling holes.
- 4. Use shims to properly fit the anchors to the barrier and roadway surfaces.
- 5. Upon removal of the anchors, clean the bolt holes and fill them with grout according to Standard Specification 6.02.3(20).



ATTACHMENT LOCATIONS



NOTE THIS PLAN IS NOT A LEGAL ENGINEER WILL A COPY MAY BE COSTANTED UPON BUT THE WASHINGTON STATE DEPONTABLY THE MASHINGTON STATE DEPONTABLY THE WASHINGTON ST

TEMPORARY CONC. BARRIER ANCHORING ~ NARROW

STANDARD PLAN K-80.37-00

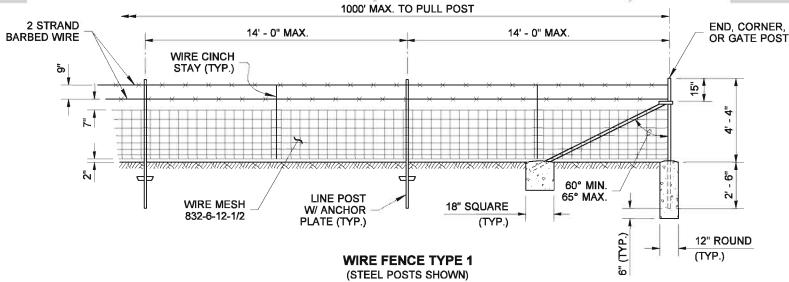
SHEET 1 OF 1 SHEET

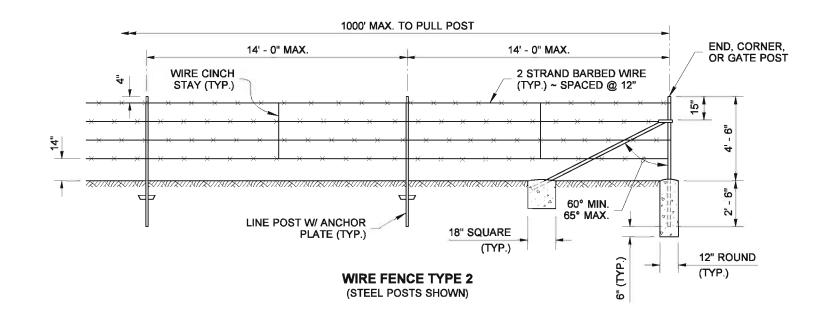
APPROVED FOR PUBLICATION

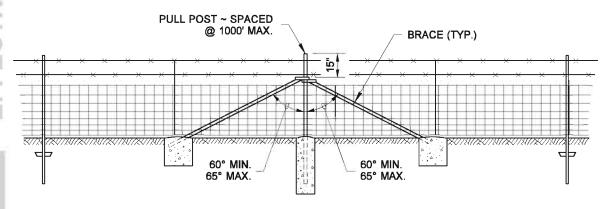


Washington State Department of Train

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008







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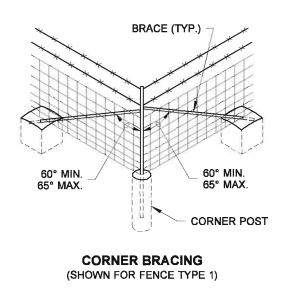
2008

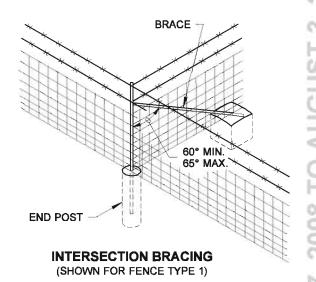
INTERMEDIATE BRACING / PULL POST (SHOWN FOR FENCE TYPE 1)

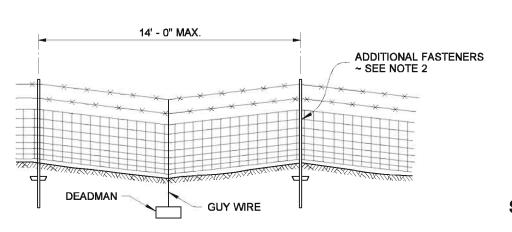
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 1. The bracing and pull post details for Wire Fence Type 2 are the same as for Type 1.
- Attach the wire mesh to the posts using four fasteners. Three additional fasteners per post are required within and at the limits of sag conditions. Use additional fasteners on posts which mark the angle point of any sudden change in topography.
- 3. Wood anchors (for wood posts) shall be 2×4 lumber, 12" long minimum, and fastened with three 16d galvanized nails.







GRADE DEPRESSION (SAG) DETAIL
(STEEL POSTS SHOWN)



WIRE FENCE TYPES 1 & 2 AND WIRE GATES

STANDARD PLAN L-10.10-00

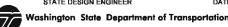
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

Ken L. Smith

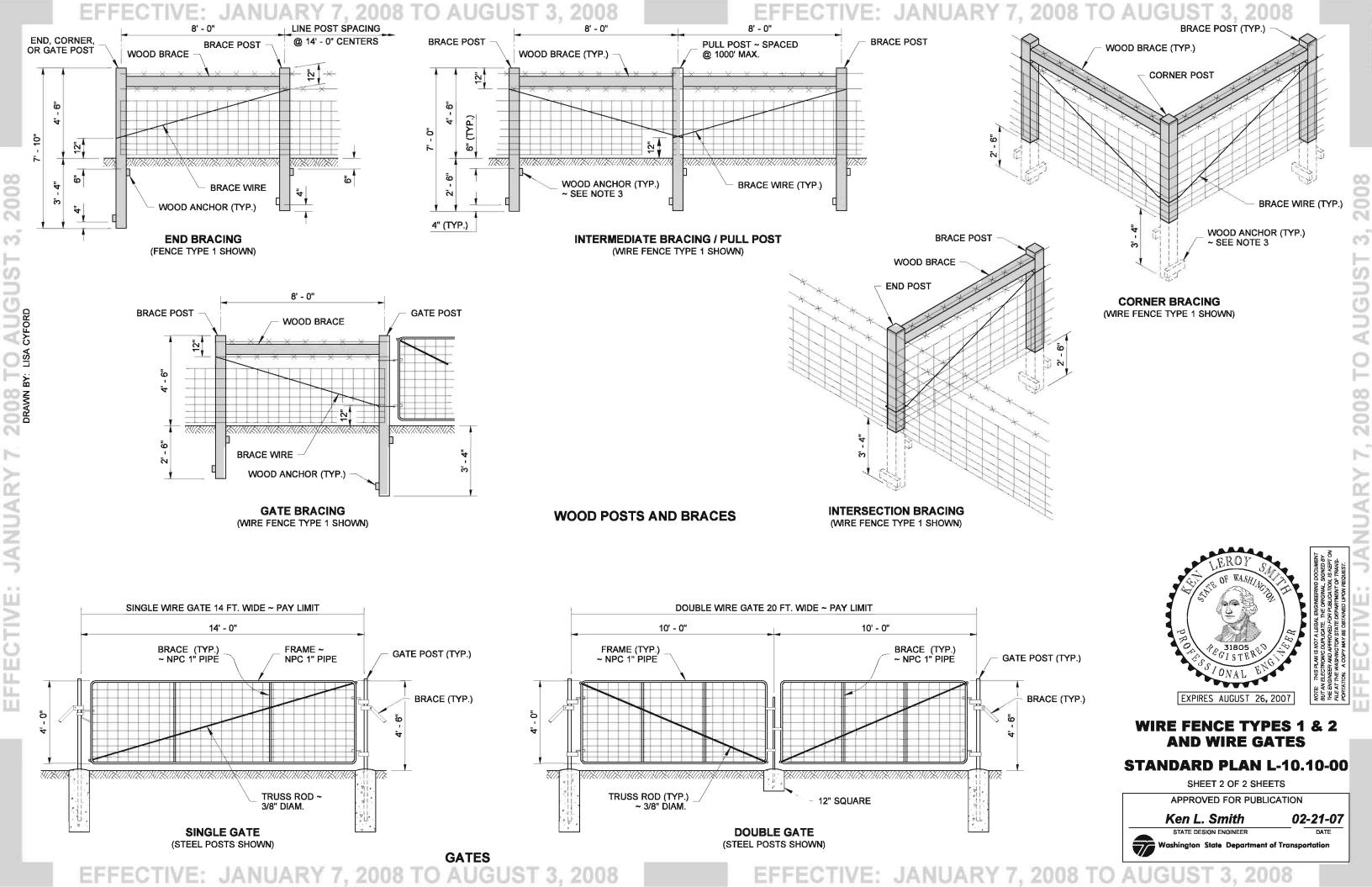
STATE DESIGN ENGINEER

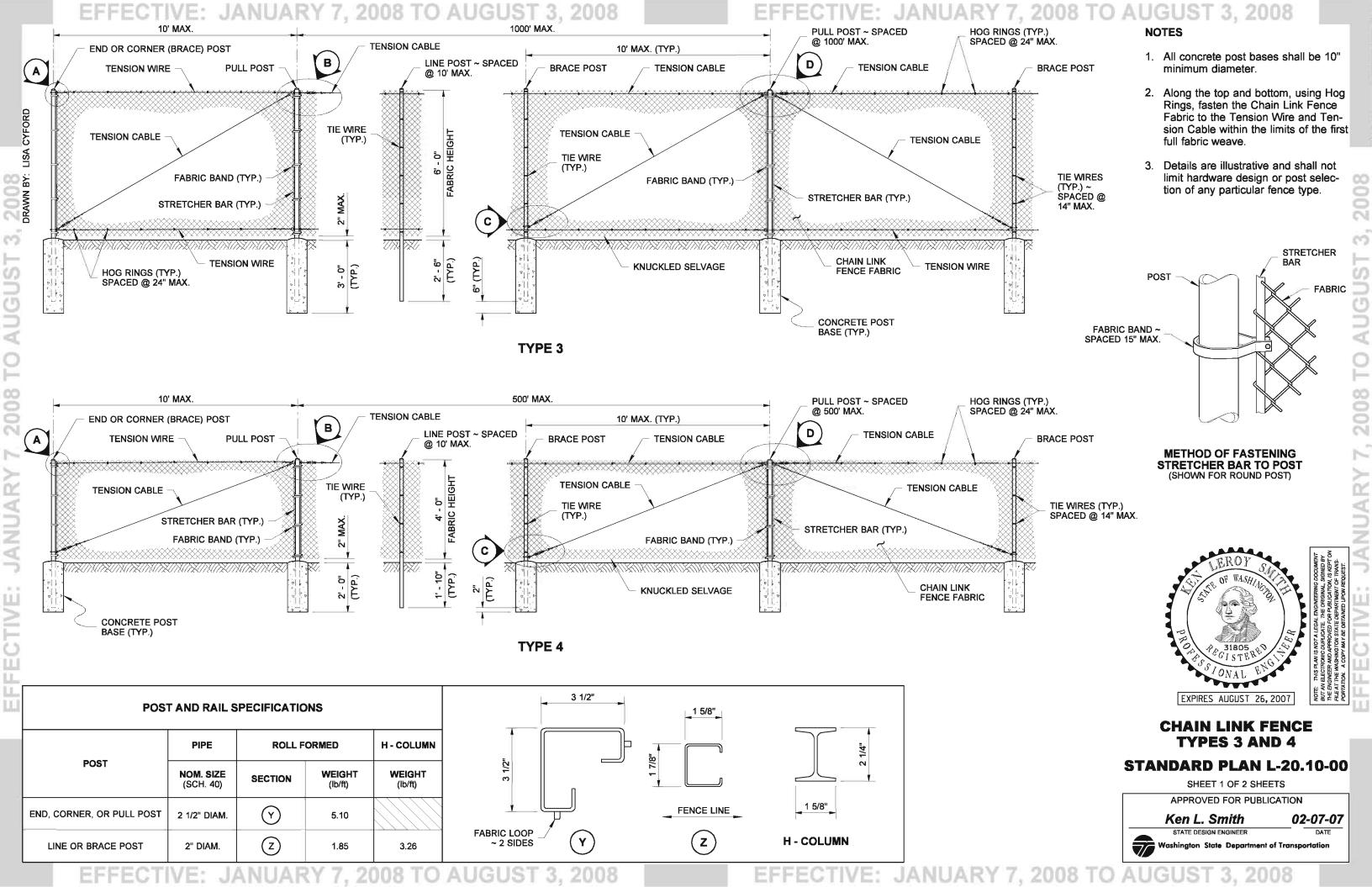
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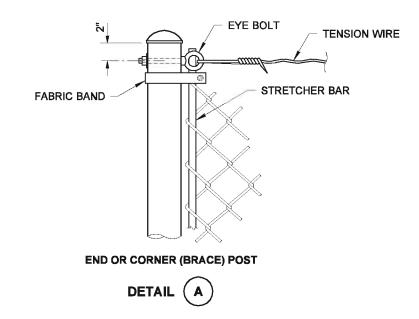


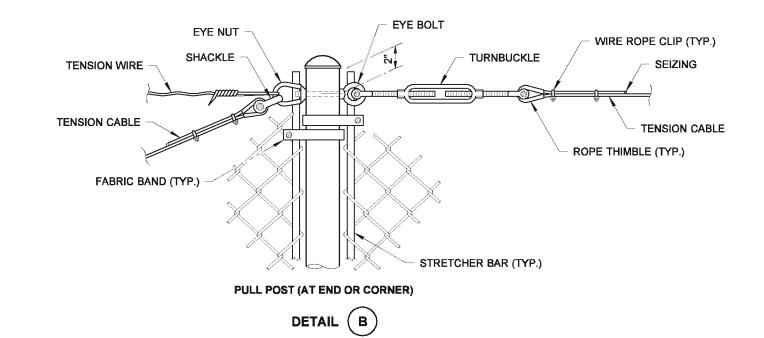
STEEL POSTS AND BRACES

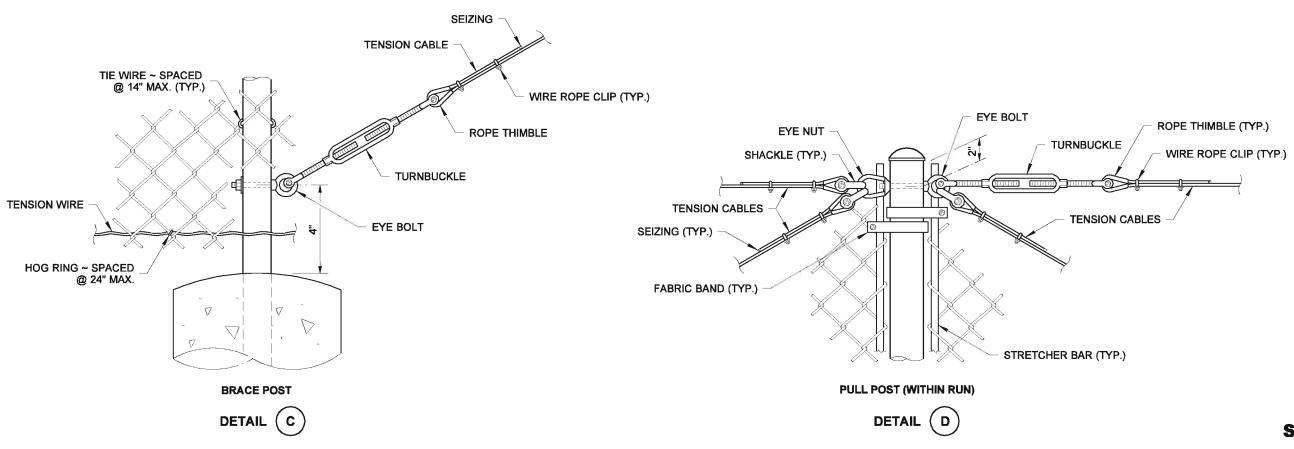
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008













CHAIN LINK FENCE TYPES 3 AND 4

STANDARD PLAN L-20.10-00

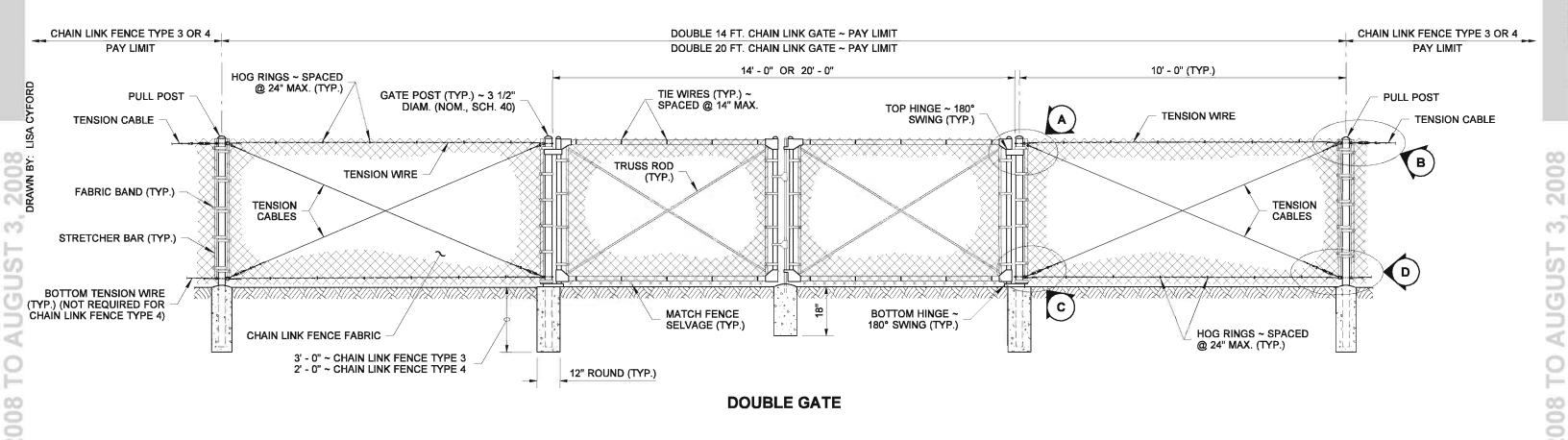
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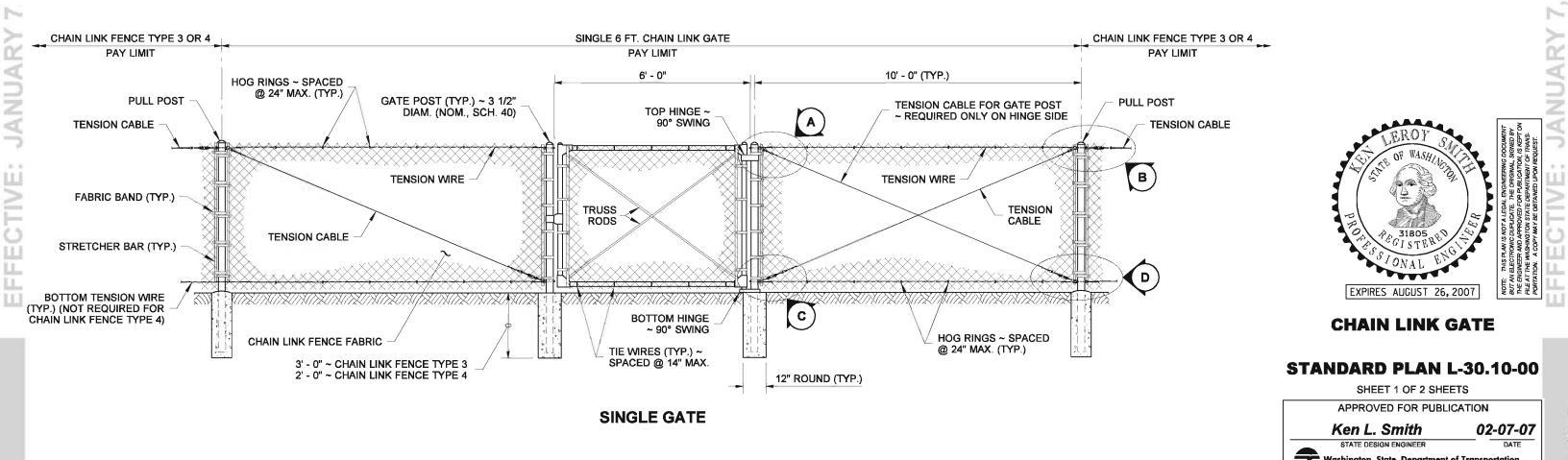
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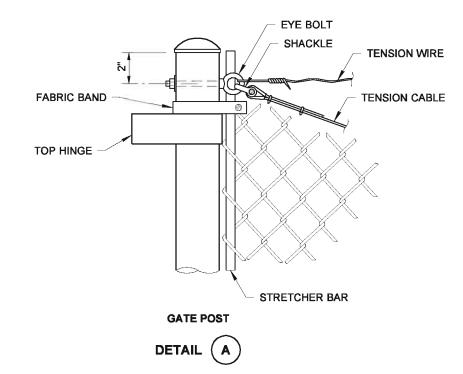
Ken L. Smith

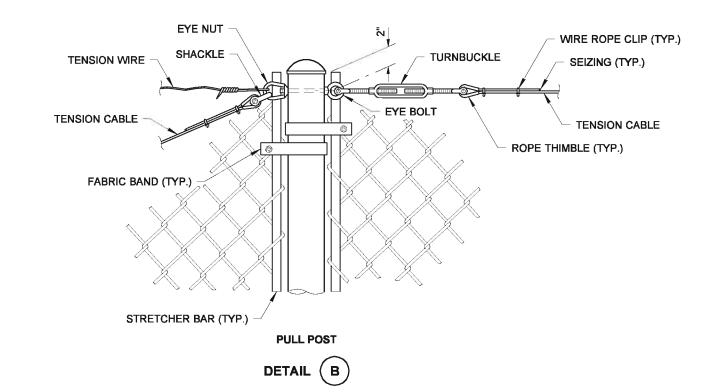


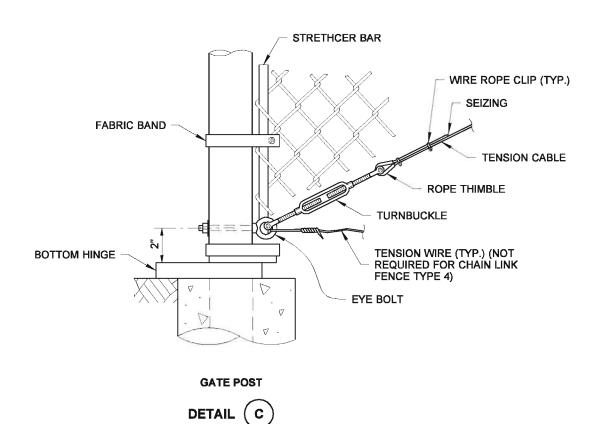
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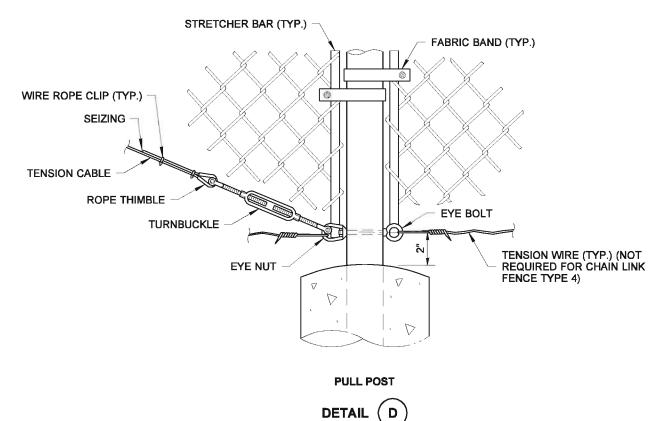














CHAIN LINK GATE

STANDARD PLAN L-30.10-00

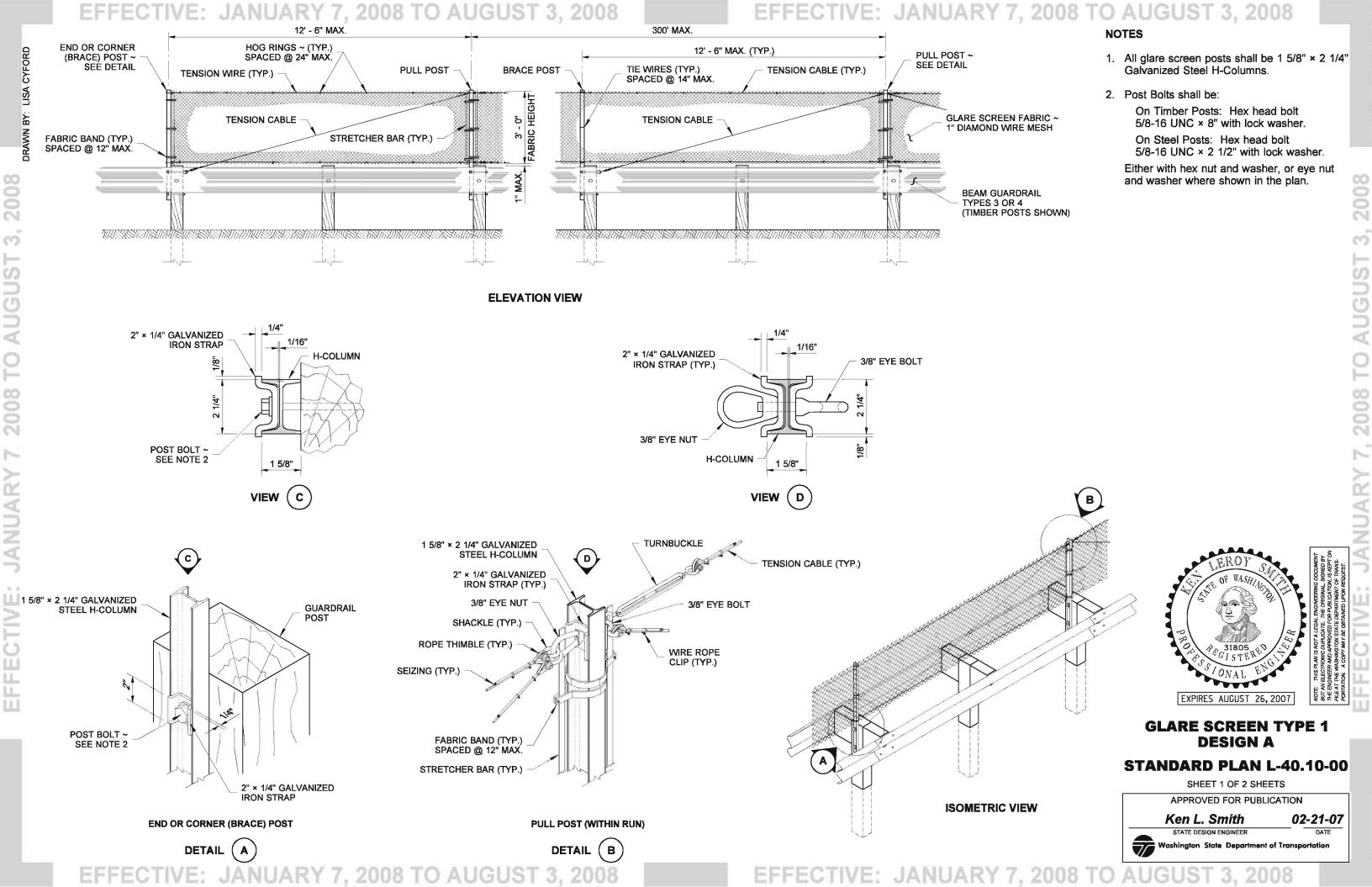
SHEET 2 OF 2 SHEETS

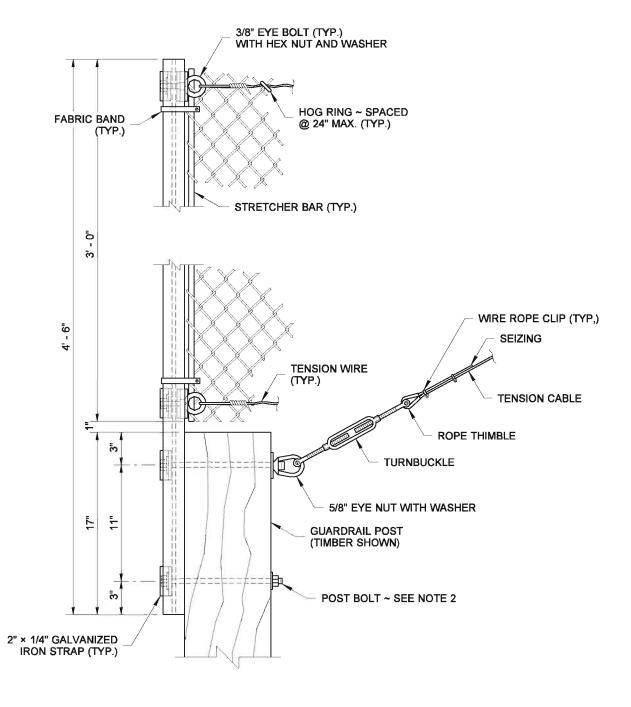
APPROVED FOR PUBLICATION



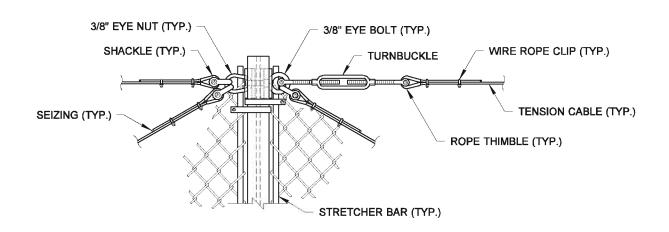
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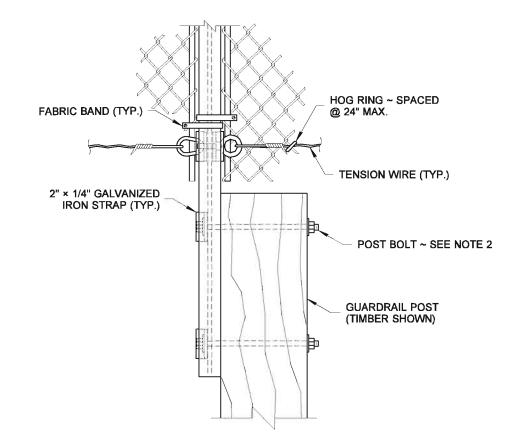






END OR CORNER, (BRACE) POST DETAIL





PULL POST (WITHIN RUN) DETAIL



GLARE SCREEN TYPE 1 DESIGN A

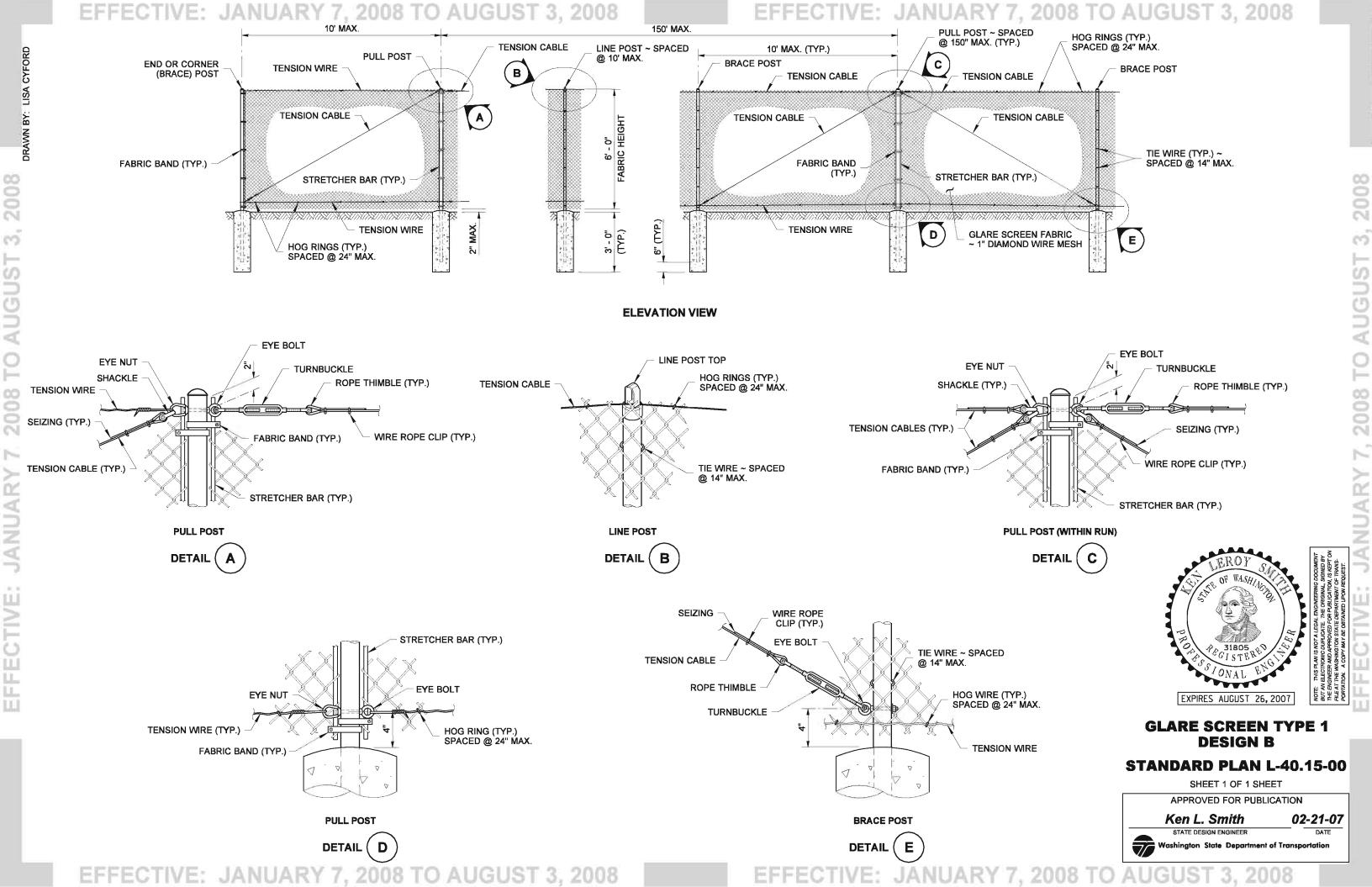
STANDARD PLAN L-40.10-00

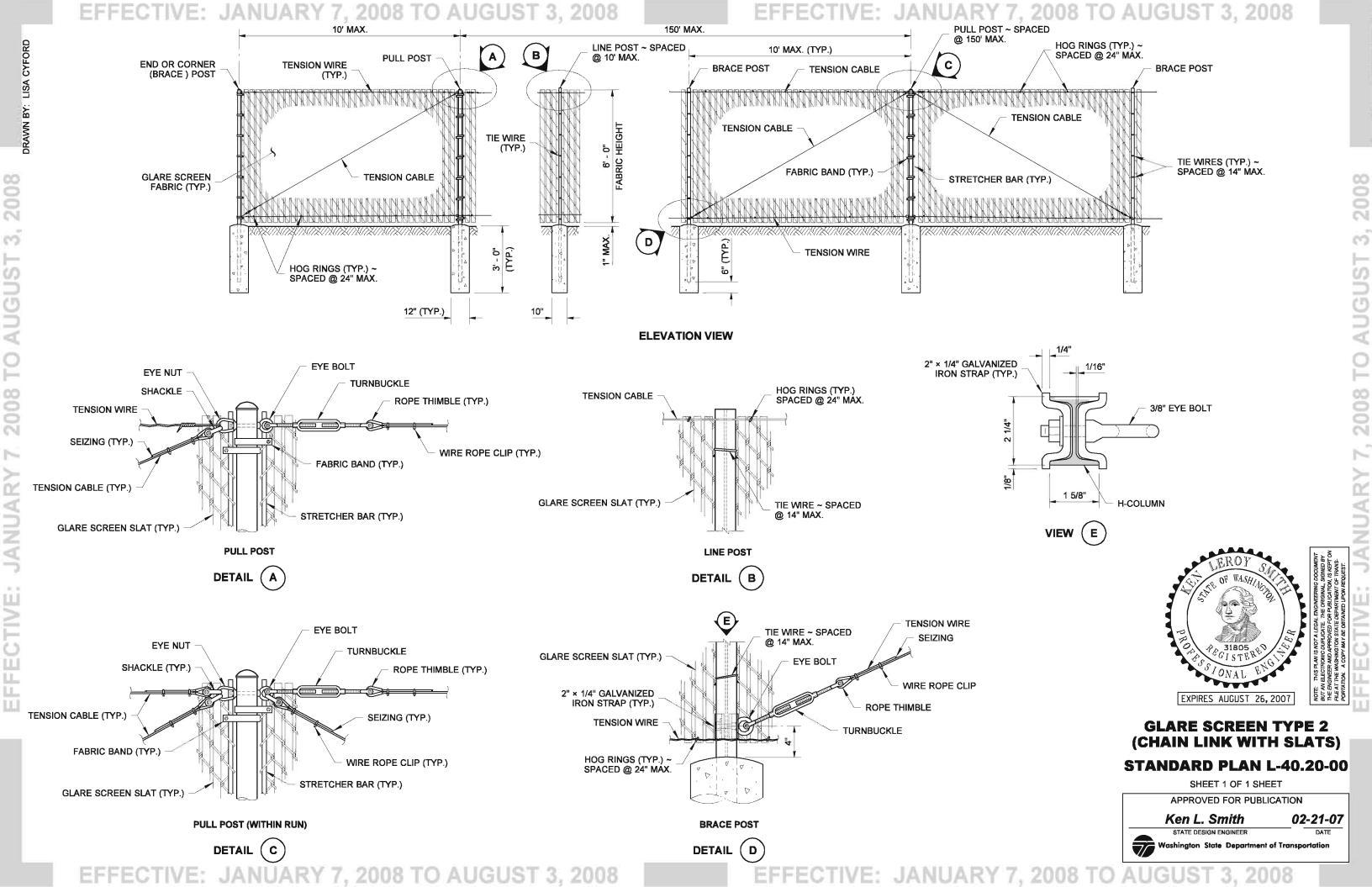
SHEET 2 OF 2 SHEETS

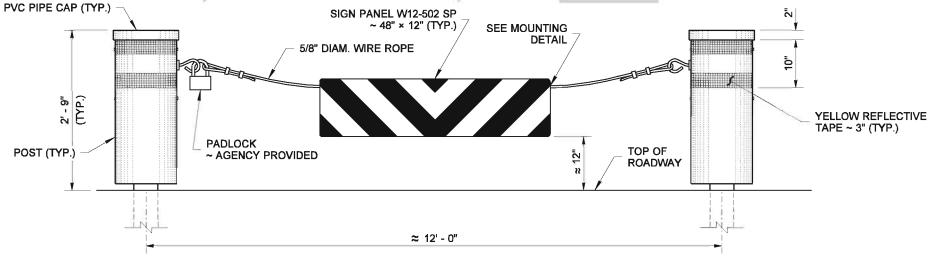
APPROVED FOR PUBLICATION

02-21-07 Ken L. Smith

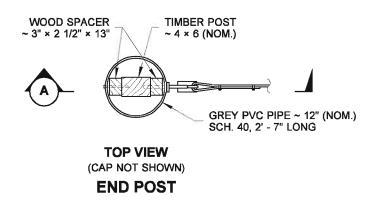


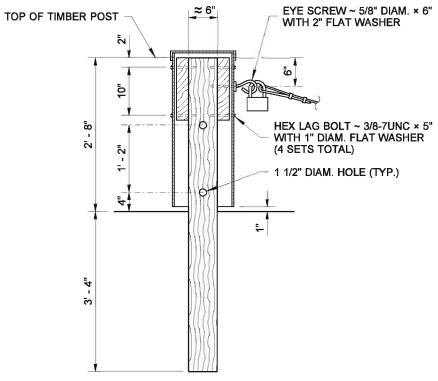




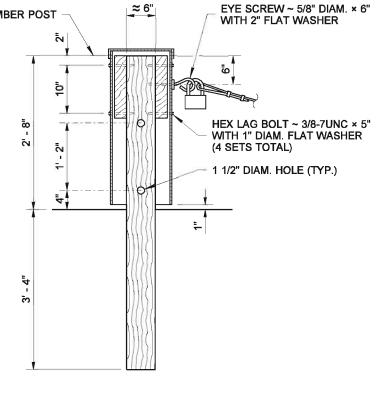


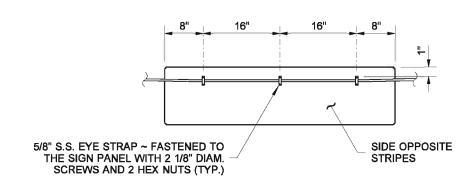
ELEVATION





SECTION (A)





SIGN PANEL MOUNTING DETAIL



ACCESS CONTROL GATE

STANDARD PLAN L-70.10-00

SHEET 1 OF 1 SHEET

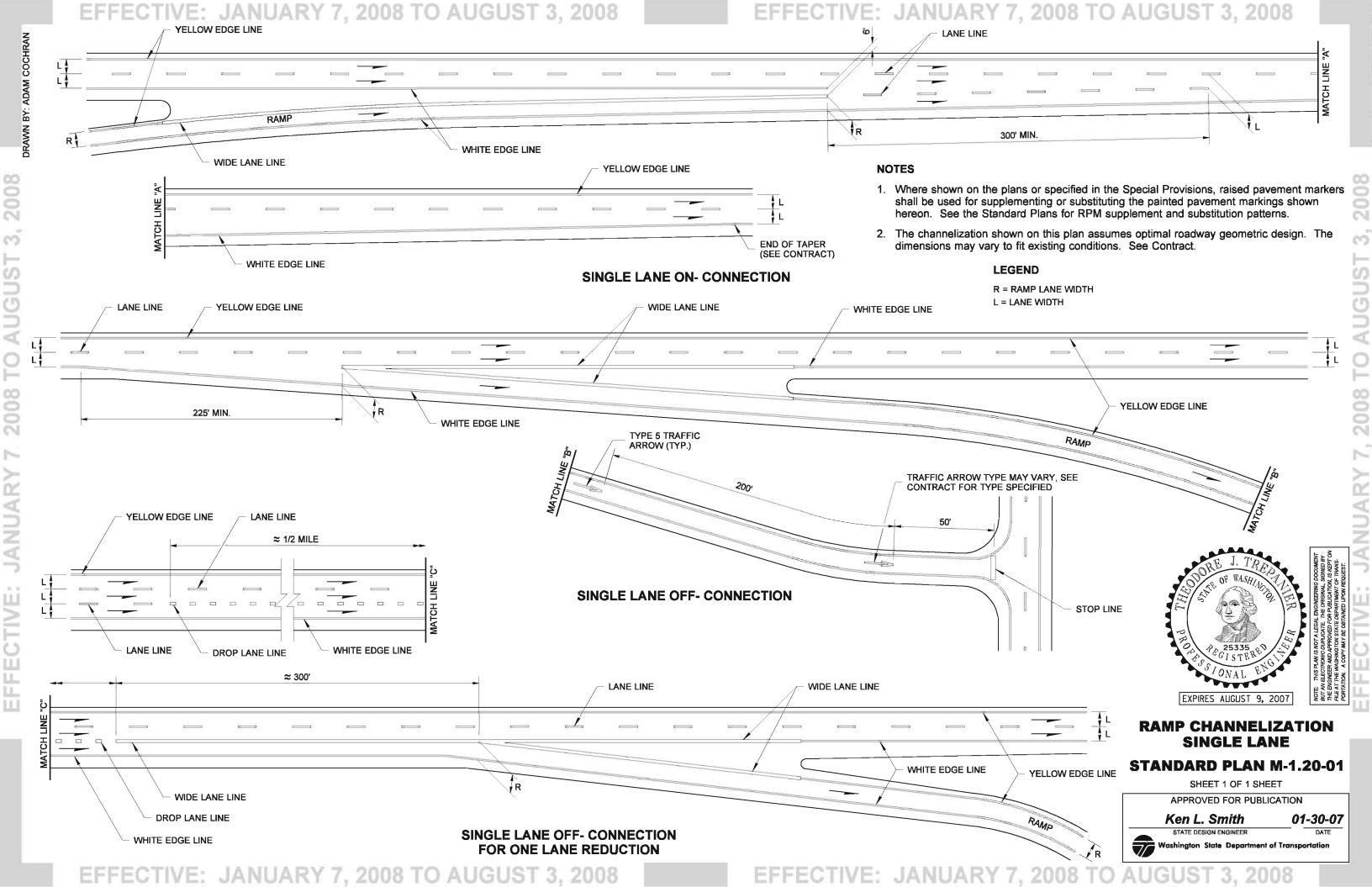
APPROVED FOR PUBLICATION

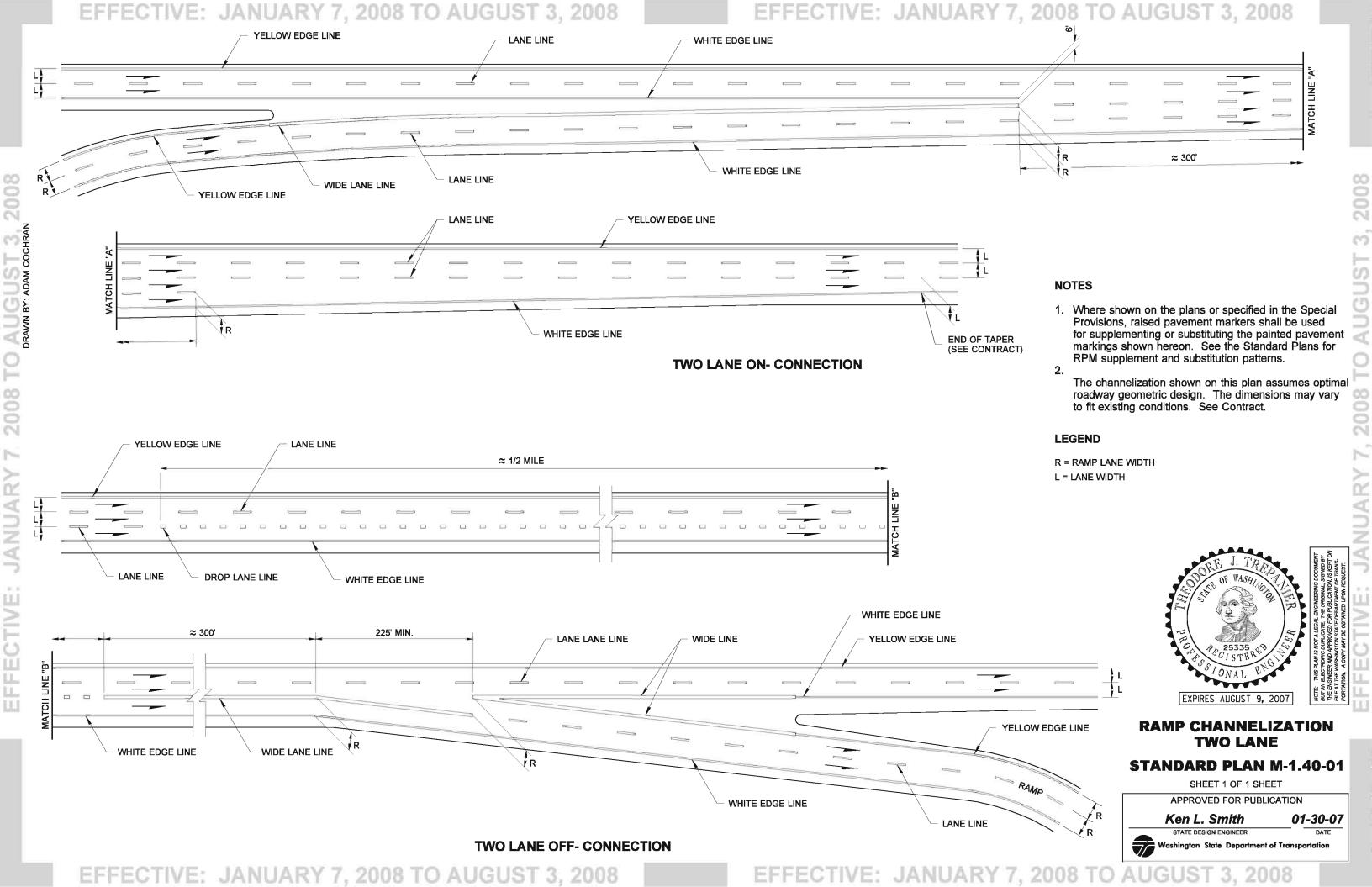
Ken L. Smith

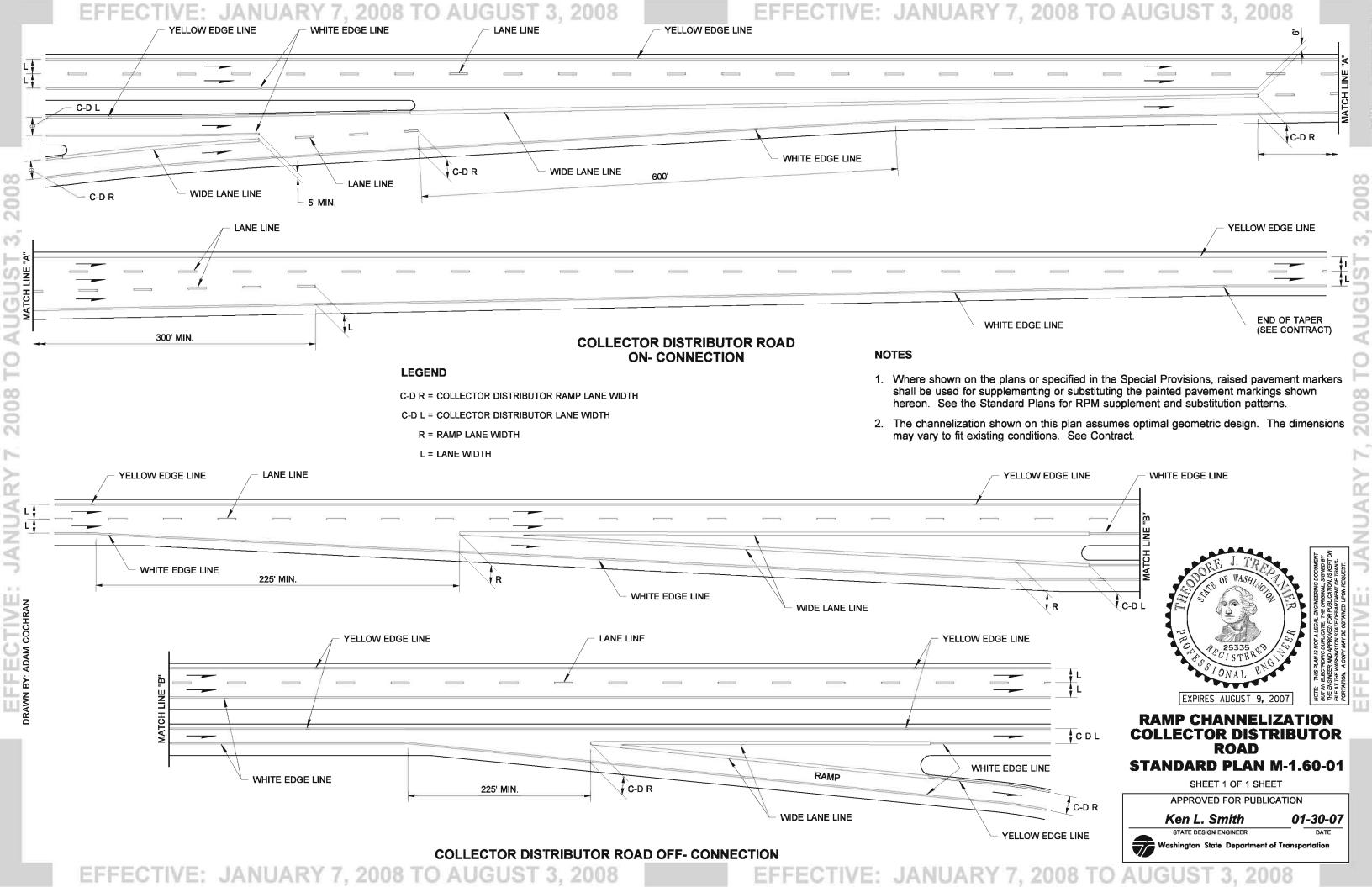
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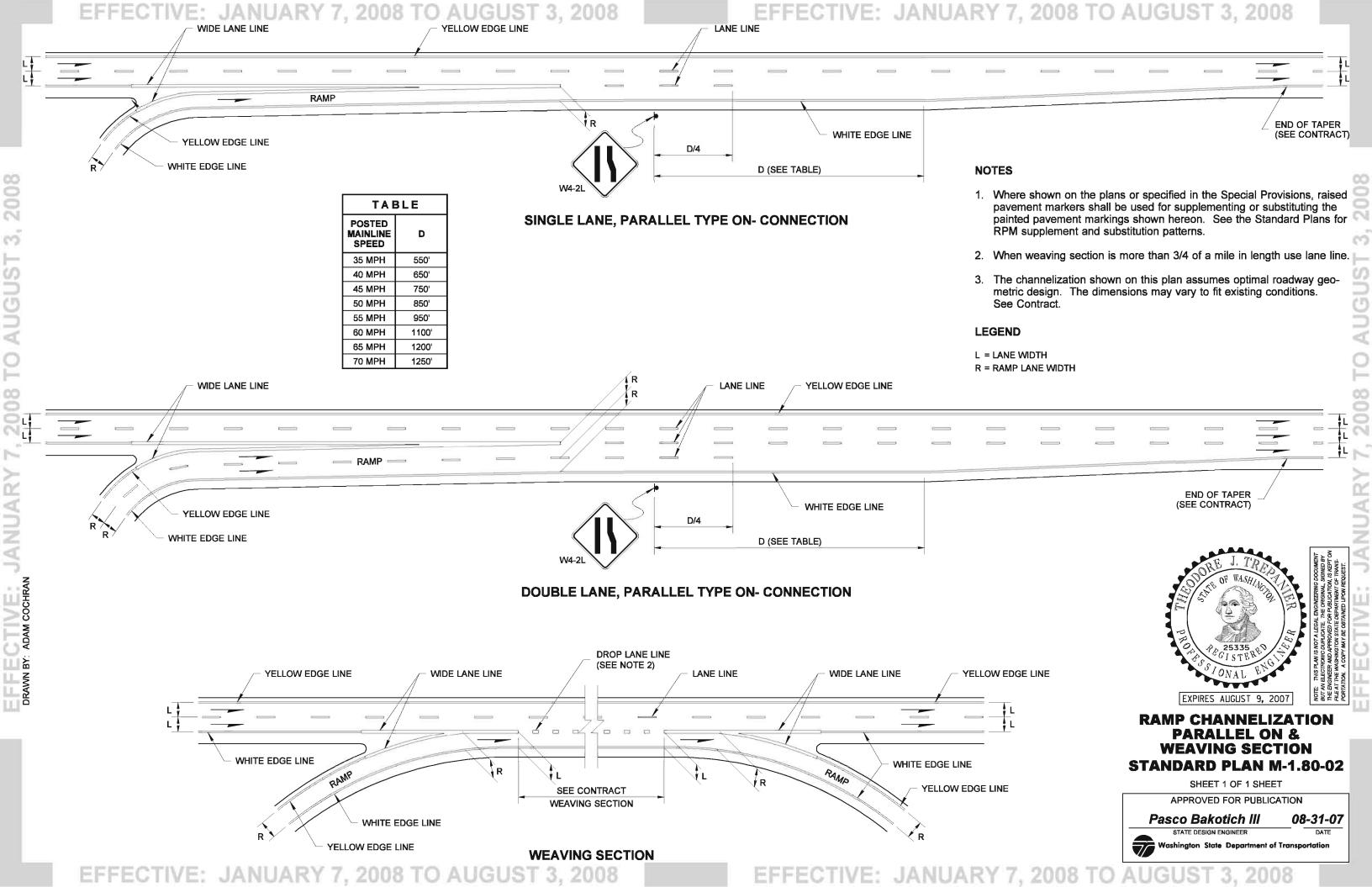


SECTION (B)







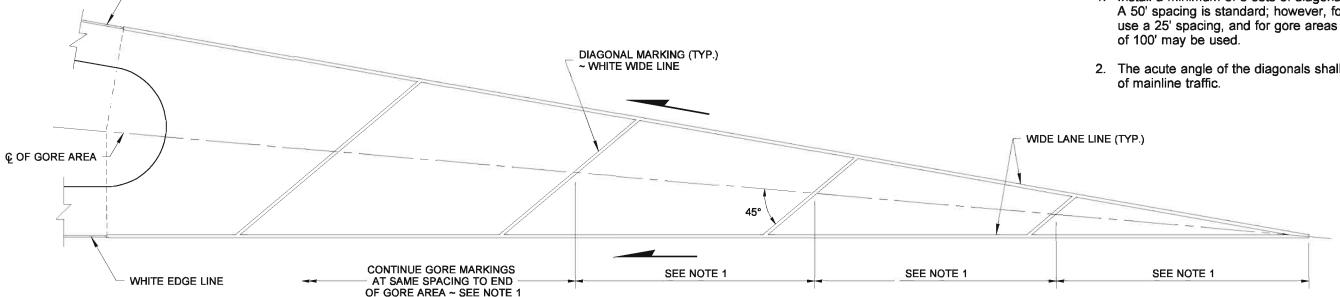


YELLOW EDGE LINE

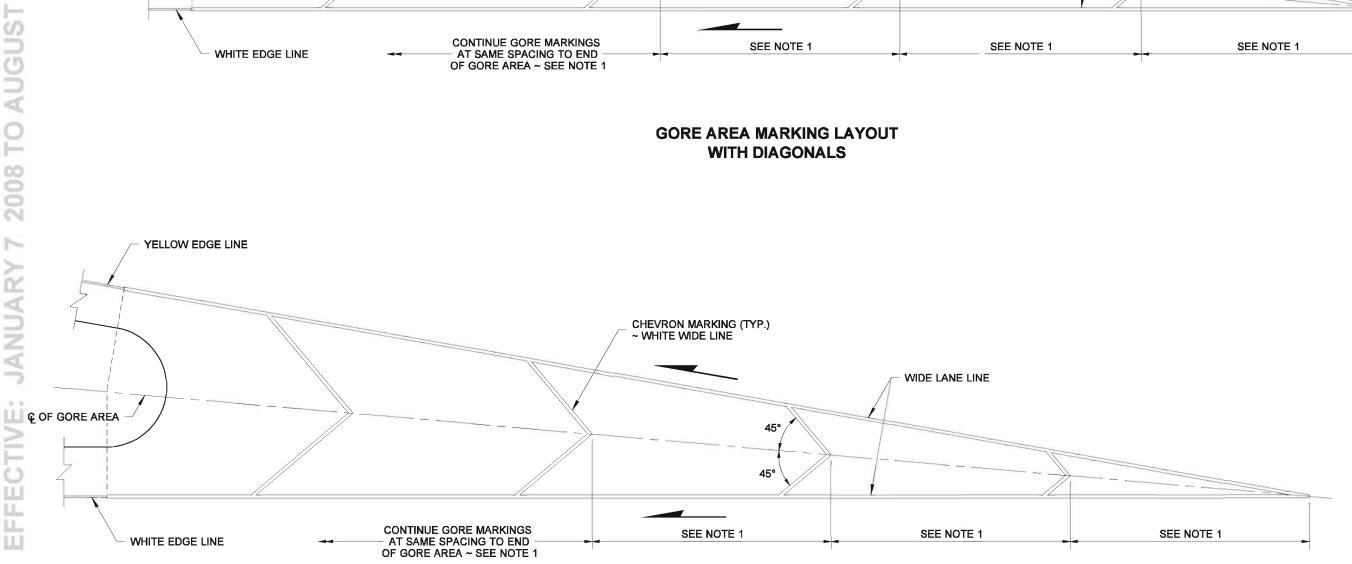
2008

NOTES

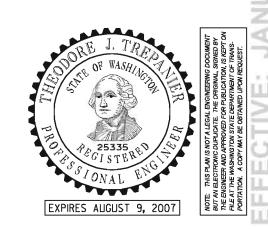
- 1. Install a minimum of 3 sets of diagonals/chevrons in the gore area. A 50' spacing is standard; however, for gore areas shorter than 150' use a 25' spacing, and for gore areas greater than 400' a spacing
- 2. The acute angle of the diagonals shall always point in the direction



GORE AREA MARKING LAYOUT WITH DIAGONALS



GORE AREA MARKING LAYOUT WITH CHEVRONS



GORE AREA MARKING LAYOUTS

STANDARD PLAN M-2.20-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith

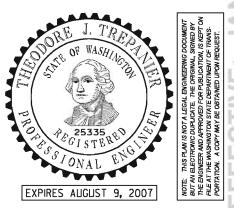
01-30-07



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 TYPE 2Y RPMS **NOTES** @ 80' SPACING YELLOW EDGE LINE 1. Install a minimum of 3 sets of diagonals/chevrons in the gore area. VARIES A 50' spacing is standard; however, for gore areas shorter than 150' (80' MAX.) 20' (TYP.) use a 25' spacing, and for gore areas greater than 400' a spacing of 100' may be used. 2. The acute angle of the diagonals shall always point in the direction TYPE 2W RPMS (TYP.) of mainline traffic. DIAGONAL MARKING (TYP.) ~ WHITE WIDE LINE WIDE LANE LINE (TYP.) 20' (TYP.) **©** OF GORE AREA 15' 45° CONTINUE GORE MARKINGS **SEE NOTE 1 SEE NOTE 1** SEE NOTE 1 WHITE EDGE LINE AT SAME SPACING TO END OF GORE AREA ~ SEE NOTE 1

GORE AREA MARKING LAYOUT TYPE 2Y RPMS WITH DIAGONALS @ 80' SPACING YELLOW EDGE LINE VARIES (80' MAX.) 20' (TYP.) WIDE LANE LINE (TYP.) TYPE 2W RPMS (TYP.) CHEVRON MARKING (TYP.) ~ WHITE WIDE LINE 20' (TYP.) 15' OF GORE AREA 45° CONTINUE GORE MARKINGS SEE NOTE 1 SEE NOTE 1 SEE NOTE 1 WHITE EDGE LINE AT SAME SPACING TO END

GORE AREA MARKING LAYOUT WITH CHEVRONS

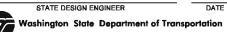


GORE AREA SUPPLEMENT WITH TYPE 2 RAISED PAVEMENT MARKERS STANDARD PLAN M-2.40-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

01-30-07 Ken L. Smith



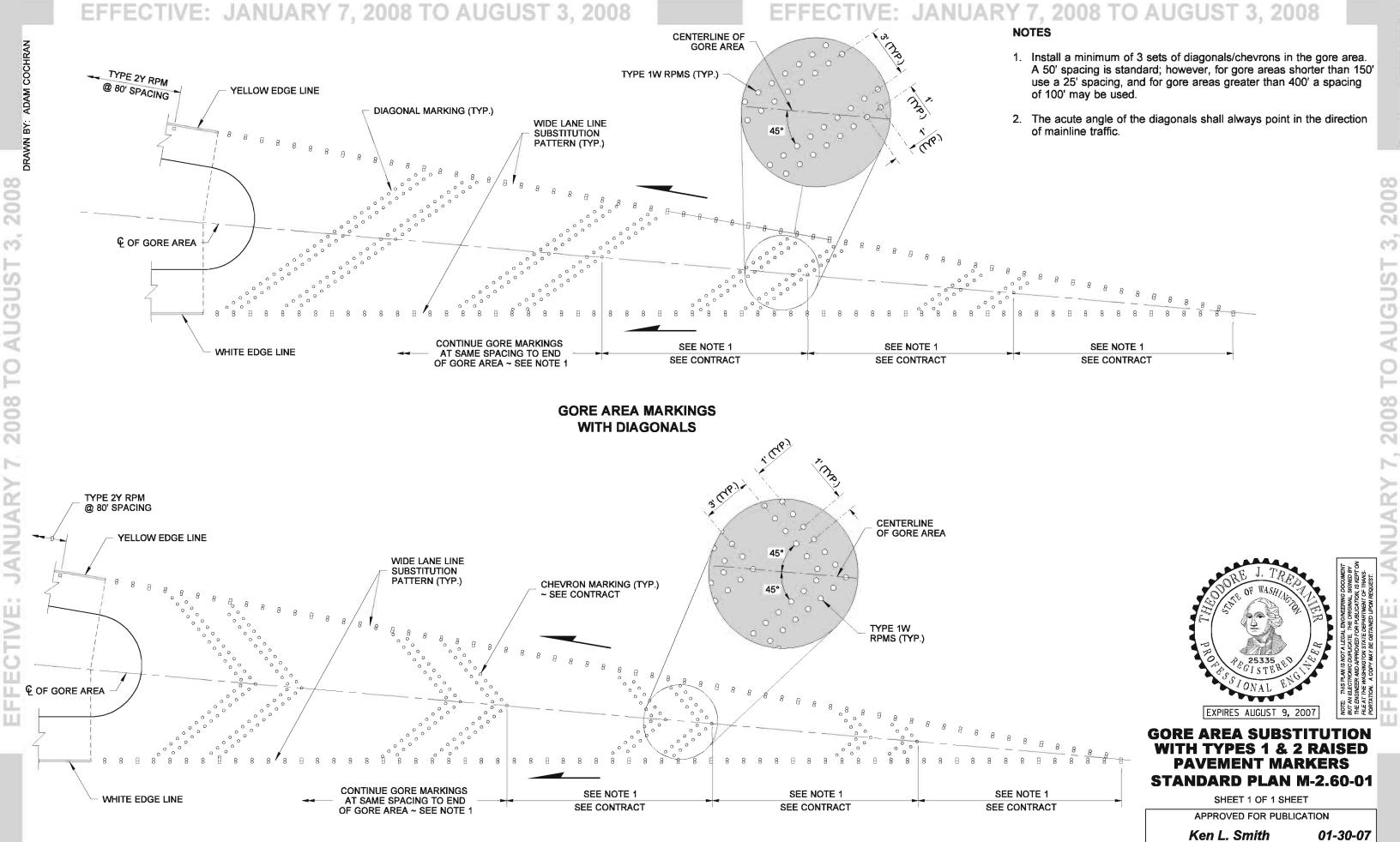
OF GORE AREA ~ SEE NOTE 1

2008

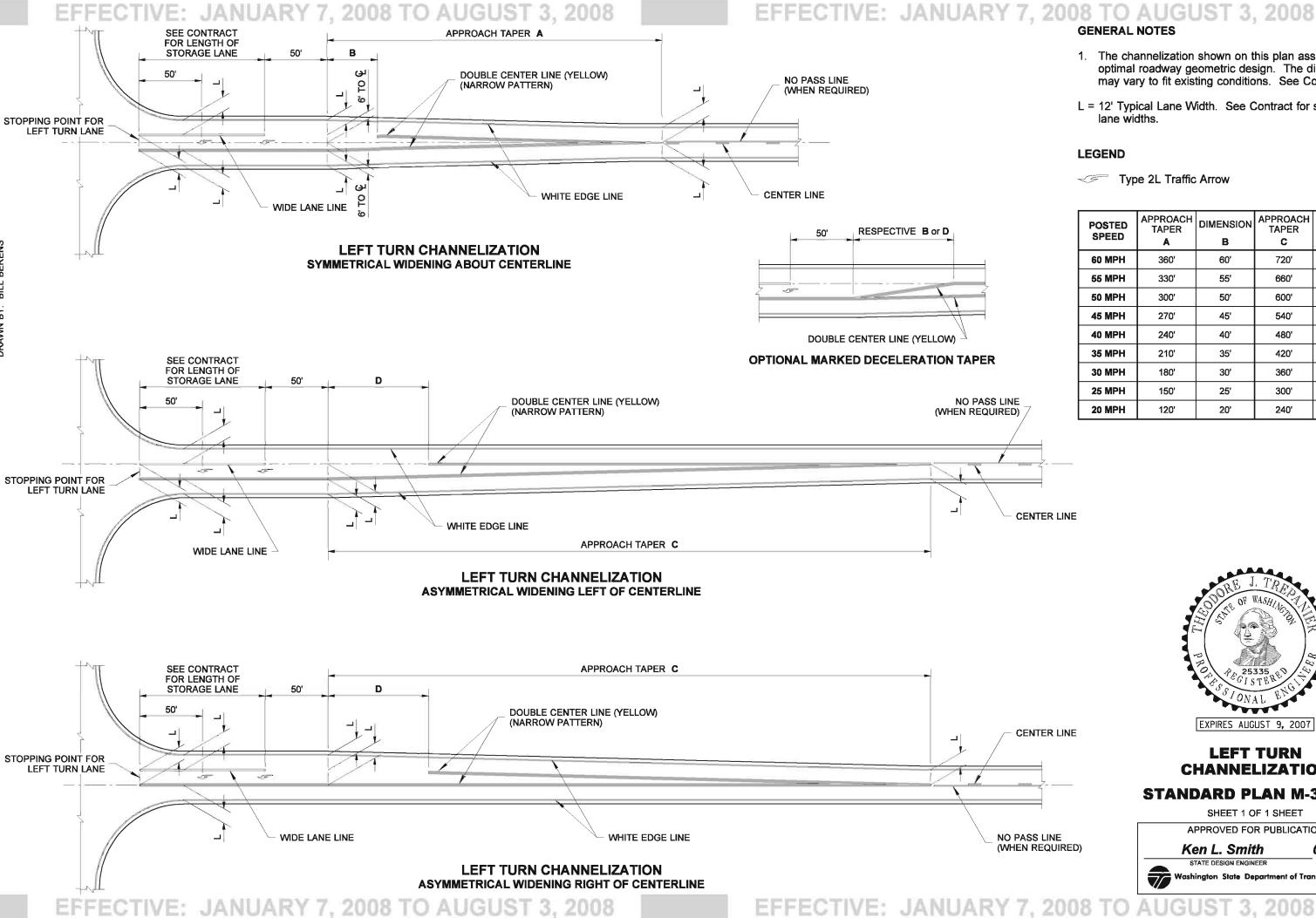
TO AUGUST

2008

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GORE AREA MARKINGS WITH CHEVRONS



- 1. The channelization shown on this plan assumes optimal roadway geometric design. The dimensions may vary to fit existing conditions. See Contract.
- L = 12' Typical Lane Width. See Contract for specified

Type 2L Traffic Arrow

POSTED SPEED	APPROACH TAPER	DIMENSION	APPROACH TAPER	DIMENSION
O. LLD	A	В	С	D
60 MPH	360'	60'	720'	120'
55 MPH	330'	55'	660'	110'
50 MPH	300'	50'	600'	100'
45 MPH	270'	45'	540'	90'
40 MPH	240'	40'	480'	80'
35 MPH	210'	35'	420'	70'
30 MPH	180'	30'	360'	60'
25 MPH	150'	25'	300'	50'
20 MPH	120'	20'	240'	40'



LEFT TURN CHANNELIZATION

STANDARD PLAN M-3.10-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

01-30-07 Ken L. Smith



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008 APPROACH TAPER G FOR LENGTH OF STORAGE LANE NO PASS LINE (WHEN REQUIRED) WHITE EDGE LINE STOPPING POINT FOR LEFT TURN LANE 15 **CENTER LINE** DOUBLE CENTER LINE (YELLOW) WIDE LANE (NARROW PATTERN) **LEFT TURN CHANNELIZATION** REDUCED TAPER LENGTHS ~ SYMMETRICAL WIDENING (FOR LIMITED USE IN URBAN AREAS WITH POSTED SPEEDS OF 40 MPH OR LESS) APPROACH TAPER J SEE CONTRACT FOR LENGTH OF STORAGE LANE 50' **DOUBLE CENTER LINE (YELLOW)** (NARROW PATTERN) **CENTER LINE** STOPPING POINT FOR **LEFT TURN LANE** JANUARY WIDE LANE LINE WHITE EDGE LINE NO PASS LINE (WHEN REQUIRED) **LEFT TURN CHANNELIZATION** REDUCED TAPER LENGTHS ~ ASYMMETRICAL WIDENING RIGHT OF CENTERLINE (FOR LIMITED USE IN URBAN AREAS WITH POSTED SPEEDS OF 40 MPH OR LESS) SEE CONTRACT FOR LENGTH OF STORAGE LANE 50' DOUBLE CENTER LINE (YELLOW) NO PASS LINE (NARROW PATTERN) (WHEN REQUIRED) STOPPING POINT FOR **LEFT TURN LANE** CENTER LINE WHITE EDGE LINE APPROACH TAPER J WIDE LANE LINE **LEFT TURN CHANNELIZATION** REDUCED TAPER LENGTHS ~ ASYMMETRICAL WIDENING LEFT OF CENTERLINE (FOR LIMITED USE IN URBAN AREAS WITH POSTED SPEEDS OF 40 MPH OR LESS)

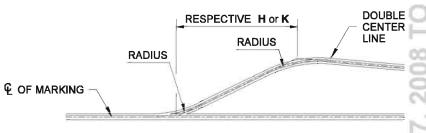
GENERAL NOTES

- 1. The channelization shown on this plan assumes optimal roadway geometric design. The dimensions may vary to fit existing conditions. See Contract.
- L = 12' Typical Lane Width. See Contract for specified lane widths.

LEGEND

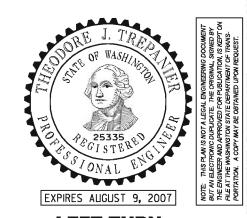
Type 2L Traffic Arrow

POSTED SPEED	APPROACH TAPER G	DIMENSION H	APPROACH TAPER J	DIMENSION K
40 MPH	160'	27'	320'	53'
35 MPH	123'	20'	245'	41'
30 MPH	90'	15'	180'	30'
25 MPH	63'	10'	125'	21'
20 MPH	40'	7'	80'	13'



RADIUS = RESPECTIVE H or K

OPTIONAL MARKED DECELERATION TAPER (FOR LIMITED USE IN URBAN AREAS)

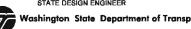


LEFT TURN CHANNELIZATION REDUCED TAPERS STANDARD PLAN M-3.20-01

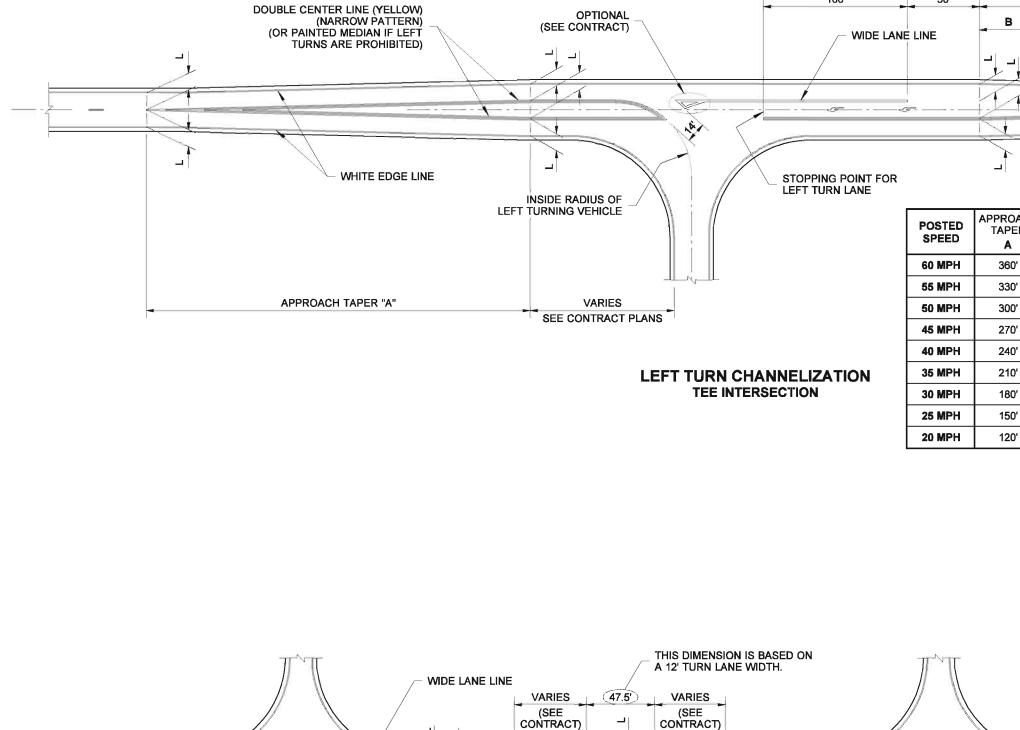
SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

01-30-07 Ken L. Smith



EFFECTIVE: JANUARY 7, 2008 TO AUGUS



WHITE EDGE LINE **DOUBLE CENTER LINE (YELLOW)** (NARROW PATTERN) APPROACH DIMENSION TAPER 120' 110' 100' 90' 80' **GENERAL NOTES** 210' 70' 60' 50' Contract. 120' 40'

- 1. The channelization shown on this plan assumes optimal roadway geometric design. The dimensions may vary to fit existing conditions. See
- L = 12' Typical Lane Width. See Contract for specified lane widths.

LEGEND

JANUARY 7, 2008 TO AUGUST 3, 2008

APPROACH TAPER A

Type 2L Traffic Arrow



EXPIRES AUGUST 9, 2007

LEFT TURN CHANNELIZATION TEE INTERSECTION AND BACK-TO-BACK TURN LANES STANDARD PLAN M-3.30-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith

01-30-07



LEFT TURN CHANNELIZATION BACK TO BACK LEFT TURN LANES

WHITE EDGE LINE

DOUBLE CENTER LINE (YELLOW)

(NARROW PATTERN)

50' R

WIDE LANE LINE

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

TAPER F ≈ 100' TWO-WAY LEFT-TURN WHITE EDGE LINE **CENTER LINE** NO PASS LINE (WHEN REQUIRED) CENTER LINE DOUBLE CENTER LINE (YELLOW) 10' (TYP.) (NARROW PATTERN)

TWO-WAY LEFT TURN LANE TRANSITION

DRAWN

2008

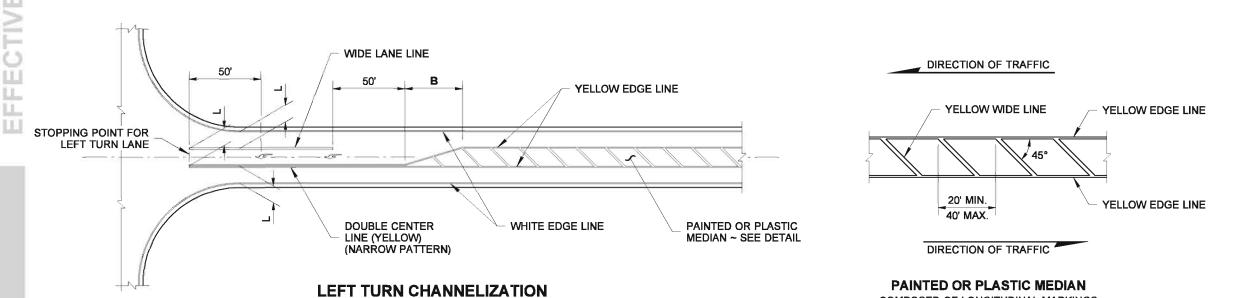
2008

POSTED SPEED	DIMENSION E	TAPER F	DIMENSION B
60 MPH	170'	360'	120'
55 MPH	160'	330'	110'
50 MPH	150'	300'	100'
45 MPH	140'	270'	90'
40 MPH	130'	240'	80'
35 MPH	120'	210'	70'
30 MPH	110'	180'	60'
25 MPH	100'	150'	50'
20 MPH	90'	120'	40'

- 1. The channelization shown on this plan assumes optimal roadway geometric design. The dimensions may vary to fit existing conditions. See Contract.
- L = 12' Typical Lane Width. See Contract for specified lane widths.

LEGEND

Type 2L Traffic Arrow





TWO-WAY LEFT-TURN AND MEDIAN CHANNELIZATION STANDARD PLAN M-3.40-01

SHEET 1 OF 1 SHEET

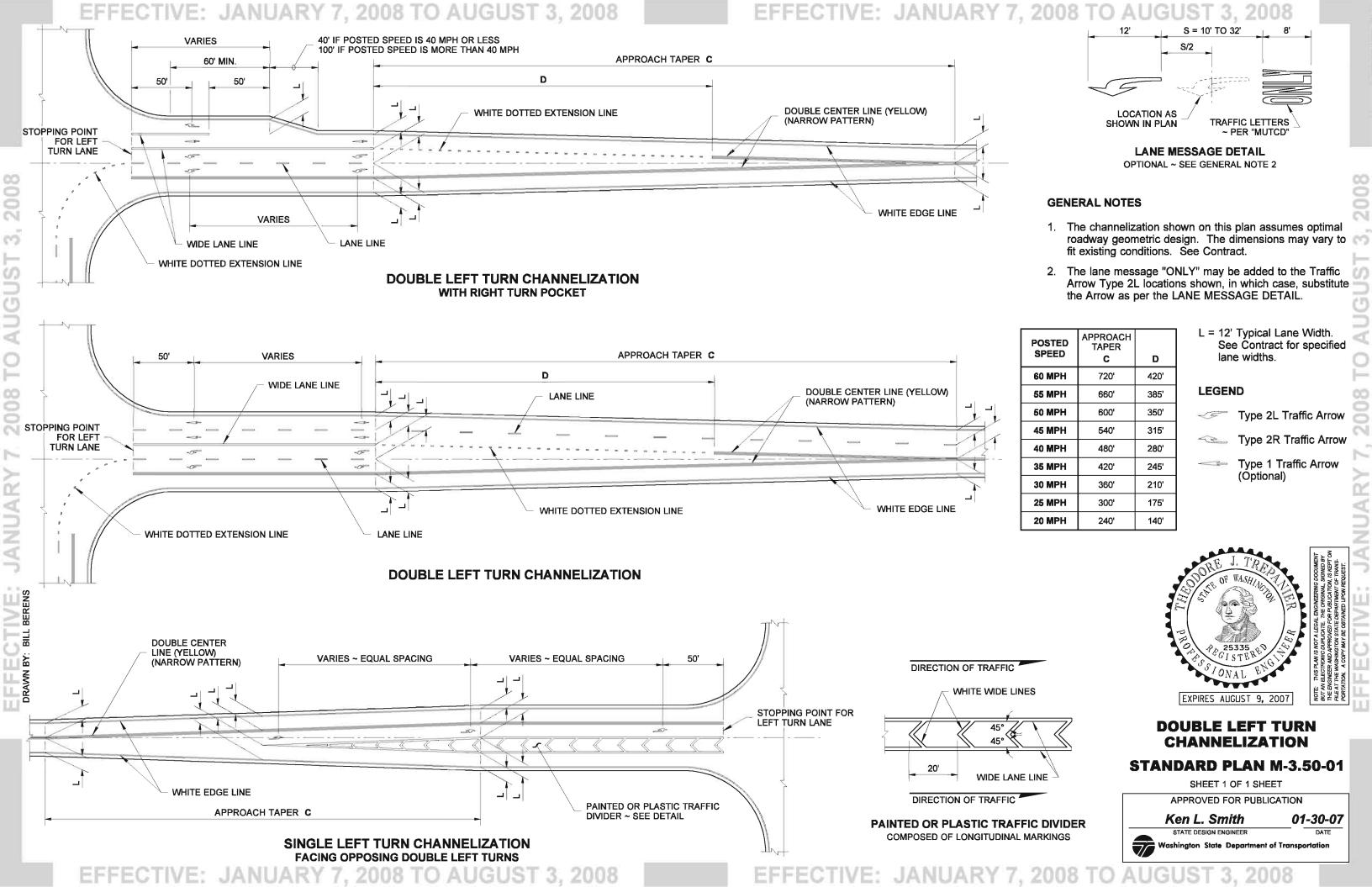
APPROVED FOR PUBLICATION

Ken L. Smith

01-30-07

IN PAINTED MEDIAN

COMPOSED OF LONGITUDINAL MARKINGS

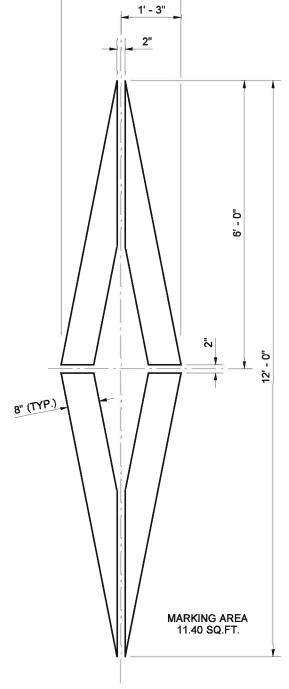


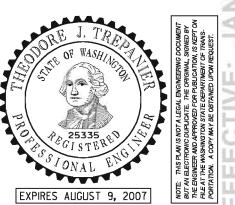
HIGHWAY SPACING = 1 CITY STREET SPACING

€ HOV LANE

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

When Specified in the Contract Plans, the HOV Symbol Marking shall





HIGH OCCUPANCY VEHICLE (HOV) LANE SYMBOL **LAYOUT STANDARD PLAN M-7.50-01**

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION

Ken L. Smith

01-30-07



LAYOUT

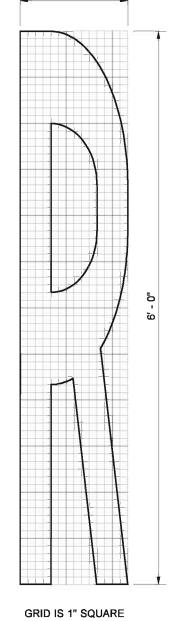
be installed with an offset of 1 foot max. from the lane centerline.

2' - 6"

HOV LANE SYMBOL

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

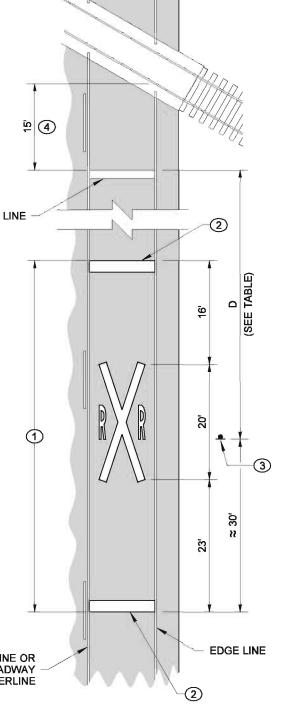
See contract for location and material requirements.



GENERAL NOTE

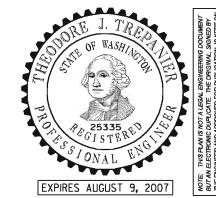
1' - 2"

<u>io</u> (4) **MPH** D* 25 50 Ft. 30 100 Ft. 35 150 Ft. 40 225 Ft. 300 Ft. 45 375 Ft. 1 55 450 Ft. 60 550 Ft. 650 Ft. 65 * DIMENSIONS SHOWN ARE APPROXIMATE. SEE CONTRACT. **EDGE LINE** LANE LINE OR ROADWAY CENTERLINE



LAYOUT

LANE SYMBOL DETAIL



RAILROAD CROSSING LAYOUT

STANDARD PLAN M-11.10-01

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION



SYMBOL DETAIL

1 TOTAL MARKING AREA (PER 12' WIDE LANE) = 109.75 SQ.FT. STANDARD SYMBOL

EDGE LINE

LANE LINE OR

ROADWAY

LAYOUT

CENTERLINE

KEY NOTES

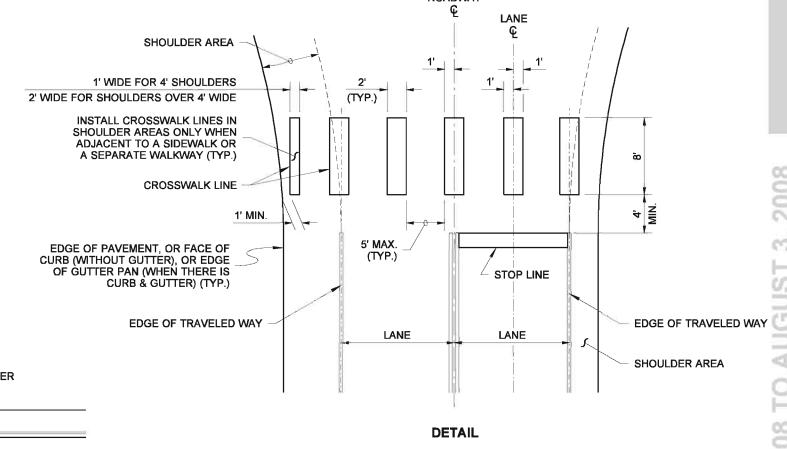
"R" DETAIL

- 1 Bid Item "Railroad Crossing Symbol" includes "X" symbol, letters, and two 24" white transverse lines.
- 2 24" white transverse line
- ③ W10-1 Advance Warning Sign (not included in RR Crossing Symbol Bid Item)
- 4 Place Stop Line 15' from the nearest rail or approximately 8 feet from RR gate, if present.

1 TOTAL MARKING AREA (PER 12' WIDE LANE) = 111.59 SQ.FT.

ALTERNATIVE SYMBOL

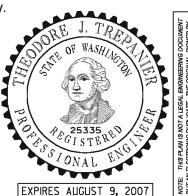
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008



NOTES

- 1. See the Contract Plans for locations of crosswalk centerlines.
- 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 centerline of the traveled way.



CROSSWALK LAYOUT

STANDARD PLAN M-15.10-01

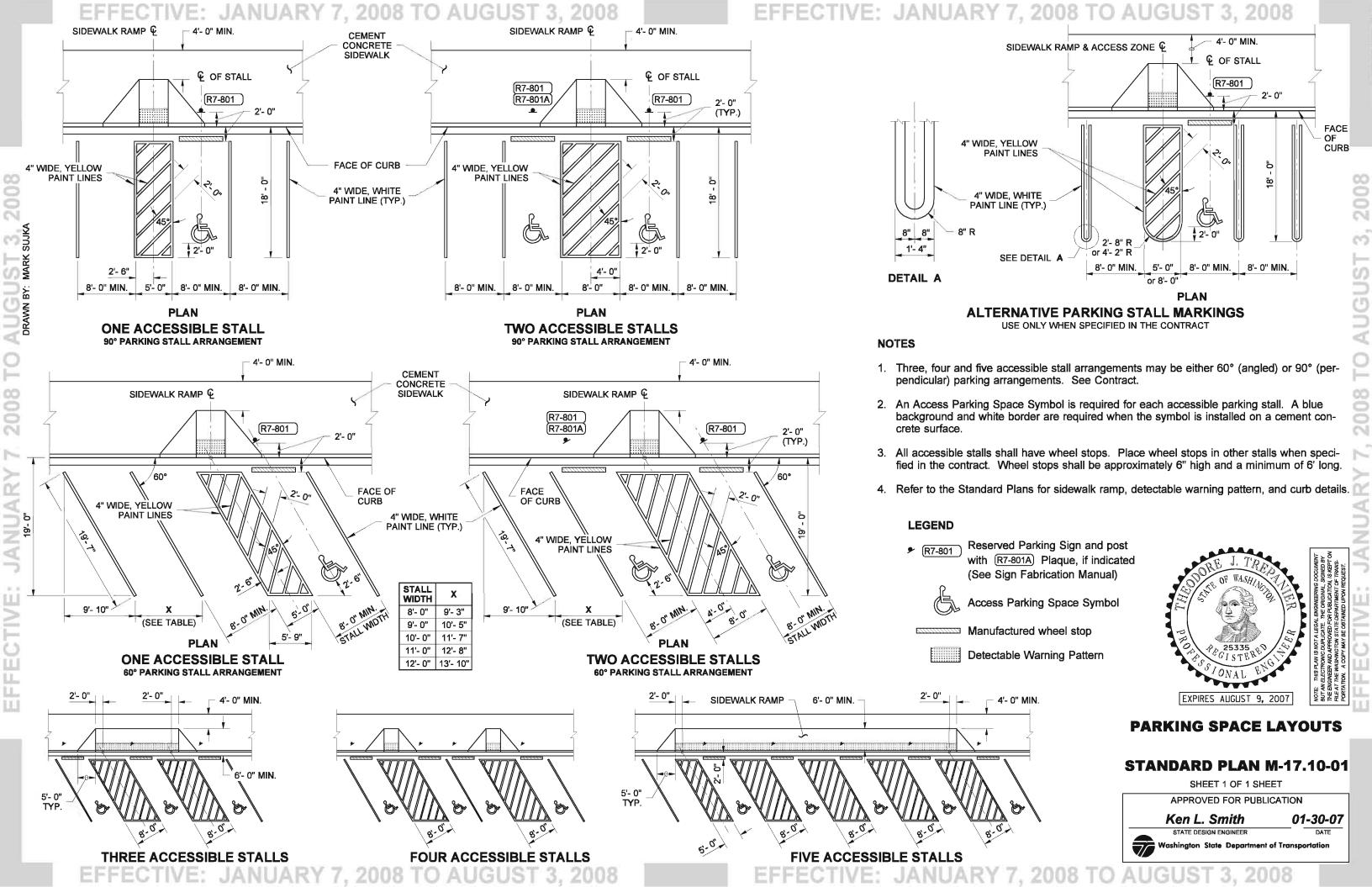
SHEET 1 OF 1 SHEET

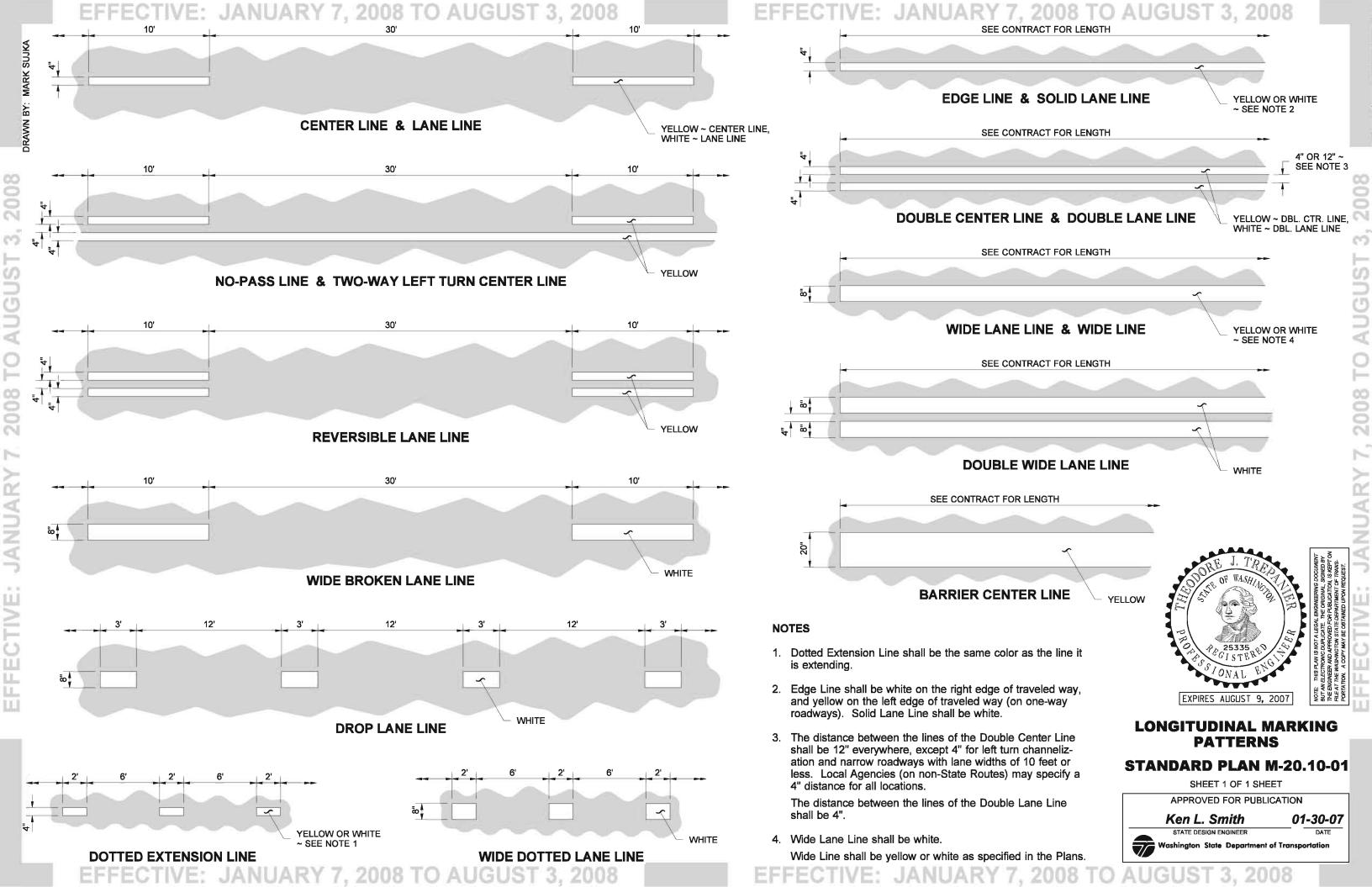
APPROVED FOR PUBLICATION

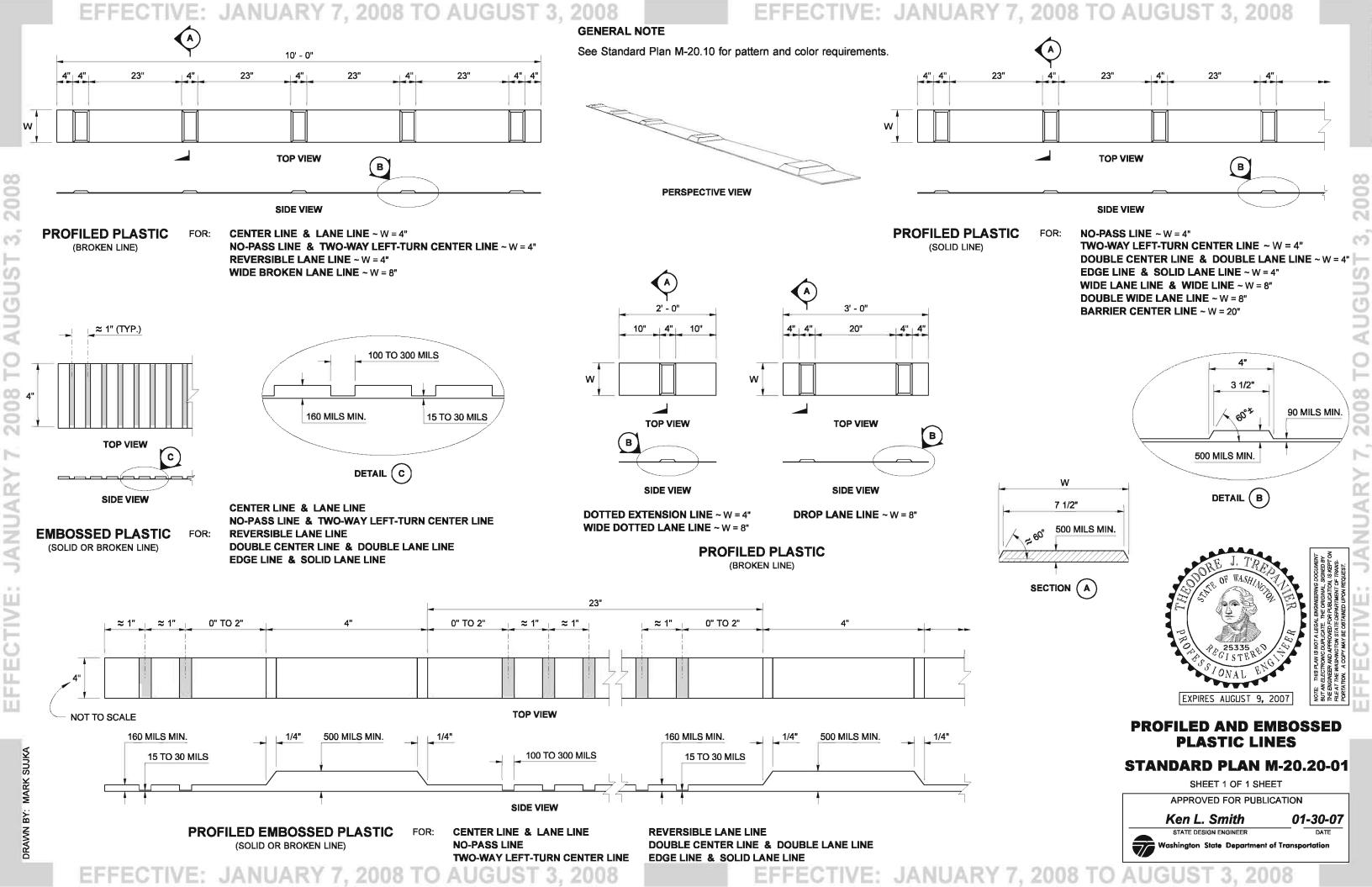
Ken L. Smith

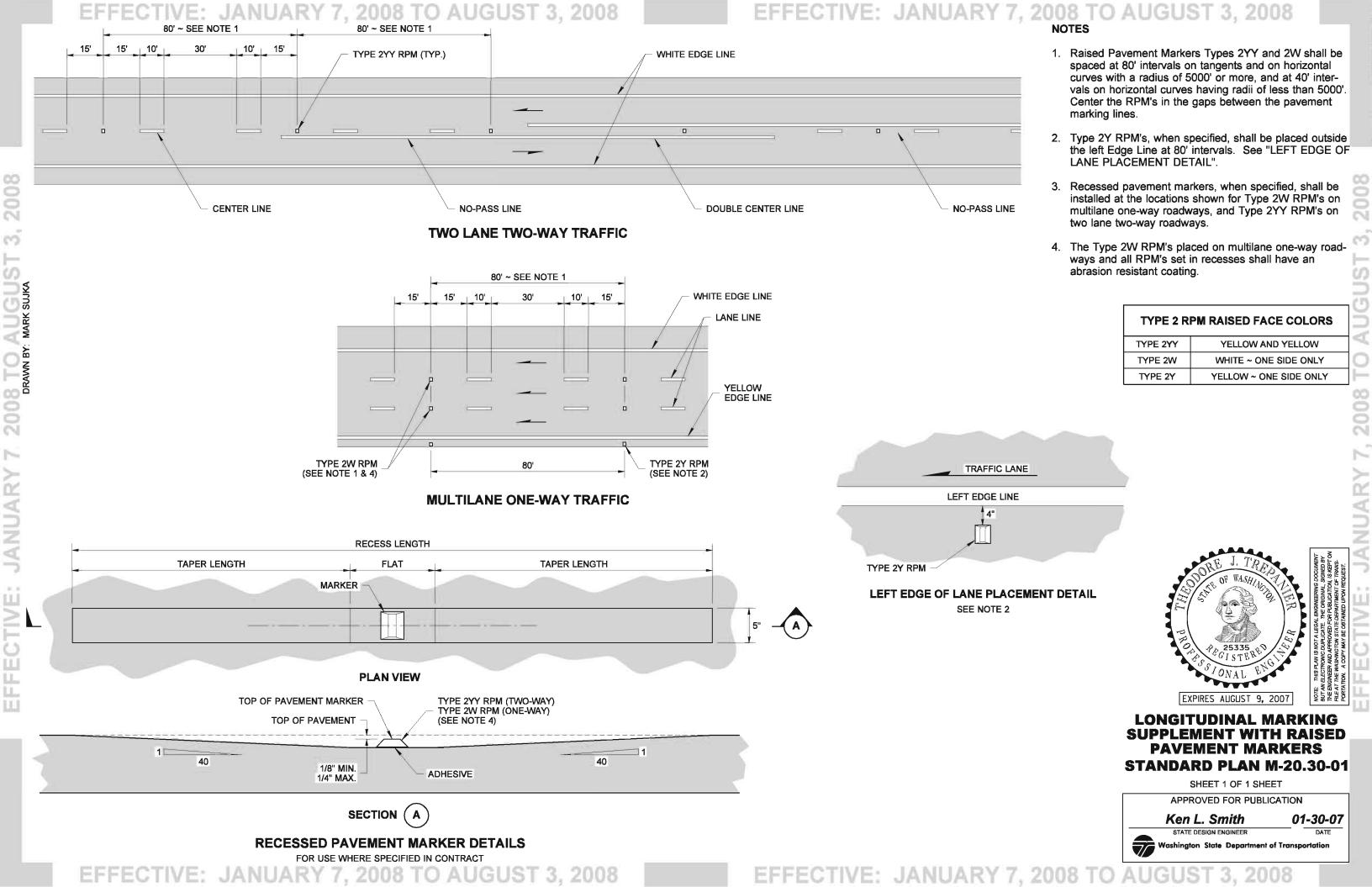
02-06-07

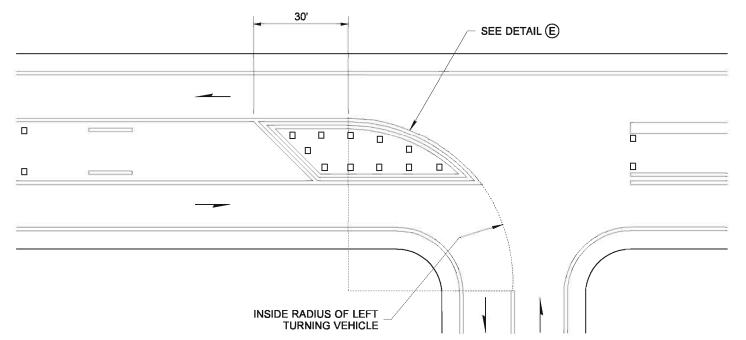
TYPICAL APPLICATIONS











END TWO-WAY LEFT-TURN LANE

EXPIRES AUGUST 9, 2007

LONGITUDINAL MARKING
SUPPLEMENT WITH RPM'S

EXPRESSION WITH RPM'S

SUPPLEMENT WITH RPM's ~ TURN LANES
STANDARD PLAN M-20.40-01

SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

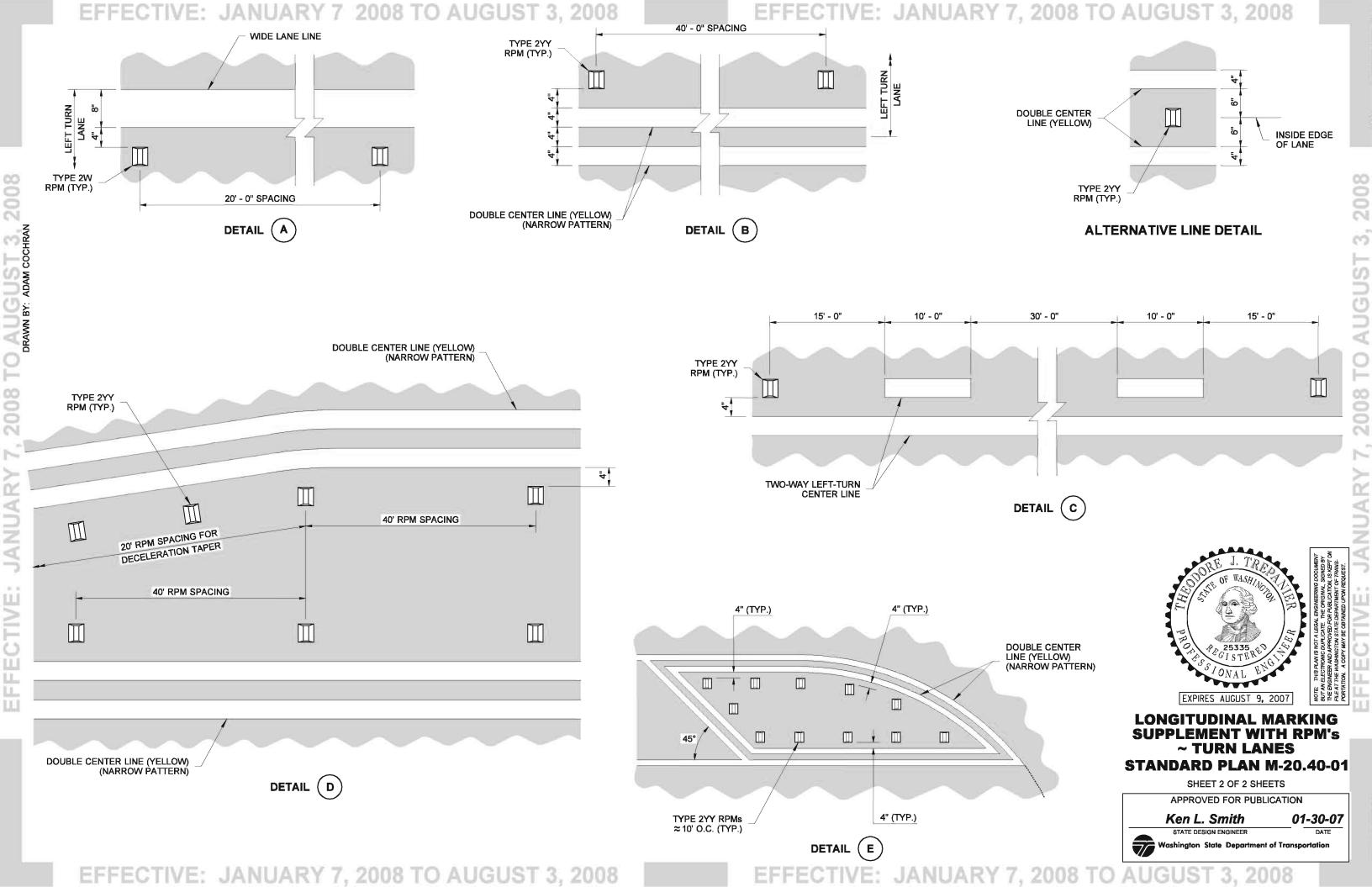
Ken L. Smith

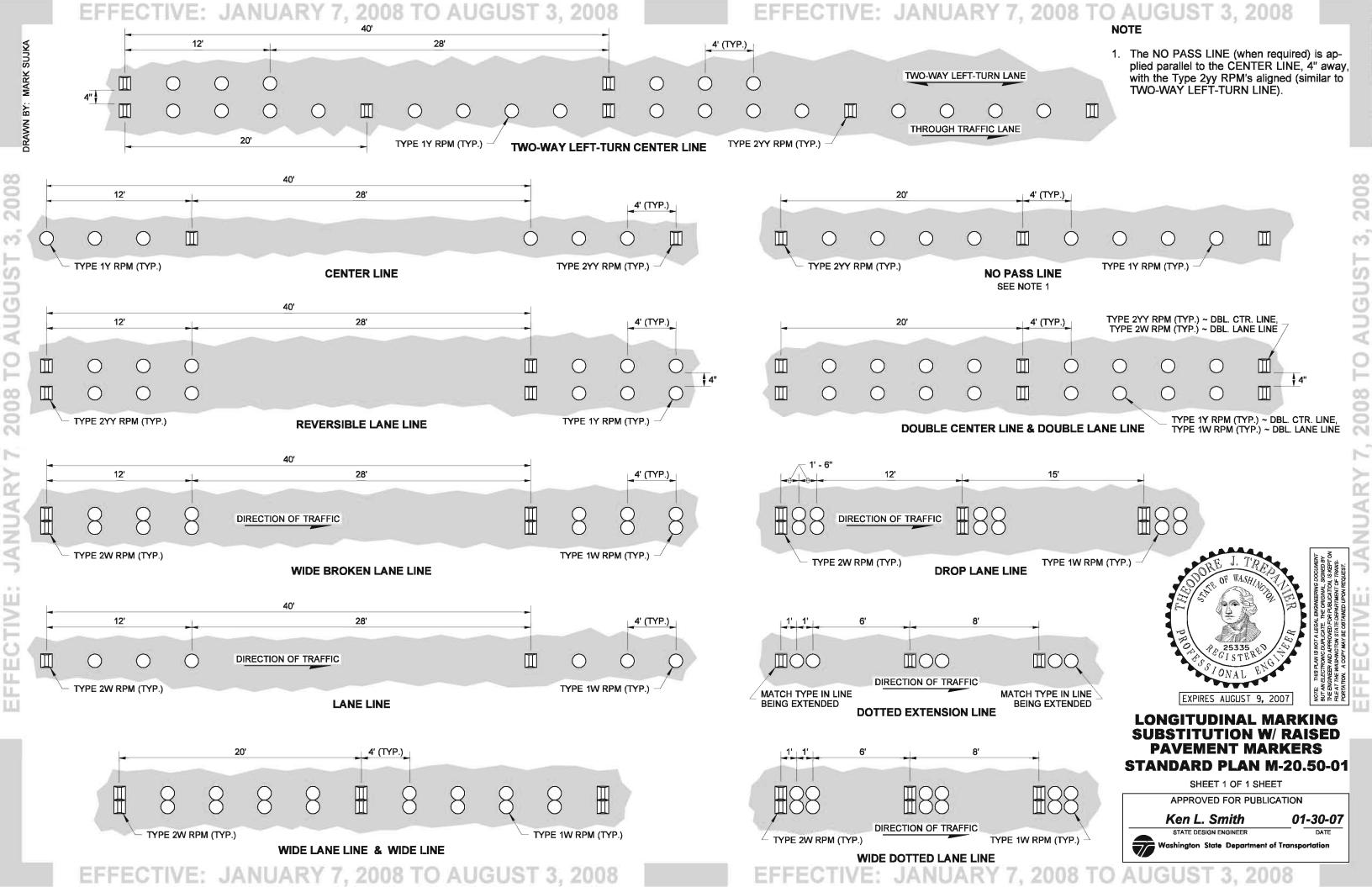
mith 01-30-07

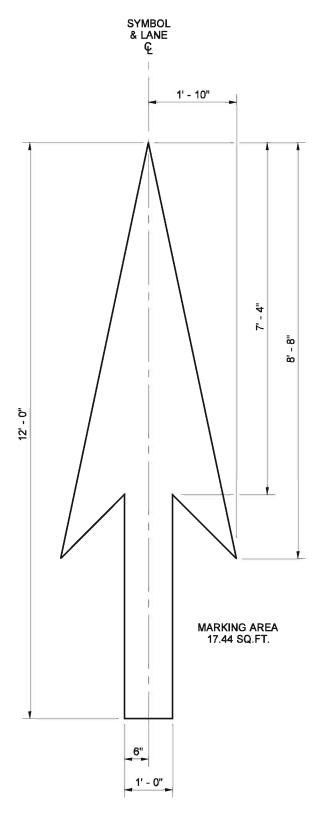


Washington State Department of Transportation

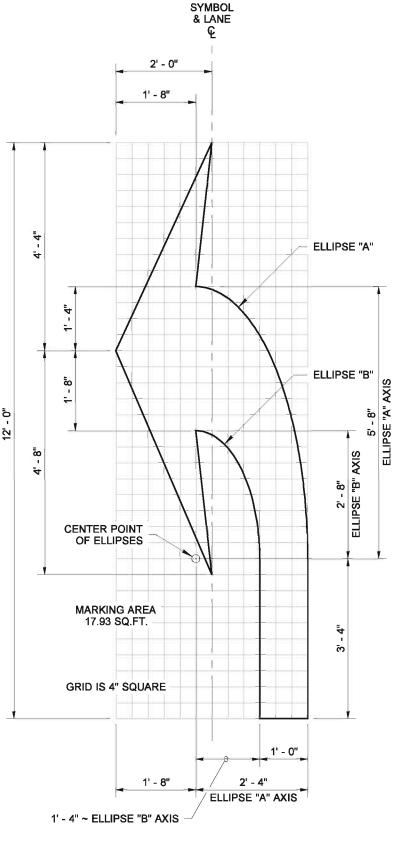
2008







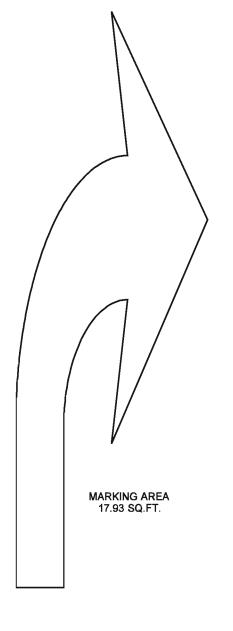
TYPE 1 TRAFFIC ARROW



TYPE 2L (LEFT)
TRAFFIC ARROW

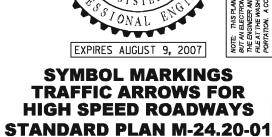
NOTE

Use the dimensions shown on this plan for each type Traffic Arrow being placed on roadways with a posted speed limit of 45 mph or higher.



TYPE 2R (RIGHT)
TRAFFIC ARROW

MIRROR IMAGE OF TYPE 2L TRAFFIC ARROW



SHEET 1 OF 3 SHEETS

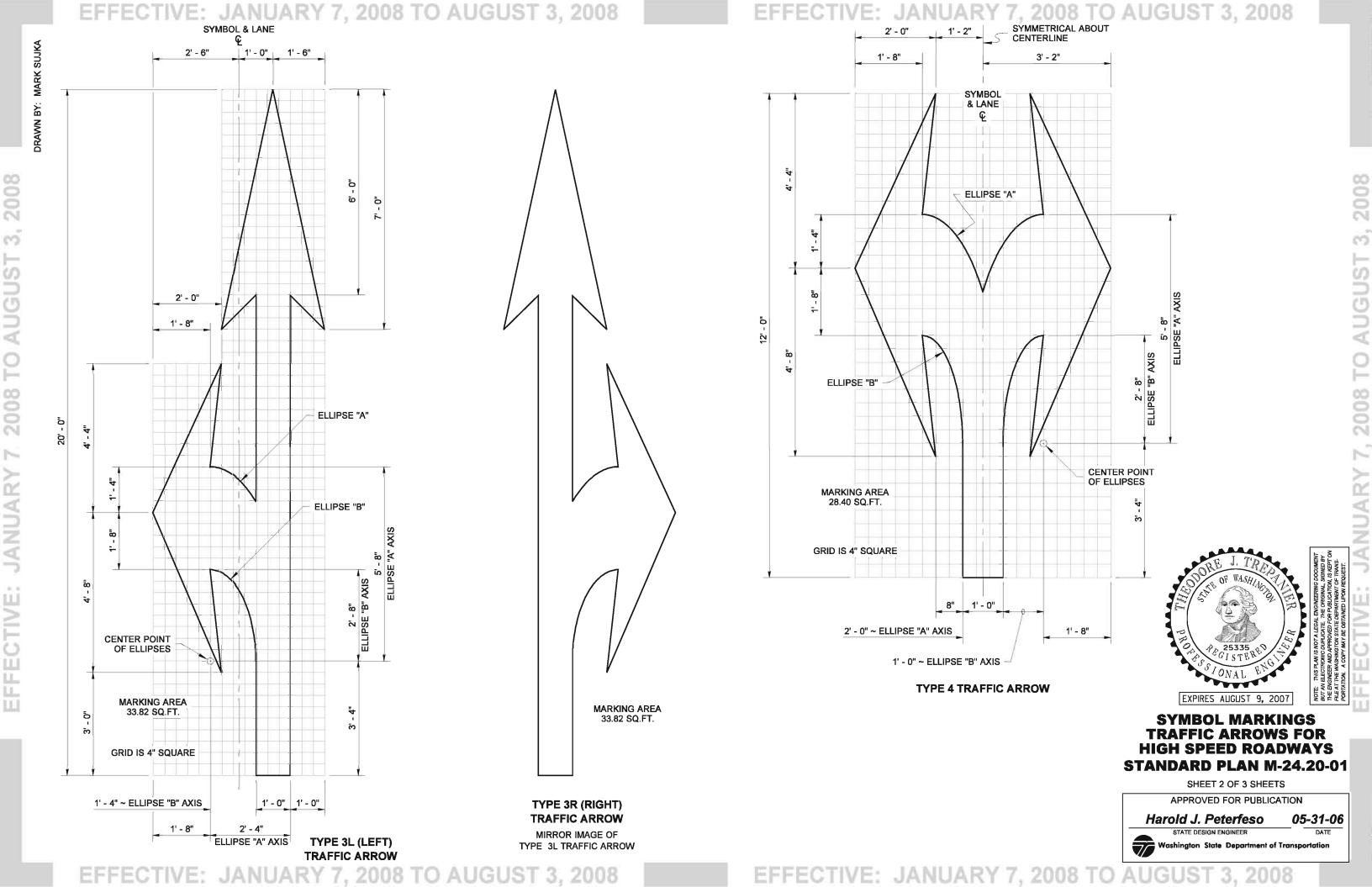
APPROVED FOR PUBLICATION

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Harold J. Peterfeso 05-31-06



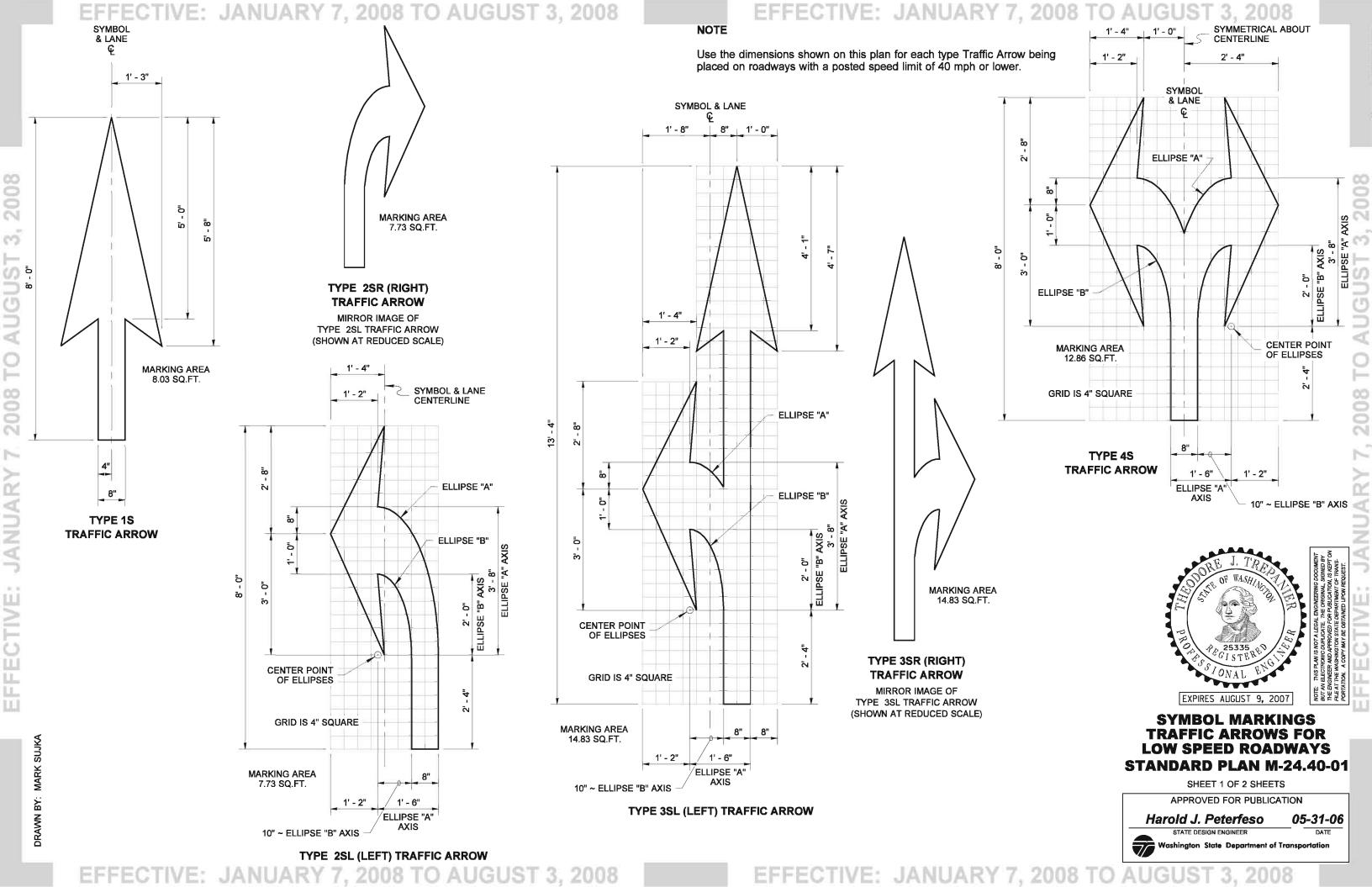
ington State Department of Transportation



EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 200

TYPE 7 TRAFFIC ARROW

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

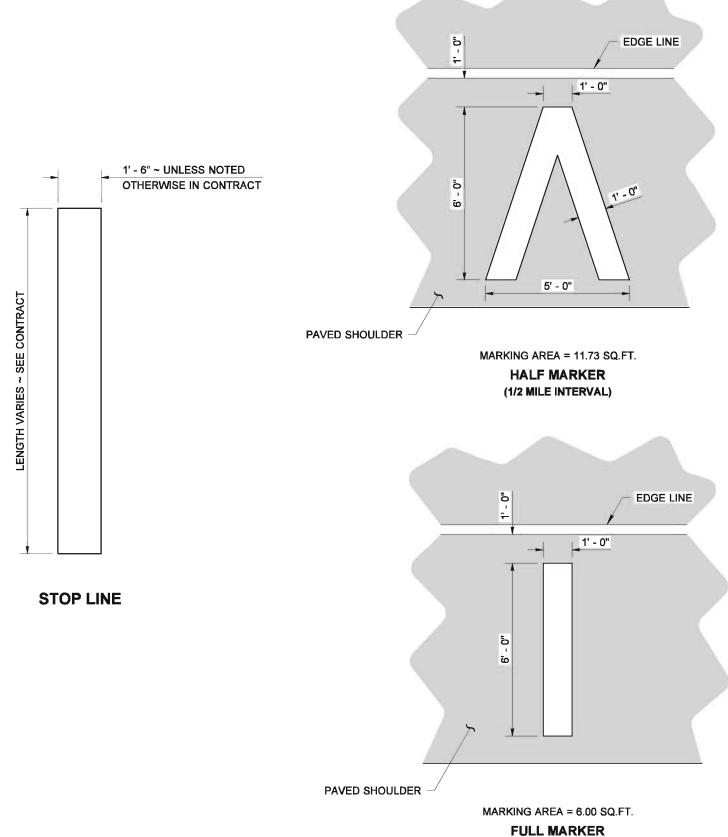


2008

2008

JANUARY

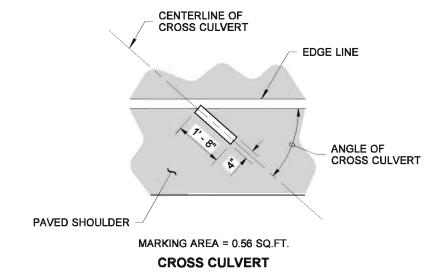
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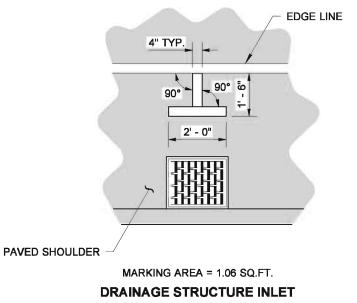


(1 MILE INTERVAL)

AERIAL SURVEILLANCE MARKERS







DRAINAGE MARKING

EXPIRES ALIGUST 9, 2007

SYMBOL MARKINGS MISCELLANEOUS

STANDARD PLAN M-24.60-02

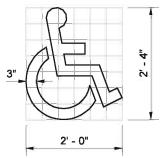
SHEET 1 OF 2 SHEETS

APPROVED FOR PUBLICATION

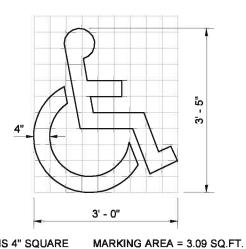
Ken L. Smith

STATE DESIGN ENGINEER

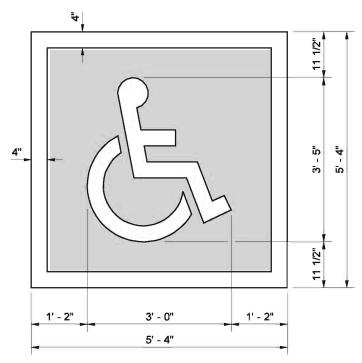
Washington State Department of Transportation



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

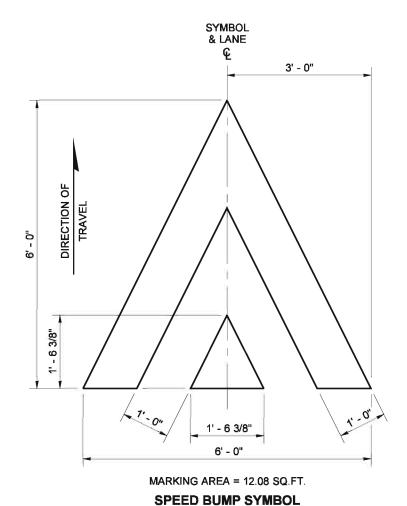


GRID IS 4" SQUARE **ACCESS PARKING SPACE SYMBOL** (STANDARD)

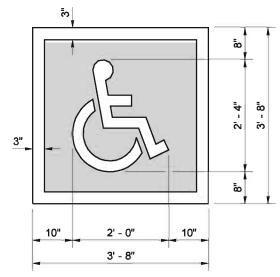


TOTAL MARKING AREA = 28.44 SQ.FT. WHITE = 9.76 SQ.FT. BLUE = 18.69 SQ.FT.

ACCESS PARKING SPACE SYMBOL (STANDARD) WITH BLUE BACKGROUND AND WHITE BORDER (REQUIRED FOR CEMENT CONCRETE SURFACES)





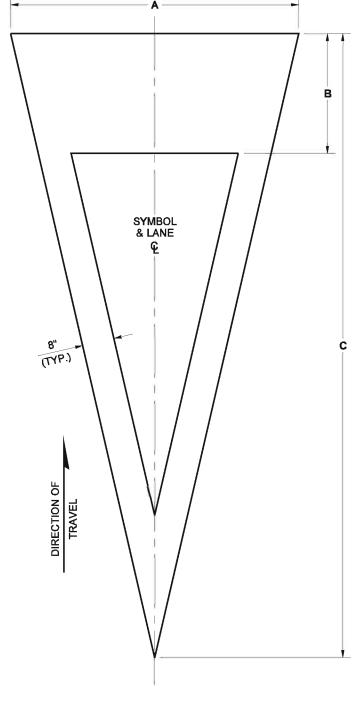


TOTAL MARKING AREA = 13.44 SQ.FT. WHITE = 4.82 SQ.FT. BLUE = 8.62 SQ.FT.

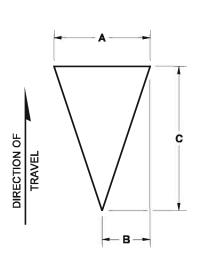
ACCESS PARKING SPACE SYMBOL (MINIMUM) WITH BLUE BACKGROUND AND WHITE BORDER (REQUIRED FOR CEMENT CONCRETE SURFACES)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

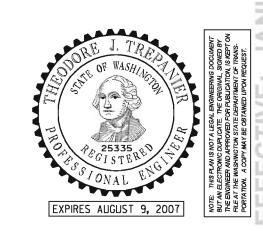
SYMBOL MARKING		A	В	С	USE	MARKING AREA
YIELD AHEAD SYMBOL	TYPE 1	6' - 0"	2' - 6"	13' - 0"	LESS THAN 45 MPH	25.90 SQ.FT.
	TYPE 2	6' - 0"	3' - 0"	20' - 0"	45 MPH OR GREATER	36.54 SQ.FT.
YIELD LINE SYMBOL	TYPE 1	1' - 0"	6"	1' - 6"	LESS THAN 45 MPH	0.75 SQ.FT.
	TYPE 2	2' - 0"	1' - 0"	3' - 0"	45 MPH OR GREATER	3.00 SQ.FT.



YIELD AHEAD SYMBOL



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



SYMBOL MARKINGS MISCELLANEOUS

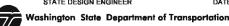
STANDARD PLAN M-24.60-02

SHEET 2 OF 2 SHEETS

APPROVED FOR PUBLICATION

Ken L. Smith

02-06-07



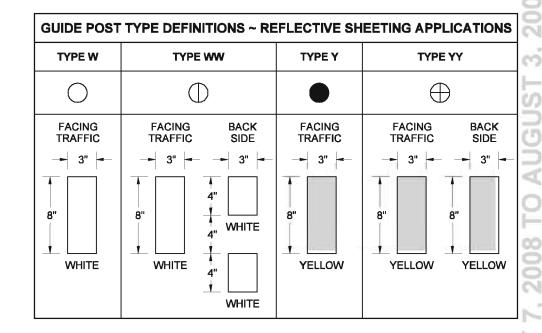
BARRIER DELINEATORS

(CONC. BARRIER TYPES AND LOCATIONS VARY. SINGLE SLOPE IN MEDIAN SHOWN)

EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

NOTES

- 1. When guardrail runs concurrent, the contractor shall either:
 - A. Drive the flexible guide post in line with the guardrail posts, or
 - B. Mount the shorter flexible guide post onto the guardrail post.
- 2. Guide posts shall be fastened to the guardrail posts using two 2" × 3/8" lag screws with washers, along centerline of post. Also acceptable is any approved method submitted by the guide post manufacturer.
- 3. When concrete barrier runs concurrent, the contractor shall mount barrier delineators where guideposts are required.



BARRIER DELINEATOR NOTES

- 1. Spacing of Barrier Delineators shall be as shown in the plans.
- 2. The housing or bracket can be flexible or rigid, molded from a durable plastic or other durable material approved by the engineer, and shall be attached to the barrier with an adhesive recommended by the manufacturer. The attachment point on the barrier surface shall be free of dirt, curing compound. moisture, paint, or any other matter that would aversely affect the adhesive bond.
- 3. Barrier Delineators shall be one-sided for single direction traffic, or two-sided for bi-directional traffic. Color shall be white on the right of traffic, and yellow on the left of traffic.
- 4. The reflective surface shall be rectangular or trapezoidal.
- 5. Reflective Sheeting: 12 square inches minimum surface area; Type III, IV, V, or VI, selected from approved materials listed in the Qualified Products List.
- 6. Plastic Reflector: 9 square inches minimum surface area; acrylic or polycarbonate conforming to AASHTO M 290. Reflectors shall equal or exceed the following minimum values of Specific Intensity:

	OBSERVATION ANGLE	ENTRANCE ANGLE		INTENSITY d/ft-c)			Pasco Ba	
	ANGLL	ANGLE	WHITE	YELLOW			STATE DES	
	0.1°	0°	126	75			Washington	
	0.1°	20°	50	30				
EFFE	CTIVE:	JANU	ARY	7, 200	08 7	0	AUGUS'	

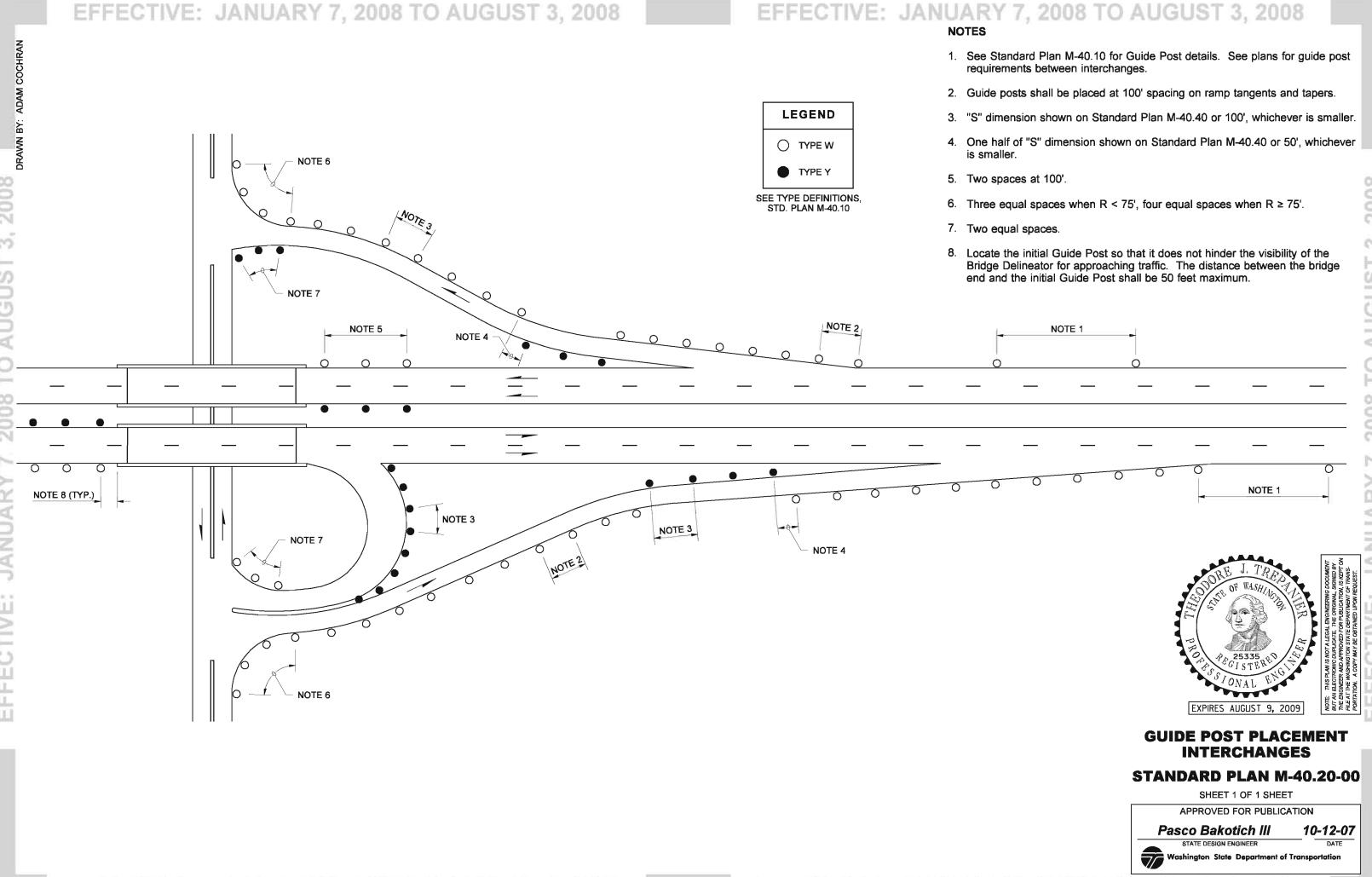


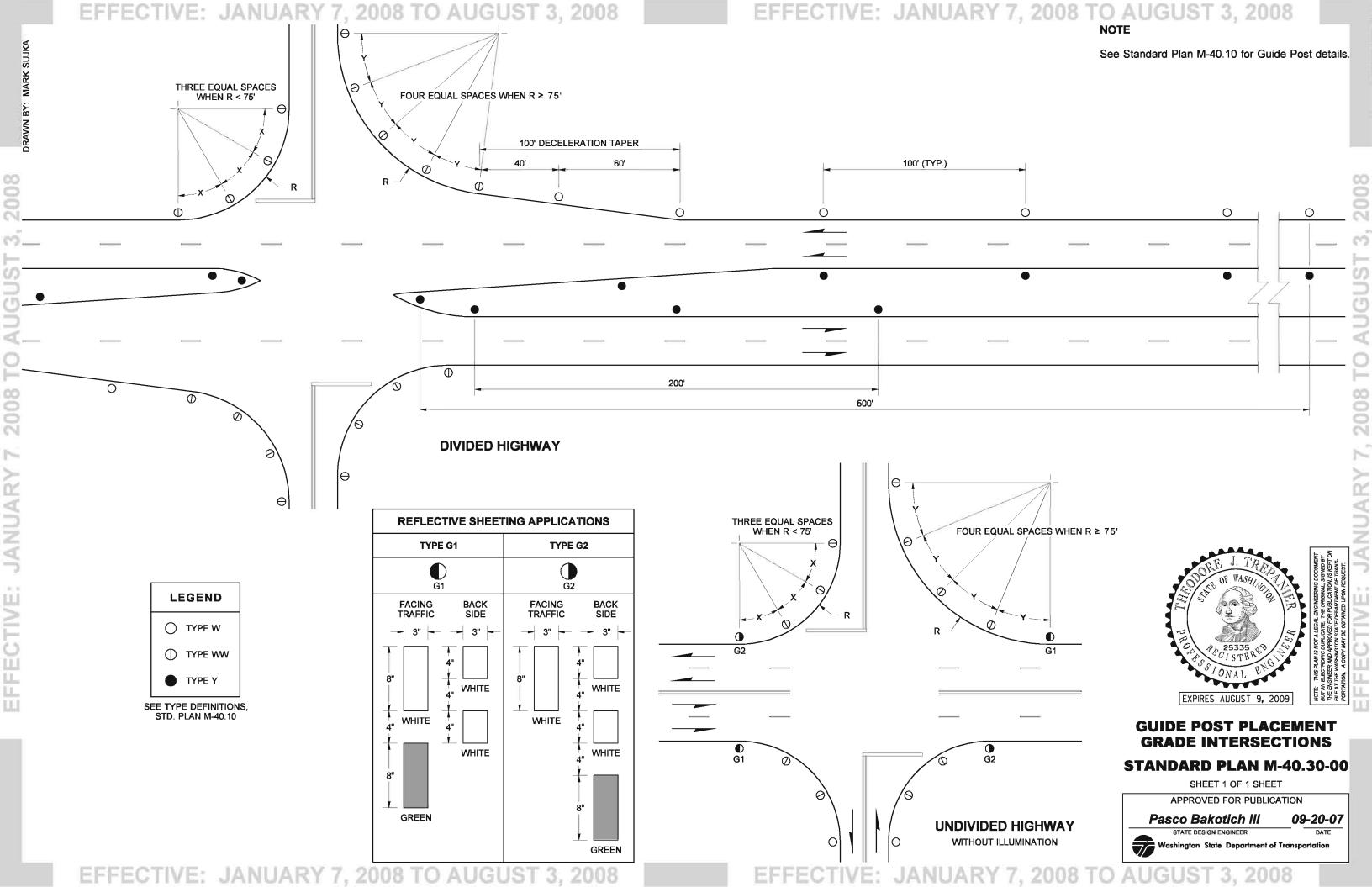
GUIDE POSTS & BARRIER DELINEATORS STANDARD PLAN M-40.10-00

SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Pasco Bakotich III 09-20-07 STATE DESIGN ENGINEER

EFFECTIVE: JANUARY 7. 2008 TO AUGUST





INTERPOLATE FROM THE TABLE FOR RADII NOT SHOWN

GUIDE POST SPACING

(FEET)

S 20

25

30

35

50

55

70

75

80

85 90

100

120

140

180

200 220

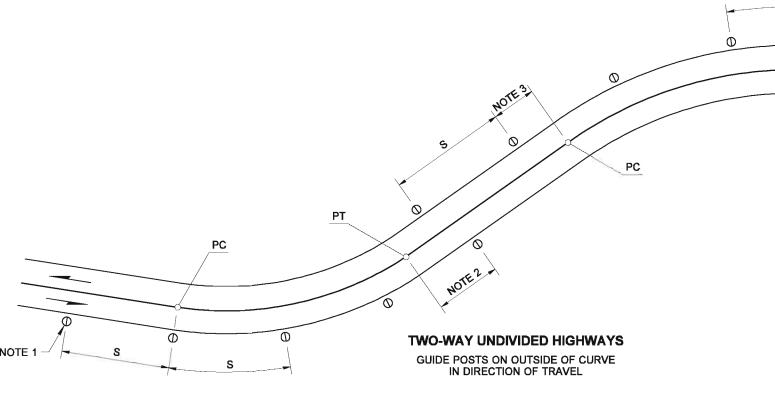
240

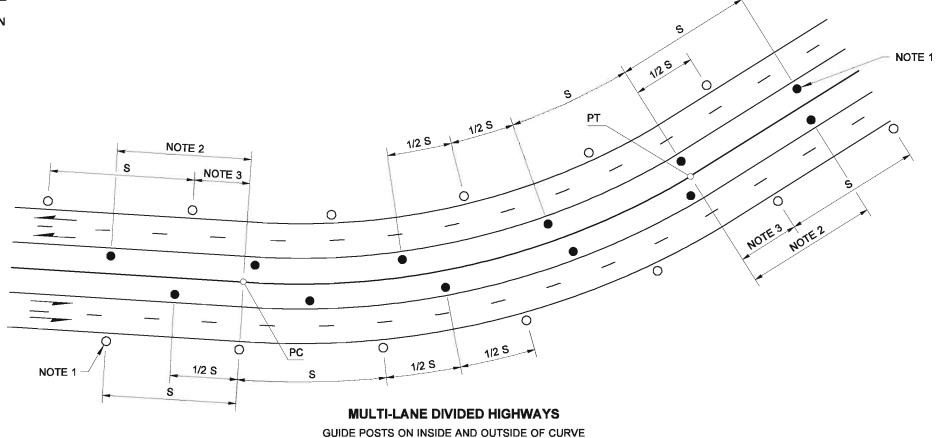
260

280

300

300





FOR EACH DIRECTION OF TRAVEL

NOTES

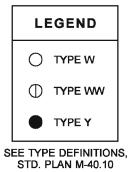
EFFECTIVE: JANUARY 7, 2008 TO AUGUST 3, 2008

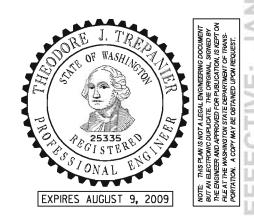
РΤ

1. The first guide post is positioned "S" distance from the beginning of curvature.

NOTE 1

- 2. If the last guide post beyond the curve is 1/2 "S" or more, no additional posts are required.
- 3. If the last guide post beyond the curve is less than 1/2 "S", one additional post is required.
- 4. See Standard Plan M-40.10 for Guide Post details.





GUIDE POST PLACEMENT HORIZONTAL CURVES

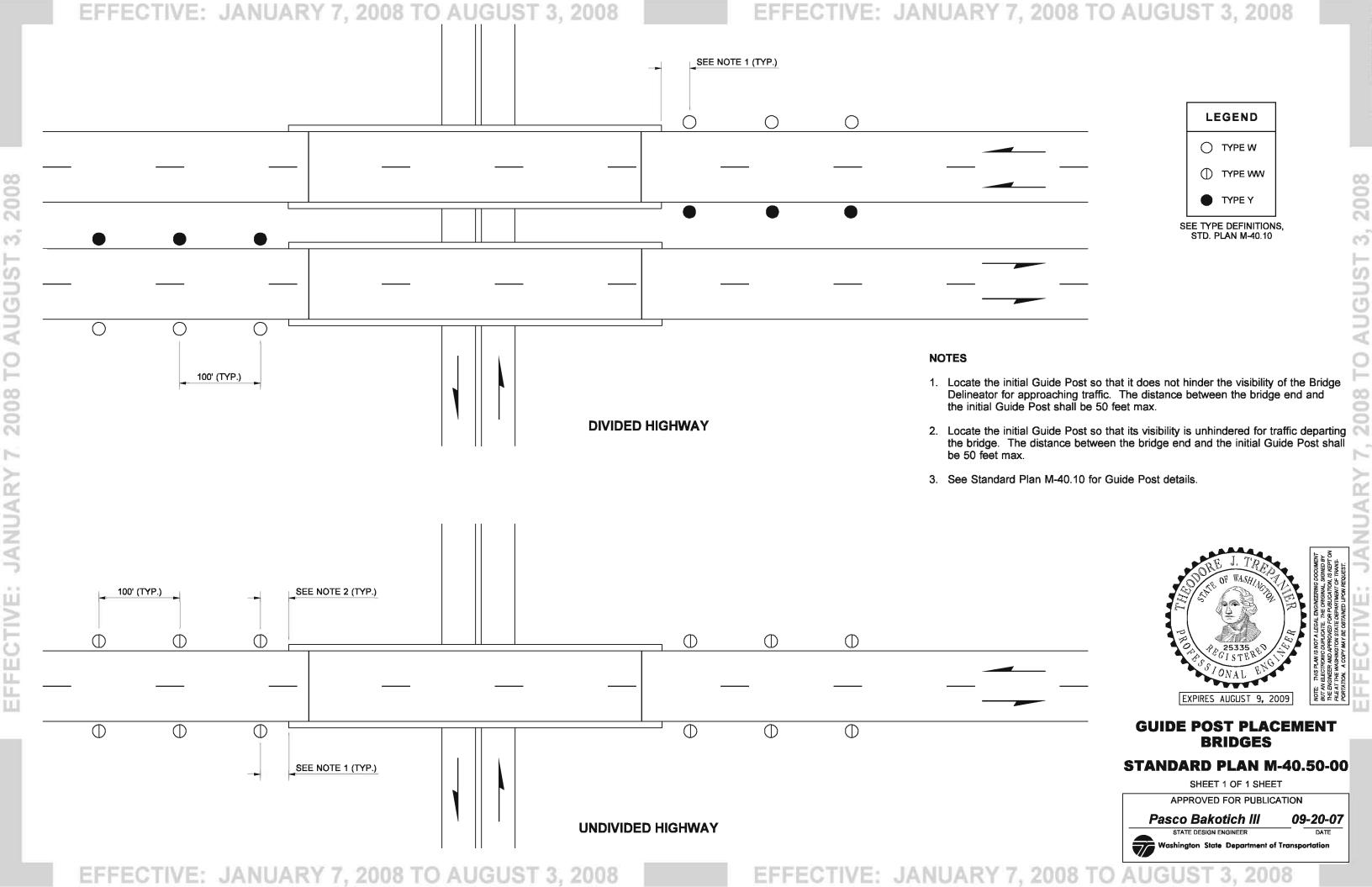
STANDARD PLAN M-40.40-00

SHEET 1 OF 1 SHEET

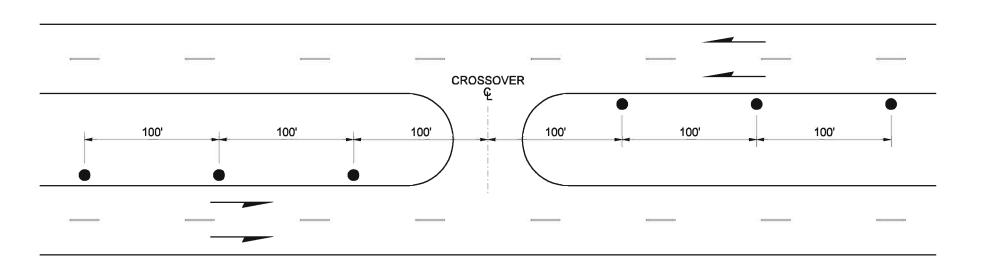
APPROVED FOR PUBLICATION Pasco Bakotich III



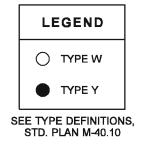
09-20-07

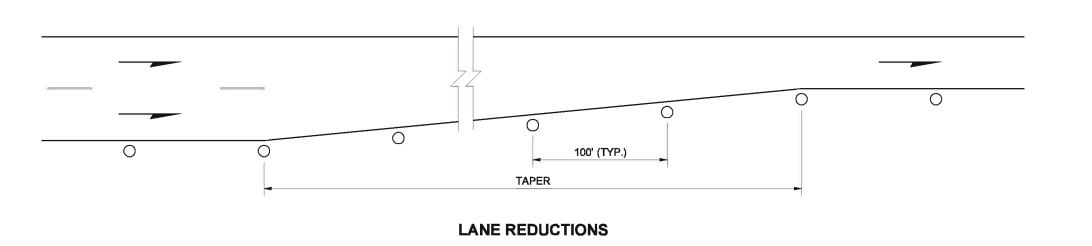


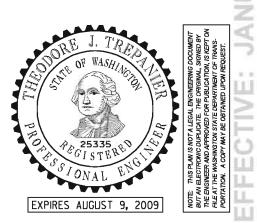
See Standard Plan M-40.10 for Guide Post details.



MEDIAN CROSSOVERS





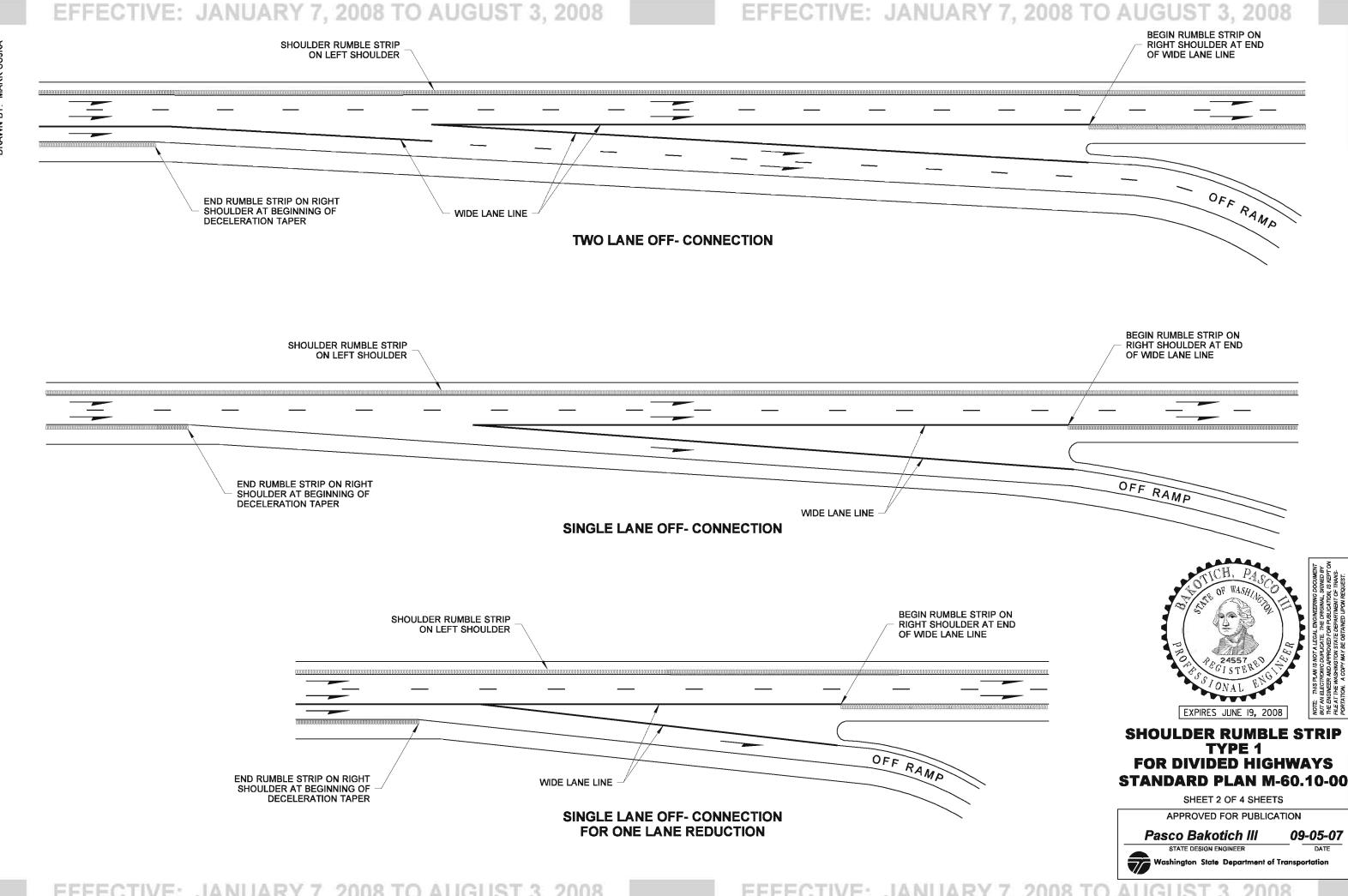


GUIDE POST PLACEMENT MISCELLANEOUS

STANDARD PLAN M-40.60-00

APPROVED FOR PUBLICATION Pasco Bakotich III



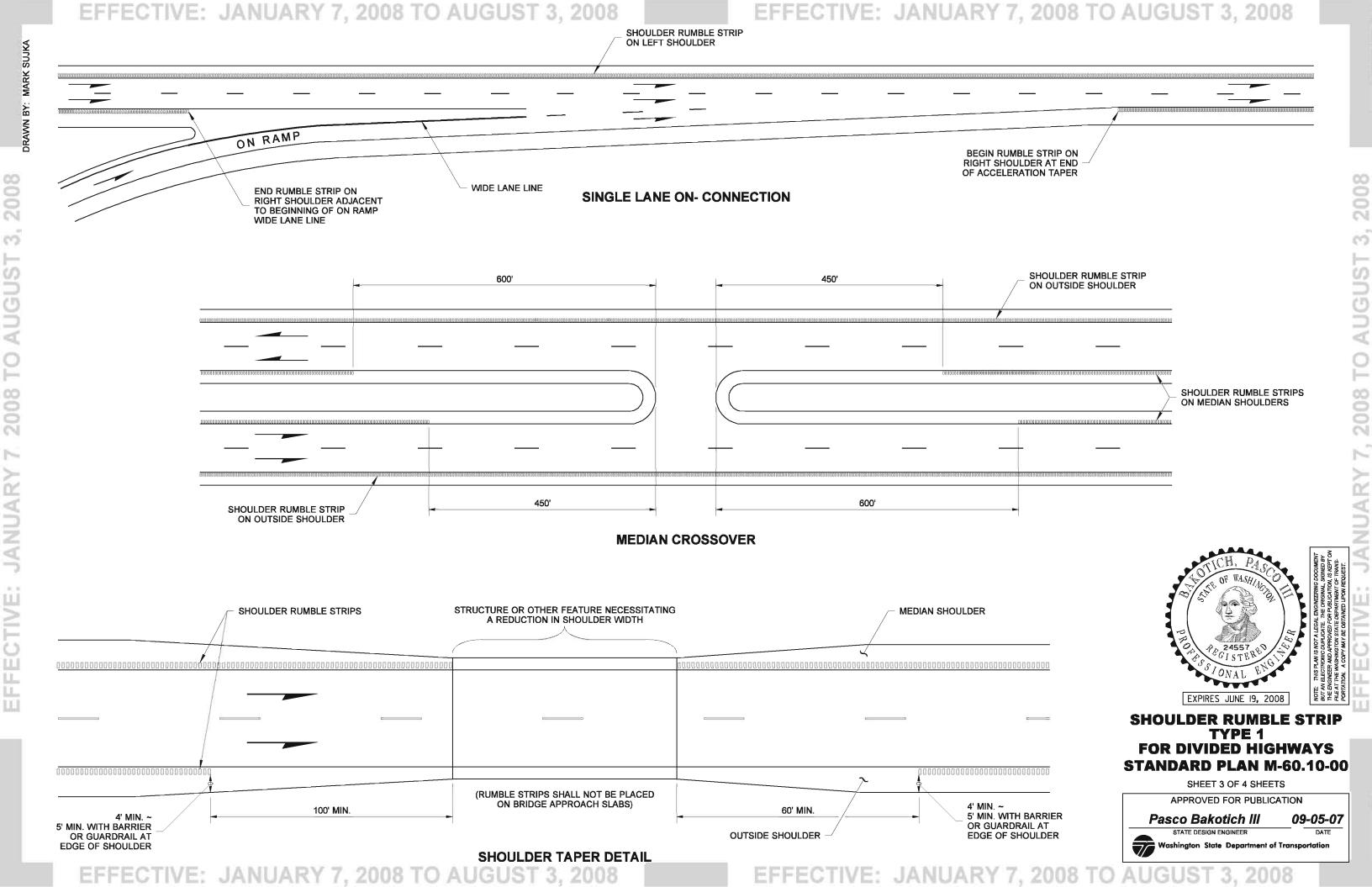


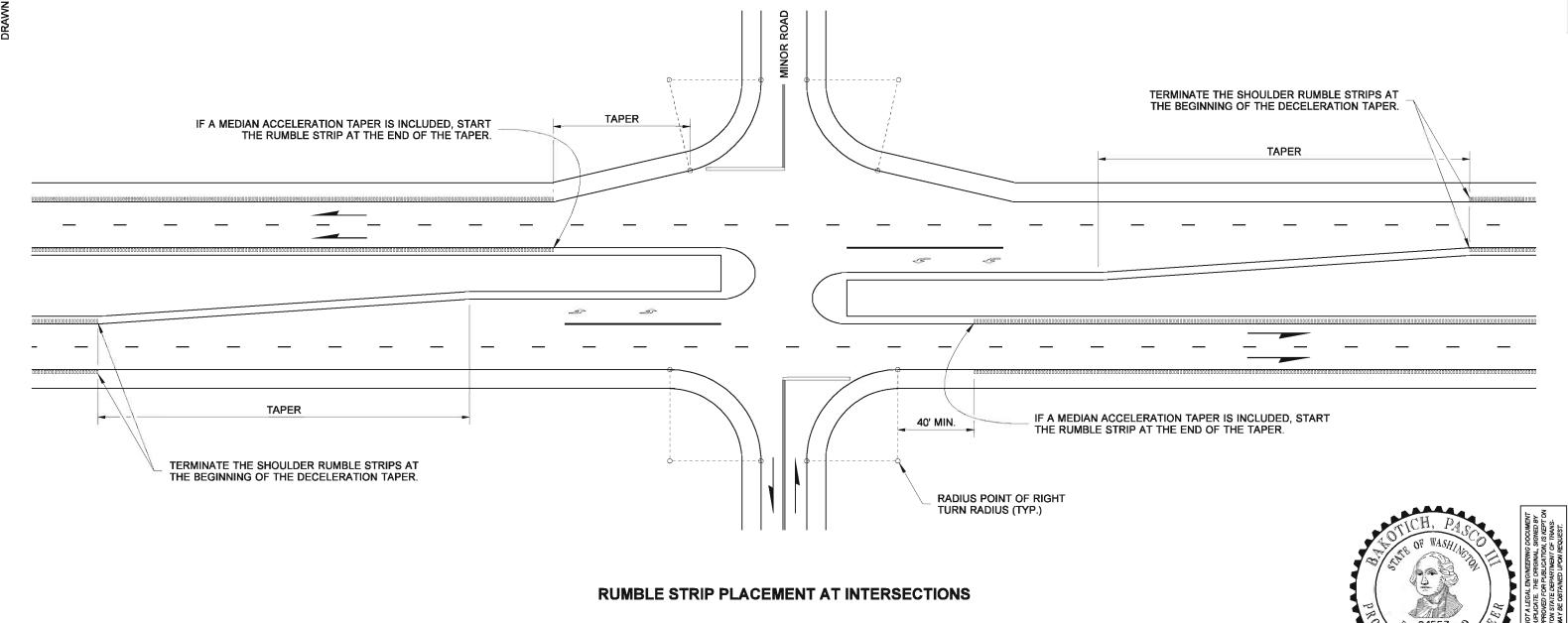
2008

TO AUGUST

2008

JANUARY





SHOULDER RUMBLE STRIP TYPE 1 FOR DIVIDED HIGHWAYS STANDARD PLAN M-60.10-00

EXPIRES JUNE 19, 2008

SHEET 4 OF 4 SHEETS

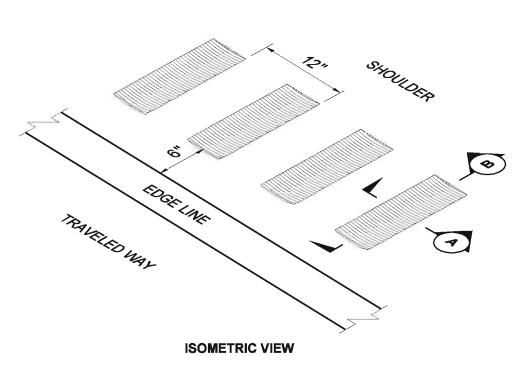
APPROVED FOR PUBLICATION

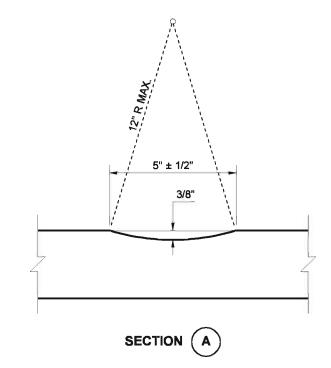
Pasco Bakotich III

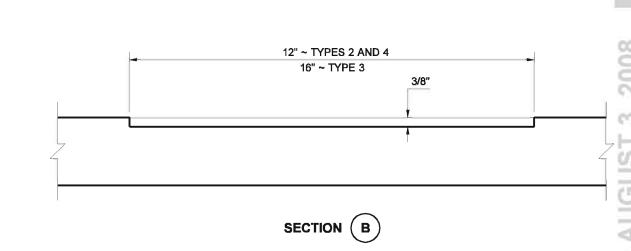


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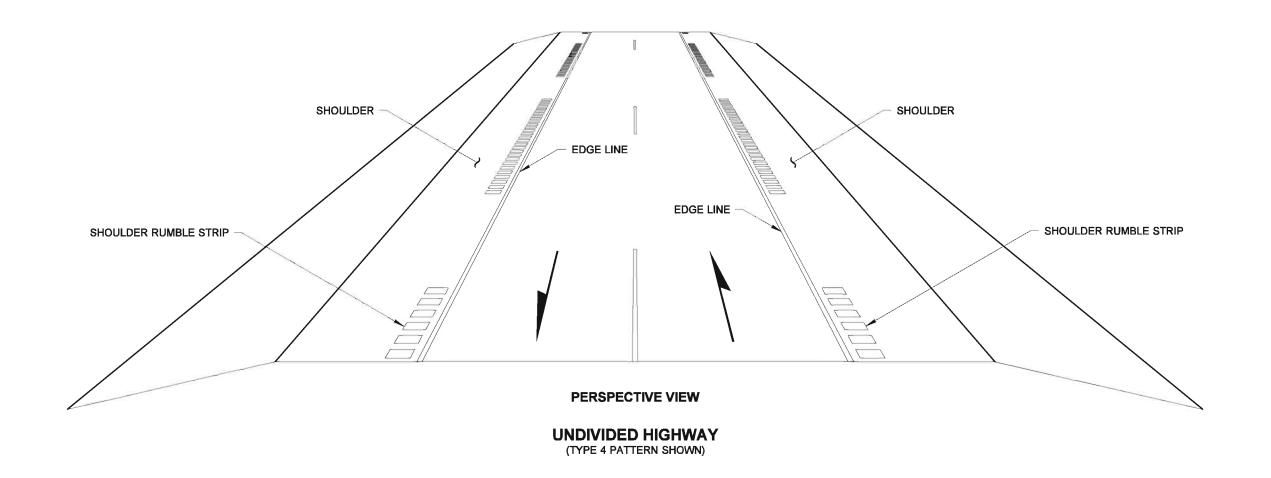




Rumble strips are not installed in certain reduced-width shoulder locations.

See the SHOULDER TAPER DETAIL on Standard Plan M-60.10.

TYPICAL SHOULDER INSTALLATION





SHOULDER RUMBLE STRIP TYPES 2, 3, & 4 FOR UNDIVIDED HIGHWAYS STANDARD PLAN M-60.20-00

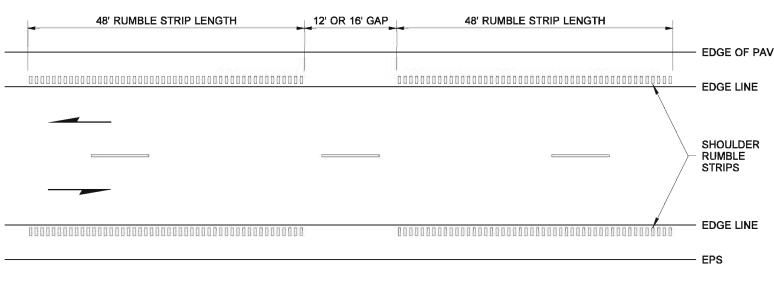
SHEET 1 OF 2 SHEETS

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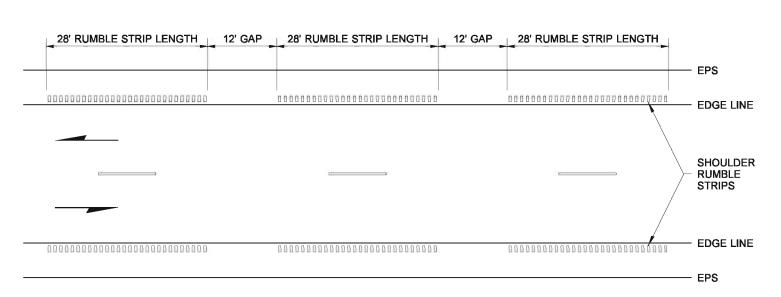
Pasco Bakotich III 09-05-07



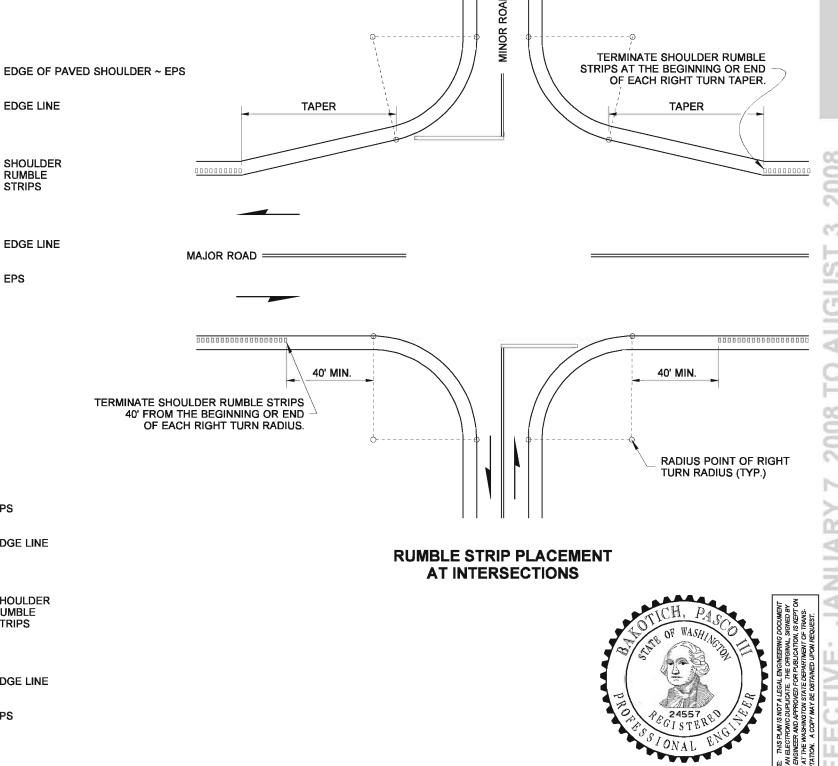
STATE DESIGN ENGINEER DATE



TYPE 2 ~ 12' GAP AND 12" WIDE STRIP
TYPE 3 ~ 16' GAP AND 16" WIDE STRIP



TYPE 4 ~ 12" WIDE STRIP



SHOULDER RUMBLE STRIP TYPES 2, 3, & 4 FOR UNDIVIDED HIGHWAYS STANDARD PLAN M-60.20-00

EXPIRES JUNE 19, 2008

SHEET 2 OF 2 SHEETS

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STATE DESIGN ENGINEER DATE

Washington State Department of Transportation

