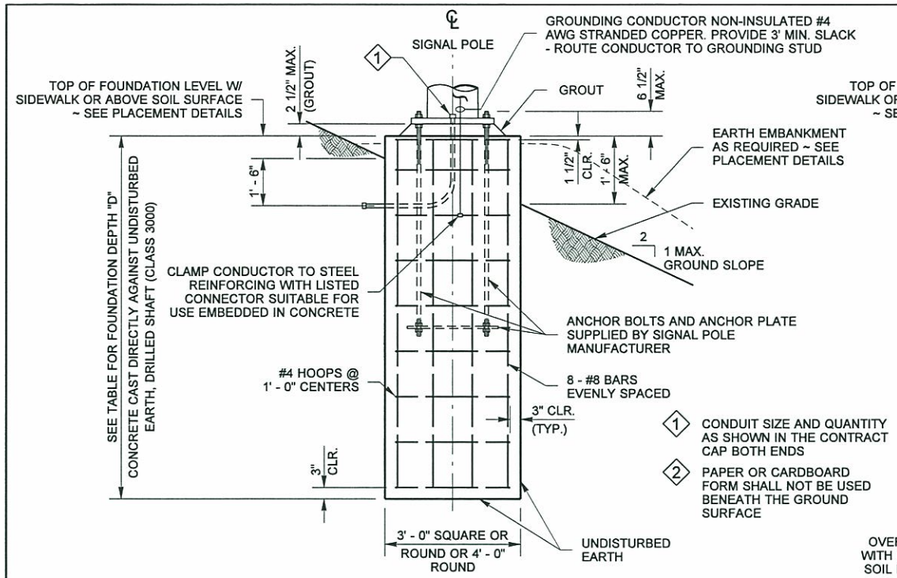
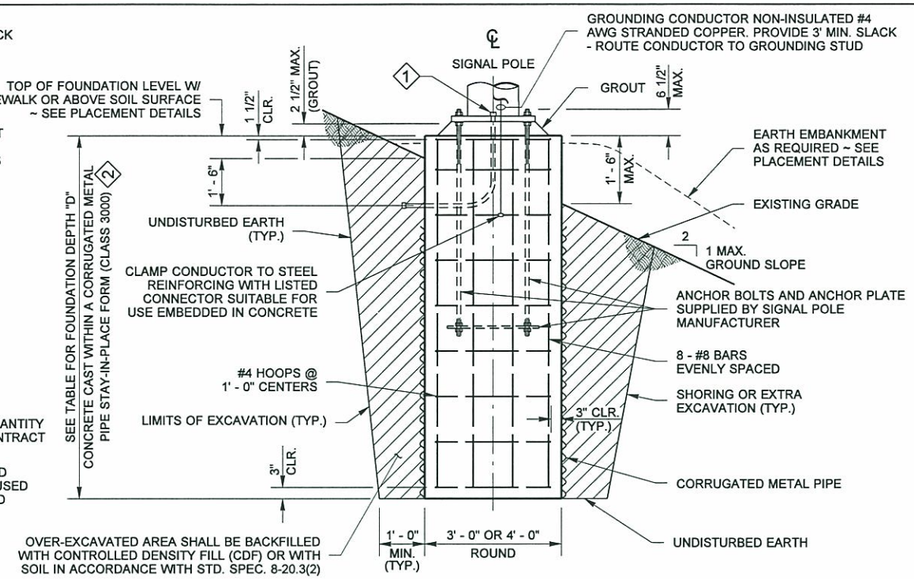


FOUNDATION REINFORCEMENT DETAIL

CONCRETE CAST DIRECTLY AGAINST UNDISTURBED EARTH, DRILLED SHAFT

ALTERNATE # 1

N.T.S.



FOUNDATION REINFORCEMENT AND BACKFILL DETAIL

2 CONCRETE CAST WITHIN A CORRUGATED METAL PIPE STAY-IN-PLACE FORM

ALTERNATE # 2

N.T.S.

NOTES

1. This structure has been designed according to the 2001 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals with interim revisions through 2006. Design wind velocity is 90 mph and fatigue category III.
2. Foundations are designed for Type II, III and SD Signal Standards with a maximum mast arm length of 65'.
3. Foundations are designed for Single Mast Arm Standards and Double Mast Arm Standards with 90° between arms. Special foundation design is required for Double Arm Standards where the angle between mast arms is other than 90°. For Double Mast Arm Standards with 90° between arms, use larger XYZ value for foundation depth selection.
4. Foundations not within the parameters of this standard require Special Design. Contact WSDOT Bridge and Structures Office through the Engineer for Special Foundation Designs.
5. Foundations constructed within Ecology Embankments shall be increased in depth by the depth of the Ecology Embankment.
6. Exposed portions of the foundation shall be formed to create a smooth concrete surface. All exposed formwork shall be removed upon completion of foundation construction.
7. For design parameters between the values listed in Table, depth requirements may be interpolated between the values provided.

ASSEMBLY NOTE

A TEMPORARY TEMPLATE SHALL BE USED TO HOLD THE TOP OF THE ANCHOR BOLT ASSEMBLY SECURELY IN THE PROPER POSITION DURING THE FOUNDATION INSTALLATION

FOUNDATION DEPTH "D" TABLE

ALTERNATE #1 - DRILLED SHAFT TYPE CONSTRUCTION

FOR LATERAL BEARING PRESSURE = 2500 PSF & Ø = 34°, 1500 PSF & Ø = 28°, 1000 PSF & Ø = 26°

GROUND SLOPE = 3H : 1V OR FLATTER

ALLOWABLE LATERAL BEARING PRESSURE	FOUNDATION TYPE	XYZ (FT^3) 700	900	1350	1500	1900	2300	2600	3000
1000 PSF	3' - 0" ROUND	10' - 0"	10' - 0"	11' - 0"	11' - 0"	15' - 0"	18' - 0"	20' - 0"	20' - 0"
	3' - 0" SQUARE	8' - 0"	8' - 0"	9' - 0"	9' - 0"	10' - 0"	11' - 0"	12' - 0"	12' - 0"
	4' - 0" ROUND	8' - 0"	8' - 0"	9' - 0"	9' - 0"	10' - 0"	11' - 0"	12' - 0"	12' - 0"
1500 PSF	3' - 0" ROUND	8' - 0"	8' - 0"	9' - 0"	11' - 0"	13' - 0"	15' - 0"	18' - 0"	18' - 0"
	3' - 0" SQUARE	7' - 0"	7' - 0"	7' - 0"	8' - 0"	8' - 0"	9' - 0"	10' - 0"	10' - 0"
	4' - 0" ROUND	7' - 0"	7' - 0"	7' - 0"	8' - 0"	8' - 0"	9' - 0"	10' - 0"	10' - 0"
2500 PSF OR GREATER	3' - 0" ROUND	6' - 0"	6' - 0"	7' - 0"	8' - 0"	9' - 0"	11' - 0"	15' - 0"	15' - 0"
	3' - 0" SQUARE	6' - 0"	6' - 0"	6' - 0"	6' - 0"	7' - 0"	7' - 0"	8' - 0"	8' - 0"
	4' - 0" ROUND	6' - 0"	6' - 0"	6' - 0"	6' - 0"	7' - 0"	7' - 0"	8' - 0"	8' - 0"

GROUND SLOPE = GREATER THAN 3H : 1V TO 2H : 1V

ALLOWABLE LATERAL BEARING PRESSURE	FOUNDATION TYPE	XYZ (FT^3) 700	900	1350	1500	1900	2300	2600	3000
1000 PSF	3' - 0" ROUND	SPECIAL FOUNDATION DESIGN							
	3' - 0" SQUARE	SPECIAL FOUNDATION DESIGN							
	4' - 0" ROUND	SPECIAL FOUNDATION DESIGN							
1500 PSF	3' - 0" ROUND	11' - 0"	11' - 0"	12' - 0"	14' - 0"	16' - 0"	18' - 0"	21' - 0"	21' - 0"
	3' - 0" SQUARE	10' - 0"	10' - 0"	10' - 0"	11' - 0"	11' - 0"	12' - 0"	13' - 0"	13' - 0"
	4' - 0" ROUND	10' - 0"	10' - 0"	10' - 0"	11' - 0"	11' - 0"	12' - 0"	13' - 0"	13' - 0"
2500 PSF OR GREATER	3' - 0" ROUND	9' - 0"	9' - 0"	10' - 0"	12' - 0"	12' - 0"	14' - 0"	18' - 0"	18' - 0"
	3' - 0" SQUARE	9' - 0"	9' - 0"	9' - 0"	9' - 0"	10' - 0"	10' - 0"	11' - 0"	11' - 0"
	4' - 0" ROUND	9' - 0"	9' - 0"	9' - 0"	9' - 0"	10' - 0"	10' - 0"	11' - 0"	11' - 0"

ALTERNATE #2 - CORRUGATED METAL PIPE TYPE CONSTRUCTION

FOR LATERAL BEARING PRESSURE = 2500 PSF & Ø = 23°, 1500 PSF & Ø = 18°, 1000 PSF & Ø = 17°

GROUND SLOPE = 3H : 1V OR FLATTER

ALLOWABLE LATERAL BEARING PRESSURE	FOUNDATION TYPE	XYZ (FT^3) 700	900	1350	1500	1900	2300	2600	3000
1000 PSF	3' - 0" ROUND	10' - 0"	10' - 0"	11' - 0"	15' - 0"	20' - 0"	25' - 0"	28' - 0"	28' - 0"
	4' - 0" ROUND	8' - 0"	8' - 0"	9' - 0"	12' - 0"	13' - 0"	14' - 0"	15' - 0"	15' - 0"
1500 PSF	3' - 0" ROUND	8' - 0"	8' - 0"	11' - 0"	15' - 0"	18' - 0"	21' - 0"	25' - 0"	25' - 0"
	4' - 0" ROUND	7' - 0"	7' - 0"	7' - 0"	8' - 0"	10' - 0"	13' - 0"	15' - 0"	15' - 0"
2500 PSF OR GREATER	3' - 0" ROUND	6' - 0"	6' - 0"	7' - 0"	11' - 0"	13' - 0"	18' - 0"	20' - 0"	20' - 0"
	4' - 0" ROUND	6' - 0"	6' - 0"	6' - 0"	6' - 0"	7' - 0"	9' - 0"	9' - 0"	9' - 0"

GROUND SLOPE = GREATER THAN 3H : 1V TO 2H : 1V

ALLOWABLE LATERAL BEARING PRESSURE	FOUNDATION TYPE	XYZ (FT^3) 700	900	1350	1500	1900	2300	2600	3000
1000 PSF	3' - 0" ROUND	SPECIAL FOUNDATION DESIGN							
	4' - 0" ROUND	SPECIAL FOUNDATION DESIGN							
1500 PSF	3' - 0" ROUND	11' - 0"	11' - 0"	14' - 0"	18' - 0"	21' - 0"	24' - 0"	28' - 0"	28' - 0"
	4' - 0" ROUND	10' - 0"	10' - 0"	10' - 0"	11' - 0"	13' - 0"	16' - 0"	18' - 0"	18' - 0"
2500 PSF OR GREATER	3' - 0" ROUND	9' - 0"	9' - 0"	10' - 0"	14' - 0"	16' - 0"	21' - 0"	23' - 0"	23' - 0"
	4' - 0" ROUND	9' - 0"	9' - 0"	9' - 0"	9' - 0"	10' - 0"	12' - 0"	12' - 0"	12' - 0"

ALTERNATE #2 - CONSTRUCTION METHOD

METAL (SUBSURFACE) FORM REQUIRED

When the existing soil will not retain a vertical face, over-excavate the foundation area and install a 36" or 48" diameter, corrugated metal (pipe) form. The top of the corrugated metal form shall terminate 1 foot below final grade. Continue forming to full height using paper or cardboard form to achieve a smooth finish on final exposed cement concrete. Support the form as necessary to remain plumb.

Place the concrete foundation.

After concrete has cured, remove the paper or cardboard form portion.

Backfill with controlled-density fill or compacted borrow in accordance with Standard Specification Section 8-20.3(2).

FILE NAME	$$$$$$$$DESIGNFILENAME$$$$$$				
TIME	$TIME$				
DATE	$$$$DATE$$$				
PLOTTED BY	$$USERNAME$$				
DESIGNED BY					
ENTERED BY					
CHECKED BY					
PROJ. ENGR.					
REGIONAL ADM.		REVISION	DATE	BY	

REGION NO.	STATE	FED.AID PROJ.NO.
10	WASH	
JOB NUMBER		
CONTRACT NO.		LOCATION NO.

STATE OF WASHINGTON — RODRIGO LANDAZURI — 22965 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 9-3-09 DATE

STATE OF WASHINGTON — RICHARD P. ZELLER — 6476 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER — 9/3/09 DATE

Washington State Department of Transportation

SIGNAL STANDARD FOUNDATION DETAILS

PLOT1

SSD1

SHEET OF SHEETS