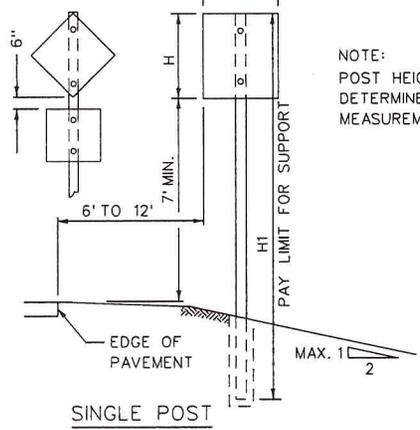
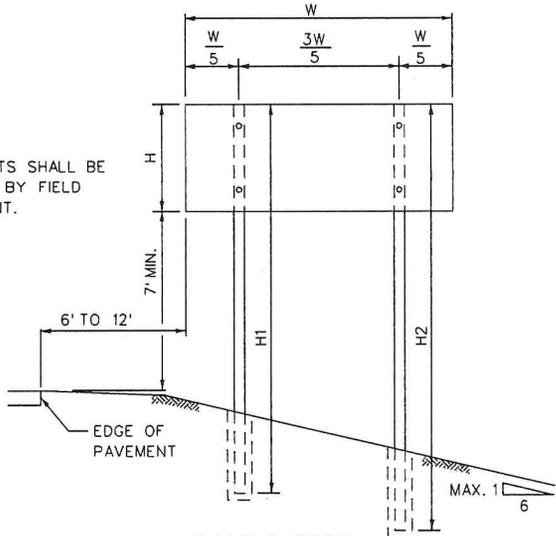


TYP. SIGN SEPARATION ON POST

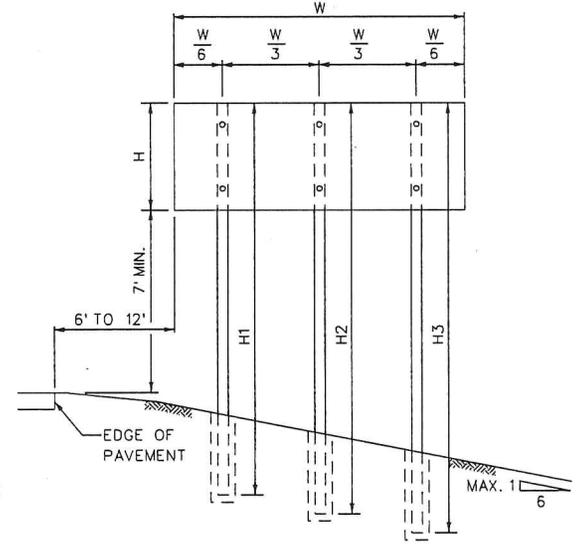


SINGLE POST

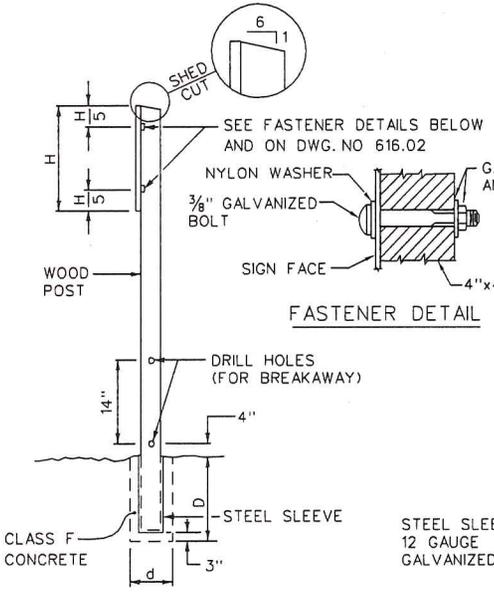
NOTE: POST HEIGHTS SHALL BE DETERMINED BY FIELD MEASUREMENT.



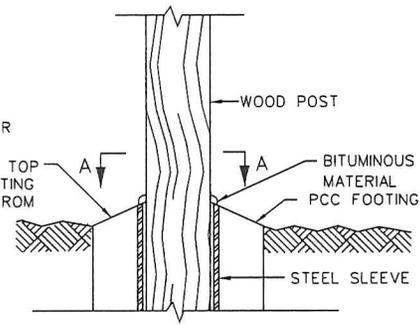
DOUBLE POST



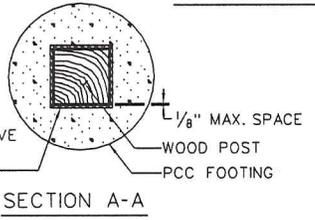
TRIPLE POST



FASTENER DETAIL



TYPICAL POST AND FOOTING



SECTION A-A

POST SIZE	d MIN.	D MIN.	MAXIMUM SIGN AREA (SQUARE FEET)			DIAM. OF DRILL HOLES INCHES
			SINGLE POST	DOUBLE POST	TRIPLE POST	
4 X 4	12"	3'	8 ▽	15	20	-
4 X 6	14"	4'	15 †	28	38	1/2"
6 X 6	16"	4'	20 †	42	58	2"

▽ USE DOUBLE 4X4 POSTS IF W IS OVER 3'
 † USE DOUBLE 4X6 POSTS IF W IS OVER 4'

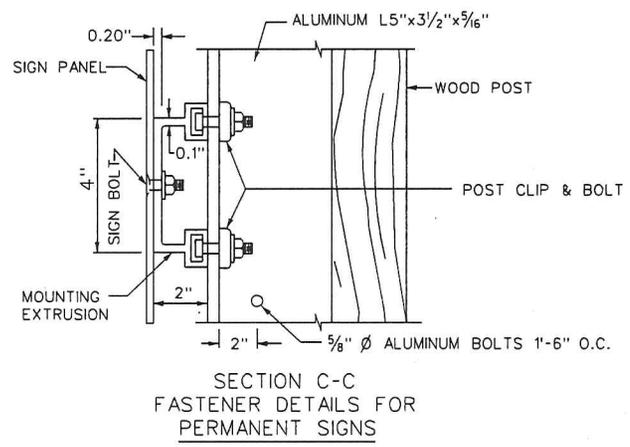
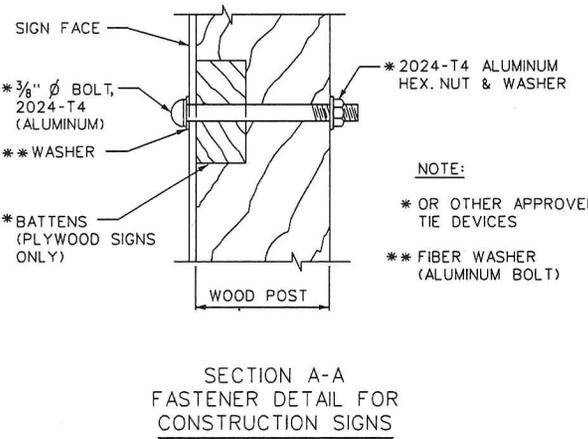
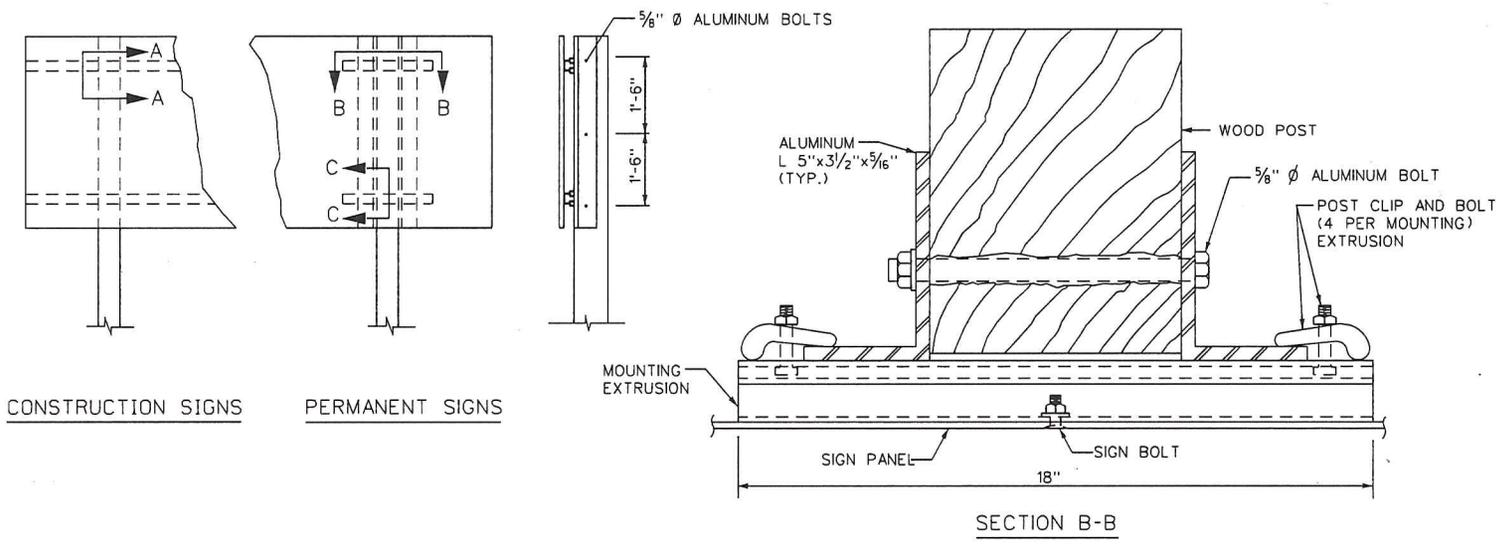
- NOTES:
1. LOCATION AND HEIGHTS SHALL BE IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, CURRENT EDITION.
 2. BREAKAWAY IS REQUIRED FOR POSTS WITH CROSS SECTION 16 SQUARE INCHES OR LARGER. DRILL HOLES TO BE PERPENDICULAR TO PAVEMENT EDGE IN THE LARGEST FACE.
 3. WOODEN SIGN SUPPORTS SHALL BE SOUTHERN PINE OR DOUGLAS FIR.
 4. FOR USE IN SUITABLE SOIL ONLY.

ISSUED: 8/2015	RECOMMENDED: <i>Adil Rijaz</i>
REVISION	APPROVAL
	PROJECT MANAGER
	APPROVED: <i>Muhammed Khalid</i>
	CHIEF ENGINEER

PERMANENT
 BREAKAWAY WOOD SIGN POST
 SMALL SIGNS

d. DISTRICT OF COLUMBIA
 DEPARTMENT OF TRANSPORTATION

DWG. NO. 616.01



ISSUED: 8/2015	RECOMMENDED: <i>Adil Riaz</i>
REVISION	APPROVAL
	PROJECT MANAGER
	APPROVED: <i>Muhammed Khalid</i>
	CHIEF ENGINEER

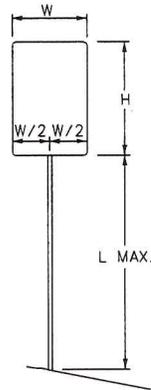
**SIGN FASTENER
WOODEN POST DETAILS**

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

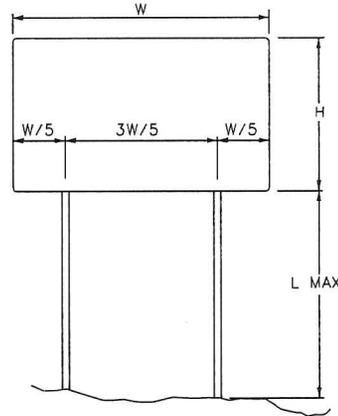
DWG. NO. 616.02

DESIGN FACTORS:

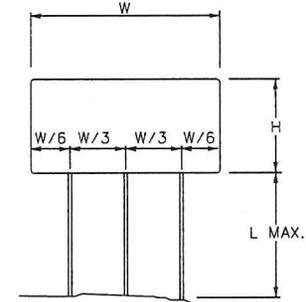
1. WIND LOAD = 80 MPH.
2. POST STEEL IS AASHTO M183.
3. MAXIMUM L = 8 FEET.
4. POST SELECTION IS DERIVED FROM THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, CURRENT EDITION.
5. FOR SIGNS LESS THAN 50 SQ. FEET, SEE DRAWING NO. 616.04 & 616.05.
6. FOR LARGER SIGNS, SEE DRAWING NO. 616.06.



SIGN ON ONE POST



SIGN ON TWO POSTS



SIGN ON THREE POSTS

POST SELECTION CODE:

- | | | | |
|----|-----|---|-----|
| 1 | S3 | x | 5.7 |
| 2 | S4 | x | 7.7 |
| 3 | W6 | x | 9 |
| 4 | W6 | x | 12 |
| 5 | W6 | x | 15 |
| 6 | W8 | x | 18 |
| 7 | W8 | x | 21 |
| 8 | W10 | x | 22 |
| 9 | W12 | x | 26 |
| 10 | W14 | x | 30 |

1 POST

H	W			
	2'	3'	4'	5'
2'	1	1	2	3
3'	1	2	3	-
4'	2	2	-	-
5'	3	3	-	-
6'	3	-	-	-
7'	-	-	-	-
8'	-	-	-	-
9'	-	-	-	-
10'	-	-	-	-
11'	-	-	-	-
12'	-	-	-	-
13'	-	-	-	-
14'	-	-	-	-
15'	-	-	-	-

2 POSTS

H	W												
	4'	5'	6'	7'	8'	10'	12'	14'	16'	18'	20'	22'	24'
2'	-	-	-	-	-	-	-	-	-	-	-	-	-
3'	-	1	1	1	1	1	-	-	-	-	-	-	-
4'	1	1	1	2	2	2	2	3	3	3	3	3	4
5'	1	1	2	2	2	2	3	3	3	4	4	4	4
6'	1	2	2	2	2	3	3	3	4	4	4	5	5
7'	1	2	2	3	3	3	4	4	4	5	5	5	6
8'	2	2	2	3	3	4	4	4	5	5	6	6	6
9'	2	3	3	3	3	4	4	5	5	6	6	6	7
10'	2	3	3	3	4	4	5	5	6	6	6	7	7
11'	2	3	3	3	4	5	5	6	6	7	7	8	8
12'	3	3	4	4	4	5	6	6	7	7	8	8	8
13'	-	-	4	4	4	5	5	6	6	7	8	8	9
14'	-	-	5	5	6	6	7	8	9	10	10	-	-
15'	-	-	5	6	6	7	8	9	10	-	-	-	-

3 POSTS

H	W									
	14'	16'	18'	20'	22'	24'	26'	28'	30'	
2'	-	-	-	-	-	-	-	-	-	
3'	-	-	-	-	-	-	-	-	-	
4'	2	2	2	2	3	3	3	3	3	
5'	2	3	3	3	3	3	3	4	4	
6'	3	3	3	3	4	4	4	4	5	
7'	3	3	4	4	4	4	5	5	5	
8'	3	4	4	4	5	5	5	5	6	
9'	4	4	5	5	5	5	6	6	6	
10'	4	5	5	5	6	6	6	6	6	
11'	5	5	5	6	6	6	6	7	7	
12'	5	5	6	6	6	7	7	7	8	
13'	5	6	6	6	7	7	8	8	8	
14'	6	7	7	8	9	9	9	10	10	
15'	6	8	8	9	9	10	10	-	-	

ISSUED:	8/2015
REVISION	APPROVAL

RECOMMENDED: *Adil Rijaz*
PROJECT MANAGER

APPROVED: *Muhammed Khelid*
CHIEF ENGINEER

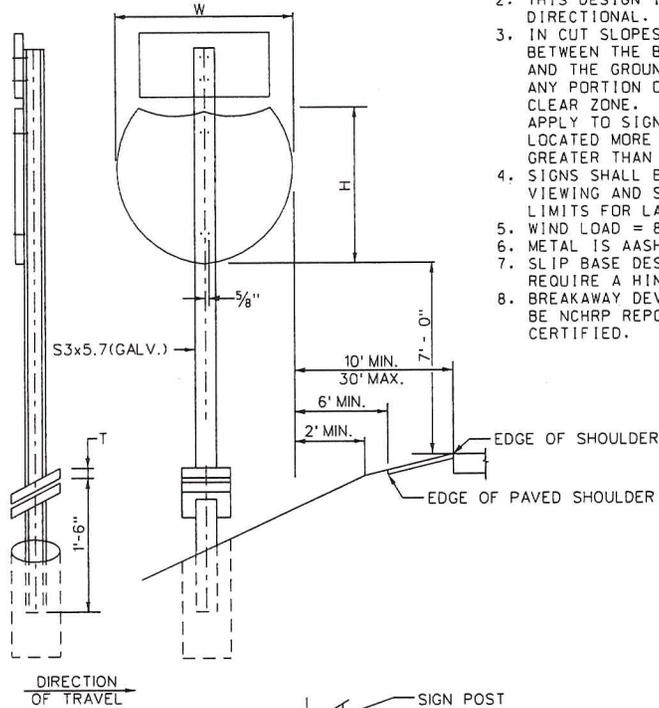
**METAL BREAKAWAY POSTS
POST SELECTION**

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

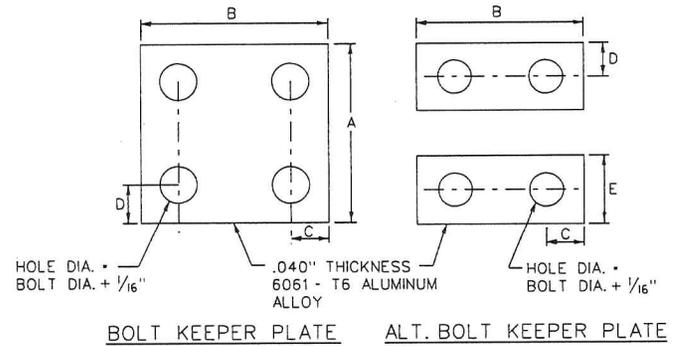
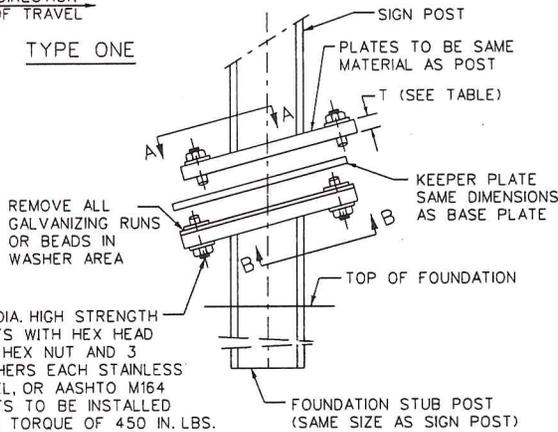
DWG. NO. 616.03

NOTES:

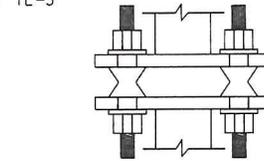
1. FOR USE WITH SMALL SIGNS (LESS THAN 50 SQ. FEET).
2. THIS DESIGN IS CONSIDERED DIRECTIONAL.
3. IN CUT SLOPES THE MINIMUM CLEARANCE BETWEEN THE BOTTOM OF THE SIGN AND THE GROUND SHALL BE 7 FEET FOR ANY PORTION OF THE SIGN WITHIN THE CLEAR ZONE. THIS REQUIREMENT WILL NOT APPLY TO SIGNS OR PORTIONS OF SIGNS LOCATED MORE THAN 10 FEET UP A SLOPE GREATER THAN 3:1.
4. SIGNS SHALL BE LOCATED TO PROVIDE OPTIMUM VIEWING AND SAFETY WITHIN THE INDICATED LIMITS FOR LATERAL PLACEMENT.
5. WIND LOAD = 80 MPH.
6. METAL IS AASHTO M270 GRADE 36.
7. SLIP BASE DESIGN DOES NOT REQUIRE A HINGE IN POST.
8. BREAKAWAY DEVICES SHALL BE NCHRP REPORT 350, TL-3 CERTIFIED.



TYPE ONE



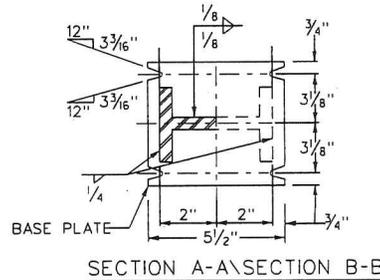
BOLT KEEPER PLATE ALT. BOLT KEEPER PLATE



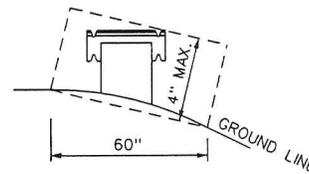
ALTERNATE TO KEEPER PLATE
4 - 5/8" BREAKAWAY BOLTS

BOLT KEEPER PLATE DATA

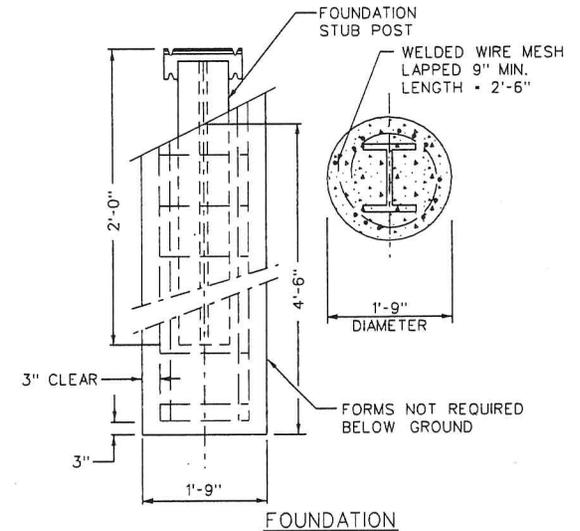
POST SHAPE	A	B	C	D	E	T
S3x5.7	3"	6 1/2"	1/2"	1/2"	1"	5/8"
S4x7.7	3"	7 1/2"	3/4"	3/4"	1 1/2"	5/8"
W6x12	7"	7 1/2"	3/4"	3/4"	1 1/2"	3/4"



SECTION A-A / SECTION B-B



MAX. PROJECTION OF STUB POST



FOUNDATION

ISSUED: 8/2015

RECOMMENDED:

REVISION APPROVAL

PROJECT MANAGER

APPROVED:

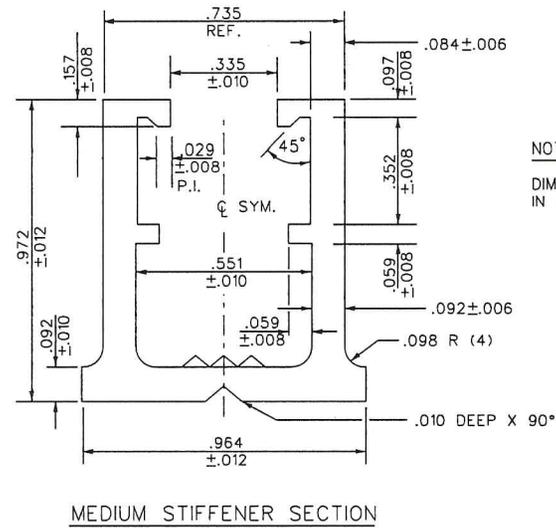
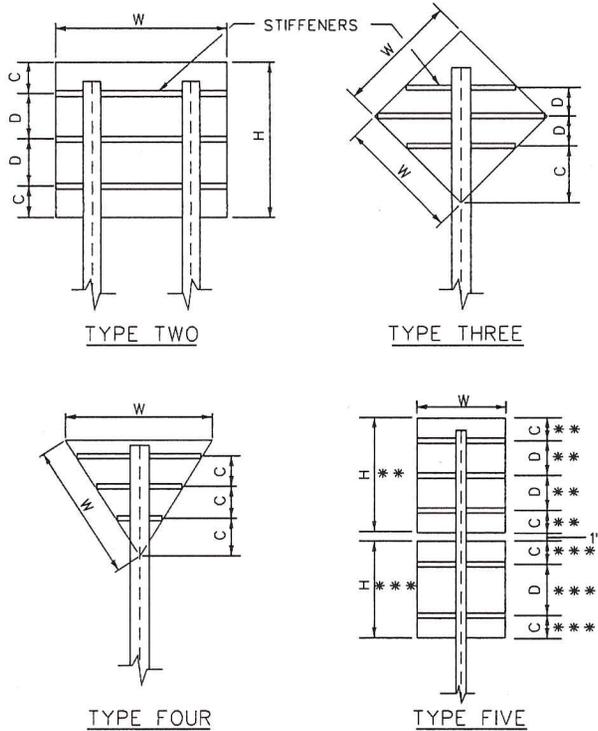
CHIEF ENGINEER

METAL BREAKAWAY POSTS
SMALL SIGNS
DETAIL - 1

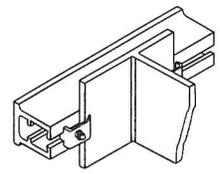
d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

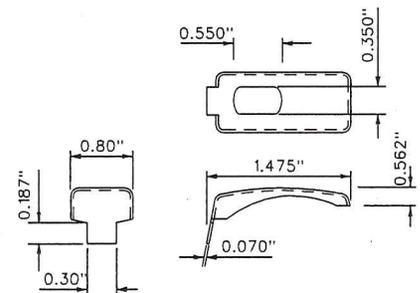
DWG. NO. 616.04



NOTE:
DIMENSIONS ARE
IN INCHES.

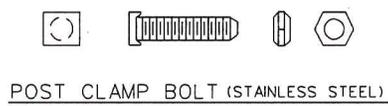


STIFFENER TO POST
ATTACHMENT DETAIL



POST CLAMP (STAINLESS STEEL)

STRUCTURE TYPE	W	H	C	D	STIFFENERS	
					NO.	SIZE
TWO	4'	4'	6"	3'-0"	2	MEDIUM
TWO	4'	5'	12"	1'-6"	3	MEDIUM
TWO	5'	3'	7"	1'-10"	2	MEDIUM
TWO	6'	5'	4"	1'-1"	5	MEDIUM
TWO	6'	6'	3.5"	1'-1"	6	MEDIUM
TWO	5'	5'	8"	1'-10"	3	MEDIUM
THREE	4'	—	8"	2'-2"	3	MEDIUM
FOUR	5'	—	1'-4"	—	3	MEDIUM
FIVE	4'	5'***	12'***	1'-6"***	3***	MEDIUM
	4'	4'***	6'***	3'-0'***	2***	MEDIUM



POST CLAMP BOLT (STAINLESS STEEL)

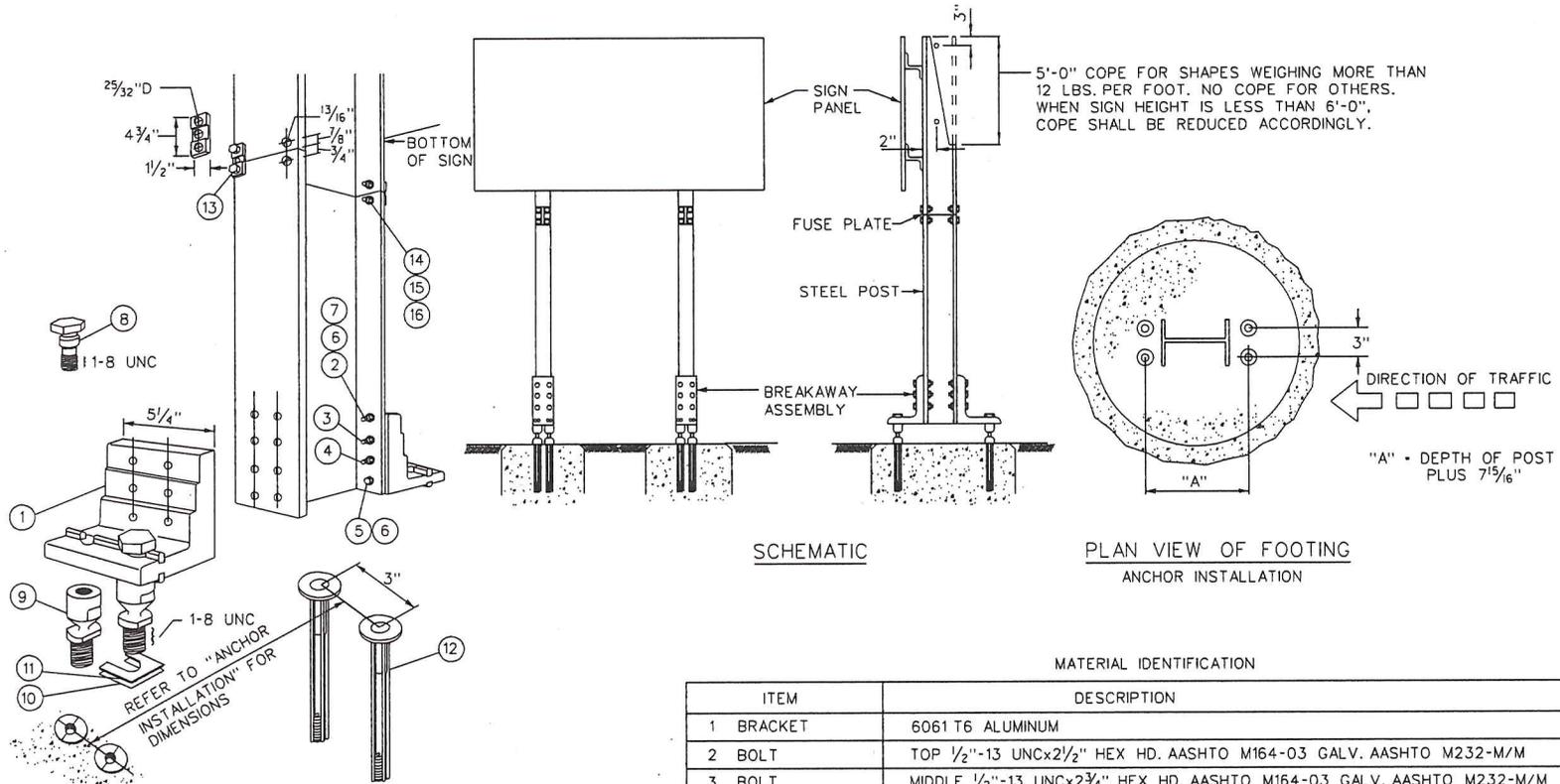
- NOTES:
1. ALL POST LENGTHS SHALL BE FIELD DETERMINED BY CONTRACTOR PRIOR TO FABRICATION.
 2. FOR ADDITIONAL INFORMATION, SEE DWG. NO. 616.04.
 3. USE OF STIFFENERS IS NOT REQUIRED ON SIGN SIZES OF 16 SQUARE FEET OR SMALLER.

ISSUED: 8/2015
 REVISION APPROVAL
 RECOMMENDED: *Adil Raza*
 PROJECT MANAGER
 APPROVED: *Muhammed Khalid*
 CHIEF ENGINEER

METAL BREAKAWAY POSTS
 SMALL SIGNS
 DETAIL - 2

d. DISTRICT OF COLUMBIA
 DEPARTMENT OF TRANSPORTATION

DWG. NO. 616.05



TYPICAL DESIGN FOR 6" AND 8" WF POSTS

NOTES:

1. SUPPORT SYSTEM WHEN TWO OR MORE WF POSTS ARE UTILIZED.
2. LENGTH OF UPPER AND LOWER POST TO BE DETERMINED BY DESIGNER.
3. REFERENCE: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS, CURRENT EDITION. BREAKAWAY DEVICES SHALL BE NCHRP REPORT 350, TL-3 CERTIFIED.
4. FOUNDATION DESIGN NOT SHOWN.
5. HINGE DESIGN TO BE INCORPORATED ON ALL LARGE GROUND MOUNT SIGNS (SIGN AREA GREATER THAN 50 SQUARE FEET).

SCHMATIC

PLAN VIEW OF FOOTING ANCHOR INSTALLATION

MATERIAL IDENTIFICATION

ITEM	DESCRIPTION
1 BRACKET	6061 T6 ALUMINUM
2 BOLT	TOP 1/2"-13 UNCx2 1/2" HEX HD. AASHTO M164-03 GALV. AASHTO M232-M/M
3 BOLT	MIDDLE 1/2"-13 UNCx2 3/4" HEX HD. AASHTO M164-03 GALV. AASHTO M232-M/M
4 BOLT	BOTTOM 1/2"-13 UNCx3" HEX HD. AASHTO M164-03 GALV. AASHTO M232-M/M
5 CAP SCREW	BRACKET 1/2"-13 UNCx1 1/4" HEX HD. ASTM A307 GALV. AASHTO M232-M/M
6 LOCKWASHER	1/2" ANSI 18-21-1 GALV. AASHTO 232-M/M
7 NUT	1/2" 13UNC HEAVY HEX. AASHTO M291 GR. DH. GALV. AASHTO 232-M/M
8 SPECIAL BOLT	1"-8 UNC AASHTO M164-03 GALV. AASHTO M298, M232-M/M
9 COUPLING	1"-8 UNC LP AMS6378D, GALV. AASHTO M298, M232-M/M
10 SHIM	1" HORSESHOE 18 GAUGE GALV. STEEL SHEET
11 SHIM	1" HORSESHOE 14 GAUGE GALV. STEEL SHEET
12 ANCHOR	1"-8 UNC 304 STAINLESS STEEL FERRULE ANSI 1038 ROD & ANSI 1008 COIL
13 HINGE PLATE	TYPE B525 ANSI 4130, GALV. AASHTO M111
14 BOLT	HINGE 3/4"-10 UNCx2 1/4" HEX HD. AASHTO M164-03 GALV. AASHTO M232-M/M
15 LOCKWASHER	3/4" ANSI 18-21-1 GALV. AASHTO M232-M/M
16 NUT	3/4"-10 UNC HEAVY HEX. AASHTO M291 GR. DH. GALV. AASHTO M232-M/M

ISSUED: 8/2015

RECOMMENDED:

Adil Raza
PROJECT MANAGER

REVISION APPROVAL

APPROVED:

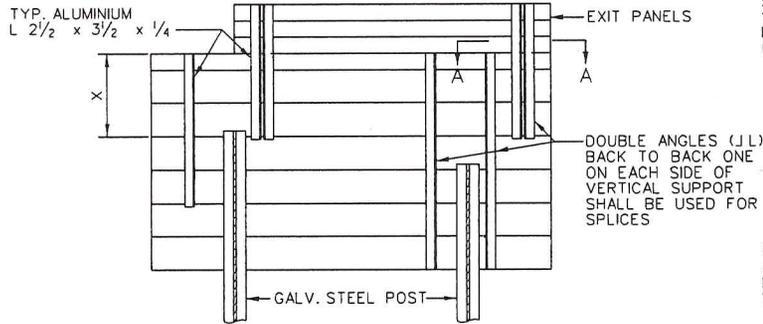
Muhammed Kholid
CHIEF ENGINEER

METAL BREAKAWAY POST SYSTEM
LARGE SIGNS

d.

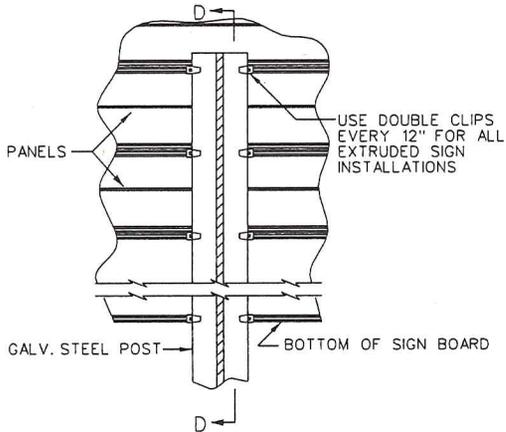
DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 616.06



VERTICAL SUPPORT SPLICE DETAIL

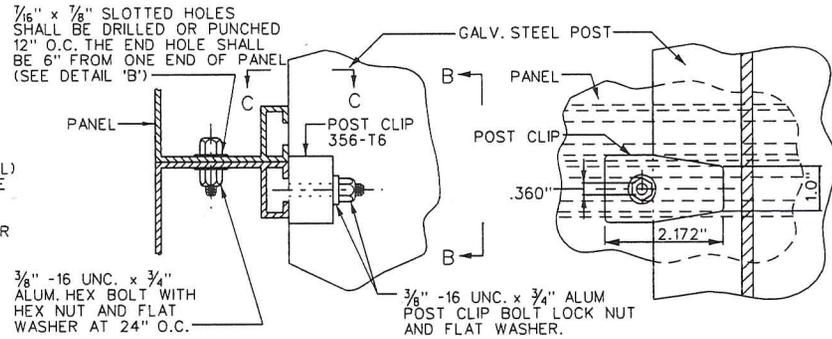
APPLICABLE ONLY TO MODIFICATIONS OF EXISTING SIGNS,
NOT NEW CONSTRUCTION. SEE NOTE 2.



NOTES:

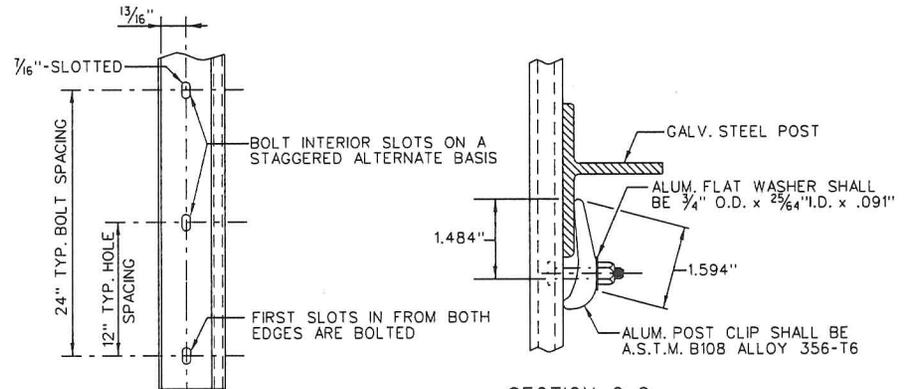
1. FOR NEW CONSTRUCTION, VERTICAL SUPPORTS ARE TO BE CONTINUOUS TO ENTIRE HEIGHT OF SIGN.
2. ON MODIFICATIONS, NON-CONTINUOUS SUPPORTS WILL BE PERMITTED. SPLICED DOUBLE ANGLES SHALL EXTEND A MIN. DISTANCE OF 'X' NOTED ABOVE. SPLICED SECTIONS 'X' OF 6'-0" OR MORE SHALL HAVE A W6X9 OR EQ. SECTION ATTACHED TO FULL HEIGHT OF SIGN.
3. ALL SUPPORTS SHALL BE POST CLIPPED AT 12" INTERVALS. THE BOTTOM PART OF THE SPLICED SUPPORT SECTIONS SHALL BE ATTACHED WITH AT LEAST TWO POST CLIPS.

VERTICAL SUPPORT ATTACHMENT DETAILS



SECTION A-A

SECTION B-B



SECTION D-D

SECTION C-C

DETAILS OF ASSEMBLING SIGN PANELS

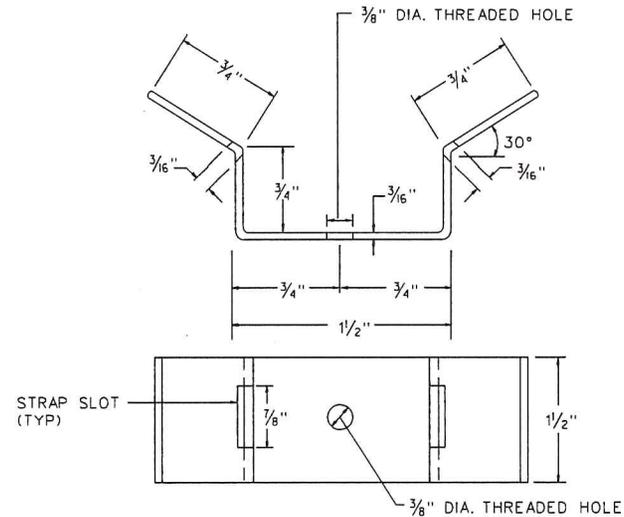
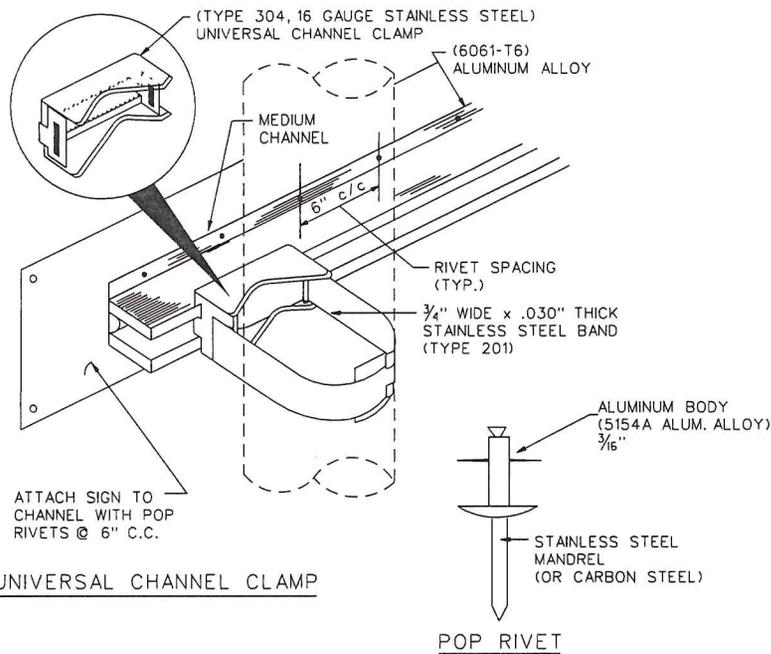
ISSUED: 8/2015	RECOMMENDED: <i>Adil Raza</i>
REVISION	APPROVAL
	PROJECT MANAGER
	APPROVED: <i>Muhammed Khalid</i>
	CHIEF ENGINEER

**EXTRUDED ALUMINUM DETAILS AND
SIGN PANEL ASSEMBLY - 1**

d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

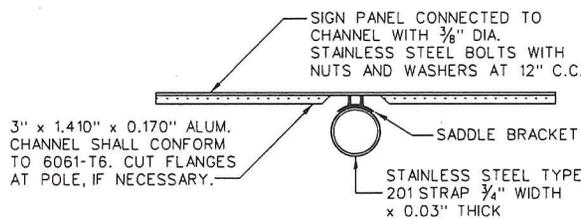
DWG. NO. 616.08



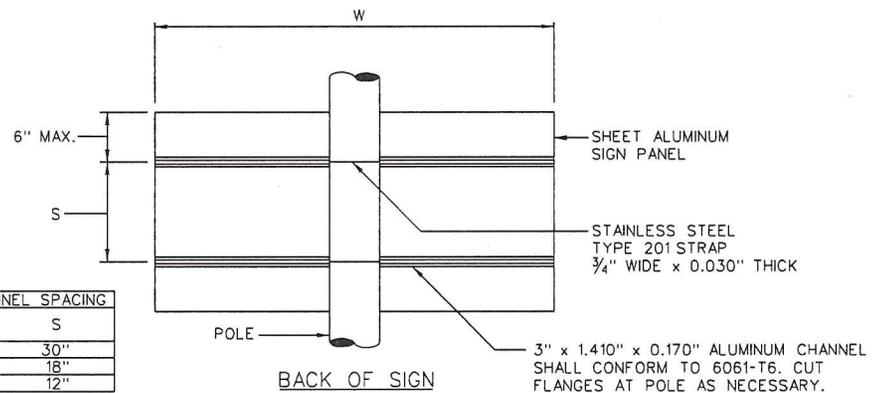
NOTES:

1. FOR SHEET ALUMINUM SIGNS 30" AND LESS IN WIDTH, STAINLESS STEEL BANDING WITH SADDLE BRACKETS CAN BE USED TO ATTACH SIGNS. NO HORIZONTAL BRACING CHANNELS ARE REQUIRED.
2. MAX SPACING OF BANDING STRAPS SHALL BE 12" CENTER-TO-CENTER.

**SIGN ATTACHMENT DETAIL
VERTICAL POLE INSTALLATION ONLY
(MAX. SIGN WIDTH 5'-0")**



CHANNEL SPACING	
W	S
36"	30"
48"	18"
60"	12"



ISSUED: 8/2015

REVISION APPROVAL

RECOMMENDED: *Adil Raj*
PROJECT MANAGER

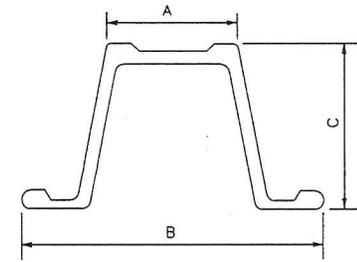
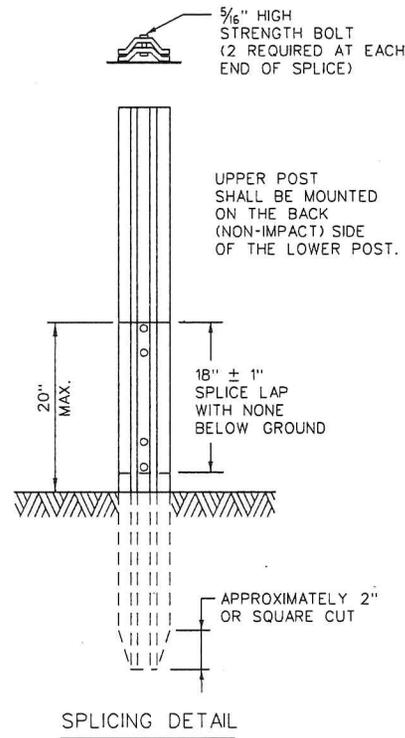
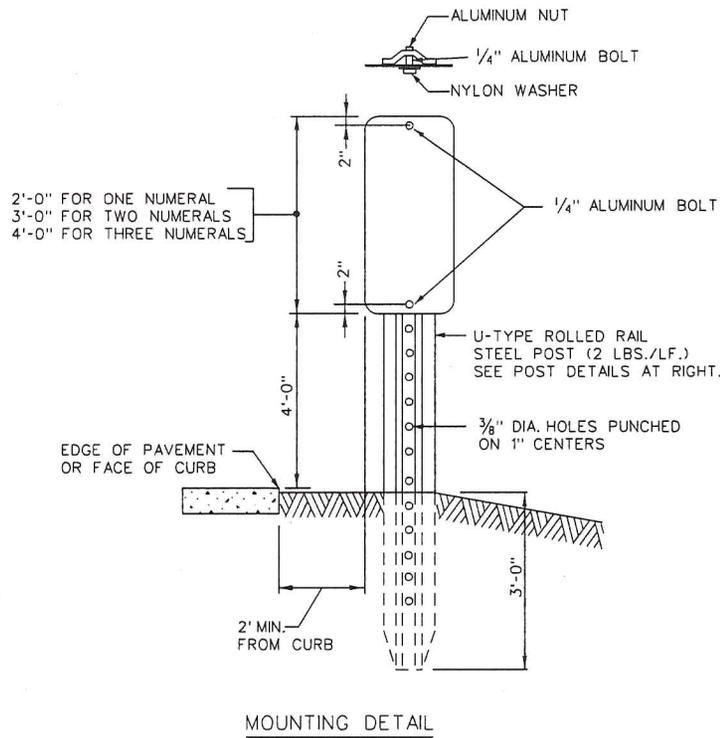
APPROVED: *Muhammed Khalid*
CHIEF ENGINEER

**EXTRUDED ALUMINUM DETAILS AND
SIGN PANEL ASSEMBLY - 2**

d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 616.09



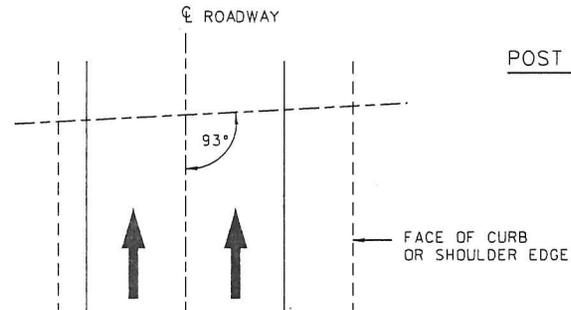
1.33 LB./LF.	
MIN.	MAX.
A. 1/2"	1"
B. 2"	2 1/4"
C. 3/4"	1 1/4"
2.00 LB./LF.	
MIN.	MAX.
A. 1 3/64"	1 9/32"
B. 3 1/16"	3 1/8"
C. 1 27/64"	1 33/64"
3.00 LB./LF.	
MIN.	MAX.
A. 1 17/64"	1 5/8"
B. 3 3/16"	3 1/2"
C. 1 1/2"	1 7/8"

LENGTH IS VARIABLE.
WEIGHT IS PER LINEAR FOOT.

POST SECTION DIMENSIONS

NOTES:

1. DRIVING CAP TO BE USED WHEN DRIVING POST.
2. PANEL TO BE FABRICATED OF ASTM B209 ALLOY 6061-T6 OR 5052-H38, 0.080" THICK, AND TYPE III SHEETING.
3. REFERENCE LOCATION SIGNS SHALL MEET THE REQUIREMENTS OF MUTCD SECTION 2D.45.
4. TOP OF PANEL TO BE FLUSH WITH TOP OF POST.
5. TO BE USED IN "STRONG SOIL" ONLY.
6. REFERENCE LOCATION MARKER TO BE LOCATED IN LINE WITH DELINEATOR POSTS, EDGE OF SHOULDER OR BACK OF GUARDRAIL, IF PRESENT.



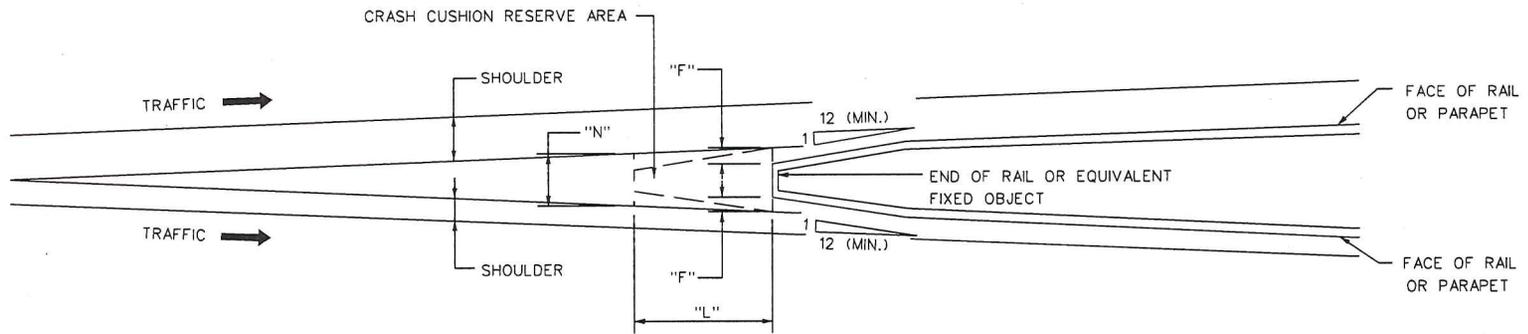
TYPICAL SIGN INSTALLATION ON SHOULDER

ISSUED: 8/2015	RECOMMENDED: <i>Adil Raza</i>
REVISION	APPROVAL
	PROJECT MANAGER
	APPROVED: <i>Muhammed Khalid</i>
	CHIEF ENGINEER

REFERENCE LOCATION SIGN
AND POST DETAILS

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 616.10



DESIGN SPEED ON MAINLINE (M.P.H.)	DIMENSIONS FOR CRASH CUSHION RESERVE AREA (FEET)								
	MINIMUM						PREFERRED		
	RESTRICTED CONDITIONS			UNRESTRICTED CONDITIONS					
	"N"	"L"	"F"	"N"	"L"	"F"	"N"	"L"	"F"
30	6	8	2	8	11	3	12	17	4
50	6	17	2	8	25	3	12	33	4
70	6	28	2	8	45	3	12	55	4

NOTES:

1. NO CURBS, RAISED PAVEMENT OR PROWS ARE TO BE BUILT OR REMAIN IN THE AREA SURROUNDING OR OCCUPIED BY THE CRASH CUSHION.
2. A CRASH CUSHION SHALL BE INSTALLED ONLY IF IT REDUCES THE SEVERITY OF POTENTIAL ACCIDENTS, AND THE RIGID OBJECT OR HAZARDOUS CONDITION CANNOT BE REMOVED, RELOCATED OR MADE BREAKAWAY.
3. RESERVE AREA DIMENSIONS WILL DETERMINE THE TYPE OF CRASH CUSHION BASED ON MANUFACTURER'S DESIGN.
4. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

ISSUED: 8/2015

RECOMMENDED:

Attila Raj
PROJECT MANAGER

APPROVED:

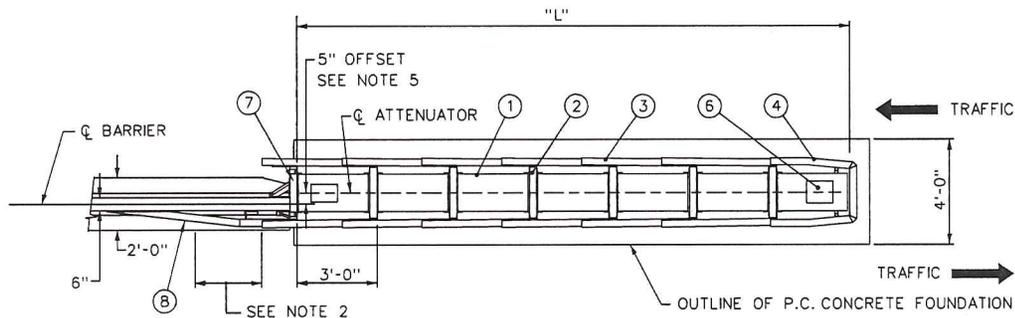
Muhammed Khalid
CHIEF ENGINEER

**CRASH CUSHION
RESERVE AREA**

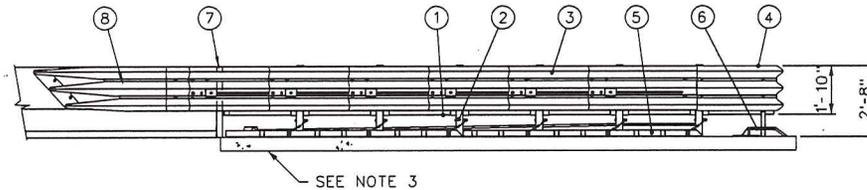
d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

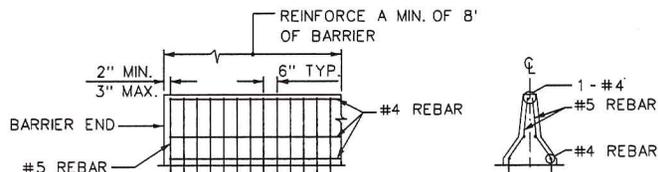
DWG. NO. 617.01



PLAN
(6 BAY UNIT SHOWN)



ELEVATION
LEFT SIDE



MINIMUM RECOMMENDED
REINFORCEMENT DETAIL

TYPICAL CRASH CUSHION
SIZE FOR DESIGN SPEED

ATTENUATOR LENGTH "L"	NO. OF BAYS	SPEED (MPH)
11'-9"	3	40 OR LESS
14'-9"	4	45
17'-9"	5	50
20'-9"	6	55
23'-9"	7	60
26'-9"	8	65

KEY

- ① CRUSHABLE CARTRIDGE
- ② DIAPHRAGM
- ③ FENDER PANEL
- ④ NOSE COVER
- ⑤ MONORAIL OR DOUBLE RAIL
- ⑥ ANCHOR BASE
- ⑦ RIGID BACK UP (FURNISHED W/SYSTEM)
- ⑧ TRANSITION PANEL (FURNISHED W/SYSTEM)

NOTES:

1. REMOVE ALL CURBS AND ISLANDS FOR PROPER IMPACT PERFORMANCE.
2. PROVISION SHALL BE MADE FOR REAR FENDER PANELS CLEARANCE TO SLIDE REARWARD UPON IMPACT.
3. 6" MIN. REINFORCED CLASS E PCC FOUNDATION OR 8" MIN. NONREINFORCED CLASS E PCC ROADWAY, OR AS SPECIFIED BY THE MANUFACTURER OF THE APPROVED SYSTEM.
4. CAUTION: ϕ OF CRASH CUSHION SHALL BE PARALLEL WITH ϕ OF BARRIER $\pm 1^\circ$.
5. 5" OFFSET IS BASED ON USING CONCRETE BARRIER (CB) WITH A 6" TOP. ANY VARIANCE FROM THIS MUST BE COMPENSATED BY CHANGING THE OFFSET BETWEEN THE UNIT C_L AND THE CONCRETE BARRIER C_L OFFSET $\cdot 8" - \frac{(\text{WIDTH OF CB TOP})}{2}$.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL OF SELECTED CRASH CUSHION SYSTEM, AND NCHRP REPORT 350, TL-2 OR TL-3 CERTIFICATION.
7. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

ISSUED: 8/2015
REVISION APPROVAL

RECOMMENDED: *Adil Raza*
PROJECT MANAGER

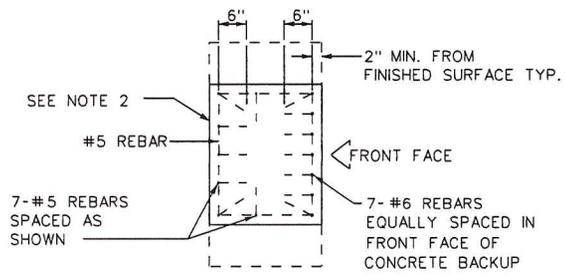
APPROVED: *Muhammed Khalid*
CHIEF ENGINEER

TYPICAL CRASH CUSHION SYSTEM
WITH NEW JERSEY OR F SHAPE
ATTACHED BACKUP AND LEFT SIDE 5"
OFFSET TRANSITION PANEL

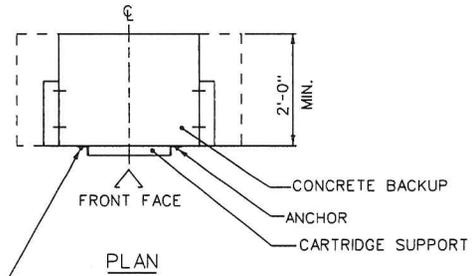
d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 617.02

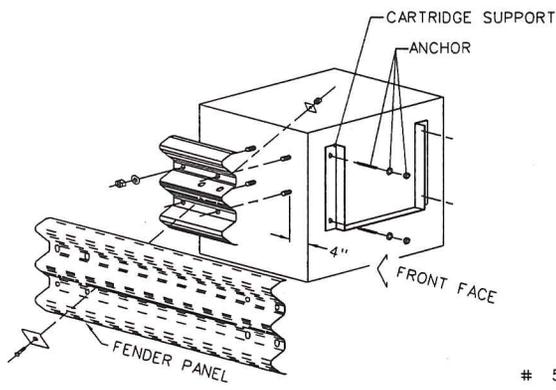


PLAN REINFORCEMENT DETAIL

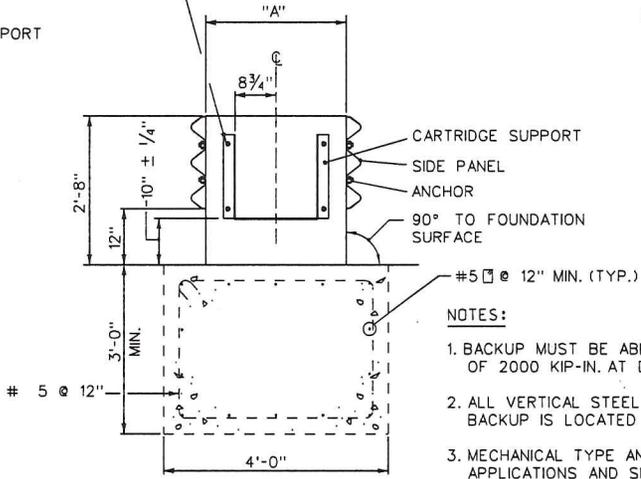


USE ANCHOR TO ATTACH CARTRIDGE SUPPORT BRACKET TO CONCRETE, RECOMMENDED HOLE DEPTH 3/4" TORQUE SHALL BE 20 FT.-LBS.

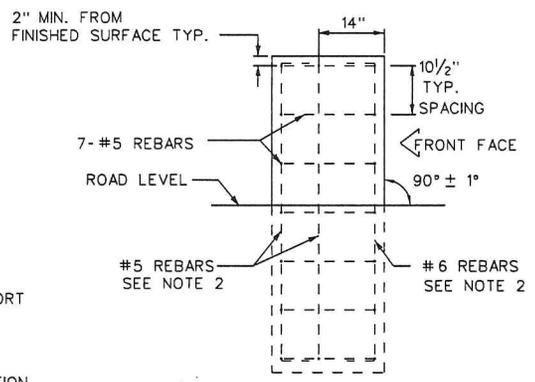
TYPICAL BACKUP WIDTHS	
WIDTH	"A"
NARROW	2'-0"
MEDIUM	2'-6"
WIDE	3'-0"



SIDE PANEL INSTALLATION



ELEVATION



SIDE VIEW REINFORCEMENT DETAIL

NOTES:

1. BACKUP MUST BE ABLE TO WITHSTAND A MAXIMUM OVERTURNING MOMENT OF 2000 KIP-IN. AT DECK LINE FOR DURATION OF ±40 MILLISECONDS.
2. ALL VERTICAL STEEL SHALL BE DOWELED INTO DECK IF CONCRETE BACKUP IS LOCATED ON DECK STRUCTURE.
3. MECHANICAL TYPE ANCHORS MAY BE SUBSTITUTED IN HORIZONTAL APPLICATIONS AND SHALL BE SUPPLIED BY OTHERS. THE SUBSTITUTED ANCHORS SHALL BE THE SAME DIAMETER AS THE MP-3 ANCHORS AND SHALL HAVE THE FOLLOWING MINIMUM PULLOUT STRENGTHS: 3/8" DIA. - 2,760 POUNDS; 1/2" DIA. - 11,000 POUNDS.
4. RIGID BACKUP ASSEMBLY SHALL CONFORM TO MANUFACTURER'S SPECIFICATIONS.
5. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

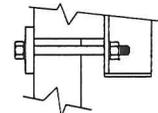
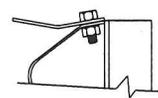
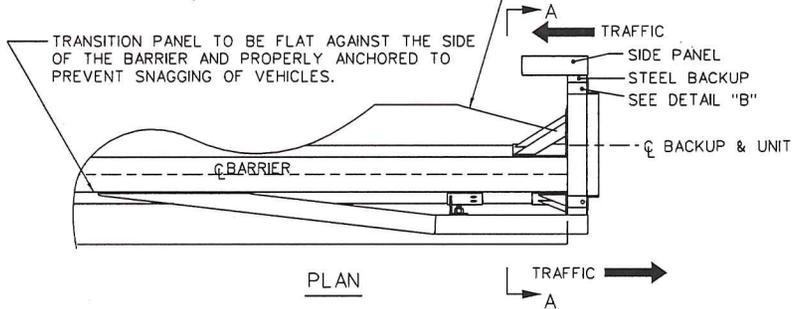
ISSUED: 8/2015	RECOMMENDED: <i>Adil Raza</i>
REVISION	APPROVAL
	PROJECT MANAGER
	APPROVED: <i>Muhammed Khalid</i>
	CHIEF ENGINEER

TYPICAL CRASH CUSHION SYSTEM RIGID BACKUP ASSEMBLY

d. DISTRICT OF COLUMBIA DEPARTMENT OF TRANSPORTATION

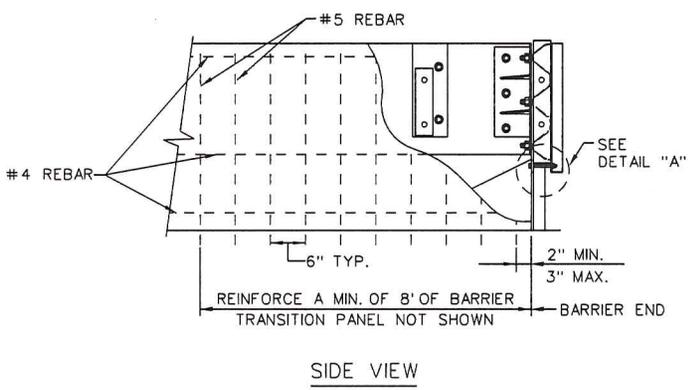
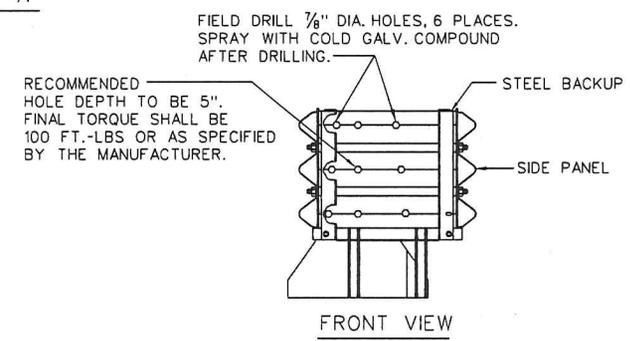
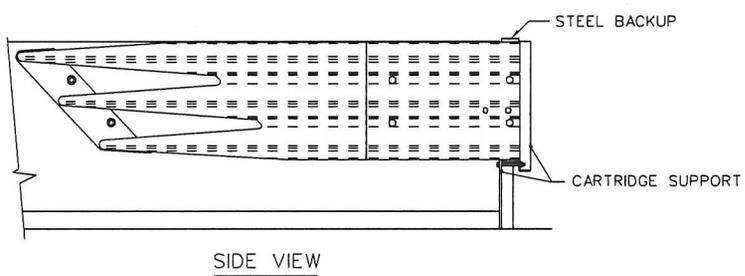
DWG. NO. 617.03

THE "2002 AASHTO ROADSIDE DESIGN GUIDE" RECOMMENDS TAPERING THE BOTTOM PORTION OF THE BARRIER TO PREVENT SNAGGING OF VEHICLES.

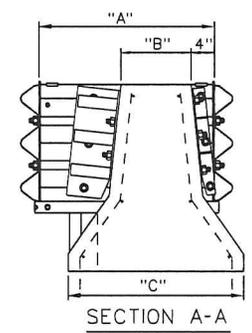


TYPICAL BACKUP DIMENSIONS

TABLE			
WIDTH	"A"	"B"	"C"
NARROW	2'-0"	6" TO 10"	24" TO 28"
MEDIUM	2'-6"	10" TO 17"	28" TO 35"
WIDE	3'-0"	17" TO 23"	35" TO 41"



- NOTE:
- DIMENSIONS AND DETAILS OF ATTACHMENT HARDWARE TO BE SHOWN ON THE SHOP DRAWINGS SUPPLIED BY THE MANUFACTURER.
 - CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.



ISSUED: 8/2015

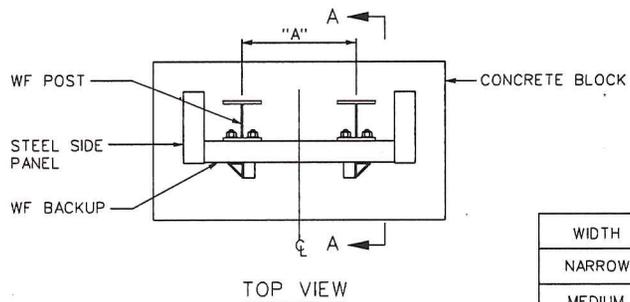
RECOMMENDED: *Adil Raza*
PROJECT MANAGER

APPROVED: *Muhammed Khalid*
CHIEF ENGINEER

TYPICAL CRASH CUSHION SYSTEM
BACKUP ASSEMBLY FOR
NEW JERSEY OR F SHAPE MEDIAN
BARRIER (BIDIRECTIONAL)

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 617.04

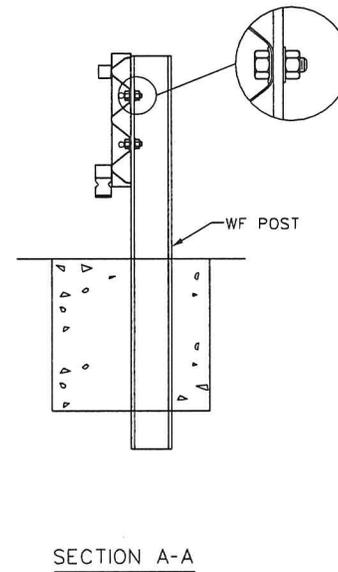
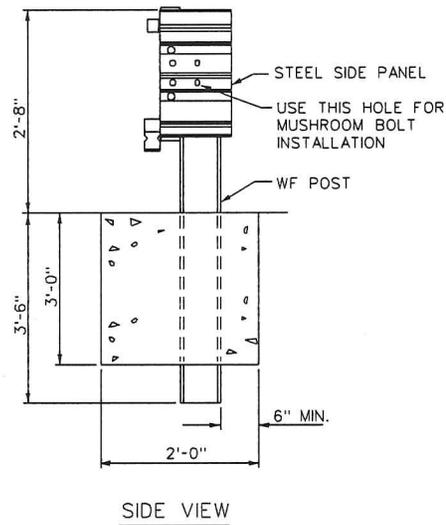
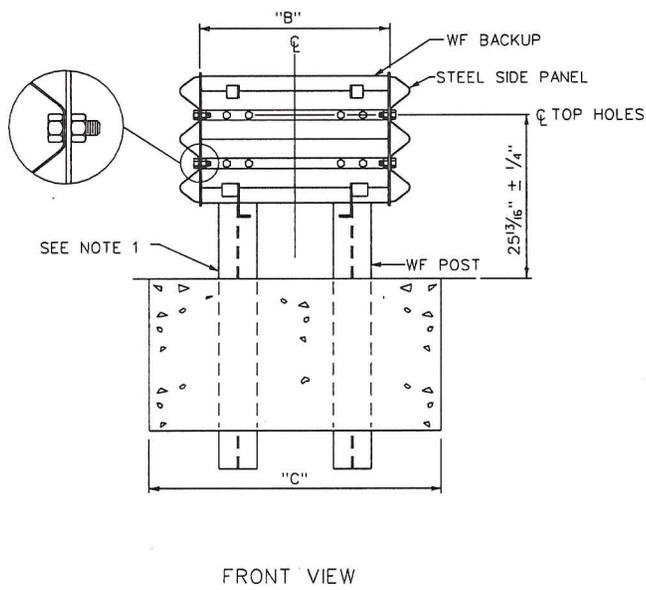


TYPICAL BACKUP DIMENSIONS

WIDTH	"A"	"B"	"C"
NARROW	1'-0"	2'-0"	3'-7 $\frac{1}{2}$ "
MEDIUM	1'-6"	2'-6"	5'-0"
WIDE	2'-0"	3'-0"	8'-6"

NOTES:

1. PRE-ASSEMBLE BACKUP TO WIDE FLANGE (WF) POSTS PRIOR TO EMBEDDING IN CONCRETE.
2. DIMENSIONS AND DETAILS OF ATTACHMENT HARDWARE TO BE SHOWN ON THE SHOP DRAWINGS SUPPLIED BY THE MANUFACTURER.
3. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

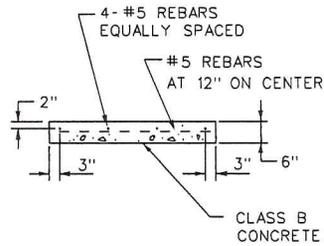


ISSUED: 8/2015	RECOMMENDED: <i>Adil Raj</i>
REVISION	APPROVAL
	PROJECT MANAGER
	APPROVED: <i>Muhammed Khalid</i>
	CHIEF ENGINEER

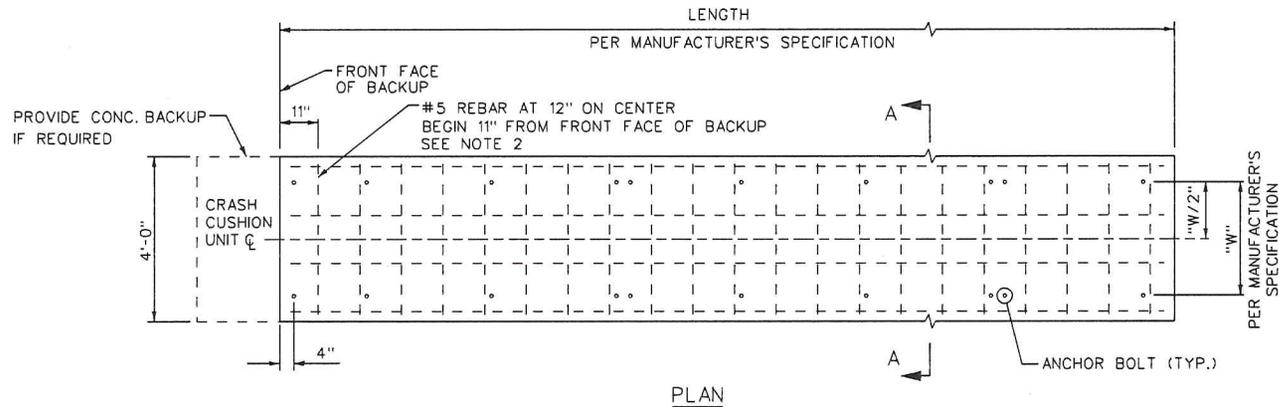
**TYPICAL CRASH CUSHION SYSTEM
WIDE FLANGE BACKUP ASSEMBLY**

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 617.05



SECTION A-A



NOTES:

1. USE RAIL FOR ANCHOR BOLT LAYOUT TEMPLATE.
2. PLACE REBAR TO AVOID INTERFERENCE WHEN DRILLING ANCHOR BOLT HOLES.
3. CROSS SLOPE OF PAD SHALL NOT EXCEED 8% AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
4. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

ISSUED: 8/2015

REVISION APPROVAL

RECOMMENDED: *Adil Raj*
PROJECT MANAGER

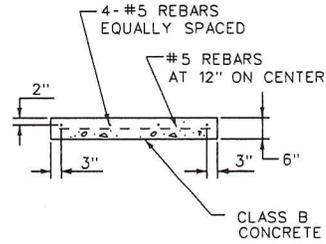
APPROVED: *Muhammed Khalid*
CHIEF ENGINEER

TYPICAL CRASH CUSHION SYSTEM
CONCRETE FOUNDATION AND
BOLT LAYOUT
(FOR CONCRETE BACKUPS)

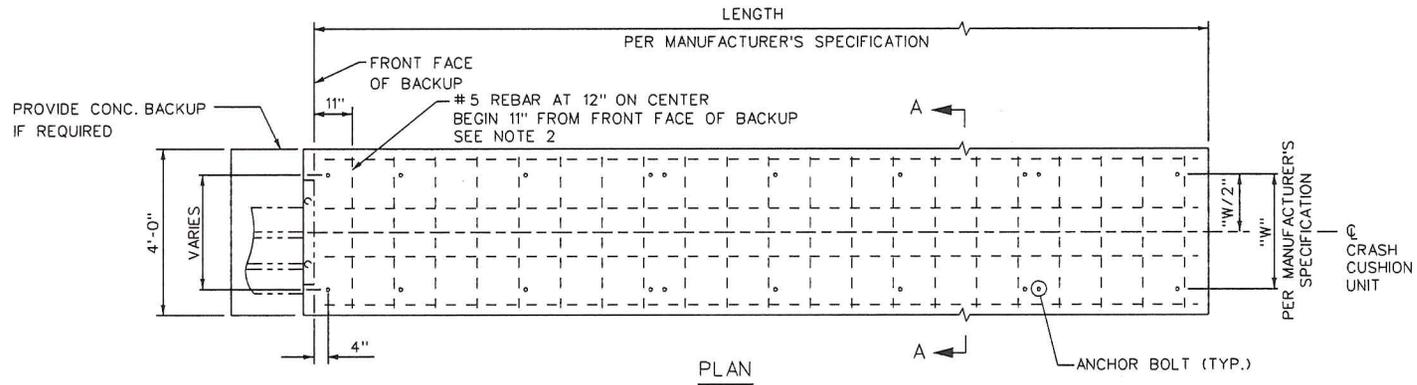
d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 617.06



SECTION A-A



NOTES:

1. USE RAIL FOR ANCHOR BOLT LAYOUT TEMPLATE.
2. PLACE REBAR TO AVOID INTERFERENCE WHEN DRILLING ANCHOR BOLT HOLES.
3. CROSS SLOPE OF PAD SHALL NOT EXCEED 8% AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
4. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

ISSUED: 8/2015

RECOMMENDED:

Adil Raj
PROJECT MANAGER

REVISION APPROVAL

APPROVED:

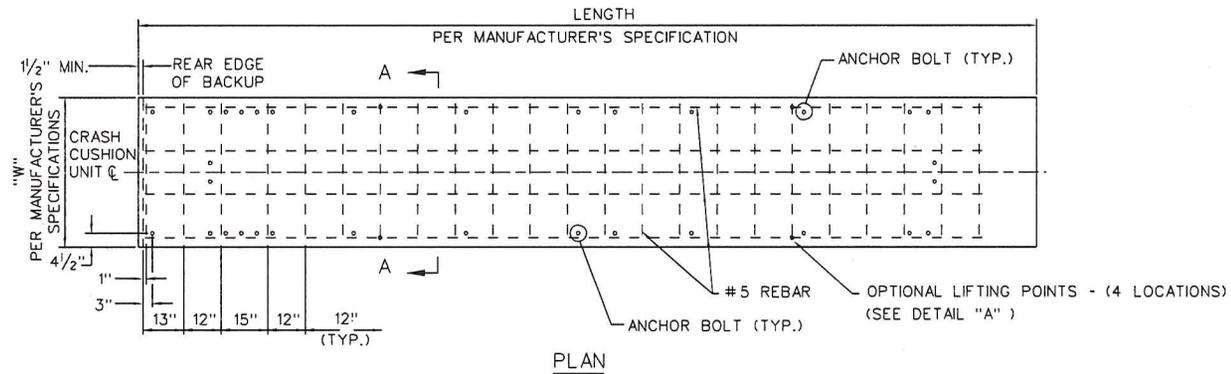
Muhammed Khalid
CHIEF ENGINEER

TYPICAL CRASH CUSHION SYSTEM
CONCRETE FOUNDATION AND
BOLT LAYOUT (FOR
NEW JERSEY OR F SHAPE BACKUPS)

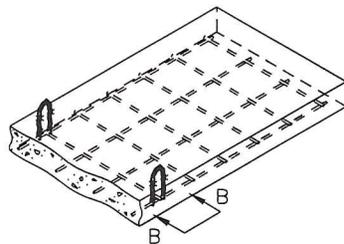
d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 617.07

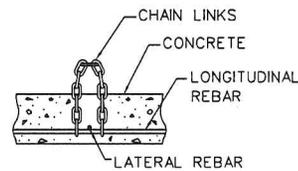


PLAN

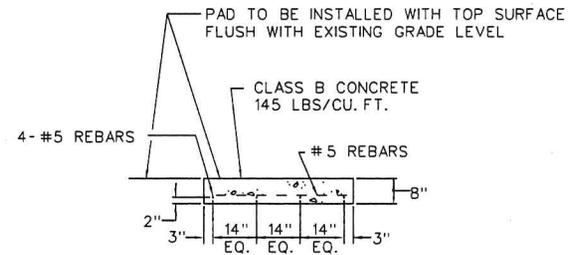


DETAIL "A"

OPTIONAL LIFTING POINTS USE 1/2 INCH PROOF COIL CHAIN. THE CHAIN MUST MEET THE REQUIREMENTS OF ASTM A-413 GRADE 28. THE MINIMUM LENGTH CHAIN IS 15 LINKS, AND THE REBAR WILL BE INSERTED THROUGH BOTH ENDS AS SHOWN.



SECTION B-B



SECTION A-A

NOTES:

1. USE THE CRASH CUSHION SYSTEM STEEL PLATFORM AS A TEMPLATE TO MARK THE CONCRETE ANCHOR BOLT LOCATIONS.
2. ACCURATE PLACEMENT OF REINFORCING STEEL IS CRITICAL TO AVOID INTERFERENCE WITH CONCRETE ANCHOR BOLTS.
3. CROSS SLOPE OF PAD SHALL NOT EXCEED 8% AND NOT VARY MORE THAN 2% FROM FRONT TO BACK.
4. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

ISSUED: 8/2015
REVISION APPROVAL

RECOMMENDED: *Adil Raj*
PROJECT MANAGER

APPROVED: *Muhammed Khalid*
CHIEF ENGINEER

TYPICAL CRASH CUSHION SYSTEM
CONSTRUCTION ZONE
CONCRETE PAD

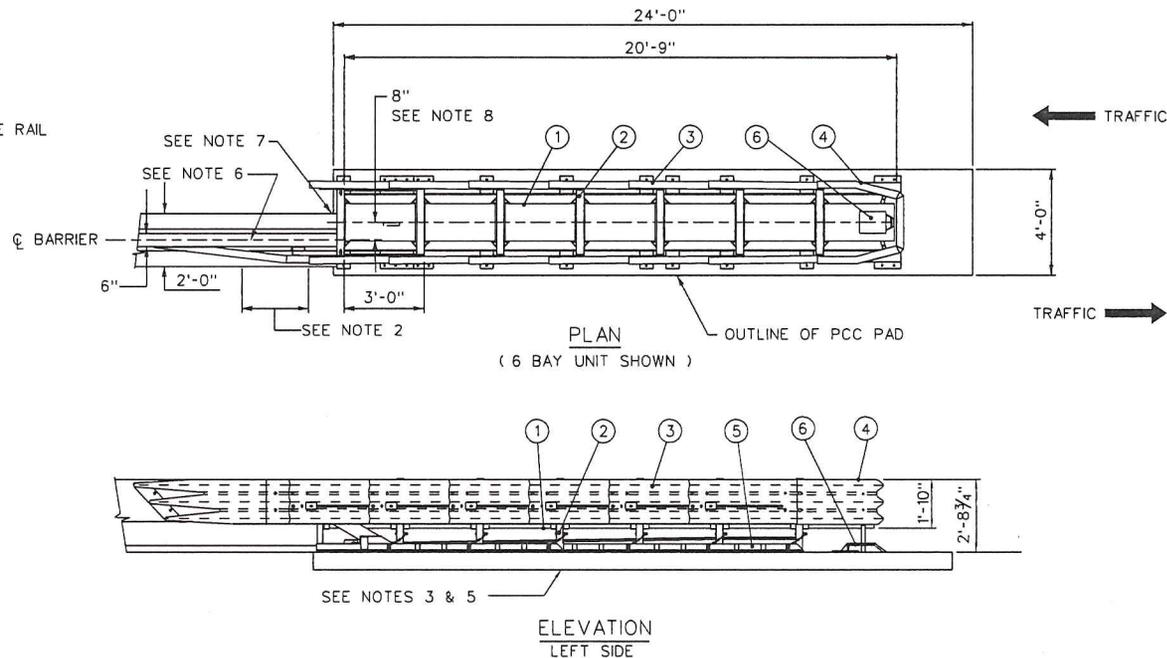
d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 617.08

KEY

- ① CRUSHABLE CARTRIDGE
- ② DIAPHRAGM
- ③ FENDER PANEL
- ④ NOSE COVER
- ⑤ MONORAIL OR DOUBLE RAIL
- ⑥ ANCHOR BASE



NOTES:

1. REMOVE ALL CURBS AND ISLANDS FOR PROPER IMPACT PERFORMANCE.
2. PROVISION SHALL BE MADE FOR REAR FENDER PANEL CLEARANCE TO SLIDE REARWARD UPON IMPACT.
3. CAUTION: THE CONSTRUCTION ZONE CRASH CUSHION MUST BE CORRECTLY ANCHORED FOR PROPER IMPACT PERFORMANCE. THE UNIT SHALL BE ANCHORED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
4. WHERE NECESSARY, THE CONTRACTOR SHALL SUPPLY A TRANSITION, DESIGNED FOR THE APPROVED CRASH CUSHION FROM THE CRASH CUSHION TO THE OBJECT BEING SHIELDED.
5. IF THE UNIT IS ANCHORED TO ASPHALT, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE IMPACT PERFORMANCE. THE 18" THREADED RODS OR ANCHOR PINS SHOULD THEN BE INSTALLED. IF NECESSARY, REPAVE AREA.
6. CAUTION: ϕ OF CRASH CUSHION SYSTEM SHALL BE PARALLEL WITH ϕ OF BARRIER $\pm 1^\circ$.
7. CAUTION: MAX. 11" CLEARANCE BETWEEN BACKUP AND BARRIER WALL. ZERO CLEARANCE RECOMMENDED.
8. 8" OFFSET IS BASED ON USING CONCRETE BARRIER (CB) WITH A 6" TOP. ANY VARIANCE FROM THIS MUST BE COMPENSATED BY CHANGING THE OFFSET BETWEEN THE UNIT ϕ AND THE CONCRETE BARRIER ϕ OFFSET = $11" - \frac{\text{WIDTH OF CB TOP}}{2}$
9. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR APPROVAL OF SELECTED CRASH CUSHION SYSTEM, AND NCHRP REPORT 350, TL-2 OR TL-3 CERTIFICATION.
10. CRASH CUSHION SHALL NOT BLOCK SIDEWALK/CROSSWALK.

ISSUED: 8/2015	RECOMMENDED: <i>Adil Raza</i>
REVISION	APPROVAL
	PROJECT MANAGER
	APPROVED: <i>Muhammed Khalid</i>
	CHIEF ENGINEER

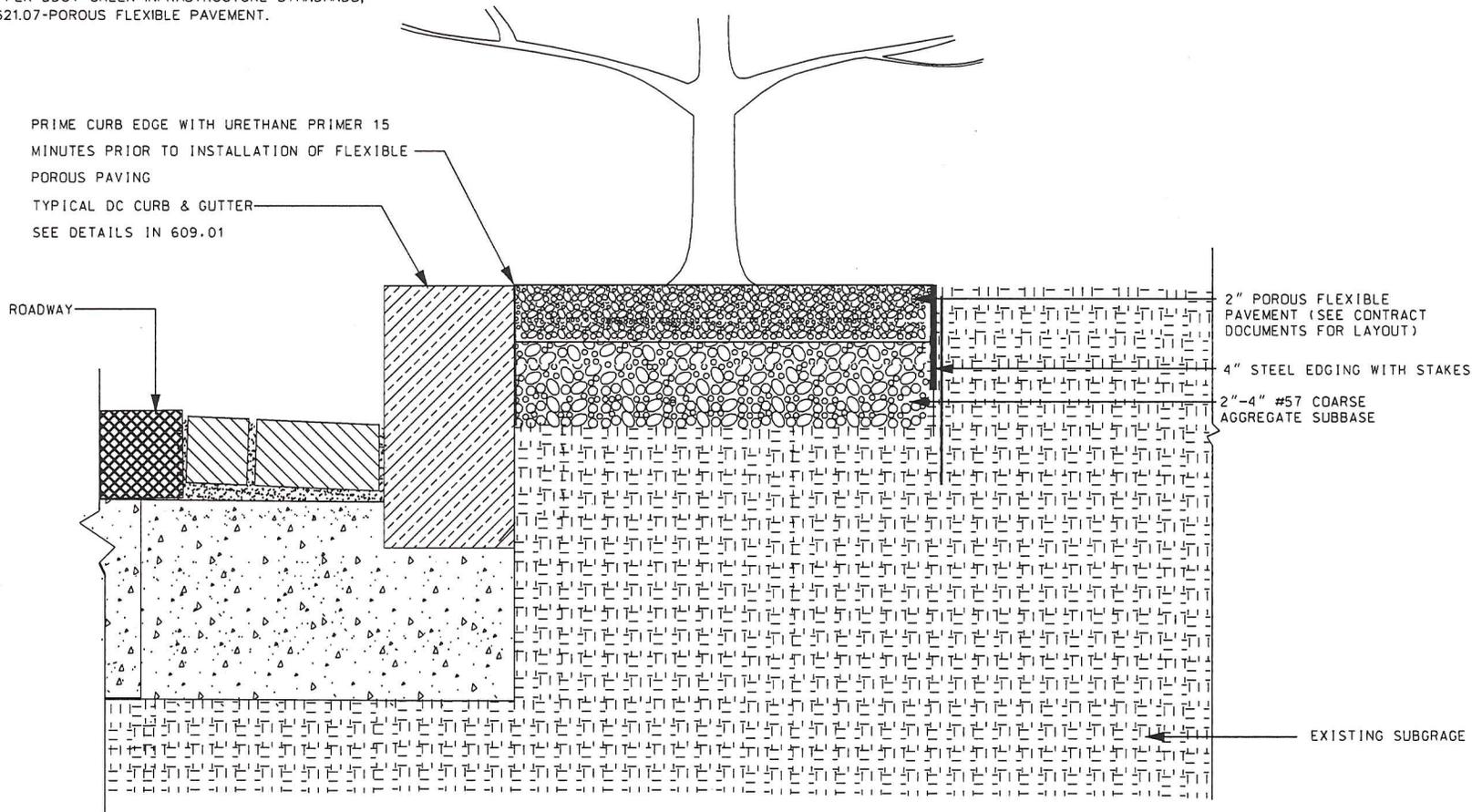
**TYPICAL CRASH CUSHION SYSTEM
CONSTRUCTION ZONE
WITH LEFT SIDE 8" OFFSET
TRANSITION PANEL**

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 617.09

NOTES:

1. OPERATIONS SHALL BE CONDUCTED SO AS TO AVOID INJURY TO TREE TRUNKS, BRANCHES, AND ROOTS. EXCAVATIONS WITHIN LIMITS OF TREE ROOT SPREAD SHALL PROCEED WITH CARE EITHER BY USE OF HAND TOOLS OR WITH EQUIPMENT THAT WILL NOT CAUSE TREE ROOT DAMAGE.
2. REFER TO DDOT STANDARD SPECIFICATIONS, SECTION 608.08, TREE ROOT PROTECTION, AND TREE PROTECTION NOTES ON DDOT STANDARD DWG. NO. 608.10.
3. POROUS FLEXIBLE PAVEMENT MATERIALS AND INSTALLATION SHALL BE PER DDOT GREEN INFRASTRUCTURE STANDARDS, SECTION 621.07-POROUS FLEXIBLE PAVEMENT.



ISSUED: 8/2015

REVISION APPROVAL

RECOMMENDED:

Adil Raza
PROJECT MANAGER

APPROVED:

Muhammed Khehid
CHIEF ENGINEER

POROUS FLEXIBLE PAVEMENT -
IN-GRADE

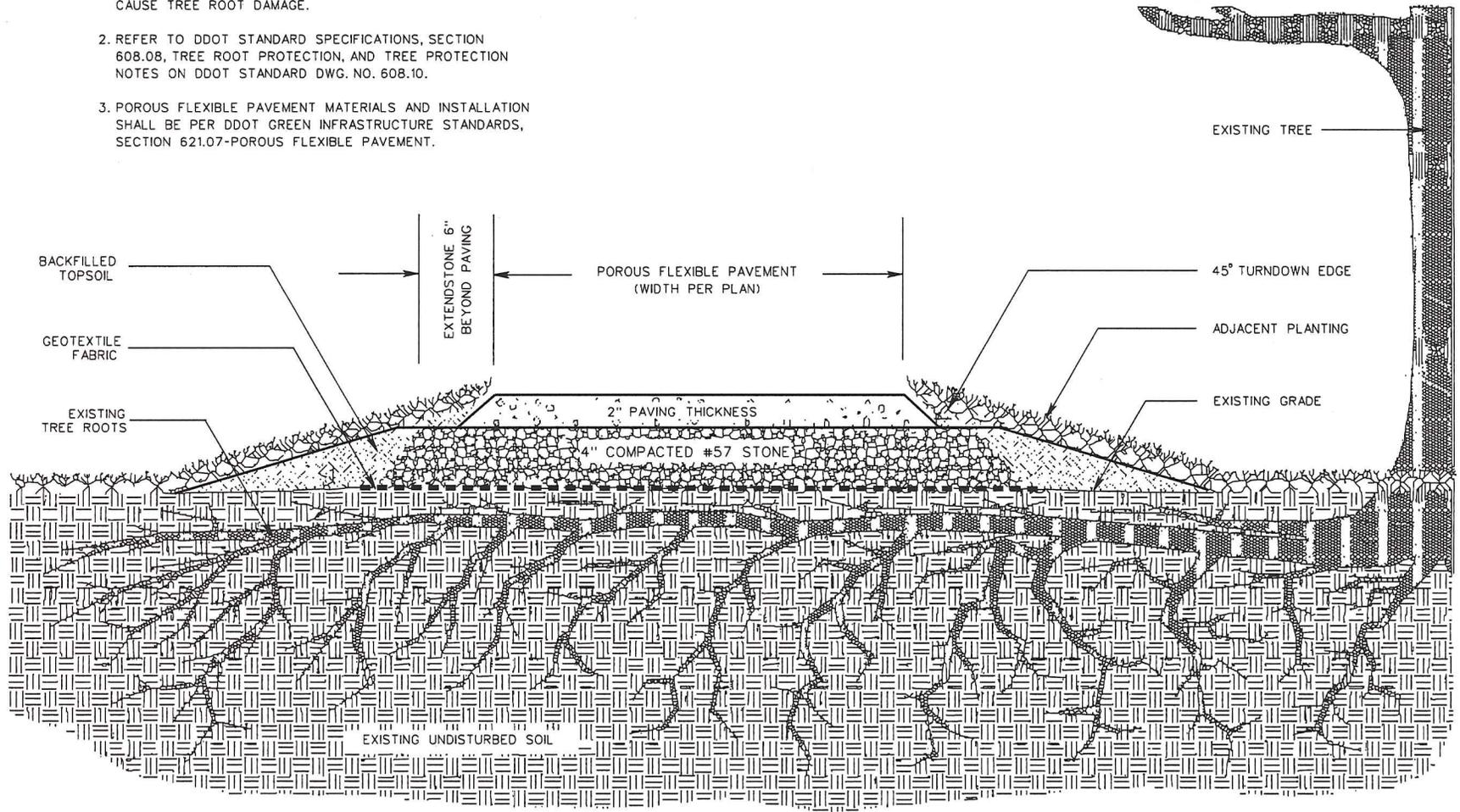
d.

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 621.07

NOTES:

1. OPERATIONS SHALL BE CONDUCTED SO AS TO AVOID INJURY TO TREE TRUNKS, BRANCHES, AND ROOTS. EXCAVATIONS WITHIN LIMITS OF TREE ROOT SPREAD SHALL PROCEED WITH CARE EITHER BY USE OF HAND TOOLS OR WITH EQUIPMENT THAT WILL NOT CAUSE TREE ROOT DAMAGE.
2. REFER TO DDOT STANDARD SPECIFICATIONS, SECTION 608.08, TREE ROOT PROTECTION, AND TREE PROTECTION NOTES ON DDOT STANDARD DWG. NO. 608.10.
3. POROUS FLEXIBLE PAVEMENT MATERIALS AND INSTALLATION SHALL BE PER DDOT GREEN INFRASTRUCTURE STANDARDS, SECTION 621.07-POROUS FLEXIBLE PAVEMENT.



ISSUED:	8/2015
REVISION	APPROVAL

RECOMMENDED: *Adil Raza*
PROJECT MANAGER

APPROVED: *Muhammed Khelid*
CHIEF ENGINEER

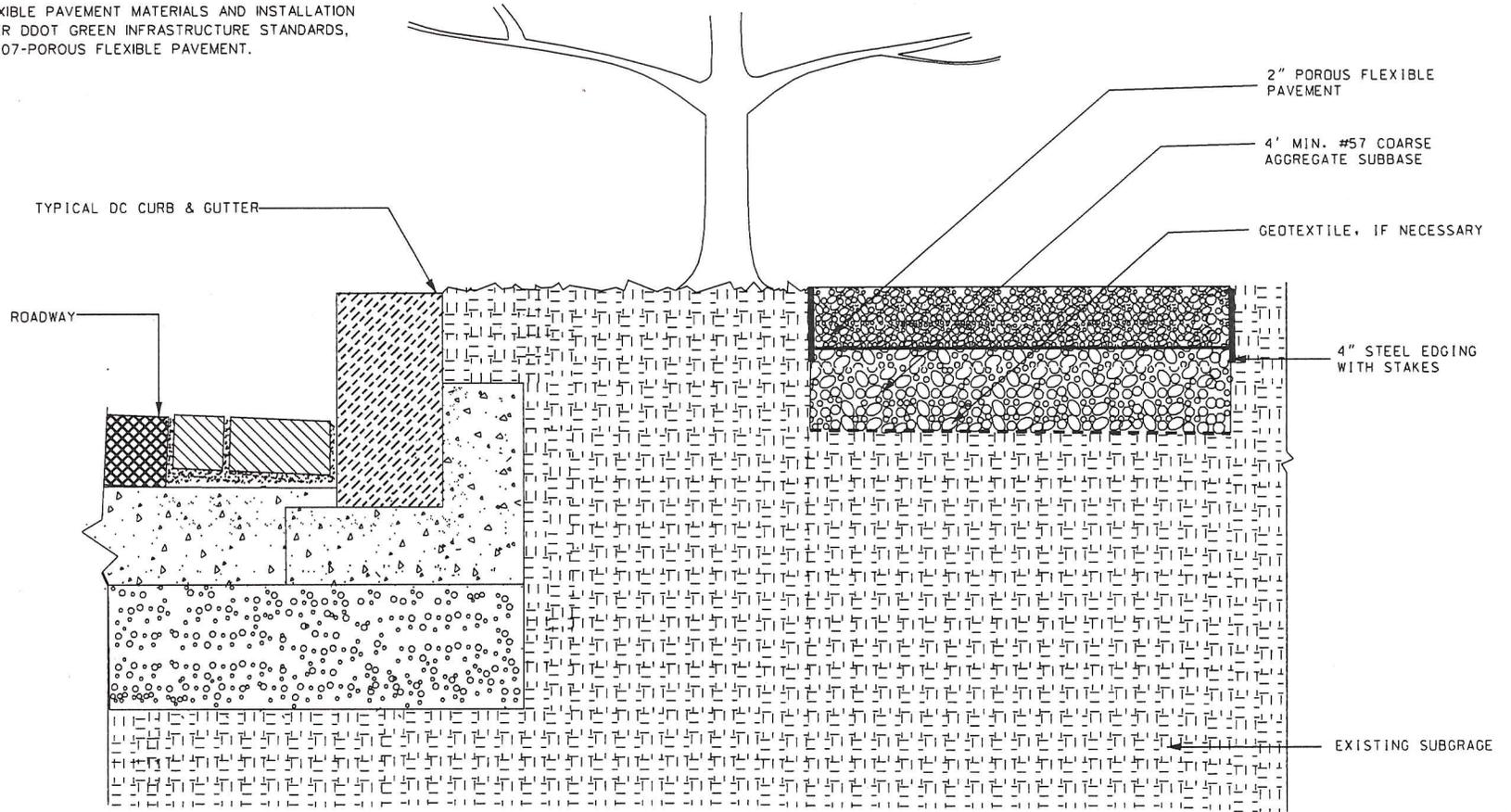
POROUS FLEXIBLE PAVEMENT - ABOVE GRADE

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 621.08

NOTES:

1. OPERATIONS SHALL BE CONDUCTED SO AS TO AVOID INJURY TO TREE TRUNKS, BRANCHES, AND ROOTS. EXCAVATIONS WITHIN LIMITS OF TREE ROOT SPREAD SHALL PROCEED WITH CARE EITHER BY USE OF HAND TOOLS OR WITH EQUIPMENT THAT WILL NOT CAUSE TREE ROOT DAMAGE.
2. REFER TO DDOT STANDARD SPECIFICATIONS, SECTION 608.08, TREE ROOT PROTECTION, AND TREE PROTECTION NOTES ON DDOT STANDARD DWG. NO. 608.10.
3. POROUS FLEXIBLE PAVEMENT MATERIALS AND INSTALLATION SHALL BE PER DDOT GREEN INFRASTRUCTURE STANDARDS, SECTION 621.07-POROUS FLEXIBLE PAVEMENT.



ISSUED: 8/2015		RECOMMENDED: <i>Adil Riaz</i> PROJECT MANAGER
REVISION	APPROVAL	
		APPROVED: <i>Muhammed Khalid</i> CHIEF ENGINEER

POROUS FLEXIBLE PAVEMENT - TRAIL

d. DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 621.09