

Guam Department of Public Works



# Standard Plans for Road and Bridge Construction

2012





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**NOTES TO USERS:**

1. DPW STANDARD PLANS SHALL BE USED IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS AND BRIDGES ON FEDERAL HIGHWAY PROJECTS (FP-03).
2. ADDITIONS AND REVISIONS TO THE STANDARD PLANS MAY BE ISSUED PERIODICALLY BY THE DPW.
3. USERS MAY SUBMIT COMMENTS AND SUGGESTED CHANGES TO THE STANDARD PLANS BY SENDING A MARKED COPY OF THE STANDARD PLAN TO:

DEPARTMENT OF PUBLIC WORKS  
 ATTN: CHIEF ENGINEER  
 542 NORTH MARINE CORPS DRIVE  
 TAMUNING, GUAM 96913

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REVISION	DATE	BY	DESCRIPTION



Guam Department of Public Works  
 542 North Marine Corps Drive  
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**DPW STANDARD PLANS INDEX**

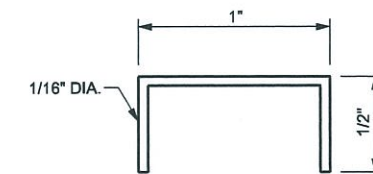
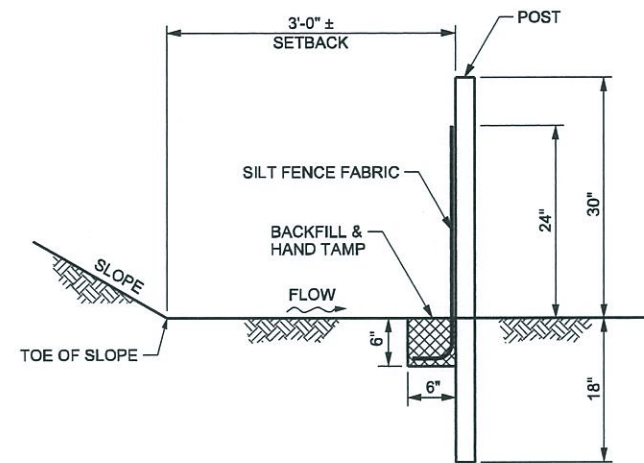
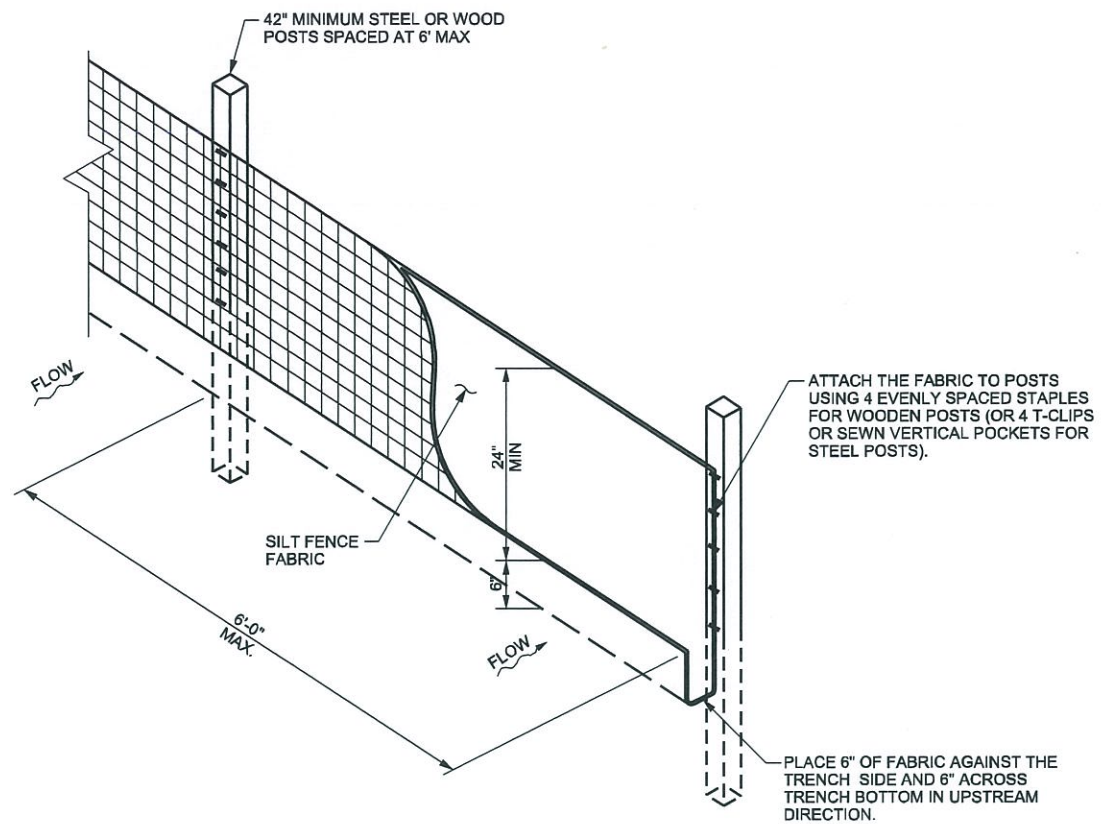
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*[Signature]*  
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STANDARD NO.

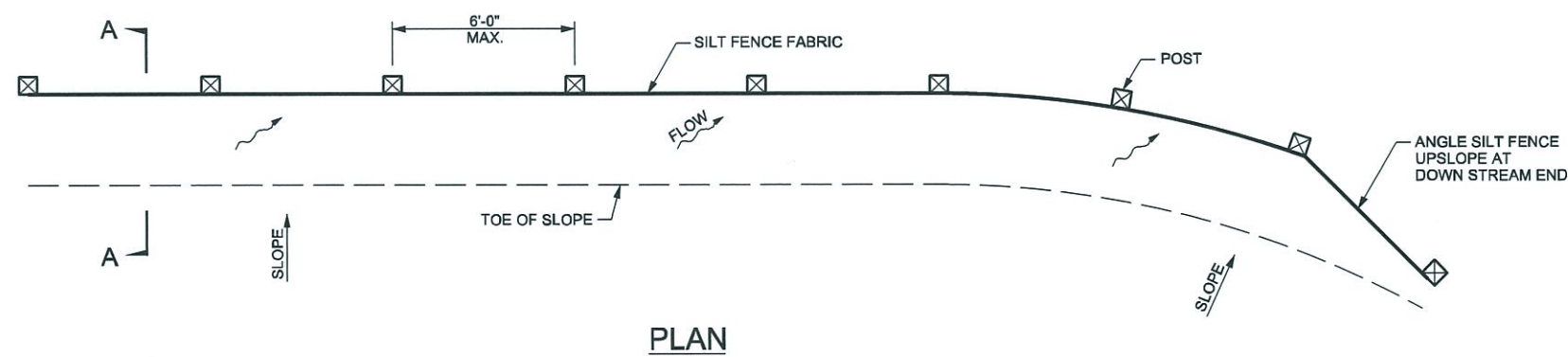
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SECTION A-A

STAPLE DETAIL



**GENERAL NOTES:**

1. SETBACK DIMENSIONS MAY VARY TO SUIT FIELD CONDITIONS.
2. ALTERNATE PREASSEMBLED SILT FENCE CONFORMING TO THE SPECIFICATIONS WILL BE ALLOWED.

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SILT FENCE DETAILS

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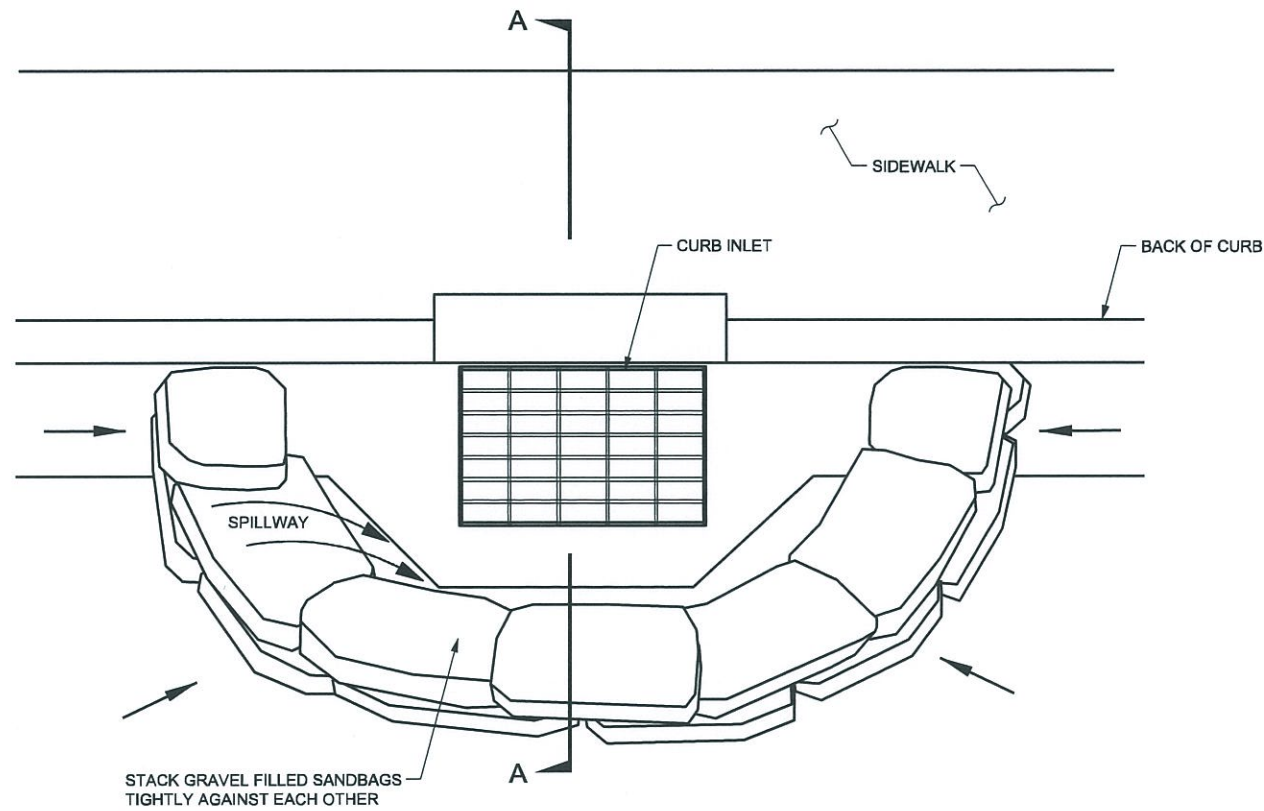
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157-01

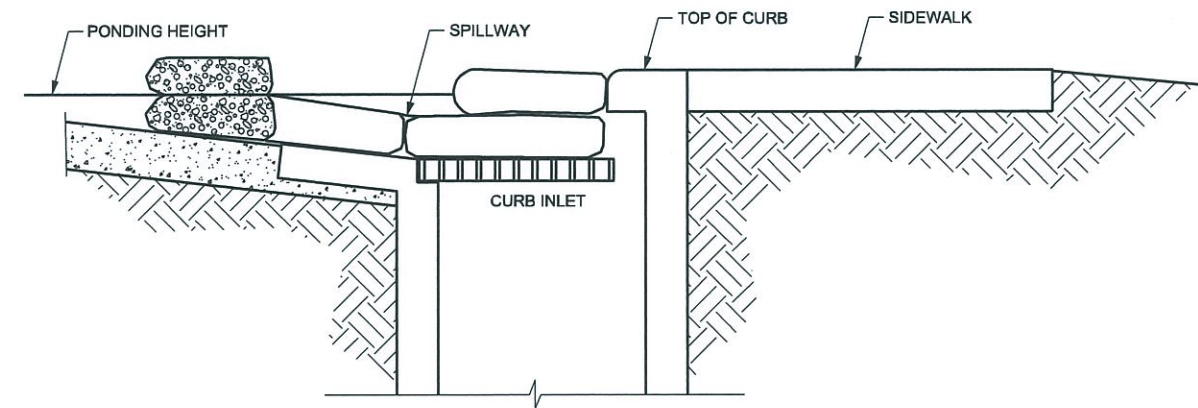


**GENERAL NOTES:**

1. PLACE CURB INLET PROTECTION AT A LOW POINT IN THE CURB PROFILE TO ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS, OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC, SHALL BE FILLED WITH GRAVEL, AND STACKED TIGHTLY.
3. LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW. TOP OF THE SPILLWAY SHALL BE BELOW THE TOP OF CURB ELEVATION.
4. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT.



**PLAN VIEW**



**SECTION A - A**

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**TEMPORARY CURB INLET PROTECTION**

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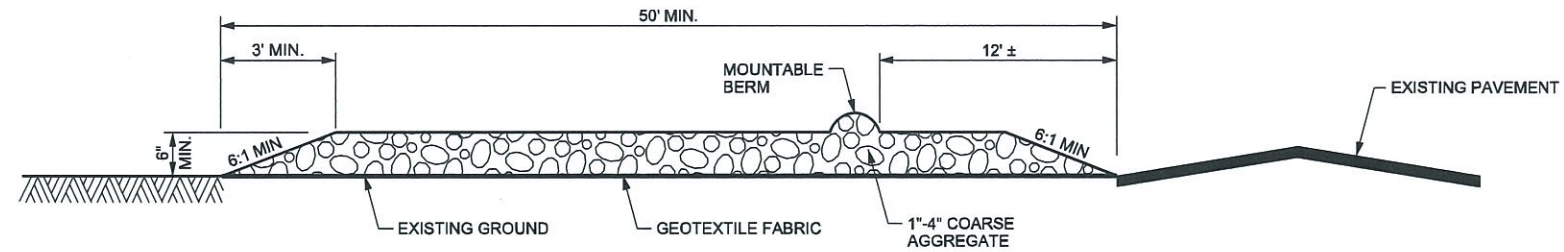
*Eng...*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS *Asky*

DATE: 10.14.12

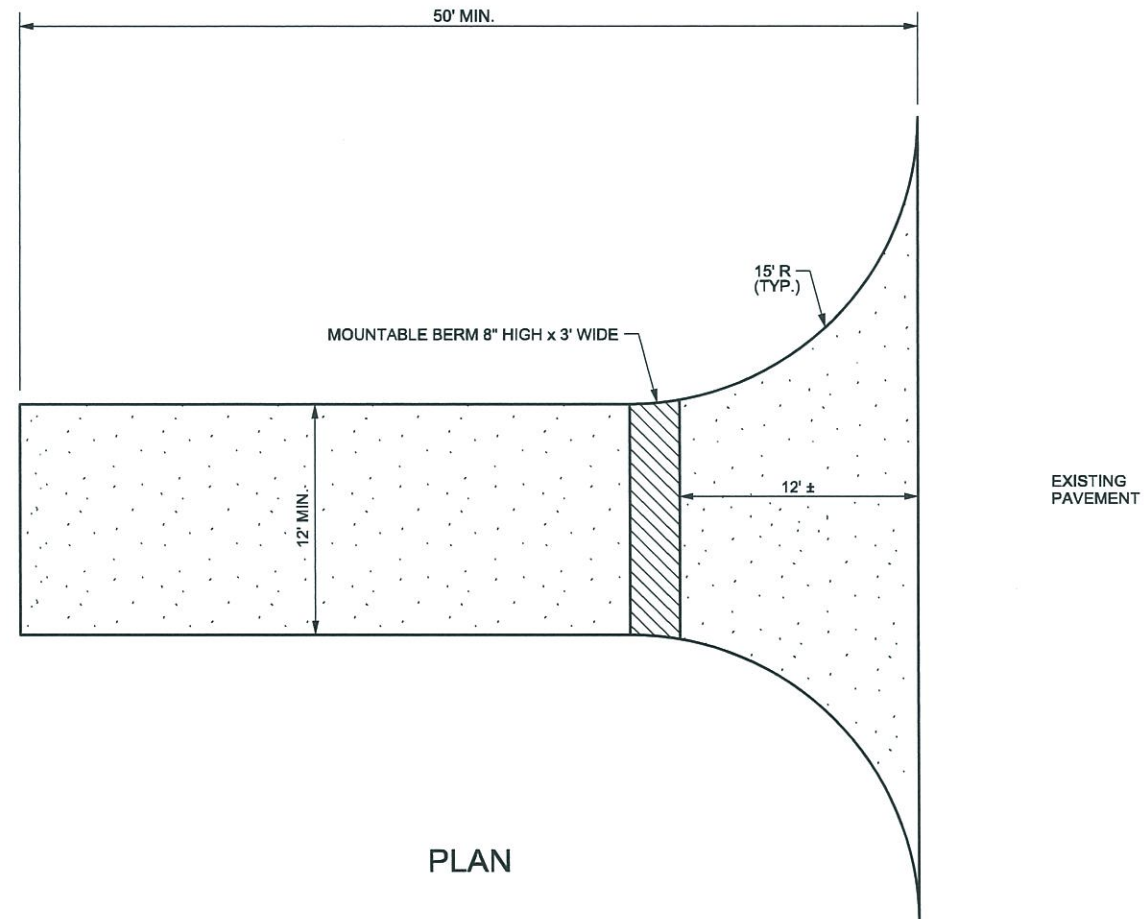
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157-02





PROFILE



PLAN

STABILIZED CONSTRUCTION ENTRANCE

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STABILIZED CONSTRUCTION ENTRANCE

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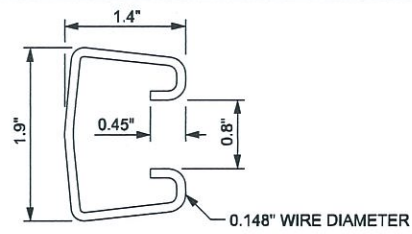
*Eugene...*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS *Acting*

DATE: 10.14.12

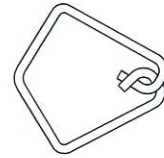
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157-03

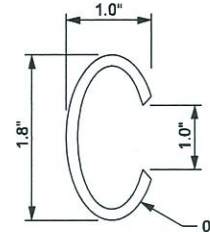




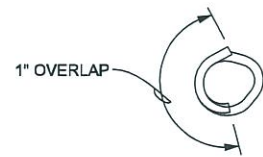
BEFORE CLOSURE  
**INTERLOCKING WIRE FASTENER**



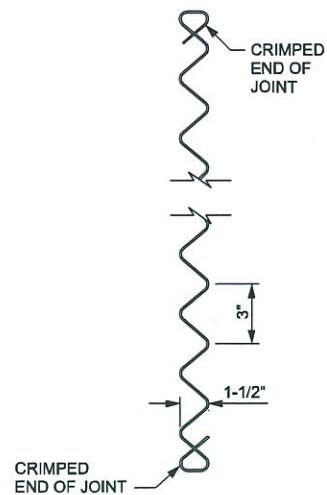
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ALL DIMENSIONS  
ARE NOMINAL



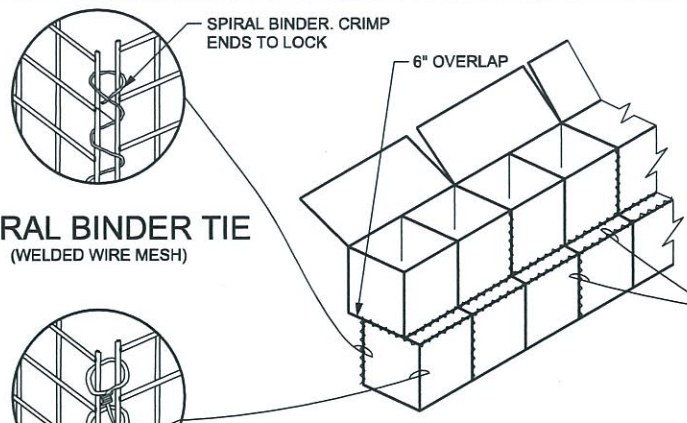
BEFORE CLOSURE  
**ALTERNATE TYING FASTENERS**



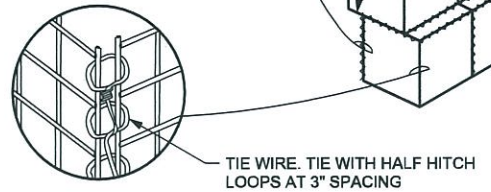
NOTE:  
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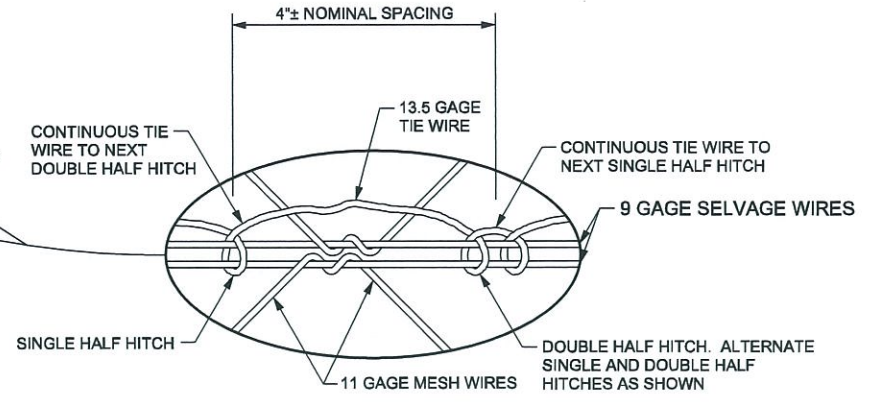
**9 GAGE  
SPIRAL BINDER**



**SPIRAL BINDER TIE  
(WELDED WIRE MESH)**



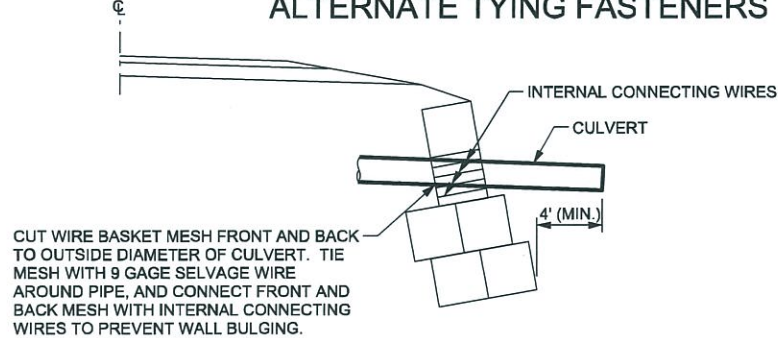
**HALF HITCH TYING DETAIL  
(WELDED WIRE MESH)**



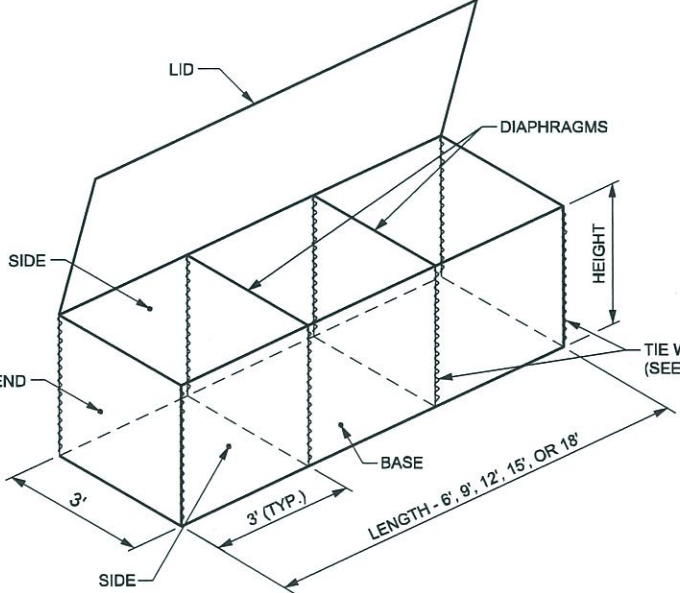
**HALF HITCH TYING DETAIL  
(TWISTED WIRE MESH)**

**TYPICAL INSTALLATION GABION BASKETS**

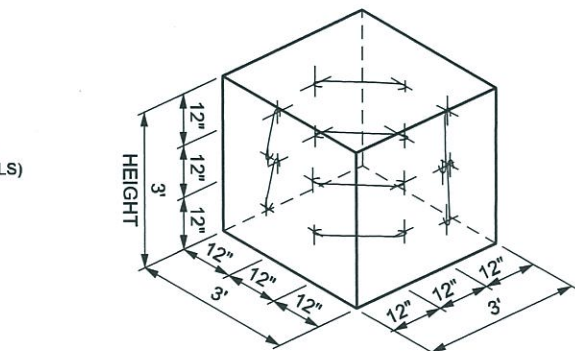
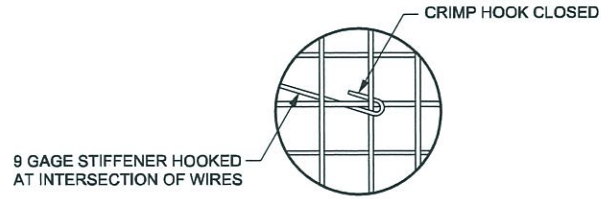
STANDARD GABION SIZES				
SIZE CODE LETTER	SIZE IN FEET		DIAPHRAGM PARTITIONS	CAPACITY (CUYD)
	LENGTH	HEIGHT		
A	6	3	1	2
B	9	3	2	3
C	12	3	3	4
D	6	1.5	1	1.00
E	9	1.5	2	1.50
F	12	1.5	3	2.00
G	6	1.0	1	0.67
H	9	1.0	2	1.00
I	12	1.0	3	1.33
X	15	3	4	5
Y	18	3	5	6



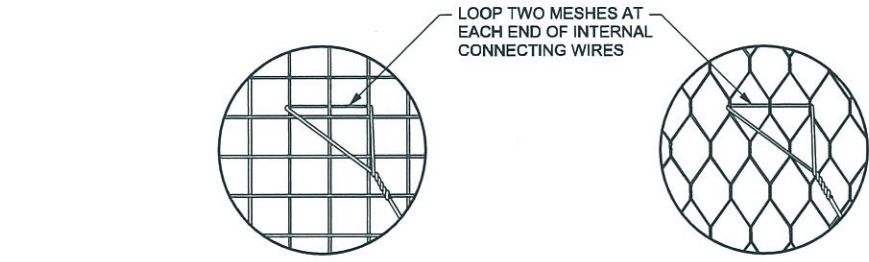
**TYPICAL CULVERT INSTALLATION  
THROUGH GABION WALL**



**TYPICAL ASSEMBLED GABION BASKET**

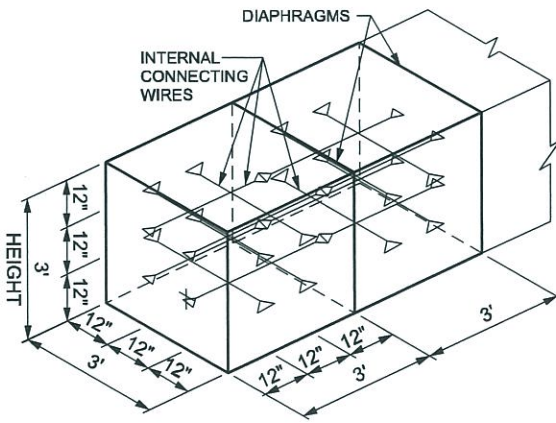


**OPTIONAL INTERNAL CONNECTING WIRES  
WELDED WIRE GABION BASKET**

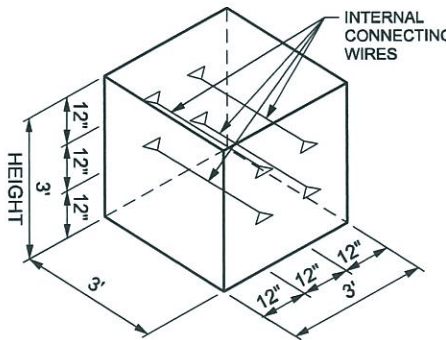


**WELDED WIRE MESH**

**TWISTED WIRE MESH**



**ALL END GABION CELLS**



**ALL INTERIOR GABION CELLS**

**TYPICAL INTERNAL CONNECTING WIRES**

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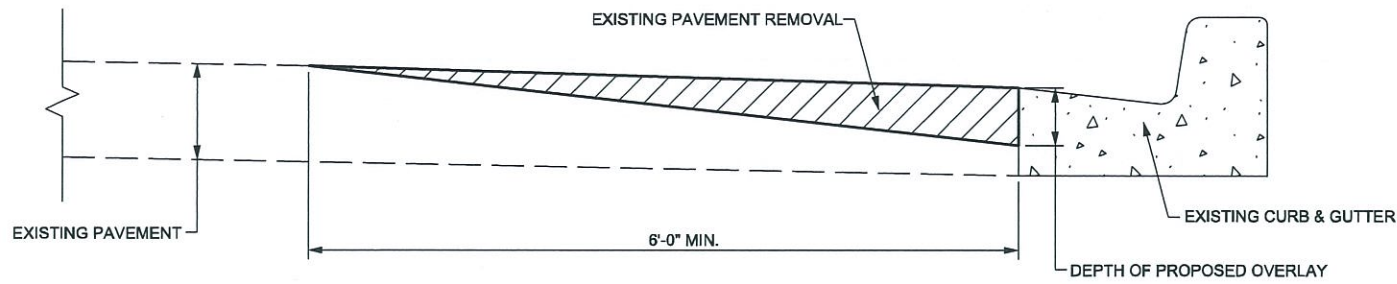


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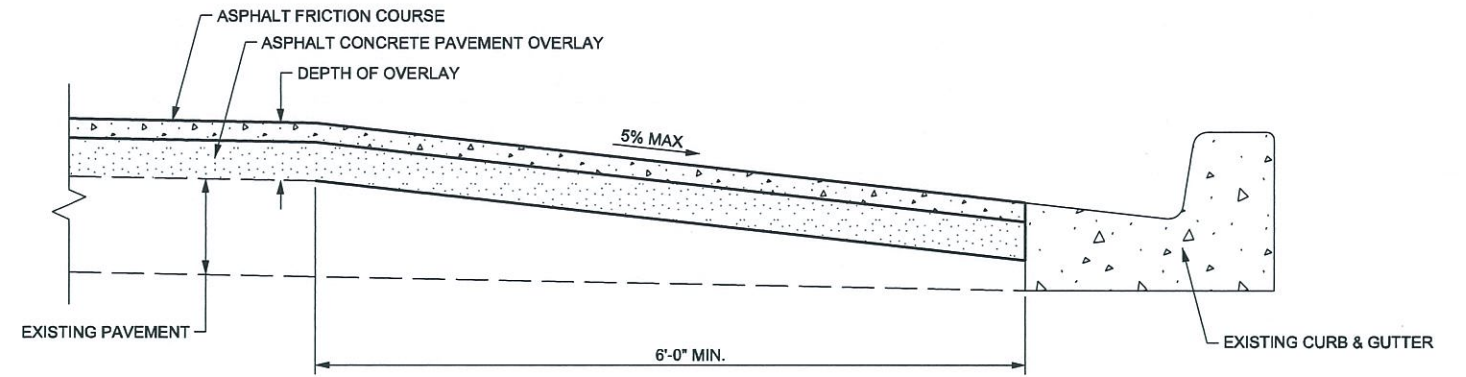
**GABION BASKET DETAILS**

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STANDARD NO.	253-01



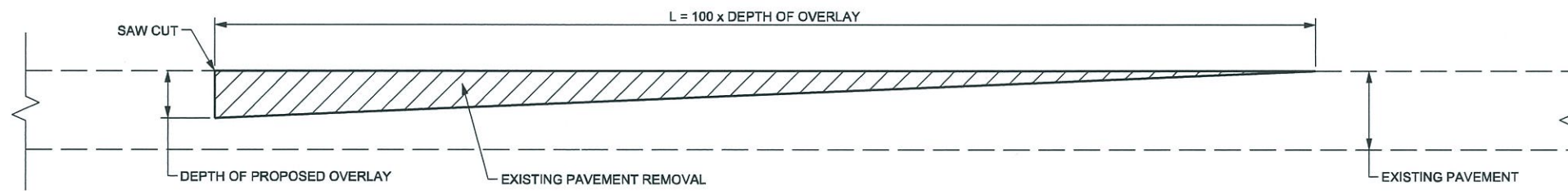


PAVEMENT REMOVAL

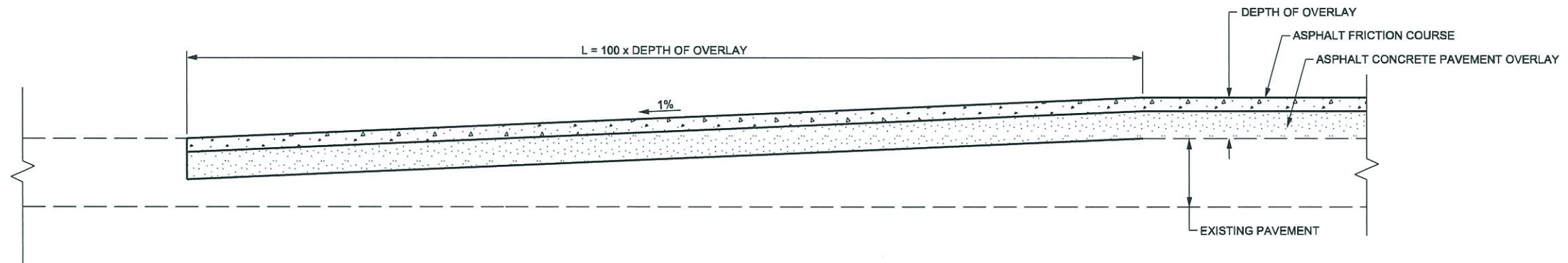


PAVEMENT OVERLAY

TAPER DETAIL FOR EXISTING CURB & GUTTER



PAVEMENT REMOVAL



PAVEMENT OVERLAY

BUTT JOINT- LONGITUDINAL SECTION

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ASPHALT PAVEMENT OVERLAY TRANSITIONS

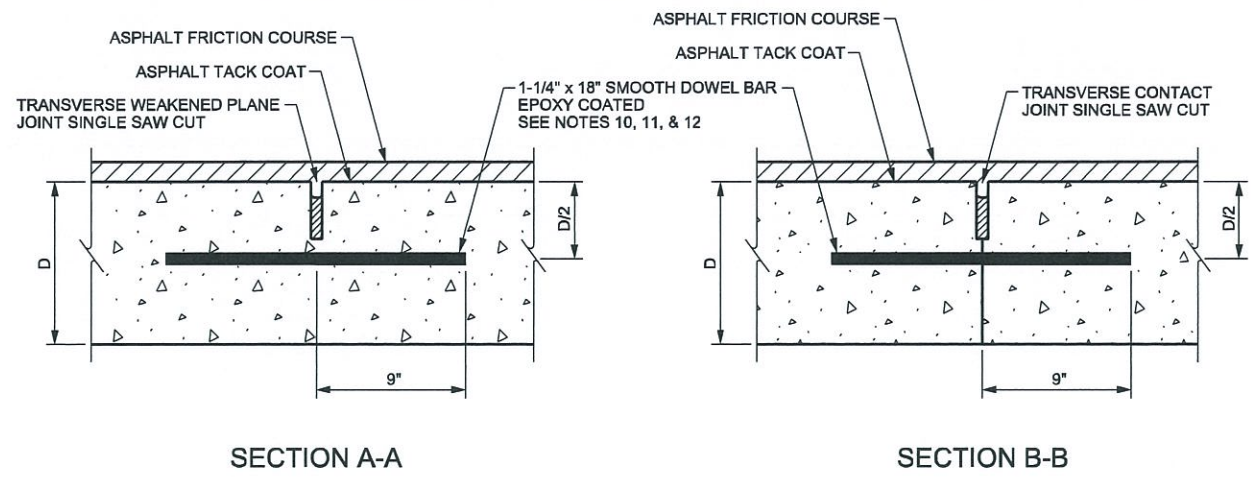
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*Ernesto Torres*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10-14-12

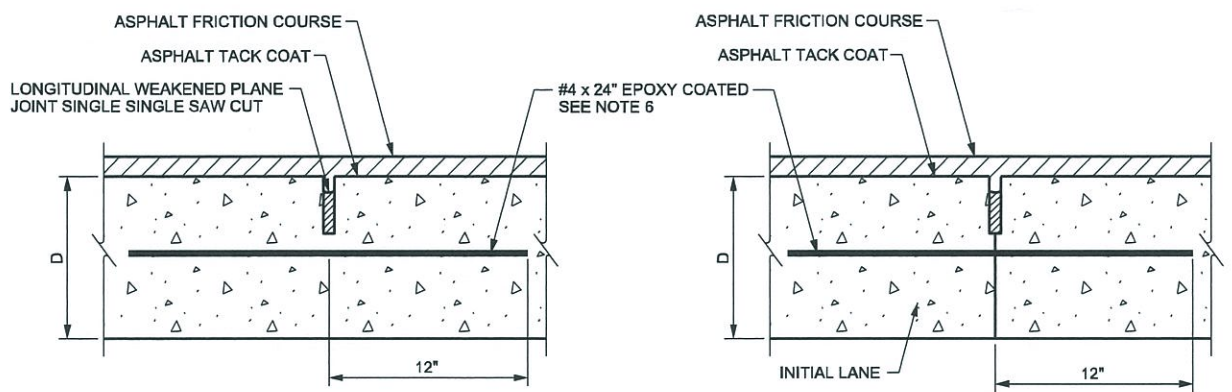
STANDARD NO. 403-01





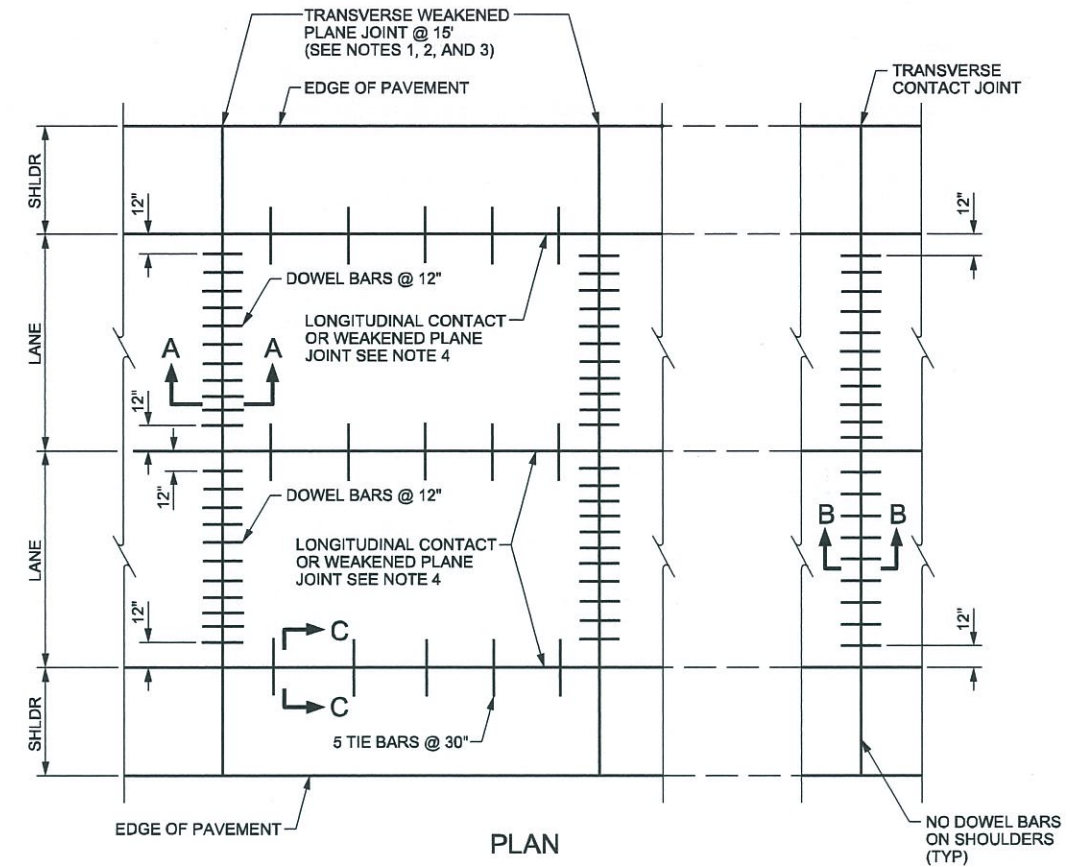
**TRANSVERSE WEAKENED PLANE JOINT**

**TRANSVERSE CONTACT JOINT**



**LONGITUDINAL WEAKENED PLANE JOINT**

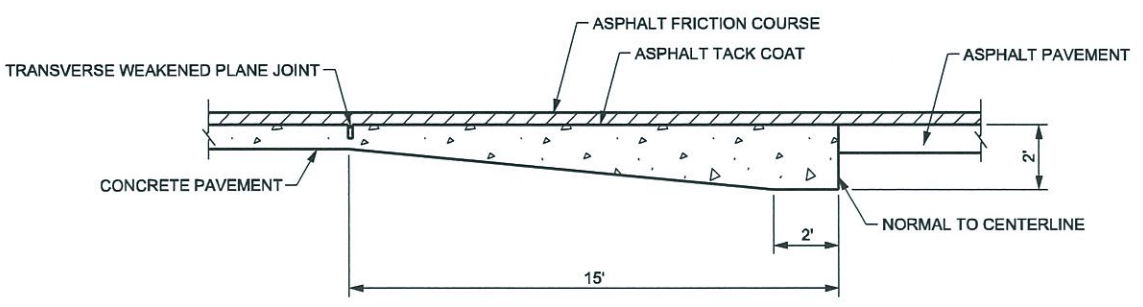
**LONGITUDINAL CONTACT JOINT**



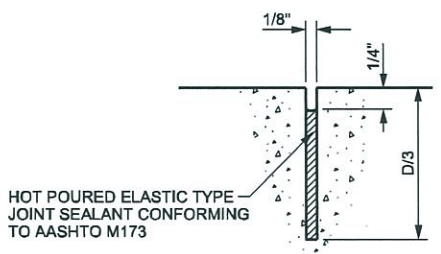
**TIE BAR AND DOWEL BAR APPLICATIONS**  
(TWO LANES SHOWN, TYP. FOR ADDITIONAL LANES)

**GENERAL NOTES:**

1. ALL WEAKENED PLANE JOINTS SHALL BE SAWED PERPENDICULAR AS SHOWN.
2. SPACING OF WEAKENED PLANE JOINTS SHALL BE 15' EXCEPT AT STRUCTURE APPROACHES.
3. TRANSVERSE WEAKENED PLANE JOINTS SHALL BE AT LEAST 6' FROM ANY CONTACT JOINT.
4. LONGITUDINAL WEAKENED PLANE JOINTS SHALL BE CUT AT ALL LANE AND SHOULDER LINES EXCEPT WHERE LANE PLUS ADJACENT SHOULDER WIDTH IS LESS THAN OR EQUAL TO 16'.
5. ALL TRANSVERSE CONTACT JOINTS SHALL BE SAWED AND JOINT SEALER USED PER RESPECTIVE TRANSVERSE CONTACT JOINT DETAIL THIS SHEET.
6. TIE BARS SHALL BE PLACED IN MIDDLE 1/3 OF SLAB THICKNESS. TIE BARS SHALL NOT BE PLACED WITHIN 1' OF DOWEL BARS.
7. TRANSVERSE CONTACT JOINTS WITH DOWEL BARS SHALL BE USED AT ALL CONSTRUCTION JOINTS.
8. PAVEMENT END ANCHORS SHALL BE CONSTRUCTED AS THE TERMINAL PANELS OF ALL PAVEMENT NOT ABUTTING EXISTING CONCRETE PAVEMENTS OR STRUCTURES.
9. 1/8" WEAKENED PLANE JOINT SAW CUT TO BE DONE WITHIN SPECIFIED TIME LIMIT.
10. DOWEL BARS SHALL BE LOCATED WITHIN 1" OF THE PLANNED TRANSVERSE AND DEPTH LOCATION AND WITHIN 2" OF THE PLANNED LONGITUDINAL LOCATION.
11. DOWEL BARS SHALL BE PARALLEL TO THE PAVEMENT SURFACE AND CENTERLINE WITHIN A TOLERANCE OF 1/2" IN 18".
12. DOWEL BARS SHALL NOT BE PLACED WITHIN 1' OF LONGITUDINAL JOINTS.
13. D = CONCRETE SLAB THICKNESS.



**PAVEMENT END ANCHOR DETAIL**  
SEE NOTE 8



**WEAKENED PLANE JOINT SINGLE SAW CUT**

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**PLAIN RIGID PAVEMENT DETAILS**

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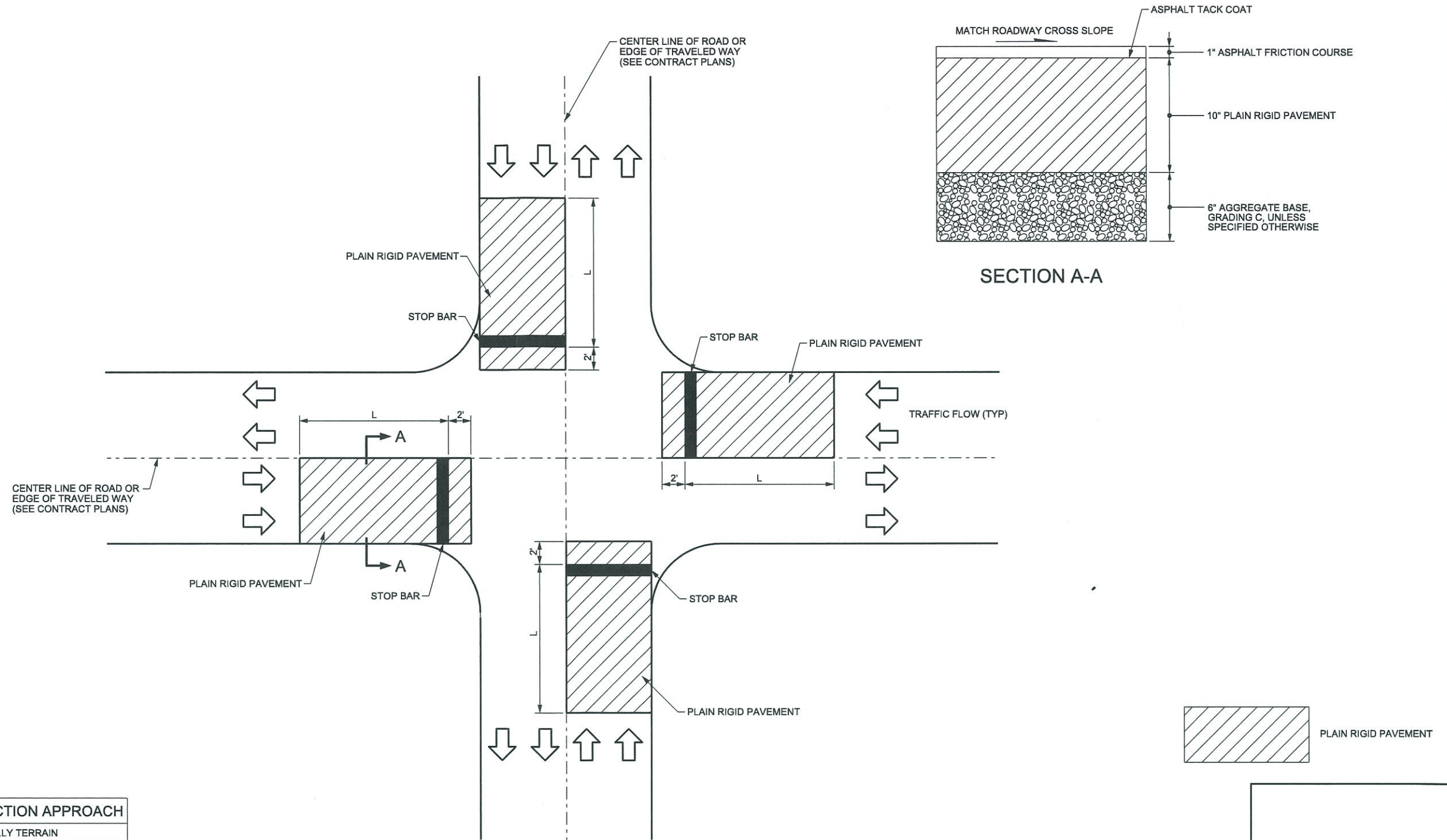
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CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS *Acting*

DATE: 10.14.12

STANDARD NO.

501-01





LENGTH OF PLAIN RIGID PAVEMENT AT INTERSECTION APPROACH

DESIGN SPEED (MPH)	FLAT TERRAIN		HILLY TERRAIN		
	< 3%	DOWNGRADE			UPGRADE
		>3%	>6%	>9%	>3%
	L	L	L	L	L
50	170'	180'	190'	205'	NR
45	140'	145'	155'	165'	NR
40	NR	115'	125'	135'	NR
35	NR	NR	95'	100'	NR
30	NR	NR	NR	75'	NR
25	NR	NR	NR	NR	NR

NR = NOT REQUIRED

**GENERAL NOTES:**

- RIGID PAVEMENT LENGTH SHALL BE BASED ON DESIGN SPEED AND APPROACH GRADE. SEE TABLE.
- RIGID PAVEMENT WIDTH SHALL INCLUDE ALL THROUGH LANES AND TURNING LANES APPROACHING THE INTERSECTION. SEE CONTRACT PLANS.
- RIGID PAVEMENT SHALL BE DIVIDED INTO PANELS BY TRANSVERSE LONGITUDINAL JOINTS WITH DOWELS, TIE BARS AND SEALANT AS SHOWN ON STD 501-01.

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PLAIN RIGID PAVEMENT INTERSECTION APPROACH

APPROVED FOR USE ON DPW PROJECTS

CHIEF ENGINEER, HIGHWAYS  
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STANDARD NO.

501-02



**TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL**

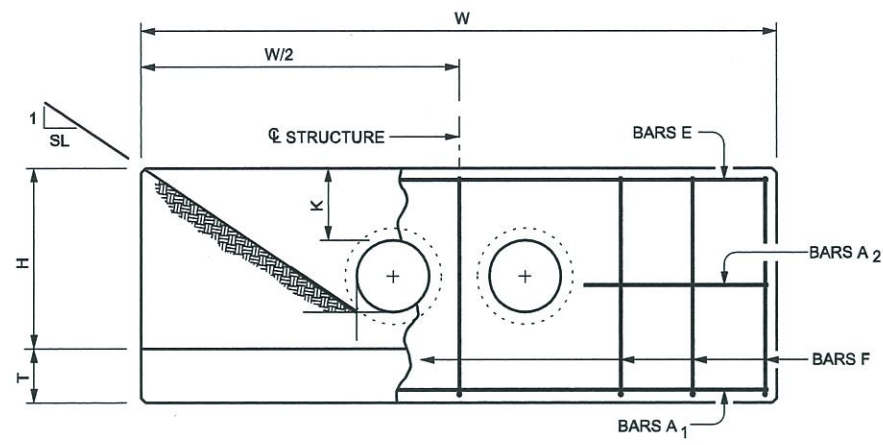
SLOPE	DIA OF PIPED	VALUES FOR ONE PIPE			VALUES TO BE ADDED FOR EACH ADDTL PIPE		
		W	REINF (LBS)	CONC (CY)	W	REINF (LBS)	CONC (CY)
2:1	12"	9'-0"	122	1.1	1'-9"	15	0.2
	15"	10'-3"	136	1.3	2'-2"	16	0.2
	18"	11'-6"	163	1.5	2'-8"	19	0.3
	21"	12'-9"	200	1.8	3'-1"	31	0.4
	24"	14'-0"	217	2.1	3'-7"	34	0.4
	27"	15'-3"	254	2.4	3'-11"	37	0.5
	30"	16'-6"	272	2.7	4'-4"	40	0.6
	33"	17'-9"	314	3.1	4'-8"	43	0.6
	36"	19'-0"	371	3.9	5'-1"	46	0.8
	42"	21'-6"	442	4.9	5'-10"	52	1.0
48"	25'-0"	569	6.4	6'-7"	59	1.3	
3:1	12"	13'-0"	175	1.6	1'-9"	14	0.2
	15"	14'-9"	193	1.9	2'-2"	17	0.2
	18"	16'-6"	228	2.2	2'-8"	19	0.3
	21"	18'-3"	299	2.6	3'-1"	31	0.4
	24"	20'-0"	323	3.0	3'-7"	33	0.4
	27"	21'-9"	371	3.5	3'-11"	37	0.5
	30"	23'-6"	415	4.0	4'-4"	40	0.5
	33"	25'-3"	469	4.6	4'-8"	43	0.6
	36"	27'-0"	556	5.7	5'-1"	46	0.8
	42"	30'-6"	675	7.1	5'-10"	52	1.0
48"	35'-6"	837	9.2	6'-7"	59	1.3	
4:1	12"	17'-0"	229	2.0	1'-9"	15	0.2
	15"	19'-3"	266	2.4	2'-2"	17	0.2
	18"	21'-6"	308	2.9	2'-8"	19	0.3
	21"	23'-9"	382	3.5	3'-1"	31	0.3
	24"	26'-0"	430	3.9	3'-7"	34	0.4
	27"	28'-3"	486	4.7	3'-11"	37	0.5
	30"	30'-6"	539	5.2	4'-4"	40	0.6
	33"	32'-9"	603	6.0	4'-8"	42	0.6
	36"	35'-0"	738	7.5	5'-1"	47	0.8
	42"	39'-6"	881	9.3	5'-10"	52	1.0
48"	46'-0"	1102	12.1	6'-7"	61	1.3	
6:1	12"	25'-0"	336	3.0	1'-9"	14	0.2
	15"	28'-3"	384	3.6	2'-2"	17	0.2
	18"	31'-6"	452	4.2	2'-8"	19	0.3
	21"	34'-9"	581	5.1	3'-1"	31	0.4
	24"	38'-0"	644	5.8	3'-7"	34	0.4
	27"	41'-3"	737	6.9	3'-11"	37	0.5
	30"	44'-6"	807	7.7	4'-4"	39	0.6
	33"	47'-9"	912	8.9	4'-8"	44	0.6
	36"	51'-0"	1108	11.0	5'-1"	48	0.8
	42"	57'-6"	1318	13.7	5'-10"	54	1.0
48"	67'-0"	1674	17.9	6'-7"	59	1.3	

**TABLE OF CONSTANT DIMENSIONS**

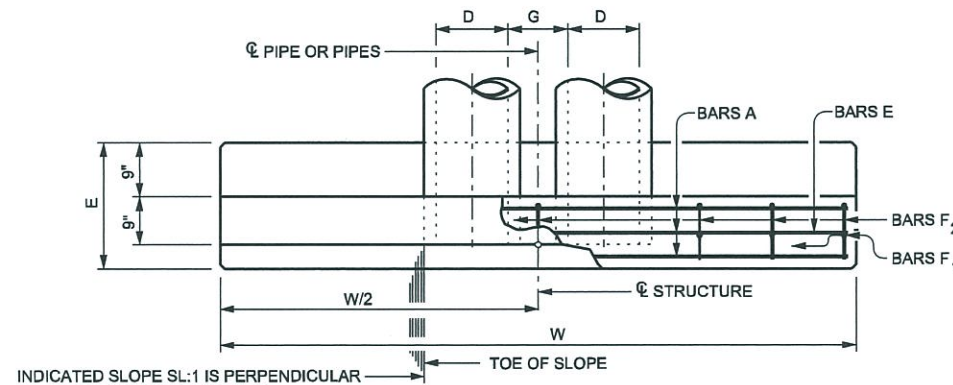
DIA OF PIPED	G	K	H	T	E
12"	9"	1'-0"	2'-8"	9"	1'-9"
15"	11"	1'-0"	2'-11"	9"	1'-9"
18"	1'-2"	1'-0"	3'-2"	9"	1'-9"
21"	1'-4"	1'-0"	3'-5"	9"	2'-0"
24"	1'-7"	1'-0"	3'-8"	9"	2'-0"
27"	1'-8"	1'-0"	3'-11"	9"	2'-3"
30"	1'-10"	1'-0"	4'-2"	9"	2'-3"
33"	1'-11"	1'-0"	4'-5"	9"	2'-6"
36"	2'-1"	1'-0"	4'-8"	1'-0"	2'-6"
42"	2'-4"	1'-0"	5'-2"	1'-0"	2'-9"
48"	2'-7"	1'-3"	5'-11"	1'-0"	3'-0"

**TABLE OF REINFORCING STEEL**

BAR	SIZE	SPA	NO.
A 1	#5	~	2
A 2	#5	1'-6"	~
E	#5	~	2
F	#5	1'-0"	~

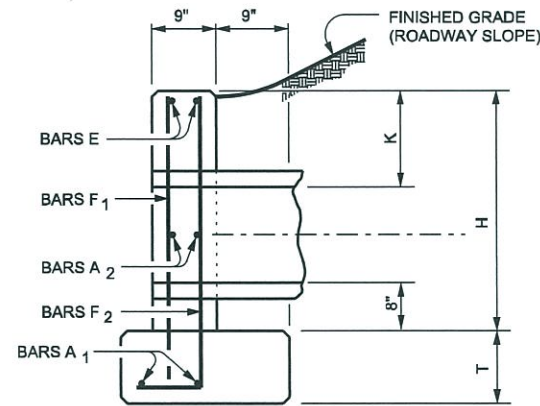


**ELEVATION**

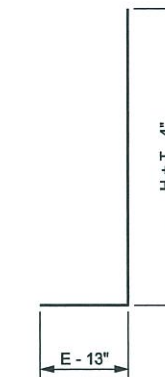


INDICATED SLOPE SL:1 IS PERPENDICULAR TO CENTERLINE PIPE OR PIPES.

**PLAN**



**SECTION**



**BARS F<sub>2</sub>**

**GENERAL NOTES:**

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 106 MINOR CONCRETE STRUCTURES.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 AND SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS. EMBED BARS AT LEAST 1-1/2" CLEAR OF CONCRETE SURFACES.
3. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1".
4. PROVIDE APPROPRIATE PROTECTION FOR VEHICLE SAFETY FOR HEADWALLS WITHIN ROADSIDE CLEAR ZONE.

SIGNED ORIGINAL ON FILE

**DRAWING REVISIONS**

REVISION	DATE	BY	DESCRIPTION



Guam Department of Public Works  
542 North Marine Corps Drive  
Tamuning, Guam 96913  
Tel: (671) 646-3131  
Fax: (671) 649-6178

**CONCRETE HEADWALLS WITH PARALLEL WINGS**

APPROVED FOR USE ON DPW PROJECTS

*Actuy*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
DATE: 10.14.12

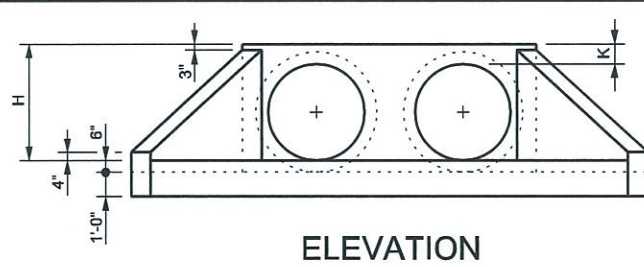
STANDARD NO.

601-01

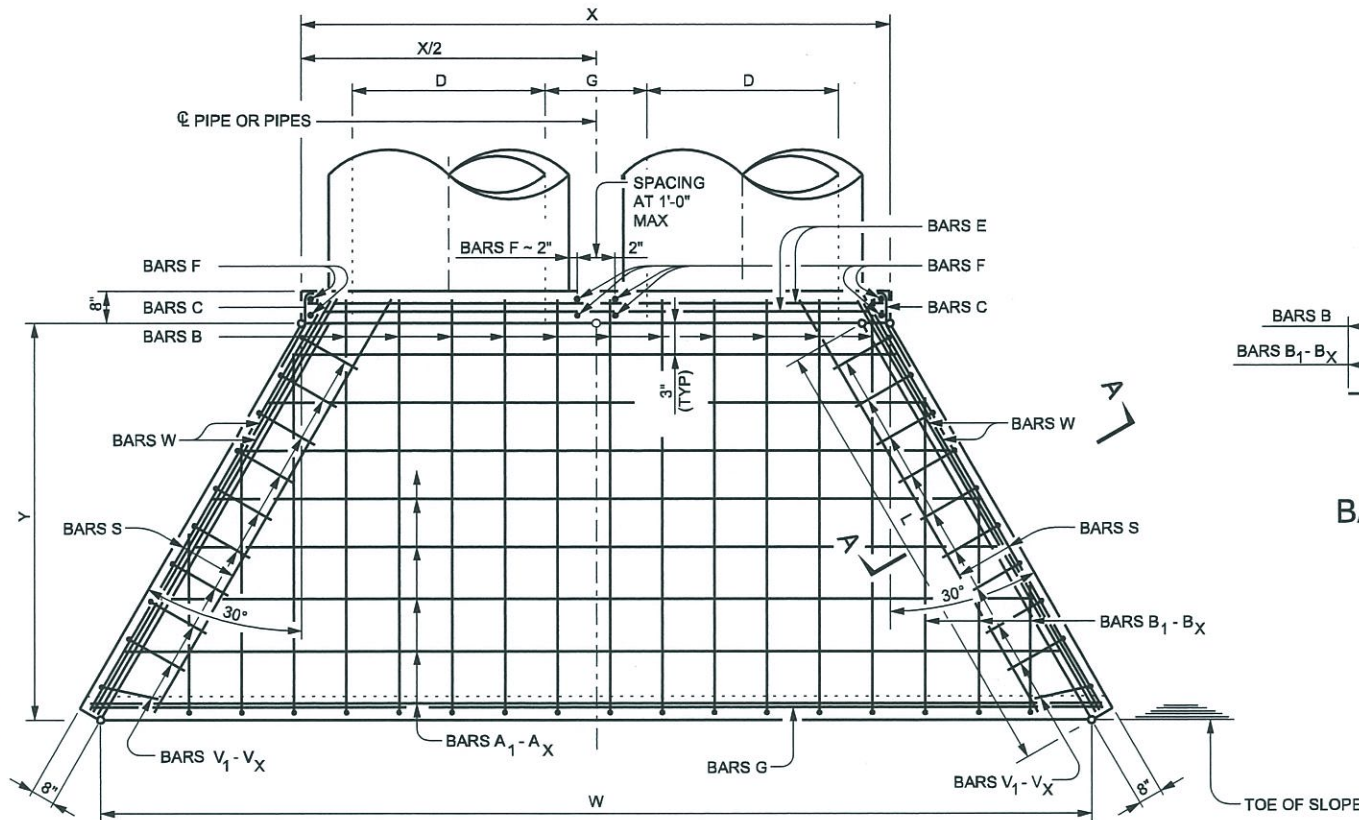


TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL

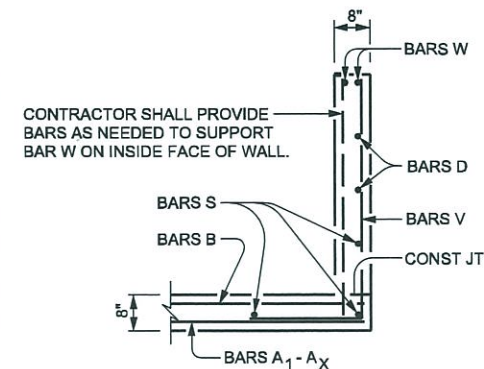
SLOPE	DIA OF PIPE, D	VALUES FOR ONE PIPE					VALUES TO BE ADDED FOR EACH ADDTL PIPE			
		W	X	Y	L	REINF (LBS)	CONC (CY)	X AND W	REINF (LBS)	CONC (CY)
2:1	12"	4'-7-1/2"	2'-6"	2'-10"	3'-3-1/4"	84	0.6	1'-9"	20	0.2
	15"	5'-5-3/4"	2'-9-1/2"	3'-4"	3'-10-1/4"	99	0.7	2'-2"	24	0.3
	18"	6'-4-1/4"	3'-1"	3'-10"	4'-5"	120	0.9	2'-8"	32	0.3
	21"	7'-2-3/4"	3'-4-1/2"	4'-4"	5'-0"	137	1.1	3'-1"	43	0.4
	24"	8'-2-1/2"	3'-9-1/2"	4'-10"	5'-7"	158	1.3	3'-7"	50	0.5
	27"	9'-1"	4'-1"	5'-4"	6'-2"	173	1.5	3'-11"	56	0.6
	30"	9'-11-1/2"	4'-4-1/2"	5'-10"	6'-8-3/4"	197	1.7	4'-4"	65	0.8
	33"	10'-10"	4'-8"	6'-4"	7'-3-3/4"	216	2.0	4'-8"	71	0.9
	36"	11'-8-1/4"	4'-11-1/2"	6'-10"	7'-10-3/4"	241	2.2	5'-1"	81	1.0
	42"	13'-5-1/4"	5'-6-1/2"	7'-10"	9'-0-1/2"	290	2.8	5'-10"	97	1.3
	48"	15'-9"	6'-1-1/2"	9'-4"	10'-9-1/4"	350	3.8	6'-7"	117	1.7
	3:1	12"	6'-3"	2'-6"	4'-3"	4'-11"	114	0.8	1'-9"	22
15"		7'-5"	2'-9-1/2"	5'-0"	5'-9-1/4"	133	1.1	2'-2"	28	0.3
18"		8'-6-3/4"	3'-1"	5'-9"	6'-7-3/4"	166	1.3	2'-8"	37	0.5
21"		9'-8-3/4"	3'-4-1/2"	6'-8"	7'-6"	189	1.6	3'-1"	48	0.6
24"		11'-0"	3'-9-1/2"	7'-3"	8'-4-1/2"	221	2.0	3'-7"	58	0.7
27"		12'-2"	4'-1"	8'-0"	9'-2-3/4"	245	2.3	3'-11"	67	0.8
30"		13'-4"	4'-4-1/2"	8'-9"	10'-1-1/2"	287	2.7	4'-4"	77	1.0
33"		14'-5-3/4"	4'-8"	9'-6"	10'-11-3/4"	310	3.1	4'-8"	84	1.2
36"		15'-7-3/4"	4'-11-1/2"	10'-3"	11'-10"	343	3.5	5'-1"	96	1.4
42"		17'-11-1/2"	5'-6-1/2"	11'-9"	13'-6-3/4"	424	4.5	5'-10"	119	1.7
48"		21'-1-3/4"	6'-1-1/2"	14'-0"	16'-2"	527	6.1	6'-7"	146	2.3
4:1		12"	7'-10-3/4"	2'-6"	5'-8"	6'-6-1/2"	144	1.1	1'-9"	24
	15"	9'-4"	2'-9-1/2"	6'-8"	7'-8-1/2"	177	1.5	2'-2"	32	0.4
	18"	10'-9-1/2"	3'-1"	7'-8"	8'-10-1/4"	217	1.9	2'-8"	42	0.5
	21"	12'-2-3/4"	3'-4-1/2"	8'-8"	10'-0"	254	2.3	3'-1"	57	0.7
	24"	13'-9-1/2"	3'-9-1/2"	9'-8"	11'-2"	295	2.8	3'-7"	67	0.9
	27"	15'-3"	4'-1"	10'-8"	12'-3-3/4"	328	3.3	3'-11"	77	1.0
	30"	16'-8-1/4"	4'-4-1/2"	11'-8"	13'-5-3/4"	379	3.8	4'-4"	89	1.3
	33"	18'-1-3/4"	4'-8"	12'-8"	14'-7-1/2"	417	4.5	4'-8"	101	1.4
	36"	19'-7"	4'-11-1/2"	13'-8"	15'-9-1/4"	464	5.1	5'-1"	115	1.7
	42"	22'-5-3/4"	5'-6-1/2"	15'-8"	18'-1"	575	6.5	5'-10"	141	2.1
	48"	26'-6-1/4"	6'-1-1/2"	18'-8"	21'-6-1/4"	720	8.9	6'-7"	175	2.8
	6:1	12"	11'-2"	2'-6"	8'-6"	9'-9-3/4"	220	1.9	1'-9"	28
15"		13'-2-1/4"	2'-9-1/2"	10'-0"	11'-6-1/2"	264	2.5	2'-2"	37	0.5
18"		15'-2-1/2"	3'-1"	11'-6"	13'-3-1/4"	326	3.2	2'-8"	50	0.7
21"		17'-2-3/4"	3'-4-1/2"	13'-0"	15'-0-1/4"	381	3.9	3'-1"	69	0.9
24"		19'-4-1/2"	3'-9-1/2"	14'-6"	16'-9"	447	4.8	3'-7"	80	1.2
27"		21'-4-3/4"	4'-1"	16'-0"	18'-5-3/4"	506	5.7	3'-11"	96	1.4
30"		23'-5-1/2"	4'-4-1/2"	17'-0"	20'-2-1/2"	587	6.7	4'-4"	110	1.7
33"		25'-5-1/2"	4'-8"	19'-0"	21'-11-1/4"	667	7.8	4'-8"	127	2.0
36"		27'-5-3/4"	4'-11-1/2"	20'-6"	23'-8"	727	9.0	5'-1"	144	2.3
42"		31'-6-1/4"	5'-6-1/2"	23'-6"	27'-1-1/2"	914	11.5	5'-10"	179	3.0
48"		37'-3-1/2"	6'-1-1/2"	28'-0"	32'-4"	1181	15.9	6'-7"	231	4.0



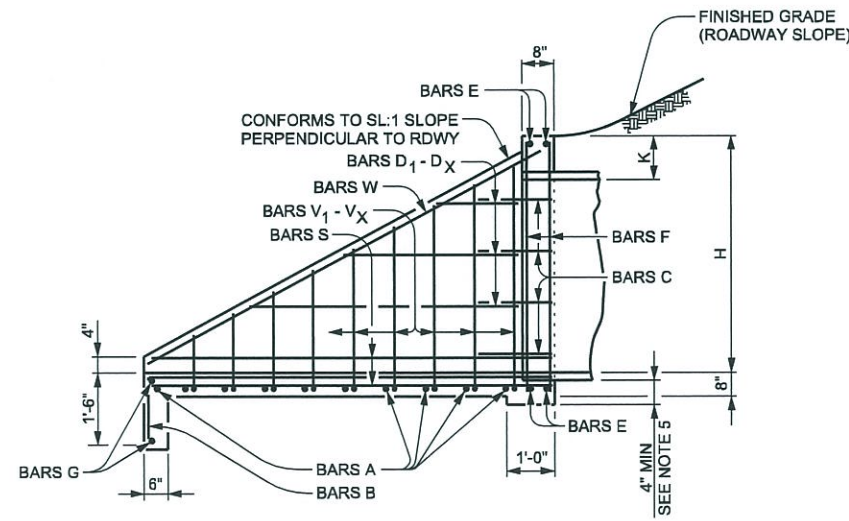
ELEVATION



PLAN



SECTION A-A



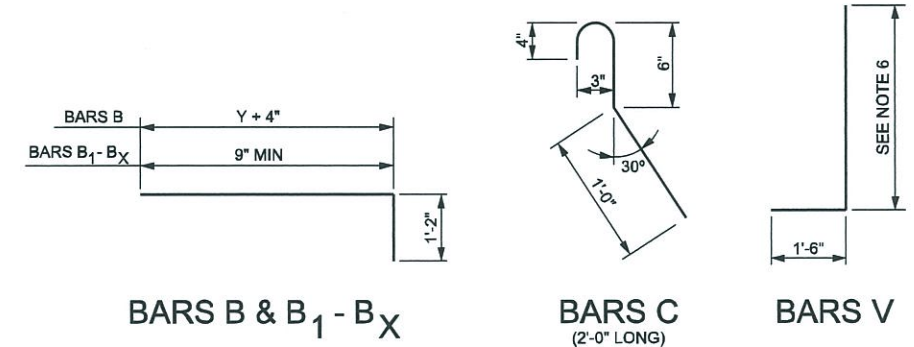
TYPICAL WING ELEVATION

TABLE OF REINFORCING STEEL

BAR	SIZE	SPA	NO.
A	#4	1'-0"	~
B	#3	1'-6"	~
C	#4	1'-0"	~
D	#3	1'-0"	~
E	#5	~	4
F	#5	~	~
G	#3	~	2
S	#4	~	6
V	#4	1'-0"	~
W	#5	~	4

TABLE OF CONSTANT DIMENSIONS

DIA OF PIPE, D	G	K	H
12"	9"	1'-0"	2'-0"
15"	11"	1'-0"	2'-3"
18"	1'-2"	1'-0"	2'-6"
21"	1'-4"	1'-0"	2'-9"
24"	1'-7"	1'-0"	3'-0"
27"	1'-8"	1'-0"	3'-3"
30"	1'-10"	1'-0"	3'-6"
33"	1'-11"	1'-0"	3'-9"
36"	2'-1"	1'-0"	4'-0"
42"	2'-4"	1'-0"	4'-6"
48"	2'-7"	1'-3"	5'-3"



GENERAL NOTES:

- CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 106 MINOR CONCRETE STRUCTURES.
- REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 AND SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS. EMBED BARS AT LEAST 1-1/2" CLEAR OF CONCRETE SURFACES.
- EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1".
- PROVIDE APPROPRIATE PROTECTION FOR VEHICLE SAFETY FOR HEADWALLS WITHIN ROADSIDE CLEAR ZONE.
- PROVIDE A 1'-0" FOOTING AS SHOWN WHERE REQUIRED TO MAINTAIN 4" MIN COVER FOR PIPES.
- MIN LENGTH =  $6" + 3" \times \left( \frac{12 \times H - 7}{12 \times L} \right)$   
MAX LENGTH =  $12 \times H - 3" \times \left( \frac{12 \times H - 7}{12 \times L} \right) - 1"$

SIGNED ORIGINAL ON FILE

DRAWING REVISIONS

REVISION	DATE	BY	DESCRIPTION



Guam Department of Public Works  
542 North Marine Corps Drive  
Tamuning, Guam 96913  
Tel: (671) 646-3131  
Fax: (671) 649-6178

CONCRETE HEADWALLS WITH FLARED WINGS

APPROVED FOR USE ON DPW PROJECTS

Chief Engineer, Highways  
Department of Public Works  
DATE: 10.14.12

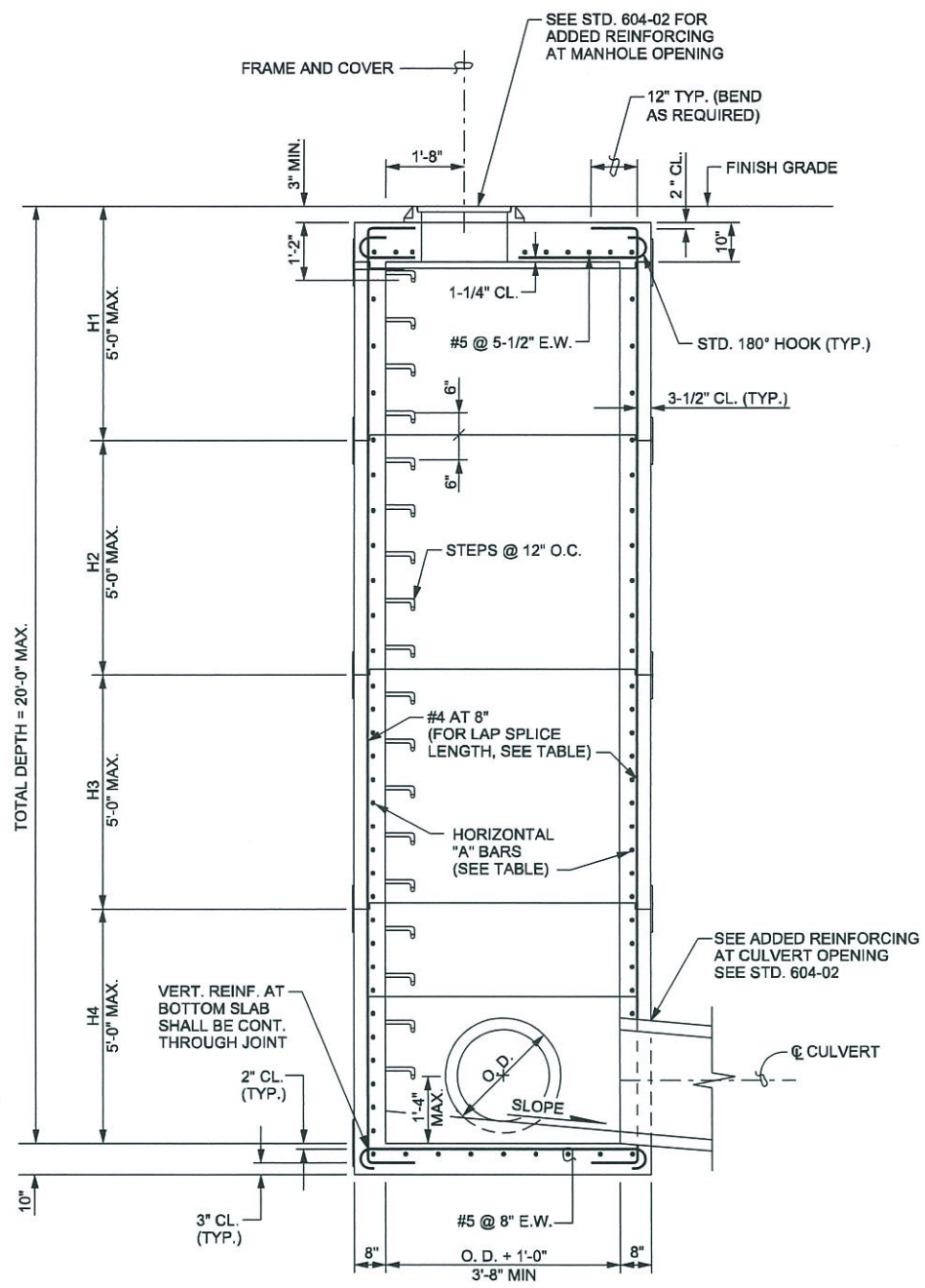
STANDARD NO.

601-02

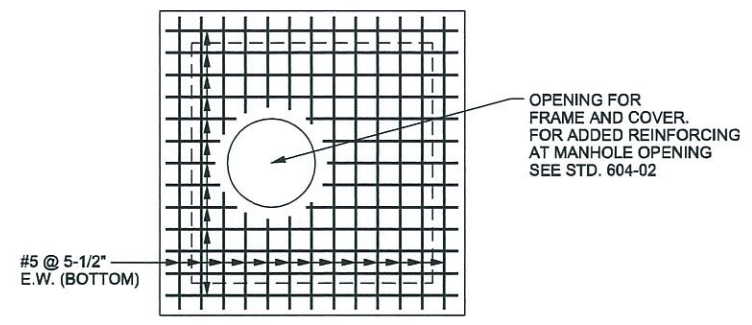


**GENERAL NOTES:**

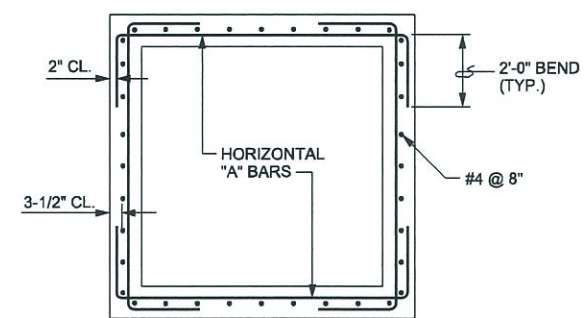
1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 601 MINOR CONCRETE STRUCTURES.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 AND SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS.
3. MANHOLE FRAMES AND COVERS SHALL CONFORM TO AASHTO M306, AND SHALL BE ADJUSTED TO MATCH THE ROADWAY PROFILE AND CROSS-SLOPE. SEE STD. 604-09 FOR CONCRETE COLLAR.
4. FOR STEP DETAILS, SEE STD. 604-02. STEPS SHALL NOT BE PROVIDED FOR MANHOLES DEEPER THAN 10 FEET.
5. PIPES CAN BE PLACED IN ANY WALL.
6. MANHOLE FLOORS SHALL BE SLOPED TO DRAIN FROM ALL DIRECTIONS TO THE OUTLET PIPE.



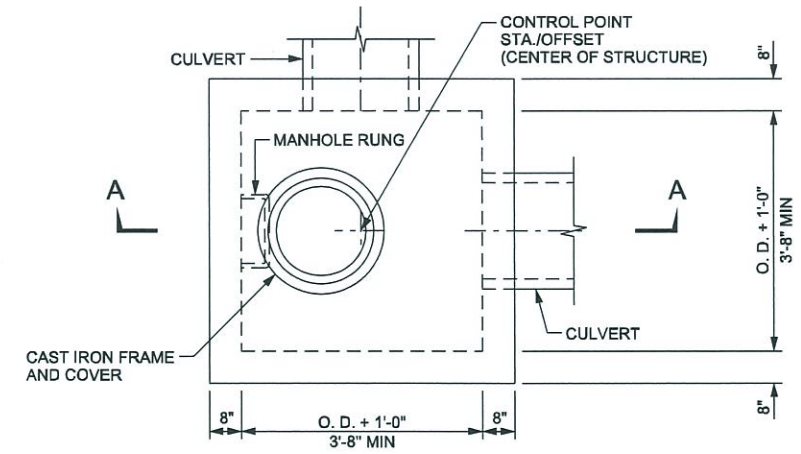
**SECTION A-A**



**PLAN VIEW OF TOP SLAB REINFORCING**



**PLAN VIEW OF WALL SECTION**



**PLAN**

HORIZONTAL "A" BARS FOR STORM DRAIN MANHOLE		
SDMH DEPTH	HORIZONTAL "A" BARS	
H1	0'-0" TO 5'-0"	#5 @ 10"
H2	5'-1" TO 10'-0"	#5 @ 8"
H3	10'-1" TO 15'-0"	#5 @ 6"
H4	15'-1" TO 20'-0"	#5 @ 6"

VERT. BAR LAP SPLICE	
BAR	VERT. LAP LENGTH
#4	1'-8"
#5	2'-2"

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DRAWING REVISIONS			
REVISION	DATE	BY	DESCRIPTION



Guam Department of Public Works  
 542 North Marine Corps Drive  
 Tamuning, Guam 96913  
 Tel: (671) 646-3131  
 Fax: (671) 649-6178

**STORM DRAIN MANHOLE**

APPROVED FOR USE ON DPW PROJECTS

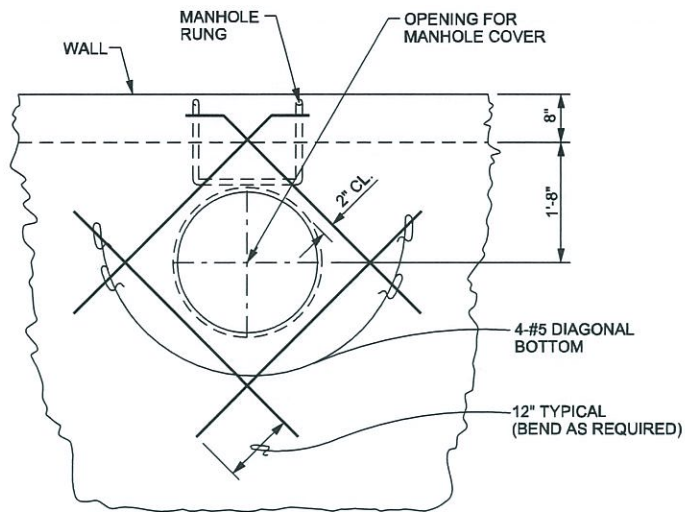
CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS  
 DATE: 10-14-12

STANDARD NO. 604-01

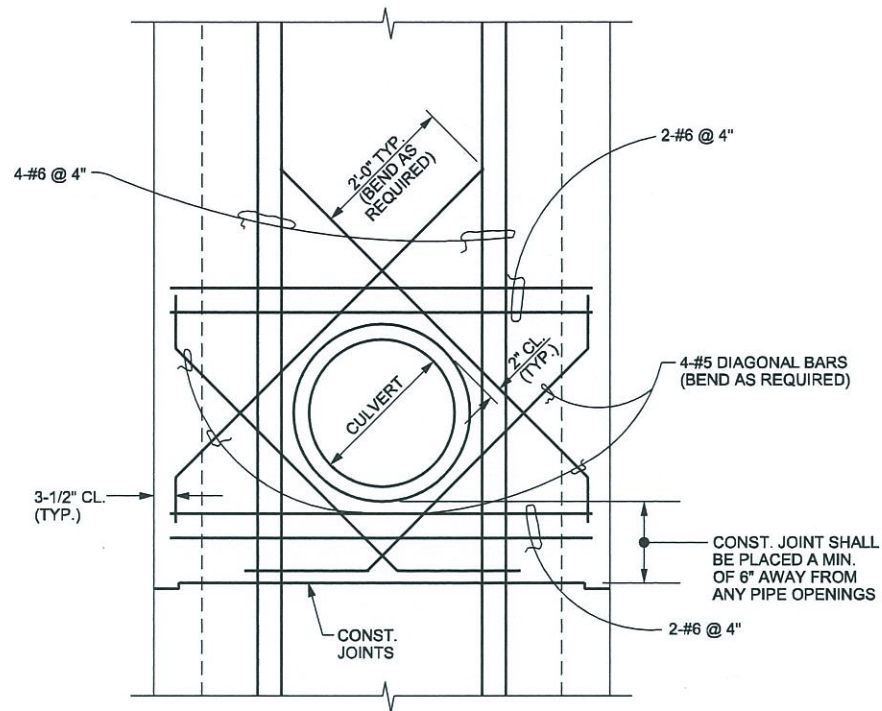


**GENERAL NOTE:**

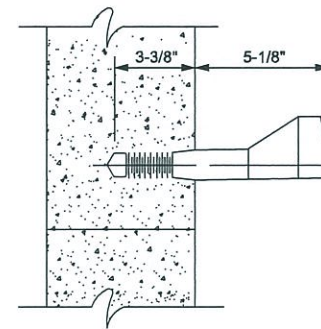
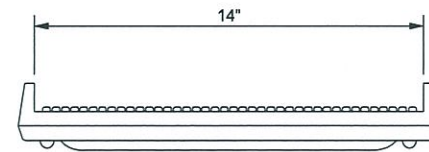
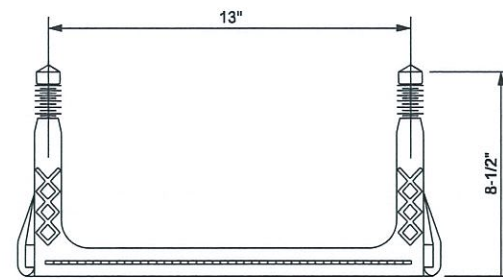
- STEPS SHALL BE POLYPROPYLENE PLASTIC REINFORCED WITH AN INNER 1/2" Ø GRADE 60 STEEL REINFORCING BAR.



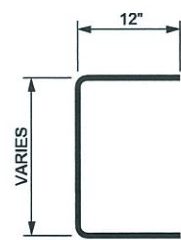
**ADDED REINFORCING AT MANHOLE OPENING**



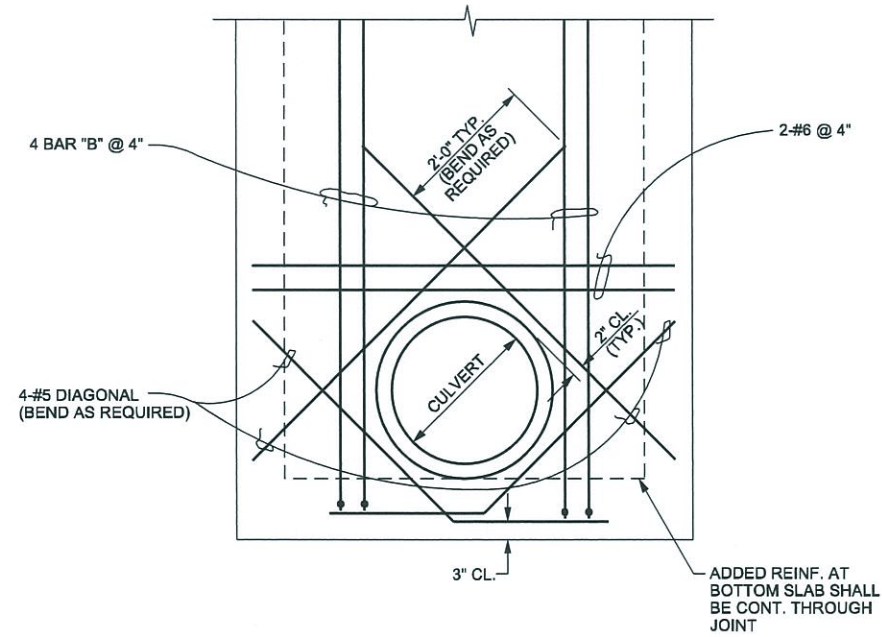
**ADDED REINFORCING FOR CULVERT OPENINGS ABOVE BOTTOM SLAB**



**STEP DETAILS**



**BAR "B" (#6)**



**ADDED REINFORCING FOR CULVERT OPENINGS AT BOTTOM SLAB**

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Guam Department of Public Works  
 542 North Marine Corps Drive  
 Tamuning, Guam 96913  
 Tel: (671) 646-3131  
 Fax: (671) 649-6178

**STORM DRAIN MANHOLE DETAILS**

APPROVED FOR USE ON DPW PROJECTS

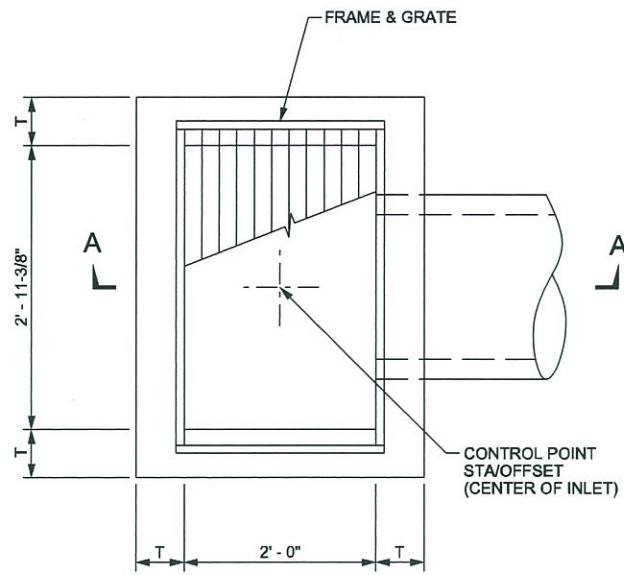
*Engineer*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10.14.12

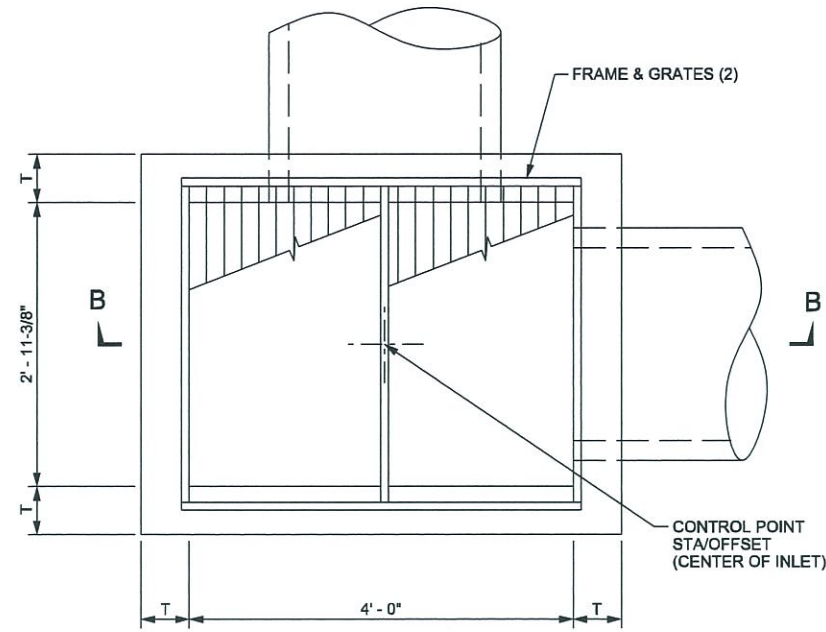
STANDARD NO.

604-02

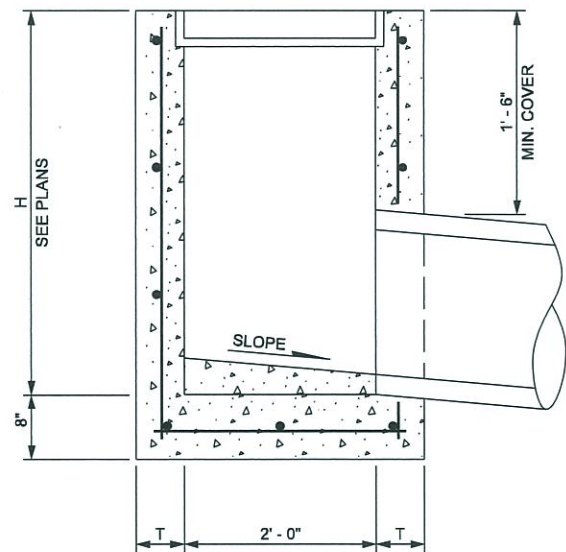




PLAN

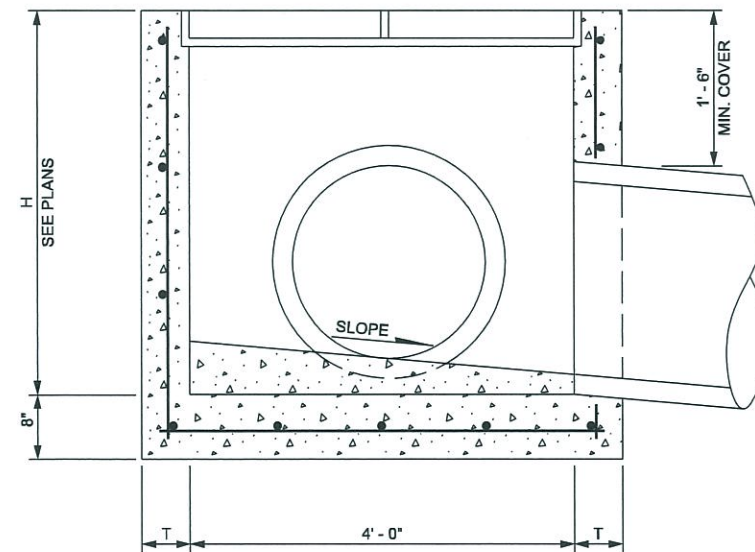


PLAN



SECTION A-A

TYPE 1



SECTION B-B

TYPE 2

**GENERAL NOTES:**

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 601 MINOR CONCRETE STRUCTURES.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 WITH MAXIMUM SPACING OF 18" ON CENTER. REINFORCING SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS AND EMBEDDED AT LEAST 2" CLEAR OF ALL CONCRETE SURFACES.
3. WALL THICKNESS T = 6" FOR H < 8'-0". T = 8" FOR H = 8'-1" TO 20'-0".
4. EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1".
5. PIPES CAN BE PLACED IN ANY WALL.
6. INLET FLOORS SHALL BE SLOPED TO DRAIN FROM ALL DIRECTIONS TO THE OUTLET PIPE.
7. FOR STEP DETAILS, SEE STD. 604-02. STEPS SHALL NOT BE PROVIDED FOR INLETS DEEPER THAN 10 FEET.
8. FOR FRAME AND GRATE DETAILS, SEE STD. 604-04.

SIGNED ORIGINAL ON FILE

DRAWING REVISIONS			
REVISION	DATE	BY	DESCRIPTION



Guam Department of Public Works  
 542 North Marine Corps Drive  
 Tamuning, Guam 96913  
 Tel: (671) 646-3131  
 Fax: (671) 649-6178

GRATED INLET - TYPE 1 & TYPE - 2

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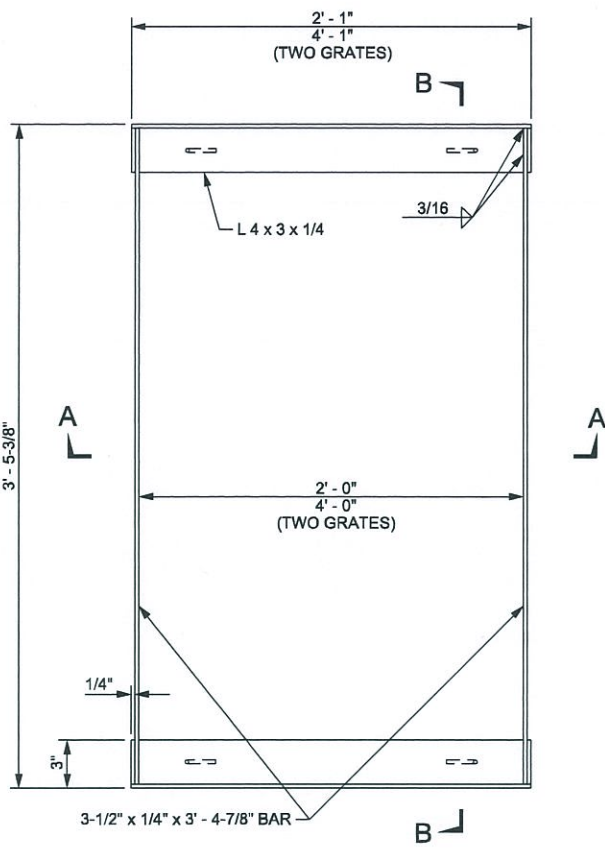
*E. Lopez*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10.14.12

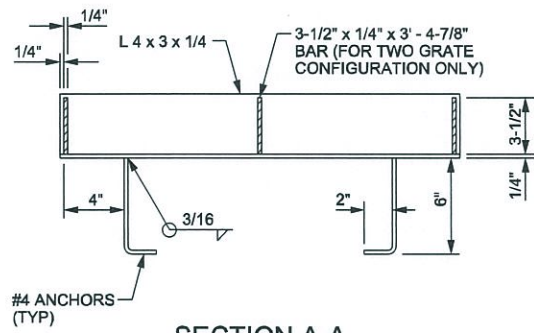
STANDARD NO.

604-03

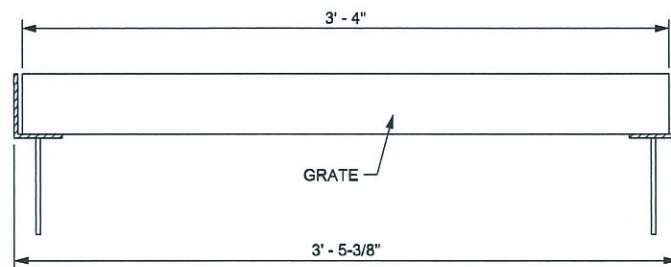




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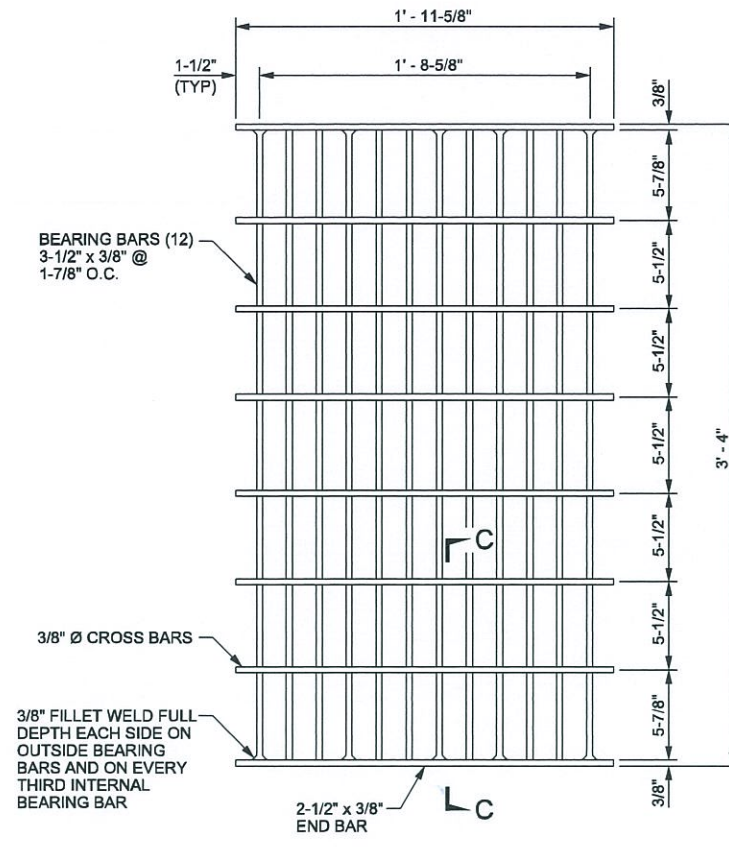


SECTION A-A

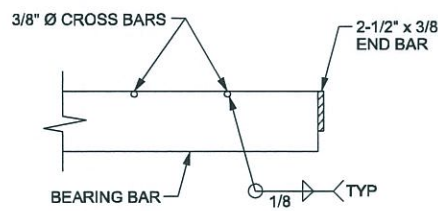


SECTION B-B

FRAME



GRATE



SECTION C-C

**GENERAL NOTES:**

1. STEEL STRUCTURAL SHAPES SHALL CONFORM TO ASTM A-36.
2. FRAMES AND GRATES SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN CONFORMANCE WITH AASHTO M111 (ASTM 123).
3. COMMERCIAL PREFABRICATED FRAMES AND GRATES MAY BE SUBSTITUTED FOR THE WELDED FRAME AND GRATE SHOWN, SUBJECT TO APPROVAL BY THE DEPARTMENT OF PUBLIC WORKS.

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 542 North Marine Corps Drive  
 Tamuning, Guam 96913  
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 Fax: (671) 649-6178

FRAME & GRATE DETAILS

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*Signature*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

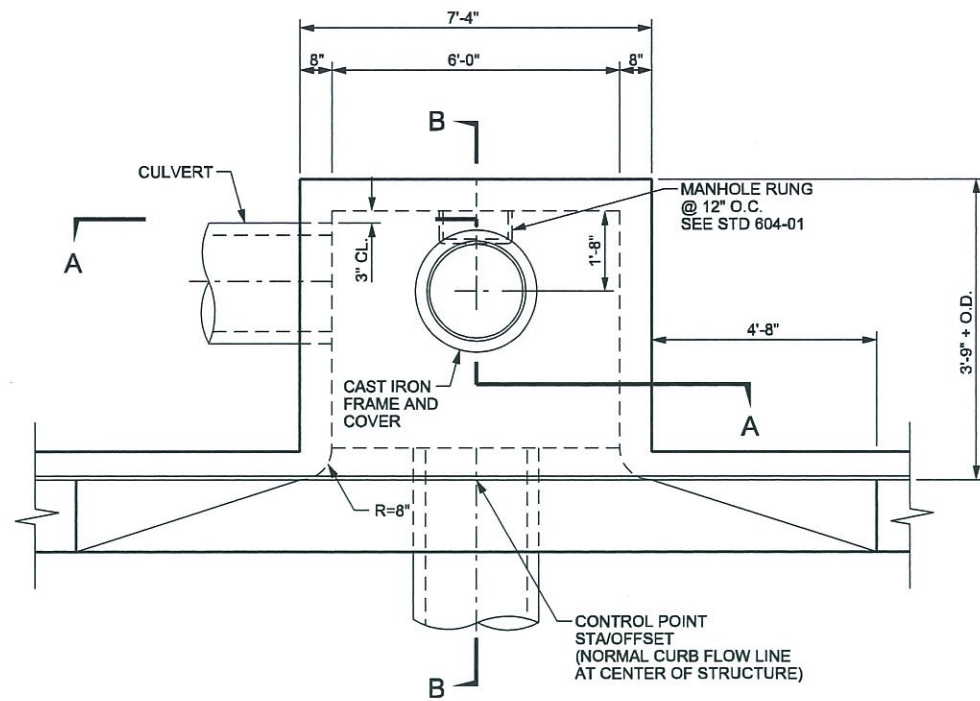
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STANDARD NO.

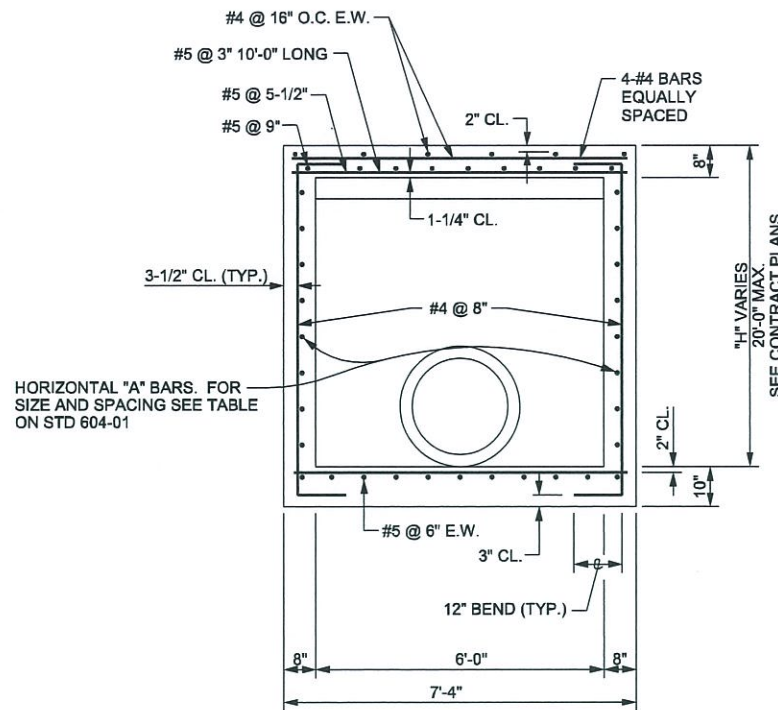
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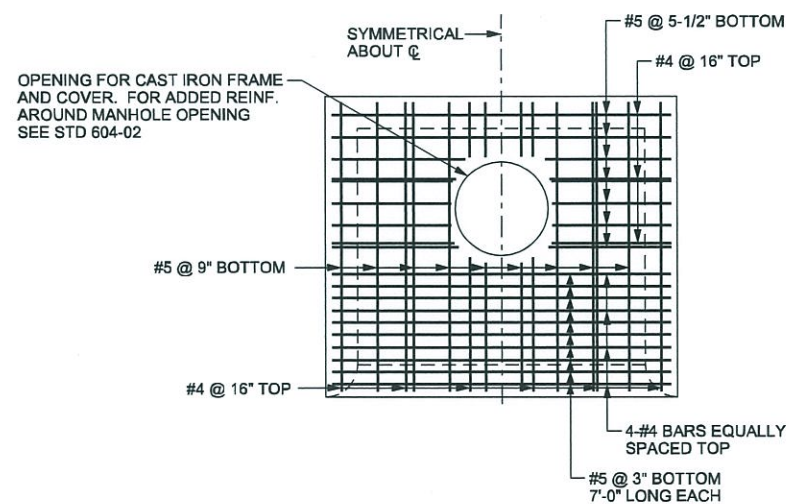




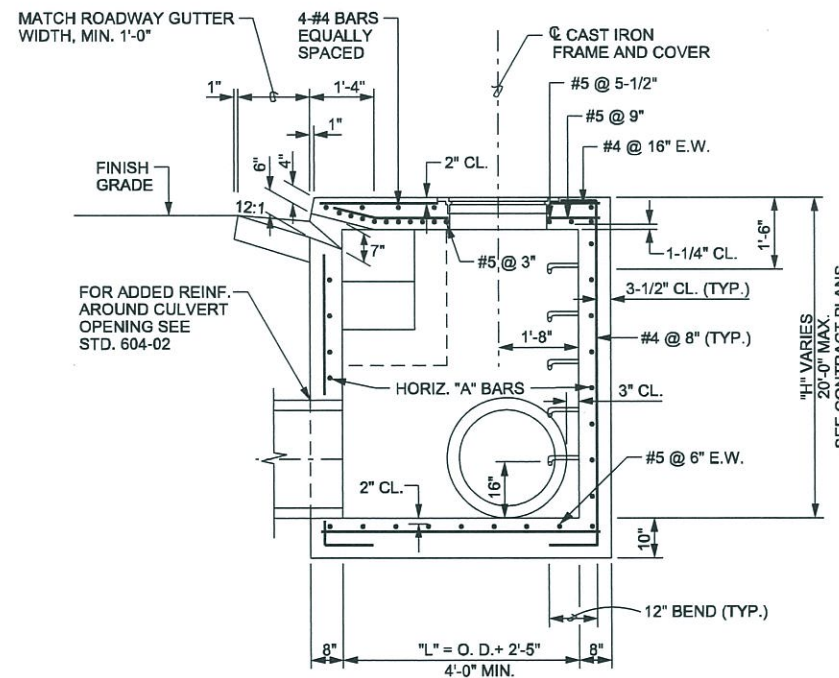
PLAN



SECTION A-A



PLAN VIEW OF REINFORCING STEEL



SECTION B-B

**GENERAL NOTES:**

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 601 MINOR CONCRETE STRUCTURES.
2. EINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 AND SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS.
3. MANHOLE FRAMES AND COVERS SHALL CONFORM TO AASHTO M306.
4. PIPES CAN BE PLACED IN ANY WALL.
5. INLET FLOORS SHALL BE SLOPED TO DRAIN FROM ALL DIRECTIONS TO THE OUTLET PIPE.
6. FOR STEP DETAILS, SEE STD. 604-02. STEPS SHALL NOT BE PROVIDED FOR INLETS DEEPER THAN 10 FEET.

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STORM DRAIN INLET TYPE 3A

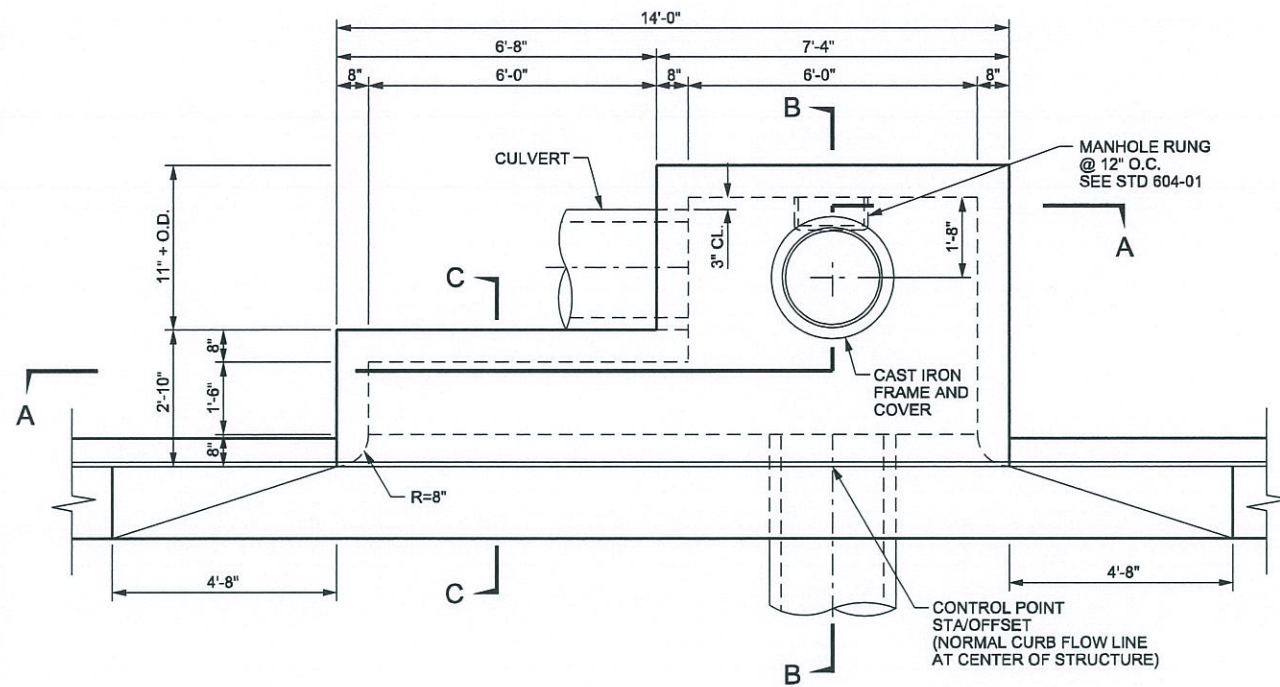
APPROVED FOR USE ON DPW PROJECTS

Chief Engineer, Highways  
 Department of Public Works  
 DATE: 10.14.12

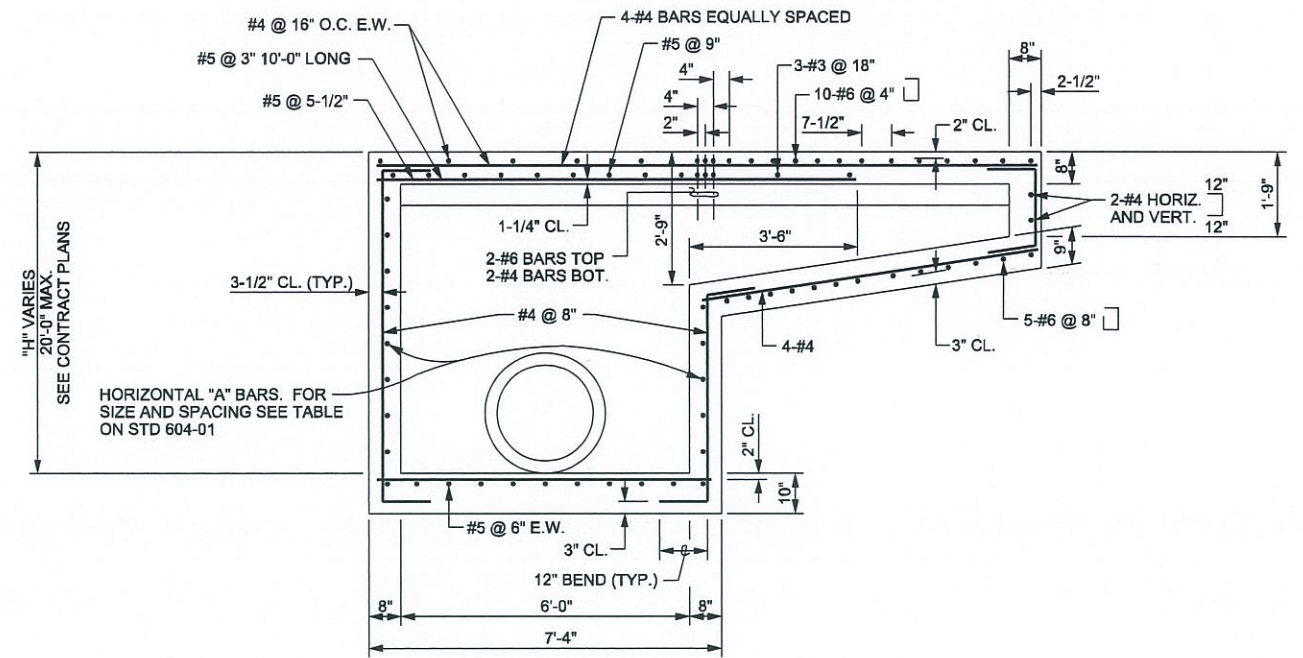
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604-05

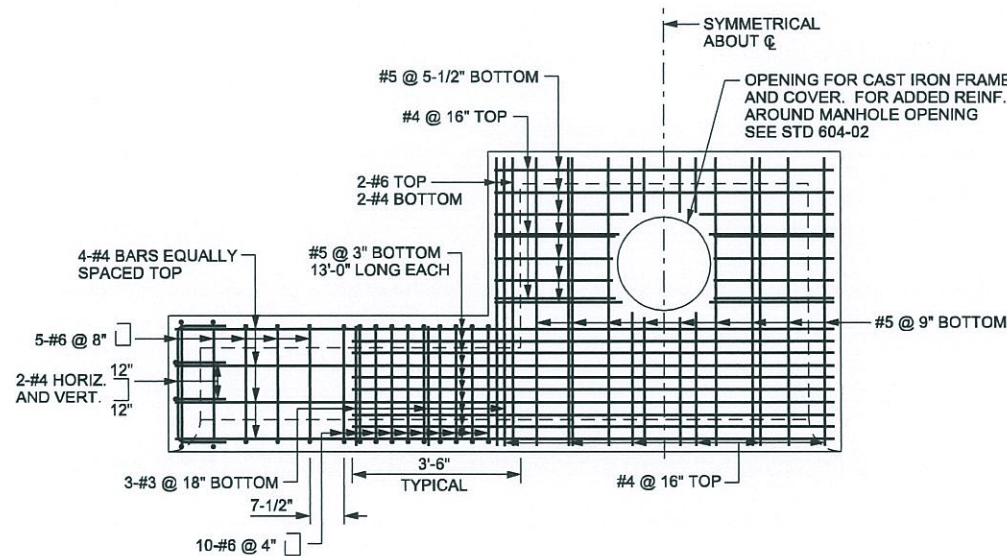




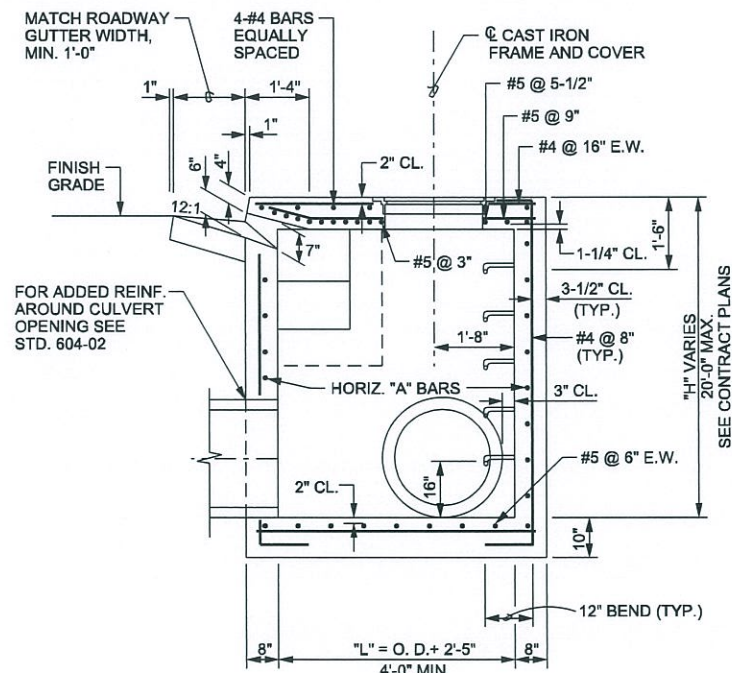
PLAN



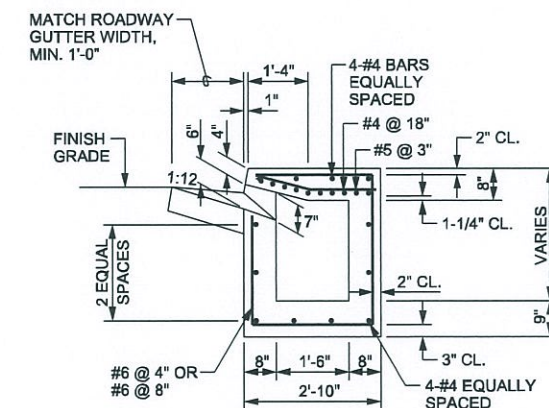
SECTION A-A



PLAN VIEW OF REINFORCING STEEL



SECTION B-B



SECTION C-C

**GENERAL NOTES:**

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 601 MINOR CONCRETE STRUCTURES.
2. ENFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 AND SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS.
3. MANHOLE FRAMES AND COVERS SHALL CONFORM TO AASHTO M306.
4. PIPES CAN BE PLACED IN ANY WALL.
5. INLET FLOORS SHALL BE SLOPED TO DRAIN FROM ALL DIRECTIONS TO THE OUTLET PIPE.
6. FOR STEP DETAILS, SEE STD. 604-02. STEPS SHALL NOT BE PROVIDED FOR INLETS DEEPER THAN 10 FEET.

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STORM DRAIN INLET TYPE 3B

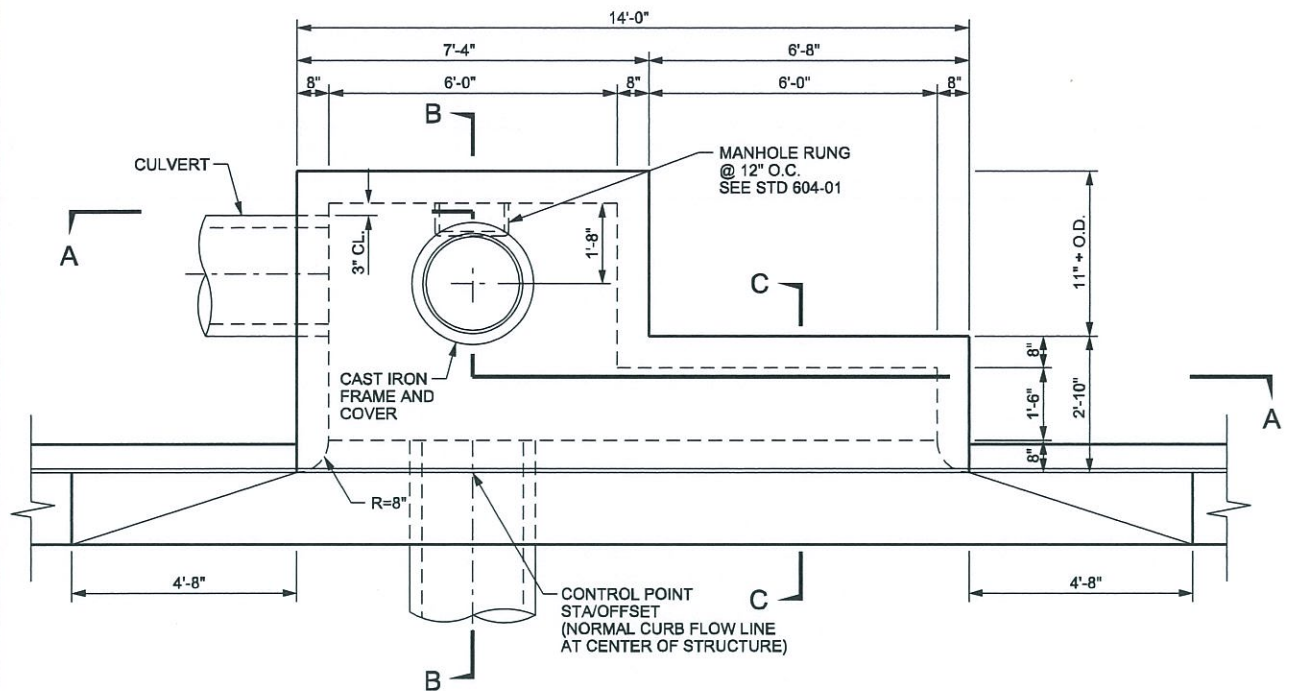
APPROVED FOR USE ON DPW PROJECTS

CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS  
 DATE: 10.14.12

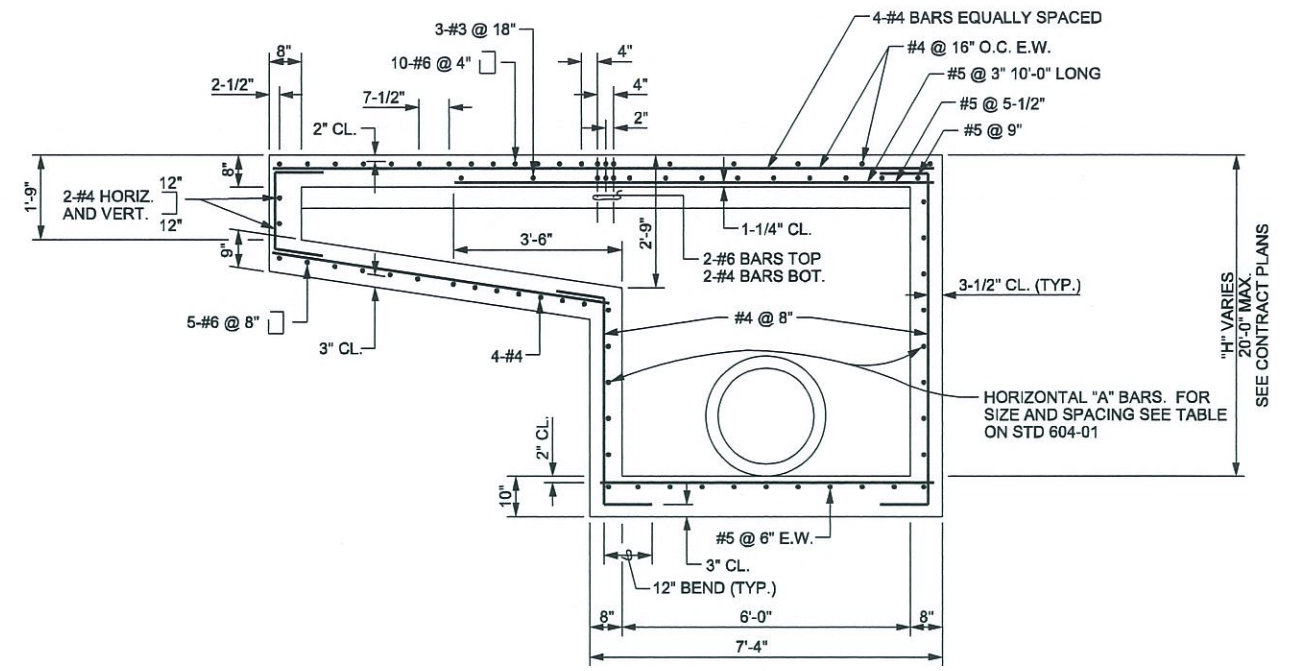
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604-06

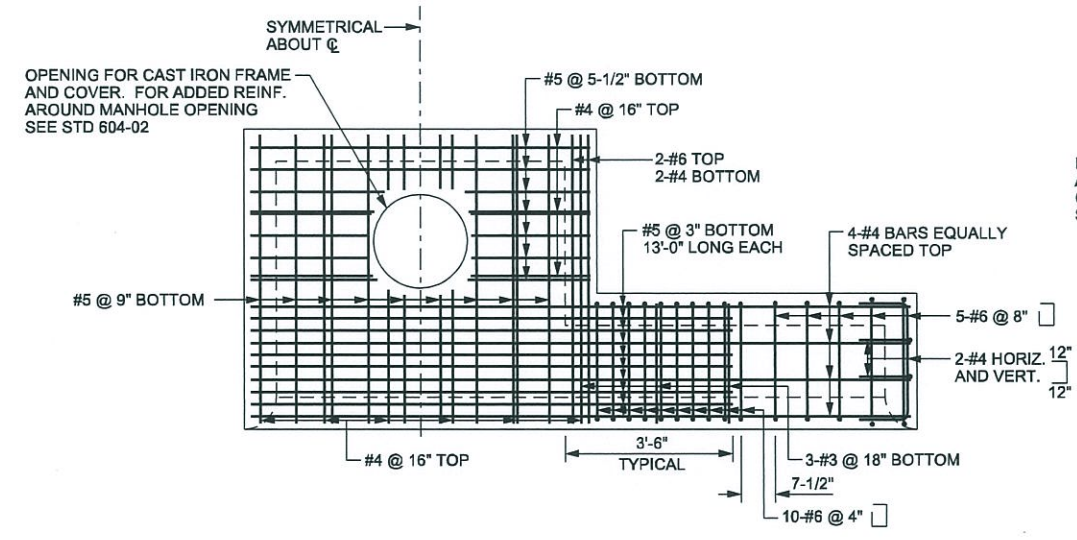




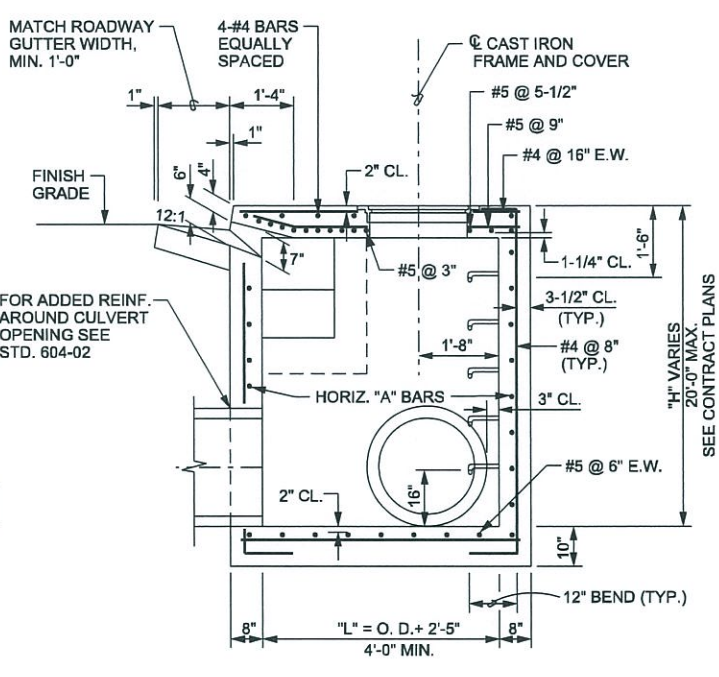
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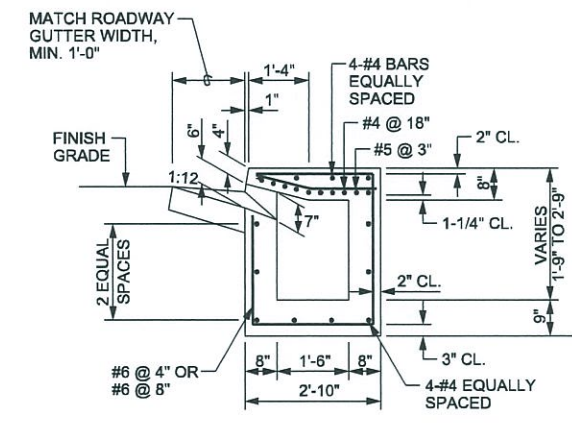
SECTION A-A



PLAN VIEW OF REINFORCING STEEL



SECTION B-B



SECTION C-C

GENERAL NOTES:

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 601 MINOR CONCRETE STRUCTURES.
2. ENFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 AND SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS.
3. MANHOLE FRAMES AND COVERS SHALL CONFORM TO AASHTO M306.
4. PIPES CAN BE PLACED IN ANY WALL.
5. INLET FLOORS SHALL BE SLOPED TO DRAIN FROM ALL DIRECTIONS TO THE OUTLET PIPE.
6. FOR STEP DETAILS, SEE STD. 604-02. STEPS SHALL NOT BE PROVIDED FOR INLETS DEEPER THAN 10 FEET.

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STORM DRAIN INLET TYPE 3C

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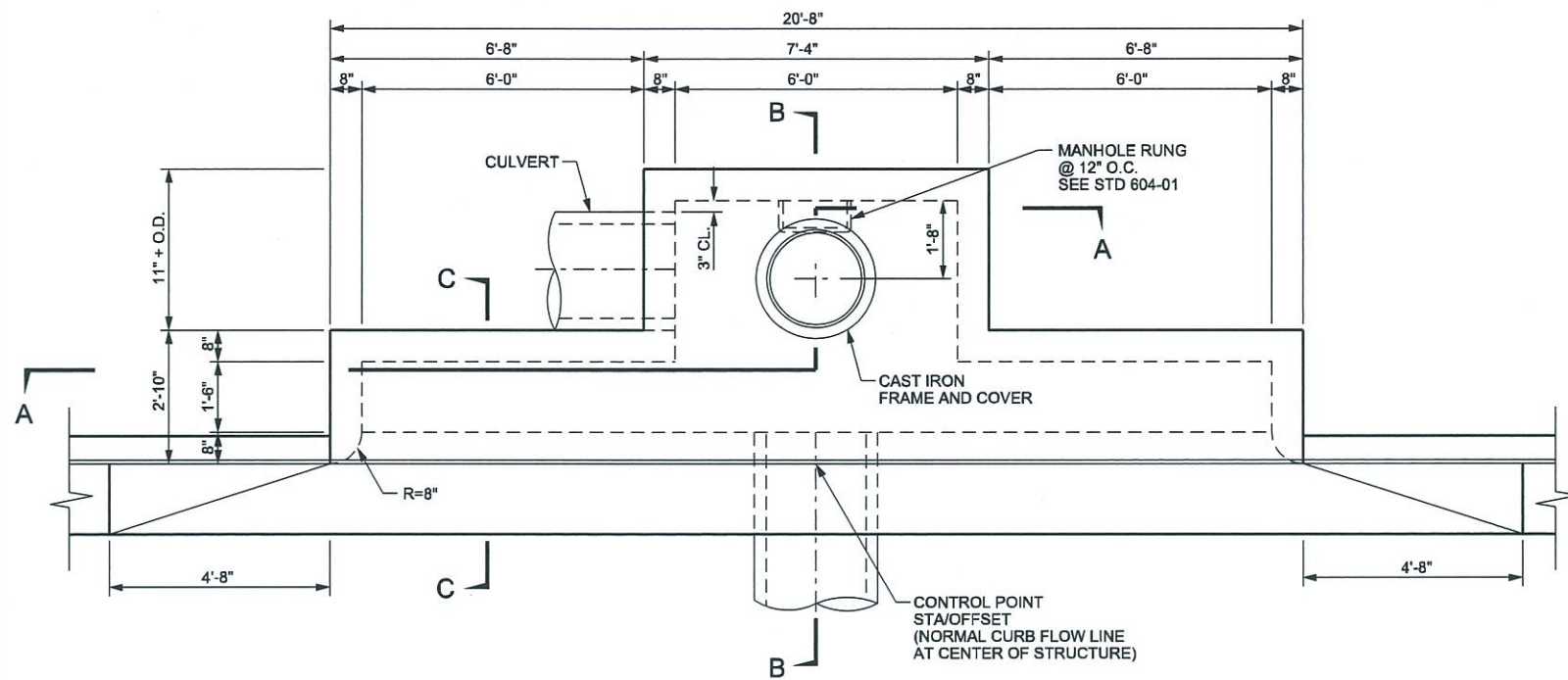
Chief Engineer, Highways  
Department of Public Works

DATE: 10.14.12

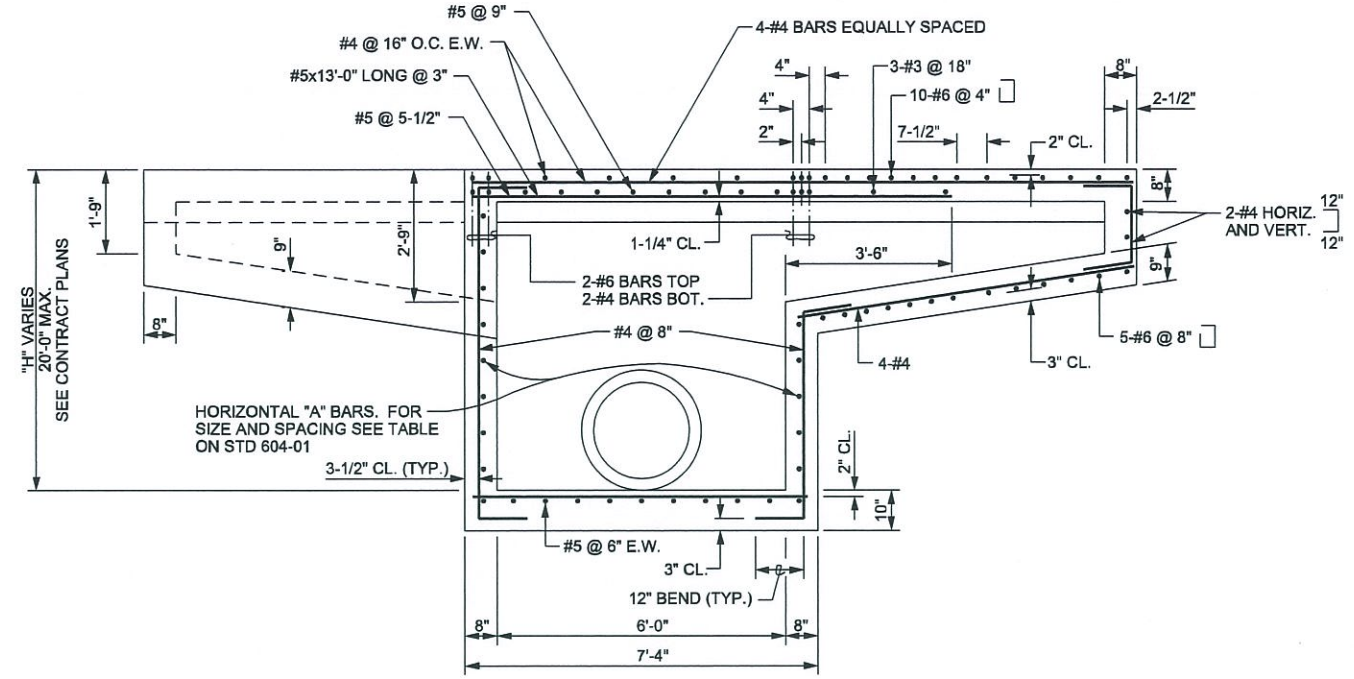
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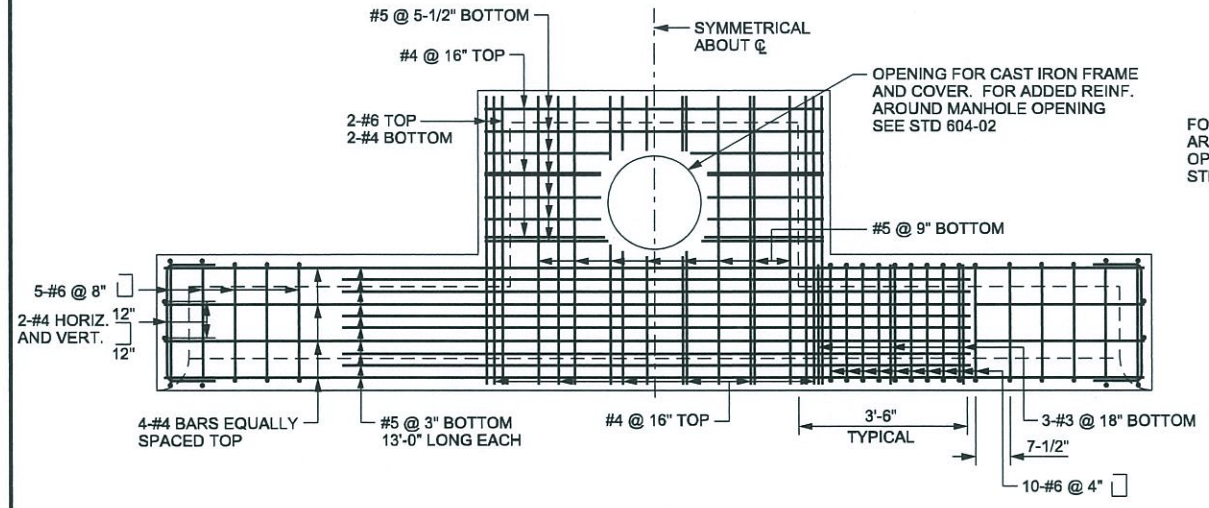




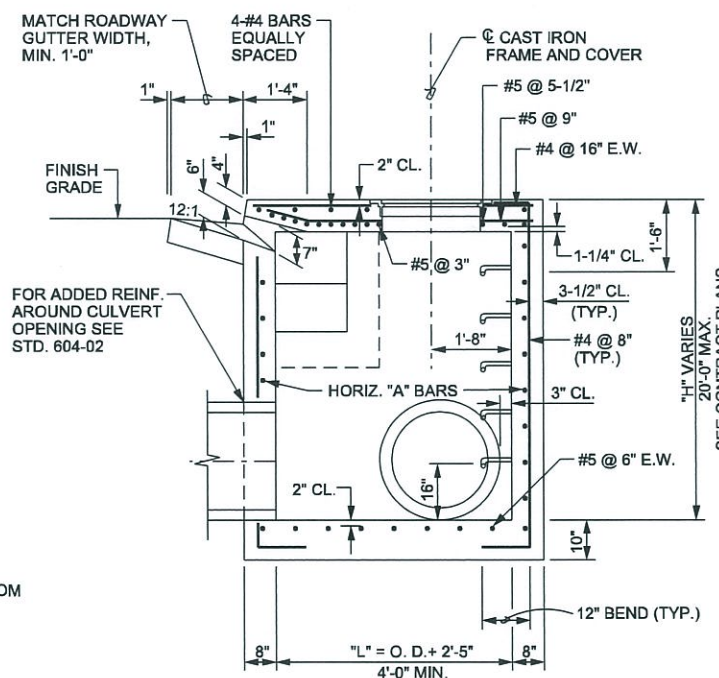
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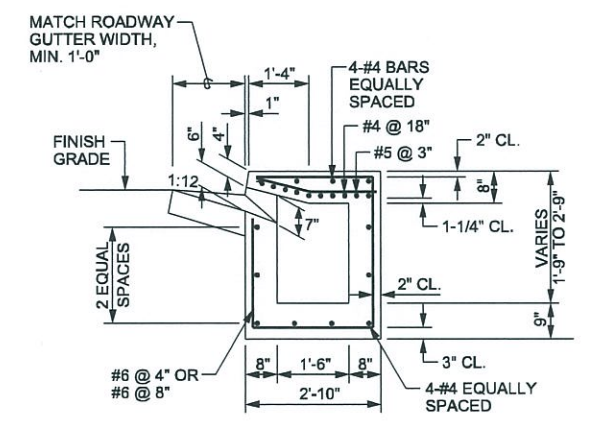
SECTION A-A



PLAN VIEW OF REINFORCING STEEL



SECTION B-B



SECTION C-C

GENERAL NOTES:

1. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 601 MINOR CONCRETE STRUCTURES.
2. EINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40 AND SHALL BE WIRED TIGHTLY AT ALL INTERSECTIONS.
3. MANHOLE FRAMES AND COVERS SHALL CONFORM TO AASHTO M306.
4. PIPES CAN BE PLACED IN ANY WALL.
5. INLET FLOORS SHALL BE SLOPED TO DRAIN FROM ALL DIRECTIONS TO THE OUTLET PIPE.
6. FOR STEP DETAILS, SEE STD. 604-02. STEPS SHALL NOT BE PROVIDED FOR INLETS DEEPER THAN 10 FEET.

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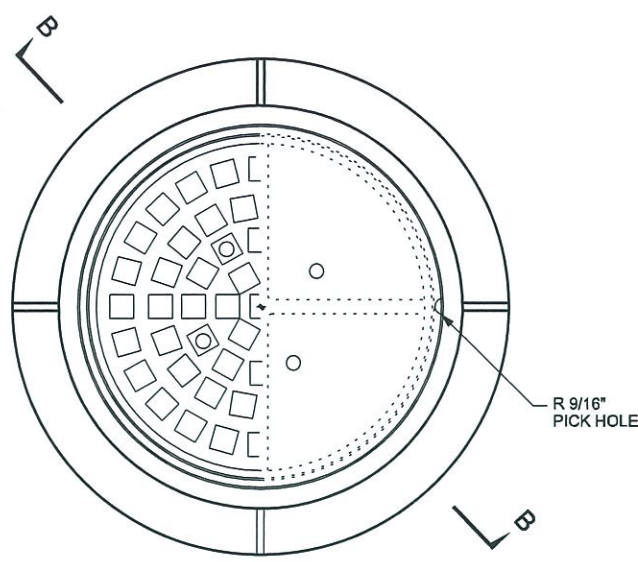
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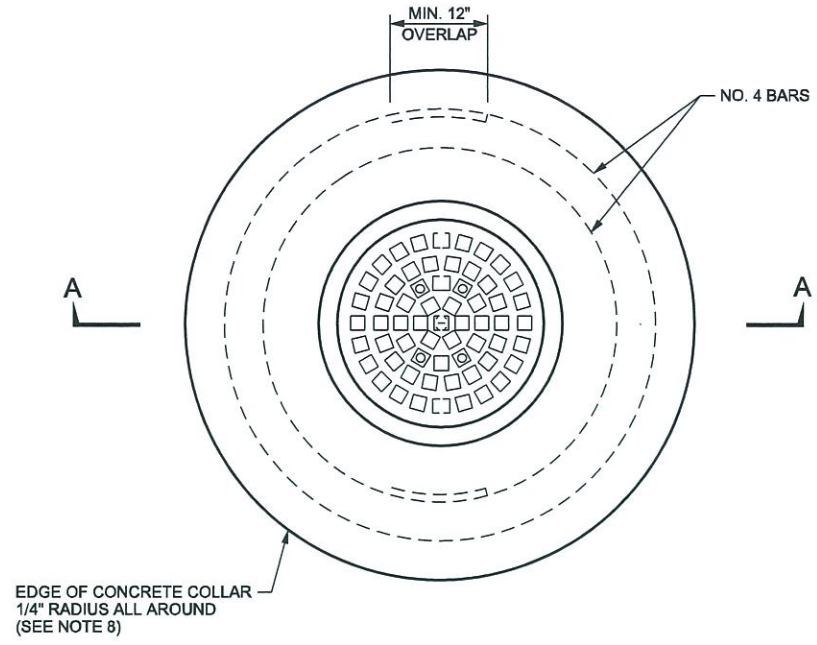
Chief Engineer, Highways  
 Department of Public Works  
 DATE: 10.14.12

STANDARD NO. 604-08

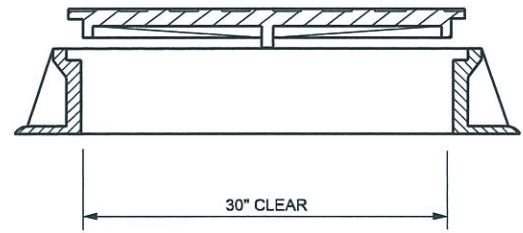




PLAN

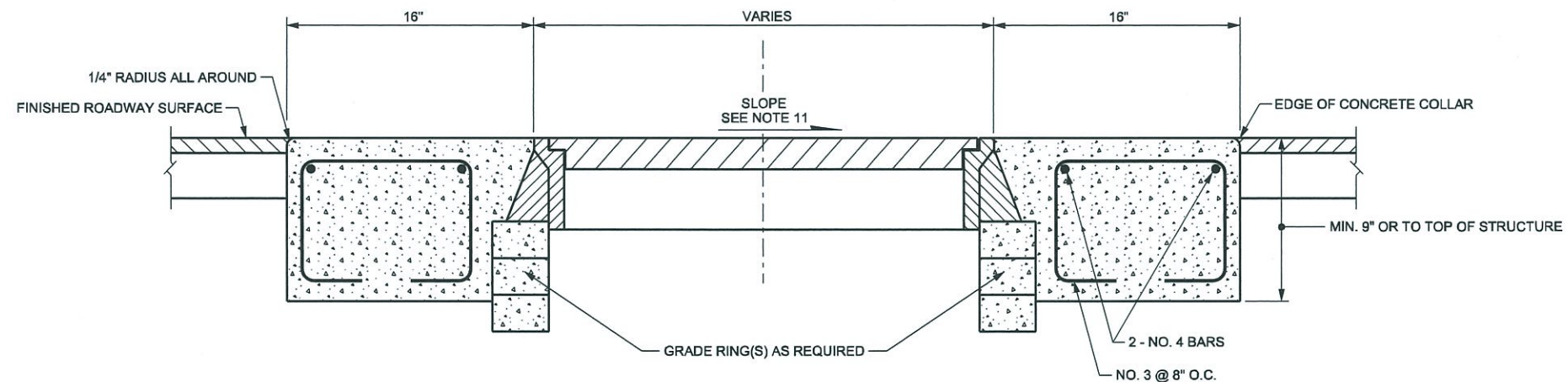


CONCRETE COLLAR PLAN



SECTION B-B

TRAFFIC-STRENGTH  
MANHOLE FRAME & COVER



**GENERAL NOTES:**

1. TRAFFIC-STRENGTH MANHOLE FRAME & COVER SHALL COMPLY WITH AASHTO M18 WHEEL LOADS. EQUIVALENT MANHOLE FRAMES & COVERS OTHER THAN SHOWN MAY BE USED UPON APPROVAL BY THE ENGINEER.
2. THE FRAME SEAT AND COVER EDGE SHALL BE MACHINED TO A TRUE BEARING SURFACE ALL AROUND.
3. THE SURFACE SHOWN IS FOR ILLUSTRATION ONLY. ANY SURFACE DESIGN, OTHER THAN SMOOTH, MAY BE USED UPON APPROVAL.
4. FRAMES & COVERS SHALL CONFORM TO ASTM A48, CLASS 40 FOR GRAY IRON CASTINGS.
5. A CAST-IN-PLACE CONCRETE COLLAR SHALL BE PLACED AROUND A MANHOLE FRAME UNLESS OTHERWISE DIRECTED.
6. MANHOLE COVER SHALL BEAR NAME OF OWNER & SYSTEM FUNCTION (IF APPLICABLE).
7. CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF FP-03 SECTION 601 MINOR CONCRETE STRUCTURE.
8. CONCRETE COLLARS MAY BE POURED ROUND, OR ANY OTHER APPROPRIATE SHAPE WHEN APPROVED BY THE ENGINEER.
9. COMMERCIAL PREFABRICATED GRADE RINGS FOR MANHOLES SHALL CONFORM TO AASHTO M 199 (ASTM C-478).
10. MANHOLE COVER & FRAME SHOWN. OTHER SHAPES MAY APPLY TO UTILITY AND VALVE COVERS AND FRAMES.
11. THE SLOPE OF THE MANHOLE COVER AND COLLAR SHALL MATCH THE ROADWAY PROFILE AND CROSS-SLOPE.

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MANHOLE COVER, FRAME,  
& CONCRETE COLLAR

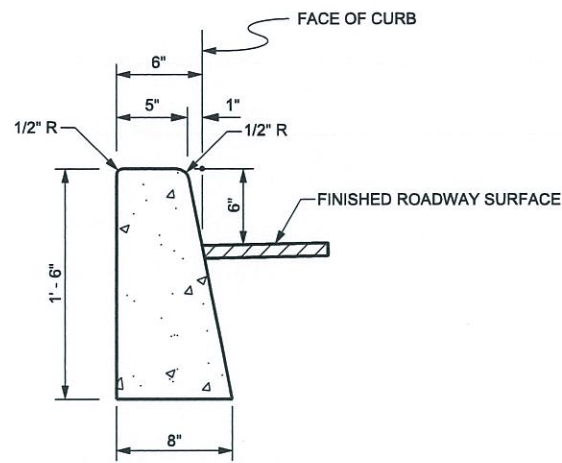
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*Ernesto A. Acuña*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS

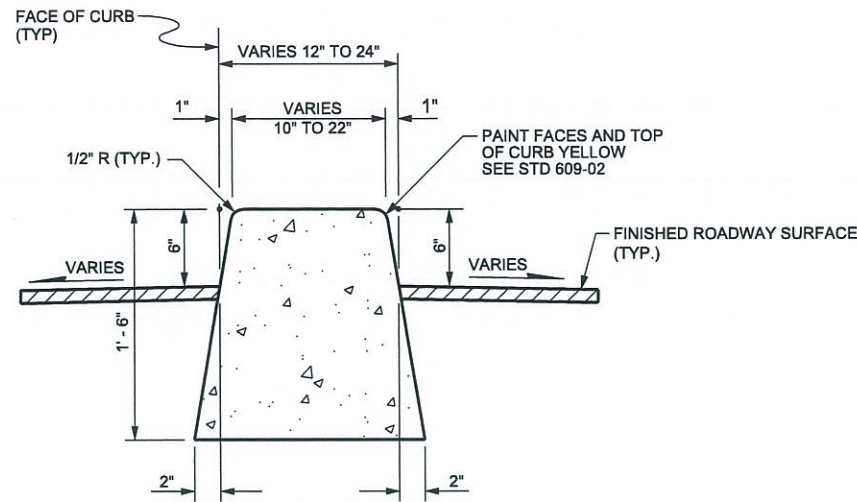
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STANDARD NO. 604-09

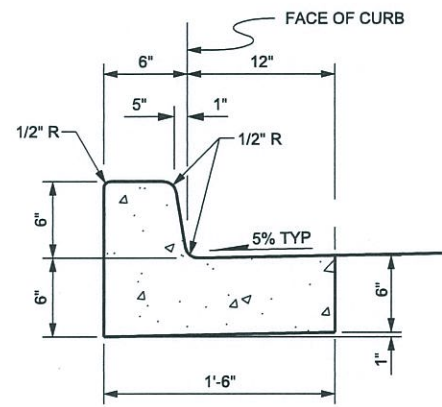




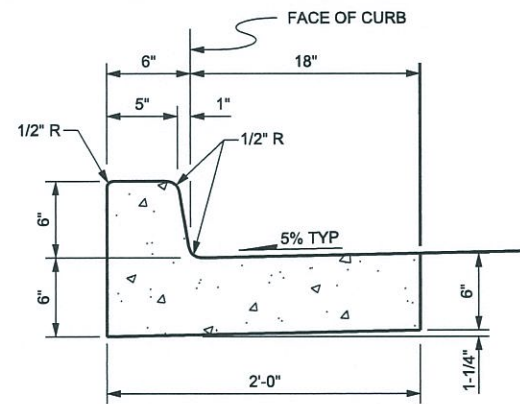
CONCRETE CURB



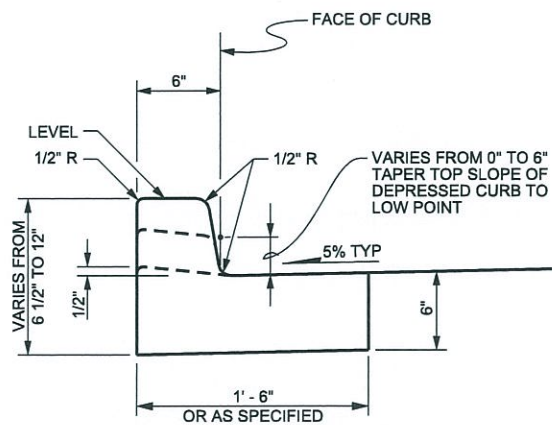
DOUBLE FACED CONCRETE CURB



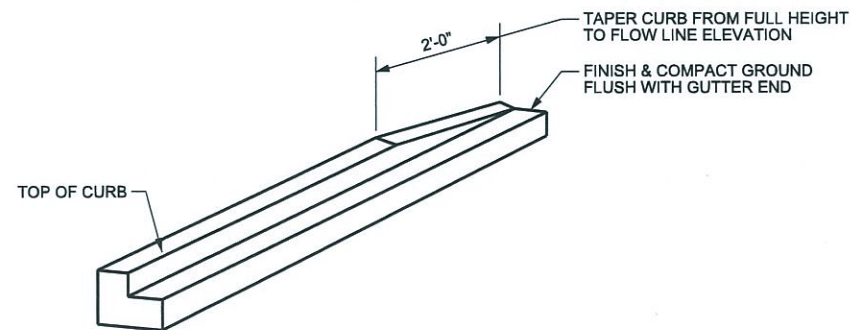
CURB AND GUTTER, 12" GUTTER



CURB AND GUTTER, 18" GUTTER



DEPRESSED CURB AT CURB RAMPS AND DRIVEWAYS



CURB END TRANSITION TAPER

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CONCRETE CURB AND GUTTER

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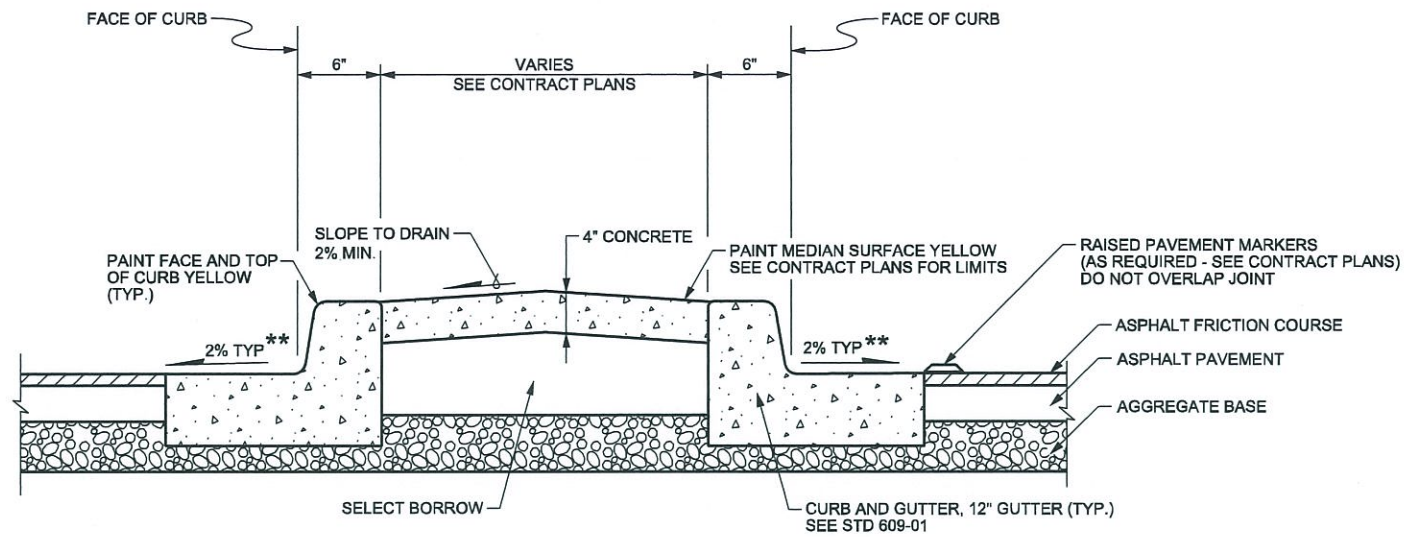
*Emmanuel Torres*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS

DATE: 10.14.12

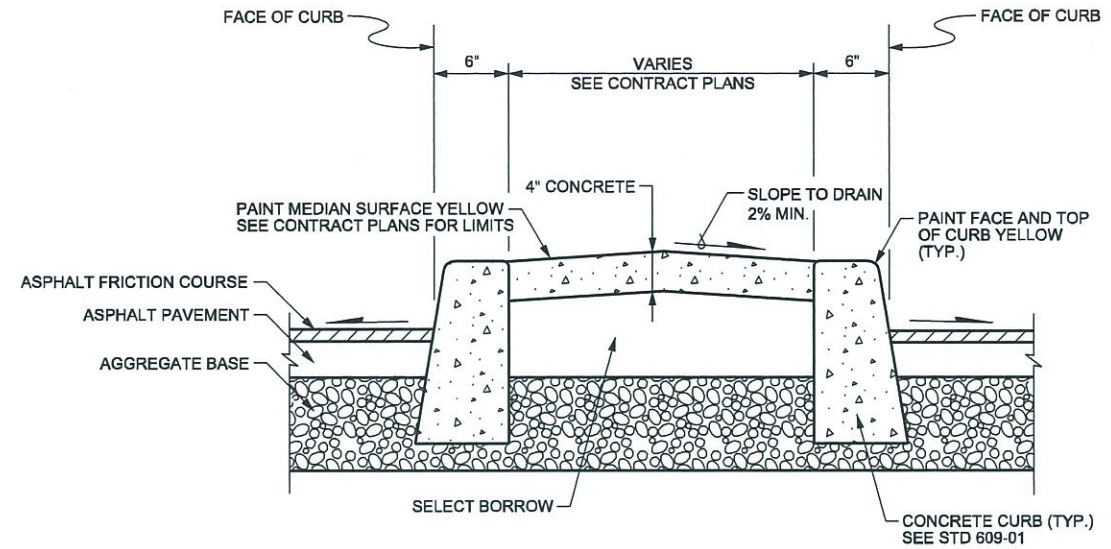
STANDARD NO.

609-01





MEDIAN WITH CURB AND GUTTER

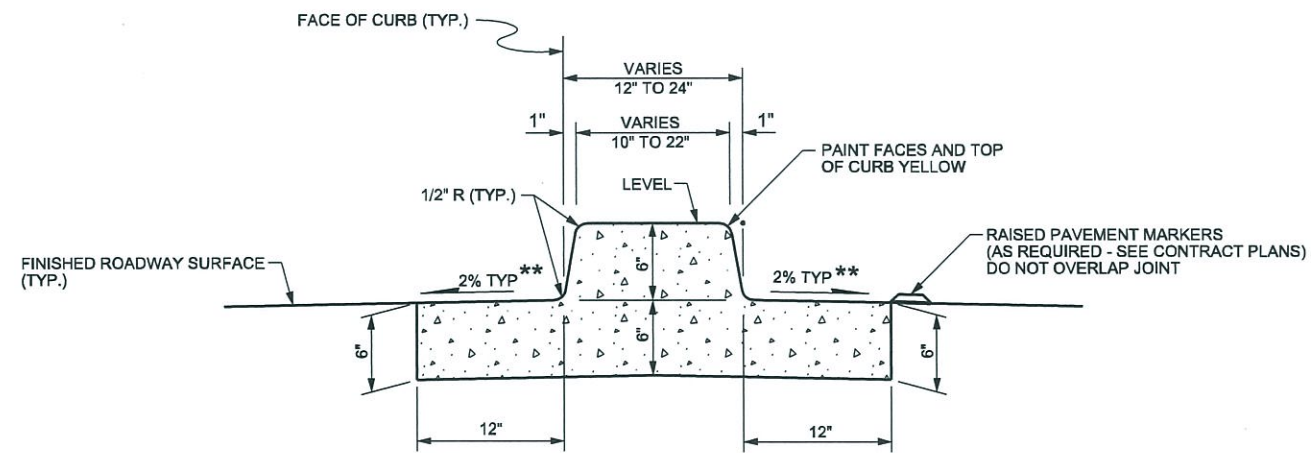


MEDIAN WITH CONCRETE CURB

\*\* GUTTER SLOPE SHALL MATCH SLOPE OF ROADWAY AS SHOWN IN CONTRACT PLANS

**GENERAL NOTE:**

1. PAINT CURBS AND MEDIAN SURFACE WITH REFLECTIVE YELLOW TRAFFIC PAINT CONFORMING TO FP-03 SECTION 718.14.



DOUBLE FACED CURB AND GUTTER

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MEDIAN DETAILS

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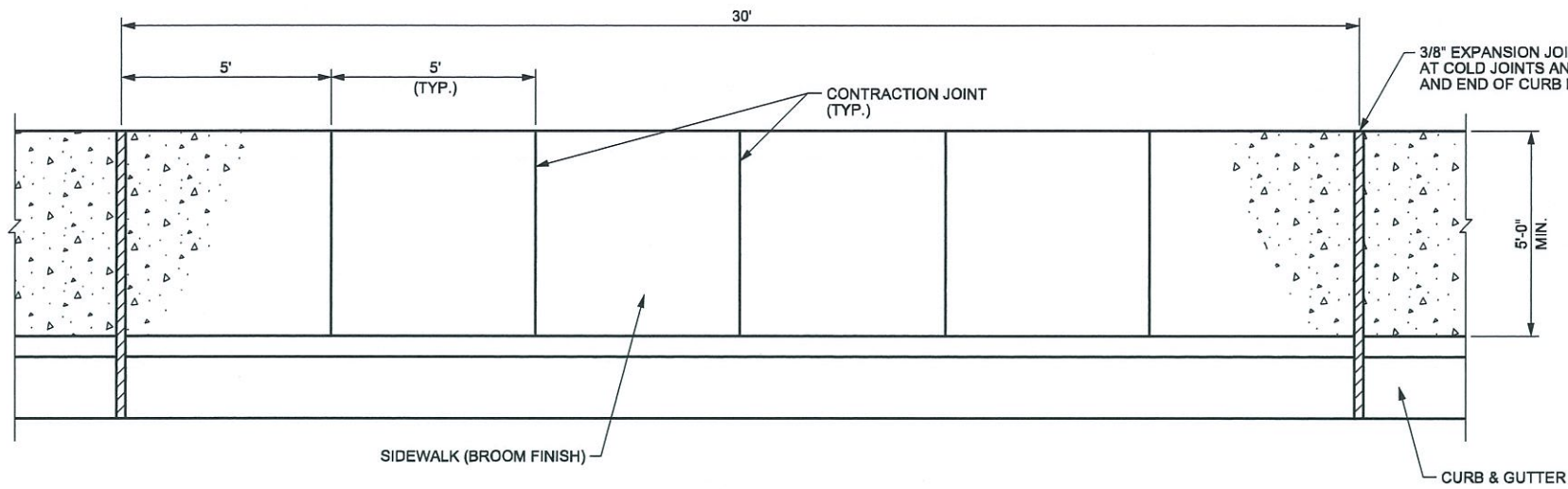
*E. Lopez*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10.14.12

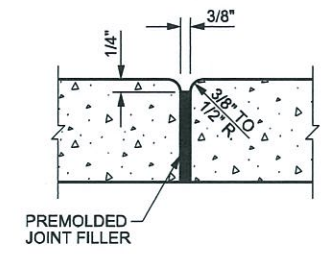
STANDARD NO.

609-02

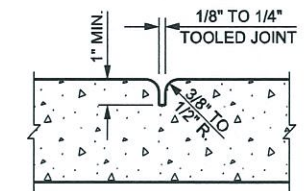




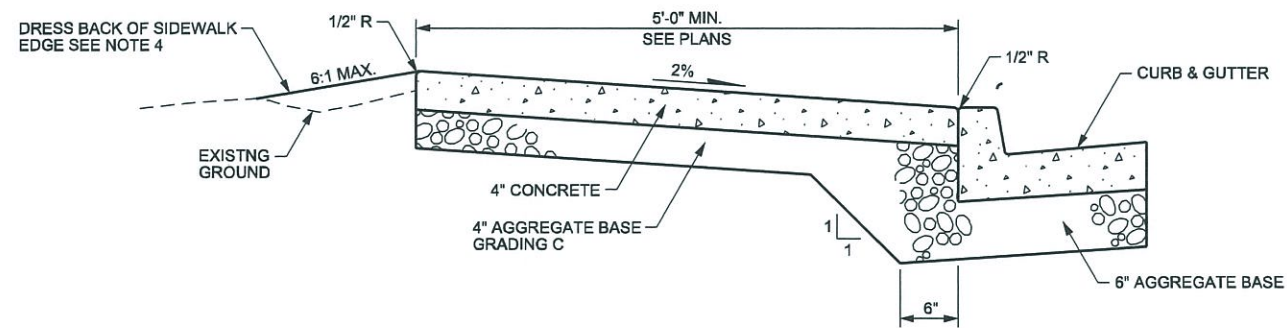
PLAN



EXPANSION JOINT



CONTRACTION JOINT



TYPICAL SECTION

**GENERAL NOTES:**

1. ALL NEW SIDEWALKS SHALL PROVIDE A MINIMUM CLEAR WIDTH OF 4'-0" (EXCLUDING CURB) FOR PEDESTRIAN CIRCULATION.
2. WHERE POSSIBLE OBSTRUCTIONS SUCH AS UTILITY POLES, FIRE HYDRANT, LIGHT AND SIGNAL POLES, SIGN POSTS, ETC. SHALL BE LOCATED CLEAR OF THE SIDEWALK AREA.
3. WHERE POSSIBLE, PULL BOXES, VALVE COVERS, MANHOLE COVERS, ETC. SHALL BE INSTALLED OUTSIDE OF THE SIDEWALK AREA. WHERE INSTALLED WITHIN THE SIDEWALK, SURFACES MUST BE FIRM STABLE, SLIP RESISTANT AND FLUSH WITH THE SIDEWALK SURFACE.
4. DRESSING BACK OF SIDEWALK SHALL CONSIST OF CLEARING, GRUBBING, RESHAPING AND COMPACTING THE AREA ADJACENT TO THE SIDEWALK WITH SUITABLE MATERIAL AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE SIDEWALK.

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SIDEWALK DETAILS

APPROVED FOR USE ON DPW PROJECTS

*Enriquez*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS *Acting*

DATE: 10-14-12

STANDARD NO.

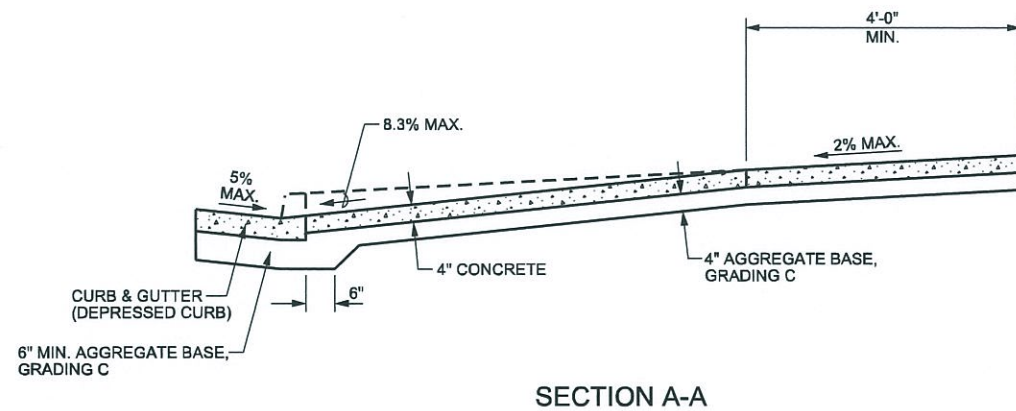
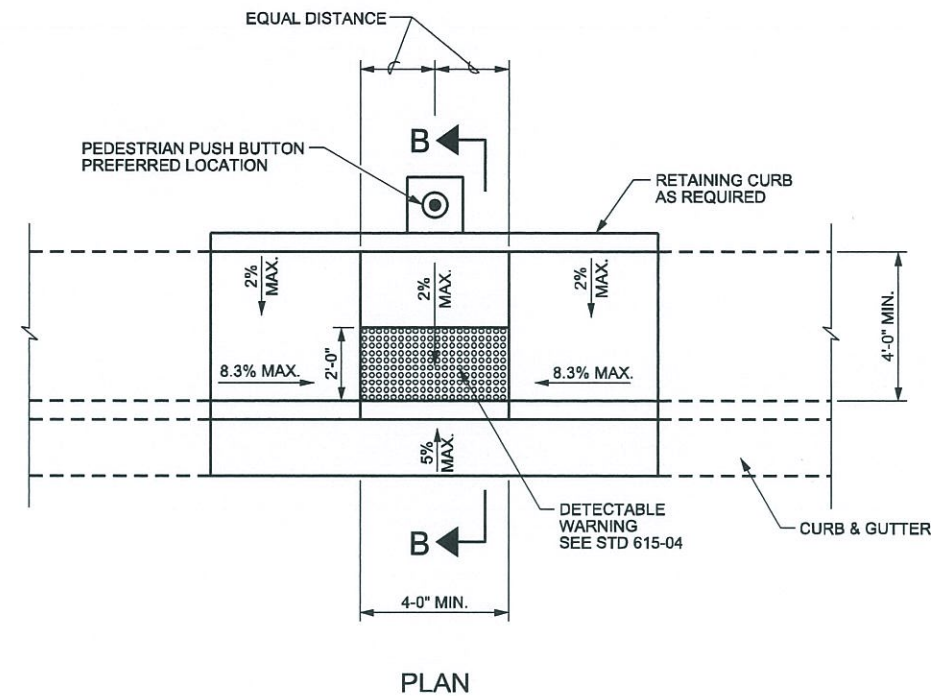
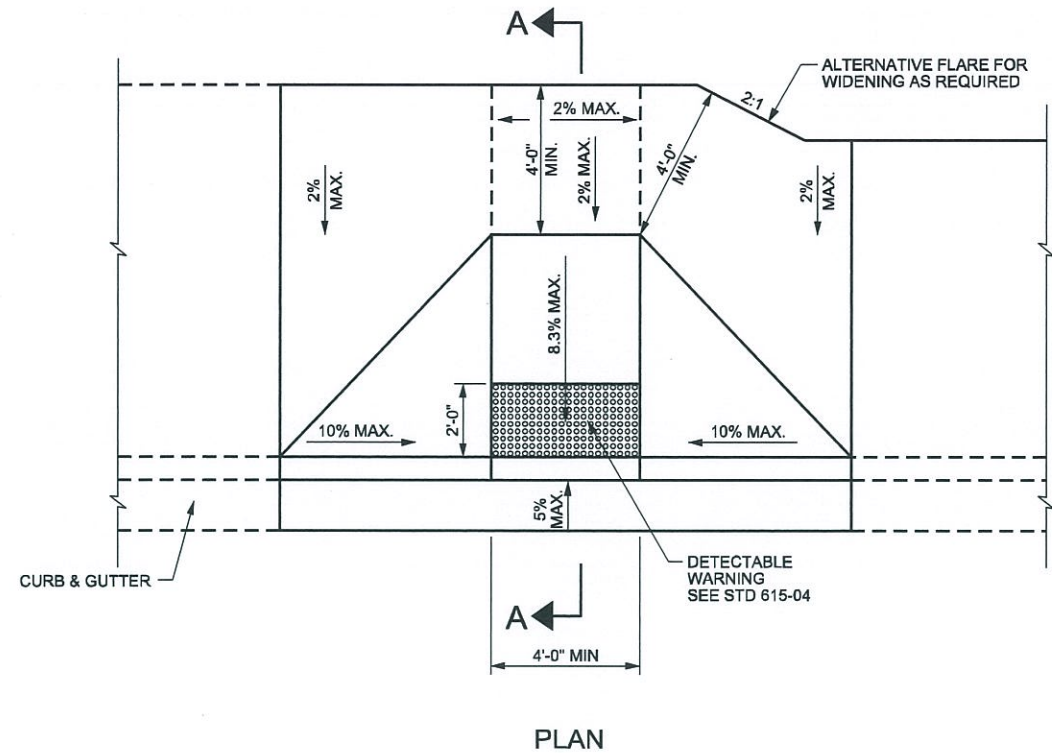
615-01



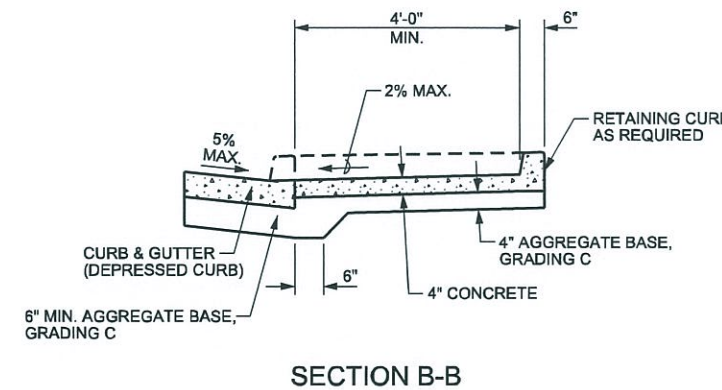
**GENERAL NOTES:**

1. ALL SLOPES RATES ARE RELATIVE TO LEVEL.
2. RAMP SLOPES SHALL NOT EXCEED 8.3% (12:1 OR FLATTER), 15' MAXIMUM LENGTH.
3. TRANSITION FROM RAMPS TO GUTTERS OR ROADWAY SURFACE SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
4. CURB RAMPS SHALL BE ALIGNED WITH CROSSWALK.
5. DRAINAGE GRATINGS OR SIMILAR ACCESSSES SHALL NOT BE LOCATED IN THE RAMP AND LANDING AREA.
6. ALL PULL BOXES SHALL BE INSTALLED OUTSIDE OF THE CURB RAMP AND SIDEWALK AREAS TO THE MAXIMUM EXTENT FEASIBLE.
7. WHERE PULL BOXES, VALVE COVERS, MANHOLE COVERS, ETC. MUST BE INSTALLED WITHIN SIDEWALK AND RAMP AREAS, THE SURFACES SHALL BE FIRM, STABLE, SLIP RESISTANT, AND FLUSH WITH THE SIDEWALK SURFACE.
8. CURB RAMPS TYPE A AND B MAY BE ADAPTED TO A CURVED ALIGNMENT AT INTERSECTIONS AND OTHER LOCATIONS.

EQUIVALENT SLOPES		
2%	50:1	1/4" PER FOOT
5%	20:1	5/8" PER FOOT
8.3%	12:1	1" PER FOOT
10%	10:1	1-1/4" PER FOOT



**CURB RAMP - TYPE A**  
SIDEWALK WIDTH 10' - 0" OR GREATER



**CURB RAMP - TYPE B**  
SIDEWALK WIDTH 4'-0" OR GREATER

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**CURB RAMPS**  
TYPE A AND TYPE B

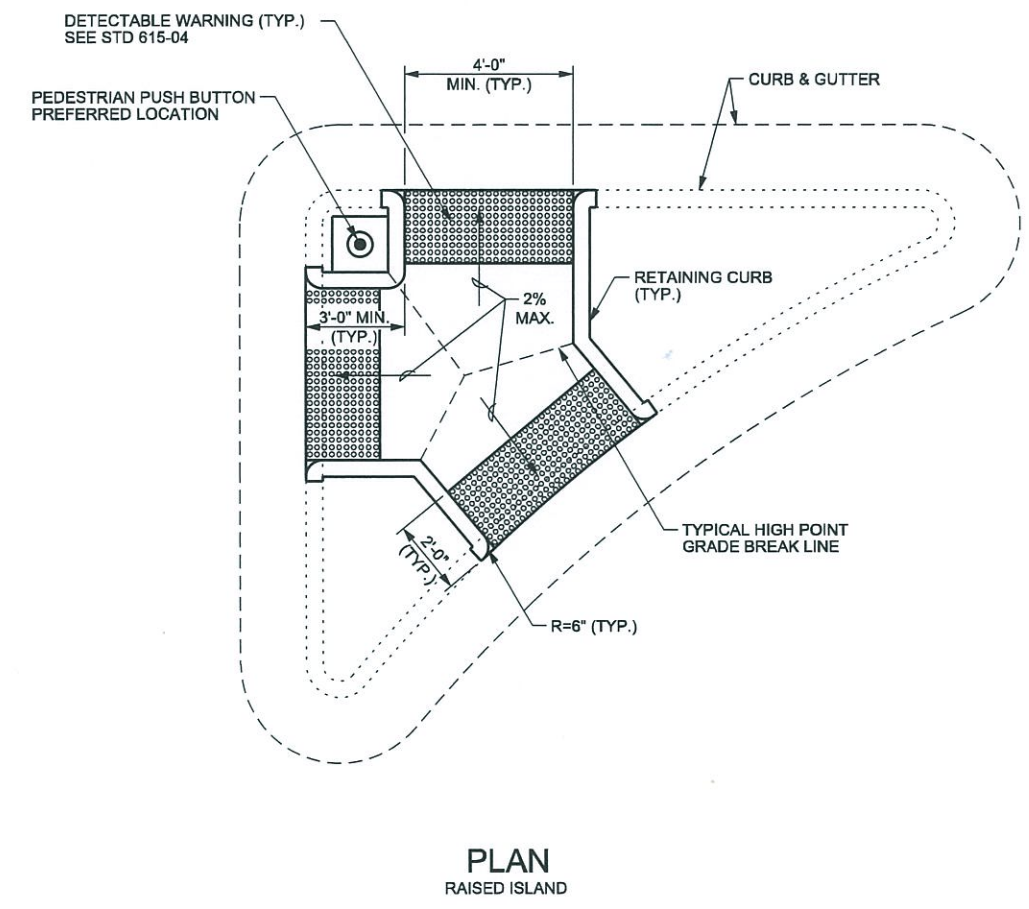
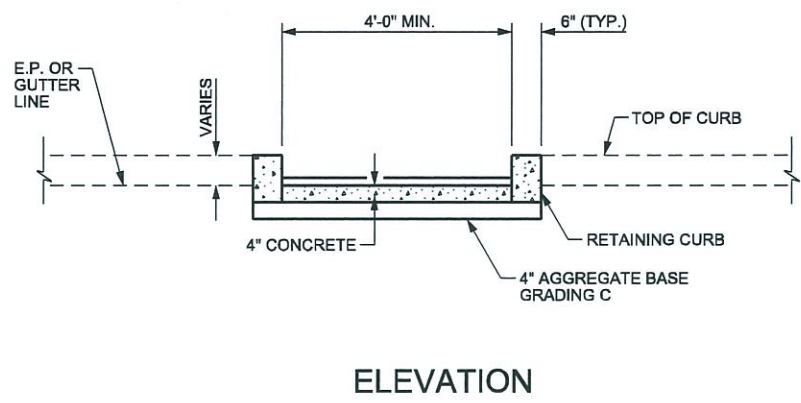
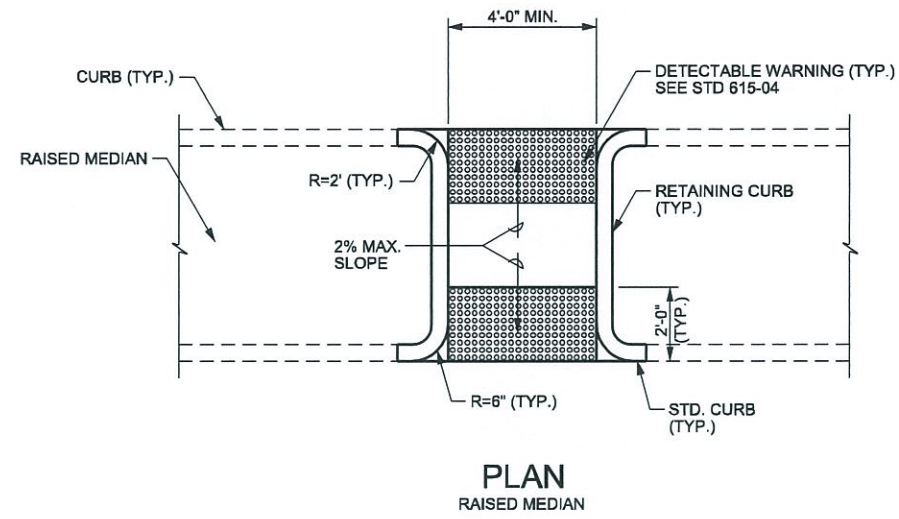
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CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
DATE: 10.14.12

STANDARD NO.

615-02





- GENERAL NOTES:**
1. ALL SLOPES RATES ARE RELATIVE TO LEVEL.
  2. RAMP SLOPES SHALL NOT EXCEED 8.3% (12:1 OR FLATTER), 15' MAXIMUM LENGTH.
  3. TRANSITION FROM RAMPS TO GUTTERS OR ROADWAY SURFACE SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
  4. CURB RAMPS SHALL BE ALIGNED WITH CROSSWALK.
  5. DRAINAGE GRATINGS OR SIMILAR ACCESSES SHALL NOT BE LOCATED IN THE RAMP AND LANDING AREA.
  6. ALL PULL BOXES SHALL BE INSTALLED OUTSIDE OF THE CURB RAMP AND SIDEWALK AREAS TO THE MAXIMUM EXTENT FEASIBLE.
  7. WHERE PULL BOXES, VALVE COVERS, MANHOLE COVERS, ETC. MUST BE INSTALLED WITHIN SIDEWALK AND RAMP AREAS, THE SURFACES SHALL BE FIRM, STABLE, SLIP RESISTANT, AND FLUSH WITH THE SIDEWALK SURFACE.

EQUIVALENT SLOPES		
2%	50:1	1/4" PER FOOT
5%	20:1	5/8" PER FOOT
8.3%	12:1	1" PER FOOT
10%	10:1	1-1/4" PER FOOT

**CURB RAMP - TYPE C**  
USE AT RAISED MEDIAN CROSSINGS AND ISLANDS

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DRAWING REVISIONS			
REVISION	DATE	BY	DESCRIPTION

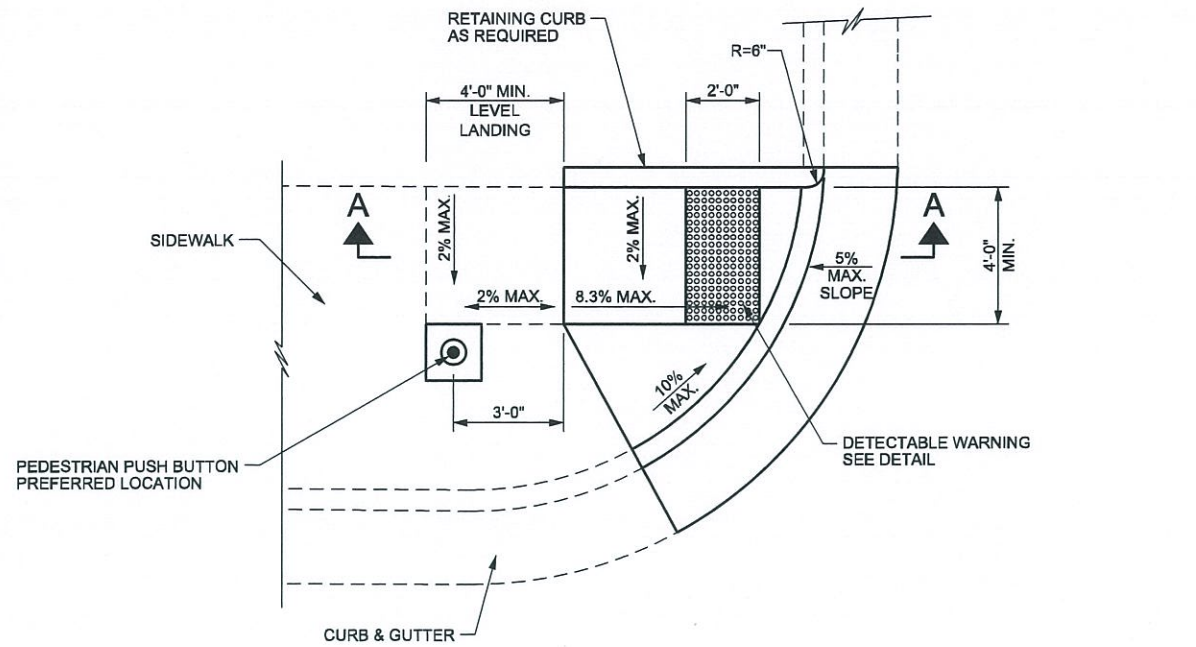


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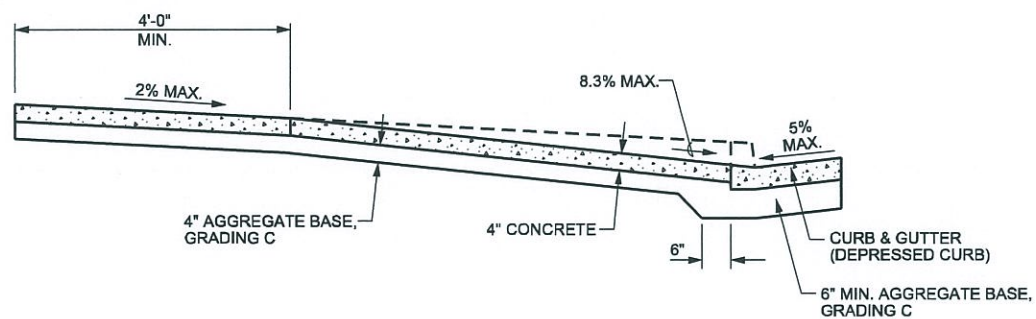
**CURB RAMP  
TYPE C**

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 CHIEF ENGINEER, HIGHWAYS DEPARTMENT OF PUBLIC WORKS	DATE: 10.14.12
STANDARD NO.	615-03





PLAN



SECTION A-A

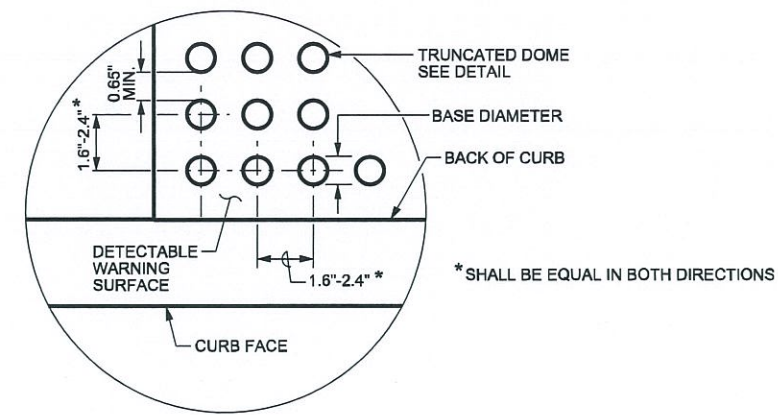
**GENERAL NOTES:**

- ALL SLOPES RATES ARE RELATIVE TO LEVEL.
- RAMP SLOPES SHALL NOT EXCEED 8.3% (12:1 OR FLATTER), 15' MAXIMUM LENGTH.
- TRANSITION FROM RAMPS TO GUTTERS OR ROADWAY SURFACE SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
- CURB RAMPS SHALL BE ALIGNED WITH CROSSWALK.
- DRAINAGE GRATINGS OR SIMILAR ACCESSSES SHALL NOT BE LOCATED IN THE RAMP AND LANDING AREA.
- ALL PULL BOXES SHALL BE INSTALLED OUTSIDE OF THE CURB RAMP AND SIDEWALK AREAS TO THE MAXIMUM EXTENT FEASIBLE.
- WHERE PULL BOXES, VALVE COVERS, MANHOLE COVERS, ETC. MUST BE INSTALLED WITHIN SIDEWALK AND RAMP AREAS, THE SURFACES SHALL BE FIRM, STABLE, SLIP RESISTANT, AND FLUSH WITH THE SIDEWALK SURFACE.

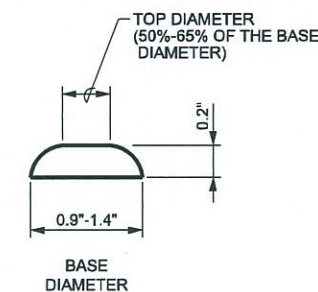
**EQUIVALENT SLOPES**

2%	50:1	1/4" PER FOOT
5%	20:1	5/8" PER FOOT
8.3%	12:1	1" PER FOOT
10%	10:1	1-1/4" PER FOOT

**CURB RAMP - TYPE D**



PLAN



**TRUNCATED DOME SECTION**

**GENERAL NOTES:**

- DETECTABLE WARNINGS SHALL BE 24 INCHES IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE RAMP OPENING OR FLUSH SURFACE (DOES NOT INCLUDE FLARES).
- TRUNCATED DOMES SHALL HAVE A DIAMETER OF 0.9 TO 1.4 INCH AT THE BOTTOM, A DIAMETER OF 50%-65% OF THE BASE DIAMETER AT THE TOP, A HEIGHT OF 0.2 INCH AND A CENTER-TO-CENTER SPACING OF 1.6 TO 2.4 INCHES MEASURED ALONG ONE SIDE OF A SQUARE ARRANGEMENT.
- TRUNCATED DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN THE DOMES.
- THERE SHALL BE A MINIMUM OF 70 PERCENT CONTRAST IN LIGHT REFLECTANCE BETWEEN THE DETECTABLE WARNING AND AN ADJOINING SURFACE, OR THE DETECTABLE WARNING SHALL BE "SAFETY YELLOW".
- THE MATERIAL USED TO PROVIDE VISUAL CONTRAST SHALL BE AN INTEGRAL PART OF THE DETECTABLE WARNING SURFACE.
- THE DETECTABLE WARNING SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS AT THE BACK OF CURB.

**DETECTABLE WARNING DETAIL**

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**CURB RAMP TYPE D & DETECTABLE WARNING DETAIL**

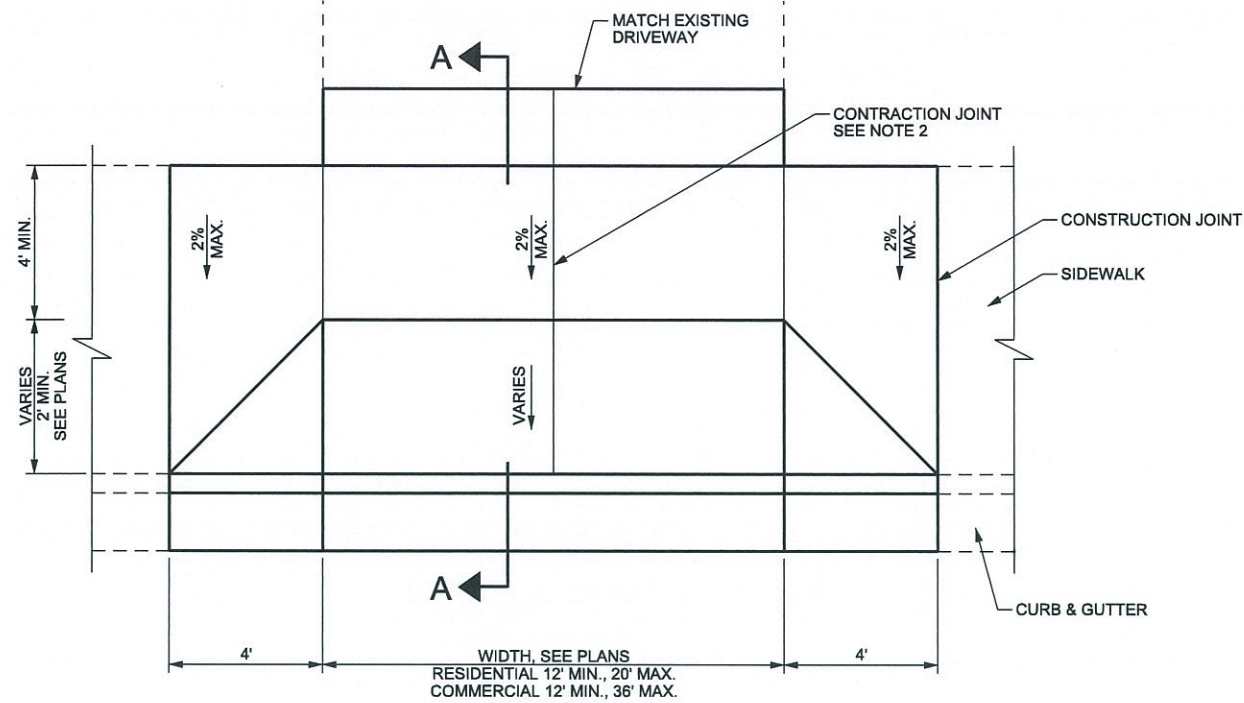
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DATE: 10-14-12

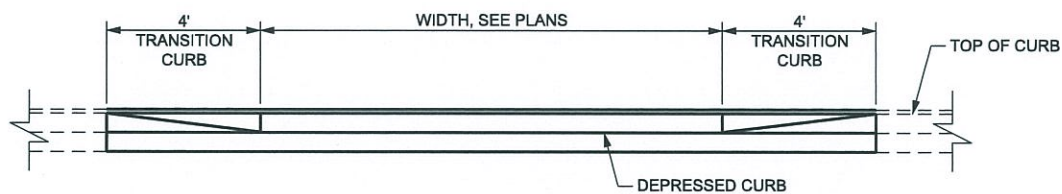
STANDARD NO.

615-04

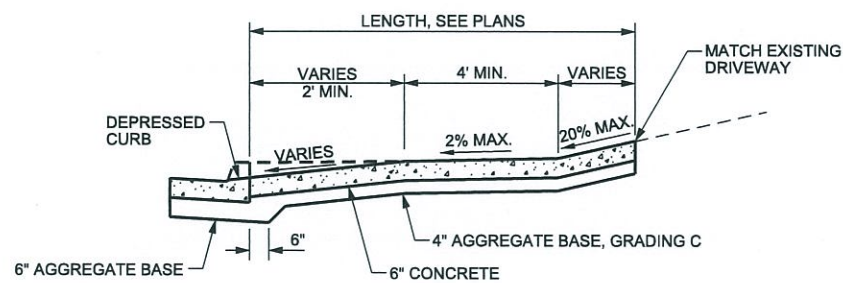




PLAN

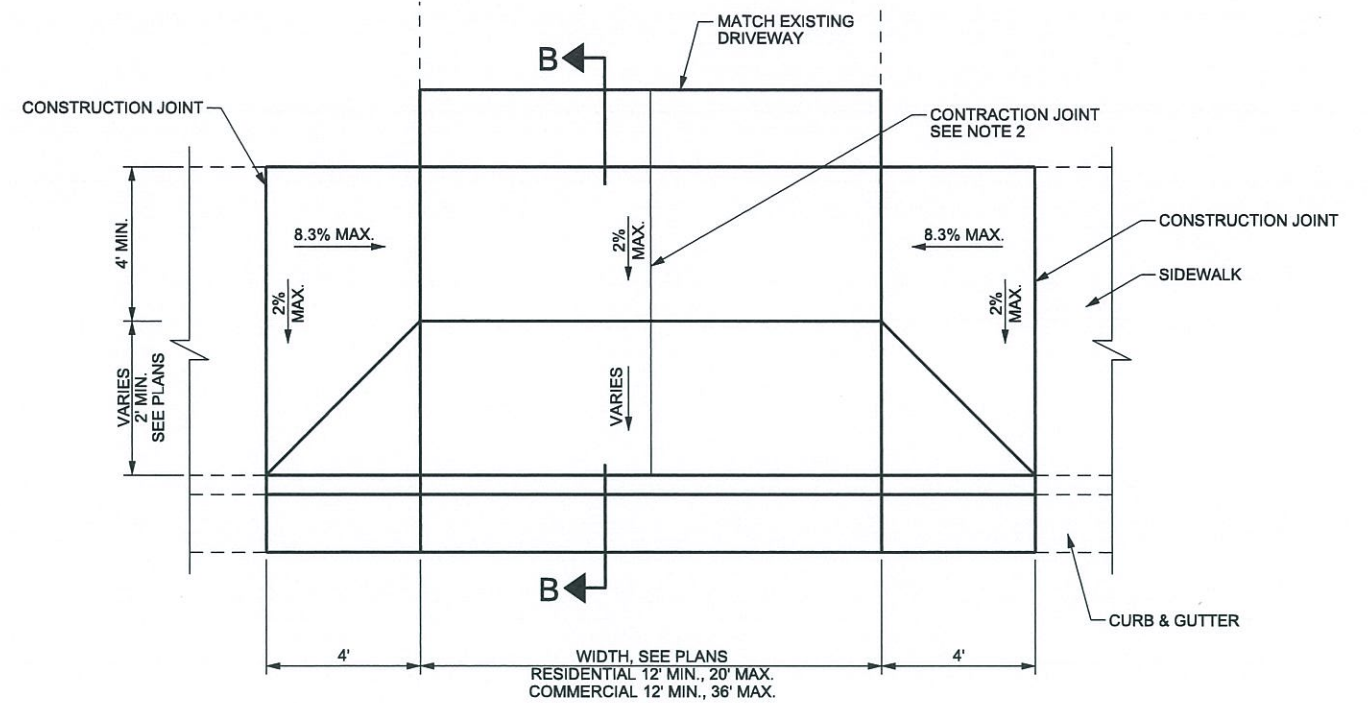


ELEVATION

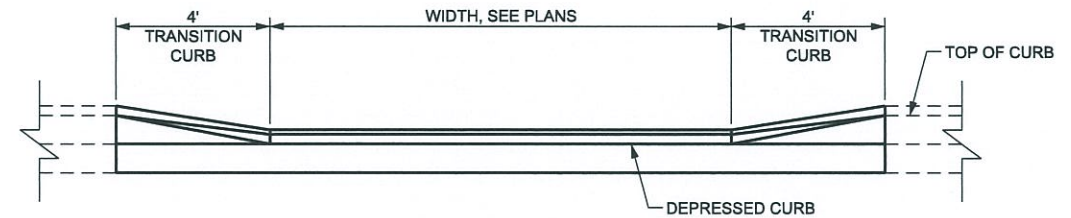


SECTION A-A

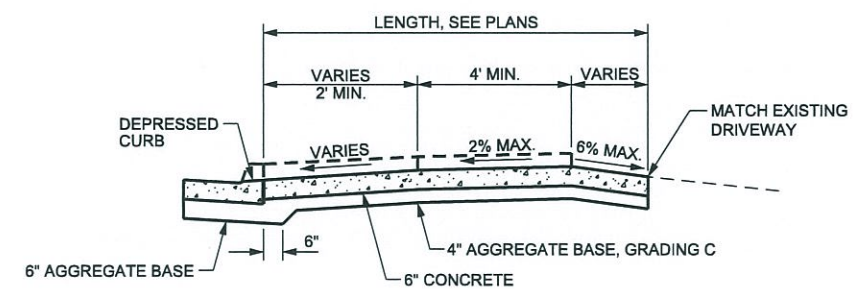
**TYPE S**  
(TYPICAL DRIVEWAY - SIDEWALK NOT DEPRESSED)



PLAN



ELEVATION



SECTION B-B

**TYPE SD**  
(TYPICAL DRIVEWAY WITH DEPRESSED SIDEWALK)

**GENERAL NOTES:**

- FOR EXTENSION TO EXISTING DRIVEWAY, SCORING AND FINISH SHALL MATCH EXISTING SCORING AND FINISH.
- TWO-INCH DEEP CONTRACTION JOINTS ARE REQUIRED FOR DRIVEWAY WIDTHS OVER 20'. JOINTS MAY BE EITHER FORMED OR SAW-CUT.

**EQUIVALENT SLOPES**

2%	50:1	1/4" PER FOOT
5%	20:1	5/8" PER FOOT
8.3%	12:1	1" PER FOOT
10%	10:1	1-1/4" PER FOOT

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**DRIVEWAYS - TYPE S AND TYPE SD**

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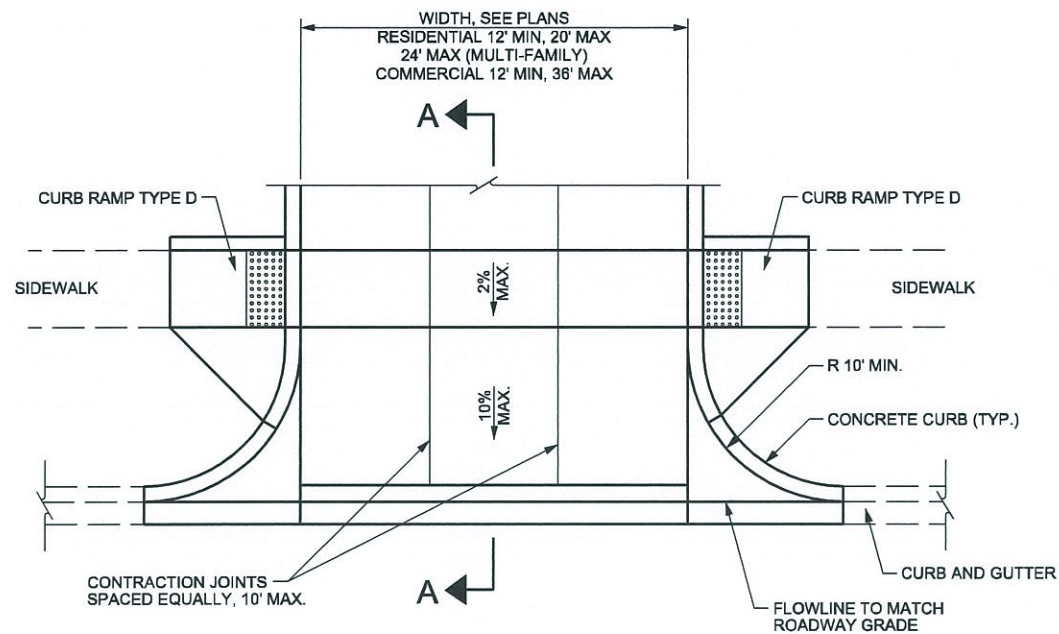
*Eng...*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS

DATE: 10.14.12

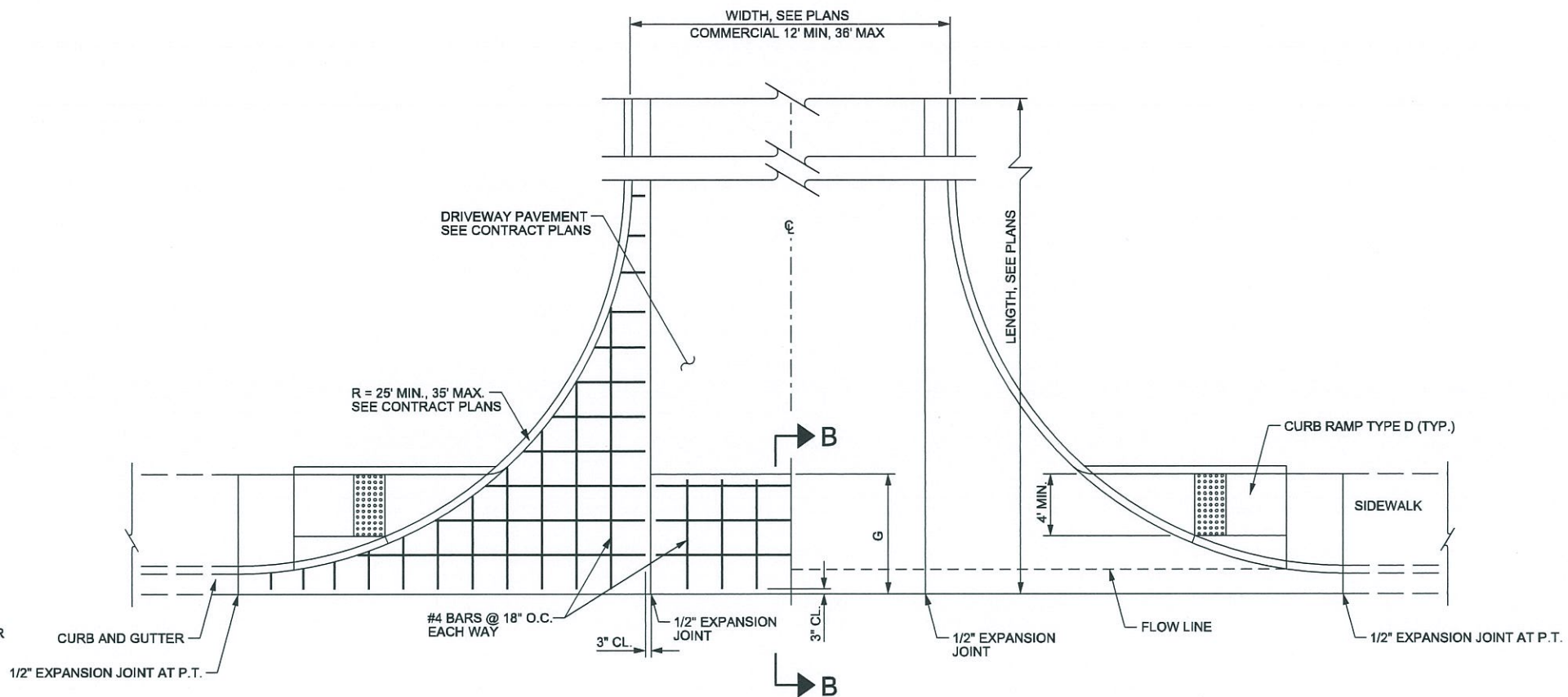
STANDARD NO.

615-05

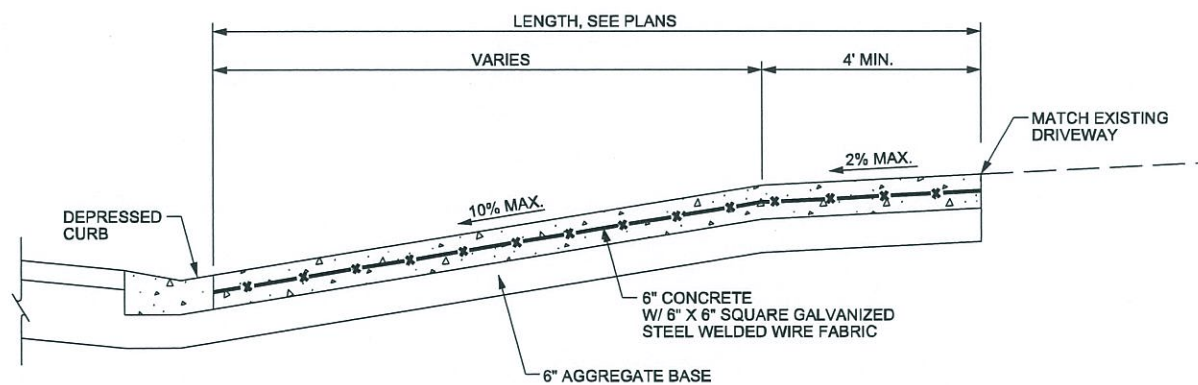




PLAN

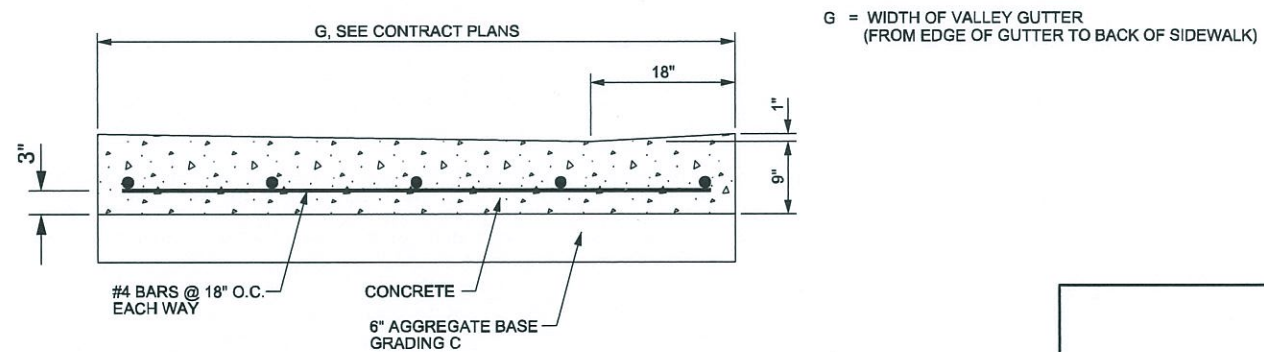


PLAN



SECTION A-A

**TYPE C-LD**  
LIGHT DUTY MULTI-FAMILY  
& COMMERCIAL DRIVEWAY



SECTION B-B

**TYPE C-HD**  
HEAVY DUTY INDUSTRIAL DRIVEWAY

NOTE: CONCRETE IN ADJACENT SPANDREL AREAS SHALL BE 9" THICK WITH 6" AGGREGATE BASE

G = WIDTH OF VALLEY GUTTER  
(FROM EDGE OF GUTTER TO BACK OF SIDEWALK)

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**DRIVEWAYS - MULTI - FAMILY & COMMERCIAL**

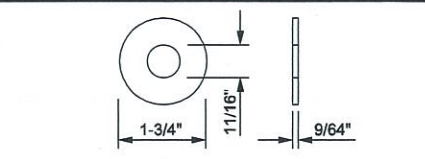
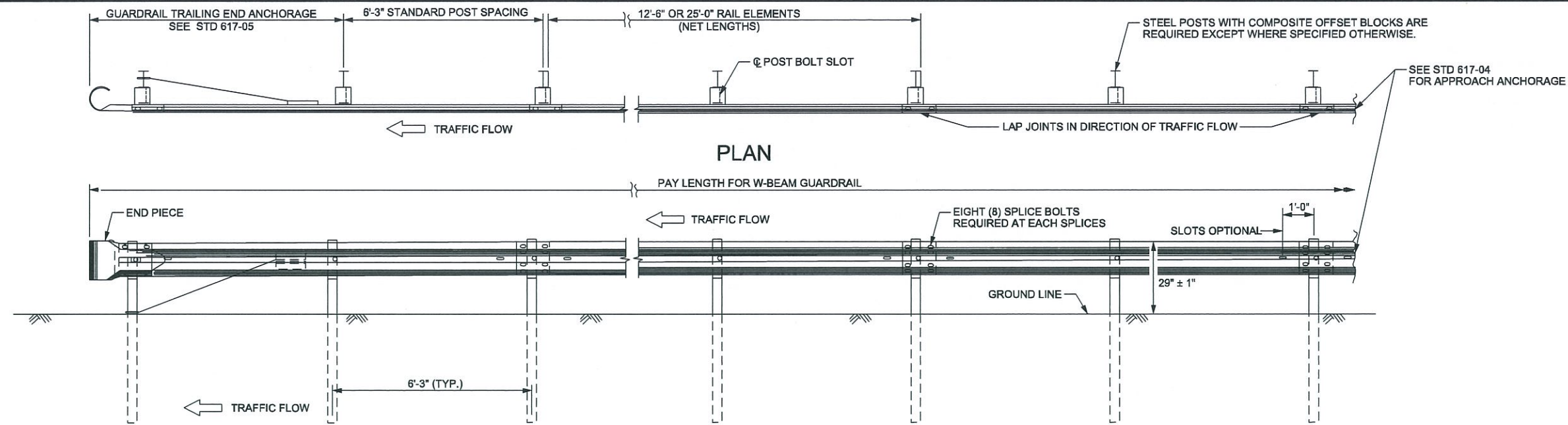
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DEPARTMENT OF PUBLIC WORKS  
DATE: 10-14-12

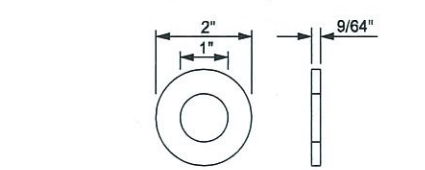
STANDARD NO.

615-06

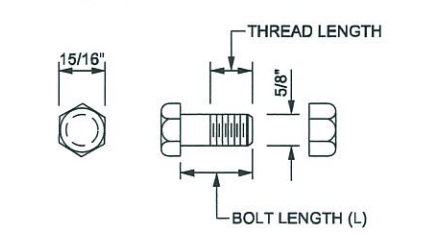




**STEEL WASHER (GALV.)**  
 (REQ'D. UNDER 5/8" HEX BOLT HEADS, UNDER HEX NUTS AND AS SPECIFIED)

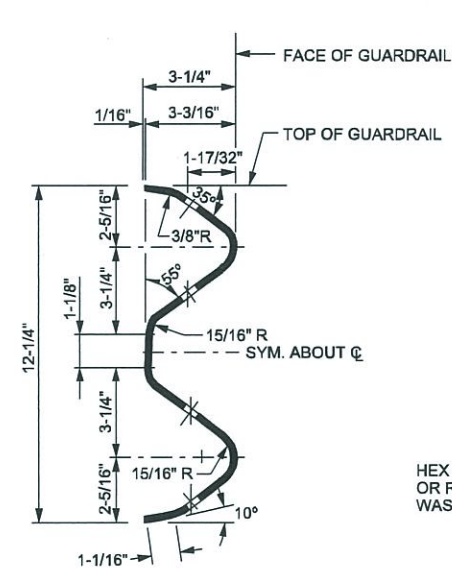


**TYPE A WASHER (GALV.)**  
 IF SLOTS IN SPECIAL END SHOE ARE 3" LONG, TYPE A WASHERS ARE REQ'D UNDER SPLICE BOLT HEADS & UNDER NUTS WITH 2" LONG SPLICE BOLTS. IF END SHOE SLOTS ARE 1-1/8" LONG, USE NORMAL SPLICE CONNECTIONS.

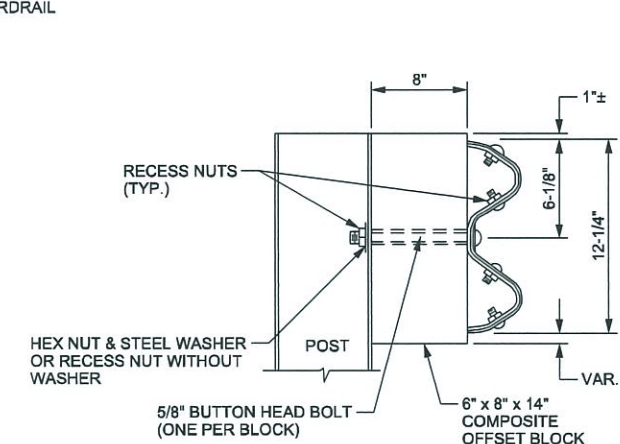


L	THREAD LENGTH
1-1/4"	FULL LENGTH
2"	1-1/2" MIN.
9-1/2"	4" MIN.
18"	4" MIN.
25"	4" MIN.

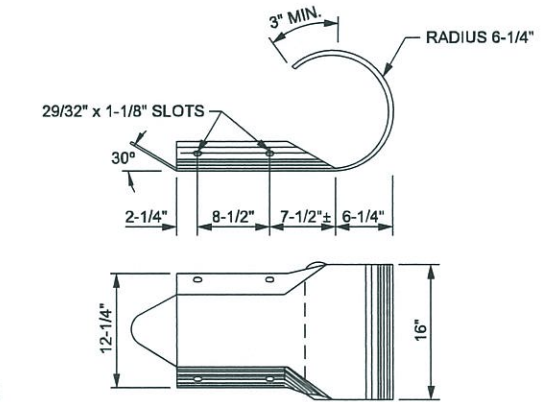
**5/8" DIA. HEX BOLT & HEX NUT**



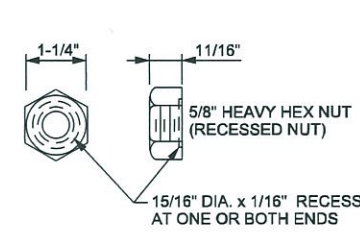
**SECTION THROUGH RAIL ELEMENT**



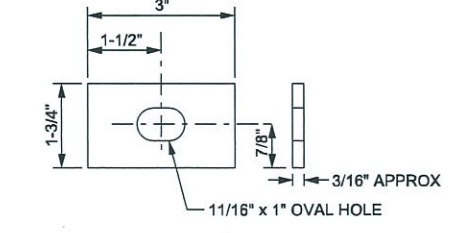
**W-BEAM SPLICE AT POST**



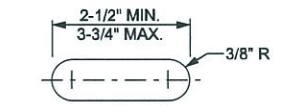
**END PIECE (FOR W-BEAM)**



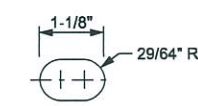
**RECESS NUT**



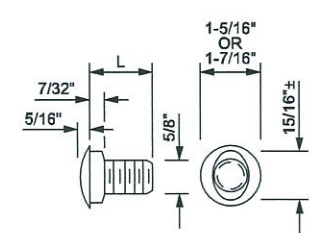
**RECTANGULAR WASHER (GALV.)**  
 (FOR USE AT TERMINAL POST OR WHERE SPECIFIED)



**POST BOLT SLOT**



**SPLICE BOLT SLOT**



**BUTTON HEAD SPLICE BOLT**

**GENERAL NOTES:**

- RAIL ELEMENTS SHALL CONFORM TO AASHTO M180 CLASS A (12 GAUGE), TYPE 2 (ZINC COATED 3.6 OZ./SQ. FT.).
- NET LENGTH OF RAIL ELEMENTS MAY BE EITHER 12'-6" OR 25'-0". THESE LENGTHS SHALL BE ARRANGED TO PROVIDE AS NEARLY AS POSSIBLE THE REQUIRED LENGTH FOR EACH INSTALLATION.
- RAIL ELEMENTS ON CURVES WITH RADII LESS THAN 150' SHALL BE PRECURVED.
- ALL STEEL HARDWARE COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING REPAIR COMPOUND SHALL BE FIELD APPLIED TO ANY COATINGS DAMAGED.
- OFFSET BLOCKS SHALL BE COMPOSITE UNLESS OTHERWISE APPROVED OR SPECIFIED.
- FOR DETAILS OF POST AND OFFSET, SEE STD 617-03.
- FOR DETAILS OF GUARDRAIL ANCHORAGES, SEE STD 617-04 & 617-05.
- ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

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**W-BEAM GUARDRAIL**

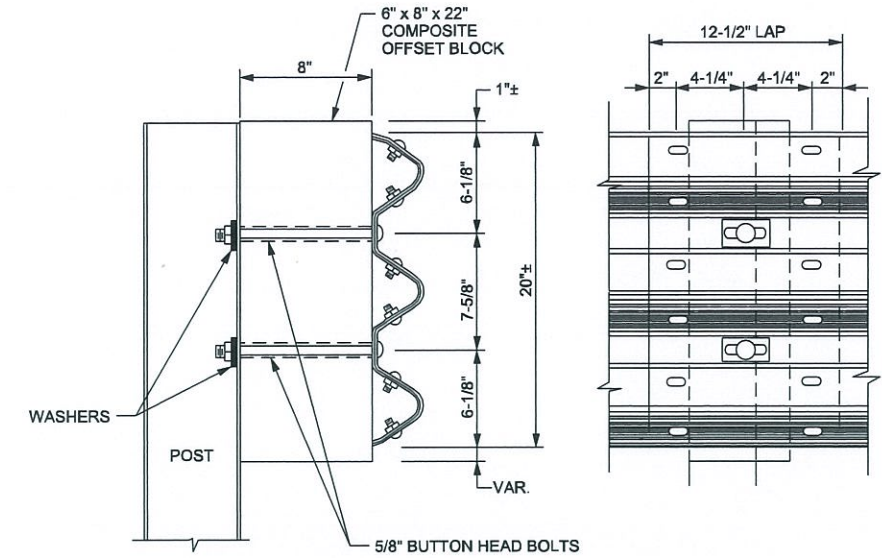
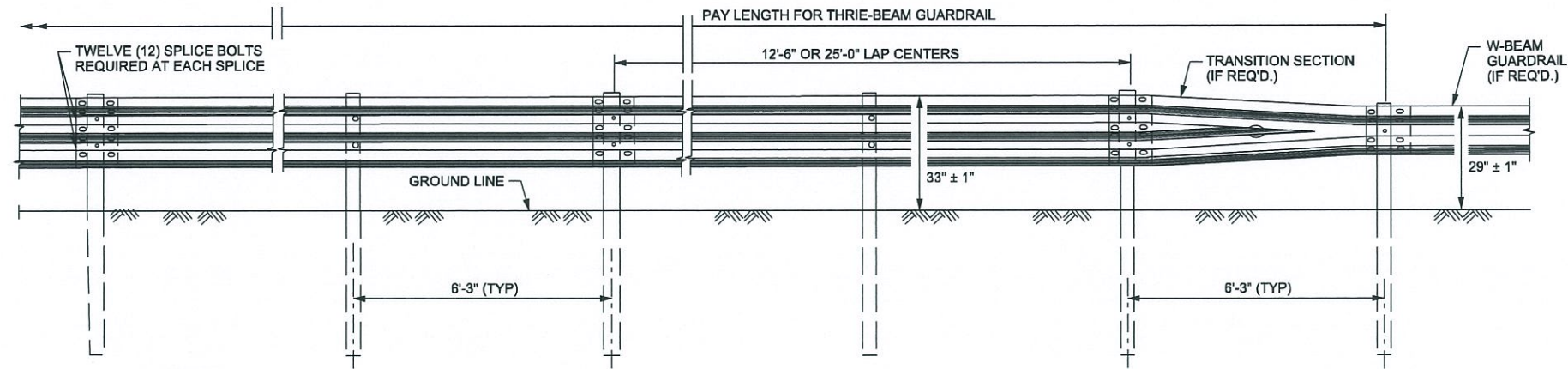
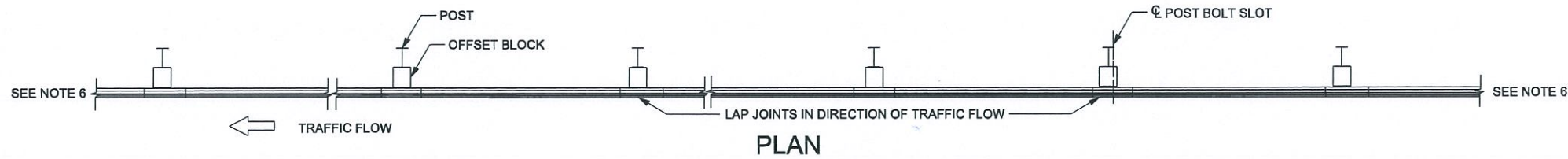
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*Engineer Signature*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

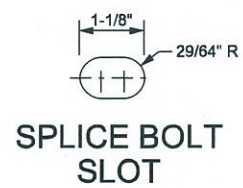
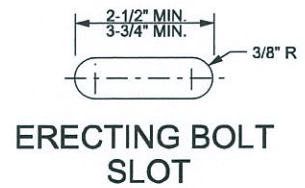
DATE: 10-14-12

STANDARD NO. 617-01

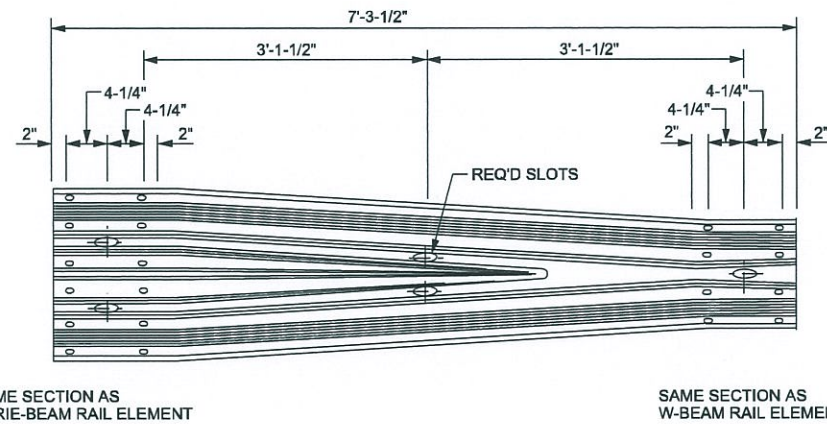




THRIE-BEAM SPLICE AT POST



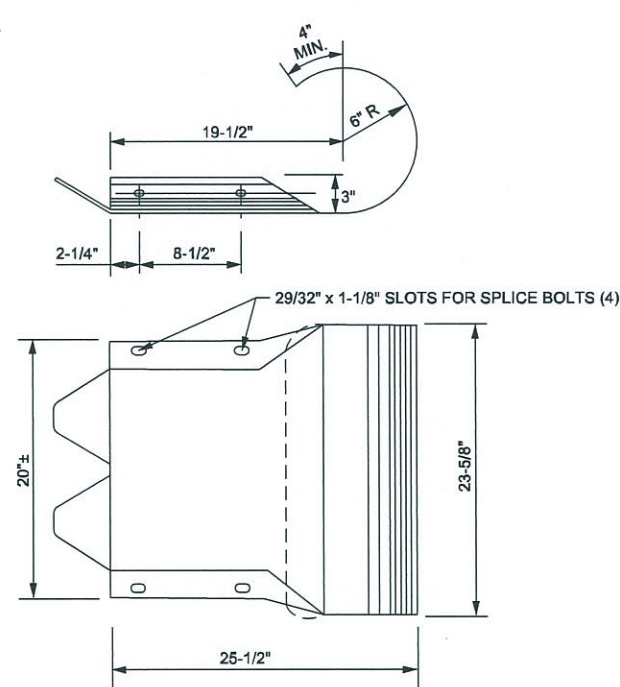
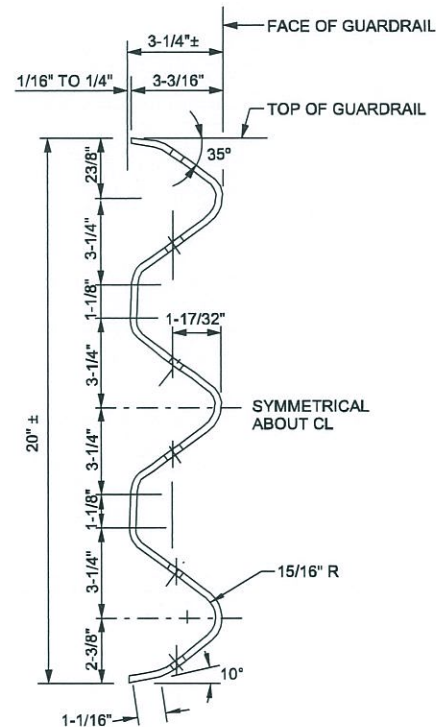
ELEVATION



SAME SECTION AS THRIE-BEAM RAIL ELEMENT

SAME SECTION AS W-BEAM RAIL ELEMENT

TRANSITION SECTION



END PIECE (FOR THRIE-BEAM)  
TO BE LAPPED ON TRAFFIC FACE OF RAIL WHERE GUARDRAIL ANCHORAGE TRAILING END IS REQUIRED

**GENERAL NOTES:**

- RAIL ELEMENTS SHALL CONFORM TO AASHTO M180 CLASS A (12 GAUGE), TYPE 2 (ZINC COATED 3.6 OZ./SQ. FT.).
- NET LENGTH OF RAIL ELEMENTS MAY BE EITHER 12'-6" OR 25'-0". THESE LENGTHS SHALL BE ARRANGED TO PROVIDE AS NEARLY AS POSSIBLE THE REQUIRED LENGTH FOR EACH INSTALLATION.
- RAIL ELEMENTS ON CURVES WITH RADII LESS THAN 150' SHALL BE PRECURVED.
- ALL STEEL HARDWARE COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING REPAIR COMPOUND SHALL BE FIELD APPLIED TO ANY COATINGS DAMAGED.
- OFFSET BLOCKS SHALL BE COMPOSITE UNLESS OTHERWISE APPROVED OR SPECIFIED.
- FOR DETAILS OF POST AND OFFSET, SEE STD 617-03.
- FOR DETAILS OF GUARDRAIL ANCHORAGES, SEE STD 617-04 & 617-05.
- FOR DETAILS OF NUTS, BOLTS AND WASHERS, SEE STD 617-01.
- ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.

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THRIE-BEAM GUARDRAIL

APPROVED FOR USE ON DPW PROJECTS

*Emerson*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS *Asing*

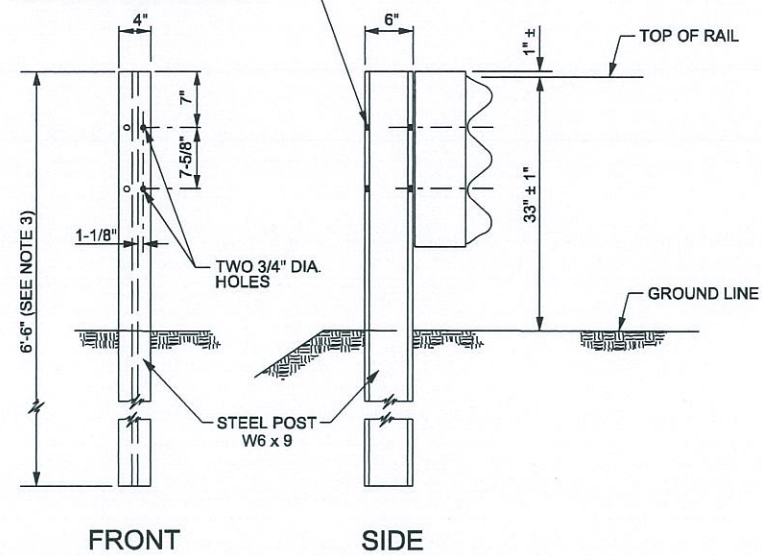
DATE: 10-14-12

STANDARD NO.

617-02

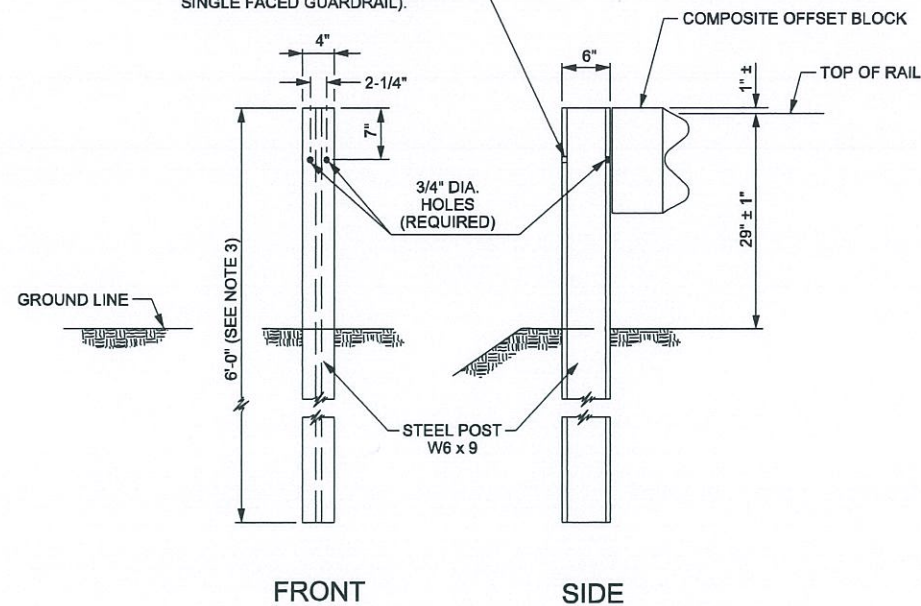


HOLES IN BOTH FACES OF STEEL POST ARE REQUIRED FOR DOUBLE FACED GUARDRAIL (OPTIONAL FOR SINGLE FACED GUARDRAIL).



STEEL POST FOR THRIE-BEAM GUARDRAIL

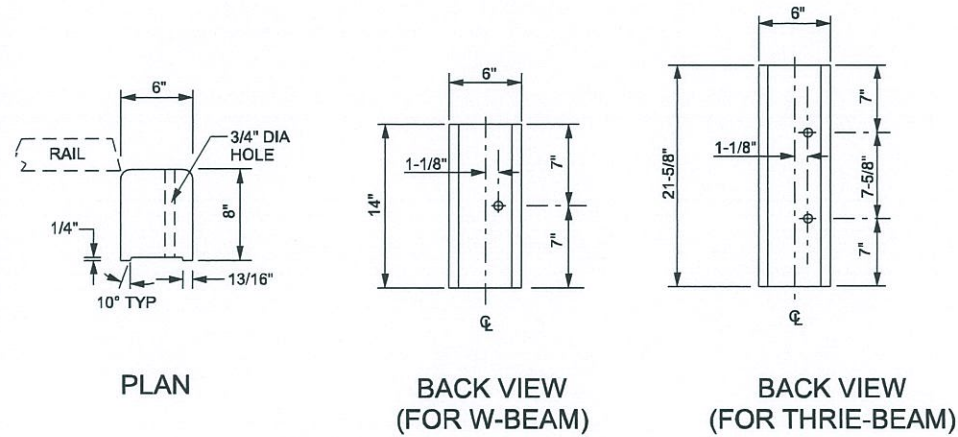
HOLES IN BOTH FACES OF STEEL POST ARE REQUIRED FOR DOUBLE FACED GUARDRAIL (OPTIONAL FOR SINGLE FACED GUARDRAIL).



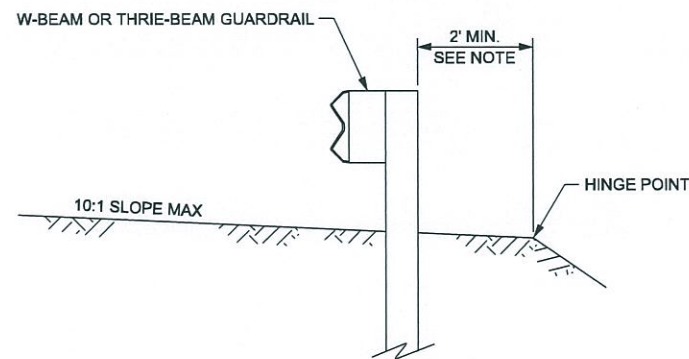
STEEL POST FOR W-BEAM GUARDRAIL

**GENERAL NOTES:**

1. STEEL POSTS MAY BE EITHER ROLLED OR WELDED STRUCTURAL SHAPES. WELDED POSTS SHALL BE SEAL WELDED BETWEEN WEB AND FLANGE BEFORE GALVANIZING.
2. POSTS SHALL BE SPACED AT 8'-3" CENTER TO CENTER, UNLESS OTHERWISE NOTED.
3. ADDITIONAL LENGTH POSTS, WHERE SPECIFIED, SHALL BE 7'-0" AND 7'-6" LONG FOR W-BEAM AND THRIE-BEAM GUARDRAIL, RESPECTIVELY WITH HOLES DIMENSIONED FROM THE POST-TOP, THE SAME AS SHOWN.

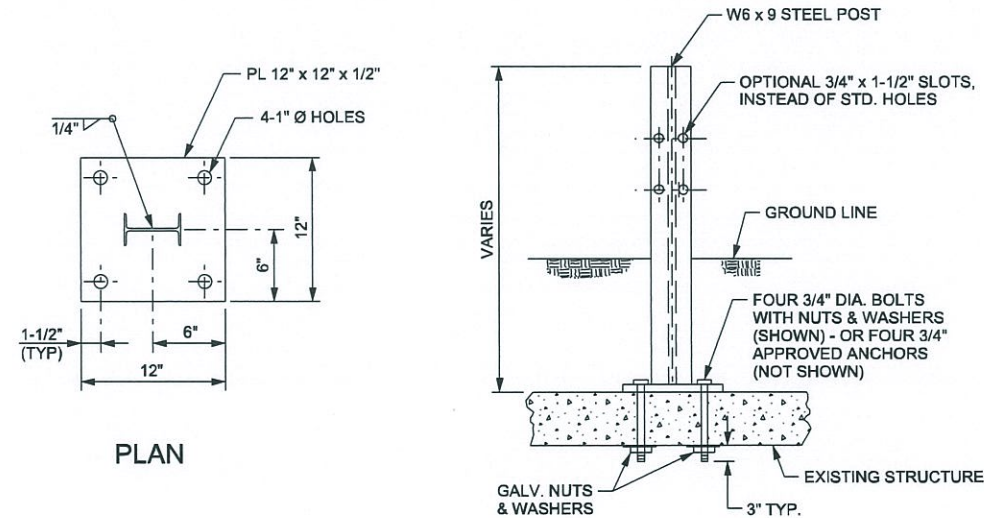


COMPOSITE OFFSET BLOCKS



NOTE: IF DISTANCE BETWEEN BACK OF POST AND HINGE POINT IS LESS THAN 2', INCREASE POST LENGTH 1' MINIMUM

POST PLACEMENT AT SLOPES



POST ATTACHMENT TO EXISTING STRUCTURE

**NOTES**

1. THIS DETAIL IS FOR USE WHERE EXISTING STRUCTURE PRECLUDES DRIVEN POST FOUNDATION.
2. POSTS AND POST PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-123, AFTER WELDING.
3. POSTS SHALL BE PLUMBED BY ADJUSTING NUTS OR MORTAR SEATING.
4. THIS DETAIL SHALL NOT BE USED FOR ANY POST IN APPROACHING END ANCHORAGE.

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**GUARDRAIL POSTS AND OFFSET BLOCKS**

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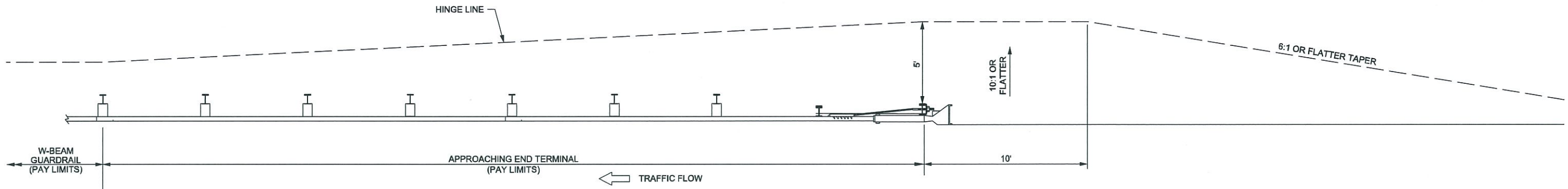
*Engineering*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS *Acting*

DATE: 10-14-12

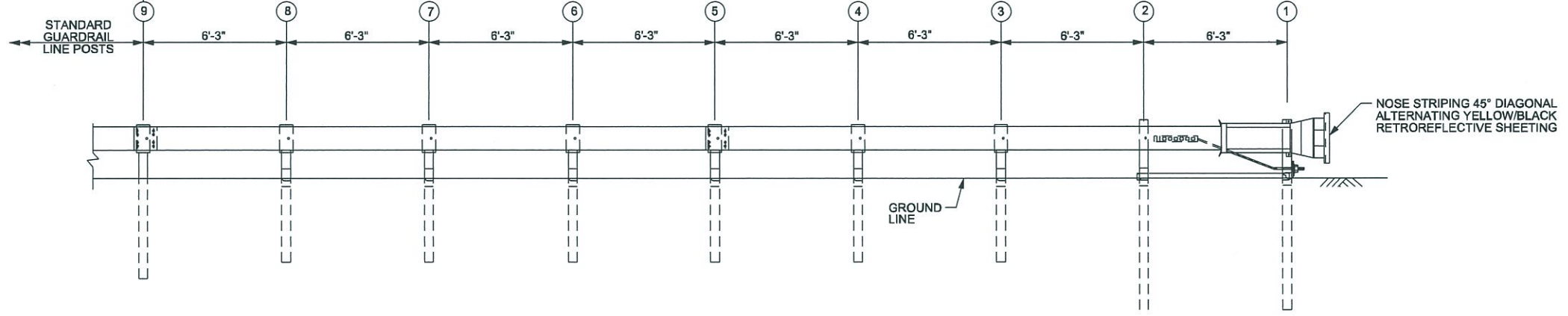
STANDARD NO.

617-03

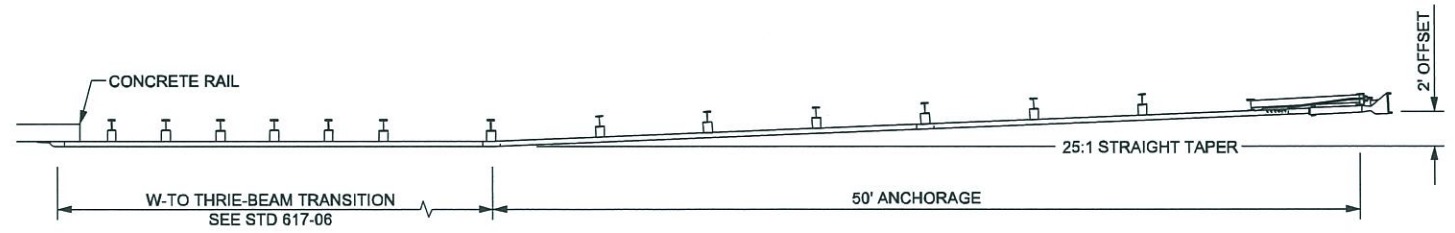




PLAN



ELEVATION



TYPICAL TERMINAL PLACEMENT FOR BRIDGE APPROACH

GENERAL NOTES:

1. GUARDRAIL APPROACHING END TERMINAL SHALL BE AN ENERGY - ABSORBING NCHRP 350 TEST LEVEL 3 (TL-3) COMPLIANT SYSTEM THAT DOES NOT USE WOOD POSTS, AND IS APPROVED FOR USE BY FHWA ON THE N.H.S.
2. ALL RAIL ELEMENTS, POSTS, HARDWARE AND ACCESSORIES SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123.
3. ASSEMBLE AND INSTALL THE APPROACHING END TERMINAL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

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GUARDRAIL APPROACHING END TERMINAL

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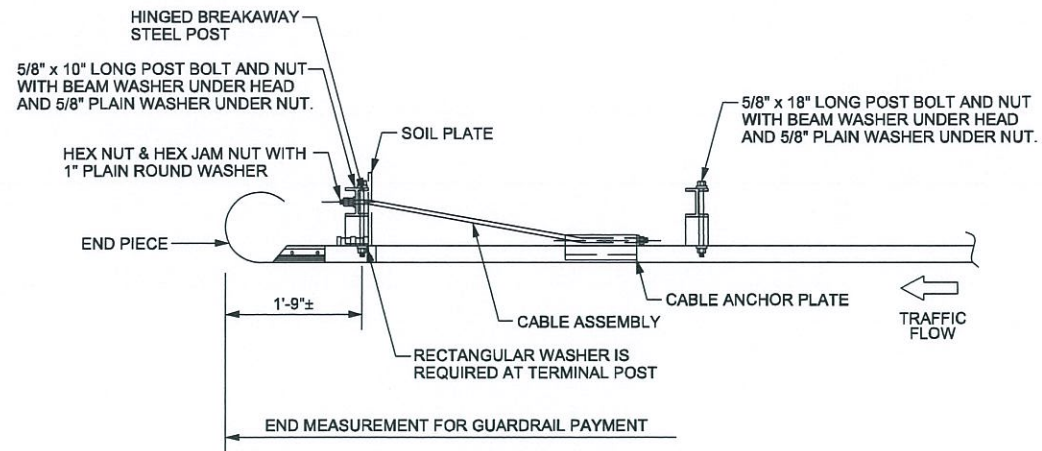
*Eugen Torres*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10-14-12

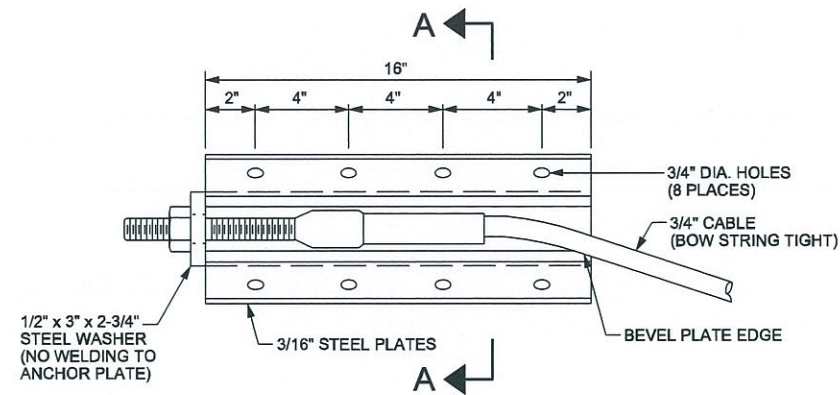
STANDARD NO.

617-04

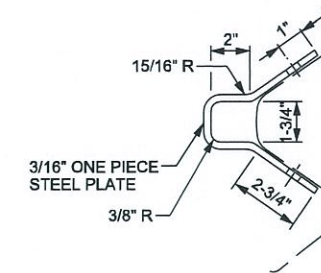




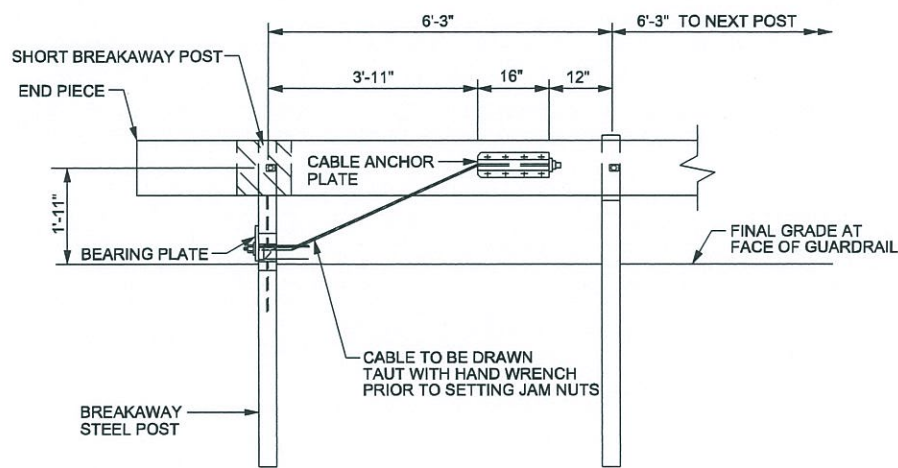
PLAN



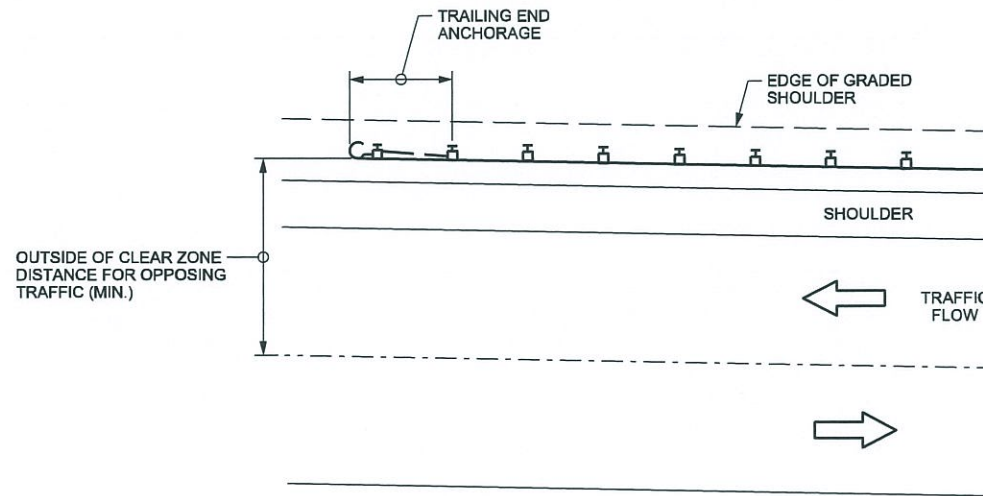
CABLE ANCHOR PLATE



SECTION A-A ANCHOR PLATE



ELEVATION



INSTALLATION PLAN

NOTES:

ANCHOR PLATES SHOWN HERE WITH W-BEAM GUARDRAIL. ATTACHMENT TO THRIE-BEAM GUARDRAIL WILL BE THE SAME EXCEPT THAT THE ANCHOR PLATE WILL BE LOCATED BETWEEN THE BOTTOM AND MIDDLE CORRUGATIONS.

GENERAL NOTES:

1. TRAILING END ANCHORAGE AS SHOWN IS APPLICABLE TO GUARDRAIL ENDS OUTSIDE OF THE CLEAR ZONE DISTANCE FOR OPPOSING TRAFFIC, AS DEFINED BY THE CURRENT EDITION OF THE AASHTO ROADSIDE DESIGN GUIDE.
2. GUARDRAIL APPROACHING END TERMINAL SHALL BE PROVIDED FOR GUARDRAIL ENDS WITHIN THE CLEAR ZONE FOR OPPOSING TRAFFIC.
3. THE APPROPRIATE END TREATMENT WILL BE SHOWN ON THE CONTRACT PLANS.
4. GUARDRAIL END PIECES SHALL BE LAPPED IN THE DIRECTION OF THE NEAREST TRAFFIC.

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GUARDRAIL TRAILING END ANCHORAGE

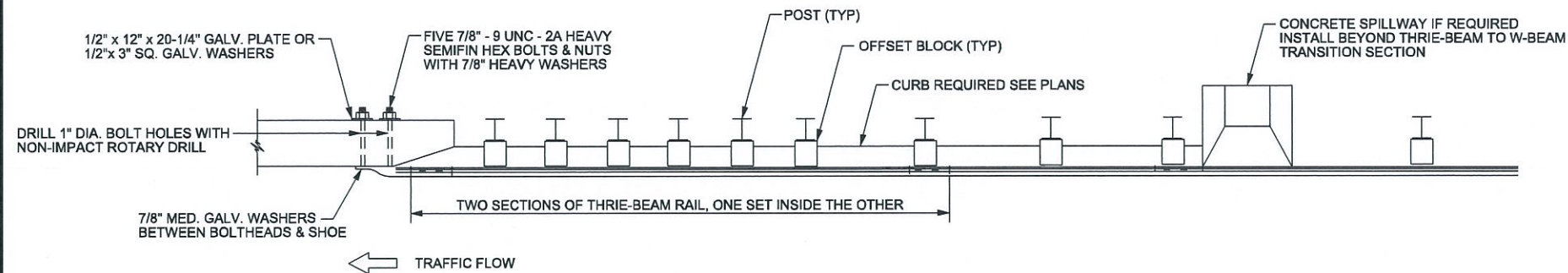
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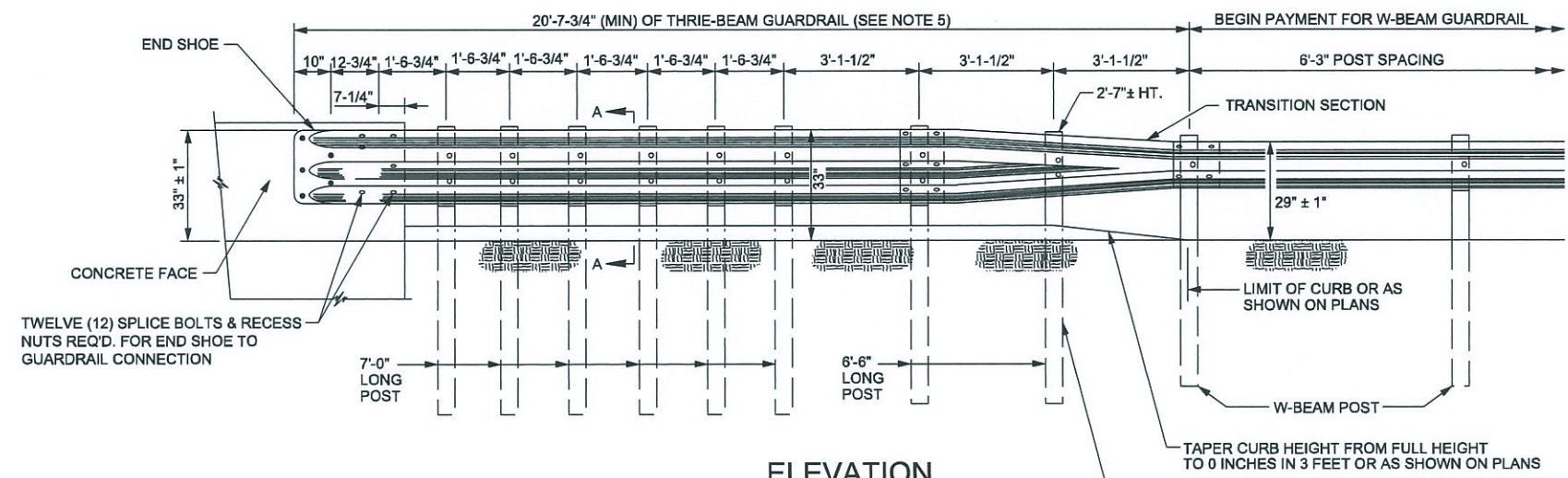
STANDARD NO.

617-05

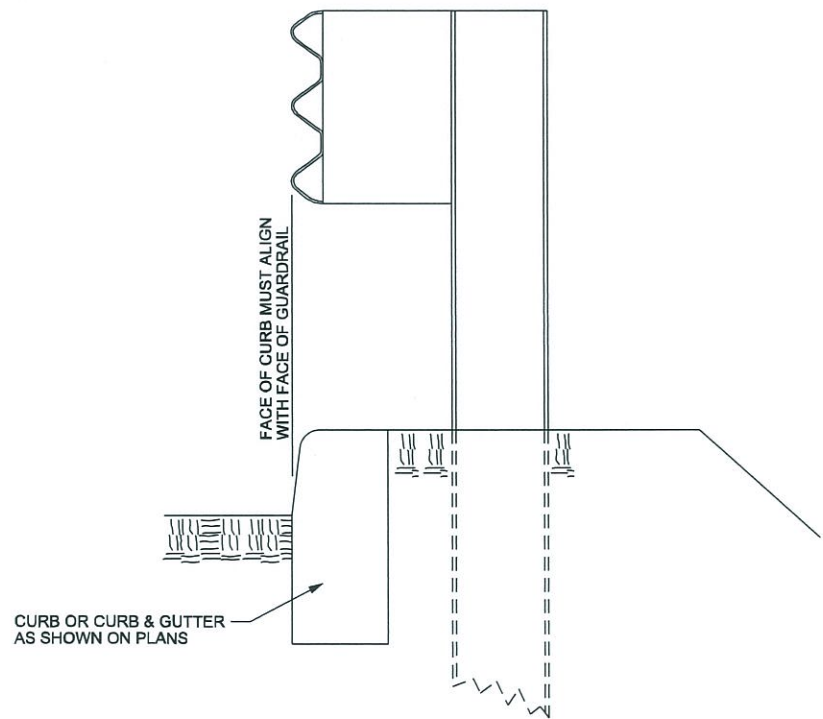




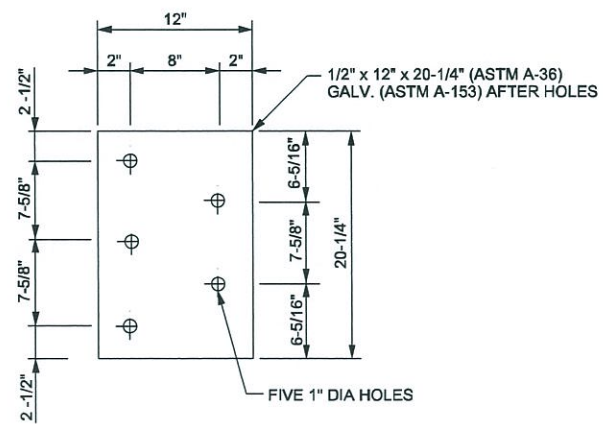
**PLAN**



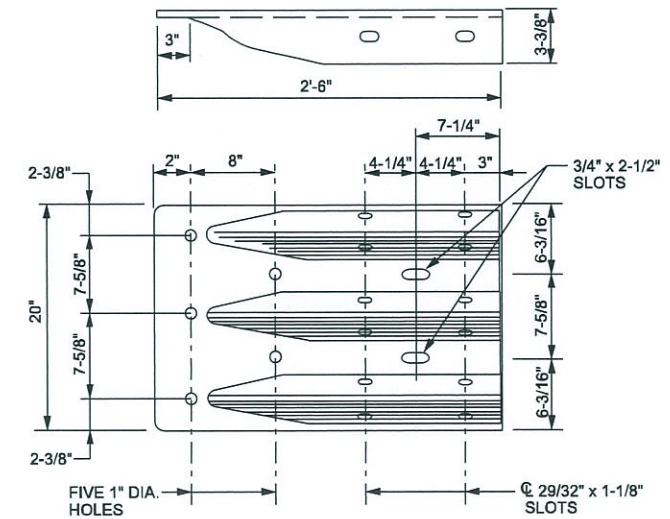
**ELEVATION**



**SECTION A-A**



**1/2" GALVANIZED STEEL PLATE**  
(FOR USE WITH END SHOE)



**THRIE-BEAM END SHOE**

**GENERAL NOTES:**

- FOR DETAILS OF GUARDRAIL HARDWARE, POST, OFFSET BLOCKS, TRANSITION SECTION, ETC., SEE STD 617-01, 617-02 & 617-03.
- GUARDRAIL INSTALLATIONS, INCLUDING ANCHORAGES AND CONNECTIONS, ARE TO BE COMPLETED BEFORE BEING SUBJECT TO TRAFFIC UNLESS OTHERWISE APPROVED.
- OFFSET BLOCKS SHALL BE COMPOSITE UNLESS SPECIFIED OTHERWISE. OFFSET BLOCKS ARE REQUIRED AT ALL POSTS.
- THE COST FOR DRILLING HOLES AND REPAIR/COPING OF EXPOSED STEEL FOR THE END SHOE CONNECTION SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE GUARDRAIL.
- WHERE GREATER THAN THE MINIMUM LENGTH OF THRIE-BEAM GUARDRAIL IS REQUIRED, ADDITIONAL POSTS REMAIN AS SHOWN WITHIN THE FIRST 20'-7 3/4" LENGTH, WITH NORMAL (8'-3" O.C.) SPACINGS FOR THE REMAINDER OF THE INSTALLATION (STD. THRIE-BEAM GUARDRAIL) UNLESS SPECIFIED OTHERWISE.
- PAYMENT FOR THRIE-BEAM GUARDRAIL INCLUDES ALL ADDITIONAL OFFSET BLOCKS, POSTS, SPECIAL END SHOE CONNECTION WITH HARDWARE, AND THE THRIE-BEAM TO W-BEAM TRANSITION SECTION.

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**GUARDRAIL CONNECTION TO BRIDGE  
OR CONCRETE BARRIER**

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*Espinoza*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS

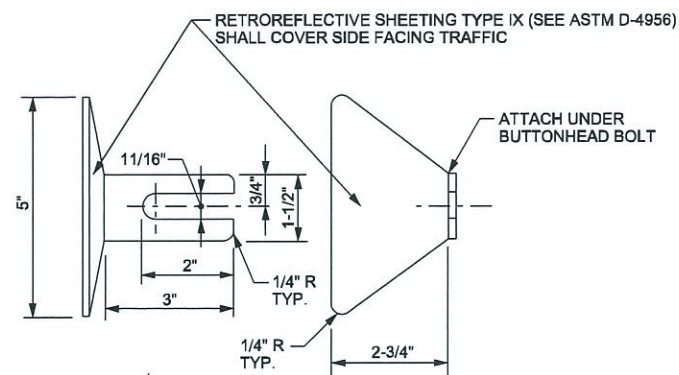
DATE: 10-14-12

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617-06

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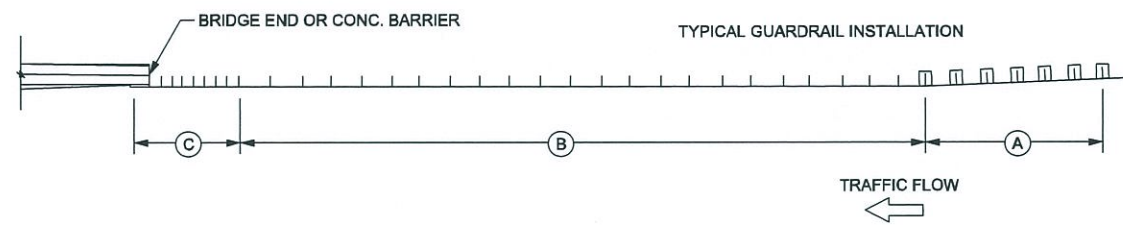
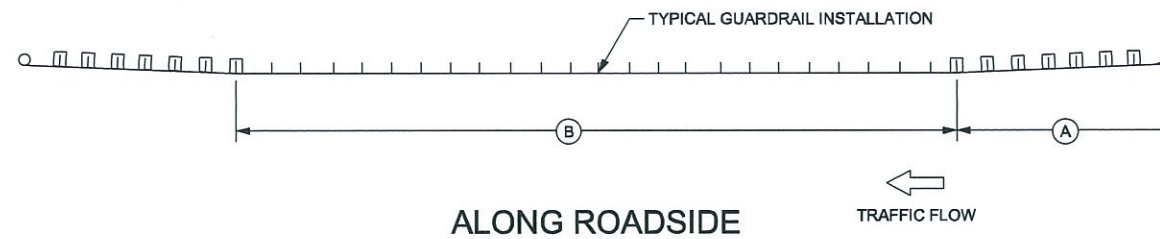




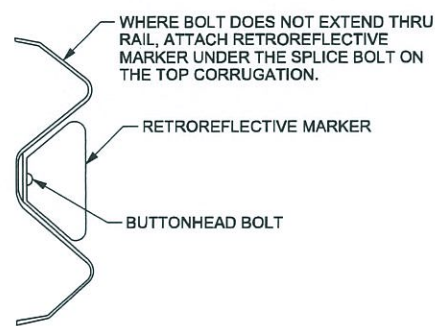
MATERIALS: ALUMINUM (ASTM B 209 ALLOY 5052 H-32)  
WITH RETROREFLECTIVE SHEETING.

COLORS: YELLOW IN MEDIANS AND  
WHITE ON OUTSIDE SHOULDERS

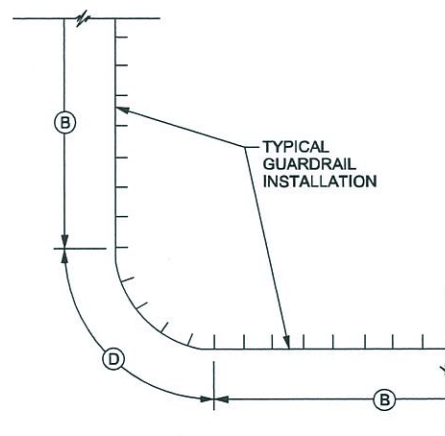
RETROREFLECTIVE MARKER DETAILS



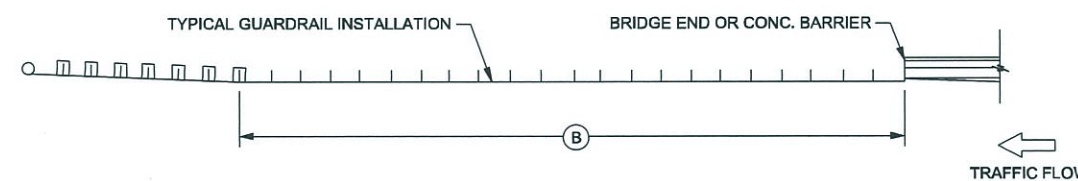
APPROACH END-BRIDGE OR CONCRETE BARRIER



MARKER LOCATION



AT TURNOUTS



TRAILING END-BRIDGE OR CONCRETE BARRIER

GENERAL NOTE:

- ADJUSTMENTS OF SPACINGS AND/OR REQUIREMENTS FOR RETROREFLECTIVE MARKER MAY BE DIRECTED BY THE ENGINEER TO SUIT INDIVIDUAL LOCATIONS.

SPACING OF RETROREFLECTIVE MARKER

- (A) NO RETROREFLECTIVE MARKERS WILL BE USED FOR APPROACHING END TERMINAL.
- (B) 75 FT. SPACINGS FOR INTERMEDIATE SECTIONS
- (C) THREE MARKERS AT 6'-3" SPACING AT CONNECTIONS TO CONCRETE FACE ON THE APPROACH END
- (D) 12'-6" SPACINGS AROUND TURNS

NOTE:  
FOR THRIE-BEAM GUARDRAIL, MARKER IS PLACED IN THE TOP INDENTION.

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GUARDRAIL MARKERS

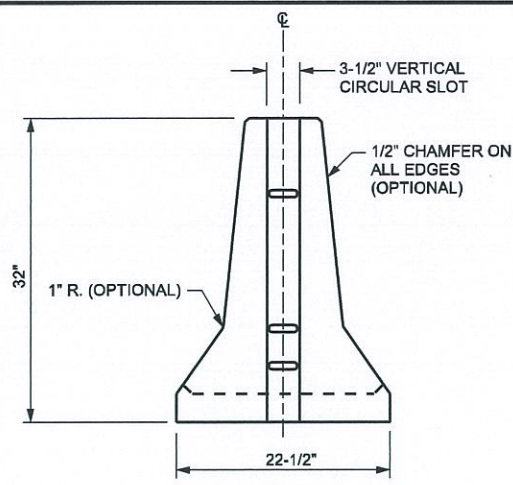
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DEPARTMENT OF PUBLIC WORKS  
DATE: 10-14-12

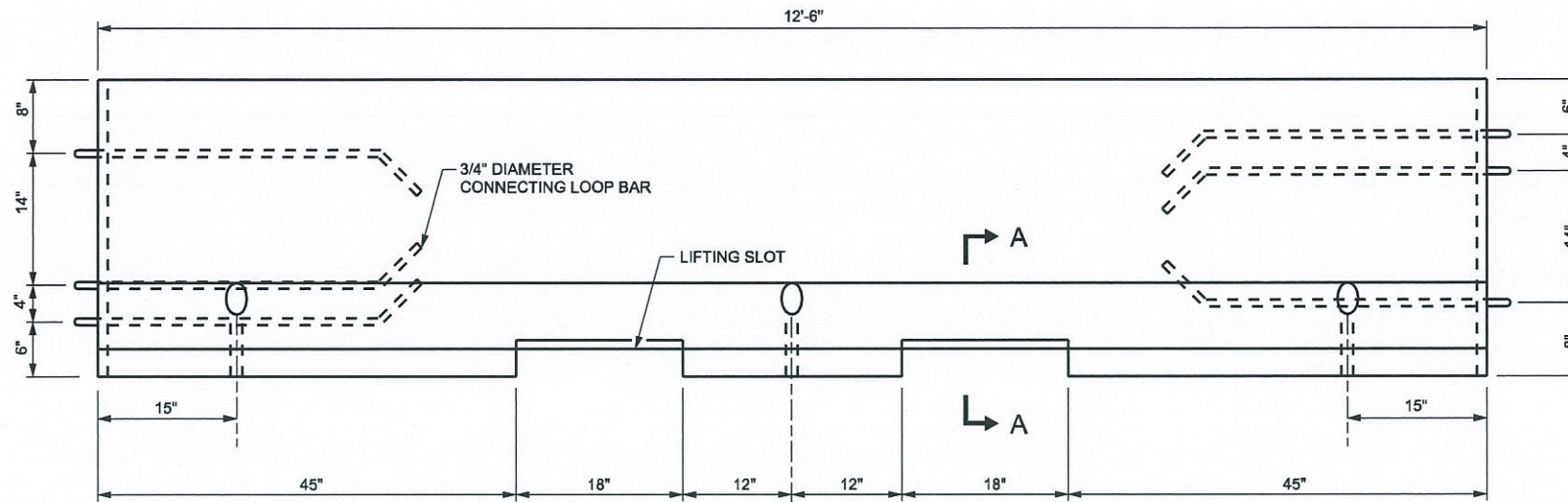
STANDARD NO.

617-07

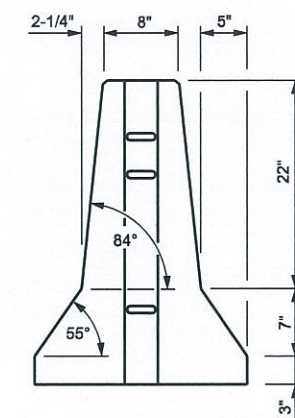




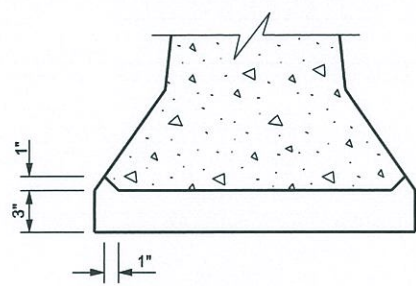
**END VIEW**  
(SHOWING LIFTING SLOT)



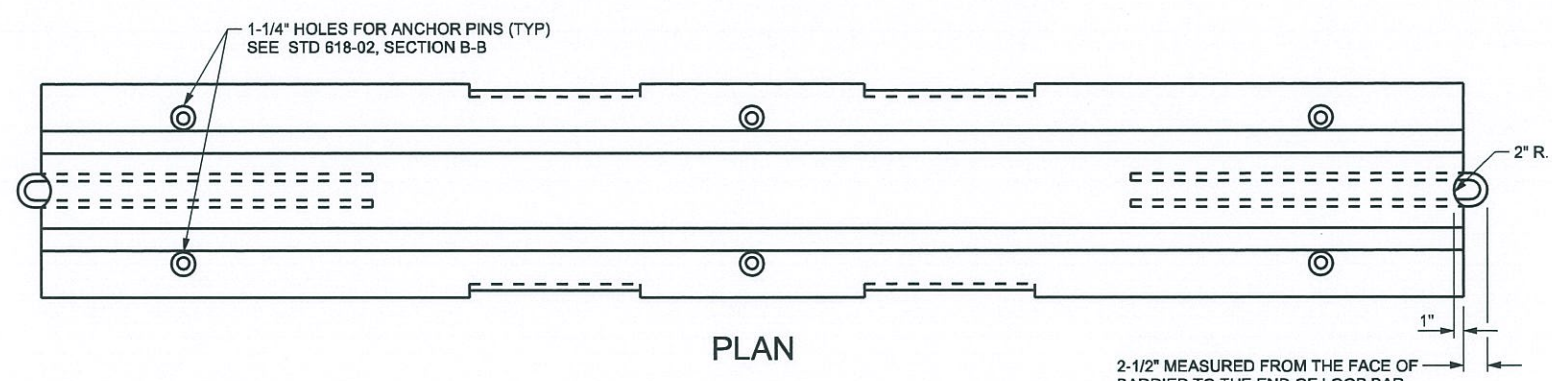
**ELEVATION**  
(SHOWING CONNECTING LOOP BARS AND VERTICAL PANEL BOLT/INSERT)



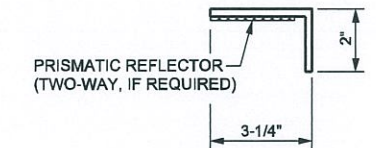
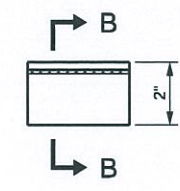
**END VIEW**



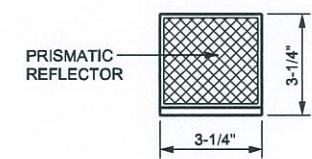
**SECTION A-A**  
**LIFTING SLOT**



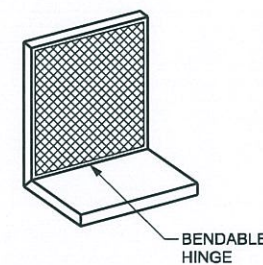
**PLAN**



**SECTION B-B**

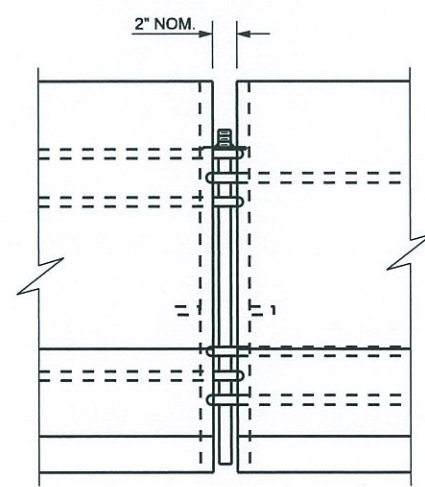


**PRISMATIC REFLECTOR**

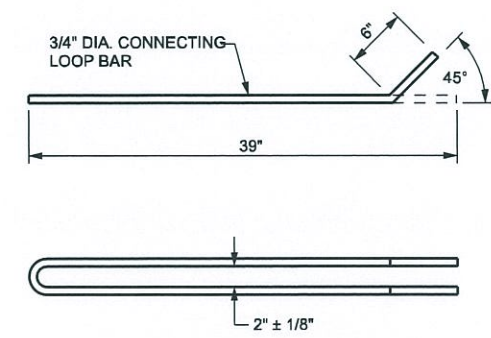


**BENDABLE HINGE**

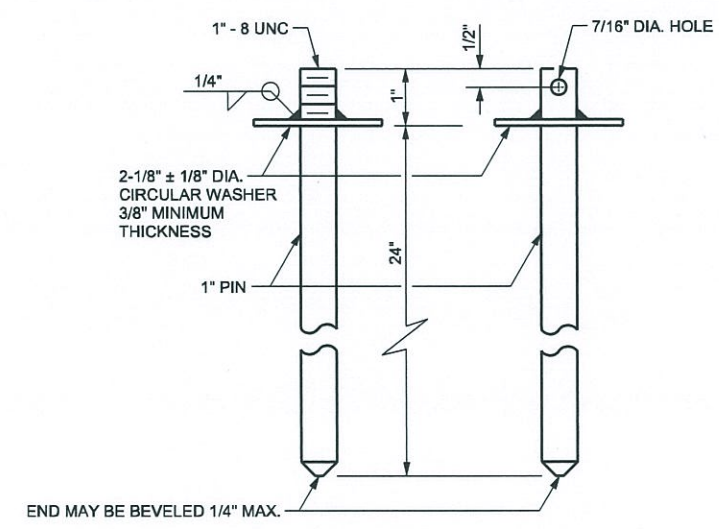
**CONCRETE BARRIER MARKER**



**CONNECTING DETAIL**



**CONNECTING LOOP BAR**  
A36, HOT-DIP GALVANIZED  
AFTER FABRICATION



**ALTERNATE CONNECTING AND ANCHOR PINS**  
ASTM 449, HOT-DIP GALVANIZED  
AFTER FABRICATION

**PRECAST CONCRETE BARRIER**

**GENERAL NOTES:**

- SEE CONTRACT PLANS FOR LAYOUT AND END TREATMENT.
- WHERE PRECAST CONCRETE BARRIER IS PLACED WITHIN 24 INCHES FROM THE EDGE OF AN EXCAVATION, ANCHOR PIN EACH SEGMENT ON THE SIDE FACING TRAFFIC, 3 PINS PER SEGMENT.
- WHEN USED FOR CHANNELIZING TRAFFIC, PRECAST CONCRETE BARRIERS SHALL BE SUPPLEMENTED WITH PRISMATIC REFLECTOR MARKERS. MARKERS SHALL BE WHITE OR YELLOW AS REQUIRED BY THE TRAFFIC CONTROL PLAN.

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**PRECAST CONCRETE BARRIER**  
**SHEET 1 OF 2**

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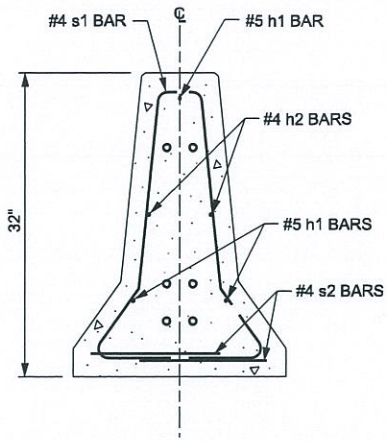
Chief Engineer, Highways  
Department of Public Works

DATE: 10-14-12

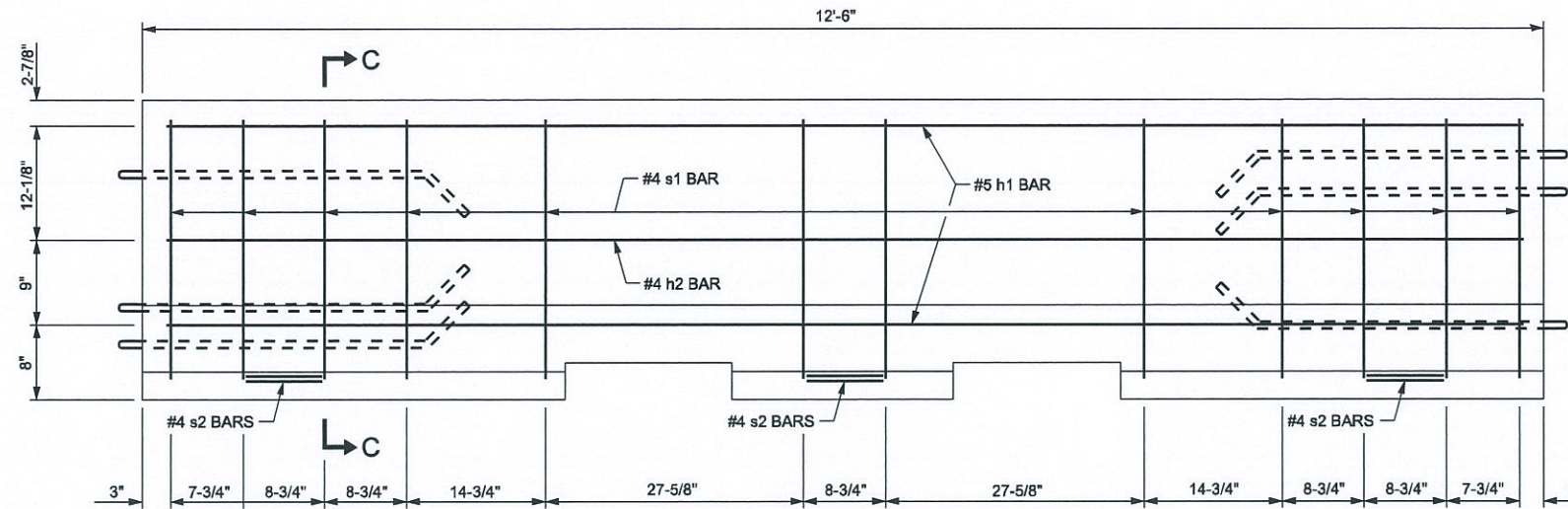
STANDARD NO.

618-01

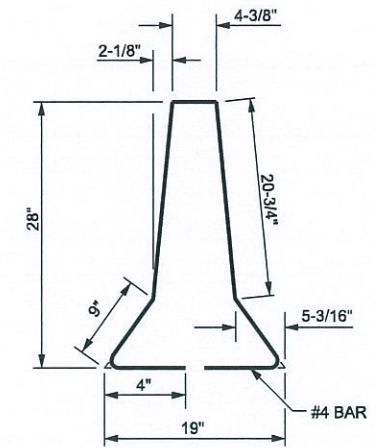




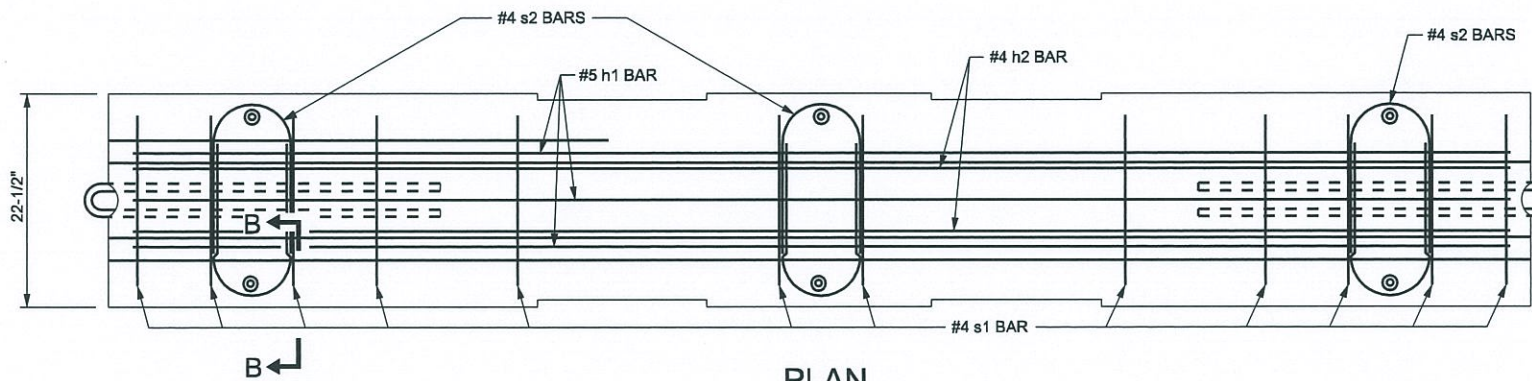
SECTION C-C



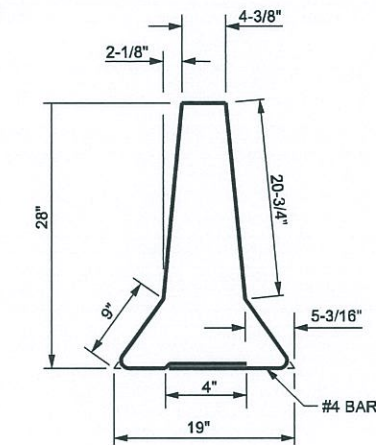
ELEVATION



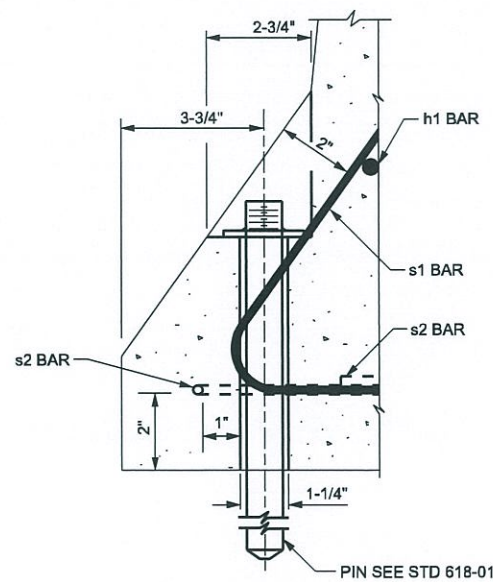
s1 BAR



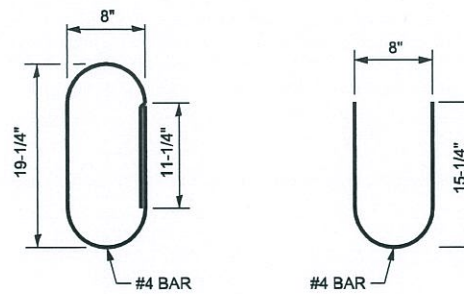
PLAN



ALTERNATE s1 BAR



SECTION B-B  
ANCHORING DETAIL



ALTERNATE s2 BARS

**GENERAL NOTES:**

1. REINFORCING STEEL SHALL BE GRADE 60. MINIMUM CLEARANCE FROM REINFORCING STEEL TO EXTERIOR CONCRETE SURFACE SHALL BE 2".
2. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH F'C = 4000PSI AT 28 DAYS.

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PRECAST CONCRETE BARRIER

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PRECAST CONCRETE BARRIER  
SHEET 2 OF 2

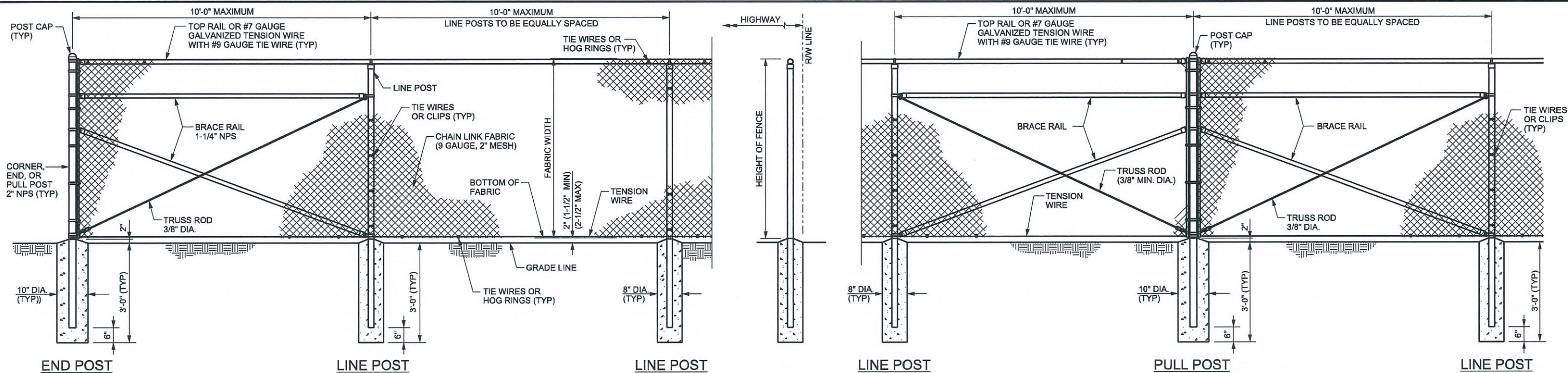
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*Ernesto Torres*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
DATE: 10-14-12

STANDARD NO.

618-02





END POST DETAILS

TYPICAL SECTION

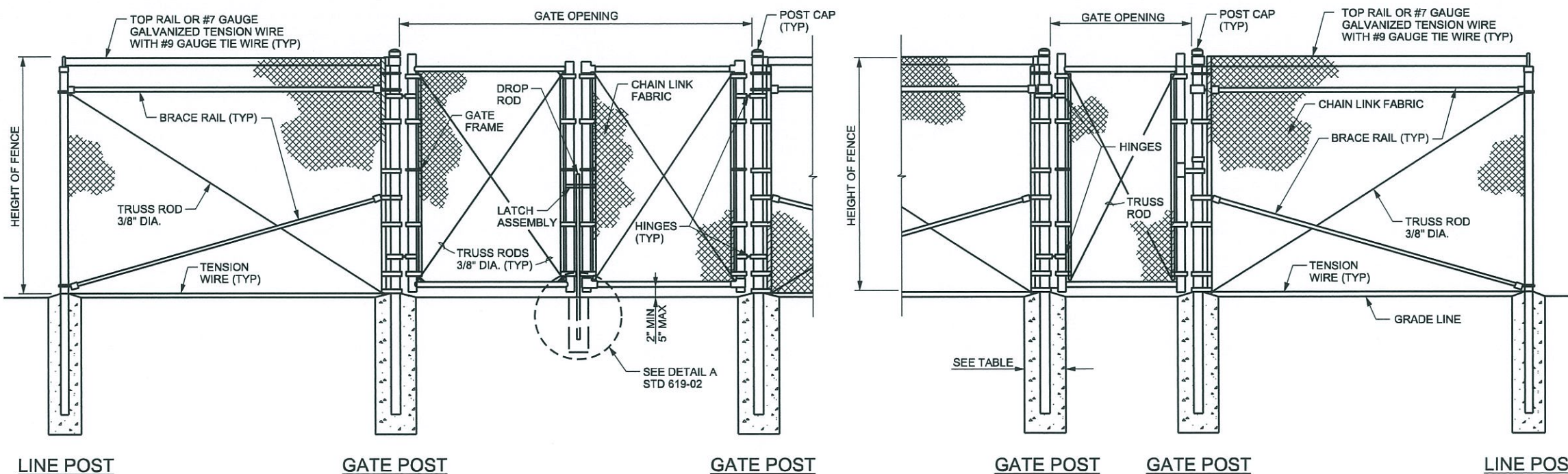
PULL POST DETAILS

CHAIN LINK FENCE DETAILS

TYPICAL MEMBER DIMENSIONS			
FENCE HEIGHT	LINE POSTS	CORNER & PULL POSTS	BRACES
UP TO 6 FT	1-1/2" NPS	2" NPS	1-1/4" NPS
OVER 6 FT	2" NPS	2-1/2" NPS	1-1/4" NPS

GENERAL NOTES:

- CHAIN LINK FABRIC, FITTINGS, AND HARDWARE SHALL CONFORM TO AASHTO M181.
- POSTS, RAILS AND GATE FRAMES SHALL CONFORM TO AASHTO M181 GRADE 1, TYPE 1.
- GATES SHALL BE CONSTRUCTED WITH DROP RODS, PADLOCKS, LATCH ASSEMBLY AND GATE KEEPERS EXCEPT AS NOTED.
- GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL-WELDED GATE FRAMES.
- GATE FORK LATCH AND LOCK, FLASH PLATE AND ANCHOR, AND PLUNGER SHALL BE INSTALLED WITH GATES, AND SHALL BE CONSIDERED AS INCIDENTAL TO CHAIN LINK FENCE GATE.
- CHAIN LINK FENCE WITH TOP RAIL SHALL NOT BE USED WITHIN THE CLEAR ZONE AS DEFINED BY THE AASHTO ROADSIDE DESIGN GUIDE.
- NPS = NOMINAL PIPE SIZE



CHAIN LINK FENCE GATE DETAILS

GATE POST		
GATE OPENING	NPS	FOOTING DIAMETER
UP TO 6'	2-1/2"	10"
OVER 6' TO 12'	4"	12"

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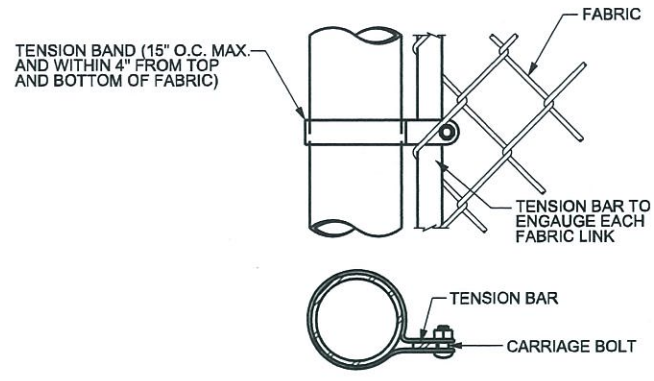
CHAIN LINK FENCE SHEET 1 OF 2

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*Emmanuel*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS  
 DATE: 10.14.12

STANDARD NO. 619-01

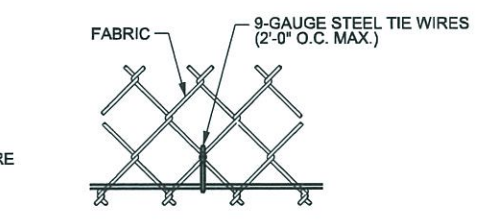
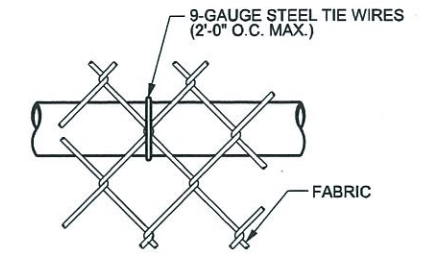




**END OR GATE POST**

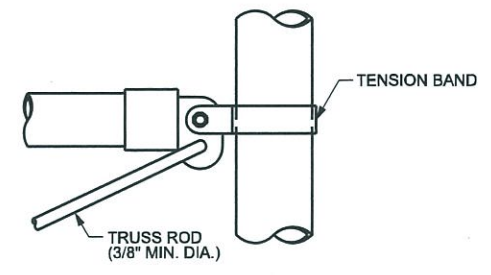


**TOP OR BRACE RAIL ATTACHMENT**

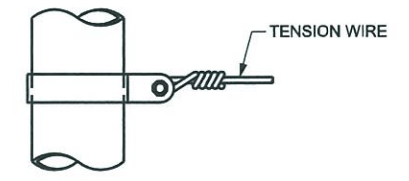


**LINE POST ATTACHMENT**

**TRUSS WIRE ATTACHMENT**



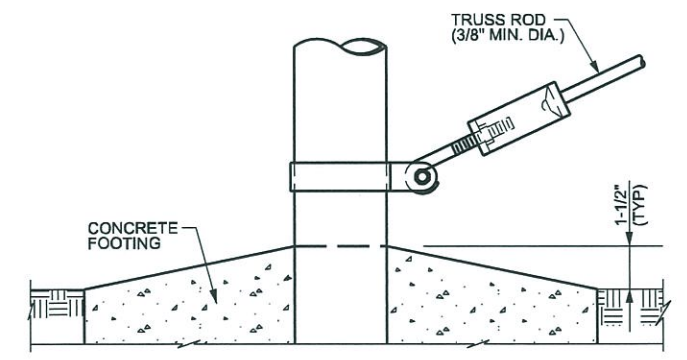
**BRACE RAIL CLAMP**



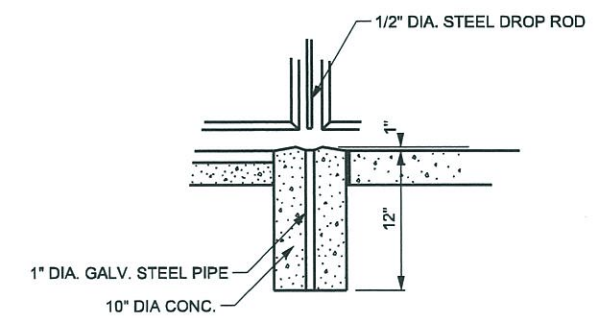
**TENSION BAND**

**FASTENING DETAILS**  
NOT TO SCALE

**ATTACHMENT DETAILS**  
NOT TO SCALE



**TRUSS ROD AND BAND DETAIL**  
NOT TO SCALE



**DETAIL A**  
NOT TO SCALE

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**CHAIN LINK FENCE**  
**SHEET 2 OF 2**

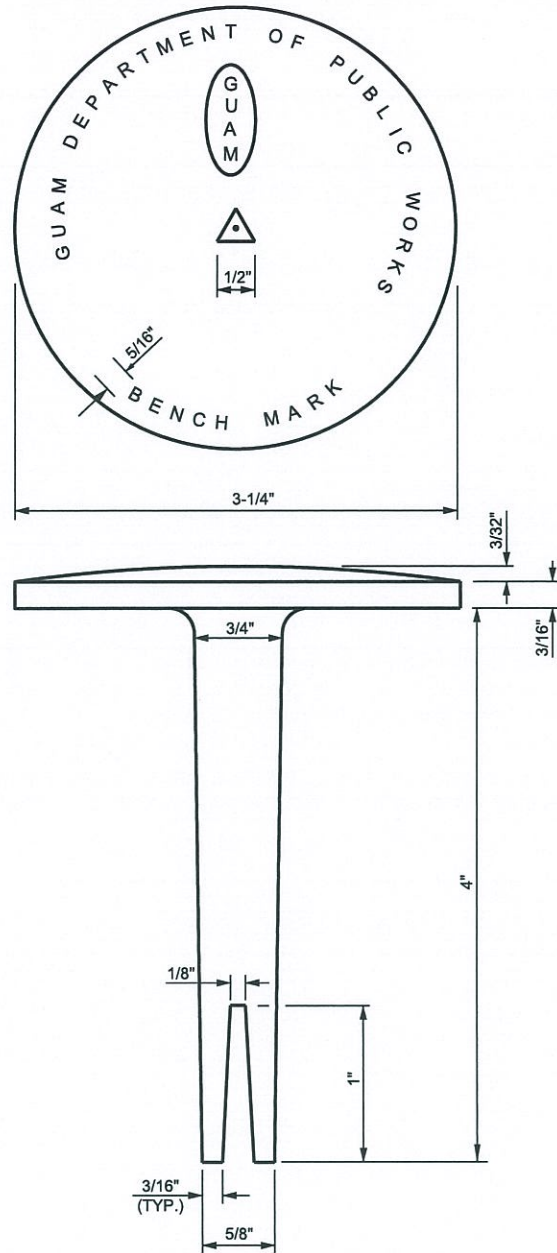
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Signature: *[Handwritten Signature]* DATE: 10-14-12

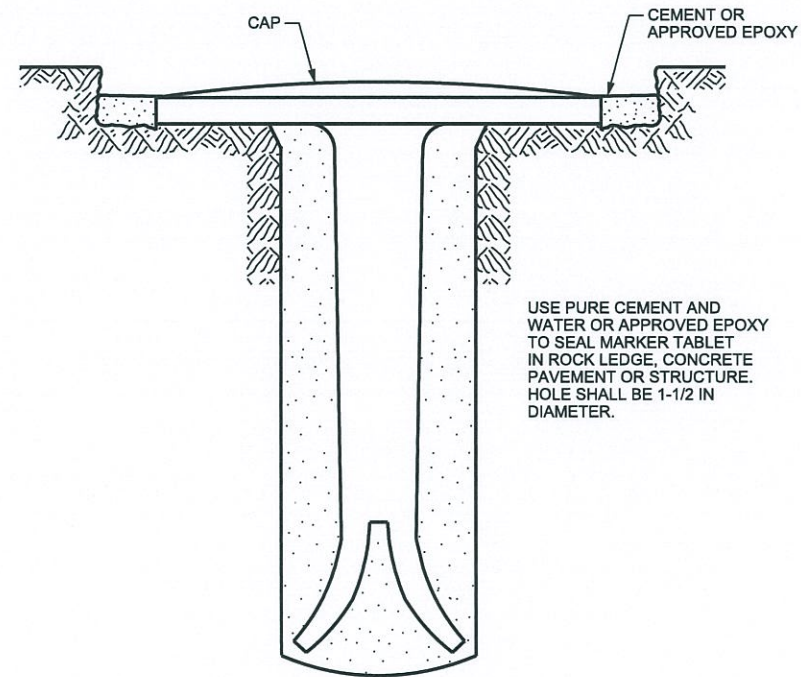
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS *Actry*

STANDARD NO.	619-02
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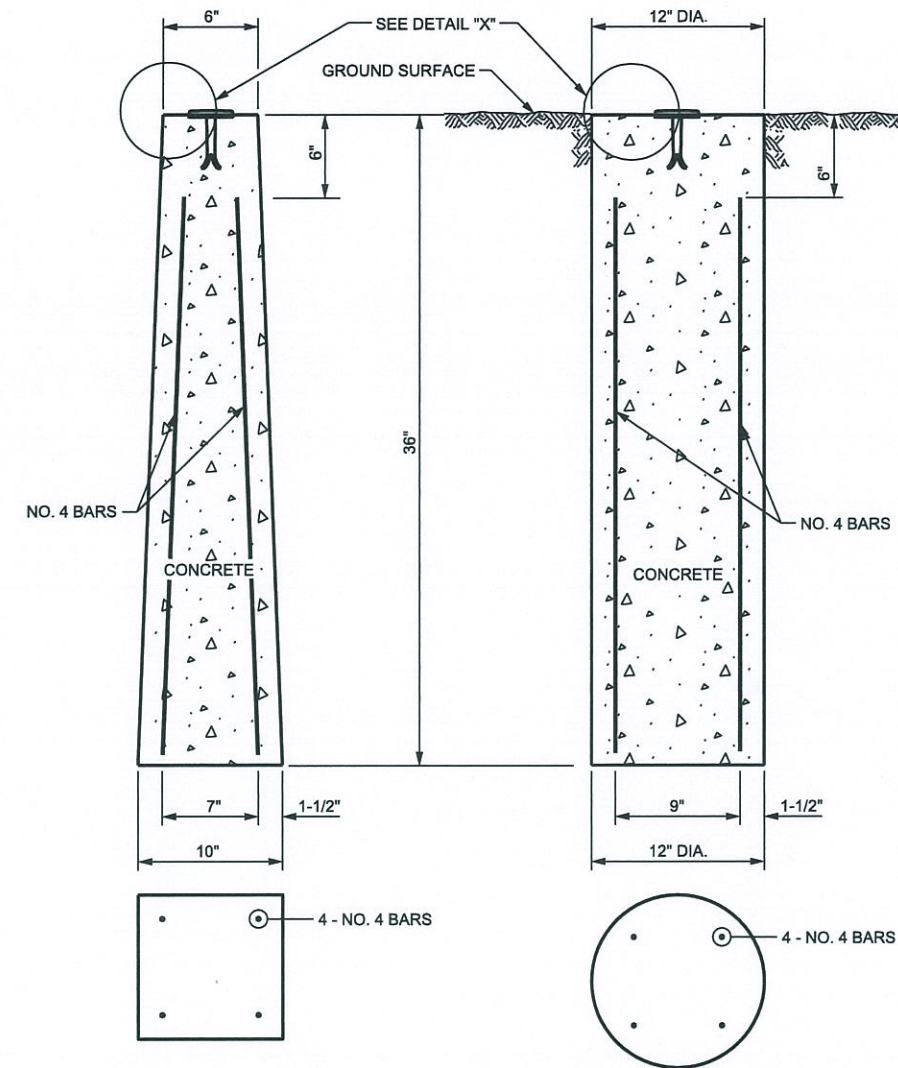




**ALUMINUM TABLET**

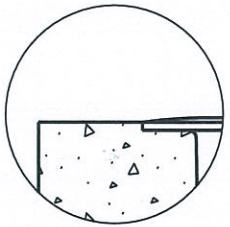


**TABLET CONSTRUCTED IN ROCK LEDGE OR CONCRETE.**



**PRECAST MARKER**

**CAST-IN-PLACE MARKER**



**DETAIL "X"**

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**BENCHMARKS**

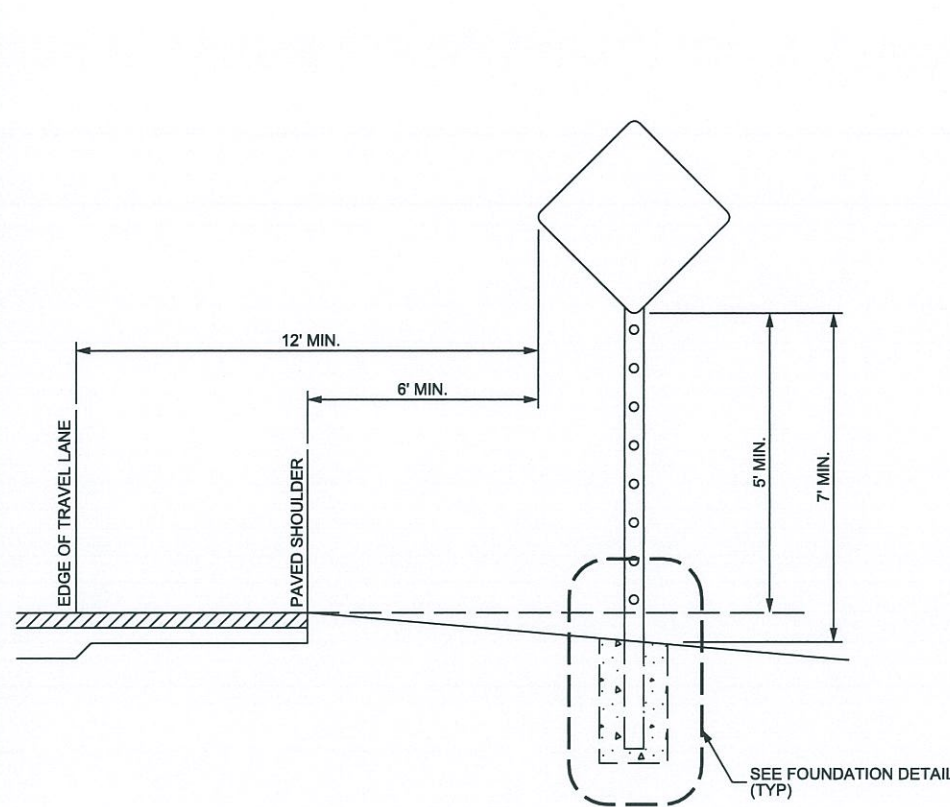
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*Engr. [Signature]*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS *Acting*

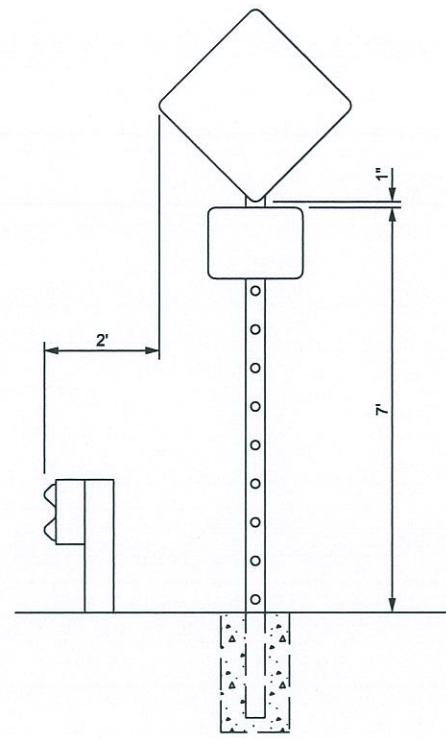
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STANDARD NO. 621-01

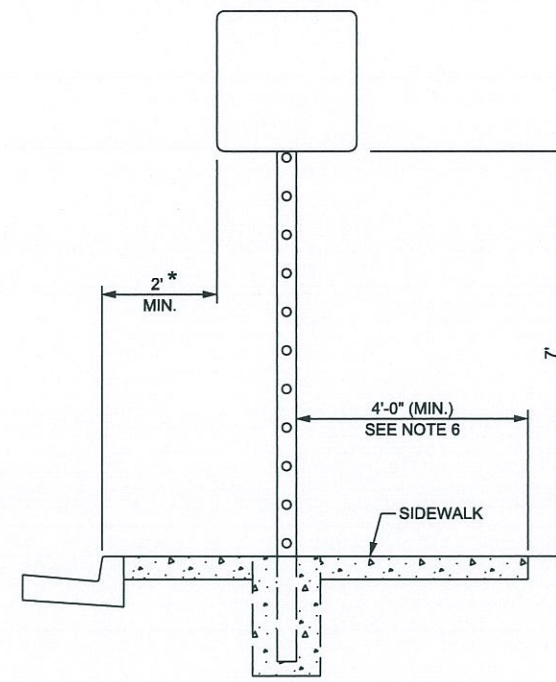




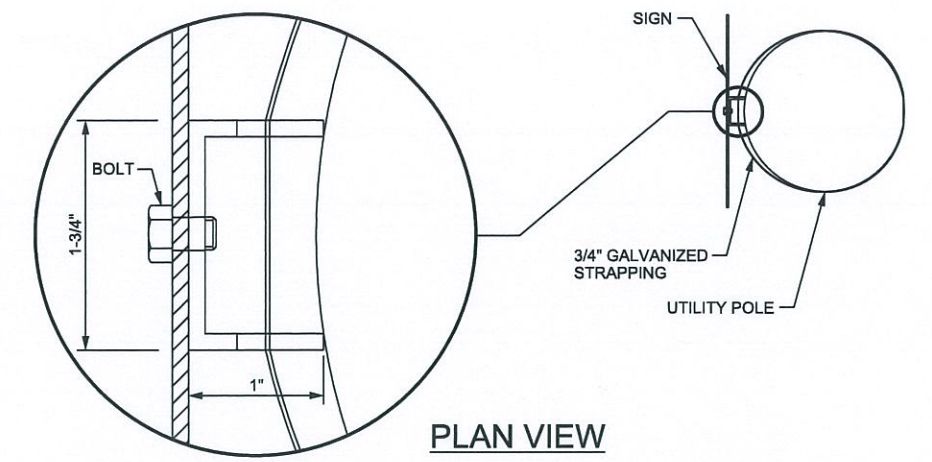
**TRAVEL LANE & SHOULDER**



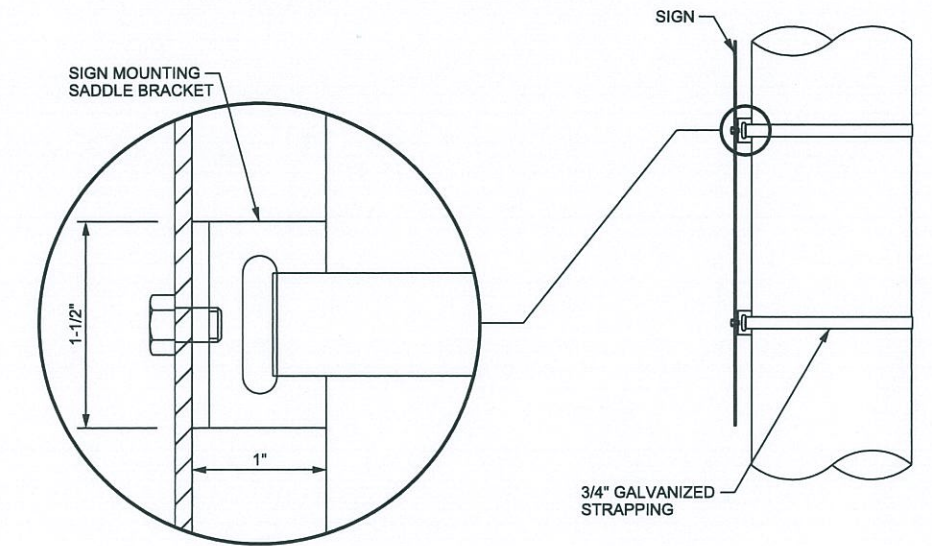
**GUARD RAIL**



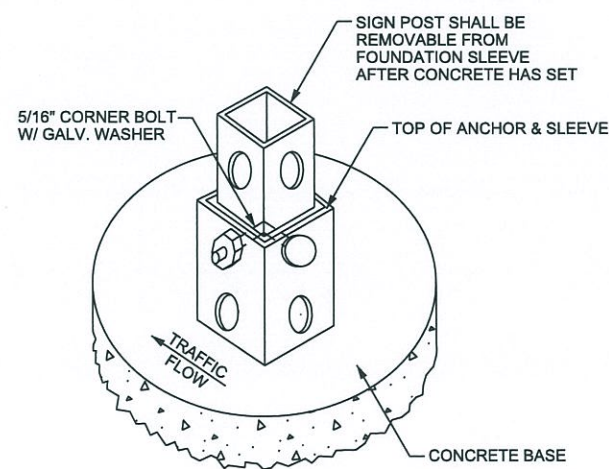
**CURB & GUTTER**



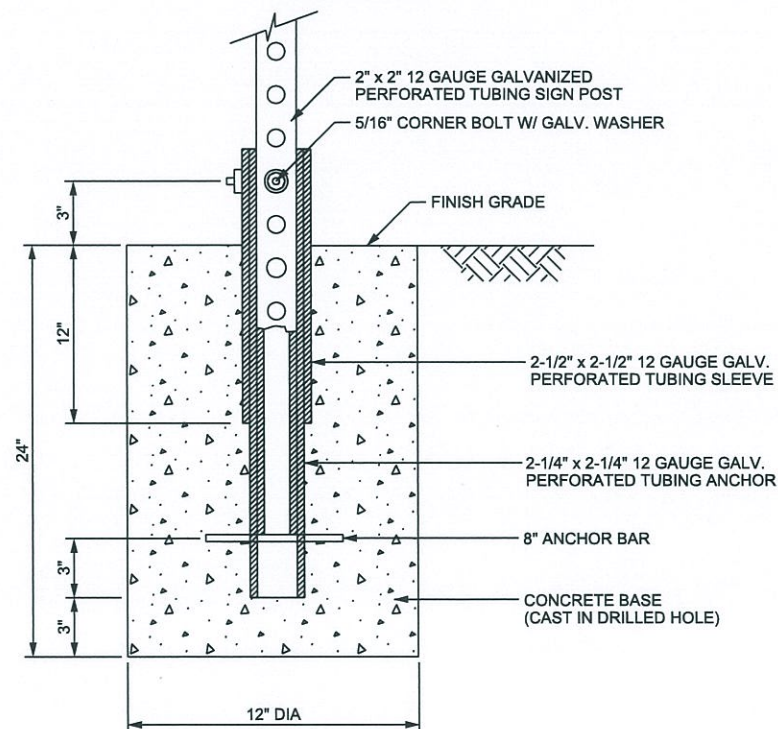
**PLAN VIEW**



**MOUNTING DETAIL FOR ADDING SIGNS TO EXISTING UTILITY POLES**



**ISOMETRIC**



**SECTION**

**FOUNDATION DETAIL**

**GENERAL NOTES:**

1. SIGNS SHALL BE INSTALLED IN CONFORMANCE WITH THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD).
2. SIGN DIMENSIONS, LETTERS AND SYMBOLS SHALL CONFORM TO THE LATEST EDITION OF THE FHWA "STANDARD HIGHWAY SIGNS".
3. SIGNS SHALL BE ATTACHED TO POST WITH 3/8" GALVANIZED BOLTS WITH NUTS AND 7/8" X 0.08" STAINLESS STEEL WASHERS WITH NEOPRENE RUBBER GASKETS ON EACH SIDE.
4. SIGNS 48" AND WIDER OR LARGER THAN 10 SQ. FT IN AREA SHALL BE MOUNTED ON TWO POSTS.
5. ALL MISCELLANEOUS HARDWARE SHALL BE GALVANIZED.
6. IN SIDEWALK AREAS PROVIDE A 4'-0" MINIMUM CLEAR PATH, EXCLUSIVE OF THE WIDTH OF THE CURB. THE CLEAR PATH MAY BE ON EITHER SIDE OF THE SIGN POST.

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**ROADSIDE SIGN INSTALLATION**

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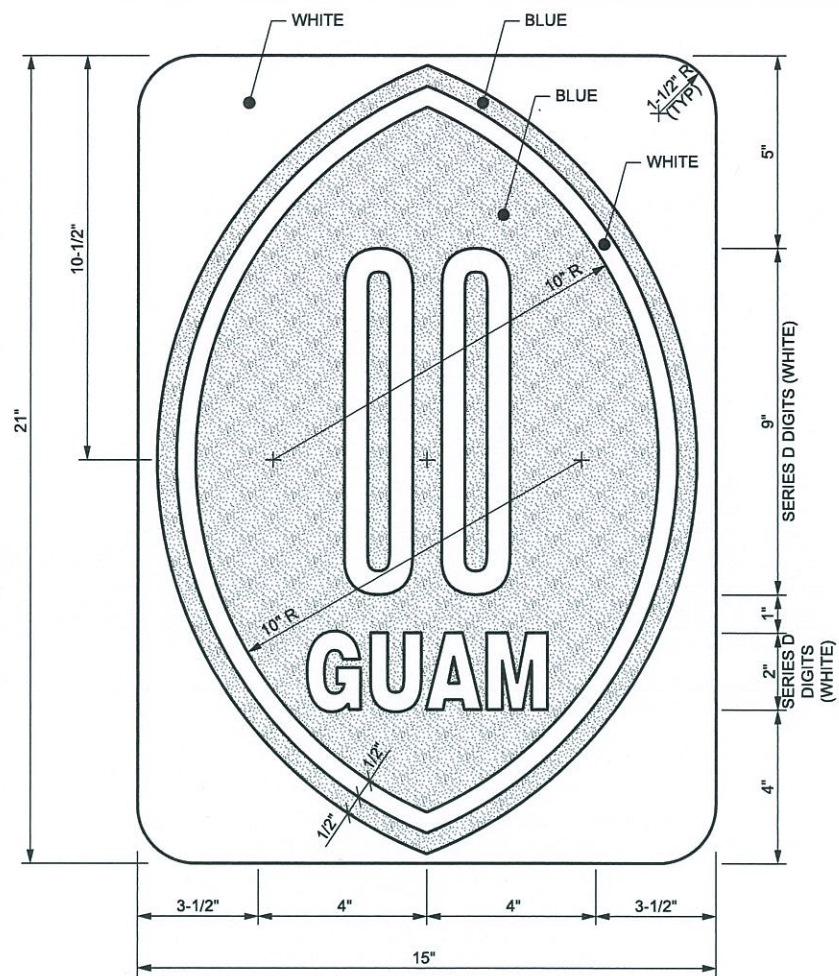
*Ernesto*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS *Acting*

DATE: 10.14.12

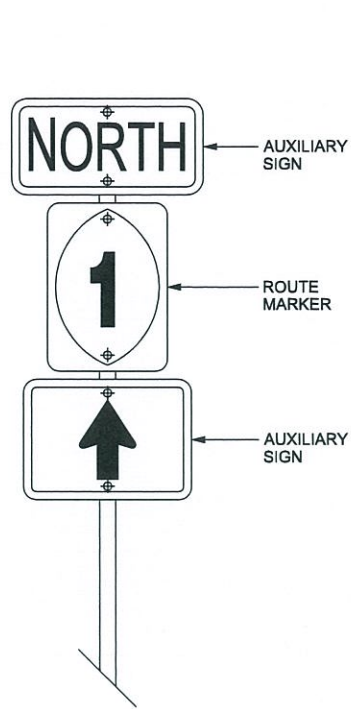
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633-01

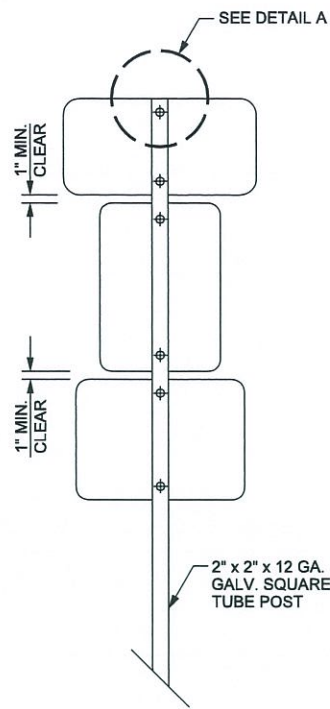




**GUAM ROUTE MARKER**

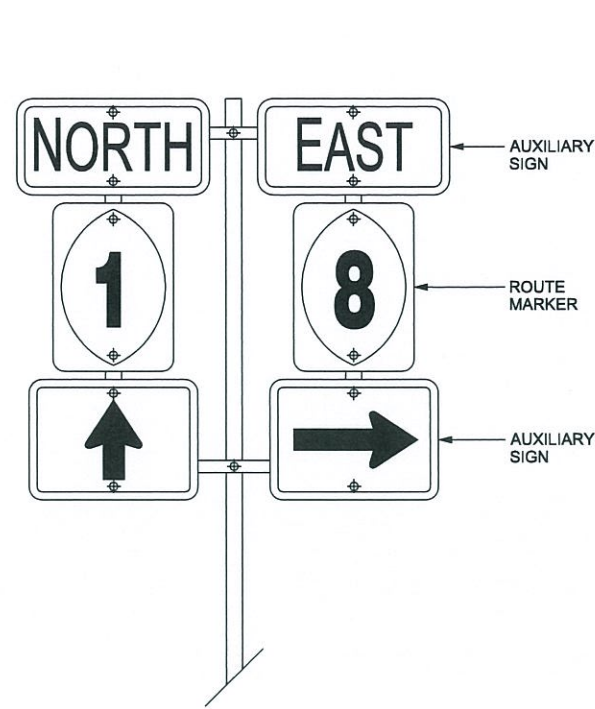


**FRONT VIEW**

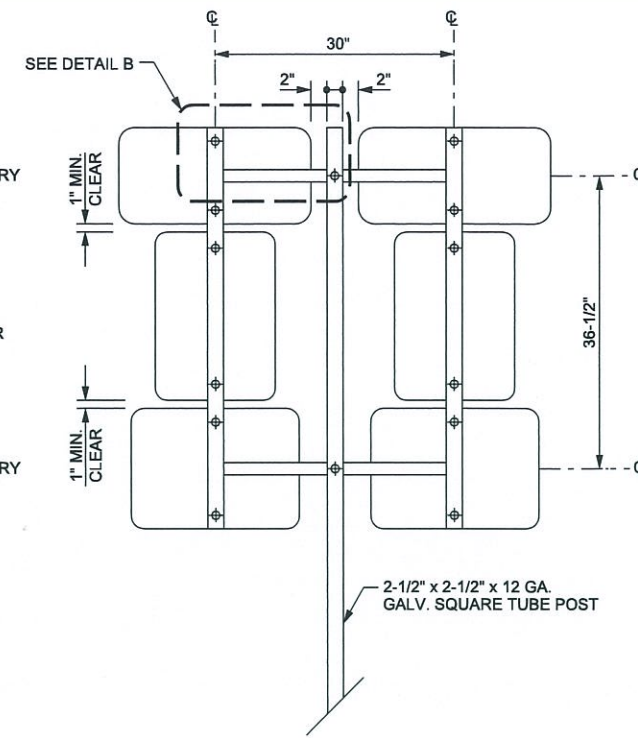


**BACK VIEW**

**TYPE A ASSEMBLY**



**FRONT VIEW**

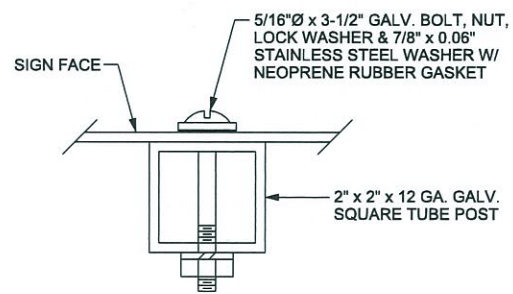


**BACK VIEW**

**TYPE B ASSEMBLY**

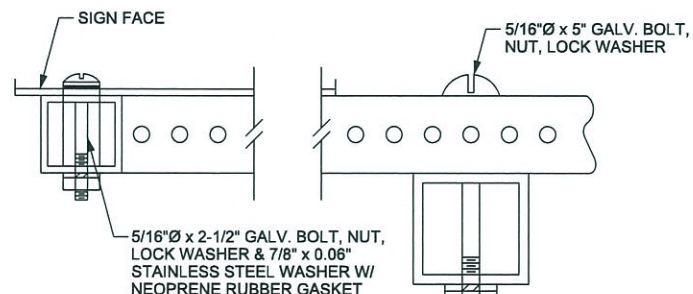
**GENERAL NOTES:**

1. SIGNS SHALL BE INSTALLED IN CONFORMANCE WITH THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD).
2. SIGN DIMENSIONS, LETTERS AND SYMBOLS SHALL CONFORM TO THE LATEST EDITION OF THE FHWA "STANDARD HIGHWAY SIGNS".
3. SIGNS SHALL BE ATTACHED TO POST WITH 3/8" GALVANIZED BOLTS WITH NUTS AND 7/8" X 0.06" STAINLESS STEEL WASHERS WITH NEOPRENE RUBBER GASKETS ON EACH SIDE.
4. ALL MISCELLANEOUS HARDWARE SHALL BE GALVANIZED.
5. IN SIDEWALK AREAS PROVIDE A 4'-0" MINIMUM CLEAR PATH, EXCLUSIVE OF THE WIDTH OF THE CURB. THE CLEAR PATH MAY BE ON EITHER SIDE OF THE SIGN POST.

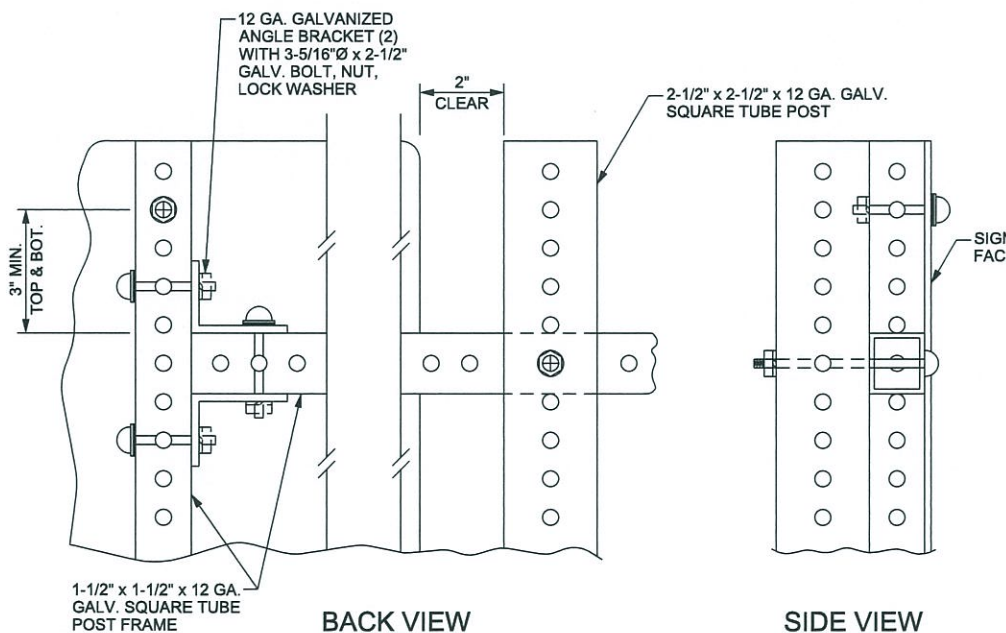


**TOP VIEW**

**DETAIL A**



**TOP VIEW**



**DETAIL B**

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**ROUTE MARKER ASSEMBLIES**

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*Emmanuel Torres*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10.14.12

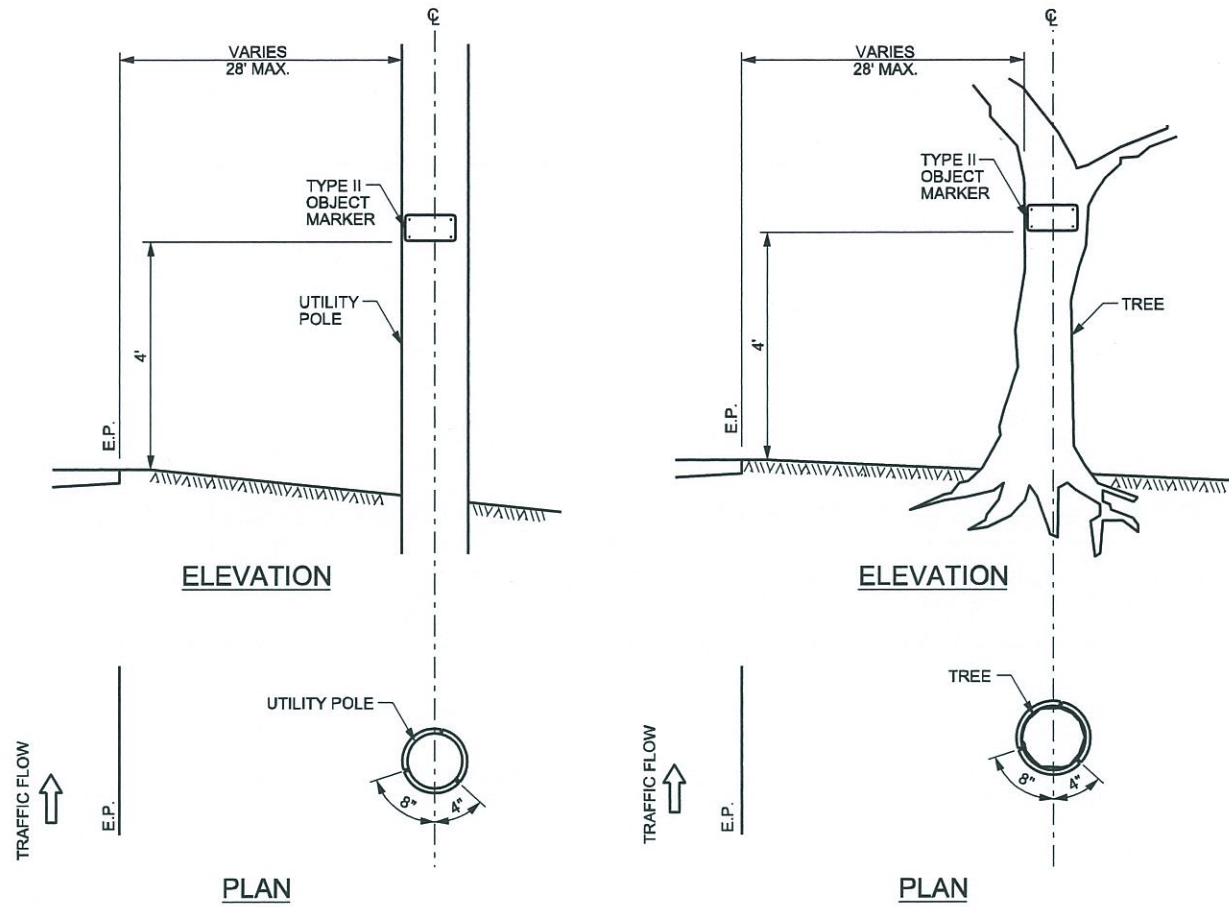
STANDARD NO.

633-02

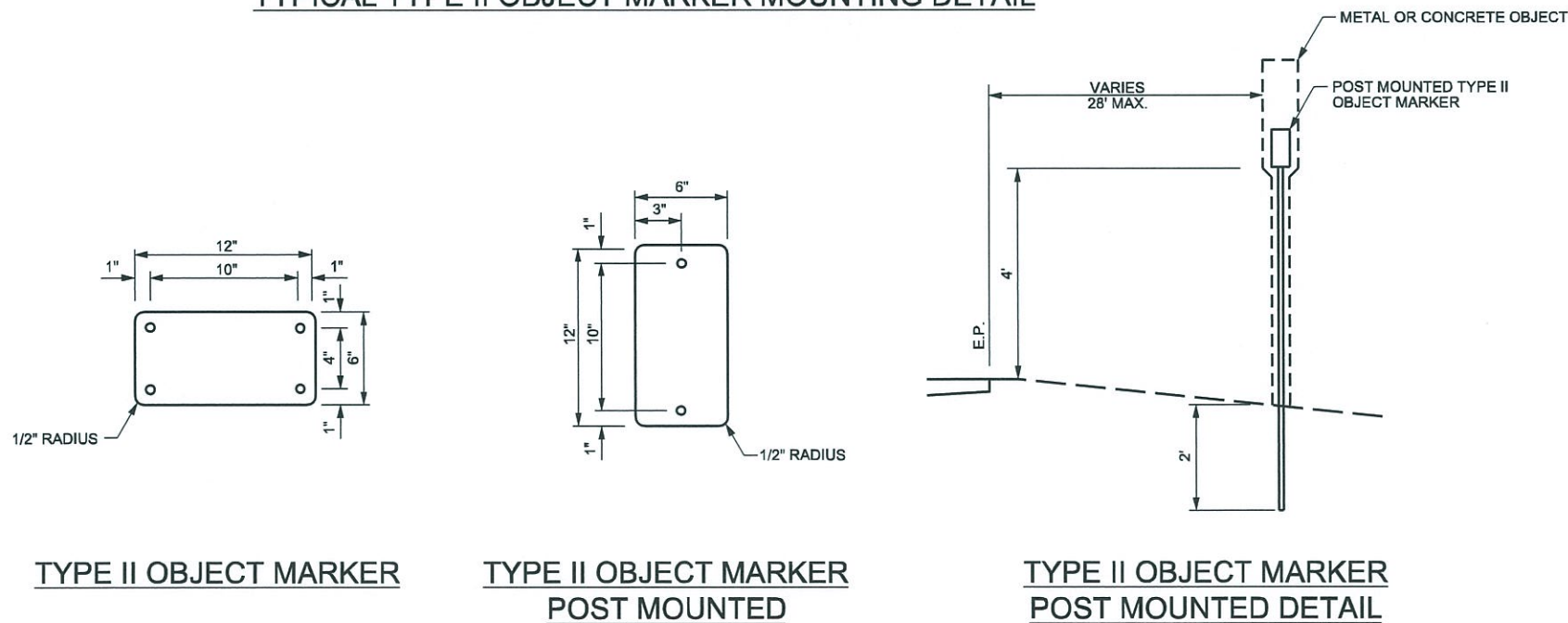


**GENERAL NOTES:**

1. TYPE II OBJECT MARKERS FOR UTILITY POLES AND TREES, ETC., SHALL BE MADE OF AMBER REFLECTIVE SHEETING MATERIAL OVERLAYED ON 0.020" ALUMINUM SHEETING.
2. POST MOUNTED TYPE II OBJECT MARKERS SHALL BE MADE OF AMBER REFLECTIVE SHEETING MATERIAL OVERLAYED ON 0.063" THICK SHEET ALUMINUM BACKING.
3. POST MOUNTED TYPE II OBJECT MARKERS SHALL BE MOUNTED ON EITHER METAL POSTS OR FLEXIBLE DELINEATOR POSTS WITH 1/4" x 2" GALVANIZED BOLTS, NUTS AND WASHERS. METAL POSTS SHALL BE GALVANIZED AND SHALL BE EITHER 1-1/2" x 1-1/2", 12 GAUGE SQUARE TUBE POSTS OR 1.12 LB PER FOOT FLANGED CHANNEL POSTS.



**TYPICAL TYPE II OBJECT MARKER MOUNTING DETAIL**



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**OBJECT MARKERS**

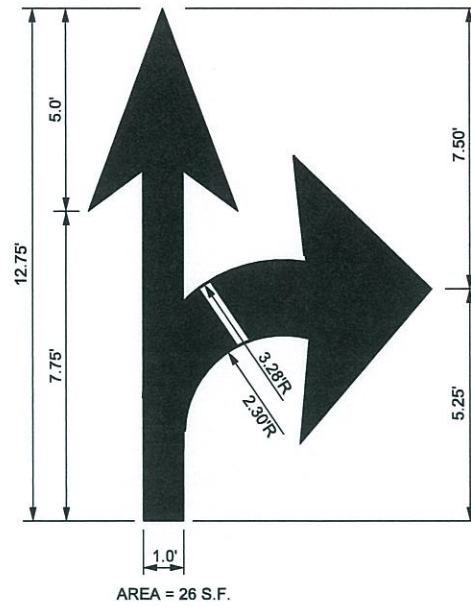
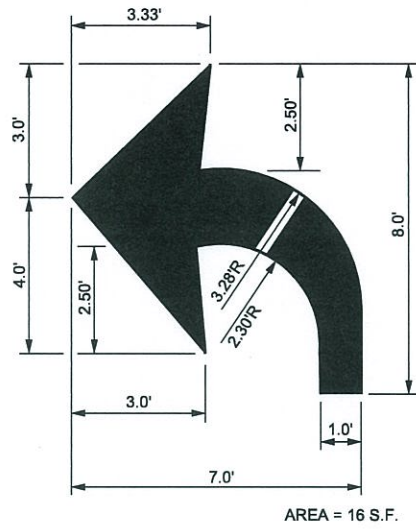
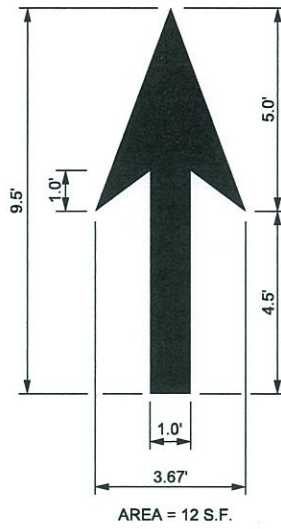
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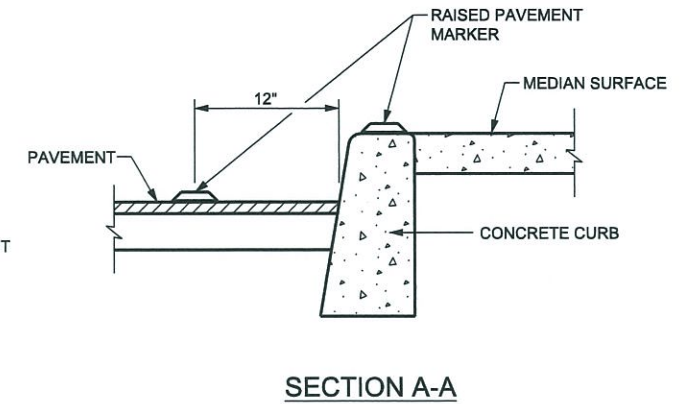
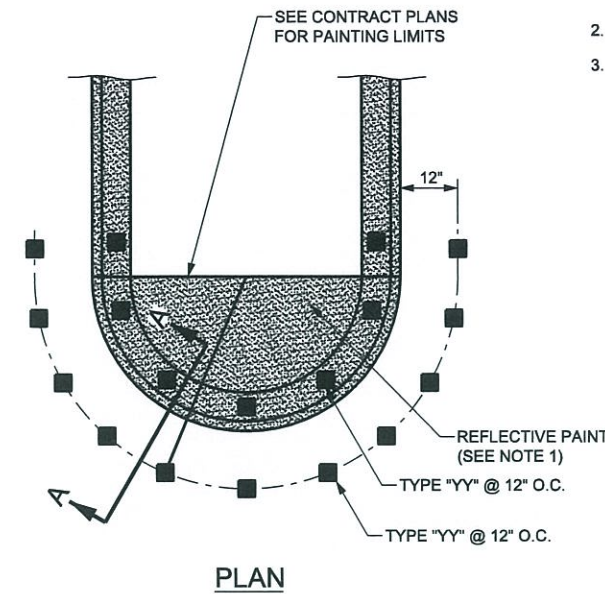
STANDARD NO.

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**DIRECTIONAL ARROWS**



**MEDIAN NOSE MARKINGS**

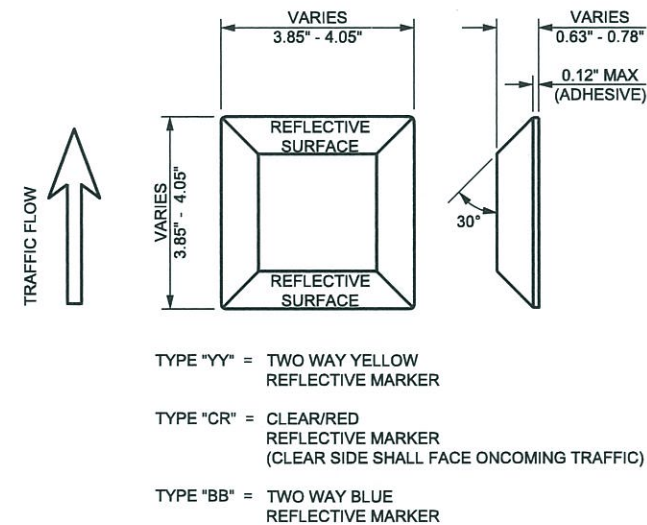
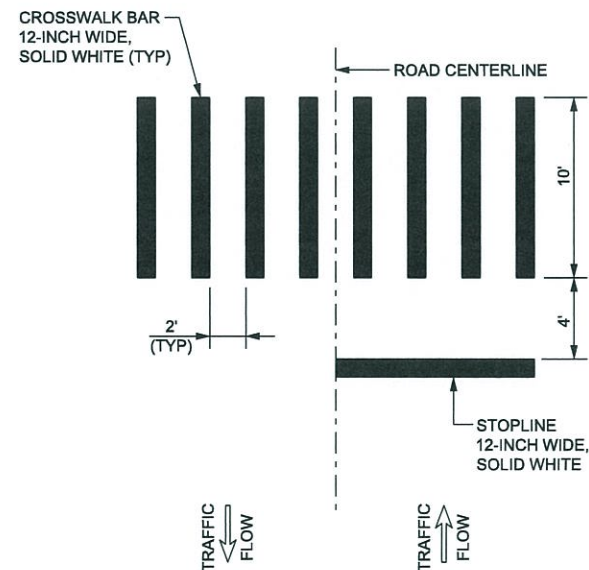
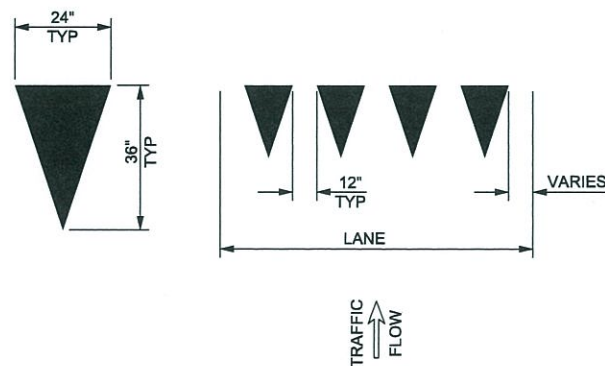
**NOTES**

1. ENTIRE MEDIAN NOSE AND ALL MEDIAN CURBS SHALL BE PAINTED WITH YELLOW REFLECTIVE PAINT.
2. SEE RAISED PAVEMENT MARKERS DETAIL.
3. RAISED PAVEMENT MARKERS SHALL BE ALIGNED TO FACE ONCOMING TRAFFIC.

**GENERAL NOTE:**

1. ALL PERMANENT PAVEMENT MARKINGS SHALL BE THERMOPLASTIC MATERIAL (TYPE H).

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- TYPE "YY" = TWO WAY YELLOW REFLECTIVE MARKER
- TYPE "CR" = CLEAR/RED REFLECTIVE MARKER (CLEAR SIDE SHALL FACE ONCOMING TRAFFIC)
- TYPE "BB" = TWO WAY BLUE REFLECTIVE MARKER

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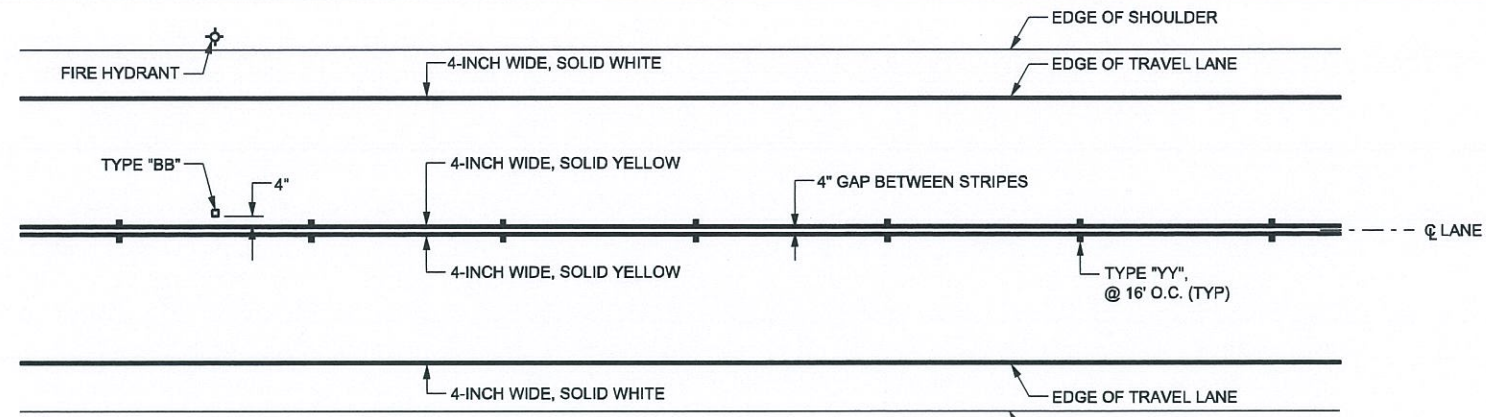


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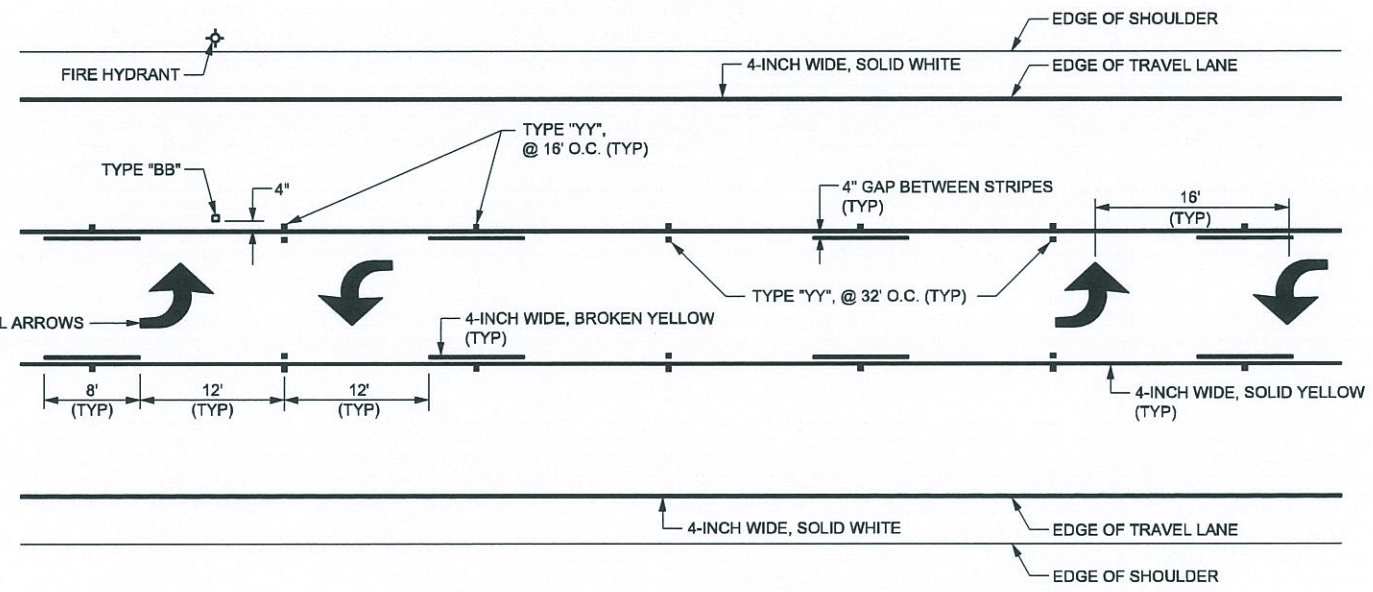
**PAVEMENT MARKERS, MARKINGS AND DIRECTIONAL ARROWS**

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 CHIEF ENGINEER, HIGHWAYS DEPARTMENT OF PUBLIC WORKS	DATE: 10.14.12
STANDARD NO.	634-01





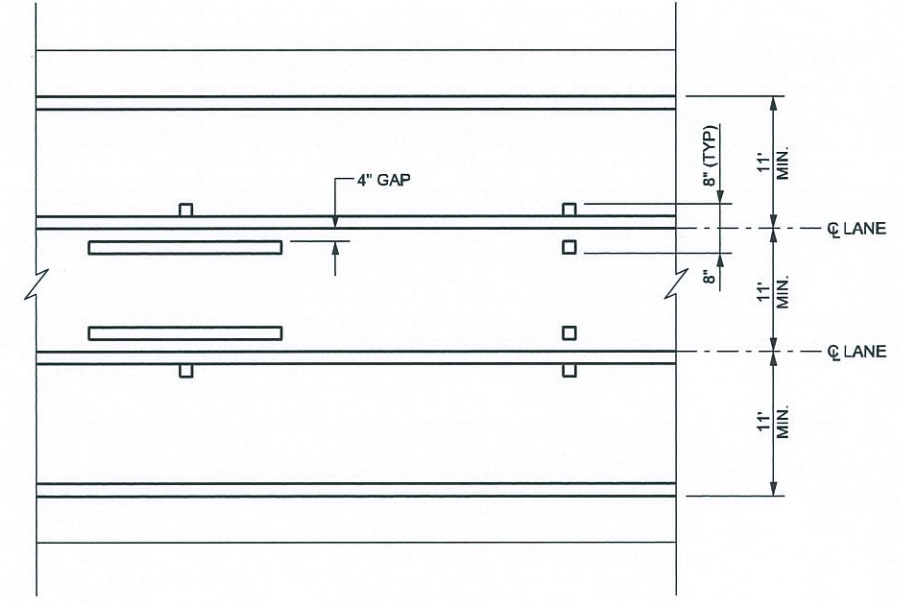
**2-LANE NO PASSING ZONE**  
NOT TO SCALE



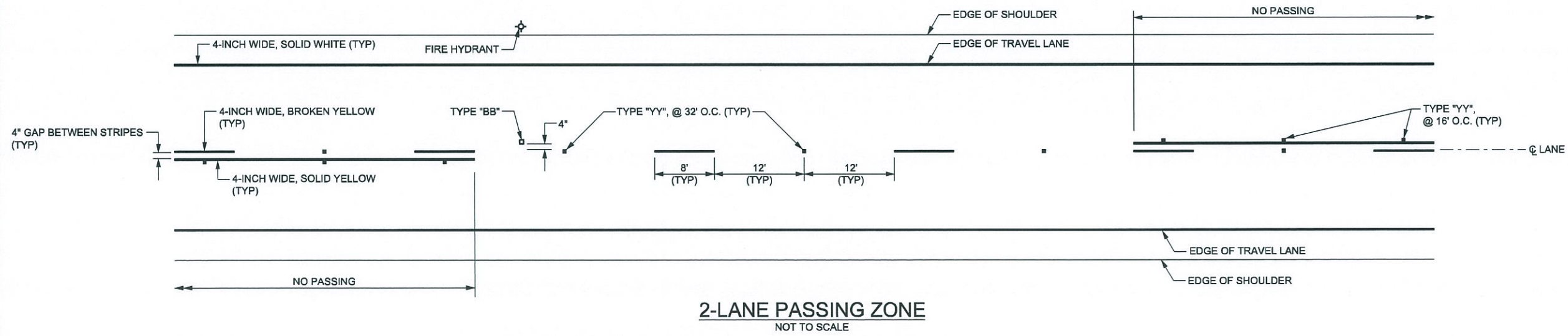
**2-LANE WITH CENTER TURNING LANE**  
NOT TO SCALE

**GENERAL NOTES:**

1. STRIPES SHALL BE THERMOPLASTIC MATERIAL (TYPE H).
2. FOR LANE WIDTH AND MEDIAN WIDTH, REFER TO CONTRACT PLANS.
3. FOR DETAILS OF RAISED PAVEMENT MARKERS, SEE STD 634-01.



**DETAIL**



**2-LANE PASSING ZONE**  
NOT TO SCALE

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**2 - LANE PAVEMENT MARKING**

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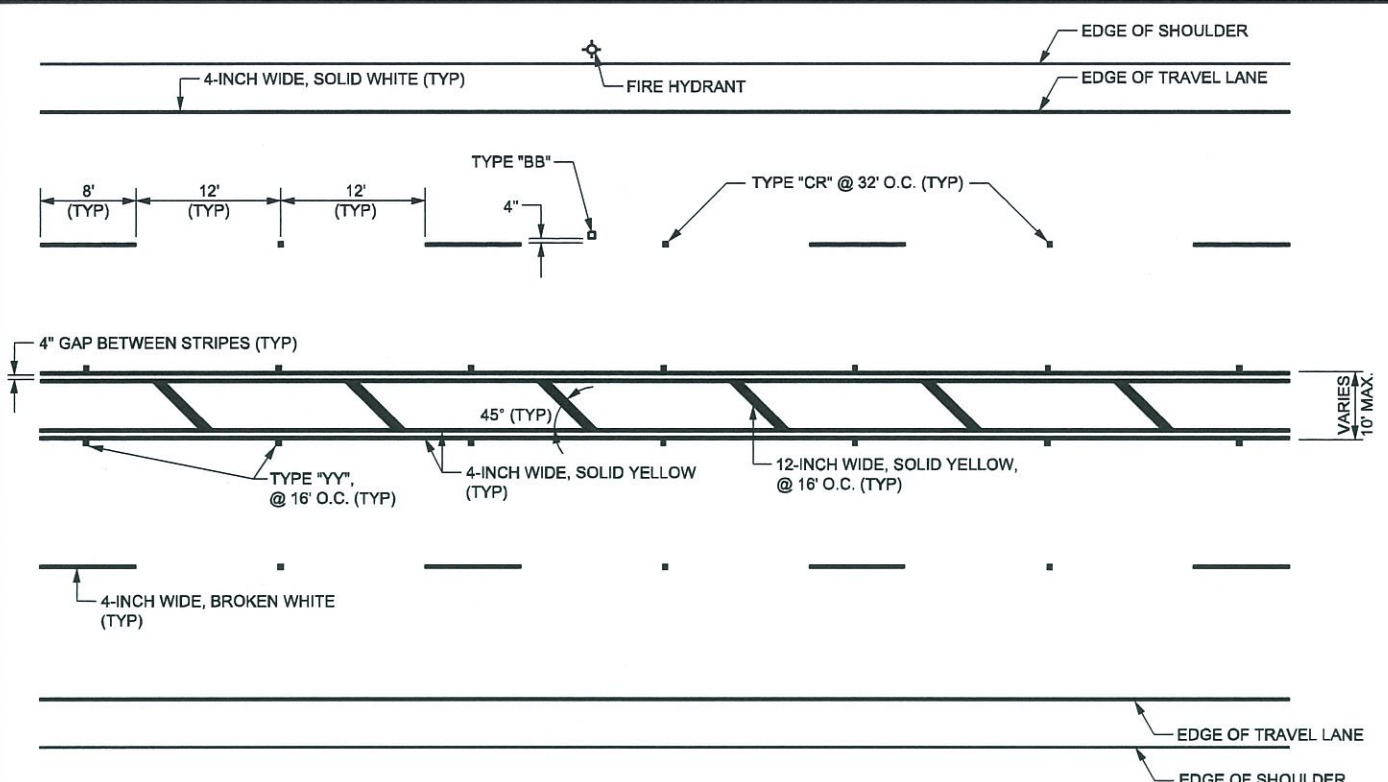
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS

DATE: 10/14/12

STANDARD NO.

634-02

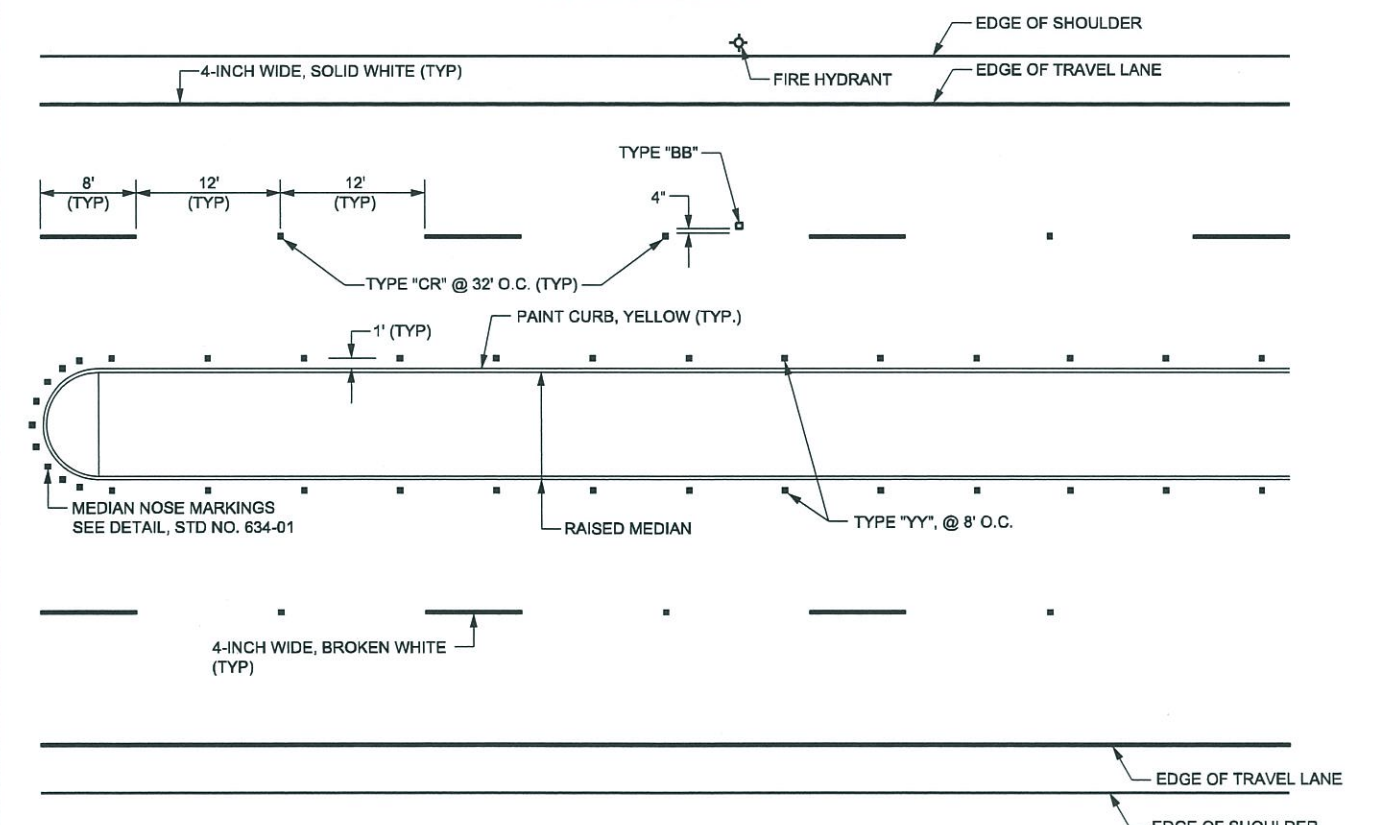




**MULTI-LANE WITH STRIPED MEDIAN**

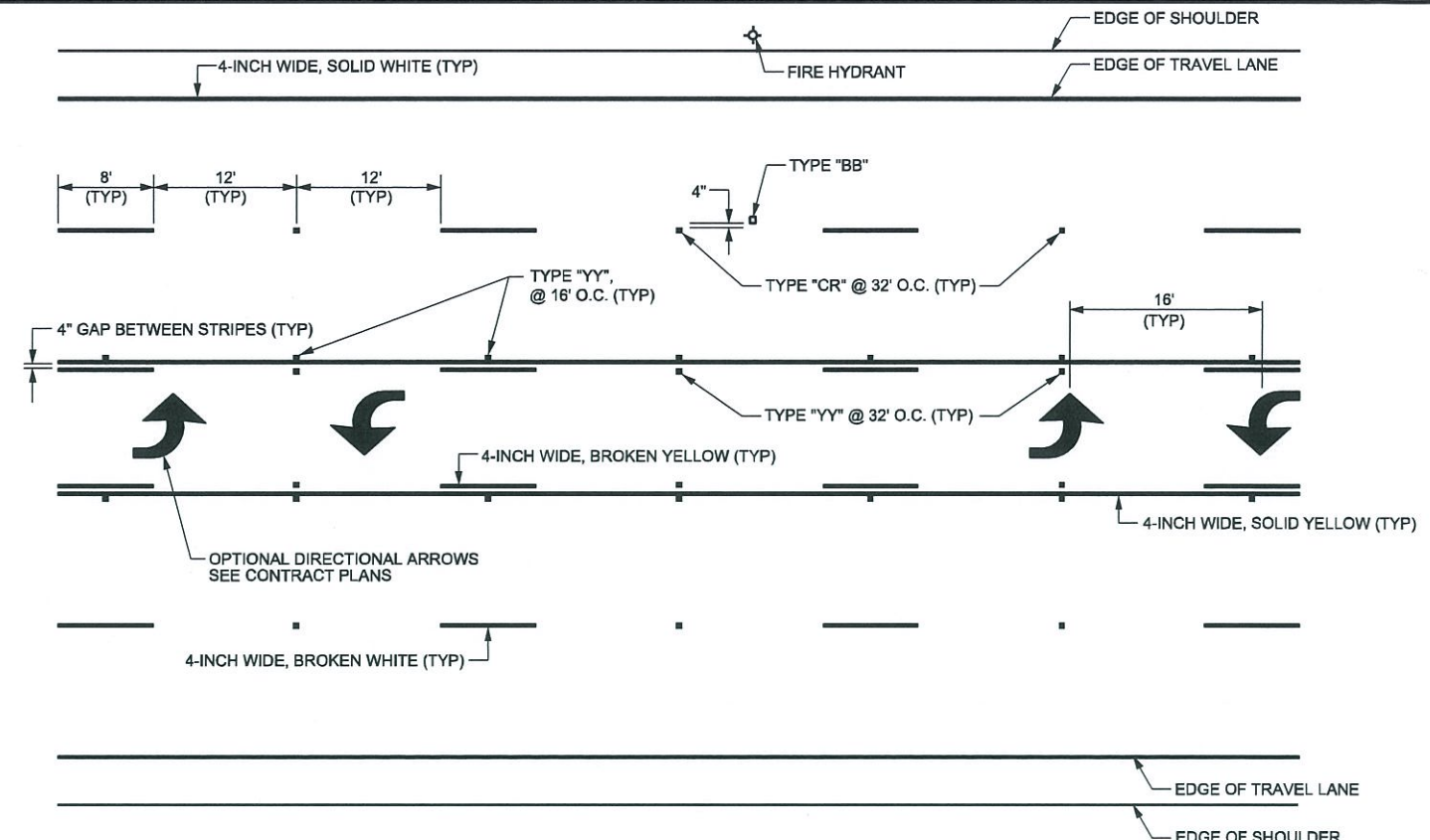
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\* MEDIAN CONDITION ALSO APPLIES TO 2 LANE CONFIGURATION



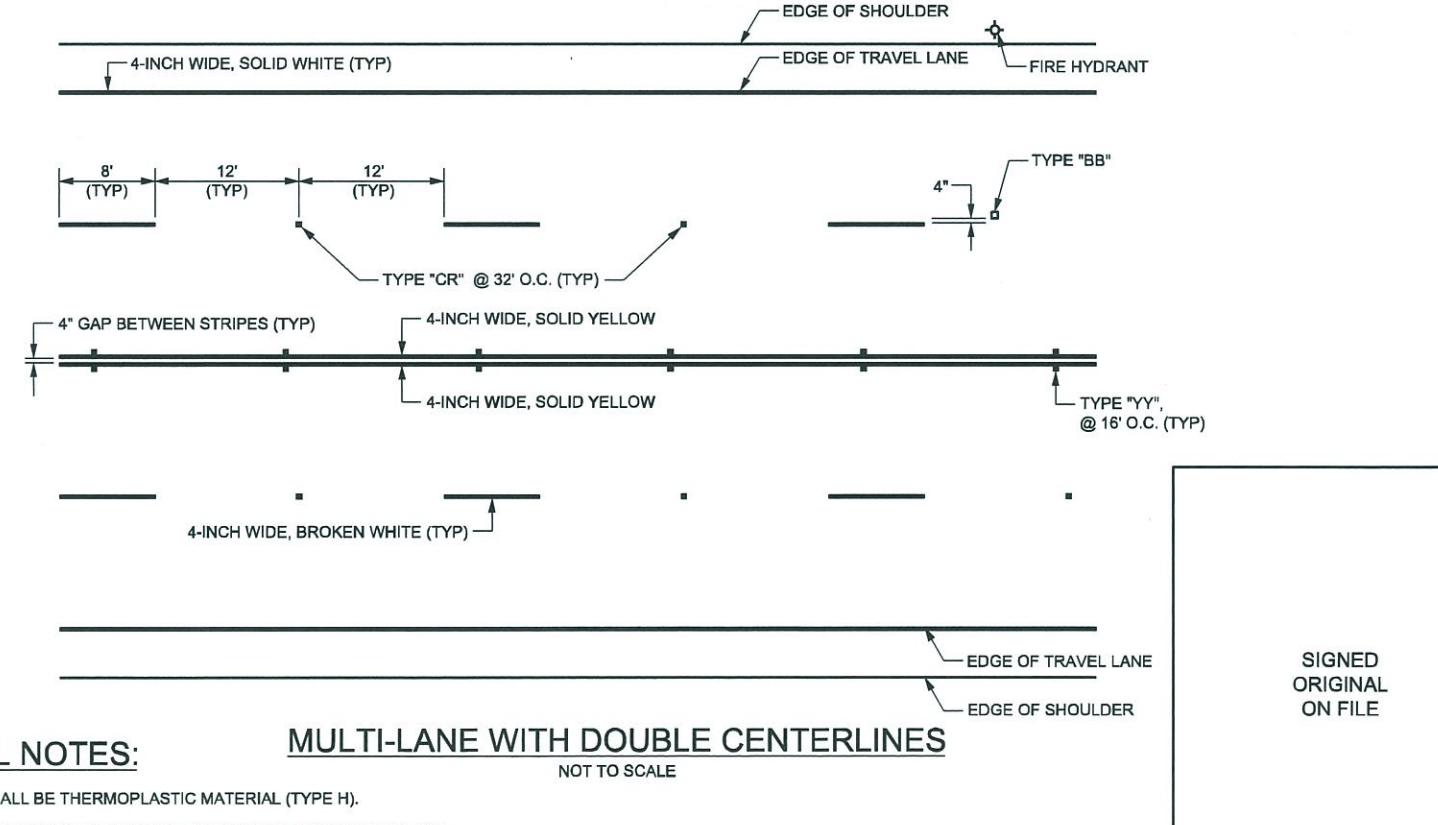
**MULTI-LANE WITH RAISED MEDIAN**

NOT TO SCALE



**MULTI-LANE WITH CENTER TURNING LANE**

NOT TO SCALE



**MULTI-LANE WITH DOUBLE CENTERLINES**

NOT TO SCALE

**GENERAL NOTES:**

1. STRIPES SHALL BE THERMOPLASTIC MATERIAL (TYPE H).
2. FOR LANE WIDTH AND MEDIAN WIDTH, REFER TO CONTRACT PLANS.
3. FOR DETAILS OF RAISED PAVEMENT MARKERS, SEE STD 634-01.

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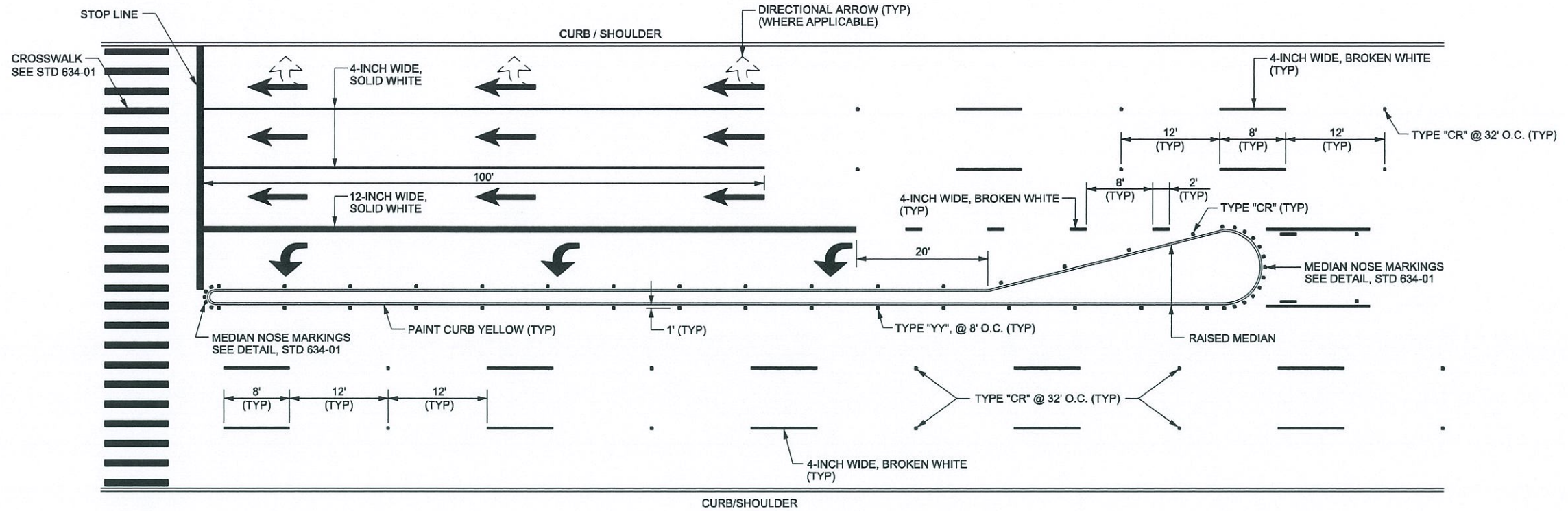
**MULTI - LANE PAVEMENT MARKING**

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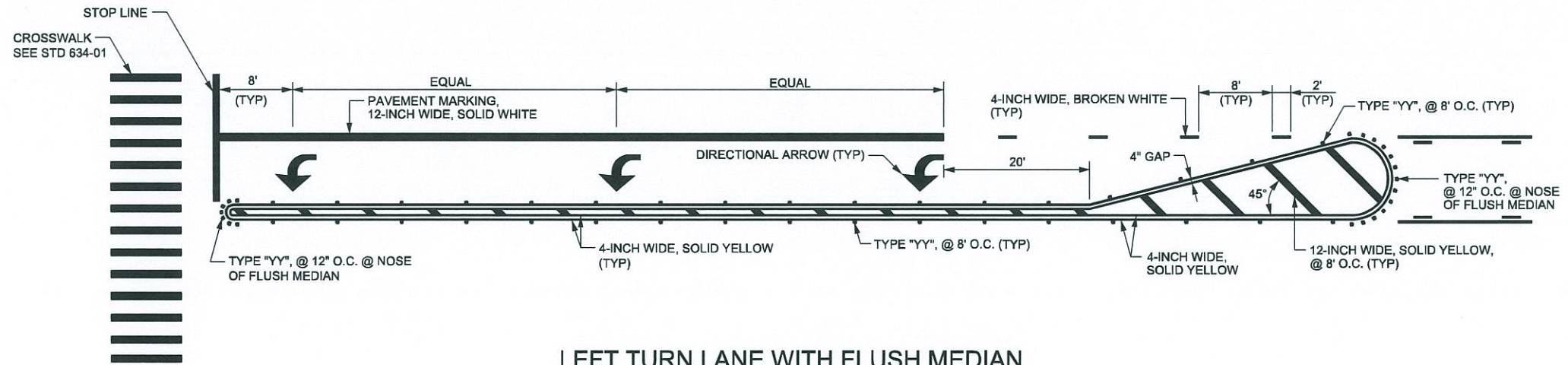
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STANDARD NO. 634-03





**MULTI-LANE INTERSECTION WITH RAISED MEDIAN**



**LEFT TURN LANE WITH FLUSH MEDIAN**



**LANE LINE EXTENSIONS THROUGH INTERSECTIONS**

**GENERAL NOTES:**

1. STRIPES SHALL BE THERMOPLASTIC MATERIAL (TYPE H).
2. FOR LANE WIDTH AND MEDIAN WIDTH, REFER TO CONTRACT PLANS.
3. FOR DETAILS OF RAISED PAVEMENT MARKERS, SEE STD 634-01.

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**INTERSECTION PAVEMENT MARKING**

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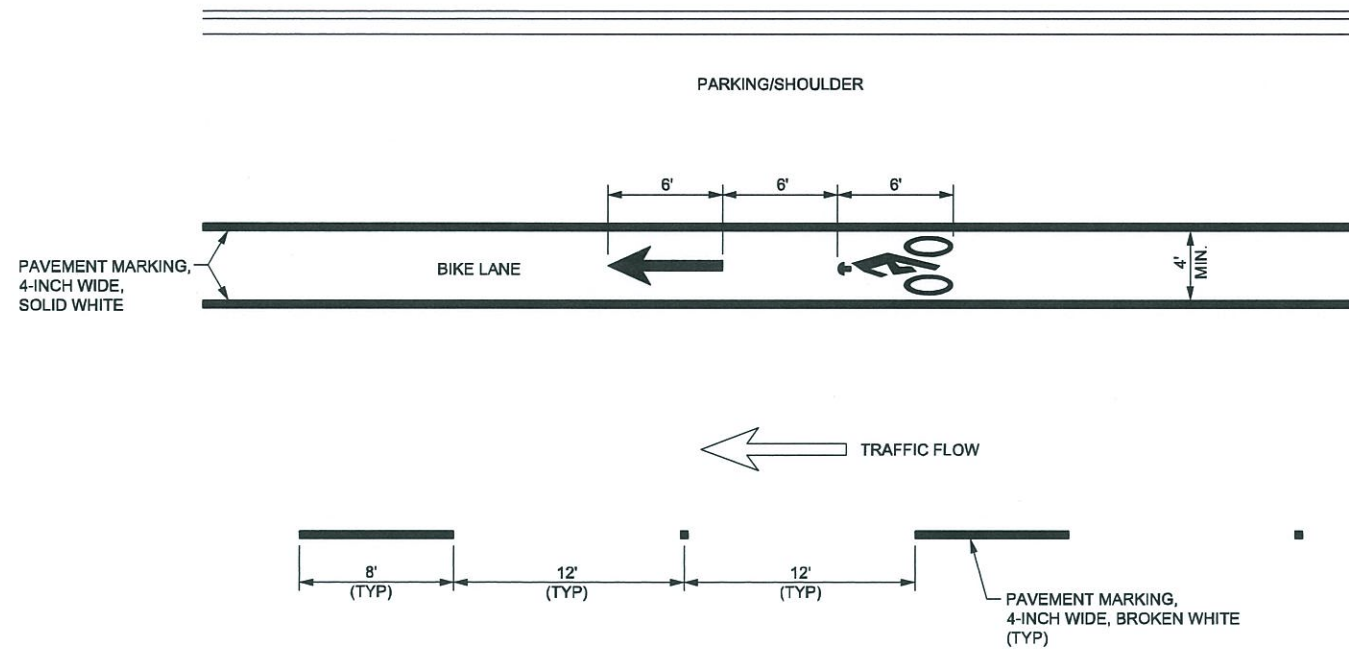
STANDARD NO.

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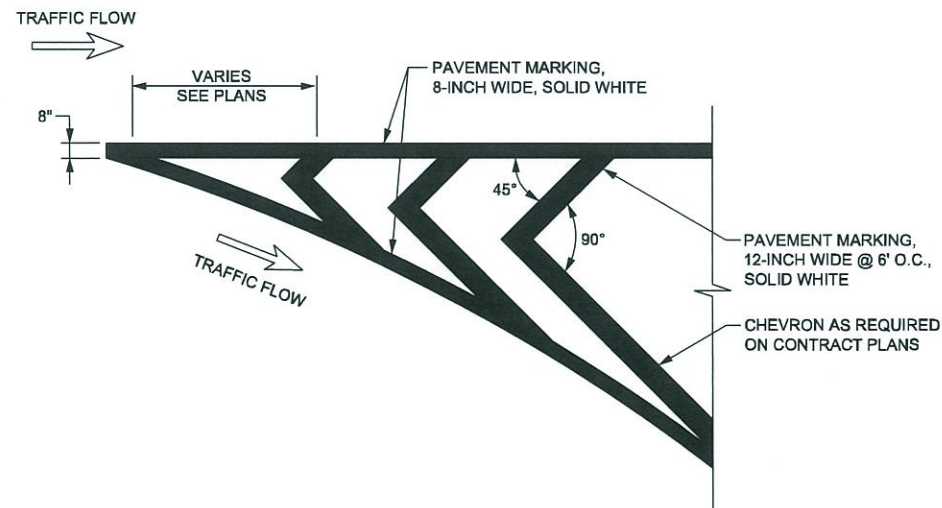


**GENERAL NOTES:**

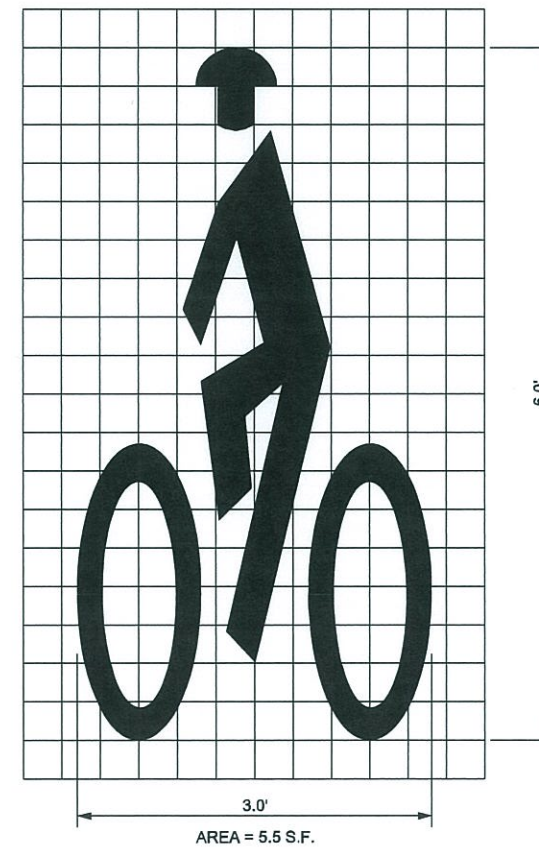
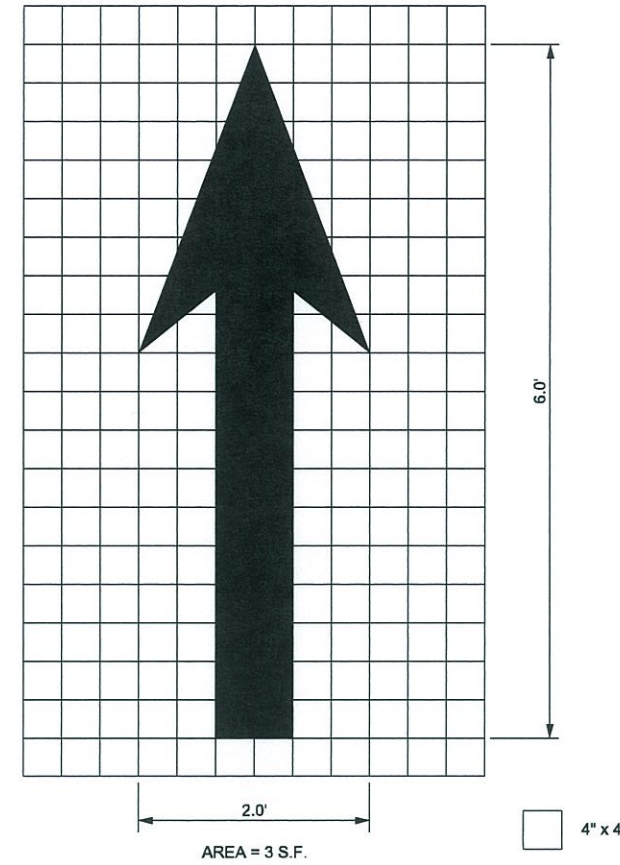
1. STRIPES SHALL BE THERMOPLASTIC MATERIAL (TYPE H).
2. FOR LANE WIDTH AND MEDIAN WIDTH, REFER TO CONTRACT PLANS.
3. FOR DETAILS OF RAISED PAVEMENT MARKERS, SEE STD 634-01.



**BIKE LANE**  
NOT TO SCALE



**STRIPED CHANNELIZING ISLAND**  
NOT TO SCALE



**BIKE LANE ONLY**

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**BIKE LANE PAVEMENT MARKING**

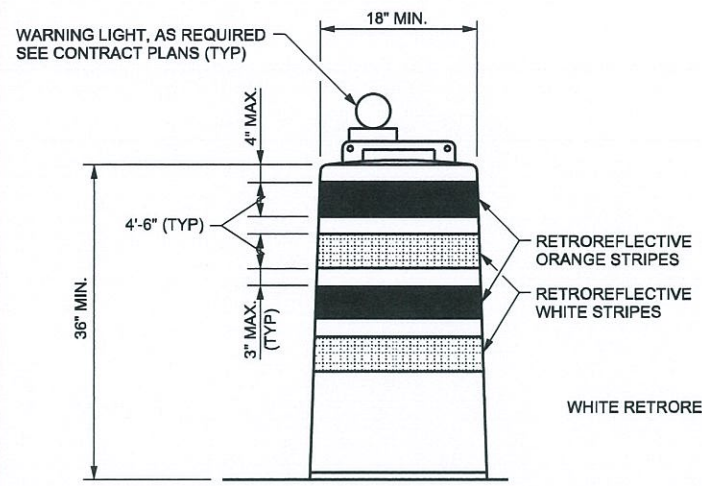
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Signature: *Eugen Torres*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
DATE: 10.14.12

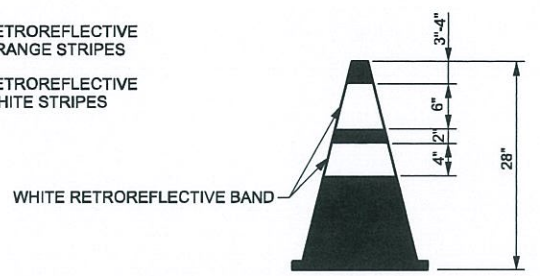
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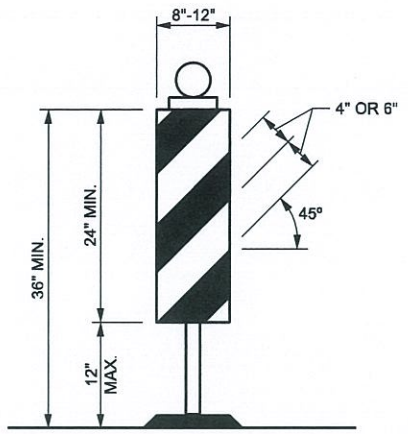




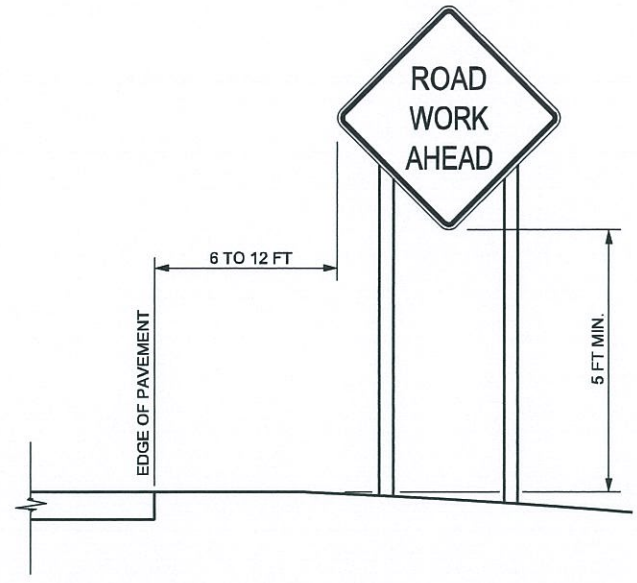
ORANGE TRAFFIC DRUMS



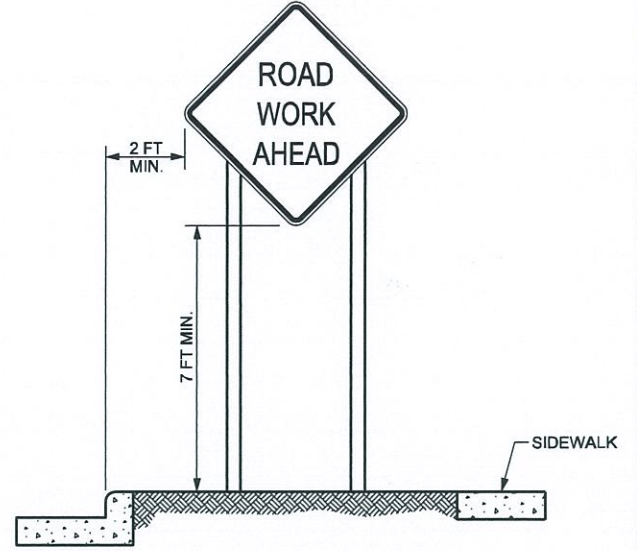
ORANGE CONES



VERTICAL PANEL



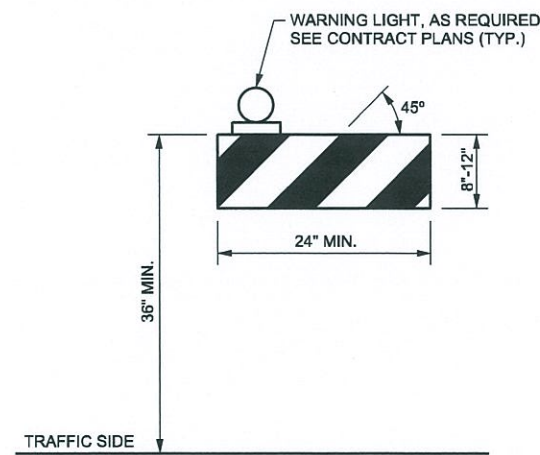
RURAL AREA



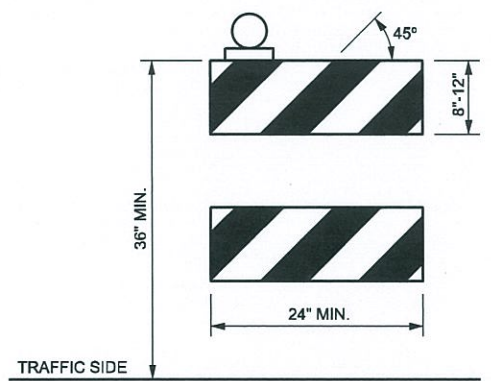
BUSINESS, COMMERCIAL, OR RESIDENTIAL AREA

CHANNELIZING DEVICES

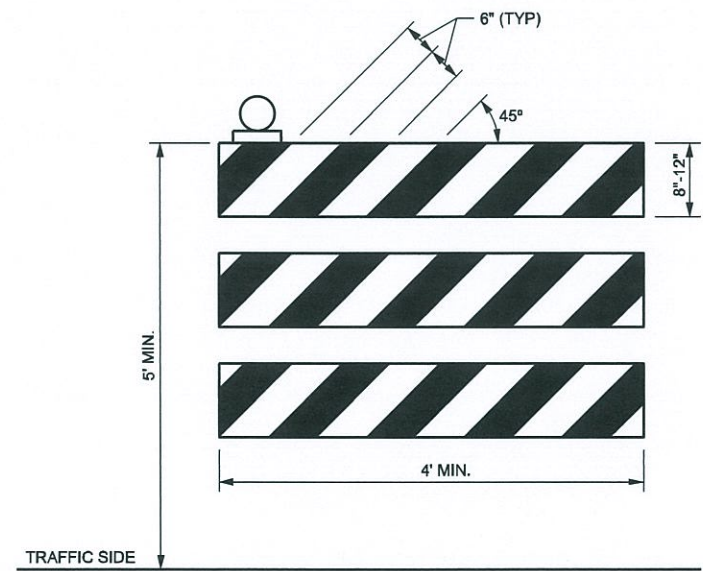
TYPICAL SIGN INSTALLATIONS



TYPE 1 BARRICADE



TYPE 2 BARRICADE



TYPE 3 BARRICADE

TRAFFIC BARRICADES

GENERAL NOTE:

1. ALL WORK ZONE HARDWARE SUCH AS DRUMS, CONES, SIGN SUPPORTS, BARRICADES, AND BARRIERS MUST MEET THE CRASHWORTHY PERFORMANCE CRITERIA IN NCHR-350/MASH AND SHALL COMPLY WITH THE REQUIREMENTS OF THE CURRENT EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD).

NOTES:

1. MARKINGS FOR BARRICADE RAILS SHALL BE RETROREFLECTIVE ORANGE AND WHITE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION OF TRAFFIC AS SHOWN.
2. TYPICAL RAIL STRIPE WIDTHS SHALL BE 6 INCHES. 4 INCH WIDE STRIPES MAY BE USED FOR RAIL WIDTHS LESS THAN 36".
3. BARRICADE SUPPORTS ARE NOT SHOWN. SUBMIT PRODUCT INFORMATION INDICATING NCHRP-350/MASH CRASH TESTED AND APPROVED.

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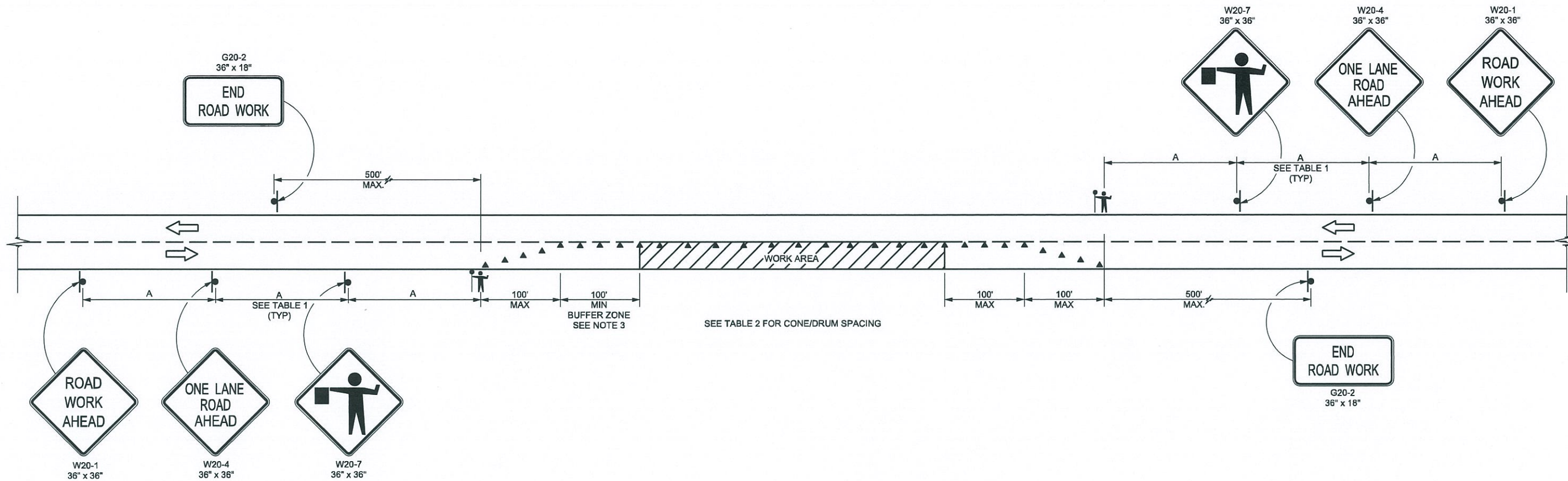
CHANNELIZING DEVICES AND BARRICADES

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


CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS  
 DATE: 10-14-12

STANDARD NO. 635-01





**LEGEND:**

-  WORK AREA
-  CHANNELIZING DEVICES
-  FLAGGER WITH STOP/SLOW PADDLE
-  SEQUENTIAL OR FLASHING ARROW
-  TEMPORARY SIGN
-  TRAFFIC FLOW

**GENERAL NOTES:**

1. PAVEMENT MARKINGS FOR TEMPORARY TRAFFIC CONTROL, IF REQUIRED, SHALL BE AS DIRECTED BY THE ENGINEER OR SHOWN IN THE CONTRACT PLANS.
2. THE SIGN LOCATION SPACINGS MAY BE VARIED FROM THE DIMENSIONS SHOWN DUE TO FIELD CONDITIONS INCLUDING ROAD ALIGNMENT, SIGHT DISTANCE, INTERSECTIONS, DRIVEWAYS, PERMANENT SIGNS OR OTHER OBSTRUCTIONS.
3. BUFFER ZONE CAN BE INCREASED AS DIRECTED BY THE ENGINEER FOR HORIZONTAL OR VERTICAL CURVES DUE TO SIGHT DISTANCE CONSIDERATION.

**TABLE 1**

SIGN SPACING	
ROAD TYPE	A (FT)
URBAN - SPEED 25 MPH OR LESS	100
URBAN - SPEED 30 MPH OR MORE	350
RURAL	500

**TABLE 2**

CONE/DRUM SPACING	
APPROACH SPEED (MPH)	SPACING (FT)
25 & BELOW	25
35	35
45	45

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**LANE CLOSURE ON TWO LANE HIGHWAY**

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*Eugene...*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS  
 DATE: 10-14-12

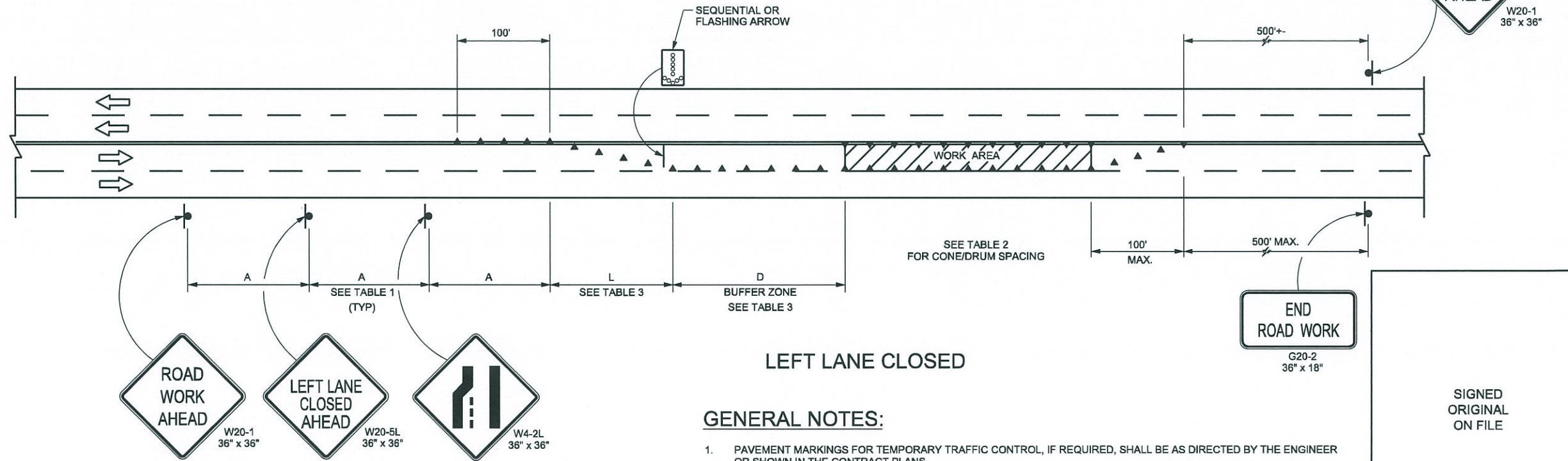
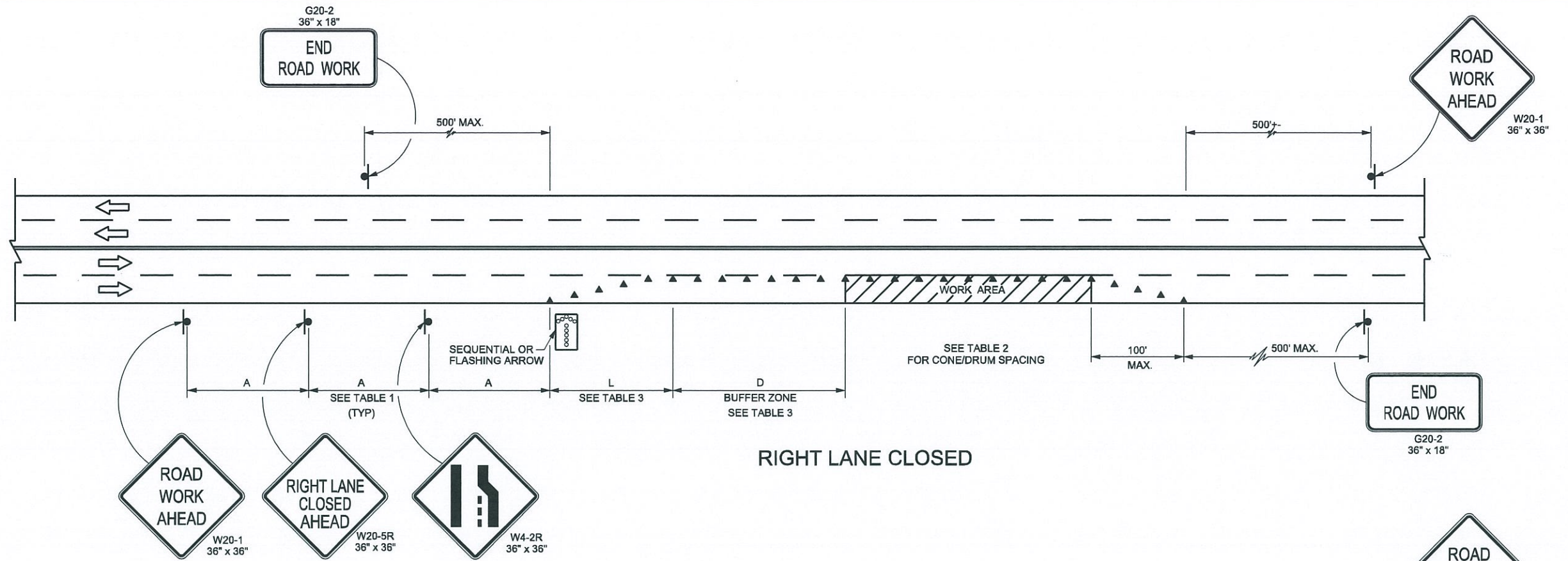
STANDARD NO.

635-02



**LEGEND:**

-  WORK AREA
-  CHANNELIZING DEVICES
-  FLAGGER WITH STOP/SLOW PADDLE
-  SEQUENTIAL OR FLASHING ARROW
-  TEMPORARY SIGN
-  TRAFFIC FLOW



**TABLE 1**

SIGN SPACING	
ROAD TYPE	A (FT)
URBAN - SPEED 25 MPH OR LESS	100
URBAN - SPEED 30 MPH OR MORE	350
RURAL	500

**TABLE 2**

CONE/DRUM SPACING	
APPROACH SPEED (MPH)	SPACING (FT)
25 & BELOW	25
35	35
45	45

**TABLE 3**

TAPER & BUFFER LENGTH		
APPROACH SPEED (MPH)	TAPER L (FT)	BUFFER D (FT)
25 & BELOW	125	155
35	245	250
45	540	360

**GENERAL NOTES:**

1. PAVEMENT MARKINGS FOR TEMPORARY TRAFFIC CONTROL, IF REQUIRED, SHALL BE AS DIRECTED BY THE ENGINEER OR SHOWN IN THE CONTRACT PLANS.
2. THE SIGN LOCATION SPACINGS MAY BE VARIED FROM THE DIMENSIONS SHOWN DUE TO FIELD CONDITIONS INCLUDING ROAD ALIGNMENT, SIGHT DISTANCE, INTERSECTIONS, DRIVEWAYS, PERMANENT SIGNS OR OTHER OBSTRUCTIONS.
3. USE DRUMS FOR CHANNELIZING DEVICES IF TEMPORARY TRAFFIC CONTROL IS TO REMAIN IN PLACE FOR 3 DAYS OR LONGER.

SIGNED ORIGINAL ON FILE

**DRAWING REVISIONS**

REVISION	DATE	BY	DESCRIPTION



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 Tamuning, Guam 96913  
 Tel: (671) 646-3131  
 Fax: (671) 649-6178

**LANE CLOSURE ON MULTI-LANE HIGHWAY**

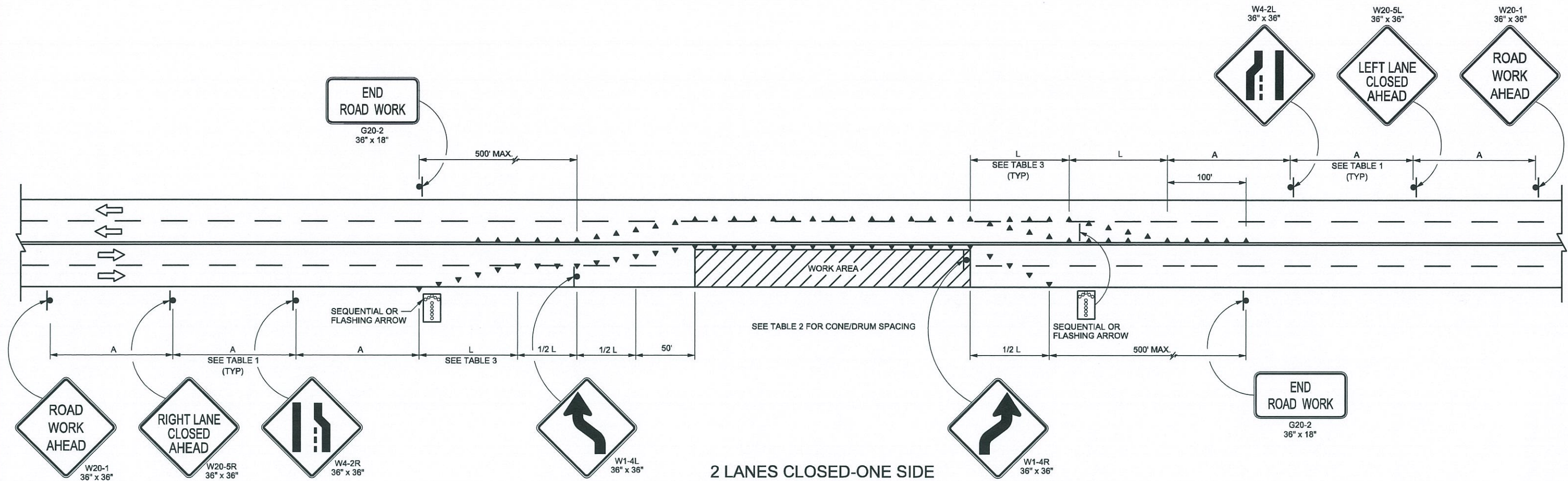
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CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS  
 DATE: 10.14.12

STANDARD NO.

635-03











2 LANES CLOSED-ONE SIDE

**GENERAL NOTES:**

1. PAVEMENT MARKINGS FOR TEMPORARY TRAFFIC CONTROL, IF REQUIRED, SHALL BE AS DIRECTED BY THE ENGINEER OR SHOWN IN THE CONTRACT PLANS.
2. THE SIGN LOCATION SPACINGS MAY BE VARIED FROM THE DIMENSIONS SHOWN DUE TO FIELD CONDITIONS INCLUDING ROAD ALIGNMENT, SIGHT DISTANCE, INTERSECTIONS, DRIVEWAYS, PERMANENT SIGNS OR OTHER OBSTRUCTIONS.
3. USE DRUMS FOR CHANNELIZING DEVICES IF TEMPORARY TRAFFIC CONTROL IS TO REMAIN IN PLACE FOR 3 DAYS OR LONGER.

**LEGEND:**

-  WORK AREA
-  CHANNELIZING DEVICES
-  FLAGGER WITH STOP/SLOW PADDLE
-  SEQUENTIAL OR FLASHING ARROW
-  TEMPORARY SIGN
-  TRAFFIC FLOW

SIGNED ORIGINAL ON FILE

**TABLE 1**

SIGN SPACING	
ROAD TYPE	A (FT)
URBAN - SPEED 25 MPH OR LESS	100
URBAN - SPEED 30 MPH OR MORE	350
RURAL	500

**TABLE 2**

CONE/DRUM SPACING	
APPROACH SPEED (MPH)	SPACING (FT)
25 & BELOW	25
35	35
45	45

**TABLE 3**

TAPER & BUFFER LENGTH		
APPROACH SPEED (MPH)	TAPER L (FT)	BUFFER D (FT)
25 & BELOW	125	155
35	245	250
45	540	360

**DRAWING REVISIONS**


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**2-LANE CLOSURE ON MULTI-LANE HIGHWAY**

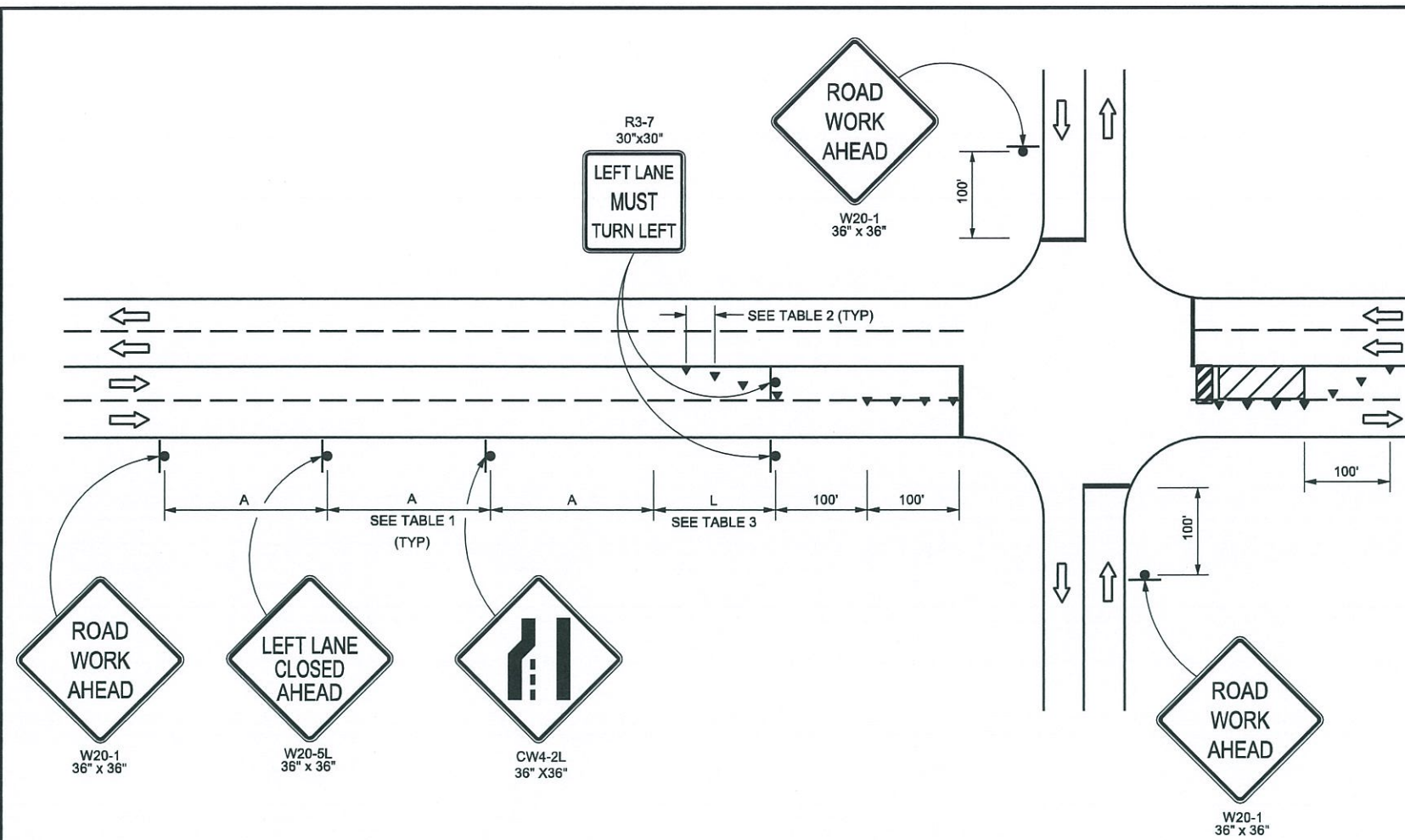
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 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS  
 DATE: 10-14-12

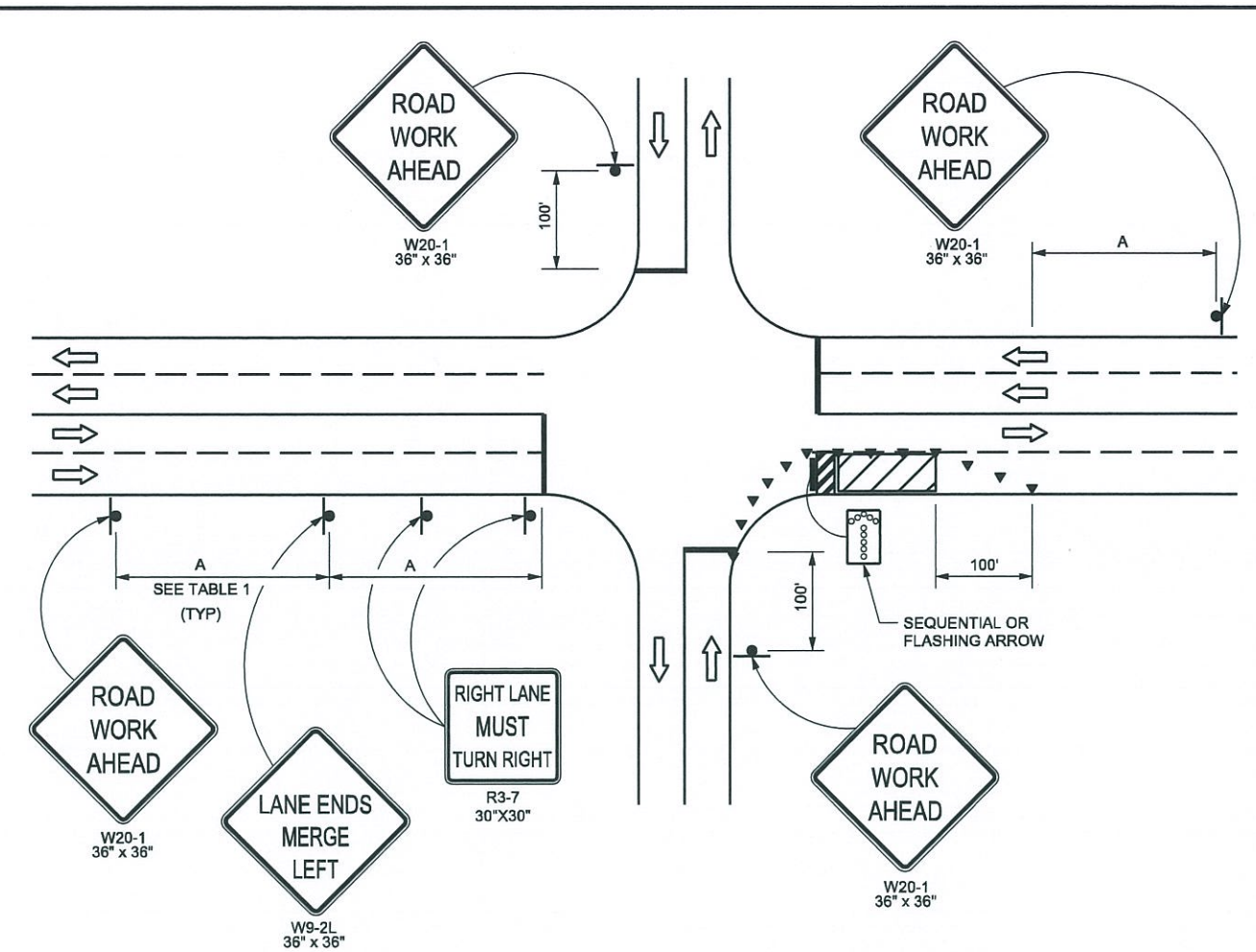
STANDARD NO.

635-04





LEFT LANE CLOSURE ON FAR SIDE OF INTERSECTION



RIGHT LANE CLOSURE ON FAR SIDE OF INTERSECTION

**GENERAL NOTES:**

1. THE SIGN LOCATION SPACINGS MAY BE VARIED FROM THE DIMENSIONS SHOWN DUE TO FIELD CONDITIONS INCLUDING ROAD ALIGNMENT, SIGHT DISTANCE, INTERSECTIONS, DRIVEWAYS, PERMANENT SIGNS OR OTHER OBSTRUCTIONS.
2. BUFFER ZONE CAN BE INCREASED AS DIRECTED BY THE ENGINEER FOR HORIZONTAL OR VERTICAL CURVES DUE TO SIGHT DISTANCE CONSIDERATION.

**LEGEND:**

- WORK AREA
- CHANNELIZING DEVICES
- FLAGGER WITH STOP/SLOW PADDLE
- SEQUENTIAL OR FLASHING ARROW
- TEMPORARY SIGN
- TYPE 3 BARRICADE
- TRAFFIC FLOW

SIGNED ORIGINAL ON FILE

**TABLE 1**  
SIGN SPACING

ROAD TYPE	A (FT)
URBAN - SPEED 25 MPH OR LESS	100
URBAN - SPEED 30 MPH OR MORE	350
RURAL	500

**TABLE 2**  
CONE/DRUM SPACING

APPROACH SPEED (MPH)	SPACING (FT)
25 & BELOW	25
35	35
45	45

**TABLE 3**  
TAPER & BUFFER LENGTH

APPROACH SPEED (MPH)	TAPER L (FT)	BUFFER D (FT)
25 & BELOW	125	155
35	245	250
45	540	360

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**TEMPORARY TRAFFIC CONTROL AT INTERSECTIONS**  
SHEET 1 OF 2

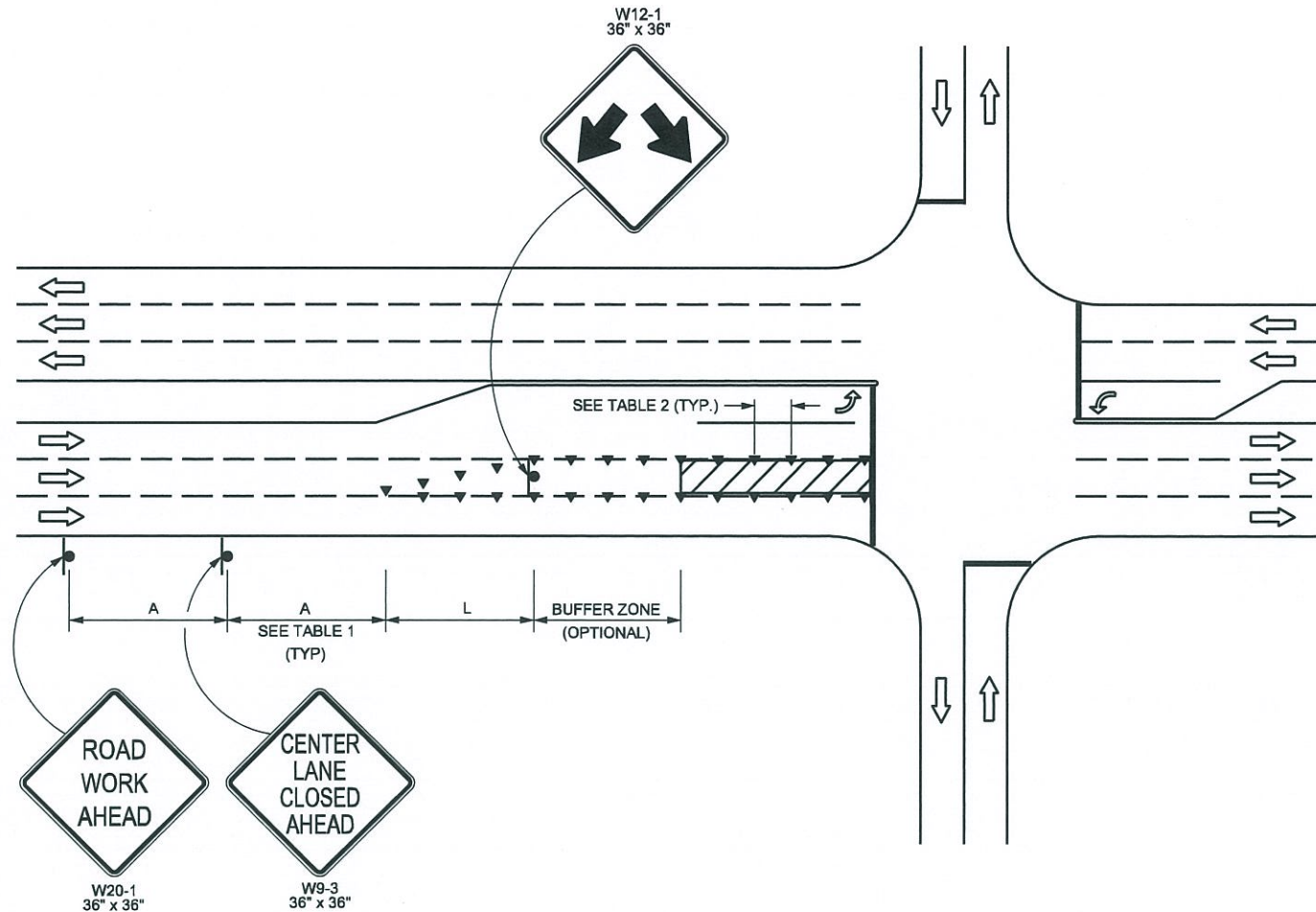
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DEPARTMENT OF PUBLIC WORKS *Acting*

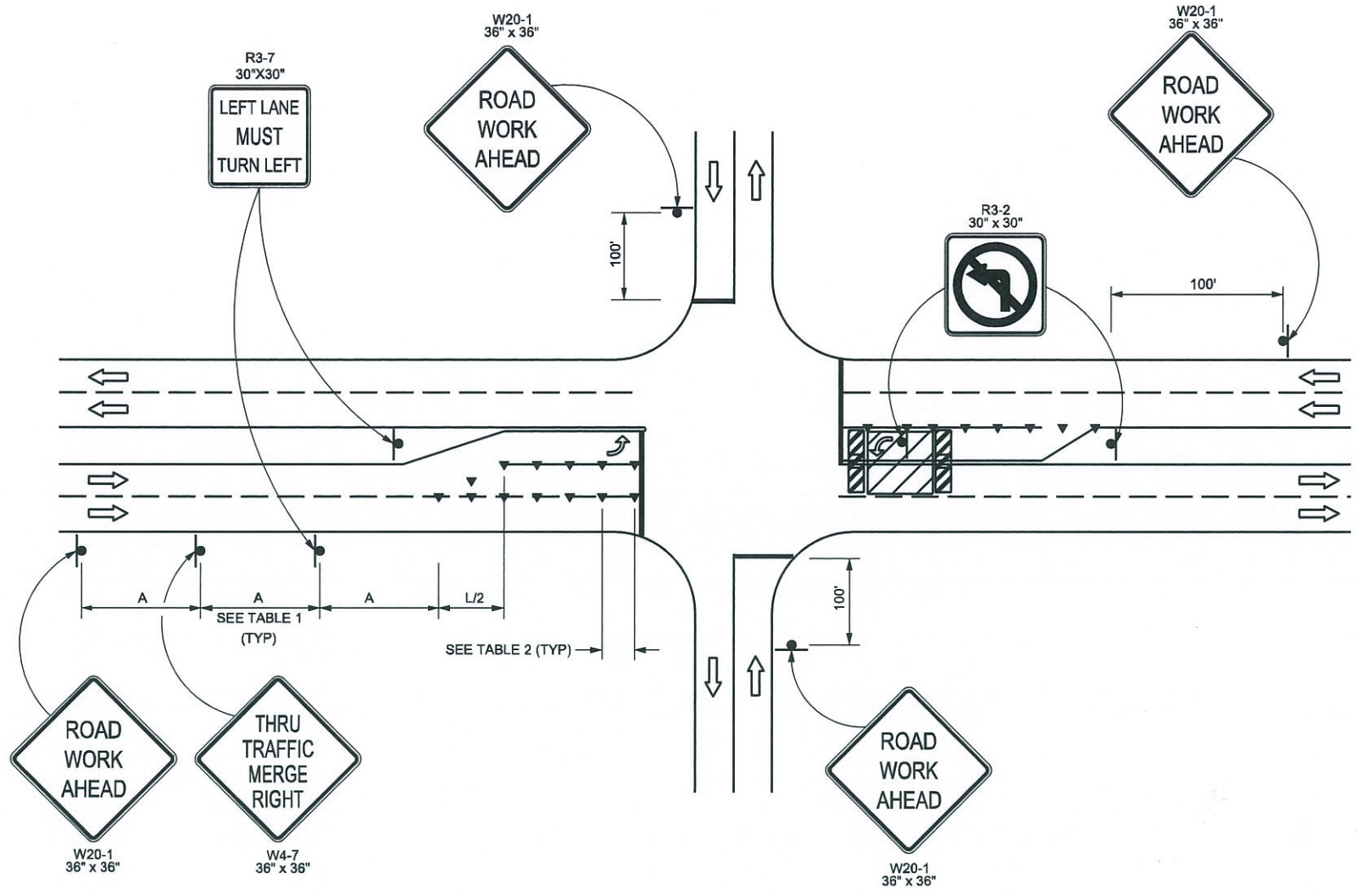
DATE: 10-14-12

STANDARD NO. 635-05





CENTER LANE CLOSURE ON NEAR SIDE OF INTERSECTION



MULTIPLE LANE CLOSURES AT INTERSECTION

**GENERAL NOTES:**

1. THE SIGN LOCATION SPACINGS MAY BE VARIED FROM THE DIMENSIONS SHOWN DUE TO FIELD CONDITIONS INCLUDING ROAD ALIGNMENT, SIGHT DISTANCE, INTERSECTIONS, DRIVEWAYS, PERMANENT SIGNS OR OTHER OBSTRUCTIONS.
2. BUFFER ZONE CAN BE INCREASED AS DIRECTED BY THE ENGINEER FOR HORIZONTAL OR VERTICAL CURVES DUE TO SIGHT DISTANCE CONSIDERATION.

**LEGEND:**

- WORK AREA
- CHANNELIZING DEVICES
- FLAGGER WITH STOP/SLOW PADDLE
- SEQUENTIAL OR FLASHING ARROW
- TEMPORARY SIGN
- TYPE 3 BARRICADE
- TRAFFIC FLOW

SIGNED ORIGINAL ON FILE

**TABLE 1**

SIGN SPACING	
ROAD TYPE	A (FT)
URBAN - SPEED 25 MPH OR LESS	100
URBAN - SPEED 30 MPH OR MORE	350
RURAL	500

**TABLE 2**

CONE/DRUM SPACING	
APPROACH SPEED (MPH)	SPACING (FT)
25 & BELOW	25
35	35
45	45

**TABLE 3**

TAPER & BUFFER LENGTH		
APPROACH SPEED (MPH)	TAPER (L)	BUFFER (D)
25 & BELOW	125	155
35	245	250
45	540	360

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REVISION	DATE	BY	DESCRIPTION



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TEMPORARY TRAFFIC CONTROL AT INTERSECTIONS  
 SHEET 2 OF 2

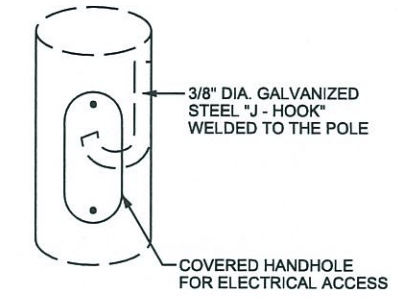
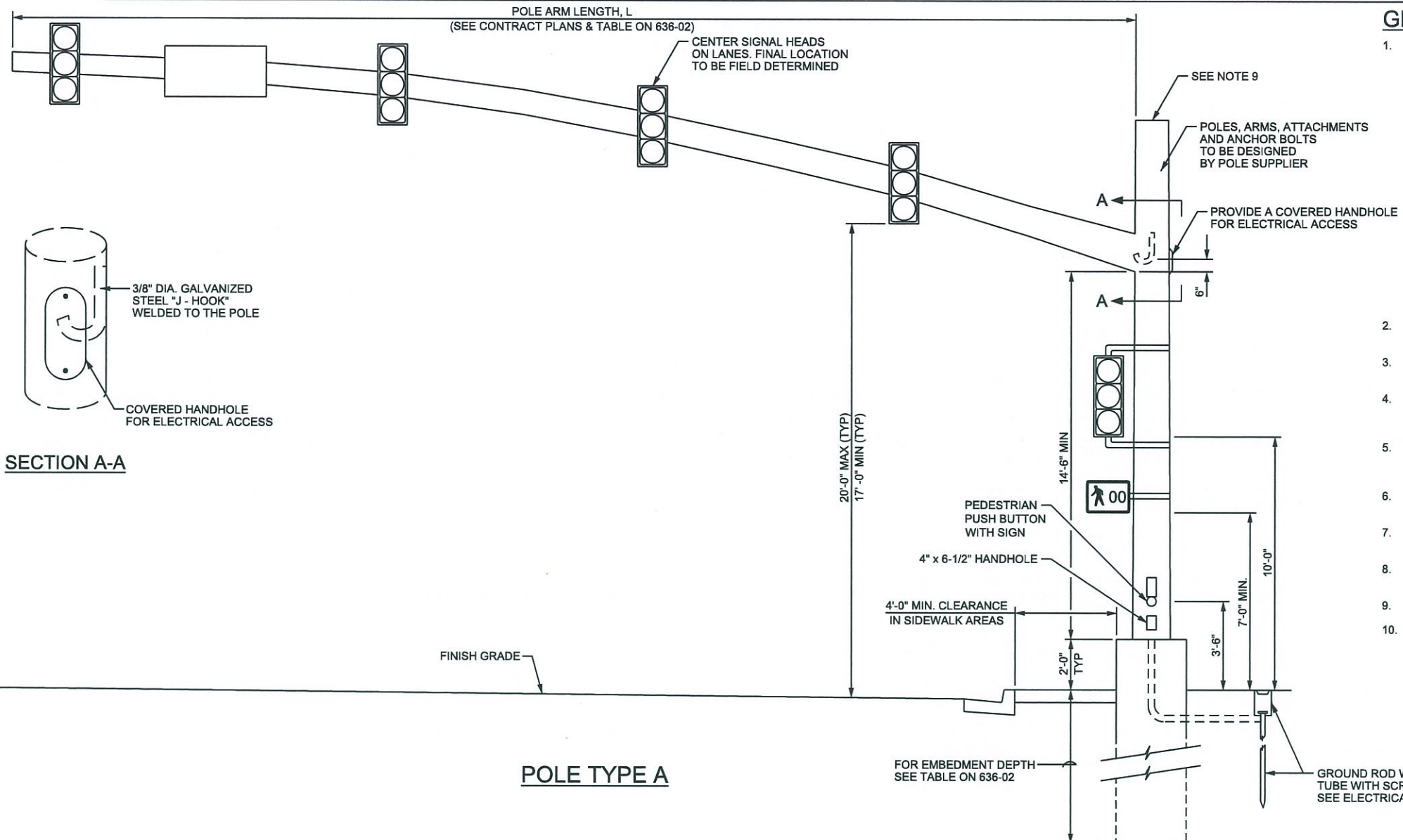
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*[Signature]*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10-14-12

STANDARD NO. 635-06





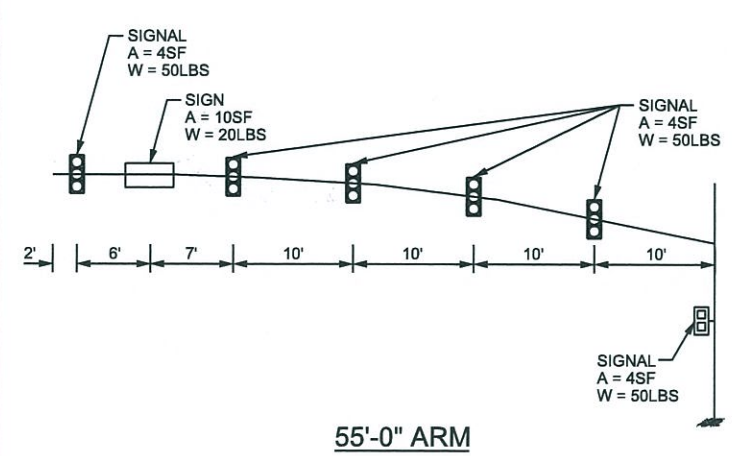
SECTION A-A

POLE TYPE A

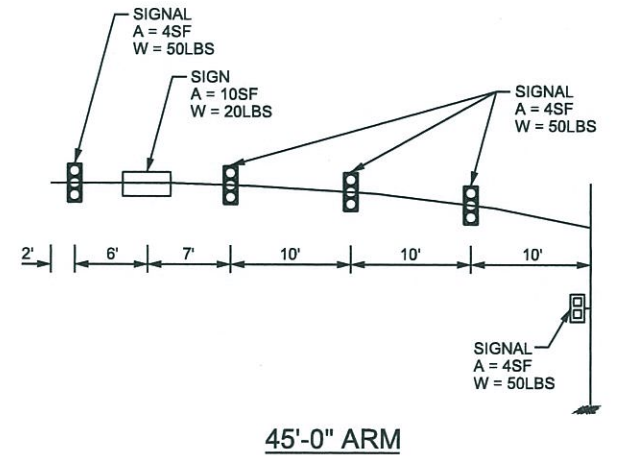
**GENERAL NOTES:**

- DESIGN FOR TRAFFIC SIGNAL POLES AND ATTACHMENTS SHALL BE IN ACCORDANCE WITH "2006 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS LUMINAIRES AND TRAFFIC SIGNALS" PUBLISHED BY THE AASHTO  
 BASIC WIND SPEED  $V = 170$  mph  
 RECURRENCE INTERVAL (50 YEARS)  $I_r = 1.00$   
 TRAFFIC SPEED = 45 mph
- ALL STEEL PEDESTAL POLE MEMBERS SHALL BE HOT DIPPED GALVANIZED INSIDE AND OUTSIDE ACCORDING TO ASTM A123.
- MOUNTING HARDWARE FOR EACH TRAFFIC SIGNAL SHALL BE FURNISHED BY THE MANUFACTURER, INCLUDING POLE PLATES FOR SIDE POLE MOUNTING.
- ALL POLES, PEDESTAL AND CABINETS SHALL BE PLACED A MINIMUM OF 2 FEET OFF THE ROADWAY MEASURED FROM THE EDGE OF SHOULDER OR FACE OF CURB. IN SIDEWALK AREAS, PROVIDE 4 FEET CLEARANCE MEASURED FROM BACK OF CURB.
- ALL SIGNAL HEADS, SIGNS AND HARDWARE SHALL BE FIELD POSITIONED AND APPROVED BY DPW TRAFFIC SIGNAL STAFF. PEDESTRIAN PUSH BUTTONS WITH SIGN SHALL BE ORIENTED AS SHOWN IN THE CONTRACT PLANS OR AS DIRECTED BY THE ENGINEER.
- TRAFFIC SIGNALS MOUNTED ON MAST ARMS SHALL BE FURNISHED WITH ASTRO TYPE MOUNTING BRACKETS. SEE STD 636-08.
- WHERE SIGNALS AND STANDARDS ARE INSTALLED BELOW OVERHEAD POWER LINES, CLEARANCES SHALL COMPLY WITH NATIONAL ELECTRIC SAFETY CODE SECTION 234 REQUIREMENTS.
- ALL OPEN FIELD DRILLED HOLES SHALL BE COVERED WITH A RUBBER GROMMET AND SEALED WITH A WATER-TIGHT SEALANT.
- POLE CAP SHALL BE SEALED RAIN TIGHT.
- MATERIALS:  
 CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH  $F'_c$  OF 3,000 psi AT 28 DAYS.  
 REINFORCING STEEL SHALL CONFORM TO ASTM A-615 GRADE 40.  
 ALL EXPOSED METAL SURFACES SHALL BE HOT DIPPED GALVANIZED.  
 ANCHOR BOLTS, BASE PLATES, AND OTHER POLE ATTACHMENTS SHALL BE DESIGNED AND SUPPLIED BY THE POLE MANUFACTURER.

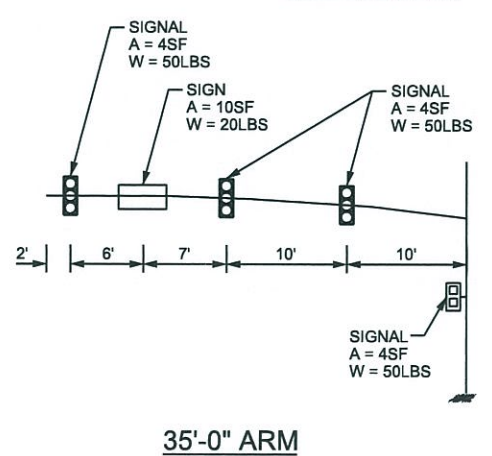
FATIGUE IMPORTANCE FACTOR, $I_F$				
FATIGUE CATEGORY	GALLOPING	NATURAL WIND GUSTS	TRUCK INDUCED GUSTS	
II	SIGN	0.65	0.75	0.89
	TRAFFIC SIGNAL	0.65	0.80	0.84
	LIGHTING	-	0.72	-



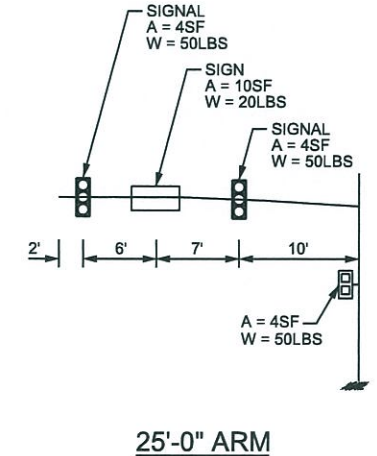
55'-0" ARM



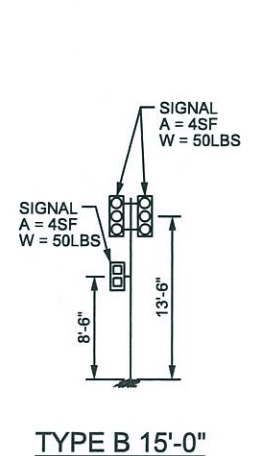
45'-0" ARM



35'-0" ARM



25'-0" ARM



TYPE B 15'-0"

**TRAFFIC SIGNALS AND SIGN POSITIONS**

(FOR POLE MANUFACTURER & FOUNDATION DESIGNER'S USE - SEE CONTRACT PLANS FOR SIGNAL HEAD TYPES AND LAYOUT)

SIGNED ORIGINAL ON FILE

DRAWING REVISIONS			
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 542 North Marine Corps Drive  
 Tamuning, Guam 96913  
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 Fax: (671) 649-6178

**TRAFFIC SIGNAL POLE AND FOUNDATION DETAILS**  
 SHEET 1 OF 2

APPROVED FOR USE ON DPW PROJECTS

*Engineer Signature*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10.14.12

STANDARD NO. 636-01



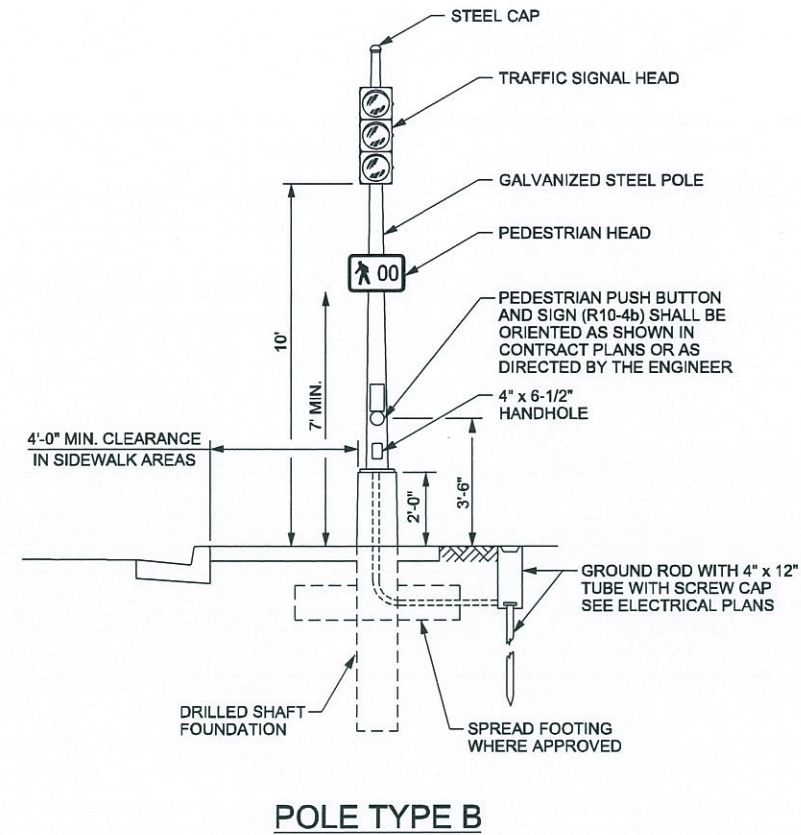
**TABLE - DRILLED SHAFT FOUNDATION**

POLE TYPE	POLE ARM LENGTH, L (FT)	DRILLED SHAFT DIAMETER (IN)	SHAFT EMBEDMENT DEPTH (FT-IN)		NO. AND SIZE OF VERTICAL BARS	HOOP SIZE & SPACING (IN)	REMARKS
			SOFT SOIL*	FIRM SOIL**			
A	25	36	7'-6"	7'-0"	8-#6	#4 @ 10" O.C.	
A	35	36	10'-6"	8'-0"	8-#7	#4 @ 6" O.C.	
A	45	36	11'-6"	9'-0"	8-#8	#5 @ 6" O.C.	
A	55	36	13'-6"	9'-0"	8-#8	#6 @ 6" O.C.	
B	-	24	5'-0"	5'-0"	6-#6	#3 @ 8" O.C.	(15' POLE) SEE ALTERNATE FOOTING

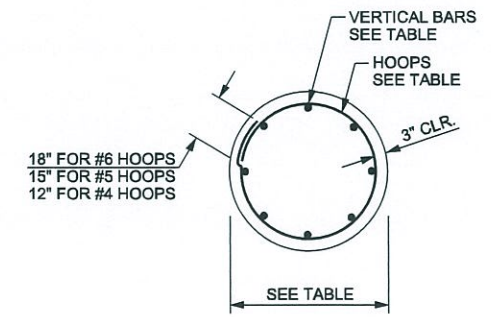
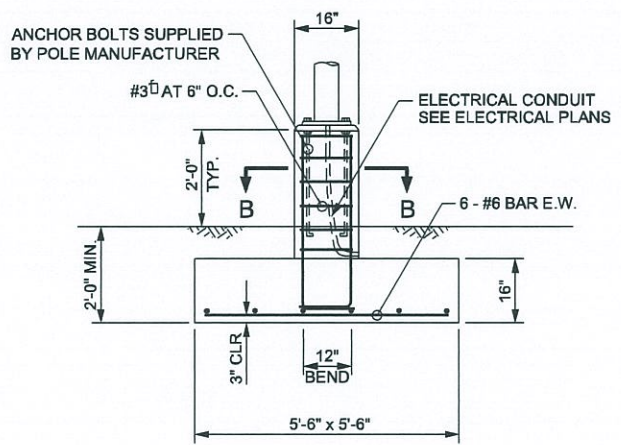
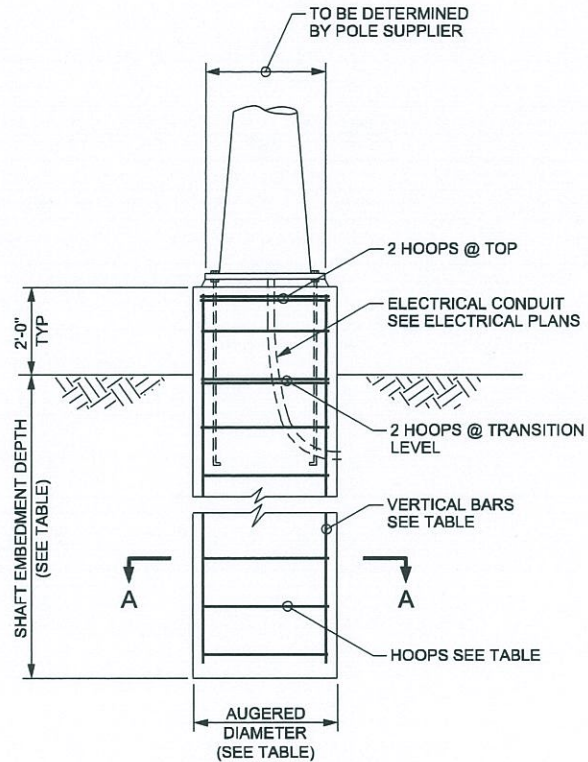
\* SOFT SOIL MEANS CLAY, SANDY CLAY, SILTY CLAY, CLAYEY SILT (CL, ML, MH AND CH) AND OTHER MATERIALS WHERE THE AVERAGE N VALUE FOR THE SOIL PROFILE IS LESS THAN 20.  
 \*\* FIRM SOIL MEANS SAND, SILTY SAND, CLAYEY SAND, SILTY GRAVEL, CLAYEY GRAVEL, SANDEY GRAVEL, FRACTURED CORALINE FORMATION (SW, SP, SM, SC, GM, GC, AND GP) AND OTHER MATERIALS WHERE THE AVERAGE N VALUE FOR THE SOIL PROFILE IS GREATER THAN 20.

**GENERAL NOTES:**

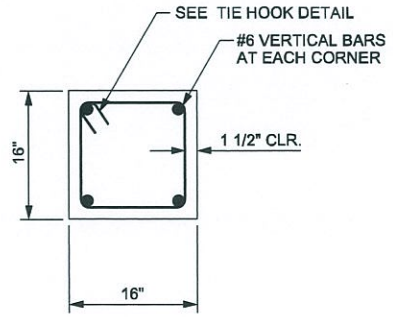
1. SEE STD 636-01 FOR GENERAL NOTES.



**POLE TYPE B**



**SECTION A-A**



**SECTION B-B**



**TIE HOOK DETAIL**

**DRILLED SHAFT FOUNDATION**

**SPREAD FOOTING FOUNDATION**

USE ONLY FOR TYPE "B" POLES WHERE APPROVED IN WRITING BY DPW TRAFFIC SIGNAL STAFF

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**TRAFFIC SIGNAL POLE AND FOUNDATION DETAILS SHEET 2 OF 2**

APPROVED FOR USE ON DPW PROJECTS

Signature: *[Handwritten Signature]*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

DATE: 10-14-12

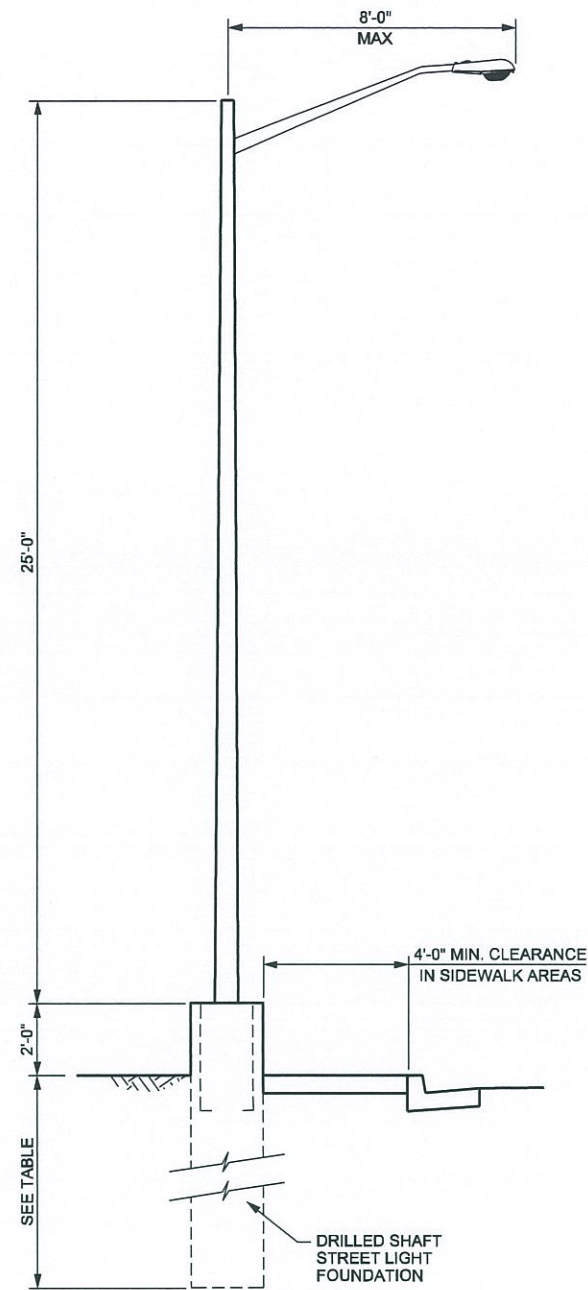
STANDARD NO.

636-02

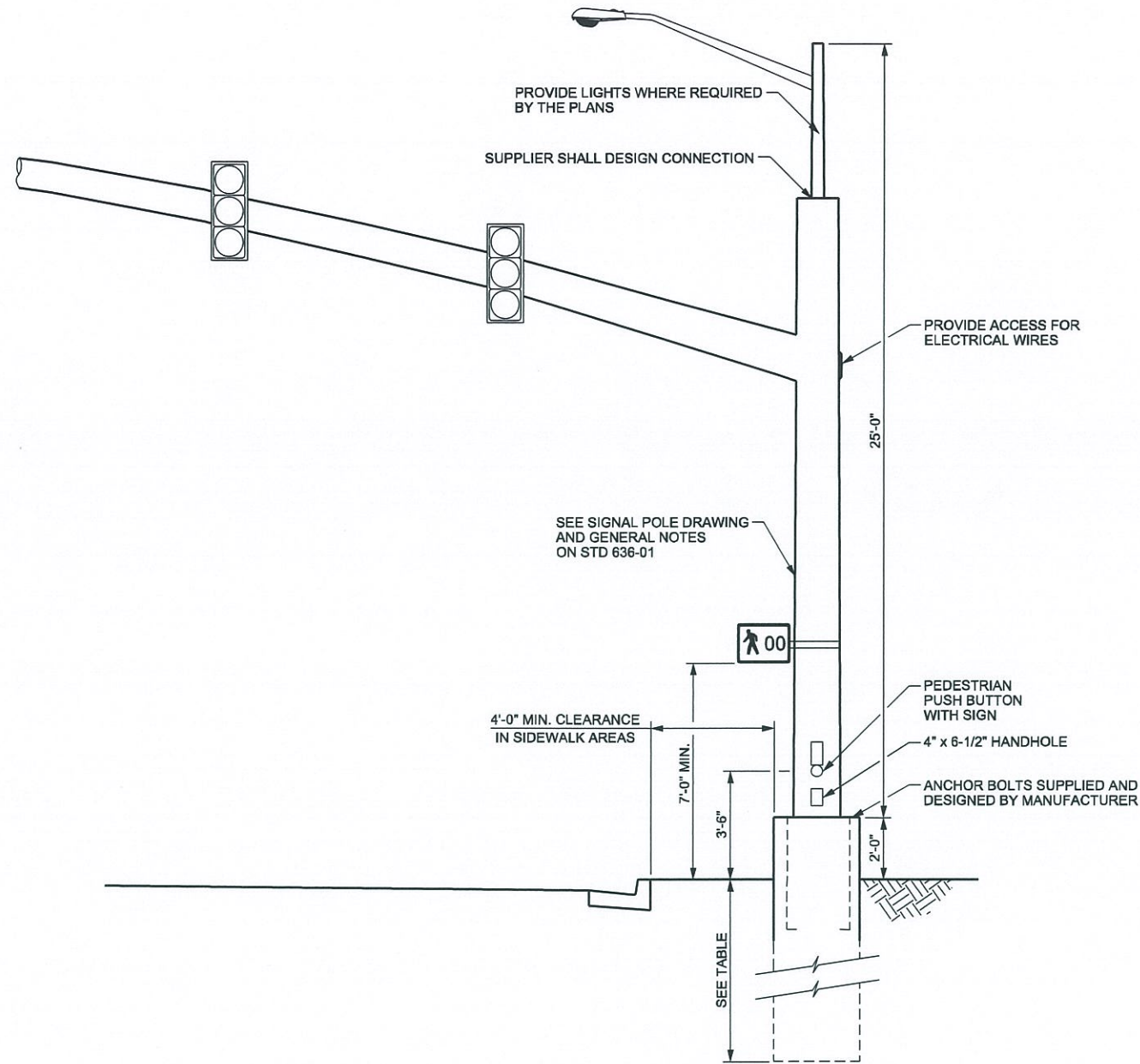


**GENERAL NOTES:**

1. SEE STD 636-01 FOR GENERAL NOTES AND ADDITIONAL DETAILS.



**STREET LIGHT POLE**



**TRAFFIC SIGNAL WITH STREET LIGHT**

**TABLE - DRILLED SHAFT FOUNDATION TYPE FOR SIGNAL POLES WITH STREET LIGHT EXTENSION**

POLE TYPE	POLE ARM LENGTH, L (FT)	DRILLED SHAFT DIAMETER (IN)	SHAFT EMBEDMENT DEPTH (FT-IN)		NO. AND SIZE OF VERTICAL BARS	HOOP SIZE & SPACING (IN)	REMARKS
			SOFT SOIL*	FIRM SOIL**			
A	25	36	9'-0"	8'-0"	8-#6	#4 @ 10" O.C.	-
A	35	36	10'-6"	9'-0"	8-#7	#4 @ 5" O.C.	-
A	45	36	12'-6"	10'-0"	8-#8	#5 @ 6" O.C.	-
A	55	36	14'-0"	11'-0"	8-#8	#6 @ 5" O.C.	-
STREETLIGHT	-	24	5'-6"	5'-6"	6-#6	#3 @ 8" O.C.	(25' POLE)

\* SOFT SOIL MEANS CLAY, SANDY CLAY, SILTY CLAY, CLAYEY SILT (CL, ML, MH AND CH) AND OTHER MATERIALS WHERE THE AVERAGE N VALUE FOR THE SOIL PROFILE IS LESS THAN 20.  
 \*\* FIRM SOIL MEANS SAND, SILTY SAND, CLAYEY SAND, SILTY GRAVEL, CLAYEY GRAVEL, SANDEY GRAVEL, FRACTURED CORALINE FORMATION (SW, SP, SM, SC, GM, GC, AND GP) AND OTHER MATERIALS WHERE THE AVERAGE N VALUE FOR THE SOIL PROFILE IS GREATER THAN 20.

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**STREETLIGHT FOUNDATION DETAILS**

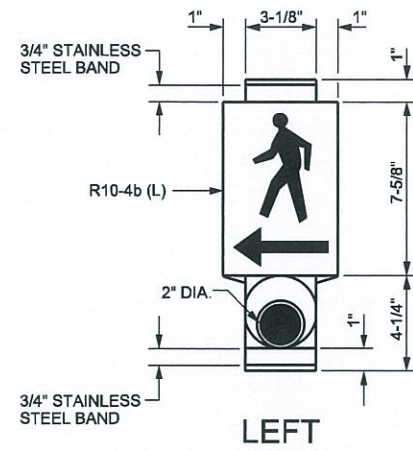
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*[Signature]*  
 CHIEF ENGINEER, HIGHWAYS  
 DEPARTMENT OF PUBLIC WORKS

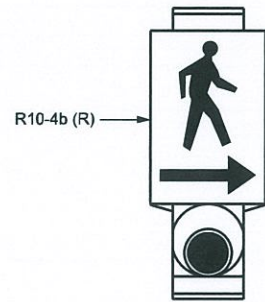
DATE: 10.14.12

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LEFT



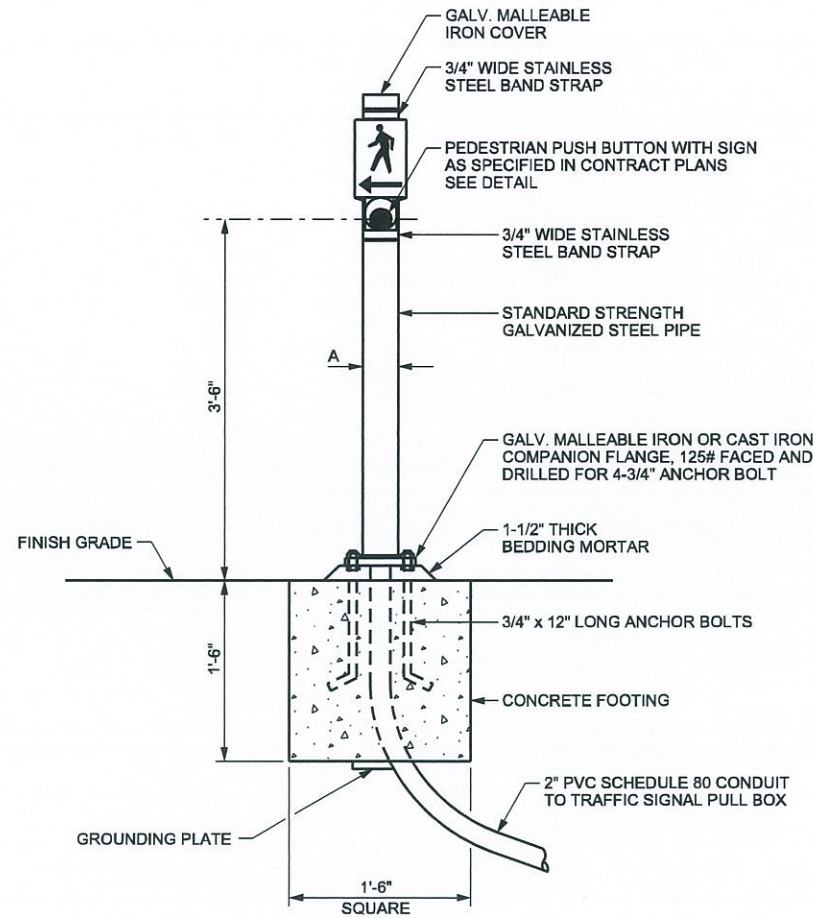
RIGHT



LEFT & RIGHT

**PEDESTRIAN PUSH BUTTON WITH SIGN**

MAN, ARROW & PUSH BUTTON - WHITE  
BACKGROUND - BLACK



**NOTES:**

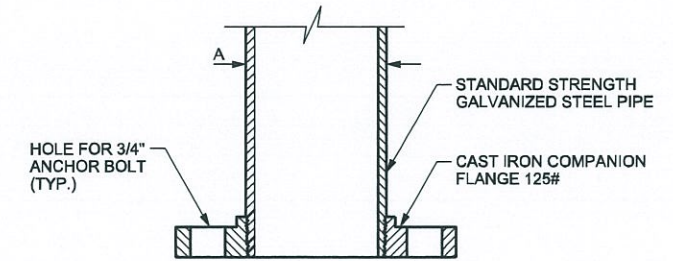
1. CONDUITS SHALL PROTRUDE 2" MAX. ABOVE FINISHED SURFACE OF FOUNDATION.
2. CONDUITS SHALL SLOPE AWAY FROM POST FOUNDATION.

POST DIMENSIONS		
NUMBER OF PEDESTRIAN PUSH BUTTONS	DIMENSIONS	
	A	B
1	3-1/2"	8"
2 - 3	4-1/2"	9"

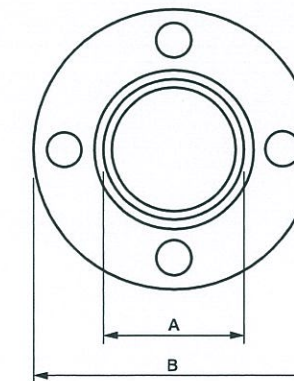
**PEDESTRIAN PUSH BUTTON POST AND FOOTING DETAIL**

**GENERAL NOTES:**

1. THERE SHALL BE A MINIMUM 30" x 48" LEVEL GROUND SURFACE (2% MAX. CROSS SLOPE, BOTH DIRECTIONS) FOR A FORWARD OR SIDE APPROACH TO A PEDESTRIAN PUSH BUTTON. LOCATION OF PEDESTRIAN PUSH BUTTON SHALL BE SHOWN ON CIVIL PLANS IN ADDITION TO ELECTRICAL PLANS.
2. CONCRETE SHALL CONFORM TO FP-03 SECTION 601 MINOR CONCRETE STRUCTURES.



SECTION



TOP VIEW

FLANGE DETAIL

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**PEDESTRIAN PUSH BUTTON DETAILS**

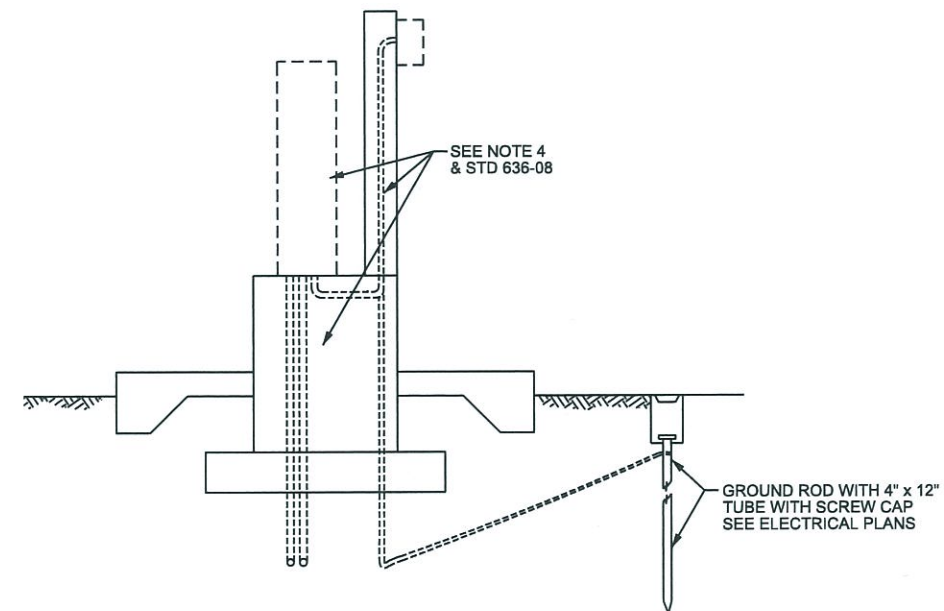
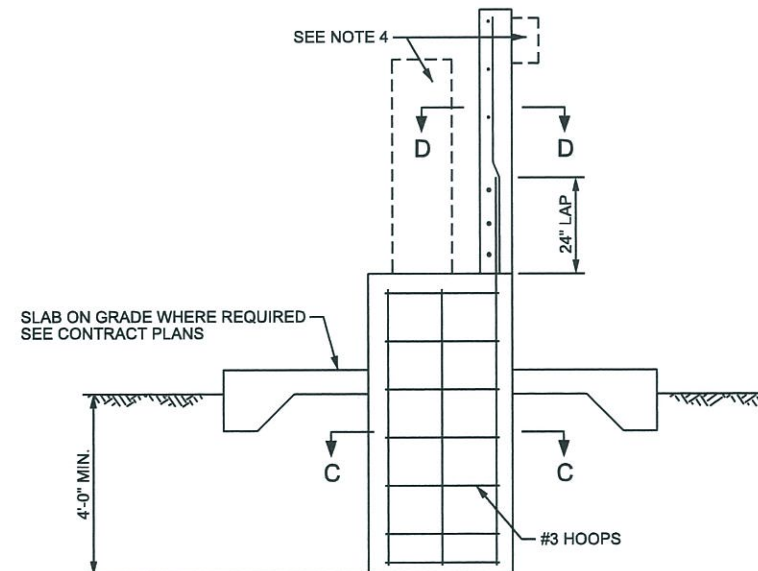
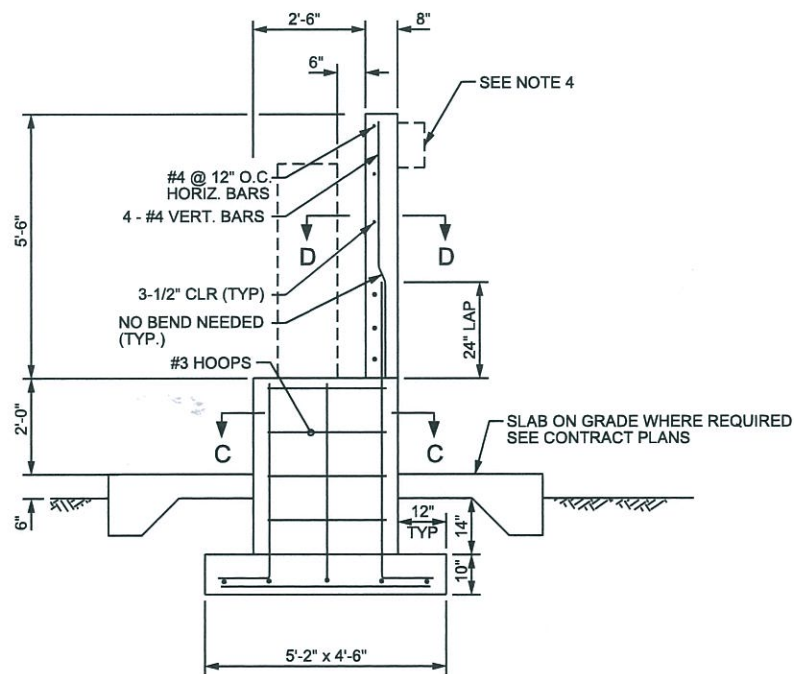
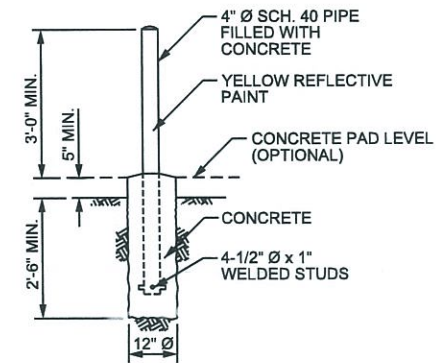
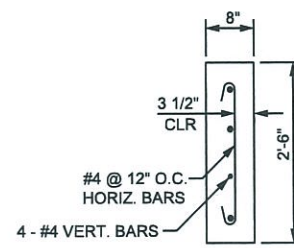
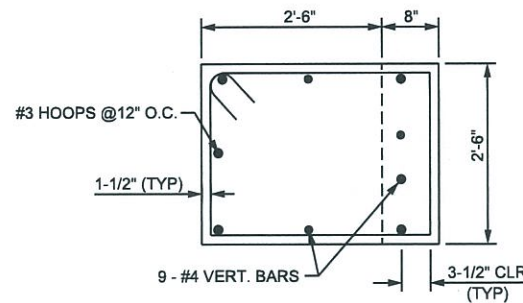
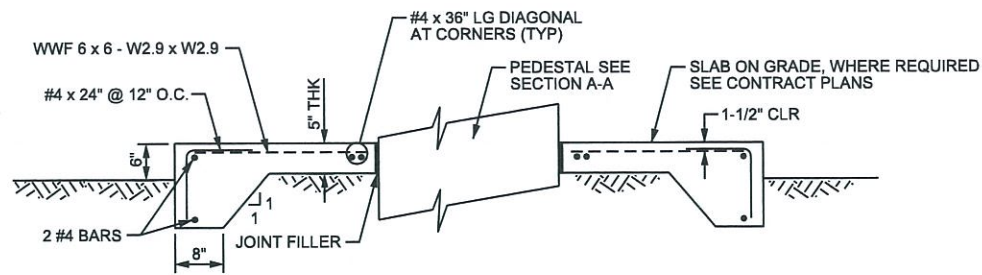
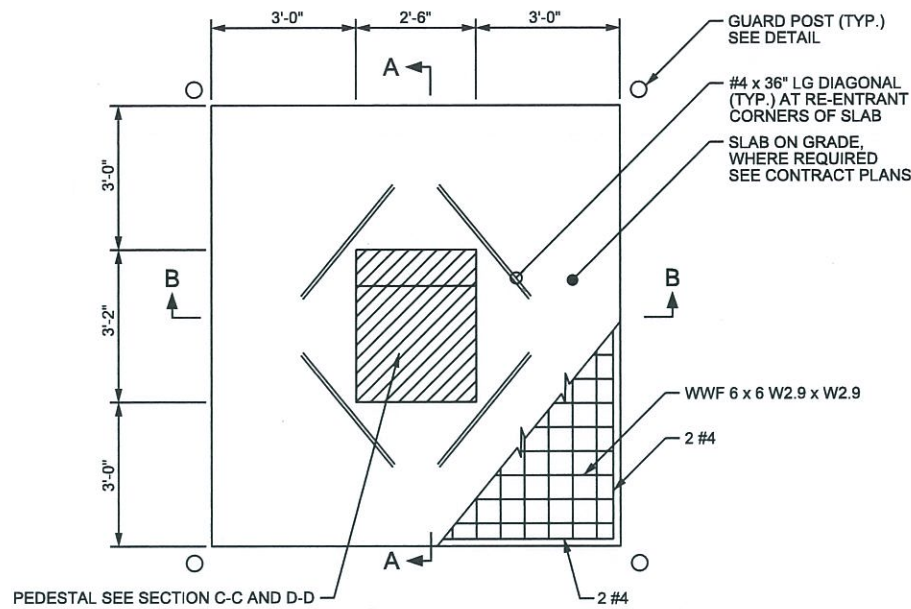
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CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
DATE: 10.14.12

STANDARD NO.

636-04





**GENERAL NOTES:**

1. ALL CONCRETE SHALL CONFORM TO FP-03 SECTION 601 MINOR CONCRETE STRUCTURES. ALL EXPOSED CONCRETE EDGES SHALL HAVE A 1 INCH CHAMFER.
2. ALL REINFORCING STEEL & INSERTS SHALL CONFORM TO ASTM A-615 GRADE 40.
3. ALL EQUIPMENT ANCHOR BOLTS, EXPANSION SHIELDS, INSERTS OR IMBEDS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED.
4. REFER TO CONTRACT DRAWINGS AND SPECIFICATIONS FOR ALL ELECTRICAL ITEMS INCLUDING CONDUITS, GROUND RODS AND GROUND WIRES.

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Fax: (671) 649-6178

TRAFFIC SIGNAL CONTROLLER PAD

APPROVED FOR USE ON DPW PROJECTS

*Ernesto*  
CHIEF ENGINEER, HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS *Achy*

DATE: 10.26.12

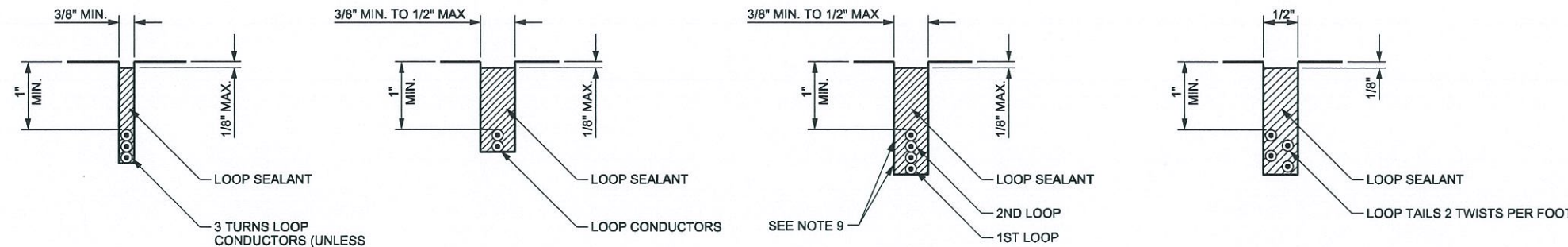
STANDARD NO.

636-05



**LOOP INSTALLATION PROCEDURE:**

1. LOOPS SHALL BE CENTERED IN LANES.
2. SAW SLOTS IN PAVEMENT FOR LOOP CONDUCTORS AS SHOWN IN DETAILS.
3. DISTANCE BETWEEN SIDE OF LOOP AND A LEAD-IN SAW CUTS SHALL BE 12" MINIMUM.
4. BOTTOM OF SAW SLOT SHALL BE SMOOTH WITH NO SHARP EDGES.
5. SLOTS SHALL BE WASHED UNTIL CLEAN, BLOWN OUT AND THOROUGHLY DRIED WITH OIL FREE COMPRESSED AIR.
6. ADJACENT LOOPS ON THE SAME SENSOR UNIT CHANNEL SHALL BE WOUND IN OPPOSITE DIRECTIONS.
7. IDENTIFY AND TAG LOOP CIRCUIT PAIRS IN THE PULL BOX WITH LOOP NUMBER, START (S) AND FINISH (F) OF CONDUCTOR. IDENTIFY AND TAG LEAD-IN-CABLE WITH SENSOR NUMBER AND PHASE.
8. INSTALL LOOP CONDUCTOR IN SLOT USING BACKER ROD OR HEAT RESISTANT SEALER STRIPS AT TWO FOOT SPACING TO HOLD LOOP CONDUCTORS AT THE BOTTOM OF THE SAWSLOT DURING SEALANT PLACEMENT.
9. NO MORE THAT 2 TWISTED PAIRS SHALL BE INSTALLED FROM THE EDGE OF PAVEMENT TO PULL BOX.
10. ALLOW ADDITIONAL 5'-0" OF SLACK LENGTH OF CONDUCTOR FOR THE LEAD-IN RUN TO PULL BOX.
11. THE ADDITIONAL LENGTH OF EACH CONDUCTOR FOR EACH LOOP SHALL BE TWISTED TOGETHER INTO A PAIR (TWO TURNS PER FOOT) BEFORE BEING INSTALLED FROM THE EDGE OF PAVEMENT IN CONDUIT LEADING TO PULL BOX.
12. TEST EACH LOOP CIRCUIT FOR CONTINUITY, CIRCUIT RESISTANCE AND INSULATION RESISTANCE AT THE PULL BOX BEFORE FILLING SLOTS.
13. FILL SLOTS AS SHOWN IN DETAILS.
14. SPLICE LOOP CONDUCTORS TO LEAD-IN-CABLE. SPLICES SHALL BE SOLDERED, COVERED WITH HEAT-SHRINK SLEEVE, AND WRAPPED WITH TWO LAYERS OF VINYL ELECTRIC TAPE. SEE LOOP SPLICE DETAIL.
15. END OF LEAD-IN-CABLE AND LOOP CONDUCTOR SHALL BE WATERPROOFED PRIOR TO INSTALLING IN CONDUIT TO PREVENT MOISTURE FROM ENTERING THE CABLE.
16. LEAD-IN-CABLE SHALL NOT BE SPLICED BETWEEN THE PULL BOX AND THE CONTROLLER CABINET TERMINALS.
17. TEST EACH LOOP CIRCUIT FOR CONTINUITY, CIRCUIT RESISTANCE AND INSULATION RESISTANCE AT THE CONTROLLER CABINET LOCATION.
18. WHERE LOOP CONDUCTORS ARE NOT TO BE SPLICED TO A LEAD-IN-CABLE, THE ENDS OF THE CONDUCTORS SHALL BE TAPED AND WATERPROOFED WITH ELECTRICAL INSULATING COATING.
19. ONE CONTINUOUS LENGTH OF 14/GC, WIRE SHALL BE USED FOR EACH LOOP FROM SIGNAL BASE OR PULL BOX AROUND THE LOOP WITH THE NUMBER OF TURNS SPECIFIED AND BACK TO THE SIGNAL BASE OR PULL BOX. LOOP WIRE SHALL BE DUCT TYPE.



SECTION A-A

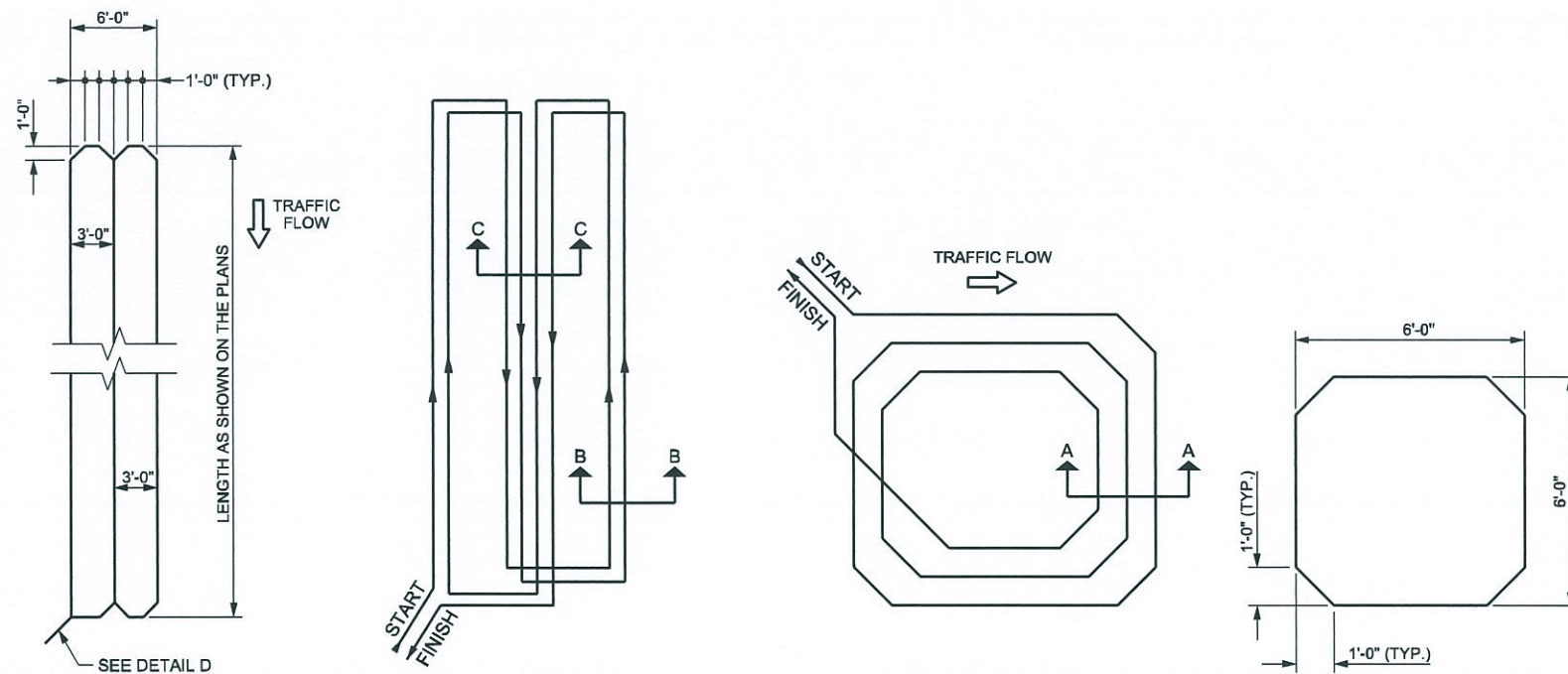
SECTION B-B

SECTION C-C

LOOP TAIL INSTALLATION

**SLOT DETAILS**

**DETAIL D**



SAWCUT DETAIL

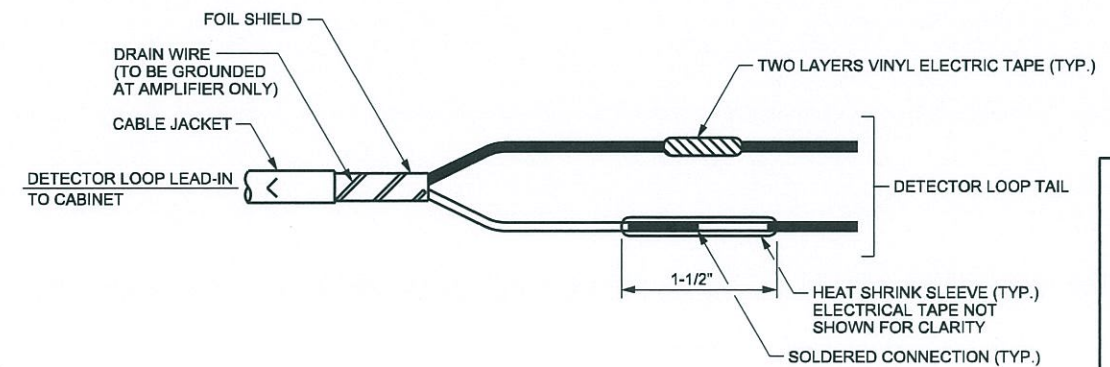
FIGURE EIGHT WINDING DETAIL

WINDING DETAIL

SAWCUT DETAIL

**DUAL LOOP DETECTOR CONFIGURATION**

**STANDARD LOOP DETECTOR CONFIGURATION**



**LOOP SPLICE DETAIL**

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DRAWING REVISIONS			
REVISION	DATE	BY	DESCRIPTION



Guam Department of Public Works  
542 North Marine Corps Drive  
Tamuning, Guam 96913  
Tel: (671) 646-3131  
Fax: (671) 649-6178

**DETECTOR LOOP DETAILS  
SHEET 1 OF 2**

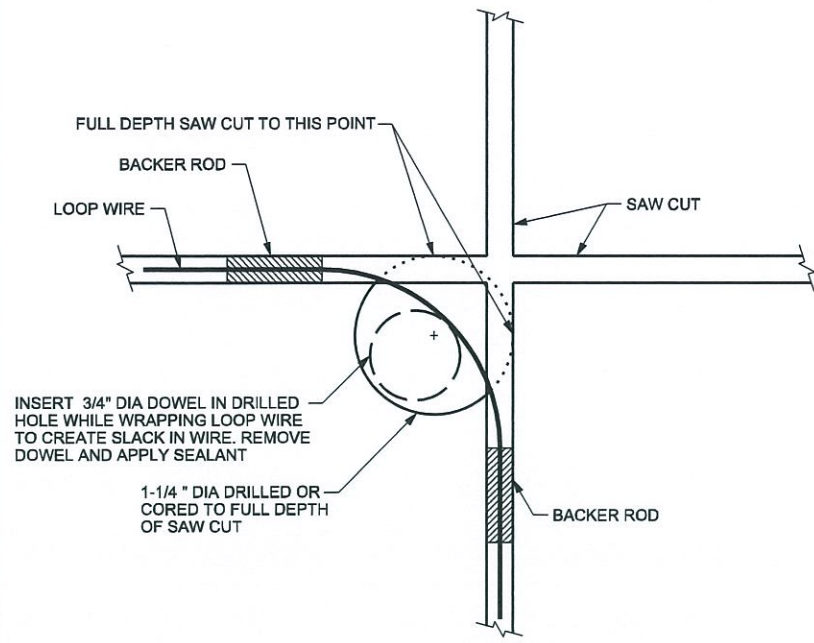
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DEPARTMENT OF PUBLIC WORKS  
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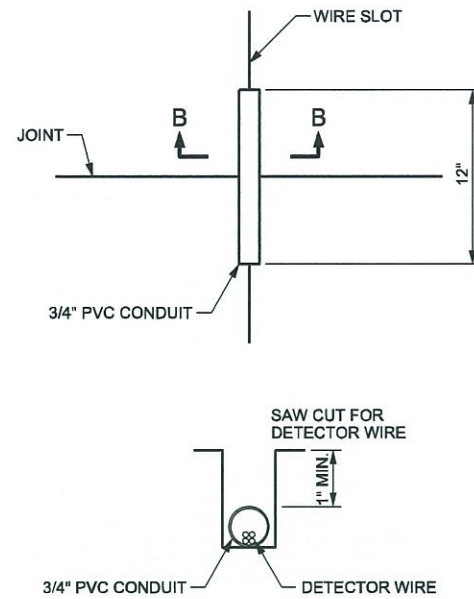
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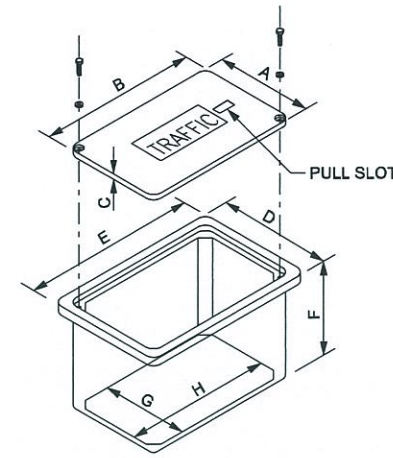
**CORING SAWCUT CORNERS**

**DETAIL A**

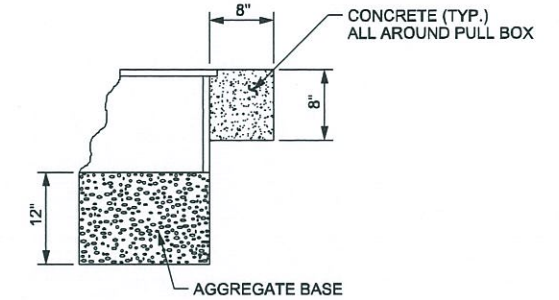


**SECTION B-B**

**DETECTOR WIRE ACROSS BRIDGE JOINTS**

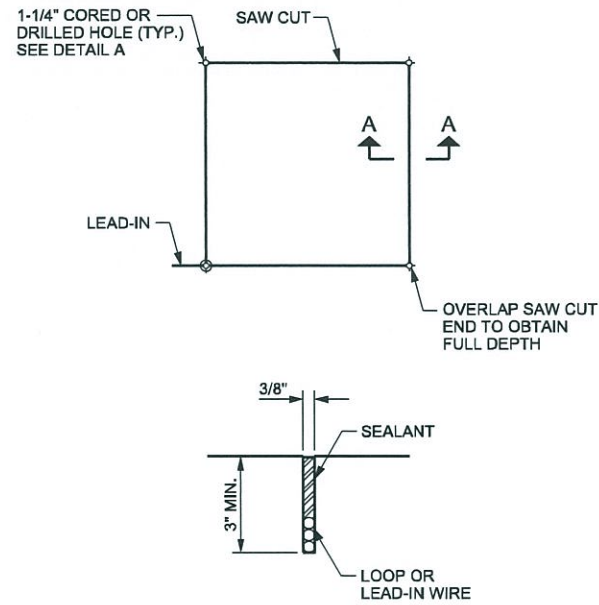


DESCRIPTION	DIMENSIONS (IN.)							
	A	B	C	D	E	F	G	H
TYPE A	13-3/4"	23-1/4"	2"	15-1/2"	25"	12"	10-1/4"	19-1/4"
TYPE B	17-1/2"	30-1/2"	2"	19-1/4"	32-1/4"	12"	13-1/2"	26-1/2"
TYPE C	30-1/8"	47-5/8"	3"	32"	49-5/8"	36"	26-5/8"	43-5/8"



FIBERGLASS REINFORCED POLYMER CONCRETE DESIGNED FOR INCIDENTAL VEHICULAR TRAFFIC (15,000 LBS ON A 10" x 10" AREA)

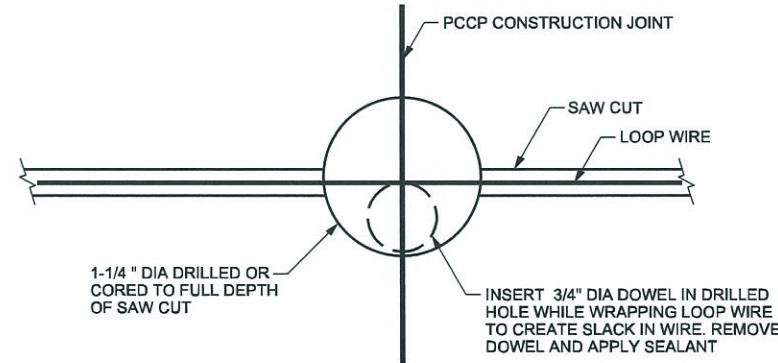
**PRECAST PULL BOX**



**SECTION A-A**

**ALTERNATE VEHICLE DETECTOR LOOP SAW CUT DETAILS**

(FOR USE WITH IMSA 51-5 OR 51-7 INDUCTIVE LOOP DETECTOR CABLE)



**SAWCUT ACROSS RIGID PAVEMENT JOINTS**

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DETECTOR LOOP DETAILS  
SHEET 2 OF 2

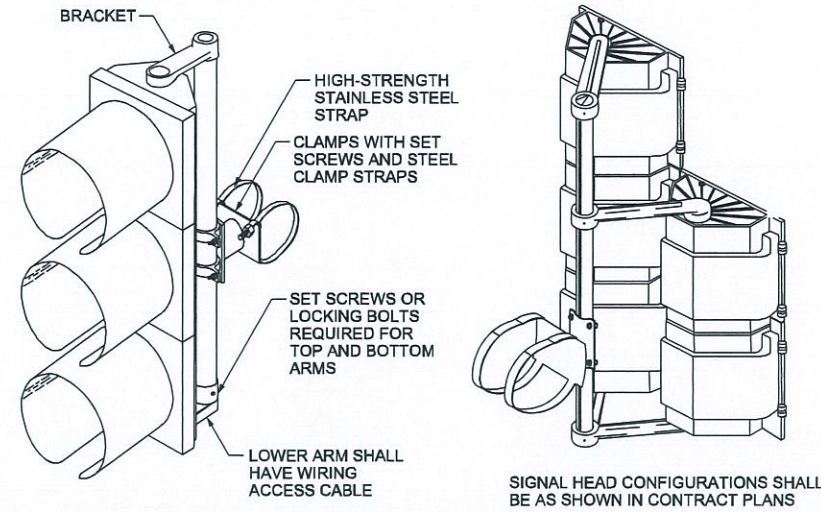
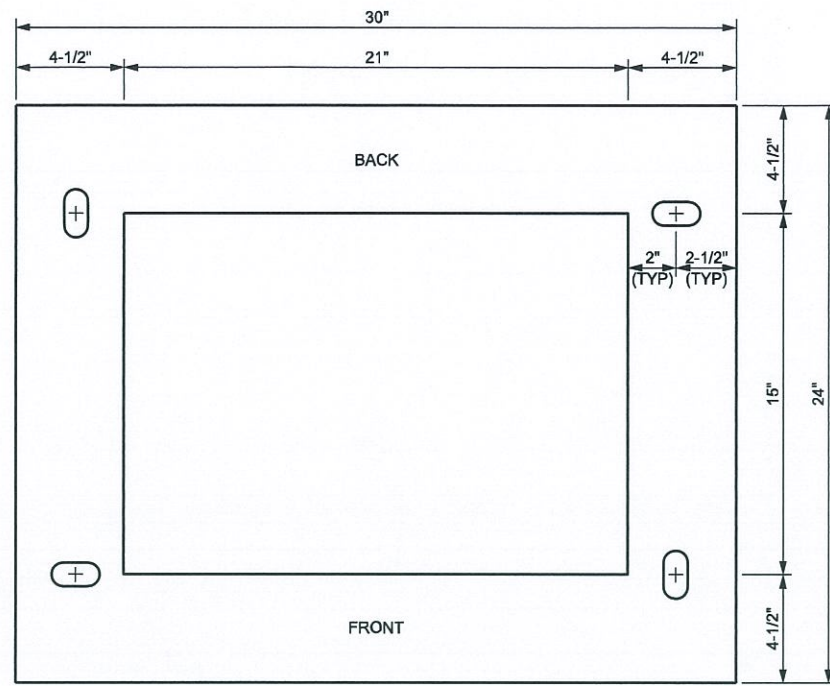
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STANDARD NO.

636-07

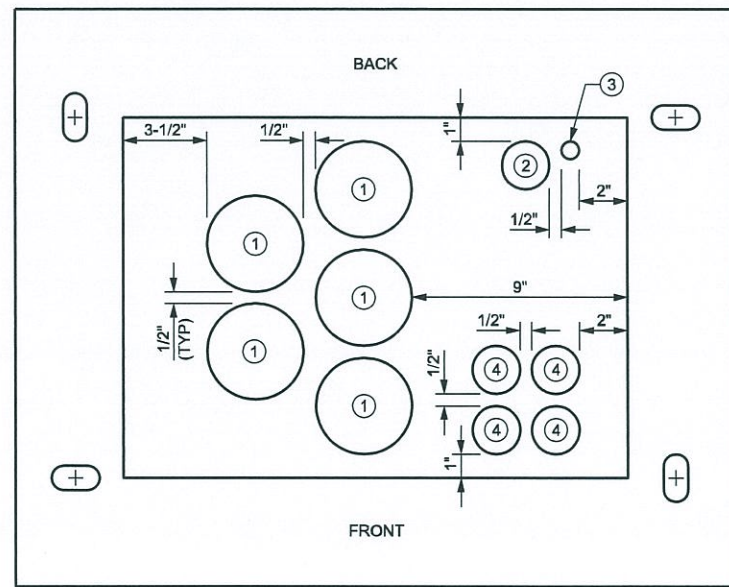




**ASTRO - TYPE MOUNTING BRACKET**

TRAFFIC SIGNAL CONDUCTOR ASSIGNMENTS					
5C PEDESTRIAN PUSH BUTTON			7C SIGNAL CABLE		
NO.	COLOR	FUNCTION	NO.	COLOR	FUNCTION
1	BLACK	PUSH BUTTON CALL	1	GREEN	SIGNAL GREEN
2	WHITE	PUSH BUTTON RETURN	2	ORANGE	SIGNAL YELLOW
3	RED	SPARE	3	RED	SIGNAL RED
4	GREEN	SPARE	4	WHITE	NEUTRAL
5	ORANGE	SPARE	5	BLACK	SPARE
			6	BLUE	SPARE
			7	WHITE/BLACK	SPARE

**332 CONTROLLER CABINET BASE PLATE TEMPLATE**



- ① 4" CONDUIT: VEHICLE & PEDESTRIAN SIGNAL HEAD PEDESTRIAN PUSH BUTTON OPTICOM SENSOR
- ② 2" CONDUIT: POWER SUPPLY
- ③ 3/4" CONDUIT: POWER SUPPLY GROUND WIRE
- ④ 2" CONDUIT: SENSOR LOOP (TYP)

**332 CONTROLLER CABINET CONDUIT CONFIGURATION**

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**MISCELLANEOUS TRAFFIC SIGNAL DETAILS**

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636-08