

Note to Designer:
The information presented in this Standard Drawing has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without competent professional examination and verification of its suitability and applicability by a licensed professional engineer. Contents within the inner border line shall not be altered.

03/11

PRIOR DISTRIBUTION DATE

TUBULAR CANTILEVER SIGN STRUCTURE ELEVATION

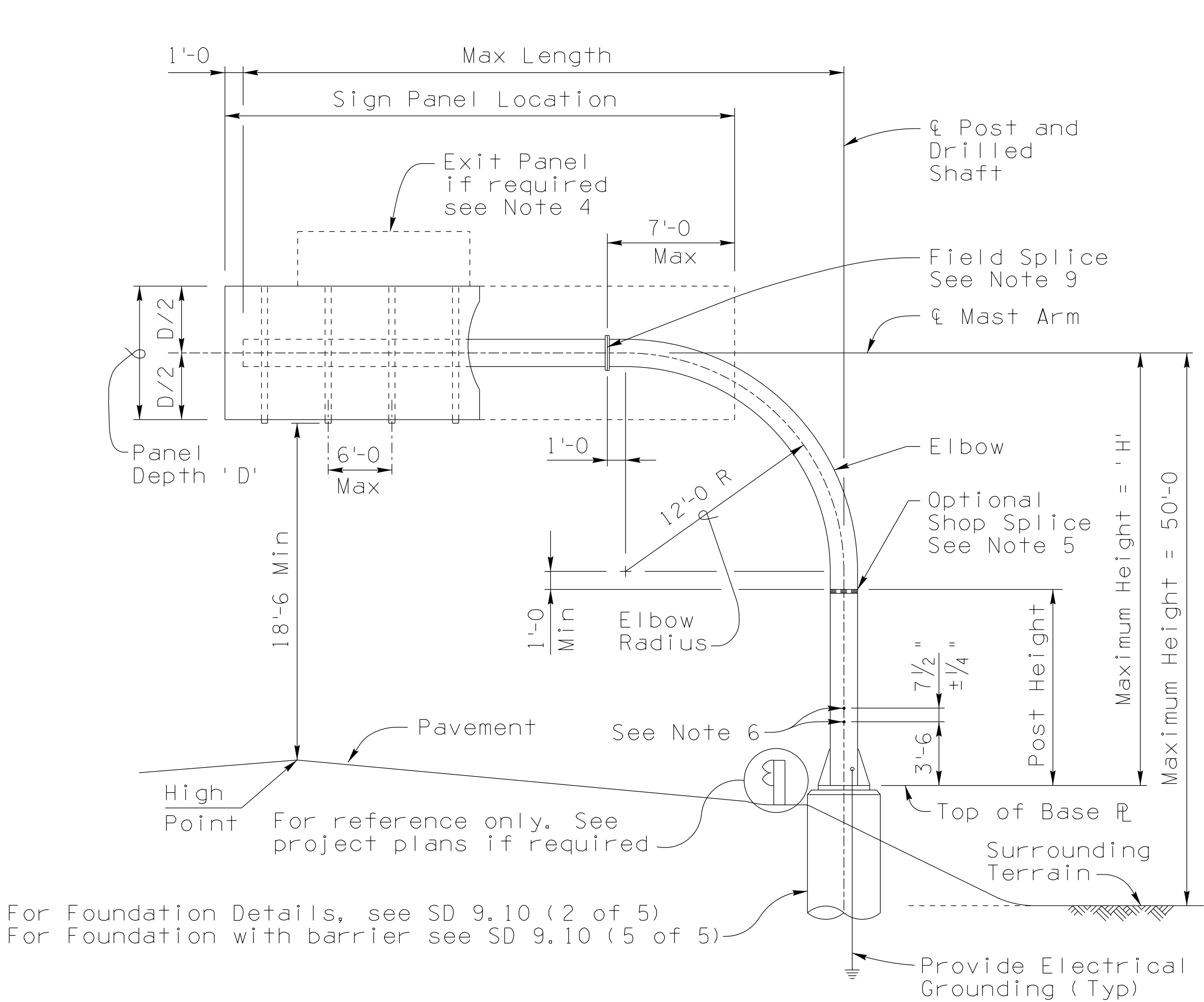
TUBULAR CANTILEVER DATA FOR SIGN PANEL SUPPORT								
TUBULAR CANTILEVER				PIPE WALL THICKNESS (INCHES)			SIGN PANEL	
Frame Type	Max Length	Max Height 'H'	Nominal Pipe Dia	Post	Elbow	Mast Arm	Max Area Sq. Ft.	Max Depth 'D'
1C	33'-0	28'-0	16"	1.219	1.219	0.500	92	12'
2C	33'-0	28'-0	18"	1.156	1.156	0.625	151	12'
3C	33'-0	28'-0	20"	1.280	1.280	0.625	245	12'
4C	43'-0	28'-0	22"	1.125	1.125	0.875	186	10'

OVERHEAD SIGN NOTES:

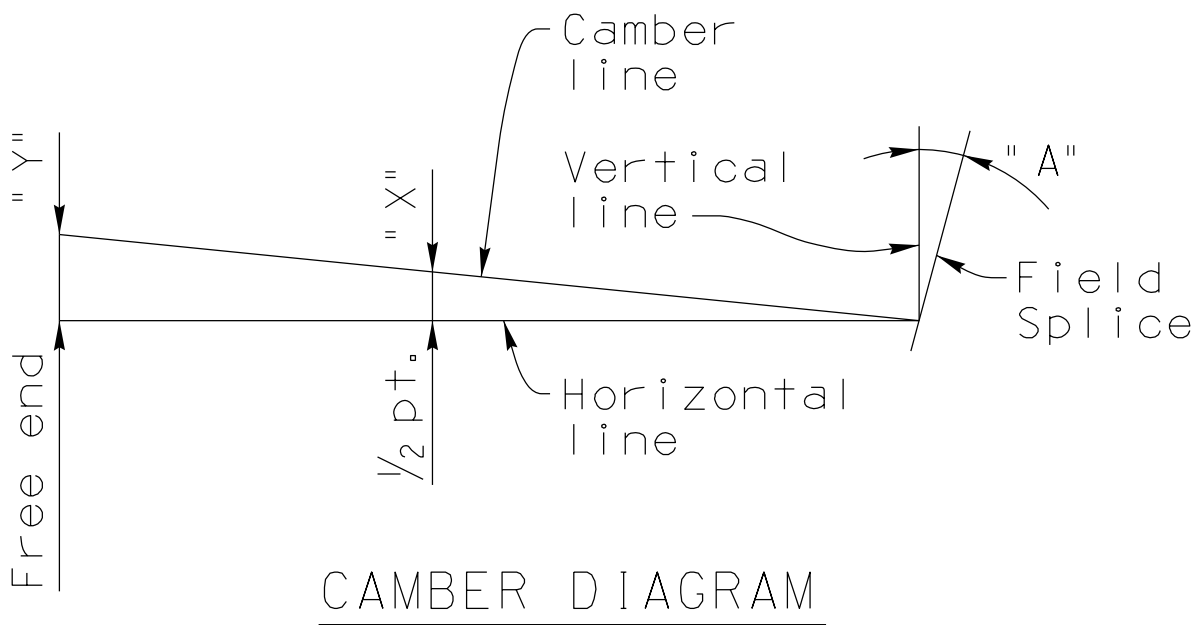
1. Wind Loading: 90 MPH Velocity.
2. Maximum Height: 50'-0 from average surrounding terrain to the center of the sign panel (Regardless of post height). The Tubular Cantilever has been designed for site conditions which are level and neither elevated above the average surrounding terrain by more than the 50'-0 height shown nor supported on a bridge.
3. The maximum sign panel overlap onto elbow shall not exceed 7'-0 from field splice.
4. The sum of the sign panel area plus the exit panel area shall not exceed the maximum area shown in the table. All signs shall be placed within Sign Panel Location.
5. The Optional Shop Splice may not be used when the splice location is less than 5'-0 above the top of base plate. Shop splice of pipe sections (other than shown) are not permitted without prior approval.

6. Drill and tap for 1½" chase nipples and plug with recessed pipe plugs. Place perpendicular to sign panel axis and away from approaching traffic.
7. If the tubular cantilever structure is erected as one unit, the pipe assembly shall be adequately suspended to avoid distortions.
8. During sign erection the post shall be raked as necessary with the use of leveling nuts to make the sign panel level. See Traffic Signing Plans for specific locations and elevations.
9. The Field Splice surfaces shall be in full contact without gaps prior to the bolts being snug tightened and fully tensioned. The contact surface is the area defined by a 1⅜" radius around each bolt.
10. Provide electrical grounding at pole foundations per ADOT Standard Specification Section 732-3.03.

STANDARDS ENGINEER	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING
A. ALZUBI	
RECOMMENDED FOR APPROVAL GROUP MANAGER	
D. EBERHART	TUBULAR SIGN STRUCTURES TUBULAR CANTILEVER GENERAL PLAN
APPROVED	
STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	DRAWING NO. SD 9.10 (1 of 5)
04/19 DATE	



TYPE	Post Height (Ft)	CAMBER		
		"X"	"Y"	
1C	0-5	7/8"	1 5/8"	0°20' 00"
	5.1-10	1"	2"	0°24' 30"
	10.1-15	1 1/8"	2 1/4"	0°29' 00"
2C	0-5	7/8"	1 1/2"	0°18' 00"
	5.1-10	1"	1 3/4"	0°22' 00"
	10.1-15	1 1/8"	2 1/8"	0°26' 00"
3C	0-5	5/8"	1 1/8"	0°13' 30"
	5.1-10	3/4"	1 3/8"	0°16' 30"
	10.1-15	7/8"	1 5/8"	0°20' 00"
4C	0-5	1 5/8"	3"	0°25' 00"
	5.1-10	1 7/8"	3 1/2"	0°30' 00"
	10.1-15	2 1/8"	4 1/8"	0°35' 30"



CAMBER NOTES:

1. The camber shown is required to be built into mast arm. Members shall be erected so that camber is provided above the horizontal line thru the field splice.
2. The calculated camber provides for deflections due to dead loads of tubular cantilever structure and dead loads due to sign panels and attachments. For post heights between 0'-0 and 15'-0 values of "A", "X", and "Y" shall be interpolated.
3. The pipe flange of mast arm shall be perpendicular to its longitudinal axis. The pipe flange of elbow shall be tilted from the vertical line at the angle given in the table.

GENERAL NOTES:

Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.

Design Specifications - AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition (2013) with 2015 interim Revisions

All tubular structural cantilever pipe shall be welded or seamless steel pipe and shall conform to ASTM Specification (Fy = 35,000 psi):

A-53	Grade B,	Type E or S
A252	Grade 2,	Type E or S
A106	Grade B,	Type S only
API 5L	Grade B,	Type E or S
API 5LX	Grade X42,	Type E or S

All other Structural Steel shall conform to ASTM Specification A36 unless noted otherwise.

All bolts shall conform to ASTM Specification F3125 GR A325.

All bolts, nuts and washers shall be galvanized in accordance with the requirements of ASTM A153. All other steel shall be galvanized after fabrication in accordance with ASTM A123.

Welding of structural tubing shall conform to the requirements of the American Welding Society, Structural Welding Code, D1.1, latest Edition.

All welding shall be continuous unless noted otherwise. All butt welds shall be full penetration using prequalified welding procedures and shall be tested by ultrasonic testing. All butt welds shall be ground flush, full width.

Grinding striations shall be parallel to the length of member.

The Column to base plate weld (WELD DETAIL A) and pipe flange to elbow and mast arm welds (WELD DETAIL C) shall be tested by ultrasonic testing. Any detected shallow toe cracks shall be repaired in the shop.

All Concrete shall be Class "S" (f'c = 3500 psi).

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60.

All hooks and bends shall meet the requirements of AASHTO 8th Edition (2017) Article 5.10.2. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

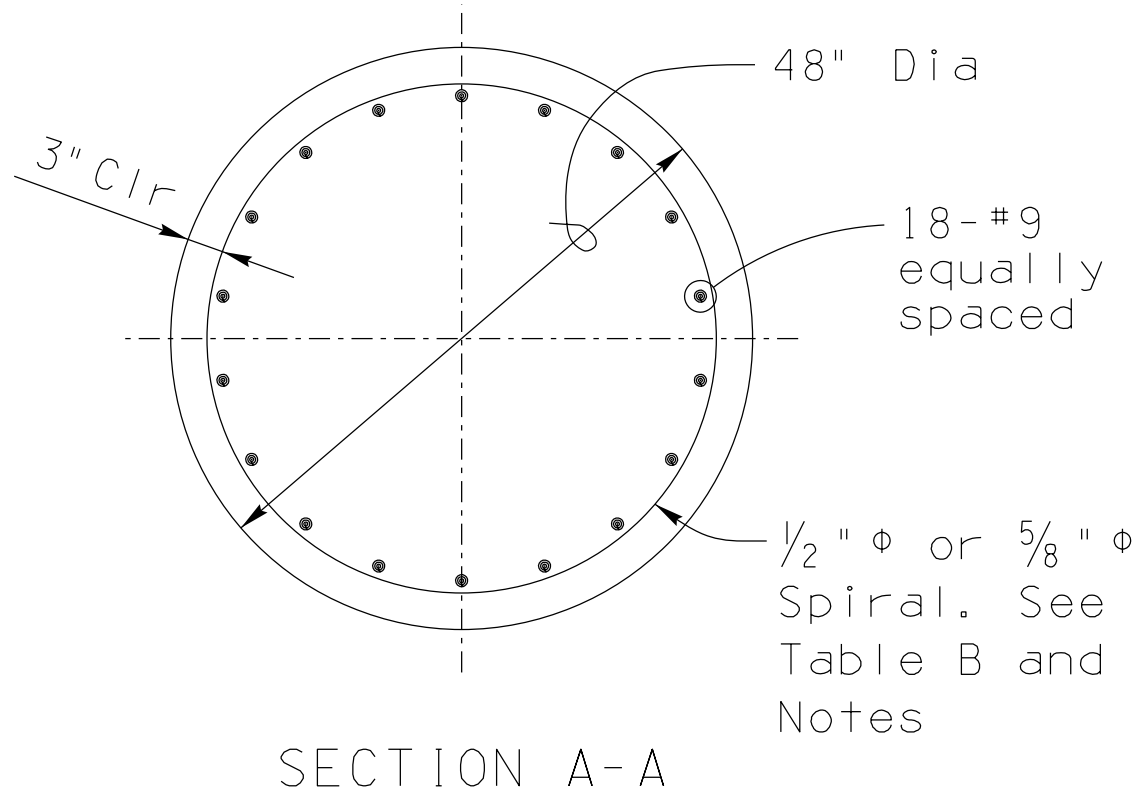
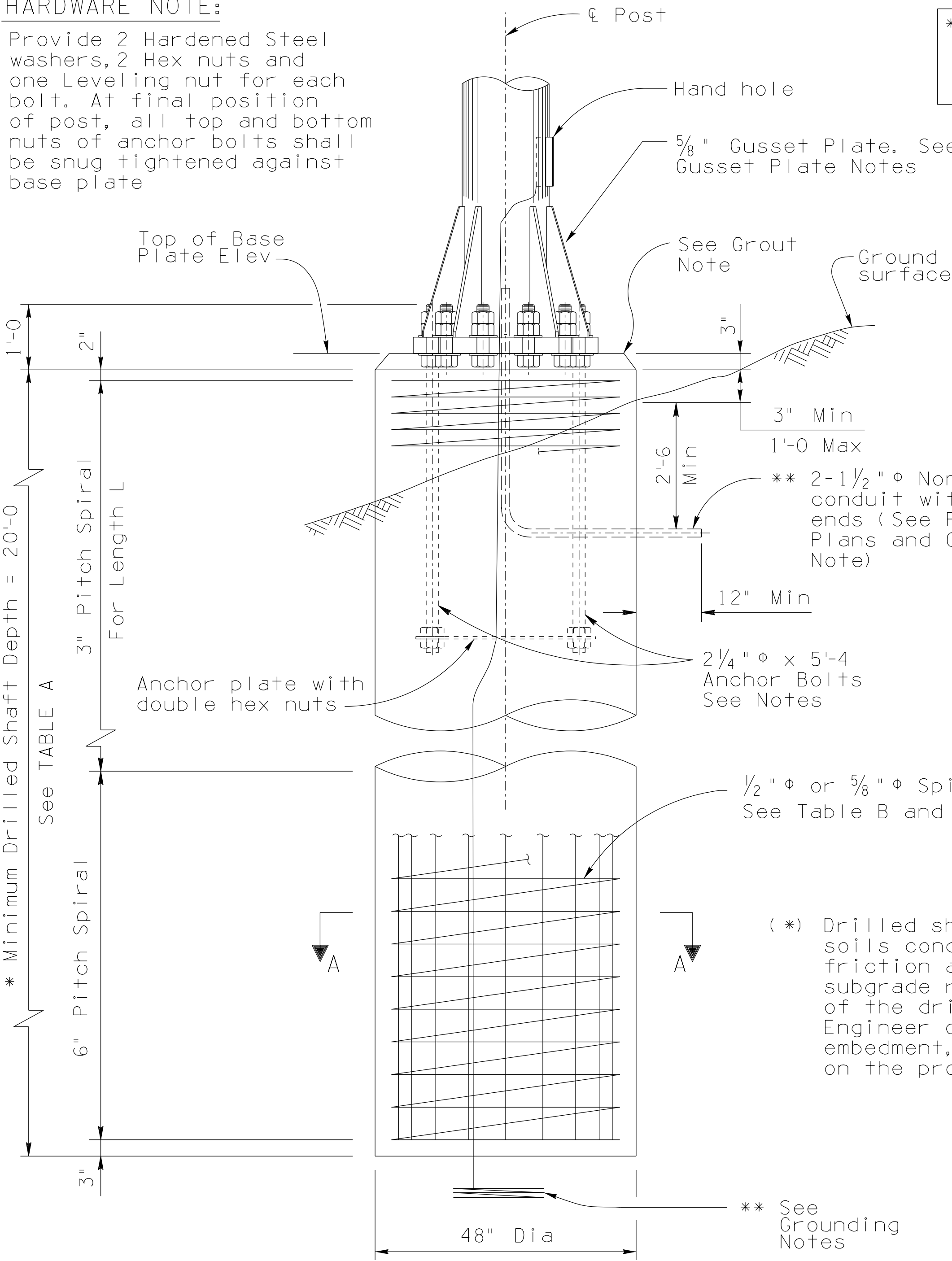
Dimensions shall not be scaled from drawings.

Drilled shaft location and top of drilled shaft elevation shall be field verified by the Contractor prior to fabrication of post.

Note to Designer:
The information presented in this Standard Drawing has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without the approval of the engineer. The engineer shall be responsible for the design and construction of the project. The engineer shall not be responsible for the design and construction of the project.

HARDWARE NOTE:

Provide 2 Hardened Steel washers, 2 Hex nuts and one Leveling nut for each bolt. At final position of post, all top and bottom nuts of anchor bolts shall be snug tightened against base plate



DRILLED SHAFT DETAILS

TABLE A	
Max Slope	' X'
8:1	0'
6:1	1'
4:1	2'
2:1	4'
1 1/2:1	5'
1:1	8'

Drilled Shaft Depth shall be adjusted for ground slope. Add value of 'X' in TABLE A to the minimum Drilled Shaft Depth to obtain the total length of shaft

** Payment for conduits and grounding wire is included in pay items 6060254, 6060255, 6060256, and 6060257 Foundation for Tubular Cantilever Sign Structure.

TABLE B		
Frame Type	Spiral Dia	Length L
1C	1/2"	6'-0"
2C	1/2"	6'-0"
3C	1/2"	6'-0"
4C	5/8"	10'-0"

(*) Drilled shaft depth is based on uniform soils condition with unit weight = 110 pcf, friction angle phi = 29 degrees, modulus of subgrade reaction K=50 psf/ft. Depth or design of the drilled shaft shall be revised by the Engineer of Record for weaker soils or rock embedment, and all revision shall be shown on the project plans.

GUSSET PLATE NOTES:

Gusset plates shall be placed perpendicular to base plate and post face, and centered between anchor bolt holes.

Gusset Plate Details are shown on SD 9.10 (3 of 5).

CONDUIT NOTE:

If the project plans do not callout for the installation of a conduit, 2-1 1/2" diameter non-metallic conduits shall be stubbed out 30" below grade. The stubbed conduits shall be perpendicular to traffic direction to the non-traffic side, be a minimum of 12" from edge of foundation cap, and the conduit ends shall be capped.

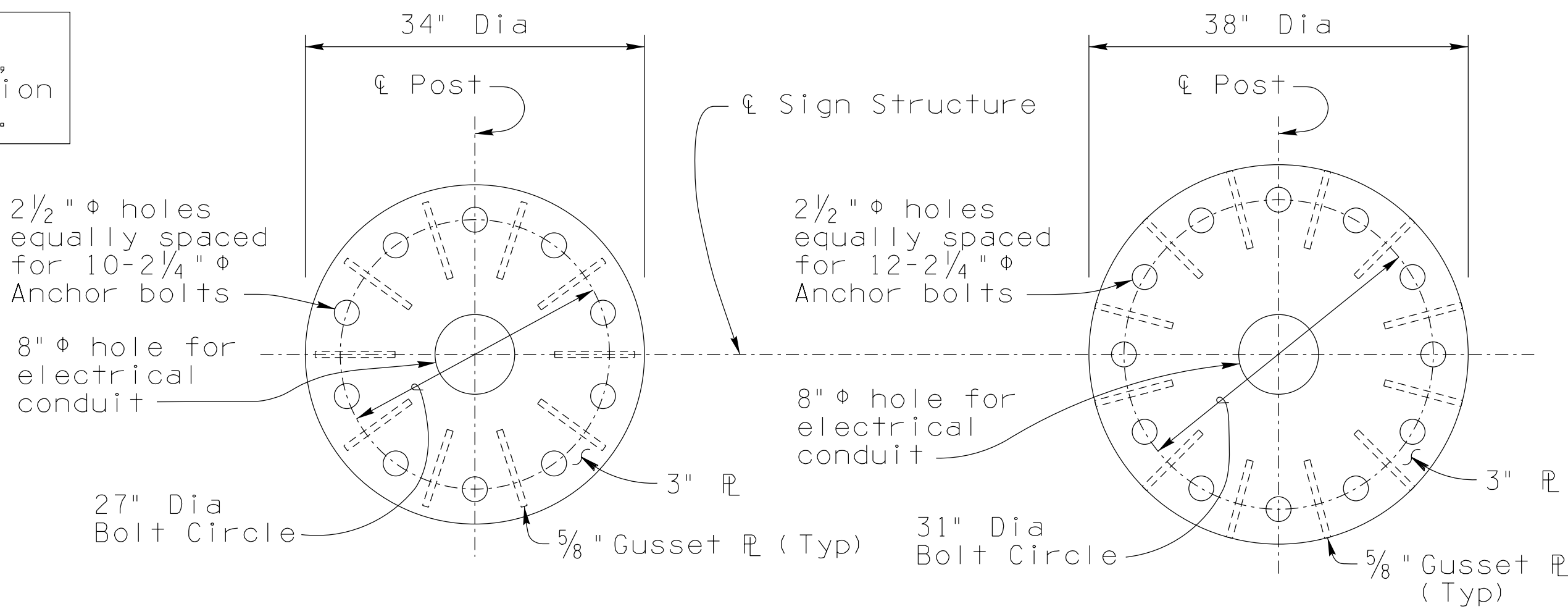
GROUNDING NOTES:

A 25 feet long coil of No. 4 AWG bare copper grounding wire shall be installed before concrete is poured and shall be connected to the post grounding screw in the hand hole.

The grounding wire shall be installed on the outside of the conduit.

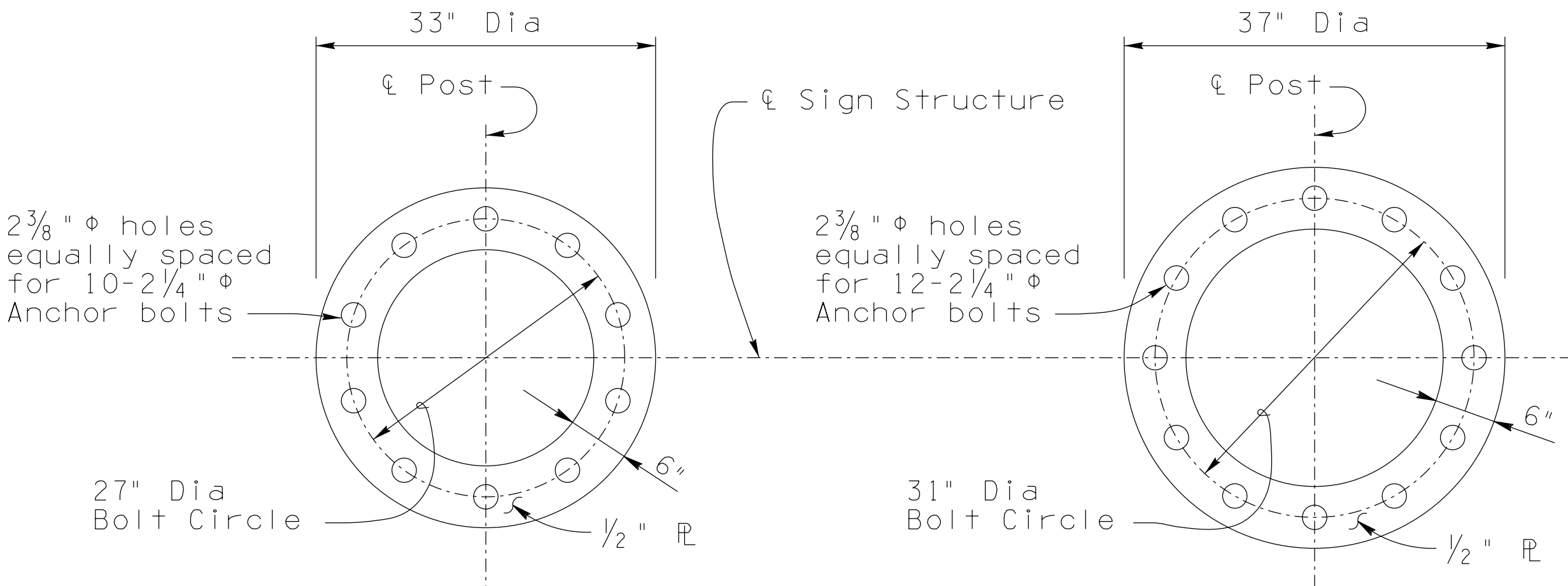
GROUT NOTE:

Space to be filled with non-shrink grout after tubular structure is permanently erected.



16" & 18" Post Dia

BASE PLATE DETAILS



20" & 22" Post Dia

ANCHOR PLATE DETAILS

NOTES:

All anchor bolts shall conform to ASTM F1554 Grade 55 Specifications. The upper 1'-2" and lower 6" shall be threaded. The upper 1'-8" shall be galvanized in accordance with the requirements of ASTM A153.

Provide bolt template during installation of anchor bolts. The bolt template shall be fabricated of 1/4" thick (Min) steel plate, similar to anchor plate details, and both the bolt template and the anchor plate shall be drilled to match the base plate.

Drilled shaft concrete shall be class 'S' and shall be placed within undisturbed material or compacted embankment. Top of drilled shaft shall be formed to 1'-0" below ground surface.

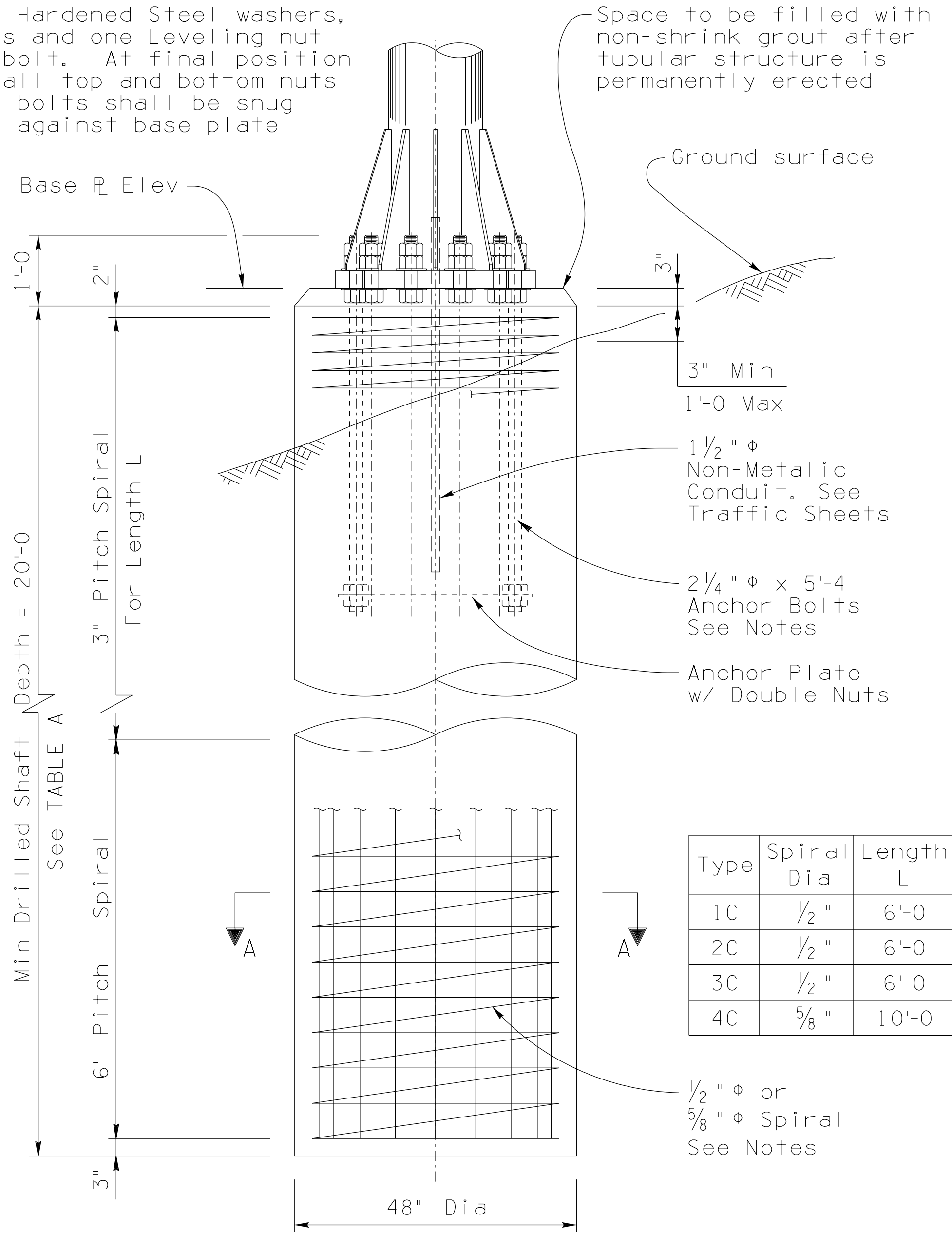
Compacted finished grade backfill or embankment shall be in place prior to erecting the post.

1/2" x 5/8" Spiral shall be cold drawn steel wire conforming to AASHTO M336, except Min Tensile Strength is 60,000 psi. Lap 1 1/2 turns at top and bottom of spiral.

STANDARDS ENGINEER A. ALZUBI RECOMMENDED FOR APPROVAL GROUP MANAGER	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING	
APPROVED D. EBERHART	TUBULAR SIGN STRUCTURES TUBULAR CANTILEVER FOUNDATION DETAILS	DRAWING NO. SD 9.10 (2 of 5)
STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	03/22 DATE	

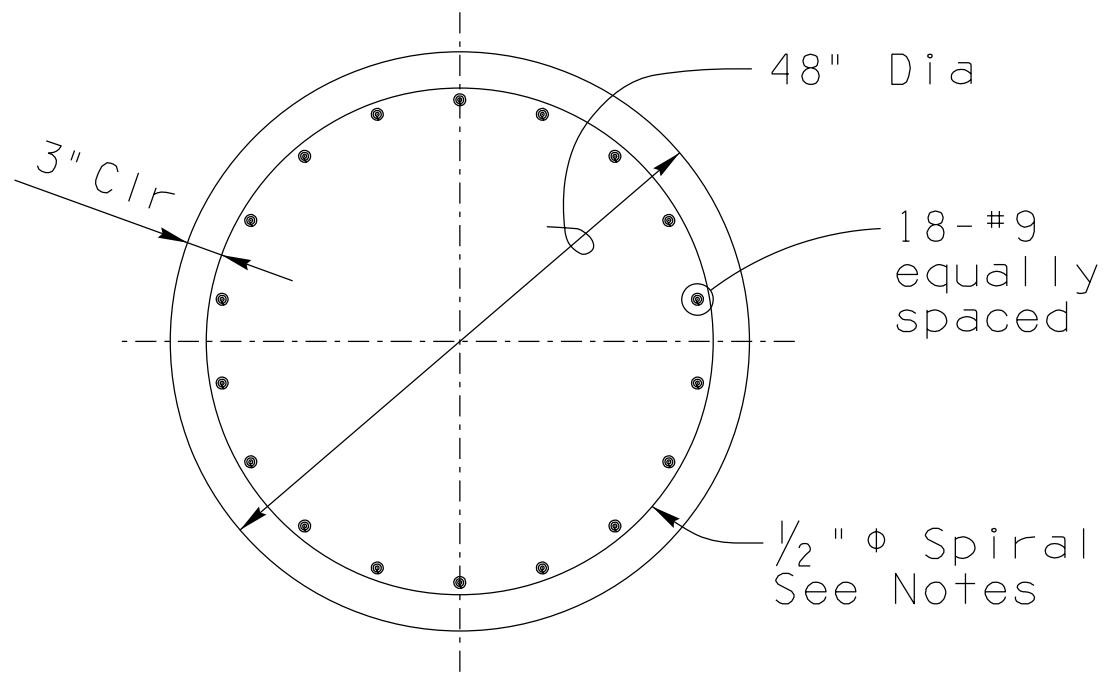
HARDWARE NOTE:

Provide 2 Hardened Steel washers, 2 Hex nuts and one Leveling nut for each bolt. At final position of post, all top and bottom nuts of anchor bolts shall be snug tightened against base plate



Type	Spiral Dia	Length L
1C	1/2"	6'-0
2C	1/2"	6'-0
3C	1/2"	6'-0
4C	5/8"	10'-0

ELEVATION



SECTION A-A

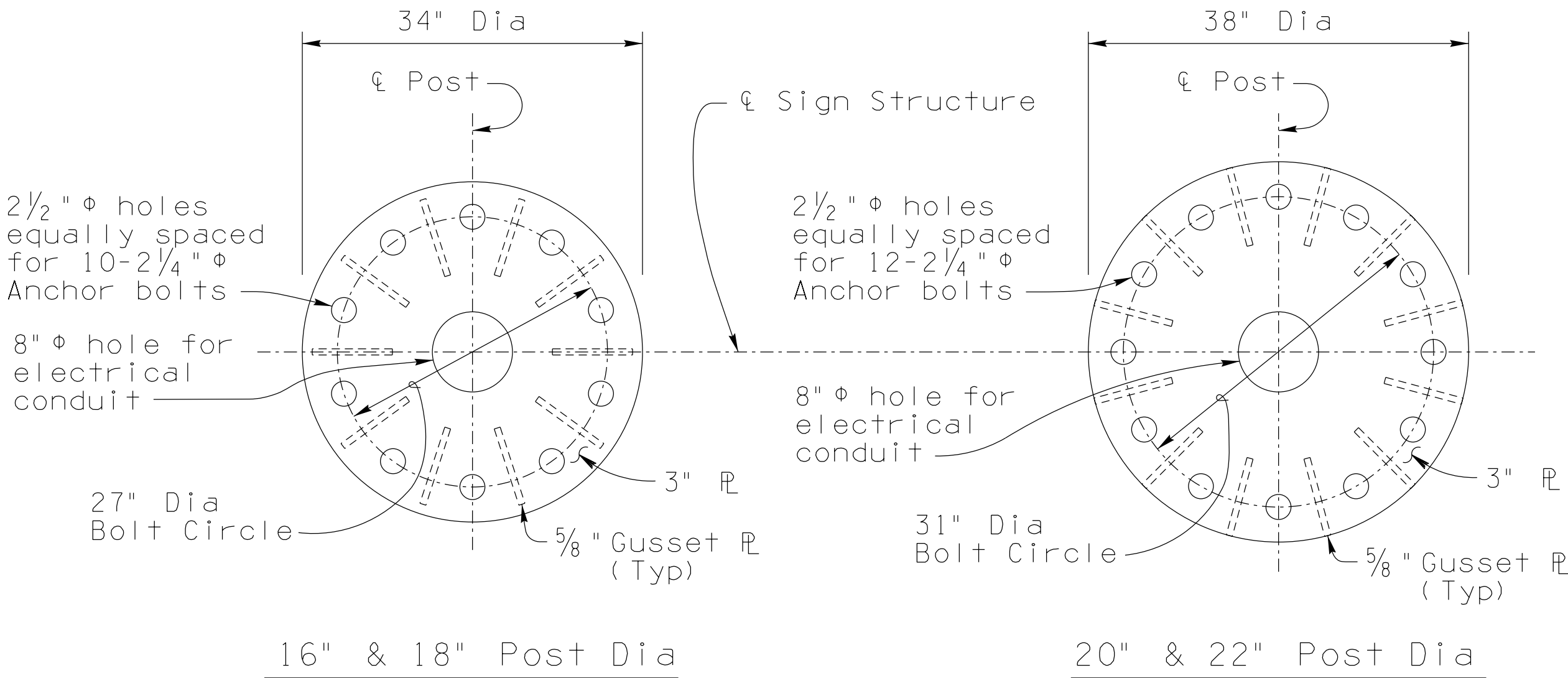
DRILLED SHAFT DETAILS

TABLE A	
Max Slope	' X'
8:1	0'
6:1	1'
4:1	2'
2:1	4'
1 1/2:1	5'
1:1	8'

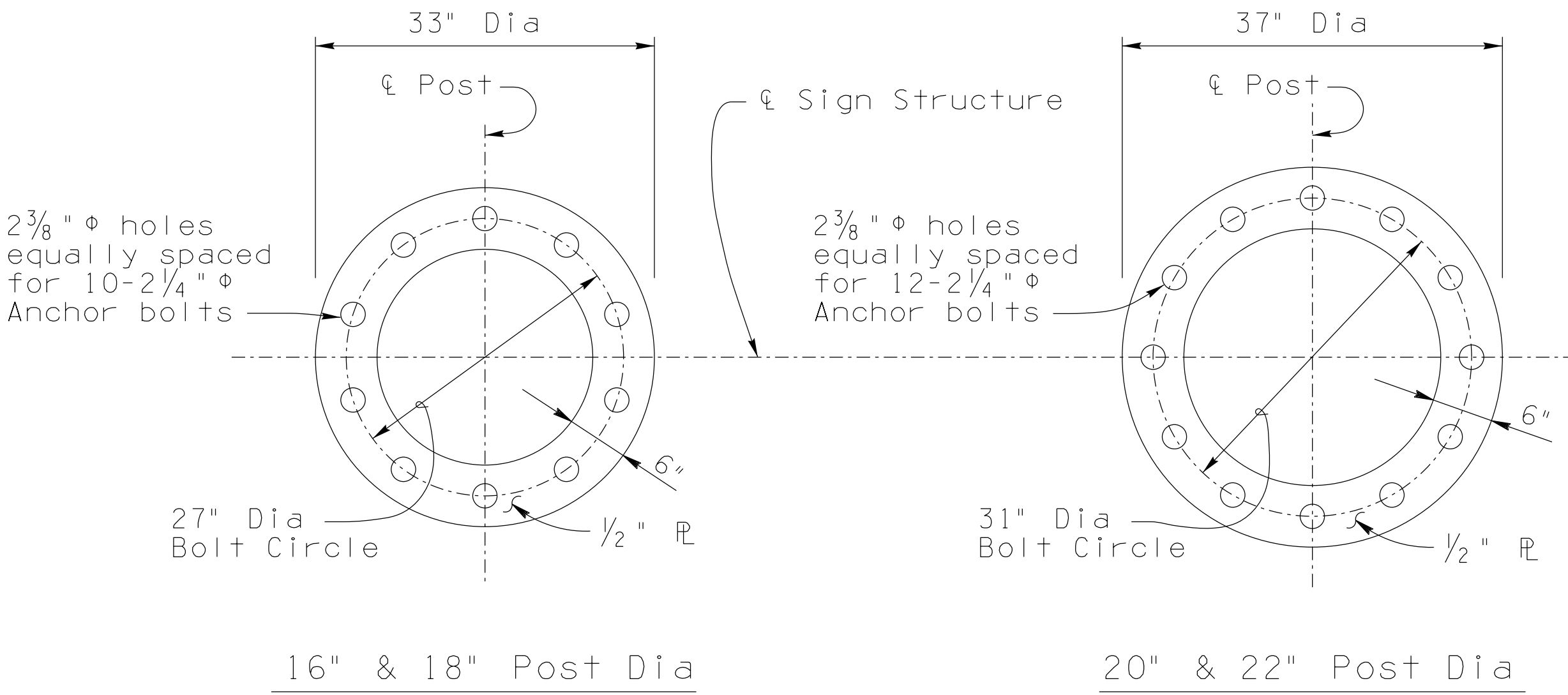
Drilled Shaft Depth shall be adjusted for ground slope. Add value of 'X' in TABLE A to the Min Drilled Shaft Depth to obtain the total length of shaft

GUSSET PLATE NOTE:

Gusset plates shall be placed perpendicular to base plate and post face, and centered between anchor bolt holes



BASE PLATE DETAILS



ANCHOR PLATE DETAILS

NOTES:

All anchor bolts shall conform to ASTM F1554 Grade 55 Specifications. The upper 1'-2 and lower 6" shall be threaded. The upper 1'-8 shall be galvanized in accordance with the requirements of ASTM A153.

Provide bolt template during installation of anchor bolts. The bolt template shall be fabricated of 1/4" thick (Min) steel plate, similar to anchor plate details, and shall be match drilled to each base plate.

Drilled shaft concrete shall be class 'S' and shall be placed within undisturbed material or compacted embankment. Top of drilled shaft shall be formed to 1'-0 below ground surface.

Compacted backfill shall be in place prior to erecting post.

1/2" or 5/8" Spiral shall be cold drawn steel wire conforming to AASHTO M336, except Min Tensile Strength = 60,000 psi. Lap 1 1/2 turns at top and bottom of spiral.

STANDARDS ENGINEER A. ALZUBI RECOMMENDED FOR APPROVAL GROUP MANAGER D. EBERHART APPROVED STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING	
	TUBULAR SIGN STRUCTURES TUBULAR CANTILEVER FOUNDATION DETAILS	DRAWING NO. SD 9.10 (2 of 5)

PRIOR DISTRIBUTION DATE	03/11
-------------------------	-------



Electrical wire shall be placed in PVC conduit and secured away from bolt tip (See traffic plans for more details)

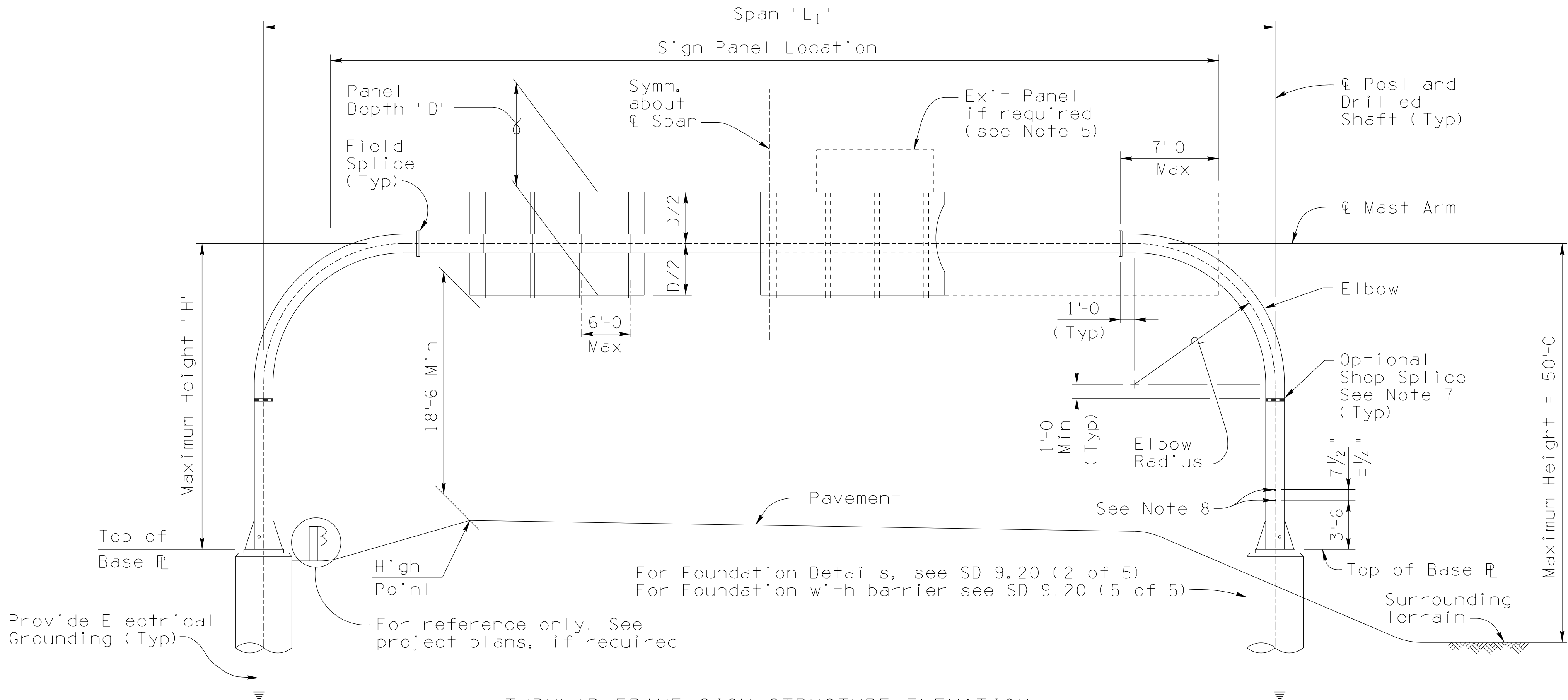


STANDARDS ENGINEER A. ALZUBI	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING	
RECOMMENDED FOR APPROVAL GROUP MANAGER D. EBERHART		
APPROVED	TUBULAR SIGN STRUCTURES TUBULAR CANTILEVER LIGHT SUPPORT DETAILS	DRAWING NO. SD 9.10 (5 of 5)
STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	04/19 DATE	

Note to Designer:
The information presented in this Standard Drawing has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without the approval of the design engineer. The design engineer shall be responsible for the availability of a licensed professional engineer. Contents within the inner border line shall not be altered.

03/11

PRIOR DISTRIBUTION DATE



TUBULAR FRAME SIGN STRUCTURE ELEVATION

TUBULAR FRAME DATA FOR SIGN PANEL SUPPORT													
TUBULAR FRAME					PIPE WALL THICKNESS (INCHES)			SIGN PANEL		PAYMENT ITEMS			
Frame Type	Frame Span 'L ₁ '	Nominal Pipe Dia	90° Elbow Radius	Max Height 'H'	Post	Elbow	Mast Arm	Max Area Sq. Ft.	Max Depth 'D'	BRIDGE SIGN STRUCTURE		FOUNDATIONS	
										Item Number	Measurement	Item Number	Measurement
1F	20' -70'	12"	10'-0	28'-0	1.312	1.312	1.000	250	8'	6060045	Ea	6060075	Ea
2F	41' -70'	16"	10'-0	30'-0	1.219	1.219	0.500	690	12'	6060046	Ea	6060076	Ea
3F	71' -110'	20"	12'-0	30'-0	1.280	1.280	0.625	920	12'	6060047	Ea	6060078	Ea
4F	111' -142'	22"	12'-0	30'-0	1.125	1.125	0.875	920	12'	6060048	Ea	6060079	Ea

OVERHEAD SIGN NOTES:

1. Wind Loading: 90 MPH Velocity
2. Maximum Height: 50'-0 from average surrounding terrain to the centerline of the mast arm (Regardless of post height). The Tubular Overhead has been designed for site conditions which are level and neither elevated above the average surrounding terrain by more than the 50'-0 height shown nor supported on a bridge.
3. Maximum difference between post heights for an individual frame = 5'-0.
4. The maximum sign panel overlap onto elbow shall not exceed 7'-0 from field splice.
5. The sum of the sign panel area plus the exit panel area shall not exceed the maximum area shown in table. All signs shall be placed within Sign Panel Location.
6. For Standard pipe mast arms with lengths greater than 60'-0 an optional field splice will be permitted at the third points of mast arm length to facilitate hauling operations. All additional field splices in the Mast Arm proposed by the fabricator will not be allowed.

7. The Optional Shop Splice may not be used when the splice location is less than 5'-0 above the top of base plate. Shop splice of pipe sections (other than shown) are not permitted without prior approval.
8. Drill and tap for 1½" chase nipples and plug with recessed pipe plugs. Place perpendicular to sign panel axis and away from approaching traffic. Install nipples on shoulder posts only.
9. Before any portion of the tubular frame is assembled in its final position, the Contractor shall demonstrate to the Engineer by preassembly or other approved methods that the span length of the frame in the no load condition is equal to (± ½ inch) the field measured span length between foundations.
10. If the tubular frame is erected as one unit the frame shall be adequately suspended to avoid distortions or changes in span length between base plates.
11. The Field Splice surfaces shall be in full contact without gaps prior to the bolts being snug tightened and fully tensioned. The contact surface is the area defined by a 1⅜" radius around each bolt.
12. Provide electrical grounding at pole foundations per ADOT Standard Specification Section 732-3.03.

GENERAL NOTES:

Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.

Design Specifications - AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition (2013) with 2015 Interim Revisions

All tubular structural cantilever pipe shall be welded or seamless steel pipe and shall conform to ASTM Specification (Fy = 35,000 psi):
A-53 Grade B, Type E or S
A252 Grade 2, Type E or S
A106 Grade B, Type S only
API 5L Grade B, Type E or S
API 5LX Grade X42, Type E or S

All other Structural Steel shall conform to ASTM Specification A36 unless noted otherwise.

All bolts shall conform to ASTM Specification F3125 GR A325.

All bolts, nuts and washers shall be galvanized in accordance with the requirements of ASTM A153. All other steel shall be galvanized after fabrication in accordance with ASTM A123.

Welding of structural tubing shall conform to the requirements of the American Welding Society, Structural Welding Code, D1.1, latest Edition.

All welding shall be continuous unless noted otherwise. All butt welds shall be full penetration using prequalified welding procedures and shall be tested by ultrasonic testing. All butt welds shall be ground flush, full width.

Grinding striations shall be parallel to the length of member.

The Column to base plate weld (WELD DETAIL A) and pipe flange to elbow and mast arm welds (WELD DETAIL C) shall be tested by ultrasonic testing. Any detected shallow toe cracks shall be repaired in the shop.

All Concrete shall be Class "S" (f'c = 3500 psi).

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60.

All hooks and bends shall meet the requirements of AASHTO 8th Edition (2017) Article 5.10.2. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

Dimensions shall not be scaled from drawings.

Drilled shaft location and top of drilled shaft elevation shall be field verified by the Contractor prior to fabrication of post.

STANDARDS ENGINEER A. ALZUBI RECOMMENDED FOR APPROVAL GROUP MANAGER D. EBERHART APPROVED STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING		
	TUBULAR SIGN STRUCTURES TUBULAR FRAME GENERAL PLAN		DRAWING NO. SD 9.20 (1 of 5)
	04/19 DATE		

GENERAL NOTES:

Construction Specification - Arizona Department of Transportation Standard Specifications for Road and Bridge Construction, latest Edition.

Design Specifications - AASHTO Standard Specification for Structural Supports for Highway Signs, Luminares, and Traffic Signals, 6th Edition (2013), including the 2015 2019, and 2020 Interim Revisions.

All tubular structural cantilever pipe shall be welded or seamless steel pipe and shall conform to ASTM Specification (Fy = 35,000 psi):
A-53 Grade B, Type E or S
A252 Grade 2, Type E or S
A106 Grade B, Type S only
API 5L Grade B, Type E or S
API 5LX Grade X42, Type E or S

All other Structural Steel shall conform to ASTM Specification A36 unless noted otherwise.

All bolts shall conform to ASTM Specification F3125 GR A325.

All bolts, nuts and washers shall be galvanized in accordance with the requirements of ASTM A153. All other steel shall be galvanized after fabrication in accordance with ASTM A123.

Welding of structural tubing shall conform to the requirements of the American Welding Society, Structural Welding Code, D1.1, latest Edition.

All welding shall be continuous unless noted otherwise. All butt welds shall be full penetration using prequalified welding procedures and shall be tested by ultrasonic testing. All butt welds shall be ground flush, full width.

Grinding striations shall be parallel to the length of member.

The Column to base plate weld (WELD DETAIL A) and pipe flange to elbow and mast arm welds (WELD DETAIL C) shall be tested by ultrasonic testing. Any detected shallow toe cracks shall be repaired in the shop.

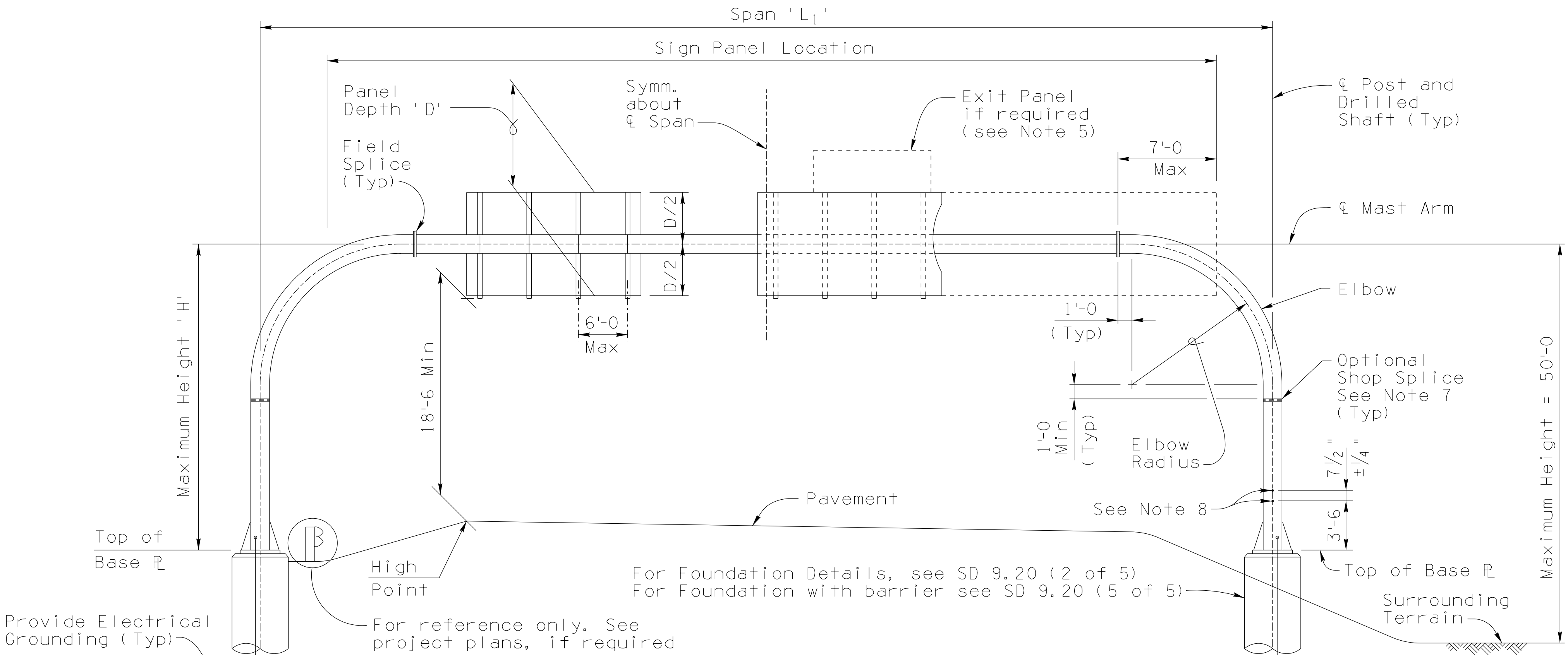
All Concrete shall be Class "S" (f'c = 3500 psi).

Reinforcing steel shall conform to ASTM Specification A615. All reinforcing shall be furnished as Grade 60.

All hooks and bends shall meet the requirements of AASHTO 8th Edition (2017) Article 5.10.2. All bend dimensions for reinforcing steel shall be out-to-out of bars. All placement dimensions for reinforcing steel shall be to center of bars unless noted otherwise.

Dimensions shall not be scaled from drawings.

Drilled shaft location and top of drilled shaft elevation shall be field verified by the Contractor prior to fabrication of post.



TUBULAR FRAME SIGN STRUCTURE ELEVATION

TUBULAR FRAME DATA FOR SIGN PANEL SUPPORT													
TUBULAR FRAME					PIPE WALL THICKNESS (INCHES)			SIGN PANEL		PAYMENT ITEMS			
Frame Type	Frame Span 'L ₁ '	Nominal Pipe Dia	90° Elbow Radius	Max Height 'H'	Post	Elbow	Mast Arm	Max Area Sq. Ft.	Max Depth 'D'	BRIDGE SIGN STRUCTURE		FOUNDATIONS	
										Item Number	Measurement	Item Number	Measurement
1F	20' - 70'	12"	10'-0"	28'-0"	1.312	1.312	1.000	250	8'	6060045	Ea	6060075	Ea
2F	41' - 70'	16"	10'-0"	30'-0"	1.219	1.219	0.500	690	12'	6060046	Ea	6060076	Ea
3F	71' - 110'	20"	12'-0"	30'-0"	1.280	1.280	0.625	920	12'	6060047	Ea	6060078	Ea
4F	111' - 142'	22"	12'-0"	30'-0"	1.125	1.125	0.875	920	12'	6060048	Ea	6060079	Ea

OVERHEAD SIGN NOTES:

1. Wind Loading: 90 MPH Velocity
2. Maximum Height: 50'-0 from average surrounding terrain to the C of the mast arm (Regardless of post height). The Tubular Overhead has been designed for site conditions which are level and neither elevated above the average surrounding terrain by more than the 50'-0 height shown nor supported on a bridge.
3. Maximum difference between post heights for an individual frame = 5'-0.
4. The maximum sign panel overlap onto elbow shall not exceed 7'-0 from field splice.
5. The sum of the sign panel area plus the exit panel area shall not exceed the maximum area shown in table. All signs shall be placed within Sign Panel Location.
6. For Standard pipe mast arms with lengths greater than 60'-0 an optional field splice will be permitted at the third points of mast arm length to facilitate hauling operations. All additional field splices in the Mast Arm proposed by the fabricator will not be allowed.

7. The Optional Shop Splice may not be used when the splice location is less than 5'-0 above the top of base plate. Shop splice of pipe sections (other than shown) are not permitted without prior approval.
8. Drill and tap for 1 1/2" chase nipples and plug with recessed pipe plugs. Place perpendicular to sign panel axis and away from approaching traffic. Install nipples on shoulder posts only.
9. Before any portion of the tubular frame is assembled in its final position, the Contractor shall demonstrate to the Engineer by preassembly or other approved methods that the span length of the frame in the no load condition is equal to (± 1/2 inch) the field measured span length between foundations.
10. If the tubular frame is erected as one unit the frame shall be adequately suspended to avoid distortions or changes in span length between base plates.
11. The Field Splice surfaces shall be in full contact without gaps prior to the bolts being snug tightened and fully tensioned. The contact surface is the area defined by a 1 3/8" radius around each bolt.
12. Provide electrical grounding at pole foundations per ADOT Standard Specification Section 732-3.03.

STANDARDS ENGINEER A. ALZUBI RECOMMENDED FOR APPROVAL GROUP MANAGER D. BENTON APPROVED STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING		
	TUBULAR SIGN STRUCTURES TUBULAR FRAME GENERAL PLAN		DRAWING NO. SD 9.20 (1 of 5)

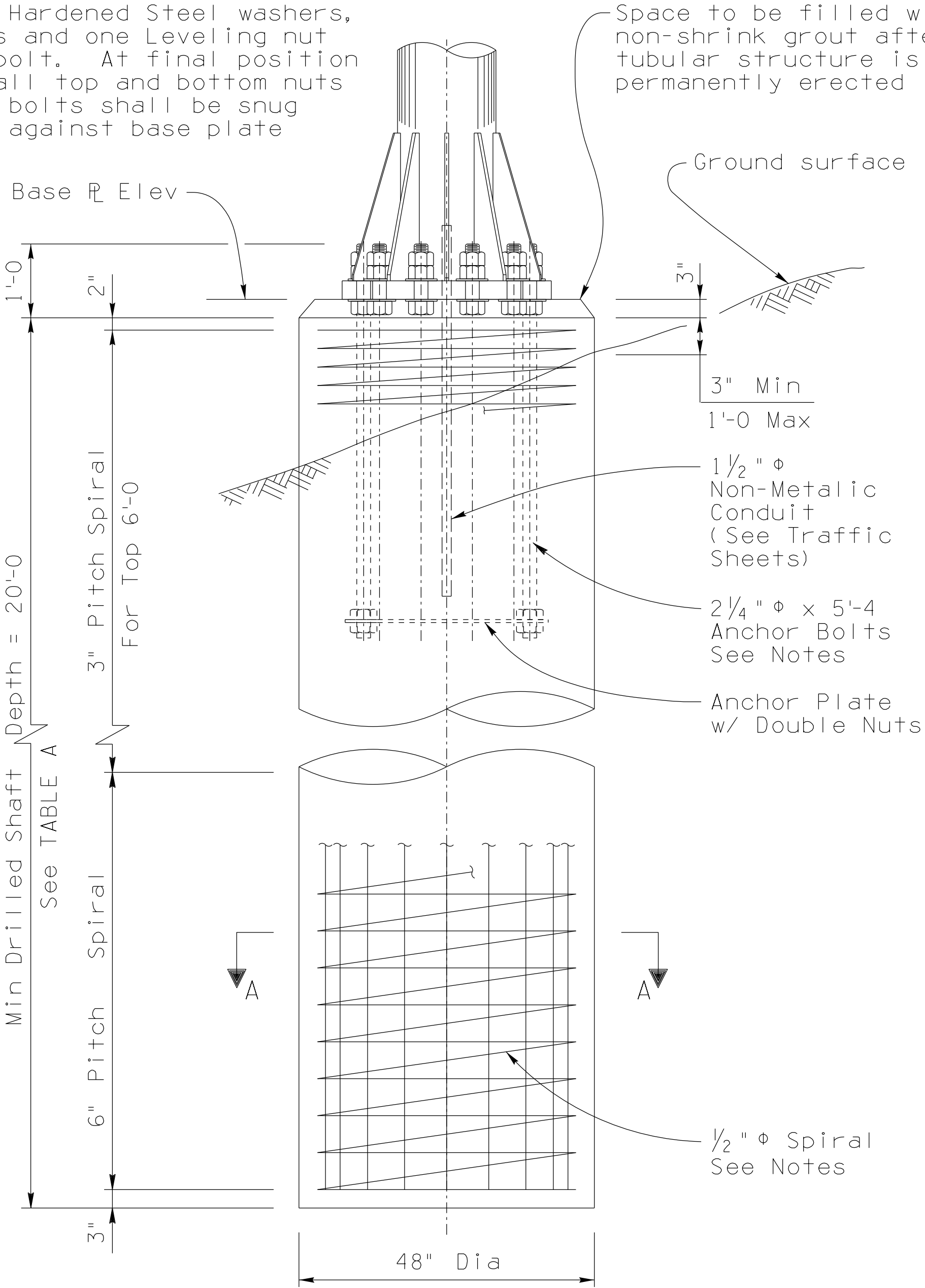
Note to Designer:
The information presented in this Standard Drawing has been prepared in accordance with recognized engineering principles and is for general use. It should not be used for specific application without competent professional examination and verification of its suitability and applicability by a licensed professional engineer. Contents within the inner border line shall not be altered.

04/19

PRIOR DISTRIBUTION DATE

NOTE:

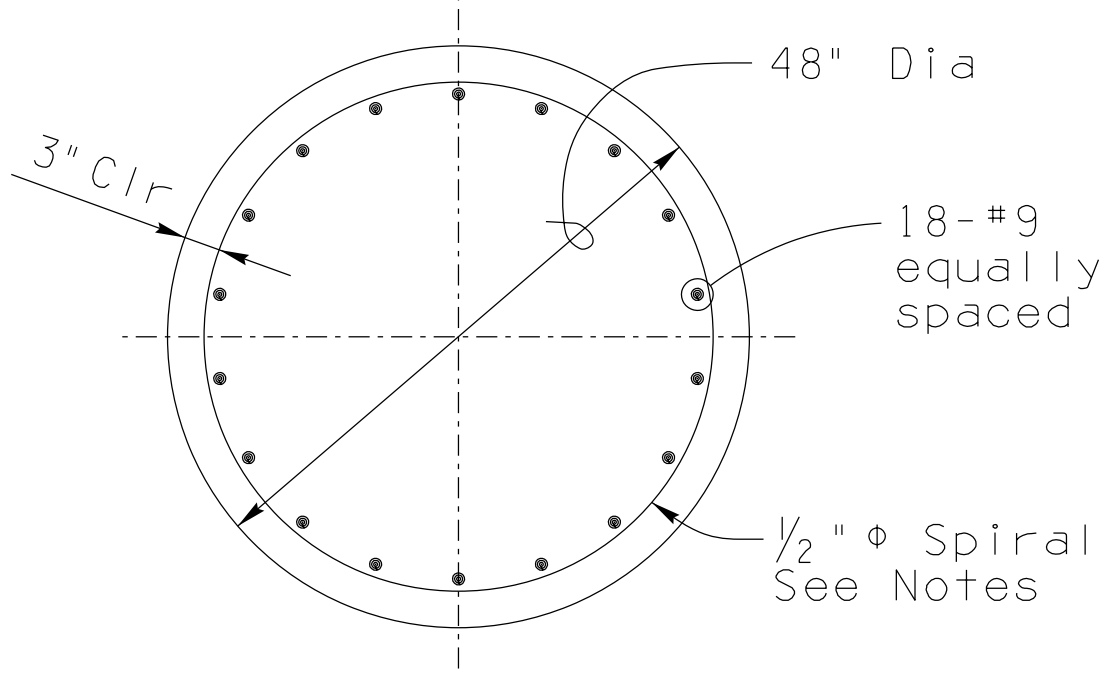
Provide 2 Hardened Steel washers, 2 Hex nuts and one Leveling nut for each bolt. At final position of post, all top and bottom nuts of anchor bolts shall be snug tightened against base plate



ELEVATION

TABLE A	
Max Slope	' X '
8:1	0'
6:1	1'
4:1	2'
2:1	4'
1 1/2:1	5'
1:1	8'

Drilled Shaft Depth shall be adjusted for ground slope. Add value of 'X' in TABLE A to the Min Drilled Shaft Depth to obtain the total length of shaft



SECTION A-A

DRILLED SHAFT DETAILS

NOTES:

All anchor bolts shall conform to ASTM F1554 Grade 55 Specifications. The upper 1'-2 and lower 6" shall be threaded. The upper 1'-8 shall be galvanized in accordance with the requirements of ASTM A153.

Provide bolt template during installation of anchor bolts. The bolt template shall be fabricated of 1/4" thick (Min) steel plate, similar to anchor plate details, and shall be match drilled to each base plate.

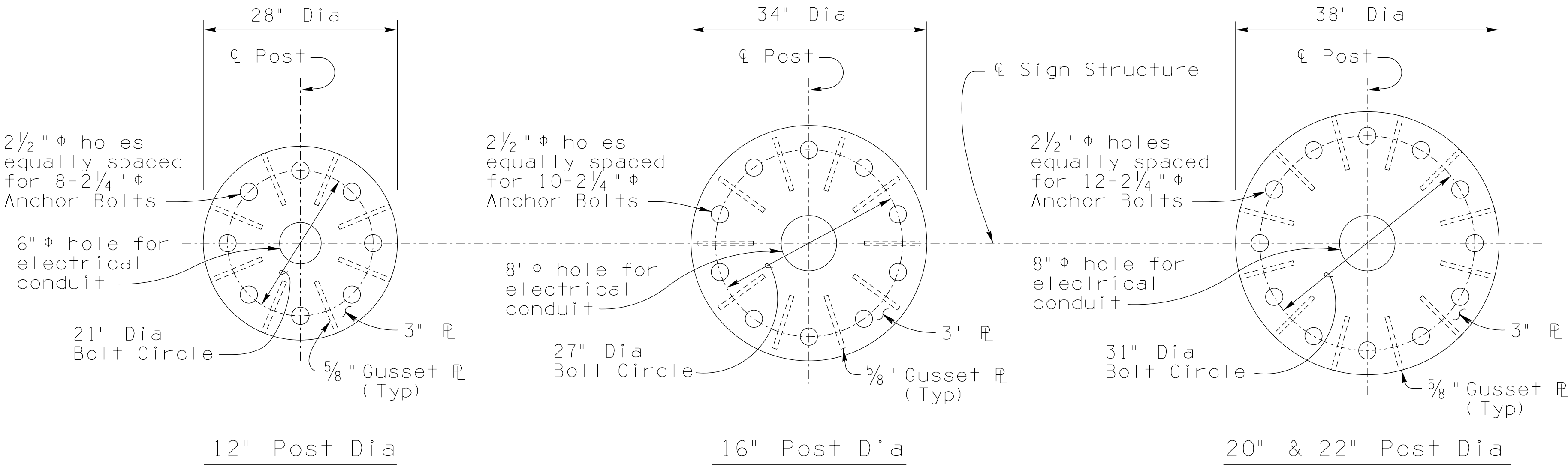
Drilled shaft concrete shall be class 'S' and shall be placed within undisturbed material or compacted embankment. Top of drilled shaft shall be formed to 1'-0 below ground surface.

Compacted backfill shall be in place prior to erecting post.

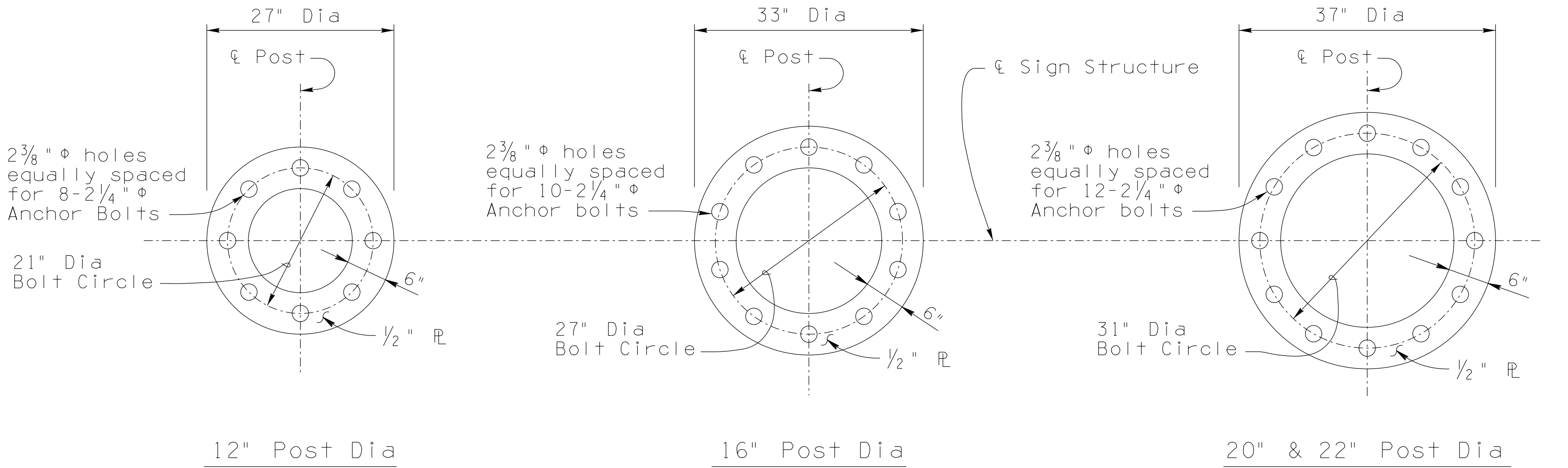
1/2" Φ Spiral shall be cold drawn steel wire conforming to AASHTO M336 except Min Tensile Strength = 60,000 psi. Lap 1 1/2 turns at top and bottom of spiral.

NOTE:

Gusset plates shall be placed perpendicular to base plate and post face and centered between anchor bolt holes

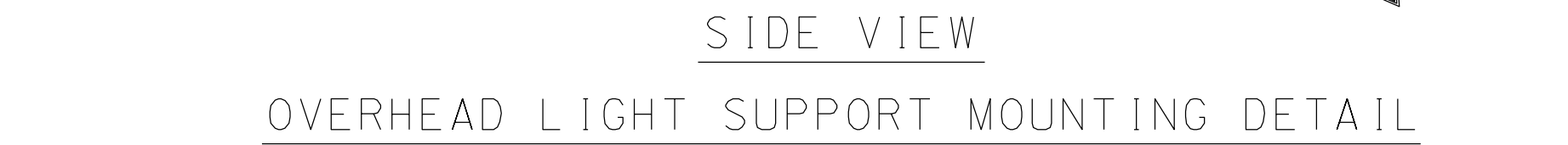


BASE PLATE DETAILS

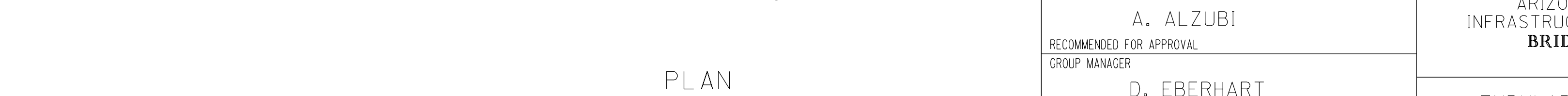
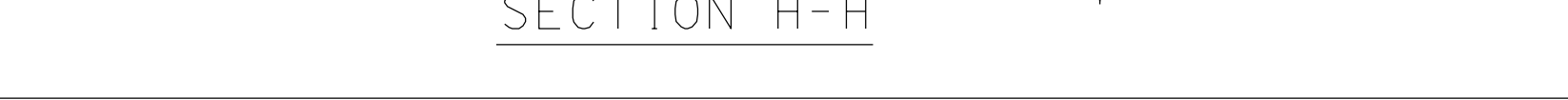


ANCHOR PLATE DETAILS

STANDARDS ENGINEER A. ALZUBI RECOMMENDED FOR APPROVAL GROUP MANAGER D. EBERHART APPROVED STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING	
	TUBULAR SIGN STRUCTURES TUBULAR FRAME FOUNDATION DETAILS	DRAWING NO. SD 9.20 (2 of 5)



Electrical wire shall be placed in PVC conduit and secured away from bolt tip (See traffic plans for more details)



STANDARDS ENGINEER A. ALZUBI	ARIZONA DEPARTMENT OF TRANSPORTATION INFRASTRUCTURE DELIVERY AND OPERATIONS DIVISION BRIDGE GROUP STANDARD DRAWING	
RECOMMENDED FOR APPROVAL GROUP MANAGER D. EBERHART	TUBULAR SIGN STRUCTURES TUBULAR FRAME LIGHT SUPPORT DETAILS	DRAWING NO. SD 9.20 (5 of 5)
APPROVED		
STANDARDS COMMITTEE APPROVED FOR DISTRIBUTION	04/19 DATE	

PRIOR DISTRIBUTION DATE	03/11
-------------------------	-------