3:
PROJECT DESCRIPTION

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3.1 PROJECT OVERVIEW

SCE proposes to construct the Devers-Mirage 115 kV Subtransmission System Split Project to maintain electric system reliability, enhance operational flexibility, and serve projected electrical demand in the Electrical Needs Area, as shown on Figure 1.1: Regional Map and Electrical Needs Area. To accomplish the split of the Devers 115 kV Subtransmission System, SCE proposes to construct two new 115 kV subtransmission line segments, rearrange and modify subtransmission line connections, replace 220 kV and 115 kV circuit breakers, install one 280 MVA 220/115 kV transformer at Mirage Substation, and construct other substation modifications in the cities of Palm Springs, Rancho Mirage, Indian Wells, Cathedral City, Palm Desert, and unincorporated areas of Riverside County, including the Thousand Palms community. In addition, SCE proposes to loop the existing Devers-Coachella Valley 220 kV transmission line into Mirage Substation. The Proposed Project is scheduled to be operational by mid-2010, with construction scheduled to begin by the second quarter of 2009.

3.1.1 Devers 115 kV Subtransmission System Split

The portion of the Proposed Project necessary to accomplish a split of the Devers 115 kV Subtransmission System into the Devers 115 kV Subtransmission System and the Mirage 115 kV Subtransmission System (See Figure 1.2: Proposed Subtransmission System Split in the Electrical Needs Area) includes the following elements:

3.1.1.1 Mirage-Santa Rosa, Mirage-Santa Rosa-Tamarisk, Mirage-Capwind-Devers-Tamarisk, and Mirage-Concho 115 kV Subtransmission Lines

Create the Mirage-Santa Rosa, Mirage-Santa Rosa-Tamarisk, Mirage-Capwind-Devers-Tamarisk, and Mirage-Concho 115 kV subtransmission lines in accordance with the following scope-of-work:

- Replace approximately 1,783 feet of the existing Mirage-Tamarisk single-circuit 115 kV subtransmission line with a new, higher capacity double-circuit 115 kV subtransmission line and replace support structures within existing SCE ROWs from Mirage Substation to Calle Francisco, in the community of Thousand Palms.

- Build a new single-circuit 115 kV subtransmission line on the west side of the existing SCE ROW from Calle Francisco to Calle Desierto (approximately 2,447 feet) on new support structures.

- Build a new single-circuit 115 kV subtransmission line on the east side of the existing SCE ROW, from Calle Desierto through the Tri-Palm Country Club golf course (approximately 1,293 feet) on new wood poles.

- Replace approximately 2,130 feet of the existing Devers-Capwind-Concho-Mirage 115 kV subtransmission line with a new, higher capacity double-circuit 115 kV subtransmission line and replace support structures within existing SCE ROWs from the Tri-Palm Country Club golf course, to I-10.

- Replace an existing single-circuit 115 kV subtransmission wood pole on the northwest corner of Portola Avenue and Gerald Ford Drive, with a new double-circuit TSP, located south of I-10, approximately 50 feet north of the existing wood pole at the intersection of Portola Avenue and Gerald Ford Drive in the City of Palm Desert.

- Install two new 115 kV subtransmission line positions at Mirage Substation; upgrade two existing 115 kV subtransmission line positions at Santa Rosa Substation; upgrade two existing 115 kV subtransmission line positions at Tamarisk Substation; and upgrade two existing 115 kV subtransmission line positions at Devers Substation.

- Replace one 115kV circuit breaker at Tamarisk Substation and replace two 115 kV circuit breakers at Devers Substation.

- Transfer existing fiber optic cable to the new support structures from Calle Francisco to Calle Desierto and install fiber optic and digital telecommunications equipment at Concho, Devers, Mirage, Santa Rosa, and Tamarisk substations.

- Replace two TSPs, one LWS pole, and one wood pole at the intersection of Dinah Shore Drive and Bob Hope Drive with four TSPs, and three LWS poles with three 115 kV pole switches:
    - At the northwest corner of Bob Hope Drive and Dinah Shore Drive, replace one TSP with one new LWS pole to obtain the required vertical rise of the existing conductors that would connect to one new TSP.
    - At the southwest corner of Bob Hope Drive and Dinah Shore Drive, replace one wood pole with one new LWS pole to obtain the required vertical rise of the existing conductors that would connect to one new TSP.
    - At the southeast corner of Bob Hope Drive and Dinah Shore Drive, replace one TSP with one new LWS pole to obtain the required vertical rise of the existing conductors that would connect to one new TSP.
    - At the northeast corner of Bob Hope Drive and Dinah Shore Drive, replace one TSP with one new TSP pole to obtain the required vertical rise.
    - Split the existing Garnet-Santa Rosa 115 kV subtransmission line at the intersection of Bob Hope Drive and Dinah Shore Drive by removing the span of wire that connects the southwest and northeast corner poles
    - Split the Santa Rosa-Tamarisk at the same intersection by dead-ending and grounding the Santa Rosa leg at the northwest corner pole.
    - Connect the open Tamarisk leg of the former Santa Rosa-Tamarisk 115 kV subtransmission line to the open Garnet leg of the former Garnet-Santa Rosa 115 kV subtransmission line at the northeast corner pole of Bob Hope Drive and Dinah Shore Drive.
    - Create the Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line by tapping the former southern segment of the Garnet-Santa Rosa 115 kV subtransmission line to the Mirage-Tamarisk 115 kV subtransmission line at the northwest corner pole.
    - Create the reconfigured Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line by installing a span of conductor between the former north segment of the Garnet-Santa Rosa 115 kV subtransmission line and the former west segment of the Santa Rosa-Tamarisk 115 kV subtransmission line at the northwest corner of Bob Hope Drive and Dinah Shore Drive.

- Split the existing Garnet-Santa Rosa 115 kV subtransmission line by dead-ending and grounding the Garnet leg to the new TSP installed east of Date Palm Drive and south of Varner Road.

- Connect the existing Devers-Capwind-Mirage 115 kV subtransmission line to the former Santa Rosa leg of the former Garnet-Santa Rosa 115 kV subtransmission line at the new TSP installed east of Date Palm Drive and south of Varner Road to form the reconfigured Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line.

3.1.1.2 Devers-Eisenhower-Thornhill and the Eisenhower-Tamarisk 115 kV Subtransmission Lines

Create the new Devers-Eisenhower-Thornhill and the Eisenhower-Tamarisk 115 kV subtransmission lines by rearranging and modifying the existing Tamarisk-Thornhill and Devers-Eisenhower 115 kV subtransmission lines in accordance with the following scope of work:

- Install two TSPs inside Eisenhower Substation.

- Rearrange the existing Tamarisk-Thornhill 115 kV subtransmission line and attach the Tamarisk tap to the switchrack at Eisenhower Substation to create the Eisenhower-Tamarisk 115 kV subtransmission line.

- Attach the Thornhill tap of the existing Tamarisk-Thornhill 115 kV subtransmission line to the existing Devers-Eisenhower 115 kV subtransmission line to create the Devers-Eisenhower-Thornhill 115 kV subtransmission line.

- Upgrade one existing 115 kV subtransmission line position at Devers Substation, upgrade one existing 115 kV subtransmission line at Thornhill Substation, upgrade three existing 115 kV subtransmission line positions at Eisenhower Substation, and upgrade one existing 115 kV subtransmission line position at Tamarisk substation.

- Replace two 115 kV circuit breakers at Devers Substation and replace three 115 kV circuit breakers at Eisenhower Substation.

- Install fiber optic and digital telecommunication equipment at Devers, Eisenhower, Tamarisk, and Thornhill substations.

After the split of the Devers 115 kV Subtransmission System, the following work is necessary to relieve a thermal overload condition that would be created on the newly reconfigured Devers 115 kV Subtransmission System and to maintain transformer emergency loading criteria at Mirage Substation.

3.1.1.3 Farrell-Garnet 115 kV Subtransmission Line

Create the Farrell-Garnet 115 kV subtransmission line in accordance with the following scope-of-work:

- Replace approximately 5.3 miles of the existing Devers-Farrell-Windland single-circuit 115 kV subtransmission line with a new higher capacity double-circuit 115 kV subtransmission line and replace support structures within existing SCE ROWs and franchise locations between Farrell and Garnet substations in the City of Palm Springs.

- Install a new 115 kV subtransmission line position at Farrell Substation and upgrade an existing 115 kV subtransmission line position at Garnet Substation.

- Install a new circuit breaker at Farrell Substation.

- Transfer existing fiber optic cable to the new double-circuit support structures for approximately 5.3 miles and install fiber optic and digital telecommunications equipment at Devers, Farrell, and Garnet substations.

3.1.2 Mirage 220/115 kV Substation

- Install one new 280 MVA 220/115 kV transformer, two new 220 kV circuit breakers, and five new 115 kV circuit breakers at Mirage Substation.

3.1.3 Devers-Coachella Valley 220 kV Loop-In

The portion of the Proposed Project necessary to resolve a forecasted post-transient voltage problem that would exist by 2009 on the Devers 220 kV Transmission System and interconnected IID and MWD facilities includes the following elements:

3.1.3.1 Devers-Coachella Valley 220 kV Loop-In at Mirage Substation

The Proposed Devers-Coachella Valley 220 kV Loop-In at Mirage Substation would include the following work:

- Loop the existing Devers-Coachella Valley 220 kV transmission line into the Mirage Substation along the existing ROW, for approximately 0.8 mile, on double-circuit LSTs, forming the new Devers-Mirage No. 2 and Mirage-Coachella Valley 220 kV transmission lines in accordance with the following scope of work:
  - Install approximately 7,240 feet of single-circuit 220 kV transmission line on eight new, double-circuit LSTs. The new LSTs would be strung with single 1033 kcmil ACSR conductors on new polymer insulators.
  - Remove 4 LSTs and 3,770 feet of existing single-circuit 220 kV transmission line in or near the existing east-west 220 kV ROW north of the Mirage Substation.
  - Install one new TSP and 1,000 feet of single-circuit 220 kV transmission line at Mirage Substation and rearrange the Julian Hinds 220 kV transmission line from the existing LSTs on the west side of the approximately 0.8-mile ROW to existing LSTs on the east side of the approximately 0.8-mile ROW.
  - Install 1,540 feet of single-circuit 220 kV transmission line and remove 820 feet of single-circuit 220 kV transmission line between the 220 kV switchrack located inside Mirage Substation and the three LSTs and one TSP adjacent to the north fence of Mirage Substation.

- Install two new 220 kV transmission line positions at Mirage Substation.
- Install three new 220 kV circuit breakers at Mirage Substation.
- Install digital telecommunications equipment within existing SCE building facilities at Edom Hill Communications Site, Mirage Substation, and Devers Substation.

3.2 PROPOSED PROJECT LOCATION

The Proposed Project would be located in eastern Riverside County, as shown in Chapter 1, Figure 1.1: Regional Map and Electrical Needs Area. The Electrical Needs Area includes the cities of Palm Springs, Cathedral City, Rancho Mirage, Palm Desert, Indian Wells, and unincorporated areas of Riverside County, including the Thousand Palms community.

3.3 PROPOSED DEVERS-COACHELLA VALLEY 220 KV LOOP-IN

3.3.1 Overview

The Proposed Project would create two new 220 kV transmission lines at the Mirage Substation by looping in the existing Devers-Coachella Valley 220 kV transmission line, creating the Devers-Mirage No. 2 and the Mirage-Coachella Valley 220 kV transmission lines within the existing ROW located north of Mirage Substation. Additionally, the Proposed Project would require the relocation of the existing Devers-Mirage, Julian Hinds-Mirage, and Mirage-Ramon 220 kV transmission lines components within the existing ROW and at Mirage Substation.

This portion of the Proposed Project requires eight new LSTs, one TSP, and the removal of four LSTs, plus the addition of new conductor, insulators, and equipment as described below.

3.3.2 Existing 220 kV Line Configurations

Currently, four 220 kV transmission lines are located within the ROW that runs north/south from Mirage Substation to the Devers-Coachella Valley 220 kV transmission line corridor. The Mirage Substation is served by two of the existing lines; the Devers-Mirage and Mirage-Ramon 220 kV transmission lines. The third line, the Julian Hinds-Mirage 220 kV transmission line, is connected to Mirage Substation, but serves as an outgoing 220 kV source line to MWD's Julian Hinds Substation. The fourth line, the Coachella Valley-Ramon 220 kV line, connects directly to the IID's Ramon Substation that is located on the east side of Mirage Substation. The Devers-Mirage, Julian Hinds-Mirage, and Coachella Valley-Ramon 220 kV transmission lines are located on LSTs within an approximately 0.8-mile long and 300-foot wide existing ROW, paralleling Vista de Oro on the east side, and starting at Mirage Substation, heading north to 30th Avenue, which is the approximate intersection of the existing northwest/southeast Devers-Coachella Valley 220 kV ROW. The Mirage-Ramon 220 kV line is located on three TSPs on the north side of the Mirage and Ramon substations, outside the substation fence.

In addition to these four 220 kV transmission lines, the Devers-Coachella Valley 220 kV transmission line is located within the Devers-Coachella Valley 220 kV transmission line ROW, approximately 0.8 mile north Mirage Substation. Figure 3.3-1: Existing and Proposed Devers-Coachella Valley 220 kV Loop-In shows the existing alignment of the above-described 220 kV transmission lines and the associated LSTs.

3.3.3 Proposed 220 kV Line Configurations

To create the proposed Devers-Mirage No. 2 and the Mirage-Coachella Valley 220 kV transmission lines, the existing Devers-Coachella Valley 220 kV transmission line would be looped into Mirage Substation through the installation of new 220 kV LSTs and conductors, and line cutovers. The existing and proposed 220 kV transmission lines would require the use of existing double-circuit LSTs and the installation of new single-circuit and double-circuit LSTs (see Figure 3.3-2: Typical Pole Configurations for the Devers-Coachella Valley 220 kV Loop-In). These lines would require the use of new and existing 1033 kcmil ACSR conductors, spanning approximately 0.8 mile from the Mirage Substation north to the Devers-Coachella Valley 220 kV transmission line ROW. These five 220 kV transmission lines are discussed in more detail below.

3.3.3.1 Reconfigured Devers-Mirage (No. 1) 220 kV Transmission Line

As shown in Figure 3.3-1: Existing and Proposed Devers-Coachella Valley 220 kV Loop-In, the existing Devers-Mirage 220 kV transmission line is located on the east side of the four existing LSTs (#6, #7, #8, and #11) that are located 190 feet east of the western property line of the north/south ROW into Mirage Substation. The existing Julian Hinds-Mirage 220 kV transmission line is located on the west side of the same LSTs.

After new LST #9 is constructed, the existing Julian Hinds-Mirage 220 kV transmission line would be reconfigured as the Devers-Mirage No. 1 line and reside on the west side of three existing LSTs (#6, #7, and #8) and two new LSTs (#5 and #9). Three new spans of conductor would be added north from Mirage Substation: one from the 220 kV switchrack to existing LST #6, one from LST #8 to LST #9, and one span from LST #9 to LST #5. The Devers-Mirage No.1 would connect at LST #5 to the existing Devers-Coachella Valley 220 kV transmission line segment that travels west to Devers Substation. Existing LST #11 would be replaced with LST #5, and two existing conductor spans would be removed: one span from LST #8 to LST #11 and one span from LST #8 to LST #17.

3.3.3.2 New Devers-Mirage No.2 220 kV Transmission Line Segment

As shown in Figure 3.3-1: Existing and Proposed Devers-Coachella Valley 220 kV Loop-In, the new Devers-Mirage No. 2 220 kV transmission line segment would be created by installing new double-circuit LSTs with new conductors for 0.8 mile, from Mirage Substation to the loop-in point. The new line segment would be comprised of five new double-circuit LSTs (#1, #2, #3, #4, and #5) placed approximately 140 feet east of the western ROW property line.

The new conductor would be placed on the east side of the new LSTs, and would connect to the south side of the existing Devers-Mirage 220 kV transmission line at new LST #5.

Figure 3.3-1: Existing and Proposed Devers-Coachella Valley 220 kV Loop-In

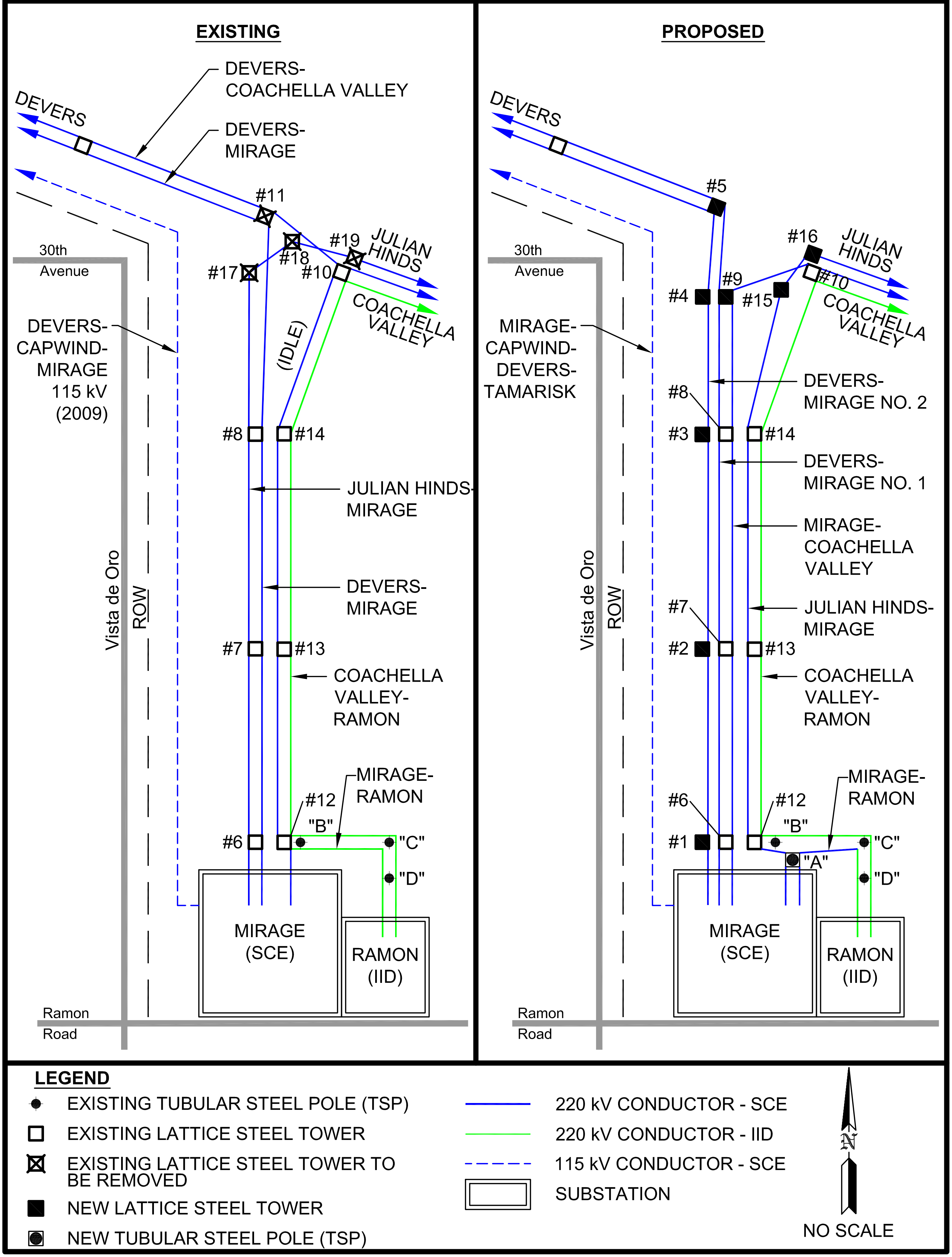

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Figure 3.3-2: Typical Pole Configurations for the Devers-Coachella Valley 220 kV Loop-In

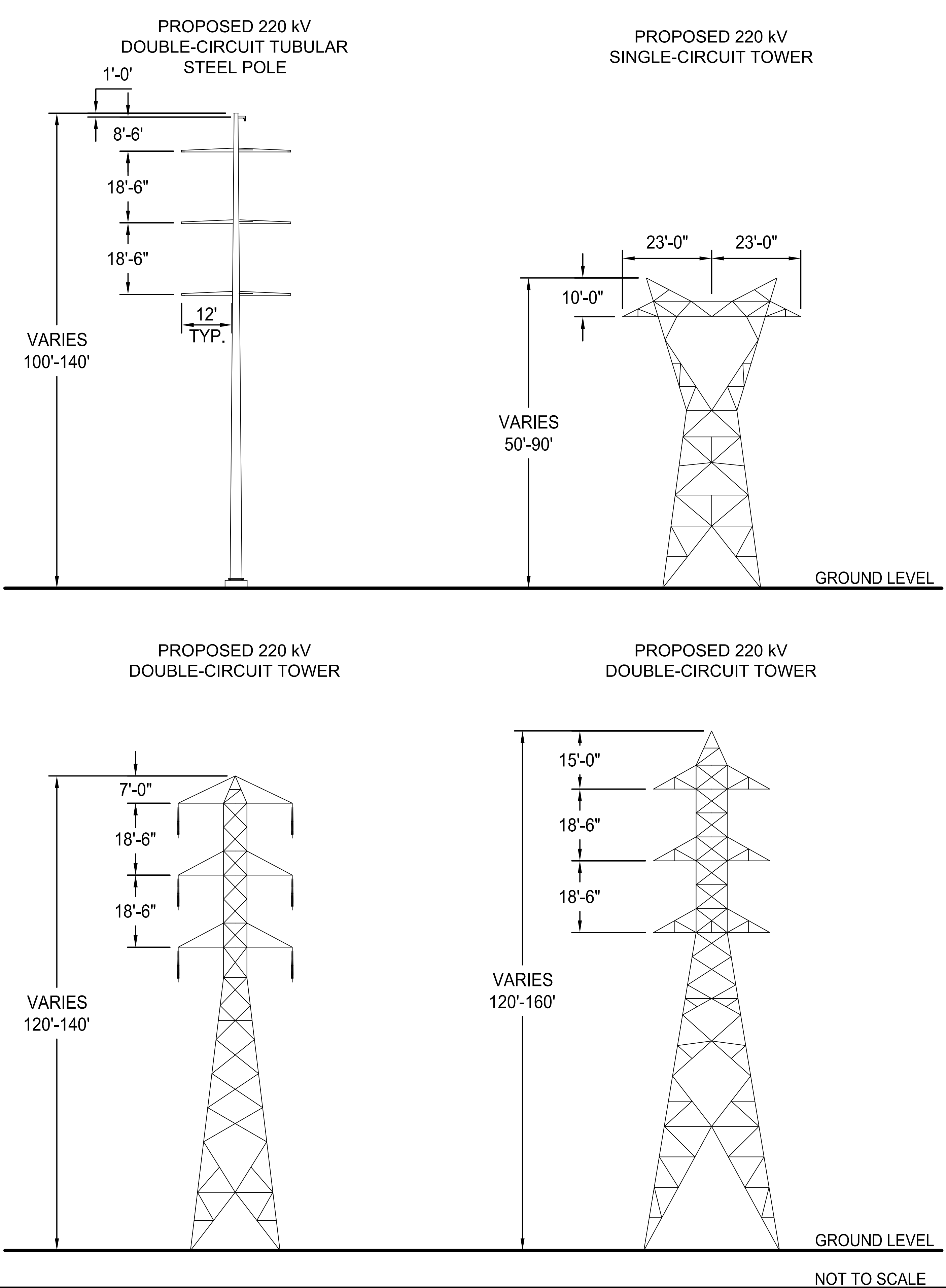

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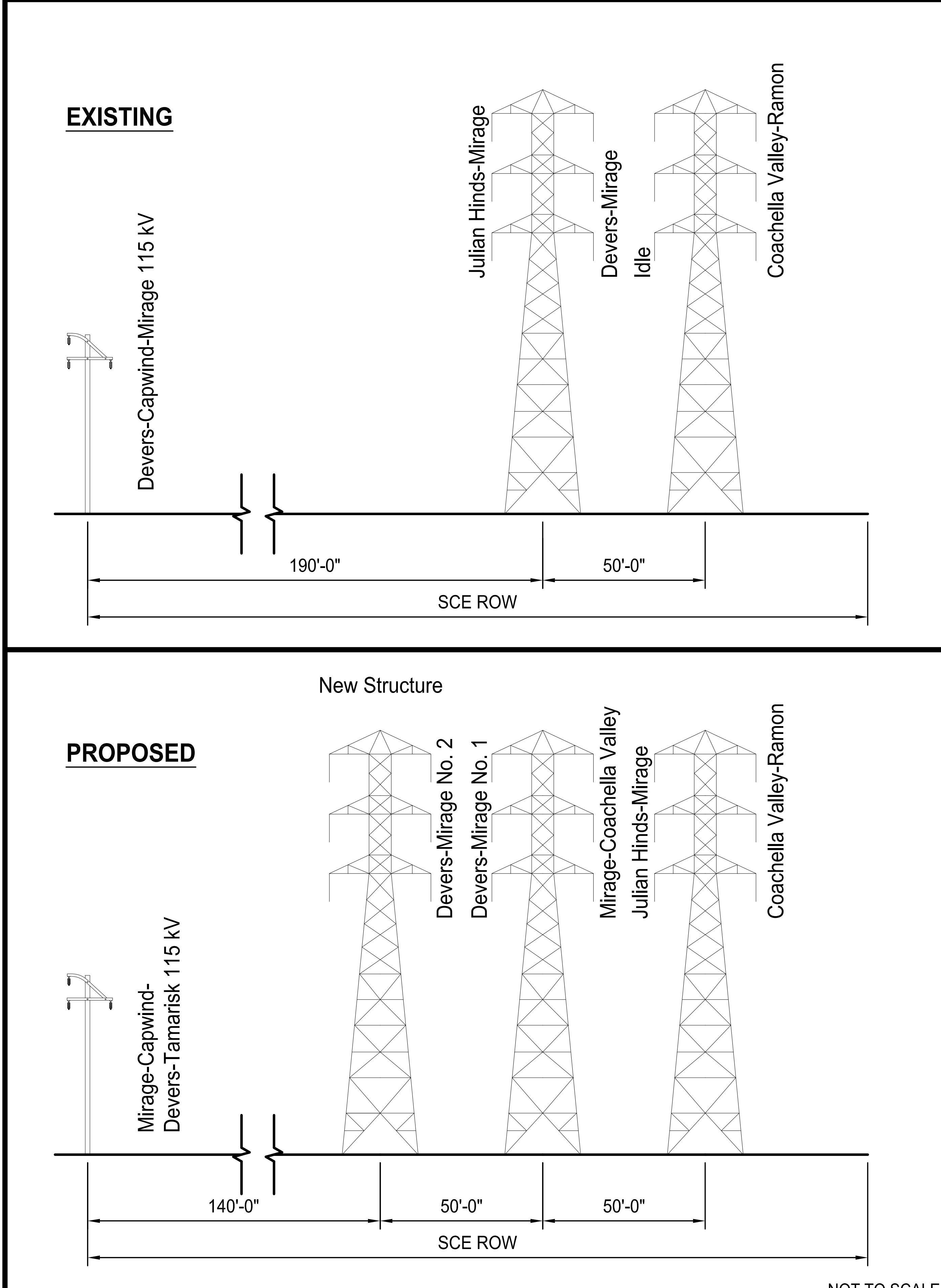
Figure 3.3-3: Existing and Proposed 220 kV Transmission Line Tower Configurations



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3.3.3.3 New Mirage-Coachella Valley 220 kV Transmission Line

As shown in Figure 3.3-1: Existing and Proposed Devers-Coachella Valley 220 kV Loop-In, the new Mirage-Coachella Valley 220 kV transmission line segment would be created by looping in the existing Devers-Coachella Valley 220 kV transmission line into Mirage Substation. This new line would use three existing LSTs (#6, #7, #8) and one new LST (#9) located within the existing ROW, approximately 190 feet east of the western ROW property line. This new line would be located on the eastern side of the LSTs. The new line would connect to the Coachella Valley segment of the former Devers-Coachella Valley 220 kV line at existing LST #10. This line would use two existing spans of conductor (previously used by the Devers-Mirage 220 kV transmission line) between LST #6 and #8 and three new spans of conductor from the Mirage Substation 220 kV switchrack to existing LST #6, between LST #8 and LST #10.

3.3.3.4 Reconfigured Julian Hinds-Mirage 220 kV Transmission Lines

As shown in Figure 3.3-1: Existing and Proposed Devers-Coachella Valley 220 kV Loop-In, the existing Julian Hinds-Mirage 220 kV transmission line resides on the west side of four existing LSTs (#6, #7, #8, and #17) that are located approximately 190 feet east of the western ROW property line along with the existing Devers-Mirage 220 kV transmission line which is located on the east side of these existing LSTs. Additionally, the existing Julian Hinds-Mirage 220 kV transmission line is strung between LST #17, #18, and #19 before proceeding southeasterly within the existing Devers-Coachella Valley 220 kV transmission line ROW.

After the two new single-circuit LSTs (#15 and #16) are constructed, the idle 220 kV transmission line residing on four existing LSTs (#10, #12, #13, and #14), located approximately 240 feet east of the western ROW property line, would be reconfigured using new TSP “A,” three existing LSTs (#12, #13, and #14), and two new LSTs (#15 and #16). Up to six new spans of conductor would be added from the Mirage Substation 220 kV switchrack traveling north to TSP “A” and then north on the LSTs, finally connecting at new LST #16, where it would connect to the existing Julian Hinds 220 kV line that travels east to Julian Hinds Substation. Existing LSTs #17, #18, and #19 would be removed. Also, at least two existing conductor spans would be removed: one span from LST #17 to LST #18 and one span from LST #18 to LST #19.

3.3.3.5 Reconfigured Mirage-Ramon 220 kV Transmission Line

The existing Mirage-Ramon 220 kV line connects SCE’s Mirage Substation to IID’s Ramon Substation. In order to perform the realignment of the Julian Hinds 220 kV line to the western side of the existing LSTs (#12, #13, and #14) described above, the Mirage-Ramon 220 kV line would be reconfigured on new TSP “A” and existing TSPs “B” and “C.” First, as shown in Figure 3.3-1: Existing and Proposed Devers-Coachella Valley 220 kV Loop-In, the existing Ramon-Mirage line would be reconfigured by removing two spans of conductor: one span between LST #12 and existing TSP “B”, on their respective south sides, and one span between TSP “B” and TSP “C,” on their respective south sides. Next, the existing conductor between LST #12 and the Mirage Substation 220 kV switchrack would be replaced with new conductor that would connect the Mirage Substation 220 kV switchrack to new TSP “A”. Finally, a new span of conductor would be installed between new TSP “A” and existing TSP “C”.

3.3.3.6 Structures and Associated Equipment

Eight 220 kV LSTs would each be built on four drilled pier concrete footings. One 220 kV TSP would be built on a single drilled concrete pier footing. The dimensions of each footing are dependent on variables such as topography, tower height, span lengths, and soil properties. On average, a typical footing would have an above-ground projection of about 3 feet. Each LST would range from 50 to 160 feet high and each TSP from 100 to 140 feet high (see Figure 3.3-2: Typical Pole Configurations for the Devers-Coachella Valley 220 kV Loop-In). Final engineering would determine the exact height of each structure. All LSTs would be constructed of dull, galvanized lattice steel angle members connected by steel bolts, and the TSP would be constructed of dull galvanized steel sections connected together through slip joints.

The proposed line segments would utilize three single 1033 kcmil ACSR conductors with non-specular (dulled) finish. Each conductor would be attached to an LST by dead-end or suspension insulator assemblies, consisting of one or two polymer insulators each, oriented horizontally or vertically in each direction. Overhead Ground Wire (OHGW) would be strung on the peaks of the LSTs and TSP for the line segments between the existing Devers-Coachella 220 kV transmission line and the Mirage Substation 220 kV switchracks.

3.3.3.7 Existing Road Activities

Approximately 0.95 mile of existing access and spur roads would be cleared of vegetation, blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy equipment. These roads would be maintained throughout the life of the Proposed Project. The graded road would have a minimum drivable width of 14 feet, with a preferable shoulder width of 2 feet on each side. Drainage structures (e.g., wet crossings, water bars, over side drains, pipe culvers, and energy dissipaters) would be installed along spur and access roads to allow for construction equipment usage, as well as to prevent erosion from uncontrolled water flow. Slides, washouts, and other slope failures would be repaired and stabilized along the roads by installing retaining walls or other means necessary to prevent future failures. The type of mechanically stabilized earth-retaining structure to be used would be based on site-specific conditions.

3.3.3.8 New Road Activities

Where the three new LSTs are to be constructed within the existing access road, the access road would need to be rerouted around each set of structures. Approximately 400 feet of new access road would be required for each of the three sets of LSTs. Also, approximately 120 feet of new spur road to new tower #15 would be required. New roads would be a minimum of 14 feet wide, with grades varying from flat to approximately 12 percent, and would include the drainage structures and erosion controls described above. Approximately 1,320 linear feet of total new access or spur road would be created within the existing Mirage 220 kV ROW.

3.3.4 Construction Plan

The Proposed Devers-Coachella Valley 220 kV Loop-In at Mirage Substation would loop the existing Devers-Coachella Valley 220 kV transmission line into the Mirage Substation along existing ROW for approximately 0.8 mile on double-circuit LSTs forming the new Devers-Mirage No. 2 and Mirage-Coachella Valley 220 kV transmission lines in accordance with the following scope of work:

- Install approximately 7,240 feet of single-circuit 220 kV transmission line on eight new, double-circuit LSTs. The new LSTs would be strung with single 1033 kcmil ACSR conductors on new polymer insulators.
- Remove 4 LSTs and 3,770 feet of existing single-circuit 220 kV transmission line in or near the existing Devers-Coachella Valley 220 kV transmission line ROW north of the Mirage Substation.
- Install one new TSP and 1,000 feet of single-circuit 220 kV transmission line at Mirage Substation and rearrange the Julian Hinds 220 kV transmission line from the existing LSTs on the west side of the approximately 0.8-mile ROW to existing LSTs on the east side of the approximately 0.8-mile ROW.
- Install 1,540 feet of single-circuit 220 kV transmission line and remove 820 feet of single-circuit 220 kV transmission line between the 220 kV switchrack located inside Mirage Substation and the three LSTs and one TSP adjacent to the north fence of Mirage Substation.

3.3.4.1 Tower Site Preparation

Each tower site would be graded or cleared to provide a relatively level pad, free of any vegetation that could hinder tower construction. The tower site (approximately 200 feet by 200 feet) would be graded so that no ponding or erosive water flow could occur that would cause damage to the tower footings. The graded pad would be compacted to at least 90 percent relative density and would be capable of supporting heavy vehicles.

3.3.4.2 Staging and Access

Material would be staged within the Mirage Substation during construction. All material for the proposed 220 kV transmission line loop-in work, including concrete, steel, and wire, would be delivered by truck. Construction traffic would use Ramon Road and would be scheduled for off-peak traffic hours to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being performed.

3.3.4.3 Foundations

After a geotechnical investigation and final engineering of the LSTs have been completed, pier-type foundations would be placed using augured excavation techniques. The depth of the underground portion of the footing would depend on the findings of the geotechnical report. The above-ground portion of the footings would be approximately 3-feet high.

3.3.4.4 Tower Assembly

LSTs would be assembled at each individual LST location. Crews would erect the steel onto the footings and would bolt together the panel sections until the entire LST was erected. Assembly and erection of the LSTs would require an erection crane to be set up approximately 60 feet from the centerline of each LST. The crane pad would be located transversely from each LST location.

3.3.4.5 Removal and Disposal of Existing Wire, Structures and Footings

SCE would remove four existing LSTs and associated hardware (e.g., insulators, vibration dampeners, suspension clamps, ground wire clamps, shackles, links, nuts, bolts, washers, cotters pins, insulator weights, and bond wires). Approximately one day would be required for the removal of each existing LST. The LSTs would be transported off-site with a 40-foot flatbed truck and a companion ¾-ton pick-up truck.

Removal of Existing Transmission Facilities

SCE proposes to remove the existing LSTs through the following activities:

- **Grading:** Grading activities near the existing LSTs may be required to ensure their safe removal.

- **Removal Crane:** For each LST, a crane pad of approximately 50 feet by 50 feet would be constructed to allow a removal crane to be set up at a distance of 60 feet from the LSTs center line. The crane pad would be located transversely from the LST locations.

- **Earth Disturbance:** The existing LST footing would be removed by cutting the tower steel at the top of the footing. The concrete footing will be jack-hammered, as well as all the exposed steel cut away, and removed to a depth of 2 feet below existing grade. Holes would be filled and compressed to 90 percent compaction with native soil and the ground area smoothed to match surrounding topography. The removed concrete and steel material will be transported by dump truck used to remove other material (e.g., conductor removal) and transported to an off-site location of a salvage contractor.

- **Steel Removal:** To remove the steel, crews would cut the steel into manageable lengths that can be loaded and transported away on a 40-foot flatbed truck for further dismantle at the off-site location of a salvage contractor. No hazards would remain following tower removal.

SCE proposes to remove the existing conductor through the following activities:

- **Wire-Pulling Locations:** Wire-pulling locations that are an estimated 200 feet by 200 feet (approximately 0.9 acre) in size and would be sited at each of the three dead-end LSTs and points of inflection. Wire-pulling equipment would be placed intermittently along the utility corridor.

- **Breakaway Reels:** The old conductor wire would be wound onto “breakaway” reels as it is removed.

- **Pulling Cable**: A ⅜-inch pulling cable would replace the old conductor as it is pulled out, thereby allowing complete control of the conductor during its removal. The ⅜-inch line would then be removed under controlled conditions to minimize ground disturbance, and all wire-pulling equipment would be removed.

- **Conductor Disposal:** The conductor would be transported to a material and equipment yard where it would be prepared for recycling.

Disposal of Existing Transmission Facilities

Recyclable or salvageable items would be handled by construction crews processing those materials into roll-off boxes. Salvageable items (e.g., conductor, steel, hardware) would be received, sorted, and baled at a commercial metal-recycling facility in Los Angeles, and then sold on the open market. Items to be recycled include 100 percent of the steel from LSTs (e.g., towers, nuts, bolts, and washers), 100 percent of the conductor wire (e.g., 1033 kcmil ACSR, 605 kcmil ACSR), and 100 percent of the hardware (e.g., shackles, clevises, yoke plates, links, or other connectors used to support conductor). Sanitation waste (i.e., human generated waste) would be recycled according to sanitation waste management practices.

All waste materials that are not recycled would be categorized by SCE in order to guarantee proper final disposal. Examples of disposable waste include wood from cribbing and packing materials, soil and vegetative matter from excavations and land-clearing activity, and miscellaneous refuse generated during construction.

3.3.4.6 Conductor Pulling

Conductor pulling includes all activities associated with the installation of conductors onto the LSTs. This activity includes the installation of OHGW and primary conductor, vibration dampeners, weights, spacers, and dead-end hardware assemblies. Two cable pulls would be performed, one for each circuit, between the switchrack and the LSTs intercepting the 220 kV line. A 200-foot by 200-foot temporary staging area would be required at each of two pulling locations.

Conductor pulling would be conducted in accordance with SCE specifications and similar to process methods detailed in the Institute for Electrical Engineers Standard 524-1992 (Guide to the Installation of Overhead Transmission Line Conductors). Conductors are pulled using individual reels, with ropes strung along the LSTs. Conductors are pulled from each pull location using take-up reels. A standard wire-stringing plan would include a sequenced program of events, beginning with determination of wire pulls and wire-pulling equipment setup positions. Advanced planning would determine circuit outages, pulling times, and safety protocols required to ensure that safe and quick installation of wire is accomplished.

3.3.4.7 Labor and Equipment

Construction would be performed by SCE construction crews and/or by contractors under the supervision of SCE personnel. Anticipated construction personnel and equipment are summarized in Table 3.3-1: Construction Equipment and Workforce Estimates By Activity (Devers-Coachella Valley 220 kV Loop-In).

TABLE 3.3-1
CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY (DEVERS-COACHELLA VALLEY 220 KV LOOP-IN)

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Estimated Workforce	Estimated Activity Schedule (Days)	Duration of Use (Hours/Day)	Estimated Production
Survey				**3**			**1.2 Miles**
½-Ton Pick-Up Truck, 4X4	200	Gas	2		3	8	0.5 Mile Per Day
Marshalling Yards				**4**			
1-Ton Crew Cab 4X4	300	Diesel	1		85 Days	2	Duration of Project
30-Ton Crane Truck	300	Diesel	1			2	
10,000-Pound Rough-Terrain Fork Lift	200	Diesel	2			5	
40-Foot Flat Bed Trailers	N/A	N/A	3			2	
Truck, Semi, Tractor	350	Diesel	1			1	
Office Trailer	N/A	N/A	1			N/A	
Storage Containers	N/A	N/A	3			N/A	
Roads and Landing Work				**3**			**1.2 Miles**
1-Ton Crew Cab 4X4	300	Diesel	1		3	5	0.5 Mile Per Day
Road Grader	350	Diesel	1		3	6	
Track Type Dozer	350	Diesel	1		3	6	
Drum Type Compactor	250	Diesel	1		3	6	
Water Trucks	350	Diesel	3		3	10	
Lowboy Truck/Trailer	500	Diesel	1		3	4	
Excavator	300	Diesel	1		3	6	
Front End Loader	350	Diesel	1		3	6	
Install Foundations				**5**			**8 Towers 1 TSP**
1-Ton Crew Cab Flat Bed, 4X4	300	Diesel	4		17	6	1 Structure Per 2 Days
30-Ton Crane Truck	300	Diesel	2		17	5	
Front End Loader	200	Diesel	1		17	5	
Diggers	500	Diesel	2		17	8	
4,000-Gallon Water Trucks	350	Diesel	2		17	5	

TABLE 3.3-1 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY (DEVERS-COACHELLA VALLEY 220 KV LOOP-IN)							
Primary Equipment Description	**Estimated Horsepower**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Activity Schedule (Days)**	**Duration of Use (Hours/Day)**	**Estimated Production**
10-Yard³ Concrete Mixer Trucks	425	Diesel	6		17	5	
Tower Legs, Haul & Erect				**6**			**8 Towers 1 TSP**
1-Ton Crew Cab Flat Bed, 4X4	300	Diesel	1		4	6	2 Structures Per Day
30-Ton Crane Truck	300	Diesel	1		4	8	
10,000-pound Rough-Terrain Fork Lift	200	Diesel	1		4	6	
40-Foot Flat Bed Truck & Trailer	350	Diesel	1		4	5	
10,000-Pound Rough-Terrain Fork Lift	200	Diesel	1		5	8	
40-Foot Flat Bed Truck & Trailer	350	Diesel	2		5	10	
Tower Assembly				**10**			**8 Towers**
80-Ton Rough Terrain Cranes	400	Diesel	2		8	8	1 Tower Per Day
30-Ton Crane Truck	300	Diesel	2		8	8	
10,000-Pound Rough Terrain Fork Lift	200	Diesel	2		8	5	
¾-Ton Pick-Up Truck, 4X4	300	Diesel	3		8	10	
1-Ton Crew Cab Flat Bed, 4X4	300	Diesel	4		8	5	
Compressor Truck	350	Diesel	2		8	5	
Tower & TSP Erection				**10**			**8 Towers, 1 TSP**
¾-Ton Pick-Up Truck, 4X4	300	Diesel	1		8	5	1 Tower and 1 TSP Per Day
1-Ton Crew Cab Flat Bed, 4X4	300	Diesel	2		8	5	
Compressor Truck	350	Diesel	1		8	5	
180-Ton Rough-Terrain Crane	500	Diesel	1		8	6	
Tower Removal				**3**			**4 Towers**
¾-Ton Pick-Up Truck, 4X4	300	Diesel	1		4	8	1 Tower Per Day
40-Foot Flat Bed Truck	350	Diesel	1		4	8	
Conductor Installation				**12**			**1.2 Miles**
1-Ton Crew Cab Flat Bed, 4X4	300	Diesel	3		10	8	0.12 Mile Per Day
Wire Trucks &	350	Diesel	2		6	2	

TABLE 3.3-1 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES BY ACTIVITY (DEVERS-COACHELLA VALLEY 220 KV LOOP-IN)							
Primary Equipment Description	**Estimated Horsepower**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Workforce**	**Estimated Activity Schedule (Days)**	**Duration of Use (Hours/Day)**	**Estimated Production**
Trailers							
Dump Truck (Trash)	350	Diesel	1		10	2	
¾-Ton Pick-Up Truck, 4X4	300	Diesel	1		10	10	
30-Ton Manitex	350	Diesel	2		10	6	
22-Ton Manitex	350	Diesel	1		10	8	
Sleeving Rigs	350	Diesel	2		10	2	
Log Truck & Trailer	500	Diesel	1		10	2	
20,000-Pound Rough-Terrain Fork Lift	350	Diesel	1		10	2	
580 Case Backhoe	120	Diesel	1		6	2	
Spacing Carts	10	Diesel	4		6	4	
Static Truck	350	Diesel	1		6	2	
Static Tensioner	0	Diesel	1		6	2	
3-Drum Strawline Pullers	300	Diesel	2		6	4	
60lk Puller	525	Diesel	1		6	3	
Sag Cat with 2 Winches	350	Diesel	1		6	2	
D8 Cats	300	Diesel	4		6	1	
Hughes 500 E Helicopter	650	Jet A	1		3	4	
Fuel, Helicopter Support Truck	300	Diesel	1		3	2	
Low Boy Truck & Trailer	500	Diesel	1		10	2	
Restoration				**5**			**½ Mile**
1-Ton Crew Cab 4X4	300	Diesel	1		4	5	½ Mile Per Day
Road Grader	350	Diesel	1		4	6	
Track Type Dozer	350	Diesel	1		4	6	
Drum Type Compactor	250	Diesel	1		4	6	
Water Trucks	350	Diesel	3		4	10	
Lowboy Truck/Trailer	500	Diesel	1		4	4	
Front End Loader	350	Diesel	1		4	6	
Excavator	300	Diesel	1		4	6	

3.3.4.8 Ground Disturbance

Table 3.3-2: Summary of Proposed Devers-Coachella Valley 220 kV Loop-In Ground Disturbing Activities provides a summary of the amounts of temporary and permanent ground disturbance that would occur as a result of construction of the Proposed Devers-Coachella Valley 220 kV Loop-In.

TABLE 3.3-2
SUMMARY OF PROPOSED DEVERS-COACHELLA VALLEY 220 KV LOOP-IN GROUND DISTURBING ACTIVITIES

Length of proposed transmission line	0.8 mile (approximately)
Number of existing structures removed	4
Area affected by structure removal	3.7 acres (temporary)
Number of new structures installed	9
Area affected by new structure installation	8.2 acres (permanent)
Number of pulling/splicing sites	5
Area affected by pulling/splicing sites	4.5 acres (temporary)
Number of laydown sites	4
Area affected by laydown sites	0.92 acre (temporary)
Area affected by widening access road and spur roads	0.55 acre (1,320 feet) (permanent)

Notes:
1) All quantities are preliminary estimates and subject to modification based on final engineering.
2) Disturbance for the pulling sites would coincide with the disturbance of the installation of the new structures, resulting in no additional permanent or temporary impacts

3.3.4.9 Hazardous Material Usage and Waste Generation

Construction of the proposed 220 kV transmission line loop-in would require limited use of hazardous materials, including fuel, lubricants, and cleaning solutions. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the Construction Storm Water Pollution Prevention Plan, for the transmission segments. Construction of the proposed 220 kV transmission line loop-in would generate waste in the form of wood, soil and vegetation, and sanitation waste.

3.3.4.10 Post-Construction Clean-Up and Restoration

All debris associated with construction of the proposed 220 kV transmission line loop-in would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations. After construction activities are completed, the area of the Proposed 220 kV transmission line loop-in would be scarified and allowed to return to natural conditions.

3.3.4.11 Construction Schedule

Construction of the proposed 220 kV transmission line loop-in would begin approximately during the second quarter of 2009 and would conclude by mid-2010.

3.4 PROPOSED 115 kV SUBTRANSMISSION LINES

3.4.1 Overview of Line Configuration to Support Proposed Devers 115 kV Subtransmission System

The Devers Subtransmission System consists of multiple 115 kV subtransmission lines connecting Devers and Mirage substations, the eight distribution substations, and wind generation in the Electrical Needs Area. The existing 115 kV subtransmission lines that would be affected by the Proposed Project as part of the newly created Devers 115 kV Subtransmission System are the Garnet-Santa Rosa, Tamarisk-Thornhill, and Devers-Eisenhower 115 kV lines (see Figure 1-6: Proposed Devers and Mirage 115 kV Subtransmission Systems [2010]). The Proposed Project addresses the forecasted Devers-Eisenhower-Thornhill 115 kV subtransmission line thermal overload by constructing the new Farrell-Garnet 115 kV subtransmission line and reconfiguring the Tamarisk-Thornhill and Devers-Eisenhower 115 kV subtransmission lines. The Garnet-Santa Rosa 115 kV subtransmission line is reconfigured as part of the Mirage 115 kV Subtransmission System work described in Section 3.4.2.

3.4.1.1 Existing Line Configurations (2009)

Devers-Windland-Farrell 115 kV Subtransmission Line

The Devers-Windland-Farrell 115 kV subtransmission line is constructed on single-circuit structures and parallels Diablo Road southerly to Garnet Road south of the I-10 Freeway. At Garnet Road, the line proceeds easterly past Indian Avenue around Garnet Substation. The line proceeds easterly by southeasterly, paralleling the I-10 Freeway until immediately west of Gene Autry Trail, where it crosses the Union Pacific Railroad in a southeasterly direction to the east side of Gene Autry Trail. The line proceeds south on the east side of Gene Autry Trail until it reaches Farrell Substation.

Tamarisk-Thornhill 115 kV Subtransmission Line

The Tamarisk-Thornhill 115 kV subtransmission line is constructed on single-circuit structures. The line proceeds west out of Tamarisk Substation until Date Palm Drive, where it proceeds north to Dinah Shore Drive. At Dinah Shore Drive, the line proceeds west to Gene Autry Trail, where it turns north and proceeds through Eisenhower Substation. At East Sunny Dunes Road, the line proceeds west to Thornhill Substation.

Devers-Eisenhower 115 kV Subtransmission Line

The Devers-Eisenhower 115 kV subtransmission line proceeds east out of Devers Substation parallel to the Devers-Mirage 220 kV transmission line corridor until Date Palm Drive, where it proceeds south to 33rd Avenue. At 33rd Avenue, the line proceeds west to Eisenhower Substation, located at East Mesquite Avenue and Gene Autry Trail.

3.4.1.2 Proposed Line Configurations (2010)

Proposed Farrell-Garnet 115 kV Subtransmission Line Configuration

The Proposed Project would construct the Farrell-Garnet 115 kV subtransmission line by replacing approximately 5.3 miles of the Devers-Windland-Farrell 115 kV subtransmission line on single-circuit wood poles between Garnet Substation and Farrell Substation with new double-circuit LWS and TSPs using existing ROWs and franchise locations. The existing Devers-Farrell-Windland 115 kV line would be transferred to the new double-circuit poles. (See Figure 3.4-1: Existing Devers-Windland-Farrell and Proposed Farrell-Garnet 115 kV Subtransmission Lines)

Reconfigured Eisenhower-Tamarisk 115 kV Subtransmission Line Configuration

The Proposed Project would create the Eisenhower-Tamarisk 115 kV subtransmission line by reconfiguring the existing Tamarisk-Thornhill 115 kV subtransmission line inside Eisenhower Substation. This new line would remain open at Tamarisk Substation and be available as a 115 kV system parallel point between the Devers and Mirage subtransmission systems. (See Figure 1.6: Proposed Devers and Mirage 115 kV Subtransmission Systems [2010])

All work would be done inside the Eisenhower Substation.

Reconfigured Devers-Eisenhower-Thornhill 115 kV Subtransmission Line

The Proposed Project would create the Devers-Eisenhower-Thornhill 115 kV subtransmission line by reconfiguring the existing Tamarisk-Thornhill 115 kV subtransmission line and connecting it to the existing Devers-Eisenhower 115 kV subtransmission line inside Eisenhower Substation (See Figure 1.6: Proposed Devers and Mirage 115 kV Subtransmission Systems [2010]).

The remaining Tamarisk-Thornhill 115 kV subtransmission line segment between Thornhill and Eisenhower substations would be connected at the 115 kV switchrack, and using two new TSPs inside the substation, to the existing Devers-Eisenhower 115 kV subtransmission line position inside Eisenhower Substation.

All work would be done inside the Eisenhower Substation.

3.4.1.3 Engineering Plan to Support the Proposed Devers 115 kV Subtransmission System

As discussed above, to accomplish the subtransmission line construction for the proposed Devers 115 kV Subtransmission System, approximately 171 new poles would be installed. Approximately 161 poles would be direct-buried, double-circuit LWS poles. The LWS poles would be approximately 65 to 80 feet high, of which approximately 10 feet would be buried. (see Figure 3.4-6: Typical 115 kV Subtransmission Line Pole Configurations) The remaining 10 poles would be bolted based TSPs between 70 and 100 feet tall above ground, depending on their specific location. The TSPs would be bolted to steel-reinforced (rebar) concrete footings approximately 6 feet in diameter and at least 22 feet below the ground surface. The above-ground portion of the footing could be approximately 2 feet. Existing distribution lines attached to the existing wood poles would be transferred to the new LWS and TSP poles.

The Proposed Project would utilize 954 SAC conductor for the proposed Farrell-Garnet 115 kV subtransmission line and for the reconfigured 115 kV line segments discussed above.

3.4.1.4 Construction Plan to Support Proposed Devers 115 kV Subtransmission System

Proposed Farrell-Garnet 115 kV Subtransmission Line

To create the proposed Farrell-Garnet 115 kV subtransmission line, the following construction would be required:

- Install approximately 8 TSPs and approximately 161 double-circuit LWS poles between Farrell and Garnet substations
- Remove 138 single-circuit wood poles
- Transfer 5.3 miles of existing 653 kcmil ACSR to the new double-circuit poles
- Install 5.3 miles of new 954 SAC to the new double-circuit poles

Reconfigured Eisenhower-Tamarisk 115 kV Subtransmission Line

To create the reconfigured Eisenhower-Tamarisk 115 kV subtransmission line, the following construction would be required:

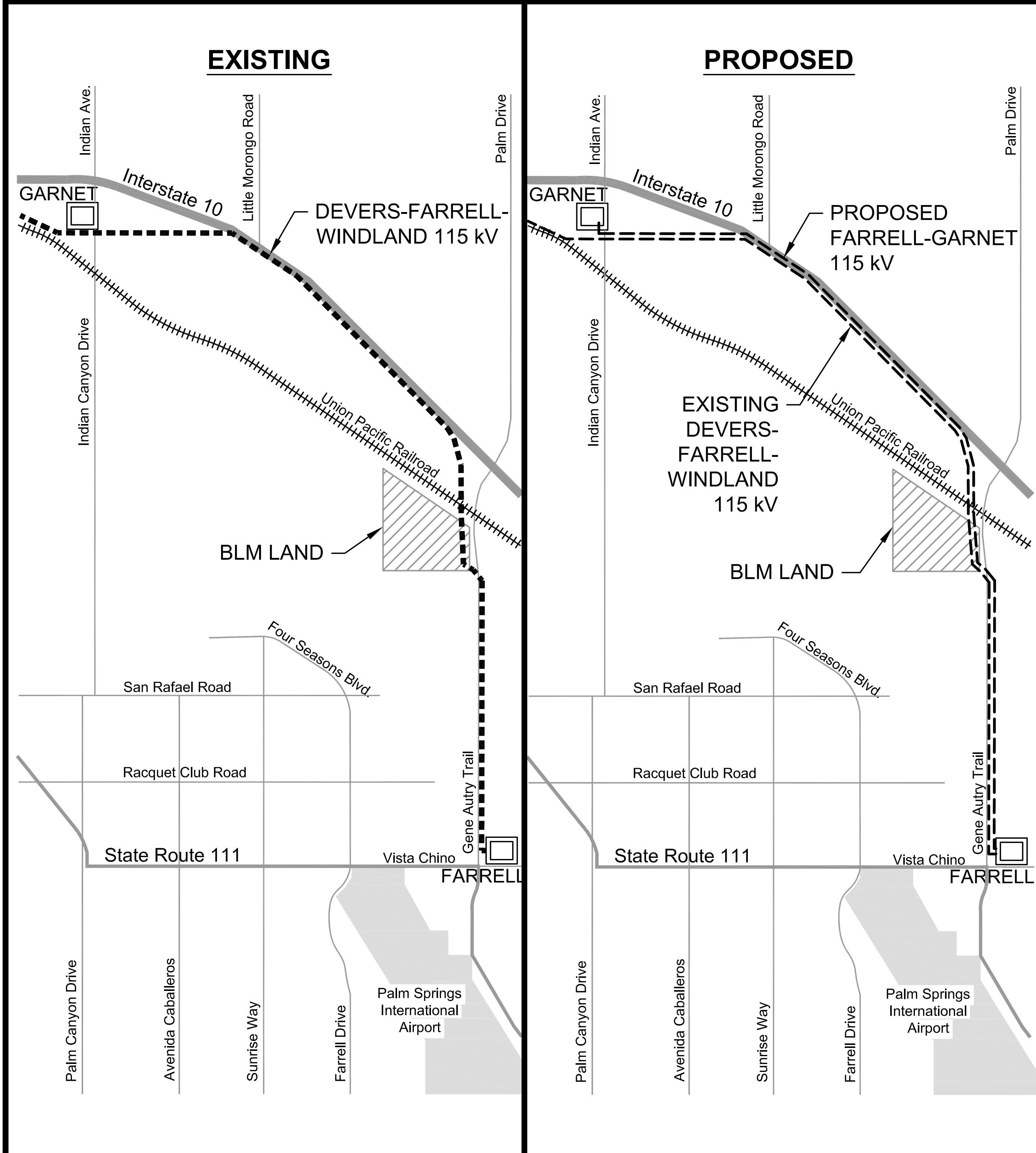
- Install two TSPs inside Eisenhower Substation
- Remove one TSP inside Eisenhower Substation
- Inside Eisenhower Substation, open the underground tap between the Tamarisk and Thornhill substations, connect the Tamarisk 115 kV subtransmission line leg to one of the TSPs, and connect the TSP to the existing substation rack

Reconfigured Devers-Eisenhower-Thornhill 115 kV Subtransmission Line

To create the reconfigured Devers-Eisenhower-Thornhill 115 kV subtransmission line, the following construction would be required:

- Connect the remaining Thornhill 115 kV subtransmission line leg to the Devers-Eisenhower 115 kV subtransmission line inside Eisenhower Substation, using the poles previously installed at Eisenhower Substation for the reconfigured Eisenhower-Tamarisk 115 kV subtransmission line.

Figure 3.4-1: Existing Devers-Windland-Farrell and Proposed Farrell-Garnet 115 kV Subtransmission Lines



LEGEND

- SUBSTATION
- EXISTING 115 kV SINGLE-CIRCUIT SUBTRANSMISSION LINE ROUTE
- PROPOSED 115 kV DOUBLE-CIRCUIT SUBTRANSMISSION LINE ROUTE
- ROADS
- RAILROAD

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3.4.1.5 Staging and Access

The primary material staging areas would be at Devers and Eisenhower Substations, due to their proximity to the work. Material and equipment would be staged in these substations and would include poles, wire reels, insulators, hardware, heavy equipment, light trucks, construction trailers, and portable sanitation facilities. All material for the 115 kV subtransmission line work would be delivered by truck. Construction traffic would primarily use Diablo Road for access to Devers Substation and Palm Drive to Mesquite Avenue for access to Eisenhower Substation. Construction traffic would be scheduled for off-peak traffic hours to the extent possible. Poles would be loaded out of Devers Substation and delivered to the specific locations for installation. For access to project construction sites, construction traffic would primarily use common highways (e.g. Garnet Avenue and Gene Autry Trail or Palm Drive and Mesquite Avenue).

3.4.2 Overview of Line Configurations to Support Proposed Mirage 115 kV Subtransmission System

As of 2007, two 115 kV subtransmission lines are connected to the Mirage Substation transformers: the Devers-Capwind-Mirage-Concho and the Mirage-Tamarisk 115 kV subtransmission lines. Prior to the construction of the Proposed Project, in 2008, the Mirage-Capwind-Concho-Devers 115 kV subtransmission line would be looped into the Mirage Substation 115 kV switchrack, creating the Devers-Capwind-Mirage and the Mirage-Concho 115 kV subtransmission lines. Thus, by the second-quarter of 2009, three 115 kV lines would be connected to the Mirage Substation. The Proposed Project addresses the Mirage-Tamarisk and the 2008 Mirage-Concho 115 kV subtransmission line thermal overloads. To address these overloads, the Proposed Project would construct the new Mirage-Santa Rosa 115 kV subtransmission line and reconfigure the existing Devers-Capwind-Mirage, Garnet-Santa Rosa, Mirage-Concho, Mirage-Tamarisk, and the Santa Rosa-Tamarisk 115 kV subtransmission lines. As a result, the following 115 kV subtransmission lines would be served from Mirage Substation: Mirage-Concho, Mirage-Capwind-Devers-Tamarisk, Mirage-Santa Rosa-Tamarisk, and the newly constructed Mirage-Santa Rosa.

3.4.2.1 Existing Line Configurations (2009)

As discussed above, prior to the Proposed Project, in 2008, the Devers-Capwind-Mirage-Concho 115 kV subtransmission line would be looped into the Mirage Substation 115 kV switchrack forming the Devers-Capwind-Mirage and Mirage-Concho 115 kV subtransmission lines. In 2009, the Mirage-Concho and Mirage-Tamarisk 115 kV subtransmission lines would proceed south out of Mirage Substation towards I-10, within an existing SCE ROW, and the Devers-Capwind-Mirage 115 kV subtransmission line would proceed north out of Mirage Substation, within an existing SCE ROW (see Figure 3.4-2: Existing and Proposed Mirage-Santa Rosa 115 kV Subtransmission Line Configuration).

The work performed in 2008 is solely for the purpose of increasing the reliability of the two existing 115 kV subtransmission lines by utilizing a 115 kV switchrack to connect the 115 kV subtransmission lines to either one of the two existing 220/115 kV transformers inside Mirage Substation in the event one of the 220/115 kV transformers were to fail. Without performing this work in 2008, the 115 kV subtransmission lines could experience sustained outages or substandard voltage related problems should either transformer fail, thus losing the power flow on the affected 115 kV subtransmission line from Mirage Substation. This work is necessary to mitigate power outages to customers or substandard voltage-drop on the 115 kV subtransmission lines served by the Mirage Substation prior to the completion of the Proposed Project.

Mirage-Concho and Mirage-Tamarisk 115 kV Subtransmission Lines

The 2008 Mirage-Concho and Mirage-Tamarisk 115 kV subtransmission lines share an existing ROW south of Mirage Substation that consists of franchise locations and easements. Between Ramon Road and Calle Desierto, the ROW is approximately 140 feet wide. From Calle Desierto to the southern edge of Tri-Palm Estates, at approximately Calle Tosca Drive, the ROW curves slightly to the east. In this portion, the ROW is approximately 150 feet wide. From Calle Tosca to I-10, the ROW straightens out and is approximately 50 feet wide (see Figure 3.4-2: Existing and Proposed Mirage-Santa Rosa 115 kV Subtransmission Line Configuration).

The 2008 Mirage-Concho line is on single-circuit wood poles in an easement on the east side of Vista de Oro, from Mirage Substation to a point just south of Calle Francisco, where it crosses Vista de Oro in a southeasterly direction to join the Mirage-Tamarisk line. The Mirage-Tamarisk line is on single-circuit wood poles within existing SCE easement on the east side of Vista de Oro until it joins the Mirage-Concho line just south of Calle Francisco.

From the juncture of the Mirage-Concho and Mirage-Tamarisk lines at Calle Francisco to a point just south of Tri-Palm Estates at Calle Tosca, the two lines are on double-circuit wood poles and one double-circuit TSP. The Mirage-Concho line is strung on the west side of these double-circuit structures and the Mirage-Tamarisk line is strung on the east side of the structures.

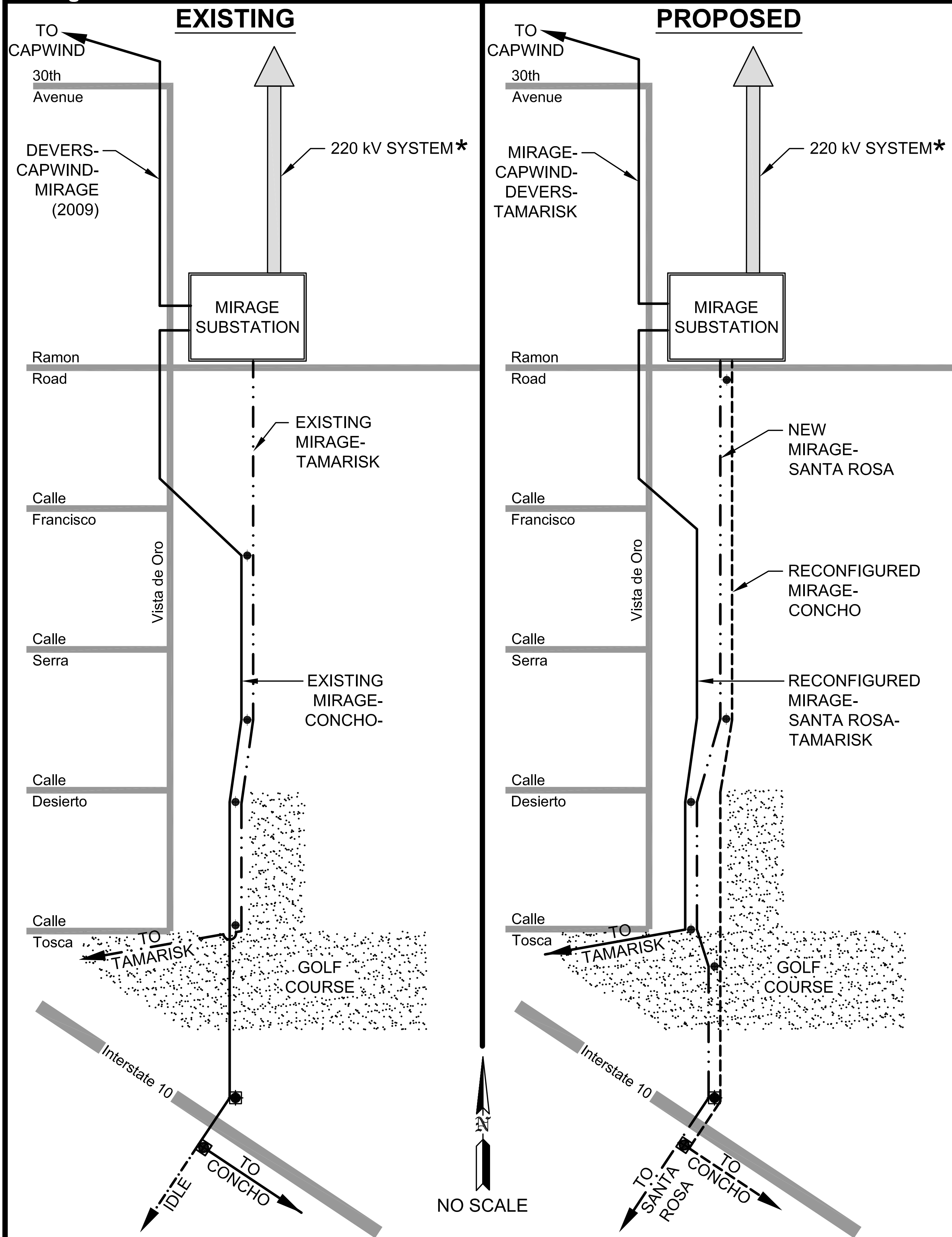
At the intersection of Vista de Oro and Calle Tosca, where the existing double-circuit TSP is located, the Mirage-Tamarisk line proceeds in a westerly direction to Tamarisk Substation on existing support structures. The Mirage-Concho line proceeds south on single-circuit wood poles until it reaches an existing TSP on the north side of I-10. This TSP is engineered for a double-circuit line but currently has only the Mirage-Concho line strung on the structure.

South of I-10, the Mirage-Concho line is strung on the east side of a double-circuit TSP before continuing to Concho Substation on existing single-circuit structures. The west side of this TSP is strung with an idle 115 kV subtransmission line segment that exists on single-circuit structures between I-10 and the corner of Gerald Ford Drive and Portola Avenue.

Devers-Capwind-Mirage 115 kV Subtransmission Line

The Devers-Capwind-Mirage 115 kV subtransmission line is on single-circuit wood poles in an easement, franchise locations, or on fee-owned ROW north of Mirage Substation. This ROW travels approximately 0.8 mile north of Mirage Substation, adjacent to Vista de Oro, from Mirage Substation to 30th Avenue, which is the approximate intersection of the existing Devers-Coachella Valley 220 kV ROW. This 115 kV subtransmission line continues northwest in the existing Devers-Coachella Valley 220 kV ROW until the intersection of Date Palm Drive and Varner Road where it continues along Varner Road until it rejoins the Devers-Coachella Valley 220 kV ROW and then travels to Devers Substation.

Figure 3.4-2: Existing and Proposed Mirage-Santa Rosa 115 kV Subtransmission Line Configuration



* See figure 3.3-1 Existing and Proposed Devers-Coachella Valley 220 kV Loop-In

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3.4.2.2 Proposed Line Configurations (2010)

In 2010, as a result of the Proposed Project, three 115 kV subtransmission lines would proceed south out of Mirage Substation within SCE's existing ROW. These three lines are the reconfigured Mirage-Santa Rosa-Tamarisk line, the proposed Mirage-Santa Rosa line, and the reconfigured Mirage-Concho line. The reconfigured Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line would proceed north out of Mirage Substation on existing structures.

There are no changes or additions to or expansion of the ROWs discussed above for this part of the Proposed Project. Construction of this portion of the Proposed Project is expected to occur completely within existing SCE easements or franchise locations. Figure 3.4-2: Existing and Proposed Mirage-Santa Rosa 115 kV Subtransmission Line Configuration shows the proposed 115 kV line and reconfigured 115 kV line segments that are created as part of the Proposed Project.

Reconfigured Mirage-Santa Rosa-Tamarisk 115 kV Subtransmission Line

The Mirage-Santa Rosa-Tamarisk line would exit on the west side of the Mirage Substation and would utilize existing conductor on one TSP. From this TSP, the 115 kV subtransmission line would utilize existing conductor on single-circuit wood poles in the same easement location previously occupied by the Mirage-Concho line. The Mirage-Santa Rosa-Tamarisk line would be on the east side of Vista de Oro, from Mirage Substation to a point just south of Calle Francisco, where it would cross Vista de Oro in a southeasterly direction. At Calle Francisco, two new TSPs would be installed, and the line would not proceed as far east as the Mirage-Concho line previously did, where it had merged with the Mirage-Tamarisk line.

From the second TSP south of Calle Francisco, the Mirage-Santa Rosa-Tamarisk line would proceed south on new single-circuit LWS poles along the west side of the ROW until it reaches Calle Desierto, where it would join with the proposed Mirage-Santa Rosa line on existing double-circuit wood poles.

The Mirage-Santa Rosa-Tamarisk line would be located on the west side of the existing double-circuit wood poles and proceed to the intersection of Vista de Oro and Calle Tosca, then it would proceed west along Calle Tosca to Tamarisk and Santa Rosa substations on existing structures.

In order to complete the reconfiguration of the Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line and connect this 115 kV subtransmission line to Santa Rosa Substation, four poles would be replaced with seven new poles at the intersection of Bob Hope Drive and Dinah Shore Drive. One wood pole located at the southwest corner would be replaced with one LWS pole (with a new pole switch) and one TSP. One LWS pole located at the northeast corner would be replaced with one TSP. One TSP at the northwest corner would be replaced with one LWS pole (with a new pole switch) and one TSP. One TSP at the southeast corner would be replaced with one LWS pole (with a new pole switch) and one TSP.

The existing Garnet-Santa Rosa 115 kV subtransmission line would be eliminated and the existing wires associated with this 115 kV line and the existing or new wires on these new structures would be used to form the Mirage-Santa Rosa-Tamarisk line and the Mirage-

Capwind-Devers-Tamarisk line. The following work would be required for the proposed reconfiguration of these two lines:

- Split the existing Garnet-Santa Rosa 115 kV subtransmission line at the intersection of Bob Hope Drive and Dinah Shore Drive by removing the span of wire that connects the southwest and northeast corner poles (See Figure 3.4-4: Existing and Proposed 115 kV Subtransmission Line Configurations at Bob Hope and Dinah Shore Drives).

- Split the Santa Rosa-Tamarisk at the same intersection by dead-ending and grounding the Santa Rosa leg at the northwest corner pole. The portion of the Santa Rosa-Tamarisk line between Bob Hope Drive east to Portola Avenue would become idle.

- Connect the open Tamarisk leg of the existing Santa Rosa-Tamarisk 115 kV subtransmission line to the open Garnet leg of the existing Garnet-Santa Rosa 115 kV subtransmission line at the northeast corner pole of Bob Hope Drive and Dinah Shore Drive.

- Create the Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line by tapping the existing southern segment of the Garnet-Santa Rosa 115 kV subtransmission line to the existing Mirage-Tamarisk 115 kV subtransmission line at the northwest corner pole.

Proposed Mirage-Santa Rosa 115 kV Subtransmission Line

The Mirage-Santa Rosa 115 kV subtransmission line would exit south out of Mirage Substation on the new double-circuit LWS poles located in approximately the same alignment as the existing Mirage-Tamarisk line. The Mirage-Santa Rosa line would be strung on the west side of these new double-circuit structures and would proceed south until Calle Francisco. From Calle Francisco the line would be on existing double-circuit wood poles until Calle Desierto, where it would proceed southwesterly to join the reconfigured Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line (discussed above). Next, the Mirage-Santa Rosa 115 kV subtransmission line would be strung on the east side of existing double-circuit wood poles between Calle Desierto and Calle Tosca, on the existing double-circuit wood poles described above.

Next, at Calle Tosca, the Mirage-Santa Rosa line would join the Mirage-Concho 115 kV subtransmission line and proceed south on the west side of new double-circuit LWS poles. At I-10, the existing double-circuit TSP on the north side of I-10 would have three additional arms and insulators installed that would provide for the crossing of I-10 to the existing double-circuit TSP on the south side of I-10.

The proposed Mirage-Santa Rosa 115 kV subtransmission line would be constructed by removing approximately 1,783 feet of existing single-circuit 115 kV subtransmission line between Mirage Substation and a point south of Calle Francisco. The existing single-circuit support structures used for existing Mirage-Tamarisk 115 kV subtransmission line would be replaced with new double-circuit LWS poles. An additional 2,130 feet of single-circuit 115 kV subtransmission line would be replaced from Calle Tosca to I-10. The existing single-circuit wood poles would be replaced with new double-circuit LWS poles.

South of I-10, an existing idle, single-circuit 115 kV subtransmission line between I-10 and the intersection of Gerald Ford Drive and Portola Avenue would be connected to the new 115 kV subtransmission line and energized. A wood pole on the northwest corner of Portola Avenue and Gerald Ford Drive would be replaced with a new double-circuit TSP, approximately 50 feet north of the existing wood pole. (See Figure 3.4-3: Existing and Proposed 115 kV Subtransmission Line Configuration at Portola Avenue and Gerald Ford Drive)

From that point, the Mirage-Santa Rosa line would continue south-west to the Santa Rosa Substation on existing single-circuit structures that were part of the existing Santa Rosa-Tamarisk line. The portion of the existing Santa Rosa-Tamarisk line on Gerald Ford Avenue west to Monterey Avenue then north to Dinah Shore Drive and then west to Bob Hope Drive will become idle.

Reconfigured Mirage-Concho 115 kV Subtransmission Line

The reconfigured Mirage-Concho line would exit Mirage Substation on the new double-circuit LWS poles described above in the discussion of the proposed Mirage-Santa Rosa line. The reconfigured Mirage-Concho line would be strung on the east side of these double-circuit structures and would proceed south until Calle Francisco. From Calle Francisco, the line would be on existing double-circuit wood poles until Calle Desierto.

From Calle Desierto, the reconfigured Mirage-Concho line would proceed south on new single-circuit wood poles to Calle Tosca, where it would angle to the west joining the Mirage-Santa Rosa line on the new double-circuit LWS poles described above.

From Calle Tosca, the reconfigured Mirage-Concho line would be strung on the east side of the new double-circuit LWS poles until it reaches the reconfigured TSP on the north side of I-10 described above. At this location the Mirage-Concho line would cross I-10 to an existing double-circuit TSP on the south side of I-10 and then continue to Concho Substation on existing single-circuit structures.

Reconfigured Mirage-Capwind-Devers-Tamarisk 115 kV Subtransmission Line

The reconfigured Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line would be created by connecting the Devers-Capwind-Mirage 115 kV subtransmission line described above, a portion of the existing Garnet-Santa Rosa 115 kV subtransmission line, a portion of the existing Mirage-Tamarisk 115 kV subtransmission line and rearranging the connections of these existing 115 kV subtransmission lines at the intersection of Bob Hope Drive and Dinah Shore Drive (Figure 3.4-4: Existing and Proposed 115 kV Subtransmission Line Configuration at Bob Hope and Dinah Shore drives) and the intersection of Date Palm Drive and Varner Road (Figure 3.4-5: Existing and Proposed 115 kV Subtransmission Line Configuration at Varner Road and Date Palm Drive).

The work at Bob Hope Drive and Dinah Shore Drive was described previously as part of the Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line work. The work at Date Palm Drive and Varner Road would consist of removing six wood poles and installing one new TSP and four wood poles. The following work would be required for the proposed reconfiguration of the Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line:

- Install a span of conductor between the existing north segment of the Garnet-Santa Rosa 115 kV subtransmission line and the existing west segment of the Santa Rosa-Tamarisk 115 kV subtransmission line at the northwest corner of Bob Hope Drive and Dinah Shore Drive.

- Split the existing Garnet-Santa Rosa 115 kV subtransmission line by dead-ending and grounding the Garnet leg to the new TSP installed east of Date Palm Drive and south of Varner Road. This portion of the Garnet-Santa Rosa line, between the intersection of Date Palm Drive and Varner Road and Garnet Substation, would become idle.

- Connect the existing Devers-Capwind-Mirage 115 kV subtransmission line to the existing Santa Rosa leg of the existing Garnet-Santa Rosa 115 kV subtransmission line at the new TSP installed east of Date Palm Drive and south of Varner Road to form the reconfigured Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line.

Summary of Proposed and Reconfigured 115 kV Subtransmission Lines for the Proposed Mirage Subtransmission 115 kV System

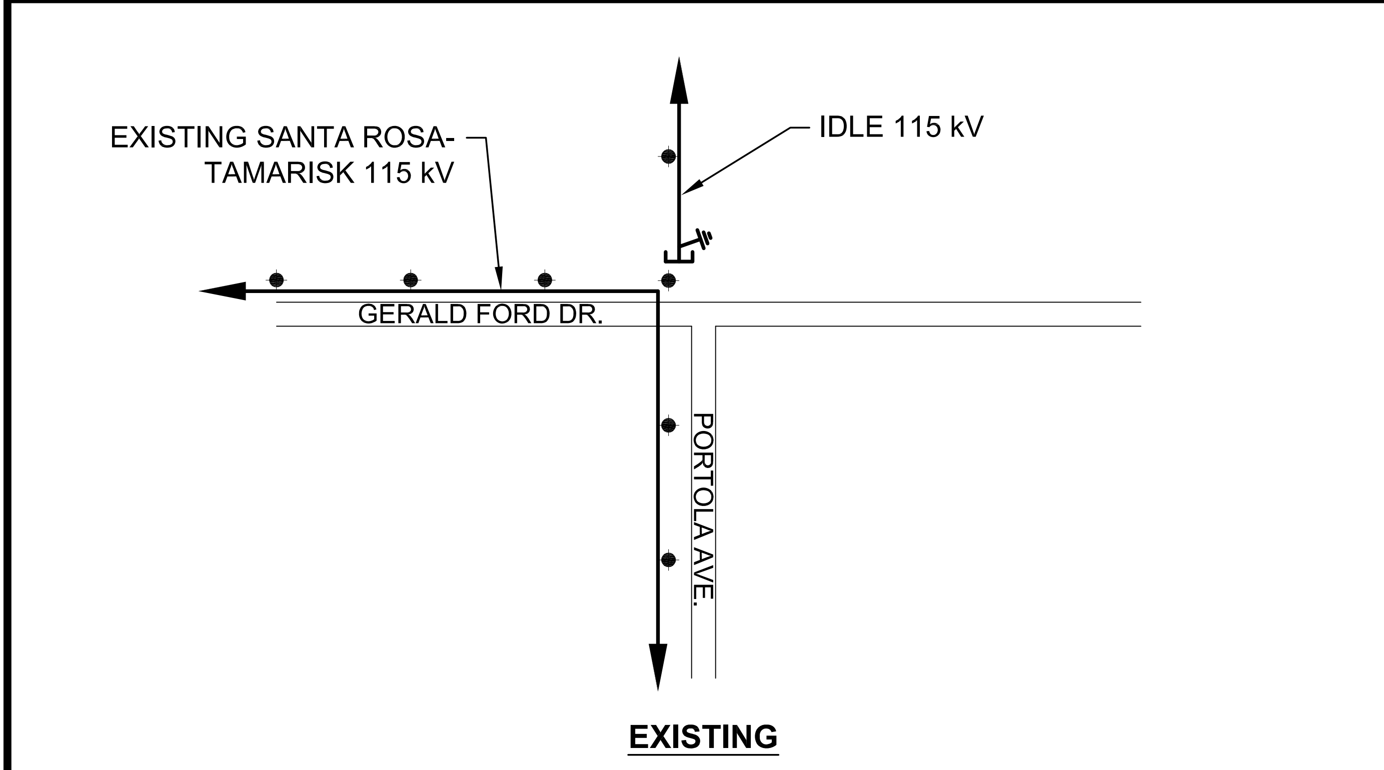
Once the work described above is completed, the existing Garnet-Santa Rosa 115 kV subtransmission line would no longer exist. The existing Mirage-Tamarisk 115 kV subtransmission line would become the Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line. The Devers-Capwind-Mirage 115 kV subtransmission line, created in 2008, would become the reconfigured Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line. The Mirage-Concho 115 kV subtransmission line, created in 2008, would continue to exist. Finally, the new Mirage-Santa Rosa 115 kV subtransmission line would be created.

3.4.2.3 Engineering Plan to Support Proposed Mirage 115 kV Subtransmission System

To accomplish the subtransmission line construction south of Mirage Substation, approximately 55 new poles would be installed. Approximately 37 poles would be direct-buried LWS poles, and approximately 11 would be wood poles. The LWS poles and the wood poles would be approximately 65 to 80 feet high, of which approximately 10 feet would be buried. Illustrations of typical LWS poles are shown in Figure 3.4-6: Typical 115 kV Subtransmission Line Pole Configurations. The remaining 7 poles would be bolted-based TSPs between 70 and 100 feet above ground, depending on their specific location. The TSPs would be bolted to steel-reinforced (rebar) concrete footings approximately 6 feet in diameter and at least 22 feet below the ground surface. The above-ground portion of the footing could be approximately 2 feet. Existing distribution lines attached to the existing wood poles would be transferred to the new LWS and TSP poles.

The Proposed Project would utilize 954 SAC conductor and one 221 kcmil ACSR ground conductor for the new Mirage-Santa Rosa 115 kV subtransmission line and for the reconfigured 115 kV line segments discussed above.

Figure 3.4-3: Existing and Proposed 115 kV Subtransmission Line Configuration at Portola Avenue and Gerald Ford Drive



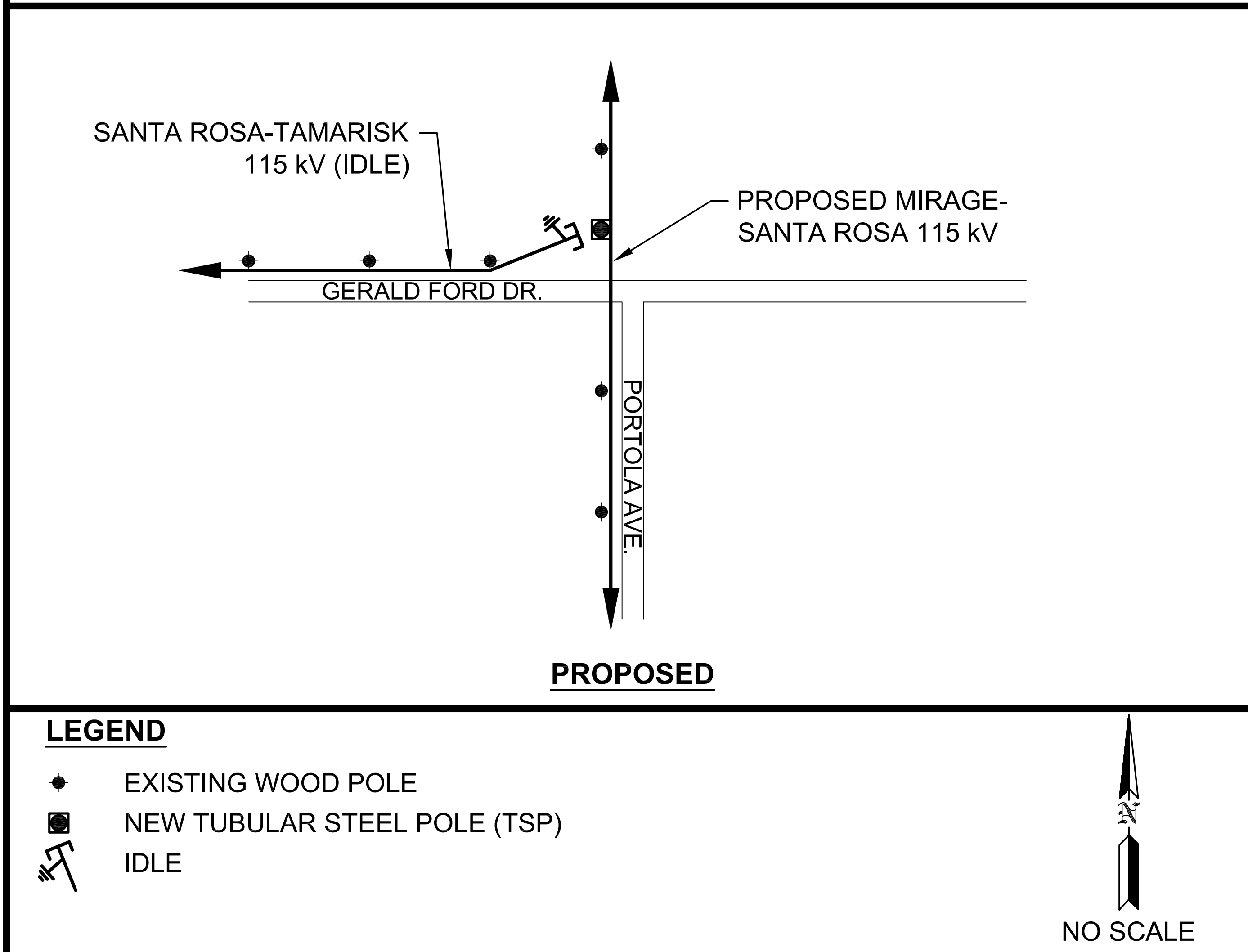


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Figure 3.4-4: Existing and Proposed 115 kV Subtransmission Line Configuration at Bob Hope and Dinah Shore Drives

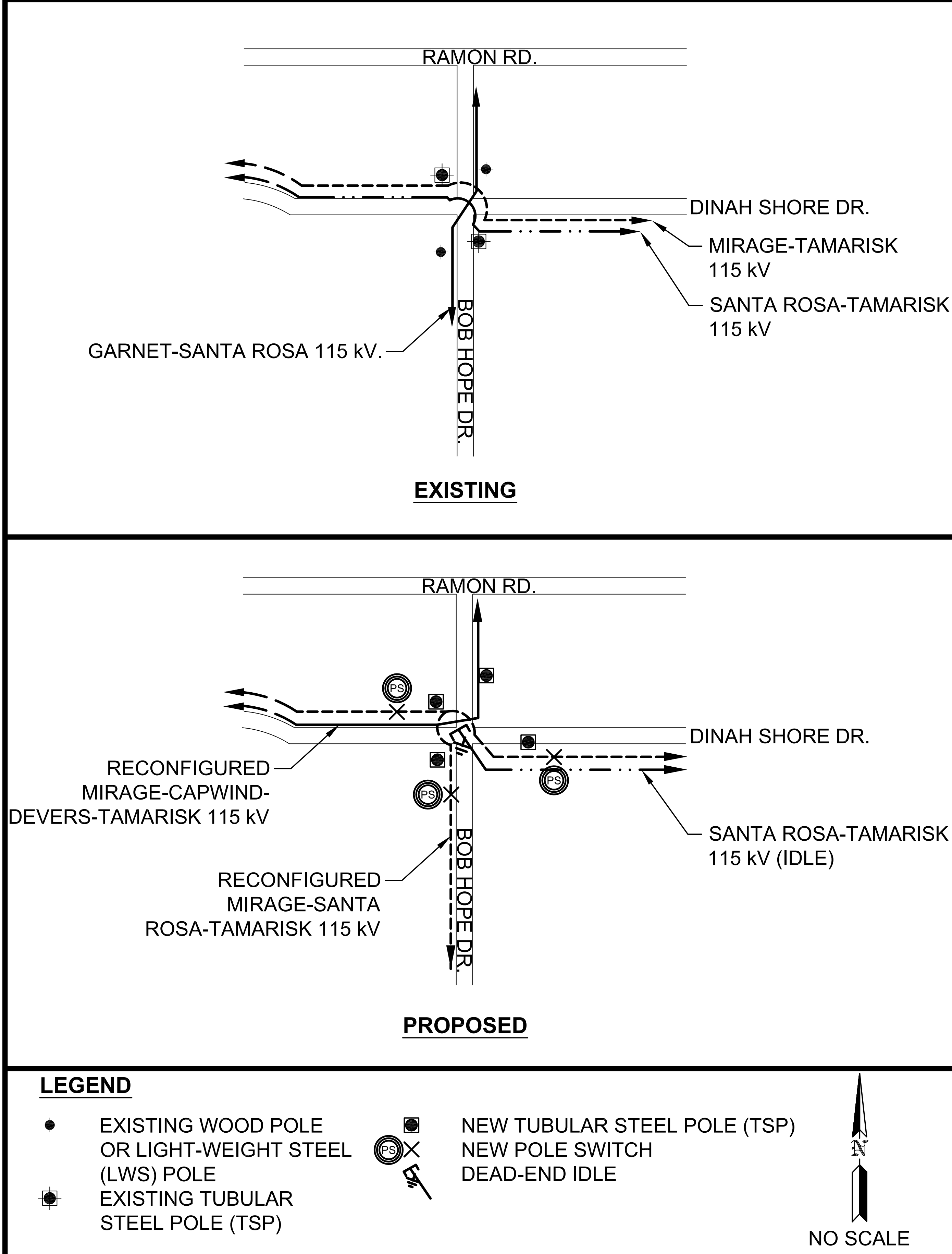

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Figure 3.4-5: Existing and Proposed 115 kV Subtransmission Line Configuration at Varner Road and Date Palm Drive

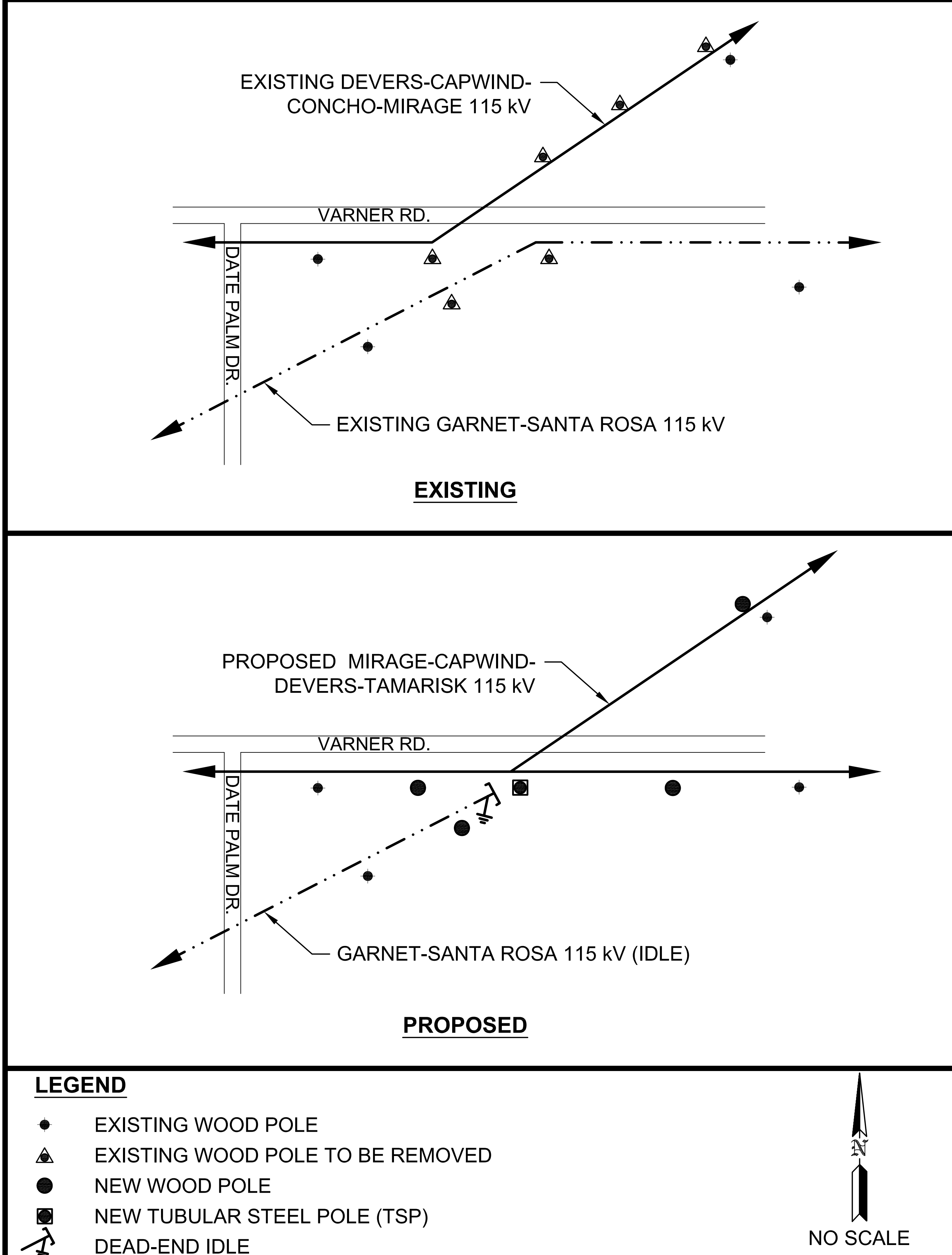

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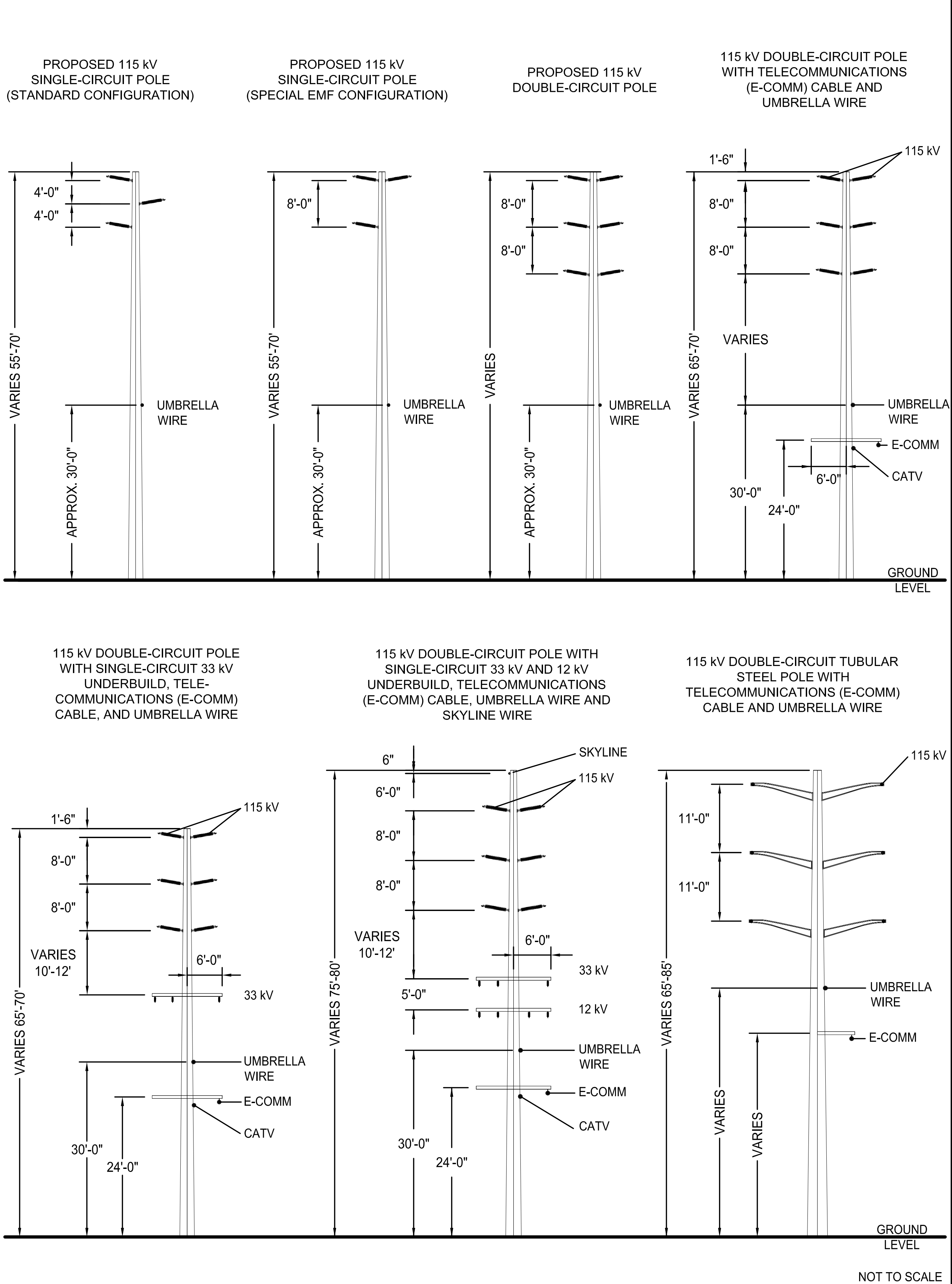
Figure 3.4-6: Typical 115 kV Subtransmission Line Pole Configurations



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3.4.2.4 Construction Plan to Support Proposed Mirage 115 kV Subtransmission System

To create the new Mirage 115 kV Subtransmission System the following construction would be required:

- Install approximately 7 TSPs, approximately 37 double-circuit LWS poles, and approximately 11 wood poles.
- Remove 29 wood poles.
- Transfer approximately 1.5 miles of existing 653 kcmil ACSR to the new LWS and wood double-circuit poles.
- Install 1.5 miles of new 954 SAC and 221 kcmil ACSR to the new double-circuit poles.

3.4.2.4 Staging and Access

Primary material staging areas would be at Mirage and Santa Rosa substations due to their proximity to the work. Material and equipment to be staged in these substation yards would include poles, wire reels, insulators, hardware, heavy equipment, light trucks, construction trailers, and portable sanitation facilities. All material for the 115 kV subtransmission line work would be delivered by truck. Construction traffic would primarily use Ramon Road for Mirage Substation and Monterey Avenue for Santa Rosa Substation. Deliveries would be scheduled for off-peak traffic hours to the extent possible. Poles would be loaded out of either of the two substations and delivered to the specific locations for installation.

All other construction methods that support this construction plan for the proposed Mirage 115 kV Subtransmission System, as well as the reconfigured Devers 115 kV Subtransmission System, are discussed in detail beginning at Section 3.1.1.

3.4.3 Design Features and Common Construction Methods for 115 kV Subtransmission Lines

The following information is common to all 115 kV subtransmission line work previously discussed in Section 3.4.1 and 3.4.2:

3.4.3.1 Structures

New wood, LWS, and TSP poles would support the proposed subtransmission lines. Any existing underbuilt subtransmission lines, distribution lines, and communication lines would be transferred (where applicable) to the new poles installed for the Proposed Project. The existing poles would be removed.

Specific pole height and spacing would be determined upon final engineering and would be constructed in compliance with CPUC General Order (GO) 95 and other factors including, but not limited to:

- length of span between poles (average span of 200 feet; 100-foot minimum span and 500-foot maximum span)

- ground clearances pursuant to GO 95 and SCE construction standards
- overhead clearances pursuant to GO 95 and SCE transmission construction standards
- wind loading
- distance between angle points
- number and voltage of electrical lines installed on the poles

Typical pole (support structures) configurations used for the new Farrell-Garnett and Mirage-Santa Rosa 115 kV subtransmission lines are shown in Figure 3.4-6: Typical 115 kV Subtransmission Line Pole Configurations.

Figure 3.4-7: Tubular Steel Pole Configurations at the Intersection of Bob Hope Drive and Dinah Shore Drive shows the TSP configurations that would be used at Bob Hope Drive and Dinah Shore Drive.

3.4.3.2 Access Roads and Spur Roads

Construction and maintenance of the proposed subtransmission lines would require access to each of the planned pole locations. Public roads and ROWs or privately owned and maintained roads adjacent to the proposed subtransmission line routes would be utilized, whenever possible, to provide construction and maintenance access.

Approximately 3.75 miles of existing access and spur roads would be used and cleared of vegetation and blade-graded to remove potholes, ruts, and other surface irregularities. The existing access and spur roads would be re-compacted to provide a smooth and dense surface capable of supporting heavy equipment. Graded dirt roads would have a minimum drivable width of 14 feet. Trees and other vegetation would be removed or trimmed to obtain the minimum 14 feet of clear, drivable width.

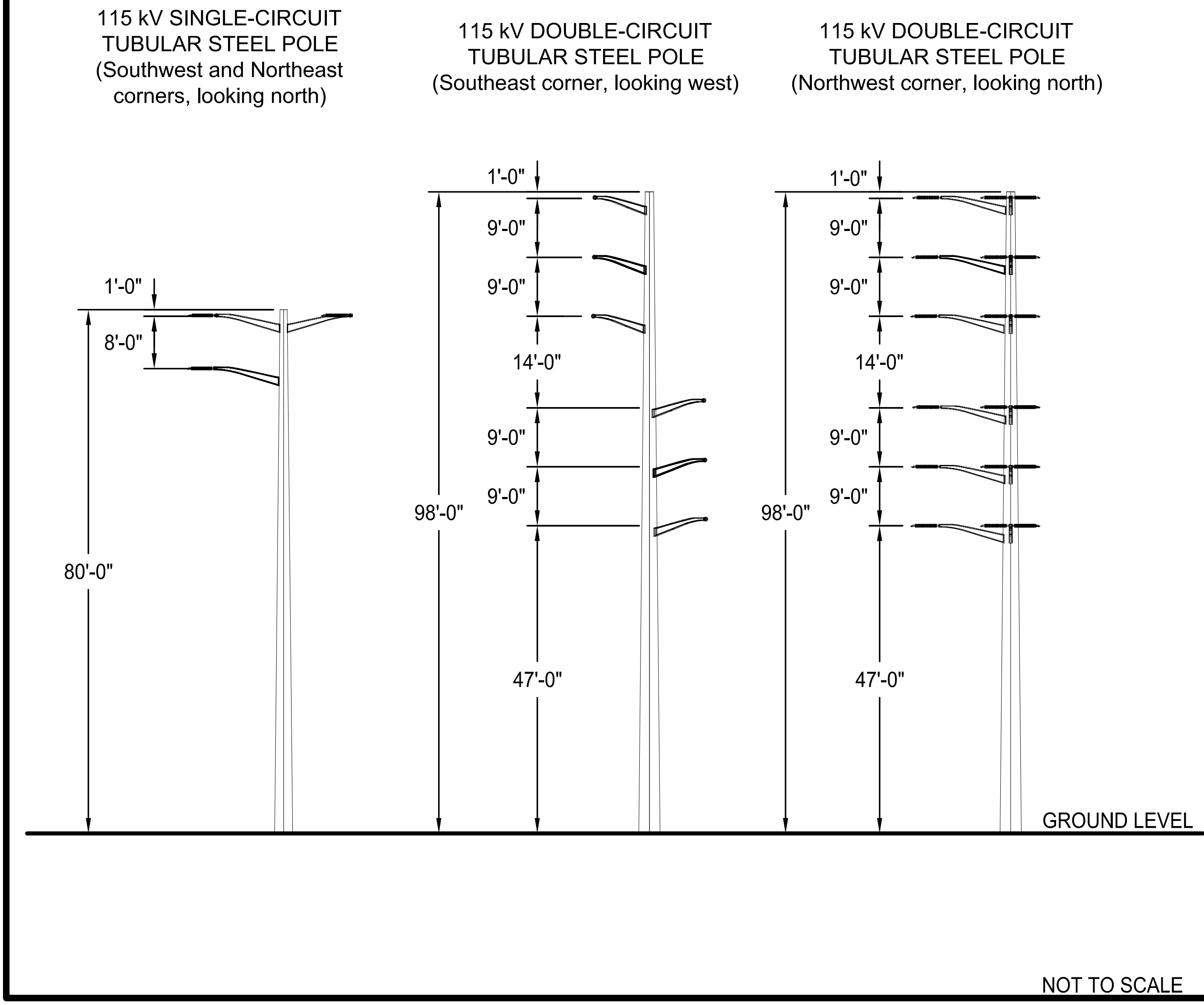
Construction would be performed by SCE construction crews and/or contractors under the supervision of SCE personnel. Anticipated construction personnel and equipment are summarized below in Table 3.4-1: Roadway Personnel and Equipment.

TABLE 3.4-1[1]
ROADWAY PERSONNEL AND EQUIPMENT

Number of Personnel	Equipment[2]	Estimated Usage		
		Hours/Day	Days/Week	Total Days
3	2 Crew Trucks (Gasoline)	2	6	10
	2 Light Trucks	2	6	10
	1 Water Truck	2	6	10
	Crawler D6	10	6	10
	Crawler D8	10	6	10
	Motor Grader	5	6	10

NOTE:
[1] This is a summary table, additional information is provided on Table 3.4-2: Construction Equipment and Workforce Estimates.
[2] Fuel for equipment is diesel except where noted
Source: SCE 2007

Figure 3.4-7: Tubular Steel Pole Configurations at the Intersection of Bob Hope Drive and Dinah Shore Drive



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3.4.3.3 General Construction Plan

To accomplish the entire proposed subtransmission line construction, approximately 226 new poles would be installed. Approximately 201 of the new poles would be direct-buried LWS poles, 75 to 80 feet high, approximately 10 feet of which would be buried. The remaining 25 would be wood poles, and bolted-based TSPs between 70 and 100 feet high (above the concrete footing), depending on their specific location. The TSPs would be bolted to steel-reinforced (rebar) concrete footings approximately 6 feet in diameter and at least 22 feet below the ground surface. The footing, above ground, could add up to 2 additional feet to the total height of installed TSPs. These structures would be placed within existing 115 kV ROWs or existing franchise locations. Existing subtransmission and distribution lines and telecommunications cables attached to the existing wood poles would be transferred to the new TSPs.

3.4.3.4 Steel Pole Installation

Construction activities would begin with the survey of the 115 kV subtransmission line routes. Survey crews would stake the steel pole locations, including reference points and centerline hubs. Survey crews would also survey limits of grading for steel pole excavations.

Any steel poles that are replacing existing wood pole structures in existing ROW areas would be installed as close as possible to the existing poles and would require new excavations to set the poles. As a result, minimal new surface disturbance would be required at these locations. Depending on their location, the assembly and erection of some of the new TSPs may require that a new crane pad, approximately 50 feet by 50 feet (approximately 0.06 acre each), be prepared to allow an erection crane to set up 60 feet from the centerline of each TSP. The crane pad would be located transversely from each applicable TSP location.

Most pole sites would need minimal site preparation prior to pole installation. All of the proposed pole locations would be within existing SCE ROWs or franchise locations. Sites may require minor grading, leveling, or clearing to accommodate the new poles. No new access roads would be necessary. Pole sites would be cleared and graded at approximately the same time that the existing access roads would be graded and cleared of vegetation.

LWS poles would be installed in native soil in holes bored approximately 24 to 30 inches in diameter and 10 to 12 feet deep. LWS poles are normally installed using a line truck. Once the LWS poles have been set in place, bore spoils (material from holes drilled in the soil) would be used to backfill the hole. If the bore spoils are not suitable for backfill, imported clean fill material, such as clean fill dirt and/or pea gravel, would be used. Excess bore spoils would be distributed at each pole site used as backfill for the holes left after removal of the wood poles, or removed..

The TSPs would be installed on top of cylindrical concrete footings approximately 6 to 8 feet in diameter and approximately 20 to 25 feet deep. After holes for the footings have been bored, a steel (rebar) cage would be inserted into the hole, and then concrete would be poured into the hole to a level up to 2 feet above the natural surface. After the concrete has cured, the TSP would be bolted onto the footing. Excess bore spoils would be distributed at each pole site, used as backfill to fill holes left after removal of nearby wood poles, or removed.

Both LWS poles and TSPs consist of separate base and top sections for ease of construction. Steel pole installation would begin by transporting the poles from the staging area and laying the individual sections on the ground at each new pole location. While on the ground, the top section would be pre-configured with the necessary insulators and wire-stringing hardware. A line truck (LWS poles) with a boom on it, or a crane (TSPs) would be used to position each pole base section into previously augured holes (LWS poles) or on top of previously prepared foundations (TSPs). When the base section is secured, the top section would be placed above the base section. The two sections may be spot-welded together for additional stability.

3.4.3.5 Removal of Existing Conductor and Wood Poles

Conductor

After the existing subtransmission and distribution lines have been transferred to the proposed subtransmission line poles, all remaining subtransmission and distribution line conductor that could not be reused by SCE would be removed and delivered to a facility for recycling.

Wood Poles

Following installation of the new steel poles, the existing wood poles would be completely removed (including the below-ground portion). The standard work practice to remove a wood pole is to attach a sling at the upper end of the pole, using boom or crane equipment, while using a hydraulic jack at the base of the pole to vertically lift the pole out of the ground until the pole can be physically lifted completely out of the ground without creating an over limit strain on the boom or crane. Excavation around the base of the wood pole is only required in the event the base of the pole has been encased in hardened soil or man-made materials (e.g., asphalt or concrete), or where there is evidence that the pole has deteriorated to the point that it would splinter or break apart by the jacking and pulling operation described above.

Once the wood pole is removed, the hole would be backfilled using imported fill in combination with fill that may be available as a result of excavation for the installation of the new steel poles. The backfill material will be thoroughly tamped and the filled-hole shall be leveled to grade with no depression or mound allowable. Holes located in areas subject to pedestrian traffic shall be filled level to the walking surface. The last 2 inches of fill shall consist of a firmly packed temporary blacktop patch or equivalent material until permanent walkway (e.g., concrete sidewalks) repairs can be made.

Depending on their condition and original chemical treatment, the wood poles removed could be reused by SCE, returned to the manufacturer, or disposed of in a Class I hazardous waste landfill.

3.4.3.6 Conductor Pulling

Conductors would be installed on 115 kV polymer insulator assemblies attached to each crossarm in a horizontal configuration or suspension assemblies consisting of single polymer insulators attached to each crossarm in a vertical configuration. Overhead ground wires would be installed on the top of the steel poles. Distribution lines transferred to the new steel poles would typically be installed on standard wood crossarms with polymer insulators.

Conductor pulling includes all activities associated with the installation of conductors onto the LWS and wood poles and TSPs. These activities include installing three 115 kV 954 SAC conductors, one 221 kcmil ACSR ground conductor, ground wire, vibration dampeners, weights, and suspension and dead-end hardware assemblies for the entire length of the proposed subtransmission lines.

The standard wire-stringing plan includes a sequenced program of events starting with a determination of the most effective wire pull equipment set-up positions. The conductor-stringing plan may require altered hours of operation, implementation of special dust control measures, or use of guard structures in particular areas to prevent inadvertent stoppages of traveled roadways.

Conductor pulls are the length of any given continuous wire installation process between two selected points along the line. Conductor pulls are selected, where possible, based on availability of dead end structures at the ends of each pull (preferably a TSP), geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setups. Pulling locations are areas of surface disturbance where equipment would be set up for installing the conductors. The dimensions of the area needed for stringing setups varies depending upon the terrain. A typical stringing setup would be 100 feet by 200 feet, depending on placement of a tensioner with a reel stand truck or a puller but, due to space limitations, crews can work within a smaller area. Typically, the maximum conductor pulls and splices would occur every 6,000 feet.

Generally, pulling locations and equipment setup would be in direct line in the direction of the overhead conductors at a distance approximately three times the height of the pole. The exact locations of the pulling sites would be determined during construction.

Special equipment is positioned at each end of the conductor pull. At one end, a puller is positioned, and on the other end a tensioner and wire reel stand truck is positioned. Once positioned, a lightweight sock line is installed through stringing sheaves on each pole for the particular distance selected for the conductor pull. The sock line is then used to pull in the conductor-pulling cable. The conductor-pulling cable is then attached to the three conductors using a special swivel joint to prevent the wire from “blanketing” and allowing it to rotate freely, thus preventing complications from twisting as the conductors unwind off the reels. At the completion of each pull, the conductors are secured to dead ends at each end, sagged to provide proper ground clearance, and secured to the insulators at each pole location. Stringing equipment from one end of the pull is then rotated 180 degrees to face the new pull direction. The equipment from the other end of the pull is then “leapfrogged” to its new pulling position, and the process is repeated. A similar process is employed for the ground wire. Conductor pulling would be in accordance with SCE specifications and similar to process methods detailed in IEEE Std. 524-1992 (Guide to the Installation of Overhead Transmission Line Conductors).

3.4.3.7 Labor and Equipment

Construction would be performed by SCE construction crews or contractors under the supervision of SCE personnel. Anticipated construction personnel and equipment are summarized below in Table 3.4-2: Construction Equipment and Workforce Estimates.

TABLE 3.4-2 CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES (115 kV Subtransmission Lines)						
Number of Personnel	**Primary Equipment Description**	**Estimated Horse-Power**	**Probable Fuel Type**	**Primary Equipment Quantity**	**Estimated Activity Schedule (Days)**	**Duration of Use (Hours/Day)**
30	**Survey**					
	½-Ton Pick-up Truck 4X4	200	Gasoline	1	3	10
	Workers			3	3	10
	Roads					
	1-Ton Crew Cab 4X4	300	Gasoline	2	10	2
	Road Grader	350	Diesel	1	10	10
	Track Type Dozer	350	Diesel	2	10	2.5
	Water Trucks	350	Diesel	1	10	10
	Workers			4	10	10
	Pole Framing and Setting					
	¾-Ton Suburban	300	Gasoline	2	147	10
	5-Ton Framing Truck 4X4	350	Diesel	2	83	10
	30-Ton Line Truck	350	Diesel	2	83	10
	Digger Truck	500	Diesel	1	24	10
	Water Trucks	350	Diesel	1	83	10
	Backhoe	350	Diesel	2	147	10
	Bucket Truck	350	Diesel	2	147	10
	Truck Mounted Crane	350	Diesel	2	147	10
	30-Ton Crane	350	Diesel	1	14	10
	Cement Truck	500	Diesel	1	3	10
	Workers	350	Diesel	16	147	10
	Material Delivery					
	60-foot Flat Bed Pole Truck	350	Diesel	2	5	8
	Forklift	200	Diesel	1	5	8
	Workers			3	5	8
	Conductor Installation					
	Flat Bed Truck & Trailer (Wire Puller)	300	Gasoline	1	24	6
	Flat Bed Truck & Trailer (Wire Dolly)	300	Gasoline	1	24	6
	30-Ton Line Truck	300	Diesel	2	24	5
	¾-Ton Suburban	300	Gasoline	2	24	10
	Water Trucks	350	Diesel	1	24	10
	Bucket Truck	350	Diesel	2	24	6
	Truck Mounted Crane	350	Diesel	2	24	6
	Workers			16	16	10
	Restoration					
	1-Ton Crew Cab 4X4	300	Gasoline	2	40	8
	Water Trucks	350	Diesel	1	40	8
	Workers			8	40	8
Source: SCE 2007						

Construction equipment powered by an internal combustion engine should be equipped with suitable exhaust and intake silencers, in accordance with manufacturers' specifications, and would be maintained in good working order. Stationary construction equipment (e.g., portable power generators, compressors) would be located at the furthest distance possible from nearby residential units while meeting construction requirements and safe work practices.

3.4.3.8 Hazardous Materials and Waste Management

Construction of the 115 kV subtransmission lines would require limited use of hazardous materials, including fuel, lubricants, and cleaning solutions. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction Storm Water Pollution Prevention Plan (SWPPP) for the proposed subtransmission line segments.

Construction of the 115 kV subtransmission lines would result in the generation of various waste materials, including wood, soil, vegetation, and sanitation waste (portable toilets) and disposed of in accordance with Section 3.4.3.10, Post-Construction and Clean-Up.

3.4.3.9 Post-Construction Clean-Up and Restoration

All construction debris associated with construction of the 115 kV subtransmission lines would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations. Although new temporary spur roads might be needed for the proposed 115 kV subtransmission line split, they would be reseeded or scarified and allowed to return to natural conditions after the completion of work. Replacement poles would not impede the flow of sands through the area.

3.4.3.10 Construction Schedule

Construction of the proposed subtransmission lines involves surveying the subtransmission line routes, engineering design based on these surveys, preconstruction biological protocol surveys, construction of the proposed subtransmission lines, and the transfer of existing lines to the new poles. Some of these activities may overlap. SCE anticipates that surveying activities would take 3 to 6 months to complete. Engineering design and physical construction activities, including grading, erecting new poles, installing conductors, transferring existing conductors, and removing unnecessary poles and conductors, would take approximately 12 months.

SCE would anticipate starting construction activities by the second quarter of 2009, following approval from the CPUC of SCE's application for a Permit to Construct (PTC). Survey crews would stake the LWS pole and TSP locations, including reference points and centerline hubs. Reference points, centerline hubs, and footing stakes would then be surveyed. Survey crews would also survey limits of grading for footing excavations, existing access and spur roads, crane pads, and lay-down areas, if necessary.

Preconstruction biological protocol surveys would be conducted after pole and road locations have been surveyed and staked. Minor pole or road relocations would be made to avoid or minimize environmental impacts, where possible. If sensitive areas could not be avoided, SCE would implement required mitigation measures to reduce the significance of these impacts.

After the completion of final engineering and biological protocol environmental surveys, construction teams would grade all areas for construction.

The proposed subtransmission lines would be energized once the Proposed Project has been constructed, including improvements at Concho, Devers, Farrell, Garnet, Mirage, and Santa Rosa substations and the installation of the telecommunication facilities.

The proposed subtransmission line construction activities would be limited to occur between the hours of 8:00 a.m. and 6:30 p.m., Monday through Saturday.[21] Construction activities would be prohibited on federal and state-recognized holidays. Construction of the 115 kV subtransmission line is scheduled to begin in the second quarter of 2009 in order to meet the mid-2010 operating deadline.

3.4.3.11 Drainage Structures

Drainage structures would be installed to allow for construction traffic usage, as well as to prevent road damage and erosion due to uncontrolled water flow. Drainage structures may include wet crossings, water bars, overside drains, pipe culverts, and on energy dissipaters. The specific need for and location of drainage systems or similar improvements would be identified during final engineering with a detailed topographic survey of the proposed subtransmission line routes.

3.4.3.12 Ground Disturbance

Table 3.4-3: Summary of Proposed 115 kV Subtransmission Line Ground Disturbing Activities provides summary of the amounts of temporary and permanent ground disturbance that would occur as a result of construction of the proposed 115 kV subtransmission lines.

TABLE 3.4-3
SUMMARY OF PROPOSED 115 KV SUBTRANSMISSION LINE GROUND DISTURBING ACTIVITIES

	Farrell-Garnet 115 kV Subtransmission Line	Mirage-Santa Rosa 115 kV Subtransmission Line	Total
Length of proposed subtransmission line	5.3 miles	1.5 miles	6.8 miles
Number of existing structures removed	138	29	167
Area affected by structure removal	8.3 acres	1.8 acres	10.1 acres
Number of new structures installed	169	55	224
Area affected by new structure installation	10.1 acres	1.6 acres	11.7 acres
Number of pulling/splicing sites	10	8	18
Area affected by pulling/splicing sites	10 acres (temporary)	8 acres (temporary)	18 acres (temporary)
Number of laydown sites	1	1	2

[21] The Proposed Project would comply with allowable construction days and time contained within local noise ordinances. If extended work days or Sunday work are required beyond the allowed schedule, SCE would obtain the applicable variance.

TABLE 3.4-3 SUMMARY OF PROPOSED 115 KV SUBTRANSMISSION LINE GROUND DISTURBING ACTIVITIES			
	Farrell-Garnet 115 kV Subtransmission Line	**Mirage-Santa Rosa 115 kV Subtransmission Line**	**Total**
Area affected by laydown sites	1 acre (temporary)	1 acre (temporary)	2 acres (temporary)
Notes: Estimates based on 0.06 acre for each structure (inclusive of temporary and permanent disturbance) and 1 acre of temporary disturbance for each pulling/splicing and laydown area. All quantities are preliminary estimates and subject to modification based on final engineering. Includes all pole replacements for line reconfigurations at Dinah Shore/Bob Hope, Date Palm/Varner, and Portola/Gerald Ford intersections.			

3.4.4 Subtransmission Line Operation, Inspection, and Maintenance

Normal operation of the proposed subtransmission lines would be controlled remotely through SCE control systems. SCE inspects subtransmission lines at least once per year by driving and/or flying the line routes.

Maintenance would occur as needed. Maintenance would include activities such as repairing conductors, replacing insulators, replacing poles, mitigation measures to prevent impacts to identified environmental resources, and access road and spur road maintenance.

3.5 SUBSTATIONS

All new electrical components would be installed within the existing fenced perimeter surrounding each substation. All construction would take place within the existing substation fences or walls, with the exception of Farrell Substation, where a new driveway would be constructed for permanent access. A description of substation construction process, personnel, equipment, waste materials, and schedules is provided in Sections 3.5.11 through 3.5.13.

3.5.1 Devers Substation

3.5.1.1 Engineering Plan

Devers Substation is a staffed, 500/220/115 kV substation located in the unincorporated area of Riverside County, north of the City of Palm Springs (see Figure 2.3: New Devers 115 kV Subtransmission Area – Proposed Project and Alternatives).

The proposed improvements at Devers Substation include the replacement of two 115 kV circuit breakers in existing Position No. 7 (new Devers-Eisenhower-Thornhill 115 kV subtransmission line) and two 115 kV circuit breakers in existing Position No. 4 (new Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission line) and installation of new line-protection relays.

3.5.1.2 Equipment

The proposed improvements to the Devers Substation would include installation of the components listed below:

Major Equipment

- Four 115 kV, 1,200 Amp, 40 kiloannum (kA) duty, circuit breakers
- Fifteen 115 kV lightning arresters

Concrete foundations and steel supports also would be required. Construction would result in approximately 978 square feet of ground disturbance within the fenced substation area.

Relays would be upgraded for the reconfigured Devers-Eisenhower-Thornhill and Mirage-Capwind-Devers-Tamarisk 115 kV subtransmission lines.

3.5.1.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.1.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.1.5 Construction Plan

All construction would take place inside the fenced perimeter of Devers Substation.

3.5.1.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Devers Substation as a result of this work.

3.5.1.7 Staging and Access

Material would be staged within the substation wall/fence during construction. All material, including circuit breakers, would be delivered by truck. Construction traffic would use Indian Wells, to Dillon Road, to Diablo Road and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic-control service would be used if needed.

3.5.1.8 Post-Construction and Clean-Up

All debris associate with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.1.9 Construction Schedule

Construction within the Devers Substation would take a total of approximately 60 days, commencing approximately in the second quarter of 2009 and concluding in mid-2010, including testing and energizing of the substation. The planned operating date is mid-2010.

3.5.2 Mirage Substation

3.5.2.1 Engineering Plan

Mirage Substation is an unstaffed, 220/115 kV substation located in unincorporated Riverside County in the general vicinity of the community of Thousand Palms (Figure 2.4: New Mirage 115 kV Subtransmission Area – Proposed Project and Alternatives).

The proposed improvements at Mirage Substation include the installation of one 280 MVA, 220/115 kV transformer bank, installation of one new 220 kV bank position, installation of one new 115 kV bank position, installation of one new 220 kV breaker-and-a-half configuration for two new 220 kV line positions, relocation of the existing Mirage-Ramon 220kV transmission line, relocation of the existing Julian Hinds-Mirage 220 kV transmission line, relocation of the existing Devers-Mirage 220 kV transmission line, looping of the Devers-Coachella Valley 220 kV transmission line into the Mirage 220 kV switchrack, installation of the new Mirage-Santa Rosa 115 kV subtransmission line, relocation of existing Mirage-Concho 115 kV subtransmission line, and installation of new line protection relays.

3.5.2.2 Equipment

The proposed improvements to the Mirage Substation would include installation of the components listed below.

Major Equipment:

- One 280 MVA 220/115 kV transformer bank
- Five 220 kV, 3,000 amp, 50 kA duty, circuit breakers
- Ten 220 kV, 3,000 amp, center-side-break disconnect switches
- Fifteen 220 kV station post insulators
- Six 220 kV metering potential transformers
- Two 115 kV, 3,000 amp, 40 kA duty circuit breakers
- Three 115 kV, 2,000 amp, 40 kA duty circuit breakers
- Four 115 kV, 3,000 amp, center-side-break disconnect switches
- Six 115 kV, 2,000 amp, center-side-break disconnect switches
- Nine 115 kV potential transformers
- Twenty-seven 115 kV post insulators

Switchrack Configurations:

- One new 220 kV transformer bank position No. 6S designed with a double-breaker configuration
- One new 220 kV line position No. 5 designed with a breaker-and-a-half configuration for relocation of the existing Julian Hinds-Mirage 220 kV transmission line (Pos. No. 5N) and relocation of the existing Mirage-Ramon 220 kV transmission line (Pos. No. 5S)
- Existing 220 kV transmission line Position No. 3 would be upgraded and remain a breaker-and-a-half configuration for the installation of the new Devers-Mirage No.2 220 kV transmission line (Pos. No. 3N) and the installation of the new Mirage-Coachella Valley 220 kV transmission line (Pos. No. 3S)
- One new 115 kV transformer bank position (No. 6N) designed with a double-breaker configuration
- One new 115 kV line position (No. 7N) designed with a double-breaker configuration
- Convert existing 115 kV line position (No. 4) from a double-breaker configuration to a breaker-and-a-half configuration

Concrete foundations and steel transformer racks, switch supports, and dead-end racks would also be required. Transformer and dead-end racks would be various sizes, up to approximately 60 feet high. Construction would result in approximately 43,226 square feet of ground disturbance within the fenced substation area.

3.5.2.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.2.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.2.5 Construction Plan

All construction would take place inside the fenced perimeter of Mirage Substation.

New relays would be provided for the installation of the new 280 MVA 220/115 kV transformer bank. Relays would be upgraded as needed for the new 115 kV subtransmission line rearrangements.

3.5.2.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Mirage Substation as a result of this work.

3.5.2.7 Staging and Access

Material would be staged within the substation wall/fence during construction in an existing staging area (230 feet x 230 feet) in the southeast corner of Mirage Substation.

All material would be delivered by truck. Construction traffic would use Ramon Road and would be scheduled for off-peak traffic hours to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. The transformer would be delivered by heavy transport vehicles and off-loaded on site by large cranes with support trucks. A traffic control service would be used for transformer delivery.

3.5.2.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.2.9 Construction Schedule

Construction within Mirage Substation would take approximately 8 months, commencing in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.3 Concho Substation

3.5.3.1 Engineering Plan

Concho Substation is an unstaffed, 115/12 kV low-profile substation located in Palm Desert (Figure 1.2: Proposed Subtransmission System Split in the Electrical Needs Area).
The proposed improvements at Concho Substation include protection relay replacements for the existing Concho-Indian Wells-Santa Rosa 115 kV subtransmission line and the existing Concho-Indian Wells 115 kV subtransmission line.

3.5.3.2 Equipment

The proposed substation improvements include only the installation of new line-protection relays.

No major equipment, switchrack configurations, structural steel racks, or concrete pads would be installed at Concho Substation for this project. No ground disturbance would occur.

3.5.3.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.3.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.3.5 Construction Plan

All construction would take place inside the fenced perimeter of Concho Substation.

Relays would be upgraded on the existing Concho-Indian Wells-Santa Rosa 115 kV subtransmission line and the existing Concho-Indian Wells 115 kV subtransmission line.

3.5.3.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Concho Substation as a result of this work.

3.5.3.7 Staging Access

Materials would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use Cook Avenue and Country Club Drive and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic-control service would be used if needed.

3.5.3.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.3.9 Construction Schedule

Construction within Concho Substation would take a total of approximately 35 days, commencing approximately in the third quarter of 2008 and concluding in the second quarter of 2009, including testing and energizing the substation. The planned operating date is the mid-2010.

3.5.4 <u>Indian Wells Substation</u>

3.5.4.1 Engineering Plan

Indian Wells Substation is an unstaffed, 115/12 kV low-profile substation located in the City of Indian Wells (Figure 1.2: Proposed Subtransmission System Split in the Electrical Needs Area).

The proposed improvements at Indian Wells Substation include the protection line relay replacements for existing Concho-Indian Wells-Santa Rosa 115kV subtransmission line and the existing Concho-Indian Wells 115kV subtransmission line.

3.5.4.2 Equipment

The proposed substation improvements include only the installation of new line protection relays.

No major equipment, switchrack configurations, structural steel racks, or concrete pads would be installed at Indian Wells Substation for this project, and no ground disturbance would occur.

3.5.4.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.4.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.4.5 Construction Plan

All construction would take place inside the fenced perimeter of Indian Wells Substation.

Relays would be upgraded on the existing Concho-Indian Wells-Santa Rosa 115 kV subtransmission line, the existing Concho-Indian Wells 115 kV subtransmission line, and the existing 115 kV bus tie position.

3.5.4.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Indian Wells Substation as a result of this work.

3.5.4.7 Staging Access

Materials would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use Monterey Avenue and Fred Waring Drive and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic-control service would be used if needed.

3.5.4.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.4.9 Construction Schedule

Construction within Indian Wells Substation would take a total of approximately 50 days, commencing approximately in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.5 Santa Rosa Substation

3.5.5.1 Engineering Plan

Santa Rosa Substation is an unstaffed, 115/33/12 kV low-profile substation located in the City of Rancho Mirage (Figure 1.2: Proposed Subtransmission System Split in the Electrical Needs Area).

The proposed improvements at Santa Rosa Substation include the conversion of the existing Santa Rosa-Garnet 115 kV subtransmission line to the new Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line; conversion of the existing Santa Rosa-Tamarisk 115 kV subtransmission line to the new Mirage-Santa Rosa 115 kV subtransmission line; installing new line-protection relays for new lines; and line protection relay replacement of the existing Concho-Indian Wells-Santa Rosa 115 kV subtransmission line.

3.5.5.2 Equipment

The proposed improvements include connecting the Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line and the new Mirage-Santa Rosa 115 kV subtransmission line and installation of new line protection relays.

No major equipment, switchrack configurations, structural steel racks, or concrete pads would be installed at Santa Rosa Substation for this project, and no ground disturbance would occur.

3.5.5.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.5.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.5.5 Construction Plan

All construction would take place inside the fenced perimeter of Santa Rosa Substation.

New relays would be provided for installation of the new Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line, and the new Mirage-Santa Rosa 115 kV subtransmission line and relays would be upgraded for the new 115 kV subtransmission line rearrangements.

3.5.5.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Santa Rosa Substation as a result of this work.

3.5.5.7 Staging Access

Materials would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use Monterey Avenue and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic-control service would be used if needed.

3.5.5.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.5.9 Construction Schedule

Construction within Santa Rosa Substation would take a total of approximately 40 days, commencing approximately in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.6 Eisenhower Substation

3.5.6.1 Engineering Plan

Eisenhower Substation is an unstaffed, 115/33/12 kV low-profile substation located in Palm Springs (Figure 1.2: Proposed Subtransmission System Split in the Electrical Needs Area).

The proposed improvements at Eisenhower Substation include the relocation of the existing Eisenhower-Farrell 115 kV subtransmission line from Position No. 3 to existing Position No. 2, conversion of the existing Eisenhower-Devers 115 kV subtransmission line to the reconfigured Eisenhower-Devers-Thornhill 115 kV subtransmission line into existing Position No. 2, installation of a the reconfigured Eisenhower-Tamarisk 115 kV subtransmission line into existing Position No. 6, replacement of three existing 115 kV circuit breakers in existing Position No.s 2, 3, and 6, and installation of new line protection relays.

3.5.6.2 Equipment

The proposed improvements to the Eisenhower Substation would include the installation of the following equipment components:

Major Equipment:

- Three 115 kV, 1,200 Amp, 40 kA duty circuit breakers
- One 115 kV, 1,200 Amp, center-side-break disconnect switch
- One 115 kV potential transformer
- Fifteen 115 kV lightning arresters

Switchrack Configurations:

- Convert one existing 115 kV bus tie position to a 115 kV line position

Concrete foundations and steel transformer, lightning arrester, and switch supports also would be required. The support structures would be various sizes, up to approximately 8 feet high. Construction would result in approximately 1,101 square feet of ground disturbance within the fenced substation area.

3.5.6.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.6.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.6.5 Construction Plan

All construction would take place inside the fenced perimeter of Eisenhower Substation.

New relays would be provided for installation of the new Eisenhower-Tamarisk 115 kV subtransmission line and the new Devers-Eisenhower-Thornhill 115 kV subtransmission line. Relays would be upgraded for the new 115 kV subtransmission line rearrangements.

3.5.6.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Eisenhower Substation as a result of this work.

3.5.6.7 Staging and Access

Material would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use Date Palm Drive, to East Ramon Road, to South Gene Autry Trail, to East Mesquite Avenue and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic-control service would be used if needed.

3.5.6.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.6.9 Construction Schedule

Construction within Eisenhower Substation would take a total of approximately 65 days, commencing approximately in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.7 <u>Farrell Substation</u>

3.5.7.1 Engineering Plan

Farrell Substation is an unstaffed, 115/12 KV low-profile substation located in Palm Springs (Figure 1.2: Proposed Subtransmission System Split in the Electrical Needs Area).

The proposed improvements at Farrell Substation include the addition of one 115 kV Position No. 3, relocation of the existing Farrell-Eisenhower 115 kV subtransmission line from Position No. 6 to new Position No. 3, relocation of the existing Farrell-Devers-Windland 115 kV subtransmission line from Position No. 7 to Position No. 6, installation of the new Farrell-Garnet 115 kV subtransmission line in existing Position No. 7, and installation of new line protection relays.

3.5.7.2 Equipment

The proposed improvements to the Farrell Substation would include the components listed below:

<u>Major Equipment:</u>

- One 115 kV, 1,200 amp, 40 kA duty circuit breaker
- Three 115 kV, 1,200 amp, center-side-break disconnect switches
- One 115 kV potential transformer
- Three 115 kV lightning arresters

<u>Switchrack Configurations:</u>

- One 115 kV line position designed with a single-breaker configuration

Concrete foundations, steel lightning arrester and switch supports, and a dead-end rack would also be required. The support structures would be approximately 8 feet high, and the dead-end rack would be 27 feet high. Construction would result in approximately 2,250 square feet of ground disturbance within the fenced substation area.

3.5.7.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.7.4 Access

A new 16-foot-wide by 30-foot-long paved substation access driveway with a 16-foot-wide double-drive access gate would be located along the Executive Drive frontage and centered approximately 50 feet from the northeastern SCE property corner. This new gate would provide access to the northern portion of the substation during construction of the new 115 kV line and during future construction activities at the substation. It would be a secondary access and would not be used for normal substation operation and maintenance activities.

Construction of the new access would include removal of approximately 20 feet of the existing substation perimeter fence; minor grading to match the existing Executive Drive curb and gutter with the substation interior finished grade; construction of a new concrete driveway approach per the City of Palm Springs standards; paving of approximately 30 feet of an asphalt concrete driveway; and the installation of a new 16-foot-wide by 8-foot-high double-drive chain-link gate with barbed wire, including new gateposts with concrete footings to match the existing fence.

Approximately 10 cubic yards of soil would be excavated, redistributed, and compacted to form the new 2 percent driveways. Paving the new driveway would require approximately 4 cubic yards of asphalt concrete and 4 cubic yards of Class II aggregate road base. The new concrete driveway approach would require approximately 1.5 cubic yards of Portland cement concrete. Each gatepost footing would require approximately 0.3 cubic yard of concrete. A total of 640 square feet of new ground disturbance would result from construction of the driveway. Construction of the new driveway would require a permit from the City of Palms Springs.

3.5.7.5 Construction Plan

All construction would take place inside the fenced perimeter of Farrell Substation, except the installation of the driveway at the northeast corner of the substation adjacent to Executive Drive.

New relays would be provided for installation of the new Farrell-Garnet 115 kV subtransmission line. Relays would be upgraded for the 115 kV subtransmission line rearrangements.

3.5.7.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Farrell Substation as a result of this work.

3.5.7.7 Staging and Access

Materials would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use North Gene Autry Trail, to East Via Escuela, to Executive Drive and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic control service would be used if needed.

3.5.7.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.7.9 Construction Schedule

Construction within Farrell Substation would take a total of approximately 65 days, commencing approximately in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.8 <u>Garnet Substation</u>

3.5.8.1 Engineering Plan

Garnet Substation is an unstaffed, 115/33/12 kV substation located in north Palm Springs (Figure 1.2: Proposed Subtransmission System Split in the Electrical Needs Area).

The proposed improvements at Garnet Substation include the conversion of the existing Garnet-Santa Rosa 115kV subtransmission line to the new Farrell-Garnet 115kV subtransmission line, installing new line protection relays, and replacing the existing bus tie protection relays.

3.5.8.2 Equipment

The proposed improvements at Garnet Substation include the installation of the new Garnet-Farrell 115 kV subtransmission line and new line protection relays.

No major equipment, switchrack configurations, concrete pads, or ground disturbance would occur at the Garnet Substation for this project.

3.5.8.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.8.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.8.5 Construction Plan

All construction would take place inside the fenced perimeter of Garnet Substation.

New relays would be provided for installation of the new Farrell-Garnet 115 kV subtransmission line, and relays would be upgraded for the 115 kV bus tie position.

3.5.8.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Garnet Substation as a result of this work.

3.5.8.7 Staging Access

Materials would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use Indian Avenue and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic-control service would be used if needed.

3.5.8.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.8.9 Construction Schedule

Construction within Garnet Substation would take a total of approximately 16 days, commencing approximately in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.9 <u>Thornhill Substation</u>

3.5.9.1 Engineering Plan

Thornhill Substation is an unstaffed, 115/12 kV low-profile substation located in Palm Springs.

The proposed improvements at Thornhill Substation include the conversion of the existing Thornhill-Tamarisk 115 kV subtransmission line to the new Devers-Eisenhower-Thornhill 115 kV subtransmission line and the installation of new line protection relays.

3.5.9.2 Equipment

The proposed improvements at Thornhill Substation include the installation of the new Devers-Eisenhower-Thornhill 115 kV subtransmission line and new line protection relays.

No major equipment, switchrack configurations, structural steel racks, concrete pads, or ground disturbance would occur at Thornhill Substation for this project.

3.5.9.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.9.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.9.5 Construction Plan

All construction would take place inside the fenced perimeter of Thornhill Substation.

New relays would be provided for installation of the new Devers-Eisenhower-Thornhill 115 kV subtransmission line in support of the of the new 115 kV subtransmission line rearrangement.

3.5.9.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Thornhill Substation as a result of this work.

3.5.9.7 Staging Access

Materials would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use Indian Avenue to South Calle Amigos and would be scheduled for off-peak traffic hours, to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic control service would be used if needed.

3.5.9.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.9.9 Construction Schedule

Construction within Thornhill Substation would take a total of approximately 40 days, commencing approximately in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.10 Tamarisk Substation

3.5.10.1 Engineering Plan

Tamarisk Substation is an unstaffed, 115/12 kV low-profile substation located in Rancho Mirage.

The proposed substation scope of work at Tamarisk Substation includes the conversion of the existing Mirage-Tamarisk 115 kV subtransmission line to the new Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line, conversion of the existing Santa Rosa-Tamarisk 115 kV subtransmission line to the new Devers-Capwind–Mirage-Tamarisk 115 kV subtransmission line, conversion of the existing Tamarisk-Thornhill 115 kV subtransmission line to the new Tamarisk-Eisenhower 115 kV subtransmission line, replacement of one 115 kV circuit breaker in existing Position No. 4, and installation of new line protection relays.

3.5.10.2 Equipment

The proposed improvements to the Tamarisk Substation would include the components listed below:

Major Equipment:

- One 115 kV, 1,200 amp, 40 kA duty circuit breaker

Approximately 171 square feet of ground disturbance would occur within the fenced substation area.

3.5.10.3 Maintenance and Lighting

Site lighting is not needed as part of the proposed substation improvements.

3.5.10.4 Access

All equipment and materials would be delivered to the sites using the access routes identified in the descriptions that follow.

3.5.10.5 Construction Plan

All construction would take place inside the fenced perimeter of Tamarisk Substation.

New relays would be installed in support of the new 115 kV subtransmission line rearrangement to accommodate the new Devers-Capwind-Mirage-Tamarisk 115 kV subtransmission line.

3.5.10.6 Drainage

Site drainage installations would be consistent with the existing NPDES permit requirements and best engineering practices. There would be no change to the existing drainage patterns at Tamarisk Substation as a result of this work.

3.5.10.7 Staging and Access

Materials would be staged within the substation wall/fence during construction. All material would be delivered by truck. Construction traffic would use Dinah Shore Drive south to Plumley Road and would be scheduled for off-peak traffic hours to the extent possible. Concrete truck deliveries may need to be made during peak hours when footing work is being prepared. A traffic control service would be used if needed.

3.5.10.8 Post-Construction and Clean-Up

All debris associated with construction within the substation would be placed in appropriate onsite containers and periodically disposed of in accordance with all applicable regulations.

3.5.10.9 Construction Schedule

Construction within Tamarisk Substation would take a total of approximately 40 days, commencing approximately in the second quarter of 2009 and concluding by mid-2010, including testing and energizing the substation.

3.5.11 Common Substation Construction for All Substations

Substation construction for all substations mentioned above would be performed by SCE construction crews and/or contractors under the supervision of SCE personnel. Construction activities would begin by mobilizing the civil or below-grade construction crews on site. The construction area would be cleared of existing crushed rock, and the rock would be temporarily stockpiled on site. Excavation and auguring would begin for the new equipment foundations, where required. Excavation would be performed with a skip loader. Foundations would be placed with corresponding anchor bolts or steel imbed plates. Trench excavation would follow for the installation of conduit duct runs and equipment grounding systems. The previously cleared crushed rock would be placed back in the affected areas after the completion of the below-grade construction.

Electrical construction crews would move on site following the completion of all below-grade structures. Electrical crews would begin by erecting structural steel, installing disconnect switches, voltage devices, surge arresters, circuit breakers, and primary conductors. Wiring crews would begin wiring the internal components of the circuit breaker and voltage devices. Wiring crews would connect secondary cables at the switch-rack equipment and in the control room. The control room would house the protective relaying equipment. The new equipment would be tested to verify electrical integrity and proper operation of the equipment throughout the construction process. Construction areas would be monitored by SCE-provided security services outside of normal working hours on Monday through Friday and 24 hours a day on Saturdays and Sundays.

3.5.12 Hazardous Materials and Waste Management

Construction for all substation work mentioned above would result in the generation of various waste materials, including materials associated with removal activities and construction within the substation. A summary of the waste generation estimates is presented below in Table 3.5-1, Substation Construction Waste Generation Estimates.

TABLE 3.5-1
SUBSTATION CONSTRUCTION WASTE GENERATION ESTIMATES

Element	Waste Item	Cubic Yards Total	Cubic Yards Reusable on Site	Cubic Yards Recyclable or Disposed
Mirage Substation				
Civil	Soil	1,200	1,200	0
	Wood	100	0	100
	Concrete	1,200	1,195	5
	Sanitation Waste	60	0	60
	Miscellaneous	20	0	20
Electrical	Wood	80	0	80
	Aluminum	240	160	80
	Copper	200	160	40
	Steel	30,000	30,000	0
	Sanitation Waste	60	0	60
	Miscellaneous	20	0	20
Concho Substation				
Electrical	Copper	3	2	1
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1

TABLE 3.5-1 SUBSTATION CONSTRUCTION WASTE GENERATION ESTIMATES				
Element	**Waste Item**	**Cubic Yards Total**	**Cubic Yards Reusable on Site**	**Cubic Yards Recyclable or Disposed**
Indian Wells Substation				
Electrical	Copper	3	2	1
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1
Santa Rosa Substation				
Electrical	Copper	3	2	1
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1
Devers Substation				
Civil	Soil	21	21	0
	Concrete	21	21	0
Electrical	Aluminum	3	2	1
	Copper	1	1	0
	Steel	2	2	0
	Sanitation Waste	2	0	2
Eisenhower Substation				
Civil	Soil	90	90	0
	Wood	1	0	1
	Concrete	90	89	1
	Sanitation Waste	2	0	2
	Rock	25	25	0
Electrical	Aluminum	40	35	5
	Copper	20	15	5
	Steel	5	5	0
	Sanitation Waste	2	0	2
Farrell Substation				
Civil	Soil	115	115	0
	Wood	1	0	1
	Concrete	118	115	3
	Sanitation Waste	2	0	2
	Rock	25	25	0
Electrical	Aluminum	40	35	5
	Copper	20	15	5
	Steel	5	5	0
	Sanitation Waste	2	0	2
Garnet Substation				
Electrical	Copper	3	2	1
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1
Thornhill Substation				
Electrical	Copper	3	2	1
	Sanitation Waste	1	0	1
Tamarisk Substation				
Civil	Soil	12	12	0
	Concrete	12	12	0
	Sanitation Waste	1	0	1
	Rock	1	1	0

TABLE 3.5-1 SUBSTATION CONSTRUCTION WASTE GENERATION ESTIMATES				
Element	**Waste Item**	**Cubic Yards Total**	**Cubic Yards Reusable on Site**	**Cubic Yards Recyclable or Disposed**
Electrical	Aluminum	3	2	1
	Copper	1	1	0
	Steel	2	2	0
	Sanitation Waste	2	0	2

Construction within substation sites would require limited use of hazardous materials, including fuel, lubricants, and cleaning solutions. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the Construction Storm Water Pollution Prevention Plan (SWPPP) and the Spill Prevention, Control, and Countermeasure Plan for the substation components.

For the installation of the additional transformer at Mirage Substation SCE would incorporate Best Management Practices (BMPs) and design measures through a SPCC Plan to minimize the possibility of any spills or releases from the transformer.

3.5.13 Substation Construction Schedule

Substation construction would be completed in the time frames as described for each substation in the previous sections, overlapping with the proposed subtransmission line construction. The scheduled operating date for the project is mid-2010. Substation construction would occur Monday through Friday. No work would be conducted on weekends or holidays, unless necessary and a variance would be obtained from the applicable jurisdiction for noise ordinance violations.

Table 3.5-2: Substation Construction Personnel and Equipment Summary, identifies the number of personnel and equipment needed for construction of the substation improvements.

TABLE 3.5-2 SUBSTATION CONSTRUCTION PERSONNEL AND EQUIPMENT SUMMARY				
Construction Element	**Number of Personnel**	**Equipment Type**	**Equipment Duration** (Days)	**Equipment Use** (Hours/Day)
Mirage Substation				
Civil	14	1-Office Trailer (Electric)	80	8
		1-Driller (Diesel)	50	8
		2-Crew Trucks (Gas/Diesel)	80	2
		1-14-Ton Crane (Diesel)	25	4
		1-Dump Truck (Gas/Diesel)	75	6
		1-Tractor (Diesel)	75	6
		1-5-Ton Truck (Gas/Diesel)	15	4
		1-Forklift (Diesel)	75	4
		1-Ditch Digger (Diesel)	55	6

TABLE 3.5-2 SUBSTATION CONSTRUCTION PERSONNEL AND EQUIPMENT SUMMARY				
Construction Element	**Number of Personnel**	**Equipment Type**	**Equipment Duration** (Days)	**Equipment Use** (Hours/Day)
Electrical	23	1-Office Trailer (electric)	110	8
		2-Manlifts (Diesel)	100	6
		1-Pick-Up Truck (Gas/ Diesel)	110	2
		1 14-Ton Crane Truck (Gas/Diesel)	90	6
		2-Crew Trucks (Gas/ Diesel)	110	2
		1-150-Ton Crane (Diesel)	60	6
		1-5-Ton Truck (Gas/Diesel)	50	2
		1-Forklift (Diesel)	100	6
		2-Carryall Vehicles (Gas/ Diesel)	110	2
		1-Support Truck (Gas/ Diesel)	25	2
Transformer Installation	12	2-Carryall (Gas/Diesel)	22	6
		1-Manlifts (Diesel)	20	6
		1-Forklift (Diesel)	22	6
		1-50-Ton Crane (Diesel)	15	6
		2-Crew Trucks (Gas/Diesel)	22	2
		1-Processing Trailer (Electric)	15	8
Maintenance	5	1-Foreman Truck (Gas/Diesel)	40	2
		1-Manlifts (Gas/Diesel)	40	6
		2-Crew Trucks (Gas/Diesel)	110	2
		1-Gas/Processing Trailer (Electric)	20	8
Test	2	1-Pick-Up Truck (Gas/Diesel)	110	2
Concho Substation				
Electrical	2	1-Carryall Vehicle (Gas/ Diesel)	34	2
Test	2	1-Pick-Up Truck (Gas/Diesel)	34	2
Indian Wells Substation				
Electrical	2	1-Carryall Vehicle (Gas/Diesel)	50	2
Test	2	1-Pick-Up Truck (Gas/Diesel)	50	2
Santo Rosa Substation				
Electrical	2	1-Carryall Vehicle (Gas/Diesel)	40	2
Test	2	1-Pick-Up Truck (Gas/Diesel)	40	2
Devers Substation				
Civil	4	1-Driller (Diesel)	2	8
		1-Crew Truck (Gas/ Diesel)	5	2
		1-Dump Truck (Gas/ Diesel)	5	6
		1-Tractor (Diesel)	5	6
Electrical	6	1-Office Trailer (Electric)	60	8
		1-Manlift (Diesel)	45	6
		1-Pick-Up Truck	60	2
		1-Crew Truck (Gas/ Diesel)	60	2
		1-150-Ton Crane (Diesel)	10	6
		1-Forklift (Diesel)	40	6
		1-Carryall Vehicle (Gas/Diesel)	60	2
Maintenance	2	1-Foreman Truck (Gas/ Diesel)	5	2
		1-Crew Truck (Gas/ Diesel)	10	2
		1-Gas/Processing Trailer (Electric)	5	8
Test	2	1-Pick-Up Truck (Gas/Diesel)	20	2

TABLE 3.5-2 SUBSTATION CONSTRUCTION PERSONNEL AND EQUIPMENT SUMMARY				
Construction Element	**Number of Personnel**	**Equipment Type**	**Equipment Duration** (Days)	**Equipment Use** (Hours/Day)
Eisenhower Substation				
Civil	4	1-Driller (Diesel)	5	8
		1-Crew Truck (Gas/Diesel)	15	2
		1-Dump Truck (Gas/Diesel)	15	6
		1-Tractor (Diesel)	15	6
		1-Ditch Digger (Diesel)	5	6
Electrical	6	1-Office Trailer (Electric)	45	8
		1-Manlift (Diesel)	35	6
		1-Crew Truck (Gas/Diesel)	45	2
		1-150-Ton Crane (Diesel)	20	6
		1-Forklift (Diesel)	45	6
		1-Carryall Vehicle (Gas/Diesel)	45	2
Maintenance	2	1-Foreman Truck (Gas/Diesel)	5	2
		1-Crew Truck (Gas/Diesel)	10	2
		1-Gas/Processing Trailer (Electric)	10	8
Test	2	1-Pick-Up Truck (Gas/Diesel)	45	2
Farrell Substation				
Civil	6	1-Driller (Diesel)	10	8
		1-Crew Truck (Gas/Diesel)	20	2
		1-Dump Truck (Gas/Diesel)	20	6
		1-Tractor (Diesel)	20	6
		1-Ditch Digger (Diesel)	10	6
Electrical	6	1-Office Trailer (Electric)	55	8
		1-Manlift (Diesel)	40	6
		1-Crew Truck (Gas/Diesel)	55	2
		1-150-Ton Crane (Diesel)	25	6
		1-Forklift (Diesel)	55	6
		1-Carryall Vehicle (Gas/Diesel)	55	2
Maintenance	2	1-Foreman Truck (Gas/Diesel)	5	2
		1-Crew Truck (Gas/Diesel)	10	2
		1-Gas/Processing Trailer (Electric)	10	8
Test	2	1-Pick-Up Truck (Gas/Diesel)	55	2
Garnet Substation				
Electrical	2	1-Carryall Vehicle (Gas/Diesel)	16	2
Test	2	1-Pick-Up Truck (Gas/Diesel)	16	2
Thornhill Substation				
Electrical	2	1-Carryall Vehicle (Gas/Diesel)	40	2
Test	2	1-Pick-Up Truck (Gas/Diesel)	40	2
Tamarisk Substation				
Civil	3	1-Crew Truck (Gas/Diesel)	5	2
		1-Dump Truck (Gas/Diesel)	5	6
		1-Tractor (Diesel)	5	6
Electrical	4	1-Office Trailer (Electric)	40	8
		1-Manlift (Diesel)	5	6
		1-Pick-Up Truck (Gas/Diesel)	40	2
		1-Crew Truck (Gas/Diesel)	40	2
		1-150-Ton Crane (Diesel)	2	6
		1-Forklift (Diesel)	5	6
		1-Carryall Vehicle (Gas/Diesel)	40	2

TABLE 3.5-2 SUBSTATION CONSTRUCTION PERSONNEL AND EQUIPMENT SUMMARY				
Construction Element	**Number of Personnel**	**Equipment Type**	**Equipment Duration** (Days)	**Equipment Use** (Hours/Day)
Maintenance	2	1-Foreman Truck (Gas/Diesel)	1	2
		1-Crew Truck (Gas/Diesel)	2	2
		1-Gas/Processing Trailer (Electric)	1	8
Test	2	1-Pick-Up Truck (Gas/Diesel)	30	2

3.6 TELECOMMUNICATIONS

3.6.1 Engineering Plan

The telecommunication systems provide circuits that interface with the protection relays to protect transmission and subtransmission lines. The telecommunication circuits allow sensor relays to operate during abnormal conditions by providing remote-control operation and monitoring of substation equipment such as circuit breakers, transformers, and capacitors. With the use of existing fiber optic cables and microwave radios, a telecommunications transport interconnect can be established between those SCE substations identified by this project as requiring protection circuits.

Telecommunication circuits required to interface with protection relays at IID Coachella Valley Substation require a hand-over of such protection circuit to IID telecommunications department for transport over IID telecommunication systems. Telecommunication system interconnect points between SCE and IID are located at Edom Hill Communications Site and Mirage Substation, and protection circuits demarcation points shall occur at one or both of the interconnect locations.

3.6.1.1 Equipment

Telecommunications equipment, including channel bank and fiber optic equipment, would be installed at Concho, Devers, Eisenhower, Farrell, Garnet, Indian Wells, Mirage, Santa Rosa, Tamarisk, and Thornhill substations. Additional telecommunication equipment, for telecommunication system interconnects, would be required at Edom Hill Communications Site and Palm Springs Service Center. All telecommunication equipment would be installed within existing buildings.

3.6.1.2 Routing

As part of the proposed project, existing fiber optic cables would be transferred from existing poles to the new poles to be installed for both the proposed Mirage-Santa Rosa and Farrell-Garnet 115 kV subtransmission lines.

3.6.2 Construction Plan

The existing fiber optic cables would be transferred from existing poles to the new 115 kV subtransmission poles that would be installed within existing ROWs or franchise locations, as described for the Proposed Project facilities in Section 3.1.1 of this PEA. The All-Dielectric Self-Supporting (ADSS) fiber optic cables would be attached to a support block beneath the end of each 10-foot, wood cross-arm on each new pole as shown in Figure 3.4-6: Typical 115 kV Subtransmission Line Pole Configurations.

Telecommunications equipment installation would occur within existing SCE substation buildings and at the Edom Hill Communications Site. IID equipment and circuit installation is expected to be in IID's mechanical-electrical equipment room (MEER).

3.6.2.1 Staging and Access

Since no new fiber optic cable would be installed, no additional staging areas for cable reel equipment would be necessary to perform the telecommunications construction.

Existing access roads would be used and therefore no new ground disturbance would occur as a result of the fiber optic cable removal and installation process.

3.6.2.2 Conductor Pulling and Splicing

Since no new fiber optic cable would be installed, no conductor pulling would be required.

3.6.2.3 Construction Schedule

The telecommunications fiber cable construction would occur after the installation of the new 115 kV poles, which would require vehicles to access each individual pole, separate from the proposed subtransmission line construction activities. Telecommunication equipment and circuit installation shall occur throughout the project timeline. With the possible exception of Edom Hill Communications Site, it is not anticipated that access to the work location would influence the construction schedule.

3.6.2.4 Labor and Equipment

The personnel, equipment, and construction schedule for the telecommunication system are listed in Table 3.6-1: Telecommunication Construction Summary.

TABLE 3.6-1 TELECOMMUNICATION CONSTRUCTION SUMMARY			
Construction Element	**Number of Personnel**	**Number of Days**	**Equipment Requirements**
Mirage-Santa Rosa 115 kV Subtransmission Route			
Cable Construction	4	5	2 – Bucket Trucks (Diesel) 1 – Pick-Up (Gasoline) 1 – 2-Axle Trailer
Receive and Load Out Materials	4	1	1 – 5-Ton Forklift (Diesel) 1 – Pick-Up (Gasoline)
Clean-Up	4	1	2 – Bucket Trucks (Diesel) 1 – Pick-Up (Gasoline)
Farrell-Garnet 115 kV Subtransmission Route			
Cable Construction	4	18	2 – Bucket Trucks (Diesel) 1 – Pick-Up (Gasoline) 1 – 2-Axle Trailer
Receive and Load Out Materials	4	1	1 – 5-Ton Forklift (Diesel) 1 – Pick-Up (Gasoline)
Clean-Up	4	1	2 – Bucket Trucks (Diesel) 1 – Pick-Up (Gasoline)
Devers, Equipment/Circuit Installation			
Equipment Installation	3	5	2 – Pick-Up (Gasoline)
Circuit Installation	2	5	2 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Mirage, Equipment/Circuit Installation			
Equipment Installation	3	10	2 – Pick-Up (Gasoline)
Circuit Installation	2	10	2 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Tamarisk, Equipment/Circuit Installation			
Equipment Installation	3	6	2 – Pick-Up (Gasoline)
Circuit Installation	2	6	2 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Eisenhower, Equipment/Circuit Installation			
Equipment Installation	3	5	2 – Pick-Up (Gasoline)
Circuit Installation	2	5	2 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Concho, Equipment/Circuit Installation			
Equipment Installation	3	5	2 – Pick-Up (Gasoline)
Circuit Installation	2	5	2 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Indian Wells, Equipment/Circuit Installation			
Equipment Installation	3	35	2 – Pick-Up (Gasoline)
Circuit Installation	2	3	2 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Santa Rosa, Equipment/Circuit Installation			
Equipment Installation	3	7	2 – Pick-Up (Gasoline)
Circuit Installation	2	7	2 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Thornhill, Equipment/Circuit Installation			
Equipment Installation	2	5	1 – Pick-Up (Gasoline)
Circuit Installation	2	5	1 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)

TABLE 3.6-1 TELECOMMUNICATION CONSTRUCTION SUMMARY			
Construction Element	**Number of Personnel**	**Number of Days**	**Equipment Requirements**
Garnet, Equipment/Circuit Installation			
Equipment Installation	2	5	1 – Pick-Up (Gasoline)
Circuit Installation	2	5	1 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Farrell, Equipment/Circuit Installation			
Equipment Installation	2	5	1 – Pick-Up (Gasoline)
Circuit Installation	2	5	1 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Edom Hill C.S., Equipment/Circuit Installation			
Equipment Installation	2	5	1 – Pick-Up (Gasoline)
Circuit Installation	2	5	1 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)
Palm Springs S.C., Equipment/Circuit Installation			
Equipment Installation	2	3	1 – Pick-Up (Gasoline)
Circuit Installation	2	3	1 – Pick-Up (Gasoline)
Clean-Up	1	1	1 – Pick-Up (Gasoline)

3.6.2.5 Hazardous Materials and Waste Management

Electronics components associated with telecommunication construction activities would be removed from location and returned to the technician's home base for disposal in accordance with SCE policies and all applicable regulations.

3.6.2.6 Post-Construction and Clean-Up

All debris associated with construction would be placed in appropriate onsite containers, or removed, and periodically disposed of in accordance with all applicable regulations.

3.6.3 Telecommunication System Operation and Maintenance

The telecommunication system would require periodic routine maintenance as well as emergency procedures for service continuity. Routine maintenance would include equipment testing, equipment monitoring, and repair. No additional SCE personnel, beyond normal staffing levels, would be required to operate or maintain the telecommunication system for the substation.

3.7 PROJECT SCHEDULE AND PERSONNEL REQUIREMENTS

Construction duration for the Proposed Project is estimated to be up to 15 months. The anticipated construction activities would be consistent with city and county noise ordinances and a variance would be obtained from the applicable jurisdiction for noise ordinance violations.

The scheduled completion date for the Proposed Project is mid-2010. Approximately 2 months would be required to energize and test transmission line components once construction has been completed. The projected operating date for the Proposed Project is mid-2010.

The Proposed Project construction would require up to approximately 30 crew members. Accordingly, this number has been used to evaluate impacts to each environmental resource category throughout Chapter 4. Construction would be performed by either SCE construction crews or contractors, depending on the availability of SCE construction personnel at the time of construction. If SCE construction crews are used, they would be based at SCE's Alhambra, Fullerton (telecommunications crew only), Rialto, or Palm Springs facilities. Contractor construction personnel would be from within Riverside County or adjacent areas and would be managed by SCE construction management personnel. Anticipated construction personnel and construction equipment are summarized in Table 3.3-1: Transmission Line Construction Table, and Table 3.6-1: Telecommunication Construction Table. Night construction activity may be required due to system outages for subtransmission and telecommunication work.