Revised East County Substation Footprint Project Description

for the

East County Substation Project

Prepared for:

SDGE
A Sempra Energy utility℠

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April 30, 2010

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1.0 INTRODUCTION

On August 11, 2009, San Diego Gas & Electric Company (SDG&E) filed a Proponent's Environmental Assessment (PEA) to obtain a Permit to Construct with the California Public Utilities Commission for the East County (ECO) Substation Project (Proposed Project). The Proposed Project includes the following components:

1. 500/230/138 kilovolt (kV) ECO Substation
2. Southwest Powerlink (SWPL) loop-in, a short loop-in of the existing SWPL transmission line to the proposed ECO Substation
3. 138 kV transmission line, approximately 13.3 miles in length, running between the proposed ECO Substation and the rebuilt Boulevard Substation
4. Boulevard Substation rebuild

In November of 2009, an additional cultural resource survey of the ECO Substation site and 138 kV transmission line right-of-way (ROW) was conducted by HDR/e^2M. The results of the survey revealed previously unidentified potentially sensitive cultural resources located within the boundaries of the ECO Substation site. In order to avoid adverse effect to these potentially sensitive cultural resources, SDG&E is proposing to shift the footprint of the ECO Substation, which would consequently alter the location and design of the SWPL loop-in and the 138 kV transmission line. The changes to each of these Proposed Project components are discussed in detail in the following sections.

1.1 PROJECT COMPONENTS

1.1.0 ECO Substation

SDG&E is proposing to shift the footprint of the ECO Substation approximately 700 feet east of the location proposed in the PEA in order to avoid adverse effects to sensitive cultural resources. This shift would cause the design of the two retention basins to be altered. As described in the PEA, two separate retention basins—one located near the northwestern corner of the 230/138 kV yard, adjacent to the northern side of the substation, and the other located along the western side of the ECO Substation site—were included as part of the original ECO Substation design. Due to the shift in the footprint location, the retention basins would be reconfigured to be one continuous basin, as opposed to two separate basins. The retention basin would be located in a similar area as proposed in the PEA—along the western side and the northwestern corner of the substation site—as shown in Figure 1: ECO Substation Revised Footprint Conceptual Layout. The revised retention basin is anticipated to be approximately 2.41 acres in size, as opposed to the approximately 3.1 acres that the previous two retention basins combined measured.

SDG&E would also add a small staging area near the intersection of the access road to the substation and Old Highway 80. This staging area would measure approximately 150 feet by 100 feet and would be the terminus for the approximately 0.5-mile-long temporary 12 kV tap, which would be rerouted to bring power from an existing distribution line to the site.

1.1.1 SWPL Loop-In

Due to the substation footprint shift, the SWPL loop-in would require the installation of six structures east of the ECO Substation fence, as opposed to four described in the PEA. Lattice structures were originally proposed for all four of the structures. Five three-pole dead-end structures and one H-frame tangent structure would comprise the SWPL loop-in for the shifted substation footprint. Typical drawings of these structures have been included in Attachment A: Structure Typical Drawings and have been labeled SD1 through SD6. The western interconnection would still be comprised of two structures (SD5 and SD6); however, these structures would be shifted approximately 1,200 feet east of the location proposed in the PEA. The eastern interconnection would be comprised of four structures (SD1 through SD4), as opposed to the two structures described in the PEA. In addition, the eastern interconnection would be shifted approximately 2,000 feet east of the location proposed in the PEA.

The height of these structures would not change from the previously anticipated maximum height of approximately 125 feet. However, the distance from the ground to the lowest conductor would be approximately 42 feet, as opposed to the approximately 35 feet described in the PEA.

1.1.2 138 kV Transmission Line

Due to the substation shift, three 138 kV transmission line steel poles—106, 107, and 108—would be shifted approximately 100 feet east of their locations described in the PEA. The shift of the substation footprint would also result in the need for one additional steel pole (108a), which would be located approximately 100 feet west of the western side of the retention pond at the shifted ECO Substation site. Therefore, the 138 kV transmission line would require the installation of approximately 99 steel poles as opposed to the 98 described in the PEA. Steel poles 77, 104, and 105 would be shifted approximately 75 feet west, 40 feet west, and 90 feet east, respectively, in order to avoid sensitive cultural resources.

Previously, the structure configuration for the transmission line was initially designed as a double circuit in an I-String configuration; however, due to new SDG&E design criteria associated with increased phase spacing for high wind and high fire areas in the Proposed Project area, the configuration would be altered to be a V-String bundled single-circuit for the initial arrangement. As shown in Attachment A: Structure Typical Drawings, the V-String bundled single-circuit configuration would include cross arms on only one side of the steel pole, as opposed to both sides. The ultimate arrangement would include a bundled double-circuit configuration (i.e., two conductors per phase) with cross-arms on both sides of the pole supporting bundled conductors, but this configuration would be reserved for future needs.

As described in the PEA, the maximum height of the steel cable riser pole was anticipated to be approximately 140 feet; however, design changes associated with high wind and fire areas would require an approximately 150-foot-tall structure. Likewise, the height of the steel poles would be increased from a maximum of approximately 140 feet to a maximum of approximately 150 feet, and would vary in height by location. Due to these changes, most, if not all, of the poles would be installed on drilled pier foundations as opposed to being direct buried. As proposed in the PEA, only the dead-end poles were to be on drilled pier foundations, and all other steel poles were to be direct-buried.

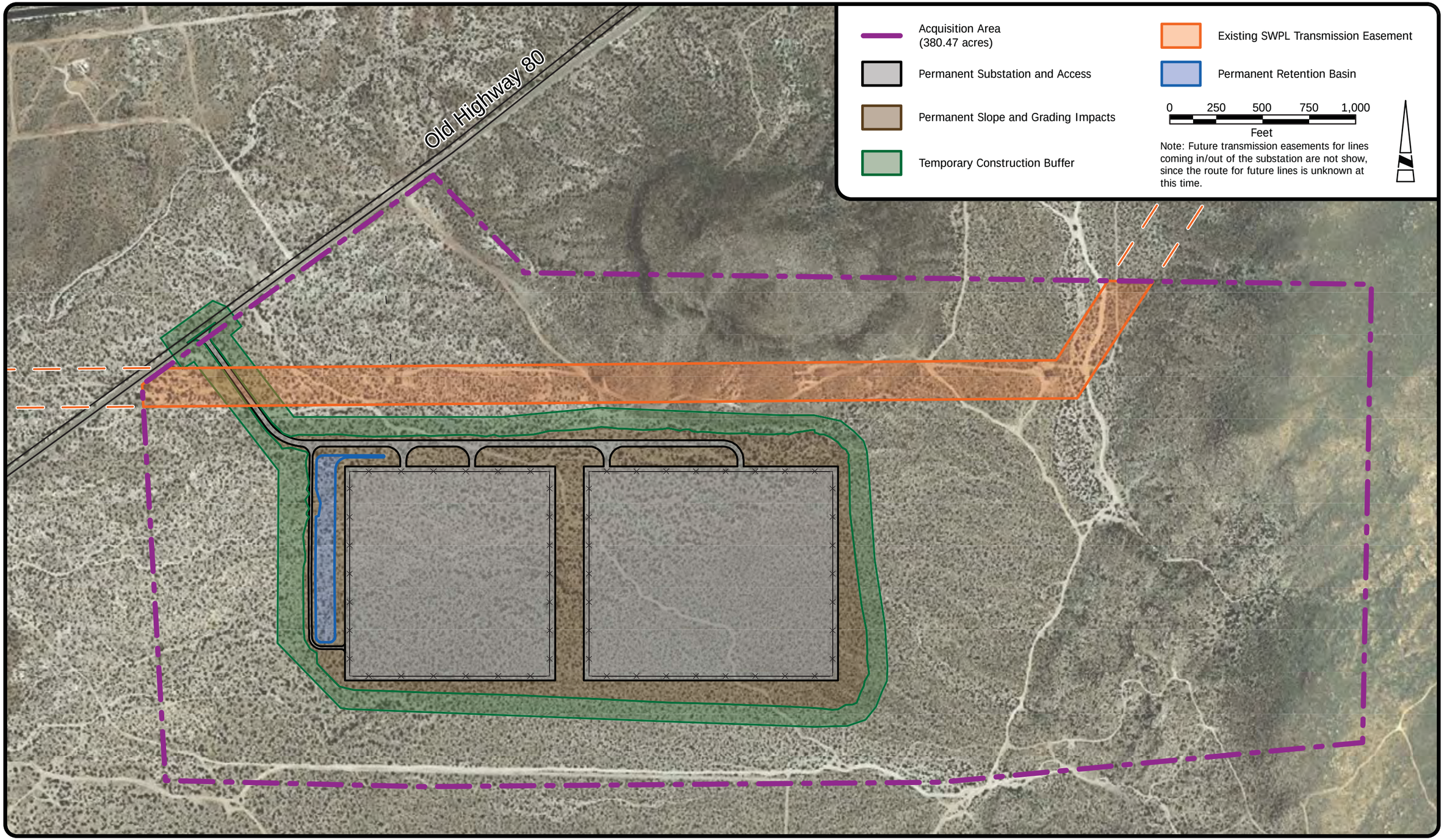

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Figure 1: ECO Substation Revised Footprint Conceptual Layout

1.2 PERMANENT LAND/RIGHT-OF-WAY REQUIREMENTS

1.2.0 Access

SWPL Loop-In

New permanent dirt access roads (approximately 20 feet wide and totaling approximately 2,000 feet long) would be constructed from the SWPL ROW to the six new SWPL loop-in structures. The total acreage would be approximately 0.92 acre, as opposed to the approximately 0.79 acre described in the PEA. The previous length of the access roads, as described in the PEA, totaled approximately 1,700 feet. Therefore, approximately 300 feet of additional access would be required. Due to the terrain in the area where the SWPL loop-in access roads would be located, additional grading outside of the access road area would be required to establish the roads.

138 kV Transmission Line

Four new, approximately 15-foot-wide permanent dirt access roads (totaling approximately 1,670 feet long) would be constructed to provide access to steel poles 106, 107, 108, and 108a. The access roads to steel poles 106, 107, and 108 totaled approximately 0.24 miles of the approximately 2.6 miles that comprised the total of new dirt roads described in the PEA. With the addition of steel pole 108a, the total mileage of the new dirt roads for the Proposed Project would be increased by less than approximately 0.10 mile.

1.2.1 Work Areas

SWPL Loop-In

Structures

As discussed in Table 1: Permanent Workspace Requirements, a permanent maintenance pad would be cleared around each of the six structure locations to accommodate installation and maintenance. Because only four structures were proposed in the PEA, only four pads were previously described. The six pads would total approximately 2.56 acres, as opposed to approximately 1.6 acres identified in the PEA. Due to the terrain in the area where the SWPL loop-in structures would be located, additional grading outside of the pad area would be required to establish the pads.

Pull Sites

Seven pull sites would be required to accommodate the installation of the SWPL loop-in, as opposed to the four that were proposed in the PEA. All seven pull sites would be located to the east of the ECO Substation footprint, as opposed to within the ECO Substation footprint and within the SWPL loop-in temporary work areas, as proposed in the PEA. As shown in Table 2: SWPL Loop-In Temporary Pull Sites, approximately 2.42 acres would be used for the pull sites, as opposed to the approximately 1.74 acres proposed in the PEA. Some of the pull sites would also require grading outside of their limits to establish a level working area.

Table 1: Permanent Workspace Requirements

Project Component	Structure Number	Approximate Pad Dimensions (feet)
SWPL Loop-In	SD1	150 by 100
	SD2	150 by 150
	SD3	150 by 100
	SD4	193 by 130
	SD5	170 by 110
	SD6	100 by 170
138 kV Transmission Line	SP106[1]	100 by 50 50 by 50
	SP107	83 by 50
	SP108	50 by 75 50 by 65
	SP108a	85 by 50

Table 2: SWPL Loop-In Temporary Pull Sites

Structure Number	Approximate Dimensions (feet)	Approximate Distance from Permanent Workspace (feet)	Direction
SD2	150 by 100	0	East
	150 by 100	60	South
SD4	150 by 100	175	Northeast
	150 by 100	600	Northeast
SD5	150 by 100	250	East
	150 by 100	270	South
SD6	150 by 100	500	East

[1] Two pads would create one L-shaped pad; thus, two dimensions are provided.

138 kV Transmission Line

Structures

As depicted in Table 1: Permanent Workspace Requirements, one additional permanent maintenance pad would be required for steel pole 108a. The additional maintenance pad would result in approximately 0.01 acre of additional permanent impacts. In addition, each of the approximately 98 steel poles described in the PEA would require permanent maintenance pads generally 80 feet by 60 feet in size[2]. These areas were identified as temporary in the PEA. The 150-foot diameter permanent areas that would be kept clear of shrubs and other obstructions for inspection and maintenance described for each structure in Section 3.8 Operations and Maintenance of the PEA would no longer be required.

Pull Sites

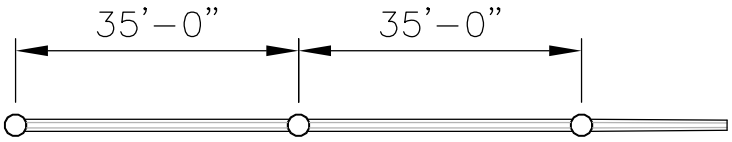
As proposed in the PEA, two pull sites were anticipated for steel pole 106; however, only one approximately 100-foot-long by 100-foot-wide pull site would be required for the shifted steel pole 106. This would result in a reduction of approximately 0.23 acre in total temporary workspace acreage.

1.3 CONSTRUCTION EQUIPMENT

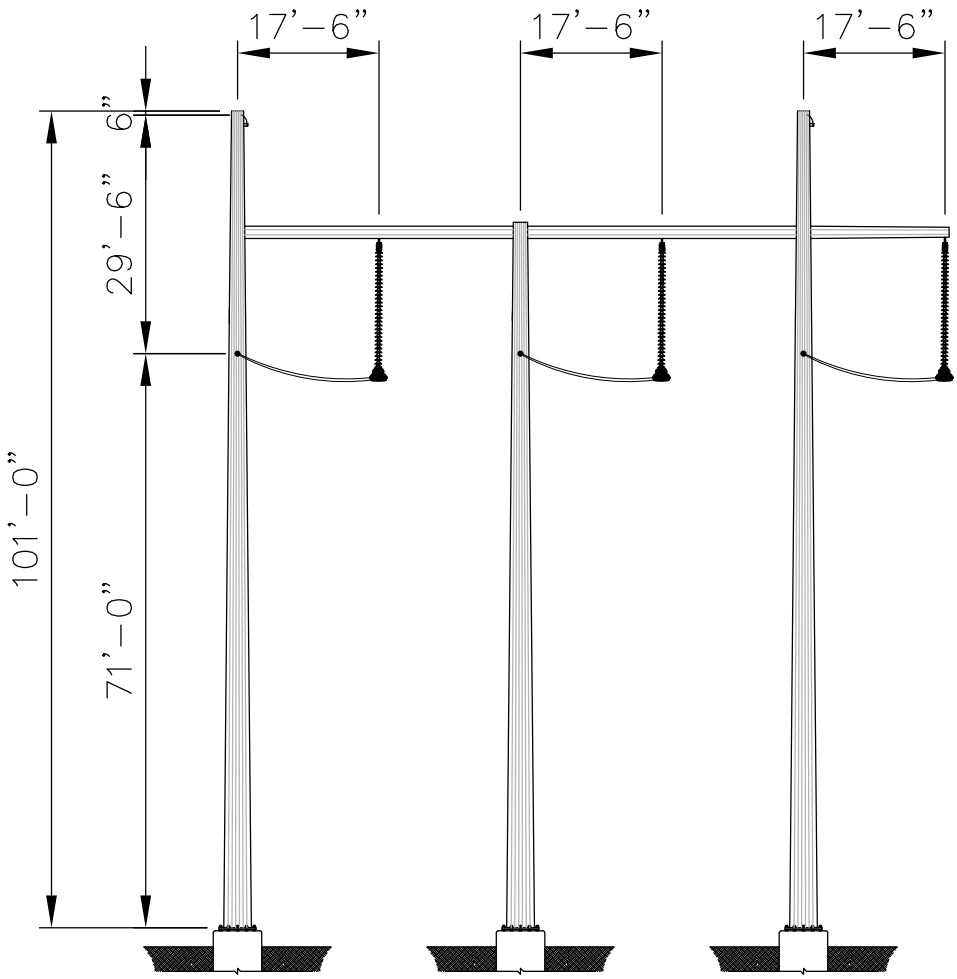
Equipment used to construct the proposed ECO Substation, along with its approximate duration of use, is provided in Attachment B: Typical Construction Equipment. The approximate duration on site and the average duration of use has been increased and/or decreased for multiple types of equipment used per activity due to the ECO Substation shift, which would increase the grading required due to the steeper topography of the area. However, the total volume of imported and exported material would not increase beyond that analyzed in the PEA.

[2] Due to the varying topography, maintenance pads range in size from approximately 80 feet by 60 feet to up to approximately 150 feet by 100 feet. Many of the maintenance pads vary in shape, so dimensions are approximate.

ATTACHMENT A: STRUCTURE TYPICAL DRAWINGS



PLAN VIEW



ELEVATION VIEW

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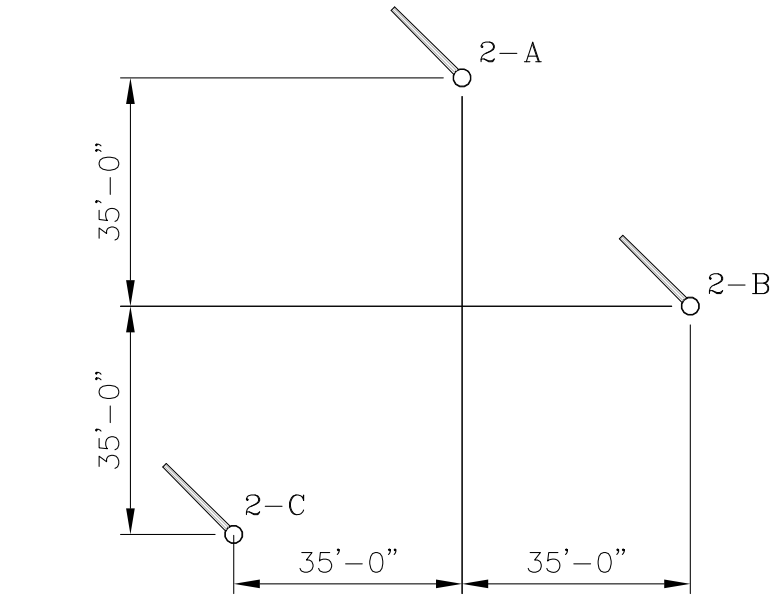
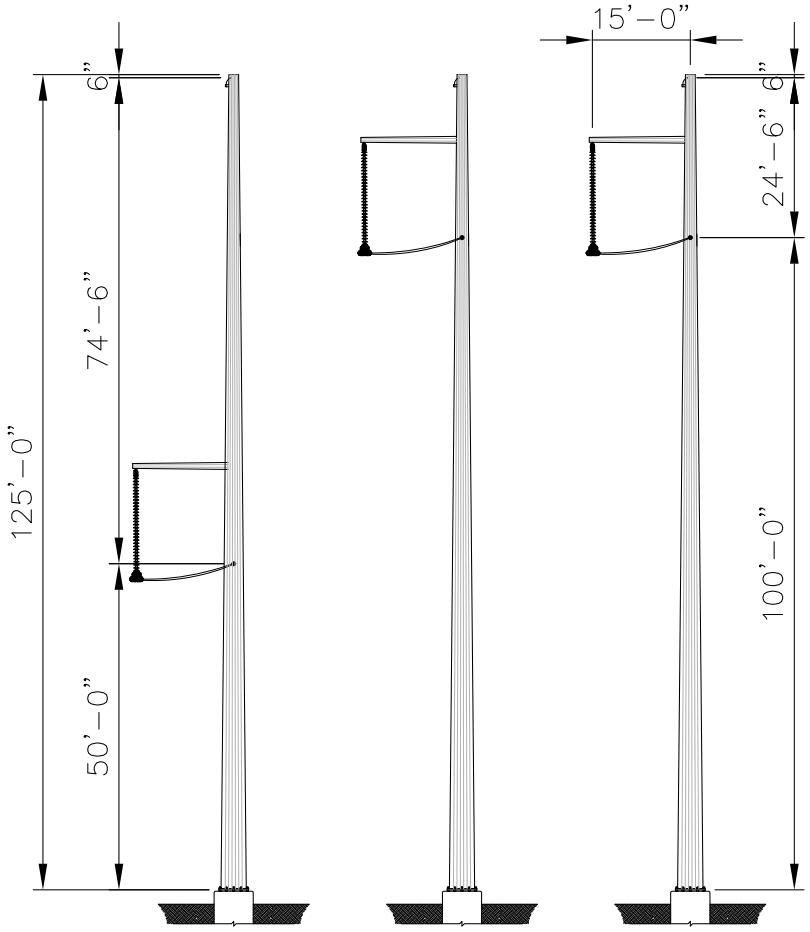
Typical 500 kV 3-Pole Dead-End Structure
(SD1)



PLAN VIEW



ELEVATION VIEW

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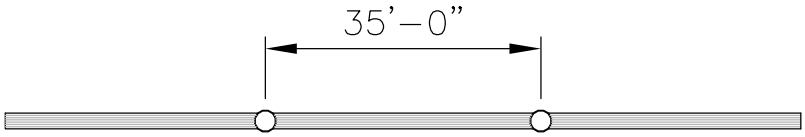
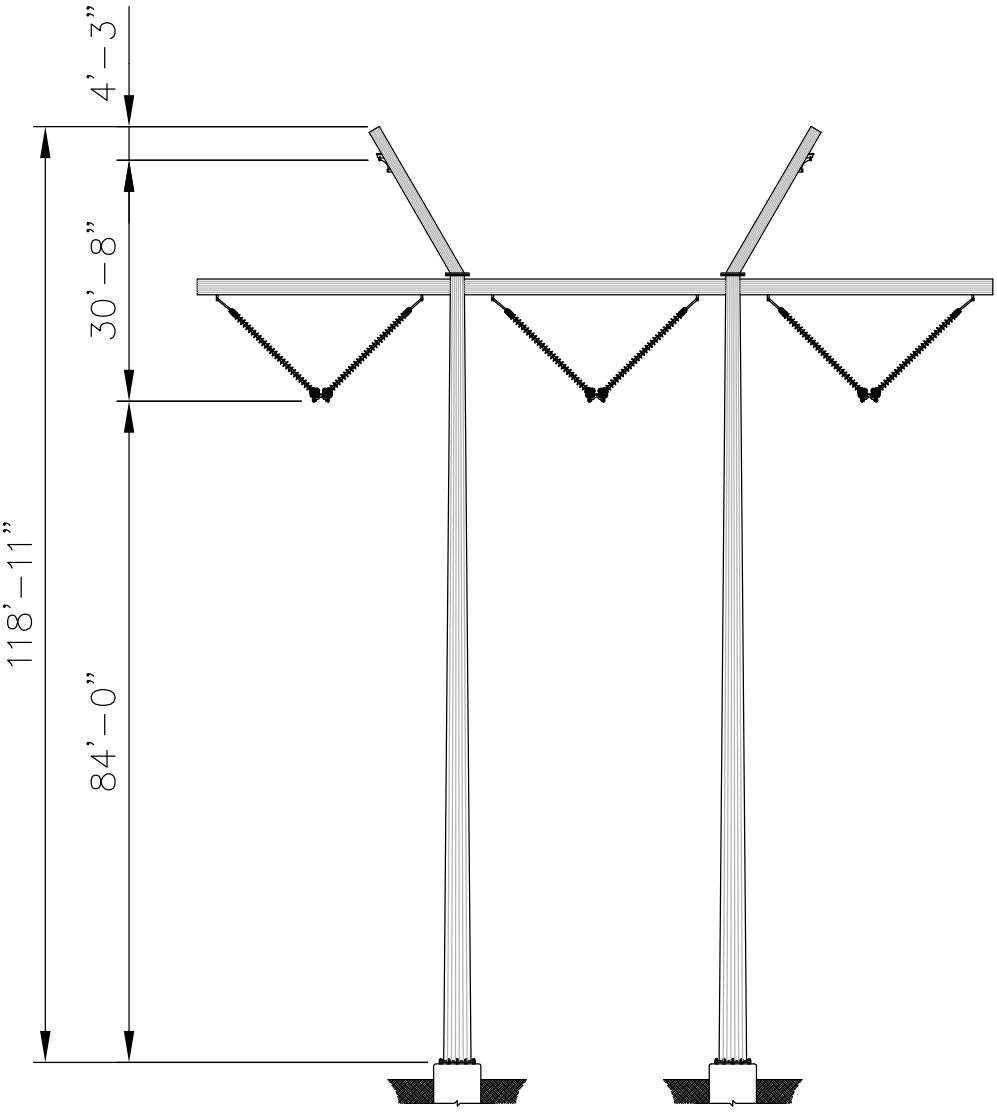
Typical 500 kV 3-Pole Dead-End Structure
(SD2)



PLAN VIEW



ELEVATION VIEW

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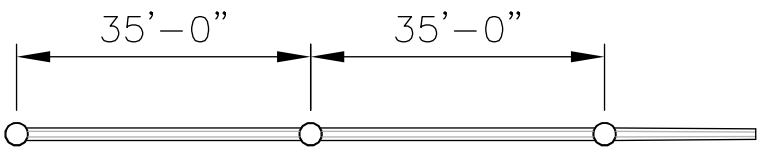
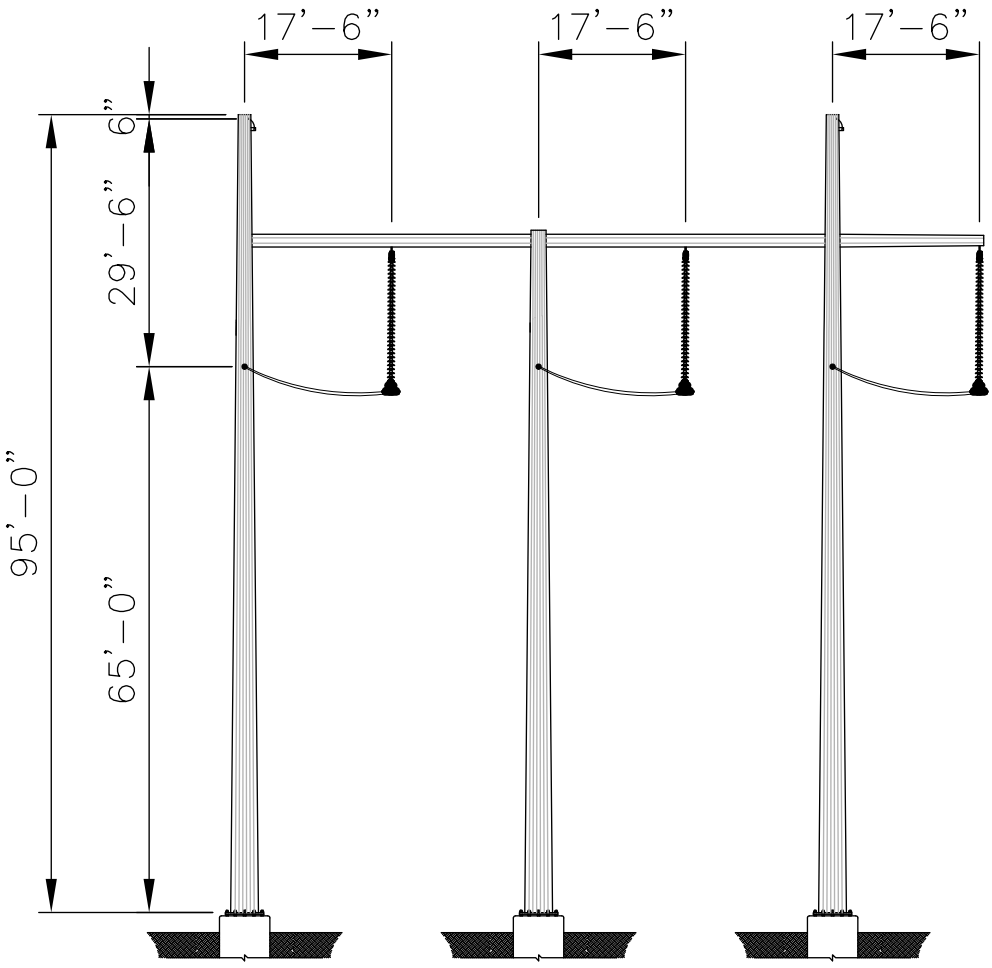
Typical 500 kV H-Frame Tangent Structure
(SD3)



PLAN VIEW



ELEVATION VIEW

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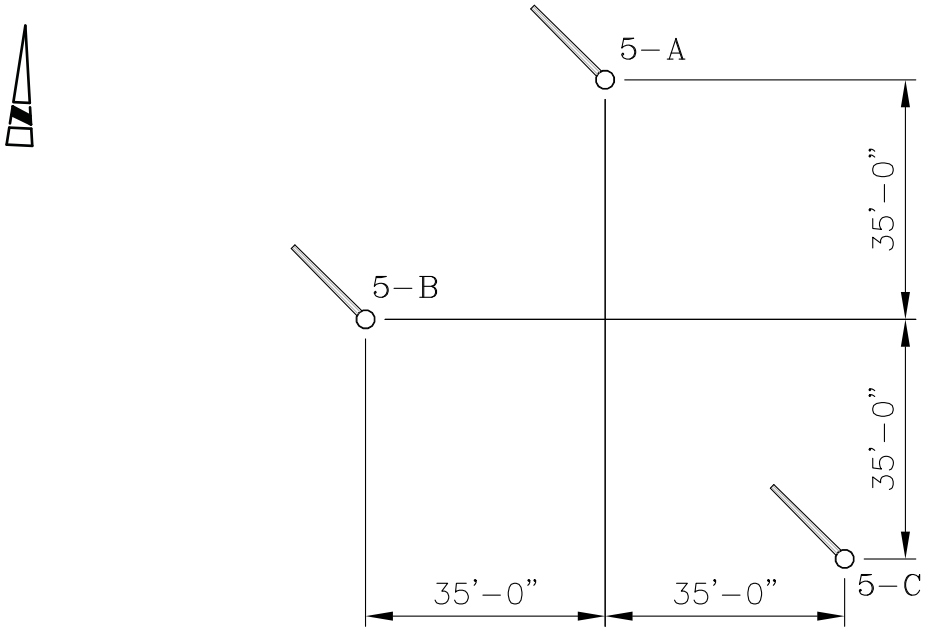
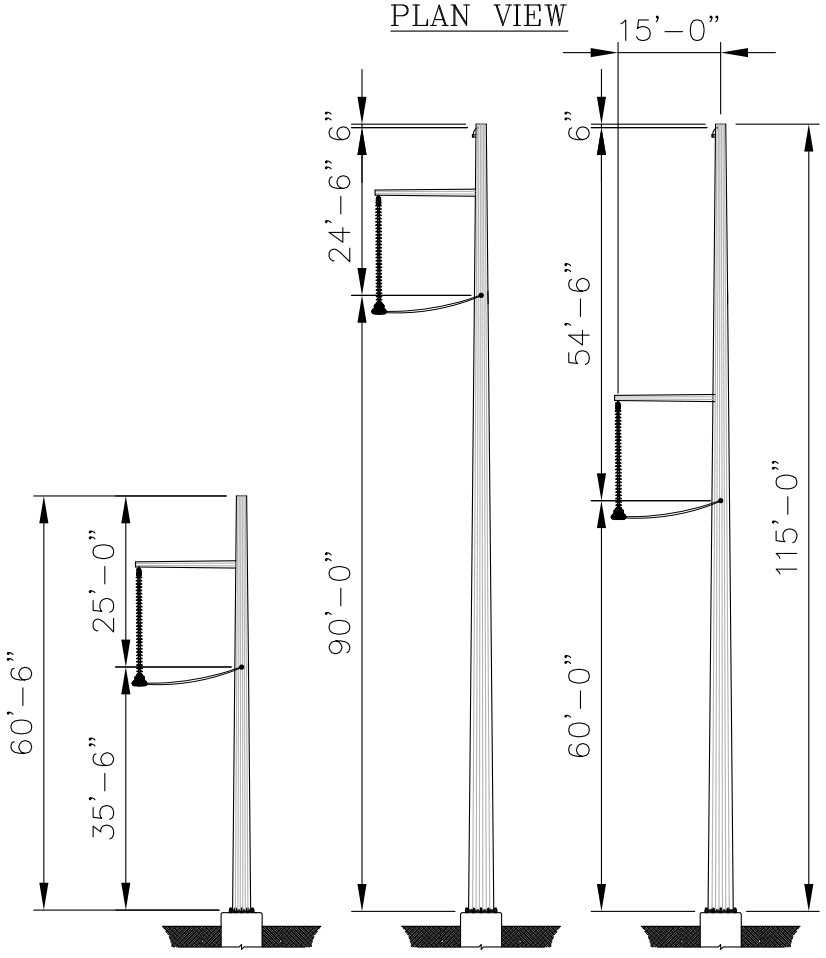
Typical 500 kV 3-Pole Dead-End Structure
(SD4)



PLAN VIEW



ELEVATION VIEW

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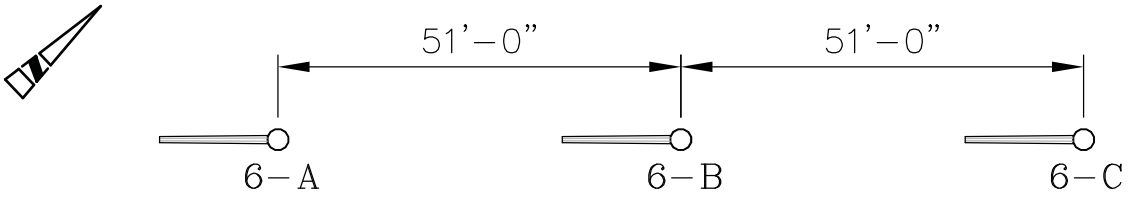
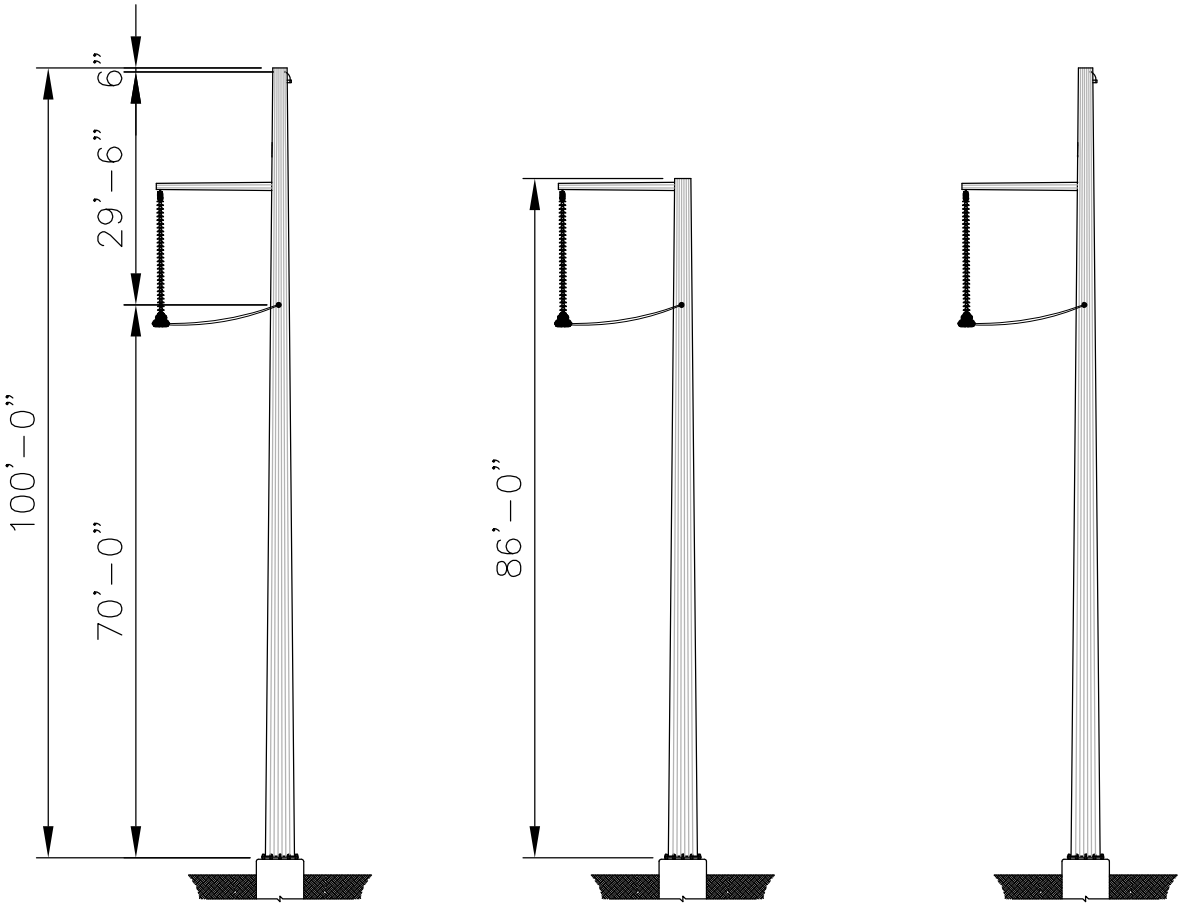
Typical 500 kV 3-Pole Dead-End Structure
(SD5)



PLAN VIEW



ELEVATION VIEW

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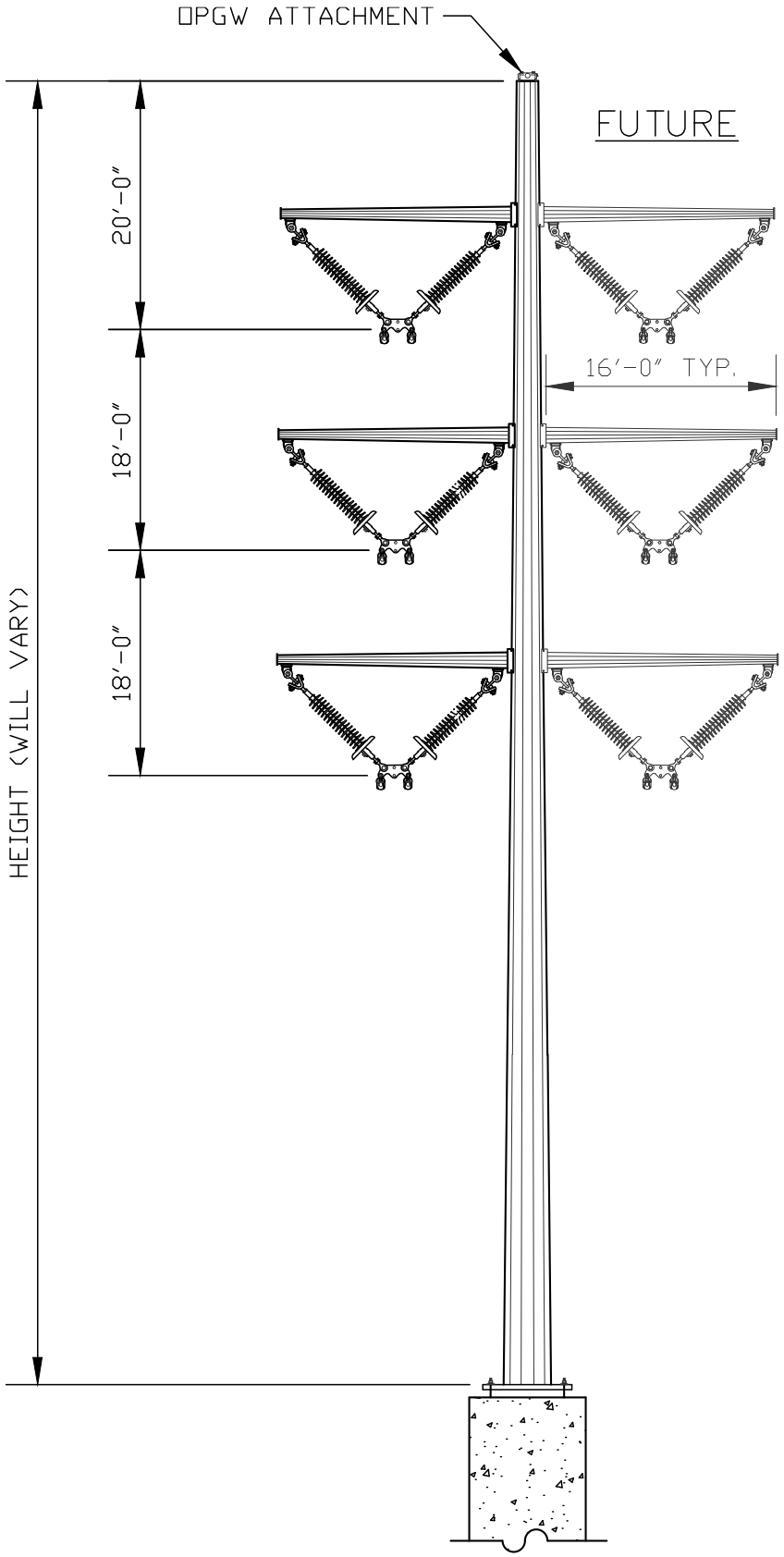
Typical 500 kV 3-Pole Dead-End Structure
(SD6)



Typical 138 kV Tangent Pole

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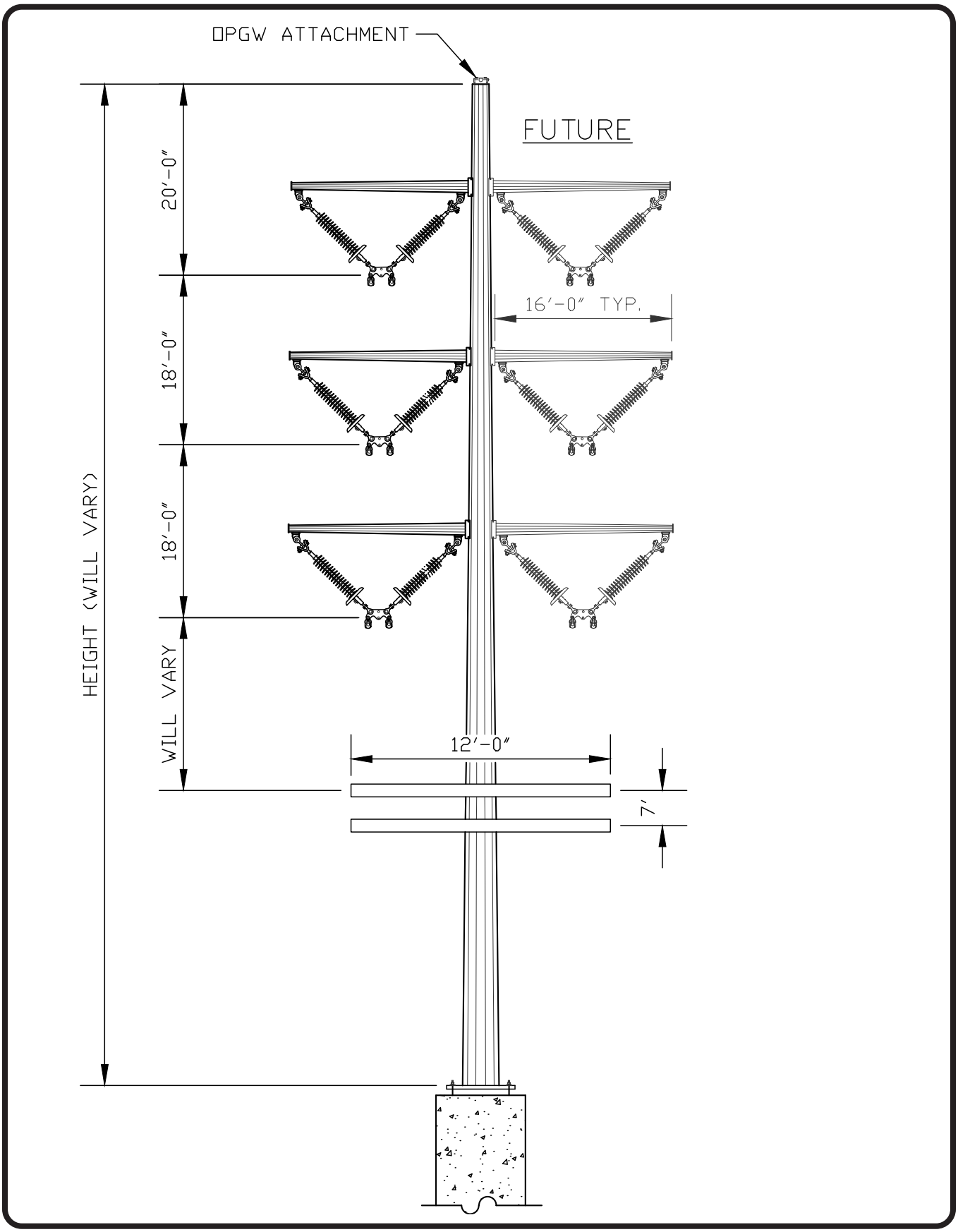

Typical 138 kV Tangent Pole with Distribution Underbuild

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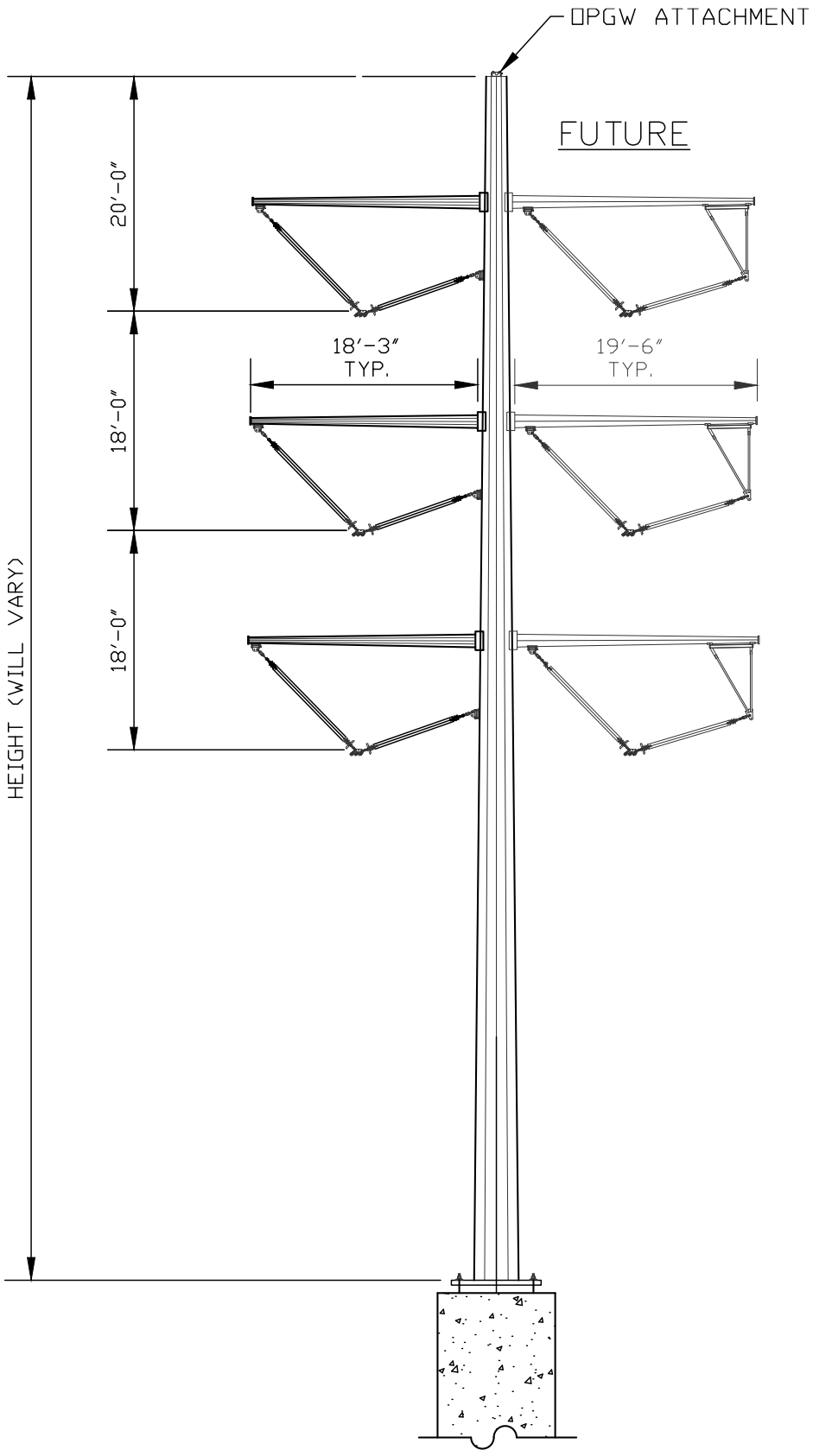

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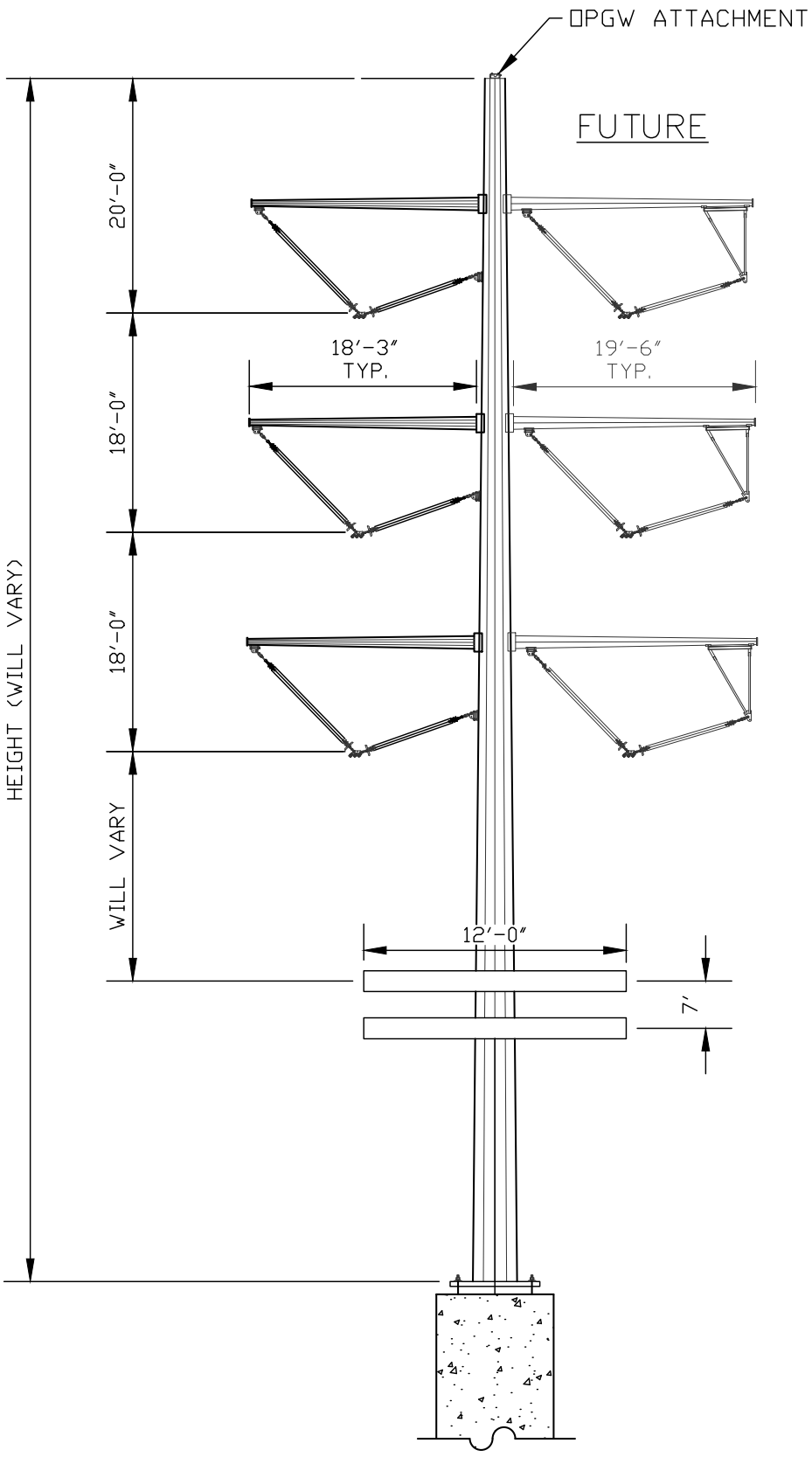
Typical 138 kV Light-Angle Pole



Typical 138 kV Light-Angle Pole with Distribution Underbuild

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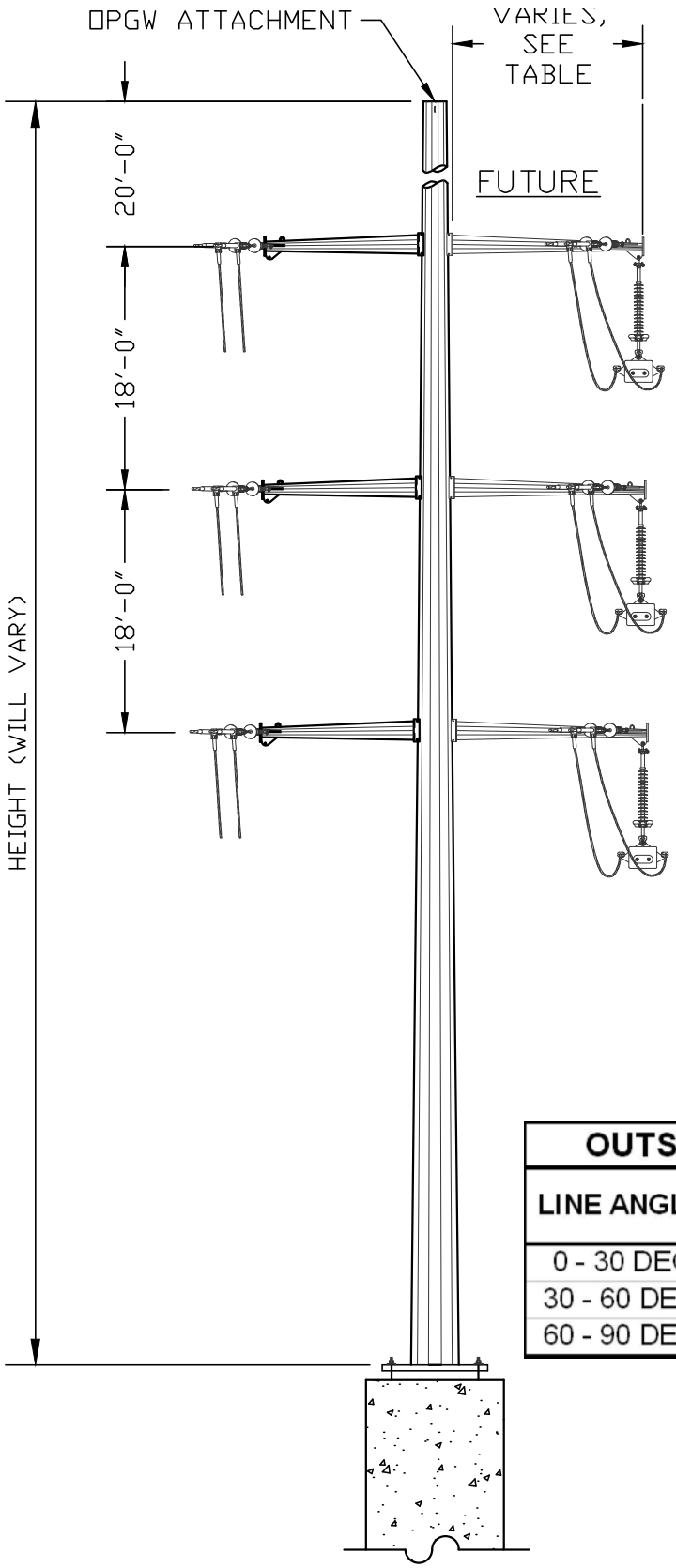

OUTSIDE CROSSARM LENGTH	
LINE ANGLE	ARM LENGTH
0 - 30 DEG	10'
30 - 60 DEG	12'
60 - 90 DEG	14'

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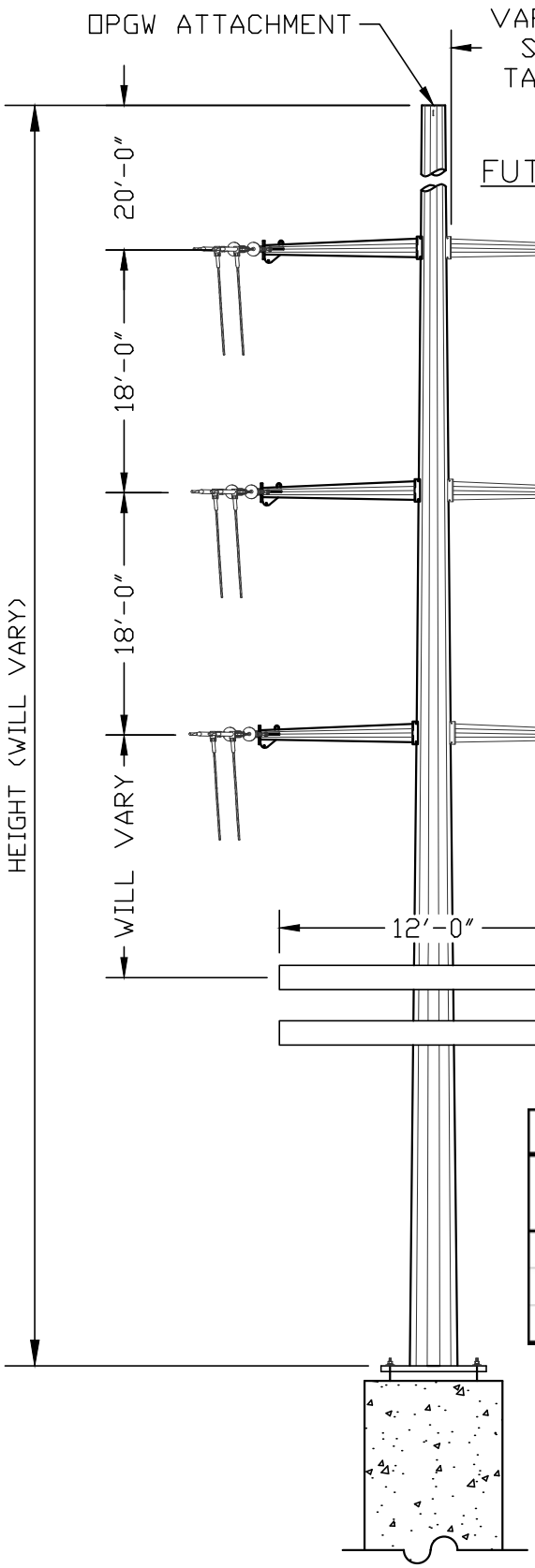
Typical 138 kV Dead-End Pole



OUTSIDE CROSSARM LENGTH	
LINE ANGLE	ARM LENGTH
0 - 30 DEG	10'
30 - 60 DEG	12'
60 - 90 DEG	14'

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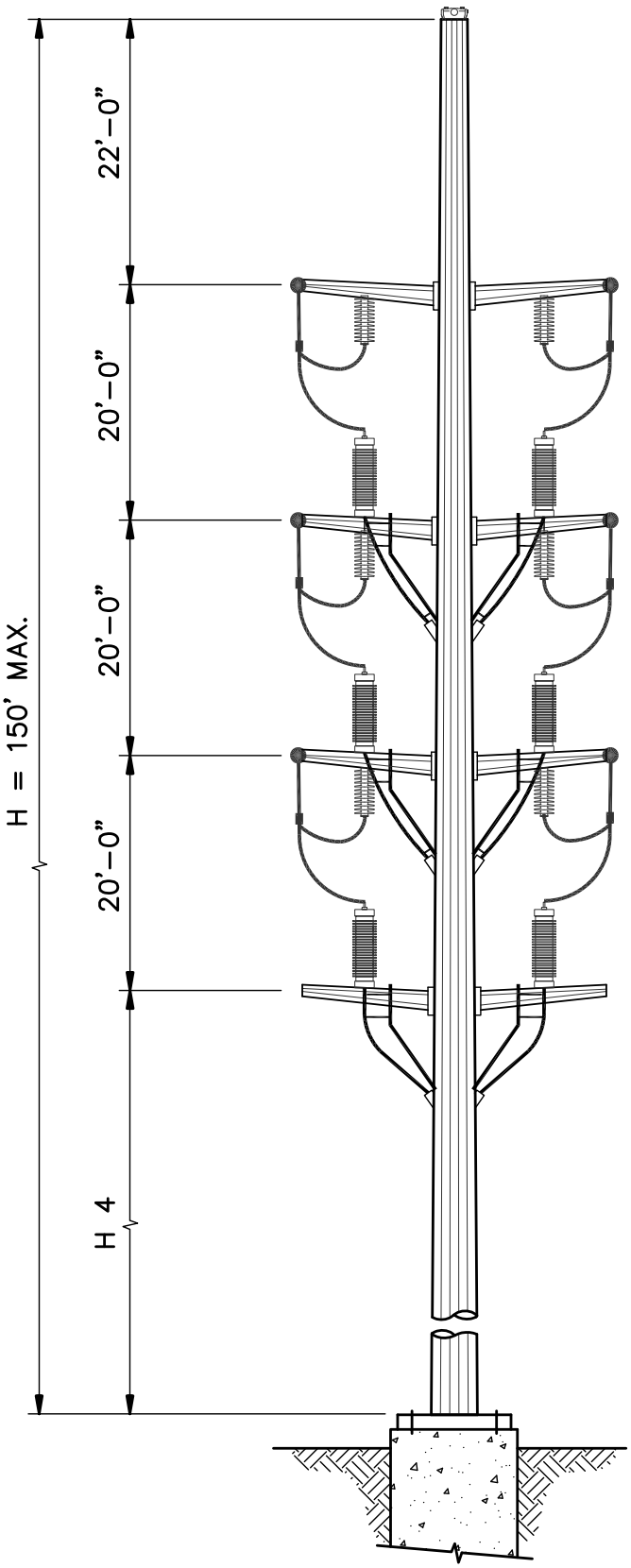
Typical 138 kV Dead-End Pole with Distribution Underbuild



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Typical 138 kV Steel Cable Riser Pole

ATTACHMENT B: TYPICAL CONSTRUCTION EQUIPMENT

ATTACHMENT B: TYPICAL CONSTRUCTION EQUIPMENT BY ACTIVITY

Project Component	Activity	Approximate Number of People	Equipment	Use	Approximate Quantity	Approximate Duration On Site (8-hour days)	Average Duration of Use (hours per day)
ECO Substation	Site Development	30	¾-ton or 1-ton pickup truck	Transport and support construction personnel	10	130	2
		2	Maintenance truck	Maintain and refuel equipment	1	130	2
		3	Bulldozer	Grade pads and access roads	3	90	10
		2	Road grader	Construct, maintain, and upgrade roads	2	90	8
		6	Scraper	Grade pads and access roads	6	90	10
		3	Compactor	Grade pads and access roads	3	90	10
		2	Loader	Load dump trucks and stockpile	2	90	8
		2	Backhoe	Excavate	2	90	8
		2	Rock truck	Move rock	2	36	6
		1	Rock crusher	Crush rock	1	36	6
		3	Water truck	Suppress dust	3	180	8

Project Component	Activity	Approximate Number of People	Equipment	Use	Approximate Quantity	Approximate Duration On Site (8-hour days)	Average Duration of Use (hours per day)
ECO Substation (continued)	Site Development (continued)	20	Haul truck	Transport Class II import material	20	50	10
		2	Concrete truck	Place concrete	2	25	4
		30	Water truck	Transport water	30	90	4
		8	Asphalt paver	Pave access roads	2	20	6
		1	Asphalt emulsion truck	Pave access roads	1	20	6
		3	Vibrating roller	Compact soil and asphalt	3	20	6
		5	Asphalt Haul Trucks	Transport asphalt	5	20	6
	Below Grade Construction	30	¾-ton or 1-ton pickup truck	Transport and support construction personnel	10	135	2
		10	Concrete truck	Pour concrete	10	70	4
		1	Maintenance truck	Maintain and refuel equipment	1	135	2
		6	Drill rig	Drill pier foundations	2	40	8
		3	Backhoe	Excavate pad foundations	3	80	8

Project Component	Activity	Approximate Number of People	Equipment	Use	Approximate Quantity	Approximate Duration On Site (8-hour days)	Average Duration of Use (hours per day)
ECO Substation (continued)	Below Grade Construction (continued)	4	Fork lift/skid steer	Move rebar, equipment, masonry, and other materials	4	75	8
		6	Light duty crane	Place material and set steel	2	60	6
		6	Trencher	Install grounding	2	50	10
		6	Backhoe	Duct bank and conduit installation	2	50	10
		1	Water truck	Suppress dust	1	135	8
		2	Compactor - handheld	Compact soil	2	80	6
	Above Grade Construction (continued)	20	¾-ton or 1-ton pickup truck	Transport and support construction personnel	10	135	2
		1	Maintenance truck	Maintain and refuel equipment	1	135	2
		15	Bucket truck/manlift	Set steel and install equipment	5	90	8
		6	Crane	Place material and set steel	2	90	6

Project Component	Activity	Approximate Number of People	Equipment	Use	Approximate Quantity	Approximate Duration On Site (8-hour days)	Average Duration of Use (hours per day)
ECO Substation (continued)	Above Grade Construction (continued)	6	Boom Truck	Place material and set steel	2	90	8
		2	Forklift	Unload and move material	2	90	8
	Communication Equipment Installation	4	Bucket truck	Set steel and install equipment	2	20	7
		2	Crane	Place material and set steel	2	20	7
	Testing and Commissioning	8	¾-ton or 1-ton pickup truck	Transport and support construction personnel	4	35	2
		2	Heavy Van	Transport and support construction personnel	2	35	2
		2	Manlift	Outdoor check out of equipment	2	30	4
		1	Diesel generator (500 kW)	Extract and remove oil	1	5	24
		3	Crane	Extract and remove oil	1	5	5