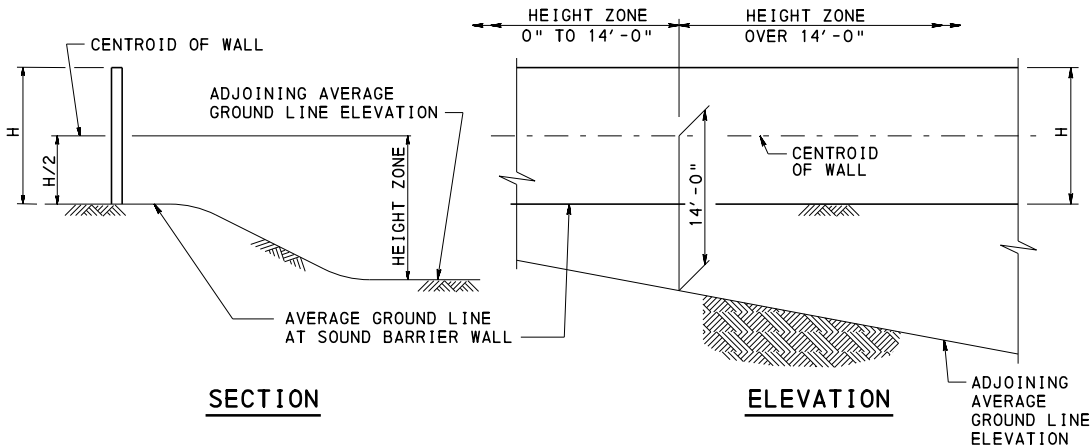


GENERAL NOTES

1. DESIGN SPECIFICATIONS:
- PENNDOT DESIGN MANUAL, PART 4, STRUCTURES APRIL 2015 EDITION.
 - 1989 AASHTO "GUIDE SPECIFICATIONS FOR STRUCTURAL DESIGN OF SOUND BARRIERS", INCLUDING THE 1992 AND 2002 INTERIMS.
 - 2002 AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", 17TH EDITION.
 - 2001 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", 4TH EDITION, INCLUDING INTERIMS THROUGH 2006.
 - DESIGN IS IN ACCORDANCE WITH THE WORKING STRESS DESIGN METHOD. (NO INCREASE IN ALLOWABLE UNIT STRESSES ARE PERMITTED EXCEPT FOR GROUP III LOADINGS WHICH PERMITS A 33% OVERSTRESS.)
2. CONSTRUCTION SPECIFICATIONS AND WORKMANSHIP:
- PROVIDE MATERIALS AND PERFORM WORK IN ACCORDANCE WITH THE CURRENT VERSION OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408, AASHTO/AWS/D1.5 BRIDGE WELDING CODE AND THE CONTRACT SPECIAL PROVISIONS. (USE AASHTO/AWS D1.1 FOR WELDING NOT COVERED IN AASHTO/AWS/D1.5)
3. DESIGN LOADS:
- WIND LOAD:
 - THE WIND LOAD INCLUDES A GUST FACTOR OF 1.3 AND A DRAG FACTOR OF 1.2 AND IS BASED ON A MAXIMUM 50-YEAR MEAN WIND VELOCITY AT 30'-0" ABOVE THE GROUND SURFACE OF 80 MPH.
 - GROUND MOUNTED SOUND BARRIER WALLS:
 - HEIGHT ZONE: 0' TO 14'-0" = 20 PSF
 - HEIGHT ZONE: OVER 14'-0" = 28 PSF
 - ICE LOAD: 3 PSF APPLIED TO ONE SIDE OF PANEL AND POST.
 - SEISMIC LOAD: SEISMIC ACCELERATION COEFFICIENT "A" EQUAL TO 0.15.
4. WALL HEIGHTS MUST EQUAL OR EXCEED THE ACOUSTICAL PROFILE.
5. PROVIDE EITHER PRECAST CONCRETE POSTS OR STEEL POSTS. DO NOT MIX POST TYPES WITHOUT PERMISSION OF THE DISTRICT BRIDGE ENGINEER.
6. PROVIDE UNCOATED REINFORCEMENT BARS IN THE FOOTING AND CAISSONS.
7. PROVIDE EPOXY COATED OR GALVANIZED REINFORCEMENT BARS IN THE POSTS AND PEDESTALS WHERE THE WALL IS WITHIN 14'-0" OF THE EDGE OF TRAVEL LANE. EPOXY COATED OR GALVANIZED REINFORCEMENT MAY BE REQUIRED IF FUTURE WIDENING IS ANTICIPATED.
8. DO NOT SPLICE VERTICAL POST REINFORCEMENT.
9. ALL DIMENSIONS SHOWN ARE HORIZONTAL, EXCEPT AS NOTED.
10. DIMENSIONS SHOWN ARE FOR A NORMAL TEMPERATURE OF 68 DEGREES F.
11. REINFORCEMENT IN SOME SECTIONS IS NOT SHOWN FOR CLARITY.

DESIGN TABLE NOTES

1. DESIGN TABLES SHOWN FOR THE POSTS AND SPREAD FOOTINGS ARE DEVELOPED FOR TWO SEPARATE WIND PRESSURES OF 20 PSF AND 28 PSF.
2. DESIGN TABLES SHOWN FOR CAISSONS ARE DEVELOPED FOR A WIND PRESSURE OF 28 PSF. USE THE INFORMATION SHOWN IN THE TABLES FOR ALL HEIGHT ZONES.
3. THE DESIGN POST SPACING (CENTER-TO-CENTER POSTS) IS TO BE THE ACTUAL POST SPACING ROUNDED UP TO THE NEXT HIGHEST INCREMENT OF POST SPACING SHOWN ON THE DESIGN TABLES.
4. THE DESIGN WALL HEIGHT IS TO BE THE ACTUAL WALL HEIGHT ROUNDED UP TO THE NEXT HIGHEST INCREMENT OF WALL HEIGHT SHOWN ON THE DESIGN TABLES.
5. FOR ANGLED AND CORNER POST NOTES REFER TO SHEET 16.



HEIGHT ZONE (FEET)	WIND PRESSURE (PSF)
0 TO 14	20
OVER 14	28

HEIGHT ZONES FOR
GROUND MOUNTED SOUND BARRIERS

INDEX OF SHEETS

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1	GENERAL NOTES - 1
2	GENERAL NOTES - 2
3	GEOMETRY AND LAYOUT
4	POST DETAILS
5	DETAIL 1
6	DETAIL 1 - POST TYPES A AND B DESIGN TABLES
7	DETAIL 1 - POST TYPES C AND D DESIGN TABLES
8	DETAIL 2
9	DETAIL 2 - POST TYPES A AND B DESIGN TABLES
10	DETAIL 2 - POST TYPES C AND D DESIGN TABLES
11	DETAIL 3
12	DETAIL 3 - POST TYPES A, B, C AND D DESIGN TABLES
13	DETAIL 4
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15	DETAIL 4 - POST TYPES C AND D DESIGN TABLES
16	DETAIL 5
17	DETAIL 6
18	DETAIL 7
19	DETAIL 8
20	CAISSON DESIGN TABLES

DESCRIPTION OF DETAILS

DETAIL	DESCRIPTION
1	PRECAST CONCRETE POST TYPES A, B, C AND D WITH BASE PLATE CONNECTION TO CAISSON
2	PRECAST CONCRETE POST TYPES A, B, C AND D WITH BASE PLATE CONNECTION TO SPREAD FOOTING
3	PRECAST CONCRETE POST TYPES A, B, C AND D EMBEDDED IN CAISSON
4	PRECAST CONCRETE POST TYPES A, B, C AND D EMBEDDED IN SPREAD FOOTING (WITH OR WITHOUT PEDESTAL)
5	ANGLED PRECAST CONCRETE POST TYPE E EMBEDDED IN CAISSON
6	CORNER PRECAST CONCRETE POST TYPE F EMBEDDED IN CAISSON
7	ANGLED PRECAST CONCRETE POST TYPE E EMBEDDED IN SPREAD FOOTING (WITH OR WITHOUT PEDESTAL)
8	CORNER PRECAST CONCRETE POST TYPE F EMBEDDED IN SPREAD FOOTING (WITH OR WITHOUT PEDESTAL)

MATERIAL NOTES

1. REFER TO BC-777M FOR MATERIAL NOTES.

ARCHITECTURAL SURFACE TREATMENTS NOTES

1. FORM LINER ARCHITECTURAL SURFACE TREATMENTS ARE NOT RECOMMENDED ON THE PRECAST CONCRETE POSTS.

GEOMETRY NOTES

1. CAISSON, FOOTING AND PEDESTAL LOCATIONS MUST BE PROPERLY SET FOR WALL PANEL ALIGNMENT. NOTCHES FOR PANELS ARE NOT CENTERED IN CORNER POST.

COMMONWEALTH OF PENNSYLVANIA
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STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

GENERAL NOTES - 1

BC-734M	ANCHOR SYSTEMS
BC-735M	WALL CONSTRUCTION AND EXPANSION JOINT DETAILS
BC-736M	REINFORCEMENT BAR FABRICATION DETAILS
BC-776M	GROUND MOUNTED SOUND BARRIERS PRECAST CONCRETE PANELS
BC-777M	GROUND MOUNTED SOUND BARRIERS PRECAST CONCRETE POSTS
BC-778M	GROUND MOUNTED SOUND BARRIERS STEEL POSTS
BC-779M	STRUCTURE MOUNTED SOUND BARRIER WALLS
BD-676M	GROUND MOUNTED SOUND BARRIERS PRECAST CONCRETE PANELS
BD-678M	GROUND MOUNTED SOUND BARRIERS STEEL POSTS
BD-679M	STRUCTURE MOUNTED SOUND BARRIER WALLS

REFERENCE DRAWINGS

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 1 OF 20

BD-677M

DESIGN PARAMETERS

1. PRECAST CONCRETE POSTS:
- POSTS ARE DESIGNED AS VERTICAL CANTILEVER BEAMS.
 - POSTS ARE DESIGNED FOR WIND PRESSURES EQUAL TO 20 PSF AND 28 PSF.
 - MAXIMUM PERMITTED POST DEFLECTION EQUALS POST HEIGHT (H) IN INCHES DIVIDED BY 360.
 - POSTS AND CONNECTIONS ARE NOT DESIGNED FOR TRAFFIC IMPACT LOADING.
2. ANCHOR BOLTS:
- ANCHOR BOLTS ARE DESIGNED IN ACCORDANCE WITH SECTION 5.17 OF THE 2001 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", 4TH EDITION, INCLUDING INTERIMS THROUGH 2006.
 - MINIMUM ANCHOR BOLT EMBEDMENT LENGTH IS CALCULATED BASED ON THE DEVELOPMENT LENGTH OF A HOOKED BAR IN TENSION (WITHOUT ANY MODIFICATION FACTORS). REFER TO SECTION 8.29 IN THE 2002 AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", 17TH EDITION.
 - THE ANCHOR BOLT EMBEDMENT LENGTH MUST EXTEND TO A DEPTH WHERE THE FOOTING/ CAISSON REINFORCEMENT IS FULLY DEVELOPED. DESIGNER MUST INCREASE EMBEDMENT LENGTH AS REQUIRED.
3. BASE PLATES:
- BASE PLATES ARE DESIGNED FOR BENDING DUE TO THE APPLIED BOLTS FORCES, COMPRESSION AND TENSION.
 - BASE PLATES ARE NOT DESIGNED TO SUPPORT THE VERTICAL LOAD OF THE PRECAST CONCRETE PANELS.
 - BASE PLATE THICKNESS IS DETERMINED USING THE ALLOWABLE BENDING STRESS IN ACCORDANCE WITH SECTION 5.8 OF THE 2001 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS", 4TH EDITION, INCLUDING INTERIMS THROUGH 2006.
 - BASE PLATE IS SUPPORTED ON THE LEVELING NUTS. THE NON-SHRINK GROUT IS NOT CONSIDERED AS A LOAD-CARRYING ELEMENT.
 - EDGE DISTANCE OF ANCHOR BOLTS:
 - THE CLEAR DISTANCE BETWEEN THE EDGES OF HOLES AND EDGES OF THE BASE PLATE SHALL NOT BE LESS THAN THE DIAMETER OF THE ANCHOR BOLT WHEN OVERSIZED OR SLOTTED HOLES ARE SPECIFIED.
4. SPREAD FOOTINGS:
- SPREAD FOOTINGS ARE DESIGNED BEARING ON SOIL WITH AN ALLOWABLE BEARING PRESSURE EQUAL TO 1.50 TONS/SQ. FT. AND A COEFFICIENT OF SLIDING FRICTION EQUAL TO 0.30.
 - SPREAD FOOTINGS ARE DESIGNED FOR WIND PRESSURES EQUAL TO 20 PSF AND 28 PSF.
 - FACTOR OF SAFETY AGAINST SLIDING = 1.50 MINIMUM
 - FACTOR OF SAFETY AGAINST SLIDING FOR SEISMIC LOADING = 1.125 MINIMUM
 - FACTOR OF SAFETY AGAINST OVERTURNING = 2.00 MINIMUM
 - FACTOR OF SAFETY AGAINST OVERTURNING FOR SEISMIC LOADING = 1.50 MINIMUM
 - WEIGHT OF BACKFILL MATERIAL = 100 LB. / CU. FT.
 - PROVIDE A MINIMUM SOIL DEPTH OF 1'-6" ABOVE THE TOP OF FOOTING.
 - SPREAD FOOTINGS ARE DESIGNED FOR NO UPLIFT.
 - SPREAD FOOTINGS ARE DESIGNED FOR LEVEL GROUND. A SITE SPECIFIC DESIGN IS REQUIRED IF GROUND IS SLOPED.
 - SPREAD FOOTINGS ARE DESIGNED WITHOUT LIVE LOAD SURCHARGE. REDESIGN FOOTINGS IF LIVE LOAD SURCHARGE IS REQUIRED.
 - ALTERNATE SPREAD FOOTING DESIGNS ARE PERMITTED IF SUPPORTED ON ROCK. FOUNDATION DESIGN PARAMETERS MUST BE ACCEPTED BY THE DISTRICT BRIDGE ENGINEER.
5. CAISSONS:
- CAISSONS ARE DESIGNED IN SOIL USING THE INDICATED SOIL PROPERTIES.
 - CASSIONS ARE DESIGNED FOR A WIND PRESSURE EQUAL TO 28 PSF.
 - FACTOR OF SAFETY AGAINST OVERTURNING = 2.0 MINIMUM
 - MAXIMUM ALLOWABLE LATERAL DESIGN DISPLACEMENT AT TOP OF CAISSON = 1/2 INCH
 - CAISSON LENGTHS DETERMINED USING COM624P COMPUTER PROGRAM. FINAL CAISSON LENGTHS INDICATED INCLUDE AN ADDITIONAL 3'-0" LENGTH TO ACCOUNT FOR FREEZING AND THAWING, WEATHERING, AND OTHER SHALLOW GROUND DISTURBANCE.
 - CAISSON MAXIMUM ALLOWABLE VERTICAL DISPLACEMENT = 1.0 INCH
 - DRILLED CAISSONS ARE DESIGNED FOR LEVEL GROUND. A SITE SPECIFIC DESIGN IS REQUIRED IF GROUND IS SLOPED.
 - DRILLED CAISSONS ARE DESIGNED WITHOUT LIVE LOAD SURCHARGE. REDESIGN CAISSONS IF LIVE LOAD SURCHARGE IS REQUIRED.
 - ALTERNATE CAISSON DESIGNS ARE PERMITTED IF SOIL PROPERTIES DIFFER FROM THOSE INDICATED OR IF CAISSON EXTENDS PARTIALLY OR ENTIRELY INTO ROCK. FOUNDATION DESIGN PARAMETERS MUST BE ACCEPTED BY THE DISTRICT BRIDGE ENGINEER.

NOTES TO DESIGNER

1. REFER TO SHEET 2 OF BD-676M FOR NOTES TO DESIGNER.

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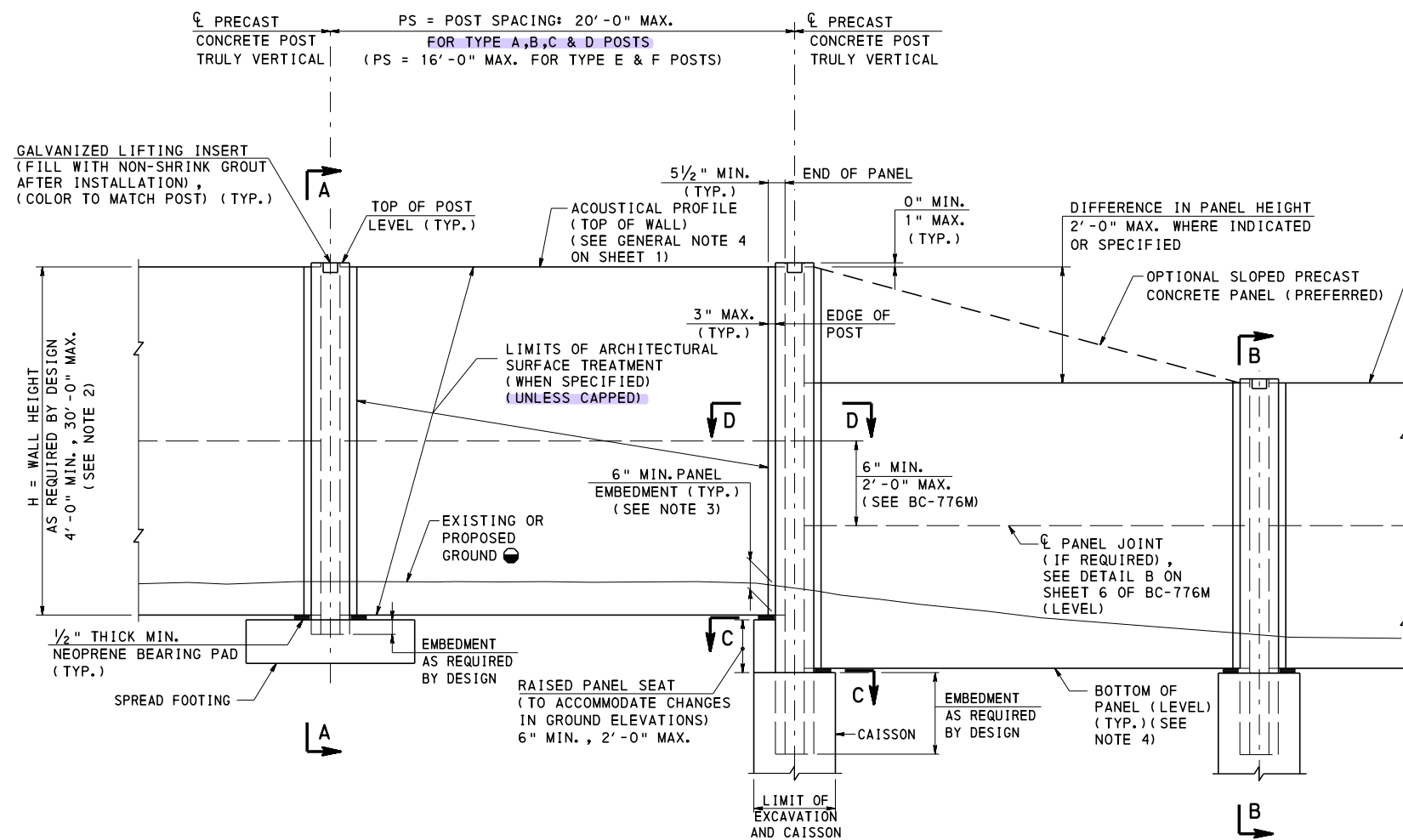
STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

GENERAL NOTES - 2

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

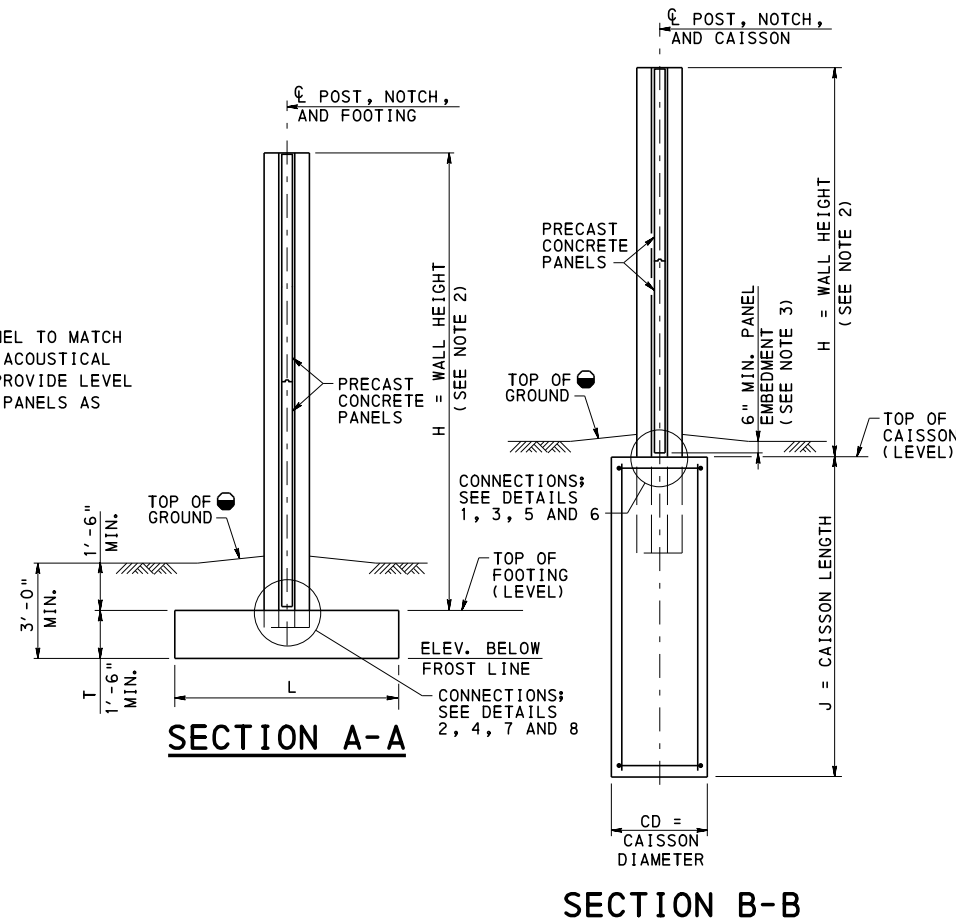
RECOMMENDED APR. 29, 2016
Brenda S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 2 OF 20
BD-677M



GROUND MOUNTED SOUND BARRIER ELEVATION

FOR POSTS WITH BASE PLATES REFER TO "PANEL NOTCH DETAIL FOR BASE PLATE CONNECTIONS" ON BD-676M, SHT. 6.



LEGEND:

- GRADE GROUND TO DRAIN WATER AWAY FROM THE WALL. FILL DEPTH ON EACH SIDE OF WALL TO BE WITHIN 1'-0" DIFFERENCE.

NOTES:

- FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
- WALL HEIGHT IS DEFINED AS FOLLOWS:
 - POST WITH BASE PLATE:
 - H = HEIGHT FROM TOP OF BASE PLATE TO TOP OF WALL
 - POST WITHOUT BASE PLATE:
 - H = HEIGHT FROM TOP OF FOOTING/CAISSON TO TOP OF WALL
- PANEL EMBEDMENT MAY NEED TO BE INCREASED TO ACCOMMODATE BASE PLATES AND ANCHOR BOLT PROJECTIONS.
- FOR OPTIONAL SLOPED BOTTOM PANEL REFER TO BD-676M, SHEET 3.
- FOR SECTIONS C-C AND D-D REFER TO BC-777M, SHEETS 2 AND 3.

COMMONWEALTH OF PENNSYLVANIA
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STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

GEOMETRY AND LAYOUT

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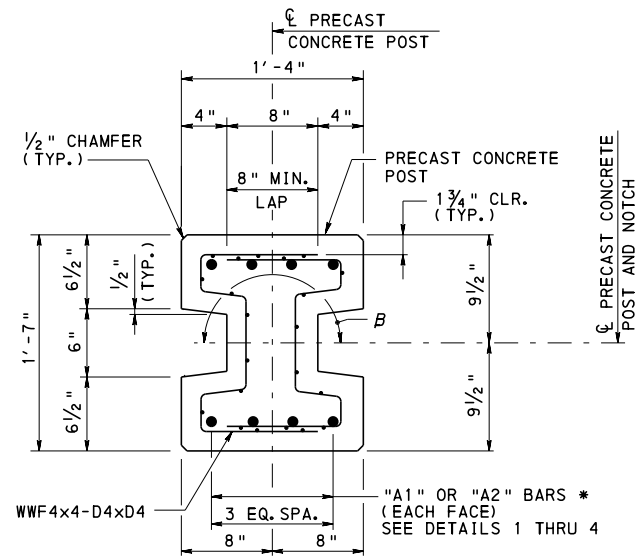
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016

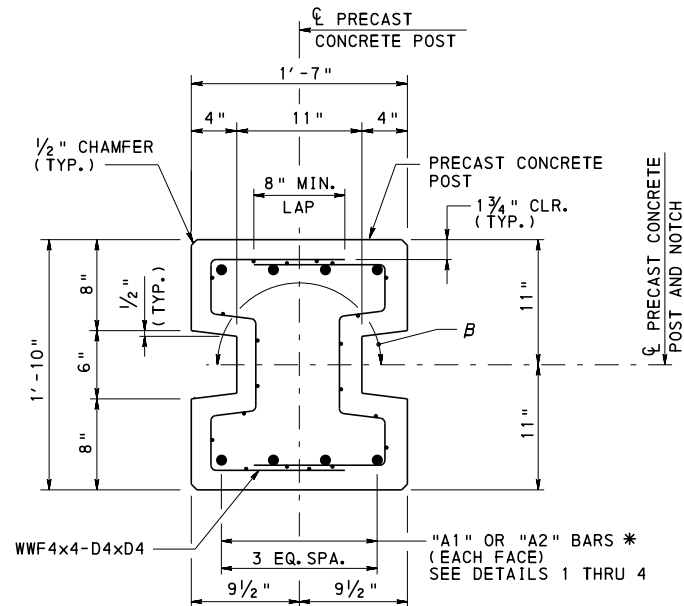
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 3 OF 20

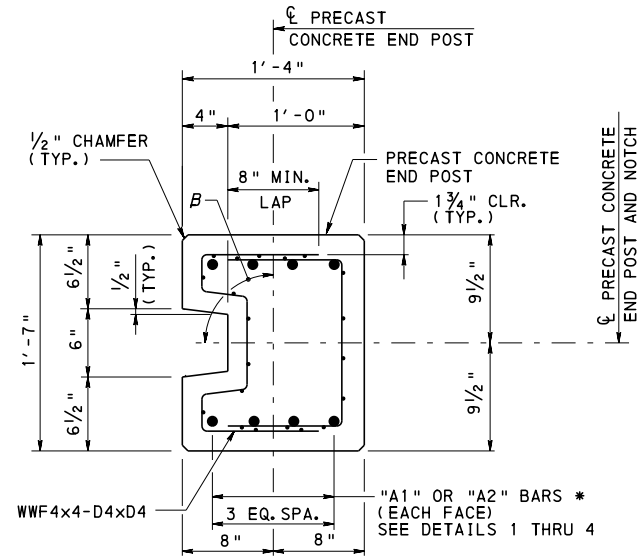
BD-677M



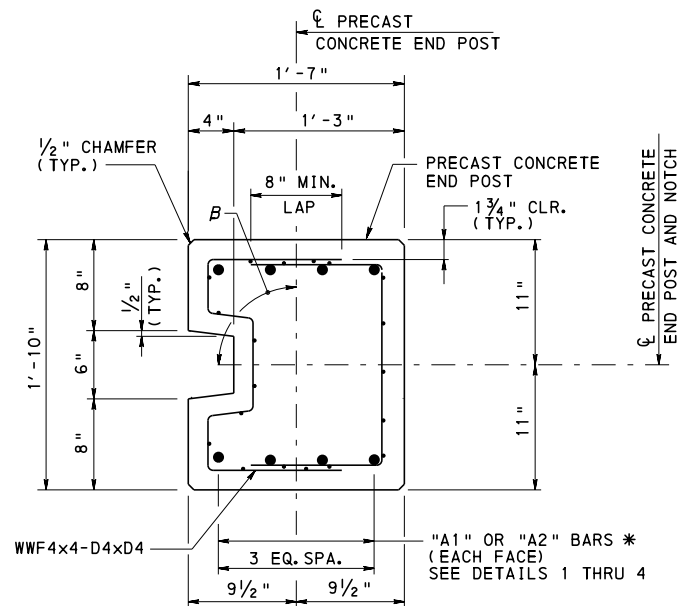
POST TYPE A - IN-LINE
 $B = 180^\circ (\pm 12^\circ)$



POST TYPE C - IN-LINE
 $B = 180^\circ (\pm 12^\circ)$



POST TYPE B - END POST
 $B = 90^\circ (\pm 6^\circ)$



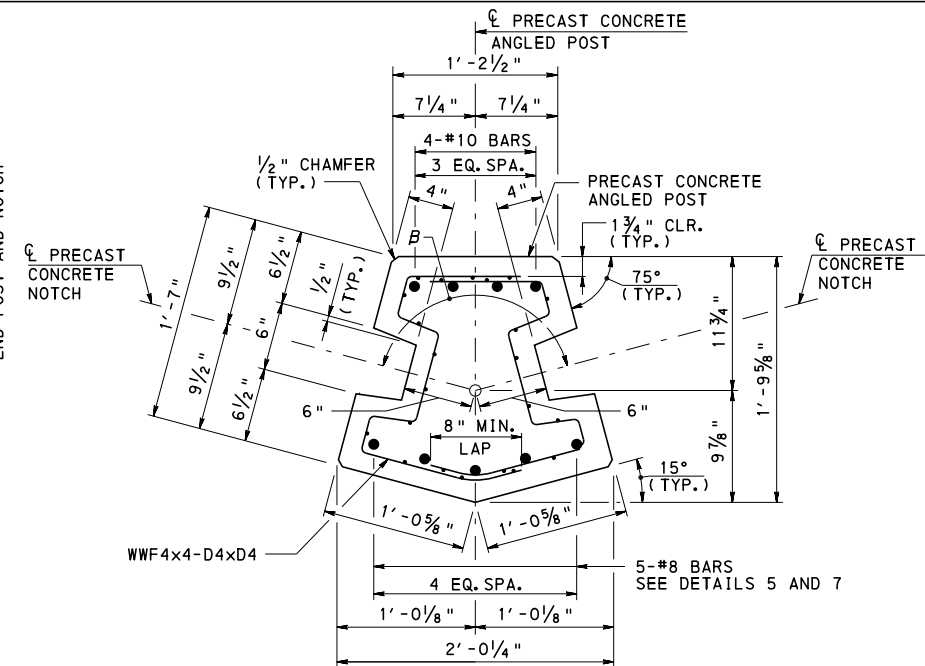
POST TYPE D - END POST
 $B = 90^\circ (\pm 6^\circ)$

* "A1" BARS ARE USED WITH BASE PLATE CONNECTIONS. BARS ARE EITHER EPOXY COATED OR GALVANIZED AND ARE THREADED AT ONE END. DESIGNER TO USE BAR SIZE SPECIFIED WITH THREADED END OR USE ONE BAR SIZE SMALLER WHEN USING UPSET THREADED END. (SEE DETAILS 1 AND 2)

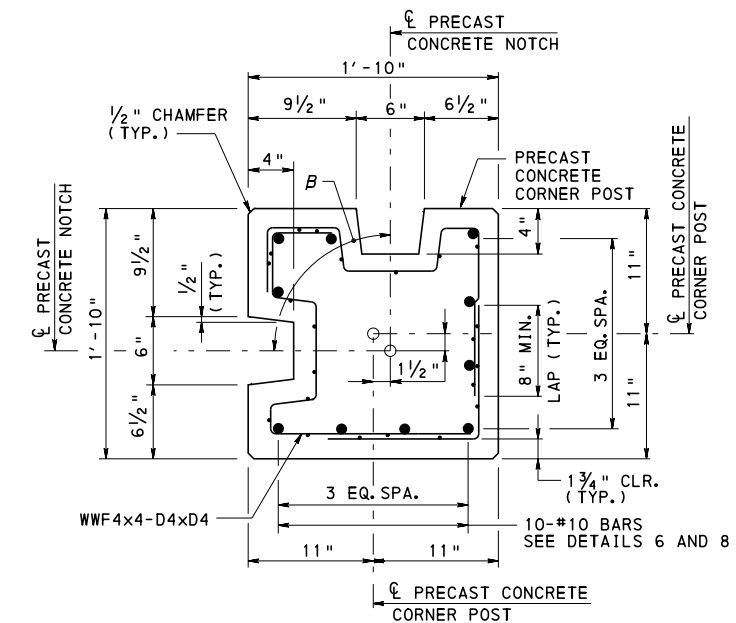
"A2" BARS ARE NOT THREADED. (SEE DETAILS 3 AND 4)

NOTES:

- FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
- B REFERS TO THE PANEL ORIENTATION. THE MAXIMUM VARIATION IN THE ANGLE BETWEEN THE CENTERLINE OF PANEL AND CENTERLINE OF POST IS 6 DEGREES. REFER TO BC-777M FOR ADDITIONAL INFORMATION.
- POST TYPES A, B, C, D & E ARE PERMITTED A MAXIMUM OF TWO LAP SPLICES FOR ITS HORIZONTAL WIRE MESH TO CREATE A CLOSED STIRRUP. POST TYPE F IS PERMITTED A MAXIMUM OF THREE LAP SPLICE LOCATIONS TO CREATE ITS CLOSED STIRRUP.
- OTHER HORIZONTAL WIRE MESH LAP SPLICE LOCATIONS THAN THOSE SHOWN ARE ALLOWED.



POST TYPE E - ANGLED IN-LINE
 $B = 150^\circ (\pm 12^\circ)$



POST TYPE F - CORNER
 $B = 90^\circ (\pm 12^\circ)$

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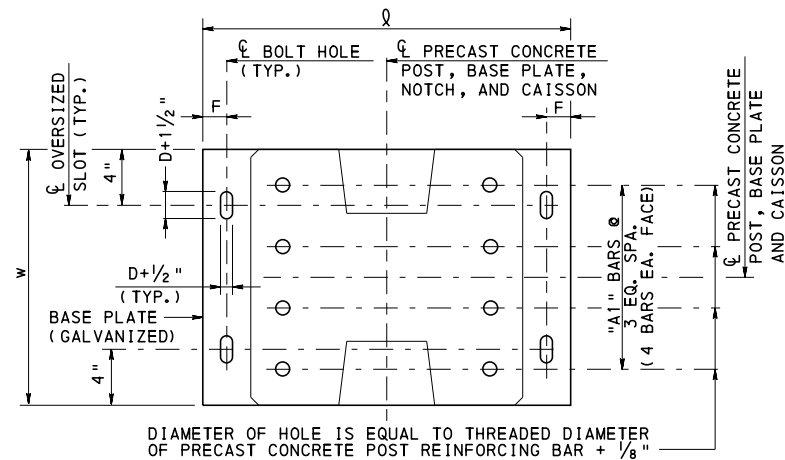
STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

POST DETAILS

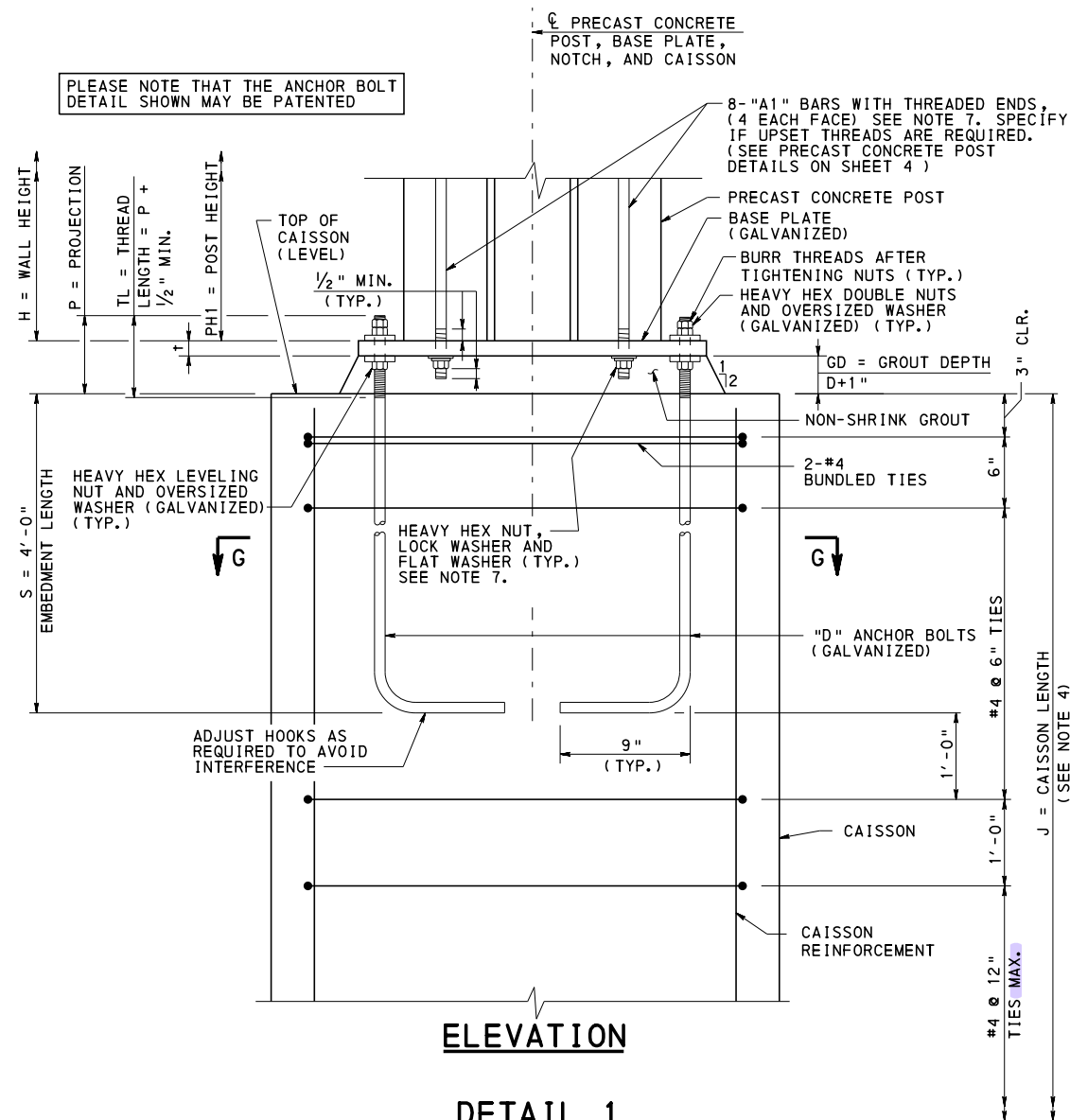
RECOMMENDED APR. 29, 2016
Thomas P. Maciore
 CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brian S. Thompson
 DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 4 OF 20
BD-677M



PLAN



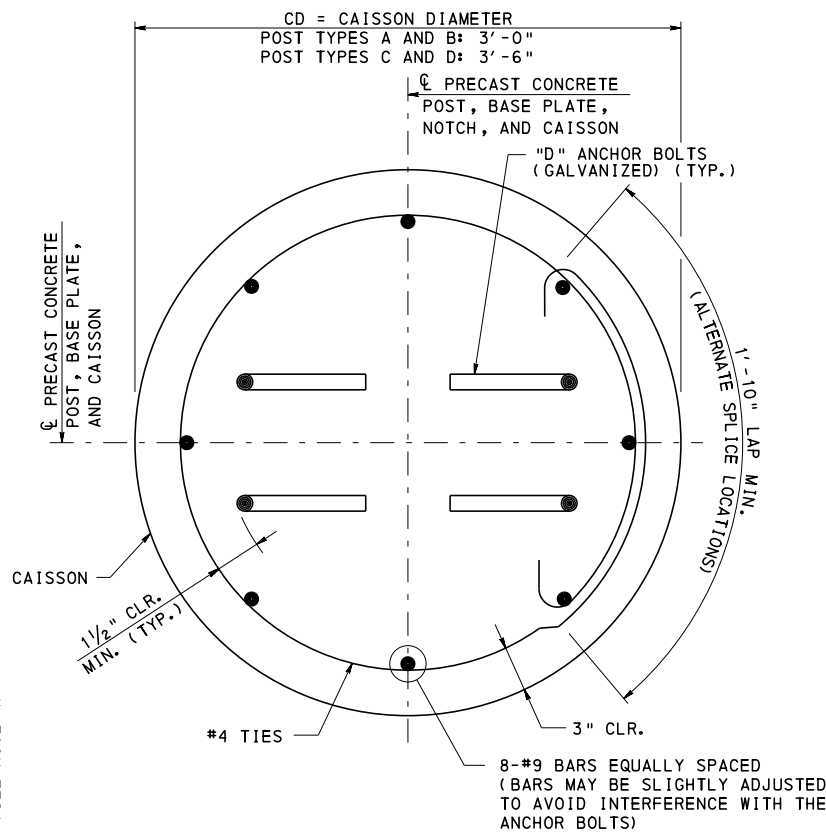
ELEVATION

**DETAIL 1
PRECAST CONCRETE POST WITH
BASE PLATE CONNECTION
TO CAISSON**

PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO CAISSON DIMENSION TABLE																	
HEIGHT ZONE = WIND PRESSURE =																	
CONCRETE POST					BASE PLATE				ANCHOR BOLTS				GROUT	CAISSON			
POST NUMBER	DESIGN POST SPACING (FT.)	DESIGN WALL HEIGHT (FT.)	POST HEIGHT PH1 (FT.)	"A1" (BAR SIZE)	THICKNESS (IN.)	LENGTH Q (IN.)	WIDTH W (IN.)	F (IN.)	DIAMETER D (IN.)	EMBEDMENT LENGTH S (IN.)	PROJECTION P (IN.)	THREAD LENGTH TL (IN.)	GROUT DEPTH GD (IN.)	CAISSON DIAMETER CD (FT.-IN.)	CAISSON LENGTH J (FT.)	VERTICAL REINFORCEMENT	
																NUMBER OF BARS	BAR SIZE

TABLE NOTES:

1. DESIGNER TO COMPLETE TABLE AND INCLUDE ON CONTRACT DRAWINGS.
2. TABLE IS PERMITTED TO BE MODIFIED AS REQUIRED AS LONG AS ALL INFORMATION IS SHOWN ON THE CONTRACT DRAWINGS.
3. SPECIFY IF UPSET THREADS ARE REQUIRED FOR THE "A1" BARS. (REFER TO SHEET 4)
4. CAISSON REINFORCEMENT TO BE DETAILED ON CONTRACT DRAWINGS.
5. PROVIDE ELEVATIONS AS REQUIRED ON CONTRACT DRAWINGS.



SECTION G-G

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
3. FOR DESIGN TABLES REFER TO SHEETS 6 AND 7.
4. FOR CAISSON LENGTHS REFER TO SHEET 20.
5. FOR PANEL SEAT DETAILS REFER TO BC-777M, SHEET 4.
6. FOR OVERSIZED WASHER DETAIL REFER TO BC-777M, SHEET 6.
7. POST "A1" BARS AND HARDWARE OPTIONS:
 - A. GALVANIZED BARS - IF THE THREADED BAR IS HOT DIP GALVANIZED, INCLUDING THE THREADED PORTION, USE NUTS AND WASHERS THAT ARE HOT-DIP GALVANIZED. IF THREADING IS PERFORMED AFTER GALVANIZING, COAT THE THREADED AREA WITH A COLD GALVANIZING REPAIR COMPOUND PER ASTM A780 AND USE EITHER MECHANICALLY GALVANIZED OR HOT DIP GALVANIZED WASHERS AND MECHANICALLY (ONLY) GALVANIZED NUTS. (WASHER - ASTM F436; NUT-ASTM A563).
 - B. EPOXY COATED BARS - COAT THREADS WITH COLD GALVANIZING REPAIR COMPOUND PER ASTM A780. USE EITHER MECHANICALLY GALVANIZED OR HOT DIP GALVANIZED WASHERS AND MECHANICALLY (ONLY) GALVANIZED NUTS. (WASHER - ASTM F436; NUT - ASTM A563)

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY**

**STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS**

DETAIL 1

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 5 OF 20
BD-677M

DETAIL 1								
PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO CAISSON								
POST TYPES A AND B								
HEIGHT ZONE 0' TO 14' WIND PRESSURE = 20 PSF								
CONCRETE POST			BASE PLATE				ANCHOR BOLTS	
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A1 (BAR SIZE)	t (IN.)	Ø (IN.)	w (IN.)	F (IN.)	D (IN.)	P (IN.)
12.0	6.0	#5	¾	26	16	1½	¾	5
	8.0	#5	¾	26	16	1½	¾	5
	10.0	#5	¾	27	16	2	1	5¾
	12.0	#5	7⁄8	27	16	2	1	5¾
	14.0	#5	1	27	16	2	1	6
	16.0	#6	1⅛	28	16	2¼	1¼	6¾
	18.0	#6	1⅜	28	16	2¼	1¼	7
	20.0	#7	1½	28	16	2¼	1¼	7¼
	22.0	#8	1¾	28	16	2¼	1¼	7¼
	24.0	#8	1⅞	29	16	2¾	1½	8¼
16.0	6.0	#5	¾	26	16	1½	¾	5
	8.0	#5	¾	27	16	2	1	5¾
	10.0	#5	7⁄8	27	16	2	1	5¾
	12.0	#5	1	27	16	2	1	6
	14.0	#6	1¼	28	16	2¼	1¼	6¾
	16.0	#7	1⅝	28	16	2¼	1¼	7
	18.0	#7	1⅝	28	16	2¼	1¼	7¼
	20.0	#8	1¾	29	16	2¾	1½	8¼
20.0	6.0	#5	¾	26	16	1½	¾	5
	8.0	#5	¾	27	16	2	1	5¾
	10.0	#5	7⁄8	27	16	2	1	5¾
	12.0	#6	1⅛	28	16	2¼	1¼	6¾
	14.0	#6	1⅜	28	16	2¼	1¼	7
	16.0	#7	1⅝	28	16	2¼	1¼	7¼
	18.0	#8	1⅞	29	16	2¾	1½	8¼

DETAIL 1								
PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO CAISSON								
POST TYPES A AND B								
HEIGHT ZONES OVER 14' WIND PRESSURE = 28 PSF								
CONCRETE POST			BASE PLATE				ANCHOR BOLTS	
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A1 (BAR SIZE)	t (IN.)	Ø (IN.)	w (IN.)	F (IN.)	D (IN.)	P (IN.)
12.0	6.0	#5	¾	26	16	1½	¾	5
	8.0	#5	¾	27	16	2	1	5¾
	10.0	#5	7⁄8	27	16	2	1	5¾
	12.0	#5	1	27	16	2	1	6
	14.0	#6	1¼	28	16	2¼	1¼	7
	16.0	#7	1⅝	28	16	2¼	1¼	7
	18.0	#8	1⅝	28	16	2¼	1¼	7¼
	20.0	#8	1⅞	29	16	2¾	1½	8¼
16.0	6.0	#5	¾	26	16	1½	¾	5
	8.0	#5	¾	27	16	2	1	5¾
	10.0	#5	1	27	16	2	1	6
	12.0	#6	1¼	28	16	2¼	1¼	7
	14.0	#7	1½	28	16	2¼	1¼	7
	16.0	#8	1¾	28	16	2¼	1¼	7¼
20.0	17.0	#8	1⅞	29	16	2¾	1½	8¼
	6.0	#5	¾	27	16	2	1	5¾
	8.0	#5	7⁄8	27	16	2	1	5¾
	10.0	#6	1⅛	28	16	2¼	1¼	6¾
	12.0	#7	1⅝	28	16	2¼	1¼	7
	14.0	#8	1⅝	28	16	2¼	1¼	7¼
	15.0	#8	1¾	29	16	2¾	1½	8¼

NOTES:

1. FOR ADDITIONAL INFORMATION REFER
TO NOTES ON SHEETS 1 AND 2.
2. FOR DETAILS, REFER TO SHEET 5.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

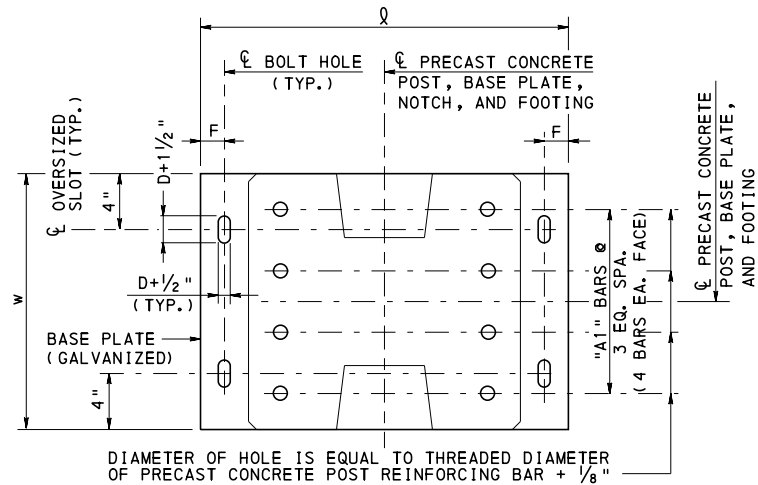
STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS
DETAIL 1 - POST TYPES A AND B
DESIGN TABLES

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

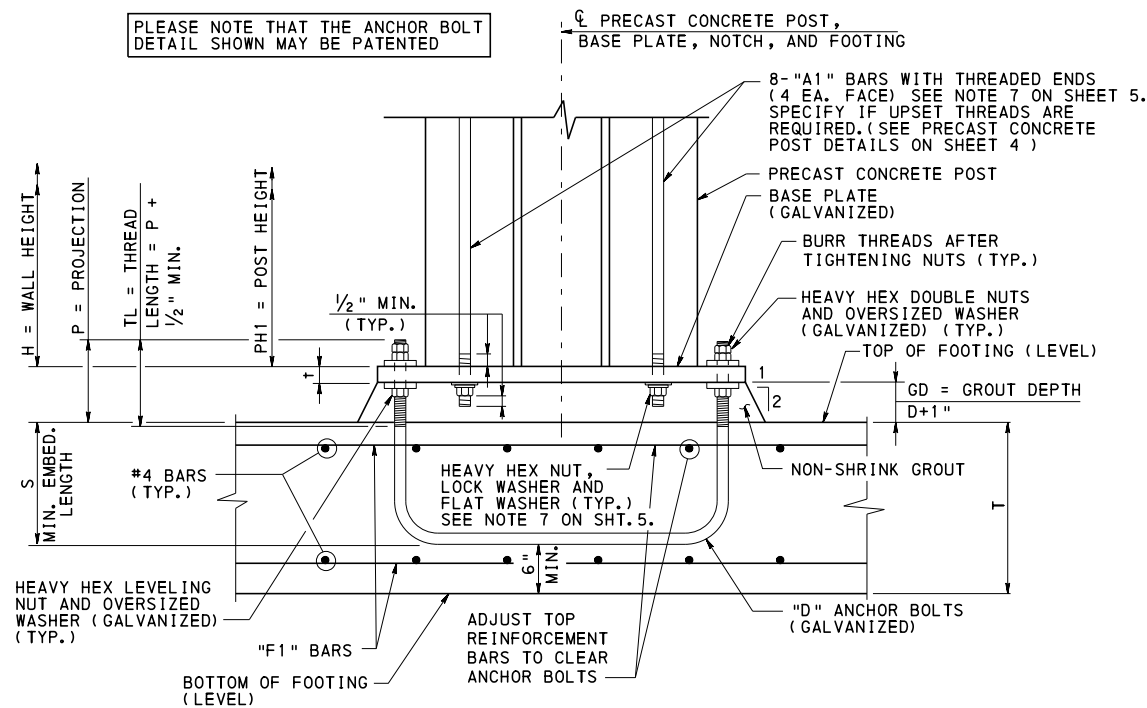
RECOMMENDED APR. 29, 2016
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 6 OF 20

BD-677M



PLAN



ELEVATION

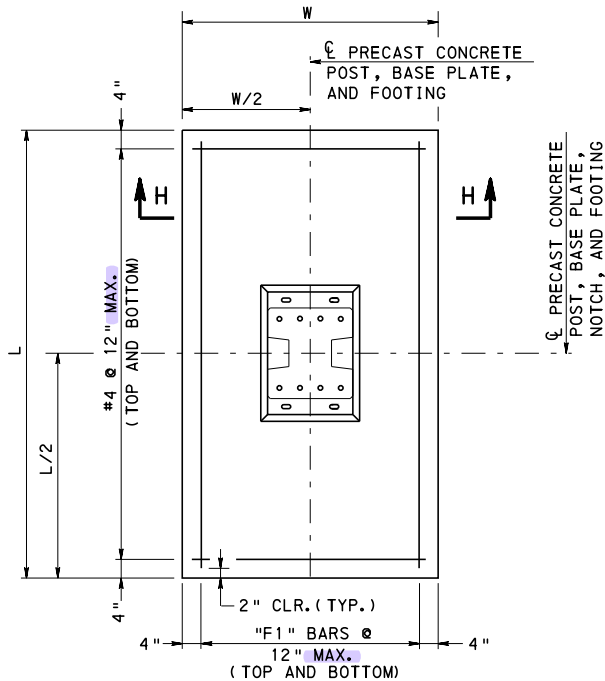
DETAIL 2
PRECAST CONCRETE POST WITH
BASE PLATE CONNECTION
TO SPREAD FOOTING

PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO SPREAD FOOTING
DIMENSION TABLE

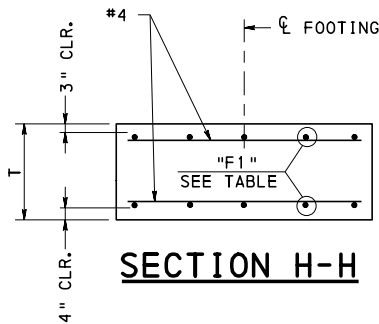
HEIGHT ZONE = WIND PRESSURE =																	
CONCRETE POST					BASE PLATE				ANCHOR BOLTS				GROUT	SPREAD FOOTING			
POST NUMBER	DESIGN POST SPACING (FT.)	DESIGN WALL HEIGHT (FT.)	POST HEIGHT PH1 (FT.)	"A1" (BAR SIZE)	THICKNESS (IN.)	LENGTH (IN.)	WIDTH (IN.)	F (IN.)	DIAMETER D (IN.)	EMBEDMENT LENGTH S (IN.)	PROJECTION P (IN.)	THREAD LENGTH TL (IN.)	GROUT DEPTH GD (IN.)	THICKNESS T (FT.)	LENGTH L (FT.)	WIDTH W (FT.)	"F1" (BAR SIZE)

TABLE NOTES:

1. DESIGNER TO COMPLETE TABLE AND INCLUDE ON CONTRACT DRAWINGS.
2. TABLE IS PERMITTED TO BE MODIFIED AS REQUIRED AS LONG AS ALL INFORMATION IS SHOWN ON THE CONTRACT DRAWINGS.
3. SPECIFY IF UPSET THREADS ARE REQUIRED FOR THE "A1" BARS. (REFER TO SHEET 4)
4. SPREAD FOOTING REINFORCEMENT TO BE DETAILED ON CONTRACT DRAWINGS.
5. PROVIDE ELEVATIONS AS REQUIRED ON CONTRACT DRAWINGS.



SPREAD FOOTING PLAN



SECTION H-H

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
3. FOR DESIGN TABLES REFER TO SHEETS 9 AND 10.
4. FOR OVERSIZED WASHER DETAIL REFER TO BC-777M, SHEET 6.
5. FOR PANEL SEAT DETAILS REFER TO BC-777M, SHEET 4.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

DETAIL 2

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 8 OF 20
BD-677M

DETAIL 2 PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO SPREAD FOOTING													
POST TYPES A AND B													
HEIGHT ZONE 0' TO 14' WIND PRESSURE = 20 PSF													
CONCRETE POST			BASE PLATE				ANCHOR BOLTS			SPREAD FOOTING			
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A1 (BAR SIZE)	t (IN.)	Q (IN.)	w (IN.)	F (IN.)	D (IN.)	S (IN.)	P (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
12.0	6.0	#5	¾	26	16	1½	¾	17	5	2.0	5.0	5.0	#4
	8.0	#5	¾	26	16	1½	¾	17	5	2.0	5.0	5.0	#4
	10.0	#5	¾	27	16	2	1	22	5¾	2.5	5.0	5.0	#4
	12.0	#5	⅞	27	16	2	1	22	5¾	2.5	6.0	5.0	#4
	14.0	#5	1	27	16	2	1	22	6	2.5	6.5	5.0	#4
	16.0	#6	1⅛	28	16	2¼	1¼	28	6¾	3.0	7.0	5.0	#4
	18.0	#6	1⅜	28	16	2¼	1¼	28	7	3.0	8.0	5.0	#4
	20.0	#7	1½	28	16	2¼	1¼	28	7¼	3.0	8.5	5.0	#4
	22.0	#8	1¾	28	16	2¼	1¼	28	7¼	3.0	9.5	5.0	#5
	24.0	#8	1⅞	29	16	2¾	1½	33	8¼	3.25	10.0	5.0	#5
16.0	6.0	#5	¾	26	16	1½	¾	17	5	2.0	5.0	5.0	#4
	8.0	#5	¾	27	16	2	1	22	5¾	2.5	5.0	5.0	#4
	10.0	#5	⅞	27	16	2	1	22	5¾	2.5	5.5	5.0	#4
	12.0	#5	1	27	16	2	1	22	6	2.5	6.5	5.0	#4
	14.0	#6	1¼	28	16	2¼	1¼	28	6¾	3.0	7.0	5.0	#4
	16.0	#7	1⅝	28	16	2¼	1¼	28	7	3.0	8.0	5.0	#4
	18.0	#7	1⅝	28	16	2¼	1¼	28	7¼	3.0	9.0	5.0	#5
	20.0	#8	1¾	29	16	2¾	1½	33	8¼	3.25	9.5	5.0	#5
20.0	6.0	#5	¾	26	16	1½	¾	17	5	2.0	5.0	5.0	#4
	8.0	#5	¾	27	16	2	1	22	5¾	2.5	5.0	5.0	#4
	10.0	#5	⅞	27	16	2	1	22	5¾	2.5	6.0	5.0	#4
	12.0	#6	1⅛	28	16	2¼	1¼	28	6¾	3.0	7.0	5.0	#4
	14.0	#6	1⅜	28	16	2¼	1¼	28	7	3.0	8.0	5.0	#4
	16.0	#7	1⅝	28	16	2¼	1¼	28	7¼	3.0	8.5	5.0	#5
	18.0	#8	1⅞	29	16	2¾	1½	33	8¼	3.25	9.5	5.0	#5

DETAIL 2 PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO SPREAD FOOTING													
POST TYPES A AND B													
HEIGHT ZONES OVER 14' WIND PRESSURE = 28 PSF													
CONCRETE POST			BASE PLATE				ANCHOR BOLTS			SPREAD FOOTING			
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A1 (BAR SIZE)	t (IN.)	Q (IN.)	w (IN.)	F (IN.)	D (IN.)	S (IN.)	P (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
12.0	6.0	#5	¾	26	16	1½	¾	17	5	2.0	5.0	5.0	#4
	8.0	#5	¾	27	16	2	1	22	5¾	2.5	5.5	5.0	#4
	10.0	#5	⅞	27	16	2	1	22	5¾	2.5	6.5	5.0	#4
	12.0	#5	1	27	16	2	1	22	6	2.5	7.5	5.0	#4
	14.0	#6	1¼	28	16	2¼	1¼	28	7	3.0	8.0	5.0	#4
	16.0	#7	1⅝	28	16	2¼	1¼	28	7	3.0	9.0	5.0	#4
	18.0	#8	1⅝	28	16	2¼	1¼	28	7¼	3.0	10.0	5.0	#5
	20.0	#8	1⅞	29	16	2¾	1½	33	8¼	3.25	10.5	5.5	#5
16.0	6.0	#5	¾	26	16	1½	¾	17	5	2.0	5.0	5.0	#4
	8.0	#5	¾	27	16	2	1	22	5¾	2.5	6.0	5.0	#4
	10.0	#5	1	27	16	2	1	22	6	2.5	7.0	5.0	#4
	12.0	#6	1¼	28	16	2¼	1¼	28	7	3.0	8.0	5.0	#4
	14.0	#7	1½	28	16	2¼	1¼	28	7	3.0	9.0	5.0	#4
	16.0	#8	1¾	28	16	2¼	1¼	28	7¼	3.0	10.0	5.0	#5
20.0	17.0	#8	1⅞	29	16	2¾	1½	33	8¼	3.25	10.0	5.5	#5
	6.0	#5	¾	27	16	2	1	22	5¾	2.5	5.5	5.0	#4
	8.0	#5	⅞	27	16	2	1	22	5¾	2.5	6.5	5.0	#4
	10.0	#6	1⅞	28	16	2¼	1¼	28	6¾	3.0	7.5	5.0	#4
	12.0	#7	1⅝	28	16	2¼	1¼	28	7	3.0	8.5	5.0	#4
	14.0	#8	1⅝	28	16	2¼	1¼	28	7¼	3.0	10.0	5.0	#5
	15.0	#8	1¾	29	16	2¾	1½	33	8¼	3.25	10.0	5.0	#5

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR DETAILS, REFER TO SHEET 8.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS
DETAIL 2 - POST TYPES A AND B
DESIGN TABLES

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brenda Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 9 OF 20

BD-677M

DETAIL 2 PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO SPREAD FOOTING													
POST TYPES C AND D													
HEIGHT ZONE 0' TO 14' WIND PRESSURE = 20 PSF													
CONCRETE POST			BASE PLATE				ANCHOR BOLTS			SPREAD FOOTING			
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A1 (BAR SIZE)	t (IN.)	Q (IN.)	w (IN.)	F (IN.)	D (IN.)	S (IN.)	P (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
12.0	6.0	#5	¾	29	19	1½	¾	17	5	2.0	5.5	5.5	#4
	8.0	#5	¾	29	19	1½	¾	17	5	2.0	5.5	5.5	#4
	10.0	#5	¾	30	19	2	1	22	5¾	2.5	5.5	5.5	#4
	12.0	#5	⅞	30	19	2	1	22	5¾	2.5	5.5	5.5	#4
	14.0	#6	1	30	19	2	1	22	6	2.5	6.5	5.5	#4
	16.0	#6	1⅛	31	19	2¼	1¼	28	6¾	3.0	7.0	5.5	#4
	18.0	#6	1⅛	31	19	2¼	1¼	28	6¾	3.0	7.5	5.5	#4
	20.0	#7	1¼	31	19	2¼	1¼	28	7	3.0	8.0	5.5	#4
	22.0	#7	1⅜	31	19	2¼	1¼	28	7	3.0	9.0	5.5	#5
	24.0	#8	1½	32	19	2¾	1½	33	8	3.25	9.5	5.5	#5
16.0	26.0	#8	1⅝	32	19	2¾	1½	33	8	3.25	10.0	5.5	#5
	28.0	#9	1⅞	32	19	2¾	1½	33	8¼	3.25	10.5	5.5	#5
	6.0	#5	¾	29	19	1½	¾	17	5	2.0	5.5	5.5	#4
	8.0	#5	¾	30	19	2	1	22	5¾	2.5	5.5	5.5	#4
	10.0	#5	¾	30	19	2	1	22	5¾	2.5	5.5	5.5	#4
	12.0	#6	⅞	30	19	2	1	22	5¾	2.5	6.0	5.5	#4
	14.0	#6	1	31	19	2¼	1¼	28	6¾	3.0	7.0	5.5	#4
	16.0	#6	1⅛	31	19	2¼	1¼	28	6¾	3.0	7.5	5.5	#4
	18.0	#7	1⅜	31	19	2¼	1¼	28	7	3.0	8.5	5.5	#4
	20.0	#7	1½	31	19	2¼	1¼	28	7¼	3.0	9.0	5.5	#5
20.0	22.0	#8	1⅝	32	19	2¾	1½	33	8	3.25	10.0	5.5	#5
	24.0	#9	1⅞	32	19	2¾	1½	33	8¼	3.25	10.5	5.5	#6
	26.0	#10	2	33	19	3	1¾	39	9¼	3.75	11.0	5.5	#6
	28.0	#10	2¼	33	19	3	1¾	39	9½	3.75	11.5	6.0	#6
	6.0	#5	¾	29	19	1½	¾	17	5	2.0	5.5	5.5	#4
	8.0	#5	¾	30	19	2	1	22	5¾	2.5	5.5	5.5	#4
	10.0	#5	⅞	30	19	2	1	22	5¾	2.5	6.0	5.5	#4
	12.0	#6	1	31	19	2¼	1¼	28	6¾	3.0	6.5	5.5	#4
	14.0	#6	1⅛	31	19	2¼	1¼	28	6¾	3.0	7.5	5.5	#4
	16.0	#7	1⅜	31	19	2¼	1¼	28	7	3.0	8.0	5.5	#4
20.0	18.0	#8	1½	31	19	2¼	1¼	28	7¼	3.0	9.0	5.5	#5
	20.0	#8	1¾	32	19	2¾	1½	33	8¼	3.0	10.0	5.5	#5
	22.0	#9	1⅞	32	19	2¾	1½	33	8¼	3.25	10.5	5.5	#6
	24.0	#10	2⅛	33	19	3	1¾	39	9¼	3.75	11.0	5.5	#6
	26.0	#11	2⅝	33	19	3	1¾	39	9½	3.75	11.5	6.0	#6
	27.0	#11	2½	34	19	3½	2	44	10½	4.25	12.0	6.0	#6

DETAIL 2 PRECAST CONCRETE POST WITH BASE PLATE CONNECTION TO SPREAD FOOTING													
POST TYPES C AND D													
HEIGHT ZONES OVER 14' WIND PRESSURE = 28 PSF													
CONCRETE POST			BASE PLATE				ANCHOR BOLTS			SPREAD FOOTING			
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A1 (BAR SIZE)	t (IN.)	Q (IN.)	w (IN.)	F (IN.)	D (IN.)	S (IN.)	P (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
12.0	6.0	#5	¾	29	19	1½	¾	17	5	2.0	5.5	5.5	#4
	8.0	#5	¾	30	19	2	1	22	5¾	2.5	5.5	5.5	#4
	10.0	#5	¾	30	19	2	1	22	5¾	2.5	6.0	5.5	#4
	12.0	#6	⅞	30	19	2	1	22	5¾	2.5	7.0	5.5	#4
	14.0	#6	1	31	19	2¼	1¼	28	6¾	3.0	7.5	5.5	#4
	16.0	#6	1¼	31	19	2¼	1¼	28	7	3.0	8.5	5.5	#4
	18.0	#7	1⅜	31	19	2¼	1¼	28	7	3.0	9.5	5.5	#4
	20.0	#8	1½	32	19	2¾	1½	33	8	3.25	10.0	5.5	#5
	22.0	#8	1¾	32	19	2¾	1½	33	8¼	3.25	11.0	5.5	#5
	24.0	#9	1⅞	32	19	2¾	1½	33	8¼	3.25	11.5	6.0	#5
	26.0	#10	2⅞	33	19	3	1¾	39	9¼	3.75	12.0	6.0	#5
	28.0	#11	2⅞	33	19	3	1¾	39	9½	3.75	12.0	6.5	#5
30.0	#11	2½	34	19	3½	2	44	10½	4.25	12.5	6.5	#5	
16.0	6.0	#5	¾	29	19	1½	¾	17	5	2.0	5.5	5.5	#4
	8.0	#5	¾	30	19	2	1	22	5¾	2.5	5.5	5.5	#4
	10.0	#5	⅞	30	19	2	1	22	5¾	2.5	6.5	5.5	#4
	12.0	#6	1	31	19	2¼	1¼	28	6¾	3.0	7.5	5.5	#4
	14.0	#6	1¼	31	19	2¼	1¼	28	7	3.0	8.5	5.5	#4
	16.0	#7	1⅜	31	19	2¼	1¼	28	7	3.0	9.5	5.5	#5
	18.0	#8	1⅝	32	19	2¾	1½	33	8	3.25	10.5	5.5	#5
	20.0	#9	1⅞	32	19	2¾	1½	33	8¼	3.25	11.0	6.0	#5
	22.0	#10	2⅞	33	19	3	1¾	39	9¼	3.75	11.5	6.0	#5
	24.0	#10	2¼	33	19	3	1¾	39	9½	3.75	12.0	6.5	#5
	26.0	#11	2½	34	19	3½	2	44	10½	4.25	12.5	6.5	#6
	20.0	6.0	#5	¾	30	19	2	1	22	5¾	2.5	5.5	5.5
8.0		#5	¾	30	19	2	1	22	5¾	2.5	6.0	5.5	#4
10.0		#6	1	31	19	2¼	1¼	28	6¾	3.0	7.0	5.5	#4
12.0		#6	1⅞	31	19	2¼	1¼	28	6¾	3.0	8.5	5.5	#4
14.0		#7	1⅜	31	19	2¼	1¼	28	7	3.0	9.5	5.5	#5
16.0		#8	1⅝	32	19	2¾	1½	33	8	3.25	10.0	5.5	#5
18.0		#9	1⅞	32	19	2¾	1½	33	8¼	3.25	11.0	5.5	#6
20.0		#10	2⅞	33	19	3	1¾	39	9¼	3.75	11.5	6.0	#6
22.0		#11	2⅞	33	19	3	1¾	39	9½	3.75	12.5	6.5	#6
23.0		#11	2½	34	19	3½	2	44	10½	4.25	12.5	6.5	#6

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR DETAILS, REFER TO SHEET 8.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS
DETAIL 2 - POST TYPES C AND D
DESIGN TABLES

RECOMMENDEDAPR. 29, 2016

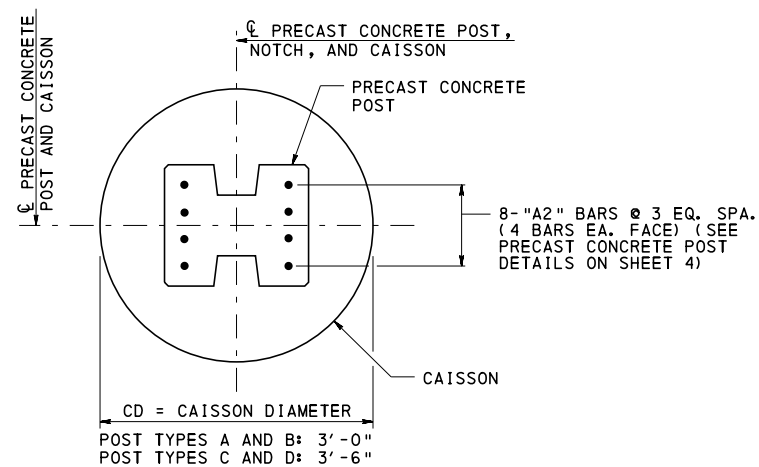
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDEDAPR. 29, 2016

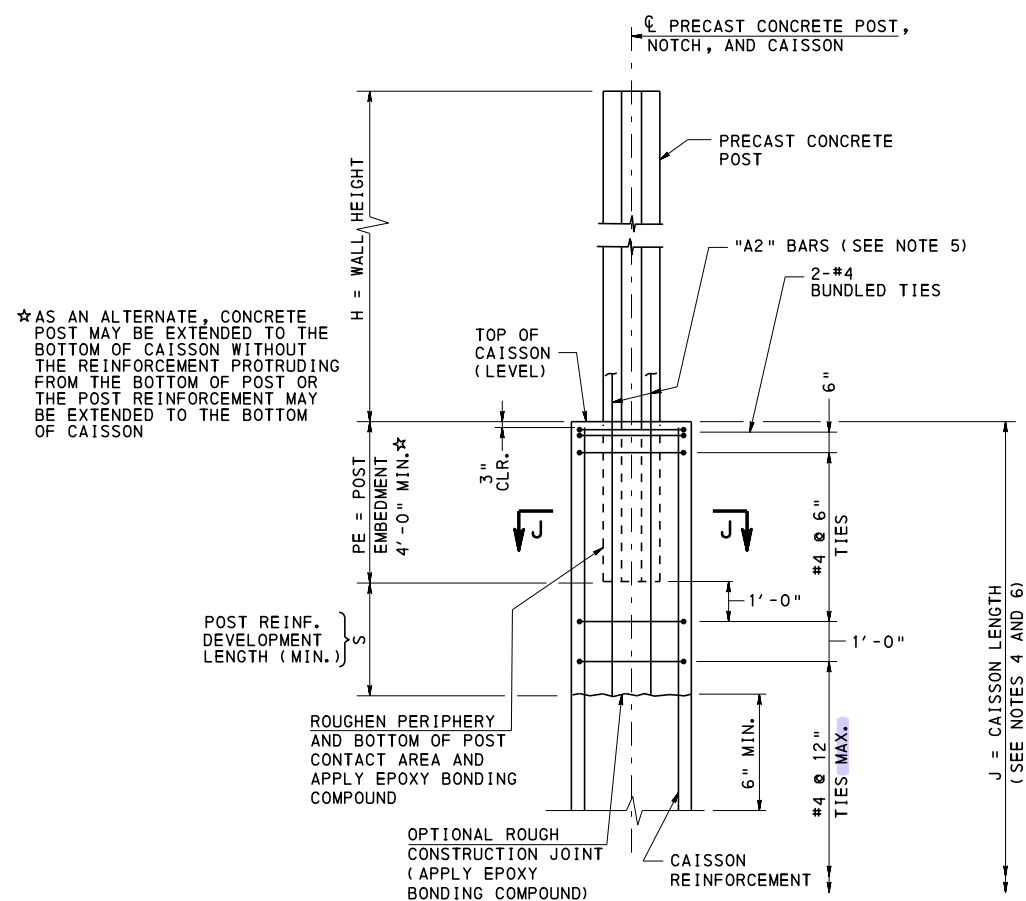
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 10 OF 20

BD-677M



PLAN



DETAIL 3
PRECAST CONCRETE POST
EMBEDDED IN CAISSON

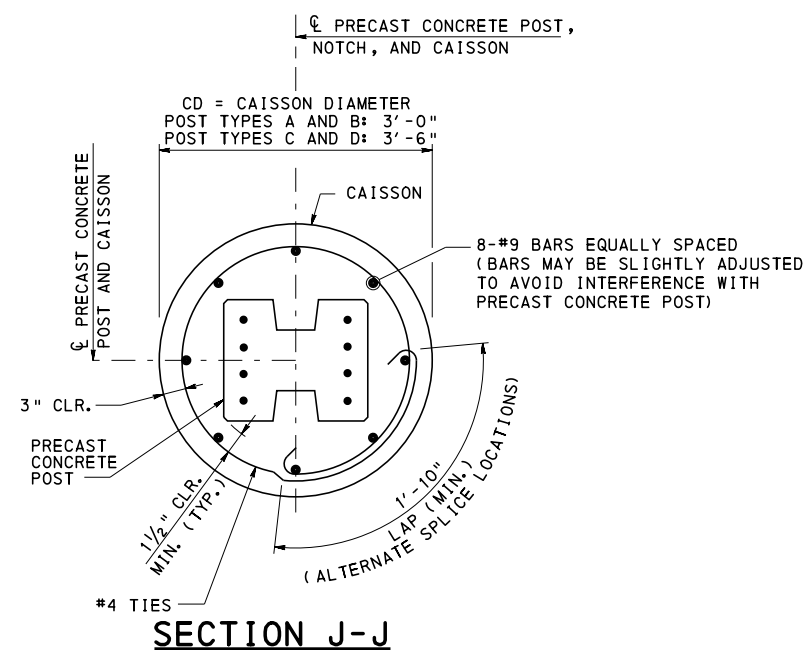
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TABLE NOTES:

1. DESIGNER TO COMPLETE TABLE AND INCLUDE ON CONTRACT DRAWINGS.
2. TABLE IS PERMITTED TO BE MODIFIED AS REQUIRED AS LONG AS ALL INFORMATION IS SHOWN ON THE CONTRACT DRAWINGS.
3. CAISSON REINFORCEMENT TO BE DETAILED ON CONTRACT DRAWINGS.
4. PROVIDE ELEVATIONS AS REQUIRED ON CONTRACT DRAWINGS.

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
3. FOR DESIGN TABLES REFER TO SHEET 12.
4. FOR CAISSON LENGTHS REFER TO SHEET 20.
5. PROVIDE UNCOATED, EPOXY COATED, OR GALVANIZED BARS IN ACCORDANCE WITH GENERAL NOTE 7, ON SHEET 1. DESIGNER TO SPECIFY ON THE CONTRACT DRAWINGS.
6. DESIGNER TO VERIFY IF REQUIRED CAISSON LENGTH NEEDS TO BE INCREASED TO ACCOMMODATE THE POST EMBEDMENT PLUS POST REINFORCEMENT DEVELOPMENT LENGTH PLUS 6".

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY**

STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

DETAIL 3

RECOMMENDED APR. 29, 2016
Thomas P. Macioce
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brenda Thompson
 DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 11 OF 20
BD-677M

DETAIL 3 PRECAST CONCRETE POST EMBEDDED IN CAISSON				
POST TYPES A AND B				
HEIGHT ZONE 0' TO 14' WIND PRESSURE = 20 PSF				
CONCRETE POST REINFORCEMENT				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	S (IN.)	
			UNCOATED OR GALVANIZED BARS	EPOXY COATED BARS
12.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#4	12	18
	14.0	#4	12	18
	16.0	#5	15	23
	18.0	#6	20	29
	20.0	#6	20	29
	22.0	#7	26	39
	24.0	#7	26	39
	26.0	#8	35	52
	28.0	#9	44	65
16.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#4	12	18
	14.0	#5	15	23
	16.0	#6	20	29
	18.0	#7	26	39
	20.0	#7	26	39
	22.0	#8	35	52
	24.0	#9	44	65
	25.0	#9	44	65
20.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#5	15	23
	14.0	#6	20	29
	16.0	#6	20	29
	18.0	#7	26	39
	20.0	#8	35	52
	22.0	#9	44	65
	24.0	#10	55	83

DETAIL 3 PRECAST CONCRETE POST EMBEDDED IN CAISSON				
POST TYPES A AND B				
HEIGHT ZONES OVER 14' WIND PRESSURE = 28 PSF				
CONCRETE POST REINFORCEMENT				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	S (IN.)	
			UNCOATED OR GALVANIZED BARS	EPOXY COATED BARS
12.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#4	12	18
	14.0	#5	15	23
	16.0	#6	20	29
	18.0	#7	26	39
	20.0	#7	26	39
	22.0	#8	35	52
	24.0	#9	44	65
	25.0	#10	55	83
16.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#5	15	23
	14.0	#6	20	29
	16.0	#7	26	39
	18.0	#8	35	52
	20.0	#8	35	52
	22.0	#9	44	65
	23.0	#10	55	83
20.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#5	15	23
	14.0	#7	26	39
	16.0	#8	35	52
	20.0	#10	55	83

DETAIL 3 PRECAST CONCRETE POST EMBEDDED IN CAISSON				
POST TYPES C AND D				
HEIGHT ZONE 0' TO 14' WIND PRESSURE = 20 PSF				
CONCRETE POST REINFORCEMENT				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	S (IN.)	
			UNCOATED OR GALVANIZED BARS	EPOXY COATED BARS
12.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#4	12	18
	14.0	#5	15	23
	16.0	#5	15	23
	18.0	#5	15	23
	20.0	#6	20	29
	22.0	#6	20	29
	24.0	#7	26	39
	26.0	#7	26	39
	28.0	#8	35	52
16.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#5	15	23
	14.0	#5	15	23
	16.0	#5	15	23
	18.0	#6	20	29
	20.0	#7	26	39
	22.0	#7	26	39
	24.0	#8	35	52
	26.0	#9	44	65
	28.0	#9	44	65
20.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#5	15	23
	14.0	#5	15	23
	16.0	#6	20	29
	18.0	#7	26	39
	20.0	#7	26	39
	22.0	#8	35	52
	24.0	#9	44	65
	26.0	#10	55	83
	28.0	#10	55	83

DETAIL 3 PRECAST CONCRETE POST EMBEDDED IN CAISSON				
POST TYPES C AND D				
HEIGHT ZONES OVER 14' WIND PRESSURE = 28 PSF				
CONCRETE POST REINFORCEMENT				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	S (IN.)	
			UNCOATED OR GALVANIZED BARS	EPOXY COATED BARS
12.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#4	12	18
	12.0	#5	15	23
	14.0	#5	15	23
	16.0	#5	15	23
	18.0	#6	20	29
	20.0	#7	26	39
	22.0	#7	26	39
	24.0	#8	35	52
	26.0	#9	44	65
	28.0	#9	44	65
16.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#5	15	23
	12.0	#5	15	23
	14.0	#5	15	23
	16.0	#5	15	23
	18.0	#6	20	29
	20.0	#7	26	39
	22.0	#8	35	52
	24.0	#9	44	65
	26.0	#9	44	65
	30.0	#10	55	83
20.0	6.0	#4	12	18
	8.0	#4	12	18
	10.0	#5	15	23
	12.0	#5	15	23
	14.0	#5	15	23
	16.0	#6	20	29
	18.0	#7	26	39
	20.0	#8	35	52
	22.0	#9	44	65
	24.0	#9	44	65
	26.0	#10	55	83
	28.0	#11	68	102

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR DETAILS, REFER TO SHEET 11.

COMMONWEALTH OF PENNSYLVANIA
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GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

DETAIL 3 - POST TYPES A, B, C AND D
DESIGN TABLES

RECOMMENDEDAPR. 29, 2016

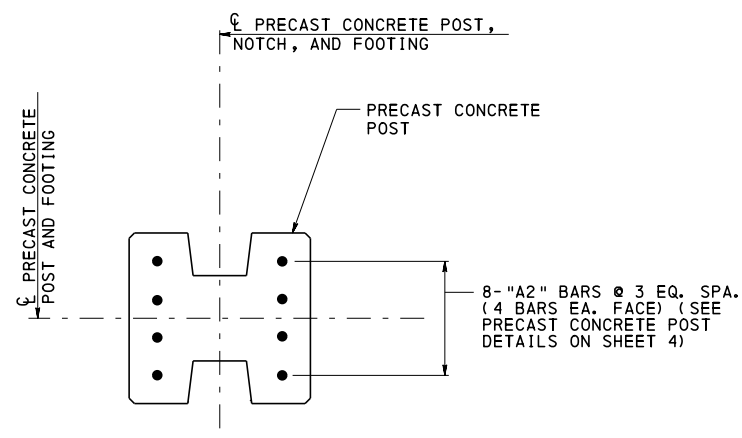
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDEDAPR. 29, 2016

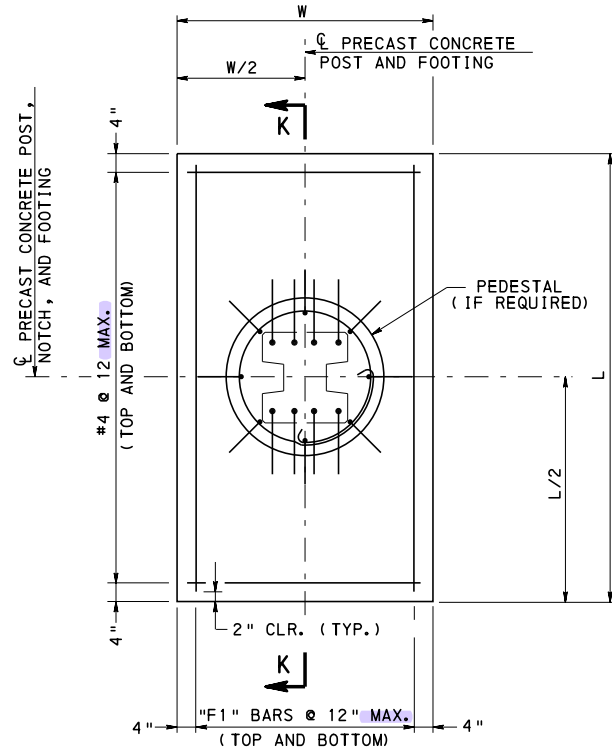
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 12 OF 20

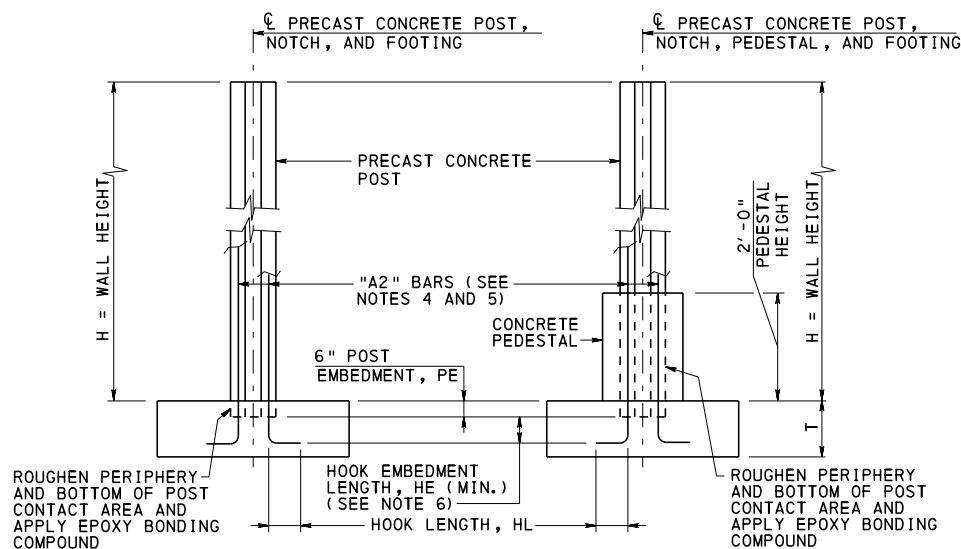
BD-677M



PLAN

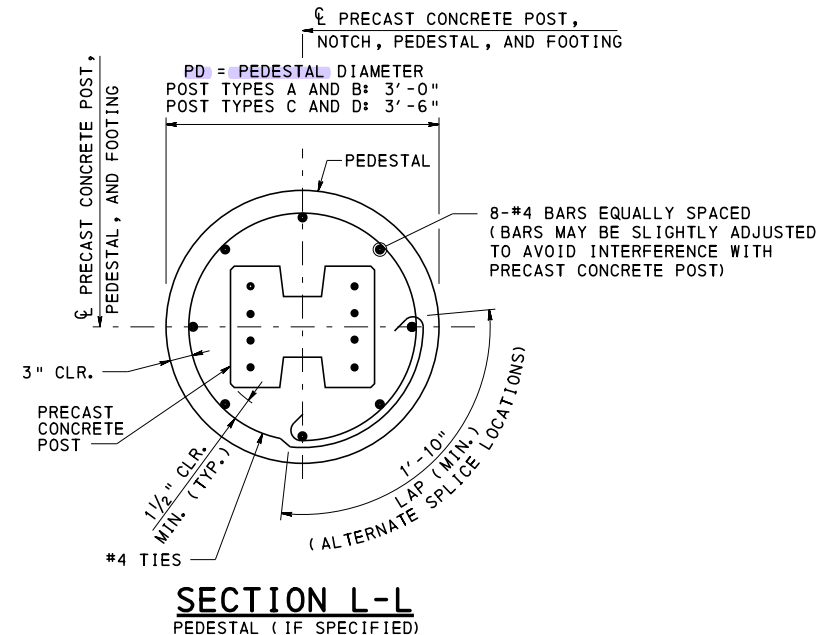


SPREAD FOOTING PLAN



WITHOUT PEDESTAL WITH PEDESTAL
ELEVATION

DETAIL 4
PRECAST CONCRETE POST
EMBEDDED IN SPREAD FOOTING
(WITH OR WITHOUT PEDESTAL)



SECTION L-L
PEDESTAL (IF SPECIFIED)

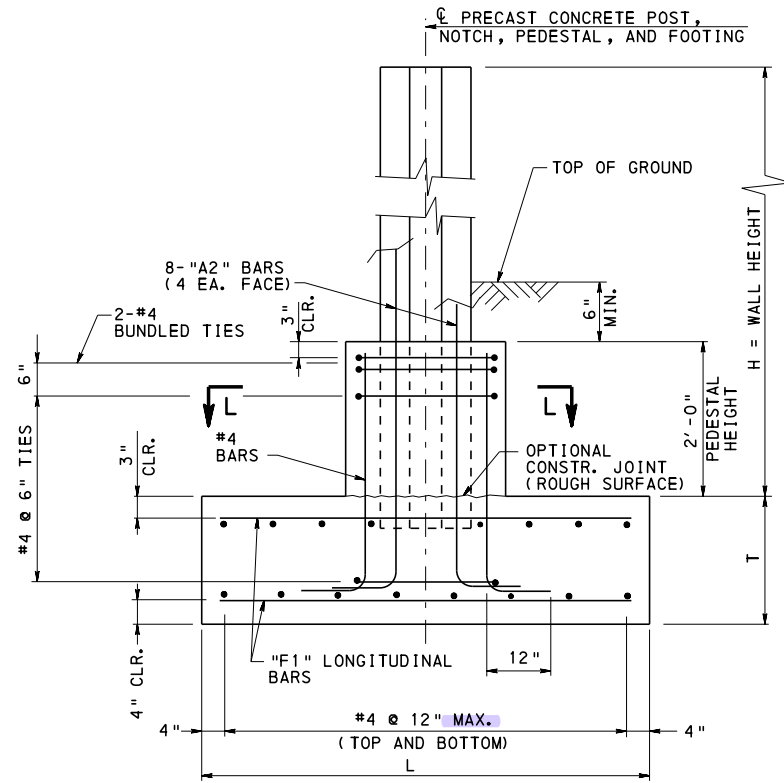
NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
3. FOR DESIGN TABLES REFER TO SHEETS 14 AND 15.
4. PROVIDE UNCOATED OR EPOXY COATED BARS IN ACCORDANCE WITH GENERAL NOTE 7, ON SHEET 1. DESIGNER TO SPECIFY ON THE CONTRACT DRAWINGS. GALVANIZED BARS NOT PERMITTED.
5. BARS MAY BE BENT AFTER FABRICATION OF POST. TOUCH-UP EPOXY COATED BARS WITH AN APPROVED EPOXY PAINT.
6. DESIGNER IS PERMITTED TO INCREASE THE EMBEDMENT LENGTH OF THE POST REINFORCEMENT BARS SO BARS CAN BE TIED TO THE BOTTOM FOOTING REINFORCEMENT BARS.

PRECAST CONCRETE POST EMBEDDED IN SPREAD FOOTING DIMENSION TABLE										
HEIGHT ZONE = WIND PRESSURE =										
CONCRETE POST							SPREAD FOOTING			
POST NUMBER	DESIGN POST SPACING (FT.)	DESIGN WALL HEIGHT (FT.)	POST EMBEDMENT PE (FT.-IN.)	"A2" (BAR SIZE)	HOOK EMBEDMENT LENGTH HE (IN.)	HOOK LENGTH HL (IN.)	THICKNESS T (FT.)	LENGTH L (FT.)	WIDTH W (FT.)	"F1" (BAR SIZE)

TABLE NOTES:

1. DESIGNER TO COMPLETE TABLE AND INCLUDE ON CONTRACT DRAWINGS.
2. TABLE IS PERMITTED TO BE MODIFIED AS REQUIRED AS LONG AS ALL INFORMATION IS SHOWN ON THE CONTRACT DRAWINGS.
3. SPREAD FOOTING REINFORCEMENT TO BE DETAILED ON CONTRACT DRAWINGS.
4. PROVIDE ELEVATIONS AS REQUIRED ON CONTRACT DRAWINGS.
5. INDICATE AND DETAIL PEDESTAL IF REQUIRED.



SECTION K-K (WITH PEDESTAL)
ADJUST FOOTING TOP REINFORCING SPACING TO CLEAR POST.

COMMONWEALTH OF PENNSYLVANIA
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STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

DETAIL 4

DETAIL 4 PRECAST CONCRETE POST EMBEDDED IN SPREAD FOOTING									
POST TYPES A AND B									
HEIGHT ZONE 0' TO 14' WIND PRESSURE = 20 PSF									
CONCRETE POST REINFORCEMENT					SPREAD FOOTING				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	HE (IN.)(MIN.)		HL (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
			UNCOATED	EPOXY					
12.0	6.0	#4	8	10	8	2.0	5.0	5.0	#4
	8.0	#4	8	10	8	2.0	5.0	5.0	#4
	10.0	#4	8	10	8	2.5	5.0	5.0	#4
	12.0	#4	8	10	8	2.5	6.0	5.0	#4
	14.0	#4	8	10	8	2.5	6.5	5.0	#4
	16.0	#5	10	12	10	3.0	7.0	5.0	#4
	18.0	#6	12	14	12	3.0	8.0	5.0	#4
	20.0	#6	12	14	12	3.0	8.5	5.0	#4
	22.0	#7	14	17	14	3.0	9.5	5.0	#5
	24.0	#7	14	17	14	3.25	10.0	5.0	#5
	26.0	#8	16	19	16	3.25	10.5	5.5	#5
	28.0	#9	18	21	19	3.75	10.5	5.5	#5
16.0	6.0	#4	8	10	8	2.0	5.0	5.0	#4
	8.0	#4	8	10	8	2.5	5.0	5.0	#4
	10.0	#4	8	10	8	2.5	5.5	5.0	#4
	12.0	#4	8	10	8	2.5	6.5	5.0	#4
	14.0	#5	10	12	10	3.0	7.0	5.0	#4
	16.0	#6	12	14	12	3.0	8.0	5.0	#4
	18.0	#7	14	17	14	3.0	9.0	5.0	#5
	20.0	#7	14	17	14	3.25	9.5	5.0	#5
	22.0	#8	16	19	16	3.25	10.0	5.5	#5
	24.0	#9	18	21	19	3.75	10.5	5.5	#5
	25.0	#9	18	21	19	3.75	11.0	5.5	#5
	6.0	#4	8	10	8	2.0	5.0	5.0	#4
20.0	8.0	#4	8	10	8	2.5	5.0	5.0	#4
	10.0	#4	8	10	8	2.5	6.0	5.0	#4
	12.0	#5	10	12	10	3.0	7.0	5.0	#4
	14.0	#6	12	14	12	3.0	8.0	5.0	#4
	16.0	#6	12	14	12	3.0	8.5	5.0	#5
	18.0	#7	14	17	14	3.25	9.5	5.0	#5
	20.0	#8	16	19	16	3.25	10.0	5.0	#6
	22.0	#9	18	21	19	3.75	10.5	5.5	#6
	24.0	#10	20	24	22	3.75	11.0	6.0	#6
	6.0	#4	8	10	8	2.0	5.0	5.0	#4
	8.0	#4	8	10	8	2.5	5.0	5.0	#4
	10.0	#4	8	10	8	2.5	6.0	5.0	#4

DETAIL 4 PRECAST CONCRETE POST EMBEDDED IN SPREAD FOOTING									
POST TYPES A AND B									
HEIGHT ZONES OVER 14' WIND PRESSURE = 28 PSF									
CONCRETE POST REINFORCEMENT					SPREAD FOOTING				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	HE (IN.)(MIN.)		HL (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
			UNCOATED	EPOXY					
12.0	6.0	#4	8	10	8	2.0	5.0	5.0	#4
	8.0	#4	8	10	8	2.5	5.5	5.0	#4
	10.0	#4	8	10	8	2.5	6.5	5.0	#4
	12.0	#4	8	10	8	2.5	7.5	5.0	#4
	14.0	#5	10	12	10	3.0	8.0	5.0	#4
	16.0	#6	12	14	12	3.0	9.0	5.0	#4
	18.0	#7	14	17	14	3.0	10.0	5.0	#5
	20.0	#7	14	17	14	3.25	10.5	5.5	#5
	22.0	#8	16	19	16	3.25	11.0	5.5	#5
	24.0	#9	18	21	19	3.75	11.5	6.0	#5
	25.0	#10	20	24	22	3.75	11.5	6.0	#5
	6.0	#4	8	10	8	2.0	5.0	5.0	#4
	8.0	#4	8	10	8	2.5	6.0	5.0	#4
	10.0	#4	8	10	8	2.5	7.0	5.0	#4
16.0	12.0	#5	10	12	10	3.0	8.0	5.0	#4
	14.0	#6	12	14	12	3.0	9.0	5.0	#4
	16.0	#7	14	17	14	3.0	10.0	5.0	#5
	18.0	#8	16	19	16	3.25	11.0	5.5	#5
	20.0	#8	16	19	16	3.25	11.0	6.0	#5
	22.0	#9	18	21	19	3.75	12.0	6.0	#5
	23.0	#10	20	24	22	3.75	12.0	6.0	#6
	6.0	#4	8	10	8	2.5	5.5	5.0	#4
	8.0	#4	8	10	8	2.5	6.5	5.0	#4
	10.0	#5	10	12	10	3.0	7.5	5.0	#4
20.0	12.0	#6	12	14	12	3.0	8.5	5.0	#4
	14.0	#7	14	17	14	3.0	10.0	5.0	#5
	16.0	#8	16	19	16	3.25	10.5	5.5	#5
	18.0	#9	18	21	19	3.25	11.0	6.0	#5
	20.0	#10	20	24	22	3.75	12.0	6.0	#6
	6.0	#4	8	10	8	2.5	5.5	5.0	#4

NOTES:
1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR DETAILS, REFER TO SHEET 13.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS
DETAIL 4 - POST TYPES A AND B
DESIGN TABLES

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brenda Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 14 OF 20
BD-677M

DETAIL 4 PRECAST CONCRETE POST EMBEDDED IN SPREAD FOOTING									
POST TYPES C AND D									
HEIGHT ZONE 0' TO 14' WIND PRESSURE = 20 PSF									
CONCRETE POST REINFORCEMENT					SPREAD FOOTING				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	HE (IN.)(MIN.)		HL (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
			UNCOATED	EPOXY					
12.0	6.0	#4	8	10	8	2.0	5.5	5.5	#4
	8.0	#4	8	10	8	2.0	5.5	5.5	#4
	10.0	#4	8	10	8	2.5	5.5	5.5	#4
	12.0	#4	8	10	8	2.5	5.5	5.5	#4
	14.0	#5	10	12	10	2.5	6.5	5.5	#4
	16.0	#5	10	12	10	3.0	7.0	5.5	#4
	18.0	#5	10	12	10	3.0	7.5	5.5	#4
	20.0	#6	12	14	12	3.0	8.0	5.5	#4
	22.0	#6	12	14	12	3.0	9.0	5.5	#5
	24.0	#7	14	17	14	3.25	9.5	5.5	#5
	26.0	#7	14	17	14	3.25	10.0	5.5	#5
	28.0	#8	16	19	16	3.25	10.5	5.5	#5
16.0	6.0	#4	8	10	8	2.0	5.5	5.5	#4
	8.0	#4	8	10	8	2.5	5.5	5.5	#4
	10.0	#4	8	10	8	2.5	5.5	5.5	#4
	12.0	#5	10	12	10	2.5	6.0	5.5	#4
	14.0	#5	10	12	10	3.0	7.0	5.5	#4
	16.0	#5	10	12	10	3.0	7.5	5.5	#4
	18.0	#6	12	14	12	3.0	8.5	5.5	#4
	20.0	#7	14	17	14	3.0	9.0	5.5	#5
	22.0	#7	14	17	14	3.25	10.0	5.5	#5
	24.0	#8	16	19	16	3.25	10.5	5.5	#6
	26.0	#9	18	21	19	3.75	11.0	5.5	#6
	28.0	#9	18	21	19	3.75	11.5	6.0	#6
20.0	6.0	#4	8	10	8	2.0	5.5	5.5	#4
	8.0	#4	8	10	8	2.5	5.5	5.5	#4
	10.0	#4	8	10	8	2.5	6.0	5.5	#4
	12.0	#5	10	12	10	3.0	6.5	5.5	#4
	14.0	#5	10	12	10	3.0	7.5	5.5	#4
	16.0	#6	12	14	12	3.0	8.0	5.5	#4
	18.0	#7	14	17	14	3.0	9.0	5.5	#5
	20.0	#7	14	17	14	3.0	10.0	5.5	#5
	22.0	#8	16	19	16	3.25	10.5	5.5	#6
	24.0	#9	18	21	19	3.75	11.0	5.5	#6
	26.0	#10	20	24	22	3.75	11.5	6.0	#6
	28.0	#10	20	24	22	4.25	12.0	6.0	#6

DETAIL 4 PRECAST CONCRETE POST EMBEDDED IN SPREAD FOOTING									
POST TYPES C AND D									
HEIGHT ZONES OVER 14' WIND PRESSURE = 28 PSF									
CONCRETE POST REINFORCEMENT					SPREAD FOOTING				
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	A2 (BAR SIZE)	HE (IN.)(MIN.)		HL (IN.)	T (FT.)	L (FT.)	W (FT.)	F1 (BAR SIZE)
			UNCOATED	EPOXY					
12.0	6.0	#4	8	10	8	2.0	5.5	5.5	#4
	8.0	#4	8	10	8	2.5	5.5	5.5	#4
	10.0	#4	8	10	8	2.5	6.0	5.5	#4
	12.0	#5	10	12	10	2.5	7.0	5.5	#4
	14.0	#5	10	12	10	3.0	7.5	5.5	#4
	16.0	#5	10	12	10	3.0	8.5	5.5	#4
	18.0	#6	12	14	12	3.0	9.5	5.5	#4
	20.0	#7	14	17	14	3.25	10.0	5.5	#5
	22.0	#7	14	17	14	3.25	11.0	5.5	#5
	24.0	#8	16	19	16	3.25	11.5	6.0	#5
	26.0	#9	18	21	19	3.75	12.0	6.0	#5
	28.0	#9	18	21	19	3.75	12.0	6.5	#5
	30.0	#10	20	24	22	4.25	12.5	6.5	#5
	6.0	#4	8	10	8	2.0	5.5	5.5	#4
16.0	8.0	#4	8	10	8	2.5	5.5	5.5	#4
	10.0	#5	10	12	10	2.5	6.5	5.5	#4
	12.0	#5	10	12	10	3.0	7.5	5.5	#4
	14.0	#5	10	12	10	3.0	8.5	5.5	#4
	16.0	#6	12	14	12	3.0	9.5	5.5	#5
	18.0	#7	14	17	14	3.25	10.5	5.5	#5
	20.0	#8	16	19	16	3.25	11.0	6.0	#5
	22.0	#9	18	21	19	3.75	11.5	6.0	#5
	24.0	#9	18	21	19	3.75	12.0	6.5	#5
	26.0	#10	20	24	22	4.25	12.5	6.5	#6
	28.0	#11	22	26	24	4.25	13.0	7.0	#6
	6.0	#4	8	10	8	2.5	5.5	5.5	#4
	8.0	#4	8	10	8	2.5	6.0	5.5	#4
	10.0	#5	10	12	10	3.0	7.0	5.5	#4
	12.0	#5	10	12	10	3.0	8.5	5.5	#4
20.0	14.0	#6	12	14	12	3.0	9.5	5.5	#5
	16.0	#7	14	17	14	3.25	10.0	5.5	#5
	18.0	#8	16	19	16	3.25	11.0	5.5	#6
	20.0	#9	18	21	19	3.75	11.5	6.0	#6
	22.0	#10	20	24	22	3.75	12.5	6.5	#6
	24.0	#10	20	24	22	4.25	13.0	6.5	#6
	25.0	#11	22	26	24	4.25	13.0	7.0	#6

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR DETAILS, REFER TO SHEET 13.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

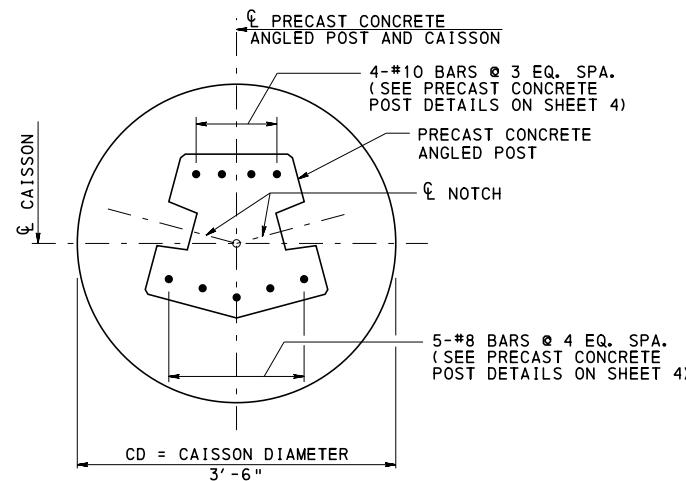
STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS
DETAIL 4 - POST TYPES C AND D
DESIGN TABLES

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

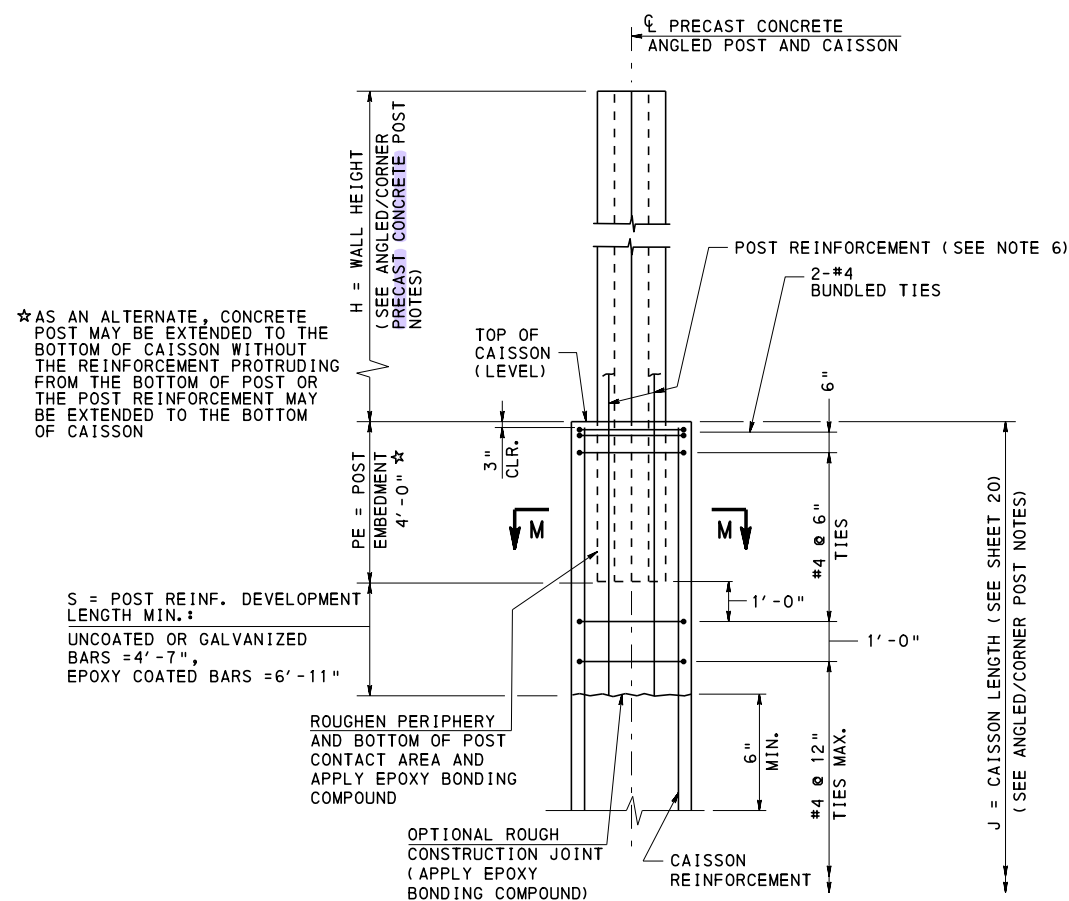
RECOMMENDED APR. 29, 2016
Brenda S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 15 OF 20

BD-677M

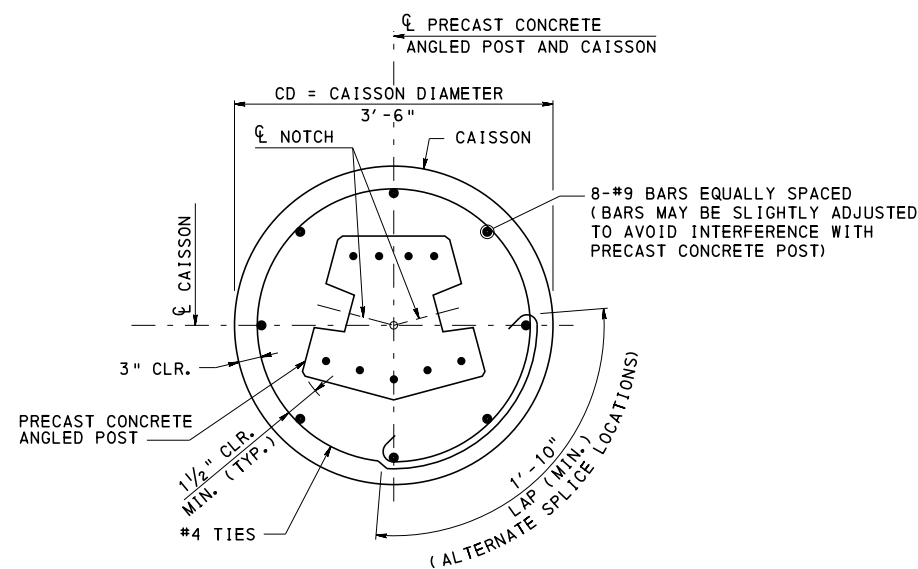


PLAN



ELEVATION

DETAIL 5
ANGLED PRECAST CONCRETE POST TYPE E
EMBEDDED IN CAISSON



SECTION M-M

ANGLED/CORNER PRECAST CONCRETE POST NOTES:

- THE ANGLED IN-LINE PRECAST CONCRETE POST (POST TYPE E) MAY ONLY BE USED WHEN THE INTERSECTING ANGLES BETWEEN THE PRECAST CONCRETE PANELS IS GREATER THAN 138 DEGREES AND LESS THAN 162 DEGREES.
- THE CORNER PRECAST CONCRETE POST (POST TYPE F) MAY ONLY BE USED WHEN THE INTERSECTING ANGLE BETWEEN THE PRECAST CONCRETE PANELS IS GREATER THAN 78 DEGREES AND LESS THAN 102 DEGREES.
- THE ANGLED/CORNER PRECAST CONCRETE POSTS WERE DESIGNED FOR THE FOLLOWING POST SPACINGS, WIND PRESSURES, AND MAXIMUM WALL HEIGHTS:
 - 12'-0" POST SPACING:
 - WIND PRESSURE = 20 PSF: MAXIMUM WALL HEIGHT = 28'-0"
 - WIND PRESSURE = 28 PSF: MAXIMUM WALL HEIGHT = 24'-0"
 - 16'-0" POST SPACING:
 - WIND PRESSURE = 20 PSF: MAXIMUM WALL HEIGHT = 24'-0"
 - WIND PRESSURE = 28 PSF: MAXIMUM WALL HEIGHT = 20'-0"
- DETAILS 5 AND 6 - ANGLED/CORNER PRECAST CONCRETE POST EMBEDDED IN CAISSON:
 - INDICATE THE REQUIRED WALL HEIGHT ON THE CONTRACT PLANS.
 - DETERMINE CAISSON LENGTH BASED ON THE POST SPACING AND WALL HEIGHT. REFER TO DESIGN TABLES ON SHEET 20.
 - PROVIDE DIMENSION TABLE SIMILAR TO TABLE SHOWN FOR DETAIL 3 OR COMPLETELY DETAIL POST AND CAISSON ON THE CONTRACT DRAWINGS.
- DETAILS 7 AND 8 - ANGLED/CORNER PRECAST CONCRETE POST EMBEDDED IN SPREAD FOOTING (WITH OR WITHOUT PEDESTAL):
 - INDICATE THE REQUIRED WALL HEIGHT ON THE CONTRACT PLANS.
 - PROVIDE SPREAD FOOTING DESIGN COMPUTATIONS TO DETERMINE THE FOOTING DIMENSIONS AND REINFORCEMENT REQUIREMENTS FOR THE REQUIRED POST SPACING AND WALL HEIGHT. PROVIDE THE FOLLOWING MINIMUM FOOTING DIMENSIONS:
 - MINIMUM FOOTING LENGTH (L) = 6'-6"
 - MINIMUM FOOTING WIDTH (W) = 6'-6"
 - MINIMUM FOOTING THICKNESS (T) = 3'-0"
 - REFER TO DESIGN PARAMETERS ON SHEET 2 FOR ADDITIONAL INFORMATION.
 - PROVIDE DIMENSION TABLE SIMILAR TO TABLE SHOWN FOR DETAIL 4 OR COMPLETELY DETAIL POST AND SPREAD FOOTING ON THE CONTRACT DRAWINGS.

NOTES:

- FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
- FOR DETAIL 6, REFER TO SHEET 17.
- FOR DETAIL 7, REFER TO SHEET 18.
- FOR DETAIL 8, REFER TO SHEET 19.
- FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
- PROVIDE UNCOATED, EPOXY COATED, OR GALVANIZED BARS IN ACCORDANCE WITH GENERAL NOTE 7, ON SHEET 1. DESIGNER TO SPECIFY ON THE CONTRACT DRAWINGS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

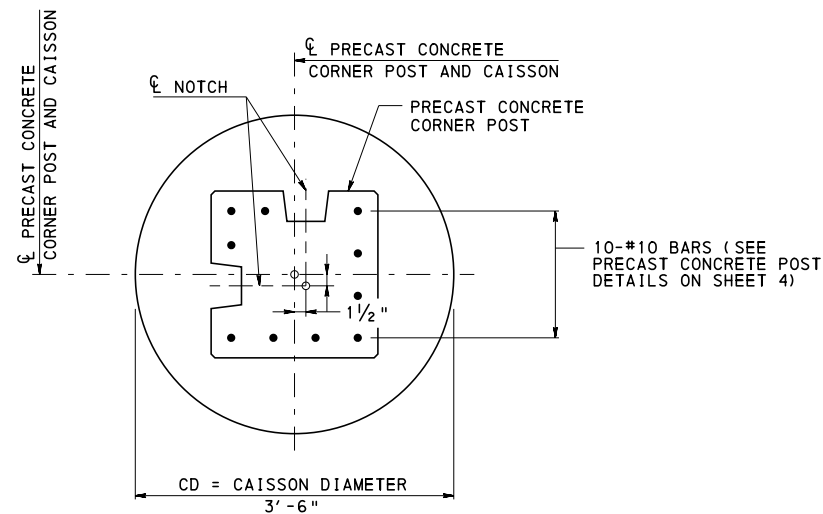
DETAIL 5

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

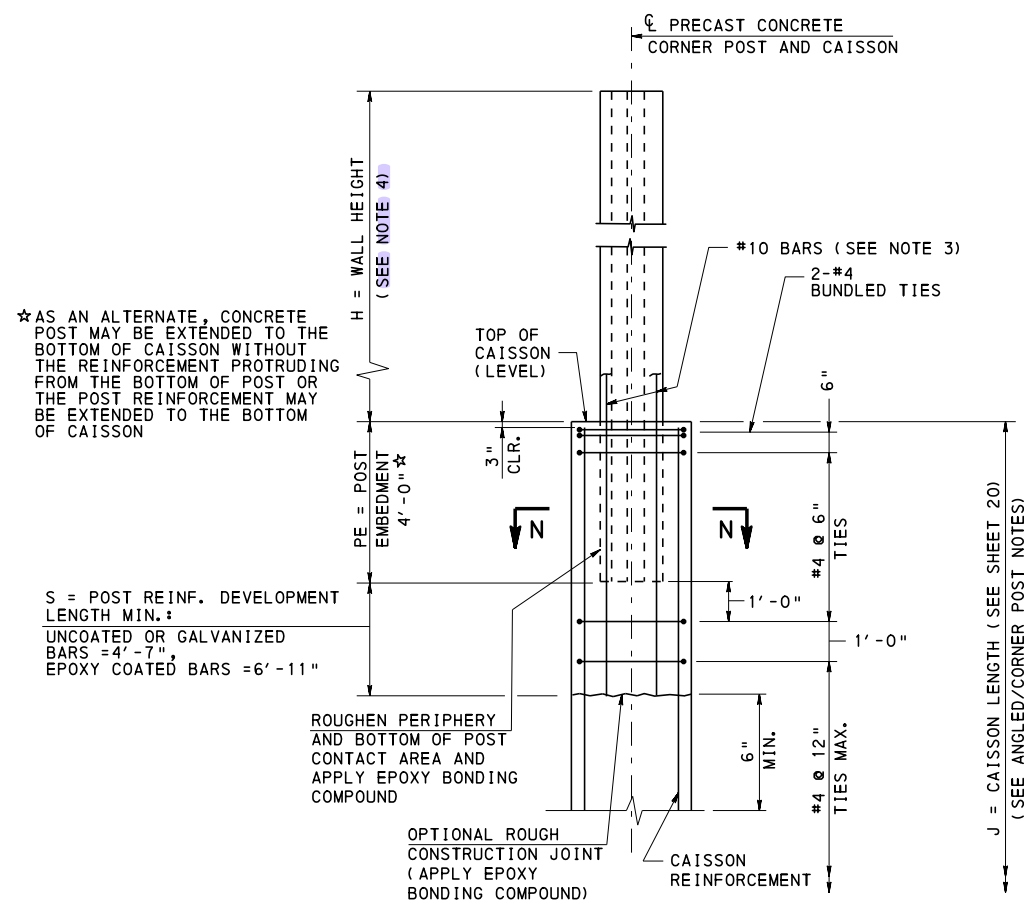
RECOMMENDED APR. 29, 2016
Brenda S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 16 OF 20

BD-677M

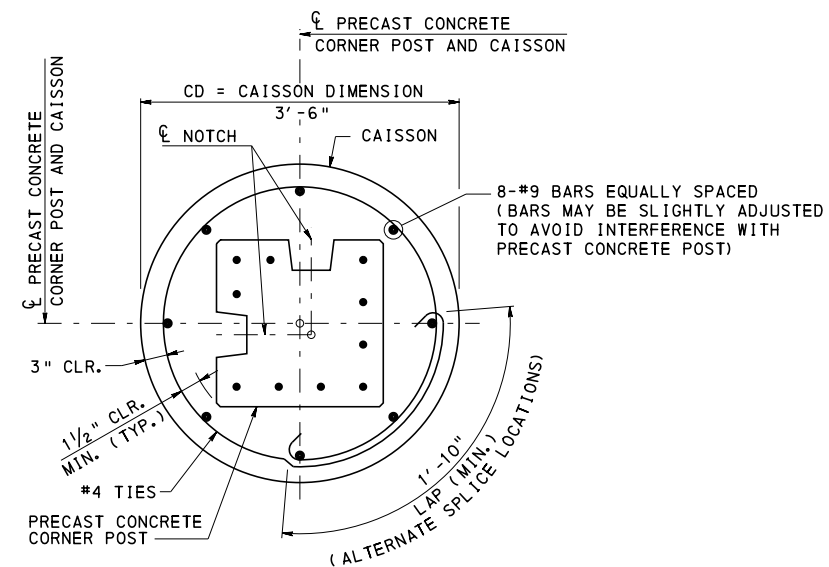


PLAN



ELEVATION

DETAIL 6
CORNER PRECAST CONCRETE POST TYPE F
EMBEDDED IN CAISSON



SECTION N-N

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
3. PROVIDE UNCOATED, EPOXY COATED, OR GALVANIZED BARS IN ACCORDANCE WITH GENERAL NOTE 7, ON SHEET 1. DESIGNER TO SPECIFY ON THE CONTRACT DRAWINGS.
4. FOR ANGLED/CORNER PRECAST CONCRETE POST NOTES REFER TO SHEET 16.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

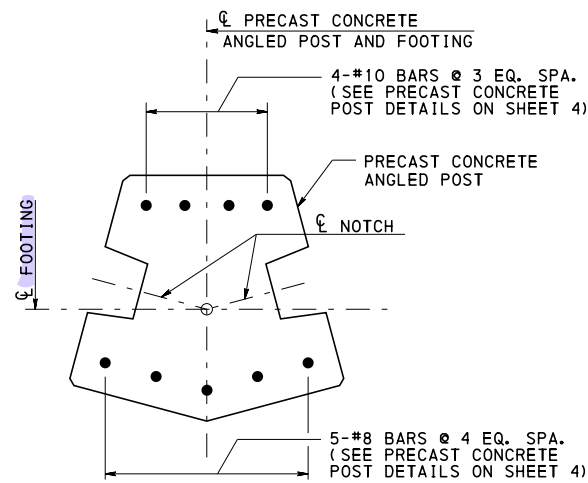
STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

DETAIL 6

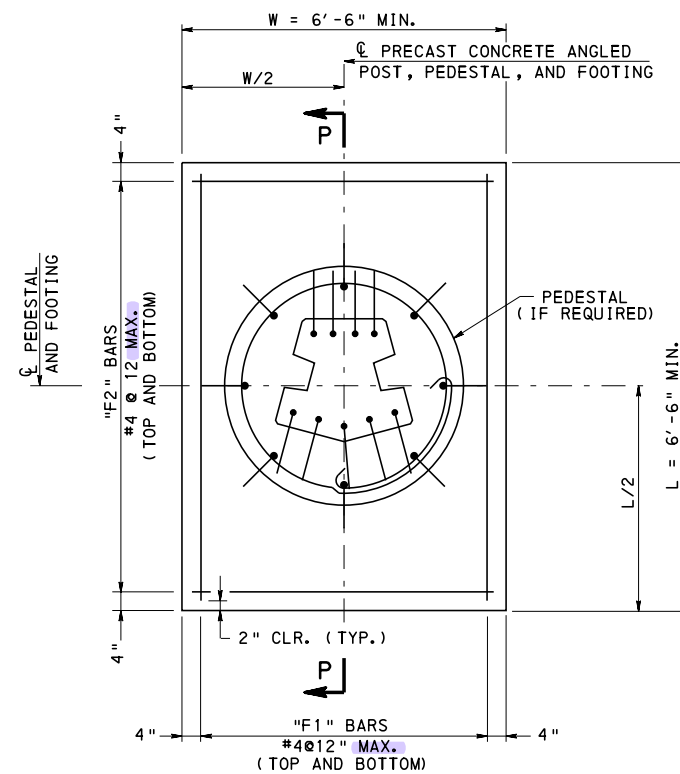
RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

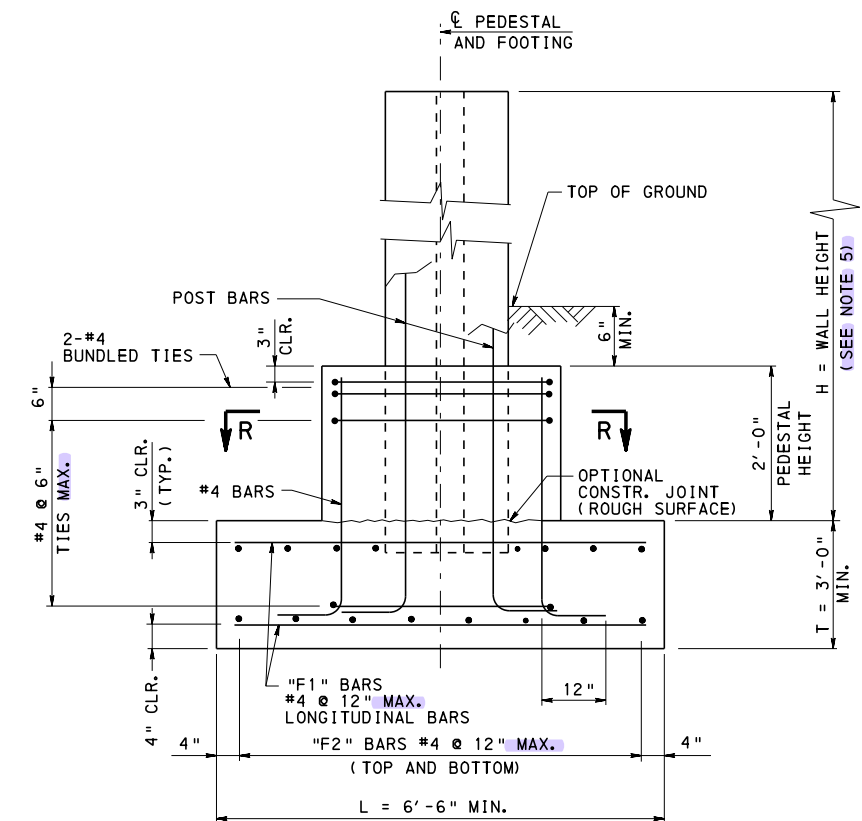
SHEET 17 OF 20
BD-677M



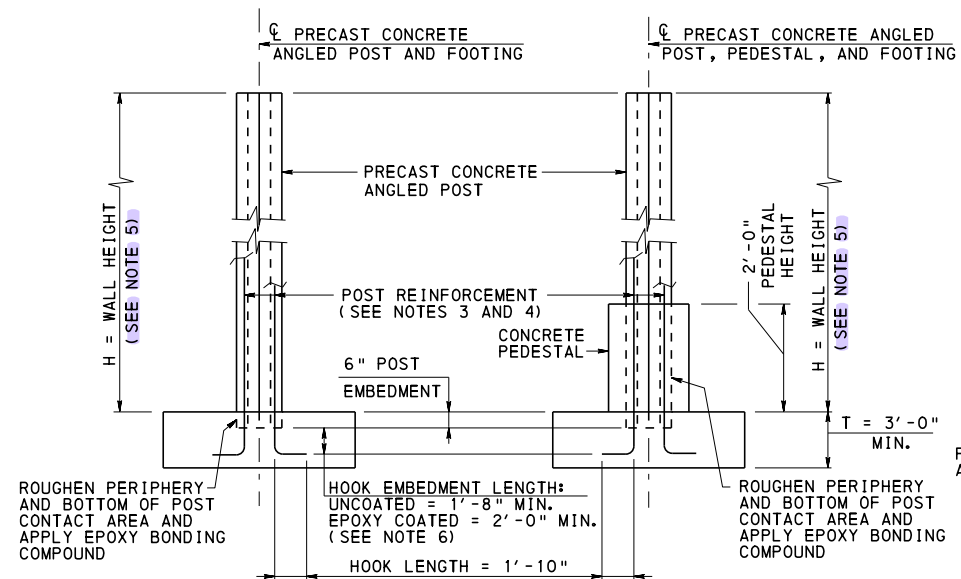
PLAN



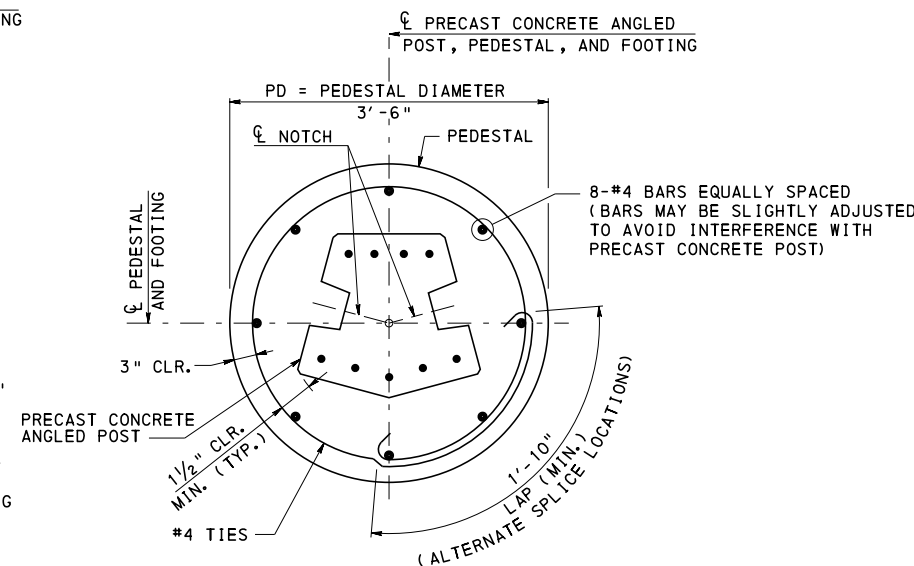
SPREAD FOOTING PLAN



SECTION P-P (WITH PEDESTAL)
ADJUST FOOTING TOP REINFORCING SPACING TO CLEAR POST.



WITHOUT PEDESTAL WITH PEDESTAL
ELEVATION



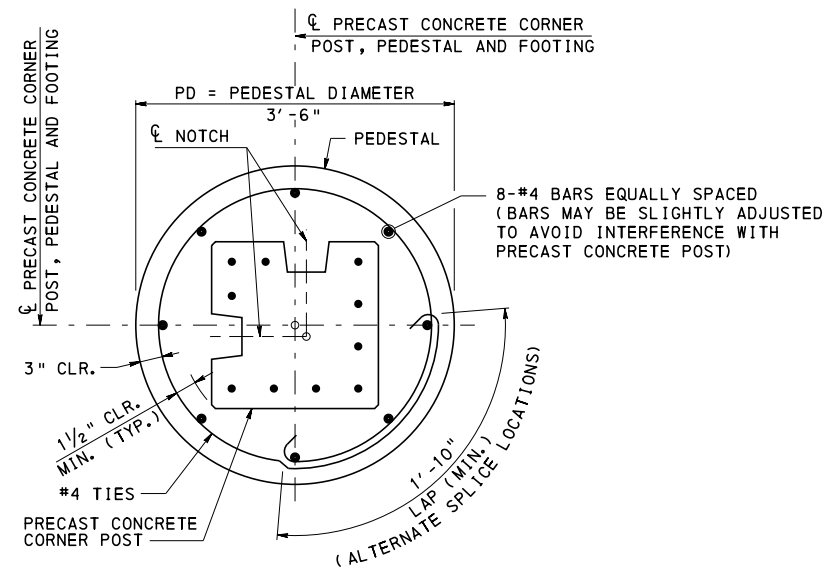
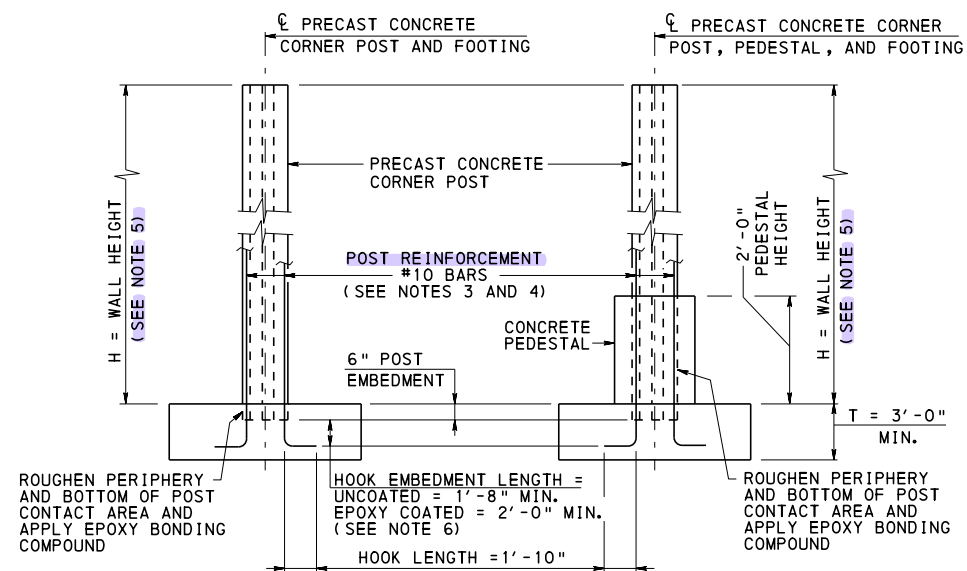
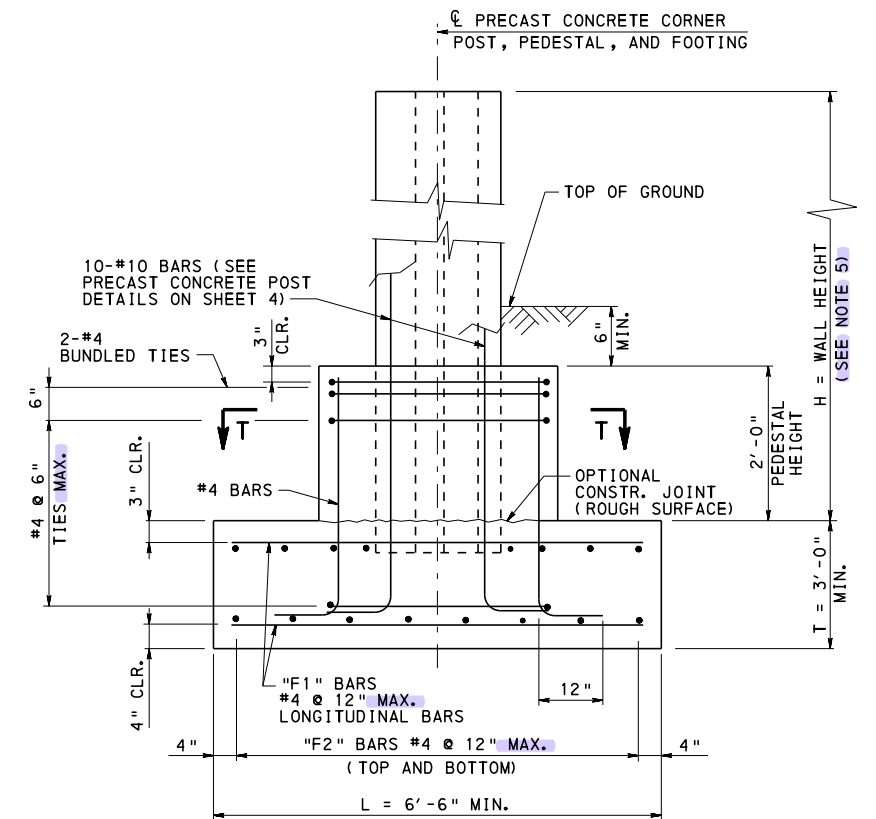
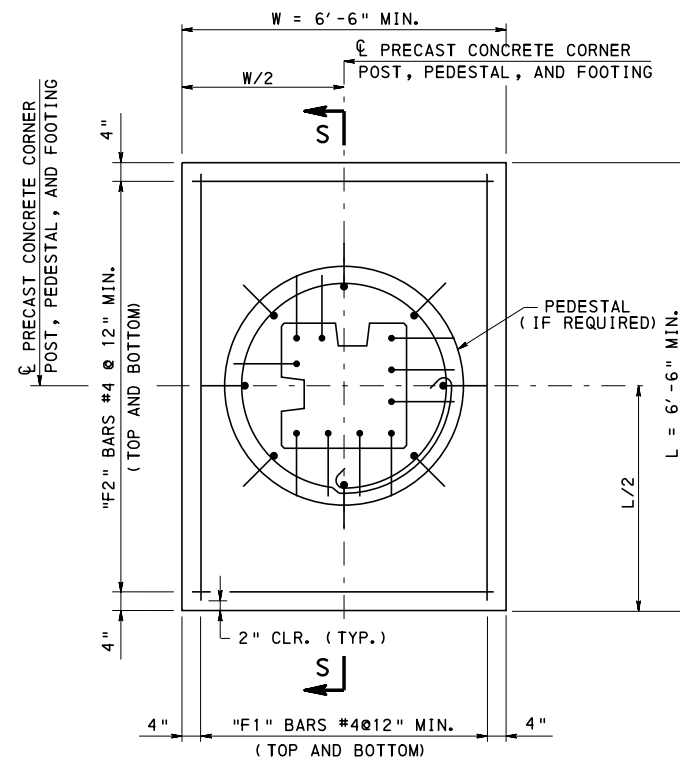
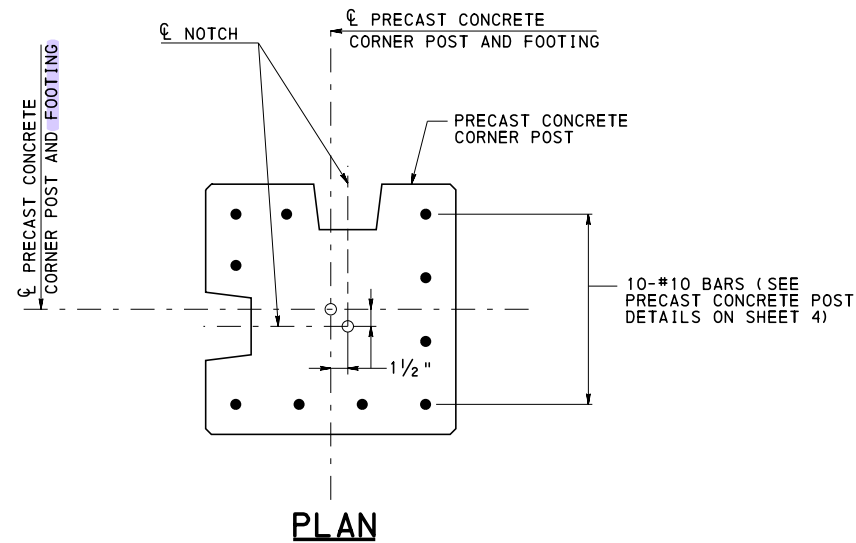
SECTION R-R
PEDESTAL (IF REQUIRED)

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
3. PROVIDE UNCOATED OR EPOXY COATED BARS IN ACCORDANCE WITH GENERAL NOTE 7, ON SHEET 1. DESIGNER TO SPECIFY ON THE CONTRACT DRAWINGS. GALVANIZED BARS NOT PERMITTED.
4. BARS MAY BE BENT AFTER FABRICATION OF POST. TOUCH-UP EPOXY COATED BARS WITH AN APPROVED EPOXY PAINT.
5. FOR ANGLED/CORNER PRECAST CONCRETE POST NOTES REFER TO SHEET 16.
6. DESIGNER IS PERMITTED TO INCREASE THE EMBEDMENT LENGTH OF THE POST REINFORCEMENT BARS SO BARS CAN BE TIED TO THE BOTTOM FOOTING REINFORCEMENT BARS.

DETAIL 7
ANGLED PRECAST CONCRETE POST TYPE E
EMBEDDED IN SPREAD FOOTING
(WITH OR WITHOUT PEDESTAL)

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF PROJECT DELIVERY		
STANDARD GROUND MOUNTED SOUND BARRIERS PRECAST CONCRETE POSTS DETAIL 7		
RECOMMENDED APR. 29, 2016 <i>Thomas P. Maciore</i> CHIEF BRIDGE ENGINEER	RECOMMENDED APR. 29, 2016 <i>Brian S. Thompson</i> DIRECTOR, BUR. OF PROJECT DELIVERY	SHEET 18 OF 20 BD-677M



SECTION S-S (WITH PEDESTAL)
ADJUST FOOTING TOP REINFORCING SPACING TO CLEAR POST.

NOTES:

1. FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
2. FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
3. PROVIDE UNCOATED OR EPOXY COATED BARS IN ACCORDANCE WITH GENERAL NOTE 7, ON SHEET 1. DESIGNER TO SPECIFY ON THE CONTRACT DRAWINGS. GALVANIZED BARS NOT PERMITTED.
4. BARS MAY BE BENT AFTER FABRICATION OF POST. TOUCH-UP EPOXY COATED BARS WITH AN APPROVED EPOXY PAINT.
5. FOR ANGLED/CORNER PRECAST CONCRETE POST NOTES REFER TO SHEET 16.
6. DESIGNER IS PERMITTED TO INCREASE THE EMBEDMENT LENGTH OF THE POST REINFORCEMENT BARS SO BARS CAN BE TIED TO THE BOTTOM FOOTING REINFORCEMENT BARS.

DETAIL 8 CORNER PRECAST CONCRETE POST TYPE F EMBEDDED IN SPREAD FOOTING (WITH OR WITHOUT PEDESTAL)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY

STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS

DETAIL 8

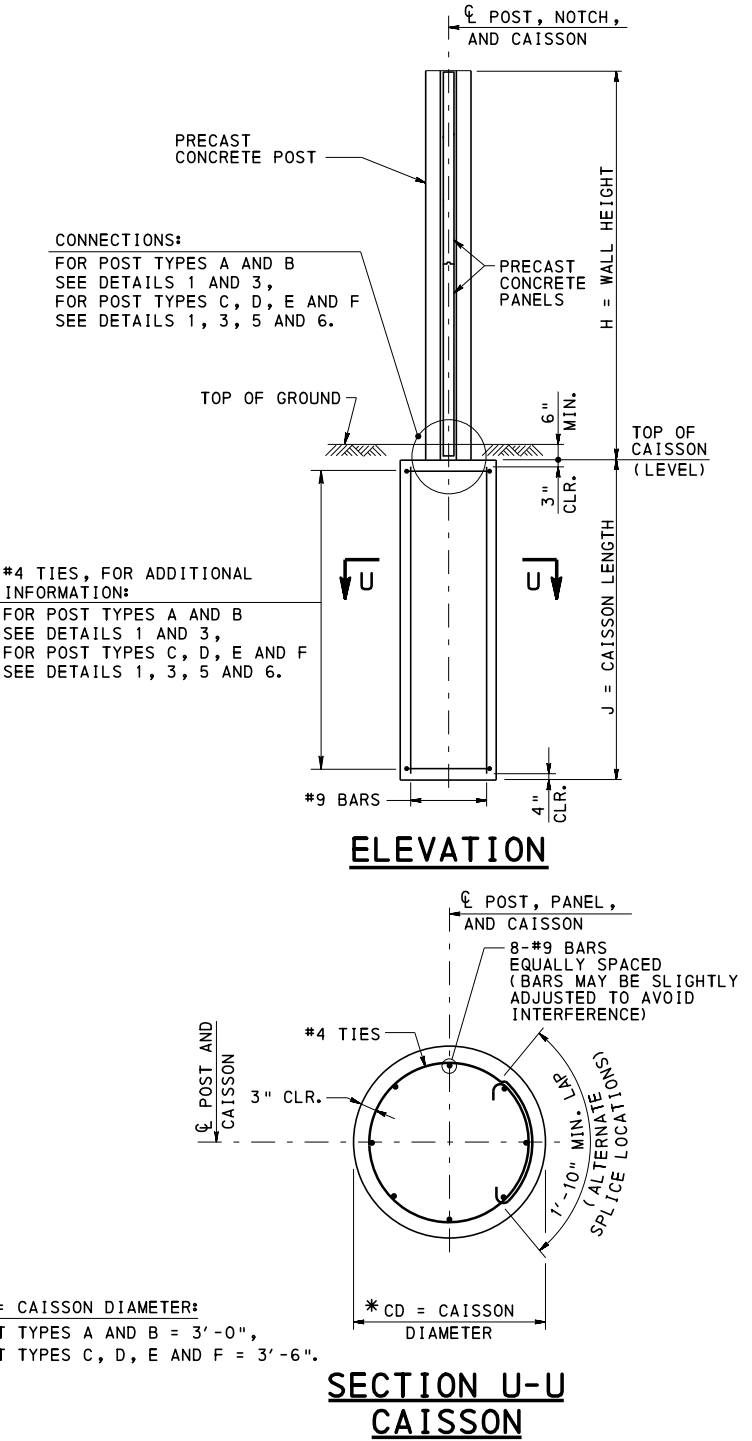
RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brenda Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 19 OF 20
BD-677M

CAISSON LENGTH											
PRECAST CONCRETE POST TYPES A AND B											
WIND PRESSURE = 28 PSF											
TYPE 1 SOIL SATURATED LOOSE SAND			TYPE 2 SOIL DRY MEDIUM DENSE SAND			TYPE 3 SOIL SATURATED SOFT CLAY			TYPE 4 SOIL DRY MEDIUM STIFF CLAY		
SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 30° 2. C = 0 LB./SQ. FT. 3. UNIT WEIGHT = 100 LB./CU. FT. 4. K = 20 LB./CU. IN.			SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 34° 2. C = 0.0 LB./SQ. FT. 3. UNIT WEIGHT = 120 LB./CU. FT. 4. K = 90 LB./CU. IN.			SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 0° 2. C = 500 LB./SQ. FT. 3. UNIT WEIGHT = 100 LB./CU. FT. 4. K = 100 LB./CU. IN.			SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 0° 2. C = 1000 LB./SQ. FT. 3. UNIT WEIGHT = 120 LB./CU. FT. 4. K = 200 LB./CU. IN.		
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)	POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)	POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)	POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)
12.0	6.0	12.0	12.0	6.0	9.0	12.0	6.0	9.5	12.0	6.0	9.0
	8.0	13.0		8.0	9.0		8.0	11.0		8.0	9.0
	10.0	14.5		10.0	10.0		10.0	13.0		10.0	9.0
	12.0	15.5		12.0	10.5		12.0	14.5		12.0	10.0
	14.0	16.5		14.0	11.0		14.0	16.0		14.0	10.5
	16.0	17.5		16.0	11.5		16.0	18.0		16.0	11.5
	18.0	18.5		18.0	12.0		18.0	19.5		18.0	12.5
	20.0	19.0		20.0	12.5		20.0	21.0		20.0	13.5
	22.0	20.0		22.0	13.0		22.0	22.5		22.0	14.5
	24.0	21.0		24.0	13.5		24.0	24.0		24.0	15.0
	26.0	22.0		26.0	14.0		26.0	25.5		26.0	16.0
	28.0	23.0		28.0	14.5		28.0	27.0		28.0	17.0
16.0	6.0	13.0	16.0	6.0	9.0	16.0	6.0	10.5	16.0	6.0	9.0
	8.0	14.0		8.0	9.5		8.0	13.0		8.0	9.0
	10.0	15.5		10.0	10.5		10.0	15.0		10.0	10.0
	12.0	17.0		12.0	11.0		12.0	17.0		12.0	11.0
	14.0	18.0		14.0	12.0		14.0	18.5		14.0	12.0
	16.0	19.0		16.0	12.5		16.0	20.5		16.0	13.0
	18.0	20.0		18.0	13.0		18.0	22.0		18.0	14.0
	20.0	21.0		20.0	13.5		20.0	24.0		20.0	15.0
	22.0	22.0		22.0	14.5		22.0	26.0		22.0	16.0
	24.0	23.5		24.0	15.0		24.0	28.0		24.0	17.0
	26.0	24.5		26.0	15.5		26.0	29.5		26.0	18.0
	28.0	25.5		28.0	16.5		28.0	31.0		28.0	19.0
20.0	6.0	13.5	20.0	6.0	9.5	20.0	6.0	12.0	20.0	6.0	9.0
	8.0	15.5		8.0	10.5		8.0	14.0		8.0	9.5
	10.0	17.0		10.0	11.0		10.0	16.5		10.0	10.5
	12.0	18.0		12.0	12.0		12.0	18.5		12.0	12.0
	14.0	19.0		14.0	12.5		14.0	21.0		14.0	13.0
	16.0	20.5		16.0	13.5		16.0	23.0		16.0	14.5
	18.0	22.0		18.0	14.0		18.0	25.0		18.0	15.5
	20.0	23.5		20.0	14.5		20.0	27.0		20.0	17.0
	22.0	25.0		22.0	15.5		22.0	29.5		22.0	18.0
	24.0	26.5		24.0	16.5		24.0	31.0		24.0	19.0
	26.0	28.0		26.0	17.5		26.0	32.5		26.0	20.0
	28.0	29.5		28.0	18.5		28.0	34.0		28.0	21.0

CAISSON LENGTH											
PRECAST CONCRETE POST TYPES C, D, E AND F											
WIND PRESSURE = 28 PSF											
TYPE 1 SOIL SATURATED LOOSE SAND			TYPE 2 SOIL DRY MEDIUM DENSE SAND			TYPE 3 SOIL SATURATED SOFT CLAY			TYPE 4 SOIL DRY MEDIUM STIFF CLAY		
SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 30° 2. C = 0 LB./SQ. FT. 3. UNIT WEIGHT = 100 LB./CU. FT. 4. K = 20 LB./CU. IN.			SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 34° 2. C = 0.0 LB./SQ. FT. 3. UNIT WEIGHT = 120 LB./CU. FT. 4. K = 90 LB./CU. IN.			SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 0° 2. C = 500 LB./SQ. FT. 3. UNIT WEIGHT = 100 LB./CU. FT. 4. K = 100 LB./CU. IN.			SOIL PROPERTIES: 1. ANGLE OF INT. FRICT. = 0° 2. C = 1000 LB./SQ. FT. 3. UNIT WEIGHT = 120 LB./CU. FT. 4. K = 200 LB./CU. IN.		
POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)	POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)	POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)	POST SPACING PS (FT.)	WALL HEIGHT H (FT.)	J (FT.)
12.0	6.0	11.5	12.0	6.0	10.5**	12.0	6.0	10.5**	12.0	6.0	10.5**
	8.0	13.0		8.0	10.5**		8.0	11.0**		8.0	10.5**
	10.0	14.0		10.0	10.5**		10.0	12.5		10.0	10.5**
	12.0	15.0		12.0	10.5**		12.0	14.0		12.0	10.5**
	14.0	16.0		14.0	11.0**		14.0	15.5		14.0	10.5**
	16.0	17.0		16.0	11.5		16.0	17.0		16.0	11.5
	18.0	18.0		18.0	12.0		18.0	18.5		18.0	12.0
	20.0	19.0		20.0	12.5		20.0	20.0		20.0	13.0
	22.0	20.0		22.0	13.0		22.0	21.5		22.0	14.0
	24.0	20.5		24.0	13.5		24.0	23.0		24.0	14.5
	26.0	21.5		26.0	14.0		26.0	24.0		26.0	15.5
	28.0	22.0		28.0	14.5		28.0	25.5		28.0	16.5
16.0	6.0	12.5	16.0	6.0	10.5**	16.0	6.0	10.5**	16.0	6.0	10.5**
	8.0	14.0		8.0	10.5**		8.0	12.5		8.0	10.5**
	10.0	15.5		10.0	10.5**		10.0	14.5		10.0	10.5**
	12.0	16.5		12.0	11.0**		12.0	16.0		12.0	10.5**
	14.0	18.0		14.0	12.0		14.0	18.0		14.0	11.5
	16.0	19.0		16.0	12.5		16.0	19.5		16.0	12.5
	18.0	20.0		18.0	13.0		18.0	21.5		18.0	13.5
	20.0	21.0		20.0	13.5		20.0	23.0		20.0	14.5
	22.0	22.0		22.0	14.0		22.0	25.0		22.0	15.5
	24.0	23.0		24.0	14.5		24.0	26.5		24.0	16.5
	26.0	24.0		26.0	15.0		26.0	28.0		26.0	17.5
	28.0	25.0		28.0	15.5		28.0	29.5		28.0	18.5
20.0 (FOR TYPES C & D ONLY)	6.0	13.5	20.0 (FOR TYPES C & D ONLY)	6.0	10.5	20.0 (FOR TYPES C & D ONLY)	6.0	11.5	20.0 (FOR TYPES C & D ONLY)	6.0	10.5
	8.0	15.0		8.0	10.5		8.0	13.5		8.0	10.5
	10.0	16.5		10.0	11.0		10.0	16.0		10.0	10.5
	12.0	18.0		12.0	12.0		12.0	18.0		12.0	11.5
	14.0	19.0		14.0	12.5		14.0	20.0		14.0	12.5
	16.0	20.0		16.0	13.0		16.0	22.0		16.0	14.0
	18.0	21.0		18.0	14.0		18.0	24.0		18.0	15.0
	20.0	22.5		20.0	14.5		20.0	26.0		20.0	16.0
	22.0	23.5		22.0	15.0		22.0	28.0		22.0	17.5
	24.0	24.5		24.0	15.5		24.0	30.0		24.0	18.5
	26.0	25.5		26.0	16.0		26.0	32.0		26.0	19.5
	28.0	27.0		28.0	17.0		28.0	34.0		28.0	20.5



INSTRUCTIONS FOR DETERMINING CAISSON LENGTHS:

- DETERMINE REQUIRED POST SPACING AND WALL HEIGHT.
- DETERMINE SOIL TYPE BASED ON THE INFORMATION SHOWN IN THE ACCEPTED STRUCTURE FOUNDATION GEOTECHNICAL REPORT. SELECT THE SOIL TYPE WHICH HAS A STRENGTH LESS THAN OR EQUAL TO THE ACTUAL SOIL STRENGTH. ALTERNATE CAISSON DESIGNS ARE PERMITTED IF SOIL PROPERTIES DIFFER FROM THOSE INDICATED FOR THE FOUR SOIL TYPES.
- DETERMINE GROUND WATER LEVEL. IF GROUND WATER IS WITHIN THE CAISSON LENGTH INDICATED IN THE TABLES FOR TYPE 2 AND TYPE 4 SOILS, USE THE CAISSON LENGTH IN THE TABLES FOR TYPE 1 OR TYPE 3 SOILS. IF GROUND WATER IS NOT WITHIN CAISSON LENGTH, USE THE CAISSON LENGTH INDICATED IN THE TABLES FOR TYPE 2 OR TYPE 4 SOILS.
- MINIMUM CAISSON LENGTH IN SOIL:
POST TYPES A AND B = 9'-0"
POST TYPES C AND D = 10'-6"
POST TYPES E AND F WITH UNCOATED OR GALVANIZED BARS IN POST = 10'-6"
** POST TYPES E AND F WITH COATED BARS IN POST = 11'-6"

NOTES:

- FOR ADDITIONAL INFORMATION REFER TO NOTES ON SHEETS 1 AND 2.
- FOR PRECAST CONCRETE POST DETAILS REFER TO SHEET 4.
- FOR DETAIL 1 REFER TO SHEET 5.
- FOR DETAIL 3 REFER TO SHEET 11.
- FOR DETAIL 5 REFER TO SHEET 16.
- FOR DETAIL 6 REFER TO SHEET 17.

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF PROJECT DELIVERY**

**STANDARD
GROUND MOUNTED SOUND BARRIERS
PRECAST CONCRETE POSTS**

CAISSON DESIGN TABLES

RECOMMENDED APR. 29, 2016
Thomas P. Maciore
CHIEF BRIDGE ENGINEER

RECOMMENDED APR. 29, 2016
Brian S. Thompson
DIRECTOR, BUR. OF PROJECT DELIVERY

SHEET 20 OF 20
BD-677M