B. Initial Study

B.1 Project Description

San Diego Gas and Electric (SDG&E) proposes to construct and operate the Vine 69/12 Kilovolt (kV) Substation Project (Proposed Project). The Vine Substation Project is proposed to be located within the southwestern portion of the City of San Diego, California near the San Diego International Airport. The Proposed Project includes four major components: (1) construction of the proposed Vine Substation, located at 3548 Kettner Boulevard at the corner of Vine Street and Kettner Boulevard (SDG&E, 2015a); (2) relocation of several 12-kV distribution circuits within City of San Diego public streets; (3) loop-in of an existing 69-kV power line to the new substation, and (4) upgrade of an existing telecommunication system. The Project is proposed to meet existing and anticipated customer-driven electrical load growth, and to improve distribution equipment reliability to prevent potential long outages or disruption of service to existing SDG&E customers in downtown and the surrounding area.

The location of the Proposed Project is depicted in Figure B.1-1 (Project Location Map), and the four components of the Proposed Project are depicted in Figure B.1-2 (Project Overview Map). Detailed maps are provided in Figure B.1-3a-k (Detailed Project Components). All figures are provided at the end of Section B.1.

The analysis in this document is based on documentation submitted by SDG&E including the Proponent's Environmental Assessment (PEA) in May 2014, PEA Supplement in February 2015, and responses to data requests.

B.1.1 Project Title

San Diego Gas and Electric's Vine 69/12-kV Substation Project

B.1.2 Project Sponsor's Name and Address

San Diego Gas and Electric Company
8330 Century Park Court, CP32D
San Diego, California 92123

B.1.3 Lead Agency Name and Address

California Public Utilities Commission
Energy Division
505 Van Ness Avenue, Fourth Floor
San Francisco, California 94102

B.1.4 Lead Agency Contact Person and Phone Number

Eric Chiang, Project Manager
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California Public Utilities Commission
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B.1.5 Project Location

The proposed Vine Substation Project is located in the southwestern portion of the City of San Diego, California approximately two miles northwest of downtown San Diego and directly adjacent to and east of the San Diego International Airport (also known as Lindberg Field). The main activity associated with the Proposed Project involves the construction of the proposed Vine Substation, which would be located at 3548 Kettner Boulevard. The 1.5-acre substation site is approximately rectangular in shape, and is located on the southwest corner of Kettner Boulevard and Vine Street (see Figure B.1-2). The substation site is currently accessed by a gate located off Vine Street. The site is owned by SDG&E and has been leased for use as a Park 'N Fly Airport Parking lot. The Park 'N Fly Airport Parking lot is being relocated to a more centralized rental car facility, which is currently under construction near the airport. The parcel is bordered to the north by Vine Street and a commercial printing business across Vine Street, to the south by an Advantage Rental Car facility, to the east by Kettner Boulevard, and to the west by the North County Transit District Coaster and San Diego Metropolitan Transit System (MTS) Trolley rail tracks. The area is characterized by light- and medium-industrial and office uses, parking lots, and rental car facilities. The substation site is currently surrounded by a chain link fence, and paved with asphalt. The site includes approximately 220 parking stalls, a guard shack, wooden storage shed, and portable toilet.

The Proposed Project also involves the relocation of distribution circuits and looping in of an existing 69-kV power line. The 69-kV loop-in would use the existing overhead power line located adjacent to and to the west of the proposed substation site. The 69-kV loop in would involve removing two existing poles near the corner of California Street and Vine Street and installing three new poles. The 69-kV Loop in is described in greater detail in Section B.1.10.3 (69-kV Loop In). The 12-kV distribution circuit relocations involve the alteration of nine distribution circuits. These circuits would be routed through new and existing underground conduits in City streets including:

- Columbia Street
- India Street
- Kettner Boulevard
- Pacific Highway
- Sassafras Street
- State Street
- Vine Street
- West Laurel Street
- West Hawthorn Street
- West Palm Street
- West Redwood Street

The 12-kV distribution circuit relocations are described in more detail in Section B.1.10.2 (12-kV Distribution Relocation).

The location of the Proposed Project is depicted in Figure B.1-1 (Project Location Map), and the four major components are depicted in Figure B.1-2 (Project Overview Map). Detailed maps are provided in Figure B.1-3a-k (Detailed Project Components). All figures are provided at the end of Section B.1. A more detailed description of the area within and around the Proposed Project is provided in Section B.1.6.

B.1.6 Surrounding Land Uses and Setting

Northwest of the Vine Substation site across Vine Street is a commercial property occupied by Rush Press, and across California Street is a parking lot partially used for rental car parking (Honeywell property); to the northeast across Kettner Boulevard, I-5 Freeway, and India Street are a gasoline service station, commercial properties, and a residence; to the southeast is a vacant rental car facility including

a car wash, fueling area, and parking lot; and to the southwest across a railroad corridor and Pacific Highway are parking lots (see Figure B.1-2).

Existing uses along the distribution circuit route within Kettner Boulevard include I-5 to the east and rental car facilities, offices, and airport parking lots to the west. Along India Street, existing uses include a gas station, a rental car facility, residential uses, and a mix of commercial and industrial uses. Existing uses along West Redwood Street and Columbia Street are predominately residential, with I-5 to the west. Budget and Alamo rental car facilities are located on West Palm Street. Along West Laurel Street, uses consist of offices, parking lots, and residences. Along State Street, existing uses include offices and residences. The relocation process would utilize a combination of existing and new underground distribution conduits, as depicted in Figure B.1-2 (Project Overview Map) and in Figure B.1-3a-k (Detailed Project Components).

B.1.7 General Plan Designation

The CPUC has preemptive jurisdiction over the Proposed Project because it authorizes the construction, operation, and maintenance of public utility facilities. Although such projects are exempt from local land-use and zoning regulations and permitting, CPUC General Order 131-D Section 1X.B states that "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the Commission's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." SDG&E has considered local and State land use plans as part of the environmental review process.

Based on the City of San Diego General Plan, the proposed Vine Substation and 69-kV loop-in would be located on a site that is designated Industrial Employment. Lands adjacent to the relocated distribution circuits have a General Plan designation of Industrial Employment at the northern end of the line and Multiple Use and Commercial Employment Retail and Services at the southern end. A wide variety of land uses are specified as being appropriate within these designations, including offices, general commercial uses, civic facilities, and light and heavy industrial uses. While utility uses are not explicitly designated as being allowed under these General Plan designations, the General Plan specifically discusses the need to integrate design elements and space requirements necessary for public utilities into planning efforts throughout the City. Figure B.1-4 (Land Use Map) presents a depiction of the general land use categories within the Project area. Table B.1-1 details the various designations and land uses within the Project area.

Due to the large size of the City of San Diego, the City's General Plan Land Use Element includes community plans for specific geographic areas. The Proposed Project is located within the boundaries of the Midway/Pacific Highway Corridor Community Plan and Downtown Community Plan, both of which are also the approved local coastal programs in this area. The substation site and 69-kV loop-in would be located within the Light Industrial community plan land use designation, which allows for light industrial uses, and the 12-kV distribution lines would be located within public ROWs along the Residential and Multiple Use community plan land use designations.

Table B.1-1: Existing and Designated Land Uses

Proposed Project Component	Existing Land Use	General Plan Designation	Zoning Designation	Community Plan Designation
Vine Substation	Parking Lot	Industrial Employment	IS-1-1	Light Industrial
12-kV Distribution Relocation	Public Street ROW	Residential, Multiple Use	MCCPD-CL-6, MCCPD-MR-1500, CC-4-5	Residential, Commercial
69-kV Loop-In	Public Street ROW	Industrial Employment	IS-1-1	Light Industrial

Source: SDG&E, 2014 (Table 4.10-1), 2015b (Table 3.10-1, 12-kV distribution relocation).

A small portion of the 12-kV distribution work for the Proposed Project is within the Coastal Zone. Such work is exempt from Coastal Development Permit requirements. Section 3060(f) of the California Public Resources Code provides that no Coastal Development Permit is required for the "installation, testing, and placement in service or the replacement of any necessary utility connection between an existing service facility and any development approved pursuant to the Coastal Act." The California Coastal Commission has interpreted this exemption in a document entitled "Repair, Maintenance, and Utility Hook-up Exclusions from Permit Requirements" that was adopted on September 5, 1978. Section II.B.2.b of that document states "a coastal permit is not required to install, test, place in service, maintain, replace, modify or relocate underground facilities…provided that work is limited to public road or railroad rights-of-way or public utility easements." The small portion of the distribution work that is in the Coastal Zone is limited to installation of new duct banks within public roads and under the railroad. Therefore, no Coastal Development Permit is necessary and the Proposed Project is exempt from California Coastal Commission review (SDG&E, 2015a).

B.1.8 Zoning

The Proposed Project is located within the City of San Diego and is subject to the City of San Diego General Plan, which provides a framework of policies, objectives, and land use designations to guide long-term development. The City of San Diego Municipal Code supports the General Plan and provides specific development regulations for lands within the individual zoning designations. The Proposed Project area is also subject to the Midway/Pacific Highway Corridor Community Plan and Downtown Community Plan, which identify goals, objectives, and recommendations for the area and establishes a vision for the future form of the community. The Proposed Project area is located east of the San Diego International Airport within the Approach Overlay Zone, and is subject to the regulations, policies, and requirements contained within the San Diego International Airport's applicable Airport Land Use Compatibility Plan (ALUCP). These plans, along with the existing uses, are described in relation to the Proposed Project in the following sections.

B.1.9 Project Overview

The Proposed Project is located in the southwestern portion of the City of San Diego, California. Specifically, the Proposed Project is approximately two miles northwest of downtown San Diego and directly adjacent to and east of the San Diego International Airport. The main components of the Proposed Project are provided below, with detailed descriptions of these components provided in Section B.1.10 (Project Components):

- Construct a new 69/12-kV Vine Substation at the southwestern corner of the intersection of Vine Street and Kettner Boulevard, just west of Interstate 5 (I-5).

- Relocate approximately nine existing 12-kV distribution circuits utilizing a combination of existing and new underground distribution conduits. The relocated distribution circuits would generally be placed within the franchise portion of City of San Diego public streets (public right-of-way [ROW]) in the Project area, including Columbia Street, India Street, Kettner Boulevard, Pacific Highway, Sassafras Street, State Street, Vine Street, West Laurel Street, West Hawthorn Street, West Palm Street, and West Redwood Street.
- Loop in an existing 69-kV power line (TL604) to the proposed Vine Substation, which includes removing two existing wood poles near the corner of California Street and Vine Street and installing three new self-supported tubular steel poles (TSPs) adjacent to the eastern lane of Pacific Highway.
- To connect the proposed Vine Substation and Kettner Substation to SDG&E's telecommunication system, additional fiber optic cable would be installed generally within the underground 12-kV distribution duct banks (approximately 2,850 feet), with an overhead connection (100 feet) into the proposed Vine Substation.

The location of the Proposed Project is depicted in Figure B.1-1 (Project Location Map), and the four major components are depicted in Figure B.1-2 (Project Overview Map). Detailed maps are provided in Figure B.1-3a-k (Detailed Project Components). All figures are provided at the end of Section B.1. A more detailed description of the area within and around the Proposed Project follows.

B.1.9.1 Project Objectives

SDG&E has identified the following objectives to meet the purpose and need described below:

- Maintain existing substation and distribution system reliability standards;
- Provide substation and circuit tie capacity that would provide additional reliability for existing and future system needs;
- Meet the area's long-term electric distribution capacity needs by constructing a substation near planned load growth; and
- Utilize existing SDG&E-owned land previously purchased for substation use to meet the scheduled in-service date of July 2017.

B.1.9.2 Project Need

SDG&E is a regulated public utility that provides electric service to approximately 1.4 million customers within an approximately 4,100-square-mile service area, covering 25 cities and unincorporated areas within San Diego County and a portion of Orange County. To better understand the need for the Project, a description of the existing distribution system in the Project area is provided.

Existing System

SDG&E currently operates four substations to provide electrical service to downtown and the surrounding area: Kettner Substation, Urban Substation, Station B Substation, and Sampson Substation. SDG&E also operates the Grant Hill Substation, which is located outside of the desired coverage area. Figure B.1-5 (Existing System Configuration) provides a schematic diagram of the existing distribution system in the Project area. As shown in Figure B.1-5, one existing tie-line (TL), TL604, connects the Kettner Substation to the existing Old Town Substation. Six existing distribution lines, circuits (C) 135, C138, C139, C367, C457, and C458, currently connect to the Kettner Substation. The remaining three distribution lines (to be relocated), C102, C108, and C113, originate at the existing Station B Substation.

Increased commercial and residential growth in the downtown area is loading these existing substations to their maximum capacities. Recent load additions in downtown and the surrounding area include an expansion of San Diego International Airport and construction of Ballpark Village, as well as a new mixed-use development which is expected to commence construction at the end of 2015. Of particular concern is Kettner Substation, which is an aging facility with a variety of reliability concerns that provides service to the San Diego International Airport and the Point Loma Wastewater Treatment Plant. SDG&E has determined that the proposed Vine Substation is needed to offload the existing substations and to maintain its current reliability of service to existing and new customers in downtown and the surrounding areas (see Section B.1.9.3, Project Capacity, below).

Because the projected load indicates that the Station B and Urban Substations would exceed 100 percent of their capacity, and the Kettner and Sampson Substations would exceed 85 percent of their capacity in 2018, SDG&E has determined that an additional 30 megavolt-amperes (MVA) are needed by mid-2017 to address reliability concerns and serve the projected electric distribution load growth (SDG&E, 2015a). The optimum maximum substation load is 85 percent, as it allows for transformer bank loads to be transferred in the event of a transformer bank outage. Optimum operating conditions maintain substation reliability and reduce outage times. All of the substations—with the exception of the Grant Hill and Sampson Substations—are near capacity and would begin to exceed their 85-percent ratings in 2015 or sooner. The Grant Hill Substation has approximately 33 MVA of remaining capacity; however, SDG&E has identified that expansion of this facility would likely require substantial power line and distribution upgrades, and as noted above is located outside of the desired coverage area. Therefore, SDG&E has determined that the proposed Vine Substation is needed by mid-2017 to eliminate existing reliability concerns at the Kettner Substation and to provide additional capacity to help offload the existing congested substations in downtown and the surrounding area.

The prime driving factors in SDG&E's determination of the need to construct a new substation in the area are:

- The need to maintain reliable service to SDG&E commercial and residential customers in the San Diego downtown and surrounding area,
- The expected electrical load growth of 30 MVA by mid-2017, and
- The need to prevent extended outages and disruption of services to new and existing customers in the area.

SDG&E considers additional substation transformer capacity when the loss of a single transformer may cause an interruption to major commercial/industrial load that cannot be restored through use of 12-kV circuit ties to other substations. The downtown and surrounding area is approaching this threshold. Therefore, SDG&E is considering planning and design of the proposed Vine Substation to provide tie capacity in the event of a loss of a single transformer.

Each of the Proposed Project objectives, as noted in Section B.1.9.1 (Project Objectives), is more thoroughly described in the subsections that follow within the context of the need for the Project.

Maintain Existing Reliability Standards

The addition of the proposed Vine Substation would help to maintain reliability for existing distribution and substation systems within downtown and the surrounding area, including reliability concerns at the Kettner Substation. The Kettner Substation is an aging substation that provides service to major customers that serve critical regional needs, including San Diego International Airport and the Point Loma Wastewater Treatment Plant. The Kettner Substation has a variety of reliability issues including its

physical configuration and aging infrastructure. Construction of the proposed Vine Substation would allow the reliability concerns at the Kettner Substation to be addressed by adding operational flexibility and ultimately provide 90 MVA of additional capacity. The proposed Vine Substation would offload approximately 30 MVA from the Station B Substation and 40 MVA from the Kettner Substation, bringing them within the optimum loading standards. (See Section B.1.9.3, Project Capacity, discussion below)

Improve Substation and Circuit Reliability

Installation of the proposed Vine Substation would allow for new circuits to serve downtown and the surrounding area, and provide increased circuit and substation reliability by freeing up capacity at the existing substations. The proposed Vine Substation would add substation capacity enabling the Station B Substation to be off-loaded, and provide additional new transformer banks and circuits, thus increasing the number of circuit ties available to transfer load in the event of a circuit or substation component outage (SDG&E, 2015a). The reliability and flexibility of the local electrical grid improves with balanced circuit loading and an increased number of circuits to transfer load in the event of a circuit or branch outage.

Meet Area Electrical Capacity Needs

The downtown San Diego area is fed primarily from the Kettner Substation, Urban Substation, Station B, and Sampson Substation. These four substations would exceed their maximum capacity by 2018. The proposed Vine Substation would have an initial capacity of 90 MVA; however, a single 30 MVA transformer bank would be transferred from Kettner Substation to Vine Substation such that the realized increase in capacity of the distribution system would be 60 MVA. The ultimate Vine Substation design includes an additional 30 MVA transformer bank, which would increase the capacity of the Vine Substation to 120 MVA, resulting in a total system increase in capacity of 90 MVA. This would allow SDG&E to accommodate future load growth beyond that of existing forecasts (SDG&E, 2015a). See Section B.1.9.3 (Project Capacity) for further information on capacity-related issues.

Meet Scheduled In-service Date

The Vine Substation is proposed to be located on an approximately 1.5-acre parcel currently owned by SDG&E within the Midway/Pacific Highway Corridor Community Plan area. The property was purchased in 1976 in anticipation of constructing the Laurel Street Substation. The Laurel Street Substation was never constructed and in 1988, it was leased as a parking lot. Because the site is already owned by SDG&E, no time is required to acquire the property. Because the property is already owned by SDG&E and the current use of the site as a parking lot is being relocated, no difficulties in meeting the scheduled in-service date are anticipated.

B.1.9.3 Project Capacity

The power line component of the Proposed Project involves looping in the existing TL604 line, which comes from the Old Town Substation, to the proposed Vine Substation forming a new tie-line (TL6976) between Vine Substation and Kettner Substation, as shown in Figure B.1-6 (Proposed System Configuration). The 69-kV loop-in serves as the incoming electrical source to the Vine Substation from the larger electrical grid. The existing TL604 line is rated at 193 MVA and is adequate to handle the ultimate configuration of the proposed Vine Substation (see Section B.1.10.1). Therefore, no additional reinforcement of the 69-kV system is anticipated at this time (SDG&E, 2015a).

The distribution portion of the Proposed Project involves relocating nine existing 12-kV distribution circuits from either Kettner Substation or Station B Substation (approximately 30 MVA of load) to the

proposed Vine Substation, as shown in Figure B.1-6 (Proposed System Configuration). As a result of the relocation, the nine existing circuits would be renamed and split into 11 new circuits (C139 and C108 would each be split into two new circuits). See Table B.1-2 (Distribution Relocation Summary) in Section B.1.10.2, below.

The Project would be constructed in phases to accommodate the additional capacity needed. Under the initial configuration, two new 30-MVA transformer banks would be installed at Vine Substation and one existing 30-MVA transformer bank would be relocated from Kettner Substation to Vine Substation (SDG&E, 2015a). Therefore, the initial capacity of Vine Substation would be 90 MVA; however, the realized increase in capacity to the distribution system would be 60 MVA. To accommodate future load growth beyond that of existing forecasts, the ultimate configuration of the Vine Substation includes installation of a fourth 30-MVA transformer, which would result in a total substation capacity of 120 MVA (90 MVA increase in the distribution system) (SDG&E, 2015a).

B.1.10 Project Components

B.1.10.1 Proposed Vine 69/12-kV Substation

The proposed Vine Substation would measure approximately 305 feet by 180 feet, requiring approximately 1.3 acres of a 1.5-acre parcel located on the southwest corner of Kettner Boulevard and Vine Street. The proposed substation site is detailed in Figure B.1-2 (Project Overview Map) and Figure B.1-3a (Detailed Project Components). The existing concrete-lined channel located on the substation property would be located outside the Proposed Project footprint; it would not be altered (realigned or modified) as part of the Proposed Project (SDG&E, 2015a).

Build-out of the Vine Substation would occur in two phases, initial and ultimate build-out. As depicted in Figure B.1-7 (Vine Substation Initial Arrangement), the initial build-out of the proposed substation to provide 90 MVA of capacity would include the following major equipment:

- Two 69-kV tie-line terminations
- Six 69-kV gas circuit breakers
- Three 69-kV potential transformers
- Three 69/12-kV standard profile, low-sound 30 MVA transformers
- Three ¼ sections of switch gear to accommodate twelve 12-kV circuits
- Three 12-kV metal-enclosed capacitor banks
- One 12-kV metal-enclosed reactor bank
- One approximately 30-foot-tall standard steel rack consisting of a 69-kV bus
- One approximately 20-foot-wide by 40-foot-long by 11-foot-tall masonry block control shelter

Ultimately, the substation is planned to be a 120-MVA, 69/12-kV distribution substation. As depicted in Figure B.1-8 (Vine Substation Ultimate Arrangement), the substation would include the following major equipment (includes the initial equipment noted above):

- Four 69-kV tie-line terminations
- Nine 69-kV gas circuit breakers
- Three 69-kV potential transformers

- Four 69/12-kV standard profile, low-sound 30 MVA transformers
- Four ¼ sections of switch gear to accommodate sixteen 12-kV circuits
- Four 12-kV metal-enclosed capacitor banks
- Two 12-kV metal-enclosed reactor banks
- One approximately 30-foot-tall standard steel rack consisting of a 69-kV bus
- One approximately 20-foot-wide by 40-foot-long by 11-foot-tall masonry block control shelter

Figure B.1-9 (Vine Substation Profile View) provides two profile views of the proposed substation.

The steel structures within the substation would be comprised of galvanized steel, while the transformers, breakers, switchgear, and capacitors would be painted ANSI 70 Grey. The control shelter would be constructed from "La Paz" brown masonry blocks, and would include a welded metal roof. Oil spill containment basins would be installed around the transformers to capture any oil accidentally leaked from these components. The basins would be designed to have a capacity that exceeds the transformer capacity by 10 percent. Under the ultimate build-out arrangement, the four transformers would contain approximately 24,100 gallons of oil (varies slightly by manufacturer). As described above, the proposed Vine Substation would be equipped with nine 69-kV circuit breakers under the ultimate configuration. Each circuit breaker would contain approximately 33 pounds of sulfur hexafluoride (SF_6). SF_6 is used in the electrical industry as a gaseous dielectric medium for high-voltage equipment such as circuit breakers or switchgear. The main purpose of the gas is to prevent or rapidly stop electrical discharges. Therefore, approximately 297 pounds of SF_6 would be used at the proposed Vine Substation under the ultimate configuration (SDG&E, 2015a).

Substation Lighting

Substation lighting would be provided by a mixture of high-pressure sodium and metal halide lights that would be installed to adhere to the following SDG&E standards:

- Provide enough light for a safe entry and exit from the substation;
- Allow for safe driving around busses/racks, corners, and roadways; and
- Allow for a preliminary visual inspection of the substation.

With the exception of the gate entry lights, which would remain on at night for safety purposes, the remaining substation lighting would not be turned on unless it is required for nighttime work and/or an emergency. One light would be installed at the main gate, one light would be installed on each side of the control shelter, and a minimum of two lights would be installed on each substation wall. Lights may also be installed on the end of the steel rack, if required. All on-site lighting would be oriented downward to minimize glare onto the surrounding property.

Substation Access

The primary access would be from Vine Street and would require relocation of the existing driveway approximately 50 feet southwest. An existing driveway from Kettner Boulevard would also be relocated, approximately 125 feet southeast, and would provide secondary access to the site. The two gates would be locked and monitored remotely to limit access to only authorized personnel. Warning signs would be posted on the substation wall and gates in accordance with federal, State, and local safety regulations.

The access road within the proposed Vine Substation would be asphalt-paved with an approximate width of 30 feet. The road would connect the primary and secondary access to the control shelter, located in the southern corner of the proposed Vine Substation. This interior road would be approximately 425 feet long, occupying approximately 0.3 acre (see Figures B.1-7 and B.1-8).

Substation Perimeter

An approximately 10-foot-tall, "La Paz" brown colored masonry wall would enclose the entire substation. Two approximately 10-foot-tall and 30-foot-wide sliding gates would be installed within the perimeter wall to provide primary and secondary access to the substation. The gates would be constructed from chain-link material and would be designed to accommodate standard brown slats. Five strands of barbed wire would be installed horizontally along the interior of the wall and gates so as to not be visible from the exterior of the substation. Following construction of the proposed Vine Substation wall, landscaping and irrigation would be installed. Landscaping around the proposed Vine Substation property would be designed to filter views for the surrounding community and other potential sensitive receptors, consistent with SDG&E's Landscape Plan. The conceptual landscape plan calls for informal clusters of small and medium height shrubs outside the perimeter wall along Vine Street and Kettner Boulevard (SDG&E, 2014). Water supply for the irrigation would be provided by a permitted municipal service connection to a water supply system that can provide an adequate supply to the site.

B.1.10.2 12-kV Distribution Relocation

As indicated in Table B.1-2 (Distribution Relocation Summary), approximately nine existing distribution circuits would be intercepted and relocated to the proposed Vine Substation. As part of the relocation process, some of the circuits would be renumbered, as noted in Table B.1-2 and depicted in Figures B.1-5 and B.1-6.

Table B.1-2: Distribution Relocation Summary

Existing Distribution Circuit Number	Approximate Interception Point	Proposed Distribution Circuit Number
135	Kettner Boulevard and Sassafras Street	135
138	State Street and Maple Street	138
139	Sassafras Street and India Street	1479
	West Laurel Street and State Street	139
367	Adjacent to Kettner Substation	367
457	West Laurel Street and Pacific Highway	457
458	Adjacent to the proposed Vine Substation	458
108	Kettner Boulevard and Ivy Street	1481A
	Pacific Highway and West Hawthorn Street	1481B
113	Reynard Way and West Maple Street	1482
102	Kettner Boulevard and West Hawthorn Street	1483

Source: SDG&E, 2014 (Table 3-1), 2015b (Table 2-1, 12-kV distribution relocation).

The relocated distribution circuits would generally travel within public ROW along the following streets:

- Kettner Boulevard between Vine Street and West Hawthorn Street;
- Vine Street between California Street and India Street;

- India Street between Vine Street and West Redwood Street;
- West Redwood Street between India Street and Columbia Street;
- Columbia Street between West Redwood Street and State Street;
- West Laurel Street between Kettner Boulevard and State Street; and
- State Street between West Laurel Street and Maple Street.

The distribution circuits would primarily be located within the franchise position of City of San Diego public streets; no additional ROW would be acquired. The distribution route would cross the MTS railroad at West Palm Street just east of Kettner Substation, which requires a Right-of-Entry Permit (see Section B.1.14, Permits and Approvals). Jack-and-bore construction would occur in this location, therefore it is not anticipated that railroad closure would be necessary (SDG&E, 2015a).

The relocation process would utilize a combination of existing and new underground distribution conduit, as depicted in Figure B.1-2 (Project Overview Map) and in Figure B.1-3a-k (Detailed Project Components). A total of approximately 9,720 feet of new duct bank would be installed to relocate the 12-kV distribution circuits. Up to an additional 500 feet of new duct bank would be installed to facilitate connecting the new duct banks with existing underground conduit and aboveground facilities (SDG&E, 2015a).

In addition to the new underground duct banks, approximately 10,000 feet of existing duct bank would be utilized to relocate the 12-kV distribution circuits. These existing facilities are located within the following roadways:

- Pacific Highway, between West Palm Street and West Laurel Street;
- Pacific Highway, between West Laurel Street and West Hawthorn Street;
- Kettner Boulevard, between West Palm Street and West Hawthorn Street;
- West Laurel Street, between Kettner Boulevard and State Street; and
- State Street, between West Laurel Street and West Maple Street.

Underground Duct Banks and Vaults

As described previously, approximately 10,220 feet (9,720 feet + 500 feet) of new underground duct banks would be installed to facilitate relocating the 12-kV distribution circuits from existing substations to the proposed Vine Substation. Each underground duct bank would be comprised of eight five-inch diameter polyvinyl chloride (PVC) conduits encased in concrete. In locations where a telecommunications cable would be collocated with the distribution cables, an additional pair of four-inch diameter PVC conduits would also be placed in the duct bank. The finished duct bank would be approximately 32 inches tall and 18 inches wide. A typical drawing of the proposed underground duct bank is provided in Figure B.1-10 (Typical 12-kV Underground Duct Bank).

In addition to the underground duct banks, approximately 16 new underground vaults would be installed to facilitate pulling and splicing of conduit during the installation process, as well as to facilitate inspections, maintenance, and repairs during operation. The proposed locations of these facilities are depicted in Figure B.1-3a-k (Detailed Project Components). The design would utilize three sizes of pre-cast concrete vaults, as summarized in Table B.1-3 (Vault Dimensions).

Table B.1-3: Vault Dimensions

Vault Type	Approximate Quantity	Dimensions (Feet)			Approximate Excavation Dimensions (feet)		
		Length	Width	Depth	Length	Width	Depth
3325	10	15	9	10.5	17	10	13.7
3326	4	21	9	10.5	23	10	13.7
3327	2	26	12	10	28	14	12.6

Source: SDG&E, 2015b (Table 2-2 12-kV Distribution Relocation)

Distribution Switches and Capacitors

Approximately eight above ground distribution switches and one aboveground capacitor would be installed along the underground duct bank routes to facilitate the relocation of the distribution circuits. Five of the proposed aboveground switches would be located adjacent to the proposed Vine Substation on the sidewalk where no additional trenching is required. The remaining three would be installed at the following locations:

- On the south side of West Laurel Street near the intersection with State Street.
- On Pacific Highway, approximately 400 feet north of the intersection with West Laurel Street.
- On Harbor Drive near a new parking facility designed to serve the San Diego International Airport.

In addition to the switches, one above ground capacitor will be installed at the southwest corner of West Juniper Street and Kettner Boulevard (SDG&E, 2015a). Each distribution switch would be installed on a concrete pad measuring approximately 70 inches long by 44 inches wide by 32 inches tall. The switches would be contained within a steel enclosure mounted atop the pad that would measure approximately 67 inches long by 41 inches wide by 50 inches tall. The single capacitor would be installed on a concrete pad, similar in size to those for the switches, and would measure approximately 60 inches long by 44 inches wide, by 60 inches tall. Typical drawings of the concrete pad, switch, and capacitor are provided in Figure B.1-12 (Typical Switch and Capacitor Pad), Figure B.1-13 (Typical 12-kV Switch), and Figure B.1-14 (Typical 12-kV Capacitor). The proposed locations of these facilities are depicted in Figure B.1-3a-k (Detailed Project Components).

Underground Cable

All underground distribution circuits would utilize 1,000-kcmil aluminum cross-linked polyethylene insulation (XPLE) cables. The distribution getaways, located between the proposed Vine Substation and the two adjacent underground vaults located in Kettner Boulevard, would contain 1,000-kcmil copper XLPE cables.

B.1.10.3 69-kV Loop-in

The power line component of the Proposed Project would consist of looping in an existing 69-kV tie-line, TL604, to the proposed Vine Substation. The existing overhead power line is located adjacent to and west of the proposed substation site. TL604 travels generally south from the Old Town Substation by spanning existing railroad tracks and Witherby Street, then traveling southeast along Kurtz Street. The line then spans Noell Street and continues parallel to and adjacent to the south side of the existing railroad tracks. Near the intersection of California Street and Vine Street, the line spans the railroad tracks, reaching the existing wood pole at the intersection of California Street and Vine Street. The line then spans the railroad tracks again and travels southeast parallel to the railroad tracks. After spanning West Palm Street, the line turns northeast, travels along West Palm Street, and terminates at the Kettner Substation.

Poles

SDG&E is proposing to loop the existing double-circuit TL604 into the proposed Vine Substation. This would require the removal of two approximately 70-foot-tall, directly buried, dead-end wood poles; the removal of one approximately 28-foot-tall, self-supported stub guy pole; and the installation two new, approximately 100-foot-tall, self-supported, dead-end TSPs (see Figure B.1-3a). These new poles range in diameter from five to seven feet at the base and two to three feet at the top. New 69-kV overhead conductor would be used to connect these new poles to the existing power line and the proposed substation, creating the loop-in. The new TSPs would be equipped with six dead-end insulators to carry the three bundled conductors from the existing steel poles to the proposed Vine Substation. One existing wood distribution pole would also be replaced by a new approximately 100-foot-tall self-supported TSP, for a total of three new TSPs. All pole designs would comply with the requirements of G.O. 95, and meet or exceed the designated safety factors (SDG&E, 2015a). The new power line poles would be installed within the franchise position along Pacific Highway. SDG&E would obtain a License Agreement from MTS for the approximately 80 feet of new, approximately 320-foot-wide ROW for the overhead conductors. The remainder of the 69-kV loop-in would be installed within the franchise position of City of San Diego public streets.

All towers and poles would be built and replaced in accordance with Avian Power Line Interaction Committee guidelines. This is achieved by either getting 60 inches of separation between phases or by using avian protection/cover-ups (SDG&E, 2015a). Typical drawings of the existing wood pole, stub guy pole, and new TSPs are provided in Figure B.1-15 (Typical Existing 69-kV Wood Pole), Figure B.1-16 (Typical Existing Stub Guy Pole), and Figure B.1-17 (Typical Proposed 69-kV Tubular Steel Pole).

Overhead Conductor

TL604 is currently configured as a bifurcated-circuit (two conductors per phase) power line, where six individual conductors are supported by the associated poles. To facilitate the loop-in of this power line, these six conductors would travel from the existing and replacement steel poles to the new TSPs. From each new TSP, six conductors would traverse the railroad tracks and terminate within the Vine Substation (SDG&E, 2015a). TL604 currently utilizes 1,033-kcmil aluminum-clad steel reinforced (ACSR) conductor, and the new loop-in would also use 1,033-kcmil ACSR. The overhead span lengths between poles would vary, but would generally be between 100 and 300 feet. The distance from the ground to the lowest conductor would be at least 35 feet, and the conductors' vertical spacing would be approximately nine feet. As described in Section B.1.10.4 (Telecommunication System Extension), fiber optic telecommunication cables would also be collocated on the 69-kV loop-in poles.

B.1.10.4 Telecommunication System Extension

Once operational, the Vine Substation would be unmanned. SDG&E's substations typically utilize a telecommunication system composed of SDG&E fiber optic cable and an AT&T telephone line to facilitate off-site monitoring and operation. In order to connect the proposed Vine Substation and Kettner Substation to this system, additional fiber optic cable would be installed as part of the Proposed Project.

In order to bring fiber communication from the proposed Vine Substation to Kettner Substation, approximately 2,850 feet of new underground fiber optic cable would be installed within the previously described underground 12-kV distribution duct banks (see discussion below). The proposed Vine Substation would be connected to the existing telecommunication network by adding approximately 100 feet of fiber optic cable from an existing underground handhole located within Pacific Highway to

one of the new 69-kV TSPs that would be installed as part of the 69-kV loop-in. The fiber optic cable would then travel overhead, across the existing railroad tracks, to the proposed Vine Substation within the power line's ROW. The proposed connection between the existing underground vault located in Pacific highway and the new 69-kV TSP would be located within new underground conduit. Once at the new 69-kV TSP, the telecommunications line would transition from an underground to overhead configuration. The telecommunications line would then travel overhead from the 69-kV TSP to the proposed Vine Substation (SDG&E, 2015a).

The AT&T phone line would be upgraded and relocated from a current system feeding the existing customer at the site. As depicted in Figure B.1-3a (Detailed Project Components), one of three potential interconnection points located adjacent to the proposed Vine Substation would be used to facilitate the connection.

Underground Duct Bank

As part of the 12-kV distribution relocation (discussed above in Section B.1.10.2), approximately 2,850 feet of new underground duct banks would be installed along Kettner Boulevard between the proposed Vine Substation and Kettner Substation. Approximately 100 additional feet of new underground duct bank would be installed between an existing handhole located within Pacific Highway and one of the new TSPs that would be installed as part of the 69-kV loop-in. These underground duct banks would include two additional four-inch diameter PVC conduits as depicted in Figure B.1-10 (Typical 12-kV Underground Duct Bank). In locations where this duct bank would enter 12-kV underground vaults, a separate underground duct bank, comprised of two four-inch-diameter PVC conduits encased in a slurry mixture, would be used to route the telecommunication cable separate from the distribution vaults. This separate underground telecommunication duct bank would be approximately 3 feet tall and 1.5 feet wide. A typical drawing of the proposed underground duct bank is provided in Figure B.1-18 (Typical Telecommunication Underground Duct Bank). In addition to the underground duct banks, approximately four underground handholes would be installed to facilitate pulling and splicing during construction and inspection, maintenance, and repair during operation. These precast concrete handholes measure approximately 44 inches long, 32 inches wide, and 24 inches deep. A typical drawing of the proposed telecommunication handhole is provided in Figure B.1-19 (Typical Telecommunication Underground Handhole). The proposed locations of these facilities are depicted in Figure B.1-3a-k (Detailed Project Components).

Underground and Overhead Cable

The telecommunication system extension would utilize all dielectric self-supporting-48 fiber optic cable that measures approximately 0.685 inch in diameter.

B.1.11 Project Construction

Proposed Project construction would include activities associated with the following:

- Land surveying,
- Development of access,
- Substation construction,
- Replacement of existing poles,
- Installation of new subtransmission poles,

- Installation of new duct banks and vaults
- Underground distribution installation,
- Telecommunications installation, and
- Overhead distribution installation.

SDG&E anticipates that Proposed Project construction would take approximately 19 months. Construction would commence following CPUC approval, final engineering, and procurement activities. In order to meet the July 2017 operating date, construction is anticipated to start in January 2016 and would last through July 2017, including testing, commissioning, and energization (see "Construction Schedule" below for additional details). The following subsections describe the construction activities associated with the Proposed Project.

B.1.11.1 All Components

Construction methods for the proposed Vine Substation, 12-kV distribution relocation, and 69-kV loop-in are described in this section. The methods used to extend the telecommunication system are similar to those that would be used to relocate the 12-kV distribution circuits. As a result they are not discussed further.

Dust Control

There are two construction areas that would be unpaved and may require watering during construction to control fugitive dust. The first would be the approximately 1.5-acre (340-foot by 190-foot) proposed Vine Substation site. This location would transition from paved to unpaved during the site development process with the current surface first being removed, then grading the site to engineering specifications, followed by covering the site with an approximately 12-inch layer of Class II aggregate base (SDG&E, 2014). The second would be the transmission work area located adjacent to Pacific Highway. This work area would be used during the installation process for the two new 69-kV TSPs located adjacent to the proposed Vine Substation. Portions of this site (approximately 250 feet by 15 feet) are currently unpaved (SDG&E, 2015a). All unpaved construction areas would be watered up to two times daily during construction to reduce fugitive dust emissions and to meet San Diego Air Pollution Control District (SDAPCD) Rule 55 requirements. SDG&E or its contractor would keep the construction area sufficiently dampened to control dust caused by construction and hauling, and would provide at all times reasonable dust control of areas subject to windblown erosion. The Proposed Project would use potable water for fugitive dust control during construction and landscaping. The water would be obtained from the City of San Diego (SDG&E, 2015a).

Traffic Control

SDG&E would prepare and implement traffic control plans to address potential disruption of traffic circulation during construction activities and address any safety issues. These traffic control plans would be prepared by the project engineer or contractor and subject to approval by the appropriate jurisdictional agency, such as the City of San Diego

Storm Water Pollution Prevention Plan

SDG&E would be required to obtain a Construction General Permit-2009-0009-DWQ (2009 CGP) from the State Water Resources Control Board (SWRCB) as the Proposed Project construction would disturb a surface area greater than one acre. To obtain coverage under the Construction General Permit, Permit Registration Documents, including a Notice of Intent (NOI), Stormwater Pollution Prevention Plan (SWPPP), risk assessment, site map, certification, and annual fee must be submitted electronically to the

SWRCB. A Waste Discharger Identification number must be assigned to the Project prior to initiating construction activities. The SWPPP would include the following:

- Identification of pollutant sources and non-storm water discharges associated with construction activity
- Specifications for Best Management Practices (BMPs) that would be implemented, inspected, and maintained during Proposed Project construction to minimize erosion, the potential for accidental releases, and pollutants in the runoff from the construction areas (including pollutants from storage and maintenance areas, as well as laydown areas for building materials)
- Specifications for spill response and implementation
- A record of training provided to persons responsible for implementing the SWPPP
- Reporting and record-keeping requirements.

Access to the Substation Location

Primary access to the proposed Vine Substation would be from Vine Street during construction via the relocated driveway. Access to the 69-kV loop-in would primarily occur from Vine Street, California Street, and Pacific Highway. The 12-kV distribution relocation activities would primarily be accessed from Kettner Boulevard. As described previously, secondary access to the proposed Vine Substation would be from Kettner Boulevard for use during operation and maintenance activities. No new permanent access roads would be constructed.

Temporary Staging Yards

The majority of construction equipment, vehicles, personnel, and material staging areas would be accommodated within the proposed Vine Substation property and within the work areas described below. Equipment staging would also be conducted at existing SDG&E facilities. Existing SDG&E facilities have been detailed in Table B.1-4 (Existing SDG&E Staging Facilities) below. No additional improvements at these sites would be required prior to construction. Additional existing SDG&E facilities or disturbed areas may be identified for use following the completion of final engineering. Temporary parking of some vehicles along Vine Street may be required depending on actual construction activities occurring at the proposed Vine Substation.

Table B.1-4: Existing SDG&E Staging Facilities

Staging Facility	Approximate location	Approximate Size (Acres)
Kearny Construction and Maintenance Staging Area	Overland Avenue and Clairemont Mesa Boulevard	11.4
Metro Staging Yard	Sunrise Street and 33rd Street	11.6
Beach Cities Staging Yard	Santa Fe Street and Damon Avenue	9.2
Clairemont Drive Staging Yard	Clairemont Drive and Denver Street	1.1

Source: SDG&E, 2015b (Attachment G).

Work Areas

In addition to the temporary staging yards discussed above, temporary work areas would be required for each Proposed Project component in order to facilitate construction. The anticipated workspace requirements are described in detail in the following subsections, and are summarized in Table B.1-5 (Temporary Workspace Requirements), and are depicted in Figure B.1-3a-k (Detailed Project Components). Temporary work areas would all be accessed by construction equipment using existing access roads

(SDG&E, 2015a). All work areas would be restored to pre-construction conditions to the extent practicable following the completion of construction. Further discussion of the restoration process is provided in Section B.3.4 (Biological Resources). Because the new telecommunication system facilities would be installed adjacent to the proposed distribution circuits or would be collocated with the overhead 69-kV loop-in, minimal additional workspace would be required.

Table B.1-5: Temporary Workspace Requirements

Proposed Project Component	Workspace Type	Required Improvements	Quantity	Approximate Dimensions (Feet)	Total Approx. Area (Acres)	Vegetation Type	Temp. Impact	Perm. Impact
Proposed Vine Substation	Substation Pad Installation Area	Grading, excavation, boundary wall and gate installation, substation component installation, and driveway installation	1	340 x 190	1.48	Disturbed/ Developed	0.00	1.48
12-kV Distribution Relocation	Underground Work Area	Excavation, duct bank installation, and cable installation	1	10,220 x 30	7.04	Disturbed/ Developed	7.04	0.00
	Vault Installation Work Area	Excavation, vault installation, and cable installation	16	60 x 40 each	0.88	Disturbed/ Developed	0.88	0.00
	Pull Site	None	56	50 x 30 each	1.93	Disturbed/ Developed	1.93	0.00
	Jack-and-bore work area	Excavation	2	100 x 25	0.06	Disturbed/ Developed	0.06	0.00
				20 x 16	0.01	Disturbed/ Developed	0.01	0.00
		None	1	100 x 55	0.13	Disturbed/ Developed	0.13	0.00
	Switch and Capacitor Installation Work Area	Excavation and Pad Installation	9	50 x 30 each	0.31	Disturbed/ Developed	0.31	<0.01
69-kV Loop-In	Work Area	Excavation, and pole and foundation installation (WA 5)	1	250 x 55	0.28	Disturbed/ Developed	0.28	<0.01
		Pole and Foundation Removal (WA 3)	1	140 x 50	0.16	Disturbed/ Developed	0.16	0.00
		Pole Removal (WA 2)	1	100 x 50	0.11	Disturbed/ Developed	0.11	0.00
		Pole Removal and Installation (WA 4)	1	85 x 50	0.15	Disturbed/ Developed	0.15	<0.01
		Conductor Installation and	1	80 x 40	0.07	Disturbed/ Developed	0.07	0.00

Table B.1-5: Temporary Workspace Requirements

Proposed Project Component	Workspace Type	Required Improvements	Quantity	Approximate Dimensions (Feet)	Total Approx. Area (Acres)	Vegetation Type	Temp. Impact	Perm. Impact
		Removal (WA 1)						
		Conductor Installation and Removal (WA 6)	1	75 x 40	0.07	Disturbed/ Developed	0.06	0.00
Telecom-munications System Extension	Underground Work Area	Excavation, duct bank installation, and cable installation	1	625 x 30	0.43	Disturbed/ Developed	0.43	0.00
	Handhole Installation Work Area	Excavation, handhole installation, and cable installation	4	50 x 30 each	0.14	Disturbed/ Developed	0.14	0.00
Total	--	--	--	--	13.11	--	11.76	1.49

Source: SDG&E, 2015a (Attachment B).

Note: The temporary workspaces provided are approximate and subject to change pending final engineering. Some of the workspaces indicated would overlap. These overlapping areas have not been removed from the above calculations. The vault installation and switch/capacitor installation work areas would also serve as pull sites.

Construction Equipment and Personnel

Construction equipment would include bulldozers, excavators, loaders, graders, and trucks for excavating, compacting, and hauling. All exported soil and new fill would be transported using street-legal dump/loader trucks. Concrete trucks, backhoes, ditch-witches, and skid steers would be used for the foundation and below-grade work. Portable cranes and heavy hauling trucks would be employed to bring in the 69/12-kV transformers. Substation crews, assist vehicles, forklifts, man lifts, and boom trucks would be used to construct the substation, along with pickup trucks and vans for the wiring and control testing of the substation equipment. Overhead and underground line trucks, assist vehicles, and cable dolly trailers would be used for the construction of the power line and distribution circuits. Table B.1-6 (Construction Equipment Requirements) provides the anticipated construction equipment that would be used for each construction activity.

It is anticipated that up to 33 workers would be employed for the site development phase of the Proposed Project. Between 12 and 24 workers are expected during the foundation and below-grade work, as well as the construction of the proposed substation. The relocation of the 12-kV distribution circuits would require between 12 and 63 workers depending on the activity and locations. Final testing and checkout would require nine electricians and/or engineers. SDG&E would employ an average of 46 workers throughout the 19-month construction period, with a peak of up to 83 workers (SDG&E, 2015b). The workers would consist of existing SDG&E employees and contract workers. SDG&E does not anticipate any of the workforce needed to construct the Proposed Project would come from outside of San Diego County (SDG&E, 2015a). A summary of the anticipated construction personnel by Proposed Project component is provided in Table B.1-7 (Construction Personnel Requirements).

Table B.1-6: Construction Equipment Requirements			
Vehicle/Equipment Type	Use	Hours Operating at Site/Day (per vehicle)	Quantity Required
Proposed Vine 69/12-kV Substation			
Site Development and Grading			
Off-road Water Truck	Suppress dust	7	1
Backhoe	Excavate and load material	6	2
Compactor	Compact soil	7	2
Dozer	Grade pads and access roads	6	2
Excavator	Excavate and load material	6	1
Loader	Load dump trucks and stockpile material	6	2
Paver	Pave access roads	6	1
Roller	Compact soil	6	2
Scraper	Grade pads and access roads	7	2
Skid-steer Loader	Move material	3	2
Trencher	Excavate trenches	6	1
Retaining/Boundary Wall Construction			
Compactor	Compact soil	9	1
Excavator	Excavate and load material	9	1
Loader	Load dump trucks and stockpile materials	9	3
Motor Grader	Grade pads and access roads	9	1
Walk-behind Compactor	Compact soil	9	3
Below-Grade Construction			
Backhoe	Excavate and load material	6	1
Loader	Move bulk material	6	2
Skid-steer Loader	Move rebar, equipment, masonry, and other material	4	1
Trencher	Excavate trenches	6	1
Substation Equipment Installation			
Cable Dolly (Trailer)	Transport reels of conductor	No Engine	1
Boom Truck	Place materials and set steel	6	2
Manlift	Set steel and install equipment	6	1
Bucket Truck	Set steel and install equipment	5	4
Oil Rig (Trailer with Generator)	Process transformer oil	24 (10 days for manufacturer setup)	1
Stringing Rig (Trailer)	Assist with conductor installation	2	No Engine
12-kV Distribution Relocation			
Duct Bank Construction and Vault Installation – Daytime			
Air Compressor	Power tools	3	4
Asphalt Spreader	Spread asphalt	6	2
Backhoe	Excavate and load material	6	2
Emulsion Trailer	Assist with repaving	5	2
Generator	Power tools and equipment	5	2
Grinding Machine	Prepare surface for repaving	5	2
Large Crane	Set vaults	4	2
Roller	Compact pavement	5	2
Saw-cutting Machine	Cut pavement	6	2
Skid-steer Loader	Excavate, move, and load materials	2	2
Small Backhoe	Excavate and load materials	2	2
Trackhoe	Excavate and load materials	6	2
Vacuum	Clean construction site	6	2
Duct Bank Construction and Vault Installation – Nighttime			
Air Compressor	Power tools	3	4
Asphalt Spreader	Spread asphalt	6	2
Backhoe	Excavate and load material	6	2
Emulsion Trailer	Assist with repaving	5	2

Table B.1-6: Construction Equipment Requirements			
Vehicle/Equipment Type	Use	Hours Operating at Site/Day (per vehicle)	Quantity Required
Generator	Power tools and equipment	5	2
Grinding Machine	Prepare surface for repaving	5	2
Large Crane	Set vaults	4	2
Light tower with generator	Light construction areas	8	8
Roller	Compact pavement	5	2
Saw-cutting Machine	Cut pavement	6	2
Skid-steer Loader	Excavate, move, and load materials	2	2
Small Backhoe	Excavate and load materials	2	2
Trackhoe	Excavate and load materials	6	2
Vacuum	Clean construction site	6	2
Cable Installation and Cutover			
Pulling Rig	Pull cable into position	2	1
Jack-and-Bore Installation			
Air Compressor	Power tools	3	1
Backhoe	Excavate bore pits and load material	6	1
Boom Truck	Setup K-rails and casing stock	6	1
Crew Truck with Welding Equipment	Install casings	4	1
Drill/Bore Rig	Install casing	6	1
Excavator	Excavate bore pits	6	1
Large Crane	Setup pit shoring and baker tanks	3	2
Pickup with Generator	Cut roads for bore pits	4	1
Pump	Dewater bore pits	6	1
Sawcutting Machine	Cut roads for bore pits	4	1
Pump	Dewater bore pits	6	1
Sawcutting Machine	Cut roads for bore pits	4	1
Skid-steer Loader	Load materials, clean construction site	3	1
Small Crane	Set bore rig	4	1
Vacuum Truck	Clean construction site	4	1
69-kV Loop-In			
Foundation Installation			
Backhoe	Excavate soil	4	1
Boom Truck	Place rebar cage	3	1
Drill/Bore Rig	Excavate soil	8	1
Forklift	Place materials	4	1
Generator	Provide power to the work area	4	1
Pole Installation and Removal			
Jack Hammer	Break up existing foundation	8	1
Air Compressor	Power tools	8	1
Boom Truck	Erect poles	8	1
Bucket Truck	Erect poles and install conductor	8	1
Conductor Installation and Cutover			
Boom Truck	Move materials and install conductor	7	1
Bucket Truck	Move materials and install conductor	7	2
Pulling Rig	Pull conductor into position	7	1
Telecommunication System Extension			
Duct Bank Construction and Vault Installation			
Backhoe	Excavate trench	3	1
Skid-steer Loader	Excavate, move, and load materials	3	1

Source: SDG&E, 2015d (Attachment A: Revised Construction Equipment and Vehicle Summary).
Note: Telecommunication cable installation would use the same equipment as the distribution cable installation; vehicles with an operating time of zero would be driven to the site and parked.

Table B.1-7: Construction Personnel Requirements		
Activity	Position	Approximate Number
Proposed Vine 69/12-kV Substation		
Site Development and Grading Construction	Construction Manager	1
	Superintendent	1
	Foreman	2
	Operator	15
	Laborer	10
	Inspector	2
	Grade Checker / Surveyor	2
Retaining/Boundary Wall Construction	Construction Manager	1
	Superintendent	1
	Operator	4
	Laborer	8
	Inspector	1
Below-Grade Construction	Foreman	1
	Laborer	4
	Concrete Finisher	2
	Equipment Operator	1
	Haul Truck Driver	1
	Concrete Truck Driver	1
	Water Truck Driver	1
	Standby Electrician	1
Substation Equipment Installation	Crew Foreman	2
	Journeyman	8
	Apprentice	2
	Assistant	1
	Operator	2
	Wiring Foreman	1
	Wiremen	2
	Relay Inspector	2
	Relay Technician	4
12-kV Distribution Relocation		
Duct Bank Construction and Vault Installation – Daytime/Nighttime [a]	Foremen	1 to 2
	Inspector	1 to 2
	Journeyman	1 to 2
	Operator	4 to 8
	Laborer	13 to 26
Cable Installation and Cutover	Foreman	3
	Journeyman	6
	Apprentice	3
Jack-and-Bore	Foreman	1
	Welder	1
	Helper	2
	Laborer	3
	Surveyor	1
69-kV Loop-In		
Foundation Installation	Foreman	1
	Laborer	4
Pole Installation and Removal	Foreman	1
	Lineman	4
Conductor Installation and Cutover	Foreman	1

Table B.1-7: Construction Personnel Requirements		
Activity	Position	Approximate Number
	Lineman	4
Telecommunication System Extension [b]		
Cable Installation	Foreman	1
	Inspector	1
	Journeyman	1
	Laborer	4
	Splicer	2
Energization		
Testing and Commissioning	Foreman	2
	Journeyman	6
	Engineer	1

Source: SDG&E, 2014 (Table 3-5), 2015b (Table 2-5 12-kV Distribution Relocation), and 2015d (Attachment C, Duct Bank Construction Vault Installation – Daytime/Nighttime).

Notes:

(a) Because a construction contractor has not been selected, SDG&E has assumed up to four crews, two during daytime hours and two during nighttime hours, may work on the 12-kV duct bank construction and vault installation each day. As a result, a range of personnel has been included for this activity.

(b) Construction personnel responsible for the installation of the 12-kV distribution relocation underground duct banks will also construct the underground duct banks required for the telecommunications system extension.

Construction Truck and Vehicle Trips

A summary of the number of truck trips required to construct each of the Proposed Project's components has been provided as Table B.1-8 (Construction Truck Trip Summary). Table B.1-9 (On-Road Vehicle Trips) provides a detailed list of all on-road vehicle requirements for the Proposed Project (SDG&E, 2015a).

Table B.1-8: Construction Truck Trip Summary	
Proposed Project Component	Approximate Truck Trips Required
Proposed Vine Substation	2,650
12-kV Distribution Relocation and Telecommunication System Extension	1,900
69-kV Loop-In	400

Source: SDG&E, 2014 (Table 3-3), 2015b (Section 2.6.5, Construction Schedule for 12-kV Distribution Relocation).

Table B.1-9: On-Road Vehicle Trips				
Component	Vehicle Type	Vehicle Category	Trips per day	Total Trips
Proposed Vine Substation				
Site Development	Commuter Trip	Worker	33	--
	Dump Truck	Hauling	--	909
	Maintenance Truck	Vendor	2	--
	Asphalt	Hauling	--	13
	Delivery	Vendor	5	--
Wall Construction	Commuter Trip	Worker	15	--
	Delivery	Vendor	1	--
	Maintenance Truck	Vendor	1	--
Below Grade	Commuter Trip	Worker	12	--
	Dump Truck	Hauling	--	50
	Concrete Truck	Hauling	--	83

Table B.1-9: On-Road Vehicle Trips

Component	Vehicle Type	Vehicle Category	Trips per day	Total Trips
	Delivery	Vendor	2	--
Substation Equipment Installation	Commuter Trip	Worker	24	--
	Crew Truck	Worker	5	--
	Delivery	Vendor	3	--
12-kV Distribution Relocation				
Duct Bank and Vault Installation – West of Interstate (I-) 5	Commuter Trip	Worker	20	--
	Dump Truck	Hauling	--	280
	Construction Truck	Worker	3	--
	Pickup Truck	Worker	3	--
	Pickup with Saw Cutter	Worker	2	--
	Concrete Truck	Hauling	--	398
	Asphalt	Hauling	--	--
	Delivery	Vendor	2	--
Duct Bank and Vault Installation – East of I-5	Commuter Trip	Worker	20	--
	Pickup Truck	Worker	8	--
	Equipment Truck	Worker	32	--
	Dump Truck	Hauling	--	187
	Concrete Truck	Hauling	--	259
	Crew Truck	Worker	1	--
	Tractor Truck/Trailer	Vendor	2	--
	Emulsion Trailer	Vendor	2	--
Cable Installation	Commuter Trip	Worker	12	--
	Line Truck	Worker	1	--
	Splice Truck	Worker	1	--
	Pickup truck	Worker	1	--
	Delivery	Vendor	2	--
69-kV Loop-In				
Foundation Installation	Commuter Trip	Worker	5	--
	Pickup Truck	Worker	2	--
	Concrete Truck	Hauling	--	20
	Dump Truck	Hauling	--	15
	Delivery	Vendor	2	--
Pole Installation and Removal	Commuter Trip	Worker	5	--
	Delivery	Vendor	2	--
Conductor Installation	Commuter Trip	Worker	5	--
	Wire Truck/Split Reel	Vendor	1	--
	Delivery	Vendor	2	--
Telecommunications System Upgrade				
Duct Bank and Vault Installation	Commuter Trip	Worker	--	--
	Dump Truck	Hauling	--	10
	Concrete/Asphalt Truck	Hauling	--	14
	Delivery	Vendor	2	--
Cable Installation	Commuter Trip	Worker	9	--
	Delivery	Vendor	2	--
Energization				
Testing and Commissioning	Commuter Trip	Worker	9	--

Source: SDG&E, 2015a (Attachment H: On-Road Vehicle Trips).

Construction Schedule

The total construction time including grading, construction, energizing, and testing of the Proposed Project is expected to take approximately 19 months, starting in January 2016. Substation construction would generally take place between 7:00 a.m. and 7:00 p.m. from Monday through Saturday (SDG&E, 2015b). Due to the potential traffic impacts related to relocation of the distribution circuits, construction within Kettner Boulevard would occur during the evenings. In addition, some concrete pours may take place during an extended day, depending on the size of the pour. Transformer oil filling may also require vacuum pulls and oil installation, which in turn may require continuous work through the night. Actual cutovers of the power line and distribution circuits to the substation would be dependent on loading requirements, and would be done in a manner that maintains uninterrupted service to customers. This may require part or all of this work to be done after normal business hours or on the weekend and/or nights.

Construction efforts for the Proposed Project would occur in accordance with Chapter 5, Article 9.5, Division 4 of the City of San Diego Municipal Code (Noise Ordinance) and would generally occur between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday. Construction activities would generally adhere to the noise ordinance of the local jurisdiction. While the final construction schedule for the 12-kV distribution work within Kettner Boulevard would be determined during through the encroachment permit process with the City of San Diego, the anticipated working hours on Kettner Boulevard would be from 10:00 p.m. to 5:00 a.m. to reduce potential traffic impacts associated with the relocation of the distribution circuits (SDG&E, 2015b). All other distribution relocation activities would occur during the normal construction hours. During nighttime hours, standard lighting units (i.e., a trailer with a lighting tower) would be set up within each work area (SDG&E, 2015a).

In the event construction activities are necessary on days or hours outside of what is specified by the local ordinance (for example, if existing lines must be taken out of service for the work to be performed safely and the line outage must be taken at night or on a weekend for system reliability reasons), SDG&E would obtain variances as necessary from appropriate jurisdictions where the work would take place. SDG&E has informed the City of San Diego that a permit from the Noise Abatement and Control Administrator per Municipal Code Section 59.5.0404 will be sought for the work occurring after 7:00 p.m. (SDG&E, 2015a).

A detailed construction schedule is provided in Table B.1-10 (Proposed Construction Schedule).

Table B.1-10: Proposed Construction Schedule

Proposed Project Component	Activity	Approximate Duration (Months)	Anticipated Start Date	Anticipated End Date
Proposed Vine Substation	Site Development and Grading	3	January 2016	March 2016
	Retaining Wall/Boundary Wall Construction	2	March 2016	April 2016
	Below-Grade Construction	6	April 2016	September 2016
	Substation Equipment Installation	10	September 2016	June 2017
12-kV Distribution Relocation	Duct Bank Construction and Vault Installation	6	October 2016	March 2017
	Cable Installation and Cutover	3	April 2017	June 2017
	Jack-and-Bore	0.75	January 2017	January 2017

Table B.1-10: Proposed Construction Schedule

Proposed Project Component	Activity	Approximate Duration (Months)	Anticipated Start Date	Anticipated End Date
69-kV Loop-In	Foundation Installation	0.5	November 2016	November 2016
	Pole Installation and Removal	3.5	Mid-November 2016	February 2017
	Conduit Installation and Cutover	2	January 2017	February 2017
Telecommunication System Extension	Duct Bank Construction and Vault Installation	1	April 2017	April 2017
	Cable Installation	1	May 2017	May 2017
Energization	Testing and Commissioning	5	February 2017	June 2017
	Energization	0.5	July 2017	July 2017

Source: SDG&E, 2015b (Table 2-6).

B.1.11.2 Vine Substation Construction

Site Development and Grading

Prior to installation and construction of the proposed Vine Substation, the site would need to be prepared/developed. This would ensure that the site conditions reflect the engineering requirements. Site preparation and development would start with the removal of the existing paved parking lot surface, which would require the use of excavators, front-end loaders, concrete saws, and/or bulldozers (see Table B.1-6, Construction Equipment Requirements).

Once cleared, remedial grading would take place based on the recommendations of the geotechnical investigation, which would determine the appropriate on-site pad elevation and foundation support that also maintains adequate site drainage. On-site material would be reused to the extent possible, as recommended by a Geotechnical Engineer. These activities are anticipated to generate approximately 4,200 cubic yards (CY) of material for off-site disposal. Approximately 4,600 CY of select fill would be imported to help achieve the conceptual design elevation. 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. Construction of the boundary walls described in Section B.1.10.1 under "Substation Perimeter" would begin once grading is complete. An approximately 12-inch layer of Class II aggregate base (approximately 2,100 CY) would also be imported and installed over the building pad area for the finished surface.

Construction of the proposed Vine Substation would require approximately 6,700 CY, or an estimated 1,470 haul truckloads, of imported fill to develop the proposed substation site. Potential sources of import material include Carrol Canyon Rock, Asphalt & Ready Mix (10051 Black Mountain Road, San Diego, CA); Superior Reach Mix Concrete, L.P. (7500 Mission Gorge Road, San Diego, CA); and Vulcan Material Company (2041 Heritage Road, Chula Vista, CA) (SDG&E, 2015d). Haul trucks would operate periodically, as needed, during the grading phase of construction. In general, an average of no more than 20 truck trips per day for an estimated five months would be required to complete the proposed substation grading and boundary wall installation. In addition, approximately five additional trips per day are anticipated for the delivery of materials and equipment for the duration of construction.

Construction trip details are summarized above in Table B.1-8 (Construction Truck Trip Summary), and Table B.1-9 (On-Road Vehicle Trips) provides a detailed list of all on-road vehicle requirements for the Proposed Project.

Below-Grade Construction

Following site development, below-grade work would begin, which would include the construction of structure and equipment foundations, underground ducts, the ground grid, and erection of the control shelter. The construction of the distribution circuits and tie lines surrounding the Vine Substation would start while the substation is under construction. Concrete trucks, backhoes, ditch-witches, and skid steer loaders would be used for the below-grade work (see Table B.1-6, Construction Equipment Requirements).

Above-Grade Construction

Once the grading activities and below-grade construction are complete, major equipment and structures would be installed and anchored on their respective foundations. The following steps would be taken to install the above-grade equipment:

- The 69-kV rack would be erected.
- The 69-kV circuit breakers would be installed on their foundations.
- The control shelter would be constructed, and relay panels, controls, battery, and station lighting and power would be installed.
- The ground grid, control, communication, and power ducts would be installed and wiring of the equipment controls and protection devices would follow.
- The 69/12-kV transformers would be installed on their foundations, assembled, and filled with oil.
- The 12-kV switchgear, capacitors, and reactor would be installed on their foundations.

Power lines and distribution circuits would be completed and connected inside the substation following final installation of the substation structures and equipment. The communication equipment for the operation of the Proposed Project would be connected inside the control shelter. Testing would be performed on all equipment after the equipment is installed and wired, and before placing it in service.

Equipment would be placed in service once the 12-kV circuits and 69-kV loop-in are ready to be energized and are tested outside the substation. Portable cranes and heavy hauling trucks would be employed to bring in the 69/12-kV transformers. Substation crews, assist vehicles, forklifts, man lifts, and boom trucks would be used to construct the substation. Oil-processing equipment and vacuum pumps would be used to fill transformers with oil. Pickup trucks and vans would be used for the wiring and control testing of the substation equipment. Line trucks, assist vehicles, and cable dolly trailers would be used for construction of the power line and distribution circuits.

A temporary tap to an existing distribution line may be installed to provide electrical service to the substation staging area during construction. This temporary tap may be used to power construction trailers, lighting, or small hand-held machinery or tools until the substation is energized. The temporary tap may require up to three directly buried wood poles (approximately 20 feet in height) to connect a distribution line from an existing underground distribution transformer located adjacent to the substation site.

Cleanup and Post-Construction Activities

All areas that are temporarily disturbed during construction would be restored to preconstruction conditions, to the extent practicable, once construction of the substation is complete. Cleanup efforts would include removal of all construction debris for recycling and/or disposal off site. In addition,

landscaping would be installed consistent with SDG&E's Landscape Plan, which is described above in Section B.1.10.1 under "Substation Perimeter". In the event that non-hazardous, non-contaminated construction materials, such as concrete or asphalt, are generated, these materials would be recycled at either Vulcan Materials Landfill (10051 Black Mountain Road, San Diego, CA 92126) or at Ennis, Inc. (12535 Vigilante Road, Lakeside, CA 92040) (SDG&E, 2015b).

B.1.11.3 12-kV Distribution Relocation

As part of the Proposed Project, portions of the existing 12-kV distribution system would need to be relocated. This requires the installation of new underground duct banks and vaults using temporary workspaces located within City of San Diego streets and public areas. The cable installation process would require a network of pull sites located adjacent to the proposed and existing underground vaults, as shown in Figure B.1-3a-k (Detailed Project Components). These pull sites would be used to stage the equipment necessary to pull the underground cable through the installed conduit (see "Work Areas" discussion below). A truck holding a reel of cable is set up on one end of the pull and a winch/line truck/similar piece of equipment on the other end. Rope is installed when the conduit is put in, which allows the line crew to pull larger rope or steel cable into the conduit with it (SDG&E, 2015c). These pull sites would be approximately 50 feet long by 20 to 30 feet wide. With the exception of the two pull sites that would be established near the intersections of Kettner and West Hawthorn Street and Pacific Highway and West Hawthorn Street, all pull sites would be located within the underground trench work area. All pull sites would be located within the paved portion of existing City streets or associated sidewalks and road shoulders; therefore, no improvement would be required prior to use.

Work Areas

In addition to the staging areas discussed above, temporary workspace would be required for the installation of new duct banks and vaults associated with the 12-kV distribution circuit relocations. Generally, underground trench work area would be approximately 30 feet wide, centered on the distribution circuit alignment. In locations where vaults would need to be installed (see Figure B.1-3a-k, Detailed Project Components), additional workspace would be established measuring approximately 60 feet by 40 feet centered on the vault location. These work areas would support all cable installation activities, including telecommunication system extension, as well as the associated construction equipment to perform the work. A total of approximately 4,320 linear feet (2.98 acres) of workspace would be required to install the duct banks (SDG&E, 2015a).

Site preparation for the underground trench work area and vault installation work areas would involve site mark out, with offsets of the proposed trench alignment, as well as setting up traffic controls according to the applicable traffic control plan prior to construction. Additional temporary work spaces measuring approximately 50 feet by 30 feet would be established to facilitate the installation of switches and capacitors. These anticipated workspace requirements are summarized in Table B.1-5 (Temporary Workspace Requirements) and depicted in Figure B.1-3a-k (Detailed Project Components).

As described below under "Jack-and-Bore," the portion of the new underground duct bank that crosses the MTS railroad line on West Palm Street would be installed using the jack-and-bore method of construction. In order to excavate the required entry and receiving pits, and to operate the associated construction equipment, an approximately 100-foot by 25-foot jack-and-bore work area would be established at the entry pit and a second approximately 20-foot by 16-foot work area would be established at the exit pit. In addition, an approximately 100-foot by 55-foot paved, fenced lot at the intersection of West Palm Street and Pacific Highway currently used by Budget Rent A Car would be used for the staging and operation of equipment and materials. The jack-and-bore work areas are

depicted on Figure B.1-3h (Detailed Project Components). The temporary work area specifications for the Proposed Project are provided above in Table B.1.5 (Temporary Workspace Requirements).

Access

The 12-kV distribution relocation activities would be access from Kettner Boulevard, Vine Street, India Street, Redwood Street, West Laurel Street, Columbia Street, and State Street. No new permanent access roads would be constructed.

Trenching

Other utility companies would be notified prior to trenching to allow the utilities time to locate and mark existing underground utilities along the proposed underground alignment. Exploratory excavations (i.e., potholing) would also be conducted within the ROW to verify the exact location of other existing facilities. All known underground facilities crossed by or in close proximity to the trench would be potholed, surveyed, and indicated on the plan and profile drawings for use during construction. The required pothole frequency depends on the number of facilities to be crossed or located in close proximity to the proposed trench. The pothole frequency would be determined during the final engineering phase (SDG&E, 2015a). Potholing activities would be conducted using hydro excavation (a high pressure water spray) to remove the soil. The soil would then be vacuumed into a sealed container and disposed of at an off-site location in accordance with all applicable laws and regulations. Once a utility is located, it would be measured, photographed, and documented. Silica sand would then be placed over the utility and the rest of the pothole would be backfilled with clean fill material (SDG&E, 2015a).

Coordination with the City may be required to secure encroachment permits for trenching in the City's ROW. It is anticipated that between one and two lanes of Kettner Boulevard would occasionally be closed during trenching activities. During the trenching in the intersection of West Palm Street and Kettner Boulevard, the intersection would be closed for a three- to five-day period (SDG&E, 2015a). Traffic controls would be implemented as required by the Encroachment Permit.

Trenching operations would be staged in intervals so that a maximum of 500 feet of trench would be left open at any one time, or as allowed by permit requirements. At any one time, open trench lengths would not exceed that required to facilitate the installation of the duct bank. Steel plating would be placed over the trenches to maintain vehicular and pedestrian traffic across areas that are not under active construction. A typical drawing of the proposed underground construction activities is provided in Figure B.1-20 (Typical Underground Construction Process within Roadways).

The duct bank would be installed using open-cut trenching techniques. Most of the duct bank would have a single-circuit vertical configuration, as shown in Figure B.1-10 (Typical 12-kV Underground Duct Bank). Transitions to a flat configuration may be required in certain areas to clear substructures in highly congested areas, or to fan out to termination structures at the transition area.

The typical trench dimensions for installation of each duct bank would be between three to six feet deep and two to seven feet wide, depending on the necessary duct bank configuration. Depths may vary depending on soil stability and the presence of existing substructures. The trench would be widened and shored where necessary to meet California Occupational Safety and Health Administration requirements. A photograph of a typical 12-kV trenching installation with shoring is included as Figure B.1-21A (Typical 12-kV Trench Photograph).

Fill generated by excavation activities would be transported to an SDG&E-approved disposal site as described above in Section B.1.11.2 (Cleanup and Post-Construction Activities). Trenches would be dewatered using a portable pump if ground water is encountered. The water would be disposed of in

accordance with acquired permits. For a more detailed list of the permits and approvals necessary for the Proposed Project, see Section B.1.14 (Permits and Approvals). As described previously, traffic controls would also be implemented to direct local traffic safely around work areas. SDG&E would coordinate provisions for emergency vehicle and local access with local jurisdictions as necessary.

Duct Bank Installation

After the trenches for the underground 12-kV duct banks are completed, SDG&E would install the cable conduits (separated by spacers) and pour concrete around the conduits in the trenches to form the duct banks. The duct banks would typically consist of eight five-inch-diameter PVC conduits, which house the electrical cables, as shown in Figure B.1-10 (Typical 12-kV Underground Duct Bank) and in Figure B.1-21B (Typical 12-kV Duct Bank Photograph). The dimensions of the duct banks would be approximately 1.5 feet wide by 2.7 feet tall for a vertical configuration. The duct package would consist of a single 12-kV distribution circuit. Two four-inch conduits would also be installed within the distribution duct bank between the proposed Vine Substation and Kettner Substation for telecommunication purposes.

Once the PVC conduits are installed in the trench, engineered slurry backfill would be imported, placed, and compacted. A road base backfill or slurry concrete cap would be applied and the disturbed road surface would be restored in compliance with local permits. While the completed trench sections are being restored, additional trench would be opened farther down the street. This process would continue until the 12-kV distribution circuits are completed. Each duct bank would have a minimum of 30 inches of cover. Larger trenches would be excavated where vaults are installed, as described in the subsection that follows.

Radial clearance between the distribution duct bank and existing substructures would depend on the soil temperature surrounding the existing substructure. Where the distribution duct bank would cross other substructures that operate at normal soil temperature (e.g., gas lines, telephone lines, water mains, storm drains, and sewer lines), a minimal radial clearance of 12 inches would be required. A minimum radial clearance of 24 inches would be required when the duct bank would be installed parallel to other substructures. Ideally the distribution duct bank would maintain clearances of two to five feet from nearby substructures. Where the duct banks cross or run parallel to substructures that operate at temperatures significantly exceeding normal soil temperature (e.g., other underground power line circuits, primary distribution cables, steam lines, and heated oil lines), additional radial clearance may be required to preserve structural integrity and stability of the distribution duct bank. All work would be done in conformance with SDG&E's current construction and operating practices.

Vault Installation

SDG&E would excavate and install pre-formed concrete splice vaults during trenching for the 12-kV circuit duct banks. The proposed trench alignment and vault locations are shown on Figure B.1-3a-k (Detailed Project Components). The installation of each vault would require an excavation measuring approximately 11 feet by 7.5 feet by 29 feet. The vaults would be used to pull distribution and telecommunications cable through the conduits and splice the cables together during construction. During operation of the Proposed Project, the vaults would provide access to the underground cables for maintenance, inspections, and repairs.

Vaults would be constructed of prefabricated, steel-reinforced concrete and designed to withstand the maximum credible earthquake in the area and traffic loading. The installation process for each vault would occur over a one-week period, beginning with the excavation and shoring of the vault pit, followed by delivery and installation of the vault, filling and compacting the backfill, and repaving the excavated area where necessary. Vault dimensions are detailed above in Table B.1-3 (Vault Dimensions) and shown

in Figure B.1-11 (Typical 12-kV Underground Vault). Photographs of typical vaults similar to the type the Proposed Project would utilize are provided in Figure B.1-22 (Typical Type 3327 Vault and Installation Photographs).

Jack-and-Bore

SDG&E would use the horizontal jack-and-bore construction technique to install approximately 200 feet of proposed conduit near the intersection of West Palm Street and the MTS railroad tracks. Horizontal jack-and-bore is an auguring operation that simultaneously pushes a casing under an obstacle, while removing the displaced material using a rotating auger inside the pushed casing. Boring operations would begin with excavating pits at each end of the bore. The entry pit for the casing would measure approximately 40 feet by 12 feet and the exit or receiving pit would measure approximately 10 feet by six feet. The proposed bore pits would be between 10 and 20 feet deep, depending on the soil type and facilities that would be crossed. In addition, an approximately 30-foot-long section of the existing raised island in the roadway would be temporarily removed to maintain access for the surrounding businesses.

Once the bore pits are complete and shored, boring equipment would be delivered to the site and installed into the entry pit. It is anticipated that a 42-inch casing size made of either steel or a fiberglass-polymer mix would be used for the crossing. A 20-foot section of the casing would be lowered into the pit with the auger inserted and attached to the auguring machine. As the casing is bored toward the receiving pit, additional 20-foot sections of casing would be attached to the previous casing until the casing breaks through at the receiving pit. It is anticipated that water would be used to lubricate the auger during the boring process.

A conduit package, which consists of 12 five-inch PVC ducts supported by polyethylene spacers, would then be pulled through the casing. The casing would then be grouted to secure the conduit package. It is anticipated that between approximately 275 to 500 CY of material would be excavated during the jack-and-bore installation. Following the installation, the bore pits would be backfilled using native material, and the duct bank exiting the casing would be covered with at least 36 inches of slurry. All soil not used for backfill would be hauled off site and disposed of at an approved facility.

A depiction of a typical jack-and-bore installation is provided in Figure B.1-23 (Typical Jack-and-Bore Installation). SDG&E would secure the necessary permits to conduct these specialized construction activities and would implement standard best management practices, including silt fencing and straw wattles, in accordance with the Proposed Project's SWPPP.

Cable Pulling, Splicing, and Termination

After installation of the conduit, SDG&E would install three cables per distribution circuit in the duct banks. Each cable segment would be pulled into the duct bank, spliced at each of the vaults along the route, and terminated at the proposed Vine Substation. To pull the cable through the ducts, a cable reel would be placed at one end of the section and a pulling rig would be placed at the other end. A larger rope would then be pulled into the duct using a previously installed pull line and would be attached to the cable-pulling eyes to pull the cable into the duct. A lubricant would be applied to the cable as it enters the duct to decrease friction during pulling. Generally, the interior of the vault would be rigged with pulling shaves so that the pulling rope and cable enters the conduit in a straight line to avoid damage to the cable or the conduit (SDG&E, 2015c). The electric cables and the communication cable would be pulled through the individual ducts at the rate of two or three segments between vaults per day.

The vaults must be kept dry at all times to keep the unfinished splices dry and prevent other impurities from affecting the cables. Splicing typically takes between two and four hours per 12-kV circuit to complete (SDG&E, 2015a). At each end of the underground segment, the cables would rise out of the ground and terminate within the substation.

Cleanup and Post-Construction Restoration

Following completion of construction, all areas that are temporarily disturbed by the 12-kV distribution relocation activities would be restored to pre-construction conditions, to the extent practicable. Restoration would include the removal of all construction debris for recycling or disposal off site and repaving, as appropriate.

B.1.11.4 69-kV Loop-In

Work Areas

The 69-kV Loop-in would require an approximately 150-foot-long by 40-foot-wide temporary workspace along Vine Street to accommodate construction equipment and activities during the removal of the existing wood power line pole and associated guy pole. A second work area, approximately 100 feet long by 40 feet wide, would be established along California Street to remove a second wood pole. No grading or vegetation removal is anticipated as the poles are located within the existing sidewalk.

In order to install the three new poles that would facilitate the loop-in of TL604, two additional work areas would be established. The first work area would measure approximately 250 feet long by 55 feet wide and would be located along Pacific Highway. The work area would be located directly adjacent to the existing fence that separates Pacific Highway from the existing railroad ROW. This placement would require the closure of up to two lanes of traffic along the northbound direction of Pacific Highway during the installation of the new poles, conductor installation, and removal activities. The existing vegetation within this pole work area may be cleared to establish safe operating conditions for construction equipment. The second work area would be located adjacent to the existing distribution pole. The second work area would be used to facilitate the installation of a new power line pole for the 69-kV loop-in. This work area would measure approximately 130 feet long by 50 feet wide and would be placed within an existing parking lot along Pacific Highway. The work areas necessary for the 69-kV Loop-in are shown in Figure B.1-3a (Detailed Project Components).

Conductor installation and removal would require two additional work areas. The first work area would be located along Frontage Road and would measure approximately 80 feet long by 40 feet wide. The second work area would measure approximately 75 feet long by 40 feet wide. The work area would be located along Pacific Highway. The work areas necessary for conductor installation and removal are also detailed in Figure B.1-3a (Detailed Project Components).

Access

The 69-kV loop-in would primarily be accessed from Vine Street, California Street, and Pacific Highway. Access to the temporary work areas would be provided by overland travel from California Street and Vine Street within newly acquired ROW. No new permanent access roads would be constructed for the 69-kV loop-in. (SDG&E, 2014)

Clearing and Grading

Minimal grading and vegetation removal are anticipated for the 69-kV loop-in since the power line poles would be located adjacent to Pacific Highway. If vegetation removal is required, mowers would be used to clear the area required for pole installation. Material removed from the clearing site during construction would be spread over the existing area as appropriate, or would be disposed of off site in accordance with all applicable laws. The vegetation and habitat communities that exist at the potential clearing sites are discussed in Section B.3.4 (Biological Resources).

Wood Pole Removal

The existing wood pole removal would begin with crews dismantling the hardware on the existing poles using cranes and aerial manlifts. The old poles would be cut off at ground level and transported off site by flatbed truck for disposal at an approved facility. The base of the poles would be abandoned in place if they cannot be removed. If the base of the poles are removed, then the voids would be backfilled and compacted with native soil, and the surrounding area would be restored. Figure B.1-15 (Typical Existing 69-kV Wood Pole) serves as an example of the type of pole to be removed.

Steel Pole Removal

The existing steel guy pole and associated guy wires would be dismantled and removed by cranes and aerial manlifts. The pole and guy cables would be transferred to a flatbed truck using a small, truck-mounted crane. The material would then be transported off site for recycling or disposal at an approved facility. Once the pole has been removed, the reinforced concrete foundation for the steel guy pole would be jack-hammered to approximately 12 to 18 inches below grade. All debris located near the vicinity of the foundation would be removed from the site and would be recycled or disposed of at an approved facility. The remaining hole would then be backfilled with material similar to the surrounding area, and the site restored. Figure B.1-16 (Typical Existing Stub Guy Pole) serves as an example of the type of pole to be removed.

Steel Pole Installation

Foundations

Additional geotechnical investigations would be conducted prior to installation of the new subtransmission poles. Two eight-inch diameter borings, up to 35 feet deep, would be performed in the vicinity of the proposed pole locations (SDG&E, 2015a).

The three steel poles that would be installed as part of the Proposed Project would be placed on new drilled concrete pier foundations. Following the preparation of the pole work areas, the foundation process would begin with the excavation of a hole using a truck-mounted excavator with augers of various diameters to match the diameter and depth requirements of the foundation.

Each foundation hole would measure approximately nine feet in diameter and approximately 40 feet deep, requiring the excavation of 95 CY of soil, depending on the conditions determined during the geotechnical investigations. Following the excavation of the foundation hole, a reinforcing steel cage and anchor bolts would be assembled at one of the Proposed Project's staging areas, transported to the foundation site, and installed within the foundation hole.

After completing the cage installation, a form would be built and concrete would be poured to a height of approximately two feet above grade. Each foundation would require approximately 80 CY of concrete to be delivered to the foundation location. Concrete would be delivered directly to the pole's location in concrete trucks with a capacity of up to 12 CY. Steel plating would be placed over excavated areas, where appropriate, to maintain vehicular and pedestrian traffic

Pole Installation

Steel poles would be delivered in one or more sections to the pole installation sites via flatbed truck and assembled on site using a small, truck-mounted crane. The poles would typically have three crossarms, supporting one circuit on one side of the pole. The crossarms would be bolted to the pole, and the

insulators would then be bolted to the crossarms. After assembly, a large crane would be used to lift and set the poles into place on the anchor bolts embedded in the concrete foundation. The nuts on the foundation anchor bolts would then be tightened and secured to complete the installation. Figure B.1-17 (Typical Proposed 69-kV Tubular Steel Pole) shows a typical design of the poles to be installed.

Overhead Conductor Installation

Conductor-stringing operations would be facilitated with the installation of sheaves or "rollers" on the pole crossarms during using aerial manlifts (e.g., bucket trucks). The sheaves would allow the conductor to be pulled through each pole until the entire line is ready to be pulled up to the final tension position.

The installation would first begin with the placement of a pull rope in the sheaves. Once the rope is in place, it would be attached to a steel cable and pulled back through the sheaves. The conductor would then be attached to the cable and pulled back through the sheaves using conventional tractor-trailer pulling equipment located at the pull site. This process would be repeated for each conductor.

After the conductor is pulled into place, the sags between the structures would be adjusted to a pre-calculated level. The line would be installed with a minimum ground clearance of 35 feet from the ground to the lowest conductor. The conductor would then be clipped into the end of each insulator, the sheaves would be removed, and vibration dampers and other accessories would be installed. This process would be repeated for each conductor. A typical drawing of the conductor installation procedure is provided as Figure B.1-24 (Typical Overhead Conductor Installation).

The work areas located along Pacific Highway would be used to facilitate the pulling activities. These work areas would be used to load the tractors and trailers with reels of conductors, and the trucks with tensioning equipment. These sites would also be used to collect conductor after it is removed from the existing lines and placed onto reels for transport off site. Figure B.1-3a-k (Detailed Project Components Map) details the locations of the work areas.

Dewatering

Previous cable underground projects in the region have not encountered water during construction activities (SDG&E, 2015c). Due to this prior knowledge, no dewatering is anticipated during construction. However, in the event that groundwater is encountered, it would potentially occur during construction of the duct bank, handhole installation for the 12-kV distribution circuits and telecommunication system extension, or foundation excavation for the 69-kV loop-in. Should dewatering be necessary, the following construction dewatering procedures would be implemented during construction:

- A submersible pump would be installed.
- The groundwater would be pumped to a desiltation tank (i.e., baker tank) for sediment and filtering. Baffles would be installed in the tank to increase sedimentation, and the water in the tank would be allowed to flow out from the opposite end for testing.
- The water would then be tested to ensure compliance with the Regional Water Quality Control Board (RWQCB) National Pollutant Discharge Elimination System requirements. If the water quality does not meet permit requirements, additional baker tanks would be used and/or additional treatment or filtering would be performed until the applicable requirements are met.
- The water would be disposed of at an approved SDG&E disposal site.

Cleanup and Post-Construction Restoration

With the exception of areas around poles that would be kept clear of shrubs and other obstructions for inspection and maintenance purposes, all other areas that are temporarily disturbed would be restored to pre-construction conditions, to the extent practicable, following the completion of the 69-kV loop-in. Post-construction restoration would include grading to original contours, reseeding, and repairing the current pavement, as appropriate. This process will be completed using the personnel identified in Table B.1-7 (Construction Personnel Requirements) and with the equipment identified in Table B.1-6 (Construction Equipment Requirements). The drainage patterns in the Proposed Project area will be returned to near pre-construction conditions (SDG&E, 2015a).

B.1.11.5 Fiber Optic Telecommunication System Construction

As described in Section B.1.10.4 (Telecommunication System Extension), new fiber optic cable would be installed from an existing underground vault located on Pacific Highway to the proposed Vine Substation. The new fiber-optic cable would also be installed from the proposed Vine Substation to the Kettner Substation. The connection from Pacific Highway to the proposed Vine Substation would be located in an overhead configuration along a new power line ROW, while the connection between the proposed Vine substation and Kettner Substation would be located in a new underground duct bank constructed during the 12-kV distribution relocation. An existing AT&T telephone line at the proposed Vine Substation site would be upgraded and relocated from the existing service to the new substation. The connection would originate from one of three locations located along the perimeter of the proposed Vine Substation site as depicted in Figure B.1-3a (Detailed Project Components). The final location of the telephone line connection would be determined during final engineering and through additional coordination with AT&T.

Underground Duct Bank

The fiber-optic telecommunication extension would be installed within approximately 2,850 feet of new underground duct banks constructed along Kettner Boulevard between the proposed Vine Substation and Kettner Substation as part of the 12-kV circuit relocation work. Approximately 100 additional feet of new underground duct bank would be constructed between an existing handhole located within Pacific Highway and one of the new TSPs that would be installed as part of the 69-kV loop-in. The underground duct banks, where the telecommunications system would be installed, would include two additional four-inch-diameter PVC conduits as depicted in Figure B.1-10 (Typical 12-kV Underground Duct Bank). The construction methods used to install the underground duct banks for the fiber-optic telecommunication system extension would be similar to those discussed above in Section B.1.11.3 under “Duct Bank Installation.”

In locations where duct banks contain both fiber-optic telecommunication lines and 12-kV distribution lines and a vault is required, a separate underground duct bank comprised of two four-inch-diameter PVC conduits encased in a slurry mixture would be used to separate the telecommunication cable and route it around the vault to a handhole. This separate underground telecommunication duct bank would be approximately 3 feet tall and 1.5 feet wide. A typical drawing of the proposed underground duct bank is provided in Figure B.1-18 (Typical Telecommunication Underground Duct Bank).

Approximately four underground handholes would be installed along the duct bank to facilitate pulling and splicing during construction and inspection, maintenance, and repair during operation. These precast concrete handholes measure approximately 44 inches long, 32 inches wide, and 24 inches deep. A typical drawing of the proposed telecommunication handhole is provided in Figure B.1-19 (Typical

Telecommunication Underground Handhole). The proposed locations of these facilities are depicted in Figure B.1-3a-k (Detailed Project Components).

B.1.12 Operation and Maintenance

B.1.12.1 Proposed Vine 69/12-kV Substation

Once the proposed Vine Substation is constructed and placed in service, it would be unmanned. The proposed Vine Substation would be monitored and controlled by SDG&E's Remote Control Center. As described in Section B.1.10.2 (Substation Perimeter), a boundary wall would be constructed around the proposed Vine Substation and all access gates would be locked to prevent unauthorized entry. In addition, signage would be posted on the substation's exterior and at the entryway to restrict entry to authorized SDG&E personnel.

Ongoing maintenance would involve testing, monitoring, and repair of the equipment, as well as emergency and routine operations. Operation and maintenance (O&M) activities would be performed by current SDG&E employees (SDG&E, 2015b). Routine maintenance is expected to require approximately six trips per year by a two- to four-person crew. Routine operations would require one or two workers in a light utility truck to visit the substation on a daily or weekly basis. It is anticipated that one annual major maintenance inspection would occur, requiring an estimated 10 personnel. It is anticipated that this inspection would take approximately one week to complete. This procedure would include a full inspection of the 69-kV circuit breakers and may include an overhaul of the 69/12-kV transformer load tap control settings. The crews would access the site using standard construction pick-up trucks and line trucks via existing access routes. The line trucks would carry the maintenance tools necessary for inspections. A majority of the inspections would be visual in nature. The work would generally be conducted between the hours of 7:00 a.m. and 7:00 p.m. (SDG&E, 2015a). Nighttime maintenance activities are not expected to occur more than once a year.

Landscape maintenance would occur on an as-needed basis for purposes of enhancing the streetscape along the perimeter of the substation and for safety and/or access. Such activities would generally require the presence of one to two maintenance vehicles and one or more employees to clear and/or trim vegetation to ensure that an adequate working space is maintained around the substation facilities.

B.1.12.2 12-kV Distribution Relocation

Maintenance requirements for the 12-kV distribution may include replacement of damaged cables or connectors. Maintenance crews would consist of four to six personnel and require a tool truck, cable truck, assist truck, and/or trouble shooter truck. Routine inspections would occur annually to identify connection problems and inspect for equipment degradation.

B.1.12.3 69-kV Loop-In

It is anticipated that the power line circuit that loops into the substation would be inspected once per year. Non-emergency major maintenance may include activities such as the replacement of damaged insulators. Maintenance crews may consist of as many as four people and may require a tool truck, an assist vehicle, and a large bucket lift truck. Polymer insulators have been selected for the Proposed Project and do not require washing (SDG&E, 2015a).

Operations and maintenance activities for the 69-kV loop-in would include routine inspection, maintenance, and repair activities. Both routine preventive maintenance and emergency procedures would occur in order to ensure that integrity of the system is maintained over the long term. Inspections

may occur through ground patrols visiting the facilities. At a minimum, such routine inspections would occur annually to identify potential corrosion, equipment misalignment, loose fittings, and/or other mechanical problems.

B.1.12.4 Telecommunication System Extension

Typically, ongoing or routine maintenance activities for a fiber optic telecommunications cable is not required. As a result, the only activities associated with the operation and maintenance of this Proposed Project component would stem from emergency repairs or future changes to the fiber optic network design.

B.1.13 Applicant-Proposed Measures

In addition to the above Project design features and ordinary construction/operating restriction included as part of the Proposed Project, SDG&E would also incorporate applicant-proposed measures (APMs) developed by SDG&E specifically for the Proposed Project. Table B.1-11 (Applicant-Proposed Measures) identifies the APMs and indicates which Proposed Project component they apply to. These measures are considered part of the Proposed Project and are considered in the evaluation of environmental impacts. CPUC approval would be based upon SDG&E adhering to the Proposed Project as described in this document, including this project description and the APMs, as well as any adopted mitigation measures.

Implementation of Applicant-Proposed Measures

As described by SDG&E in the PEA, SDG&E would be responsible for overseeing the assembly of construction and environmental teams that would implement and evaluate the Proposed Project APMs. SDG&E maintains an environmental compliance management program to allow for implementation of the APMs to be monitored, documented, and enforced during each Proposed Project phase, as appropriate. All those contracted by SDG&E to perform this work would be contractually bound to properly implement the APMs to ensure their effectiveness in reducing potential environmental effects.

Implementation of the proposed APMs would be the responsibility of the environmental compliance team. The team would include an environmental project manager, resource specialists, and environmental monitors. All APMs would be implemented consistent with applicable federal, State, and local regulations. The environmental compliance team would be responsible for the inspection, documentation, and reporting of SDG&E compliance with all APMs as proposed. Environmental specialists would be retained as needed to verify that all APMs are properly implemented during the construction phase.

If conditions occur where construction may potentially adversely affect a known or previously unknown environmentally sensitive resource, or if construction activities significantly deviate from Proposed Project requirements, SDG&E monitors and/or contract administrator(s) would have the authority to halt construction activities until an alternative method or approach can be identified. Any concerns that arise during implementation of the APMs would be communicated to the appropriate authority to determine if corrective action is required, or the concerns would be addressed on site, as applicable.

As the proposed APMs are implemented, environmental monitors from SDG&E would be responsible for the review and documentation of such activities. Field notes and digital photographs would be used to document and describe the status of APMs as necessary.

Table B.1-11: Applicant Proposed Measures

APM Number	Description	Justification	Proposed Project Component			
			Proposed Vine 69/12-kV Substation	12-kV Distribution Relocation	69-kV Loop-In	Telecommunication System Extension
BIO-01	A nighttime emergent bat survey will be conducted no more than five days prior to the removal of the palm trees located on the proposed Vine Substation Site. During This survey, an AnaBat System will be used to detect bat activity in the vicinity of the trees, and the trees will be visually monitored for the emergence of bats. This survey will be conducted from 30 minutes prior to sunset to 90 minutes after sunset. Following the survey, the tree removal will proceed as follows: -If no bats are detected during the emergent survey, the trees will be removed within five days. If the trees are not removed within five days, the emergent survey will be repeated. -If bats are detected in the trees outside of the pupping season (typically April through July), emergent surveys will be repeated. If no bats are detected for two consecutive nights, the trees will be removed within five days. If the trees are not removed within five days, the emergent survey will be repeated. -If bats are detected in the trees during the pupping season, tree removal will wait until the end of pupping season and the emergent surveys will be repeated. In addition to the above pre-construction survey SDG&E will perform quarterly day/night emergent surveys (one night each quarter) between now and the start of construction to confirm presence/absence of bats at each palm tree.	Based on recent scientific studies and observations, several bat species have been known to utilize palm trees for roosting. A suitable prey base (in the form of insects) exists due to the abundant use of artificial nighttime lighting in the vicinity of the proposed Vine Substation site.	Yes	No	No	No
CUL-01	An archaeological monitor(s) familiar with the types of prehistoric and historic resources that could be encountered within the Project area will be present during ground-disturbing activities associated with the Vine Substation. In addition, an archaeological monitor(s) will be present during all trenching activities associated with the underground 12-kilovolt lines along Kettner Boulevard. In the event that cultural resources are discovered, the archaeological monitor will have the authority to divert or temporarily halt ground disturbance to allow evaluation of the potentially significant cultural resources. The archaeological monitor will contact SDG&E's Cultural Resource Specialist and Environmental Project Manager at the time of discovery. The archaeological monitor, in consultation with SDG&E's Cultural Resource Specialist, will determine the significance of the discovered resources. SDG&E's Cultural Resource Specialist and Environmental Project Manager must concur with the evaluation procedures to be performed before construction activities in the vicinity of the discovery are allowed to resume. For significant cultural resources, a Research Design and Data Recovery Program would be prepared and carried out to mitigate impacts. All collected cultural remains will be cleaned, cataloged, and permanently curated with an appropriate institution. All artifacts will be analyzed to identify function and chronology as they relate to the history of the area. Faunal material will be identified to the species level. If locomotive and/or electric rails are discovered during construction and fall within a recommended period of significance, and cannot be preserved in place, they will be immediately documented using standard documentation. All materials that cannot be preserved in place will be offered to the Pacific Southwest Railway Museum for preservation. If preservation is not feasible, the monitor will	This measure ensures that ground-disturbing activities are monitored so that impacts can be mitigated through proper investigation and recovery of cultural resources.	Yes	Yes	Yes	Yes

Table B.1-11: Applicant Proposed Measures

APM Number	Description	Justification	Proposed Project Component			
			Proposed Vine 69/12-kV Substation	12-kV Distribution Relocation	69-kV Loop-In	Telecommunication System Extension
	photograph, map and document the location of the resource and summarize the results in a Department of Parks and Recreation (DPR 523) form that will be submitted to the South Coastal Information Center (SCIC). A monitoring results report—which includes appropriate graphics and describes the results, analyses, and conclusions of the monitoring program—will be prepared and submitted to SDG&E's Cultural Resource Specialist and Environmental Project Manager following completion of the program. Any cultural sites or features encountered will be recorded on appropriate Department of Parks and Recreation forms. All forms and reports will be submitted to the SCIC at San Diego State University and to the City of San Diego Development Services Department.					
CUL-02	A paleontological monitor will be on site to observe excavation operations that involve the original cutting of deposits with high paleontological resource sensitivity (i.e., Bay Point Formation) to depths greater than 3.5 feet. In the event that fossils are encountered, the paleontological monitor will have the authority to divert or temporarily halt construction activities in the area of discovery to allow the recovery of fossil remains. The paleontological monitor will contact SDG&E's Cultural Resource Specialist and Environmental Project Manager at the time of discovery. The paleontologist, in consultation with SDG&E's Cultural Resource Specialist, will determine the significance of the discovered resources. SDG&E's Cultural Resource Specialist and Environmental Project Manager must concur with the evaluation procedures to be performed before construction activities are allowed to resume. When fossils are discovered, a paleontologist (or the paleontological monitor) will recover them, along with pertinent stratigraphic data. Fossil remains collected during monitoring and salvage would be cleaned, repaired, sorted, cataloged, and deposited in a scientific institution with permanent paleontological collections. A final summary report will be completed that outlines the results of the mitigation program. The report will discuss the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.	This measure ensures that excavation in areas containing Pleistocene-age deposits of the Bay Point Formation and Lindavista Formation are monitored so that impacts can be mitigated through proper investigation and recovery of cultural resources.	Yes	Yes	Yes	Yes
HAZ-01	Prior to approval of the final construction plans for the Proposed Project, a project-specific Hazardous Materials and Waste Management Plan will be prepared for the construction phase of the Proposed Project to ensure compliance with all applicable federal, state, and local regulations. The Hazardous Materials and Waste Management Plan will reduce or avoid the use of potentially hazardous materials for the purposes of worker safety, protection from groundwater contamination, and proper disposal of hazardous materials. The plan will include the following information related to hazardous materials and waste, as applicable: ▪ A list of the hazardous materials that will be present on site during construction, including information regarding their storage, use, and transportation; ▪ Any secondary containment and countermeasures that will be required for	The Hazardous Materials and Waste Management Plan will reduce or avoid the use of potentially hazardous materials for the purposes of worker safety, protection from groundwater contamination, and proper disposal of hazardous materials.	Yes			

Table B.1-11: Applicant Proposed Measures

APM Number	Description	Justification	Proposed Project Component			
			Proposed Vine 69/12-kV Substation	12-kV Distribution Relocation	69-kV Loop-In	Telecommunication System Extension
	onsite hazardous materials, as well as the required responses for different quantities of potential spills; ▪ A list of spill response materials and the locations of such materials at the Proposed Project site during construction; ▪ A list of the adequate safety and fire suppression devices for construction activities involving toxic, flammable, or exposure materials; ▪ A description of the waste-specific management and disposal procedures that will be conducted for any hazardous materials that will be used or are discovered during construction of the Proposed Project; and ▪ A description of the waste minimization procedures to be implemented during construction of the Proposed Project.					

Source: SDG&E, 2014 (Table 3-8); SDG&E, 2015a (APM BIO-01); SDG&E, 2015e (APM CUL-01 revised).

Project Design Features

The Proposed Project includes design features and ordinary construction and operating restrictions that avoid and minimize environmental impacts. The design features and ordinary construction and operating restrictions incorporated into the Proposed Project include measures that are routinely implemented by SDG&E on other projects that involve ground disturbance. Many of these features and restrictions have been developed over time to avoid and minimize environmental impacts, to comply with SDG&E's Subregional Natural Community Conservation Plan (NCCP – PEA Attachment 4.4-C), and to comply with applicable environmental laws and regulations. Consistent with its existing practices, SDG&E would implement these operating restrictions as appropriate during construction, operation, and maintenance to avoid and minimize potential environmental impacts.

A description of many of the design features and ordinary construction and operating restrictions incorporated into all phases of the Proposed Project follows.

- Safety and Environmental Awareness Program. SDG&E would prepare a Safety and Environmental Awareness Program (SEAP) for project-personnel. The SEAP may include training for relevant topics such as:
  - General safety procedures,
  - General environmental procedures,
  - Fire safety,
  - Biological resources,
  - Cultural resources,
  - Paleontological resources,
  - Hazardous materials protocols and BMPs, and
  - Storm Water Pollution Prevention Plan (SWPPP).

The program would include a multi-level approach that is commensurate to each worker's role on the Proposed Project. Supervisors, including construction foremen, would be required to actively participate in a training session to identify the specific requirements of the Proposed Project. SDG&E crews and other staff would also be given training and a review of the Proposed Project requirements prior to the commencement of any grading or construction work.

- **Galvanized Steel Structures.** New structures would utilize galvanized steel to avoid potential adverse effects due to high moisture content in coastal areas. The dulled aspect of the galvanized steel poles would also minimize the potential for visual impacts relating to glare.
- **Aerial Marking**. SDG&E would consult with the FAA concerning aerial marking and lighting requirements for all new overhead facilities. As required, lighting and aerial marking would be added to applicable overhead facilities, including new structures. The FAA confirmed on October 8, 2014 that the proposed TSPs will not require marking or lighting. The FAA's determination is valid for 18 months, at which point SDG&E can apply for a one-time 18-month extension, if necessary (SDG&E, 2015a).
- **Construction Scheduling**. To the greatest extent practical, SDG&E would plan construction of the Proposed Project such that any potential overlap with other SDG&E projects would be coordinated such that net impacts would be minimized.

- **Hazardous Materials**. SDG&E would address potential impacts relating to the handling and use of hazardous materials through compliance with numerous state and federal regulations, including, but not limited to:
  - Federal Occupational Safety and Health Administration (OSHA) regulations for worker safety in hazardous material remediation and hazardous waste operations (29 CFR Section 1910.120),
  - Federal OSHA regulations hazard communication for workers (29 CFR Section 1910.1200),
  - Federal OSHA regulations for toxic air contaminants for workers (29 CFR Section 1910.1000),
  - CalOSHA regulations for worker safety in hazardous material remediation and hazardous waste operations (8 California Code of Regulations [CCR] 5192),
  - CalOSHA regulations for hazard communication for workers (8 CCR 5194), and
  - Department of Toxic Substances Control (DTSC) regulations implementing Resource Conservation and Recovery Act of 1976 (RCRA) and the California Hazardous Waste Control Law (HWCL) (22 CCR Division 4.5).
- **Health and Safety Plan.** SDG&E will prepare and implement a Health and Safety Plan to guide construction workers on how to properly manage any contamination discovered during construction. (SDG&E, 2014, p. 4.8-13)
- **SDG&E Subregional NCCP**. The Proposed Project would avoid and minimize impacts to biological resources through implementation of the SDG&E Subregional NCCP. The SDG&E Subregional NCCP establishes a mechanism for addressing biological resource impacts incidental to the development, maintenance, and repair of SDG&E facilities within the SDG&E Subregional NCCP coverage area.
- **SDG&E Water Quality Construction BMP Manual**. SDG&E's Water Quality Construction BMPs Manual (BMP Manual – PEA Attachment 4.8-B) organizes and presents SDG&E's standard water quality protection procedures for various specific actions that routinely occur as part of SDG&E's ongoing construction, operation, and maintenance activities. The primary focus of most BMPs is the reduction and/or elimination of potential water quality impacts during construction. The BMPs described within the BMP Manual were derived from several sources including the State of California guidelines as well as the California Department of Transportation (Caltrans) Water Quality BMPs.
- **Erosion and Sediment Control and Pollution Prevention During Construction**. Projects that disturb one acre or more of soil are required to obtain coverage under the California SWRCB's General Permit for Storm Water Discharges Associated with Construction Activity Order No. 2009-0009-DWQ (Construction General Permit). To obtain coverage under the Construction General Permit, Permit Registration Documents, including a Notice of Intent, SWPPP, risk assessment, site map, certification, and annual fee, must be submitted electronically to the SWRCB, and a Waste Discharger Identification number must be assigned prior to initiating construction activities. The SWPPP would include the following:
  - Identification of pollutant sources and non-storm water discharges associated with construction activity
  - Specifications for BMPs that would be implemented, inspected, and maintained during Proposed Project construction to minimize erosion, the potential for accidental releases, and pollutants in the runoff from the construction areas (including pollutants from storage and maintenance areas, as well as laydown areas for building materials)
  - Specifications for spill response and implementation

  - A record of training provided to persons responsible for implementing the SWPPP
  - Reporting and record-keeping requirements

- **Hazardous Waste and Spill Prevention.** During construction, the San Diego RWQCB would oversee and inspect for compliance with the Construction General Permit for the SWRCB. In addition, a Hazardous Materials Business Plan (HMBP) and Spill Prevention, Control, and Countermeasure Plan (SPCC) would be prepared prior to construction of the Proposed Project, and would be implemented during construction to ensure that any potential release or spill of hazardous materials is properly handled. All non-hazardous soil and grub material that would be transported off site may be disposed of at the Miramar Landfill (5180 Convoy Street, San Diego, CA), located approximately 7.2 miles northeast of the proposed Vine Substation (approximately 12.4-mile one-way trip distance [SDG&E, 2015d]). All other construction waste (i.e., refuse, spoils, trash, oil, fuels, poles, pole structures, etc.) would be disposed of properly and in accordance with all applicable federal, State, and local laws regarding solid and hazardous waste disposal.
- **Temporary Lighting**. Temporary lighting at staging and storage areas would be directed on site and away from any sensitive receptors.
- **Visual Screening of Staging Yard**. Where the proposed Vine Substation is visible to the public, opaque mesh or slats (or equivalent material) would be installed along a temporary six-foot tall construction fence that would soften the view of the site from roads, residences, and other public vantage points.
- **Materials.** Non-specular conductor and galvanized steel poles would be used in order to reduce potential glare.
- **Restoring Appearance of Temporarily Disturbed Areas**. When Proposed Project construction has been completed, all temporarily disturbed terrain would be restored, as needed and as appropriate, to approximate pre-construction conditions.
- **Soil Stabilization**. Disturbed areas must be stabilized per the SWPPP.
- **Fugitive Dust Control**. All unpaved construction areas would be watered up to two times daily during construction to reduce dust emissions and to meet SDAPCD Rule 55 requirements. SDG&E or its contractor would keep the construction area sufficiently dampened to control dust caused by construction and hauling, and would provide at all times reasonable dust control of areas subject to windblown erosion.
- **Bulk Material Transport**. All loads would be secured by covering or be sufficiently watered and use of at least two feet of freeboard to avoid carry-over. Bulk material transport will include the removal of spoils from excavation activities during remedial grading and duct bank installation, as well as the import of fill during site development activities. The bed of all trucks hauling this material will be covered with a tarp or similar material. If a cover is not used, the material will be sufficiently watered and at least two feet of freeboard will be maintained to avoid carry-over (SDG&E, 2015b).
- **Equipment Emissions**. SDG&E or its contractor would maintain and operate construction equipment to minimize exhaust emissions. During construction, trucks and vehicles in loading and unloading queues would have their engines turned off after five minutes when not in use. Construction activities would be phased and scheduled to avoid emission peaks, and equipment use would be curtailed during second-stage smog alerts.
- **Volatile Organic Compound (VOC) Reduction**. Low- and non-VOC-containing coatings, sealants, adhesives, solvents, asphalt, and architectural coatings would be used to reduce VOC emissions.

- **Mufflers**. Functioning mufflers would be maintained on all equipment.
- **Resident Notification**. Residents within 300 feet of the Proposed Project would receive notification of the start of construction at least one week prior to the start of construction activities within that area.
- **Construction Noise**. For locations where the Proposed Project could exceed the noise ordinances, SDG&E would meet and confer with the City of San Diego to discuss temporarily deviating from the requirements of the Noise Ordinance.
- **Standard Traffic Control Procedures**. SDG&E would implement traffic control plans to address disruption of traffic circulation during construction activities and address any safety issues. These traffic control plans would be prepared by the project engineer or contractor and subject to approval by the appropriate jurisdictional agency, such as the City of San Diego.
- **Encroachment Permits**. SDG&E would obtain the required encroachment permits from the City of San Diego for work within City streets (see Table B.1-12) and would ensure that proper safety measures are in place while construction work is occurring within and near public roadways. These safety measures include the use of flagging, proper signage, and orange cones to alert the public to construction activities near and within the roadway.

B.1.14 Permits and Approvals

The CPUC is the lead California agency for the Proposed Project. SDG&E must comply with the CPUC's GO No. 131-D Section III-B, which contains the permitting requirements for the construction of the Proposed Project. In addition to the Permit to Construct, SDG&E is required to obtain a number of other permits from federal, state, and local agencies. Table 3-11: Permit, Approval, and Consultation Requirements lists the permits, approvals, and licenses that SDG&E anticipates obtaining from jurisdictional agencies.

Table B.1-12: Permit, Approval, and Consultation Requirements

Agency	Permit, Approval, or Consultation	Jurisdiction/Purpose
Federal Agencies		
USFWS	Implementation of SDG&E's NCCP	Activities within NCCP coverage areas that impact biological resources (required only for review of the Proposed Project, and no approval or permit is involved)
State Agencies		
CPUC	Permit to Construct	Overall project approval and California Environmental Quality Act (CEQA) review
SWRCB	National Pollutant Discharge Elimination System General Construction Permit	Storm water discharges associated with construction activities disturbing more than one acre of land
CDFW	Implementation of SDG&E's NCCP	Activities within NCCP coverage areas (required only for the review of Proposed Project, no approval or permit is involved)
Local Agencies		
North County Transit District (NCTD)	Right-of-Entry permit	Access to NCTD Property during construction
MTS	Right-of-Entry Permit	Access to MTS property during construction

Table B.1-12: Permit, Approval, and Consultation Requirements		
Agency	Permit, Approval, or Consultation	Jurisdiction/Purpose
MTS	License Agreement	Operation and maintenance within, under, or over a railroad ROW.
Burlington North Santa Fe (BNSF) Railway	Temporary Occupancy Agreement	Access to BNSF property during construction
BNSF Railway	Utility Agreement License	Operation and maintenance, within, under, or over a railroad ROW
City of San Diego	Encroachment Permit	Construction, operation, and maintenance within, under, or over city or county road ROW
City of San Diego	Grading Permit	On-site grading activities
City of San Diego	Noise Abatement and Control Administrator Permit	For work occurring after 7:00 p.m.
City of San Diego	Traffic Management Plan	SDG&E will submit the plan to the City of San Diego prior to construction and will abide by the requirements set forth in the permit as it pertains to ingress and egress routes.

Source: SDG&E, 2014 (Table 3-7), 2015a.

Right of Way Requirements

As described previously, SDG&E currently owns the approximately 1.5-acre parcel on which the proposed Vine Substation would be constructed; therefore, no new ROW would be required to install this Proposed Project component. Because the new and relocated 12-kV distribution circuits and underground portions of the telecommunication system extension would be placed entirely within City of San Diego public streets, they would occupy the franchise position and no new ROW would be obtained. SDG&E would obtain a License Agreement from MTS for the approximately 80 feet of new, approximately 320-foot-wide ROW for the overhead 69-kV loop-in conductors. The remainder of the 69-kV loop-in would be installed within the franchise position of City of San Diego public streets.

PROJECT DESCRIPTION FIGURES

Figure B.1-1: Project Location Map

Proposed Vine 69/12 kV Substation
Existing Kettner Substation
Existing 69 kV Overhead
Existing 69 kV Overhead to be Removed
Proposed 69 kV Overhead
Existing 12 kV Duct Bank
Proposed 12 kV Duct Bank
Proposed 12 kV and Telecommunications Duct Bank
Proposed Telecommunications Duct Bank

Source: SDG&E,2015b

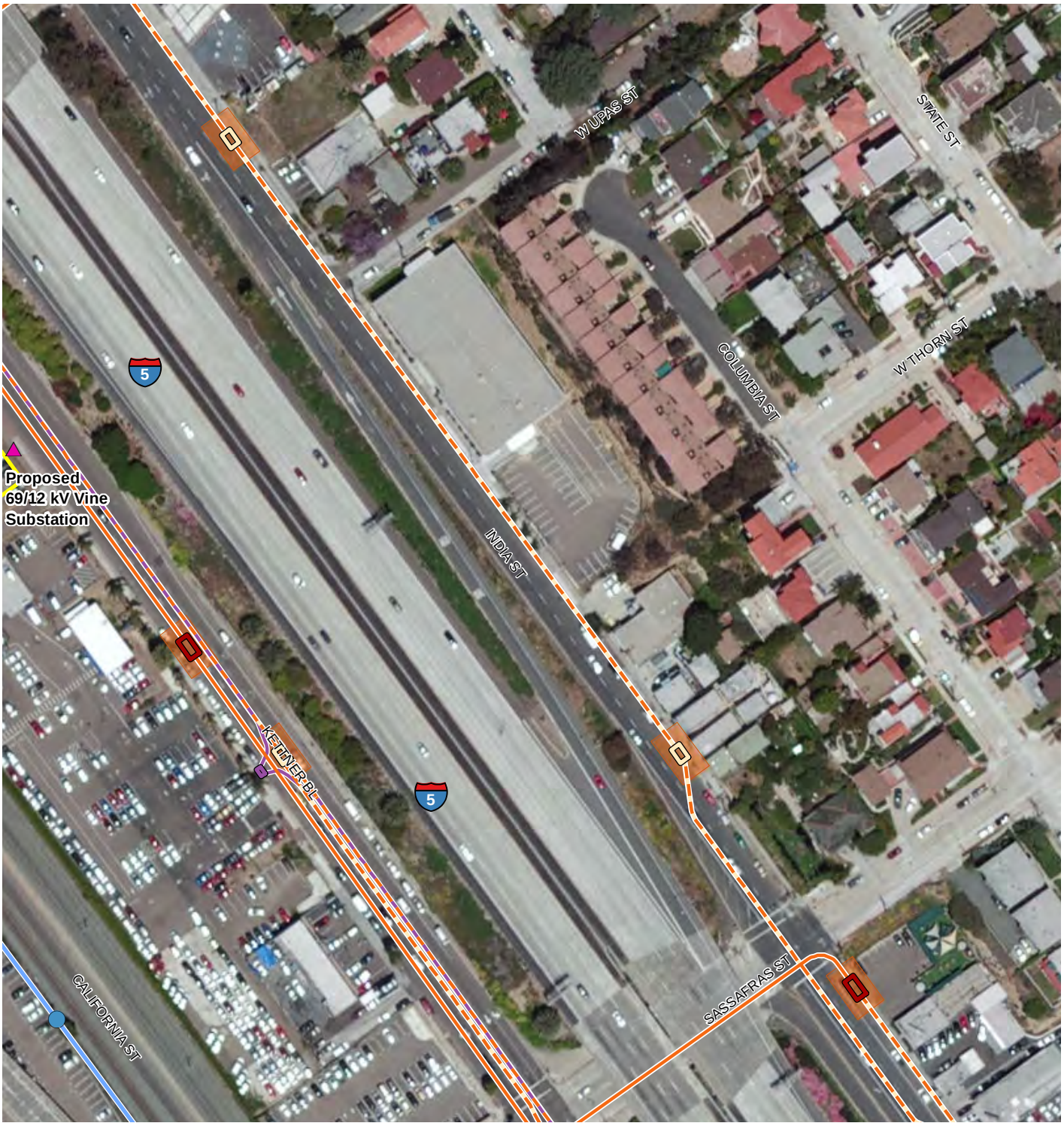
1:8,000
0 500 1,000 Feet

Figure B.1-2: Project Overview Map

Source: SDG&E,2015b

1:1,600
0 100 200 Feet

Figure B.1-3a: Detailed Project Components



Source: SDG&E,2015b

1:1,600
0 100 200 Feet

Figure B.1-3b: Detailed Project Components

Source: SDG&E,2015b

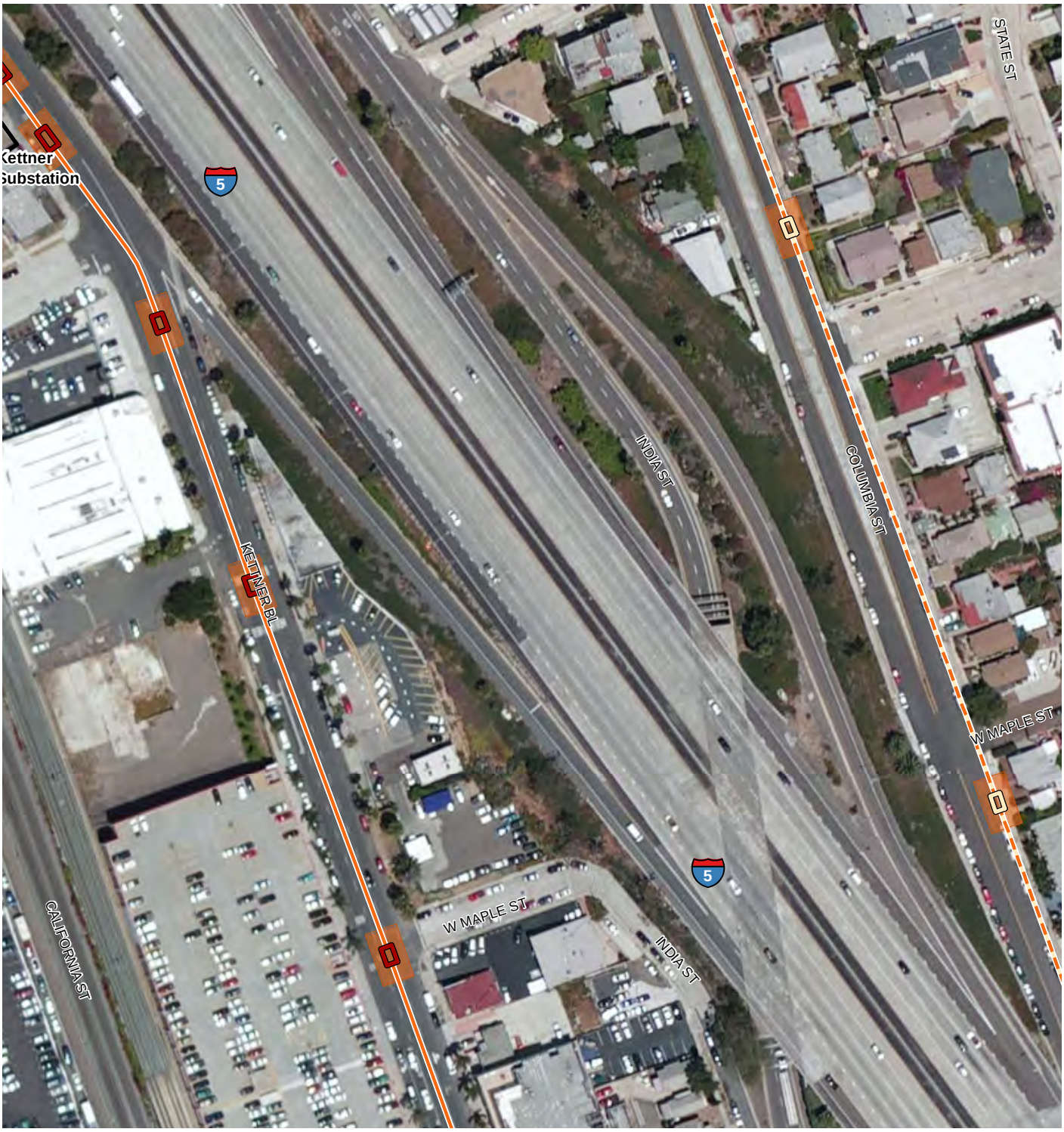
1:1,600
0 100 200 Feet

Figure B.1-3c: Detailed Project Components

Source: SDG&E,2015b

1:1,600
0 100 200 Feet

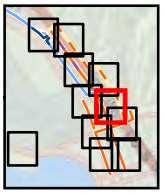
Figure B.1-3d: Detailed Project Components



Proposed Vine 69/12 kV Substation
Existing Kettner Substation
Transmission Work Area
Jack-and-Bore Work Area
Existing 12 kV Distribution Vault
Proposed 12 kV Distribution Vault
Proposed Telecommunication Handhole
Proposed 12 kV Distribution Pull Site

Existing Pole
Install New TSP
Replace Existing Pole with TSP
Remove Existing Pole
Remove Existing Stub Guy Pole
Potential AT&T Interconnection Point
Proposed Capacitor Bank
Proposed Switch

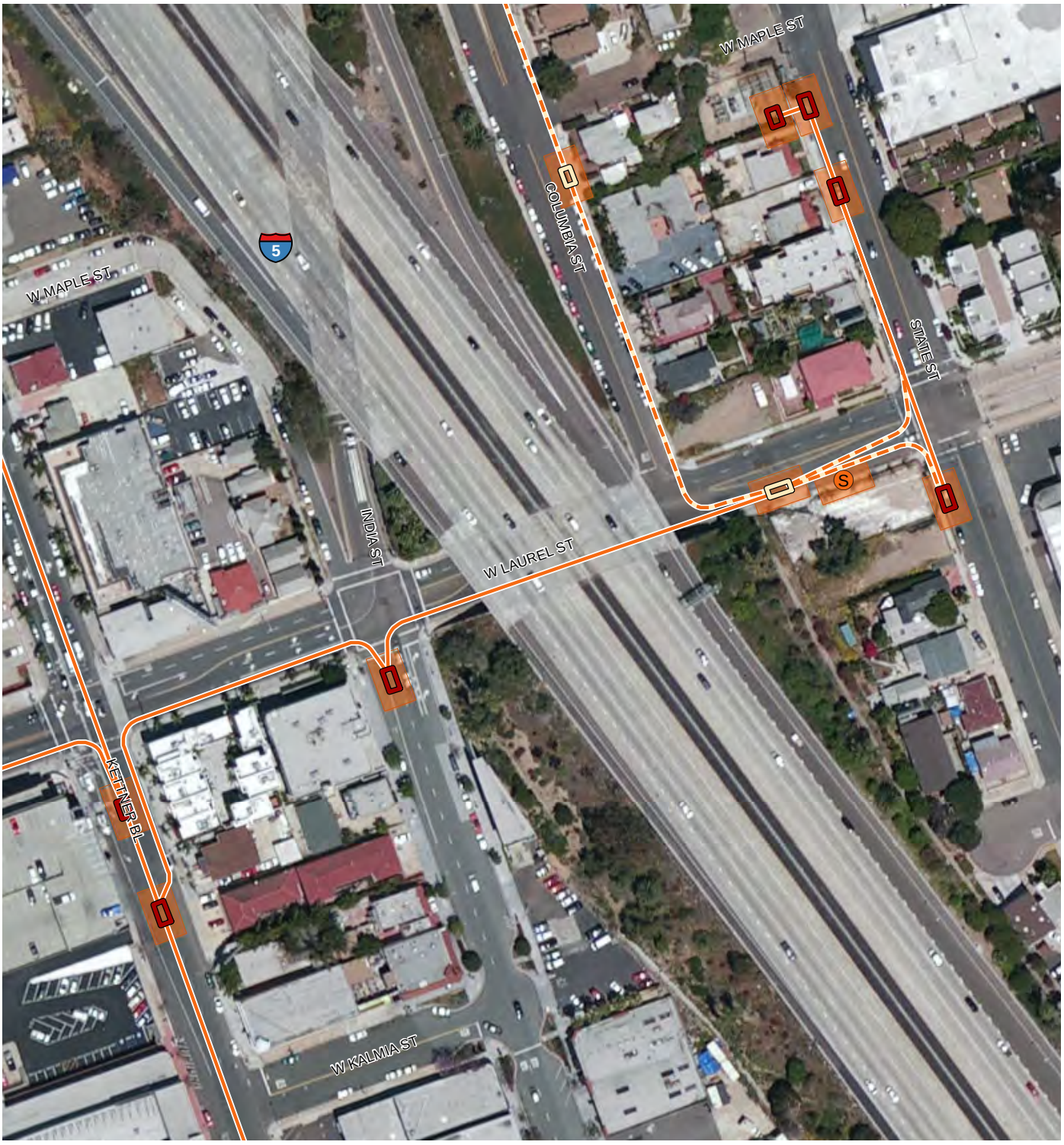
Existing 69 kV Overhead
Existing 69 kV Overhead to be Removed
Proposed 69 kV Overhead
Existing 12 kV Duct Bank
Proposed 12 kV Underground
Proposed 12 kV and Telecommunications Duct Bank
Proposed Telecommunications Duct Bank



Source: SDG&E,2015b

1:1,600
0 100 200 Feet

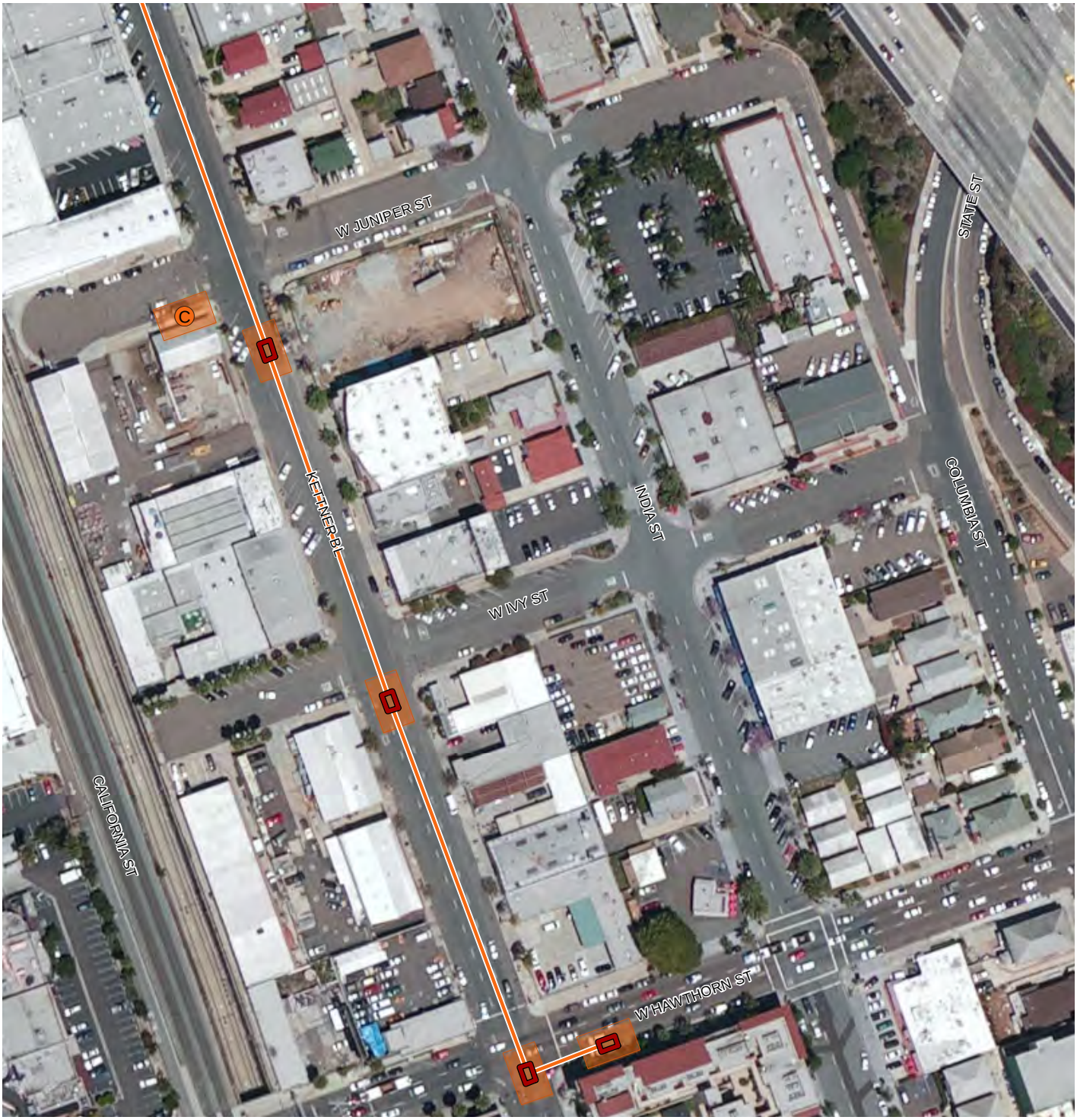
Figure B.1-3e: Detailed Project Components



Source: SDG&E,2015b

1:1,600
0 100 200 Feet

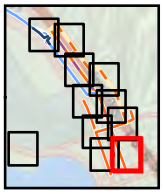
Figure B.1-3f: Detailed Project Components



Proposed Vine 69/12 kV Substation
Existing Kettner Substation
Transmission Work Area
Jack-and-Bore Work Area
Existing 12 kV Distribution Vault
Proposed 12 kV Distribution Vault
Proposed Telecommunication Handhole
Proposed 12 kV Distribution Pull Site

Existing Pole
Install New TSP
Replace Existing Pole with TSP
Remove Existing Pole
Remove Existing Stub Guy Pole
Potential AT&T Interconnection Point
Proposed Capacitor Bank
Proposed Switch

Existing 69 kV Overhead
Existing 69 kV Overhead to be Removed
Proposed 69 kV Overhead
Existing 12 kV Duct Bank
Proposed 12 kV Underground
Proposed 12 kV and Telecommunications Duct Bank
Proposed Telecommunications Duct Bank

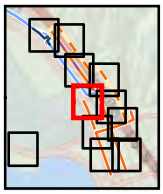


Source: SDG&E,2015b

1:1,600
0 100 200 Feet

Figure B.1-3g: Detailed Project Components

- Proposed Vine 69/12 kV Substation
- Existing Kettner Substation
- Transmission Work Area
- Jack-and-Bore Work Area
- Existing 12 kV Distribution Vault
- Proposed 12 kV Distribution Vault
- Proposed Telecommunication Handhole
- Proposed 12 kV Distribution Pull Site
- Existing Pole
- Install New TSP
- Replace Existing Pole with TSP
- Remove Existing Pole
- Remove Existing Stub Guy Pole
- Potential AT&T Interconnection Point
- Proposed Capacitor Bank
- Proposed Switch
- Existing 69 kV Overhead
- Existing 69 kV Overhead to be Removed
- Proposed 69 kV Overhead
- Existing 12 kV Duct Bank
- Proposed 12 kV Underground
- Proposed 12 kV and Telecommunications Duct Bank
- Proposed Telecommunications Duct Bank



Source: SDG&E,2015b

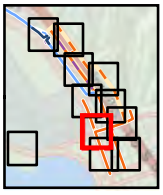
1:1,600
0 100 200 Feet

Figure B.1-3h: Detailed Project Components

Proposed Vine 69/12 kV Substation
Existing Kettner Substation
Transmission Work Area
Jack-and-Bore Work Area
Existing 12 kV Distribution Vault
Proposed 12 kV Distribution Vault
Proposed Telecommunication Handhole
Proposed 12 kV Distribution Pull Site

Existing Pole
Install New TSP
Replace Existing Pole with TSP
Remove Existing Pole
Remove Existing Stub Guy Pole
Potential AT&T Interconnection Point
Proposed Capacitor Bank
Proposed Switch

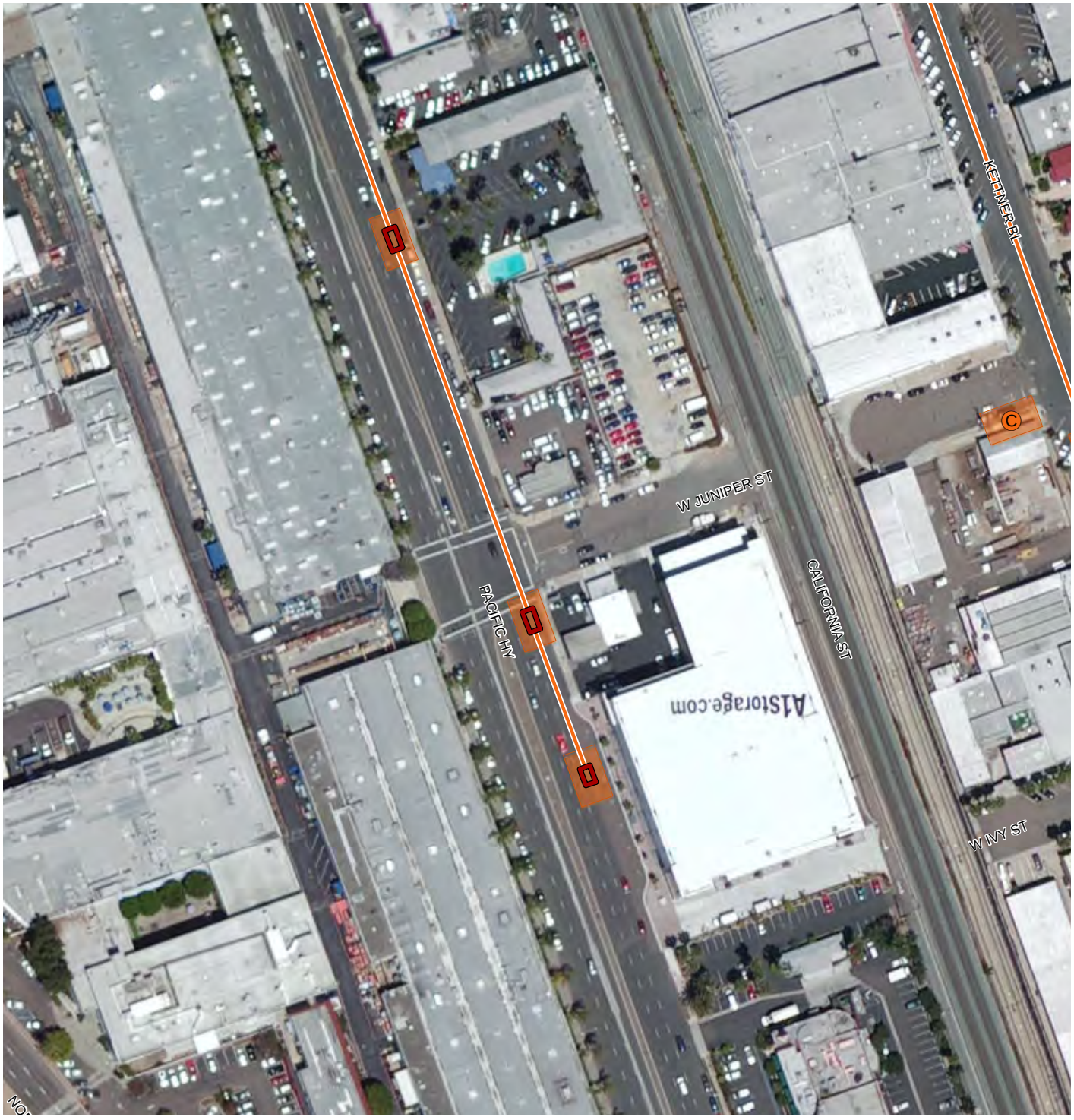
Existing 69 kV Overhead
Existing 69 kV Overhead to be Removed
Proposed 69 kV Overhead
Existing 12 kV Duct Bank
Proposed 12 kV Underground
Proposed 12 kV and Telecommunications Duct Bank
Proposed Telecommunications Duct Bank



Source: SDG&E,2015b

1:1,600
0 100 200 Feet

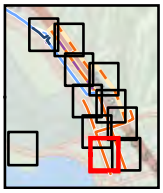
Figure B.1-3i: Detailed Project Components



Proposed Vine 69/12 kV Substation
Existing Kettner Substation
Transmission Work Area
Jack-and-Bore Work Area
Existing 12 kV Distribution Vault
Proposed 12 kV Distribution Vault
Proposed Telecommunication Handhole
Proposed 12 kV Distribution Pull Site

Existing Pole
Install New TSP
Replace Existing Pole with TSP
Remove Existing Pole
Remove Existing Stub Guy Pole
Potential AT&T Interconnection Point
Proposed Capacitor Bank
Proposed Switch

Existing 69 kV Overhead
Existing 69 kV Overhead to be Removed
Proposed 69 kV Overhead
Existing 12 kV Duct Bank
Proposed 12 kV Underground
Proposed 12 kV and Telecommunications Duct Bank
Proposed Telecommunications Duct Bank

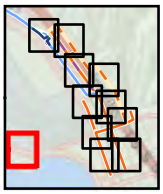


Source: SDG&E,2015b

1:1,600
0 100 200 Feet

Figure B.1-3j: Detailed Project Components

- Proposed Vine 69/12 kV Substation
- Existing Kettner Substation
- Transmission Work Area
- Jack-and-Bore Work Area
- Existing 12 kV Distribution Vault
- Proposed 12 kV Distribution Vault
- Proposed Telecommunication Handhole
- Proposed 12 kV Distribution Pull Site
- Existing Pole
- Install New TSP
- Replace Existing Pole with TSP
- Remove Existing Pole
- Remove Existing Stub Guy Pole
- Potential AT&T Interconnection Point
- Proposed Capacitor Bank
- Proposed Switch
- Existing 69 kV Overhead
- Existing 69 kV Overhead to be Removed
- Proposed 69 kV Overhead
- Existing 12 kV Duct Bank
- Proposed 12 kV Underground
- Proposed 12 kV and Telecommunications Duct Bank
- Proposed Telecommunications Duct Bank



Source: SDG&E, 2015b

1:1,600
0 100 200 Feet

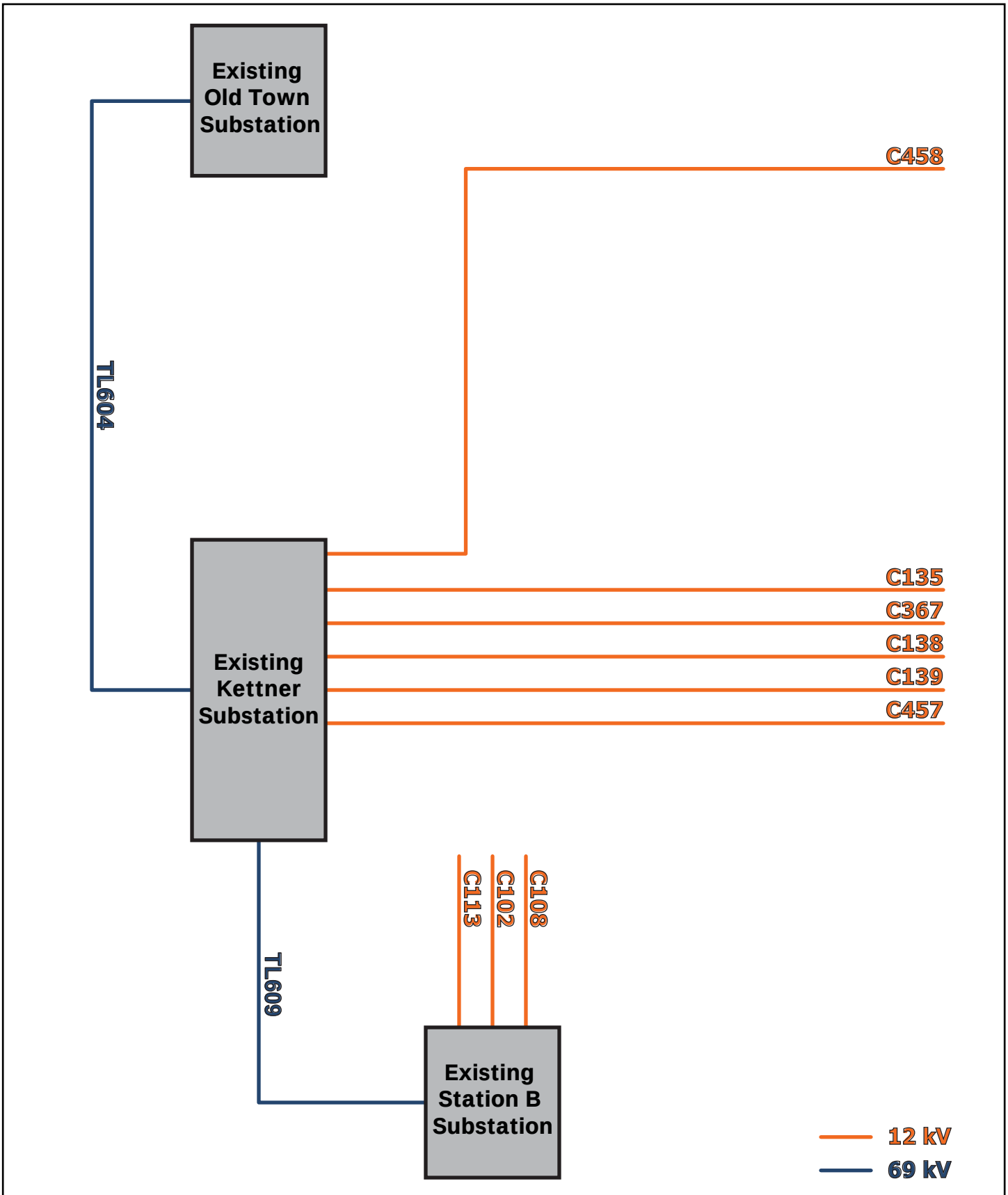
N

Figure B.1-3k: Detailed Project Components

Source: SDG&E,2015b

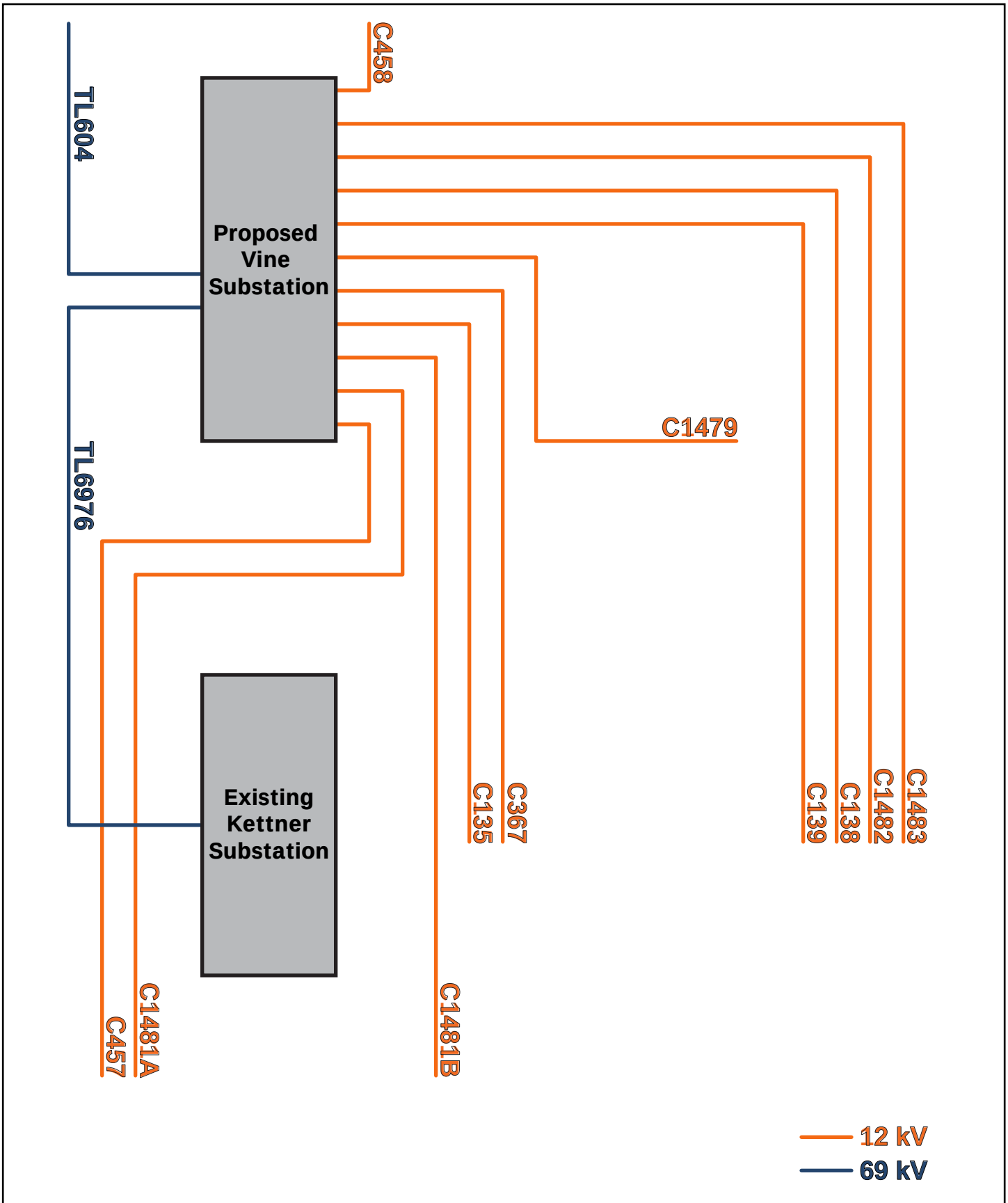
1:8,000
0 500 1,000 Feet

Figure B.1-4: Land Use Map



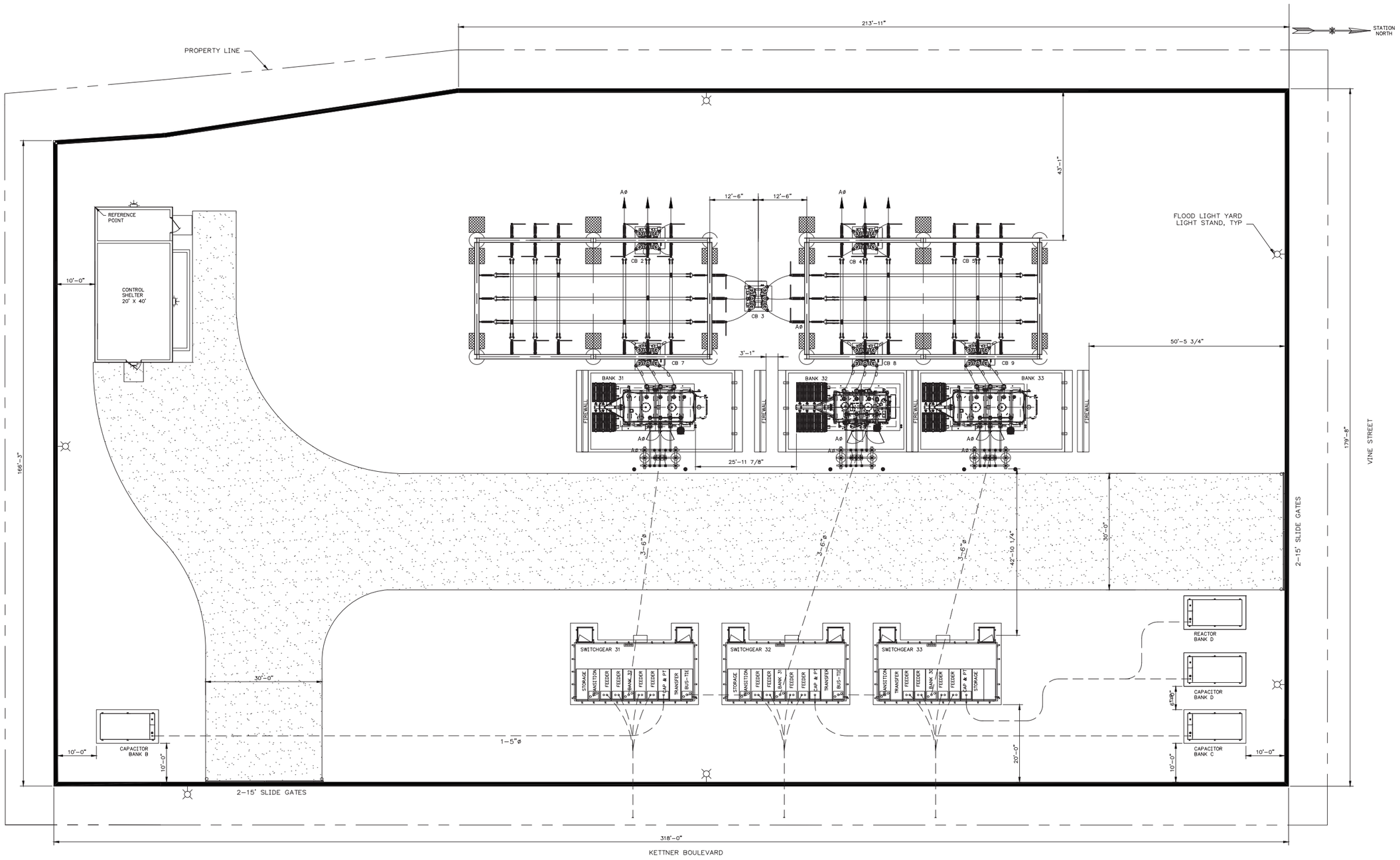
Source: SDG&E,2015b

Figure B.1-5: Existing System Configuration



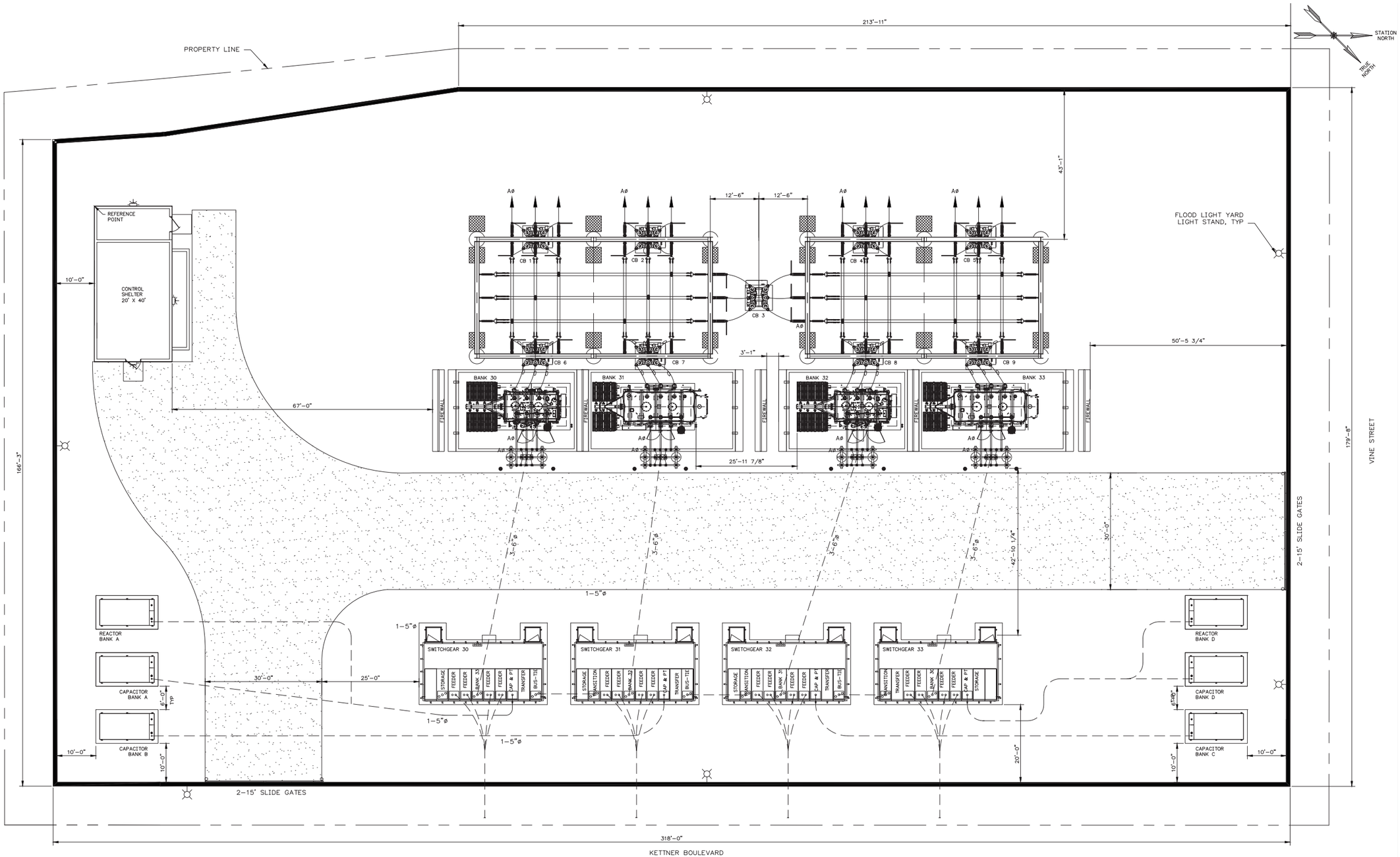
Source: SDG&E,2015b

Figure B.1-6: Proposed System Configuration



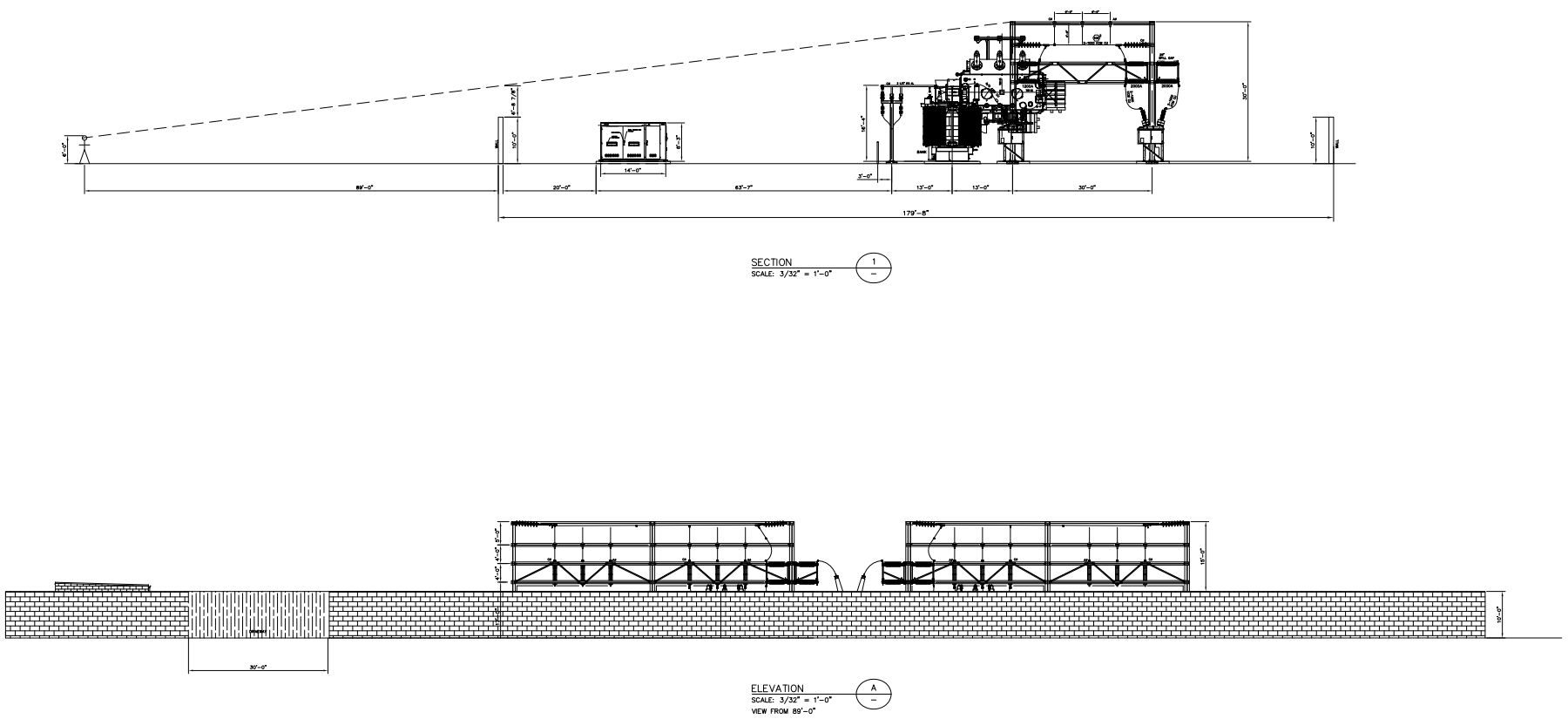
Source: SDG&E,2014

Figure B.1-7: Vine Substation Initial Arrangement



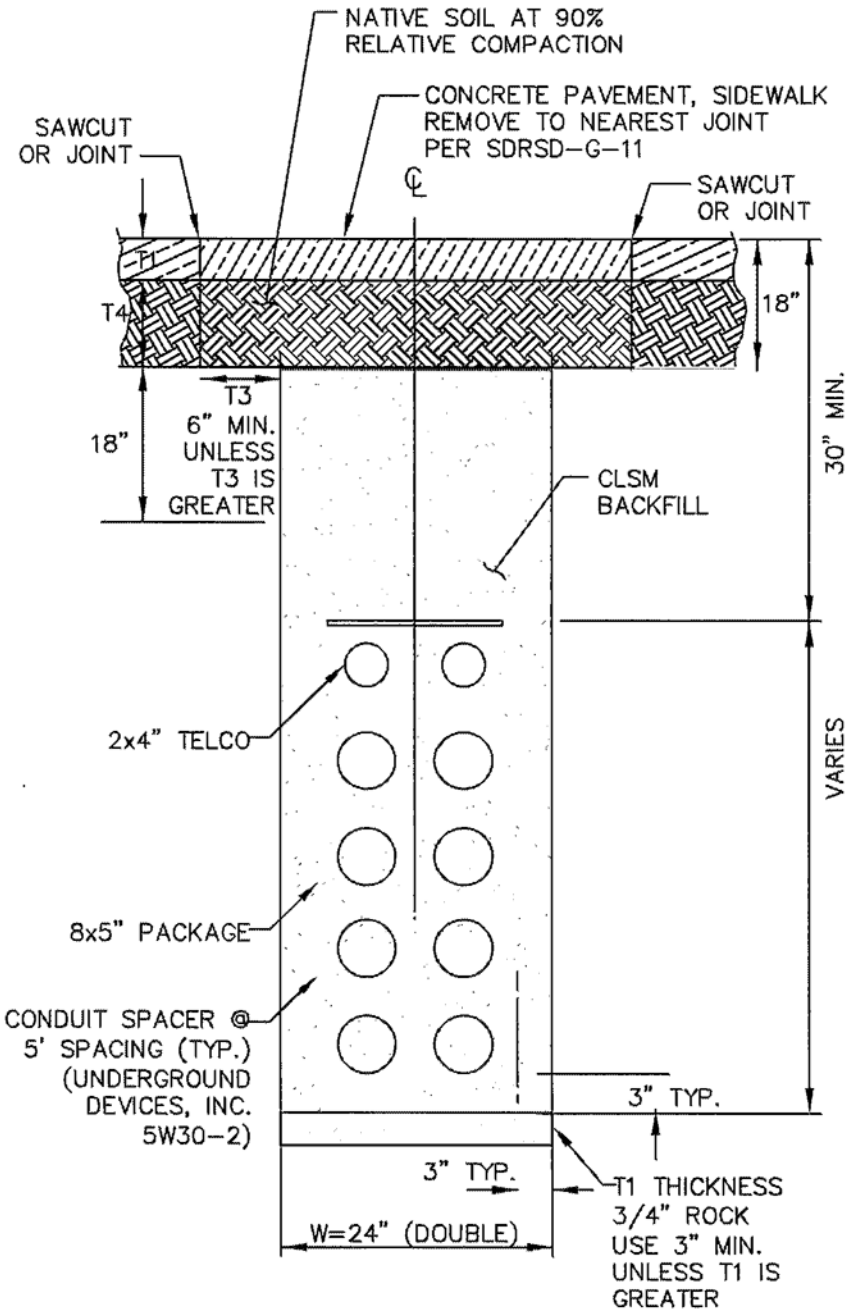
Source: SDG&E,2014

Figure B.1-8: Vine Substation Ultimate Arrangement



Source: SCG&E,2015a

Figure B.1-9: Vine Substation Profile View

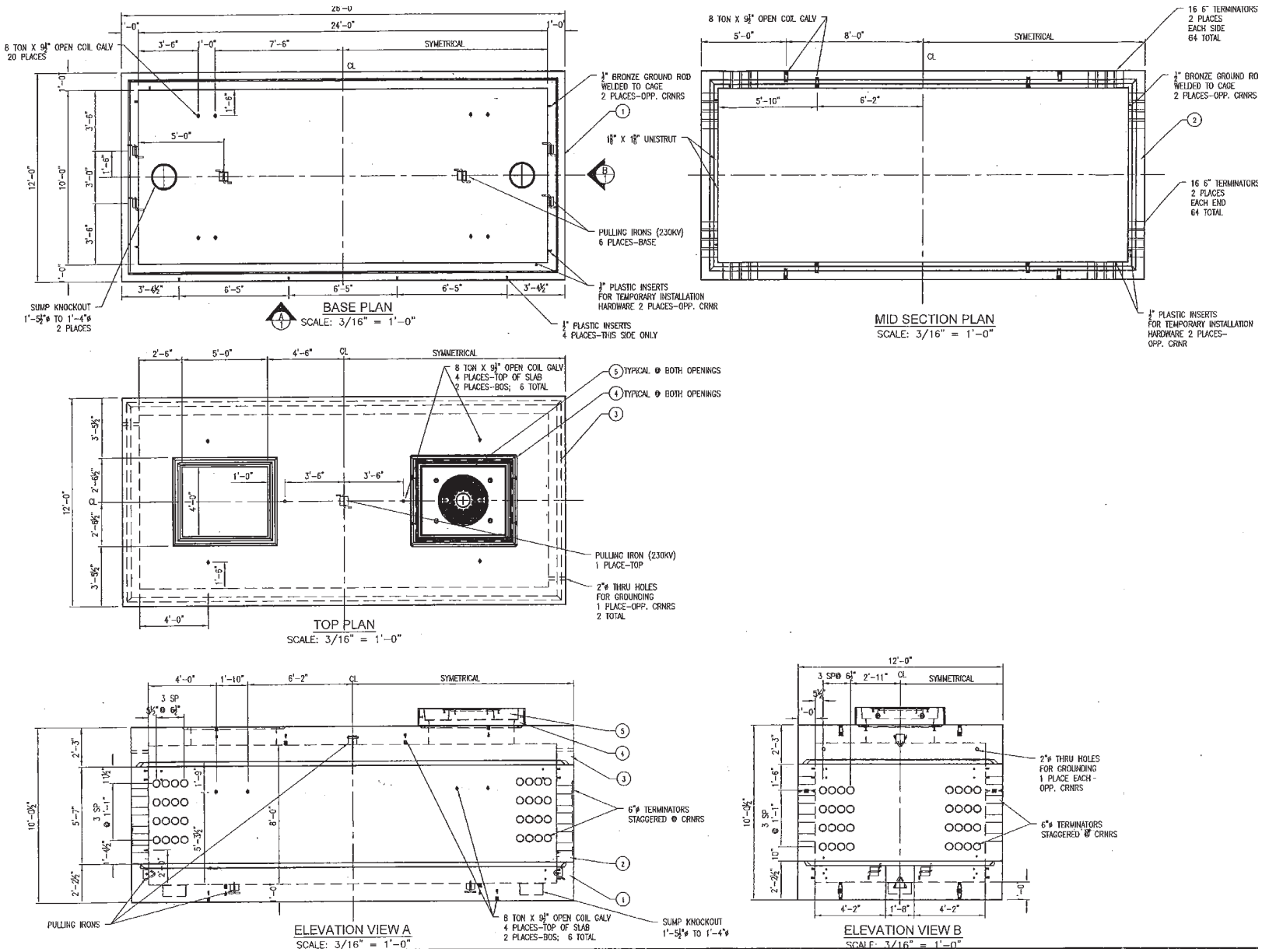


DETAIL O

ASPHALT THICKNESS ENCOUNTERED IN THE
POTHOLING VARIED BETWEEN x & x" THICK,
UNDERLYING CONCRETE FOUND APPROXIMATELY x & x" THICK.

Source: SDG&E,2014

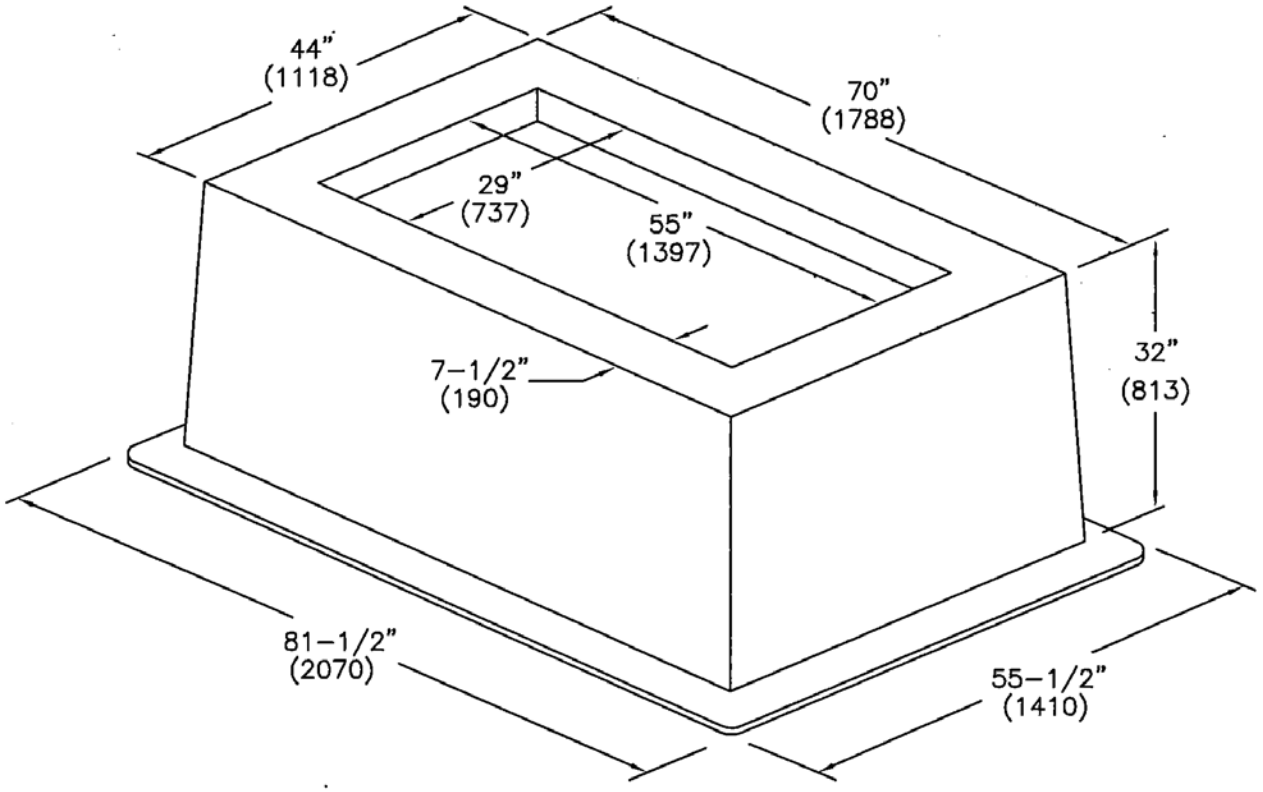
Figure B.1-10: Typical 12-kV Underground Duct Bank



Source: SDG&E,2014

Figure B.1-11: Typical 12-kV Underground Vault

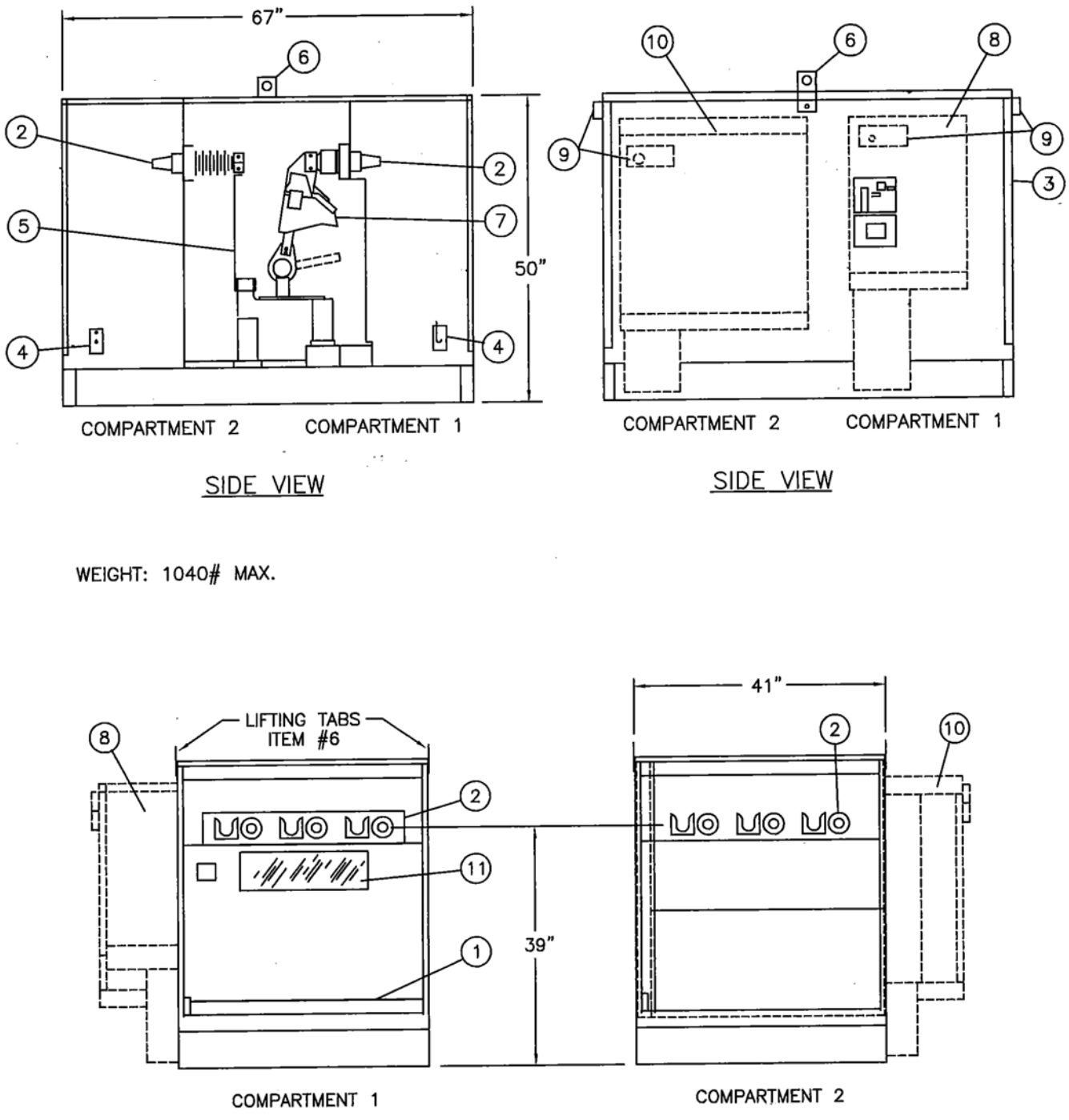
WEIGHT: 195 LB (88 KG)
DIMENSIONS 70" X 44" X 32" (1778 X 1118 X 813)



APPEARANCE AND DIMENSIONS MAY VARY SLIGHTLY
BETWEEN MANUFACTURERS

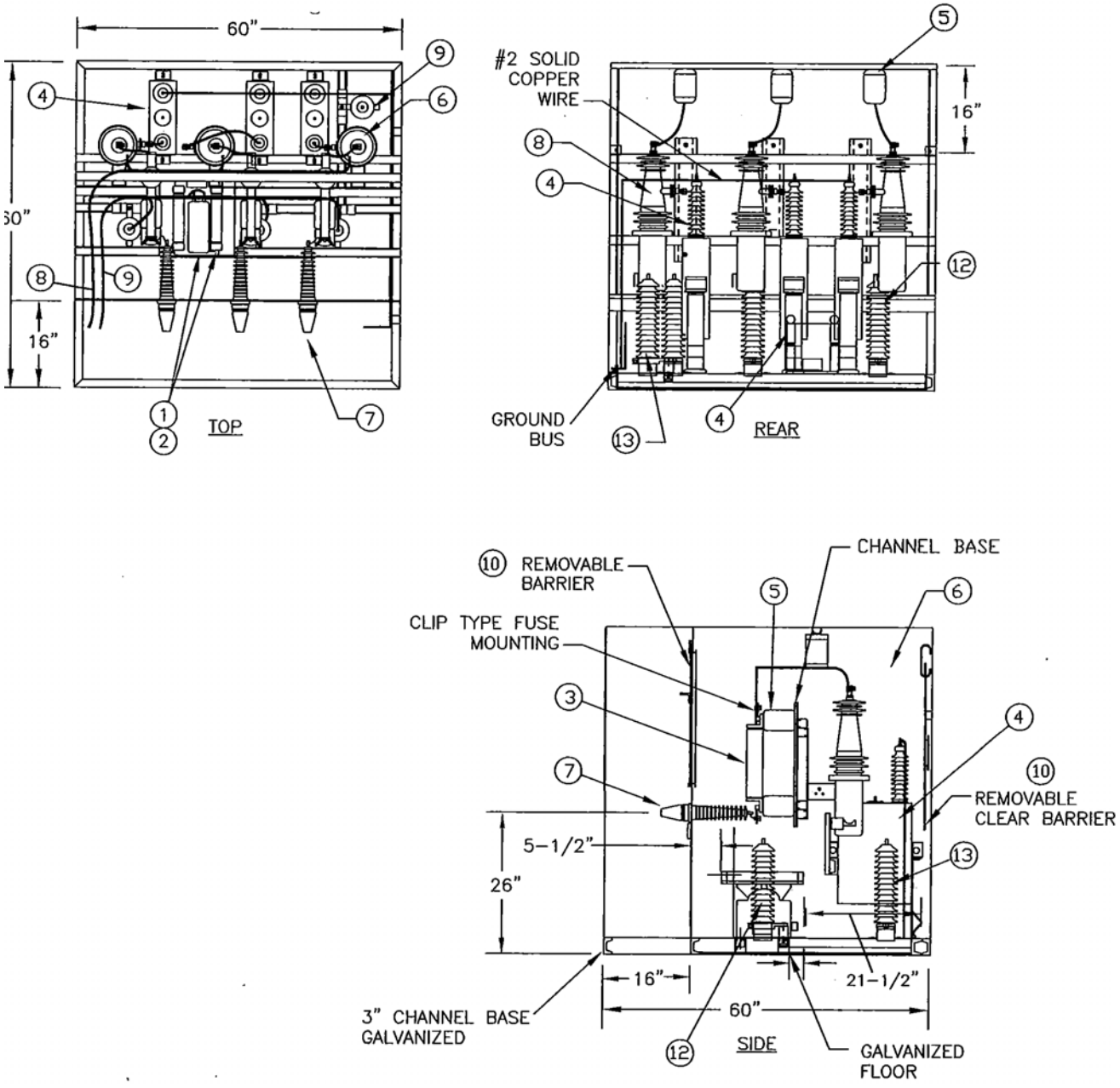
Source: SDG&E,2014

Figure B.1-12: Typical Switch and Capacitor Pad



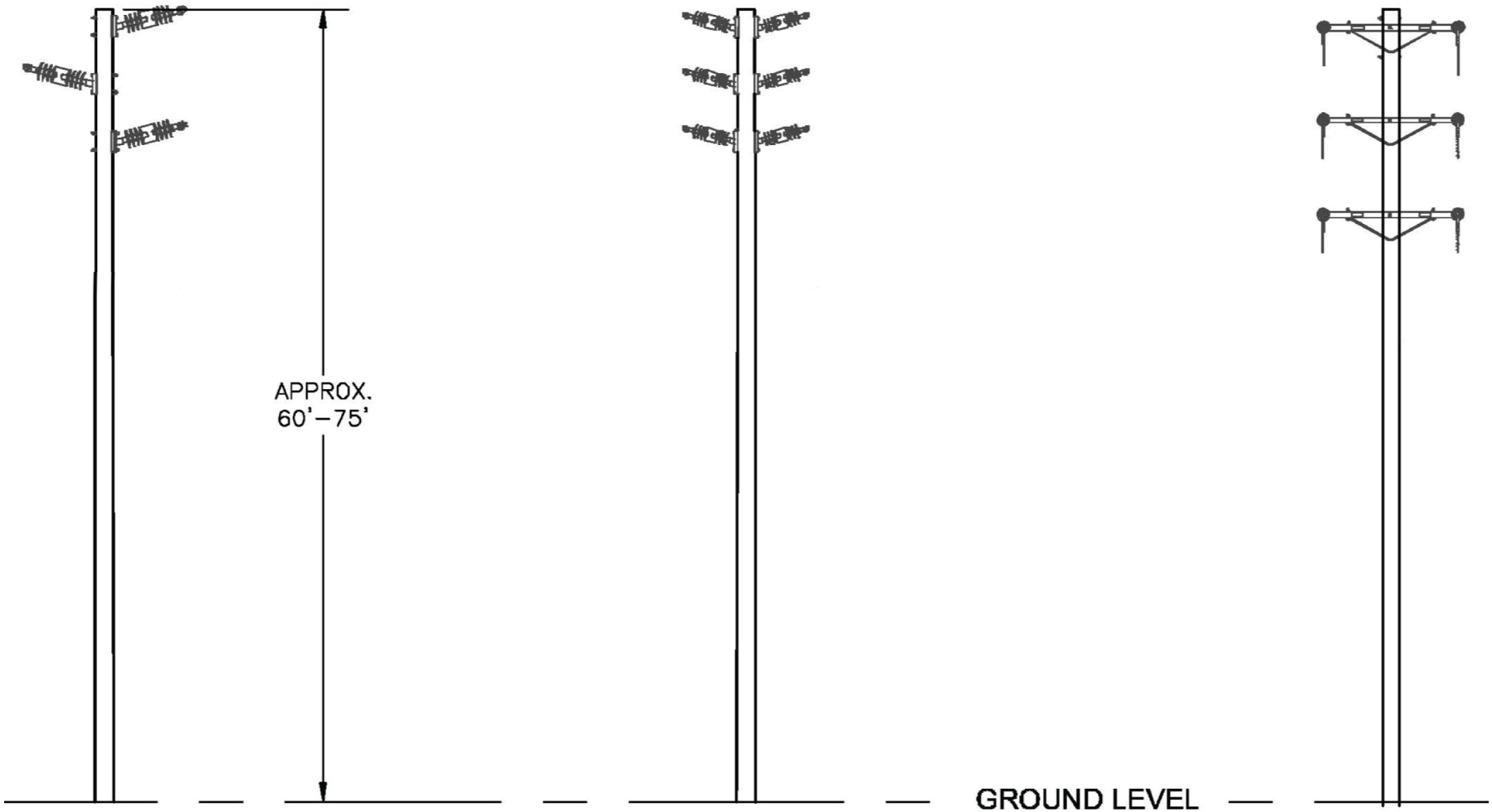
Source: SDG&E,2014

Figure B.1-13: Typical 12-kV Switch



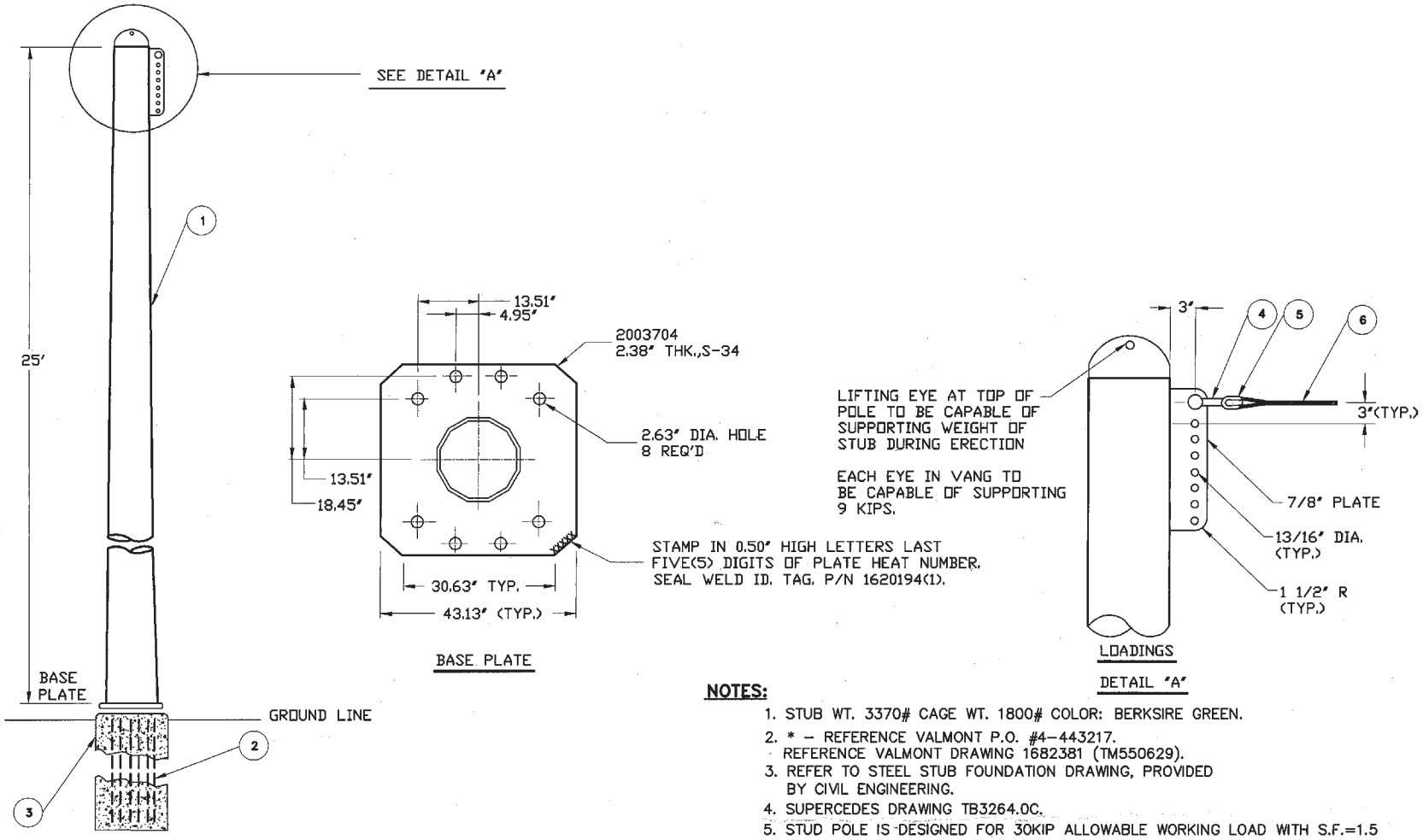
Source: SDG&E,2014

Figure B.1-14: Typical 12-kV Capacitor



Source: SDG&E,2014

Figure B.1-15: Typical Existing 69-kV Wood Pole

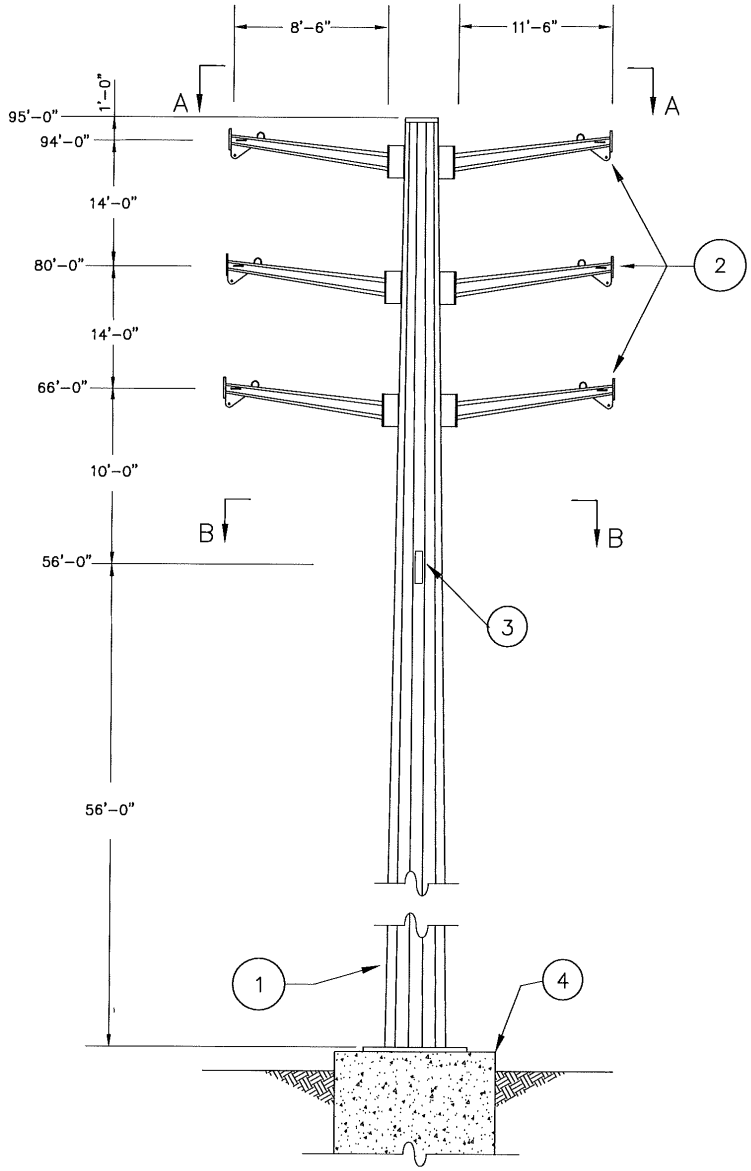


NOTES:

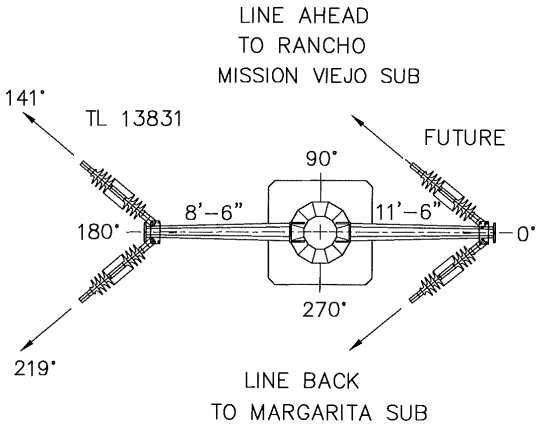
1. STUB WT. 3370# CAGE WT. 1800# COLOR: BERKSIRE GREEN.
2. * – REFERENCE VALMONT P.O. #4–443217.
   REFERENCE VALMONT DRAWING 1682381 (TM550629).
3. REFER TO STEEL STUB FOUNDATION DRAWING, PROVIDED BY CIVIL ENGINEERING.
4. SUPERCEDES DRAWING TB3264.0C.
5. STUD POLE IS DESIGNED FOR 30KIP ALLOWABLE WORKING LOAD WITH S.F.=1.5

Source: SDG&E,2014

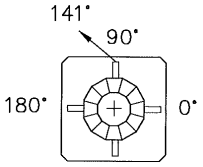
Figure B.1-16: Typical Existing Stub Guy Pole



DEADEND STEEL POLE



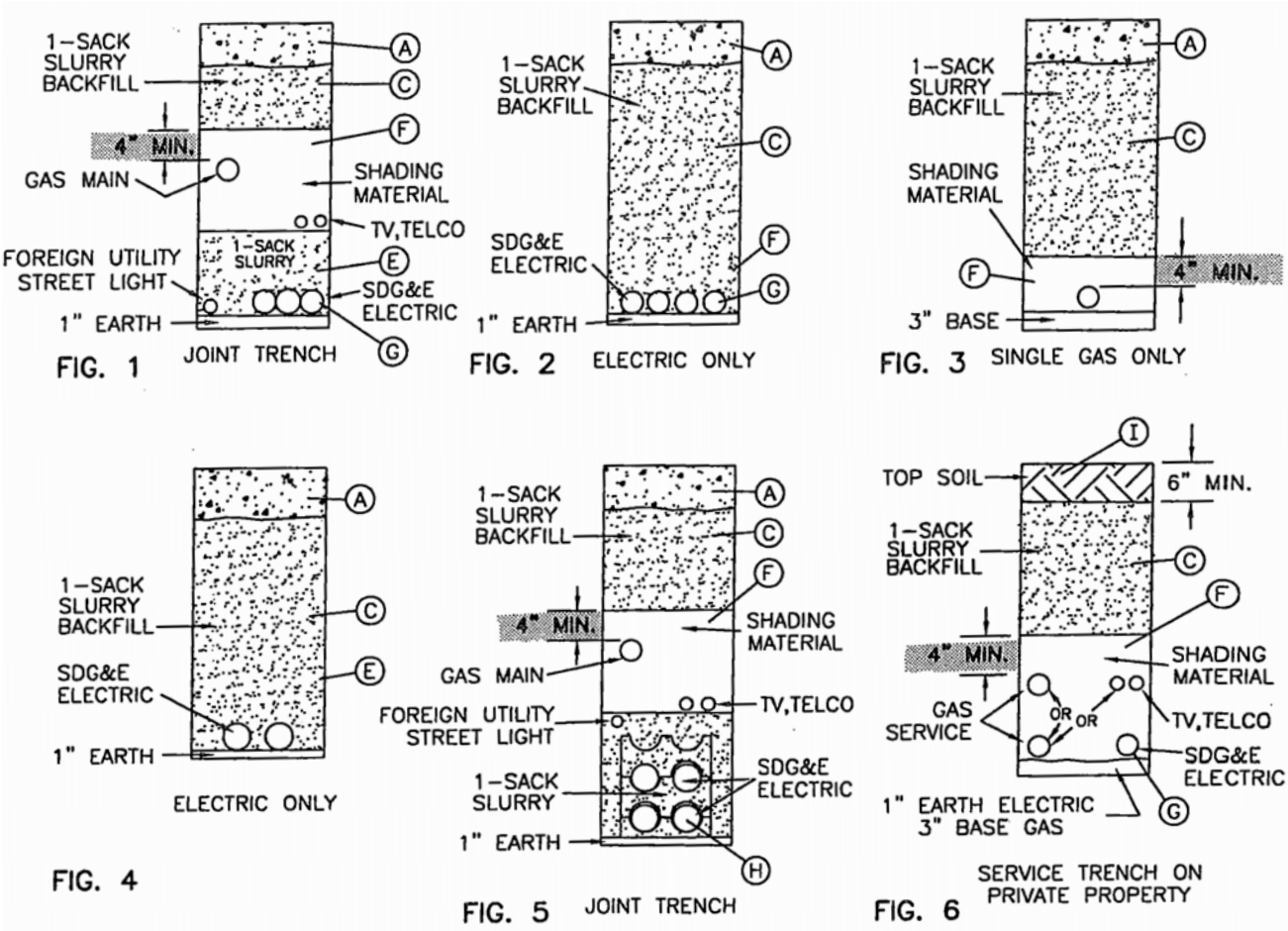
VIEW B–B (138 kV)
102 degree line angle



VIEW B–B (FIBER OPTIC VANGS)
51 degree line angle

Source: SDG&E,2014

Figure B.1-17: Typical Proposed 69-kV Tubular Steel Pole



INSTALLATION:

(A) ALL TRENCH RESURFACING SHALL BE DONE ACCORDING TO GOVERNMENTAL AGENCIES REQUIREMENTS.

B. SHADING MATERIAL SHALL MEET GAS STANDARD 7405 OR UNDERGROUND 3370/3371 SPECIFICATIONS AND MUST BE APPROVED BY AN SDG&E AUTHORIZED INSPECTOR.

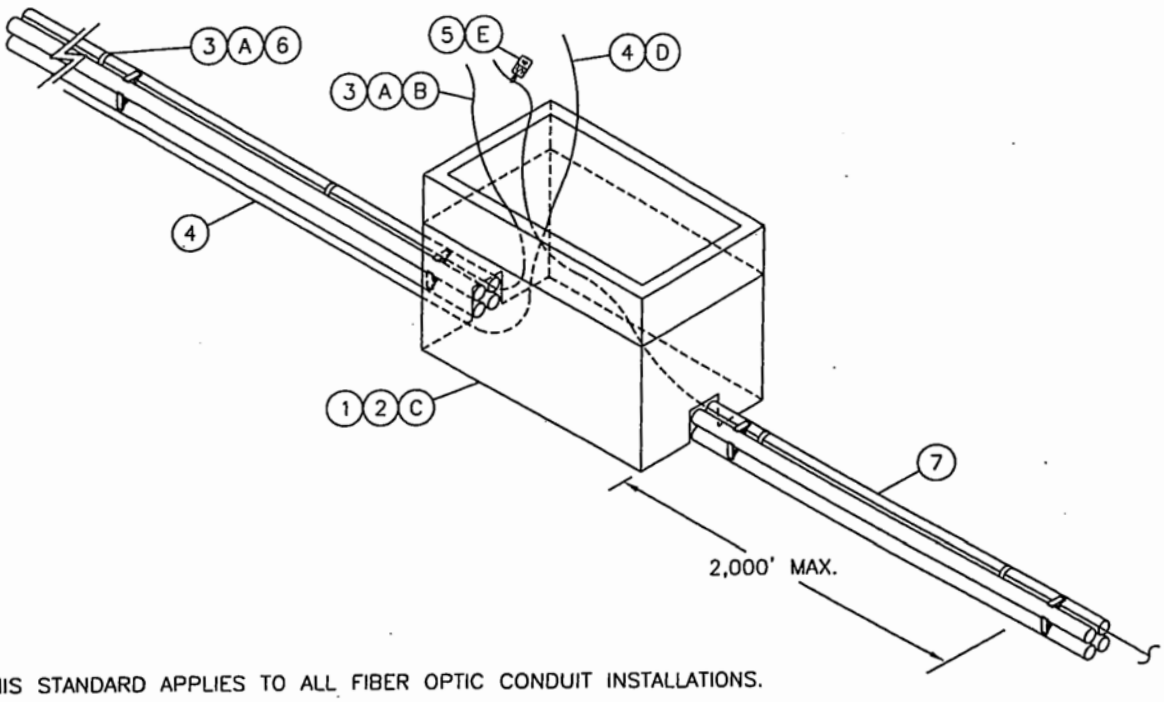
(C) BACKFILL MATERIAL SHALL MEET THE GOVERNMENTAL (PERMITTING) AGENCIES REQUIREMENTS AND SDG&E STANDARDS. THE SAND USED FOR THE ONE SACK SLURRY OR TWO SACK, IF REQUIRED BY GOVERNMENTAL AGENCIES, MUST MEET THE CONCRETE SAND SPECIFICATION LISTED IN THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREEN BOOK) AND CONTAIN NO GRAVEL. SLURRY MUST BE FIRM BEFORE A PAVEMENT CONCRETE CAP IS INSTALLED. SLURRY IS TYPICALLY USED FOR BACKFILLING AROUND SUBSTRUCTURES, UNDER EQUIPMENT PADS, FOR TRENCHES IN EXISTING PAVED AREAS, AND UNDER CONCRETE OR PAVED DRIVEWAYS.

IT MAY NOT BE APPROPRIATE TO USE ONE SACK SLURRY UNDER THE THE FOLLOWING CIRCUMSTANCES:

- GOVERNMENTAL AGENCIES DO NOT ALLOW ONE SACK OR MAY REQUIRE TWO SACK SLURRY BACKFILL.
- INACCESSABILITY OF CONCRETE TRUCKS DELIVERING SLURRY.
- WHEN SLURRY IS NOT COST EFFECTIVE.
- NEW RESIDENTIAL SUBDIVISIONS, SINGLE FAMILY RESIDENCE SERVICE TRENCH
- SHALLOW WELD HOLES, POT HOLES, ETC.

Source: SDG&E,2014

Figure B.1-18: Typical Telecommunications Underground Duct Bank



NOTE:

– THIS STANDARD APPLIES TO ALL FIBER OPTIC CONDUIT INSTALLATIONS.

– REFER TO THE SPECIFIC TRANSMISSION PROJECT FOR INSTRUCTIONS ON THE USE OF TRACER WIRE IN THE TRANSMISSION TRENCH.

I. ALLATION:

(A) YELLOW TRACER WIRE SHALL BE INSTALLED IN THE TRENCH ALONGSIDE CONDUIT WHICH IS DESIGNATED FOR FIBER OPTIC CABLE. THE WIRE SHALL BE TAPED TO THE CONDUIT 8 TO 10 FOOT INTERVALS.

(B) THE TRACER WIRE SHALL BE LOOPED INSIDE THE HANDHOLE WITH ENOUGH SLACK TO EXTEND 12" BEYOND THE TOP OF THE BOX. CUT THE TRACER WIRE, SEAL AND TAPE THE ENDS.

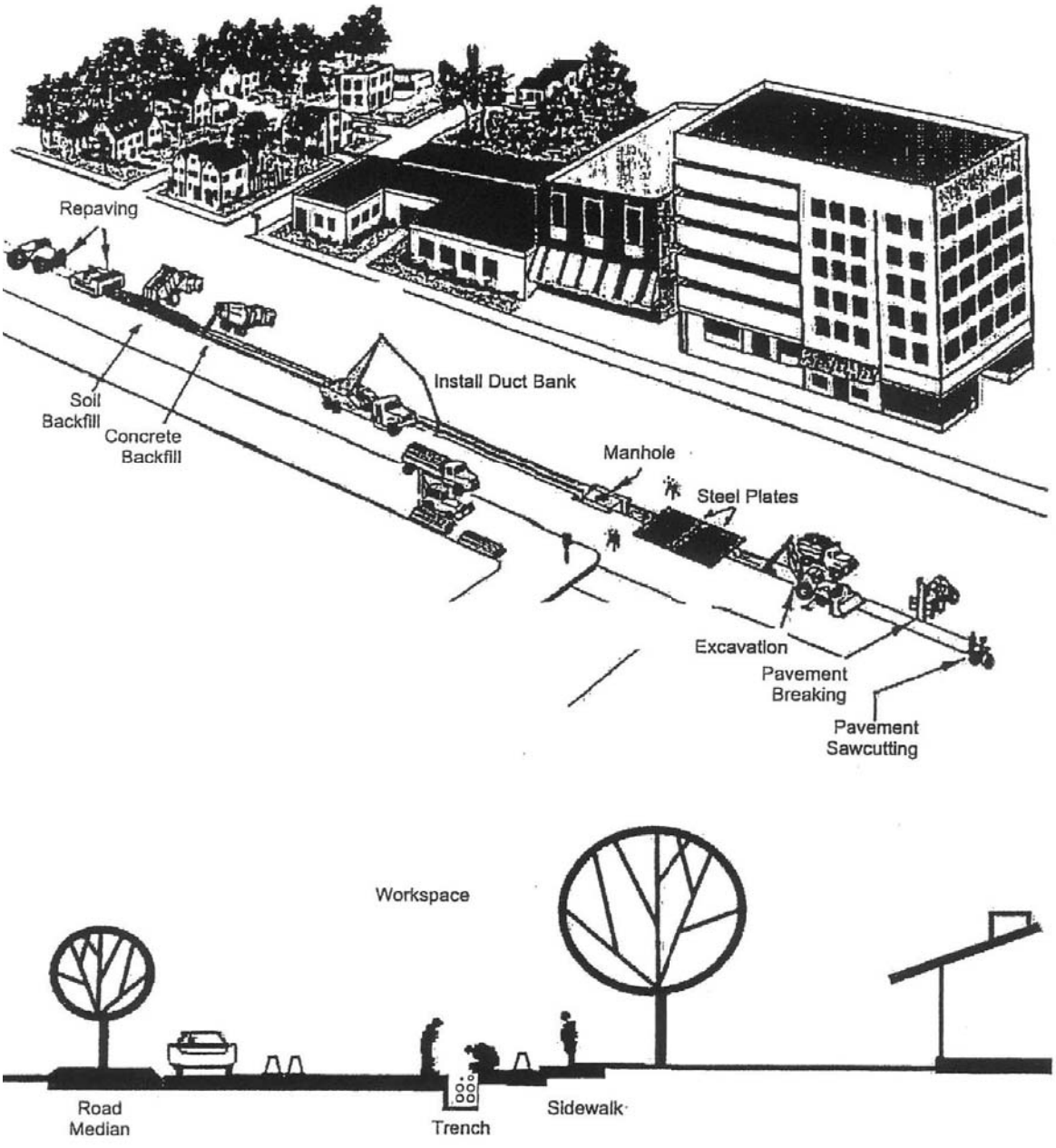
(C) LOCATE ACCESS POINTS (HANDHOLES) TO THE TRACER WIRE AT 2000' INTERVALS.

(D) EXTEND GROUND WIRE 12 INCHES BEYOND THE TOP OF BOX.

(E) ATTACH AN "S4" TAG TO ALL TRACER WIRE AT ACCESS POINTS.

Source: SDG&E,2014

Figure B.1-19: Typical Telecommunication Underground Handhole



Source: SDG&E,2014

Figure B.1-20: Typical Underground Construction Process within Roadways

A. Typical 12-kV Trench

B. Typical 12-kV Duct Bank

Source: SDG&E,2015b

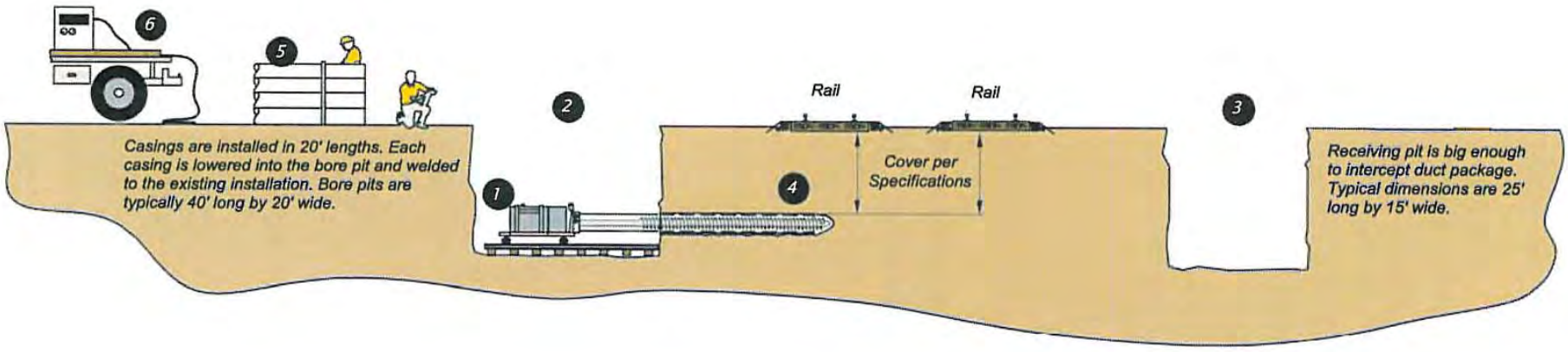
Figure B.1-21
Typical 12-kV Underground Installation Photographs

C. Typical Type 3327 Vault

D. Typical Vault Installation

Source: SDG&E,2015b

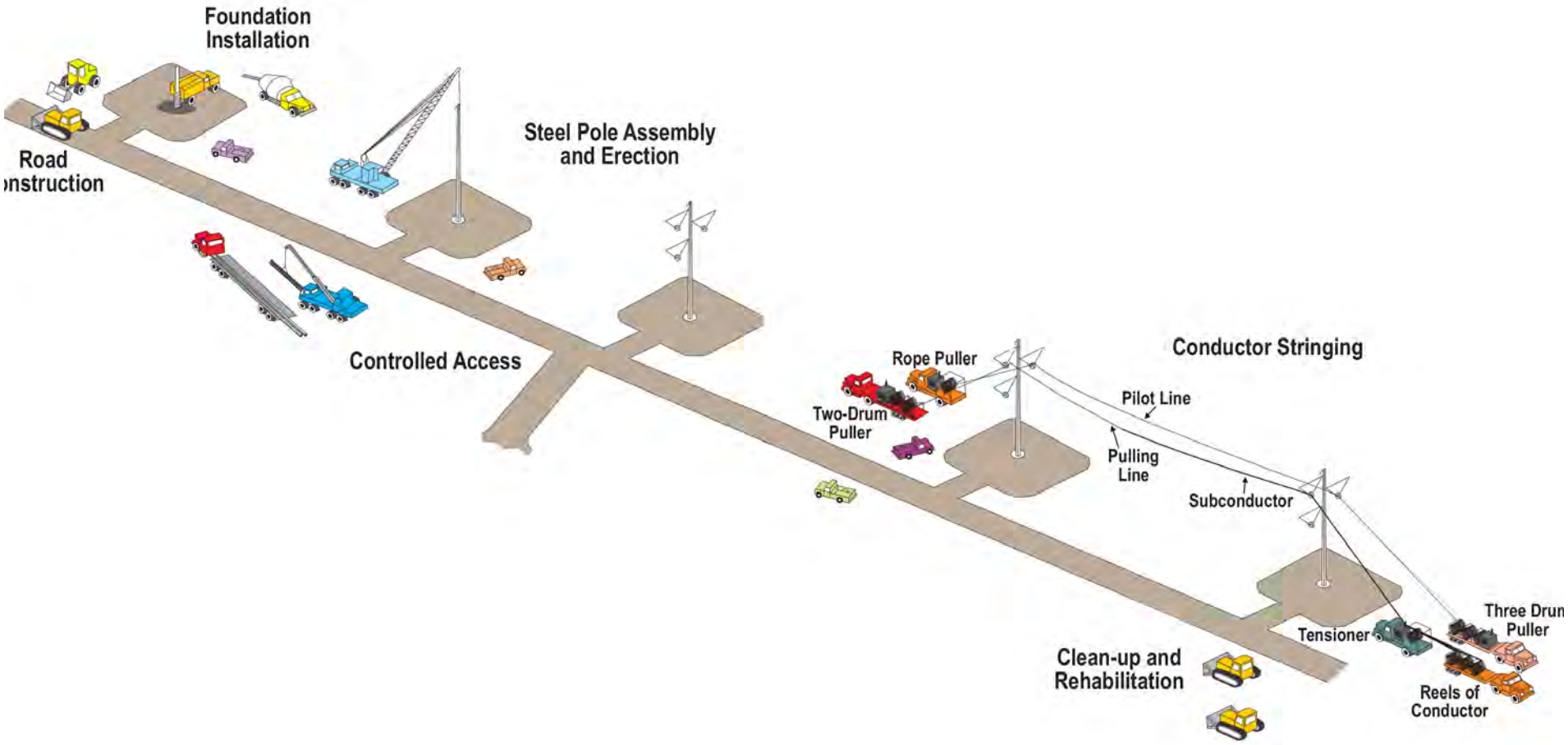
Figure B.1-22
Typical Type 3327 Vault and Installation Photographs



1 Jack & Bore Machine
2 Bore Pit
3 Receiving Pit
4 Carrier Pipe (Casing)
5 Carrier Stock Pipe (Casing Sections)
6 Welding Machine

Source: SDG&E,2015b

Figure B.1-23: Typtical Jack-and-Bore Installation



Source: SDG&E,2014

Figure B.1-24: Typical Overhead Conductor Installation