BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

In the Matter of the Application of SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) for a Permit to Construct Electrical Substation Facilities With Voltages Above 50 kV: Mesa 500 kV Substation Project	)))))	Application No. _______________

PROPONENT'S ENVIRONMENTAL ASSESSMENT

MESA 500 kV SUBSTATION PROJECT

VOLUME 1 of 4

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Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
3-D	Three-dimensional
A.B.	Assembly Bill
A.D.	Anno Domini
AB 32	California Global Warming Solutions Act of 2006 (Assembly Bill 32)
AC	Alternating Current
ACSR	aluminum-clad steel reinforced
af	Acre feed
AGL	Above Ground Level
amsl	Above mean sea level
ANF	Angeles National Forest
APLIC	Avian Power Line Interaction Committee
APM	Applicant-Proposed Measure
APN	Assessor’s Parcel Number
APSA	Aboveground Petroleum Storage Act
AQMP	Air Quality Management Plan
ARTS	Area Rapid Transit System
ASCE	American Society of Civil Engineers
AST	Aboveground Storage Tank
ATCM	Airborne Toxic Control Measure
B.P.	Before Present
Basin Plan	Water Quality Control Plan
BGEPA	Bald and Golden Eagle Protection Act
bgs	below ground surface
BLM	Bureau of Land Management
BMPs	best management practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAISO	California Independent System Operator
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
CalRecycle	Caliofornia Department of Resources Recycling and Recovering
Caltrans	California Department of Transportation

Cal Water	California Water Service Company
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Act Information System
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGC	California Government Code
CGS	California Geological Survey
CH_4	methane
CHRIS	California Historical Resources Information System
CIP	Capital Improvement Program
CJUTCM	California Joint Utility Traffic Control Manual
cm/sec	centimeters per second
cmils	circular mils
CMNWD	Central Basin Municipal Water District
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CORRACTS	Resource Conservation and Recovery Act Corrective Action Report
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CSMD	Consolidated Sewer Maintenance District
CUPA	Certified Unified Program Agency
CWA	Clean Water Act (Federal Water Pollution Control Act)
CY	cubic yards
dB	decibel

dBA	A-weighted decibel
DC	Direct Current
DDT	dichlorodiphenyltrichloroethane
DOC	California Department of Conservation
DOGGR	DOC Division of Oil, Gas, and Geothermal Resources
DOT	Department of Transportation
DPM	diesel particulate matter
DPW	Los Angeles Department of Public Works
DR	Design Review
DSP	Distribution Substation Plan
DTSC	California Department of Toxic Substances Control
DWR	Department of Water Resources
EB	eastbound
EDD	California Employment Development Department
EDR	Environmental Data Resources, Inc.
EEC	Edison Electric Company
EECAP	Energy Efficient Climate Action Plan
EIR	Environmental Impact Report
ENA	Electrical Needs Area
EPA	United States Environmental Protection Agency
EPSP	East Pasadena Specific Plan
FAA	Federal Aviation Administration
FEIR	Final Environmental Impact Report
FESA	Federal Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FMMP	Farmland Mapping and Monitoring Program
FTA	Federal Transit Administration
g	gravity
G.O.	General Order
GCC	Grid Control Center
GHG	Greenhouse Gases
GIS	Geographic Information System
GIS	gas insulated switchgear
GPA	General Plan Amendment
gpcd	gallons per capita per day

GPS	Global Positioning System
GSWC	Golden State Water Company
GWP	global warming potential
GWR	Groundwater Recharge
H&SC	Health and Safety Code
HCP	Habitat Conservation Plan
HDD	Horizontal directional drilling
HHMD	Health Hazardous Materials Division
HHRA	Human Health Risk Assessment
HMBP	Hazardous Materials Business Plan
HMMP	Hazardous Materials Management Plan
HMTA	Hazardous Materials Transporatation Act
hp	Horsepower
HRI	Historical Resource Inventory
HVDC	High-voltage direct current
HWCL	California Hazardous Waste Control Law
I-	Interstate
ICF	ICF International
ICU	Intersection Capacity Utilization
IEEE	Institute of Electrical and Electronics Engineers
IID	Imperial Irrigation District
Insignia	Insignia Environmental
IPCC	Intergovernmental Panel on Climate Change
ISO	Independent System Operator
ITP	Incidental Take Permit
kcmil	1,000 circular mils
kg	kilogram
KOP	key observation point
kV	kilovolt
kW	kilowatt
LACSD	Sanitation Districts of Los Angeles County
LASD	Los Angeles County Sheriff's Department
LAX	Los Angeles International Airport
L_{dn}	Day-Night Average Sound Level
LED	light-emitting diode
L_{eq}	Equivalent Noise Level
LOS	Level of Service
LQG	Large Quantity Generator
LSAA	Lake and Streambed Alteration Agreement

LST	lattice steel tower
LTP	leachate treatment plant
LTPP	Long Term Procurement Plan
LUST	leaking underground storage tank
LWS	light weight steel
Masin Basin	Main San Gabriel Valley Basin
MBTA	Migratory Bird Treaty Act
MCLs	Maximum Contaminant Level
MEER	Mechanical Electrical Equipment Room
Metro	Los Angeles County Metropolitan Transportation Authority
mgd	million gallons per day
MPFD	Monterey Park Fire Department
mph	miles per hour
MPPD	Monterey Park Police Department
MRZ	Mineral Resource Zones
MS4	Municipal Separate Storm Sewer System
MT	metric tons
$MTCO_2e$	metric tons carbon dioxide equivalent
MUN	Municipal and Domestic Supply
MVA	megavolt-ampere
MW	megawatt
MWD	Metropolitan Water District of Southern California
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NB	Northbound
NCCP	Natural Community Conservation Planning
NDMA	n-nitrosodimethamine
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NO	nitric oxide
NO_2	Nitrogen dioxide
NOAA Fisheries	National Oceanic and Atmospheric Administration's National Marine Fisheries Service
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPPA	Native Plant Protection Act
NPS	National Park Service

NRHP	National Register of Historic Plance
NWP	Clean Water Act Section 404 Nationwide Permit
O_3	ozone
O&M	Operation and Maintenance
OEM	Office of Emergency Management
OHGW	overhead ground wire
OII	Operating Industries Inc.
OMR	Office of Mine Reclamation
OPGW	overhead optical ground wire
OPLA-PRP	Omnibus Public Lands Act-Paleontological Resources Preservation
OSHA	Occupational Safety and Health Administration
OTC	Once Through Cooling
PCBs	polychlorinated biphenyls
PCE	tetrachloroethylene
PEA	Proponent’s Environmental Assessment
PERP	Portable Equipment Registration Program
PFD	City of Pasadena Fire Department
PFYC	Potential Fossil Yield Classification
pH	acidity level
PL	Planning Case
PLPC	Pacific Light & Power Company
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
Porter-Cologne	Porter-Cologne Water Quality Control Act
PPD	City of Pasadena Police Department
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code
PSHA	Probabilistic Seismic Hazard Assessment
PVC	polyvinyl chloride
PWP	Pasadena Water and Power
Qw	Quaternary wash deposits
Qwf	Quarternary young alluvial
Qof	Quaternary older alluvium
RARE	Rare, Threatened, and Endangered Species
RBS	Rocks Biological Consulting
RCRA	Resource Conservation and Recovery Act of 1976
ROGs	reactive organic compounds

ROW	right-of-way
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SAC	stranded alumnium copper
SARA	Superfund Amendments and Reauthorization Act
SB	Southbound
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCCIC	South Central Coastal Information Center
SCE	Southern California Edison Company
SCN	State Clearinghouse Number
SDC	seismic design category
SDG&E	San Diego Gas & Electric Company
SDWA	Safe Drinking Water Act
SEA	significant ecological area
SF_6	Sulfur hexifluoride
SGCWD	San Gabriel County Water District
SIP	State Implementation Plan
SLIC	Spills, Leaks, Investigations, and Cleanups
SMARA	Californai Surface Mining and Reclamation Act
SMGB	State Mining and Geology Board
SO	System Operator
SO2	Sulfur dioxide
SoCalGas	Southern California Gas Company
SONGS	San Onofre Nuclear Generation Station
SOS	Substation Operations Supervisor
SEIR	Supplemental Environmental Impact Report
SO_x	Sulfur Oxides
SPCC	Spill Prevention, Control, and Countermeasure
SQG	Small Quantity Generator
SR-	State Route
SSC	species of special concern
STEP	Strategic Trasmission Expansion Plan
SUSMP	Standard Urban Storm Water Mitigation Plan
SWP	State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TACs	toxic air contaminants

TCE	tricholorethylene
TDS	total dissolved solids
TE-VS	Talega-Escondido/Valley Serrano
TL	Transmission line
TMDL	Total maximum daily load
TPZ	Timberland Production Zone
TQs	Threshold quantities
TRTP	Tehachapi Renewable Transmission Project
TSP	tubular steel pole
TTM	Tentative Tract Map
U.S.	United States
U.S.C.	United States Code
UBC	Uniform Building Code
UFC	Uniform Fire Code
UIC	Underground injection control
Upper District	Upper San Gabriel Valley Municipal Water District
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Services
USGS	United States Geological Survey
UST	Underground Storage Tank
UWMP	Urban Water Management Plans
V/C	volume-to-capacity
VOC	volatile organic compounds
WARM	Warm Freshwater Habitat
WATCH	Work Area Traffic Control Handbook
WB	Westbound
WDR	waste discharge requirements
WEAP	Worker Environmental Awareness Program
WECC	Western Electricity Coordinating Council
WET	Wetland Habitat
WILD	Wildlife Habitat
Williamson Act	California Land Conservation Act of 1965
WNOU	Whittier Narrows Operable Unit
WRP	Wastewater Reclamation Plan
ZC	Zone Change

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Chapter 1
PEA Summary

In accordance with California Public Utilities Commission (CPUC) General Order 131-D, Southern California Edison Company (SCE) is submitting this Proponent's Environmental Assessment (PEA) as part of its application for a Permit to Construct the Mesa 500 kilovolt (kV) Substation Project (Proposed Project) in the cities of Monterey Park, Montebello, Rosemead, South El Monte, Commerce, Bell Gardens, and Pasadena, and portions of unincorporated Los Angeles County, California.

1.1 Project Components

The Proposed Project[1] consists of the following major components:

- Construction of the proposed Mesa Substation and demolition of the existing Mesa Substation within the City of Monterey Park
- Removal, relocation, modification, and/or construction of transmission, subtransmission, distribution, and telecommunications structures within the cities of Monterey Park, Montebello, Rosemead, South El Monte, and Commerce, and in portions of unincorporated Los Angeles County
- Conversion of an existing street light source line from overhead to underground between three street lights on Loveland Street within the City of Bell Gardens
- Installation of a temporary 220 kV line loop-in at Goodrich Substation within the City of Pasadena
- Additional minor modifications within several existing substations, as discussed in Section 3.5.4.23, Modifications to Existing Substations in Chapter 3, Project Description. These minor modifications would be located within the substations' existing fenced perimeters, and the associated work would be similar to Operation and Maintenance activities currently performed by SCE.

1.2 Project Location

The Proposed Project is located in Los Angeles County, California, primarily in the City of Monterey Park, with other main components also located in Montebello, Rosemead, South El Monte, Commerce, Bell Gardens, Pasadena, and in portions of unincorporated Los Angeles

[1] The term "Proposed Project" is inclusive of all components of the Mesa Substation 500 kV Project. Where the discussion in this section focuses on a particular component, that component is called out by its individual work area (e.g., "telecommunications line reroute between Mesa and Harding substations").

County, as depicted in Figure 1-1: Proposed Project Location. Section 3.1 of Chapter 3, Project Description contains detailed locations for main Proposed Project components.

Minor internal modifications within the existing fenced perimeter of multiple existing substations throughout the Electrical Needs Area (ENA), including three additional substations, Mira Loma, Pardee, and Vincent that fall outside of the ENA. Locations of minor modifications are presented in Attachment 3-B of Chapter 3, Project Description.

The Proposed Project would serve the ENA of the Western Los Angeles Basin area, as shown in Figure 1-2: Electrical Needs Area. The California Independent System Operator (CAISO) defines the Western Los Angeles Basin area as follows:

- **Northwest Los Angeles Basin sub-area includes these substations**: El Segundo, Chevmain, El Nido, La Cienega, La Fresa, Redondo, Hinson, Arcogen, Harborgen, Long Beach, Lighthipe, and Laguna Bell
- **Western Central Los Angeles Basin sub-area includes these substations**: Center, Del Amo, Mesa, Rio Hondo, Walnut, Olinda
- **Southwest Los Angeles Basin sub-area includes these substations**: Alamitos, Barre, Lewis, Villa Park, Ellis, Huntington Beach, Johanna, Santiago, and Viejo

Figure 1.1:
Proposed Project Location
Mesa 500 kV Substation Project

Proposed Project Location
Interstate
State Highway
County Boundary

Sources: U.S. Geological Survey, Teale Data Center GIS Solutions Group

1:500,000
0 5 10 15 Miles

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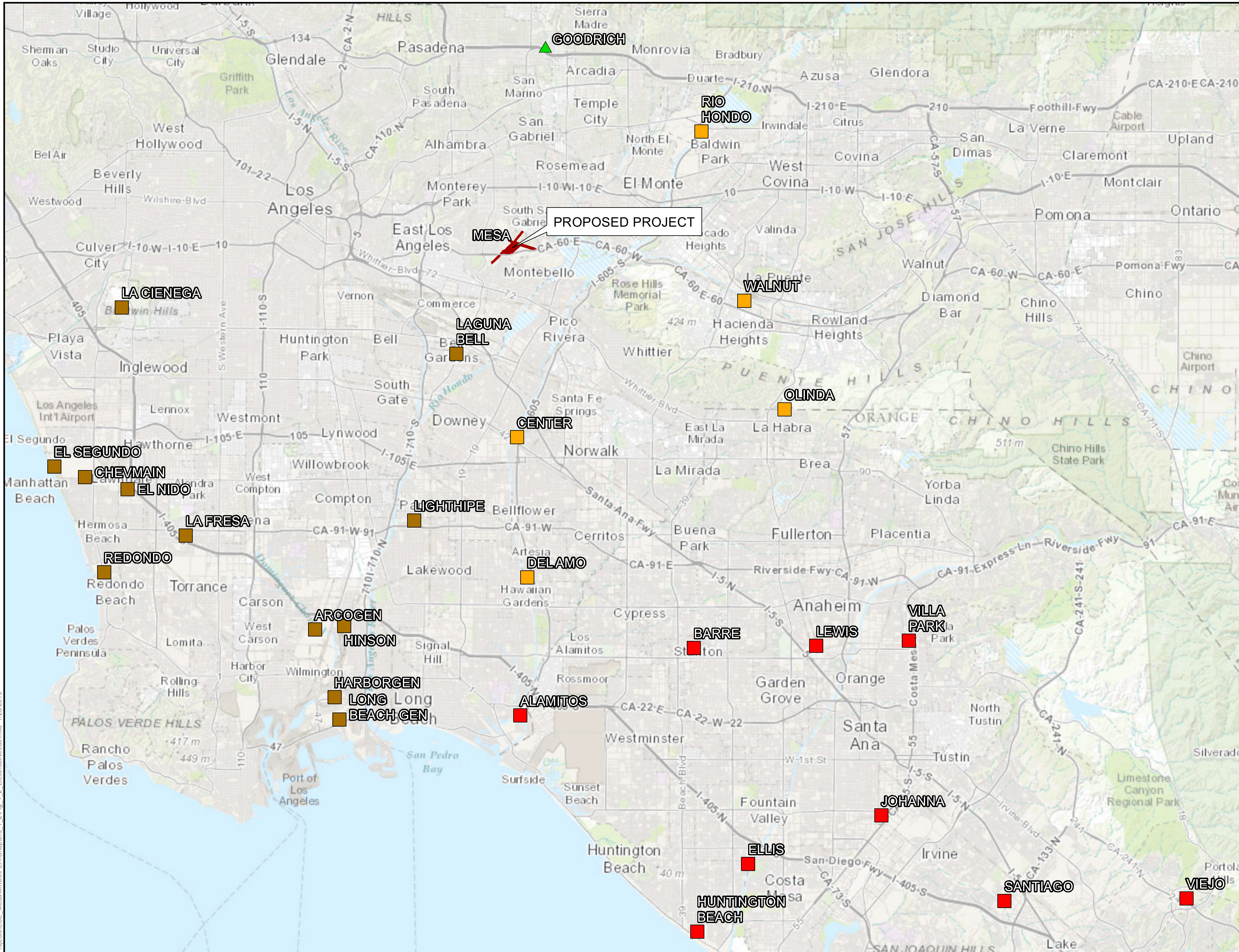
Figure 1.2:
Electrical Needs Area
Mesa 500 kV Substation Project



Proposed Project

Goodrich Substation (Owned by Pasadena Water & Power)

Western Los Angeles (LA) Basin Regional Substations

Northwest LA

Southwest LA

Western Central LA

Source: Southern California Edison, 2015

1:240,000

0 2 4 Miles

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1.3 Project Needs and Alternatives

The Proposed Project was selected as the only feasible option as it was approved by CAISO, meets project objectives (including the project need date), and has fewest potential environmental impacts; therefore, no other alternatives were analyzed other than the No Project Alternative discussed in Chapter 5, Detailed Discussion of Significant Impacts.

1.4 Agency Coordination

1.4.1 County of Los Angeles

In January 2015, SCE met with office of County Supervisor Hilda Solis (Teresa Villegas, Legislative Deputy) and the Los Angeles County Department of Public Works (Bill Winters, Deputy Director) about the Proposed Project. County representatives did not raise any concerns about the Proposed Project.

1.4.2 City of Monterey Park

On October 19, 2014, SCE met with City of Monterey Park staff (the City Manager, Public Works Director, and Assistant City Engineer) to provide an overview of the Proposed Project. City staff had questions regarding impacts to traffic and existing roads, the regulatory review process, and property acquisitions needed for the project. SCE also shared plans on how SCE would inform the community about the Proposed Project. SCE and city staff also discussed the proposed Monterey Park Market Place shopping center development adjacent to the Mesa Substation site.

On December 11, 2014, SCE met with the Monterey Park Assistant City Engineer and others for a technical review of details on preliminary project grading plans. The City’s primary concerns were the location of the proposed primary entrance driveway in proximity to Greenwood Avenue, the proposed relocation of two existing cell towers to the corner of Greenwood Avenue and Potrero Grande Drive, and the need to coordinate efforts with the approvals and development of the Monterey Park Market Place development. SCE will continue to meet regularly with the City to address its concerns.

1.4.3 City of Montebello

SCE briefed City of Montebello Mayor Jack Hadjinian about the Proposed Project on January 14, 2015. The Mayor asked that city residents be informed about the Proposed Project, was encouraged to learn that an open house was scheduled, and that SCE would be reaching out to residents about this opportunity to become aware of the Proposed Project.

SCE met with City of Montebello Planning and Community Development Director Alex Hamilton on January 29, 2015. The necessary acquisition of city permits was discussed; however, no concerns were raised.

1.4.4 City of Rosemead

SCE briefed the City of Rosemead at the February 10, 2015 Rosemead City Council meeting about the work planned in their community related to the Proposed Project. The acquisition of necessary city permits was discussed; however, no concerns were raised.

1.4.5 City of South El Monte

SCE briefed the City of South El Monte at the February 10, 2015 South El Monte City Council meeting about the work planned in their community related to the Proposed Project. The necessary acquisition of city permits was discussed; however, no concerns were raised.

1.4.6 City of Commerce

SCE briefed the City of Commerce Public Works Department (Director Maryam Babaki) on February 11, 2015, about the work planned in the city related to the Proposed Project. The city asked about the CEQA process and lead agency authority and requested close coordination during construction with major businesses near the work location.

1.4.7 City of Bell Gardens

SCE briefed Bell Gardens Assistant City Manager John Oropeza on February 4, 2015, about the planned conversion of a segment of street light source line from overhead to underground in the city as part of the Proposed Project. The city raised no concerns about this element of the Proposed Project.

1.4.8 City of Pasadena

SCE briefed the City of Pasadena's City Manager and Public Works Director on February 2, 2015, about Proposed Project plans to provide a temporary feed to the city's Goodrich Substation if needed during construction. The city has no concerns about the Proposed Project as long as proper notifications about the work are made to the city and the surrounding neighborhood.

1.4.9 United States Army Corps of Engineers

SCE project managers, biological staff, and biologists from Insignia Environmental met with a biologist from the United States (U.S.) Army Corps of Engineers (USACE) on July 9, 2014 on the Proposed Project site to review site conditions and identify jurisdictional Waters of the U.S.

1.4.10 Metropolitan Water District

The Proposed Project requires the relocation of a Metropolitan Water District (MWD) waterline, which currently travels through the Proposed Project property to the west of the existing Mesa Substation. SCE staff has begun the necessary coordination with MWD to incorporate plans to move the waterline to cross the property further to the west to avoid the proposed Mesa Substation footprint.

1.4.11 Environmental Protection Agency

The Proposed Project site is located to the north of a former landfill site operated by Operating Industries Inc. (OII). Due to contaminated groundwater in the vicinity of the landfill, several groundwater monitoring stations are located on the substation expansion areas. SCE has begun coordination with OII to prepare for the development of a Well Management Plan, which will address designation and management processes for OII facilities and equipment to ensure the proper treatment of the wells during construction. SCE met with OII in December 2014 to develop a process to designate and manage OII monitoring wells in an around Mesa Substation. SCE will work with OII and interested stakeholders to complete a Well Management Plan by the end of March 2015. The Well Management Plan will be finalized and submitted to the U.S. Environmental Protection Agency (EPA) in early April 2015, with the intent of obtaining U.S. EPA feedback and approval by July 1, 2015. Subject to U.S. EPA approval, OII will implement appropriate elements of the Well Management Plan in collaboration with SCE by year-end 2015.

1.4.12 Tribes

Coordination with Native American groups and individuals regarding cultural resources of Native American importance in or near the Proposed Project began in January 2015. As of January 29, 2015, responses were received from Chairman Andrew Salas of the Gabrieleño Band of Mission Indians/Kizh (Kit'c) Nation and Tribal Administrator John Tommy Rosas of the Tongva Ancestral Territorial Tribal Nation.

1.5 PEA Contents

This PEA, which was prepared in accordance with the November 24, 2008 *WORKING DRAFT Proponent's Environmental Assessment (PEA) Checklist for Transmission Line and Substation Projects* issued by the CPUC, is divided into six sections. This chapter discusses the contents and conclusions of the PEA and describes SCE's ongoing and past coordination efforts. Chapter 2, Project Purpose and Need and Objectives outlines the Proposed Project's objectives.

A detailed description of the Proposed Project is provided in Chapter 3, Project Description. This discussion includes specifics regarding the Proposed Project location, existing system, the Proposed Project components, permanent and temporary land/ROW requirements, construction methods, construction schedule, anticipated operations and maintenance activities, and federal and local permits that would be obtained for the Proposed Project.

Chapter 4, Environmental Impact Assessment Summary includes an environmental impact assessment summary and a discussion of the existing conditions and potential anticipated impacts of the Project for each of the resources areas identified by the California Environmental Quality Act (CEQA) Guidelines. The CPUC's Checklist indicates that the environmental setting section can be provided separately or combined with the impacts and applicant-proposed measures (APMs). SCE has elected to combine the environmental setting, impacts, and APMs for each resources area in Chapter 4, Environmental Impact Assessment Summary.

Chapter 5, Detailed Discussion of Significant Impacts identifies the potentially significant impacts resulting from the Proposed Project, evaluates alternatives to the Proposed Project, describes the justification for the preferred alternative, and discusses the Proposed Project's potential to induce growth in the area.

Chapter 6, Other Process-Related Data Needs provides property owner information for all parcels located within 300 feet of the Proposed Project.

Throughout this PEA, SCE has addressed all items in the CPUC PEA Checklist. To facilitate confirmation of this and review of the PEA, Table 1-1: PEA Checklist Key, which identifies the section in which each checklist item is addressed, has been included at the end of this section.

1.6 PEA Conclusions

This PEA analyzes the potential environmental impacts associated with construction, operation, and maintenance of the Proposed Project. The following 16 resource areas would not be impacted by the Proposed Project or would experience less than significant impacts:

- Aesthetics
- Agriculture and Forestry Resources
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation and Traffic
- Utilities and Service Systems

The APMs that would be implemented to reduce impacts to a less than significant level are discussed in detail in their relevant sections in Chapter 4, Environmental Impact Assessment Summary.

While the APMs referenced previously would reduce the environmental impacts resulting from the Proposed Project, impacts to one resource area is expected to remain significant and unavoidable. Expected significant and unavoidable impacts are summarized as follows:

- Air Quality – Emissions from construction of the Proposed Project would exceed the South Coast Air Quality Management District's (SCAQMD's) significance thresholds for particulate matter (PM), carbon monoxide (CO), volatile organic compounds (VOCs), and nitrogen oxides (NO_x). With the implementation of APMs, Proposed Project emissions would be reduced below the SCAQMD thresholds for PM and VOCs. However, NO_x and CO emissions would continue to exceed SCAQMD thresholds even with the implementation of these APMs. As a result, impacts related to these emissions would be significant and unavoidable.

1.7 Public Outreach

Public outreach and communications are critical elements of SCE's planning process. SCE identified and reached out to key stakeholders in the Proposed Project area to solicit input and provide information about the Proposed Project.

SCE's outreach efforts focus on educating stakeholders about the Proposed Project need and identifying their concerns about the Proposed Project by written notification, social media advertising, website (on.sce.com/mesa), toll-free information line, in-person visits to nearby stakeholders, and providing an accessible Proposed Project team member to address questions or concerns.

In 2014, SCE initiated the Proposed Project. SCE conducted initial briefings with jurisdictions within the Proposed Project study area. SCE has conducted periodic briefings throughout the development of the Proposed Project. Summaries of these discussions are presented in Section 1.4, Agency Coordination. No major concerns have been reported by jurisdictions. In January 2015, SCE mailed a Proposed Project information letter to property owners and occupants located within 300 feet of the Proposed Project and beyond 300 feet where determined appropriate. The purpose of the mailing was to provide the general public information about the Proposed Project and invite them to an open house to learn more.

SCE also conducted briefings with key stakeholders, including an adjacent water treatment facility, the developer of the Monterey Park Market Place, the management of the Resurrection Cemetery, the Union Bank data center, Care 1st Health Plan, and the Best Western Markham. Concerns about construction-related impacts such as traffic and noise were reported by stakeholders at that time. Summaries of the discussions with these stakeholders are presented in Section 1.7.1, Controversy and/or Major Issues.

SCE held an open house on February 5, 2015 to educate the public and interested stakeholders about the Proposed Project. SCE provided a brief presentation, followed by an opportunity for attendees to meet and talk with subject matter experts about various Proposed Project-related topics. A total of eight members of the public and local government representatives attended the open house.

SCE plans to provide in-person briefings to local jurisdictions at key milestones throughout the life of the Proposed Project, such as prior to filing the application, immediately after a final decision, and prior to the start of construction (assuming the Proposed Project is approved).

SCE regularly reevaluates public outreach strategies based upon the needs of individual communities, input from key stakeholders and the public, and the needs of the Proposed Project. SCE would continue to maintain a Proposed Project website throughout the life of the Proposed Project in order to provide the public with timely information and offer accessible resources for answering questions and addressing concerns related to the Proposed Project.

1.7.1 Controversy and/or Major Issues

Based on input from key stakeholder briefings and public comment at the open house on February 5, 2015, there are general concerns about health, aesthetics, construction-related impacts, and impacts to planned developments in the City of Monterey Park.

Table 1-1: PEA Checklist Key

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
Chapter 1: PEA Summary		
	Include major conclusions of the PEA	Section 1.6, PEA Conclusions
	List any areas of controversy	Sections 1.4, Agency Coordination and Section 1.7.1, Controversy and/or Major Issues
	Include a description of public outreach efforts, if any	Section 1.7, Public Outreach
	Include a description of inter-agency coordination, if any	Section 1.4, Agency Coordination
	Identify any major issues that must be resolved, including the choice among reasonably feasible alternatives and mitigation measures, if any	Section 1.3, Project Needs and Alternatives; Section 1.6, PEA Conclusions; and Section 1.7.1, Controversy and/or Major Issues
Chapter 2: Project Purpose and Need		
2.1 Overview	Include an analysis of Project objectives and purpose and need that is sufficiently detailed so that the Commission can independently evaluate the Project need and benefits in order to accurately consider them in light of the potential environmental impacts	Section 2.1, Project Overview and Section 2.2, Project Objectives
	Explain the objective(s) and/or purpose and need for implementing the Project	Section 2.1, Overview

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
2.2 Project Objectives	Include an analysis of the reason why attainment of these objectives is necessary or desirable. Such analysis must be sufficiently detailed to inform the Commission in its independent formulation of Proposed Project objectives which will aid any appropriate CEQA alternatives screening process	Section 2.2, Project Objectives
Chapter 3: Project Description		
3.1 Project Location	Identify geographical location: County, city (provide Proposed Project location map[s])	Section 3.1, Project Location Figure 1-1: Proposed Project Location
	Provide a general description of land uses within the Proposed Project site (e.g., residential, commercial, agricultural, recreation, vineyards, farms, open space, number of stream crossings, etc.)	Section 3.1, Project Location Section 4.10.1.1, Existing Land Uses
	Describe if the Proposed Project is located within an existing property owned by the applicant, traverses existing ROW, or requires new ROW. Provide the approximate area of the property or the length of the Proposed Project that is in an existing ROW or which requires new ROWs	Section 3.1, Project Location Section 3.6, Right-of-Way Requirements
3.2 Existing System	Describe the local system to which the Proposed Project relates. Include all relevant information about substations, transmission lines, and distribution circuits	Section 3.2, Existing System
	Provide a schematic diagram and map of the existing system	Figure 3-6: Existing and Proposed System Map and Figure 3-7: Existing and Proposed System Schematic
	Provide a schematic diagram that illustrates the system as it would be configured with the implementation of the Proposed Project	Figure 3-7: Existing and Proposed System Schematic

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.3 Project Objectives	Can refer to Chapter 2 Project Purpose and Need, if already described there	Section 2.2, Project Objectives and Section 3.2, Project Objectives
3.4 Proposed Project	Describe the whole of the Proposed Project. Is it an upgrade, a new line, new substations, etc.?	Section 3.4, Proposed Project
	Describe how the Proposed Project fits into the regional system. Does it create a loop for reliability, etc.?	Section 3.4.1, Project Capacity
	Describe all reasonably foreseeable future phases or other reasonably foreseeable consequences of the Proposed Project	Section 3.4.1, Project Capacity
	Provide the capacity increase in megawatts (MW). If the Proposed Project does not increase capacity, state that	Section 3.4.1, Project Capacity
	Provide geographic information system (GIS) (or equivalent) data layers for the Proposed Project preliminary engineering, including estimated locations of all physical components of the Proposed Project, as well as those related to construction	GIS for the Proposed Project will be provided under separate cover
3.5 Project Components 3.5.1 Transmission Line	Describe what type of line exists and what type of line is proposed (e.g., single-circuit, double-circuit, upgrade 69 kV to 115 kV)	Section 3.5, Project Components
	Identify the length of the upgraded alignment, the new alignment, etc.	Section 3.5, Project Components
	Describe whether construction would require one-for-one pole replacement, new poles, steel poles, etc.?	Section 3.5, Project Components
	Describe what would occur to other lines and utilities that may be collocated on the poles to be replaced (e.g., distribution, communication, etc.)	Section 3.5, Project Components

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.5.2 Poles/Towers	Provide information for each pole/tower that would be installed and for each pole/tower that would be removed	Section 3.5.2, Poles/Towers; Figure 3-2: Proposed Project Overview (Transmission); Figure 3-3: Proposed Project Overview (Subtransmission); Figure 3-4: Proposed Project Overview (Telecommunications); and Figure 3-5: Proposed Project Overview (Distribution)
	Provide a unique identification number to match GIS database information	GIS for the Proposed Project will be provided under separate cover
	Provide a structural diagram and, if available, photos of existing structure. Preliminary diagram or "typical" drawings and, if possible, photos of proposed structure. Also provide a written description of the most common types of structures and their use (e.g., tangent poles would be used when the run of poles continues in a straight line, etc.). Describe if the pole/tower design meets raptor safety requirements	Attachment 3-B: Typical Drawings
	Provide the type of pole (e.g., wood, steel, etc.) or tower (e.g., self-supporting, lattice, etc.)	Section 3.5.2, Poles/Towers
	Identify typical total pole lengths, the approximate length to be embedded, and the approximate length that would be above ground surface; for towers, identify the approximate height above ground surface and approximate base footprint area	Section 3.5.2, Poles/Towers
	Describe any specialty poles or towers; note where they would be used (e.g., angle structures, heavy angle lattice towers, stub guys, etc.); make sure to note if any guying would likely be required across a road	Section 3.5.2, Poles/Towers

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.5.2 Poles/Towers (cont.)	If the Proposed Project includes pole-for-pole replacement, describe the approximate location of where the new poles would be installed relative to the existing alignment	Section 3.5.2, Poles/Towers
	Describe any special pole types (e.g., poles that require foundations, transition towers, switch towers, microwave towers, etc.) and any special features	Section 3.5.2, Poles/Towers
3.5.3 Conductor/Cable 3.5.3.1 Above-Ground Installation	Describe the type of line to be installed on the poles/tower (e.g. single-circuit with distribution, double circuit, etc.)	Section 3.5.3.1, Above-Ground Installation
	Describe the number of conductors required to be installed on the poles or tower and the number on each side, including applicable engineering design standards	Section 3.5.3.1, Above-Ground Installation
	Provide the size and type of conductor (e.g., aluminum conductor, steel reinforced, non-specular, etc.) and insulator configuration	Section 3.5.3.1, Above-Ground Installation
	Provide the approximate distance from the ground to the lowest conductor and the approximate distance between the conductors (i.e., both horizontally and vertically). Provide specific information at highways, rivers, or special crossings	Section 3.5.3.1, Above-Ground Installation
	Provide the approximate span lengths between poles or towers, note where different if distribution is present or not if relevant	Section 3.5.3.1, Above-Ground Installation
	Determine whether other infrastructure would likely be collocated with the conductor (e.g., fiber optics, etc.); if so, provide conduit diameter of other infrastructure	Section 3.5.3.1, Above-Ground Installation

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.5.3.2 Below Ground Installation	Describe the type of line to be installed (e.g., single circuit crosslinked polyethylene-insulated solid-dielectric, copper-conductor cables)	Section 3.5.3.2, Below Ground Installation
	Describe the type of casing the cable would be installed in (e.g., concrete-encased duct bank system); provide the dimensions of the casing	Section 3.5.3.2, Below Ground Installation
	Provide an engineering 'typical' drawing of the duct bank and describe what types of infrastructure would likely be installed within the duct bank (e.g., transmission, fiber optics, etc.)	Attachment 3-B: Typical Drawings
3.5.4 Substation	Provide "typical" plan and profile views of the proposed substation and the existing substation if applicable	Figure 3-8: Proposed Substation Layout and Figure 3-9: Proposed Substation Profile
	Describe the types of equipment that would be temporarily or permanently installed and provide details as to what the function/use of said equipment would be. Include information such as, but not limited to mobile substations, transformers, capacitors, and new lighting	Section 3.5.4, Substations
	Provide the approximate or "typical" dimensions (width and height) of new structures including engineering and design standards that apply	Section 3.5.4, Substation
	Describe the extent of the Proposed Project. Would it occur within the existing fence line, existing property line or would either need to be expanded?	Section 3.5.4, Substation
	Describe the electrical need area served by the distribution substation	Section 3.2, Existing System

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.6 Right-of-Way Requirements	Describe the ROW location, ownership, and width. Would the existing ROW be used or would new ROW be required?	Section 3.6, Right-of-Way Requirements
	If a new ROW is required, describe how it would be acquired and approximately how much land would be required (length and width)	Section 3.6, Right-of-Way Requirements
	List the properties likely to require acquisition	Section 3.6, Right-of-Way Requirements
3.7 Construction 3.7.1 For All Projects 3.7.1.1 Staging Areas	Where would the main staging area(s) likely be located?	Section 3.7.1.1, Staging Areas and Figure 3-10: Conductor Installation and Removal Work Areas
	Approximately how large would the main staging area(s) be?	Section 3.7.1.1, Staging Areas
	Describe any site preparation required, if known, or generally describe what might be required (i.e., vegetation removal, new access road, installation of rock base, etc.)	Section 3.7.1.1, Staging Areas
	Describe what the staging area would be used for (e.g., material and equipment storage, field office, reporting location for workers, parking area for vehicles and equipment, etc.)	Section 3.7.1.1, Staging Areas
	Describe how the staging area would be secured; would a fence be installed? If so, describe the type and extent of the fencing	Section 3.7.1.1, Staging Areas
	Describe how power to the site would be provided if required (e.g., tap into existing distribution, use of diesel generators, etc.)	Section 3.7.1.1, Staging Areas
	Describe any grading activities and/or slope stabilization issues	Section 3.7.1.1, Staging Areas

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.1.2 Work Areas	Describe known work areas that may be required for specific construction activities (i.e., pole assembly, hill side construction, etc.)	Section 3.7.1.2, Work Areas
	For each known work area, provide the area required (include length and width) and describe the types of activities that would be performed	Section 3.7.1.2, Work Areas
	Identify the approximate location of known work areas in the GIS database	GIS for the Proposed Project will be provided under separate cover
	Describe how the work areas would likely be accessed (e.g., construction vehicles, walk-in, helicopter, etc.)	Section 3.7.1.2, Work Areas and Section 3.7.1.3, Access Roads and/or Spur Roads
	If any site preparation is likely required, generally describe what and how it would be accomplished	Section 3.7.1.2, Work Areas
	Describe any grading activities and/or slope stabilization issues	Section 3.7.1.2, Work Areas
	Based on the information provided, describe how the site would be restored	Section 3.7.1.2, Work Areas
3.7.1.3 Access Roads and/or Spur Roads	Describe the types of roads that would be used and/or would need to be created to implement the Proposed Project. Road types may include, but are not limited to: new permanent road; new temporary road; existing road that would have permanent improvements; existing road that would have temporary improvements; existing paved road; existing dirt/gravel road; and overland access	Section 3.7.1.3, Access Roads and/or Spur Roads
	For road types that require preparation, describe the methods and equipment that would be used	Section 3.7.1.3, Access Roads and/or Spur Roads
	Identify approximate location of all access roads (by type) in the GIS database	GIS for the Proposed Project will be provided under separate cover

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.1.3 Access Roads and/or Spur Roads (cont.)	Describe any grading activities and/or slope stabilization issues.	Section 3.7.1.3, Access Roads and/or Spur Roads
3.7.1.4 Helicopter Access	Identify which proposed poles/towers would be removed and/or installed using a helicopter	Section 3.7.1.4, Helicopter Access
	If different types of helicopters are to be used, describe each type (e.g., light, heavy, or sky crane) and what activities they would be used for	Section 3.7.1.4, Helicopter Access
	Provide information as to where the helicopters would be staged, where they would refuel, and where they would land within the Proposed Project site	Section 3.7.1.4, Helicopter Access
	Describe any Best Management Practices (BMPs) that would be employed to avoid impacts caused by use of helicopters, for example: air quality and noise considerations	Section 3.7.1.4, Helicopter Access
	Describe flight paths, payloads, hours of operations for known locations, and work types	Section 3.7.1.4, Helicopter Access
3.7.1.5 Vegetation Clearance	Describe the types of vegetation clearing that may be required (e.g., tree removal, brush removal, flammable fuels removal) and why (e.g., to provide access, etc.)	Section 3.7.1.5, Vegetation Clearance
	Identify the preliminary location and provide an approximate area of disturbance in the GIS database for each type of vegetation removal	Section 3.7.1.5, Vegetation Clearance
	Describe how each type of vegetation removal would be accomplished	Section 3.7.1.5, Vegetation Clearance
	For removal of trees, distinguish between tree trimming as required under G.O. 95 and tree removal	Section 3.7.1.5, Vegetation Clearance

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.1.5 Vegetation Clearance (cont.)	Describe the types and approximate number and size of trees that may need to be removed	Section 3.7.1.5, Vegetation Clearance
	Describe the type of equipment typically used	Section 3.7.5.1, Equipment Descrption and Attachment 3-D: Construction Equipment and Workforce Estimates
3.7.1.6 Erosion and Sediment Control and Pollution Prevention during Construction	Describe the areas of soil disturbance including estimated total areas and associated terrain type and slope. List all known permits required. For project sites of less than one acre, outline the BMPs that would be implemented to manage surface runoff. Things to consider include, but are not limited to: Erosion and sedimentation BMPs, vegetation removal and restoration, and/or hazardous waste, and spill prevention plans	Section 3.7.1.6, Erosion and Sediment Control and Pollution Prevention during Construction
	Describe any grading activities and/or slope stabilization issues	Section 3.7.4.1, Site Preparation and Grading
	Describe how construction waste (i.e., refuse, spoils, trash, oil, fuels, poles, pole structures, etc.) would be disposed	Section 3.7.1.6, Erosion and Sediment Control and Pollution Prevention during Construction
3.7.1.7 Cleanup and Post-Construction Restoration	Describe how cleanup and post-construction restoration would be performed (i.e., personnel, equipment, and methods). Things to consider, but are not limited to, restoration of natural drainage patterns, wetlands, vegetation, and other disturbed areas (i.e. staging areas, access roads, etc.)	Section 3.7.1.7, Cleanup and Post-Construction Restoration

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.2 Transmission Line Construction (Above Ground) 3.7.2.1 Pull and Tension Sites	Provide the general or average distance between pull and tension sites	Section 3.7.2.1, Pull and Tension Sites
	Provide the area of pull and tension sites including the estimated length and width	Section 3.7.2.1, Pull and Tension Sites
	According to the preliminary plan, identify the number of pull and tension sites that would be required, and their locations. Provide the location information in GIS	Section 3.7.2.1, Pull and Tension Sites; GIS for the Proposed Project will be provided under separate cover
	Describe the type of equipment that would be required at these sites	Section 3.7.2.1, Pull and Tension Sites and Attachment 3-D: Construction Equipment and Workforce Estimates
	If conductor is being replaced, describe how it would be removed	Section 3.7.2.2, Pole and Foundation Removal
3.7.2.2 Pole Installation and Removal	Describe how the construction crews and their equipment would be transported to and from the pole site locations. Provide vehicle type, number of vehicles, estimated number of trips, and hours of operation	Section 3.7.2.2, Pole Installation and Removal
	Describe the process of removing the poles and foundations	Section 3.7.2.2, Pole Installation and Removal
	Describe what happens to the holes that the poles were in (i.e., reused or backfilled)?	Section 3.7.2.2, Pole Installation and Removal
	If the holes are to be backfilled, what type of fill would be used and where would it come from?	Section 3.7.2.2, Pole Installation and Removal
	Describe any surface restoration that would occur at the pole sites	Section 3.7.2.2, Pole Installation and Removal

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.2.2 Pole Installation and Removal (cont.)	Describe how the poles would be removed from the sites	Section 3.7.2.2, Pole Installation and Removal
	If topping is required to remove a portion of an existing transmission pole that would now only carry distribution lines, describe the methodology to access and remove the tops of these poles. Describe any special methods that would be required to top poles that may be difficult to access, etc.	Section 3.7.2.2, Pole Installation and Removal
	Describe the process of how the new poles/towers would be installed; specifically identify any special construction methods (e.g., helicopter installation) for specific locations or for different types of poles/towers	Section 3.7.2.2, Pole Installation and Removal
	Describe the types of equipment and their use as related to pole/tower installation	Section 3.7.2.2, Pole Installation and Removal and Attachment 3-D: Construction Equipment and Workforce Estimates
	Describe the actions taken to maintain a safe work environment during construction (e.g., covering of holes/excavation pits, etc.)	Section 3.9.2, Worker Environmental Awareness Training
	Describe what would be done with soil that is removed from a hole/foundation site	Section 3.7.2.2, Pole Installation and Removal
	For any foundations required, provide a description of the construction method(s), approximate average depth and diameter of excavation, approximate volume of soil to be excavated, approximate volume of concrete or other backfill required, etc.	Section 3.7.2.2, Pole Installation and Removal
	Describe briefly how poles/towers and associated hardware are assembled	Section 3.7.2.2, Pole Installation and Removal

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.2.2 Pole Installation and Removal (cont.)	Describe how the poles/towers and associated hardware would be delivered to the site; would they be assembled off site and brought in or assembled on site?	Section 3.7.2.2, Pole Installation and Removal
	Provide the following information about pole/tower installation and associated disturbance area estimates: pole diameter for each pole type (e.g., wood, self-supporting steel, lattice, etc.), base dimensions for each pole type, auger hole depth for each pole type, permanent footprint per pole/tower, number of poles/towers by pole type, average work area around poles/towers by pole type (e.g., for old pole removal and new pole installation), and total permanent footprint for poles/towers	Table 3-1: Typical Transmission Structure Dimensions and Table 3-2: Typical Subtransmission Structure Dimensions
3.7.2.3 Conductor/Cable Installation	Provide a process-based description of how new conductor/cable would be installed and how old conductor/cable would be removed, if applicable	Section 3.7.2.3, Conductor/Cable Installation
	Generally describe the conductor/cable splicing process	Section 3.7.2.3, Conductor/Cable Installation
	If vaults are required, provide their dimensions and approximate location/spacing along the alignment	Section 3.5.3.2, Below-Ground Installation
	Describe in what areas conductor/cable stringing/installation activities would occur	Section 3.7.2.1, Pull and Tension Sites
	Describe any safety precautions or areas where special methodology would be required (e.g., crossing roadways, stream crossing, etc.)	Section 3.7.2.3, Conductor/Cable Installation
3.7.3 Transmission Line Construction (Below Ground)	Describe the approximate dimensions of the trench (e.g., depth, width)	Section 3.7.3.1, Trenching
	Describe the methodology of making the trench (e.g., saw cutter to cut the pavement, backhoe to remove, etc.)	Section 3.7.3.1, Trenching

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.3.1 Trenching	Provide the total approximate cubic yardage of material to be removed from the trench, the amount to be used as backfill and the amount to subsequently be removed/disposed of off-site	Section 3.7.3.1, Trenching
	Provide off-site disposal location, if known, or describe possible option(s)	Section 3.7.3.1, Trenching
	If engineered fill would be used as backfill, provide information as to the type of engineered backfill and the amount that would be typically used (e.g., top two feet would be filled with thermal-select backfill)	Section 3.7.3.1, Trenching
	Describe if dewatering would be anticipated and, if so, how the trench would be dewatered, what the anticipated flows of the water are, whether there would be treatment, and how the water would be disposed of	Section 3.7.3.1, Trenching
	Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants that could be exposed as a result of trenching operations	Section 3.7.3.1, Trenching
	If pre-existing hazardous waste was encountered, describe the process of removal and disposal	Section 3.7.3.1, Trenching
	Describe any standard BMPs that would be implemented	Section 3.7.3.1, Trenching

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.3.2 Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling	Provide the approximate location of the sending and receiving pits	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Provide the length, width and depth of the sending and receiving pits	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Describe the methodology of excavating and shoring the pits	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Describe the methodology of the trenchless technique	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Provide the total cubic yardage of material to be removed from the pits, the amount to be used as backfill and the amount to subsequently be removed/disposed of off-site	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Describe the process for safe handling of drilling mud and bore lubricants	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.3.2 Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling (cont.)	Describe the process for detecting and avoiding "fracturing-out" during horizontal directional drilling operations	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Describe the process for avoiding contact between drilling mud/lubricants and streambeds	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	If engineered fill would be used as backfill, provide information as to the type of engineered backfill and the amount that would be typically used (e.g., top two feet would be filled with thermal-select backfill)	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	If dewatering is anticipated, describe how the pit would be dewatered, what the anticipated flows of the water are, whether there would be treatment, and how the water would be disposed of	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	If a pre-existing hazardous waste was encountered, describe the process of removal and disposal	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.3.2 Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling (cont.)	Describe any grading activities and/or slope stabilization issues	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
	Describe any standard BMPs that would be implemented	Section 3.7.3.2, Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling
3.7.4 Substation Construction	Describe any earth-moving activities that would be required; what type of activity and, if applicable, estimate cubic yards of materials to be reused and/or removed from the site for both site grading and foundation excavation	Section 3.7.4.1, Site Preparation and Grading; Table 3-5: Substation Cut and Fill Grading Summary; Table 3-10: Substation Ground Surface Improvement Materials
	Provide a conceptual landscape plan in consultation with the municipality in which the substation is located	Section 3.7.4.7, Landscaping
	Describe any grading activities and/or slope stabilization issues	Section 3.7.4.1, Site Preparation and Grading
	Describe possible relocation of commercial or residential property, if any	Section 3.6, Right-of-Way Requirements
3.7.5 Construction Workforce and Equipment	Provide the estimated number of construction crew members	Section 3.7.5, Construction Workforce and Equipment
	Describe the crew deployment, whether crews would work concurrently (i.e., multiple crews at different sites), if they would be phased, etc.	Section 3.7.5, Construction Workforce and Equipment

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.7.5 Construction Workforce and Equipment (cont.)	Describe the different types of activities to be undertaken during construction, the number of crew members for each activity (i.e., trenching, grading, etc.), and the number and types of equipment expected to be used for said activity. Include a written description of the activity	Section 3.7.5, Construction Workforce and Equipment and Attachment 3-D: Construction Equipment and Workforce Estimates
	Provide a list of the types of equipment expected to be used during construction of the Proposed Project as well as a brief description of the use of the equipment	Section 3.7.6, Construction Workforce and Equipment; Table 3-14: Construction Equipment Description; and Attachment 3-D: Construction Equipment and Workforce Estimates
3.7.6 Construction Schedule	Provide a preliminary project construction schedule; include contingencies for weather, wildlife closure periods, etc.	Section 3.7.6, Construction Schedule and Table 3-14: Proposed Construction Schedule
3.8 Operation and Maintenance	Describe the general system monitoring and control (i.e., use of standard monitoring and protection equipment, use of circuit breakers and other line relay protection equipment, etc.)	Section 3.8, Operation and Maintenance
	Describe the general maintenance program of the Proposed Project including timing of inspections (i.e., monthly, every July, as needed), type of inspection (i.e., aerial inspection, ground inspection), and a description of how the inspection would be implemented. Things to consider: who/how many crew members, how would they access the site (i.e., walk to site, vehicle, all terrain vehicle), would new access be required, would restoration be required, etc.)	Section 3.8, Operation and Maintenance

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
3.8 Operation and Maintenance (cont.)	If additional full time staff would be required for operation and/or maintenance, provide the number of workers and for what purpose they are required	Section 3.8, Operation and Maintenance
3.9 Applicant-Proposed Measures	If there are measures that the Applicant would propose to be part of the Proposed Project, include those measures and reference plans or implementation descriptions	Section 3.9, Applicant-Proposed Measures
Chapter 4: Environmental Setting		
	For each resource area discussion within the PEA, include a description of the physical environment in the vicinity of the Proposed Project (e.g., topography, land use patterns, biological environment, etc.), including the local environment (site-specific) and regional environment	Chapter 4 – Combined with the Environmental Impact Assessment Summary
	For each resource area discussion within the PEA, include a description of the regulatory environment/context (federal, State, and local)	Chapter 4 – Combined with the Environmental Impact Assessment Summary
	Limit detailed descriptions to those resource areas which may be subject to a potentially significant impact	Chapter 4 – Combined with the Environmental Impact Assessment Summary
Chapter 5: Environmental Impact Assessment Summary		
5.1 Aesthetics	Provide visual simulations of prominent public view locations, including scenic highways, to demonstrate the views before and after project implementation. Additional simulations are highly recommended	Figures 4.1-6: Visual Simulations
5.2 Agriculture Resources	Identify the types of agricultural resources affected	Section 4.2, Agriculture and Forestry Resources

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
5.3 Air Quality	Provide supporting calculations/ spreadsheets/technical reports that support emission estimates in the PEA	Appendix E: CalEEMod Results
	Provide documentation of the location and types of sensitive receptors that could be impacted by the Project (e.g., schools, hospitals, houses, etc.). Critical distances to receptors are dependent on type of construction activity	Section 4.3, Air Quality
	Identify Proposed Project GHG emissions	Section 4.7, Greenhouse Gas Emissions
	Quantify GHG emissions from a business as usual snapshot. That is, what the GHG emissions will be from the Proposed Project if no mitigations were used	Section 4.7, Greenhouse Gas Emissions
	Quantify GHG emission reductions from every APM that is implemented. The quantifications will be itemized and placed in tabular format	N/A
	Identify the net emissions of the Proposed Project after mitigation have been applied	N/A
	Calculate and quantify GHG emissions (CO2 equivalent) for the Proposed Project, including construction and operation	Section 4.7, Greenhouse Gas Emissions
	Calculate and quantify the GHG reduction based on reduction measures proposed for the Proposed Project	N/A
	Propose APMs to implement and follow to maximize GHG reductions. If sufficient, CPUC will accept them without adding further mitigation measures	N/A

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
5.3 Air Quality (cont.)	Discuss programs already in place to reduce GHG emissions on a system-wide level. This includes the Applicant's voluntary compliance with the U.S. Environmental Protection Agency (EPA) SF6 reduction program, reductions from energy efficiency, demand response, long-term procurement plan, etc.	Section 4.7, Greenhouse Gas Emissions
	Ensure that the assessment of air quality impacts is consistent with PEA Section 3.7.5, as well as with the PEA's analysis of impacts during construction, including traffic and all other emissions	Section 4.3, Air Quality
5.4 Biological Resources	Provide a copy of the Wetland Delineation and supporting documentation (i.e., data sheets). If verified, provide supporting documentation. Additionally, GIS data of the wetland features should be provided as well	Appendix F: Biological Resources Reports; GIS for the Proposed Project will be provided under separate cover
	Provide a copy of special-status surveys for wildlife, botanical and aquatic species, as applicable. Any GIS data documenting locations of special-status species should be provided	Appendix F: Biological Resources Reports; GIS for the Proposed Project will be provided under separate cover

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
5.5 Cultural Resources	Cultural Resources Report documenting a cultural resources investigation of the Proposed Project. This report should include a literature search, pedestrian survey, and Native American consultation	Appendix G: Cultural Resources Reports; the archaeological and historical infrastructure reports are confidential and will be provided under a separate cover; the paleontological resources report will be provided upon request
	Provide a copy of the records found in the literature search	Appendix G: Cultural Resources Reports; the archaeological and historical infrastructure reports are confidential and will be provided under a separate cover; the paleontological resources report will be provided upon request
	Provide a copy of all letters and documentation of Native American consultation	Appendix H: Cultural Consultation Letters
5.6 Geology, Soils, and Seismic Potential	Provide a copy of the geotechnical investigation if completed, including known and potential geologic hazards such as ground shaking, subsidence, liquefaction, etc.	A geotechnical report for the Proposed Project will be provided under separate cover when available
5.7 Hazards and Hazardous Materials	Include an Environmental Data Resources report	Appendix I: Hazardous Materials Record Search Results
	Include a Hazardous Substance Control and Emergency Response Plan, if required	N/A

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
5.7 Hazards and Hazardous Materials (cont.)	Include a Health and Safety Plan, if required	N/A
	Describe the Worker Environmental Awareness Program	Section 3.9.2, Worker Environmental Awareness Training
	Describe which chemicals would be used during construction and operation of the Proposed Project. For example, fuels for construction, naphthalene to treat wood poles before installation, etc.	Section 4.8, Hazards and Hazardous Materials; Table 4.8-2: Hazardous Materials Typically Used for Construction
5.8 Hydrology and Water	Describe impacts to groundwater quality including increased runoff due to construction of impermeable surfaces, etc.	Section 4.9, Hydrology and Water Quality
	Describe impacts to surface water quality including the potential for accelerated soil erosion, downstream sedimentation, and reduced surface water quality	Section 4.9, Hydrology and Water Quality
5.9 Land Use and Planning	Provide GIS data of all parcels within 300 feet of the Proposed Project with the following data: APN number, mailing address, and parcel's physical address	GIS for the Proposed Project will be provided under separate cover
5.10 Mineral Resources	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area	Section 4.11, Mineral Resources
5.11 Noise	Provide long-term noise estimates for operational noise (e.g., corona discharge noise, and station sources such as substations, etc.)	Section 4.12, Noise
5.12 Population and Housing	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area	Section 4.13, Population and Housing
5.13 Public Services	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area	Section 4.14, Public Services

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
5.14 Recreation	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area	Section 4.15, Recreation
5.15 Transportation and Traffic	Discuss traffic impacts resulting from construction of the Proposed Project including ongoing maintenance operations	Section 4.16, Transportation and Traffic
	Provide a preliminary description of the traffic management plan that would be implemented during construction of the Proposed Project	Section 4.16, Transportation and Traffic
5.16 Utilities and Services Systems	Describe how treated wood poles would be disposed of after removal, if applicable	Section 4.17, Utilities and Services
5.17 Cumulative Analysis	Provide a list of projects (i.e., past, present, and reasonably foreseeable future projects) within the Proposed Project area that the applicant is involved in	Section 4.18, Cumulative Analysis
	Provide a list of projects that have the potential to be proximate in space and time to the Proposed Project. Agencies to be contacted include, but are not limited to, the local planning agency, Caltrans, etc.	Section 4.18, Cumulative Analysis
5.18 Growth-Inducing Impacts, If Significant	Provide information on the Proposed Project's growth- inducing impacts, if any	Section 4.19, Growth-Inducing Impacts and Section 5.3, Growth-Inducing Impacts
	Provide information on any economic or population growth in the surrounding environment that will, directly or indirectly, result from the Proposed Project	Section 4.19, Growth-Inducing Impacts and Section 5.3, Growth-Inducing Impacts
	Provide information on any increase in population that could further tax existing community service facilities (e.g., schools, hospitals, fire, police, etc.), that will directly or indirectly result from the Proposed Project	Section 4.19, Growth-Inducing Impacts and Section 5.3, Growth-Inducing Impacts

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
5.18 Growth-Inducing Impacts, If Significant (cont.)	Provide information on any obstacles to population growth that the Proposed Project would remove	Section 4.19, Growth-Inducing Impacts and Section 5.3, Growth-Inducing Impacts
	Describe any other activities, directly or indirectly encouraged or facilitated by the Proposed Project, that would cause population growth that could significantly affect the environment, either individually or cumulatively	Section 4.19, Growth-Inducing Impacts and Section 5.3, Growth-Inducing Impacts
Chapter 6: Detailed Discussion of Significant Impacts		
6.1 Mitigation Measures Proposed to Minimize Significant Effects	Discuss each mitigation measure and the basis for selecting a particular mitigation measure should be stated	Section 5.1, Applicant-Proposed Measures to Minimize Significant Effects
6.2 Description of Project Alternatives and Impact Analysis	Provide a summary of the alternatives considered that would meet most of the objectives of the Proposed Project and an explanation as to why they were not chosen as the Proposed Project	Section 5.2, Description of Project Alternatives and Impact Analysis
	Alternatives considered and described by the Applicant should include, as appropriate, system or facility alternatives, route alternatives, route variations, and alternative locations	Section 5.2, Description of Project Alternatives and Impact Analysis
	A description of a "No Project Alternative" should be included	Section 5.2, Description of Project Alternatives and Impact Analysis
	If significant environmental effects are assessed, the discussion of alternatives shall include alternatives capable of substantially reducing or eliminating any said significant environmental effects, even if the alternative(s) substantially impede the attainment of the Proposed Project objectives and are more costly	Section 5.2, Description of Project Alternatives and Impact Analysis

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
6.3 Growth-Inducing Impacts	Discuss if the Proposed Project would foster economic or population growth, either directly or indirectly, in the surrounding environment	Section 5.3, Growth-Inducing Impacts
	Discuss if the Proposed Project would cause an increase in population that could further tax existing community services (e.g., schools, hospitals, fire, police, etc.)	Section 5.3, Growth-Inducing Impacts
	Discuss if the Proposed Project would remove obstacles to population growth	Section 5.3, Growth-Inducing Impacts
	Discuss if the Proposed Project would encourage and facilitate other activities that would cause population growth that could significantly affect the environment, either individually or cumulatively	Section 5.,3 Growth-Inducing Impacts
6.4 Suggested Applicant-Proposed Measures to address GHG Emissions	Include a menu of suggested APMs that applicants can consider to address GHG emissions. Suggested APMs include, but are not limited to:	Section 5.4, Suggested Applicant Proposed Measures to Address GHG Emissions and Section 4.7, Greenhouse Gas Emissions
	1. If suitable park-and-ride facilities are available in the Project vicinity, construction workers will be encouraged to carpool to the job site to the extent feasible. The ability to develop an effective carpool program for the Proposed Project would depend upon the proximity of carpool facilities to the job site, the geographical commute departure points of construction workers, and the extent to which carpooling would not adversely affect worker show-up time and the Project’s construction schedule	If applicable, Section 4.7, Greenhouse Gas Emissions

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
6.4 Suggested Applicant-Proposed Measures to address GHG Emissions (cont.)	2. To the extent feasible, unnecessary construction vehicle and idling time will be minimized. The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel powered vehicles, have extended warm-up times following start-up that limit their availability for use following startup. Where such diesel powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The Proposed Project will apply a "common sense" approach to vehicle use; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction foremen will include briefings to crews on vehicle use as part of pre-construction conferences. Those briefings will include discussion of a "common sense" approach to vehicle use	If applicable, Section 4.7, Greenhouse Gas Emissions
	3. Use low-emission construction equipment. Maintain construction equipment per manufacturing specifications and use low emission equipment described here. All off road construction diesel engines not registered under the California Air Resources Board (CARB) Statewide Portable Equipment Registration Program shall meet at a minimum the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Sec. 2423(b)(1)	If applicable, Section 4.7, Greenhouse Gas Emissions
	4. Diesel Anti-Idling: In July 2004, the CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling	If applicable, Section 4.7, Greenhouse Gas Emissions
	5. Alternative Fuels: CARB would develop regulations to require the use of one to four percent biodiesel displacement of California diesel fuel	If applicable, Section 4.7, Greenhouse Gas Emissions

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
6.4 Suggested Applicant-Proposed Measures to address GHG Emissions (cont.)	6. Alternative Fuels: Ethanol, increased use of ethanol fuel	If applicable, Section 4.7, Greenhouse Gas Emissions
	7. Green Buildings Initiative	If applicable, Section 4.7, Greenhouse Gas Emissions
	8. Facility wide energy efficiency audit	If applicable, Section 4.7, Greenhouse Gas Emissions
	9. Complete GHG emissions audit. The audit will include a review of the GHG emitted from those facilities (substations), including carbon dioxide, methane, CFC, and HFC compounds (SF_6)	If applicable, Section 4.7, Greenhouse Gas Emissions
	10. There is an EPA approved SF_6 emissions protocol (http://www.epa.gov/electricpowersf6/resources/ index.html#three)	If applicable, Section 4.7, Greenhouse Gas Emissions
	11. SF_6 program wide inventory. For substations, keep inventory of leakage rates	If applicable, Section 4.7, Greenhouse Gas Emissions
	12. Increase replacement of breakers once leakage rates exceed one percent within 30 days of detection	If applicable, Section 4.7, Greenhouse Gas Emissions
	13. Increased investment in current programs that can be verified as being in addition to what the utility is already doing	If applicable, Section 4.7, Greenhouse Gas Emissions
	14. The SF_6 Emission Reduction Partnership for the Electric Power Systems was launched in 1999 and currently includes 57 electric utilities and local governments across the U.S.	If applicable, Section 4.7, Greenhouse Gas Emissions

Location in CPUC Checklist	Checklist Item	Location in PEA and Associated Notes
6.4 Suggested Applicant-Proposed Measures to address GHG Emissions (cont.)	15. SF_6 is used by this industry in a variety of applications, including that of dielectric insulating material in electrical transmission and distribution equipment, such as circuit breakers. Electric power systems that join the Partnership must, within 18 months, establish an emission reduction goal reflecting technically and economically feasible opportunities within their company. They also agree to, within the constraints of economic and technical feasibility, estimate their emissions of SF_6, establish a strategy for replacing older, leakier pieces of equipment, implement SF_6 recycling, establish and apply proper handling techniques, and report annual emissions to the EPA. The EPA works as a clearinghouse for technical information, works to obtain commitments from all electric power system operators and will be sponsoring an international conference in 2000 on SF_6 emission reductions	If applicable, Section 4.7, Greenhouse Gas Emissions
	16. Quantify what comes into the system and track programmatically SF_6	If applicable, Section 4.7, Greenhouse Gas Emissions
	17. Applicant can propose other GHG reducing mitigations	If applicable, Section 4.7, Greenhouse Gas Emissions
Chapter 7: Other Process-Related Data Needs		
Noticing	Include an excel spreadsheet that identifies all parcels within 300 feet of any Proposed Project component with the following data: APN number, owner mailing address, and parcels physical address	A spreadsheet of parcels within 300 feet of the Proposed Project is provided in *Chapter 6, Other Process-Related Needs*

Note: "N/A" = Not Applicable

1.8 References

Aspen Environmental Group. (2014a). *Transmission Options and Potential Corridor Designations in Southern California in Response to Closure of San Onofre Nuclear Generating Station (SONGS) Environmental Feasibility Analysis.* Retrieved January 12, 2015, from http://www.energy.ca.gov/2014publications/CEC-700-2014-002/CEC-700-2014-002.pdf.

Aspen Environmental Group. (2014b). *Addendum to Transmission Options and Potential Corridor Designations in Southern California in Response to Closure of San Onofre Nuclear Generating Station (SONGS) Environmental Feasibility Analysis.* Retrieved January 12, 2015, from http://www.energy.ca.gov/2014publications/CEC-700-2014-002/CEC-700-2014-002-AD.pdf.

Aspen Environmental Group. (2015). *Second Addendum to Transmission Options and Potential Corridor Designations in Southern California in Response to Closure of San Onofre Nuclear Generating Stations (SONGS) Environmental Feasibility Analysis.* Retrieved February 4, 2015, from http://www.energy.ca.gov/2014publications/CEC-700-2014-002/CEC-700-2014-002-AD2.pdf.

Association of Environmental Professionals. (2014). *California Environmental Quality Act Statute and Guidelines.* Retrieved January 12, 2015, from http://resources.ca.gov/ceqa/docs/2014_CEQA_Statutes_and_Guidelines.pdf.

CAISO. (2014). *2013-2014 Transmission Plan.* Retrieved January 12, 2015, from http://www.caiso.com/Documents/Board-Approved2013-2014TransmissionPlan_July162014.pdf.

CPUC. (1995). *General Order No. 131-D*. Retrieved January 12, 2015, from http://docs.cpuc.ca.gov/PUBLISHED/Graphics/589.PDF.

CPUC. (2008). *WORKING DRAFT Proponent's Environmental Assessment (PEA) Checklist – Transmission.* Retrieved January 12, 2015, from http://www.cpuc.ca.gov/NR/rdonlyres/E2456E99-83F0-469C-AC83-1A123B3C3383/0/CPUCPEAChecklistwithGHG.pdf.

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Chapter 2
Project Purpose and Need and Objectives

This chapter defines objectives, purpose, and need for the Southern California Edison Company (SCE) proposed Mesa 500 kilovolt (kV) Substation Project (Proposed Project), as required by the California Public Utilities Commission's (CPUC) Proponent's Environmental Assessment (PEA) Guidelines (CPUC Information and Criteria List, Appendix B, Section V) and the California Environmental Quality Act (CEQA) Guidelines (Section 15000 *et seq.*). Additional information regarding the Proposed Project's purpose and need is provided in SCE's application to the CPUC in accordance with CPUC General Order 131-D.

2.1 Overview

SCE is a public utility that provides electric service to a population of approximately 14 million people within a 50,000-square-mile service area that encompasses 180 cities throughout Southern California. SCE's Proposed Project would address reliability concerns resulting from the pending shutdown of certain generation facilities which rely on Once Through Cooling (OTC) Technology as well as the recent retirement of the San Onofre Nuclear Generating Station (SONGS). The Proposed Project would address these concerns by providing additional transmission import capability, allowing greater flexibility in the siting of new generation, and reducing the total amount of new generation required to meet local reliability needs in the Western Los Angeles Basin area. As shown in Figure 1-2: Electrical Needs Area in Chapter 1, PEA Summary, the California Independent System Operator (CAISO) defines the Western Los Angeles Basin area as follows:

- **Northwest Los Angeles Basin sub-area includes these substations**: El Segundo, Chevmain, El Nido, La Cienega, La Fresa, Redondo, Hinson, Arcogen, Harborgen, Long Beach, Lighthipe, and Laguna Bell

- **Western Central Los Angeles Basin sub-area includes these substations**: Center, Del Amo, Mesa, Rio Hondo, Walnut, Olinda

- **Southwest Los Angeles Basin sub-area includes these substations**: Alamitos, Barre, Lewis, Villa Park, Ellis, Huntington Beach, Johanna, Santiago, and Viejo

Figure 1-1: Proposed Project Location in Chapter 1, PEA Summary shows the location of the Proposed Project in relation to the larger regional area.

The Proposed Project[1] consists of the following major components:

- Construction of the proposed Mesa Substation and demolition of the existing Mesa Substation within the City of Monterey Park
- Removal, relocation, modification, and/or construction of transmission, subtransmission, distribution, and telecommunications structures within the cities of Monterey Park, Montebello, Rosemead, South El Monte, and Commerce, and in portions of unincorporated Los Angeles County
- Conversion of an existing street light source line from overhead to underground between three street lights on Loveland Street within the City of Bell Gardens
- Installation of a temporary 220 kV line loop-in at Goodrich Substation within the City of Pasadena
- Additional minor modifications within several existing substations, as discussed in Section 3.5.4.23, Modifications to Existing Substations in Chapter 3, Project Description. These minor modifications would be located within the substations' existing fenced perimeters, and the associated work would be similar to Operation and Maintenance activities currently performed by SCE.

2.2 Project Objectives

The Proposed Project is being proposed to meet the following fundamental objectives:

1. Provide safe and reliable electrical service
2. Address reliability concerns resulting from the recent retirement of the San Onofre Nuclear Generation Station (SONGS) and from Once Through Cooling (OTC) shutdowns expected by December 31, 2020
3. Allow greater flexibility in the siting of future generation projects to meet local reliability needs in the Western Los Angeles Basin while reducing the total amount of new generation required by providing additional transmission import capability
4. Maintain or improve system reliability within the Electrical Needs Area
5. Comply with all applicable reliability planning criteria required by North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC), and CAISO
6. Meet Proposed Project needs while minimizing environmental impacts

[1] The term "Proposed Project" is inclusive of all components of the Mesa Substation 500 kV Project. Where the discussion in this section focuses on a particular component, that component is called out by its individual work area (e.g., "telecommunications line reroute between Mesa and Harding substations").

7. Design and construct the Proposed Project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, distribution, and telecommunications system projects

The Proposed Project components, location, preliminary configuration, and the existing and proposed components, are presented in Chapter 3, Project Description. Each of the Proposed Project objectives is more thoroughly described as follows.

Provide safe and reliable electrical service

Under the Federal Energy Regulatory Commission (FERC), NERC, WECC, and CPUC rules, guidelines and regulations, SCE has the responsibility to ensure that electrical transmission, subtransmission, and distribution systems have sufficient capacity to maintain safe, reliable, and adequate service to customers. To ensure the availability of safe and reliable electric service, SCE has established a set of criteria by which it determines when new projects are needed. The safety and reliability of the systems must be maintained under normal conditions when all facilities are in service and also maintained under abnormal conditions when facilities are out of service due to equipment or line failures, maintenance outages, or outages that cannot be predicted or controlled which are caused by weather, earthquakes, traffic accidents, and other unforeseeable events.

SCE's annual transmission system studies are performed to ensure that there is adequate capacity to provide electrical service during peak electrical demand periods under normal and abnormal system conditions. This involves determining whether an initiating fault (short circuit) and subsequent loss of electric facilities (such as transmission lines, generators, transformers, bus sections and circuit breakers) violates system performance requirements specified by the NERC Reliability Standards.[2] Power flow studies of a network of transmission lines evaluate the specific power flows that occur on the lines within the network and the power flow values that result are dictated by the electrical demand values of the substations served by the transmission lines, generation sources connected to the network, and the characteristics of the power lines themselves (i.e., impedance of the lines). When studies determine there is insufficient capacity to provide service and prevent overloads from occurring, a project is identified to address the projected overload and stay within specified operating limits under the NERC Reliability Standards.

The Proposed Project would provide safe and reliable electrical service by allowing SCE to reinforce the bulk transmission system and improve its voltage performance in order to stay within the specified operating limits under NERC Reliability Standards.

Address reliability concerns resulting from the recent retirement of the San Onofre Nuclear Generation Station and the expected Once Through Cooling shutdowns

SCE's and CAISO's Long Term Procurement Plan (LTPP) studies focused on the year 2022; however, with SONGS now retired, the compliance dates for the OTC facilities in 2020 become

[2] NERC transmission planning Reliability Standards include TPL-001-3 (Category A), TPL-002-2b (Category B), TPL-003-2b (Category C), and TPL-004-2a (Category D).

significant milestones. While SCE has not studied the need for generation in 2020, the demand forecast used in both CAISO and SCE's studies show limited demand growth of about one percent per year in the period 2020-2022. Therefore, the Local Capacity Requirement need for 2020 is most likely similar to the need for 2022 (SCE 2013).

In 2020, the projected retirement of nearly 6,100 megawatt (MW) of OTC generation coupled with the previous retirement of SONGS would stress the existing transmission system and impact its ability to provide reliable electric service (CAISO 2014). This occurs under peak electrical demand conditions and abnormal system conditions which cause thermal overloads (e.g., an N-1-1 outage of the Lewis-Serrano No. 1 230 kV Transmission Line followed by an outage of the Serrano-Villa Park No. 2 230 kV Transmission Line which causes overloads on the Serrano-Villa Park No. 2 230 kV Transmission Line) and voltage collapse (e.g., an N-1-1 outage of the Eco-Miguel 500 kV Transmission Line followed by the subsequent outage of the Ocotillo-Suncrest 500 kV Transmission Line). A significant element of the permanent solution that addresses the reliability need in southern California under abnormal system conditions is the construction of the Mesa 500 kV Substation.

The Proposed Project would address reliability concerns resulting from the recent retirement of SONGS and the expected OTC shutdowns by allowing SCE to reinforce the bulk transmission system and improve its voltage performance against the critical overlapping N-1-1 contingency of the Southwest Powerlink and the Sunrise Powerlink in southern San Diego (CAISO 2014).

Allow greater flexibility in the siting of future generation projects to meet local reliability needs in the Western Los Angeles basin while reducing the total amount of new generation required by providing additional transmission import capability

By the year 2020, it is expected that a significant amount of generation facilities in the center of SCE's metropolitan load center would be retired. SONGS was retired on June 7, 2013, with an installed capacity of 2,246 MW. In addition, approximately 4,000 MW of additional generation in the Western Los Angeles Basin is expected to be retired by the year 2020 in order to comply with the State Water Resources Control Board OTC regulations.[3] The construction of the Proposed Project provides an additional point of 500 kV service into SCE's metropolitan load center "delivering power from Tehachapi wind resource area or resources located in Pacific Gas and Electric service territory or the Northwest via the 500 kV bulk transmission network."[4] This reduces the amount of local capacity needed to replace retired generation, allows flexibility of type and geographic diversity of electrical resources and fosters more competition reducing procurement costs (CAISO 2014; SCE 2013).

Maintain or improve system reliability within the Electrical Needs Area

In addition to the benefits of increased capacity to serve existing and long-term projected electrical demand in the Electrical Needs Areas (ENA), which is identified as the Western Los Angeles Basin, the Proposed Project also serves to maintain or improve system reliability and operational flexibility. Currently the electrical needs of the ENA are served primarily by five

[3] State Water Resources Control Board Resolution No. 2013-0018.
[4] CAISO Board Approved 2013-2014 Transmission Plan p. 98, Section 2.6.3.

500 kV substations (Lugo, Mira Loma, Rancho Vista, Serrano, and Vincent). The new 500 kV substation would provide increased system reliability under both planned and unplanned line outages. System operators would have increased operational flexibility allowing additional opportunities to coordinate planned outages and to restore electrical service during unplanned outages. The additional 500 kV substation would also provide increased voltage support to the system within the ENA.

Additionally, the Proposed Project includes installation of three 500/220 kV transformers banks and three 220/66 kV transformer banks providing significant capacity to deliver power from the 500 kV transmission system to serve electrical demand in the Western Los Angeles Basin. The Mira Loma-Vincent 500 kV, Laguna Bell-Rio Hondo 220 kV, and Goodrich-Laguna Bell 220 kV Transmission Lines would be looped into the expanded substation to provide new transmission source lines and to distribute power toward coastal cities to the south (CAISO 2014).

Comply with all applicable reliability planning criteria required by NERC, WECC, and the CAISO

The Proposed Project would allow SCE to comply with planning criteria issued by the NERC and the WECC Regional Business Practices (NERC 2005; NERC 2009; NERC 2010; NERC 2011; WECC 2011). Transmission lines must be planned and constructed in accordance with reliability planning criteria developed by CAISO, WECC, NERC, and the individual utility. These criteria require that potential outages of transmission lines (both proposed and existing lines) be analyzed and the transmission system be designed to continue to function if an outage occurs. A transmission line outage would occur when a component has been removed from service due to planned or unplanned events. In accordance with these Reliability Planning Criteria, SCE must utilize acceptable measures to ensure electric system reliability is maintained in the event of a simultaneous loss of two or more transmission lines within the same transmission corridor. Depending on transmission planning studies, these measures may include installation of a Remedial Action Scheme, construction of additional facility upgrades, or both. The Proposed Project would satisfy applicable reliability planning criteria required by NERC, WECC, and CAISO.

Meet project needs while minimizing environmental impacts

CEQA and the CEQA Guidelines – Title 14 of the California Code of Regulations, Section 15000, *et seq.* – require that an environmental impact report describe a reasonable range of alternatives to a proposed project, or the location of the proposed project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project. CEQA Guidelines Section 15126.6(d) requires that sufficient information about each alternative be included to allow meaningful evaluation and analysis.

The Proposed Project described in this PEA was ultimately selected because it would address reliability concerns resulting from the recent retirement of SONGS and the OTC shutdowns expected by the end of 2020. Additionally, it is technically feasible, would not require condemnation of any existing properties,[5] and would result in the fewest potential environmental impacts while still meeting the project objectives, and meeting the timeline when the project is needed.

Design and construct the project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, distribution, and telecommunications system projects

SCE strives to construct electrical facilities in a consistent manner, meaning that the substation designs, transmission line designs, subtransmission line designs, distribution facility designs, telecommunications designs, and operating requirements for each type of facility are consistent and familiar to the field personnel that are required to operate and maintain the facilities. These standards are developed and revised as necessary based on experience to ensure SCE constructs safe, reliable, and operable facilities on a consistent basis. In addition, the consistent design ensures that upgrades to existing facilities are completed in a manner that provides the lowest total cost of ownership.

SCE's standards provide a base to evaluate the merits of proposed changes, which are evaluated to determine impact on safety, reliability, operations, maintenance, construction, and cost.

[5] The Proposed Project anticipates the acquisition of two remnant parcels.

2.3 References

Association of Environmental Professionals. (2014). *California Environmental Quality Act Statute and Guidelines.* Retrieved January 12, 2015, from http://resources.ca.gov/ceqa/docs/2014_CEQA_Statutes_and_Guidelines.pdf.

CAISO. (2014). *2013-2014 Transmission Plan.* Retrieved January 12, 2015, from http://www.caiso.com/Documents/Board-Approved2013-2014TransmissionPlan_July162014.pdf.

NERC. (2005). *Standard TPL-004-0 — System Performance Following Extreme BES Events.* Retrieved January 20, 2015, from http://www.nerc.com/files/TPL-004-0.pdf.

NERC. (2009*). Standard TPL-001-0.1 — System Performance Under Normal Conditions.* Retrieved January 20, 2015, from http://www.nerc.com/files/TPL-001-0_1.pdf.

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NERC. (2011). *Standard TPL-001-2 — Transmission System Planning Performance Requirements.* Retrieved January 20, 2015, from http://www.nerc.com/files/TPL-001-2.pdf.

SCE. (2013). *LTPP Testimony Version Track 4 Testimony of Southern California Edison Company*. Retrieved January 20, 2015, from http://www.dra.ca.gov/WorkArea/DownloadAsset.aspx?id=2534.

WECC. (2011). *System Performance: TLP-001-WECC-RBP-2 Regional Business Practice.* Retrieved January 22, 2015, from https://www.wecc.biz/Reliability/TPL-001-WECC-RBP-2.1.pdf.

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Chapter 3
Project Description

This section provides a detailed description of Southern California Edison Company's (SCE's) Mesa 500 kilovolt (kV) Substation Project (Proposed Project[1]).

3.1 Project Location

The Proposed Project is located in Los Angeles County, California primarily in the City of Monterey Park, with other components also located in Montebello, Rosemead, South El Monte, Commerce, Bell Gardens, and Pasadena, and in portions of unincorporated Los Angeles County, as depicted in Figure 3-1: Proposed Project Components Overview Map. The associated components of the Proposed Project would be located in the following locations:

- Construction of the proposed Mesa Substation and demolition of the existing Mesa Substation within the City of Monterey Park[2]
- Removal, relocation, modification, and/or construction of transmission, subtransmission, distribution, and telecommunications structures within the cities of Monterey Park, Montebello, Rosemead, South El Monte, and Commerce, and in portions of unincorporated Los Angeles County
- Conversion of an existing street light source line from overhead to underground between three street lights on Loveland Street within the City of Bell Gardens
- Installation of a temporary 220 kV line loop-in at Goodrich Substation within the City of Pasadena
- Minor internal modifications within the existing fenced perimeter of multiple existing substations throughout the Electrical Needs Area (ENA) and at Mira Loma, Pardee, and Vincent Substations, which are not in the ENA

Geographical Location: The vast majority of Proposed Project activities—consisting of the construction of the 500/220/66/16 kV Mesa Substation and associated transmission, subtransmission, distribution, and telecommunications lines—would be located in the City of Monterey Park. The City of Monterey Park is bordered by the unincorporated area of East Los Angeles to the west, the cities of Los Angeles and Alhambra to the north, the City of Rosemead to the east, and the City of Montebello to the east and south. The Mesa Substation site is located

[1] The term "Proposed Project" is inclusive of all components of the Mesa 500 kV Substation Project. Where the discussion in this section focuses on a particular component, that component is called out by its individual work area (e.g., "telecommunications line reroute between Mesa and Harding substations").

[2] The 500/220/66/16 kV Mesa Substation would replace the existing 220/66/16 kV Mesa Substation and add a 500 kV switchrack. The proposed substation would be located at the existing Mesa Substation site, which is approximately 86.2 acres, but would result in a footprint that is expanded from approximately 21.6 acres to approximately 69.4 acres.

south of Potrero Grande Drive, west of Greenwood Avenue, east of Markland Drive, and north of State Route (SR-) 60. Removal, relocation, and construction of transmission, subtransmission, distribution, and telecommunications structures and lines would occur primarily within existing SCE fee-owned and/or properties be acquired, including existing fee-owned rights-of-way (ROWs) and franchise areas in or near Potrero Grande Drive, Saturn Street, Greenwood Avenue, Markland Drive, Via Campo, North Vail Avenue, San Gabriel Boulevard, and SR-60. Figure 3-2: Proposed Project Overview (Transmission), Figure 3-3: Proposed Project Overview (Subtransmission), Figure 3-4: Proposed Project Overview (Telecommunications), and Figure 3-5: Proposed Project Overview (Distribution) depict the locations of the Proposed Project components.

Three telecommunications lines would be installed and one would be rerouted as part of the Proposed Project within the cities of Monterey Park and Montebello, and in portions of unincorporated Los Angeles County. The first telecommunications cable would connect Mesa Substation to a transmission tower located southeast in unincorporated Los Angeles County. The proposed telecommunications route would exit Mesa Substation, travel east on Potrero Grande Drive, and continue south along Hill Drive and San Gabriel Boulevard, before transitioning east to an existing SCE fee-owned ROW, just south of Darlington Avenue.

The second telecommunications line would connect Mesa Substation to an existing transmission tower also located in unincorporated Los Angeles County. The route would exit Mesa Substation in a southeasterly direction, cross SR-60, and continue along Montebello Boulevard. The route would then travel east along Avenida De La Merced and continue northeast along Lincoln Avenue, before heading southeast on Durfee Avenue.

The third telecommunications line would be rerouted between Mesa Substation and Harding Substation, located south of Mesa Substation in the City of Montebello. The reroute would exit Mesa Substation, travel west on Potrero Grande Drive, and continue in a southerly direction on Markland Drive, before crossing SR-60 and continuing westerly on Via Campo. The route would then head southwesterly along an existing SCE ROW and would continue in a southerly direction along Wilcox Avenue before heading east on Lincoln Avenue and connecting to existing facilities near Harding Substation.

Within the City of Commerce, an existing transmission tower would be replaced within an SCE fee-owned ROW. This tower is approximately 2.4 miles southwest of Mesa Substation and approximately 2.1 miles north of Laguna Bell Substation.

A street light source line would be converted from overhead to underground between three street lights on Loveland Street within the City of Bell Gardens, approximately 0.2 mile south of Laguna Bell Substation.

Finally, a temporary 220 kV line loop-in would be installed at Goodrich Substation within SCE’s adjacent ROW in the City of Pasadena, approximately 7.2 miles north of Mesa Substation.

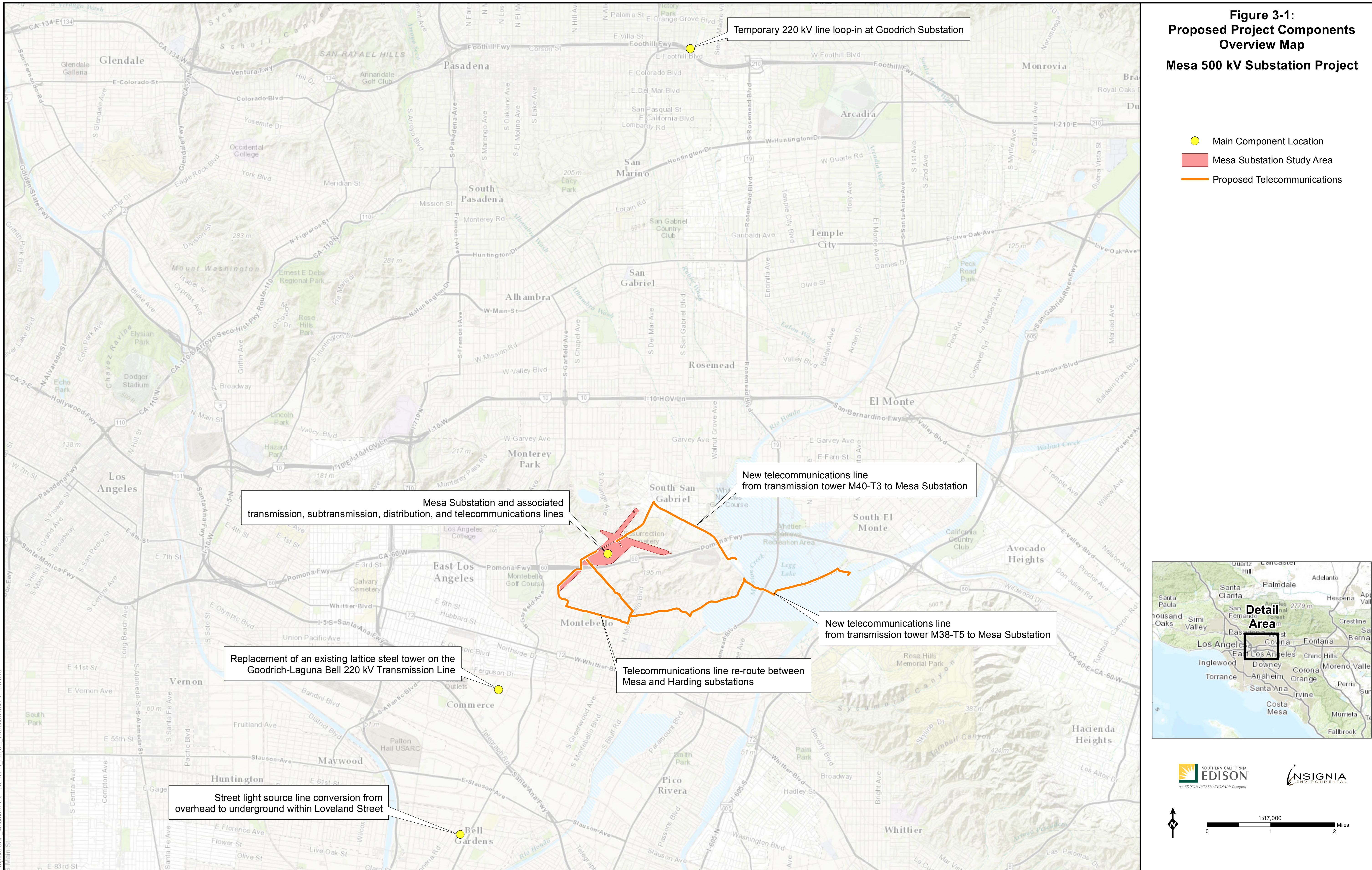

Figure 3-1: Proposed Project Components Overview Map

Mesa 500 kV Substation Project

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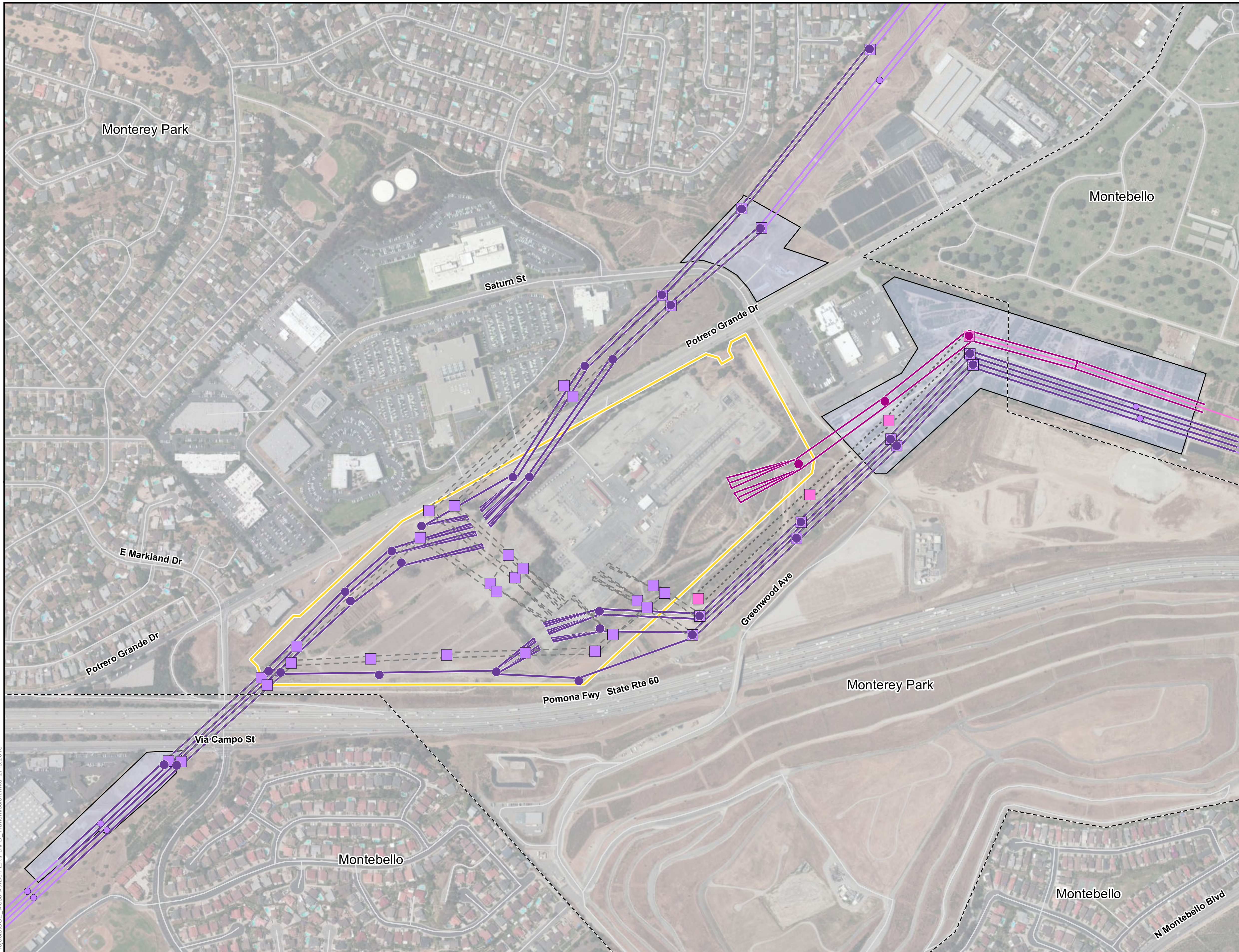
Figure 3-2: Proposed Project Overview (Transmission)

Mesa 500 kV Substation Project



Proposed Substation Perimeter Wall
Staging Yard
City Boundary

500 kV Transmission

Proposed 500 kV Structure
Existing 500 kV Structure to be Removed
Proposed 500 kV Line
Existing 500 kV Line to be Removed
Existing 500 kV Line to Remain

220 kV Transmission

Proposed 220 kV Structure
Existing 220 kV Structure to be Removed
Existing 220 kV Structure to Remain
Proposed 220 kV Line
Existing 220 kV Line to be Removed
Existing 220 kV Line to Remain

Note: Location of proposed facilities are approximate. Exact locations to be determined after final design is completed.

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Figure 3-3: Proposed Project Overview (Subtransmission)

Mesa 500 kV Substation Project

- Proposed Substation Perimeter Wall
- Staging Yard
- City Boundary

Subtransmission Structures

- Existing Structure to Remain
- Proposed Structure
- Existing Structure to be Removed
- Proposed Vault

Subtransmission Lines

- Existing Overhead 66 kV Line to Remain
- Existing Overhead 66 kV Line to be Removed
- Existing Underground 66 kV Line to be Removed
- Proposed Overhead 66 kV Line
- Proposed Underground 66 kV Line

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

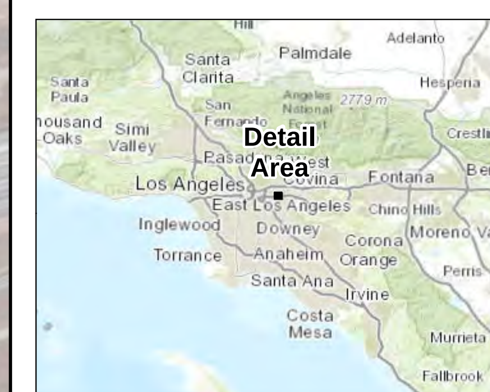

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Figure 3-4:
Proposed Project Overview (Telecommunications)

Mesa 500 kV Substation Project

- Proposed Substation Perimeter Wall
- Staging Yard
- City Boundary

Existing Telecommunication Structures

- Existing Pole
- Existing Vault (Manhole)

Proposed Telecommunication Lines

- Proposed Overhead
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground
- Existing Line to be Removed

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

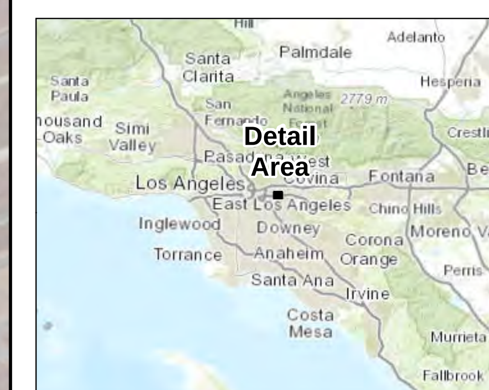

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**Figure 3-5:
Proposed Project Overview
(Distribution)**

Mesa 500 kV Substation Project

Proposed Substation Perimeter Wall
Staging Yard
City Boundary

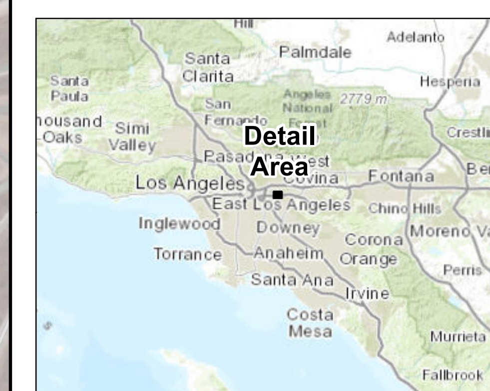
Distribution Structures

Existing Pole
Existing Vault (Manhole)
Proposed Pole
Proposed Vault

Distribution Lines

Existing 16 kV Underground Line to Remain
Proposed 16 kV Underground Line
Re-Route 16 kV Underground Line
Existing 16 kV Underground Line to be Removed

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.



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General Land Use: Mesa Substation is located within the City of Monterey Park, which is generally urban and developed with few areas of open space or parkland. The Mesa Substation site is surrounded by industrial and office land uses to the north; SR-60 to the south; the SCE Montebello Service Center to the east; Resurrection Cemetery to the northeast, which is located in the City of Montebello; and low-density residential and commercial land uses to the northwest. A large retail shopping center development—the Monterey Park Market Place—is currently in the entitlement phase and is proposed to be located directly southeast of the Proposed Project site. Proposed transmission, subtransmission, distribution, and telecommunications activities would occur primarily within SCE property, including existing fee-owned ROWs, and franchise locations along public roads. A portion of the existing ROW is currently leased to a third-party landscape nursery that would minimize their operations during Proposed Project construction and have the option of returning following Proposed Project completion.

The unincorporated area of Los Angeles County in the vicinity of the Proposed Project is bordered by the City of Monterey Park to the west and south, the unincorporated area of South San Gabriel to the north, the City of Montebello to the southeast, and the City of Rosemead to the east. An approximately 1.1-mile portion of the telecommunications line would be located along Potrero Grande Drive and Hill Drive within the unincorporated community of South San Gabriel. An additional approximately 2 miles of telecommunications line would be located along San Gabriel Boulevard and Durfee Avenue within Whittier Narrows Recreation Area and Natural Area, in unincorporated Los Angeles County. The Whittier Narrows Recreation and Natural Area is located on property owned by the United States (U.S.) Army Corps of Engineers (USACE) and managed by the County of Los Angeles Department of Parks and Recreation. Existing land uses in the vicinity include a mix of commercial and residential uses. Existing land uses in the vicinity include Whittier Narrows Recreation Area, Whittier Narrows Water Reclamation Plant, the USACE Los Angeles District offices, commercial and residential uses, and a trucking storage yard.

Portions of the transmission, subtransmission, distribution, and telecommunications work would occur within the City of Montebello. The City of Montebello is composed predominantly of industrial, commercial, and residential uses. The majority of the transmission, subtransmission, distribution, and telecommunications work within the City of Montebello would occur within existing SCE ROWs and franchise locations along public roads. Telecommunications lines would be installed on existing overhead poles and predominantly within existing conduits along Potrero Grande, San Gabriel Boulevard, Lincoln Avenue, Avenida De La Merced, Wilcox Avenue, and Markland Drive. Existing land uses in these areas are predominately residential. The existing ROW east of Mesa Substation is in part occupied by a third-party landscape nursery and is bordered by a cemetery and residential uses to the northeast and by a vacant former landfill and SR-60 to the south. To the south of Mesa Substation, the existing ROW is bordered by SR-60 to the north, Schurr High School to the south and east, another third-party landscape nursery to the southwest, and a shopping center to the west.

An approximately 0.9-mile portion of the telecommunications line would be located along San Gabriel Boulevard within the City of Rosemead. The proposed telecommunications line would be installed on existing overhead poles. Uses along this portion of the telecommunications route include a mix of commercial and residential uses, a church, and Don Bosco Technical Institute.

Within the City of South El Monte, an approximately 160-foot segment of the telecommunications line would be located south of Durfee Avenue on existing overhead poles. Existing adjacent land uses include commercial and residential uses and Whittier Narrows Recreation Area.

Within the City of Commerce, an existing transmission tower would be replaced within an SCE fee-owned ROW. The tower is approximately 2.4 miles southwest of Mesa Substation and approximately 2.1 miles north of Laguna Bell Substation. The City of Commerce is bordered by the unincorporated community of East Los Angeles to the north, the City of Bell Gardens to the south, the cities of Montebello and Pico Rivera to the east, and the cities of Vernon and Maywood to the west. Land uses surrounding the proposed 220 kV tower replacement include a Union Pacific rail line to the north, SCE ROW to the south, and industrial uses to the east and west.

Within the City of Bell Gardens, an existing street light source line would be converted from overhead to underground between three street lights on Loveland Street, between Darwell Avenue and Toler Avenue, and approximately 0.2 mile south of Laguna Bell Substation. The City of Bell Gardens is bordered by the City of Commerce to the north, the City of South Gate to the south, the City of Downey to the east, and the cities of Bell and Cudahy to the west. Land uses surrounding the proposed underground conversion include SCE ROW to the north and south and residential uses to the east and west.

The City of Pasadena is primarily residential with large areas of open space and parks, institutional uses, and vacant land, as well as a few areas of commercial and industrial uses. The installation of a temporary 220 kV line loop-in at Goodrich Substation would occur on SCE and City of Pasadena property. Land uses surrounding Goodrich Substation include vacant/undeveloped land, a park, and a parking lot to the north; Interstate 210 (Foothill Freeway) and East Foothill Boulevard to the south; Pasadena City College Community Education Center to the east; and residential uses to the west.

Property Description: The existing Mesa Substation, which has been in operation since 1950, is located on SCE fee-owned property. The proposed Mesa Substation would be constructed within approximately 69.4 acres of primarily SCE fee-owned and/or properties to be acquired. The proposed transmission, subtransmission, distribution, and telecommunications line work would be constructed within approximately 1.8 miles of SCE fee-owned and/or properties to be acquired and within approximately 8 miles of franchise locations. The proposed work at Goodrich Substation would occur on land owned by SCE and the City of Pasadena, and further information is provided in Section 3.6, Right-of-Way Requirements.

3.2 Existing System

The Proposed Project would serve the ENA of the Western Los Angeles Basin area. The California Independent System Operator (CAISO) defines the Western Los Angeles Basin area as follows:

- **Northwest Los Angeles Basin subarea**: El Segundo, Chevmain, El Nido, La Cienega, La Fresa, Redondo, Hinson, Arcogen, Harborgen, Long Beach, Lighthipe, and Laguna Bell substations
- **Western Central Los Angeles Basin subarea:** Center, Del Amo, Mesa, Rio Hondo, Walnut, and Olinda substations
- **Southwest Los Angeles Basin subarea:** Alamitos, Barre, Lewis, Villa Park, Ellis, Huntington Beach, Johanna, Santiago, and Viejo substations

The ENA for the Proposed Project is depicted in Figure 1-2: Electrical Needs Area in Chapter 1, PEA Summary. The existing and proposed system configurations are depicted in Figure 3-6: Existing and Proposed System Map. A schematic diagram of the existing and proposed 500 kV, 220 kV, and 66 kV system configurations are shown in Figure 3-7: Existing and Proposed System Schematic.

3.3 Project Objectives

As described further in Chapter 2, Project Purpose and Need and Objectives, the Proposed Project is being proposed to meet the following objectives:

- Provide safe and reliable electrical service
- Address reliability concerns resulting from the recent retirement of the San Onofre Nuclear Generation Station (SONGS) and from Once Through Cooling (OTC) shutdowns expected by December 31, 2020
- Allow greater flexibility in the siting of future generation projects to meet local reliability needs in the Western Los Angeles Basin, while reducing the total amount of new generation required by providing additional transmission import capability
- Maintain or improve system reliability within the ENA
- Comply with all applicable reliability planning criteria required by the North American Electric Reliability Corporation, Western Electricity Coordinating Council, and CAISO
- Meet Proposed Project needs while minimizing environmental impacts
- Design and construct the Proposed Project in conformance with SCE’s approved engineering, design, and construction standards for substation, transmission, subtransmission, distribution, and telecommunications system projects

3.4 Proposed Project

The main activity associated with the Proposed Project involves the construction of an approximately 69.4-acre, 500/220/66/16 kV Mesa Substation in place of the existing, approximately 21.6-acre, 220/66/16 kV Mesa Substation primarily on approximately 86.2 acres of SCE fee-owned property. Construction of the proposed Mesa Substation would be conducted in phases, and the power lines from the existing Mesa Substation would be relocated to the new switchracks as they are constructed. All of the existing Mesa Substation structures and equipment would be removed.

SCE currently operates various 220 kV transmission lines, 66 kV subtransmission lines, 16 kV distribution lines, and telecommunications lines that connect to the existing Mesa Substation. As part of the Proposed Project, SCE would replace existing structures and lines, as necessary, to allow these existing circuits to connect to the proposed Mesa Substation configuration. In addition, the Proposed Project involves the loop-in of one existing 500 kV circuit and two existing 220 kV circuits that currently pass through the existing Mesa Substation property. The Proposed Project includes the following elements:

- Construct the 500/220/66/16 kV Mesa Substation. This substation would be constructed on the existing 220/66/16 kV Mesa Substation site. Mesa Substation would be a staffed, 3,360 megavolt-ampere (MVA) at 500/220 kV, 840 MVA at 220/66 kV, and 56 MVA at 66/16 kV, substation with a potential capacity of 4,480 MVA at 500/220 kV, 1,120 MVA at 220/66 kV, and 112 MVA at 66/16 kV at ultimate build-out

  - Construct a new 500 kV switchrack with three 500/220 kV transformer banks

  - Loop-in the existing Mira Loma-Vincent 500 kV Transmission Line (which currently passes through the substation without landing on a rack position) into the new 500 kV switchrack with new overhead getaways

  - Replace existing 220/66/16 kV switchracks, three 220/66 kV transformer banks, and two 66/16 kV transformer banks

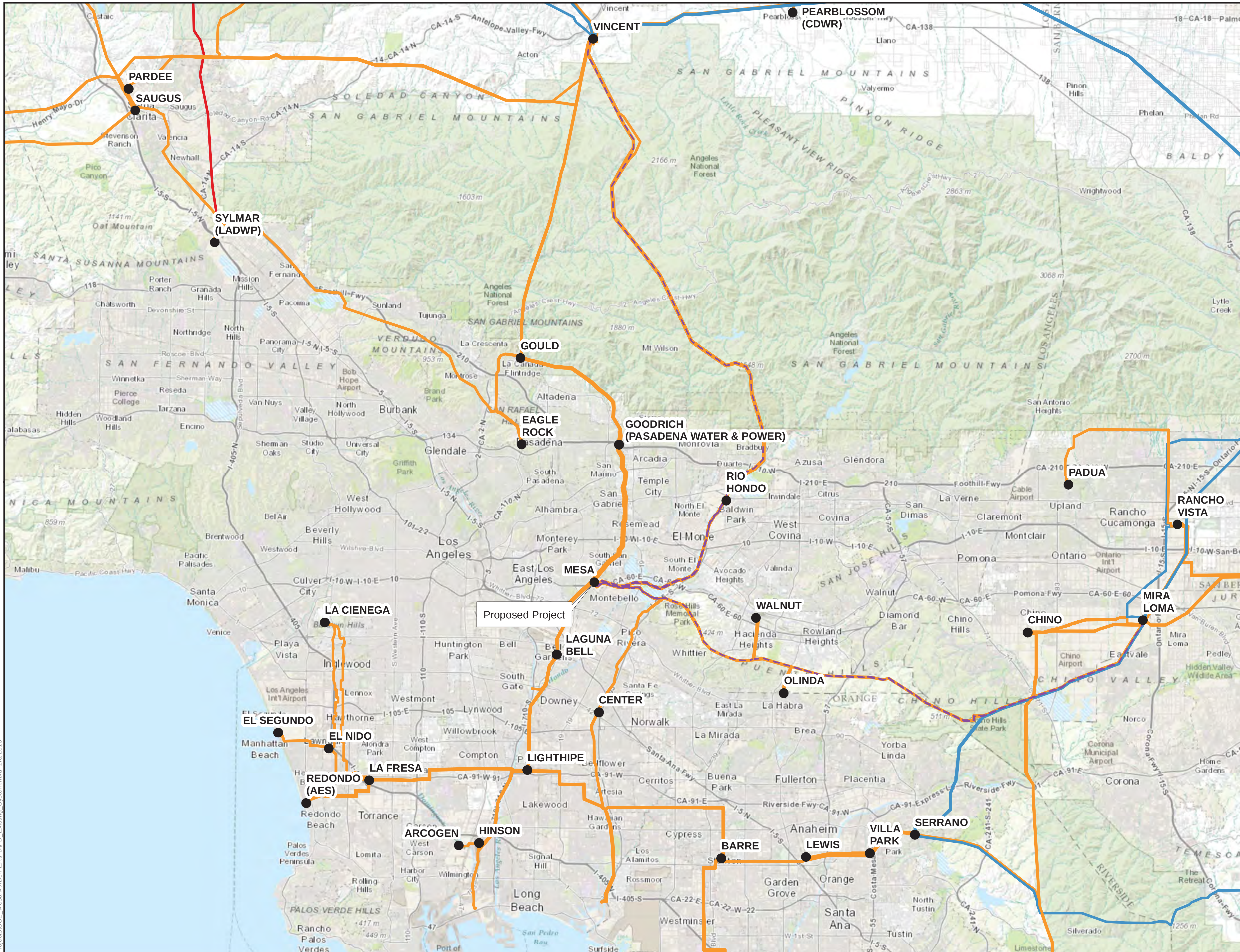
  - Relocate eight existing 220 kV transmission lines to the new 220 kV switchrack with new overhead getaways

  - Loop-in the existing Goodrich-Laguna Bell 220 kV and Laguna Bell-Rio Hondo 220 kV transmission lines (which both currently pass through the substation without landing on a rack position) into the new 220 kV switchrack with new overhead getaways

  - Relocate 16 existing 66 kV subtransmission lines to the new 66 kV switchrack with new underground getaways

  - Relocate five existing 16 kV distribution lines to the new 16 kV switchrack with new underground getaways

Figure 3-6:
Existing and Proposed System Map
Mesa 500 kV Substation Project



● Existing Substation

Existing Major Transmission

- 220 kV
- 500 kV
- ± 500 kV (TRTP*)
- 800 kV (LADWP**)

* Tehachapi Renewable Transmission Project (Under Construction)
** Los Angeles Department of Water & Power

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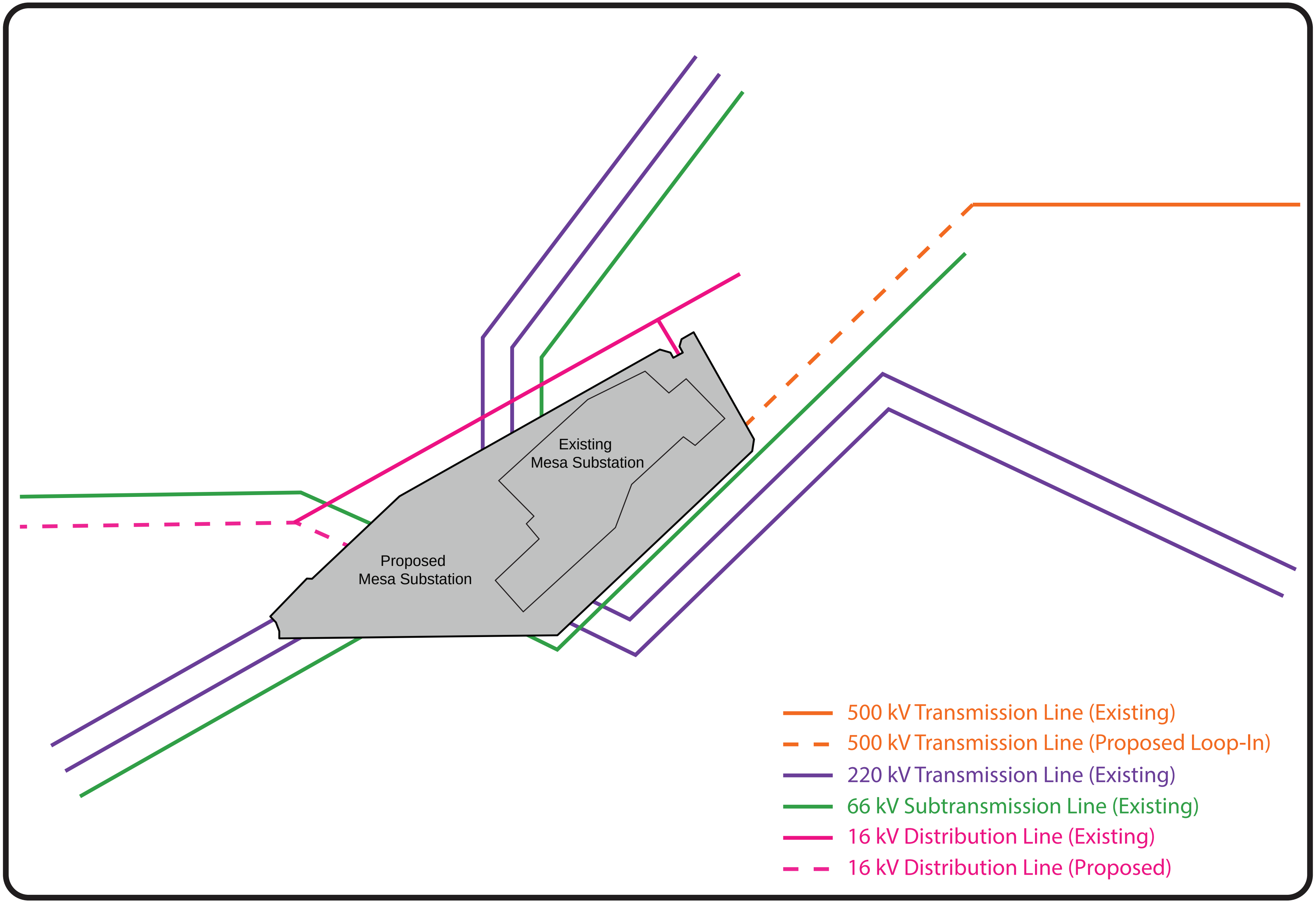

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Figure 3-7: Existing and Proposed Schematic

  - Construct two new Mechanical Electrical Equipment Rooms (MEERs), a Test and Maintenance Building, and an Operations Building

  - Relocate various telecommunications cables

  - Remove a Metropolitan Water District 72-inch-diameter waterline that currently runs through the middle of the proposed Mesa Substation property and replace it with an 84-inch-diameter waterline to a westerly location on the substation site

  - Relocate two sets of third-party cellular telephone buildings, towers, and antennas to the northeast corner of the property

  - Install new 16 kV distribution Station Light and Power supplies from the existing franchise areas adjacent to Mesa Substation to replace the existing supplies

- Remove, relocate, and construct new transmission, subtransmission, and distribution structures within existing SCE transmission and substation fee-owned properties, ROWs, and franchise areas to accommodate the new Mesa Substation configuration

  - Remove one and relocate up to three existing 500 kV overhead structures in the transmission ROW adjacent to Mesa Substation and modify existing access roads as needed

  - Replace up to 17 existing 220 kV overhead structures in the transmission ROW adjacent to Mesa Substation and modify existing access roads as needed

  - Remove approximately 65 existing overhead 66 kV structures and approximately 2,000 linear feet of underground cable. Install approximately 24 new overhead 66 kV structures, 17,000 linear feet of underground duct, and 15 vault structures within adjacent transmission ROW and franchise areas and modify existing access roads as needed

  - Construct new 16 kV underground getaways to connect with existing underground facilities located within franchise areas

  - Replace existing tower M2-T1 with a taller lattice steel tower (LST) on the Laguna Bell-Mesa No. 1 220 kV Transmission Line

  - Reroute one existing telecommunications line to clear the Mesa Substation construction area

  - Install two new telecommunications lines into Mesa Substation to meet the increased circuit diversity needed to support protection requirements

- Install temporary steel pole structures and conductor to temporarily connect the Eagle Rock-Mesa 220 kV Transmission Line to Goodrich Substation and provide a second line of service to the City of Pasadena during the line outage required to loop-in the existing Goodrich-Laguna Bell 220 kV Transmission Line into Mesa Substation

- Minor internal modifications within the existing fenced perimeter of multiple existing substations
  - Replace various 220 kV line termination equipment, including, but not limited to, wave traps, circuit breakers, and disconnect switches at Laguna Bell Substation on the Laguna Bell-Mesa No. 1 220 kV Transmission Line and the future Laguna Bell-Mesa No. 2 220 kV Transmission Line
  - Replace various 220 kV line termination equipment, including, but not limited to, wave traps, circuit breakers, and disconnect switches at Lighthipe Substation on the Lighthipe-Mesa 220 kV Transmission Line
  - Upgrade various 220 kV line protection relays and/or telecommunications equipment inside the existing MEERs at 11 satellite substations
  - Upgrade various 66 kV line protection relays and/or telecommunications equipment inside the existing MEERs at 16 satellite substations
  - Reroute existing telecommunications inside the perimeter fence lines of Vincent, Pardee, and Walnut substations to improve circuit diversity
- Convert three spans of existing streetlight conductors from overhead to underground below one span of the Lighthipe-Mesa 220 kV Transmission Line

The Proposed Project description is based on planning-level assumptions. Exact details would be determined following completion of final engineering; identification of field conditions; availability of labor, material, and equipment; and compliance with applicable environmental and permitting requirements.

Additionally, as it relates to each of the Proposed Project components, this chapter utilizes conservative ground disturbance assumptions based on preliminary engineering to estimate surface area disturbance. This expanded surface area disturbance is located within existing SCE fee-owned properties, ROWs, franchise, and/or properties to be acquired within the Proposed Project area provided to ensure that the environmental analysis included in this Proponent’s Environmental Assessment sufficiently analyzes the potential environmental impacts of conservative ground disturbance assumptions. The actual surface area disturbance is expected to be reduced following completion of final engineering.

3.4.1 Project Capacity

The Proposed Project would address reliability concerns resulting from the recent retirement of SONGS and the expected OTC shutdowns by providing additional transmission import capability, reducing the overall need for generation, and allowing greater flexibility in the siting of new generation proposed to meet local reliability needs in the Western Los Angeles Basin area. The Proposed Project would provide a capacity benefit in the ENA of approximately 300 to 640 megawatts (MW) for the critical contingency, as determined in CAISO's 2013-2014 Transmission Planning Process assessment (CAISO 2014).[3] Additionally, the Proposed Project's three transformer banks would provide 3,360 MVA of capacity between the 500 kV and 220 kV transmission systems at Mesa Substation.

3.5 Project Components

The components of the Proposed Project are described in more detail in the following subsections and depicted in Attachment 3-A: Detailed Project Components Map.

3.5.1 Transmission Line

The following subsections provide a description of the transmission line, subtransmission line, telecommunications line, and distribution line work associated with the Proposed Project. The transmission lines would be installed in existing SCE ROWs, franchise locations, and existing SCE fee-owned property.

3.5.1.1 500/220 kV Transmission Line Description

The Proposed Project would include the following 500 kV transmission line elements, as depicted in Figure 3-2: Proposed Project Overview (Transmission):

- Remove an existing overhead portion of the Mira Loma-Vincent 500 kV Transmission Line, including up to four existing LSTs
- Loop-in the existing overhead, single-circuit Mira Loma-Vincent 500 kV Transmission Line into the new 500 kV switchrack. The existing overhead transmission line alignment to Mesa Substation would be realigned with up to three new LSTs, resulting in the Mesa-Mira Loma and Mesa-Vincent 500 kV transmission lines

The Proposed Project would include the following 220 kV transmission line elements, as depicted in Figure 3-2: Proposed Project Overview (Transmission):

- Removal of portions of the existing overhead 220 kV transmission lines, including approximately 35 existing single- and double-circuit LSTs and approximately four tubular steel poles (TSPs)
- Loop-in of the existing overhead Goodrich-Laguna Bell and Laguna Bell-Rio Hondo 220 kV transmission lines into the new 220 kV switchrack by constructing new overhead

[3] According to industry standards, conductor and equipment ratings and capacity, power flow values, and other such measures are typically provided in amperes and/or MVA. However, per the California Public Utilities Commission's (CPUC's) "Working Draft Proponent's Environmental Assessment (PEA) Checklist for Transmission Line and Substation Projects," dated November 2008, values have been converted to MW. A unity power factor has been assumed in converting values to MW.

getaways—supported by new double-circuit LSTs—from the existing transmission line alignment to Mesa Substation

- Relocation of the following eight existing overhead 220 kV transmission lines into the new 220 kV switchrack by constructing new overhead getaways—supported by approximately 25 new double-circuit LSTs and approximately six new single- or double-circuit TSPs—from the existing transmission line alignment to Mesa Substation forming the following circuits:

  - Center-Mesa 220 kV Transmission Line
  - Eagle Rock-Mesa 220 kV Transmission Line
  - Lighthipe-Mesa 220 kV Transmission Line
  - Mesa-Redondo 220 kV Transmission Line
  - Mesa-Rio Hondo 220 kV Transmission Line
  - Mesa-Vincent No. 1 220 kV Transmission Line
  - Mesa-Vincent No. 2 220 kV Transmission Line
  - Mesa-Walnut 220 kV Transmission Line

- Replacement of an existing 220 kV LST with a new 220 kV LST to increase the capacity rating of the existing Goodrich-Laguna Bell (future Laguna Bell-Mesa No. 1) and Mesa-Redondo 220 kV Transmission Lines

3.5.1.2 66 kV Subtransmission Line Description

The Proposed Project would include the following 66 kV subtransmission line elements, as depicted in Figure 3-3: Proposed Project Overview (Subtransmission):

- Relocation of the following 16 overhead 66 kV subtransmission circuits into the new 66 kV switchrack with new underground getaways:

  - Mesa-Anita-Eaton 66 kV Subtransmission Line
  - Mesa-Laguna Bell-Narrows 66 kV Subtransmission Line
  - Mesa-Narrows 66 kV Subtransmission Line
  - Mesa-Newmark No. 1 66 kV Subtransmission Line
  - Mesa-Newmark No. 2 66 kV Subtransmission Line
  - Mesa-Newmark-Ramona 66 kV Subtransmission Line
  - Mesa-Ravendale-Rush 66 kV Subtransmission Line
  - Mesa-Repetto 66 kV Subtransmission Line
  - Mesa-Repetto-Wabash 66 kV Subtransmission Line
  - Mesa-Rosemead No. 1 66 kV Subtransmission Line
  - Mesa-Rosemead No. 2 66 kV Subtransmission Line
  - Mesa-Rush No. 2 66 kV Subtransmission Line
  - Mesa-Rush No. 3 66 kV Subtransmission Line
  - Mesa-San Gabriel 66 kV Subtransmission Line
  - Rio Hondo-Amador-Jose-Mesa 66 kV Subtransmission Line
  - Walnut-Hillgen-Industry-Mesa-Reno 66 kV Subtransmission Line

Relocating the existing 66 kV lines to the Mesa Substation would involve:

- The removal of existing overhead structures
- The installation of new underground line segments in new duct banks and vault structures
- The installation of new overhead line segments supported by single- and double-circuit TSPs and light-weight steel (LWS) poles

3.5.1.3 Telecommunications Description

Telecommunications infrastructure, which includes DC power, LightWave, data, and channel equipment, would be added to connect the Proposed Project to SCE's telecommunications system and would provide Supervisory Control and Data Acquisition, protective relaying, data transmission, physical and cyber security, and telephone voice services for the Proposed Project and 20 associated facilities. As depicted in Figure 3-4: Proposed Project Overview (Telecommunications) and Attachment 3-A: Detailed Project Components Map, the Proposed Project would include the following telecommunications line elements at Mesa Substation, as well as other Proposed Project locations:

- Relocate existing overhead and underground telecommunications lines, including telecommunications structures, from the existing Mesa Substation to its point of termination within the proposed Mesa Substation footprint, which would include the use of approximately five existing vaults and one existing manhole

- Install new telecommunications lines between transmission tower M40-T3—near the intersection of San Gabriel Boulevard and Darlington Avenue in the City of Rosemead as depicted on Map 10 of Attachment 3-A: Detailed Project Components Map—and Mesa Substation, including the use of existing manholes and utility poles

- Install new telecommunications lines overhead and in existing and new underground conduits between transmission tower M38-T5—near Durfee Avenue in unincorporated Los Angeles County as depicted on Map 1 of Attachment 3-A: Detailed Project Components Map—and Mesa Substation, including the use of two new manholes, and existing manholes and utility poles

- Install new telecommunications lines overhead and in existing and new underground conduits between Mesa Substation and the intersection of Montebello Boulevard and Lincoln Avenue near Harding Substation, including the use of existing manholes and utility poles

- Remove an existing overhead and underground portion of a telecommunications line between Mesa Substation and an existing splice location in an existing manhole at the intersection of Montebello Boulevard and Lincoln Avenue

- Reroute telecommunications lines within Pardee Substation, Vincent Substation, and Walnut Substation to satisfy diversity requirements

- Relocate privately owned cellular towers and antennas to the northeast corner of the Mesa Substation property

- Install a foundation for a potential future microwave tower within the walled portion of the proposed Mesa Substation

3.5.1.4 Distribution Description

The Proposed Project would include the following distribution line elements, as depicted in Figure 3-5: Proposed Project Overview (Distribution):

- Relocation of the following five existing underground 16 kV distribution lines into the new 16 kV switchracks with new underground getaways:
  - Arboles 16 kV Distribution Line
  - Cerveza 16 kV Distribution Line
  - Coronado 16 kV Distribution Line
  - Lomas 16 kV Distribution Line
  - Picador 16 kV Distribution Line
- Conversion of an existing street light source line from overhead to underground between three street lights on Loveland Street within the City of Bell Gardens

Within the proposed Mesa Substation, five initial 16 kV distribution circuits would be placed in an underground conduit system. At ultimate build-out, the proposed substation could accommodate up to twelve 16 kV distribution circuits. Additional electrical distribution circuits would be constructed from the proposed substation to areas of demand on an as-needed basis and with consideration of the following guidelines:

- The location of the current load growth
- Existing electrical distribution facilities in the area
- The location of roads and existing SCE ROWs

3.5.2 Poles/Towers

3.5.2.1 500 kV/220 kV Transmission Poles/Towers

The 500 kV transmission route would utilize LSTs and the 220 kV transmission routes would utilize both LSTs and TSPs. Typical drawings of the 500 kV LSTs are shown in Figure 3-8: Typical 500 kV Double Circuit Dead-End Lattice Structure and Figure 3-9: Typical 500 kV Double-Circuit Suspension Lattice Structure. Typical drawings of the 220 kV TSPs and LSTs are shown in Figure 3-10: Typical 220 kV Single-Circuit Dead-End Tubular Steel Pole, Figure 3-11: Typical 220 kV Single-Circuit Suspension Tubular Steel Pole, Figure 3-12: Typical 220 kV Double-Circuit Dead-End Lattice Structure, Figure 3-13: Typical 220 kV Double-Circuit Suspension Lattice Structure, Figure 3-14: Typical 220 kV Double-Circuit Dead End Tubular Steel Pole, and Figure 3-15: Typical 220 kV Double-Circuit Suspension Tubular Steel Pole. The approximate dimensions of the LSTs and TSPs are summarized in Table 3-1: Typical Transmission Structure Dimensions.

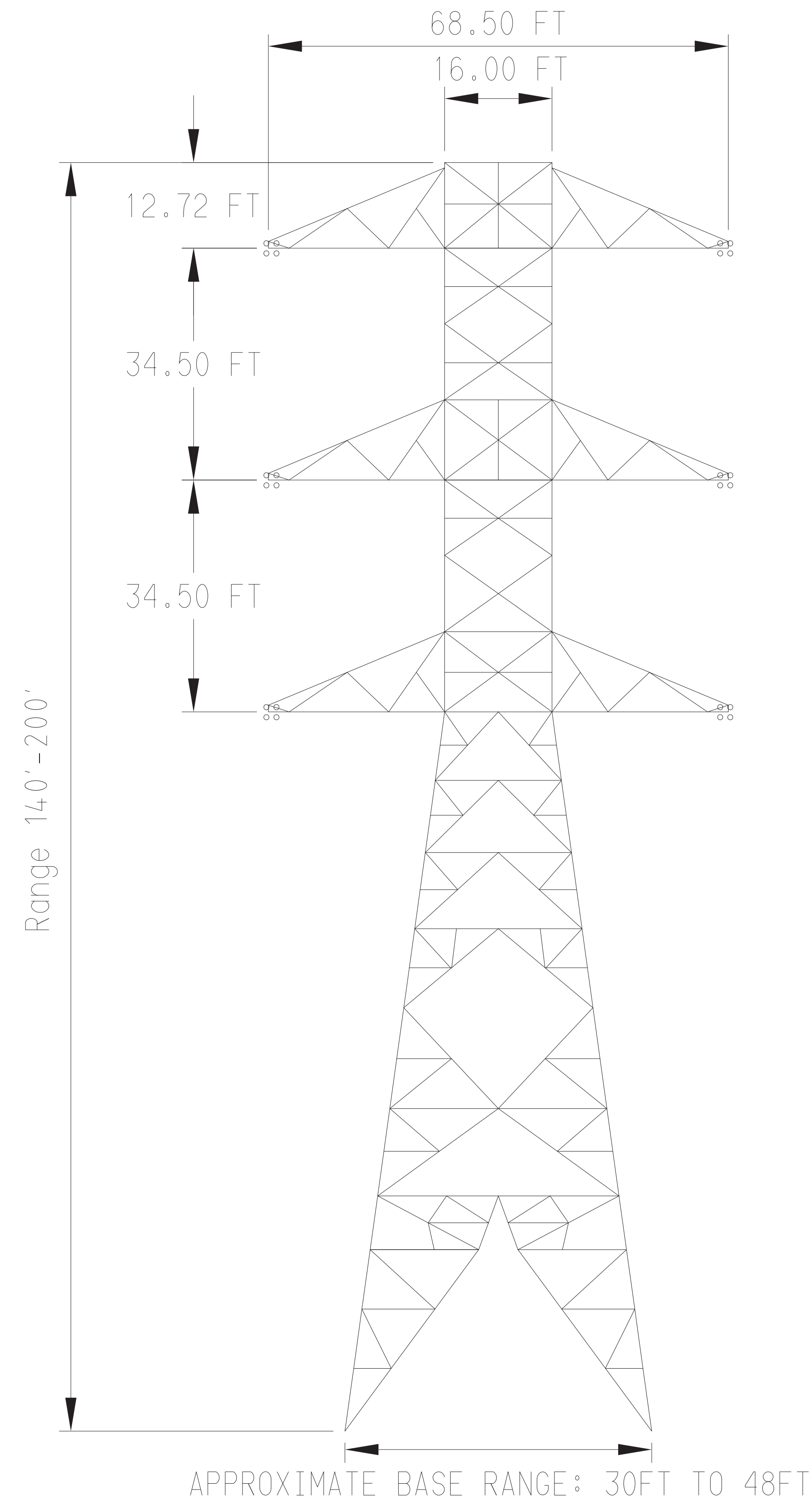

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Figure 3-8:
Typical 500 kV Double-Circuit Dead-End Lattice Structure

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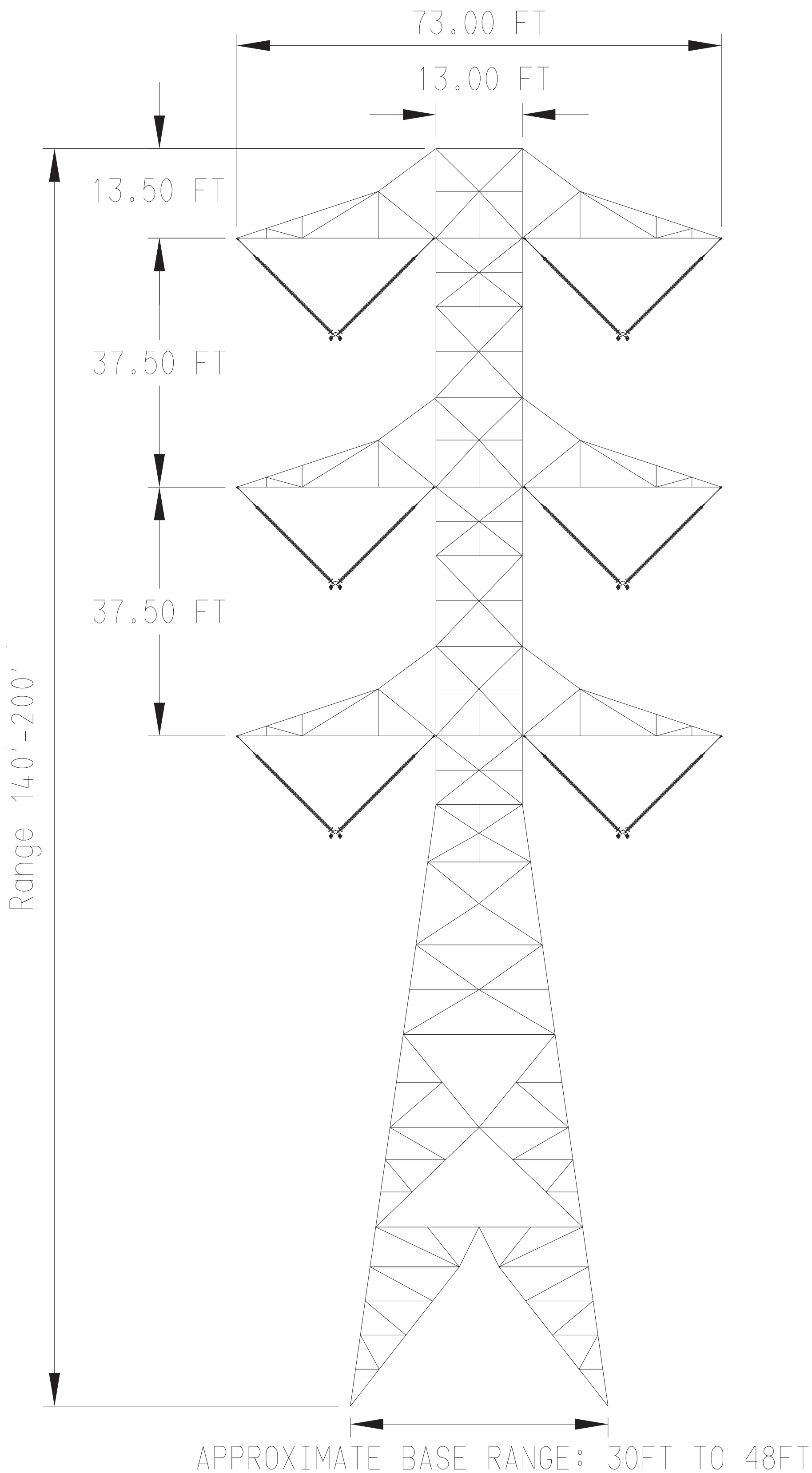

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Figure 3-9:
Typical 500 kV Double-Circuit Suspension Lattice Structure

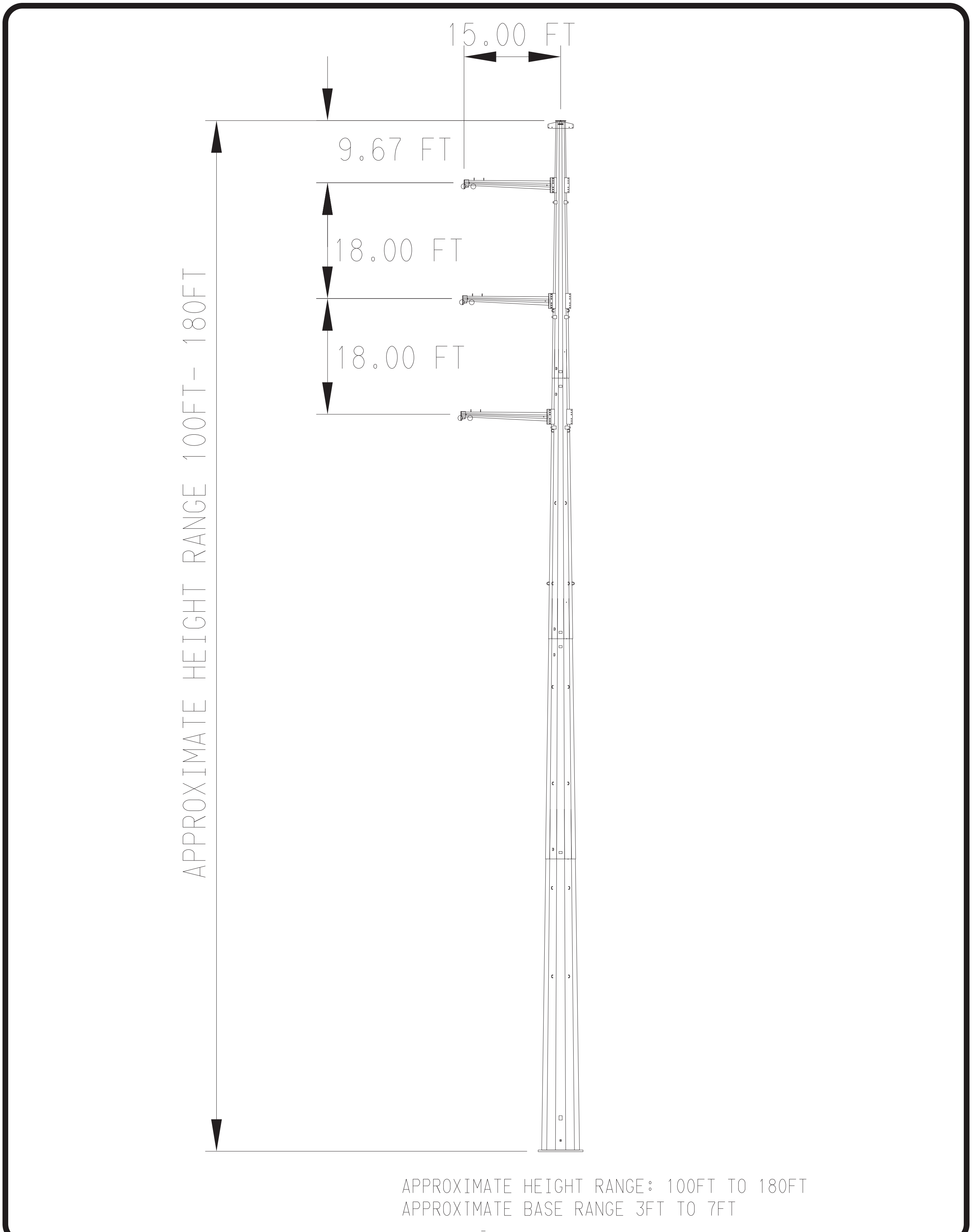

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Figure 3-10:
Typical 220 kV Single-Circuit Dead-End Tubular Steel Pole

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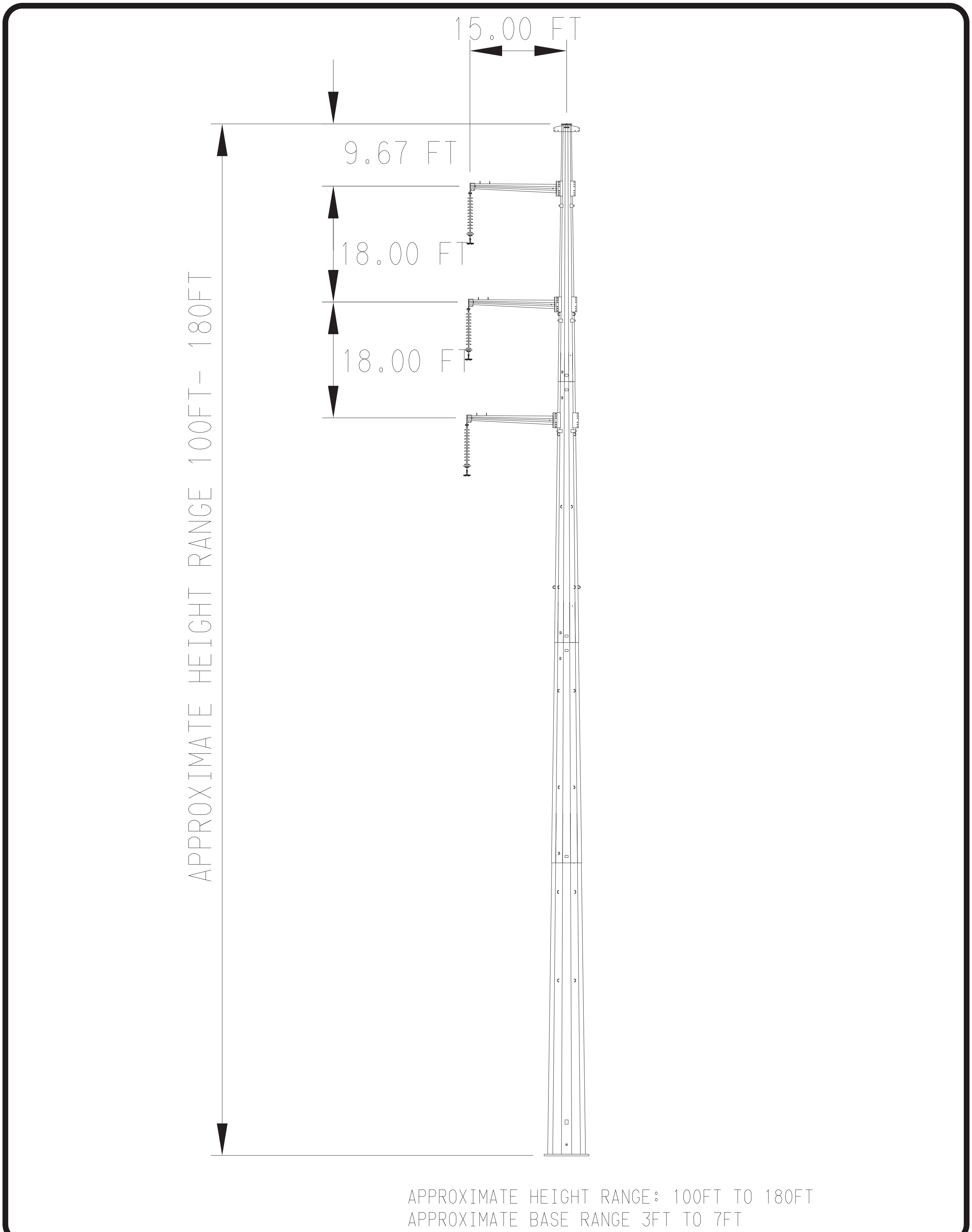

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Figure 3-11:
Typical 220 kV Single-Circuit Suspension Tubular Steel Pole

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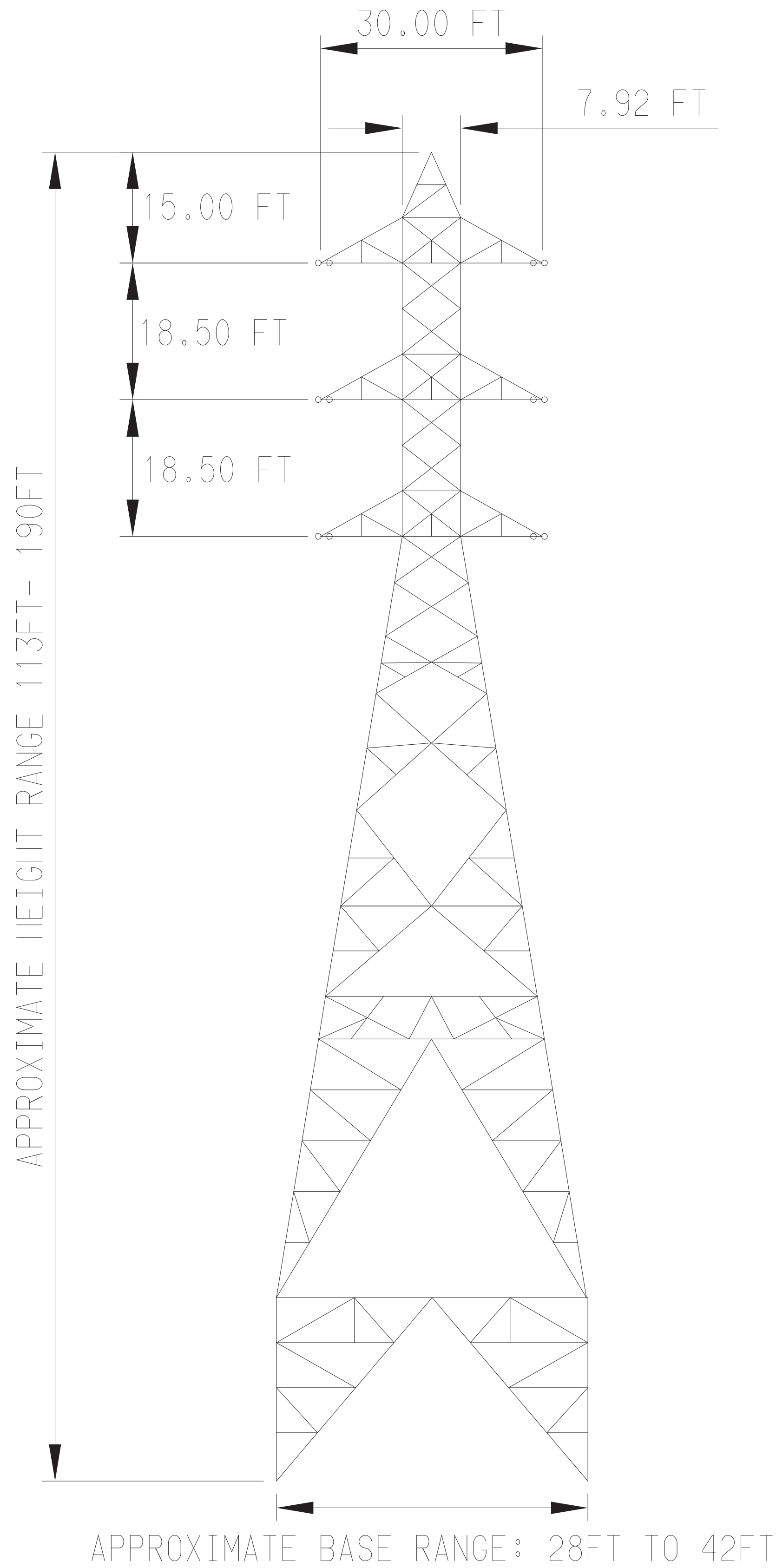

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Figure 3-12:
Typical 220 kV Double-Circuit Dead-End Lattice Structure

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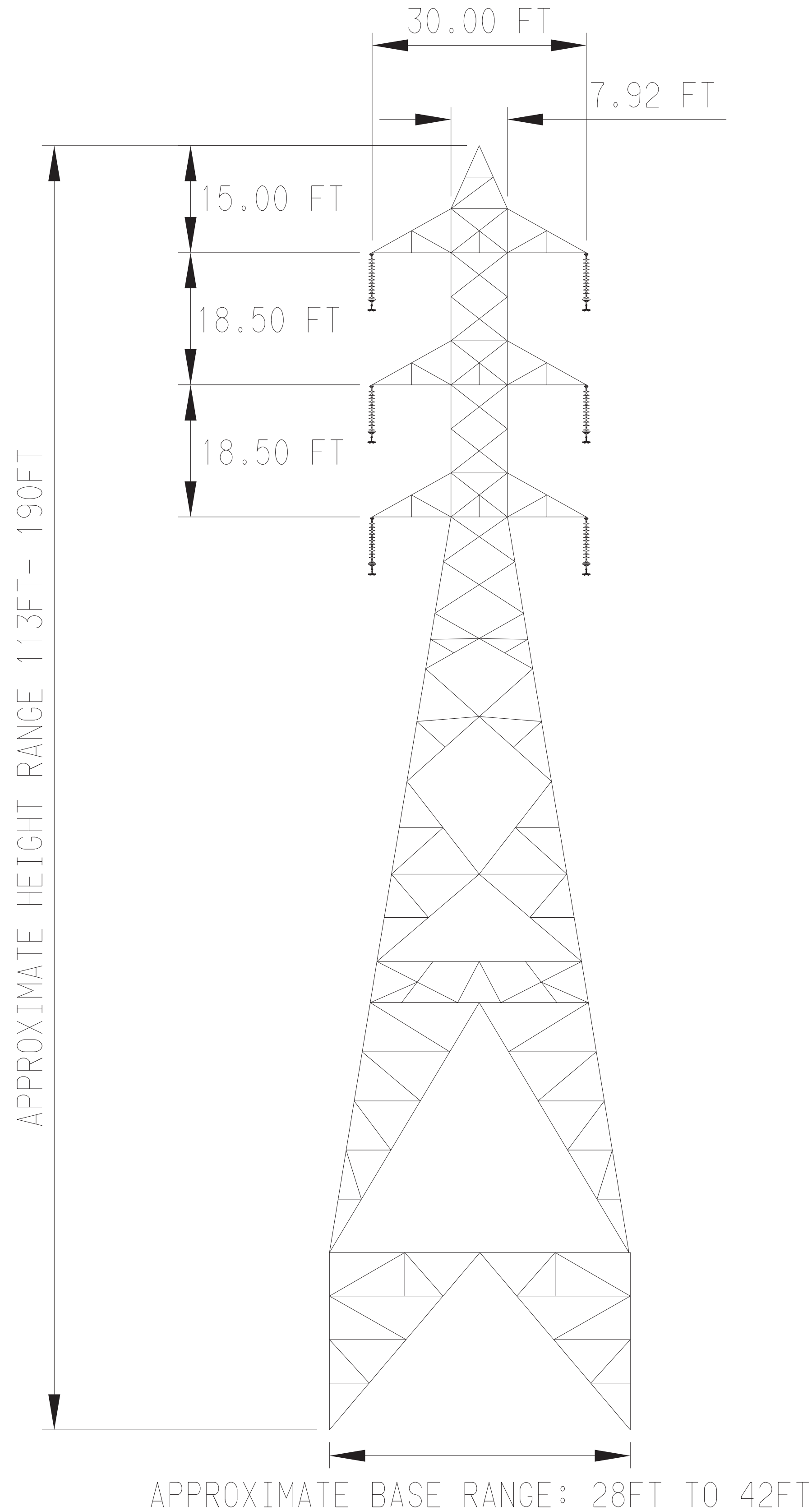

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Figure 3-13:
Typical 220 kV Double-Circuit Suspension Lattice Structure

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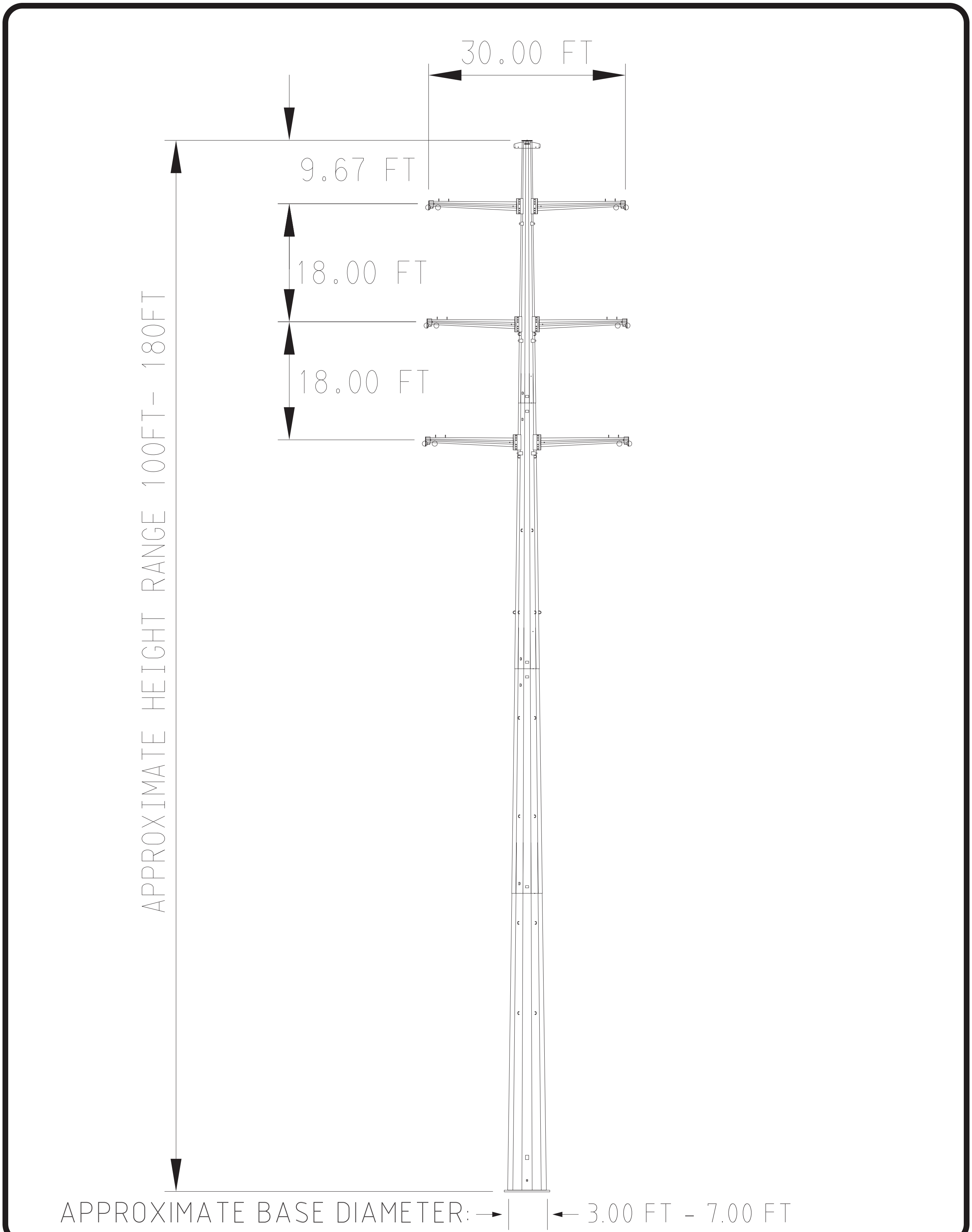

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Figure 3-14:
Typical 220 kV Double-Circuit Dead-End Tubular Steel Pole

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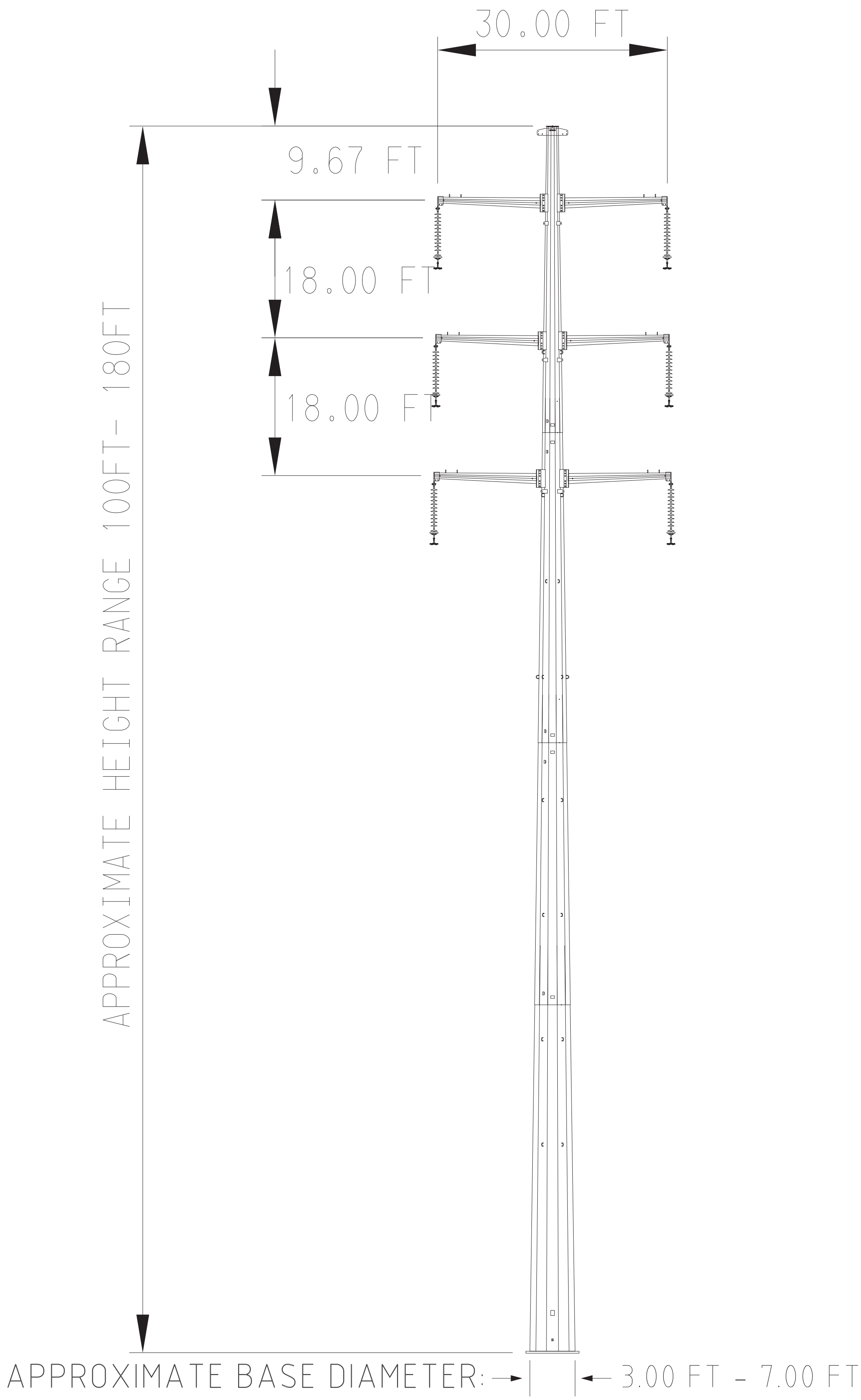

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Figure 3-15:
Typical 220 kV Double-Circuit Suspension Tubular Steel Pole

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Table 3-1: Typical Transmission Structure Dimensions

Type of Structure	Proposed Number of Structures	Approximate Height Above Ground (Feet)	Approximate Footing or Pole Diameter (Feet)	Approximate Auger Hole Depth (Feet)	Approximate Auger Diameter (Feet)
500 kV LST	3	140 to 200	5 to 7	30 to 60	7 to 9
220 kV LST	26	113 to 190	3 to 7	30 to 60	5 to 9
220 kV TSP	6	100 to 180	3 to 7	30 to 60	5 to 9

Note: Specific tower height and spacing would be determined upon final engineering and would be constructed in compliance with CPUC General Order (G.O.) 95. All data provided in this table are approximations based on planning-level assumptions and may change following completion of final engineering using SCE's design and construction practices, standards and specifications, identification of field conditions, availability of material, equipment, and compliance with applicable environmental and/or permitting requirements.

Transmission facilities would be designed consistent with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (Avian Power Line Interaction Committee [APLIC] 2006) where feasible. Transmission facilities would also be evaluated for potential collision reduction devices in accordance with *Reducing Avian Collisions with Power Lines: The State of Art in 2012* (APLIC 2012).

Approximately 29 LSTs would be installed for the Proposed Project. The LSTs would have a minimum footprint of approximately 28 feet by 28 feet and a maximum footprint of 48 feet by 48 feet and extend approximately 113 feet to 200 feet above ground. Each LST would be attached to four concrete foundations that would be approximately 3 to 7 feet in diameter and would extend underground to a depth of approximately 30 to 60 feet with up to approximately 1 foot to 4 feet of concrete visible above ground. The LSTs would be all steel structures with a dulled galvanized finish. The foundations for the 29 LSTs would require an average of approximately 200 cubic yards (CY) of concrete or 5,800 cubic yards (CY) of concrete total.

Approximately six TSPs would be installed for the 220 kV transmission portion of the Proposed Project. The TSPs would be 3 to 7 feet in diameter at the base and would extend 100 to 180 feet above ground. The TSPs would be attached to concrete foundations that would be 5 to 9 feet in diameter and would extend underground approximately 30 to 60 feet with up to approximately 2 to 4 feet of concrete visible above ground. Each TSP would use an average of approximately 88 CY of concrete, or 696 CY of concrete total. The TSPs would be steel structures with a dulled finish.

SCE would file Federal Aviation Administration (FAA) notifications for Proposed Project structures, as required. With respect to Proposed Project structures, the FAA would conduct its own analysis and may recommend no changes to the design of the proposed structures; or may request redesigning any proposed structures near an airport to reduce the height of such structures; or marking the structures, including the addition of aviation lighting; or placement of marker balls on wire spans.

SCE would evaluate the FAA recommendations for reasonableness and feasibility, and in accordance with Title 14, Part 77 of the Code of Federal Regulations (CFR), SCE may petition the FAA for a discretionary review of its determination to address any issues with the FAA determination. FAA agency determinations for permanent structures typically are valid for 18 months, and, therefore, such notifications would be filed upon completion of final engineering and before construction commences. The entirety of the Proposed Project area would be built within a combination of existing SCE fee-owned property, SCE ROWs, franchise areas, and/or properties to be acquired and all construction activities would be performed at a distance from airport activity sufficient to minimize safety concerns to construction personnel.

Transmission poles/towers at heights of 200 feet are anticipated to require FAA notifications. SCE would consult with the FAA and consider recommendations, to the extent feasible. Typical recommendations include, but are not limited to, the following: installation of marker balls on spans (catenaries) between structures, and/or installation of lighting on structures. Generally, marking or lighting is recommended by the FAA for those spans or structures that exceed 200 feet in height above ground level (AGL); however marking or lighting may be recommended for spans and structures that are less than 200 feet AGL, but located within close proximity to an airport or other high-density aviation environment. The specific requirements for the installation of marker balls or lights are specified in FAA Advisory Circular AC 70/7460-1K; when marker balls are installed, SCE complies with FAA installation requirements, as follows:

Marker Ball Specifications

- **Size and Color:** The diameter of the markers used on extensive catenary wires across canyons, lakes, rivers, etc., should be not less than 36 inches. Smaller 20-inch spheres are permitted on less extensive power lines or on power lines below 50 feet above the ground and within 1,500 feet of an airport runway end. Each marker should be a solid color such as aviation orange, white, or yellow.

- **Spacing:** Markers should be spaced equally along the wire at intervals of approximately 200 feet or a fraction thereof. Intervals between markers should be less in critical areas near runway ends (i.e., 30 to 50 feet). They should be displayed on the highest wire or by another means at the same height as the highest wire. Where there is more than one wire at the highest point, the markers may be installed alternately along each wire if the distance between adjacent markers meets the spacing standard. This method allows the weight and wind loading factors to be distributed.

- **Pattern:** An alternating color scheme provides the most conspicuity against all backgrounds. Mark overhead wires by alternating solid colored markers of aviation orange, white, and yellow. Normally, an orange sphere is placed at each end of a line and the spacing is adjusted (not to exceed 200 feet) to accommodate the rest of the markers.

When lighting is installed, SCE complies with FAA installation requirements, as follows:

Lighting Specifications

- **Structures 150 feet or less:** Structures 150 feet or less have two steady burning red lights on the top of the structure. The lights are illuminated only during darkness.
- **Structures over 150 feet:** Taller structures that exceed 150 feet have a flashing red beacon on the top of the structure, and two steady burning red lights at mid-height. They are illuminated only during darkness.

3.5.2.2 66 kV Subtransmission Poles/Towers

The aboveground subtransmission segments of the Proposed Project would utilize TSPs. Typical drawings of the 66 kV TSPs are shown in Figure 3-16: Typical 66 kV Single-Circuit Dead-End Wood Pole with Guying, Figure 3-17: Typical 66 kV Single-Circuit Suspension Wood Pole, Figure 3-18: Typical 66 kV Double Circuit Dead-End Wood Pole with Guying, Figure 3-19: Typical 66 kV Double-Circuit Tubular Steel Pole Riser, and Figure 3-20: Typical 66 kV Double-Circuit Tubular Steel Pole with No Underbuild. The appropriate dimensions of the TSPs are summarized in Table 3-2: Typical Subtransmission Structure Dimensions.

Table 3-2: Typical Subtransmission Structure Dimensions

Type of Structure	Proposed Number of Structures	Approximate Height Above Ground (Feet)	Approximate Pole Footing Diameter (Feet)	Approximate Auger Hole Depth (Feet)	Approximate Auger Diameter (Feet)
66 kV TSP	24	50 to 100	3 to 7	20 to 40	5 to 9

The 66 kV subtransmission structures would be designed consistent with the *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).

Approximately 24 TSPs would be installed for the subtransmission portion of the Proposed Project. The TSPs would be approximately 3 to 5 feet in diameter at the base and extend approximately 50 to 100 feet above ground. The TSPs would be attached to concrete foundations that would be approximately 5 to 7 feet in diameter and would extend underground approximately 20 to 40 feet with up to 4 feet of concrete visible above ground. Each TSP would use approximately 14 to 63 CY of concrete. The TSPs would be steel structures with a dulled finish.

It is not anticipated that subtransmission structures would require FAA notifications. If notifications are required, SCE would consult with the FAA as described in Section 3.5.2.1, 500 kV/220 kV Transmission Poles/Towers.

3.5.2.3 Telecommunications Poles/Towers

The telecommunications system cables would utilize existing wood poles, LWS poles, and LSTs, and would range in height from 52 to 79 feet above ground. In addition, up to approximately 46 existing wood poles would be replaced as part of the Proposed Project, depending on the results of wind-load testing. As shown in Figure 3-21: Typical 16 kV Single-Circuit Tubular Steel Pole Riser with Telecommunications and Table 3-3: Typical Telecommunications Structure Dimensions, the wood distribution poles would be approximately 1.2 to 2 feet in diameter at the base and would extend approximately 52 to 79 feet above ground.

Table 3-3: Typical Telecommunications Structure Dimensions

Type of Structure	Proposed Number of Structures	Approximate Height Above Ground (Feet)	Approximate Pole Diameter (Feet)	Approximate Auger Hole Depth (Feet)	Approximate Auger Diameter (Feet)
Wood Pole/ LWS Pole	46	52 to 79	1.2 to 2	7 to 9	4 to 6

3.5.3 Conductor/Cable

The following subsections describe the above-ground and below-ground installation of the transmission, subtransmission, distribution, and telecommunications lines.

3.5.3.1 Above-Ground Installation

Transmission

The 500 kV transmission line would be installed on LSTs and the 220 kV transmission lines would be installed on both LSTs and TSPs. The 500 kV LSTs would support a two-conductor bundle of non-specular 2,156 kcmil aluminum-clad steel reinforced (ACSR) conductors,[4] and the 220 kV LSTs and TSPs would support a two-conductor bundle of non-specular 1,590 kcmil ACSR conductor. Typically, one circuit with three phases would be installed on each side of an LST or TSP and spaced according to the dimensions depicted in Figure 3-8: Typical 500 kV Double Circuit Dead-End Lattice Structure, Figure 3-9: Typical 500 kV Double-Circuit Suspension Lattice Structure, Figure 3-10: Typical 220 kV Single-Circuit Dead-End Tubular Steel Pole, Figure 3-11: Typical 220 kV Single-Circuit Suspension Tubular Steel Pole, Figure 3-12: Typical 220 kV Double-Circuit Dead-End Lattice Structure, Figure 3-13: Typical 220 kV Double-Circuit Suspension Lattice Structure, Figure 3-14: Typical 220 kV Double-Circuit Dead End Tubular Steel Pole, and Figure 3-15: Typical 220 kV Double-Circuit Suspension Tubular Steel Pole. Conductors

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

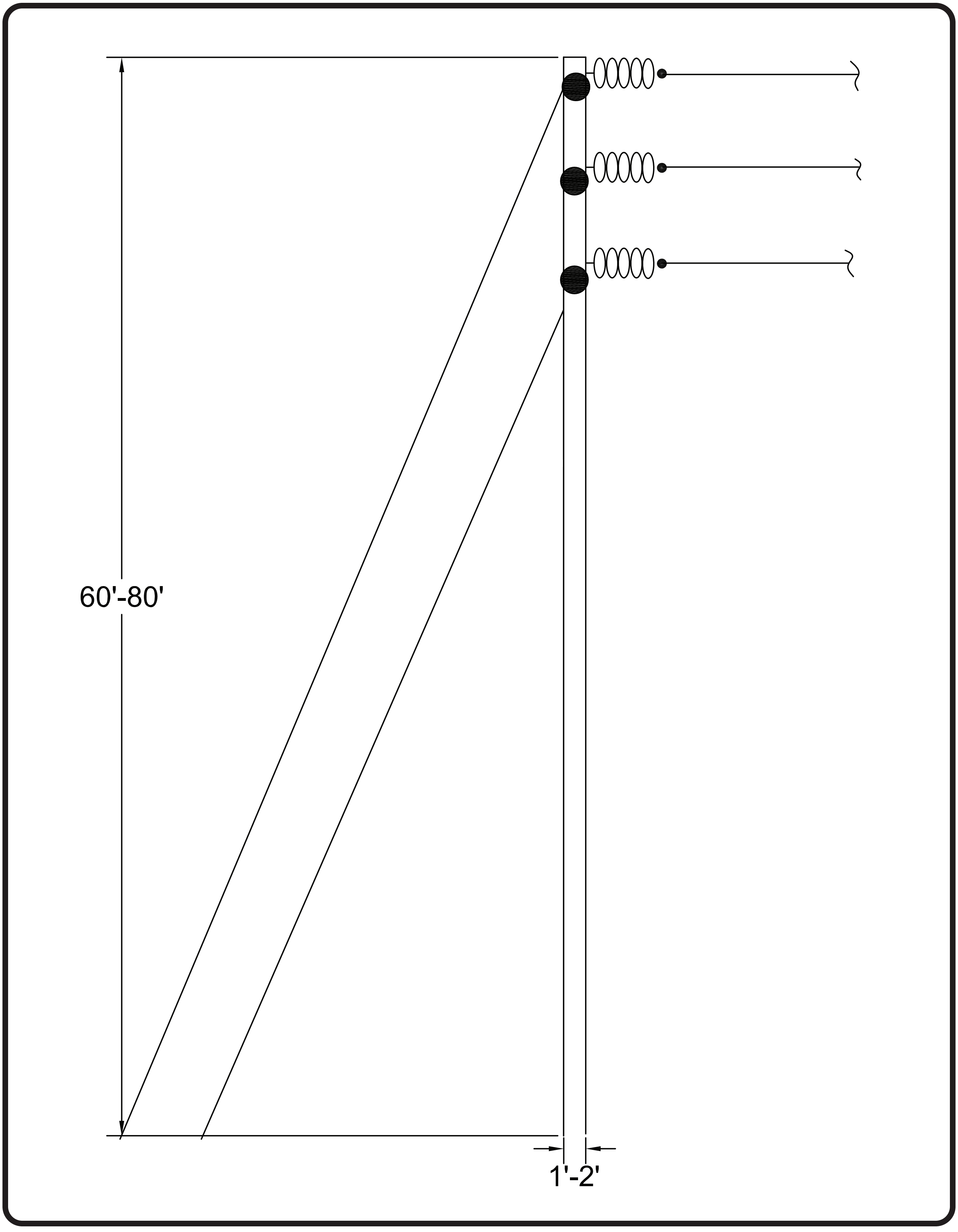

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Figure 3-16:
Typical 66 kV Single-Circuit Dead-End Wood Pole with Guying

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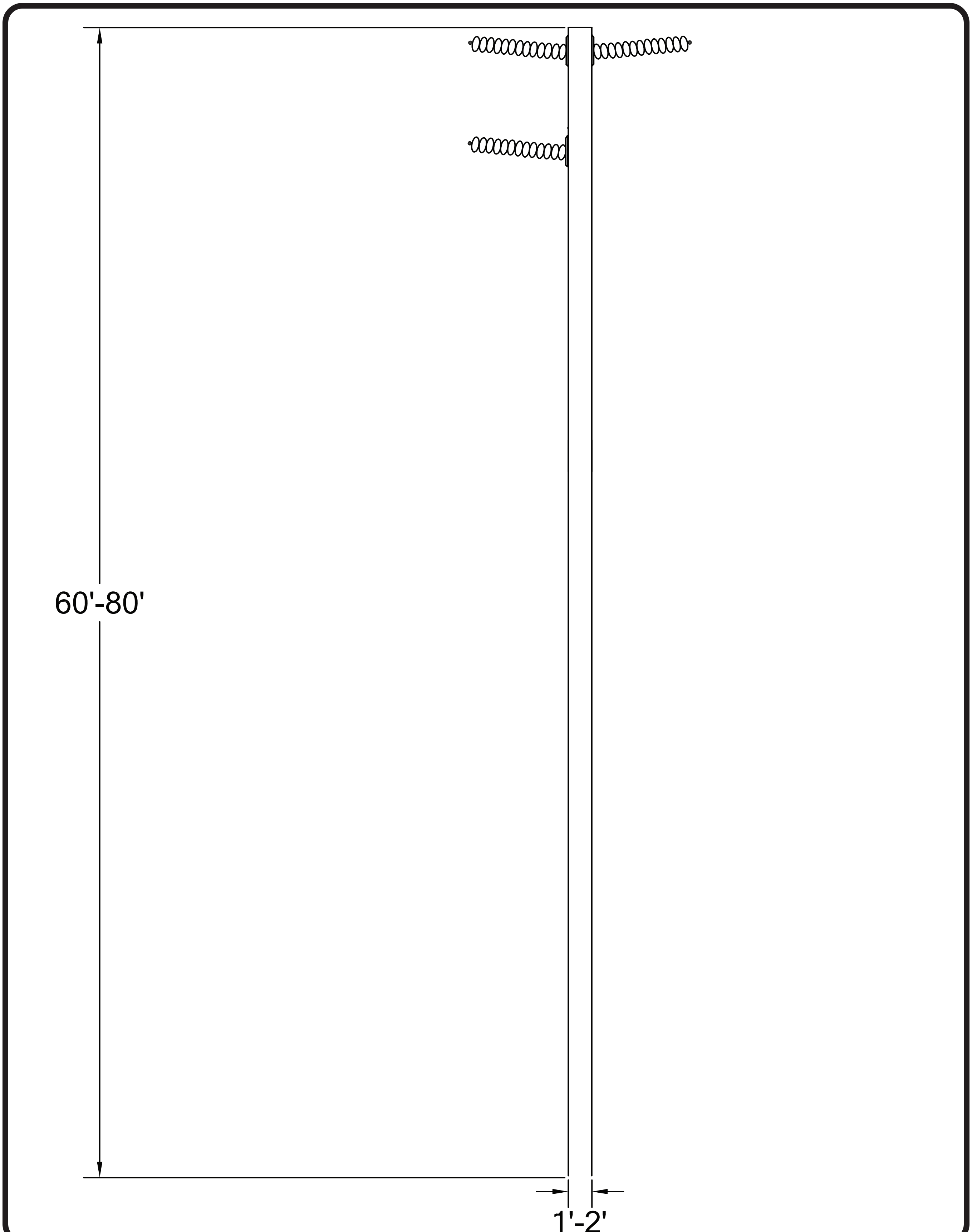

Figure 3-17:
Typical 66 kV Single-Circuit Suspension Wood Pole

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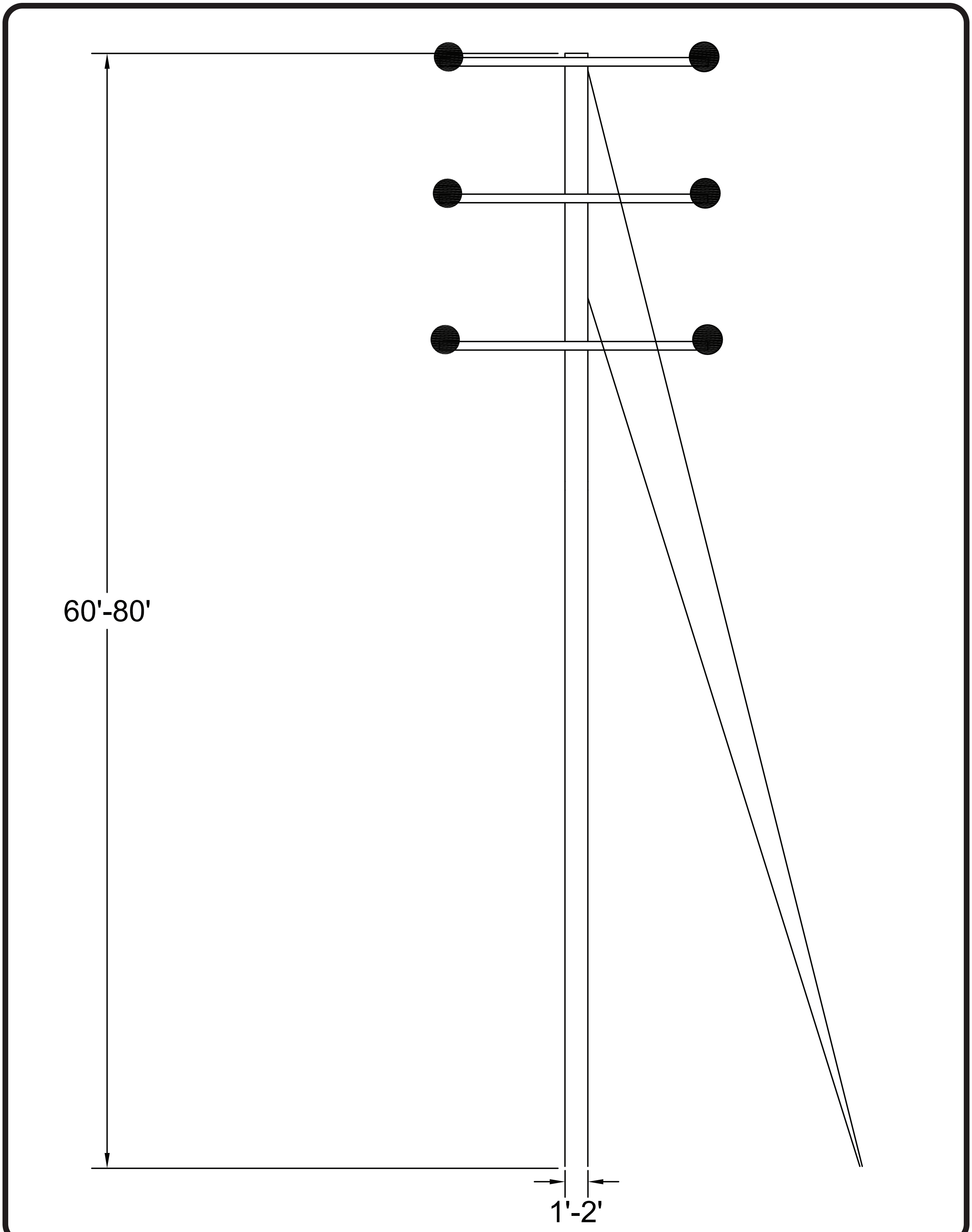

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Figure 3-18:
Typical 66 kV Double Circuit Dead-End Wood Pole with Guying

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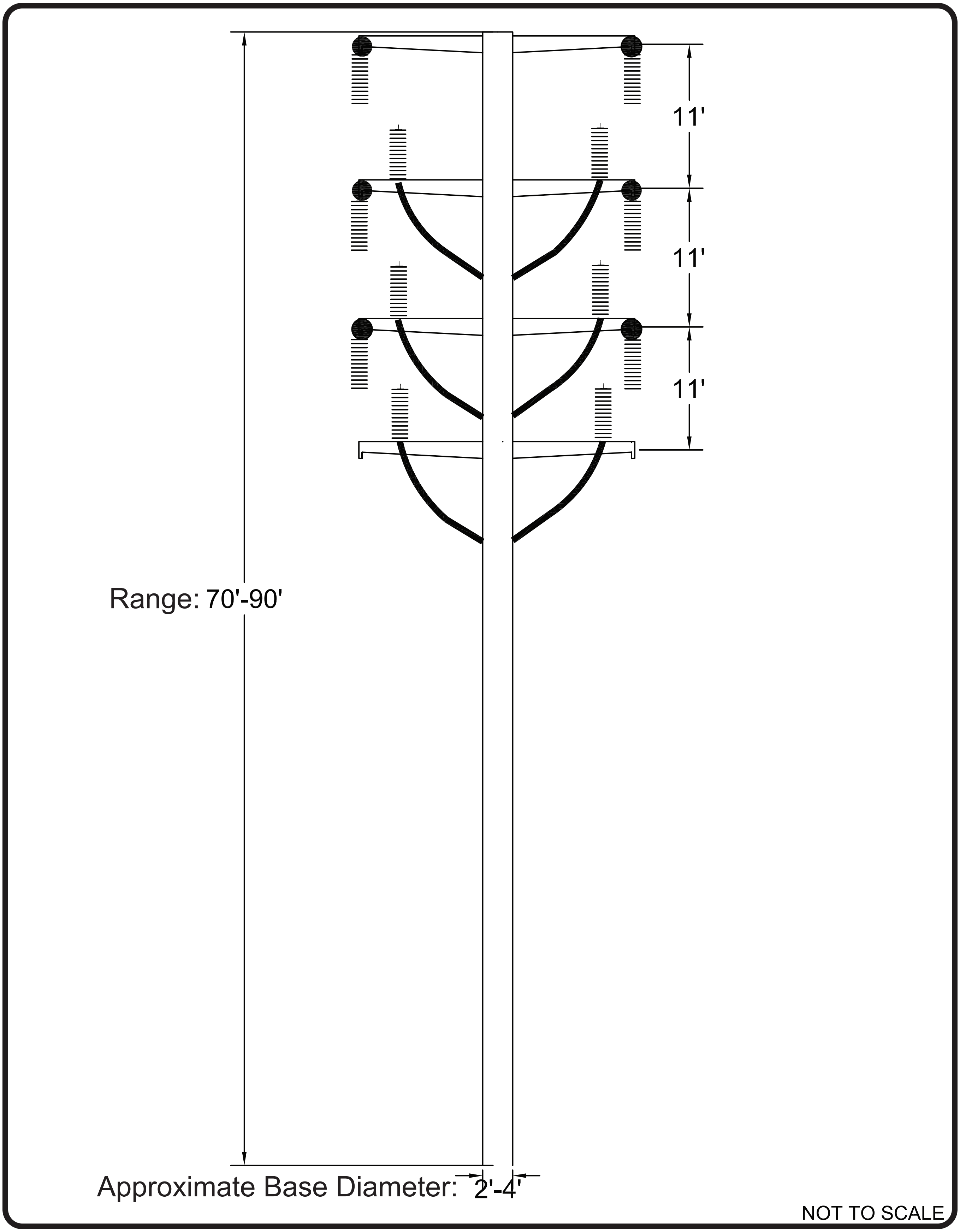

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Figure 3-19:
Typical 66 kV Double-Circuit Tubular Steel Pole Riser

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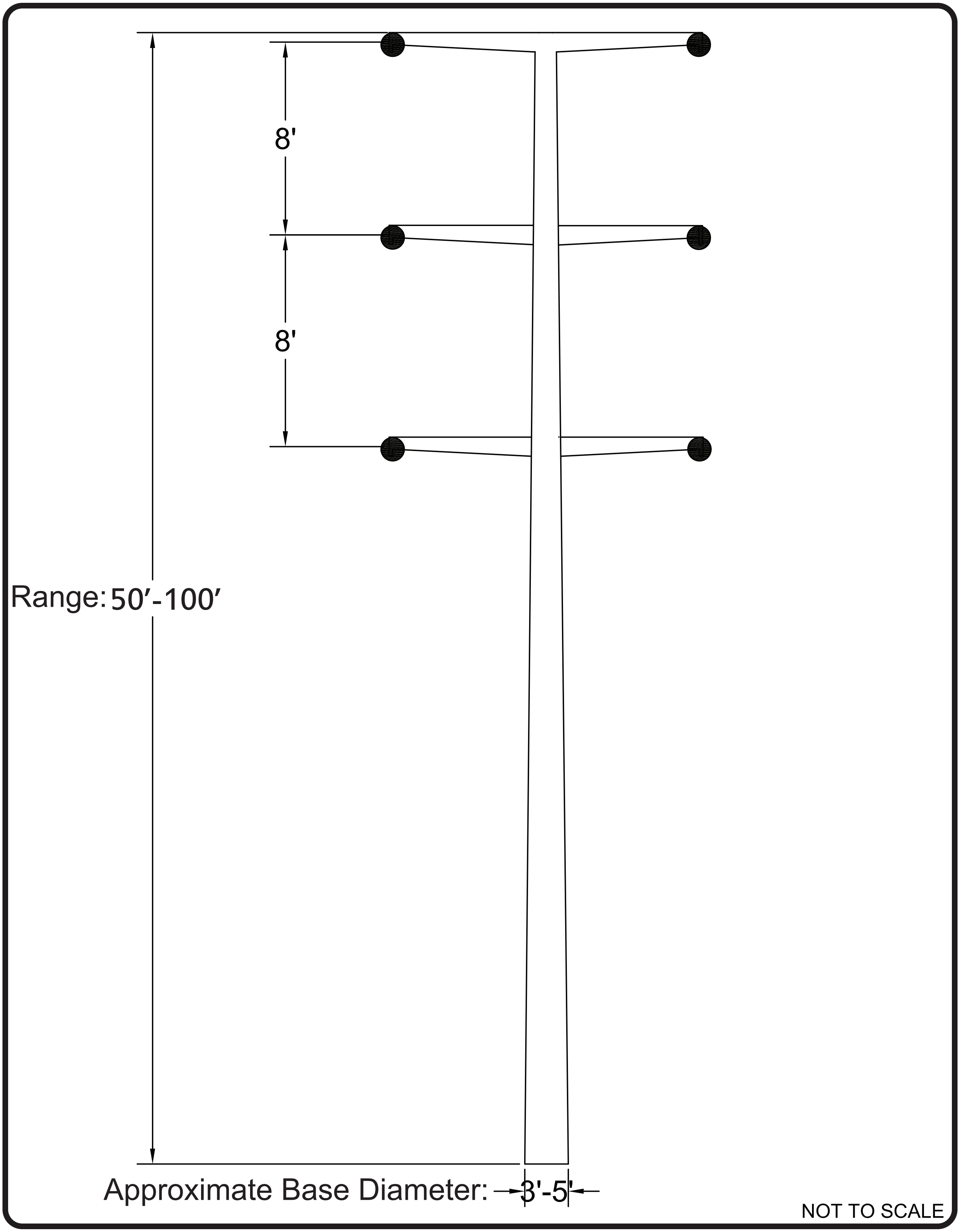

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Figure 3-20:
Typical 66 kV Double-Circuit Tubular Steel Pole with No Underbuild

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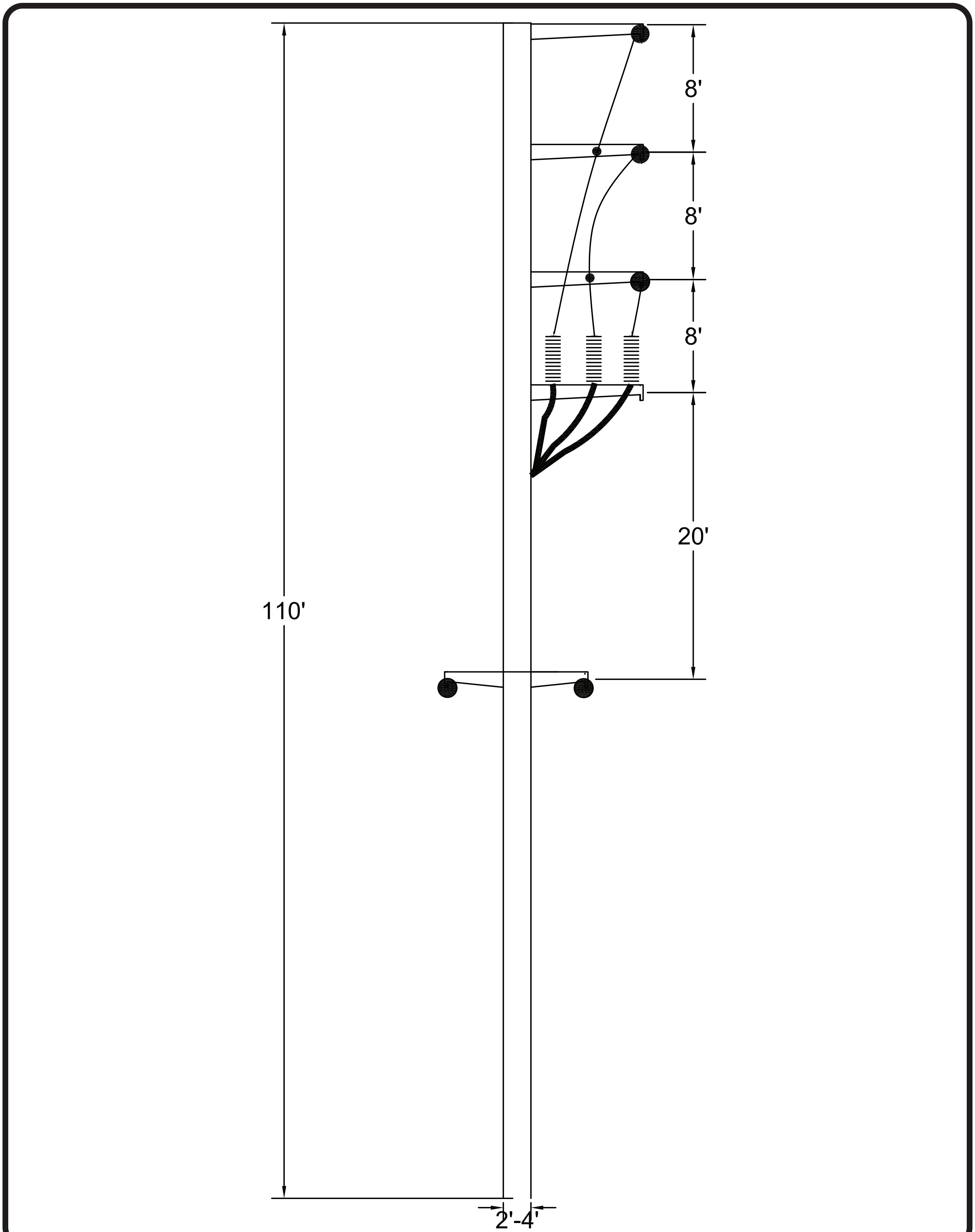

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Figure 3-21:
Typical 16 kV Single-Circuit Tubular Steel Pole Riser with Telecomunications

would be designed to meet the minimum ground-to-conductor clearance requirements set by CPUC G.O. 95. The average span length between towers would be approximately 600 feet.

Subtransmission

The aboveground 66 kV transmission lines would be installed on single- or double-circuit TSPs. The 66 kV TSPs would support non-specular 954 kcmil stranded aluminum conductor (SAC). Typically, one circuit with three phases would be installed on each side of the TSPs and spaced according to the dimensions depicted in Figure 3-19: Typical 66 kV Double-Circuit Tubular Steel Pole Riser and Figure 3-20: Typical 66 kV Double-Circuit Tubular Steel Pole with No Underbuild. Conductors would be designed to meet the CPUC G.O. 95 minimum ground-to-conductor clearance requirements. The average span length between TSPs would be approximately 180 feet.

Telecommunications

The telecommunications line would be installed on existing wood poles, LWS poles, and LSTs. These structures would support 0.5-inch-diameter fiber optic cable. The lowest cable would be approximately 20 to 30 feet above the ground. The average span length between overhead structures would be approximately 150 to 200 feet.

Distribution

The distribution lines would be installed entirely underground, which is described in Section 3.5.3.2, Below-Ground Installation.

3.5.3.2 Below-Ground Installation

Transmission

The transmission lines would be installed entirely overhead, which is described in Section 3.5.3.1, Above-Ground Installation.

Subtransmission

The Proposed Project includes the installation of approximately 5.5 miles of underground subtransmission lines in new duct banks, ranging in length from 800 to 3,300 feet outside of the substation perimeter, with approximately 28 vaults.[5] The duct banks would consist of six 5-inch conduits, conduit spacers, and concrete. The typical dimensions of the subtransmission vaults and duct banks are provided in Table 3-4: Underground Structure Dimensions. A typical subtransmission vault and duct bank are depicted in Figure 3-22: Typical 66 kV Subtransmission Vault and Figure 3-23: Typical 66 kV Subtransmission Duct Bank.

[5] There would be a total of 28 vaults for the Proposed Project—13 within the 69.4-acre substation site and 15 outside of the substation site.

Table 3-4: Underground Structure Dimensions

Type of Structure	Approximate Number of Structures	Approximate Width (Feet)	Approximate Length (Feet)	Approximate Depth (Feet)
Subtransmission Vault	28	10	20	8
Subtransmission Duct Bank	10	2	27,400	5 to 7
Telecommunications Vault	5	5	5	6
Telecommunications Duct Bank	6	2	1,600	3
Distribution Vault	5	7	18	8
Distribution Duct Bank	5	2	5,000	4.5

Note: The approximate number of structures represents the total number, both within the substation site and outside of the substation site. The total length of telecommunications duct bank includes both new and existing structures.

Telecommunications

The Proposed Project includes the installation of approximately 2.9 miles of underground telecommunications cable in existing and new underground duct banks. The approximately 2-foot-wide by 1,600-foot-long by 3-foot-deep newly installed duct banks would typically consist of two 5-inch conduits, conduit spacers, and concrete. In addition, approximately 9,400 feet of existing underground conduit would be utilized. The Proposed Project would utilize approximately 18 existing vaults and five new vaults measuring approximately 5 feet wide by 5 feet long by 6 feet deep. The dimensions of the duct banks and distribution vaults are provided in Table 3-4: Underground Structure Dimensions.

The Proposed Project would also include the installation of a new foundation for a potential future microwave tower. The foundation would be located within the walled portion of the proposed Mesa Substation, adjacent to the senior MEER.

Distribution

The Proposed Project would include the installation of approximately 1 mile of underground distribution cables in new duct banks. At a minimum, the duct banks would measure approximately 2 feet wide by 4.5 feet deep, and would each consist of approximately six 5-inch conduits, conduit spacers, and concrete. Five new vaults would be installed measuring approximately 7 feet wide by 18 feet long by 8 feet deep.

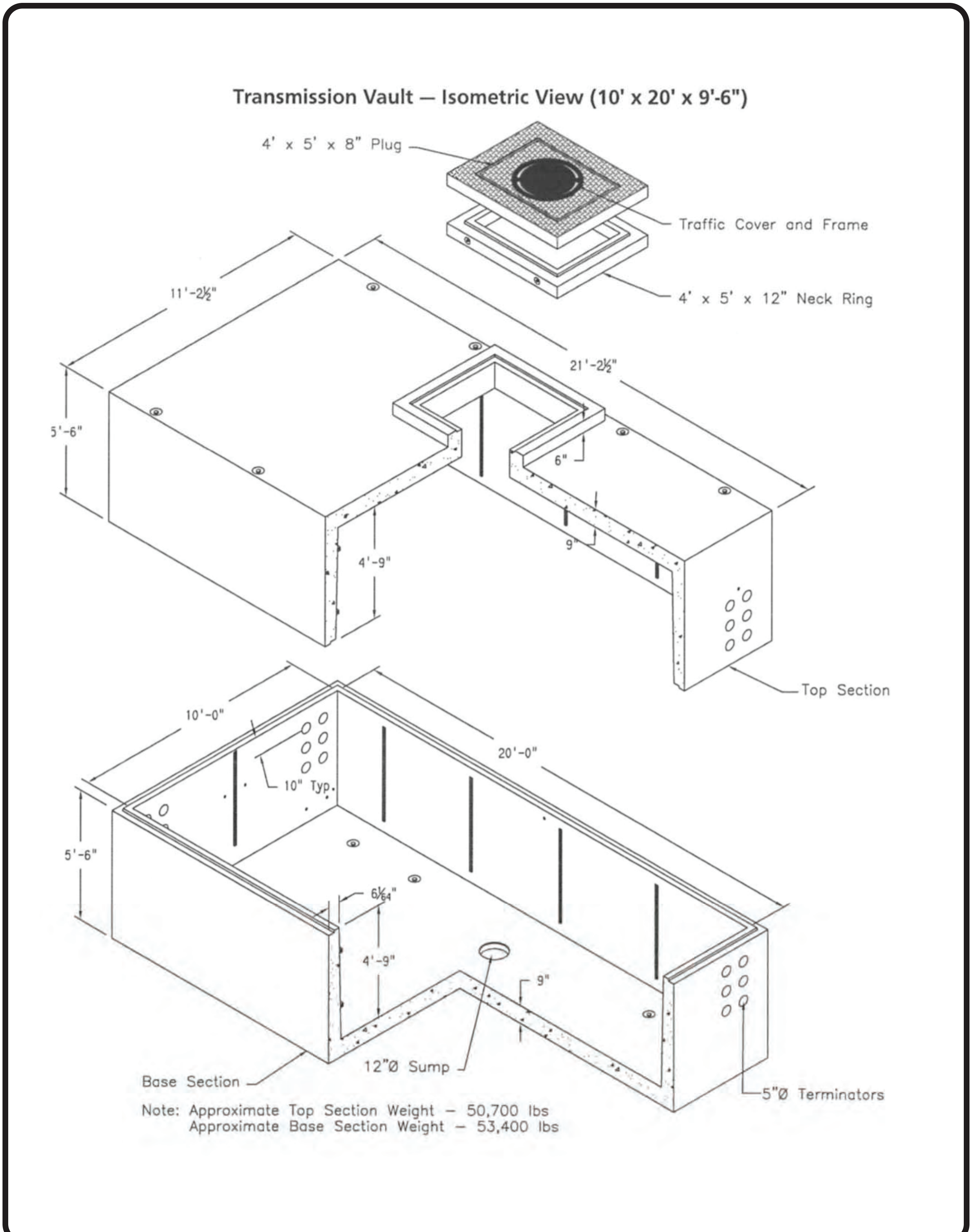

Figure 3-22: Typical 66 kV Subtransmission Vault

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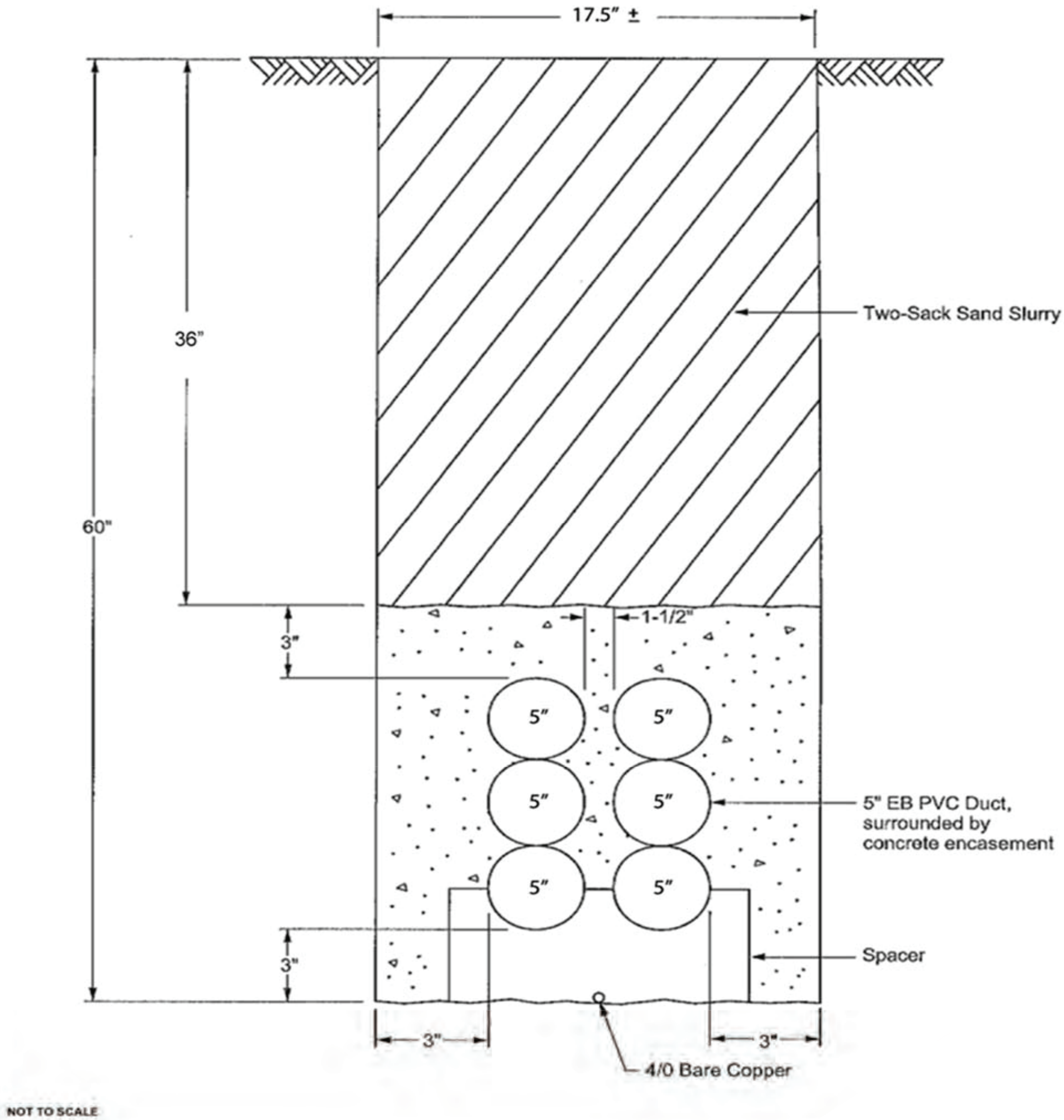

Figure 3-23: Typical 66 kV Subtransmission Duct Bank

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3.5.4 Substations

Mesa Substation would be a 500/220/66/16 kV staffed, automated substation, operating at 3,360 MVA at 500/220 kV, 840 MVA at 220/66 kV, and 56 MVA at 66/16 kV. The substation capacity would have the potential to expand to 4,480 MVA at 500/220 kV, 1,120 MVA at 220/66 kV, and 112 MVA at 66/16 kV, as necessary. The proposed Mesa Substation would be constructed on approximately 69.4 acres within approximately 86.2 acres of SCE fee-owned property located in the City of Monterey Park, in Los Angeles County. The existing Mesa Substation occupies approximately 21.6 acres—within the same approximately 69.4-acre area that the proposed Mesa Substation would be constructed.

The existing Mesa Substation has water and sewer connections that would be rerouted to the new restrooms in the Operations Building and the Test and Maintenance Building.

SCE considers the latest edition of the California Building Code and the Institute of Electrical and Electronic Engineers (IEEE) Standard 693, Recommended Practices for Seismic Design of substations when designing substation structures and equipment.

The substation components are described in the subsections that follow. Figure 3-24: Proposed Substation Layout shows the dimensions of the substation parcel and the placement and orientation of the major components that would be included in the construction of Mesa Substation. Figure 3-25: Proposed Substation Profile provides a profile view of the proposed substation. Table 3-5: Substation Structure Dimensions provides the approximate number and dimensions of the substation structures.

Table 3-5: Substation Structure Dimensions

Type of Structure	Approximate Number of Structures	Approximate Width (Feet)	Approximate Length (Feet)	Approximate Height (Feet)
500 kV Switchrack	1	550	650	65
500/220 kV Transformer Area	11	30	33	35
500/220 kV Firewall	13	2	45	35
220 kV Switchrack	1	330	900	40
220/66 kV Transformer Area	3	25	35	27
66 kV Switchrack	1	135	460	22
66/16 kV Transformer Area	2	25	35	14
16 kV Switchrack	1	34	162	18.5

3.5.4.1 500 kV Switchrack

The proposed 500 kV steel switchrack would be approximately 65 feet high, 650 feet long, and 550 feet wide. The switchrack would consist of a maximum of six approximately 90-foot-wide positions.

The four 500 kV equipped switchrack positions would each have circuit breakers and disconnect switches.

3.5.4.2 500-220 kV Transformers

Transformation would consist of 11, oil-filled, single phase, 373 MVA, 500-220 kV transformers. The dimensions of the area needed for each transformer would be approximately 35 feet high, 33 feet long, and 30 feet wide (with radiators). Each transformer would contain approximately 27,000 gallons of oil.

Firewalls would be installed in between transformers and would be approximately 45 feet long and 35 feet high. The firewall system would consist of fire barrier panels placed between the transformers and the oil spill collection system. Vertical steel columns would be placed between the fire barrier panels for support. The oil spill collection system would consist of catch basins around transformers and underground piping that would connect the basins to a remote oil collection and retention basin.

3.5.4.3 220 kV Switchrack

The proposed 220 kV steel switchrack would be approximately 40 feet high, 900 feet long, and 330 feet wide. The switchrack would consist of a maximum of 14 approximately 50-foot-wide positions.

3.5.4.4 220-66 kV and 66-16 kV Transformers

220-66 kV Transformers

Transformation would consist of three, oil-filled, three phase, 280 MVA, 220-66 kV transformers with adjacent group-operated disconnect switches on the high-voltage and low-voltage sides. The dimensions of the area needed for each transformer would be approximately 27 feet high, 35 feet long, and 25 feet wide. Each transformer would contain approximately 25,000 gallons of transformer oil.

66-16 kV Transformers

Transformation would consist of two, oil-filled, three phase, 28 MVA, 66-16 kV transformers with adjacent group-operated disconnect switches on the high-voltage and low-voltage sides. The dimensions of the area needed for each transformer would be approximately 14 feet high, 35 feet long, and 25 feet wide. Each transformer would contain approximately 3,500 gallons of transformer oil.

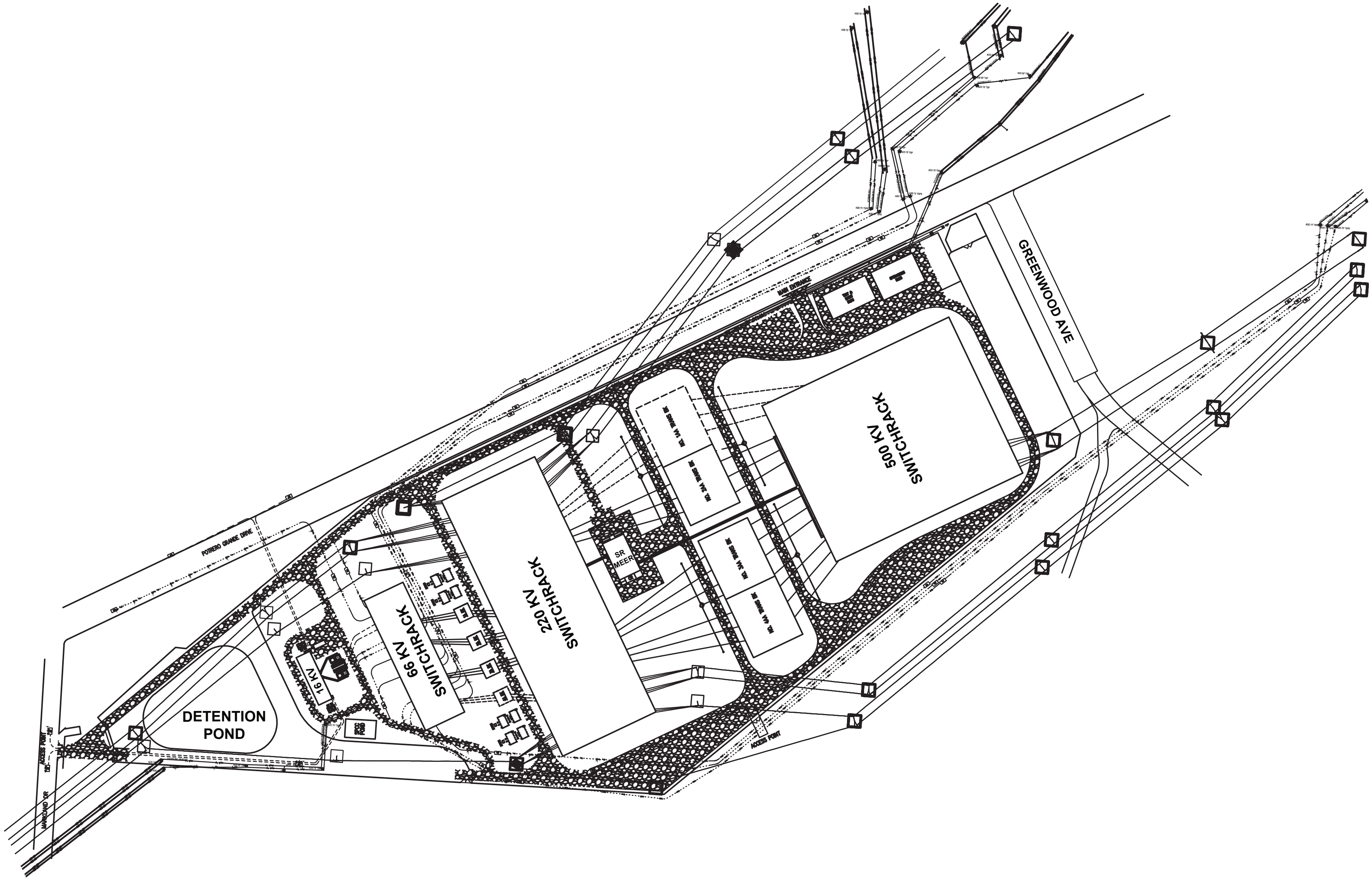

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Figure 3-24: Proposed Substation Layout

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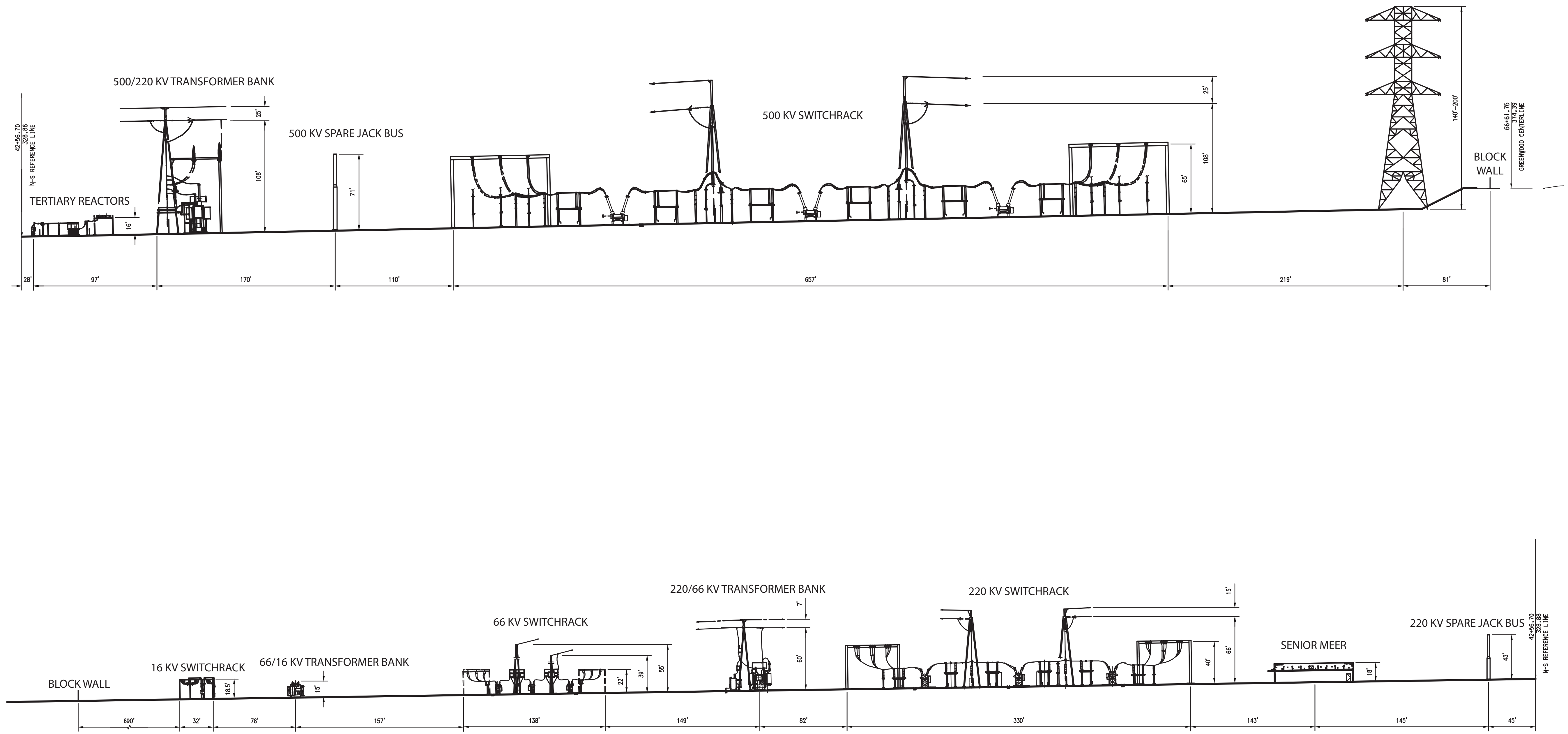

Figure 3-25: Proposed Substation Profile View

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3.5.4.5 66 kV Switchrack

The proposed 66 kV steel switchrack would be approximately 22 feet high, 460 feet long, and 135 feet wide. The switchrack would consist of a maximum of 20 positions measuring approximately 22 feet wide.

3.5.4.6 16 kV Switchrack

The proposed 16 kV steel switchrack would be approximately 18.5 feet high, 162 feet long, and 34 feet wide. The switchrack would consist of a maximum of 18 positions measuring approximately 9 feet wide.

3.5.4.7 Capacitor Banks

Three capacitor banks would be installed for the 66 kV switchrack and each would be approximately 85 feet long and 38 feet wide.

Two capacitor banks would be installed for the 16 kV switchrack and each would be approximately 37 feet long and 13 feet wide.

3.5.4.8 Other Electrical Equipment

No other electrical equipment would be installed as part of the Proposed Project.

3.5.4.9 Control Building (Operations Building)

The monitoring equipment for the operation of the Mesa Substation and portions of the SCE system would be located in a permanent Operations Building structure that would typically be a pre-engineered metal building shell. SCE anticipates the Operations Building would have pre-finished metal panel exterior walls in earth-tone colors, green tinted glazed windows, and metal doors painted to match the adjacent exterior building metal siding. An exterior patio will be constructed at the northeast corner with translucent roof panels and perforated metal panel windscreens. The Operations Building dimensions would be approximately 100 feet wide, 150 feet long, and 25 feet high.

3.5.4.10 Substation Electrical Power

The proposed substation would have three independent sources of 120/240 volt electrical power. The first source of power would be an output of one of the substation’s main transformers. A second source would be a nearby distribution line that would be connected to the substation site.

The third source, for use in case of emergency, would be a 500 kilowatt (kW), 120/240 volt, three-phase stationary backup generator. It would have a fuel tank capable of storing approximately 1,000 gallons of diesel fuel. This stationary generator would be permitted by the applicable regulatory agency.

In addition, the Operations Building and the Test and Maintenance Building would have a separate feed from the nearby distribution line, as well as an additional back-up generator.

3.5.4.11 Mechanical and Electric Equipment Room

A MEER is a conventional structure that is typically constructed with metal framing, structural steel, concrete masonry unit, and concrete. SCE anticipates the senior MEER would have a dark-colored roof and desert tan colored walls, and that the roofline, wall joints, and doorway would have an earth-tone trim. Control cable trenches would be installed to connect the senior MEER to the 500, 220, and 66 kV switchracks. The senior MEER dimensions would be one-story, approximately 18 feet high, 220 feet long, and 80 feet wide. A full basement of the same footprint would be installed for cable pulling purposes.

A junior MEER is a prefabricated structure that is typically constructed with metal framing and structural steel. SCE anticipates the junior MEER would have a dark-colored roof and desert tan colored walls, and that the roofline, wall joints, and doorway would have an earth-tone trim. Control cable trenches would be installed to connect the junior MEER to the 16 kV switchrack. The junior MEER dimensions would be approximately 10 feet high, 40 feet long, and 15 feet wide and would include a slab foundation with cable trenches for cable pulling purposes.

3.5.4.12 Microwave Tower/Monopole

No microwave towers or monopoles would be installed as part of the Proposed Project; however, a microwave tower foundation would be installed during the construction of the proposed Mesa Substation for potential future use. The foundation would consist of four concrete piles measuring approximately 7 feet in diameter and 45 feet deep. The piles would be separated by approximately 29 feet. Approximately 10 CY of concrete would be required to complete the foundation.

3.5.4.13 Counterpoise

Transmission structures located within the substation boundary would be grounded to the substation ground grid. Foundations for 220/500 kV structures located more than 700 feet outside a substation would require adequate individual grounding.

If adequate foundation to ground resistance criteria cannot be met with ground rods, a counterpoise system would be installed. A counterpoise is an additional ground wire installed below ground adjacent to and attached to the structure to increase conductivity between the structure and the ground so that adequate grounding can be achieved.

3.5.4.14 Ancillary Facilities

The Proposed Project would also include the construction of a new, approximately 90-foot-long, 45-foot-wide, and 35-foot-tall Test and Maintenance Building. SCE anticipates that the Test and Maintenance Building would be a pre-engineered metal building shell in earth-tone colors, similar to the Operations Building described in Section 3.5.4.9 Control Building (Operations Building).

3.5.4.15 Restroom Facilities

Permanent restrooms would be installed within the substation perimeter, incorporated within the Operations Building and the Test and Maintenance Building. SCE would apply to the City of Monterey Park for modified sewer and water service. Both the Operations Building and Test and Maintenance Building would incorporate men's and women's restrooms and locker rooms.

3.5.4.16 Fire Water Retention Basin and/or Collection System

In the event of a fire on the substation site, water provided by firefighting efforts would flow toward the retention pond in the southwest corner of the substation site as depicted in Figure 3-24: Proposed Substation Layout. The retention basin would be approximately 1 acre with a capacity of approximately 455,000 gallons and would be constructed from mulch, gravel, soil, and geotextile membrane layers.

In the event of a fire within the 500-220 kV transformer bank area, water provided by firefighting efforts would flow into a catch basin system installed around each transformer, which connects to a drainage pipe that flows into a concrete lined detention basin, approximately 100 feet long, 50 feet wide, and 20 feet deep.

3.5.4.17 Substation Access

Primary access to the proposed Mesa Substation would be provided from Potrero Grande Drive via a new asphalt and/or concrete access driveway. Secondary access would be provided via a new access driveway off of East Markland Drive. The entrance at Potrero Grande Drive would be approximately 150 feet wide, and the entrance at East Markland Drive would be approximately 25 feet wide. Gates would be installed at both driveway entrances. SCE would construct a sidewalk along Potrero Grande Drive outside of the substation and would provide landscaping around the entire perimeter. Figure 3-24: Proposed Substation Layout depicts the substation access driveways.

3.5.4.18 Substation Parking Area

Parking would be available outside of the Operations Building and would include several spaces designated for handicap use.

3.5.4.19 Substation Grading and Drainage Description

Prior to construction, the Mesa Substation site would be cleared and graded to prepare the site for construction. Approximately 83.3 acres of the site would be graded. Approximately 20 acres of on-site vegetation would be removed during the clearing, grubbing, and grading for the construction of the proposed Mesa Substation, including trees along the frontage and within the fence line of the existing Mesa Substation site. Mowers, excavators, front-end loaders, and/or D-9 bulldozers would be utilized to conduct the clearing and vegetation removal activities.

One of the first activities at the proposed Mesa Substation would be to construct the new driveway from East Markland Drive, which would be utilized as the secondary driveway after project completion. The access roads from this driveway would be graded flat to a width of approximately 30 feet to allow for safe operation of construction equipment and the delivery and removal of materials to and from the site. The primary driveway from Potrero Grande Drive would be established once construction activities within the existing Mesa Substation begin. Figure 3-24: Proposed Substation Layout depicts the location of this driveway and access roads. Section 3.5.4.17, Substation Access further describes the Mesa Substation access roads. Once the access driveways are constructed, rolling gates would be installed to control access to the site.

Construction of the proposed Mesa Substation would occur in phases. Initial construction activities, including relocation of a Metropolitan Water District (MWD) waterline and access road construction, would occur in the area of the substation site outside of the existing substation fence. As the new substation equipment is constructed and the new power line alignments are tied into the new switchracks, the equipment at the existing substation would be removed and the site would be graded for installation of the new switchracks and associated equipment.

Once the new power line alignments are tied into the new switchracks, construction crews would decommission the site of its existing use. This process would involve removing the existing materials stored around the existing substation site, and eventually the equipment within the existing substation. The existing Mesa Substation property would be overexcavated, and the on-site soil would be recompacted to prepare the area for site development, and grading would ensue. The site development and grading would be based on the recommendations of the geotechnical investigation that achieves the desired on-site pad elevation and foundation support while maintaining adequate site drainage.

Approximately 650,000 CY of on-site soil would be overexcavated during the decommissioning process. These activities are anticipated to generate approximately 100,000 CY of excess material for off-site disposal. Approximately 550,000 CY of structural fill would be required to raise the substation site to the conceptual design elevation, which ranges from 280 to 375 feet above mean sea level. Approximately 25,000 CY of imported Class II base material and 35,000 CY of crushed rock would be used for the construction of Mesa Substation interior roads. On-site material would be reused to the extent possible, as recommended by the Geotechnical Engineer. Site grading would be accomplished primarily with bulldozers and backhoes, which would condition, cut and fill, and blend the native soil and imported material to the desired pad elevations. A summary of the anticipated grading quantities for Mesa Substation is provided in Table 3-6: Substation Cut and Fill Grading Summary.

Table 3-6: Substation Cut and Fill Grading Summary

Element	Material	Approximate Quantity (Square Feet)	Approximate Volume (CY)
Site Grading, Cut	Dirt	1,800,000	650,000
Site Grading, Fill	Selected Fill Material/Borrow	2,000,000	550,000
Site Grading, Net	Dirt	200,000	-100,000
Internal Driveways, Spoils, Net	Dirt	650,000	50,000
Substation Equipment Foundations, Spoils, Cut	Dirt	184,500	25,000
Cable Trench, Spoils, Cut	Dirt	45,000	5,000
Drainage Structure, Spoils, Cut	Dirt	5,500 linear feet	1,500
Wall foundation, Spoils, Cut	Dirt	14,000 linear feet	1,400

The initial construction of Mesa Substation would require approximately 100,000 CY—or approximately 10,000 haul truckloads—of imported fill to develop the substation site. The final phase would have approximately 200,000 CY—or approximately 20,000 haul truckloads—of cut material to be exported from the new substation site. Haul trucks would operate periodically and as needed during the grading phase of construction. In general, no more than 100 truck trips per day for an estimated five to 12 months would be required to complete the initial phase grading, and no more than 100 truck trips per day for an estimated six to eight months would be required to complete the final phase grading. In addition, approximately 20 additional trips per day are anticipated for the delivery of materials and equipment for the duration of construction.

SCE would prepare and implement a drainage plan to comply with the requirements of the jurisdictional agency, as well as to minimize surface water and erosion impacts. Existing drainage structures, facilities, and devices may need to be modified, removed, replaced, and/or relocated to meet post-development hydrology conditions. The substation pad area would be finish-graded from a high point elevation at the east end of the pad to the perimeter at a slope of approximately one percent. Drainage inlets and pipes would be constructed to collect and divert storm water runoff. The surrounding area would be regraded and the low points would be filled to provide positive surface drainage to the southwest.

Currently, the property generally drains by sheet flow to ephemeral drainages at the southwest corner of the site. These ephemeral drainages connect to storm drains that connect to the Rio Hondo Channel, which flows into the Los Angeles River. A retention basin would be constructed in the southwest corner of the new substation site, and other site and source control best management practices (BMPs) would be included in the design to help mitigate surface runoff. Drainage systems would be constructed along the perimeter of the substation to direct interior surface runoff to the retention basin. The site would be designed to comply with the latest jurisdictional agency Low-Impact Development Standard Manual and a National Pollutant Discharge Elimination System permit.

The permanent cut and fill slopes for the proposed Mesa Substation and the permanent cut and fill for the access roads and retention basin would be stabilized during construction by utilizing BMPs described in the Proposed Project's Storm Water Pollution Prevention Plan (SWPPP). Landscaping would also be installed around the perimeter of the substation site. Appropriate SWPPP BMPs would remain in place and would be maintained until the landscaping has been established.

3.5.4.20 Substation Lighting

Lighting at the proposed Mesa Substation would consist of light-emitting diode (LED) lights located in the switchracks around the transformer banks and in areas of the yard where Operation and Maintenance (O&M) activities may take place during evening hours for emergency/scheduled work. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. The maintenance lighting would be directed downward to reduce glare outside the facility. A flashing orange beacon light, indicating the operation of the rolling gate, would automatically turn on once the gate begins to open and would turn off shortly after the gate is closed.

3.5.4.21 Substation Perimeter

The proposed substation would be enclosed on all sides by a perimeter wall measuring at least 10 feet high, which would satisfy City of Monterey Park requirements for materials and aesthetics. Barbed wire and/or razor wire would be affixed near the top of the perimeter enclosure inside of the substation and would not be visible from the outside.

3.5.4.22 Subtransmission/Distribution Getaways

The Proposed Project would include 10 underground subtransmission getaways and five underground distribution getaways, which are described in Section 3.5.3.2, Below-Ground Installation.

3.5.4.23 Modifications to Existing Substations

The Proposed Project would require minor internal modifications at other existing SCE substations, as described in Attachment 3-B: Modifications at Existing Substations.

3.6 Right-of-Way Requirements

The Proposed Project would be built on a combination of SCE fee-owned property, existing SCE ROW, franchise areas, and the two parcels adjacent to the existing substation that would be acquired. Upon final engineering and receipt of project approvals, SCE would confirm the necessary land and acquire the land rights required for the proposed Mesa 500 kV Substation Project. Certain land rights may need to be acquired and/or amended as follows:

- **Substation:** The proposed Mesa Substation would be located in Monterey Park, north of SR-60 at Potrero Grande Drive. SCE would utilize existing fee-owned property to complete the substation work. SCE would acquire one small parcel adjacent to the existing substation for grading and drainage purposes.

- **Access:** Access to Mesa Substation would be provided from Potrero Grande Drive and from Markland Drive. All other Proposed Project components would be provided directly from existing public roads or existing SCE access roads.

- **Transmission:** SCE would utilize existing fee-owned properties and ROWs to complete the necessary work and would not require additional land rights.

- **Subtransmission/Distribution:** SCE would acquire one small parcel adjacent to the existing substation for the relocation of the MWD waterline and underground subtransmission and distribution getaways.

- **Telecommunications:** Telecommunications lines would be constructed on existing subtransmission and distribution poles to the support the proposed substation. Along the proposed routes, telecommunications lines would be co-located on existing structures or located underground within existing SCE ROWs. Upon final engineering, additional or amended land rights may be required.

3.7 Construction

The following subsections describe the construction activities associated with the Proposed Project.

3.7.1 For All Projects

The following subsections describe the construction activities that are required for all SCE projects.

3.7.1.1 Staging Areas

Construction of the Proposed Project would require the establishment of temporary staging yards, as depicted in Figure 3-26: Conductor Installation and Removal Work Areas.[6] Typically, two types of staging yards would be used during construction—substation construction staging yards and transmission, subtransmission, distribution, and/or telecommunications construction staging yards.

Staging yards would be used as a reporting location for workers, vehicle and equipment parking, and material storage. The yards may have construction trailers for supervisory and clerical personnel to serve as office and meeting locations. Staging yards may be lit for security

[6] Three out of the four staging yards associated with the Proposed Project are depicted on Figure 3-26: Conductor Installation and Removal Work Areas. The fourth staging yard is depicted in Map 13 of Attachment 3-A: Detailed Project Components Map.

purposes. Normal maintenance and refueling of construction equipment would also be conducted at these yards. All refueling and storage of fuels would be in accordance with the SWPPP.

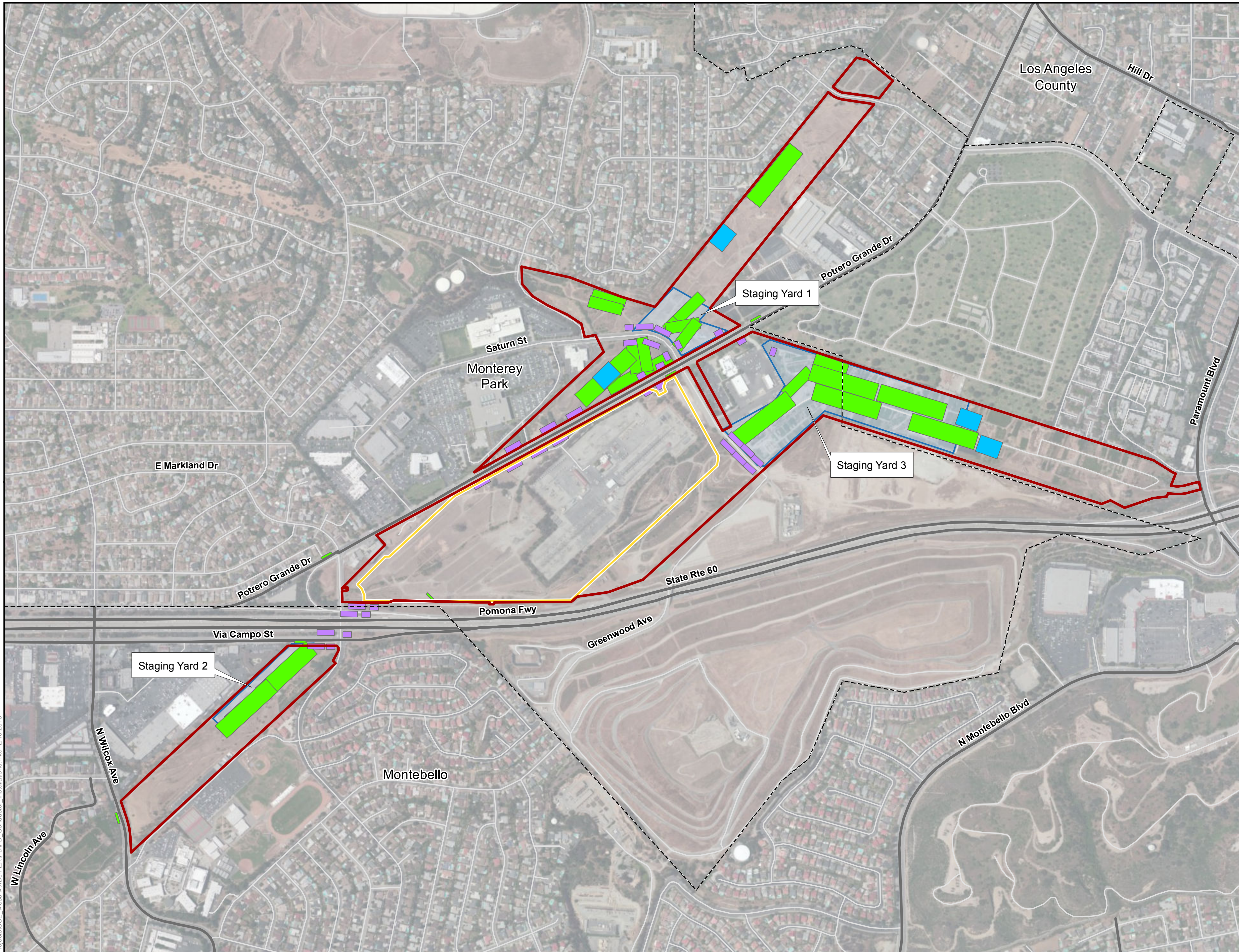
SCE anticipates using one or more of the possible locations listed in Table 3-7: Potential Staging Yard Locations as the staging yard(s) for the Proposed Project. All proposed staging yards would be located within SCE fee-owned property. Typically, the preferred acreage for each yard would be 5 to 25 acres in size, depending on land availability and intended use. Preparation of the staging yards would include temporary perimeter fencing and, depending on existing ground conditions at the site, clearing and grubbing and/or grading may be required to provide a plane and dense surface for the application of gravel or crushed rock in some locations. Land disturbed at the staging yards would either be returned to pre-construction conditions or left in its modified condition.

Table 3-7: Potential Staging Yard Locations

Yard Name	Location	Condition	Approximate Area (Acres)	Proposed Project Component
Material Staging Yard 1	Northwest of the intersection of Potrero Grande Drive and Saturn Drive	Disturbed	4.95	Mesa Substation and transmission, subtransmission, distribution, and telecommunications lines
Material Staging Yard 2	Southwest of the intersection of Via Campo and North Vail Avenue	Disturbed and Undisturbed	3.80	Mesa Substation and transmission, subtransmission, distribution, and telecommunications lines
Material Staging Yard 3	Southeast of the intersection of Potrero Grande Drive and Greenwood Avenue	Disturbed	23.90	Mesa Substation and transmission, subtransmission, distribution, and telecommunications lines
Material Staging Yard 4	North of Goodrich Substation	Disturbed	1.50	Temporary 220 kV line loop-in at Goodrich Substation

Figure 3-26: Conductor Installation and Removal Work Areas

Mesa 500 kV Substation Project



Mesa Substation Study Area
Proposed Substation Perimeter Wall
City Boundary
Splicing Setup Area
Pulling and Tensioning Area
Guard Structure Work Area
Staging Yard

Note: In some locations, multiple work areas overlap with each other. These overlapping areas were removed from the values presented in to avoid double-counting.

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The need for temporary power would be determined based on the type of equipment/facilities being used at the staging yards. If existing distribution facilities are available, a temporary service and meter may be installed for electrical power at one or more of the yards. If it is determined that temporary power would not be available at the staging yards full time, a portable generator may be used intermittently for electrical power at one or more of the yards.

Materials commonly stored at substation construction staging yards would include, but not be limited to: electrical equipment such as circuit breakers, disconnect switches, lightning arresters, transformers, vacuum switches, steel beams, rebar, foundation cages, conduit, insulators, conductor and cable reels, pull boxes, and line hardware.

Materials and equipment commonly stored at the transmission, subtransmission, distribution, and/or telecommunications construction staging yards would include, but not be limited to: construction trailers, construction equipment, portable sanitation facilities, steel bundles, steel/wood poles, conductor reels, overhead ground wire (OHGW) or overhead optical ground wire (OPGW) reels, hardware, insulators, cross arms, signage, consumables (such as fuel and filler compound), waste materials for salvaging, recycling, or disposal, and BMP materials (straw wattles, gravel, and silt fences).

A majority of materials associated with the construction efforts would be delivered by truck to designated staging yards, while some materials may be delivered directly to the transmission and subtransmission construction work areas described in 3.7.1.2, Work Areas.

3.7.1.2 Work Areas

Transmission and subtransmission construction work areas serve as working areas for crews and where Proposed Project-related equipment and/or materials are placed at or near each structure location, within SCE property, existing public ROWs, or franchise areas. Table 3-8: Approximate Laydown/Work Area Dimensions identifies the approximate dimensions of the land disturbance for these Proposed Project construction areas.

Table 3-8: Approximate Laydown/Work Area Dimensions

Laydown/Work Area Feature	Preferred Size (L x W) (Feet)
Transmission Guard Structures	150 x 50
Subtransmission Guard Structures	75 x 50
LSTs	220 x 220
TSPs	220 x 150
LWS H-Frame	175 x 125
LWS Pole	175 x 100
Lattice Structure	175 x 100
Wood Pole	175 x 100
Transmission Conductor Stringing	600 x 150
Subtransmission Conductor Stringing	300 x 100
Transmission Conductor Splicing	200 x 150
Underground Duct Bank (Unpaved)	13,000 x 30
Underground Duct Bank (Paved)	5,000 x 2
Underground Vaults (Unpaved)	100 x 100
Underground Vaults (Paved)	20 x 30

Note: The dimensions listed in this table are preferred for construction efficiency; actual dimensions may vary depending on Proposed Project constraints.

The new structure pad locations and laydown/work areas, provided in Table 3-8: Approximate Laydown/Work Area Dimensions, would first be cleared of vegetation and/or graded as required to provide a reasonably vegetation-free and level surface for structure installation. Sites requiring grading would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the structure footings. The graded area would be compacted to at least 90-percent relative density, and would be capable of supporting heavy vehicular traffic.

Erection of the structures may also require establishment of a temporary crane pad. The crane pad would occupy an area of approximately 50 feet by 50 feet and be located adjacent to each applicable structure within the laydown/work area used for structure assembly. The pad may be cleared of vegetation and/or graded as necessary to provide a level surface for crane operation. The decision to use a separate crane pad would be determined during final engineering for the Proposed Project and the selection of the appropriate construction methods to be used by SCE or its Contractor.

3.7.1.3 Access Roads and/or Spur Roads

Where required, a network of existing access roads could be improved and new roads would be constructed to current SCE road specifications to support the construction and O&M of the Proposed Project

Typical transmission access consists of a network of unpaved and paved roads accessed from public and private roads located on public, and private lands. These access roads include of a network of through roads and spur roads that are used to access transmission facilities. Access to the transmission line ROW for construction activities and future O&M activities associated with the Proposed Project would be accomplished by utilizing this network of roads.

During construction of the Proposed Project, crews would utilize existing public roads and existing transmission access roads to the maximum extent feasible. New access roads would be constructed in accordance with current SCE practices for safety during construction and O&M. Rehabilitation, road widening, and/or upgrades to existing access roads may also be required to facilitate construction access and to support O&M activities.

Typical construction activities associated with rehabilitation of existing unpaved access roads include vegetation clearing, blade-grading, grubbing, mowing, and re-compacting to remove potholes, ruts, and other surface irregularities in order to provide a riding surface that is capable of supporting heavy construction and maintenance equipment. Existing unpaved roads may also require additional upgrades, such as protection (e.g., soil cover and steel plates) for existing underground utilities.

Typical construction activities associated with new roads generally include similar activities as described for the rehabilitation of existing unpaved roads, but may also include the following additional construction requirements that depend upon the existing land terrain:

- **Existing relatively flat terrain with grades up to four percent:** Construction activities are generally similar to rehabilitation activities on existing unpaved roads and may also require activities such as clearing and grubbing, as well as constructing drainage improvements (e.g., wet crossings, water bars, and culverts). Detailed information on locations requiring drainage improvements would be provided during final engineering.

- **Existing rolling terrain with grades of five to 12 percent:** Construction activities generally include typical to flat terrain activities and may also require cut and fill in excess of 2 feet in depth, benched grading, drainage improvements (e.g., v-ditches, downdrains, and energy dissipaters), retaining walls, and slope stability improvements (e.g., geogrid reinforcement). The extent of retaining walls and slope stability improvements would be determined during final engineering, as would detailed information on locations requiring cut and fill, benched grading, and/or drainage improvements.

- **Existing mountainous terrain with grades over 12 percent:** Construction activities would include rolling terrain construction activities and would also likely require significant cut and fill depths, benched grading, drainage improvements, and slope stability improvements. Detailed information on locations requiring cut and fill, benched grading, and/or drainage improvements would be provided during final engineering.

Typical construction activities associated with temporary access could include vegetation clearing, blade-grading, grubbing, mowing, and re-compacting.

In addition, other slope stability systems considered include mechanically stabilized systems, along with drainage improvements (i.e., v-ditches, downdrains, and energy dissipaters). The extent of slope stability improvements and earth-retaining structures would be determined during final engineering.

Generally, access roads would have a minimum drivable width of 14 feet with 2 feet of shoulder on each side, as determined by the existing land terrain to accommodate required drainage features. Typically, the drivable road width would be widened and would generally range up to an additional 8 feet along curved sections of the access road, creating up to 22 feet of drivable surface for the access road. Access road gradients would be leveled so that sustained grades generally do not exceed 14 percent. Curves would typically have a minimum radius of curvature of 50 feet measured from the center line of the drivable road width. Specific site locations may require a wider drivable area to accommodate multi-point turns where 50-foot minimum radii cannot be achieved.

Access roads would typically have turnaround areas around the structure location. In some cases where a turnaround is not practical, an alternative configuration would be constructed to provide safe ingress/egress of vehicles to access the structure location. It is common to use access road turnaround areas for the dual purpose of structure access and as a construction pad for construction activities. If a construction pad is built, it would remain a permanent feature for O&M.

The Proposed Project access roads generally follow the proposed transmission line route. Transmission line roads are classified into two groups: access roads and spur roads. Access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along line ROWs. Spur roads are roads that lead from access roads and terminate at one or more structure sites due to terrain considerations and topographic constraints.

Approximately 5.6 miles of existing dirt access roads on SCE property and existing ROWs would be used to access the Proposed Project work areas. If improvements are required, they would be conducted in accordance with existing O&M practices.

3.7.1.4 Helicopter Access

Helicopters would be used to support construction activities. Specifically, SCE currently anticipates helicopters would be utilized during conductor stringing activities for the 500 kV and 220 kV transmission lines. SCE would consider IEEE Standards 524-2003, *Guide to the Installation of Overhead Transmission Line Conductors*, in the construction of the Proposed Project. For the Proposed Project, helicopters would be based at an existing aviation facility and fly to the site from that location. Helicopters may use the potential staging yard locations as needed. Helicopters typically used for stringing activities would include a Hughes 500 F.

Helicopters for the Proposed Project would most likely be based out of El Monte and Chino airports, where refueling would occur.

Helicopter operations and support areas typically include helicopter staging and material yards, storage and maintenance sites, and ground locations in close proximity to conductor pulling, tensioning, and splice sites and/or within previously disturbed areas near construction sites. In addition, helicopters must be able to land within SCE ROWs, which could include landing on access or spur roads. At night or during off days, for safety and security concerns, helicopters and their associated support vehicles and equipment would be based at a local airport(s).

Flight paths would be determined immediately prior to construction by the helicopter contractor. Flight paths would be filed with the appropriate authorities, where required. SCE would implement an operating plan for helicopter use, in accordance with Title 14, Part 77 of the CFR, and in coordination with and to be approved by the FAA Flight Standards District Office.

3.7.1.5 Vegetation Clearance

The proposed Mesa Substation site would require vegetation clearing (i.e., tree and brush removal) within its boundaries to prepare the approximately 69.4-acre site for installation of the substation equipment.

Vegetation clearing (i.e., tree and brush removal and tree trimming) may also be required in the proposed transmission ROWs to accommodate construction work areas, and to reduce the potential for fire during construction activities.

3.7.1.6 Erosion and Sediment Control and Pollution Prevention during Construction

Storm Water Pollution Prevention Plan

Construction of the Proposed Project would disturb a surface area greater than 1 acre. Therefore, SCE would be required to obtain coverage under the Statewide Construction General Permit (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-0006-DWQ) from the State Water Resources Control Board, as explained further in the discussion on the Clean Water Act Section 402 in Section 4.9, Hydrology and Water Quality in Subsection 4.9.2.1, Federal. Commonly used BMPs are storm water runoff, sediment and erosion control measures, dewatering procedures, and concrete waste management. The SWPPP would be based on final engineering design and would include all Proposed Project components.

Dust Control

During construction, migration of fugitive dust from the construction sites would be limited by control measures set forth by the South Coast Air Quality Management District (SCAQMD). These measures may include the use of water trucks and other dust control measures. Additional discussion regarding dust control activities is provided in Section 4.3, Air Quality.

Hazardous Materials

Construction of the Proposed Project would require the limited use of hazardous materials, such as fuels, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations. Material Safety Data Sheets would be made available at the construction site for all crew workers.

Because the anticipated volume of hazardous liquid materials, such as the mineral oil used as electrical insulation for the transformers, at the site would exceed 1,320 gallons after construction is completed, a Spill Prevention, Control, and Countermeasure Plan (SPCC) and Hazardous Materials Business Plan (HMBP) would be in place for the site and would be updated in accordance with 40 CFR Parts 112.1-112.7. Additional discussion regarding the presence of on-site hazardous materials, the SPCC, and the HMBP is provided in Section 4.8, Hazards and Hazardous Materials.

Reusable, Recyclable, and Waste Material Management

Construction of the Proposed Project would result in generation of various waste materials, including wood, metal, soil, vegetation, and sanitation waste (portable toilets). Sanitation waste (i.e., human-generated waste) would be disposed of in accordance with applicable sanitation waste management practices. Material from existing infrastructure that would be removed as part of the Proposed Project, such as conductor, steel, concrete, and debris, would be temporarily stored in one or more staging yards as the material awaits salvage, recycling, and/or disposal.

The existing wood poles removed for the Proposed Project would be returned to a staging yard, and reused by SCE, returned to the manufacturer, disposed of in a Class I hazardous waste landfill, and/or disposed of in the lined portion of a Regional Water Quality Control Board-certified municipal landfill.

Material excavated for the Proposed Project would either be used as fill and/or disposed of offsite at an appropriately licensed waste facility. If contaminated material is encountered during excavation, work would stop at that location and SCE's Spill Response Coordinator would be called to the site to make an assessment and notify the proper authorities. Additional discussion regarding the disposal of waste and other materials is provided in Section 4.17, Utilities and Service Systems.

3.7.1.7 Cleanup and Post-Construction Restoration

SCE would clean up all areas that would be temporarily disturbed by construction of the Proposed Project (which may include the material staging yards, stringing sites, and splicing sites) to as close to pre-construction conditions as feasible, or to the conditions agreed upon between the landowner and SCE following the completion of construction of the Proposed Project.

If restoration and/or revegetation occurs within sensitive habitats, a habitat restoration and/or revegetation plan(s) would be developed by SCE with the appropriate resource agencies and implemented after construction is complete. Additional information pertaining to the habitat restoration and/or revegetation plan(s) can be found in Section 4.4, Biological Resources.

3.7.2 Transmission Line Construction (Above Ground)

The following subsections describe the above-ground construction activities associated with installing the transmission, subtransmission, distribution, and telecommunications line segments for the Proposed Project.

3.7.2.1 Pull and Tension Sites

Transmission and Subtransmission Pull and Tension Sites[7]

The pulling, tensioning, and splicing set-up locations associated with the Proposed Project would be temporary, and the land would be restored to its previous condition following completion of stringing and splicing activities. The set-up locations require level areas to allow for maneuvering of the equipment and, when possible, these locations would be located on existing level areas to minimize the need for grading and cleanup. Approximately 40 set-up locations are currently proposed,[8] as detailed in Figure 3-26: Conductor Installation and Removal Work Areas. The final number and location of these sites would be determined upon final engineering. The approximate area needed for stringing set-ups associated with wire installation is variable and depends upon terrain. Table 3-8: Approximate Laydown/Work Area Dimensions provides the approximate size of pulling, tensioning, and splicing equipment set-up areas and laydown dimensions.

Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected based on a variety of factors, including availability of dead-end structures, conductor size, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment set-up locations. On relatively straight alignments, typical wire pulls occur every 4,000 to 5,500 feet for transmission lines and 6,000 to 8,000 feet for subtransmission lines, and wire splices occur every 7,500 to 9,000 feet on flat terrain. When the line route alignment contains multiple deflections or is situated in rugged terrain, the length of the wire pull is typically diminished. Generally, pulling locations and equipment set-ups would be in line with the direction of the overhead conductors and established at a distance that is approximately three times the height of the adjacent structure.

Each stringing operation consists of a puller set-up positioned at one end and a tensioner set-up with a wire reel stand truck positioned at the other end of the wire pull. Pulling and wire tensioning locations may also be utilized for splicing and field snubbing of the conductors. Temporary splices, if required, may be necessary since permanent splices that join the conductor together cannot travel through the rollers. Splicing set-up locations are used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each structure. Field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension at locations where stringing equipment cannot be positioned in back of a dead-end structure.

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[7] For the purposes of this PEA, the term “pull and tension site” is synonymous with the term “stringing site.”

[8] The Proposed Project would require a total of approximately 40 pull and tension sites—this includes 19 telecommunications pull and tension sites.

Telecommunications Pull and Tension Sites

The telecommunications pull and tension sites would be approximately 20 feet by 100 feet, or approximately 0.05 acre. The Proposed Project would require the use of approximately 19 telecommunications pull and tension sites on SCE property, existing ROWs, franchise locations, the Mesa Substation site, and the SCE Montebello Service Center. The average distance between telecommunications pull and tension sites would be approximately 5,000 feet. Equipment used to pull the telecommunications line would be similar to that described previously for the transmission and subtransmission lines. When existing cable is replaced, flat-bed trucks would be used to haul the cable off site for disposal or recycling.

Temporary Structures

A shoo-fly is a temporary power line installed during construction to maintain electrical service to the area while allowing portions of a permanent line to be taken out of service or installed, ensuring safe working conditions during construction activities. Each shoo-fly would be removed after construction is completed, as described in more detail in the following paragraphs. The approximate dimensions of the proposed temporary structures are shown in Figure 3-27: Typical 220 kV Single-Circuit Dead-End Shoo-Fly Structure. The number of shoo-fly configurations for all voltage levels would be determined after final engineering and when the construction work plan is developed.

Shoo-fly configurations would be installed during the realignment of the MWD waterline. Another shoo-fly configuration would also be installed for the Mesa-Vincent No. 1 220 kV circuit to ensure sufficient supply is maintained at Mesa Substation and other affected substations during construction. A third shoo-fly configuration would be installed for the temporary 220 kV line loop-in at Goodrich Substation.

Each temporary steel pole would require a hole to be excavated using either an auger or a backhoe, and the steel poles would be direct buried. Excavated material would be used as fill, as described in Section 3.7.1.6, Erosion and Sediment Control and Pollution Prevention during Construction. The temporary structures would typically consist of separate base and top sections, and may be placed in temporary laydown areas at each pole location. Depending on conditions at the time of construction, the top sections may come pre-configured, may be configured on the ground, or may be configured after pole installation with the necessary cross arms, insulators, and wire-stringing hardware. The temporary structures would then be installed in the holes, typically by a line truck with an attached boom. When the base section is secured, the top section(s) would be installed on top of it. Depending on the terrain and available equipment, the pole sections could also be assembled into a complete structure on the ground prior to setting the poles in place within the holes.

The temporary steel poles would be approximately 2 to 6 feet in diameter at the base and would extend 55 feet to 130 feet above ground. The temporary steel poles would be embedded with embedment depths of approximately 8 to 30 feet. If needed, temporary steel guy stub poles would be installed similarly to temporary steel poles.

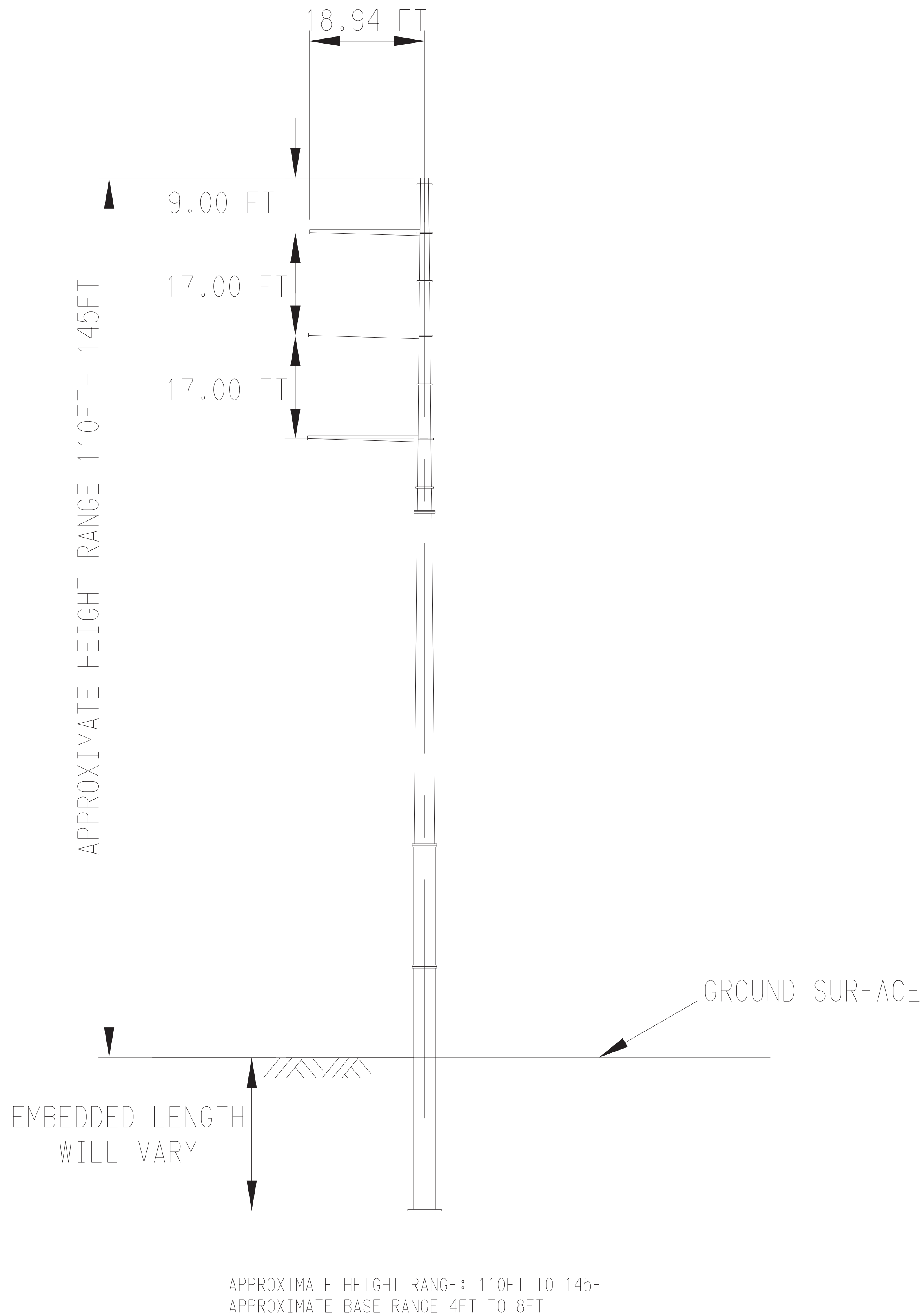

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Figure 3-27:
Typical 220 kV Single-Circuit Dead-End Shoo-Fly Structure

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Following construction, the above- and below-ground portions of the temporary pole would be removed. The holes left from removing the poles would be backfilled with spoil that may be available as a result of excavating from other construction areas and using imported fill, as needed.

3.7.2.2 Pole Installation and Removal

Construction crews and equipment would travel to the pole site locations using public roads and new and existing access roads. Section 3.7.5, Construction Workforce and Equipment describes the anticipated equipment and workforce required for the Proposed Project. To get to and from the pole sites, stringing sites, and material staging yards, the crews would use one or more of the construction vehicles listed in Attachment 3-C: Construction Equipment and Workforce Estimates for each construction activity on any given day. The numbers of anticipated trips are discussed in Section 4.16, Transportation and Traffic.

Pole and Foundation Removal

The Proposed Project would involve removing structures, conductor, and associated hardware. This work is proposed in the following sequence:

- Road work – Existing access roads would be used to reach structures, but some rehabilitation and grading may be necessary before removal activities would begin to establish temporary crane pads for structure removal, etc.

- Wire-pulling locations – Wire pulling sites would be located every 4,000 to 5,500 feet for transmission lines and 6,000 to 8,000 feet for subtransmission lines along the existing utility corridor, and would include locations at dead-end structures and turning points.

- Conductor removal – SCE would remove existing conductors in a method similar to reversing the conductor installation process. The old conductor would be transported to a construction yard, where it would be prepared for recycling.

- Structure removal – Structures would be dismantled down to the foundations and the materials would be transported to a construction yard, where they would be prepared for recycling.

- Footing/foundation removal – Footings would be removed to a point 1 to 2 feet below grade and the holes would be filled with excess soil and smoothed to match the surrounding grade. Footing materials would be transported to a construction yard where they would be prepared for disposal.

Any existing transmission lines, subtransmission lines, distribution lines, and telecommunications lines (where applicable) would be transferred to temporary structures or directly to the new structures prior to removal of existing structures. Any remaining facilities that are not reused by SCE would be removed and transported to a facility for disposal, as described in Section 3.7.1.6, Erosion and Sediment Control and Pollution Prevention during Construction.

The existing wood poles would be completely removed once the subtransmission and telecommunications lines are transferred to the new poles. The removal would consist of the above-ground and below-ground portions of the pole. The holes left from removing the poles would be backfilled with spoils that may be available as a result of the excavation for new poles and using imported fill as needed.

Top Removal

For the Proposed Project, topping existing wood poles would be required when third-party telecom/cable would remain on the topped poles. Access to the pole tops would be via bucket truck(s), or linemen would climb the poles where vehicle access was limited. Once the subtransmission and/or distribution conductors have been removed and transferred to the new poles, the support cross arms on the existing poles (if equipped) would be removed and the top portion of the poles above the existing telecom/cable attachment point would be cut and removed.

Pole/Tower Installation

Foundation Installation

<u>Lattice Steel Tower</u>

Structure foundations for each LST would consist of four poured-in-place concrete footings. Actual footing diameters and depths for each of the structure foundations would depend on the soil conditions and topography at each site and would be determined during final engineering.

The foundation process begins with the drilling of the holes for each footing. The holes would be drilled using truck or track-mounted excavators with augers of various diameter to match the diameter requirements of the foundation footing. LSTs typically require four excavated holes that are each 3 to 7 feet in diameter and 30 to 60 feet deep. On average, each footing for an LST structure would protrude 1 to 4 feet above ground level.

The excavated material would be distributed at each structure site, used to backfill excavations from the removal of nearby structures (if any) and/or used in the rehabilitation of existing access roads. Alternatively, the excavated soil may be disposed of at an off-site disposal facility in accordance with applicable laws, as described in Section 3.7.1.6, Erosion and Sediment Control and Pollution Prevention during Construction.

Following excavation of the foundation footings, steel-reinforced rebar cages would be set, survey positioning would be verified, and concrete and stub angles would then be placed. Steel-reinforced rebar cages and stub angles may be assembled at staging yards and delivered to each structure location by flatbed truck or assembled at the job site. Depending upon the type of structure being constructed, soil conditions, and topography at each site, LSTs would require an average of approximately 200 CY of concrete delivered to each structure location.

Slight to severe ground caving is possible during the drilling of the LST foundations due to the presence of loose soils. The use of water, fluid stabilizers, drilling mud, and/or casings would be made available to control ground caving and to stabilize the sidewalls from sloughing. If fluid stabilizers are utilized, mud slurry would be added in conjunction with the drilling. The concrete for the foundation is then pumped to the bottom of the hole, displacing the mud slurry. Mud slurry brought to the surface is typically collected in a pit adjacent to the foundation and/or vacuumed directly into a truck to be reused or discarded at an off-site disposal facility in accordance with all applicable laws.

Concrete samples would be drawn at time of pour and tested to ensure engineered strengths are achieved. A normally specified SCE concrete mix typically takes approximately 20 to 30 days to cure to an engineered strength. This strength is verified by controlled testing of sampled concrete. Once this strength has been achieved, crews would be permitted to commence erection of the structure.

Conventional construction techniques would generally be used as described previously for new foundation installation. Alternative foundation installation methods would be used where conventional methods are not practical. In certain cases, equipment and material may be deposited at structure sites by workers on foot, and crews may prepare the foundations using hand labor assisted by hydraulic or pneumatic equipment, or other methods.

During construction, existing concrete supply facilities would be used where feasible. If the use of existing concrete supply facilities is not feasible, a temporary concrete batch plant would be set up in an established material staging yard. Equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos. Dust emissions would be controlled by watering the area, sealing the silos, and transferring the fine particulates pneumatically between the silos and the mixers.

Prior to drilling for footings for LSTs, SCE or its Contractor would contact Underground Service Alert to identify any existing underground utilities in the construction zone.

Tubular Steel Pole

Each TSP would require a drilled, poured-in-place, concrete footing that would form the structure foundation. The hole would be drilled using truck or track-mounted excavators with various diameter augers to match the diameter requirements of the structure foundation. Excavated material would be used as described in Section 3.7.1.6, Erosion and Sediment Control and Pollution Prevention during Construction. Following excavation of the foundation footings, steel-reinforced cages would be set, positioning would be survey-verified, and concrete would then be poured. Foundations in soft or loose soil or those that extend below the groundwater level may be stabilized with drilling mud slurry or by the use of temporary caissons. In this instance, mud slurry would be placed in the hole during the drilling process to prevent the sidewalls from sloughing. Concrete would then be pumped to the bottom of the hole, displacing the mud slurry. Depending on site conditions, the mud slurry brought to the surface would typically be collected in a pit adjacent to the foundation or vacuumed directly into a truck to be reused or discarded at an appropriate off-site disposal facility. TSP foundations typically require an excavated hole approximately 5 feet to 9 feet in diameter and 30 feet to 60 feet deep. TSPs would require an average of approximately 88 CY of concrete delivered to each structure location.

During construction, existing concrete supply facilities would be used where feasible. If the use of existing concrete supply facilities is not feasible, a temporary concrete batch plant would be set up in an established material staging yard. Equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos. Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers.

Prior to drilling for foundations, SCE or its Contractor would contact Underground Service Alert to identify any existing underground utilities in the construction zone.

Lattice Steel Tower Installation

LSTs would be assembled within the construction areas at each tower site. See Table 3-8: Approximate Laydown/Work Area Dimensions for approximate laydown dimensions. Structure assembly would begin with the hauling and stacking of steel bundles, per engineering drawing requirements, from a staging yard to each structure location. This activity would require several trucks with 40-foot trailers and a rough terrain forklift. After the steel is delivered and stacked, crews would proceed with assembly of leg extensions, body panels, boxed sections, and the cages/bridges. Assembled sections would be lifted into place with a crane and secured by a combined erection and torquing crew. When the steel work is completed, the construction crew may opt to install insulators and wire rollers (travelers).

Tubular Steel Pole Installation

TSPs typically consist of multiple sections. The pole sections would be placed in temporary laydown areas at each pole location. See Table 3-8: Approximate Laydown/Work Area Dimensions for approximate laydown dimensions. Depending on conditions at the time of construction, the top sections may come pre-configured, may be configured on the ground, or configured after pole installation with the necessary cross arms, insulators, and wire stringing hardware. A crane would then be used to set each steel pole base section on top of the previously prepared foundation. If existing terrain around the TSP location is not suitable to support crane activities, a temporary crane pad would be constructed within the laydown area. When the base section is secured, the subsequent section of the TSP would be slipped into place onto the base section. The pole sections may be spot welded together for additional stability. Depending on the terrain and available equipment, the pole sections could also be pre-assembled into a complete structure prior to being set.

TSP guy stubs would be installed similarly to TSPs.

Wood Pole Installation

Depending on the results of the wind-load testing, up to 46 existing wood subtransmission and/or distribution poles may need to be replaced due to the proposed telecommunications lines. Each wood pole would require a hole to be excavated using either an auger, backhoe, or with hand tools. Excavated material would be used as described in Section 3.7.1.6, Erosion and Sediment Control. The wood poles would be placed in temporary laydown areas at each pole location.

While on the ground, the wood poles may be configured (if not preconfigured) with the necessary cross arms, insulators, and wire stringing hardware before being set in place. The wood poles would then be installed in the holes, typically by a line truck with an attached boom. Wood guy stub poles would be installed similarly to wood poles.

Light-Weight Steel Pole Installation

No LWS poles are expected to be installed as part of the Proposed Project.

Microwave Installation

No microwave towers or monopoles are planned to be installed as part of the Proposed Project.

Transmission, Subtransmission, and Telecommunications Land Disturbance

The land disturbance from above-ground construction of the transmission, subtransmission, and telecommunications lines is provided in Table 3-9: Transmission and/or Subtransmission and/or Telecommunications Approximate Land Disturbance Table.

Table 3-9: Transmission and/or Subtransmission and/or Telecommunications Approximate Land Disturbance Table

Proposed Project Feature	Proposed Number of Structures[1]	Approximate Work Area (L x W) (Feet)	Approximate Area Disturbed During Construction (Acres)	Approximate Area to be Restored (Acres)	Approximate Area Permanently Disturbed (Acres)
500 kV LST	2	220 x 220	5.4	4.8	0.6
220 kV LST	18				
66 kV TSP	19	220 x 150	7.0	7.0	0.0
Wood Pole[2]	46	125 x 50	6.6	6.6	0.0

Notes:
1. For purposes of calculating approximate land disturbance, only Proposed Project structures located outside of the 69.4-acre substation site are included in this table. All disturbance within the Mesa Substation site has been attributed to this Proposed Project component. Due to the proximity of the Proposed Project components, overlapping portions of the work areas have been removed in the Approximate Area Disturbed During Construction column.
2. Depending on the results of the wind-load testing, up to 46 wood poles may need to be replaced for the proposed telecommunications lines.

3.7.2.3 Conductor/Cable Installation

Above Ground

Wire stringing activities would be in accordance with SCE common practices detailed in the IEEE Standard 524-2003, *Guide to the Installation of Overhead Transmission Line Conductors*. To ensure the safety of workers and the public, safety devices (such as traveling grounds), guard structures, radio-equipped public safety roving vehicles, and linemen would be in place prior to the initiation of wire stringing activities. Advanced planning is required to determine circuit outages, pulling times, and safety protocols to ensure that the safe installation of wire is accomplished.

Wire stringing includes all activities associated with the installation of the primary conductors onto transmission line structures. These activities include the installation of conductor, OHGW/OPGW, insulators, stringing sheaves (rollers or travelers), vibration dampeners, weights, and suspension and dead-end hardware assemblies for the entire length of the route.

The following five steps describe typical wire stringing activities:

- Step 1 – Planning: A wire stringing plan would be developed to determine the sequence of wire pulls and the set-up locations for the wire pull/tensioning/splicing equipment.
- Step 2 (Option 1) – Sock Line Threading: A bucket truck would typically be used to install a lightweight sock line from structure to structure. The sock line would be threaded through the wire rollers in order to engage a camlock device that would secure the pulling sock in the roller. This threading process would be repeated at all structures selected for a conductor pull.
- Step 2 (Option 2) – Sock Line Threading: A helicopter would fly a lightweight sock line from structure to structure, which would be threaded through rollers in order to engage a camlock device that would secure the pulling sock in the roller. This threading process would be repeated at all structures selected for a conductor pull.
- Step 3 – Pulling: The sock line would be used to pull in the conductor pulling rope and/or cable. The pulling rope or cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel.
- Step 4 – Splicing, Sagging, and Dead-Ending: Once the conductor is pulled in, if necessary, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to structures.
- Step 5 – Clipping-In: After the conductor is dead-ended, the conductors would be secured to all tangent structures; this process is called “clipping in.” Once this is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

Below Ground

Following vault and duct bank installation, SCE would pull the electrical cables through the duct banks, splice the cable segments at each vault, and terminate the cables at the transition structures where the subtransmission line would transition from underground to overhead. To pull the cables through the duct banks, a cable reel would be placed at one end of the conduit segment, and a pulling rig would be placed at the opposite end. The cable from the cable reel would be attached to a rope in the duct bank, and the rope linked to the pulling rig, which would pull the rope and the attached cable through the duct banks. A lubricant would be applied as the cable enters the ducts to decrease friction and facilitate travel through the polyvinyl chloride (PVC) conduits. The electrical cables would typically be pulled through the individual conduits in the duct bank at a rate of two to three segments between vaults per day.

After cable pulling is completed, the electrical cables would be spliced together. A splice crew would conduct splicing operations at each vault location and continue until all splicing is completed.

The fiber optic cable would be installed throughout the length of the underground conduit and structures through an innerduct, which provides protection and identification for the cable. First, the innerduct would be pulled in the conduit from structure to structure using a pull rope and pulling machine or truck-mounted hydraulic capstan. Then the fiber optic cable would be pulled inside the innerduct using the same procedure.

Guard Structures

Guard structures are temporary facilities that would typically be installed at transportation, flood control, and utility crossings for wire stringing/removal activities. These structures are designed to stop the movement of a conductor should it momentarily drop below a conventional stringing height. SCE estimates that 35 guard structures may need to be constructed along the proposed route.

Typical guard structures are standard wood poles. Depending on the overall spacing of the conductors being installed, approximately two to four guard poles would be required on either side of a crossing. In some cases, the wood poles could be substituted with the use of specifically equipped boom trucks or, at highway crossings, temporary netting could be installed if required. The guard structures would be removed after the conductor is secured into place.

For road crossings, SCE would work closely with the applicable agency to secure the necessary permits to string conductor over the applicable infrastructure.

3.7.3 Transmission Line Construction (Below Ground)

The following sections describe the below-ground construction activities associated with installing the subtransmission, distribution, and telecommunications line segments for the Proposed Project.

3.7.3.1 Trenching

Subtransmission Survey

Construction activities would begin with the survey of existing underground utilities along the proposed underground subtransmission source line route. SCE would notify all applicable utilities via Underground Service Alert to locate and mark existing utilities and conduct exploratory excavations (potholing), as necessary, to verify the location of existing utilities. SCE would secure encroachment permits for trenching in public streets, as required.

Subtransmission Trenching

The Proposed Project includes a total of approximately 5.5 miles of new underground 66 kV subtransmission lines and associated transition and support structures. A trench measuring approximately 24 inches wide and 60 inches deep would be required to place the 66 kV subtransmission line underground. This depth is required to meet the minimum 36 inches of cover above the duct bank. Trenching may be performed by using the following general steps, including but not limited to: mark the location and applicable underground utilities, lay out trench line, saw cut asphalt or concrete pavement as necessary, dig to appropriate depth with a backhoe or similar equipment, and install the new duct bank. Once the duct bank has been installed, the trench would typically be backfilled with a sand slurry mix. Excavated materials would be reused as fill for the Proposed Project and/or be disposed of at an off-site disposal facility in accordance with applicable laws if necessary. A list of likely off-site disposal facilities within a 20-miles of the Proposed Project is included in Table 3-10: Off-Site Disposal Facilities. Should groundwater be encountered, it would be pumped into a tank and disposed of at an off-site disposal facility in accordance with applicable laws.

Table 3-10: Off-Site Disposal Facilities

Disposal Facility	City	Approximate Distance from the Proposed Project (Miles)
Savage Canyon Landfill	City of Whittier	7
Azusa Land Reclamation	City of Azusa	12
Scholl Canyon Landfill	City of Los Angeles	20

The trench for underground construction would be widened and/or shored where appropriate to meet California's Division of Occupational Safety and Health requirements. Trenching would be staged so that open trench lengths would not exceed that which is required to install the duct banks. Where needed, open trench sections would have steel plates placed over them in order to maintain vehicular and pedestrian traffic. Provisions for emergency vehicle access would be arranged with local agencies in advance of construction activities.

Subtransmission Vault Installation

Installation of each vault would typically take place over a one-week period depending on soil conditions. First, the vault pit would be excavated and shored; a minimum of 6 inches of mechanically compacted aggregate base would be placed to cover the entire bottom of the pit, followed by delivery and installation of the vault. Once the vault is set, grade rings and the vault casting would be added and set to match the existing grade. The excavated area would be backfilled with a sand slurry mix to a point just below the top of the vault roof. Excavated materials, if suitable, would be used to backfill the remainder of the excavation and any excess spoils would be disposed of at an off-site disposal facility in accordance with all applicable laws. Finally, the excavated area would be restored as required.

Fiber Optic Installation

New underground conduit and structures would typically be installed with a backhoe. The trench would be excavated to approximately 24 inches wide and a minimum of 36 inches deep. PVC conduit would be placed in the trench and covered with approximately 30 inches of concrete slurry then backfilled and compacted. For manholes and pull boxes, a hole would be excavated between 6 and 9 feet deep, 7 and 8 feet long, and 6 and 7 feet wide. The manhole or pull box would be lowered into place, connected to the conduits, and the hole backfilled with concrete slurry.

3.7.3.2 Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling

Unless alternate methods are required to cross existing facilities or sensitive resources, duct banks would be installed using open-cut trenching techniques. In the event that trenchless techniques are required, SCE would utilize one of the methods described in the following subsections.

Microtunnel Method

The microtunnel method would not be utilized for the Proposed Project.

Jack-and-Bore

SCE would use the horizontal jack-and-bore construction technique to install the conduit at locations along the underground route where open-cut trenching may not be permitted or may not be otherwise feasible or preferred, such as at railroad and trolley tracks, roads, and drainage channel crossings.

Horizontal boring (jack-and-bore) is an augering operation that simultaneously pushes a casing under an obstacle and removes the spoil inside the casing with a rotating auger. Boring operations would begin with excavating bore pits at the sending and receiving ends of the bore. Boring and receiving pits would typically measure approximately 20 feet by 40 feet. The depth of the proposed bore pits would be between 10 and 20 feet, depending on the facilities that would be crossed. It is anticipated that between 590 and 1,180 CY of material would be excavated to facilitate each jack-and-bore installation required for the Proposed Project. Following the duct bank installation, the bore pits would be backfilled using native material, and the duct bank would be covered with at least 36 inches of engineered or native fill, as appropriate. Soil not used for backfill would be hauled off site and disposed of at an approved facility.

After establishing the bore pits, boring equipment would be delivered to the site and then installed into the bore pit at the sending end. Jack-and-bore crossings involve pushing or boring a 36- to 42-inch steel casing through the earth and under the obstacle being crossed. Depending on soil conditions, water is often used to lubricate the auger during the boring process. The casings would typically be installed at least 3 to 4 feet below the obstacle, or as required by the relevant permitting agency. Once the casing is in place, the conduit would be installed within the casing by using spacers to hold them in place, and then the remaining space would be backfilled with a slurry mix. The casings would be left in place to protect the conduit once it has been installed. An approximately 150-foot by 150-foot temporary construction area would be required at each bore pit location. SCE would secure the necessary permits to conduct these specialized construction activities and would implement standard BMPs, including silt fencing and straw wattles, in accordance with the Proposed Project's SWPPP.

Horizontal Directional Drilling

Horizontal directional drilling (HDD) technology is an underground boring technique that uses hydraulically powered, horizontal drilling equipment. It involves drilling along a vertical arc that passes beneath the intended feature. HDD technology utilizes lubrication containing water and bentonite clay (referred to as drilling mud) to aid the drilling, coat the walls of the bore hole, and maintain the open hole. The HDD technology uses a hydraulically powered horizontal drilling rig supported by a drilling mud tank and a power unit for the hydraulic pumps and mud pumps. A variable-angle drilling unit would initially be adjusted to the proper design angle for the particular drill. A 6- to 8-inch-diameter drill would typically be used.

The first step would be to drill a fluid-filled pilot bore. The first and smallest of the cutting heads would begin the pilot hole at the surveyed entry point. The first section of the drill stem has an articulating joint near the drill-cutting head that the HDD operator can control. Successive drill stem sections would be added as the drill head bores under the crossing. The drill head would then be articulated slightly by the operator to follow a designed path under the crossing and climb upward toward the exit point. Once the pilot hole is completed, a succession of larger cutting heads and reamers would be pulled and pushed through the bore hole until it is the appropriate size for the steel casing. Once the steel casing is in place, ducts would be installed within the steel casing using spacers to maintain the needed separation, and then the remaining space would be backfilled with a slurry mix.

During the HDD process, the underground cable to be pulled through the crossing would be strung on cable supports down the ROW or within temporary extra workspace areas.

As part of the drilling design process, geotechnical surveys of subsurface conditions would be conducted to determine the underlying geologic strata along the bore path. Infrequently, the geologic strata above the bore may be weaker than anticipated and/or unconsolidated. As the HDD passes under these locations, the high pressure of the drilling mud may result in a fracture of these strata, allowing drilling mud to rise to the surface. This situation is termed a "frac-out" and is usually resolved by reducing the mud system pressure or increasing the mud viscosity. If a frac-out occurs, the boring operation would be stopped immediately, and a frac-out contingency plan would be implemented to contain and remove the drilling mud.

3.7.4 Substation Construction

The following subsections describe the construction activities associated with installing the components of Mesa Substation for the Proposed Project.

3.7.4.1 Site Preparation and Grading

The substation site would be prepared by clearing existing vegetation within the boundaries of the Mesa Substation site. Once vegetation clearance is completed, the site would be graded in accordance with approved grading plans and a temporary chain-link fence would be installed around the substation perimeter. Table 3-6: Substation Cut and Fill Grading Summary provides a summary of the cut and fill grading at the substation site.

3.7.4.2 Ground Surface Improvements

The surface of the substation would be overlain with gravel, and the access driveways would be paved. Table 3-11: Substation Ground Surface Improvement Materials provides a summary of the ground surface improvements at the substation site.

Table 3-11: Substation Ground Surface Improvement Materials

Element	Material	Approximate Surface Area (Acres)	Approximate Volume (CY)
Access Road Surface Area	Asphalt and/or concrete	19	15,000
Gravel Surfacing	Gravel	52	30,000

3.7.4.3 Below-Grade Construction

After the substation site is graded, below-grade facilities would be constructed. Below-grade facilities include, for example, a ground grid, cable trenches, equipment foundations, substation perimeter foundations, conduits, duct banks, vaults, and basements.

3.7.4.4 Above-Grade Construction

Above-grade installation of substation facilities such as buses, capacitor banks, switchracks, disconnect switches, circuit breakers, transformers, steel support structures, perimeter wall, gates, guard shack, the MEERs, and the Operation Building, Test and Maintenance Building, and other facilities would commence after the below-grade structures are in place.

The transformers would be delivered by heavy-transport vehicles and installed on the transformer foundation. If necessary, traffic control would be implemented, as described in Section 3.9.3, Traffic Control.

3.7.4.5 Distribution Getaway Construction

Following cable trenching and vault and duct bank installation, SCE would conduct the following activities:

- Pull the electrical distribution-rated cables through the cable trench, vault, and duct banks
- Make pothead terminations at the switchrack
- Splice the cable segments at each vault
- Use a pothead termination at any transition structures where the distribution lines would transition from underground to overhead

Distribution cable would be pulled through the cable trench, duct banks, and vaults with a cable reel (which would be placed at one end of the conduit segment) and a pulling rig (which would be placed at the opposite end). A rope or wrench line would be pulled using a fiber rope. The cable from the cable reel would be attached to a rope in the duct bank and the rope linked to the pulling rig, which would pull the rope and the attached cable through the duct banks. To decrease friction and facilitate travel through the PVC conduits, a lubricant would be applied as the cable enters the ducts. The electrical cables for the distribution line would typically be pulled through the individual conduits in the duct bank at a rate of two to three segments between vaults per day. After cable pulling is completed, the electrical cables would be spliced together. A splicing crew would conduct splicing operations at each vault location and continue until all splicing is completed.

3.7.4.6 Telecommunications Equipment Installation

Telecommunications lines within the proposed Mesa Substation would be installed both overhead and underground. Overhead fiber optic cable would be installed on overhead structures, as described in Section 3.5.2.3, Telecommunications Poles/Towers. A truck with a cable reel would be set up at one end of the section to be pulled, and a truck with a winch would be set up at the other end. Cable would be pulled into the pole and permanently secured. Fiber strands in the cable from one reel would be spliced to fiber strands in the cable from the next reel to form one continuous path.

As described in Section 3.5.3.2, Below-Ground Installation, new underground conduit and structures would typically be installed with a backhoe. The trench would be excavated to a width of approximately 24 inches and a minimum depth of 36 inches. PVC conduit would be placed in the trench and covered with approximately 30 inches of concrete slurry, then backfilled and compacted. For manholes and pull boxes, a hole is excavated between 6 and 9 feet deep, 7 and 8 feet long, and 6 and 7 feet wide. The manhole or pull box would be lowered into place, connected to the conduits, and the void would be backfilled with concrete slurry.

3.7.4.7 Landscaping

Where appropriate, prior to commencement of the substation construction, SCE would develop a landscaping plan and would consult with the local jurisdiction regarding landscaping.

3.7.4.8 Substation Land Disturbance Table

Table 3-12: Substation Estimated Land Disturbance provides a summary of the land disturbance estimates associated with the construction of the proposed Mesa Substation. The estimates in the table include any transmission and telecommunications structures within the substation property.

Table 3-12: Substation Estimated Land Disturbance

Proposed Project Feature	Quantity	Approximate Area Disturbed During Construction (Acres)	Approximate Area to be Restored (Acres)	Approximate Area Permanently Disturbed (Acres)
Substation Site	1	69.4	0	69.4

3.7.4.9 Modifications at Other Facilities

As described in Section 3.5.4.23, Modifications to Existing Substations, minor internal modifications would be necessary at several existing SCE substations, as described further in Attachment 3-B: Modifications at Existing Substations.

Modifications at Goodrich Substation may require a temporary loop-in of the Eagle Rock-Mesa 220 kV Transmission Line, which would include installation of a 110- to 145-foot-tall temporary structure and conductor to loop the Eagle Rock-Mesa 220 kV Transmission Line into an existing Goodrich Substation rack position. The work area for the structure would be approximately 220 feet by 220 feet, and a temporary staging yard would be established for material and equipment storage, as detailed in Table 3-7: Potential Staging Yard Locations.

3.7.4.10 Land Disturbance Summary

Land disturbance would include all areas affected by construction of the Proposed Project. It is estimated that the total permanent land disturbance for the Proposed Project would be approximately 77.7 acres. It is estimated that the Proposed Project would temporarily disturb approximately 147.4 acres. The estimated amount of land disturbance for each Proposed Project component is summarized in Table 3-13: Proposed Project Estimated Land Disturbance.

Table 3-13: Proposed Project Estimated Land Disturbance

Proposed Project Feature	Quantity	Approximate Work Area (L x W) (Feet)	Approximate Area Disturbed During Construction (Acres)	Approximate Area to be Restored (Acres)	Approximate Area Permanently Disturbed (Acres)
Mesa Substation					
Internal Grading of Substation Site	1	Irregular	69.4	0.0	69.4
External Grading of the Substation Site (Excluding Access Roads)	1	Irregular	13.9	12.9	1.0
Total Estimated for Substation			**83.3**	**12.9**	**70.4**
Transmission Project Features					
500 kV LST	2	220 x 220	5.4	4.8	0.6
220 kV LST	18				
Guard Structures	21	150 x 50	0.7	0.7	0.0
Conductor Stringing (Pull and Tension)	9	600 x 150	10.0	10.0	0.0
Conductor Splicing	5	200 x 150	1.6	1.6	0.0
Total Estimated for Transmission			**17.7**	**17.1**	**0.6**
Subtransmission Project Features					
66 kV TSPs	19	220 x 150	7.0	7.0	0.0
Guard Structures	14	75 x 50	0.5	0.5	0.0
Conductor Pull and Tension Sites	12	300 x 100	1.9	1.9	0.0

Proposed Project Feature	Quantity	Approximate Work Area (L x W) (Feet)	Approximate Area Disturbed During Construction (Acres)	Approximate Area to be Restored (Acres)	Approximate Area Permanently Disturbed (Acres)
Vaults (Unpaved Areas)	10	100 x 100	<0.1	0.0	<0.1
Vaults (Paved Areas)	5	30 x 20	<0.1	0.0	<0.1
Duct Banks (Unpaved Areas)	9	13,000 x 30	4.2	4.2	0.0
Duct Banks (Paved Areas)		5,000 x 3	0.3	0.3	0.0
Total Estimated for Subtransmission			**13.9**	**13.9**	**<0.1**
Telecommunications Project Features					
Wood Poles	46	125 x 50	6.6	6.6	0.0
Vaults (Manholes)	5	5 x 5	<0.1	0.0	<0.1
Duct Banks	6	1,600 x 2	0.1	0.1	0.0
Pull and Tension Sites	19	100 x 20	0.7	0.7	0.0
Total Estimated for Telecommunications			**7.5**	**7.5**	**<0.1**
Distribution					
Vaults	4	100 x 100	0.5	0.5	<0.1
Duct Banks	5	1,200 x 2	<0.1	<0.1	0.0
Total Estimated for Distribution			**0.5**	**0.5**	**<0.1**
Staging Areas					
Staging Area	4	N/A	11.3	11.3	0.0
Total Estimated for Staging Areas			**11.3**	**11.3**	**0.0**

Proposed Project Feature	Quantity	Approximate Work Area (L x W) (Feet)	Approximate Area Disturbed During Construction (Acres)	Approximate Area to be Restored (Acres)	Approximate Area Permanently Disturbed (Acres)
Access Roads and/or Spur Roads					
New Access Roads	N/A	N/A	26.2	19.6	6.6
Existing Access Roads to be Improved					
Total Estimated for Access Roads and/or Spur Roads			**26.2**	**19.6**	**6.6**
General Disturbance					
Total Additional Estimated General Disturbance			64.7	64.7	0.0
Total Estimated for Proposed Project			**225.1**	**147.4**	**77.7**

Notes:

1. "N/A" = Not Applicable
2. Disturbance calculations presented for the transmission, subtransmission, distribution, and telecommunications structures only account for areas outside of the 69.4-acre Mesa Substation site. All disturbance within the Mesa Substation site has been attributed to this Proposed Project component. Due to the proximity of the Proposed Project components, overlapping portions of the work areas have been removed in the Approximate Area Disturbed During Construction column.
3. This table includes the removal of existing conductor, the teardown of existing structures, and the removal of foundations to 2 feet below ground surface.
4. This table includes structure assembly and erection, and conductor and OPGW installation. The area would be restored after construction. A portion of the ROW within 20 feet of all structures would remain cleared of vegetation. Permanently disturbed areas would measure approximately 0.25 acre for LSTs, and 0.06 acre for TSPs.
5. This table is based on the approximate length of roads in miles, with a drivable road width of 18 feet with an approximately 2-foot berm on each side.
6. This table includes improving existing roads to current standards. It also assumes that an existing improved road width of approximately 10 feet and the additional width of 4 feet, plus an approximately 2-foot berm on each side of the road, would exist.
7. The disturbed acreage calculations are estimates based upon SCE's preferred area of use for the described Proposed Project feature, the width of the existing ROW, or the width of the proposed ROW.

3.7.5 Construction Workforce and Equipment

The proposed activities, number of personnel, and equipment required for construction of the Proposed Project are summarized in Attachment 3-C: Construction Equipment and Workforce Estimates.

Construction would be performed by either SCE construction crews, contractors, or a combination of both. If SCE construction crews are used, they typically would be based at SCE's local facilities (e.g., service centers, substations, etc.) or a temporary material staging yard set up for the Proposed Project. Contractor construction personnel would be managed by SCE construction management personnel and based out of the Contractor's existing yard (if they have one in the area) or a temporary material staging yard set up for the Proposed Project. SCE anticipates a total of 150 to 200 construction personnel would be working on any given day. SCE anticipates that crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would vary depending on factors such as material availability, resource availability, and construction scheduling.

In general, construction efforts would occur in accordance with accepted construction industry standards. If feasible, SCE would comply with local ordinances for construction activities.

3.7.5.1 Equipment Description

Table 3-14: Construction Equipment Description lists the equipment SCE expects to use during construction and a brief description of the use of that equipment.

Table 3-14: Construction Equipment Description

Equipment Type	Use Description
Bucket Truck	Lift and transport workers
Survey Truck	Transport survey crew
Dozer	Grade pads and access roads
Loader	Move or load materials
Scraper	Grade pads and access roads
Grader	Grade substation site, pads, and access roads; ROW clearing; and restoration
Water Truck	Suppress dust and condition soil for compaction
Haul Truck	Transport impact/export material
Bobcat	Excavate, move, and load materials
Foundation Auger	Drilling foundation holes
Backhoe	Excavate and load materials
Dump Truck	Transport import/export material
Bobcat Skid Steer	Move materials
Forklift	Lift and move materials
Crane	Lift and place materials
Generator	Provide power to the work area
Scissor Lift	Provide access to elevated work areas
Manlift	Set steel and install equipment
Flatbed Truck	Deliver poles and hardware
Concrete Pump Truck	Deliver and pour concrete
Asphalt Paver	Pave access roads
Tractor	Hauling materials
Helicopter	Conductor installation activities

3.7.6 Construction Schedule

SCE anticipates that construction of the Proposed Project would take approximately 55 months, as shown in Table 3-15: Proposed Construction Schedule.[9] Construction would commence following CPUC approval, final engineering, procurement activities, land rights acquisition, and receipt of all applicable permits.

Table 3-15: Proposed Construction Schedule

Proposed Project Activity	Approximate Duration (Months)	Approximate Start Date
CPUC Permit to Construct	12	March 13, 2015
Final Engineering	36	September 15, 2014
Right-of-Way/Property Acquisition	11	December 15, 2014
Acquisition of Permits Required to Start Construction	12	March 13, 2015
Substation Construction	55	April 11, 2016
Transmission Line Construction	48	April 18, 2016
Subtransmission Line Construction	36	April 18, 2016
Telecommunications Construction	48	April 18, 2016
Distribution Construction	36	April 18, 2016
Cleanup	4	August 1, 2020
Project Operational	0	December 31, 2020

3.7.7 Energizing Transmission, Subtransmission, and Distribution Lines

Energizing the new lines is the final step in completing the transmission and subtransmission construction. The existing transmission, subtransmission, and distribution lines would be de-energized in order to connect the new line segments to the existing system. To reduce the need for electric service interruption, de-energizing and re-energizing the existing lines may occur at night when electrical demand is low.

3.8 Operation and Maintenance

Ongoing O&M activities are necessary to ensure reliable service, as well as the safety of the utility workers and the general public, as mandated by the CPUC. SCE substation and

[9] The proposed construction schedule does not account for unforeseen Proposed Project delays, including but not limited to those due to inclement weather and/or stoppage necessary to protect biological resources (e.g., nesting birds).

transmission facilities are subject to Federal Energy Regulatory Commission jurisdiction. SCE transmission facilities are under operational control of the CAISO.

SCE currently operates the existing Mesa Substation, which would be replaced by the proposed Mesa Substation. O&M activities for the substation and transmission, subtransmission, distribution, and telecommunications lines—as well as O&M at the other substations where modifications would be completed—would be conducted in the same manner as they are at the existing facilities. These O&M activities are described in the following subsections.

3.8.1 Mesa 500 kV Substation

Mesa Substation would function as a switching center manned by Transmission System operators acting under the direction of the Grid Control Center (GCC) to operate the portion of the system under Mesa Substation jurisdiction.

The Switching Center personnel are headed by the Substation Operations Supervisor (SOS) in charge of the operations at the switching center and all substations under its jurisdiction. The SOS has the responsibility for scheduling shifts and has the final decision on certain events that are beyond the boundaries of established practices, as specified in the operation system procedures.

The System Operator (SO) works under the supervision of the SOS and is in charge of the shift activities and real-time operations at the switching center and all other substations under the switching center jurisdiction. Functions of the SOS include writing and approving switching programs, responding to unscheduled outages and coordinating with the GCC, Distribution Operations Centers, and with other SOs.

The SOS works with the SO and assists in the operations of the various substations under the switching center jurisdiction. The SOS performs remote station inspections, routine and emergency switching, logging, and reporting conditions of remote substations.

Maintenance personnel are responsible for substation equipment, routine scheduled maintenance, and repairs of malfunctioning equipment. A separate group of Testmen performs testing, setting, and maintenance of protective relays and control wirings including test procedures for new or relocated equipment prior to placing equipment in service.

A utility person handles non-operation activities within the switch center and acts as a handyman in maintaining non-electrical facilities including bathroom cleanups, changing air conditioning filters, and general yard housekeeping.

3.8.2 Transmission, Subtransmission, and Distribution Lines

The transmission, subtransmission, and distribution lines would be maintained in a manner consistent with CPUC G.O. 95 and G.O. 128 as applicable, and the National Electrical Safety Code for those circuits that are located outside of California. Normal operation of the lines would be controlled remotely through SCE control systems, and manually in the field, as required. SCE inspects the transmission, subtransmission, and distribution facilities in a manner consistent with CPUC G.O. 165 a minimum of once per year via ground and/or aerial observation, but these inspections usually occur more frequently based on field conditions and system reliability. Maintenance would occur as needed and could include activities such as repairing conductors, washing or replacing insulators, repairing or replacing other hardware components, replacing poles and towers, tree trimming, brush and weed control, and access road maintenance. O&M activities of overhead facilities are performed from existing access roads and structure pads with no additional disturbance required. On rare occasions repairs to existing facilities, such as repairing or replacing damaged structures, could occur outside of existing access roads and structure pads. Existing conductors could require re-stringing to repair damages. Some pulling site locations could be in previously undisturbed areas and at times, conductors could be passed through existing vegetation on route to their destination.

Routine access road inspections are conducted on an annual basis and maintenance occurs annually and/or as-needed. Road maintenance includes maintaining a vegetation-free corridor (to facilitate access and for fire prevention) and blading to smooth over washouts, eroded areas, and washboard surfaces, as needed. Access road maintenance could include brushing (i.e., trimming or removal of shrubs) approximately 2 to 5 feet beyond berms or road's edge when necessary to keep vegetation from intruding into the roadway. Road maintenance would also include cleaning ditches, moving and establishing berms, maintaining drain inlets to culverts, culvert repair, clearing and establishing water bars, and cleaning and/or repairing over-side drains. Access road maintenance could include the installation of new storm water diversion devices on an as-needed basis.

Insulators could require periodic washing with deionized water to prevent the buildup of contaminants (dust, salts, droppings, smog, condensation, etc.) and reduce the possibility of electrical arcing which can result in circuit outages and potential fire. Frequency of insulator washing is region-specific and based on local conditions and build-up of contaminants. Replacement of insulators, hardware, and other components is performed as needed to maintain circuit reliability.

In addition, wood pole testing and treating is a necessary maintenance activity conducted to evaluate the condition of wood structures both above and below ground level. Intrusive inspections require the temporary removal of soil around the base of the pole, usually to a depth of approximately 12 to 18 inches, to check for signs of deterioration. Roads and trails are utilized for access to poles. For impact prevention, all soil removed for intrusive inspections would be reinstalled and compacted at completion of the testing.

Regular tree pruning must be performed to be in compliance with existing State and federal laws, rules, and regulations and is crucial for maintaining reliable service, especially during severe weather or disasters. Tree pruning standards for distances from overhead lines have been set by the CPUC (G.O. 95, Rule 35), California Public Resource Code 4293, California Code of Regulations Title 14, Article 4, and other government and regulatory agencies. SCE's standard approach to tree pruning is to remove at least the minimum required by law plus one year's growth (species dependent).

In addition to maintaining vegetation-free access roads, clearances around electrical lines, clearance of brush and weeds around poles and/or transmission tower pads, and as may be required by applicable regulations on existing SCE ROWs, is necessary for fire protection. A 10-

foot radial clearance around non-exempt poles (as defined by California Code of Regulations Title 14, Article 4) and a 25- to 50-foot radial clearance around non-exempt towers (as defined by California Code of Regulations Title 14, Article 4) are maintained in accordance with California Public Resource Code 4292.

In addition to regular O&M activities, SCE conducts a wide variety of emergency repairs in response to emergency situations, such as damage resulting from high winds, storms, fires, and other natural disasters, and accidents. Such repairs could include replacement of downed poles, transmission towers, or lines or re-stringing conductors. Emergency repairs could be needed at any time.

3.8.3 Telecommunications Lines

The telecommunications equipment would be subject to maintenance and repair activities on an as-needed or emergency basis. Activities would include replacing defective circuit boards and damaged radio antennas or feedlines, and testing the equipment. Telecommunications equipment would also be subject to routine inspection and preventative maintenance, such as filter change-outs or software and hardware upgrades. Most regular O&M activities of telecommunications equipment are performed at substation or communication sites and inside the equipment rooms and are accessed from existing access roads with no surface disturbance; helicopter transportation may be required to access remote Communications Sites for routine or emergency maintenance activities. Access road maintenance is performed as mentioned in Section 3.8.2, Transmission, Subtransmission, and Distribution Lines.

The telecommunications cables would be maintained on an as-needed or emergency basis. Maintenance activities would include patrolling, testing, repairing, and replacing damaged cable and hardware. Most regular maintenance activities of overhead facilities are performed from existing access roads with no surface disturbance. Repairs done to existing facilities, such as repairing or replacing existing cables and re-stringing cables, could occur in undisturbed areas. Access and habitat restoration, as mentioned in Section 3.8.2, Transmission, Subtransmission, and Distribution Lines, may be required for routine or emergency maintenance activities.

3.9 Applicant-Proposed Measures

As part of the Proposed Project, SCE has identified applicant-proposed measures (APMs) that it plans to implement during construction and/or operation of the Proposed Project to reduce or avoid impacts. SCE would conduct the design, construction, and O&M of the Proposed Project in accordance with its APMs. The proposed APMs are listed in Table 3-16: Applicant-Proposed Measures.

Table 3-16: Applicant-Proposed Measures

Applicant-Proposed Measure	Description
APM-AIR-01	**Fugitive Dust.** During construction, surfaces disturbed by construction activities would be covered or treated with a dust suppressant until completion of activities at each site of disturbance. On-site unpaved roads and off-site unpaved access roads utilized during construction within the Proposed Project area would be effectively stabilized to control dust emissions (e.g., using water or chemical stabilizer/suppressant). On-road vehicle speeds on unpaved roadways would be restricted to 15 mph.
APM-AIR-02	**Tier 3 Engines.** Off-road diesel construction equipment with a rating between 100 and 750 horsepower would be required to use engines compliant with U.S. Environmental Protection Agency Tier 3 non-road engine standards. In the event that a Tier 3 engine is not available, the equipment would be equipped with a Tier 2 engine and documentation would be provided from a local rental company stating that the rental company does not currently have the required diesel-fueled off-road construction equipment, or that the vehicle is specialized and is not available to rent. Similarly, if a Tier 2 engine is not available, that equipment would be equipped with a Tier 1 engine and documentation of unavailability would be provided.
APM-BIO-01	**Special-Status Plant Species.** During the appropriate phenological periods, formal pre-construction surveys for rare plants would be conducted in areas where special-status plants have the potential to occur within the construction areas. Prior to construction, the locations of any special-status plants identified during the surveys would be marked or flagged for avoidance. This boundary would be maintained during work at these locations and would be avoided during all construction activities to the extent possible. Impacts to Nevin's barberry would be avoided. Where disturbance to these areas cannot be avoided, SCE would develop and implement a Revegetation Plan. The Revegetation Plan would include measures for transplanting or replacing special-status plant species that may be impacted by construction of the Proposed Project. This plan would also include general measures in the event that special-status plant species are encountered prior to construction of the Proposed Project, as well as post-construction invasive weed management measures, where necessary, to ensure successful revegetation back to pre-construction conditions or to equivalent conditions of representative habitat immediately adjacent to the affected area.

Applicant-Proposed Measure	Description
APM-BIO-02	**Revegetation Plan.** To the extent feasible, SCE would minimize impacts and permanent loss to riparian habitat, native trees, and other vegetation that is regulated by federal, State, or local agencies, and/or that provides suitable habitat for special-status species. Impacts would be minimized at construction sites by flagging native vegetation to be avoided. If unable to avoid impacts to protected vegetation, a Revegetation Plan would be prepared in coordination with the appropriate agencies for areas of native habitat temporarily and/or permanently impacted during construction. The Revegetation Plan would describe, at a minimum, which vegetation restoration method (e.g., natural revegetation, planting, or reseeding with native seed stock in compliance with the Proposed Project's SWPPP) would be implemented in the Proposed Project area. The Revegetation Plan would also include the species or habitats that could be impacted, the replacement or restoration ratios (as appropriate), the restoration methods and techniques, and the monitoring periods and success criteria, as identified in each measure.
APM-BIO-03	**Biological Monitoring.** To the extent feasible, biological monitors would monitor construction activities in areas with special-status species, native vegetation, wildlife habitat, or unique resources to ensure such resources are avoided.
APM-BIO-04	**Coastal California Gnatcatcher Protection.** A U.S. Fish and Wildlife Service- (USFWS-) approved biologist would conduct pre-construction surveys for coastal California gnatcatcher (*Polioptila californica californica*) no more than seven days prior to the start of ground-disturbing activities, if this work would commence between February 1 and August 30. Surveys for coastal California gnatcatchers would be conducted in suitable nesting habitat within 500 feet of the Proposed Project area. If a breeding territory or nest is confirmed, the USFWS would be notified, and in coordination with the USFWS an exclusion buffer would be established around the nest. Construction activities in occupied gnatcatcher habitat would be monitored by a full-time USFWS-approved biologist. Unless otherwise authorized by the USFWS, no Proposed Project activities would occur within the established buffer until it is determined by the biologist that the young have left the nest. Temporary and permanent impacts to coastal California gnatcatchers and their habitat would be mitigated as required by the USFWS.

Applicant-Proposed Measure	Description
APM-BIO-05	**APM-BIO-05: Least Bell’s Vireo Protection.** SCE would avoid ground-disturbing activities within suitable habitat for least Bell’s vireo (*Vireo bellii pusillus*) during the nesting season to the extent possible. In the event that activities within least Bell’s vireo nesting habitat are unavoidable, a USFWS-approved biologist would conduct pre-construction surveys for least Bell’s vireo no more than seven days prior to the start of ground-disturbing activities, if this work would commence between March 15 and September 30. Surveys for least Bell’s vireo would be conducted in suitable nesting habitat within approximately 500 feet of the Proposed Project area. If a breeding territory or nest is confirmed, the USFWS and California Department of Fish and Wildlife (CDFW) would be notified, and—in coordination with the USFWS and CDFW—an exclusion buffer would be established around the nest. Construction activities in occupied least Bell’s vireo habitat would be monitored by a full-time USFWS- and CDFW-approved biologist. Unless otherwise authorized by the USFWS and CDFW, no Proposed Project activities would occur within the established buffer until it is determined by the biologist that the young have left the nest. Temporary and permanent impacts to least Bell’s vireo, and their habitat would be mitigated as required by the USFWS and CDFW.
APM-BIO-06	**Nesting Birds.** SCE would conduct pre-construction clearance surveys no more than seven days prior to construction to determine the location of nesting birds and territories, during the nesting bird season (typically February 1 to August 31, or earlier for species such as raptors). An avian biologist would establish a buffer area around active nest(s) and would monitor the effects of construction activities to prevent failure of the active nest. The buffer would be established based on construction activities, potential noise disturbance levels, and behavior of the species. Monitoring of construction activities that have the potential to affect active nest(s) would continue until the adjacent construction activities are completed or until the nest is no longer active.
APM-BIO-07	**Avian Protection.** Electrical facilities would be designed in accordance with APLIC’s *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006).
APM-BIO-08	**Compensation for Permanent Impacts.** Permanent impacts to all jurisdictional water resources would be compensated at a 1-to-1 ratio, or as required by the USACE, CDFW, and Regional Water Quality Control Board.

Applicant-Proposed Measure	Description
APM-CUL-01	**Paleontological Resources Management Plan.** A Paleontological Resources Management Plan would be developed for construction within areas that have been identified as having a moderate and high sensitivity for paleontological resources. The Paleontological Resources Management Plan would be prepared by a professional paleontologist in accordance with the recommendations of the Society of Vertebrate Paleontology.
APM-NOI-01	**Transformer Noise.** SCE would provide an engineering solution to decrease the operational noise levels of the substation transformers to 50 dBA or below, as measured at residential receptors. This may include the use of quieter transformers, a barrier wall, or another engineering solution. A feasible engineering solution will be incorporated during final engineering.

3.9.1 Environmental Surveys

SCE has conducted an initial biological, cultural, and paleontological resources evaluation and would conduct further focused environmental surveys after Proposed Project approval, but prior to the start of construction. These surveys would identify and/or address any potential sensitive biological, paleontological, and cultural resources that may be impacted by the Proposed Project, including the substation site; transmission, subtransmission, distribution, and telecommunications line routes; access roads; construction work areas; and staging yards. Where feasible, the information gathered from these surveys may be used to finalize Proposed Project design in order to avoid sensitive resources, or to minimize the potential impact to sensitive resources from Proposed Project-related activities. The results of these surveys would also determine the extent to which environmental specialist construction monitors would be required.

Biological resources in the vicinity of the Proposed Project are presented in detail in Section 4.4, Biological Resources.

The following biological surveys would occur prior to construction:

- Pre-construction surveys for rare plants during the appropriate phonological periods
- Pre-construction surveys for coastal California gnatcatcher (*Polioptila californica californica*) in the appropriate time period within two weeks prior to construction
- Pre-construction surveys for nesting birds in the appropriate time period within seven days prior to construction

Prior to the start of ground-disturbing activity, the following surveys would be conducted:

- Clearance Surveys – A clearance survey would be conducted no more than 30 days prior to the start of construction in a particular area to identify potential plant and animal species that may be impacted by construction activities. Clearance surveys include a field survey by a qualified botanist and wildlife biologist and would be limited to areas directly impacted by construction activities.

- Clearance surveys for nesting birds would be conducted as described in APM-BIO-06 within Section 4.4, Biological Resources.

Cultural and paleontological resources in the vicinity of the Proposed Project, as well as relevant APMs and BMPs, are presented in detail in Section 4.5, Cultural and Paleontological Resources.

3.9.2 Workers Environmental Awareness Training

Prior to construction, a Worker Environmental Awareness Program would be developed. A presentation would be prepared by SCE and used to train all site personnel prior to the commencement of work. A record of all trained personnel would be kept. In addition to instruction on compliance with any additional APMs and Proposed Project mitigation measures developed after the pre-construction surveys, all construction personnel would also receive the following:

- A list of phone numbers of SCE environmental specialist personnel associated with the Proposed Project (archaeologist, biologist, environmental coordinator, and regional spill response coordinator)

- Instruction on the SCAQMD fugitive dust rules

- A description of applicable noise construction time and/or noise level limits

- A review of applicable local, State and federal ordinances, laws and regulations pertaining to historic and paleontological preservation; a discussion of disciplinary and other actions that could be taken against persons violating historic and paleontological preservation laws and SCE policies; a review of paleontology, archaeology, history, prehistory and Native American cultures associated with historical and paleontological resources in the Proposed Project vicinity inclusive of instruction on what typical cultural and paleontological resources look like; and instruction that if discovered during construction, work is to be suspended in the vicinity of any find and the site foreman and SCE Project Archaeologist or environmental compliance coordinator are to be contacted for further direction

- Instruction on the roles of environmental monitors (cultural, paleontological and biological), if present, and the appropriate treatment by on-site personnel of areas designated as Environmentally Sensitive Areas

- Information on biological resource issues including California gnatcatcher and other special status species with a potential to occur within the Project area and instruction on consulting with the site foreman and biological monitor to determine whether or not on-going construction activities would impact the special status species.

- Instruction on the importance of maintaining the construction site inclusive of ensuring all food scraps, wrappers, food containers, cans, bottles, and other trash from the Proposed Project area would be deposited in closed trash containers. Trash containers would be removed from the Proposed Project as required and would not be permitted to overfill.

- Instruction on the individual responsibilities under the Clean Water Act, the Proposed Project SWPPP, site-specific BMPs, and the location of Material Safety Data Sheets for the Proposed Project

- Instructions to notify the foreman and regional spill response coordinator in case of a hazardous materials spill or leak from equipment, or upon the discovery of soil or groundwater contamination

- Instructions to cover all holes/trenches or install ramps at the end of each day

- A copy of the truck routes to be used for material delivery

- Instruction that non-compliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the Proposed Project
- Instruction on Ozone Precursor Control Measures
- Direction that site vehicles must be properly muffled

3.9.3 Traffic Control

Construction activities completed within public street ROWs would require the use of a traffic control service, and all lane closures would be conducted in accordance with applicable requirements. These traffic control measures would be consistent with those published in the *California Joint Utility Traffic Control Manual (CJUTCM)* (California Inter-Utility Coordinating Committee 2010).

3.10 General Interconnection Facilities Description

There are no interconnection facilities associated with the Proposed Project.

3.11 General Interconnection Facilities Construction

There are no interconnection facilities associated with the Proposed Project.

3.12 Other Major Components Description

Construction of the Proposed Project would require the relocation of an approximately 2,700 linear feet portion of the existing MWD 72-inch waterline. The MWD waterline traverses the Mesa Substation site in a north-south direction and crosses Potrero Grande Drive into fee-owned SCE ROW. SCE would coordinate with MWD in advance of construction. The line would be replaced with an approximately 3,200 linear foot long 84-inch-diameter line and relocated to the west of its existing configuration.

3.13 Other Major Components Construction

It is anticipated that relocation of the waterline would take approximately six to nine months. During that time the existing line is anticipated to remain in-service until the new line is ready to be cut in, at which time MWD would utilize alternate resources to maintain service, if needed. Relocation of the waterline within Potrero Grande Drive may result in temporary lane closures. SCE would obtain an encroachment permit from the City of Monterey Park and would implement the traffic control measures articulated by that permit. SCE would follow MWD's construction specifications.

3.14 Decommissioning

Prior to removal or abandonment of the facilities on private lands or within a reasonable time following termination, SCE would prepare a removal and restoration plan. The removal and restoration plan would address removal of SCE's facilities from the permitted area, and any requirements for habitat restoration and revegetation. The removal and restoration plan would then be approved by the permitting agency before implementation.

3.15 Project Alternatives Components Description

The proposed project was selected as the only feasible option as it was approved by CAISO, meets project objectives (including the project need date), and has fewest potential environmental impacts; therefore, no other alternatives were analyzed other than the No Project Alternative discussed in Chapter 5, Detailed Discussion of Significant Impacts.

3.16 References

APLIC. (2006). *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. Retrieved October 3, 2014, from http://www.dodpif.org/downloads/APLIC_2006_SuggestedPractices.pdf.

APLIC. (2012). *Reducing Avian Collisions with Power Lines: The State of Art in 2012*. Retrieved October 21, 2014, from http://www.aplic.org/uploads/files/11218/Reducing_Avian_Collisions_2012watermarkLR.pdf.

CAISO. (2014). *2013-2014 Transmission Plan*. Retrieved January 8, 2015 from http://www.caiso.com/Documents/Board-Approved2013-2014TransmissionPlan_July162014.pdf.

City of Pasadena. (2004). *The City of Pasadena Comprehensive General Plan*. Retrieved September 30, 2014, from http://cityofpasadena.net/Planning/CommunityPlanning/General_Plan/.

ATTACHMENT 3-A: DETAILED PROJECT COMPONENTS MAP

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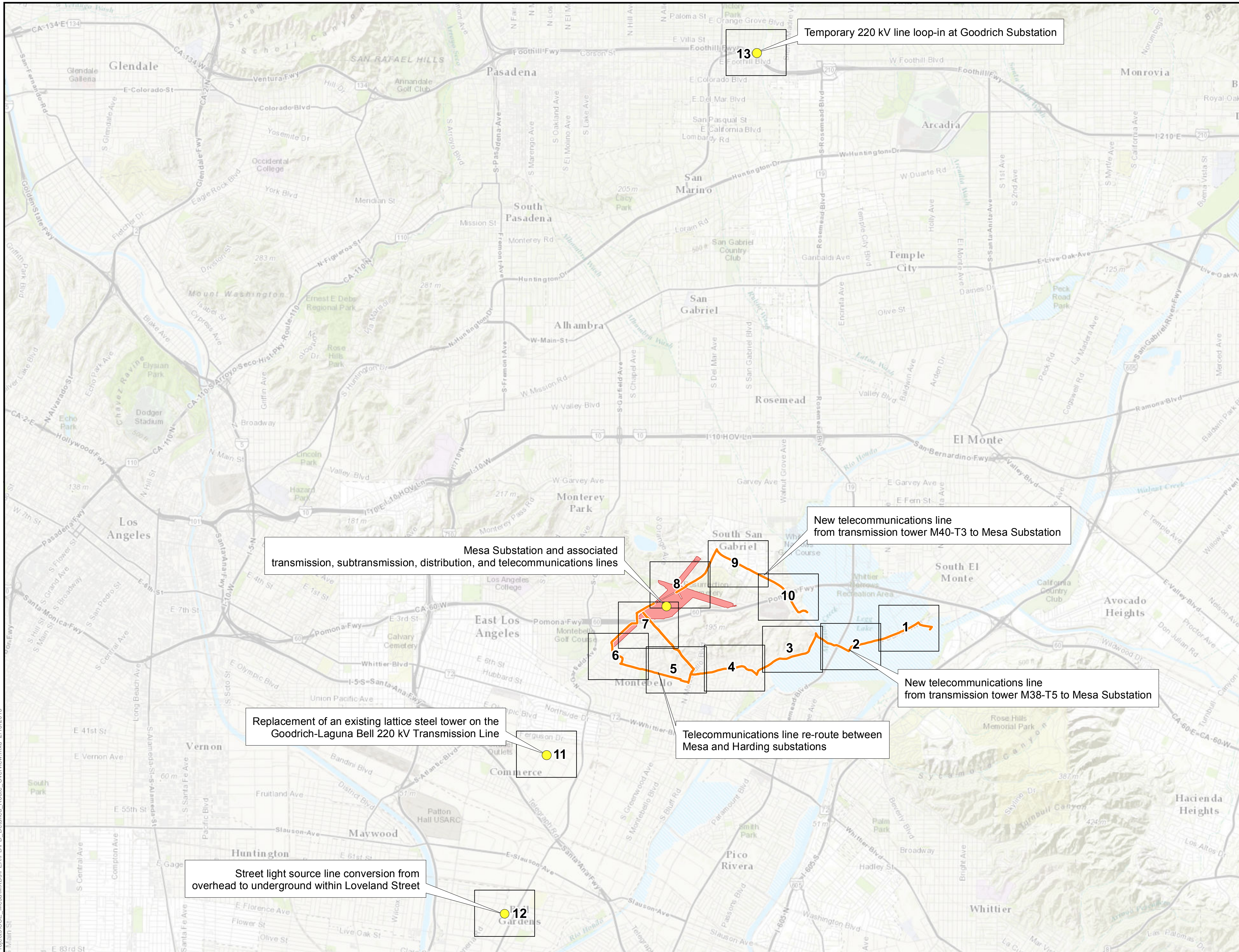
Attachment 3-A: Detailed Project Components Map Overview

Mesa 500 kV Substation Project



Map Extent

Main Component Location

Mesa Substation Study Area

Proposed Telecommunications

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Attachment 3-A: Detailed Project Components Map 1 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission
- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission
- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission
- Proposed 66 kV Vault
- Proposed 66 kV Structure
- Existing 66 kV Structure to Remain
- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications
- Proposed Vault/Manhole
- Existing Pole
- Existing Vault/Manhole
- Existing Pull Box
- Proposed Overhead (On Existing Facilities)
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution
- Proposed 16 kV Vault
- Proposed 16 kV Pole
- Existing 16 kV Pole
- Existing Street Light
- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate. Exact locations to be determined after final design is completed.

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Attachment 3-A: Detailed Project Components Map 2 of 13

Mesa 500 kV Substation Project

Mesa Substation Study Area
Proposed Substation Perimeter Wall
Staging Yard
Existing Substation
City Boundary

500 kV Transmission
Proposed 500 kV Structure
Proposed 500 kV Line

220 kV Transmission
Proposed Temporary 220 kV Structure
Proposed 220 kV Structure
Existing 220 kV Structure to Remain
Proposed 220 kV Line
Existing 220 kV Line to Remain

66 kV Subtransmission
Proposed 66 kV Vault
Proposed 66 kV Structure
Existing 66 kV Structure to Remain
Proposed Underground 66 kV Line
Proposed Overhead 66 kV Line
Existing Overhead 66 kV Line to Remain

Telecommunications
Proposed Vault/Manhole
Existing Pole
Existing Vault/Manhole
Existing Pull Box
Proposed Overhead (On Existing Facilities)
Proposed Underground
Re-Route Overhead
Re-Route Underground

16 kV Distribution
Proposed 16 kV Vault
Proposed 16 kV Pole
Existing 16 kV Pole
Existing Street Light
Existing 16 kV Vault/Manhole
Proposed 16 kV Underground Line
Re-Route 16 kV Underground Line (In Existing Facilities)
Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A: Detailed Project Components Map 3 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission
- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission
- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission
- Proposed 66 kV Vault
- Proposed 66 kV Structure
- Existing 66 kV Structure to Remain
- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications
- Proposed Vault/Manhole
- Existing Pole
- Existing Vault/Manhole
- Existing Pull Box
- Proposed Overhead (On Existing Facilities)
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution
- Proposed 16 kV Vault
- Proposed 16 kV Pole
- Existing 16 kV Pole
- Existing Street Light
- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate. Exact locations to be determined after final design is completed.

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Attachment 3-A:
Detailed Project Components
Map 4 of 13
Mesa 500 kV Substation Project

Mesa Substation Study Area
Proposed Substation Perimeter Wall
Staging Yard
Existing Substation
City Boundary

500 kV Transmission

Proposed 500 kV Structure
Proposed 500 kV Line

220 kV Transmission

Proposed Temporary 220 kV Structure
Proposed 220 kV Structure
Existing 220 kV Structure to Remain
Proposed 220 kV Line
Existing 220 kV Line to Remain

66 kV Subtransmission

Proposed 66 kV Vault
Proposed 66 kV Structure
Existing 66 kV Structure to Remain
Proposed Underground 66 kV Line
Proposed Overhead 66 kV Line
Existing Overhead 66 kV Line to Remain

Telecommunications

Proposed Vault/Manhole
Existing Pole
Existing Vault/Manhole
Existing Pull Box
Proposed Overhead (On Existing Facilities)
Proposed Underground
Re-Route Overhead
Re-Route Underground

16 kV Distribution

Proposed 16 kV Vault
Proposed 16 kV Pole
Existing 16 kV Pole
Existing Street Light
Existing 16 kV Vault/Manhole
Proposed 16 kV Underground Line
Re-Route 16 kV Underground Line (In Existing Facilities)
Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A:
Detailed Project Components
Map 5 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission
- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission
- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission
- Proposed 66 kV Vault
- Proposed 66 kV Structure
- Existing 66 kV Structure to Remain
- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications
- Proposed Vault/Manhole
- Existing Pole
- Existing Vault/Manhole
- Existing Pull Box
- Proposed Overhead (On Existing Facilities)
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution
- Proposed 16 kV Vault
- Proposed 16 kV Pole
- Existing 16 kV Pole
- Existing Street Light
- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A: Detailed Project Components Map 6 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission

- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission

- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission

- Proposed 66 kV Vault
- Proposed 66 kV Structure
- Existing 66 kV Structure to Remain
- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications

- Proposed Vault/Manhole
- Existing Pole
- Existing Vault/Manhole
- Existing Pull Box
- Proposed Overhead (On Existing Facilities)
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution

- Proposed 16 kV Vault
- Proposed 16 kV Pole
- Existing 16 kV Pole
- Existing Street Light
- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate. Exact locations to be determined after final design is completed.

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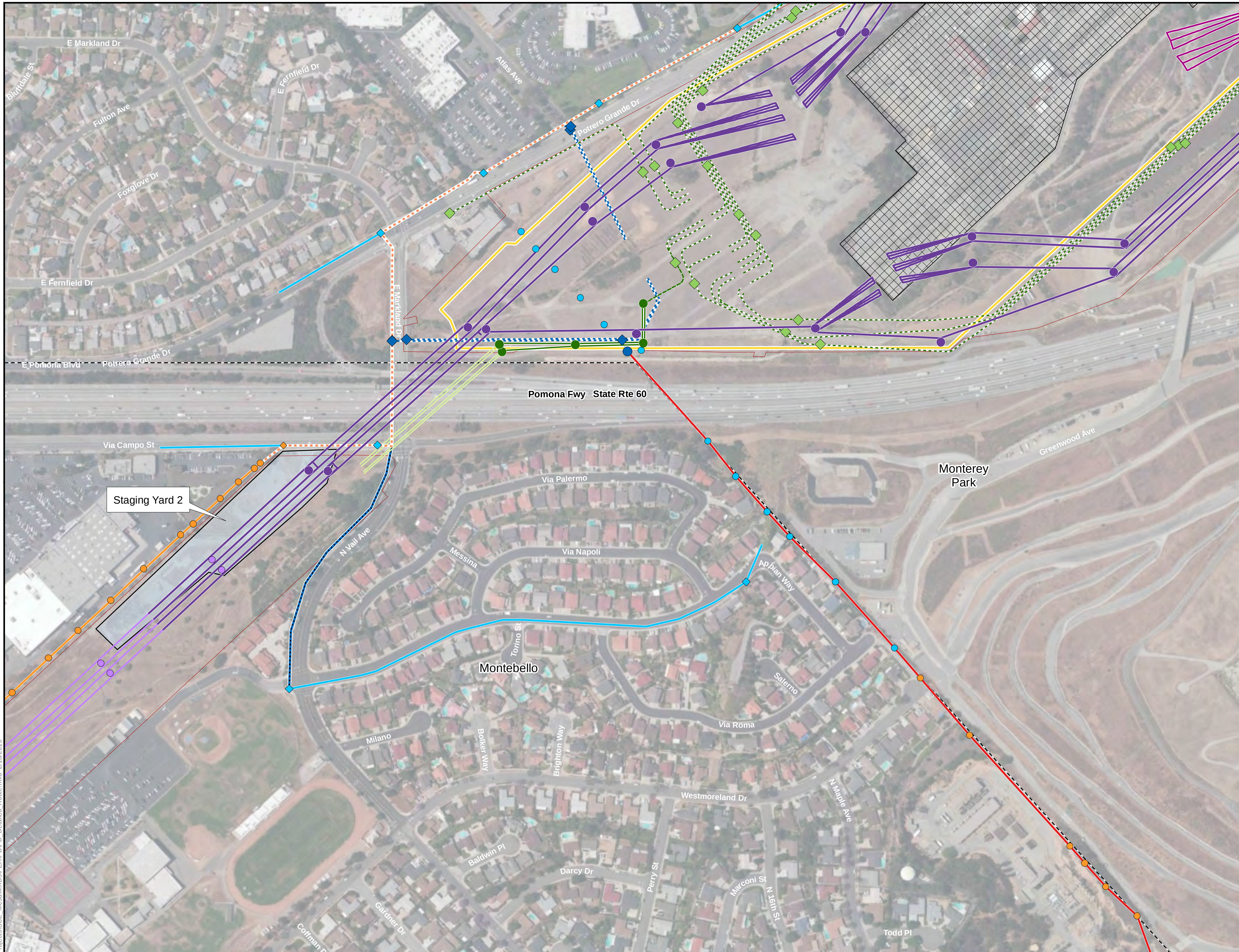

Attachment 3-A: Detailed Project Components Map 7 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission

- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission

- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission

- Proposed 66 kV Vault
- Proposed 66 kV Structure
- Existing 66 kV Structure to Remain
- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications

- Proposed Vault/Manhole
- Existing Pole
- Existing Vault/Manhole
- Existing Pull Box
- Proposed Overhead (On Existing Facilities)
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution

- Proposed 16 kV Vault
- Proposed 16 kV Pole
- Existing 16 kV Pole
- Existing Street Light
- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A: Detailed Project Components Map 8 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission

- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission

- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission

- Proposed 66 kV Vault
- Proposed 66 kV Structure
- Existing 66 kV Structure to Remain
- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications

- Proposed Vault/Manhole
- Existing Pole
- Existing Vault/Manhole
- Existing Pull Box
- Proposed Overhead (On Existing Facilities)
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution

- Proposed 16 kV Vault
- Proposed 16 kV Pole
- Existing 16 kV Pole
- Existing Street Light
- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate. Exact locations to be determined after final design is completed.

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Attachment 3-A:
Detailed Project Components
Map 9 of 13

Mesa 500 kV Substation Project

Mesa Substation Study Area
Proposed Substation Perimeter Wall
Staging Yard
Existing Substation
City Boundary

500 kV Transmission

Proposed 500 kV Structure
Proposed 500 kV Line

220 kV Transmission

Proposed Temporary 220 kV Structure
Proposed 220 kV Structure
Existing 220 kV Structure to Remain
Proposed 220 kV Line
Existing 220 kV Line to Remain

66 kV Subtransmission

Proposed 66 kV Vault
Proposed 66 kV Structure
Existing 66 kV Structure to Remain
Proposed Underground 66 kV Line
Proposed Overhead 66 kV Line
Existing Overhead 66 kV Line to Remain

Telecommunications

Proposed Vault/Manhole
Existing Pole
Existing Vault/Manhole
Existing Pull Box
Proposed Overhead (On Existing Facilities)
Proposed Underground
Re-Route Overhead
Re-Route Underground

16 kV Distribution

Proposed 16 kV Vault
Proposed 16 kV Pole
Existing 16 kV Pole
Existing Street Light
Existing 16 kV Vault/Manhole
Proposed 16 kV Underground Line
Re-Route 16 kV Underground Line
(In Existing Facilities)
Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A: Detailed Project Components Map 10 of 13

Mesa 500 kV Substation Project

Mesa Substation Study Area
Proposed Substation Perimeter Wall
Staging Yard
Existing Substation
City Boundary

500 kV Transmission
Proposed 500 kV Structure
Proposed 500 kV Line

220 kV Transmission
Proposed Temporary 220 kV Structure
Proposed 220 kV Structure
Existing 220 kV Structure to Remain
Proposed 220 kV Line
Existing 220 kV Line to Remain

66 kV Subtransmission
Proposed 66 kV Vault
Proposed 66 kV Structure
Existing 66 kV Structure to Remain
Proposed Underground 66 kV Line
Proposed Overhead 66 kV Line
Existing Overhead 66 kV Line to Remain

Telecommunications
Proposed Vault/Manhole
Existing Pole
Existing Vault/Manhole
Existing Pull Box
Proposed Overhead (On Existing Facilities)
Proposed Underground
Re-Route Overhead
Re-Route Underground

16 kV Distribution
Proposed 16 kV Vault
Proposed 16 kV Pole
Existing 16 kV Pole
Existing Street Light
Existing 16 kV Vault/Manhole
Proposed 16 kV Underground Line
Re-Route 16 kV Underground Line (In Existing Facilities)
Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A: Detailed Project Components Map 11 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission
- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission
- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission
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- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications
- Proposed Vault/Manhole
- Existing Pole
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- Existing Pull Box
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- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution
- Proposed 16 kV Vault
- Proposed 16 kV Pole
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- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A: Detailed Project Components Map 12 of 13

Mesa 500 kV Substation Project

Mesa Substation Study Area
Proposed Substation Perimeter Wall
Staging Yard
Existing Substation
City Boundary

500 kV Transmission

Proposed 500 kV Structure
Proposed 500 kV Line

220 kV Transmission

Proposed Temporary 220 kV Structure
Proposed 220 kV Structure
Existing 220 kV Structure to Remain
Proposed 220 kV Line
Existing 220 kV Line to Remain

66 kV Subtransmission

Proposed 66 kV Vault
Proposed 66 kV Structure
Existing 66 kV Structure to Remain
Proposed Underground 66 kV Line
Proposed Overhead 66 kV Line
Existing Overhead 66 kV Line to Remain

Telecommunications

Proposed Vault/Manhole
Existing Pole
Existing Vault/Manhole
Existing Pull Box
Proposed Overhead (On Existing Facilities)
Proposed Underground
Re-Route Overhead
Re-Route Underground

16 kV Distribution

Proposed 16 kV Vault
Proposed 16 kV Pole
Existing 16 kV Pole
Existing Street Light
Existing 16 kV Vault/Manhole
Proposed 16 kV Underground Line
Re-Route 16 kV Underground Line (In Existing Facilities)
Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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Attachment 3-A:
Detailed Project Components
Map 13 of 13

Mesa 500 kV Substation Project

- Mesa Substation Study Area
- Proposed Substation Perimeter Wall
- Staging Yard
- Existing Substation
- City Boundary

500 kV Transmission

- Proposed 500 kV Structure
- Proposed 500 kV Line

220 kV Transmission

- Proposed Temporary 220 kV Structure
- Proposed 220 kV Structure
- Existing 220 kV Structure to Remain
- Proposed 220 kV Line
- Existing 220 kV Line to Remain

66 kV Subtransmission

- Proposed 66 kV Vault
- Proposed 66 kV Structure
- Existing 66 kV Structure to Remain
- Proposed Underground 66 kV Line
- Proposed Overhead 66 kV Line
- Existing Overhead 66 kV Line to Remain

Telecommunications

- Proposed Vault/Manhole
- Existing Pole
- Existing Vault/Manhole
- Existing Pull Box
- Proposed Overhead (On Existing Facilities)
- Proposed Underground
- Re-Route Overhead
- Re-Route Underground

16 kV Distribution

- Proposed 16 kV Vault
- Proposed 16 kV Pole
- Existing 16 kV Pole
- Existing Street Light
- Existing 16 kV Vault/Manhole
- Proposed 16 kV Underground Line
- Re-Route 16 kV Underground Line (In Existing Facilities)
- Existing 16 kV Underground Line to Remain

Note: Location of proposed facilities are approximate.
Exact locations to be determined after final design is completed.

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ATTACHMENT 3-B: MODIFICATIONS AT EXISTING SUBSTATIONS

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ATTACHMENT 3-B: MODIFICATIONS AT EXISTING SUBSTATIONS

Substation	Scope	Location
Mira Loma	Reconfigure communication channels, update relay settings, and conduct end-to-end testing and in service testing	Ontario
Vincent	Reconfigure communication channels, update relay settings, and conduct end-to-end testing and in service testing	Palmdale
	Install new conduits within substation perimeter to provide fiber optic routes into Communications Room	
Center	Upgrade relays, reconfigure communication channels, and conduct end-to-end testing and in service testing	Norwalk
Eagle Rock	Conduct end-to-end testing and in service testing	Eagle Rock
	Alhambra-Ramona: Upgrade relays, and conduct end-to-end testing and in service testing	
	Fairfax-Wabash: Upgrade relays, and conduct end-to-end testing and in service testing	
	Garfield-Wabash: Upgrade relays, and conduct end-to-end testing and in service testing	
Goodrich	Update relay settings, reconfigure SEL-311L relay, add communication channels, and conduct end-to end testing and in service testing	Pasadena
	Install new conduits to adjacent transmission towers to provide diverse fiber optic routes into the Communications Room	
	Install a temporary structure, with an approximate height of 110 to 145 feet, to loop-in the existing Eagle Rock-Mesa 220 kilovolt (kV) line	
La Fresa	Remove wave trap, add communication channel, and conduct end-to-end testing and in service testing	Torrance

Substation	Scope	Location
Laguna Bell	Mesa No. 1 – Replace two circuit breakers, disconnects, and line risers; remove wave trap(s); reconfigure and update relay settings; add communication channels; and conduct end-to-end testing and in service testing	Commerce
	Mesa No. 2 – Replace two circuit breakers, disconnects, and line risers; remove wave trap(s); upgrade relays; reconfigure communication circuit; add communication circuit; and conduct end-to end testing and in service testing	
	Mesa-Narrows: Upgrade relays, and conduct end-to-end testing and in service testing	
	Newmark-Vail: Upgrade relays, and conduct end-to-end testing and in service testing	
Lighthipe	Replace two circuit breakers, disconnects, line risers; remove wave trap(s); add communication channel; conduct end-to-end testing and in service testing	Long Beach
Pardee	Install new conduits within the substation perimeter to provide diverse fiber optic routes into the Communications Room	Valencia
Redondo	Remove wave trap, add communication channel, and conduct end-to-end testing and in service testing	Redondo Beach
Rio Hondo	Upgrade relays and reconfigure communication circuits	Irwindale
	Amador-Jose-Mesa: Conduct in service testing	
	Mesa No. 1: Upgrade relays, and conduct end-to-end testing and in service testing	
	Mesa No. 2: Upgrade relays, and conduct end-to-end testing and in service testing	
Vincent	Test relays to Mesa Substation and conduct in service testing	Palmdale
	Mesa No. 1: Conduct end-to-end testing and in service testing	
	Mesa No. 2: Conduct end-to-end testing and in service testing	

Substation	Scope	Location
Walnut	Upgrade relays, reconfigure communication channels, conduct end-to-end testing and in service testing	Industry
	Install new conduits within the substation perimeter to provide diverse fiber optic routes into the Communications Room	
Amador	Mesa-Jose-Rio Hondo: Conduct in service testing	El Monte
Anita	Mesa-Eaton: Upgrade relays, and conduct end-to-end testing and in service testing	Arcadia
Eaton	Anita-Mesa: Upgrade relays, and conduct end-to-end testing and in service testing	Pasadena
	Ravendale: Upgrade relays, and conduct end-to-end testing and in service testing	
Fairfax	Eagle Rock-Wabash: Upgrade relays, and conduct end-to-end testing and in service testing	Los Angeles
Garfield	Bus Tie: Upgrade relays, and conduct end-to-end testing and in service testing	Pasadena
	Alhambra-Newmark-Ramona: Upgrade relays, and conduct end-to-end testing and in service testing	
	Eagle Rock-Wabash: Upgrade relays, and conduct end-to-end testing and in service testing	
Hillgen	Industry-Mesa-Reno-Walnut: Conduct in service testing	Industry
Industry	Hillgen-Mesa-Reno-Walnut: Conduct in service testing	Industry
Jose	Amador-Mesa-Rio Hondo: Conduct in service testing	Commerce
Narrows	Bus Tie: Upgrade relays, and conduct end-to-end testing and in service testing	Pico Riviera
	Mesa: Upgrade relays, and conduct end-to-end testing and in service testing	
	Mesa-Laguna Bell: Upgrade relays, and conduct end-to-end testing and in service testing	

Substation	Scope	Location
Newmark	Mesa No. 1: Upgrade relays, and conduct end-to-end testing and in service testing	Monterey Park
	Mesa No. 2: Upgrade relays, and conduct end-to-end testing and in service testing	
	Laguna Bell-Vail: Upgrade relays, and conduct end-to-end testing and in service testing	
	Repetto-Wabash: Upgrade relays, and conduct end-to-end testing and in service testing	
	Mesa-Ramona: Upgrade relays, and conduct end-to-end testing and in service testing	
	Alhambra-Garfield-Ramona: Upgrade relays, and conduct end-to-end testing and in service testing	
Ravendale	Mesa-Rush: Upgrade relays, and conduct end-to-end testing and in service testing	Temple City
	Rosemead: Upgrade relays, and conduct end-to-end testing and in service testing	
	Eaton: Upgrade relays, and conduct end-to-end testing and in service testing	
	San Gabriel: Upgrade relays, and conduct end-to-end testing and in service testing	
	Bus Tie: Upgrade relays, and conduct end-to-end testing and in service testing	
Repetto	Mesa: Upgrade relays, and conduct end-to-end testing and in service testing	Monterey Park
	Mesa-Wabash: Upgrade relays, and conduct end-to-end testing and in service testing	
	Newmark-Wabash: Upgrade relays, and conduct end-to-end testing and in service testing	
	Bus Tie: Upgrade relays, and conduct end-to-end testing and in service testing	
Rosemead	Mesa No. 1: Upgrade relays, and conduct end-to-end testing and in service testing	Rosemead
	Mesa No. 2: Upgrade relays, and conduct end-to-end testing and in service testing	
	Ravendale: Upgrade relays, and conduct end-to-end testing and in service testing	
	Bus Tie: Upgrade relays, and conduct end-to-end testing and in service testing	

Substation	Scope	Location
Rush	Mesa-Ravendale: Upgrade relays, and conduct end-to-end testing and in service testing	Rosemead
	Mesa No. 2: Upgrade relays, and conduct end-to-end testing and in service testing	
	Mesa No. 3: Upgrade relays, and conduct end-to-end testing and in service testing	
	Bus Tie: Upgrade relays, and conduct end-to-end testing and in service testing	
San Gabriel	Mesa: Upgrade relays, and conduct end-to-end testing and in service testing	San Gabriel
	Ravendale: Upgrade relays, and conduct end-to-end testing and in service testing	
Vail	Laguna Bell-Newmark: Upgrade relays, and conduct end-to-end testing and in service testing	Commerce
Wabash	Mesa-Repetto: Upgrade relays, and conduct end-to-end testing and in service testing	East Los Angeles
	Newmark-Repetto: Upgrade relays, and conduct end-to-end testing and in service testing	
	Bus Tie (Eagle Rock-Fairfax): Upgrade relays, and conduct end-to-end testing and in service testing	
	Eagle Rock-Garfield: Upgrade relays, and conduct end-to-end testing and in service testing	

ATTACHMENT 3-C: CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES

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ATTACHMENT 3-C: CONSTRUCTION EQUIPMENT AND WORKFORCE ESTIMATES

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Substation Construction					
Survey	2	250	Survey Truck	1	10
Grading Phase 1	14	185	Dozer	2	10
			Loader	2	10
			Scraper	4	10
			Grader	2	10
			Water Truck	4	10
			Tool Truck	1	10
			4x4 Pickup	3	10
			Haul Truck	20	10
Fencing Phase 1 Block Wall	16	60	Bobcat	1	10
			Forklift	1	10
			4x4 Backhoe	1	10
			Concrete Pump Truck	1	6
			Flatbed Truck	1	2
			Crewcab Truck	1	2

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Civil Phase 1	60	140	Excavator	3	10
			Foundation Auger	3	10
			Backhoe	6	10
			Dump Truck	3	6
			Skip Loader	3	10
			Water Truck	3	10
			Bobcat Skid Steer	4	10
			Forklift	4	6
			17-Ton Crane	2	5
			Concrete Pump Truck	1	5
			Tool Truck	4	3
Mechanical and Electric Equipment Room (MEER) Phase 1	50	120	Carry-All Truck	2	3
			Tool Truck	5	2
			Stake Truck	1	5
			20-Ton Crane	11	5
			Concrete Pump Truck	11	5
			Forklift	33	5
			Backhoe	22	10
			Loader	11	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
MEER Phase 1 (cont.)	50	120	Bobcat Skid Steer	22	10
			400 Kilowatt (kW) Generator	21	10
Electrical Phase 1	50	260	Scissor Lift	4	5
			Manlift	4	5
			Reach Manlift	3	5
			15-Ton Crane	2	5
			20-Ton Crane	1	10
			50-Ton Crane	1	8
			100-Ton Crane	1	8
			Flatbed Truck	1	5
			Tool Trailer	2	3
			Forklift	3	6
			Crew Truck	3	2
Wiring Phase 1	50	90	Manlift	3	5
			Tool Trailer	2	3
			Forklift	3	3
Maintenance Crew Equipment Check Phase 1	5	65	Maintenance Truck	2	5

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Testing Phase 1	9	200	Crew Truck	4	3
Asphalting Phase 1	15	30	Paving Roller	2	5
			Asphalt Paver	1	10
			Stake Truck	2	5
			Tractor	1	3
			Dump Truck	1	5
			Crew Truck	2	2
			Asphalt Curb Machine	1	3
Test and Maintenance Building Phase 1	50	150	Carry-All Truck	2	3
			Tool Truck	5	2
			Stake Truck	1	5
			20-Ton Crane	1	5
			Concrete Pump Truck	1	5
			Forklift	3	5
			Backhoe	2	10
			Loader	1	10
			Bobcat Skid Steer	2	10
			Manlift	2	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Control Building Phase 1	50	180	Carry-All Truck	2	3
			Tool Truck	5	2
			Stake Truck	1	5
			20-Ton Crane	1	5
			Concrete Pump Truck	1	5
			Forklift	3	5
			Backhoe	2	10
			Loader	1	10
			Bobcat Skid Steer	2	10
			Manlift	2	10
Electrical Demo Phase 2	20	25	Manlift	2	6
			Reach Lift	3	6
			15-Ton Crane	1	6
			50-Ton Crane	1	6
			Tool Trailer	2	5
			Forklift	2	6
			Crew Truck	3	2

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Civil Demo/Grading Phase 2	14	40	Excavator	2	10
			Backhoe	2	10
			Dump Truck	3	10
			Skip Loader	2	10
			Water Truck	5	10
			Bobcat Skid Steer	2	10
			Forklift	2	6
			Dozer	2	10
			Loader	2	10
			Scraper	2	10
			Grader	1	10
Civil Installation Phase 2	20	60	Excavator	2	10
			Foundation Auger	2	10
			Backhoe	2	10
			Dump Truck	3	10
			Skip Loader	2	10
			Water Truck	1	10
			Bobcat Skid Steer	2	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Civil Installation Phase 2 (cont.)	20	60	Forklift	2	5
			Tool Trailer	1	5
Electrical Phase 2 Including Wiring	50	80	Scissor Lift	2	10
			Manlift	3	10
			Reach Lift	3	10
			15-Ton Crane	1	6
			50-Ton Crane	1	10
			100-Ton Crane	1	10
			Tool Trailer	2	10
			Forklift	3	6
			Crew Truck	3	5
			Flatbed Truck	1	6
Maintenance Crew Equipment Check Phase 2	3	25	Maintenance Truck	2	5
Testing Phase 2	9	100	Crew Truck	4	3
Civil Demo/Grading Phase 3	75	150	Excavator	3	10
			Backhoe	4	10
			Dump Truck	4	10
			Skip Loader	3	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Civil Demo/Grading Phase 3 (cont.)	75	150	Water Truck	6	10
			Bobcat Skid Steer	4	10
			Forklift	4	10
			Dozer	3	10
			Loader	2	10
			Scraper	6	10
			Grader	2	10
			Haul Truck	30	10
Civil Installation Phase 3	75	175	Excavator	4	10
			Foundation Auger	4	10
			Backhoe	5	10
			Dump Truck	3	10
			Skip Loader	2	10
			Water Truck	4	10
			Bobcat Skid Steer	6	10
			Forklift	3	5
			Tool Trailer	2	5

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Electrical Phase 3 Including Wiring	80	240	Scissor Lift	4	10
			Manlift	4	10
			Reach Manlift	3	10
			15-Ton Crane	1	6
			20-Ton Crane	1	5
			100-Ton Crane	1	10
			Tool Trailer	3	5
			Forklift	4	7
			Crew Truck	3	7
			Flatbed Truck	1	7
			500 kW Generator	1	10
Maintenance Crew Equipment Check Phase 3	5	80	Maintenance Truck	3	5
Testing Phase 3	9	360	Crew Truck	4	3
Asphalting and Fencing Phase 3	25	90	Paving Roller	2	10
			Asphalt Paver	1	10
			Stake Truck	2	5
			Tractor	1	10
			Dump Truck	1	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Asphalting and Fencing Phase 3 (cont.)	25	90	Crew Truck	2	2
			Asphalt Curb Machine	1	10
			Concrete Pump	1	6
			Forklift	1	6
			Backhoe	1	10
Transmission Line Construction					
Survey	4	Duration of Project	1-Ton Truck	2	10
Staging Yard	4	10	1-Ton 4x4 Truck	1	4
			R/T Forklift	1	5
			Boom/Crane Truck	1	5
			Water Tanker/Truck	1	10
			Semi-Tractor Truck	1	6
Right-of-Way (ROW) Clearing	5	20	1-Ton 4x4 Truck	2	10
			Backhoe/Front Loader	2	7
			Track Type Dozer	2	7
			Road Grader	2	7
			Water Truck	2	9
			Lowboy Truck/Trailer	2	5

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Roads and Landing Work	12	35	1-Ton 4x4 Truck	2	5
			Backhoe/Front Loader	2	7
			Track Type Dozer	2	7
			Motor Grader	2	5
			Water Truck	2	10
			Drum Type Compactor	2	5
			Excavator	2	7
			Lowboy/Truck Trailer	2	4
Wet Crossing Installation	6	10	1-Ton 4x4 Truck	2	10
			Tracked Excavator	1	10
			Rubber Tire Backhoe	1	10
			Wheel Loader	1	10
			Dump Truck	1	10
			Water Truck	1	10
			Concrete Truck	1	10
			Flatbed Trailer	1	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Guard Structure Installation	6	35	3/4-Ton 4x4 Truck	1	8
			1-Ton 4x4 Truck	1	8
			Compressor Trailer	2	7
			Manlift/Bucket Truck	2	5
			Boom/Crane Truck	2	8
			Water Truck	2	10
			Auger Truck	2	8
			Extendable Flatbed Pole Truck	2	8
Shoo-Fly Pole Haul	4	7	3/4-Ton 4x4 Truck	1	10
			Water Truck	1	10
			Boom/Crane Truck	2	8
			Flatbed Pole Truck	2	10
Shoo-Fly Pole Assembly	12	4	3/4-Ton 4x4 Truck	2	10
			Compressor Trailer	1	10
			1-Ton 4x4 Truck	2	10
			Water Truck	1	10
			Boom/Crane Truck	1	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Install Shoo-Fly Pole	12	4	1-Ton 4x4 Truck	2	6
			Manlift/Bucket Truck	2	10
			Boom/Crane Truck	2	7
			Auger Truck	2	8
			Water Truck	2	10
			Backhoe/Front Loader	2	10
			Extendable Flatbed Pole Truck	2	6
Install Shoo-Fly Conductor	15	15	3/4-Ton 4x4 Truck	2	10
			1-Ton 4x4 Truck	2	10
			Manlift/Bucket Truck	2	10
			Boom/Crane Truck	2	10
			R/T Crane	2	10
			Wire Truck/Trailer	1	10
			Truck Mounted – Three Drum Fly-Line Pulling Machine (equipped with 3/8 steel pulling cable)	1	10
			Static Truck/Tensioner	1	10
			Conductor Splicing Rig	1	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
			Fiber Splicing Lab	1	10
			Spacing Cart	4	10
			Backhoe/Front Loader	2	8
			Track Type Dozer	1	8
			Sag Cat with two winches	1	10
			Lowboy Truck/Trailer	2	10
Remove Existing Conductor and Overhead Optical Ground Wire (OPGW)	28	130	1-Ton 4x4 Truck	4	10
			Manlift/Bucket Truck	4	10
			Boom/Crane Truck	2	10
			Track Type Dozer	1	5
			Sag Cat with two winches	1	5
			V-Groove or Equivalent Rewinder	1	5
			Truck Mounted – Three Drum Fly-Line Pulling Machine (equipped with 3/8-steel pulling cable)	1	5
	28	130	Hardline 30,000-Pound Puller	1	5
			Truck, Semi-Tractor	2	2

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
			Water Truck	2	6
			Lowboy Truck/Trailer	4	4
Lattice Steel Tower (LST) Removal	12	25	1-Ton 4x4 Truck	2	8
			Compressor Trailer	2	10
			Water Truck	1	10
			Dump Truck	1	6
			R/T Crane (M)	2	5
			R/T Crane (L)	2	7
			Flatbed Truck/Trailer	2	10
LST Foundation Removal	8	24	3/4-Ton 4x4 Truck	2	8
			Compressor Trailer	2	10
			Water Truck	1	10
			Backhoe/Front Loader	2	10
			Dump Truck	2	10
			Excavator	1	10
Tubular Steel Pole (TSP) Removal	12	4	3/4-Ton 4x4 Truck	2	8
			1-Ton 4x4 Truck	2	8
			Water Truck	1	10
			Compressor Trailer	2	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
			R/T Crane (L)	2	7
TSP Foundation Removal	8	5	3/4-Ton 4x4 Truck	2	8
			Compressor Trailer	2	10
			Water Truck	1	10
			Backhoe/Front Loader	2	10
			Dump Truck	2	10
			Excavator	1	10
66 Kilovolt (kV) Pole Removal	12	20	1-Ton 4x4 Truck	2	8
			Compressor Trailer	1	10
			Manlift/Bucket Truck	2	7
			Boom/Crane Truck	2	7
			Flatbed Pole Truck	2	10
Install LST Foundations	14	44	3/4-Ton 4x4 Truck	2	5
			Boom/Crane Truck	2	7
			Backhoe/Front Loader	2	10
	14	44	Auger Truck	2	10
			Water Truck	2	10
			Dump Truck	4	10
			Concrete Truck	4	7

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
LST Steel Haul	4	11	1-Ton 4x4 Truck	1	10
			Water Truck	1	10
			R/T Forklift	2	8
			Flatbed Truck/Trailer	2	10
LST Steel Assembly	20	55	3/4-Ton 4x4	2	5
			1-Ton 4x4 Truck	2	5
			Compressor Trailer	2	7
			R/T Forklift	2	7
			R/T Crane (L)	2	10
LST Erection	24	55	3/4-Ton 4x4 Truck	2	8
			1-Ton 4x4 Truck	2	8
			Water Truck	2	10
			Compressor Trailer	4	7
			R/T Crane (M)	2	7
			R/T Crane (L)	2	7
Install TSP Foundations	12	46	3/4-Ton 4x4 Truck	4	5
			Boom/Crane Truck	2	7
			Backhoe/Front Loader	2	10
			Auger Truck	2	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
			Water Truck	2	10
			Dump Truck	2	10
			Concrete Mixer Truck	10	6
TSP Haul	4	16	3/4-Ton 4x4 Truck	1	8
			Water Truck	1	10
			Boom/Crane Truck	2	8
			Flatbed Pole Truck	2	10
TSP Assembly	12	10	3/4-Ton 4x4 Truck	2	6
			1-Ton 4x4 Truck	2	6
			Water Truck	1	10
			Compressor Trailer	2	6
			Boom/Crane Truck	2	7
TSP Erection	12	10	3/4-Ton 4x4 Truck	2	6
			1-Ton 4x4 Truck	2	6
			Water Truck	1	10
			Compressor Trailer	2	6
			R/T Crane (L)	2	7
Install/Transfer Conductor	30	309	3/4-Ton 4x4 Truck	2	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
			1-Ton 4x4 Truck	2	10
			Manlift/Bucket Truck	2	10
			Boom/Crane Truck	2	10
			R/T Crane (M)	2	10
			Wire Truck/Trailer	1	10
			Truck Mounted – Three Drum Fly-Line Pulling Machines (equipped with 3/8-inch steel pulling cable)	1	10
			Static Truck/Tensioner	1	10
			Conductor Splicing Rig	1	10
			Fiber Splicing Lab	1	10
			Spacing Cart	4	10
	30	309	Backhoe/Front Loader	2	8
			Track Type Dozer	1	8
			Sag Cat with Two Winches	1	10
			Lowboy Truck/Trailer	2	10
			Hughes 500 F	1	7
			Helicopter Support Truck Fuel	1	7

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
Shoo-Fly Pole Removal	6	4	1-Ton 4x4 Truck	2	6
			Compressor Trailer	2	6
			Water Truck	1	10
			Manlift/Bucket Truck	2	10
			Boom/Crane Truck	2	7
			Flatbed Truck/Trailer	2	6
Remove Shoo-Fly Conductor and OPGW	30	20	1-Ton 4x4 Truck	2	10
			Manlift/Bucket Truck	2	10
			Sleeving Truck	2	5
			Boom/Crane Truck	4	5
			Bull Wheel Puller	2	5
			Semi-Tractor Truck	2	2
	30	20	Hydraulic Rewind Puller	2	5
			Water Truck	1	10
			Lowboy Truck/Trailer	2	10
Guard Structure Removal	6	18	3/4-Ton 4x4 Truck	2	7
			1-Ton 4x4 Truck	8	7
			Compressor Trailer	2	7
			Water Truck	1	10

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
			Manlift/Bucket Truck	2	5
			Boom/Crane Truck	2	10
			Extendable Flatbed Pole Truck	2	7
Vault Installation	16	21	1-Ton 4x4 Truck	2	5
			Backhoe/Front Loader	2	8
			Excavator	2	7
			Dump Truck	2	10
			Water Truck	1	10
			Crane (L)	1	7
			Concrete Mixer Truck	10	3
			Lowboy Truck/Trailer	2	5
			Flatbed Truck/Trailer	2	5
Duct Bank Installation	16	43	1-Ton 4x4 Truck	2	5
			Compressor Trailer	2	5
			Backhoe/Front Loader	2	7
			Dump Truck	2	7
			Pipe Truck/Trailer	1	7
			Water Truck	1	10
			Concrete Mixer Truck	10	4

Activity	Approximate Number of Personnel	Approximate Number of Work days	Primary Equipment Name	Approximate Primary Equipment Quantity	Approximate Duration of Use (Hours/Day)
			Flatbed Truck/Trailer	1	5
			Lowboy Truck/Trailer	1	5
			Concrete Saw	2	8
Install Underground Cable	16	57	1-Ton 4x4 Truck	2	5
			Manlift/Bucket Truck	4	5
			Boom/Crane Truck	1	7
			Water Truck	1	10
			Pipe Truck/Trailer	1	7
			Wire Truck/Trailer	1	5
			Puller	2	5
			Flatbed Truck/Trailer	2	5
Splice Underground Cable	8	57	1-Ton 4x4 Truck	2	10
			Splice Truck	2	10
Restoration	7	11	1-Ton 4x4 Truck	2	4
			Backhoe/Front Loader	2	7
			Motor Grader	2	7
			Water Truck	2	10
			Drum Type Compactor	2	7
			Lowboy Truck/Trailer	1	3

Notes:

Crew Size Assumptions:

Survey = one 4-man crew
Construction and Materials Yards = one 4-man crew for each yard
ROW Clearing = one 5-man crew
Roads and Landing Work = two 6-man crews
Wet Crossing Installation = one 6-man crew
Guard Structure Installation = one 6-man crew
Shoo-Fly Haul = one 4-man crew
Install Shoo-Fly Pole = two 6-man crews
Shoo-fly Assembly = two 6-man crews
Remove Existing Conductor and OPGW = two 14-man crews
LST Removal = two 6-man crews
LST Foundation Removal = two 4-man crews
TSP Removal = two 6-man crews
TSP Foundation Removal = two 4-man crews
66 kV Pole Removal = two 6-man crews
Install LST Foundations = two 7-man crews
LST Steel Haul = one 4-man crew
LST Steel Assembly = two 10-man crews
LST Erection = two 12-man crews
Install TSP Foundations = two 6-man crews
TSP Haul = one 4-man crew
TSP Assembly = two 6-man crews
TSP Erection = two 6-man crews
Install/Transfer Conductor = two 15-man crews
Shoo-Fly Pole Removal = one 6-man crew
Remove Shoo-Fly Conductor and OPGW = two 15-man crews
Guard Structure Removal = one 6-man crews
Vault Installation = two 8-man crews
Duct Bank Installation = two 8-man crews
Install Underground Cable = two 8-man crews
Splice Underground Cable = two 4-man crews