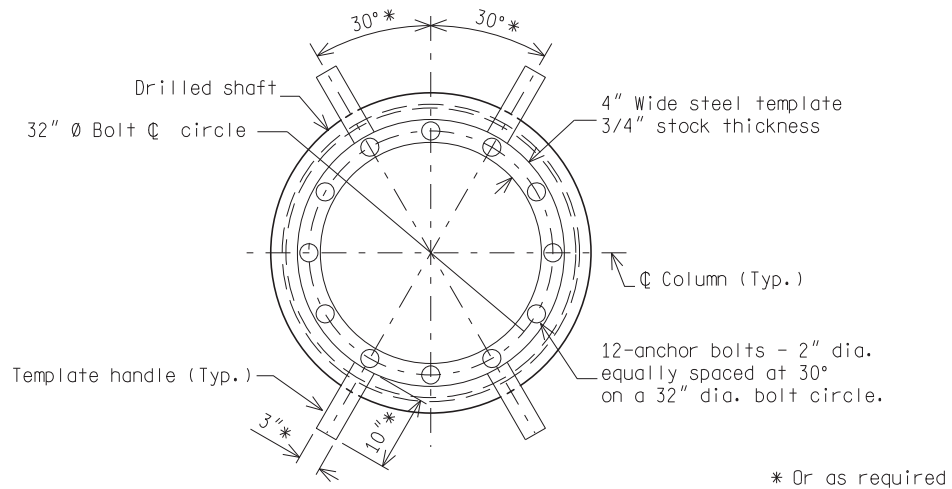
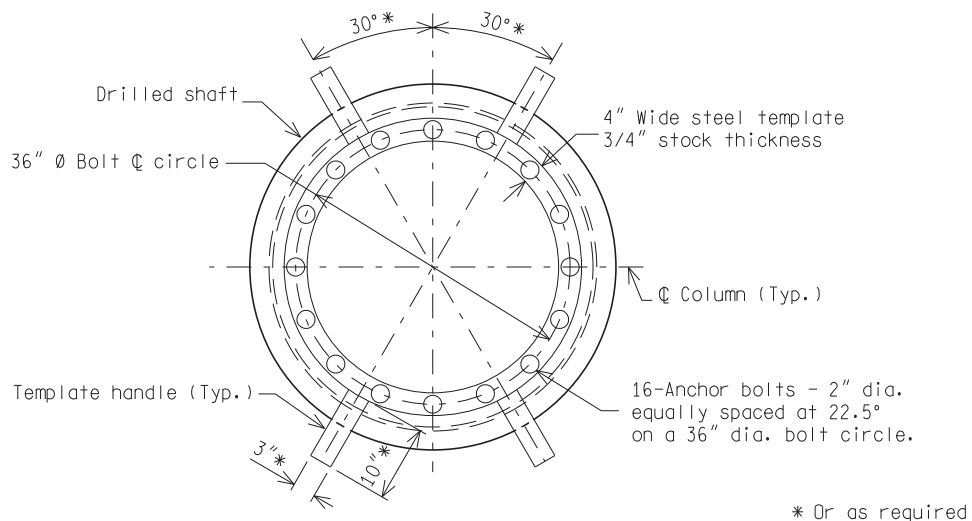


PLAN VIEW DRILLED SHAFT FOR TYPE E CANTILEVERS



PLAN VIEW DRILLED SHAFT FOR TYPE E TRUSS 50' - 105'



PLAN VIEW DRILLED SHAFT FORTYPE E TRUSS 110' - 140'

NOT TO SCALE

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN

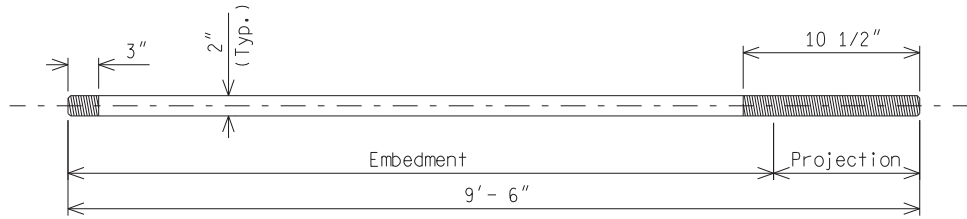
05/24/18
F.H.W.A. APPROVAL

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PLAN DATE

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ANCHOR BOLT DETAIL

ANCHOR BOLT TABLE		
STRUCTURE TYPE	PROJECTION	NUMBER REQ'D
TYPE E CANTILEVER	8 1/2"	8
50' TO 105' TYPE E TRUSS	10"	12
110' TO 140' TYPE E TRUSS	10"	16

Nuts: 3 per anchor bolt
Washers: 3 per anchor bolt

NOTES:

1. Steel reinforcement shall be per MDOT Standard Specifications for Construction.
2. Anchor bolts, nuts and washers shall be per section 908.14 of the MDOT Standard Specifications for Construction.
3. A template and anchor bolt cage shall be shop fabricated, assembled, and approved by MDOT prior to shipping.
4. Diameter of bolt holes in template shall be 1/16" larger than anchor bolt diameter.
5. The template and handles shall be well supported, horizontally level and firmly anchored in place a minimum of 24 hours after the concrete placement is completed.
6. Take care during concrete placement to avoid displacing the anchor bolts. Concrete shall be in accordance with MDOT Standard Specifications For Construction, Subsection 810.03.J.
7. No hammering on the anchor bolts or template will be allowed.
8. After template is removed, thread nuts on to bolt flush with the bolt end to protect threads until sign support is erected.

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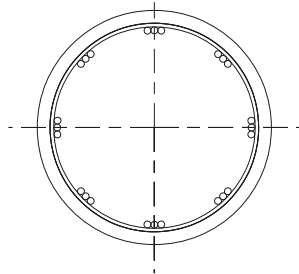
STEEL BAR REINFORCEMENT CHART

STRUCTURE TYPE	FOUNDATION DIAMETER (in)	VERTICAL REINFORCEMENT		CONFINEMENT REINFORCEMENT		
		BAR SIZE	NUMBER OF BARS	BAR RADIUS	BARS SIZE	BAR SPACING
TYPE E CANTILEVER	48	11	24	20 1/4"	6	6"
TYPE E TRUSS	48	11	36	20 1/4"	6	6"
	54	11	48	23 1/4"	6	6"
	72	11	57	32 1/4"	6	6"

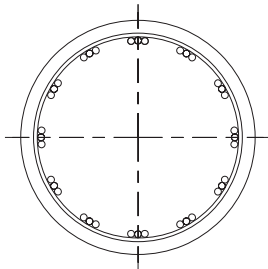
See sheets 5 and 6 for foundation information.

Vertical reinforcement bars shall be bundled side by side, 3 bars per bundle all in the same plane. Provide a 10'-9" lap, stagger the ends of the lap by the amount of the lap length.

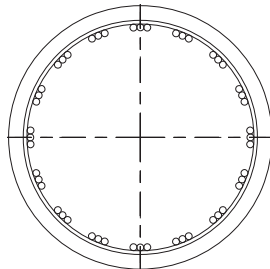
Provide a 3'-10" lap for # 6 bar circles or a 12" lap if bar circle lap is welded.



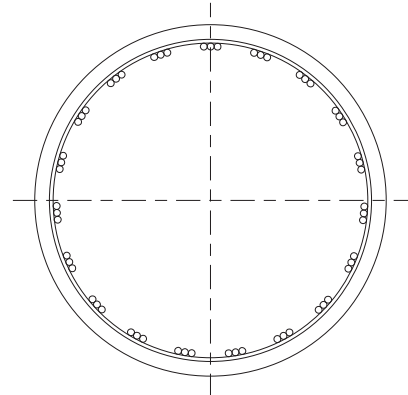
TYPE E CANTILEVER 48"



TYPE E TRUSS 48" DIAMETER

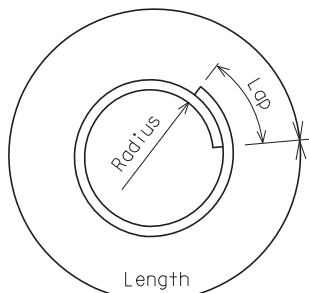


TYPE E TRUSS 54" DIAMETER



TYPE E TRUSS 72" DIAMETER

SECTION A-A (SHEET 1)



**CONFINEMENT
REINFORCEMENT**



**VERTICAL
REINFORCEMENT**

REINFORCEMENT DETAILS

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NON-CANTILEVER TRUSS FOUNDATION CHART

SPAN	SOIL TYPE	SOIL CONDITION		DIAMETER (in)	DEPTH "D" (ft)	CONCRETE (cyd)
		Suc	N			
50' TO 80'	LOW SAND	-	5 < N < 10	48	37	17.3
	MED SAND	-	10 < N < 20		35	16.3
	HIGH SAND	-	N > 20		32	14.9
	LOW CLAY	400 < Suc < 1000	-	72*	54	56.6
	MED CLAY	1000 < Suc < 2000	-	48	41	19.1
	HIGH CLAY	Suc > 2000	-		32	14.9
85' TO 105'	LOW SAND	-	5 < N < 10	48	38	17.7
	MED SAND	-	10 < N < 20		36	16.8
	HIGH SAND	-	N > 20		34	15.9
	LOW CLAY	400 < Suc < 1000	-	72*	59	61.8
	MED CLAY	1000 < Suc < 2000	-	48	47	21.9
	HIGH CLAY	Suc > 2000	-		37	17.3
110' TO 120'	LOW SAND	-	5 < N < 10	54	37	21.8
	MED SAND	-	10 < N < 20		34	20.1
	HIGH SAND	-	N > 20		31	18.3
	LOW CLAY	400 < Suc < 1000	-	72*	62	65.0
	MED CLAY	1000 < Suc < 2000	-	54	44	26.0
	HIGH CLAY	Suc > 2000	-		30	17.7
125' TO 140'	LOW SAND	-	5 < N < 10	54	39	23.0
	MED SAND	-	10 < N < 20		36	21.3
	HIGH SAND	-	N > 20		35	20.7
	LOW CLAY	400 < Suc < 1000	-	72*	65	68.1
	MED CLAY	1000 < Suc < 2000	-	54	45	26.6
	HIGH CLAY	Suc > 2000	-		32	18.9

Suc = Ultimate shear in cohesive soil (lbs/ft²)

N = Number of blows / foot of penetration
(ASTM testing procedure D1586)

* 72"Ø foundation provided for information only, site specific foundation design required.

NOTE:

IF SOILS WITH SPT N-VALUES GREATER THAN 50 BPF DOMINATE THE LOWER 1/2, OR MORE, OF A DRILLED SHAFT, OR IF ROCK SOCKETS FOR THE DRILLED SHAFTS ARE REQUIRED, THEN A DETAILED SITE SPECIFIC DESIGN FOR THE DRILLED SHAFT FOUNDATION IS REQUIRED.

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CANTILEVER FOUNDATION CHART						
CANTILEVER TYPE	SOIL TYPE	SOIL CONDITION		DIAMETER (in)	DEPTH "D" (ft)	CONCRETE (cyd)
		Suc	N			
E	LOW SAND	-	5 < N < 10	48	27	12.6
	MED SAND	-	10 < N < 20		26	12.2
	HIGH SAND	-	N > 20		26	12.2
	LOW CLAY	400 < Suc < 1000	-		44	20.5
	MED CLAY	1000 < Suc < 2000	-		28	13.1
	HIGH CLAY	Suc > 2000	-		20	9.4

Suc = Ultimate shear in cohesive soil (lbs/ft²)

N = Number of blows / foot of penetration (ASTM testing procedure D1586)

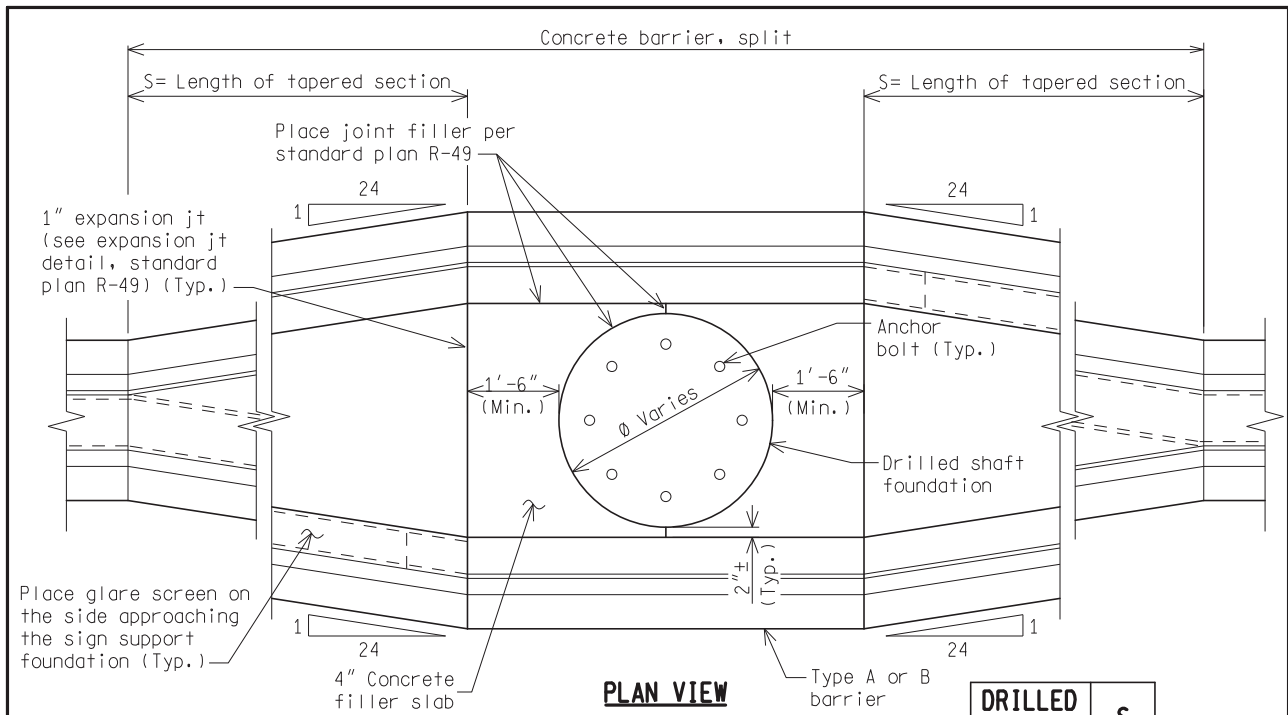
NOTE:

IF SOILS WITH SPT N-VALUES GREATER THAN 50 BPF DOMINATE THE LOWER 1/2, OR MORE, OF A DRILLED SHAFT, OR IF ROCK SOCKETS FOR THE DRILLED SHAFTS ARE REQUIRED, THEN A DETAILED SITE SPECIFIC DESIGN FOR THE DRILLED SHAFT FOUNDATION IS REQUIRED.

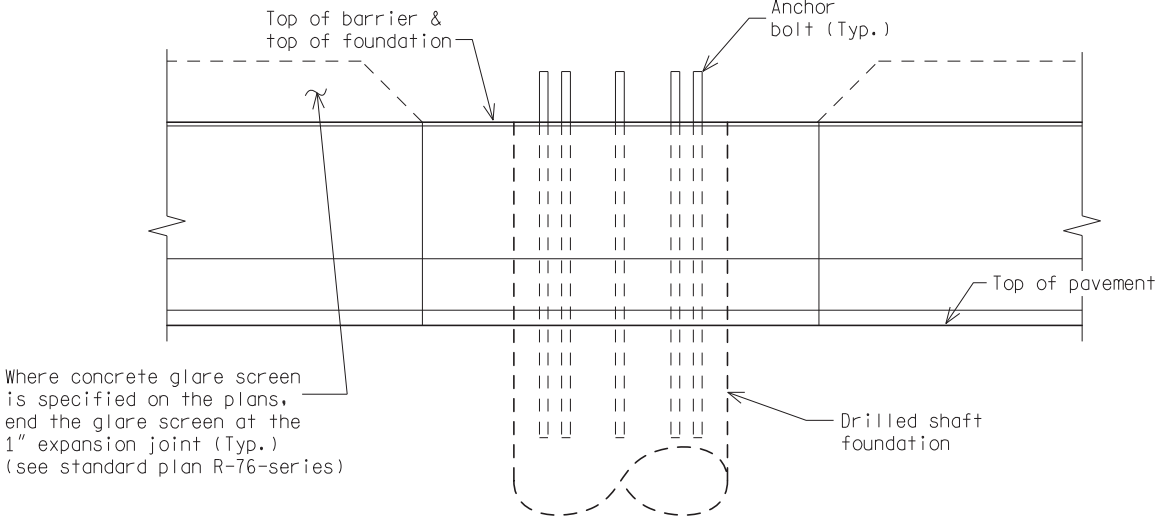
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DRILLED SHAFT Ø	S
48"	54'
60"	66'
72"	78'



MEDIAN BARRIER FOUNDATION DETAILS

NOTES:

When the foundation will be located within the median barrier, use standard plan R-49 series. Increase the foundation depth by the height of the barrier (not including the height of the glare screen if present) and locate the top of foundation at the top of barrier. Provide a parallel barrier section along the drilled shaft foundation.

Specific details vary depending on the use of Type A or Type B Barrier. For barrier details not shown see Standard Plan R-49.

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