2 PROJECT DESCRIPTION

2.1 INTRODUCTION

This section of the IS/MND describes the proposed project, including the existing electrical system, project components that would be installed or modified, construction activities and methods, and operation and maintenance activities. SDG&E-proposed measures to reduce environmental impacts, and an overview of electromagnetic fields (EMF) associated with the proposed project are provided at the end of this section.

2.2 PROPOSED PROJECT SUMMARY

The proposed project would involve reconductoring approximately 8.41 miles of 69-kilovolt (kV) power line conductor on TL 695 and TL 6971, replacing existing wood pole structures with new steel pole structures, and installing ~~a~~ an approximately 0.09 mile new underground 69-kV power line. In addition, 1.74 miles of existing TL 695 would be taken out of service and removed. The total length of the proposed project would be approximately 10.24 miles. SDG&E anticipates construction of the proposed project would take eight months, beginning in January 2018 and finishing in August 2018.

2.3 PROPOSED PROJECT OBJECTIVES

SDG&E owns and operates TL 695 and TL 6971, which primarily provide electrical service to MCB CPEN. In the 2011/2012 Transmission Planning Process, SDG&E identified a North American Electric Reliability Corporation (NERC) Category B violation on segments of TL 695 resulting from an outage of a segment of TL 690. A NERC Category B violation occurs if the loss of a single element in the system is projected to cause a transmission or power line to exceed its megavolt ampere (MVA) rating, resulting in an overload~~,~~ and potentially causing a power loss. During the 2011/2012 Transmission Planning Process, the California Independent System Operator approved the reconductoring of TL 695 to mitigate the overload. The new Basilone Substation was placed in service in 2013, which resulted in a change in scope of the original TL 695 reconductoring project. The original TL 695 was split into two segments (TL 695 and TL 6971) to feed Basilone Substation and support the growing energy demand in the proposed project area. The MVA ratings in both segments were adjusted as a result of the new substation. Because of the limitations of existing conductor, TL 695 and TL 6971 are limited to 24 and 32 MVA, respectively. The NERC Category B violation identified in the 2011/2012 Transmission Planning Process continues to apply to TL 695, as well as the recently created TL 6971. To eliminate a NERC Category B violation and increase reliability, SDG&E proposes to reconductor TL 695 and TL 6971 to increase the lines to a 60-MVA rating.

The proposed project objectives defined by SDG&E are to:

- Eliminate a NERC Category B violation to increase reliability by reconductoring TL 695 and TL 6971
- Increase fire safety and service reliability of TL 695 and 6971 by replacing existing wood poles with new steel pole structures
- Minimize adverse environmental impacts to the extent feasible

2.4 PROPOSED PROJECT LOCATION

The proposed project would be located in Orange and San Diego Counties within the City of San Clemente and MCB CPEN. Approximately 0.5 mile of the proposed project would be located in the southern portion of the City of San Clemente. Most of the proposed project, approximately 9.7 miles, would be located in the western portion of MCB CPEN. The regional location of the proposed project is shown on Figure 2.5-1.

2.5 EXISTING ELECTRICAL SYSTEM

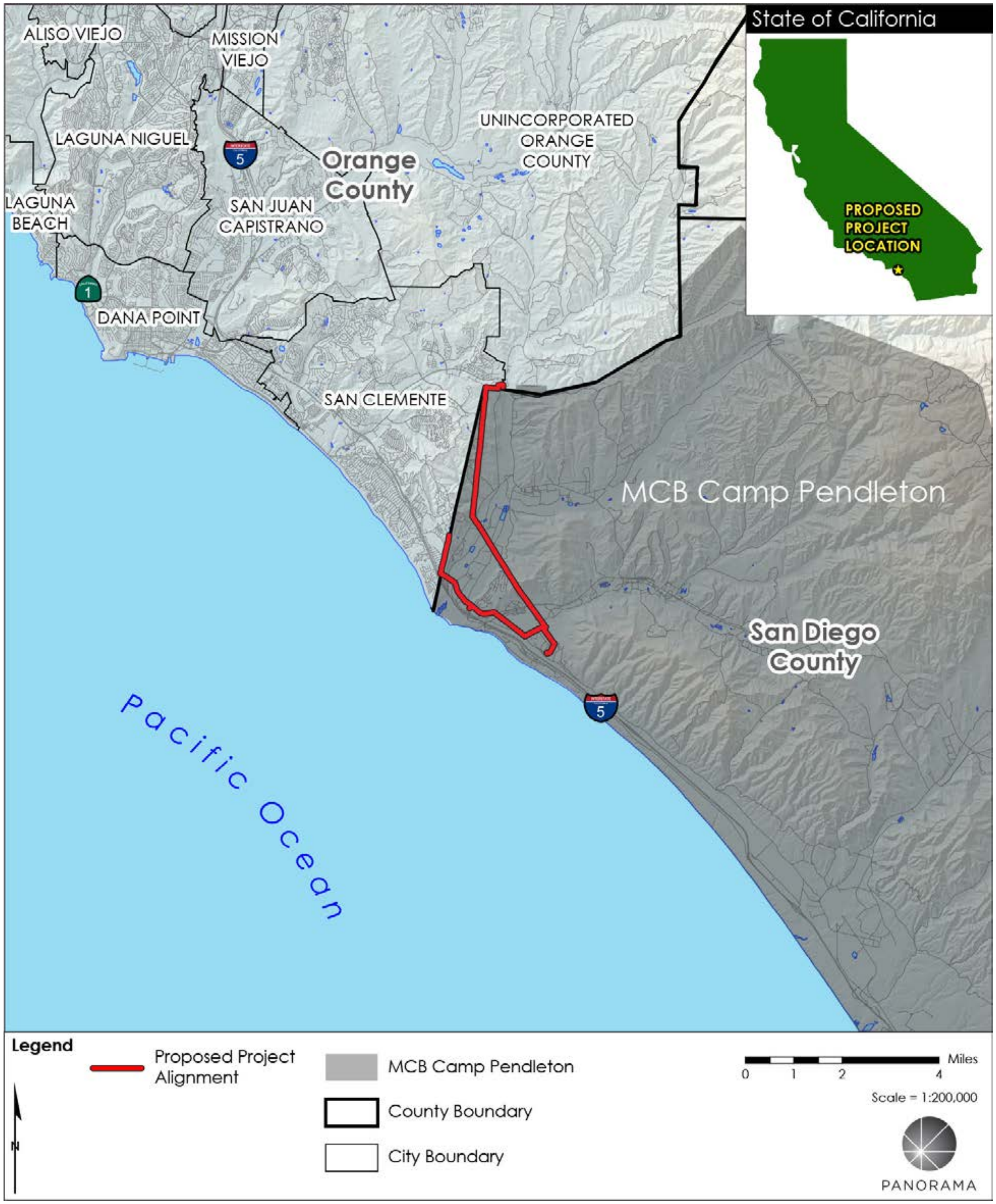
2.5.1 Power Circuits

The existing system configuration in the proposed project area, including the existing 69-kV power lines, is shown on Figure 2.5-2. Existing power lines include TL 695 between Talega Substation and Basilone Substation, and TL 6971 between Basilone Substation and Japanese Mesa Substation. The existing TL 695 circuit runs in a generally north/south alignment between Talega and Basilone Substations. The TL 6971 circuit runs from Basilone Substation to Japanese Mesa Substation. Table 2.5-1 describes the orientation and features of each segment. The proposed project involves reconductoring both existing power lines.

2.5.2 Substations

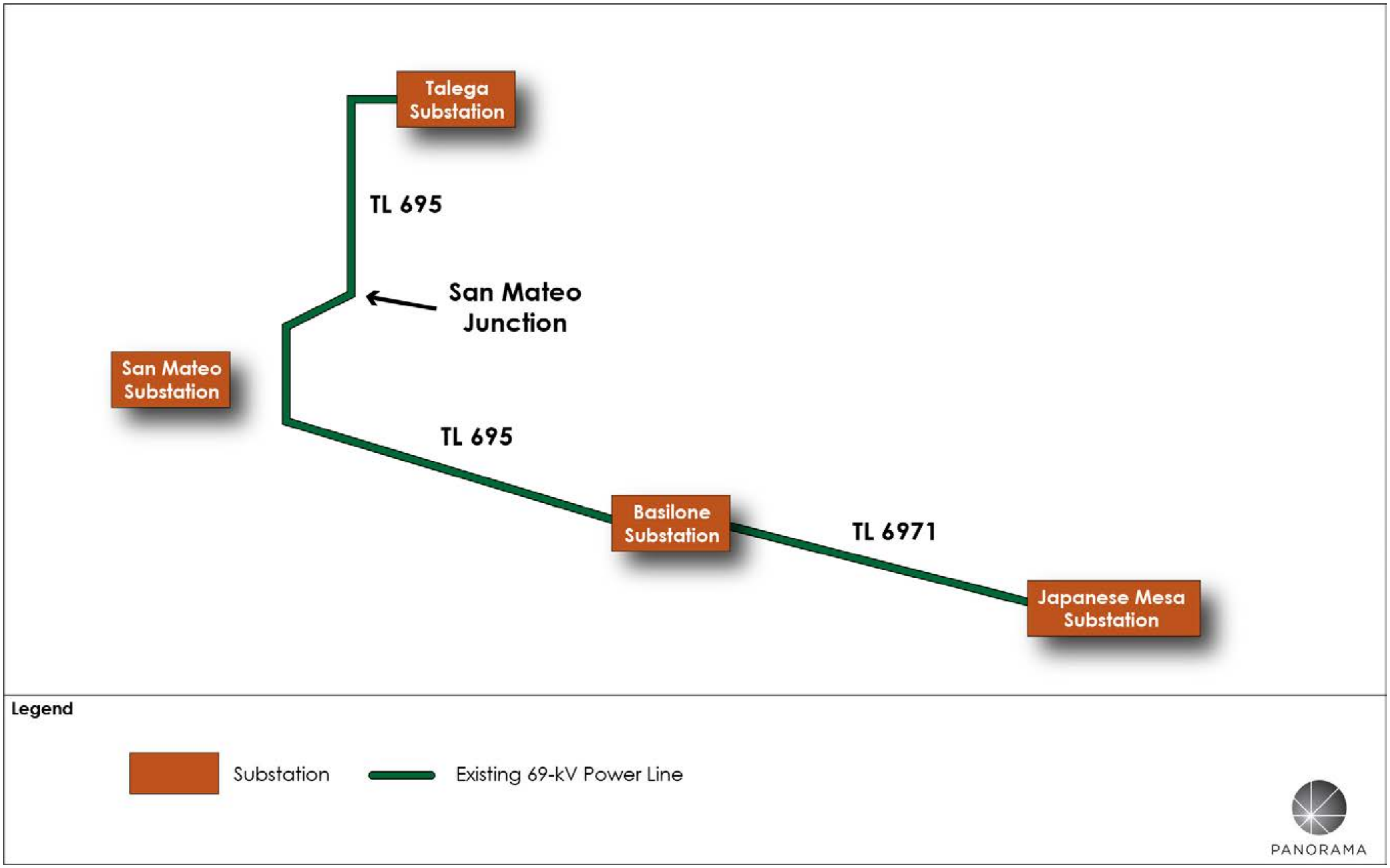
There are a total of four existing substations in the existing system configuration (Figure 2.5-2). Talega Substation is an existing 230/138/69-kV substation located approximately 2.7 miles northeast of San Mateo Junction. The Japanese Mesa Substation is an existing 12/69-kV substation located on the southern boundary of San Onofre Nuclear Generation System (SONGS) Mesa, approximately 1.9 miles southeast of Basilone Substation. Basilone Substation is an existing 69/12-kV substation located approximately 1.7 miles south of San Mateo Junction and 1.6 miles southeast of San Mateo Substation.

Figure 2.5-1 Regional Project Location (Revised)



Source: (ESRI 2016, SDG&E 2016e)

Figure 2.5-2 Line Diagram of Existing Electrical System



Source: (SDG&E 2016c)

Table 2.5-1 Description of Each Segment of Existing TL 695 and TL 6971 Lines

Segment	Orientation	Other Features
TL 695		
Talega Substation to San Mateo Junction	Runs in a north/south orientation	Two distribution lines are underbuilt on existing TL 695 H-frame structures between Talega Substation and San Mateo Junction Parallel to two SDG&E transmission lines (138-kV and 230-kV) and a Southern California Edison (SCE) transmission line
San Mateo Junction to San Mateo Substation	From San Mateo Junctions, runs in a southwest orientation towards San Mateo Substation; TL 695 does not enter San Mateo Substation	Parallel to two existing SDG&E 138-kV power lines
San Mateo Substation to Basilone Substation	From the approximate location of San Mateo Substation, TL 695 runs south and adjacent to the western boundary of MCB CPEN	A distribution line is underbuilt on the same structures as TL 695 between San Mateo Substation and Basilone Substation Several existing poles for TL 695 between San Mateo Substation and Basilone Substation are located outside of MCB CPEN on land within the City of San Clemente
TL 6971		
Basilone Substation and Japanese Mesa Substation	Runs in an east/west orientation	A distribution line is underbuilt on the same poles as TL 6971 between Basilone Substation and Japanese Mesa Substation

Source: (SDG&E 2016c)

2.6 PROPOSED PROJECT COMPONENTS

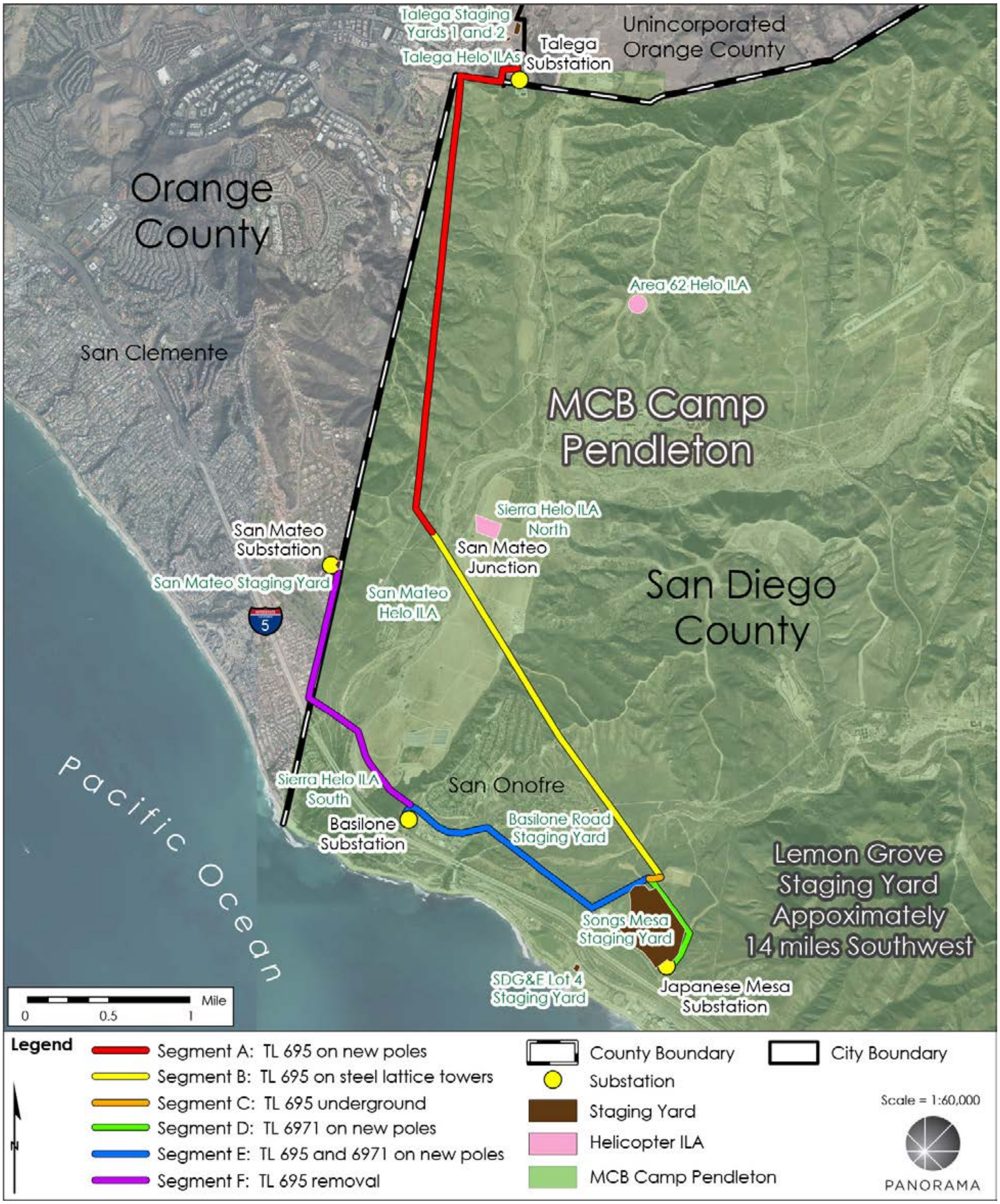
2.6.1 Power Line Segments

The proposed project would involve reconductoring approximately 8.41 miles of TL 695 and TL 6971 between the Talega, Basilone, and Japanese Mesa Substations, replacing existing wood pole structures with new steel pole structures, and installing a new underground power line. A summary of construction by power line segment is described in Table 2.6-1. Locations of proposed project elements are shown on Figure 2.6-1. Appendix A includes detailed maps that show the locations of proposed project components and work areas, including temporary work areas, staging yards, and helicopter incidental landing areas (ILAs), that would be used during project construction.

2.6.2 Right-of-Way/Easements

Approximately 9.1 miles of the 10.24-mile-long alignment would be located within existing right-of-way (ROW) and easements, including easements from MCB CPEN, private and public easements within San Clemente, and franchise ROW for City of San Clemente streets.

Figure 2.6-1 Proposed Project Components (Revised)



Sources: (SDG&E 2016c, SANDAG 2016)

Table 2.6-1 Power Line Segments

Segment	Description
TL 695 Reconductoring	
Segment A: Talega Substation to San Mateo Junction	Segment A would be approximately 3.33 miles long, extending from Talega Substation to San Mateo Junction as shown on Figure 2.6-1. Segment A would be located entirely within existing easement granted by the DoN, and ~~City of San Clemente ROW~~ rights of way and easements passing through various public and privately held parcels in San Clemente.
Segment B: San Mateo Junction to SONGS Mesa	Segment B would be approximately 2.56 miles long, extending from San Mateo Junction to the eastern cable pole of Segment C at SONGS Mesa as shown on Figure 2.6-1. Segment B would be located entirely within existing easement granted by the DoN.
Segment C: Underground near SONGS Mesa	The underground portion of the proposed project, Segment C, would be approximately 450 feet (0.09 mile) long and located on the eastern side of SONGS Mesa. Segment C would be located within an existing SCE utility corridor that runs along the eastern side of SONGS Mesa. SDG&E would obtain a new easement from the DoN prior to construction of the underground power line.
TL 6971 Reconductoring	
Segment D: SONGS Mesa to Japanese Mesa Substation	Segment D would be approximately 0.70 mile long, extending from the western cable pole of Segment C to Japanese Mesa Substation as shown on Figure 2.6-1. SDG&E would acquire an easement modification from the DoN to incorporate the power line alignment into existing easement before performing any construction activities within Segment D.
TL 695 and TL 6971 Reconductoring	
Segment E: SONGS Mesa to Basilone Substation	Segment E would be approximately 1.82 miles long, extending from the western cable pole of Segment C to Basilone Substation as shown on Figure 2.6-1. SDG&E would acquire an easement modification from the DoN to incorporate approximately 0.4 mile of the power line alignment into existing easement before performing any construction activities within Segment E; the remainder of Segment E would be located entirely within existing easement granted by the DoN.
TL 695 Removal	
Segment F: Basilone Substation to San Mateo Substation	Segment F would be approximately 1.74 miles long, extending from Talega Substation to San Mateo Substation as shown on Figure 2.6-1. Segment F would be located entirely within existing easements and ROW.

Source: (SDG&E 2016c)

SDG&E would obtain a new 20-foot-wide easement from the DoN to complete the underground portion of the proposed project (Segment C), which would be approximately 450 feet in length. SDG&E would also obtain a 20-foot wide easement modification for approximately 0.70 mile of the proposed project between SONGS Mesa and Japanese Mesa Substation (Segment D) and for an approximately 0.4-mile segment northwest of SONGS Mesa (Segment E). The easement modification is required to align the legal description of the easement with the physical location of the existing and proposed power lines along the perimeter of SONGS Mesa.

2.6.3 Distribution and Communication Lines

Distribution circuits that are underbuilt on TL 695 and TL 6971 pole structures would also be reconductored in areas where poles would be replaced. Existing telecommunication cables and other utility cables (e.g., cable television, Internet, telephone) would be transferred from the wood pole structures to the new steel pole structures.

2.6.4 Pole Structures

Poles

Existing wood pole structures would be replaced by new dull galvanized steel pole structures at an approximately one-for-one ratio. Table 2.6-2 provides the total number of structures to be installed and removed within each segment of the proposed project. New steel pole structures would be placed in new holes and/or set in existing holes. The steel pole structures would typically be placed in line with the existing conductor and an average of approximately 12 feet from the existing pole structure locations.

SDG&E would use tangent pole structures when the pole structure alignment continues in a generally straight line and angle pole structures when the run of pole structures changes direction. Pole structures would be installed with an average conductor span length of approximately 500 feet. SDG&E would also install all necessary guys and anchors to stabilize pole structures. Tangent, H-frame, and dead-end structures would be used for aboveground power line support. Cable poles would be used where the power line would transition from overhead to underground. The different types and dimensions of pole structures that would be used are defined in Table 2.6-3. Figure 2.6-2 through Figure 2.6-5 present diagrams of pole structures that would be used for the proposed project.

The steel pole structures would range from approximately 23 to 112 feet in height, including 2 feet of foundation reveal above ground level. All power line poles would be constructed in compliance with SDG&E standards for avian protection. Galvanized steel pole steps would be installed on steel pole structures if the pole structure locations are not accessible by a 24-hour, all-weather access road.

Foundations

Three types of foundations, direct-bury, concrete pier, and micropile, would be used for installation of the new steel pole structures. Direct-bury foundations would be used for most pole structures, including tangent, H-frame, distribution, and dead end H-frame pole structures. The pole is installed directly in the ground at direct-bury pole foundations, and the hole then is backfilled with concrete. Direct bury poles would be installed approximately 5 to 30 feet deep. The foundation would extend approximately 2 feet above the ground surface and have a diameter of approximately 20 to 30 inches.

Concrete pier foundations would be used for cable poles and dead end pole structures. A pier is installed into the ground at concrete pier foundations, the pole is then anchored to the pier.

Table 2.6-2 Summary of Infrastructure Removed and Installed

Infrastructure	Existing Count	Proposed Actions	Resulting Count
Segment A			
69-kV wood pole structure	40	• Remove 33 wood pole structures • Remove 4 wood pole structures from service (structures remain in place) • Perform overhead work at 2 wood pole structures (structures remain in place) • Top 1 wood pole structure	7
69-kV steel pole structure	0	• Install 6 new steel poles with concrete pier foundations • Install 30 new steel poles as direct-bury pole structures	36
Segment B			
138-kV steel lattice tower	11	• String new TL 695 69-kV conductor on one of three positions on the west side of the steel lattice towers (structures remain in place)	11
69-kV wood pole structure	1	• Perform overhead work at 1 pole structure (structure remains in place)	1
69-kV steel pole structure	0	• Install 2 new steel poles as direct-bury pole structures	2
Segment C			
69-kV steel cable pole structure	0	• Install 2 new steel cable poles on either end of the underground power line	2
69-kV underground package (i.e., distance of duct bank and splice vault)	0 feet	• Install approximately 450 feet of concrete-encased duct bank containing a single-circuit 69-kV power line	450 feet
69-kV splice vault	0	• Install 1 69-kV concrete splice vault	1
Segment D			
69-kV wood pole structure	21	• Remove 20 wood pole structures • Perform overhead work at 1 wood pole structure (structure remains in place)	1
69-kV steel pole structure	0	• Install 4 new steel poles with concrete pier foundations • Install 15 new steel poles as direct-bury pole structures	19
Segment E			
69-kV wood pole structure	32	• Remove 25 wood pole structures • Perform overhead work at 4 wood pole structures (structures remain in place) • Remove 3 wood pole structures from service (structures will be removed)	4

Infrastructure	Existing Count	Proposed Actions	Resulting Count
69-kV steel pole structure	0	• Install 8 new steel poles with concrete pier foundations • Install 17 new steel poles as direct-bury pole structures • Install 1 new steel pole with micropile foundation	26
Segment F			
69-kV wood pole structure	32	• Top 23 wood pole structures (poles remain in place) • Perform overhead work at 7 wood pole structures (structures remain in place) • Remove 1 wood pole structure from service (structure will be removed)	31
69-kV steel pole structure	0	• Install 2 new steel poles as direct-bury pole structures	2
TOTAL	**137**		**143**

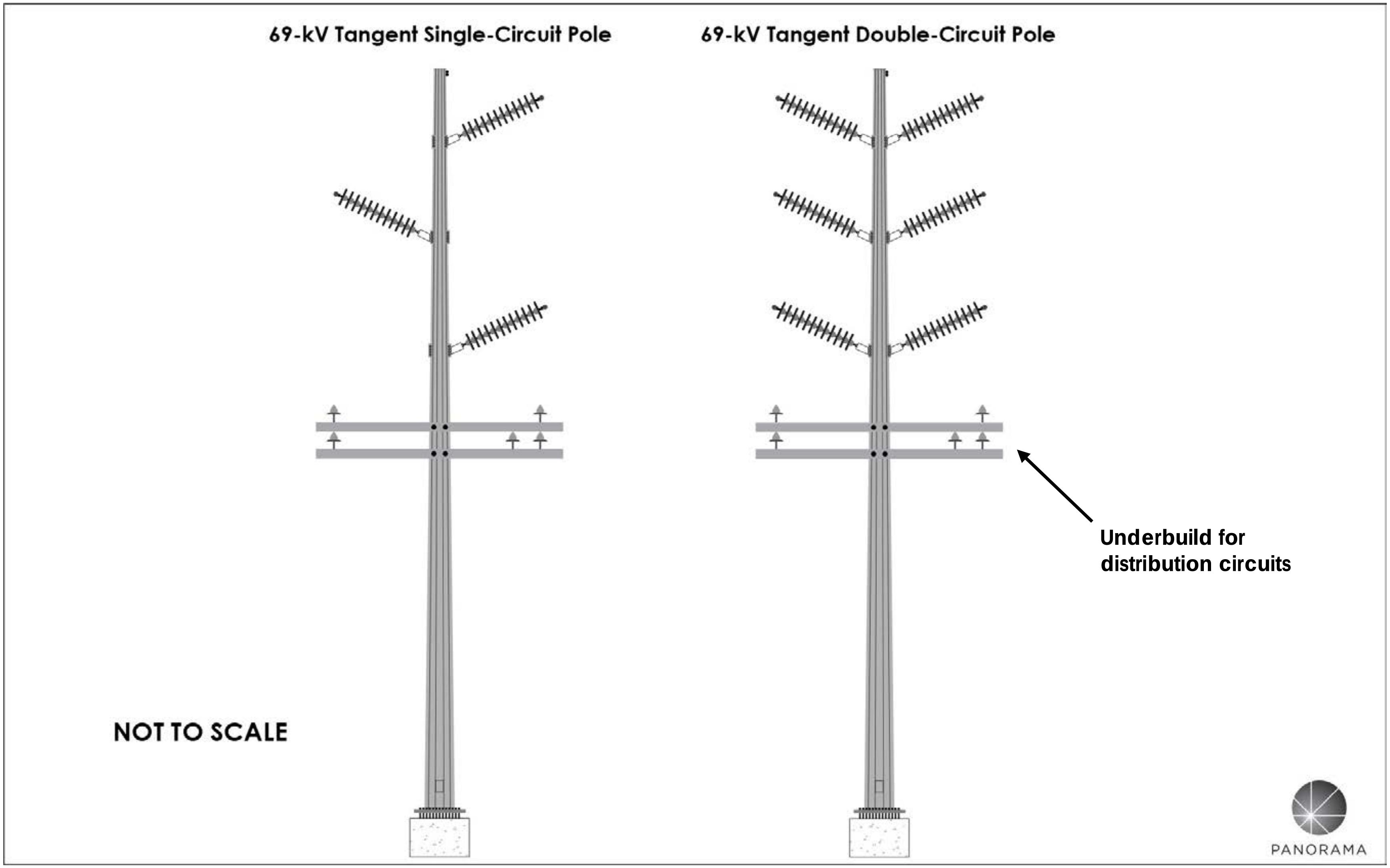
Source: (SDG&E 2017)

Table 2.6-3 Pole Characteristics

Pole Type	Definition and Typical Use of Pole Type	Average Height (feet)	Diameter (inches)	
			Base	Top
69-kV Single-Circuit Tangent	Steel pole supporting one 69-kV circuit; used where the power line is straight	70	20 to 30	8 to 14
69-kV Double-Circuit Tangent	Steel pole supporting two 69-kV circuits; used where the power line is straight	75	20 to 30	8 to 14
69-kV H-Frame	Two poles connected with a cross-arm; used to support a single 69-kV circuit	70	20 to 30	10 to 14
69-kV Dead End H-Frame	Two poles connected with a cross-arm; used to at the end of a line (e.g., at a substation)	55	20 to 30	10 to 14
69-kV Double-Circuit Dead End	Pole used to terminate two circuits (e.g., at a substation)	92	48 to 60	24 to 40
69-kV Dead End 3-Pole Angle	Three pole structure used at the end of a line; each pole supports one conductor	62	32 to 48	12 to 24
69-kV Modified Dead End 3-Way	Pole used to support one 69-kV circuit dead-ended inline and one dead-ended tap	77	48 to 72	24 to 48
69-kV Cable Pole	Pole used to transition a power line from overhead to underground and vice versa	112	48 to 72	24 to 48
12-kV Distribution Pole	Pole used to support distribution lines	45	20 to 30	8 to 14

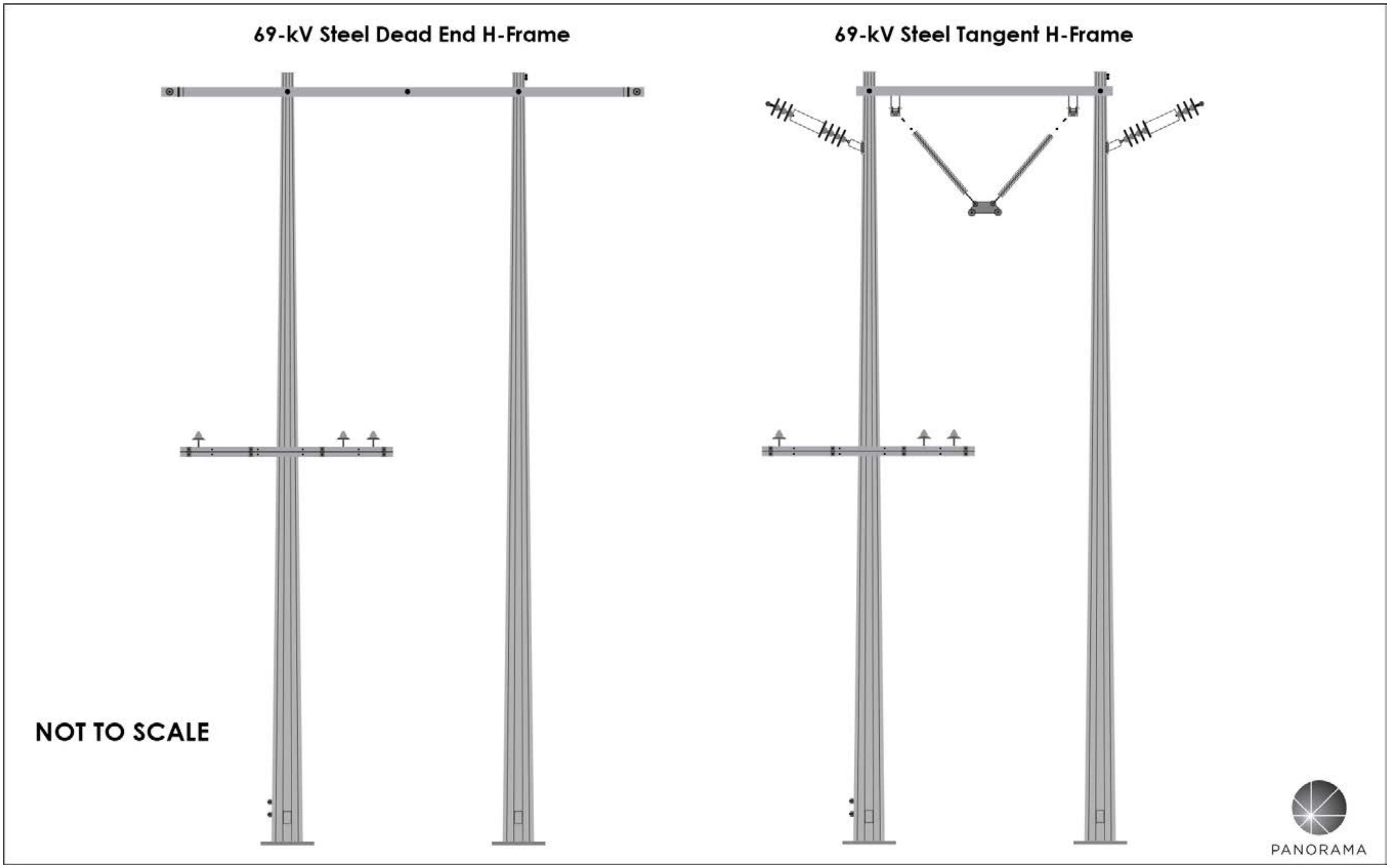
Source: (SDG&E 2016d)

Figure 2.6-2 Diagram of Proposed Tangent Pole Structures with Underbuild



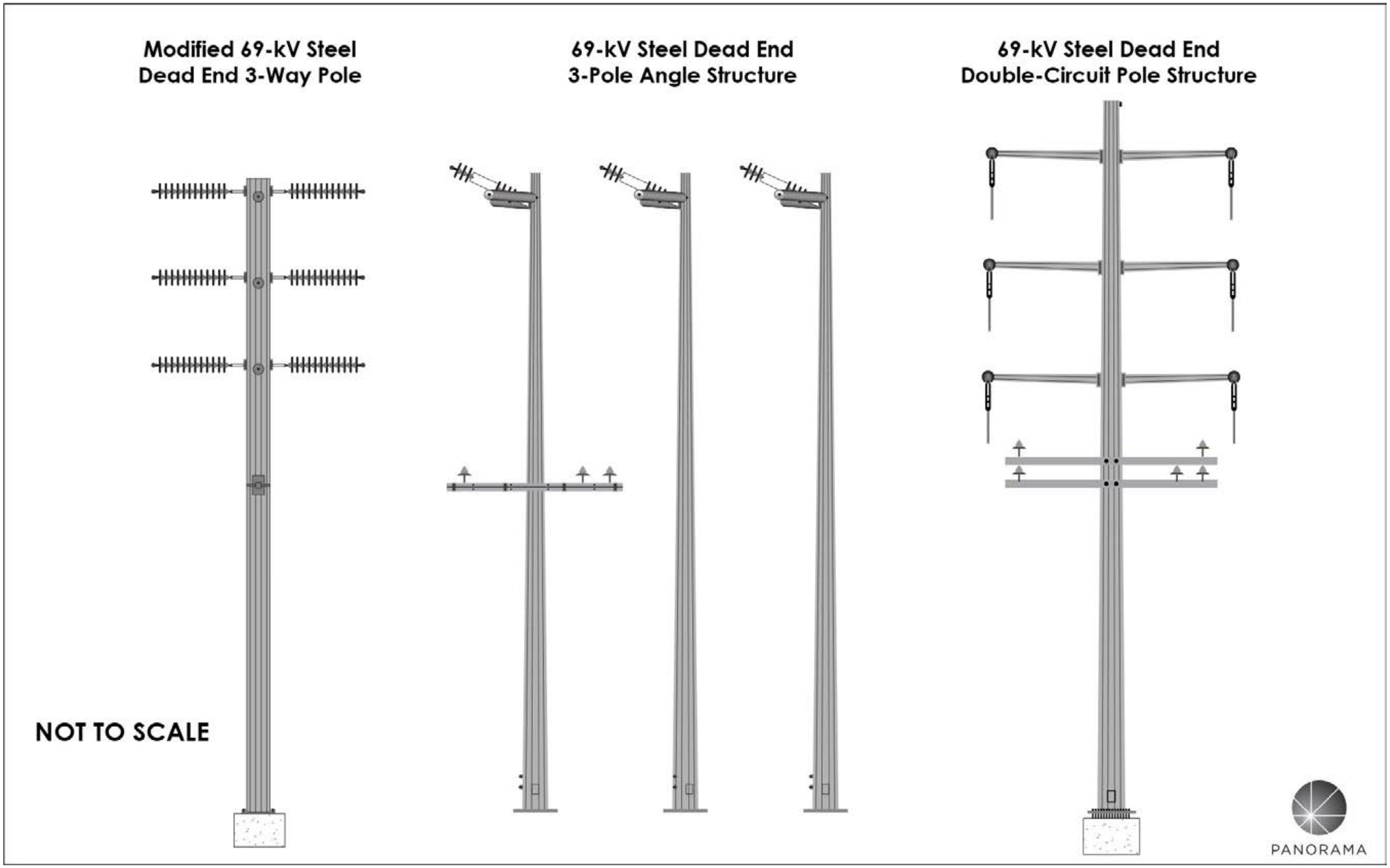
Source: (SDG&E 2016c)

Figure 2.6-3 Diagram of Proposed H-Frame Structures with Underbuild



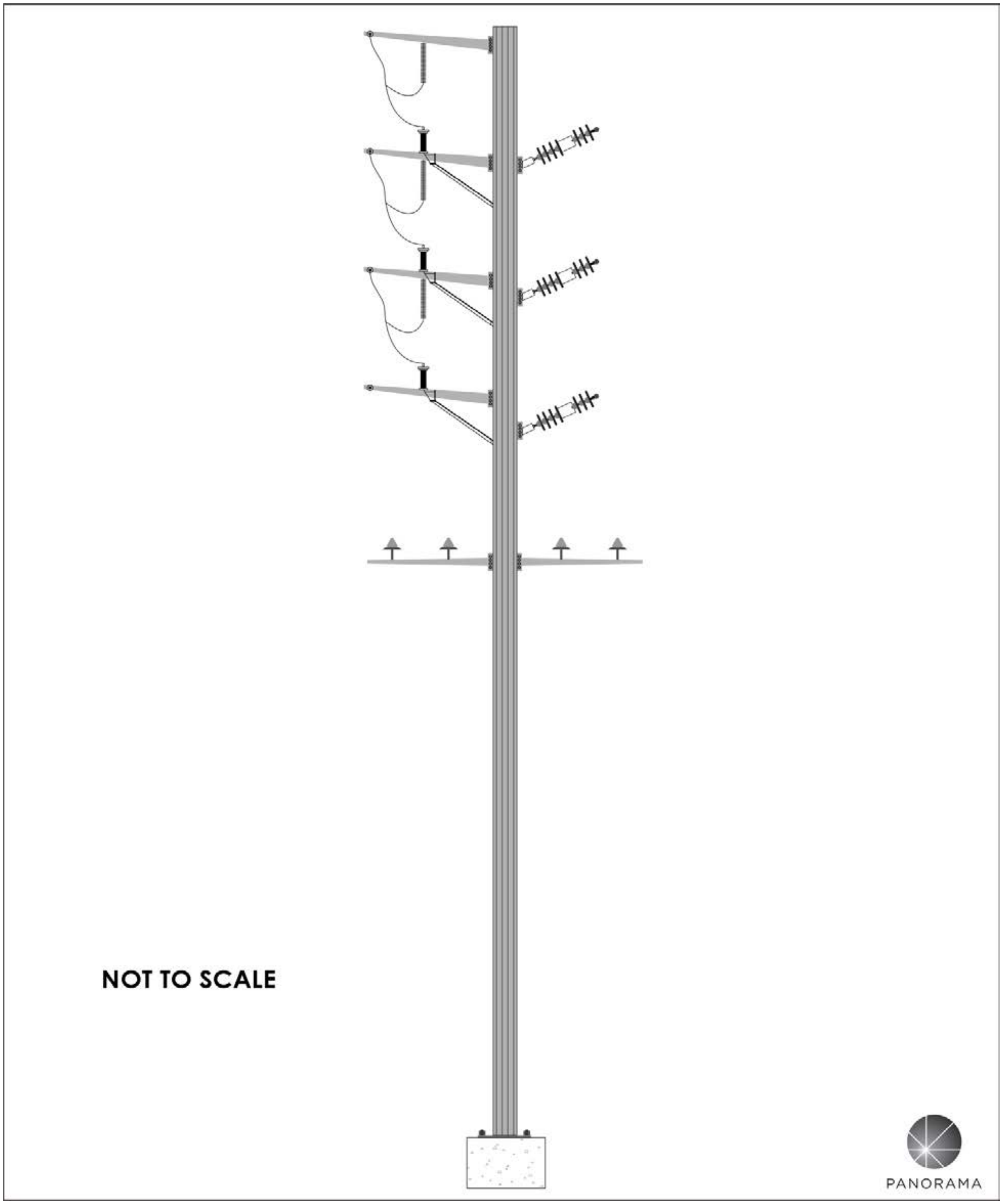
Source: (SDG&E 2016c)

Figure 2.6-4 Diagram of Proposed Dead End Structures with Underbuild



Source: (SDG&E 2016c)

Figure 2.6-5 Diagram of Proposed 69-kV Cable Pole



Source: (SDG&E 2016c)

The foundation would be installed approximately 30 to 40 feet deep. The foundations would extend approximately 2 feet above the ground surface.

A micropile foundation would be used for one double-circuit dead end pole structure (Pole 76). A micropile is a small, 6- to 9-inch diameter, drilled and grouted reinforced foundation. A single micropile typically consists of a small hole excavated to a depth of approximately 10 to 30 feet. Micropile foundation installation involves a series of approximately 4 to 16 micropiles arranged in a circular pattern.

2.6.5 Fiber Optic Cable

SDG&E would install a new SDG&E owned and operated fiber optic cable between the Talega, Basilone, and Japanese Mesa Substations. The new fiber optic line would be installed on the new steel pole structures and existing lattice tower structures and would be used to transfer information between the three substations. The fiber optic line would allow for the use of the latest substation relay technology and communication.

2.6.6 Substation Modifications

Reconductoring would take place within the Talega, Basilone, and Japanese Mesa Substations. No work would be performed at the San Mateo Substation. There would be no other substation modifications.

2.6.7 Conductor

The proposed overhead 69-kV conductor would be 336 kcmil[1] (0.72 inch) aluminum-clad, Invar[2]-reinforced conductor. The proposed overhead 12-kV (distribution line) conductor would be 636 kcmil (0.977 inch) aluminum-clad, Invar-reinforced conductor.

2.6.8 Underground Duct Bank

Duct Bank

The proposed underground power line in Segment C would consist of concrete-encased duct bank installed underground a minimum of 3 feet below the ground surface. The duct bank would contain 6- to 8-inch diameter polyvinyl chloride (PVC) conduits (i.e., ducts) that conductor cable would be pulled through and 2- to 4-inch diameter PVC conduits for the telecommunications cable. Duct bank dimensions would be approximately 3 feet high by 3 feet wide. The duct bank configuration would be designed based on required clearances and the location of existing underground utility lines. The duct bank would include one splice vault.

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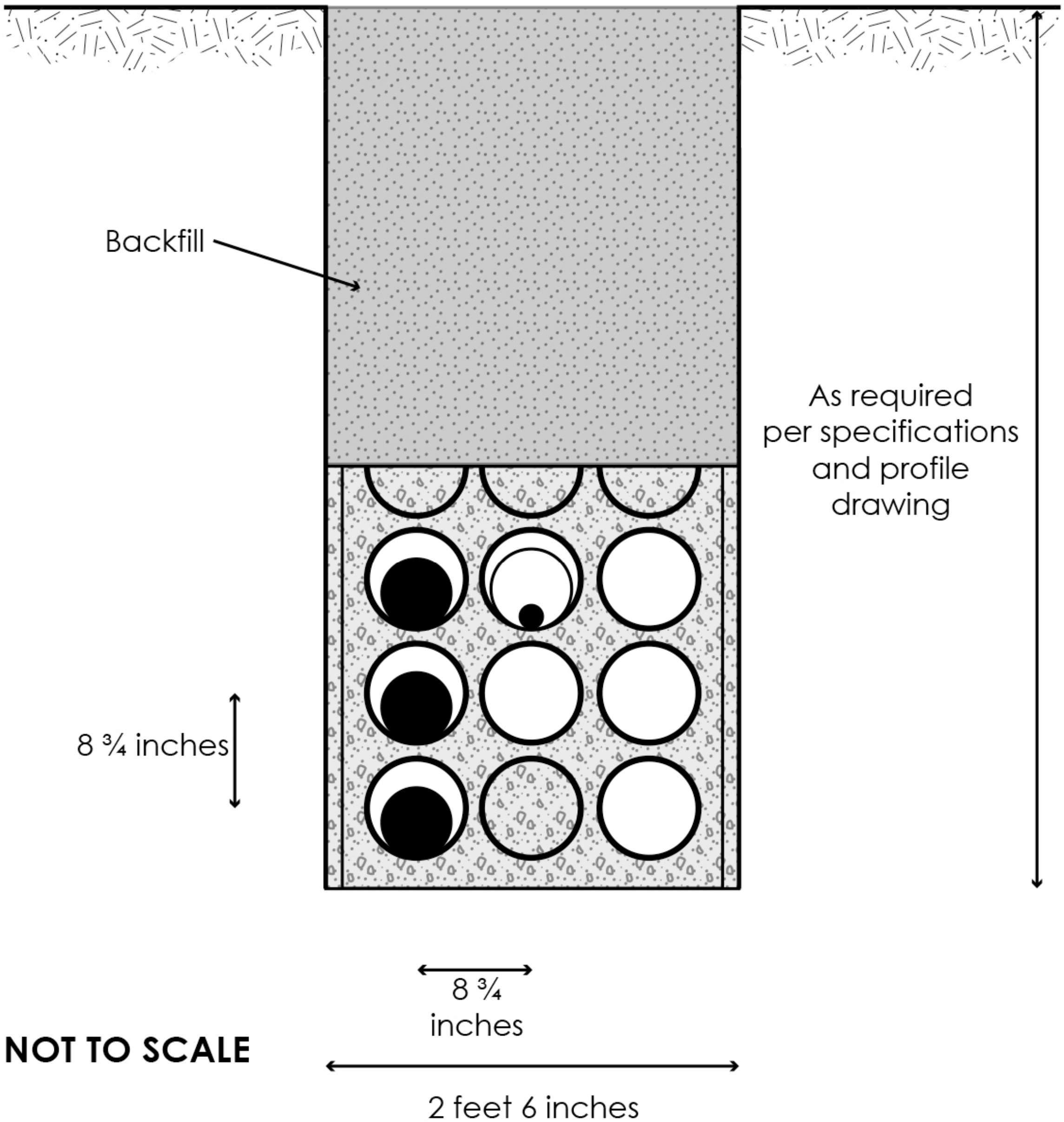
1 kcmil (1,000 circular mils) is a quality of measure for the size of a conductor. Kcmil wire size is the equivalent cross-sectional area in thousands of cmils. A cmil is the area of the circle with a diameter of 0.001 inch.

2 A special steel alloy consisting of iron and nickel.

Splice Vault

Splice vaults facilitate pulling of cables through the duct bank and splicing (i.e., connecting) segments of cable. During operation, splice vaults provide access to the underground cables for maintenance inspections, repairs, and replacement, if needed. One concrete splice vault would be constructed of prefabricated, steel-reinforced concrete. The splice vault would measure about 17 feet long by 9 feet wide by 11 feet deep. The vault would have one 4-foot by 5-foot manhole. A diagram of a typical 69-kV duct bank is provided in Figure 2.6-6.

Figure 2.6-6 Diagram of Proposed 69-kV Duct Bank



2.7 CONSTRUCTION

This section describes the following:

- Summary of Land Disturbance
- Temporary Work Areas
- Access Roads
- Aboveground Power Lines
- Underground Power Line
- Helicopter Use
- Water Use
- Site Cleanup and Waste Disposal
- Workforce and Equipment
- Construction Schedule

2.7.1 Summary of Land Disturbance

Areas of proposed project disturbance are summarized in Table 2.7-1 and described further in the sections below. Note that the area of temporary disturbance includes all staging yard areas including some locations that are currently covered in asphalt (e.g., SONGS Mesa) where no soil disturbance would occur during proposed project construction.

Table 2.7-1 Areas of Temporary and Permanent Proposed Project Disturbance

Proposed Project Component	Disturbance Area (acres) [a, b, c]		
	Permanent	Temporary	Total
Power Line Segments			
New Poles	0.06	5.46	5.52
Pole Topping and Overhead Work	0.00	0.33	0.33
Underground Power Line	0.00	0.51	0.51
Poles Removed From Service	0.00	0.07	0.07
Guard Structures	0.00	0.01	0.01
Subtotal	*0.06*	*6.38*	*6.44*
Access Roads			
New Permanent Access Road	0.01	0.00	0.01
Footpaths	0.00	0.30	0.30
Overland Travel	0.00	0.25	0.25
Subtotal	*0.01*	*0.55*	*0.56*
Staging Yards, Work/Staging/Turnaround Areas, and Stringing Sites			
Lemon Grove Staging Yard	0.00	1.42	1.42
Basilone Road Staging Yard	0.00	0.38	0.38
Talega Staging Yards	0.00	2.01	2.01
SDG&E Lot 4 Staging Yard	0.00	0.82	0.82
San Mateo Staging Yard	0.00	0.65	0.65
SONGS Mesa Staging Yard [d]	0.00	84.20[d]	84.20[d]
Work/Staging/Turnaround Areas	0.00	1.16	1.16
Stringing Sites	0.00	2.19	2.19
Subtotal	*0.00*	*92.83*	*92.83*

Proposed Project Component	Disturbance Area (acres) [a, b, c]		
	Permanent	Temporary	Total
Incidental Landing Areas			
Talega Helo East	0.00	0.32	0.32
Talega Helo West	0.00	0.24	0.24
Area 62 Helo	0.00	6.47	6.47
San Mateo Helo	0.00	0.10	0.10
Sierra North Helo	0.00	9.42	9.42
Sierra South Helo	0.00	0.14	0.14
Subtotal	*0.00*	*16.68*	*16.68*
TOTAL	**0.07**	**116.44[d]**	**116.51[d]**

Notes:

[a] Based on preliminary engineering. Estimates may change based on final design and construction.

[b] Overlapping areas were removed to avoid double-counting impact acreage (e.g., if a staging yard or structure access site intersected with a stringing site area).

[c] Acreages are rounded and may not add up to subtotals or totals provided.

[d] SDG&E would select a 2- to 3-acre staging area within the SONGS Mesa site prior to construction.

Source: (SDG&E 2016d)

2.7.2 Temporary Work Areas

SDG&E would use several types of temporary work areas to construct the proposed project. Preparation (i.e., site clearing, vegetation removal, grading) and use of temporary work areas are described below. Temporary work areas are shown on the maps in Appendix A.

Staging Yards

SDG&E would utilize six staging yards (refer to Table 2.7-1) for materials laydown and temporary storage. Site preparation activities at staging yards would include mowing and installing chain-link fence around the staging yard, if required. Staging yards would be used for the following activities:

- Refueling construction equipment, vehicles, and helicopters
- Maintenance/repair of construction equipment and vehicles
- Short-term helicopter operations
- Assembling pole structures
- Laydown and storage of materials and equipment
- Parking personal vehicles
- Housing construction trailers and portable restrooms
- Worker meet-up

SDG&E would use best management practices (BMPs) as necessary to control sedimentation, prevent stormwater runoff from leaving the site, and control dust (i.e., placement of fiber rolls and rumble plates). The locations of the six staging yards are shown on Figure 2.6-1 as well as in Appendix A.

Helicopter Incidental Landing Areas

Helicopter ILAs would be used for short-term helicopter operations, including picking up conductor and other materials and equipment, and refueling. Helicopters would be staged out of local airports (Oceanside Municipal Airport and McClellan-Palomar Airport). Maintenance and repair of helicopters would occur at the local airports. The locations of the helicopter ILAs are shown on Figure 2.6-1 as well as in Appendix A.

Stringing Sites

Stringing sites would be used to install conductor on pole structures and would generally be located at the ends of straight power line segments where the line changes direction. The 31 conductor stringing sites are shown in Appendix A. Vegetation removal and minor grading activities may occur within the stringing sites. Stringing sites would be returned to pre-construction conditions after use.

Structure Work Areas

Structure work areas would be used for equipment and vehicles access, and material laydown during pole installation. Work areas would be subject to minor earthwork and vegetation trimming or removal. Most vegetation clearing activities would involve overgrown brush removal, trimming, and mowing. A mower, weed whackers, blading equipment, and hand tools would be used for vegetation removal and trimming. Removed vegetation would be disposed of appropriately off site or cut into small pieces and distributed nearby. The dimensions of structure work areas by type of work is provided in Table 2.7-2.

Table 2.7-2 Structure Work Area Dimensions

Structure or Work Type	Work Area Dimension
Overhead work (i.e., conductor removal and stringing), pole structure removal, pole topping	10-foot radius work area (314 square feet)
Direct-bury pole structures	20-foot radius work area (1,260 square feet)
Pier and micropile foundation pole structures	75- by 75-foot work area (5,625 square feet)
Conductor stringing on steel lattice towers (Segment B)	10-foot radius work area around one tower leg (314 square feet)

Source: (SDG&E 2016c)

2.7.3 Access Roads

Construction work areas would be accessed through a combination of existing paved roads, existing unpaved roads, one new unpaved road, overland routes, and footpaths. Access roads are shown on the maps in Appendix A.

Existing Access Roads

Most work areas would be accessed via existing unpaved roads. Existing access roads would be improved as needed to facilitate their use for construction access. SDG&E would conduct the following activities to maintain and re-establish existing access roads:

- Clear, trim, or mow overgrown vegetation using a mower, weed whackers, and hand tools. Remove vegetation material and dispose of off-site or cut and spread nearby.
- Resurface and smooth where necessary with a grader.
- Transfer, add, or compact fill material (e.g., soil or gravel) with earth-moving equipment.
- Water the roadway with a water truck to compact the road and control dust.
- Install water bars and dissipaters or refresh existing dissipaters (e.g., replacing rip rap or cleaning out rip rap or accumulated silt).

New Access Road

One new 50-foot-long permanent, unpaved access road would be constructed to access Pole 102 near Japanese Mesa Substation. The road would be a maximum of 14 feet wide. SDG&E would clear vegetation with a mower and then grade the road.

Overland Routes and Footpaths

Overland routes and footpaths provide access to poles and work areas where no preexisting road or path is present or where access is substantially overgrown. Temporary overland routes and footpaths would be developed to access pole sites and would require the removal or trimming of vegetation. These routes would be restored following construction.

2.7.4 Aboveground Power Lines

Installation of New Pole Structures

New pole structures would be installed in all segments of the proposed project. For each new overhead structure, a foundation would be installed and then the structure would be erected on the foundation. Direct-bury, concrete pier, or micropile foundations would be used, depending on geologic and site specific conditions, and the type of pole structure. Plywood boards would be used to cover excavated holes if pole installation activities occur over multiple days. Plywood boards would be anchored and the sides sealed with gravel or sand bags. Blasting and dewatering may be necessary if hard rock or water, respectively, is encountered during excavation. Helicopters may be used to deliver the new pole structures, concrete, and reinforced steel cages.

Concrete Pier Foundations

Concrete pier foundations would be installed using a large auger. The steps for installing a concrete pier foundation are as follows:

1. Excavate a 6- to 8-foot-diameter hole 30 to 40 feet deep
2. If the soil is unstable, install steel casing to stabilize the sides of the excavation
3. Install a reinforcing steel cage and anchor bolt cage in each hole
4. Pour concrete into the excavation, and allow concrete to cure

Direct-Bury Foundations

Direct-bury pole structures would be installed in two sections. The steps for installing a direct-bury foundation are as follows:

1. Excavate an approximately 4.5-foot-diameter hole 5 to 30 feet deep
2. Place the lower portion of the direct-bury pole structure in the hole, pour concrete into the excavation, and allow concrete to cure
3. Attach the top portion of the direct-bury pole

Micropile Foundations

The micropile foundation would be installed using a platform-mounted drill rig. The steps for installing a micropile foundation are as follows:

1. Place a level working platform from which small-diameter micropiles will be installed
2. Drill multiple holes in a radial pattern
3. Insert a reinforcing element (i.e., steel rebar) and grout into the holes and backfill the holes using cement mortar

Blasting

If rock is encountered when excavating foundation holes, SDG&E may use a hydraulic rock drilling and splitting procedure (i.e., rock splitting) to minimize the time it takes to excavate the foundation hole. Rock splitting involves drilling a hole in the rock and inserting a non-blasting cartridge of propellant. The cartridge would be mechanically initiated by an impact generation device, causing the rock to crack without causing airborne rock pieces, noxious fumes, or ground vibrations.

Controlled detonations would be used in situations where solid rock is encountered but the rock splitting technique would be ineffective. Detonation blast holes (about 3 inches in diameter) would be drilled to the full depth of the excavation. Explosives would be detonated in the blast holes using a non-electric detonator. Seismographs would be placed to measure and record peak particle velocity and air blast levels at various distances from the blast site. SDG&E would use flyrock protection and dust control during controlled detonations. Dust control would include a combination of steel plate covering, geo-textile fabric with chain-link fence covering, and wetting the blasting surface.

If the pole location is only accessible by a footpath and rock is encountered, SDG&E may use a pneumatic drill/jackhammer (with a hose running along the footpath) to excavate a hole for the pole foundation.

Dewatering

Dewatering may be necessary if water is encountered during excavation for pole structure foundations. Drilling mud, wet drilling techniques, casing, or dewatering may be required to install the foundations. In the event that dewatering of the pole foundation is required, dewatering activities would be conducted in accordance with all existing regulations and requirements. A submersible pump would be installed in the excavation, and water would be discharged to a baker tank for sediment filtering. Subsequently, water would be discharged to an upland area or surface water, or disposed of at a site licensed to handle wastewater. SDG&E may also use bentonite (water-absorbing clay) or another stabilizing material for foundation installation if water is present in the foundation excavation.

Structure Erection
Cranes, flatbed trucks, drill rigs, and excavators would be used to install pole structures. Flatbed trucks would deliver the poles in two or more sections to structure sites. Heavy-lift helicopters may be used to transport poles to areas with limited access. A small truck-mounted crane would be used to assemble the poles on site. A crane would lift the pole and set it in place onto the anchor bolts in the pole foundation, and the pole would be attached to the foundation.

Conductor Installation
Conductor would be installed on new pole structures and placed on existing pole structures.

Guard Structures
Guard structures would be used during conductor stringing to prevent any dropped conductor from coming into contact with pedestrians, vehicles, or utilities (e.g., distribution lines and communication facilities) located beneath the stringing activities. Guard structures would also be used at crossings for large roadways and sensitive waterways. Anticipated guard structure locations are shown in Appendix A.

Two types of structures or boom trucks would be used as guard structures. The guard structures may consist of a single wood pole with a cross-beam attached to side extensions or a two-pole wood structure with a cross-beam between them. Holes would be augered into the ground for the wood poles. A crane or a line truck would then lift the wood poles into place. Netting may be suspended between guard structures for larger crossings. Wood guard structures would be removed after stringing, and the augered holes would be backfilled with the excavated soil. Alternatively, a boom truck may be used as a guard structure; this option is typically used in paved areas. No foundations would be needed, and no grading would occur for installation of guard structures.

In lieu of guard structures, traffic control would be used during conductor stringing at road, freeway, and pedestrian crossings. Traffic control would involve flaggers temporarily holding traffic for short time periods while overhead line is installed. Traffic control would typically be used at small roadway crossings.

Conductor and Fiber Optic Cable Stringing
SDG&E would use aerial manlifts (e.g., bucket trucks) or helicopters to install travelers or “rollers” on the pole structure prior to conductor installation. The travelers would allow the conductor to be pulled past each structure prior to being pulled up to the final tension position. Following installation of the travelers, a sock line (a small cable used to pull the conductor) would be pulled onto the travelers using a helicopter. Once the sock line is in place, it would be attached to the conductor and pulled back through the travelers using conventional tractor-trailer pulling equipment located at the pull and reel sites (i.e., stringing sites). A large spool of conductor on a wire truck would be parked at the reel site, and a pulling rig parked at the reel

site would be used to pull the conductor through the structures. The conductor would be pulled through each structures under a controlled tension to keep it elevated and away from obstacles. This process would be repeated for each conductor and line segment (stringing site to stringing site).

After the conductor is pulled into place, the sags between the structures would be adjusted to a pre-calculated level. The line would be installed with a minimum ground clearance of 30 feet. The conductor would then be clipped into the end of each insulator, the travelers would be removed, and vibration dampers and other accessories would be installed. This process would be repeated for each conductor and line segment including power lines, distribution lines, and fiber optic cables proposed for installation.

Removal of Existing Facilities

Existing facilities would be removed where existing power lines would be relocated and where poles would be removed.

Conductor Removal

Conductor would be removed from poles using wire trucks and pulling rigs; guard structures (see discussion above) would be used where needed. For segments that would be reconductored, existing hardware and insulators would be removed and replaced with new polymer insulators and hardware.

Pole Removal

For structures that would be removed from service or replaced, the old pole structures and attached components would be dismantled using boom and bucket trucks, and hand tools. Wood poles would be removed fully or cut approximately 2 feet below grade. Helicopters may be used to remove the existing structure. Any remaining concrete foundations would be jackhammered to approximately 2 feet below grade, and the debris would be removed. The remaining hole would be backfilled with native soil or imported materials similar to the surrounding area, and the site would be restored to approximate pre-existing conditions.

Pole Structure Topping

After conductor is removed from the existing wood pole structures in Segment F, the pole structures would be cut approximately 1.5 to 2 feet above the existing distribution circuits, and the distribution portion of the existing pole would remain in place. This process is commonly referred to as "topping." Crews would use a line truck or a bucket truck to top the pole structures. Topping activities may also be completed using hand tools. Excess materials would be hauled away with trucks, recycled or reused if feasible, or disposed of at a landfill.

Regulator Station Removal

An existing pad-mounted regulator station would be removed west of SONGS Mesa. An excavator and dump truck would be used to remove the regulator station, concrete pad, and existing chain link fence surrounding the station. The work area for removal of the regulator station would be approximately 35 by 30 feet.

2.7.5 Underground Power Lines

Utility Avoidance

SDG&E would utilize the Underground Service Alert system to notify other utility companies to locate and mark existing underground utilities along the proposed project alignment prior to trenching. SDG&E may also conduct exploratory excavations (i.e., potholing) to verify the locations of existing facilities marked out in the field prior to excavating.

Typical trench dimensions would be a minimum of 6 feet deep and 3 feet wide. Depth of the trench may vary depending on soil stability and the presence of existing underground utilities. The trench would be widened and shored where necessary to meet the requirements of Title 8 CCR § 1541.1. If water is encountered, trenches would be dewatered using a portable pump, and recovered water would be disposed of in accordance with existing regulations and requirements.

Vault Installation

SDG&E would excavate to approximately 14 feet below ground surface, place approximately 1 foot of bedding material (i.e., crushed rock) in the trench, and install the precast splice vault in the trench. Backfill would then be placed, grouted, and compacted. Installation of the vault would occur over approximately one week.

Duct Bank Installation

Most of the duct bank would have a double-circuit vertical duct bank configuration (see Figure 2.6-6), with occasional transitions to a flat configuration to clear existing structures in highly congested areas or to fan out to termination structures at the cable pole transition area.

SDG&E would install the conduits (separated by spacers) and place concrete around the PVC conduits to form the duct bank encasement as each section of the trench for the duct bank is completed. The duct bank would be, at a minimum, 3 feet below the ground surface. After the PVC conduits are encased in concrete, SDG&E would place approximately 1 foot of concrete slurry. Native soil or slurry would be installed for the remaining two feet of backfill. As the trench is being filled in one segment, additional trench would be opened further down the underground alignment, with the process continuing until the entire duct bank is in place.

Cable Pulling, Splicing, and Termination

SDG&E would install cables in the duct bank once the duct bank and splice vault are installed. Each cable segment would be pulled through the duct bank, and cable ends would be spliced together at the splice vault. At each end of Segment C, cable segments would terminate where the line transitions to overhead. A cable reel and a pulling rig, each piece of equipment placed at opposing ends of the cable segment, would be used to pull the cable through the ducts. After cables are pulled through the ducts, a splice trailer would be set up adjacent to the vault, one at a time, in order to complete the cable splicing. Each splice would require approximately three days to complete.

Underground Distribution Line Removal

A 12-kV underground distribution line would be removed within the SONGS Mesa staging yard. An existing handhole (10 feet long by 8 feet wide by 6 feet deep) would be removed using an excavator, and the conduit at Poles 91 and 92 would be cut and capped below ground level. A take-up reel attached to a pickup truck would be used to remove the 12-kV underground distribution line.

Underground Conduit Re-route

Pole 83 would replace an existing structure that has two secondary underground conduits. The existing conduits would be intercepted and re-routed to the proposed pole structure. Intercepting and re-routing these conduits would require excavating two trenches (2 feet wide by 3 feet deep by 20 feet long) within the 75- by 75-foot work area. An excavator would be used to intercept and re-route the conduits.

2.7.6 Helicopter Use

Helicopters would be used for:

- Removal of existing conductors and pole structures
- Foundation installation for new pole structures
- Erection of new pole structures
- Stringing of new conductors and fiber optic cable
- Transporting equipment and personnel

Staging yards and helicopter ILAs would be used for refueling, and helicopter maintenance and repair would occur at local airports. All required spill prevention measures would be in place at the time and location of fueling. Staging yards and stringing sites would also be used for short-term helicopter operations, such as picking up conductor.

Medium- and heavy-duty helicopters would be used for pole installation acitivites, and light-duty helicopters would be used to string conductor and transport construction personnel to remote work areas. SDG&E anticipates that only one type of helicopter would be used for construction at a time on any given day; however, multiple types of helicopters could be used in succession (e.g., a light-duty helicopter would transport personnel followed by a heavy-duty helicopter that would transport a new pole structure).

Helicopter use would occur intermittently during the 60-day conductor stringing phase and the 90-day pole installation phase. Anticipated helicopter use is summarized in Table 2.7-3.

Helicopter flight paths would generally be limited to the existing easements and work areas, except when flying to work areas from adjacent landing areas and airports. Helicopter use would comply with all applicable MCB CPEN and FAA regulations and requirements for pilot qualifications, aircraft worthiness, and FAA-approved practices and equipment, where applicable. SDG&E would coordinate with local air traffic control to prevent conflict with air traffic generated by local airports.

Table 2.7-3 Helicopter Use

Helicopter Class	Peak Daily Use	Days of Use during Construction [a]
Light-duty	4 hours of cruising time 6 landings and takeoffs	4
Medium- or heavy-duty	5 hours of cruising time 6 landings and takeoffs	10

Note:

[a] The number of days of helicopter use may vary based on factors such as inclement weather, training exercises at MCB CPEN, and other considerations.

Source: (SDG&E 2016d)

2.7.7 Water Use

Water would be required for dust control on access roads and for wash pens (for concrete clean-out) and may be required for dust control at pole locations. Water would be obtained from the City of San Clemente. SDG&E anticipates using approximately 8 million gallons of water for the proposed project.

2.7.8 Site Cleanup and Waste Disposal

SDG&E would restore all temporarily disturbed areas used during construction that would not be maintained for operation and maintenance purposes (see Section 2.8 for a discussion of areas maintained during the operation and maintenance phase). Areas would be restored to approximate preconstruction conditions. Restoration activities may include minor grading to return the sites to original contours and reseeding.

All construction materials and debris would be reused onsite (e.g., excavated soil), or removed from the proposed project area and recycled or otherwise disposed of offsite. SDG&E would produce up to approximately 3,000 cubic yards of excavated soils. SDG&E would attempt to reuse, or recycle, or donate all old structures, poles, materials, and components not needed for the proposed project. Materials that could not be reused, or recycled, or donated would be disposed of at an appropriate facility. Table 2.7-4 describes the likely end use of waste generated during the proposed project. SDG&E would conduct a final survey to ensure that cleanup activities are completed.

Table 2.7-4 Typical End Destination of Removed Materials

Material	End Destination
Wood Pole Structures	Donated for reuse or dDisposed of at Otay Landfill
Conductor, Scrap Metal, Concrete	Recycled by SOS Metals
Insulators, Cleared Vegetation	Disposed of at Otay Landfill
Soils	Reused on site or disposed of at Clean Harbors in Buttonwillow or WMI-Chemical Waste Management in Kettleman Hills, if contaminated
Batteries	Recycled

Source: (SDG&E 2016c)

2.7.9 Workforce and Equipment

Construction of the proposed project would require construction crews, environmental monitors, construction inspectors, and SDG&E personnel. Crews may work simultaneously along the proposed project alignment and work areas, with up to approximately 29 to 36 people working at one time. Table 2.7-5 lists the number of workers and types of equipment that would be needed for each proposed project activity. Table 2.7-6 describes the typical use of equipment for the proposed project.

Table 2.7-5 Construction Equipment Use and Workers

Activity	Number of Workers	Quantity and Types of Equipment	
Staging Yard Preparation Access Road Improvements Vegetation Removal and Trimming	5 to 7	1 dump truck 2 graders 2 mowers	2 tractor/trailer units 2 water trucks
Concrete Pier and Micropile Foundation Construction	5 to 6	3 air compressors 10 cement trucks 3 crew trucks 3 drilling rigs/truck-mounted augers	3 forklifts 2 water trucks 1 cement/mortar mixer 1 dump truck 1 excavator
Direct-Bury Foundation Construction Pole Structure Installation	20 to 25, plus 4 to 5 for hand digging	3 aerial bucket trucks 3 air compressors 3 cranes 3 tractor/trailer units	3 drilling rigs/truck-mounted augers 3 water trucks
Conductor Stringing	10 to 12	3 aerial bucket trucks 3 boom trucks 3 crew trucks 3 pickup trucks	1 pulling rig 3 water trucks 1 wire truck
Underground Power Line Construction	6 to 8	2 aerial bucket trucks 3 backhoes 1 drilling rig	1 water truck 1 wire dolly
Demobilization and Cleanup	5 to 7	1 crew truck 1 grader 1 loader	1 pickup truck 1 spray truck 1 water truck

Source: (SDG&E 2016c)

Table 2.7-6 Construction Equipment and Usage

Equipment Type	Equipment Use
Aerial bucket truck	Access pole structures, string conductor, modify structure arms, provide guard structures
Air compressor	Operate air tools
Backhoe	Excavate trenches

Equipment Type	Equipment Use
Boom truck	Access pole structures and other height-restricted items; unload pole structures, transformers, and other items
Cement and mortar mixer	Prepare grout for placement at micropile foundations
Cement truck	Transport and process cement
Crane	Lift and position structures
Crew truck	Transport construction personnel and equipment
Drilling rig/Truck-mounted auger	Excavate holes for direct-bury and concrete pier foundations
Dump truck	Haul excavated materials and import backfill
Excavator	Excavate materials such as soil and concrete pads
Flatbed truck	Haul and unload materials
Forklift	Transport materials at structure sites and staging yards
Grader	Construct and improve access roads and staging areas
Helicopter	Transport materials, string conductor, install and remove travelers, set structures
Loader	Load materials onto trucks for transport
Mower	Clear vegetation
Pickup truck	Transport construction personnel
Pulling rig	Pull conductor
Spray truck	Distribute aggregate for filling potholes
Tractor/Trailer unit	Transport materials at structure work sites and staging yards
Water truck	Control dust
Wire dolly	Pull and tension cable
Wire truck	Hold spools of wire

Source: (SDG&E 2016c)

2.7.10 Construction Schedule

The proposed project is anticipated to take approximately eight months to construct. Construction would take place six days a week and would generally be limited to no more than 12 hours per 24-hour period. Construction is anticipated to begin in January 2018 and end in August 2018. Table 2.7-7 summarizes the anticipated duration of each construction activity.

Table 2.7-7 Construction Duration

Proposed Construction Activity	Estimated Construction Duration (days)
Staging Yard Preparation Access Road Improvements Vegetation Removal and Trimming	30

Proposed Construction Activity	Estimated Construction Duration (days)
Concrete Pier and Micropile Foundation Construction	50
Direct-Bury Foundation Construction Pole Structure Installation	90
Conductor Stringing	60
Underground Power Line Construction	10
Demobilization and Cleanup	40

Source: (SDG&E 2016c)

2.8 OPERATION AND MAINTENANCE

This section describes the operation and maintenance activities that SDG&E would conduct for the proposed project. SDG&E currently operates and maintains similar power and transmission facilities along all of the proposed project alignment except the undergrounded Segment C. SDG&E would continue to regularly inspect, maintain, and repair the new and reconstructed power line and distribution line facilities following completion of proposed project construction. Operation and maintenance of the aboveground and underground facilities are described in greater detail in this section.

2.8.1 Permanent Work Areas

SDG&E would maintain existing access roads to access pole structures for routine inspection, maintenance, and repair activities. Road maintenance would be performed as necessary to maintain the quality of the roads. Maintenance would include the use of graders, water trucks, and pickup trucks for spot-repair of erosion sites, vegetation trimming, and maintaining BMPs (i.e., diversion berms, sand bag barriers, drainage swales).

2.8.2 Vegetation Clearances

Some permanent work areas would need to be maintained. To comply with the fire break clearance requirements in PRC § 4292 and Title 14 CCR § 1254, SDG&E would trim or remove flammable vegetation within a 10-foot radius of power line structures. Typically, a one-person crew would trim or remove vegetation using chain saws, weed trimmers, rakes, shovels, and leaf blowers. SDG&E would also trim trees and vegetation in accordance with tree and power line clearance requirements in PRC § 4293, Title 14 CCR § 1256, and CPUC General Order (GO) 95. SDG&E would trim vegetation that grows within 4 horizontal feet of any conductor within the easement. SDG&E would conduct tree-trimming activities with a two-person crew in an aerial bucket truck. SDG&E would inspect pole structures and conductors on an annual basis to determine if vegetation trimming or removal is necessary.

2.8.3 Herbicide Application

Herbicides may be applied after the mechanical removal of vegetation around pole structures to prevent vegetation from recurring. Herbicide application generally requires one person in a pickup truck and takes only minutes to spray around the base of the pole structure within a radius of approximately 10 feet. The employee either walks from the nearest access road to apply the herbicide or drives a pickup truck directly to each pole structure location as access permits.

2.8.4 Equipment Repair and Replacement

SDG&E may need to add, repair, or replace equipment in order to maintain uniform, adequate, safe, and reliable service. SDG&E may remove and replace an existing structure with a larger/stronger structure at the same location or at a nearby location due to damage or changes in conductor size. Equipment repair or replacement requires crew access to the equipment to be repaired or replaced. Helicopters may be used for maintenance activities in areas that have no vehicle access or in rough terrain.

2.8.5 Inspection

SDG&E uses helicopters in the visual inspection of overhead facilities and to routinely patrol power lines. SDG&E's Transmission Department uses helicopters for patrolling power lines during trouble jobs (e.g., outages/service curtailments). For patrolling during such jobs, the helicopter picks up the patrolman at the district yard and lands within a reasonable and safe walking distance of the structures targeted for service. The helicopter needs a flat staging yard for fueling and picking up material, equipment, and personnel. The area required for small helicopter staging is generally 100 feet by 100 feet. The size of the crew needed varies from four to 10 crew members, two helicopter staff, and a water truck driver to apply water for dust control at the staging yard. Most helicopter operations take only one day.

The new underground power line in Segment C would be inspected consistent with SDG&E's existing underground inspection and maintenance program. The line would be accessed from new vaults during the annual underground power line inspection program. The inspection requires opening the vault covers and performing a visual survey from above (entry into vault with energized cables is not permitted), and use of infra-red, partial discharge monitoring, or other diagnostic instrumentation that may be available. The total time to inspect the vault is expected to be less than one day under normal operating conditions. The inspection of the underground power line would be the same for all existing underground inspection currently completed by SDG&E within its service territory.

2.9 ELECTROMAGNETIC FIELDS

This IS/MND provides information regarding EMF associated with electric utility facilities because there is public interest and concern regarding potential health effects from exposure to EMF from power lines. The CPUC does not consider EMF to be an environmental issue in the context of CEQA because (1) there is no agreement among scientists that EMF creates a potential health risk, and (2) CEQA does not define or adopt standards for defining any potential risk from EMF. As a result, the following EMF information is presented for the benefit of the public and decision makers, but it is not considered within the context of CEQA.

2.9.1 Defining Electric and Magnetic Fields

Electric fields and magnetic fields are distinct phenomena that occur both naturally and as a result of human activity. Naturally occurring electric and magnetic fields are caused, for example, by atmospheric conditions and the Earth's geomagnetic field. The fields caused by human activity result from technological application of the electromagnetic spectrum for uses such as communications, appliances, and the generation, transmission, and local distribution of electricity through power lines[3]. Electric and magnetic fields are vector quantities that have the properties of direction and amplitude (field strength).

Electric and magnetic fields of power lines also have the property of frequency, which is determined by the rate at which the fields change their direction each second (Hertz [Hz] is the unit of frequency). For power lines in the United States, the frequency of change is 60 times per second, leading to the designation "60 Hz power." In Europe and many other countries, the frequency of electric power is 50 Hz. Radio and other communications systems operate at much higher frequencies, from approximately 3,000 Hz (3 kilohertz) to approximately 300,000,000,000 Hz (300 gigahertz), at which frequencies the fields share a mutual relationship in forming EMF.

Electric power flows across utility electric systems from generating sources to serve electrical loads within the community. The power flowing over these lines is determined by the line's voltage and current. The higher the line's voltage level, the lower the amount of current needed to deliver the same amount of power. For example, a 115,000-volt (115-kV) "power" line with 200 amperes of current would transmit approximately 40,000 kilowatts (kW), whereas a 230-kV "transmission" line requires only 100 amperes of current to deliver the same 40,000 kW.

2.9.2 Electric Fields

Electric fields from power lines are created whenever the lines are energized. Field strength is directly dependent on the voltage of the line creating it. Electric field strength is typically described in units of kV per meter. Electric field strength attenuates (weakens) rapidly as the distance from the source increases. Electric fields from the lines are reduced in many locations because they are effectively shielded by most objects or materials such as trees or houses.

Unlike magnetic fields, which penetrate almost everything and are unaffected by buildings, trees, and other obstacles, electric fields are distorted by any object that is within the electric field, including the human body. Trying to measure an electric field with electronic instruments is difficult because the devices themselves alter the levels recorded. Determining an individual's

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3 The term "power lines" in this section refers generally to electric lines of all voltage classes operating in SDG&E's electric system. However, CPUC GO 131-D distinguishes between distribution lines ("designed to operate under 50 kV"), power lines ("designed to operate between 50 and 200 kV"), and transmission lines ("designed to operate at or above 200kV").

exposure to electric fields requires the understanding of many variables, including the electric field itself, how effectively a person is grounded, and a person's body surface area within the electric field.

Electric fields in the vicinity of power lines can cause phenomena similar to the static electricity experienced on a dry winter day or clothing just removed from a clothes dryer, and may result in nuisance electric discharges when touching long metal fences, pipelines, or large vehicles. An acknowledged potential impact to public health from electric power lines is the hazard of electric shock: electric shocks from power lines are generally the result of accidental or unintentional contact by the public with the energized wires.

2.9.3 Magnetic Fields

Magnetic fields from power lines are created whenever current flows through power lines at any voltage. The strength of the field is directly dependent on the current in the line. Magnetic field strength is typically measured in milligauss. Similar to electric field strength, magnetic field strength attenuates rapidly with distance from the source. Unlike electric fields, magnetic fields are not shielded by most objects or materials.

2.9.4 Electric and Magnetic Fields Research

Media reports on potential EMF exposure from power lines have generated much public interest and concern. As a result of the public concerns, researchers have conducted numerous national- and international-sponsored studies to further understand and quantify the risks of EMF. In an effort to determine whether health standards are necessary, agencies such as the CPUC, California Department of Health Services, the US Environmental Protection Agency (USEPA), the National Institute of Environmental Health Sciences, and the World Health Organization have reviewed the research. The technical review of scientific data regarding EMF conducted by these state and federal agencies concluded that there is no basis for setting health standards for EMF (ATI Architects and Engineers 2004). CPUC Decision 93-11-013 issued on November 2, 1993, which addresses public concern about possible EMF health effects from electric utility facilities, concluded the following:

> "We find that the body of scientific evidence continues to evolve. However, it is recognized that public concern and scientific uncertainty remain regarding the potential health effects of EMF exposure…We do not find it appropriate to adopt any specific numerical standard in association with EMF until we have a firm scientific basis for adopting any particular value."

2.9.5 Electric and Magnetic Field Sources in the Proposed Project Area

EMF exposure to the public in developed areas varies over a range of field intensities and durations due to sources in home and work environments, electric power distribution, and, infrequently, from proximity to power and transmission lines. SDG&E's TL 13835, TL 13846, TL 23007, and TL 23052 in the existing transmission corridors are just some of the sources of EMF in the proposed project area. Residences are located adjacent to the existing TL 695 along Segment F of the proposed project.

2.9.6 Electric and Magnetic Fields Associated with the Proposed Project

The specific EMF sources associated with the proposed project consists of the reconductored 69-kV power lines. The CPUC issued decisions regarding EMF in 1993 (D.93-11-013) and 2006 (D.06-01-042). The 2006 decision re-affirmed a key finding of the 1993 decision, stating that "a direct link between exposure to EMF and human health effects has yet to be proven despite numerous studies including a study ordered by this Commission and conducted by DHS". In the decisions, the CPUC directed utilities to consider "no cost" and "low cost" measures to reduce public exposure to EMF from new or upgraded electrical utility facilities up to approximately four percent of total project cost. In order to comply with direction from the CPUC, SDG&E developed its EMF Design Guidelines for Electrical Facilities and filed the guidelines with the CPUC in 2006 (SDG&E 2016b). The following are examples of possible EMF reduction measures identified in SDG&E's EMF Design Guidelines for Electrical Facilities in accordance with CPUC Decisions 93-11-013 and 06-01-042:

- Increase the distance from electrical facilities by:
  - Increasing structure height
  - Increasing burial depth of the duct bank
  - Locating power lines closer to the centerline of the corridor
- Reduce conductor spacing
- Phase circuits to reduce magnetic fields

SDG&E's application for a PTC (SDG&E 2016a) includes a detailed Magnetic Field Management Plan describing the magnetic field reduction measures that were considered and adopted for the proposed project. SDG&E adopted magnetic field reduction measures include phase rearrangement and removal of the existing TL 695 power line from Segment F of the proposed project (SDG&E 2016b). Implementation of the Magnetic Field Management Plan would be monitored and verified by the CPUC during construction.

2.10 APPLICANT PROPOSED MEASURES

SDG&E proposes to implement measures, referred to herein as applicant proposed measures (APMs), during the design and construction of the proposed project to avoid or minimize potential environmental impacts. APMs listed in Table 2.10-1 are considered part of the proposed project in the evaluation of environmental impacts (see Sections 3.1 through 3.18). CPUC approval would be based upon SDG&E adherence to the proposed project as described in this document, including implementation of the APMs and any adopted mitigation measures identified in this IS/MND.

Table 2.10-1 details each APM by environmental issue area. Several APMs have been edited or superseded since their initial proposal in the PEA.

Table 2.10-1 Applicant Proposed Measures

Applicant Proposed Measure	Revised or Superseded?
Biological Resources	
APM BIO-01: Migratory Birds. Trimming or removal of vegetation during the peak breeding season (February 15 to August 31) will require a pre-construction survey by a qualified biologist to confirm that active nests will not be affected. If an active nest is detected within the construction area during the survey, work will be halted and redirected away from the site. The qualified biologist in the field will determine a no-work buffer zone around the nest that is of sufficient size and dimensions that construction activities will not result in disturbance or direct removal of the active nest, or will not cause a breeding bird to abandon its nest. The no-work buffer zone will remain in effect until the young have fledged, or the qualified biologist has determined that the nest is no longer active.	Superseded by MM Biology-6: Mitigation for Bird Species
APM BIO-02: Coastal California Gnatcatcher. • Prior to construction, SDG&E shall retain a qualified coastal California gnatcatcher biologist to conduct surveys for the coastal California gnatcatcher in suitable coastal sage scrub habitat, to determine if any active nests are within or in the immediate vicinity of the Proposed Project. • Trimming or removal of vegetation during the peak-breeding season (February 15 to August 31) will require a pre-construction survey by a qualified biologist to confirm that active nests will not be affected. If an active nest is detected within the construction area during the survey, work will be halted and redirected away from the site. The qualified biologist in the field will determine a no-work buffer zone around the nest that is of sufficient size and dimensions that construction activities will not result in disturbance or direct removal of the active nest, or will not cause a breeding bird to abandon its nest. The no-work buffer zone will remain in effect until the young have fledged, or the qualified biologist has determined that the nest is no longer active.	Superseded by MM Biology-7: Coastal California Gnatcatcher Avoidance and Minimization
APM BIO-03: Pacific Pocket Mouse. • Prior to construction, SDG&E shall retain a qualified Pacific pocket mouse biologist to conduct pre-construction surveys for Pacific pocket mouse in suitable habitat (in coordination with MCB Camp Pendleton and the U.S. Fish and Wildlife Service [USFWS]), to avoid a mortality of the species from any Proposed Project activity. • A qualified biologist, approved by the USFWS and experienced with Pacific pocket mouse, will be assigned to monitor all construction activities conducted within occupied Pacific pocket mouse habitat. The qualified Pacific pocket mouse biologist will have the authority to halt or redirect construction activities that may impact the Pacific pocket mouse.	Superseded by MM Biology-11: Mitigation for Pacific Pocket Mouse
APM BIO-04: Arroyo Toad. • Prior to conducting soil disturbing or vegetation removal activities at sites in proximity to arroyo toad breeding habitat (riparian areas) within the Proposed Project, a qualified biologist will survey the site for any sign of arroyo toad in the anticipated impact area. If arroyo toads and/or potential burrows are found, steps will be taken to avoid the toads and/or burrow sites to the extent possible. • For sites immediately adjacent to or within suitable riparian habitat, impacts to arroyo toad shall be avoided by installing fencing, flagging, and/or signage, or marking the areas to be avoided. If individual arroyo toads are encountered	Superseded by MM Biology-5: Arroyo Toad Avoidance and Minimization

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during construction, sites located within or immediately adjacent to suitable riparian habitat shall be monitored by a qualified biologist to minimize potential impacts to the arroyo toad. The biological monitor will have the authority to stop or redirect construction activities to minimize or avoid impacts to this species. • Since this species is considered nocturnal, construction activities shall be conducted during daylight hours, in order to minimize impacts to active arroyo toads, except in rare circumstances where there is a need to finish unplanned/delayed work or for public safety or other emergency. A qualified biologist will perform pre-activity survey(s) and monitor the work within arroyo toad habitat, as needed. • To prevent the trapping of toads or other wildlife, plywood boards should cover the excavated hole if pole structure installation activities do not occur within the same day. The plywood boards should be anchored and the sides sealed with gravel or sand bags. A proper seal with appropriate materials shall prevent wildlife from moving into the hole/trench and becoming trapped.	
APM BIO-05: Impacts to Federally and State Listed Species. • Federally listed species with potential to occur onsite include coastal California gnatcatcher, Pacific pocket mouse, thread-leaved brodiaea, San Diego fairy shrimp, Riverside fairy shrimp, southern steelhead, arroyo toad, least Bell's vireo, southwestern willow flycatcher and western yellow-billed cuckoo. Impacts to potential or known habitat for these species should not proceed without consultation under Section 7 of the Endangered Species Act (ESA). Construction and operation of the Proposed Project shall proceed according to conditions outlined in the relevant take authorizations. • Mitigation for impacts to federally listed species and/or their habitat would be determined through Section 7 ESA consultation between MCB Camp Pendleton and the USFWS. Additional Project specific measures developed during Section 7 consultation would also be implemented as directed by the USFWS. • State listed species with potential to occur onsite include: bank swallow, least Bell's vireo, southwestern willow flycatcher and western yellow-billed cuckoo. Impacts to potential or known habitat for these species should not proceed without consultation with the appropriate agencies including CDFW and MCB Camp Pendleton.	No revisions.
Cultural and Paleontological Resources	
APM CUL-01: Stub Pole Structure in San Mateo Archaeological District (SMAD). SDG&E will conduct additional surveys and testing and evaluation to assess whether or not the proposed stub pole structure will affect buried cultural deposits in the SMAD. A qualified archaeologist and Native American monitor will monitor all overhead work within the SMAD to ensure no impact is made during the ingress and egress of large vehicles. All ground disturbance work within the SMAD will be monitored by a qualified archaeologist and Native American monitor. As necessary and as feasible, SDG&E will investigate and implement additional design adjustments to avoid and/or minimize impacts to this resource.	Superseded by MM Cultural-1: Cultural Resource Monitoring, MM Cultural-2: Cultural Resource Avoidance Procedures, and MM Cultural-3: Discoveries of Cultural Resources

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APM CUL-02: Additional Avoidance and Minimization. SDG&E will implement additional avoidance and minimization recommendations described in the Recommendations for Cultural Resources Protection and Avoidance for the TL 695 and TL 6971 Reconductor Project Report. This document describes avoidance and minimization recommendations at each Proposed Project component that may have an adverse effect on cultural resources. The recommendations include no access roadway improvements within specified cultural sites, use of a truck mounted guard structure at guard structure 3, periodic archaeological and Native American spot-checking of construction activities, and other recommendations.	No revisions.
APM CUL-03: Cultural Resources Sensitivity Training. Prior to construction or ground disturbing activities, all SDG&E, contractor, and subcontractor personnel will receive training regarding the appropriate work practices necessary to effectively implement standard operating procedures and APMs relating to cultural resources, including the potential for exposing subsurface cultural resources and paleontological resources. This training will include presentation of the procedures to be followed upon the discovery or suspected discovery of archaeological materials, including Native American remains, as well as of paleontological resources. A qualified archaeologist will demarcate work areas prior to the start of construction so as to minimize impacts to Environmentally Sensitive Areas. Construction crews will be instructed to work within designated work areas.	Superseded by MM Cultural-4: Worker Training
APM CUL-04: Archaeological Monitoring. A qualified archaeologist and Native American monitor will attend preconstruction meetings, as needed, and a qualified archaeological and Native American monitor will monitor all activities in the vicinity of all known cultural resources within the Proposed Project area. The requirements for archaeological and Native American monitoring will be noted on the construction plans. The archaeologist's duties will include monitoring, evaluation of any finds, analysis of materials, and preparation of a monitoring results report conforming to Archaeological Resource Management Reports guidelines. In the event that cultural resources are discovered, the archaeologist would have the authority to divert or temporarily halt ground disturbance to allow evaluation of potentially significant cultural resources. The archaeologist would contact SDG&E's Cultural Resource Specialist, the Environmental Project Manager, and MCB Camp Pendleton Archaeologist immediately at the time of discovery. The archaeologist, in consultation with SDG&E's Cultural Resource Specialist, and MCB Camp Pendleton Archaeologist shall determine the significance of the discovered resources. SDG&E's Cultural Resource Specialist the Environmental Project Manager, and MCB Camp Pendleton Archaeologist would have to concur with the evaluation procedures to be performed before construction activities would be allowed to resume. For significant cultural resources, preservation in place would be the preferred manner of mitigating impacts. For resources that could not be preserved in place, a Research Design and Data Recovery Program would be prepared and upon approval from MCBCP would be carried out to lessen impacts. A cultural resources curation plan would be developed and implemented if resources cannot be preserved in place, and are considered to be unique and important. All collected cultural remains would be cataloged, and permanently curated with an appropriate institution. All artifacts would be analyzed to identify function and chronology as they relate to the history of the area. Faunal material would be identified as to species.	Superseded by MM Cultural-1: Cultural Resource Monitoring, MM Cultural-2: Cultural Resource Avoidance Procedures, and MM Cultural-3: Discoveries of Cultural Resources

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APM CUL-05: Unanticipated Discovery of Human Remains. If human remains are encountered during construction, SDG&E will comply with California State law (Health and Safety Code Section 7050.5; PRC Sections 5097.94, 5097.98 and 5097.99). This law specifies that work will stop immediately in any areas where human remains or suspected human remains are encountered. The appropriate agency and SDG&E will be notified of any such discovery. SDG&E will contact the Office of the Medical Examiner. The Medical Examiner has two working days to examine the remains after being notified by SDG&E. Under some circumstances a determination may be made without direct input from the Medical Examiner (e.g., when the remains can be positively identified by the archaeologist as being non-human). When the remains are determined to be Native American, the Medical Examiner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will immediately notify the identified most likely descendant (MLD) and the MLD has 24 hours to make recommendations to the landowner or representative for the respectful treatment or disposition of the remains and grave goods. If the MLD does not make recommendations within 24 hours, the area of the property must be secured from further disturbance. If there are disputes between the landowner and MLD, the NAHC will mediate the dispute to attempt to find a resolution. If mediation fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall re-inter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance.	Superseded by MM Cultural-5: Procedure for Discovery of Human Remains
APM CUL-06: Paleontological Monitoring. A paleontological monitor will work under the direction of a qualified Project paleontologist and will be on site to observe excavation operations that involve the original cutting of previously undisturbed deposits for the eight pole structures located within paleontologically sensitive formations (i.e., Pomerado Conglomerate, Late Pleistocene to Holocene-age channel deposits). A paleontological monitor is defined as an individual who has experience in the collection and salvage of fossil materials.	Superseded by MM Paleo-1: Paleontological Monitoring
APM CUL-07: Unanticipated Discovery of Fossils. In the event that fossils are encountered, the paleontological monitor would have the authority to divert or temporarily halt construction activities in the area of discovery to allow recovery of fossil remains in a timely fashion. The paleontologist would contact SDG&E's Cultural Resource Specialist and Environmental Project Manager at the time of discovery. The paleontologist, in consultation with SDG&E's Cultural Resource Specialist would determine the significance of the discovered resources. SDG&E's Cultural Resource Specialist and Environmental Project Manager would have to concur with the evaluation procedures to be performed before construction activities would be allowed to resume. Because of the potential for recovery of small fossil remains, it may be necessary to set up a screen-washing operation on site. If fossils are discovered, the paleontologist (or paleontological monitor) would recover them along with pertinent stratigraphic data. In most cases, this fossil salvage can be completed in a short period of time. Because of the potential for recovery of small fossil remains, such as isolated mammal teeth, recovery of bulk sedimentary-matrix samples for off-site wet screening from specific strata may be necessary, as determined in the field. Fossil remains collected during monitoring and salvage would be cleaned, repaired, sorted, cataloged, and deposited in a scientific	Superseded by MM Paleo-2: Evaluation and Treatment of Previously Undiscovered Paleontological Resources

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institution with permanent paleontological collections, and a paleontological monitoring report would be prepared.	
Hydrology and Water Quality	
APM HYD-01: Work within and near Jurisdictional Wetlands. Pole structures 124 and 125 are located within a jurisdictional wetland. Activities within a jurisdictional wetland will be limited to overhead work only. No digging, filling or other ground disturbing activity shall occur at these locations. Minor vegetation trimming to create an access footpath is permitted.	No revisions.
Noise	
APM NOI-01: Construction Notification. Residents within 50 feet of Proposed Project activities will receive notification of the start of construction at least one week prior to the start of construction activities in that area.	Superseded by MM Noise-2: Notification and Complaints
APM NOI-02: Meet and Confer with City of San Clemente. SDG&E will meet and confer with the City of San Clemente, as needed, to discuss any anticipated deviations from the requirements of the City's noise ordinance.	Superseded by MM Noise-1: Adherence to City of San Clemente Noise Ordinance
APM NOI-03: Helicopter Use. Helicopter takeoffs and landings conducted at the two ILAs along Avenida Pico and at the Talega Staging Yard will be restricted to the furthest distance from residences as practicable. Helicopter usage will conform to acceptable hours for construction activities, as outlined within the City of San Clemente Noise Ordinance.	Superseded by MM Noise-3: Helicopter Use
Recreation	
APM REC-01: Construction Notification. Signage will be posted at least four weeks prior to the start of construction in parks and near trails that are adjacent to or cross the Proposed Project. The signage will describe the location and duration of construction activities. The signage will also include contact information for the Proposed Project's public liaison. Recreational managers will also be notified in advance to coordinate at least four weeks prior to the beginning of construction.	No revisions.

2.11 REFERENCES

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SDG&E. 2016a. "Application of San Diego Gas & Electric Company (U 902E) for a Permit to Construct the Tie Line (TL) 695 and TL 6971 Reconductor Project." April 25.

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—. 2016d. "SDG&E Follow-up Response to CPUC Request for Additional Data #2; Permit to Construct the TL 695 and 6971 Reconductoring Project – Application No. A.16-04-022."

—. 2016e. "TL 695 and 6971 Reconductor Project GIS Datasets."

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