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CHAPTER 3 – PROJECT DESCRIPTION

3.0 PROJECT LOCATION

3.0.0 Regional Vicinity

The proposed South Bay Substation Relocation Project (Proposed Project) is located in the City of Chula Vista (City), California in the southwesterly portion of San Diego County. The main activity associated with the Proposed Project involves the relocation of the existing South Bay Substation to a new site approximately 0.5 mile south. The existing substation would be relocated to the proposed Bay Boulevard Substation site, which is situated approximately two miles south of the City of National City, approximately five miles northeast of the City of Imperial Beach, and approximately seven miles southeast of downtown San Diego.

For the purposes of this document, the Proposed Project is divided into the following five components:

1. Construction of the Bay Boulevard Substation approximately 0.5 mile south of the existing South Bay Substation
2. Construction of a 230 kilovolt (kV) loop-in
3. Relocation of 69 kV transmission lines
4. Extension of 138 kV transmission lines
5. Demolition of the existing South Bay Substation

The location of the Proposed Project is depicted in Figure 3-1: Project Location Map and the five project components are depicted in Figure 3-2: Project Overview Map. A more detailed description of the area in and around the Proposed Project follows.

3.0.1 Bay Boulevard Substation

The proposed substation site is a 12.42-acre parcel, approximately 0.5 mile south of the existing South Bay Power Plant (SBPP) site, on the southern half of a former Liquefied Natural Gas (LNG) plant site. The site is generally situated between the San Diego Bay to the west and Bay Boulevard to the east. This parcel is located in a generally industrial area. An unused San Diego & Arizona Eastern Railroad (SD&AE) track borders the site immediately adjacent and parallel to the west side of Bay Boulevard, adjacent to the proposed substation site. The northern edge of the substation site is bordered by the existing SBPP, fuel oil tanks, and the existing San Diego Gas & Electric Company (SDG&E) South Bay Substation. Light industrial uses border the site to the east and the south, while the west is bordered by the Western Salt Works salt crystallizer ponds, which are used for the production of salt for commercial purposes. The proposed substation site is depicted on Figure 3-2: Project Overview Map and in Attachment 3-A: Detailed Project Components Map. The enclosed portion of the Bay Boulevard Substation would occupy approximately 9.7 acres.

Existing elevations on the proposed site range from approximately 10 feet to 17 feet above mean sea level (MSL). The site is mostly flat with a mild slope to the west and north. A man-made berm—ranging in elevation from approximately 14 feet to 16 feet above MSL—is located along the southern and western ends of the property, adjacent to the existing fence. This berm inhibits the natural drainage pattern of the site. Additional portions of the site are elevated as a result of a man-made containment berm that ranges in elevation from approximately 21 feet to 23 feet above MSL. The containment berm was installed around the former LNG site storage tanks. The site is disturbed and contains non-native grassland, disturbed coastal coyote bush scrub, eucalyptus woodland, and ornamental vegetation.

The current land use designation for the Bay Boulevard Substation site is Industrial under the existing City of Chula Vista General Plan. Section 4.9 Land Use and Planning describes the land use changes in the area in more detail. Subject to the satisfaction of several conditions precedent, including but not limited to the termination by the California Independent System Operator (CAISO) of the Must-Run Service Agreement with respect to all electricity generating units at the SBPP (Reliability Must Run [RMR] Termination), SDG&E would acquire a 12.42-acre parcel as described in Section 3.5 Permanent Land and Right-of-Way Requirements. Work associated with the construction of the Bay Boulevard Substation is planned to occur within the newly acquired 12.42-acre parcel and, subject to further coordination with the San Diego Unified Port District (Port District), SDG&E's existing easements in the Proposed Project area, as described in Section 3.5 Permanent Land and Right-of-Way Requirements.

3.0.2 230 kV Loop-in

The 230 kV loop-in is proposed to be constructed in the same general location of the Bay Boulevard Substation, as depicted in Figure 3-2: Project Overview Map and Attachment 3-A: Detailed Project Components Map. The existing 230 kV line—TL23042—constructed as part of the Otay-Metro Power Loop (OMPL) (formerly referred to as the Otay Mesa Power Purchase Agreement), traverses the site in a generally north-to-south direction within an existing 300-foot-wide easement. As part of the Proposed Project, the northern interconnection to the Bay Boulevard Substation would begin at an existing approximately 165-foot-tall steel riser structure. This structure would be removed and the line would continue underground for approximately 675 feet in a generally southwesterly direction before entering the northwest corner of the Bay Boulevard Substation. The southern interconnection would exit the substation overhead along the substation's eastern border, traveling in a generally southeasterly direction for approximately 150 feet to a new, approximately 121-foot-tall steel pole, before continuing approximately 150 feet southeast to an existing, approximately 145-foot-tall steel dead-end structure. At this point, it would tie into an existing overhead section of TL23042 and would continue east, spanning Bay Boulevard.

3.0.3 69 kV Relocation

SDG&E currently operates six 69 kV overhead transmission lines that connect into the existing South Bay Substation. Three of these overhead transmission lines—TL645, TL646, and TL647—enter the Proposed Project area from the south. The remaining three overhead transmission lines—TL641, TL642, and TL644—connect to the existing South Bay Substation from the north. These overhead transmission lines are shown on Figure 3-2: Project Overview Map and in Attachment 3-A: Detailed Project Components Map.

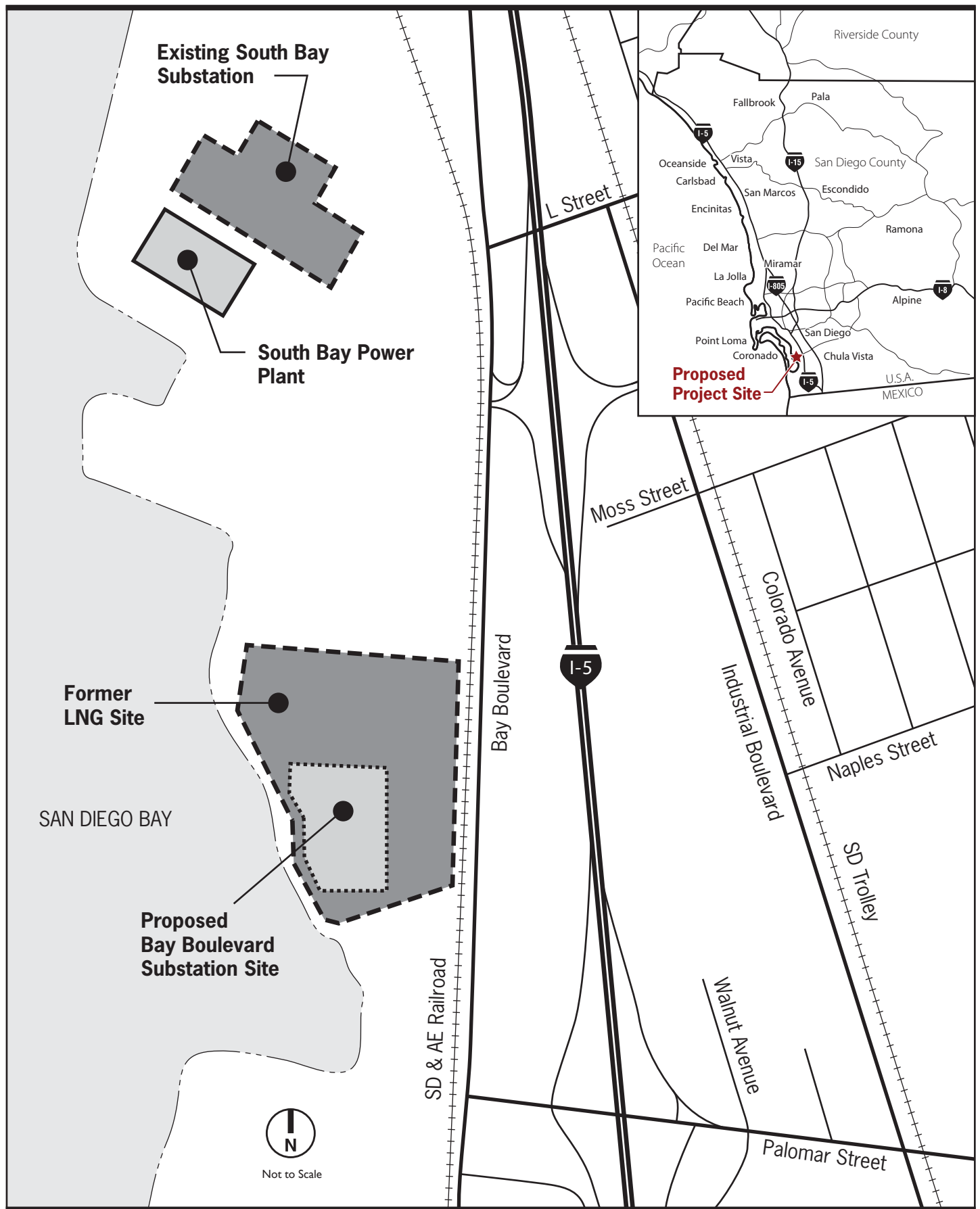
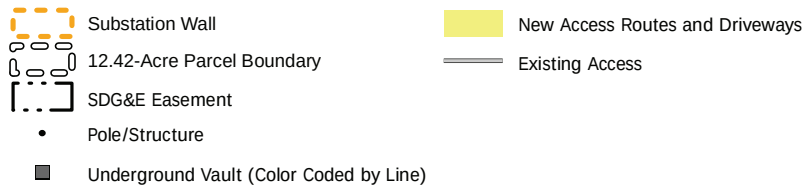


Figure 3-1: Project Location Map



Figure 3-2: Project Overview Map

South Bay Substation Relocation Project



1:5,000



Southern 69 kV Transmission Lines

As described previously, TL645, TL646, and TL647 approach the existing South Bay Substation from the south by traveling in a generally south to north direction within SDG&E's existing transmission easement, as shown in Figure 3-2: Project Overview Map and Attachment 3-A: Detailed Project Components Map. These overhead transmission lines would be rerouted to the Bay Boulevard Substation by intercepting them as they pass by and terminating them at the new substation.

TL645 would be intercepted using a new steel cable riser pole, located directly to the west of and adjacent to Bay Boulevard. From this point, the line would be constructed within an approximately 800-foot-long underground duct bank. This duct bank would travel south within Bay Boulevard for approximately 120 feet before heading west, crossing under a drainage and the SD&AE railroad tracks, and entering the Bay Boulevard Substation. TL646 and TL647 would be intercepted using a new steel cable riser pole located on the west side of Bay Boulevard approximately 200 feet east of the proposed substation. From this point, they would be constructed within underground duct banks measuring approximately 1,000 feet long. These duct banks would travel west and generally parallel to the Bay Boulevard Substation's southern wall and then turn north into the substation and continue to their designated termination points.

Northern 69 kV Transmission Lines

As described previously, TL641, TL642, and TL644 approach the existing South Bay Substation from the north by traveling within SDG&E's existing transmission easement, as shown in Figure 3-2: Project Overview Map and Attachment 3-A: Detailed Project Components Map. These overhead transmission lines would be rerouted to the Bay Boulevard Substation, continuing in a generally north-to-south direction. Each of these overhead transmission lines would be relocated approximately 2,500 feet south from their current termination point at the existing South Bay Substation to the Bay Boulevard Substation.

TL641 and TL642 would travel overhead, south from the existing South Bay Substation along the same general corridor vacated by the relocation of TL646 and TL647. As depicted on Figure 3-3: Bay Boulevard Substation Conceptual Site Plan, both lines would intercept the new steel cable riser poles located approximately 105 feet and 155 feet east of the Bay Boulevard Substation wall, respectively. Each transmission line would enter its own underground duct bank and travel south for a short distance before turning west and entering the Bay Boulevard Substation. TL644 would travel overhead, south from the existing South Bay Substation generally parallel to and directly west of Bay Boulevard, along the same general corridor vacated by the relocation of TL645. Approximately 300 feet north of the proposed main access route to the Bay Boulevard Substation, TL644 would intercept a new steel cable riser pole located to the west of and adjacent to Bay Boulevard. From this point, it would transition to an underground duct bank and continue south within Bay Boulevard for a short distance before turning west, heading under the new main access road and driveway, entering the Bay Boulevard Substation, and reaching its termination point.

3.0.4 138 kV Extension

Three existing 138 kV lines are connected overhead into the existing South Bay Substation. The northern interconnection is provided by TL13815, which currently travels south within SDG&E's existing transmission easement in an underground duct bank before being intercepted by an existing three-pole wood riser structure¹ located outside of the South Bay Substation. From this point, it continues overhead and terminates at the South Bay Substation. The southern interconnections are provided by TL13823 and TL13824, which travel overhead along SDG&E's right-of-way (ROW) from the east, spanning Bay Boulevard and intercepting a steel lattice structure—Tower 188701. From this point, TL13823 and TL13824 continue overhead, north along four additional steel lattice structures before terminating at the South Bay Substation.

As part of the Proposed Project, the 138 kV connections to the South Bay Substation would be removed and TL13815 would be extended until intercepting the existing TL13823 and TL13824 just north of Tower 188701 with a new steel riser pole. Approximately 3,800 feet of underground duct bank would be installed, starting at the existing three-pole wood riser structure to be removed, extending the existing underground duct bank in a generally north-to-south direction. Along its alignment, the 138 kV underground duct bank would cross under Telegraph Creek using the jack-and-bore construction method. Telegraph Creek is an approximately 50-foot-wide concrete-lined channel that enters SDG&E's existing easement near the intersection of Bay Boulevard and L Street and continues northwest until draining into the bay. At the end of this underground portion, a new steel cable riser pole would be installed to intercept the existing TL13823 and TL13824. At this point, TL13815 would be connected to TL13823 and TL13824, forming the new extension of TL13815 from Grant Hill to Telegraph Canyon substations. An additional approximately 500 feet of underground duct bank would be installed from the 138 kV extension to the Bay Boulevard Substation to accommodate the ultimate configuration. The proposed 138 kV extension is shown in Figure 3-2: Project Overview Map and Attachment 3-A: Detailed Project Components Map.

3.0.5 South Bay Substation Demolition

As part of the Proposed Project, subject to the satisfaction of several conditions precedent, including but not limited to the RMR Termination and the energization of the Bay Boulevard Substation and the relocation of the existing 69 kV transmission lines, the existing 7.22-acre South Bay Substation would be decommissioned and demolished. The existing South Bay Substation is located approximately 0.5 mile north of the Bay Boulevard Substation site and adjacent to the northeastern border of the SBPP, in a generally industrial and disturbed area. Work associated with the demolition of the existing South Bay Substation is planned to occur within the substation boundaries, and, subject to further coordination with the Port District, in an area extending approximately 50 feet from the existing substation boundaries.

In addition to the demolition of the existing South Bay Substation, certain transmission structures used exclusively in connection with the operation of the existing South Bay Substation would be removed from the existing 10.47-acre adjacent transmission and distribution easement site as a part of the South Bay Substation Relocation Project.

¹ This three-pole wood riser structure is treated as a single structure within the pole data base contained in Attachment 3-D: Transmission Pole Summary.

3.1 EXISTING SYSTEM

SDG&E is a regulated public utility that provides electric service to approximately 1.4 million customers within a 4,100-square-mile service area, covering 25 cities and unincorporated areas within San Diego County and a portion of Orange County. The SBPP was constructed by SDG&E in 1961 and was owned and operated by SDG&E until April of 1999, when the facility was sold to the Port District. SDG&E operates the existing South Bay Substation pursuant to an exclusive substation easement in perpetuity that SDG&E reserved for its use from the conveyance to the Port District, pursuant to the 1999 transaction. Pursuant to the 1999 transaction, SDG&E also reserved two non-exclusive transmission and distribution easements for electric transmission and distribution facilities, including but not limited to the transmission lines connecting the existing South Bay Substation to the SDG&E system.

Concurrently with its acquisition of the SBPP, the Port District as Landlord entered into a lease (Plant Lease) with Duke Energy South Bay, LLC (Duke) as Tenant, for Duke to operate the SBPP. Duke assigned the Plant Lease to LS Power in 2006. Dynegy assumed the Plant Lease pursuant to a merger with LS Power. As a result, Dynegy is the current lessee/operator of the SBPP. As discussed in detail in Chapter 2 – Project Purpose and Need, the SBPP is slated to retire after the RMR termination.

Figure 3-4: Existing Transmission System Configuration and Figure 3-5: Proposed Transmission System Configuration provide schematic diagrams of the existing system and the system as it would be configured following construction of the Proposed Project, respectively. As shown in Figure 3-4: Existing Transmission System Configuration and Figure 3-6: Map of the Existing and Proposed System, three existing 138 kV lines—TL13815, TL13823, and TL13824—connect to the existing South Bay Substation. TL13815 connects to the Grant Hill Substation, a new substation located just south of State Route 94 in the Grant Hill area of the City of San Diego. TL13823 connects to the Telegraph Canyon Substation, located in the City of Chula Vista, east of Interstate 805 along the H Street Corridor and TL13824 connects to the Los Coches Substation, located east of El Cajon near Highway 8. Six 69 kV lines—TL641, TL642, TL644, TL645, TL646, and TL647—also connect to the existing South Bay Substation. The northern 69 kV lines—TL641, TL642, and TL644—connect to two substations located north of the Proposed Project site. The Montgomery Substation—located along the East San Diego Bay, east of I-5, and north of the City—is connected to TL641 and TL642. TL642 and TL644 connect to the Sweetwater Substation, located in National City, just east of I-5 at H Street in the City. The southern 69 kV lines—TL645, TL646, and TL647—connect to the Imperial Beach Substation and Otay Substation. The Otay Substation, which connects to TL645 and TL646, is located in the City of Chula Vista, east of I-5 along Main Street. The Imperial Beach Substation is located in the city of Imperial Beach and provides a connection point for TL647. The existing 230 kV line—TL23042—passes by the South Bay Substation with no interconnection. In addition to the four 69 kV distribution substations directly connected to the South Bay Substation—Montgomery, Sweetwater, Imperial Beach, and Otay—there are five additional distribution substations that comprise the South Bay Area transmission network—Border, Division, National City, San Ysidro, and Sunnyside.

As shown in Figure 3-5: Proposed Transmission System Configuration and Figure 3-6: Map of the Existing and Proposed System, the aforementioned 230 kV TL23042 and the six 69 kV

transmission lines would connect to the Bay Boulevard Substation. The 138 kV extension would bypass the substation entirely and create a connection between the Telegraph Canyon and Grant Hill substations.

3.2 PROJECT OBJECTIVES

In reviewing the South Bay region, annual grid study findings, and incorporating the benefits of other local area projects coming online, the following objectives were identified as critical to planning the future southern SDG&E transmission system:

- Objective 1: Replace aging and obsolete substation equipment.
- Objective 2: Design a flexible transmission system that would accommodate regional energy needs subsequent to the retirement of the SBPP.
- Objective 3: Facilitate the City of Chula Vista’s Bayfront redevelopment goals by relocating the South Bay Substation and furthering the goals of the SDG&E-City of Chula Vista Memorandum of Understanding (MOU).
- Objective 4: Provide for future transmission and distribution load growth for the South Bay region.

Chapter 2 – Project Purpose and Need provides additional details regarding the Proposed Project’s objectives.

3.3 PROJECT CAPACITY

With regards to the ultimate substation configuration, the Proposed Project’s effect on system capacity varies by voltage class. The existing South Bay Substation is a 138/69 kV substation while the Bay Boulevard Substation would ultimately be a 230/69/12 kV substation. By relocating the substation, the high-side voltage would increase from 138 kV to 230 kV and there would ultimately be no increase in capacity from a 230 kV system perspective. This is a result of the Bay Boulevard Substation’s proposed tapping into the existing OMPL 230 kV system—including the Otay Mesa generators—which would provide the most local source of power for the South Bay and Chula Vista areas in place of the SBPP. The existing 230 kV system is more broadly connected, with higher capacity and more diverse power source connections than the 138 kV system. Thus, the inherent capacity increase currently associated with the 230 kV system would have a capacity effect for the lower voltage classes, as explained further in the following paragraphs.

In terms of the 138 kV system, no increase in capacity would result from the Proposed Project. The 138 kV system would bypass the Bay Boulevard Substation by directly connecting the 138 kV lines that formerly looped into or originated from the existing South Bay Substation. This eliminates the South Bay 138 kV connections by directly connecting the Grant Hill and Telegraph Canyon substations. The 138 kV system would continue to receive bulk power at 230 kV from Encina, Miguel, Mission, Penasquitos, San Luis Rey, and Sycamore substations. This is unchanged from the current configuration.

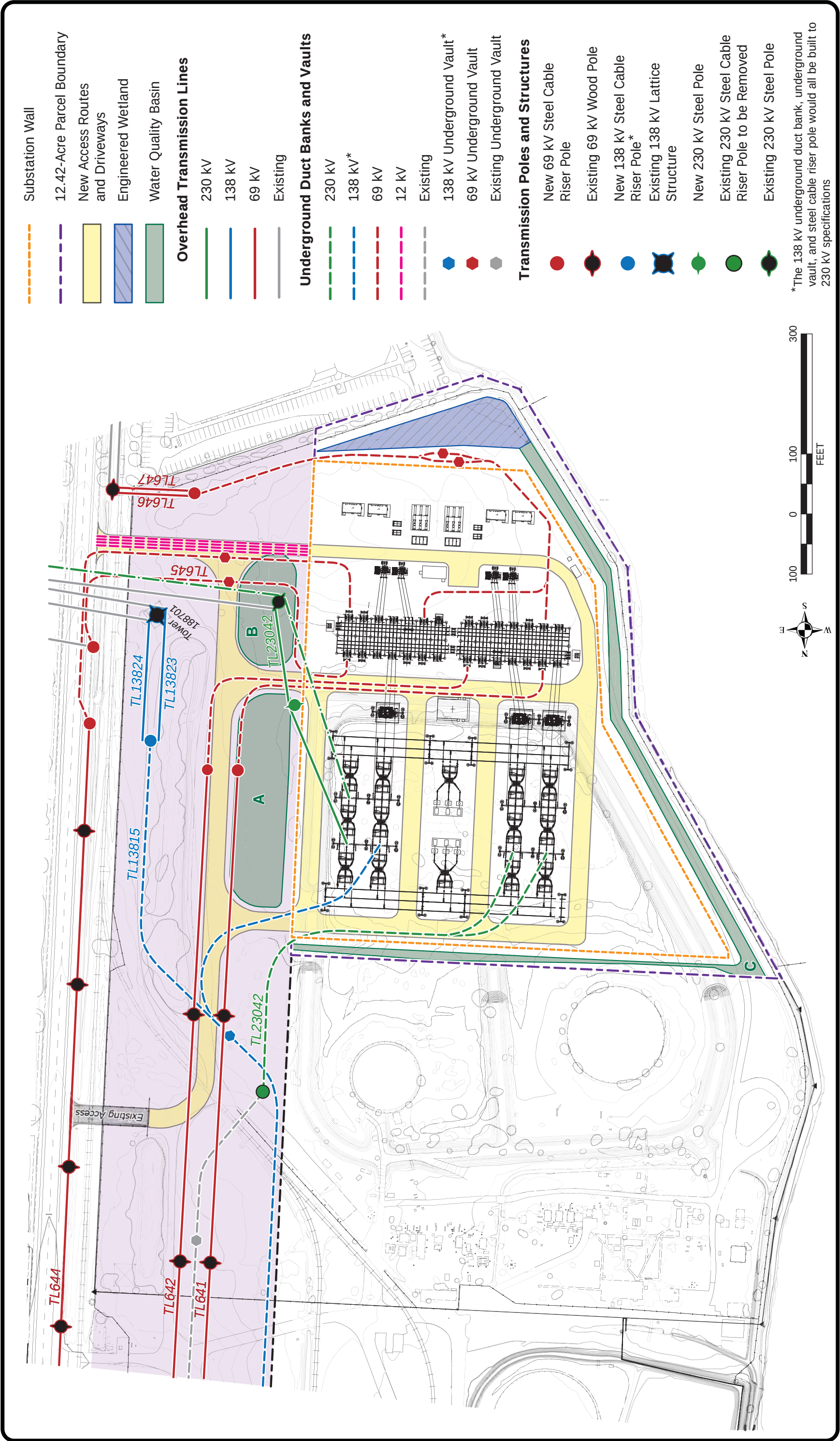


Figure 3-3: Bay Boulevard Substation Conceptual Site Plan

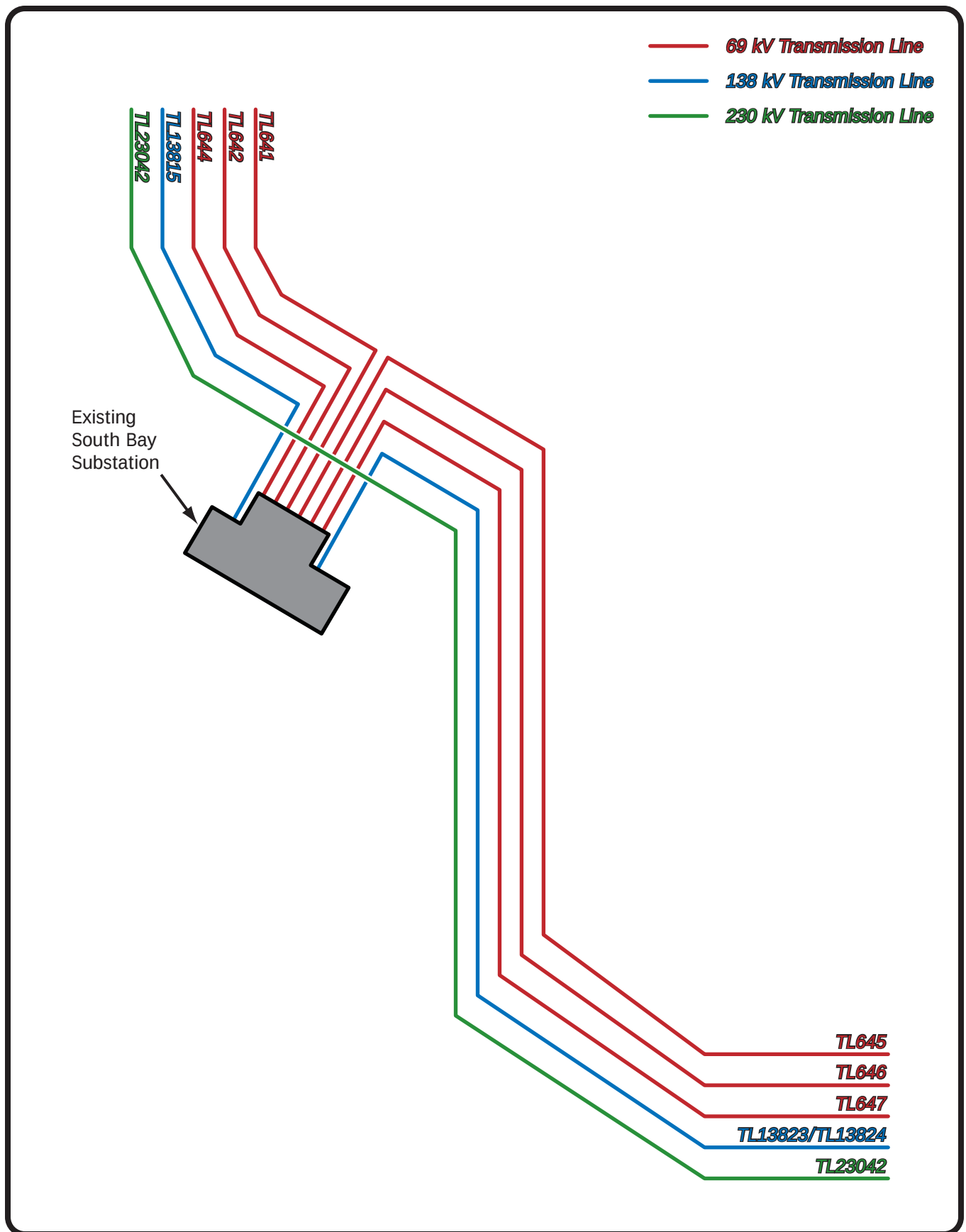


Figure 3-4: Existing Transmission System Configuration

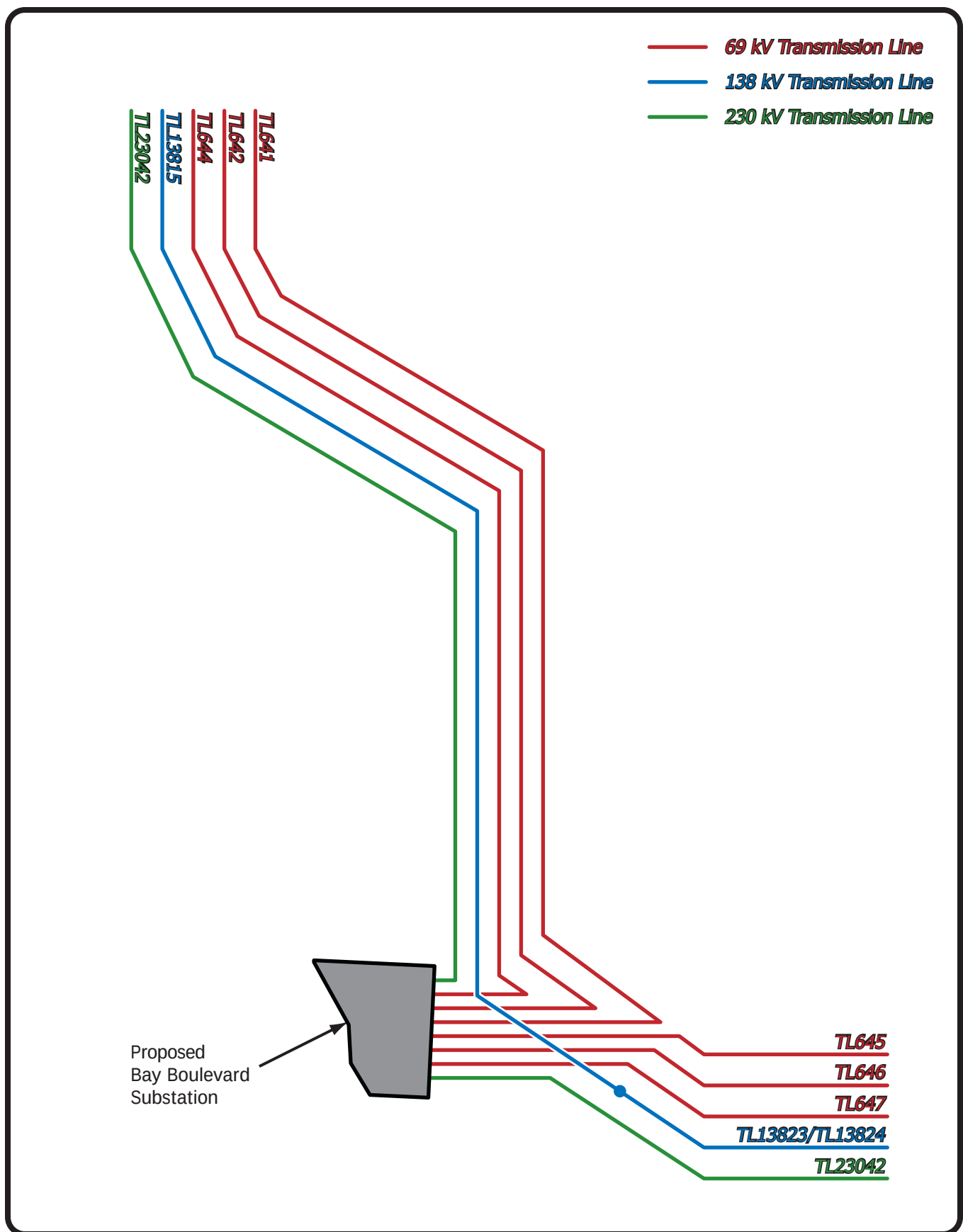


Figure 3-5: Proposed Transmission System Configuration

Figure 3-6: Map of the Existing and Proposed System

Figure 3-6: Map of the Existing and Proposed System has been omitted from this document due to its confidential nature.

For the 69 kV transmission system, the existing 69 kV lines that currently originate at the existing South Bay Substation would be relocated to the Bay Boulevard Substation. As a part of this relocation, they would be terminated with greater capacity and a stronger bulk power source from the more robust 230 kV transmission line system. The result would be an increase in capacity of the 69 kV system that serves the South Bay and Chula Vista areas. If and when the 69/12 kV distribution portion of the Bay Boulevard Substation is constructed, then increased capacity available to the 12 kV system serving South Bay and western Chula Vista would be realized. This increased capacity would serve future load growth currently anticipated to occur in the Bayfront area in accordance with the City of Chula Vista adopted General Plan Update.

3.4 PROJECT COMPONENTS

The Proposed Project includes the following five main components as more fully outlined below:

1. Bay Boulevard Substation - a new, approximately 9.7-acre 230/69/12 kV substation and related fixtures, facilities and equipment located on a 12.42-acre parcel
2. 230 kV Loop-in - an approximately 1,000-foot-long underground interconnection and an approximately 300-foot-long overhead interconnection of the existing 230 kV TL23042 and associated communication cables to the Bay Boulevard Substation
3. 69 kV Relocation - the relocation of six overhead transmission lines—TL641, TL642, TL644, TL645, TL646, and TL647—and associated communication cables to the new Bay Boulevard Substation, requiring the relocation of approximately 7,500 feet of overhead line and the construction of approximately 4,100 feet of underground line
4. 138 kV Extension - the connection of the existing TL13815, TL13823, and TL13824 via an approximately 3,800-foot-long underground duct bank and an approximately 200-foot-long overhead span from one new steel cable riser pole to an existing steel lattice structure, forming the Grant Hill-Telegraph Canyon 138 kV line
5. South Bay Substation Demolition - the demolition of a 7.22-acre existing 138/69 kV substation and related fixtures, facilities and equipment

These five components are described in greater detail in Section 3.4 Project Components and are depicted in Figure 3-2: Project Overview Map and Attachment 3-A: Detailed Project Components Map. The estimated total cost associated with constructing the Proposed Project is presented in Table 3-1: Proposed Project Cost Estimate.

3.4.0 Bay Boulevard Substation

The new Bay Boulevard Substation is planned to occupy approximately 9.7 acres (approximately 800 feet by 730 feet at its widest points) within a 12.42-acre parcel, which would be enclosed by an approximately 10-foot-tall concrete masonry wall around the perimeter of the substation. As discussed in Section 3.5 Permanent Land and Right-of-Way Requirements, acquisition of the

Table 3-1: Proposed Project Cost Estimate

Table 3-1: Proposed Project Cost Estimate has been omitted from this document due to its confidential nature.

12.42-acre parcel would only occur upon the satisfaction of several conditions precedent, including but not limited to the RMR Termination. The Proposed Project would involve the following two steps:

1. the decommissioning of portions of the existing LNG site, including the removal of the existing containment berm and the over excavation and recompaction of the existing soil
2. the site development and construction of the new substation

The completed substation would include permanent cut and fill slopes in the area surrounding the enclosed portion of the substation as depicted in Figure 3-7: Bay Boulevard Substation Temporary and Permanent Impact Areas. In addition, a clear area around the perimeter of the substation measuring approximately 30 feet wide would be maintained, as depicted in Figure 3-7: Bay Boulevard Substation Temporary and Permanent Impact Areas. In addition, three water quality basins and one wetland would be constructed around the perimeter of the substation. As depicted in Figure 3-3: Bay Boulevard Substation Conceptual Site Plan, basins A and B would be constructed between the substation's wall and the new main access driveway. Basin C would be constructed adjacent to the north and west sides of the substation. These basins would occupy approximately 1.7 acres of land and would have a combined capacity of approximately 119,500 cubic feet.² The wetland would be constructed along the southern border of the substation and would occupy approximately 0.4 acre.

With regard to phasing, two arrangements—the initial and ultimate—are discussed in this section. The Bay Boulevard Substation initial configuration, depicted in Figure 3-8: Bay Boulevard Substation Initial Arrangement, would be designed to include the following components:

- A 230 kV yard with double 230 kV busses and five bays of breaker and a half configuration. Two line positions would be installed to terminate two 230 kV transmission lines. Two bank positions would be installed to terminate two 230/69 kV, 224 megavolt-ampere (MVA) transformer banks. The 230 kV transmission line and transformer dead-end structures would be approximately 55 feet tall with a 10-foot static mast. The 230 kV bus dead ends would be approximately 39 feet high.
- Two 230/69 kV, 224 MVA transformers³ and associated circuit breakers, disconnects, and controls would be installed. Oil spill containment basins would also be installed around each of the transformers.⁴
- Two 230 kV transmission lines would be terminated with associated circuit breakers, disconnects, and controls.

² The capacity of the water quality basins was evaluated assuming a water depth of two feet.

³ The maximum amount of oil required for the transformers at the Bay Boulevard Substation would be approximately 40,000 gallons and 80,000 gallons for the initial and ultimate arrangements, respectively.

⁴ The oil spill containment basins would have a capacity that is 10 percent greater than the oil capacity of the transformers or to maintain at least six inches of freeboard, whichever is greater.

- A 69 kV yard with 14 double breaker bays in a quad bus configuration. The 69 kV rack structure would be approximately 45 feet high. Two station lights and power transformers and associated disconnects would be installed.
- Six 69 kV line positions would be used to terminate six 69 kV transmission lines with associated circuit breakers, disconnects, and controls.
- Four 69 kV bank positions would be used to terminate the low voltage side of two 230/69 kV, 224 MVA transformer banks with associated circuit breakers, disconnects, and controls.
- Two 69 kV capacitor positions would be installed to feed two 69 kV capacitors and associated circuit breakers, disconnects, and controls.
- Two 69 kV grounding transformers and associated circuit breakers, disconnects, and controls would be installed.
- An approximately 75-foot-tall lattice steel tower to support an approximately eight-foot-diameter microwave telecommunication disc would be installed in the southwest corner of the substation. An enclosure, with an approximate footprint of 12 feet wide, 20 feet long, and 10 to 12 feet tall, would be installed adjacent to the tower to house critical communications equipment.
- A control house measuring approximately 32 feet wide, 50 feet long, and 12 feet tall, would be installed to house substation controls and protection.
- Distribution and Transmission duct packages would be installed and stubbed out at both ends.

Initially, the Bay Boulevard Substation would not include distribution equipment. Distribution circuits and ancillary equipment to serve the City and the surrounding area would be added to the Bay Boulevard Substation as local distribution load develops. This equipment has been included in the ultimate arrangement, as depicted in Figure 3-9: Bay Boulevard Substation Ultimate Arrangement and Figure 3-10: Bay Boulevard Substation Ultimate Profile View. The following list of components would be included in the proposed ultimate arrangement:

- Three 230 kV transmission lines and associated circuit breakers, disconnects, and controls, for a total of five 230 kV transmission lines would be installed.
- Six 69 kV transmission lines and associated circuit breakers, disconnects, and controls for a total of twelve 69 kV transmission lines would be installed.
- One 230/69 kV, 224 MVA transformer bank and associated circuit breakers, disconnects, and controls for a total of three 230/69 kV, 224 MVA transformer banks would be installed.



**Figure 3-7: Bay Boulevard Substation
Temporary and Permanent Impact Areas**

**South Bay Substation
Relocation Project**

- | | |
|----------------------------|------------------------------------|
| Substation Wall | Permanent Substation and Driveways |
| 12.42-Acre Parcel Boundary | Permanent Cut and Fill |
| SDG&E Easement | Limits of Temporary Disturbance |



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0 100 200 400 600 Feet



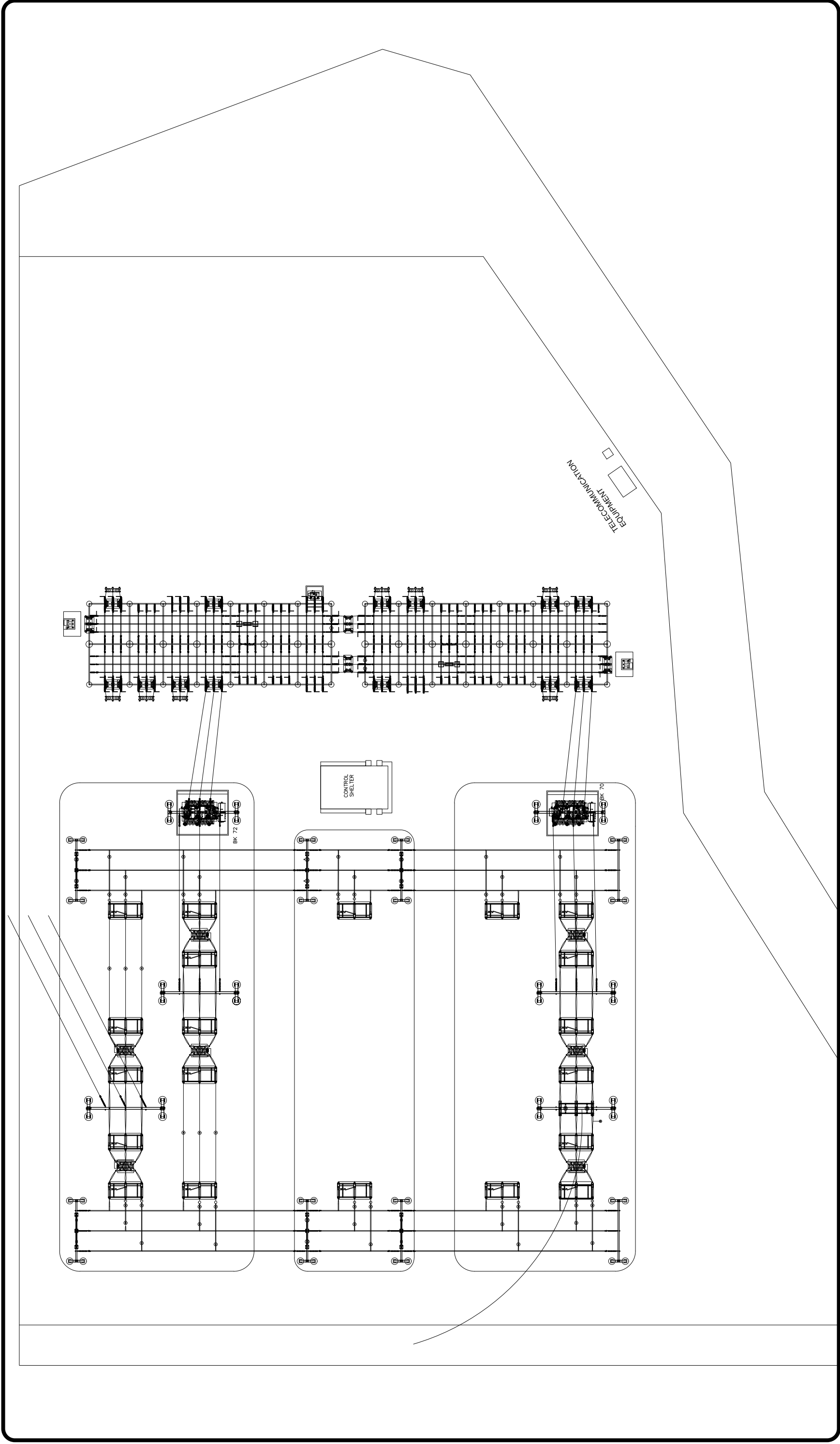


Figure 3-8: Bay Boulevard Substation Initial Arrangement

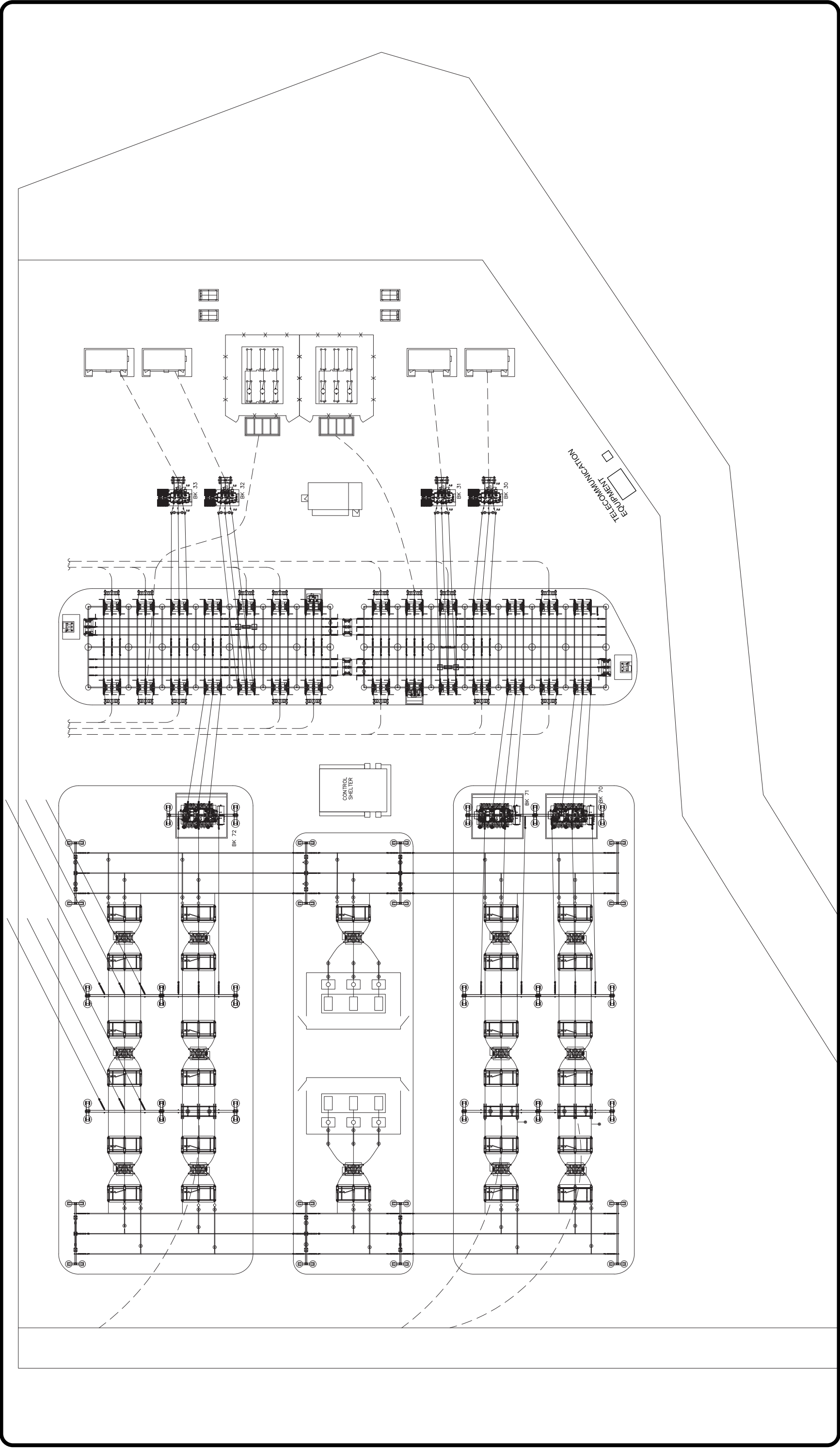


Figure 3-9: Bay Boulevard Substation Ultimate Arrangement

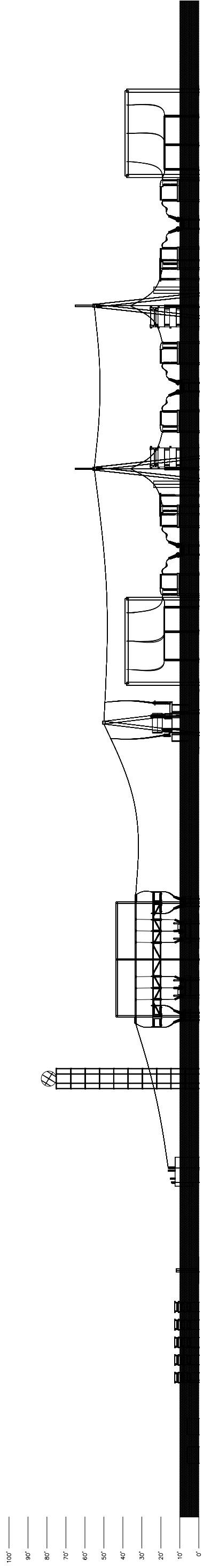


Figure 3-10: Bay Boulevard Substation Ultimate Profile View

- Two 230 kV capacitor banks and associated circuit breakers, disconnects, and controls would be installed.
- Four 69/12 kV, 28 MVA transformers, associated switchgear, capacitor banks, and controls would be installed.
- A control house measuring approximately 20 feet wide, 40 feet long, and 12 feet tall would be installed to house substation controls and protection would be installed.
- Sixteen 12 kV distribution lines would be installed.
- Four 12 kV capacitors would be installed.

Substation lighting would be provided by approximately fifteen 175-watt tungsten-quartz lamps placed near major electrical equipment to allow for equipment inspection and safe movement inside the substation. In addition, approximately four 75-watt lights would be placed around each control shelter. Because maintenance activities are not anticipated to occur at night, this lighting would remain turned off until needed. One 100-watt yellow floodlight would be mounted near each substation gate to allow for safe entry, and would remain on during nighttime hours. All on-site lighting would be oriented downward to minimize glare onto surrounding property and habitat.

An approximately 10-foot-tall concrete masonry wall would enclose the entire substation. The three entrance gates would be locked and monitored remotely to limit access to only qualified personnel. Warning signs would be posted on the substation wall and gates in accordance with federal, state, and local safety regulations.

Current access to the Bay Boulevard Substation is from an existing paved driveway from Bay Boulevard at the north end of the LNG site. A new main access driveway would be constructed from Bay Boulevard, at the south end of the LNG site, to the proposed substation site. As discussed in Section 3.5 Permanent Land and Right-of-Way Requirements, obtaining access satisfactory to SDG&E is a condition precedent to the acquisition of the Bay Boulevard Substation site. The new main access driveway entrance, located at the south end of the property, would provide primary access to the substation during operation and maintenance activities. This route would extend west from Bay Boulevard, crossing the existing drainage channel and railroad tracks, for approximately 160 feet. At this point, it would turn north and parallel the eastern border of the substation. Three driveways would extend from the main access route to gated entrances and the substation's interior paved roads. The existing paved entrance from Bay Boulevard to the LNG site is planned to be improved to provide construction and secondary access to the Bay Boulevard Substation. The existing route leads west from Bay Boulevard for approximately 160 feet. From this point, the secondary access route would turn to the south and head toward the Bay Boulevard Substation where it would connect to the main access route.

Except for the main access route's initial approximately 20-foot-long concrete apron, the access routes, driveways, and interior substation access roads are planned to be approximately 30 feet wide and bordered by approximately three-foot-wide Class II aggregate shoulders. The main

access route would be asphalt-paved between the end of the 20-foot-long concrete apron from Bay Boulevard and the two southernmost substation gates. The remainder of the access routes and driveways—north of the center substation gate—would have a graded Class II aggregate road surface. In order to maintain flow in the existing drainage channel located directly adjacent to Bay Boulevard, a culvert is planned to be installed under the main access driveway. The primary and secondary access routes would be approximately 1,500 feet long, occupying approximately one acre. The substation’s interior access roads and parking areas at the control houses would occupy approximately 2.2 acres. A detailed drawing depicting the substation layout, planned access routes, driveways, and interior access roads is included as Figure 3-3: Bay Boulevard Substation Conceptual Site Plan.

Prior to the installation of the new main access route and driveways, SDG&E plans to install the underground duct bank for TL644 as well as four approximately 355-foot-long concrete underground duct banks running east between the substation wall and Bay Boulevard for the future 12 kV distribution circuits. These duct banks would be comprised of six approximately six-inch-diameter and one approximately four-inch-diameter polyvinylchloride (PVC) conduits. The conduits would be separated by spacers and then encased in concrete to form the final duct package. A typical drawing of the proposed duct banks have been included in Attachment 3-C: Typical Drawings.

3.4.1 230 kV Loop-in

Transmission Poles and Underground Duct Bank

As described previously, SDG&E is proposing to loop the existing bundled-circuit TL23042, as well as the associated communication cables, into the Bay Boulevard Substation. This would require the removal of one approximately 165-foot-tall steel cable riser pole⁵ and the installation one new, approximately 121-foot-tall steel angle pole.⁶ These poles range in diameter from approximately five feet to six feet at the base and two feet to three feet at the top. The poles range in height from approximately 90 feet to 110 feet. The new steel angle pole would be equipped with six dead-end insulators to carry the three bundled conductors from the Bay Boulevard Substation equipment to the existing steel angle pole. A summary of typical pole dimensions has been provided as Table 3-2: Transmission Pole Dimensions and typical drawings of the existing steel cable riser pole and new steel angle pole have been included in Attachment 3-C: Typical Drawings. A summary of the poles planned to be removed and installed, including the pole numbers, configuration, and material has been included as Attachment 3-D: Transmission Pole Summary.

⁵ A riser pole is a type of transmission pole used to transition a circuit from an aboveground to underground configuration.

⁶ An angle pole is a type of transmission pole used to allow the circuit’s alignment to change direction.

Table 3-2: Transmission Pole Dimensions

Pole Type	Approximate Diameter (feet)		Approximate Height (feet)
	Top	Base	
230 kV Steel Cable Riser Pole	2 to 3	5 to 6	165
230 kV Angle Pole	2 to 3	5 to 6	90 to 110
138 kV Steel Cable Riser Pole	1.5 to 2	4 to 5	165
69 kV Steel Cable Riser Pole	1.5	3 to 4	85
69kV Wood Tangent Pole	1.5	2.5	60 to 75
Stub Wood Pole (for guying)	0.5	1	25 to 30

In addition, approximately 1,000 feet of underground duct package would be installed to complete the northern interconnections's substation getaways. The underground duct package would be comprised of six approximately eight-inch-diameter and one approximately four-inch-diameter PVC conduits encased in concrete. A typical drawing of the proposed underground duct bank package has been included in Attachment 3-C: Typical Drawings. The proposed locations of these facilities with respect to the Bay Boulevard Substation are depicted in Figure 3-3: Bay Boulevard Substation Conceptual Site Plan and in Attachment 3-A: Detailed Project Components Map. Any existing trench packages that are not part of the interconnection work would be abandoned in place.

Conductor

The northern interconnection would continue as a bundled-circuit underground configuration and the southern interconnection would exit the substation as a bundled-circuit overhead configuration. A bundled 2,000 to 3,500 kcmil⁷ copper extruded dielectric cable would be installed within the underground duct banks. A bundled 900 kcmil aluminum-clad steel supported (ACSS)/Alumoweld (ACSS/AW) conductor would be installed on the overhead portions of the loop-in with a vertical configuration (the three bundled conductors comprising one circuit would be installed on the same side of the aboveground structure). The distance from the ground to the lowest conductor would be at least 30 feet and the conductors would maintain a vertical spacing of approximately 32 feet. A summary of the conductors that would be installed as part of the Proposed Project has been included as Table 3-3: Circuit Configuration and Conductor Data. In addition to the electrical conductors, existing communication cables would be looped into the Bay Boulevard Substation. Two types of communication cables—fiber optic and copper—would be installed as part of the Proposed Project. The fiber optic cables would measure approximately 0.53 inch in diameter and be comprised of 48-strand all-dielectric self-supporting cable. The copper cables would measure approximately 0.98 inch in diameter and be comprised of 54 pairs of 22 American wire gauge cables.

⁷ kcmil (1,000 cmils) is a quantity of measure for the size of a conductor; kcmil wire size is the equivalent cross-sectional area in thousands of circular mils. A circular mil (cmil) is the area of a circle with a 0.001-inch-diameter.

Table 3-3: Circuit Configuration and Conductor Data

Project Component	Anticipated Circuit Configuration and Conductor Type	
	Overhead	Underground
230 kV Loop-in		
TL23042	Bundle-Circuit – 900 kcmil ACSS/AW	Bundle-Circuit – 2,000 to 3,500 kcmil Copper Extruded Dielectric
69 kV Relocation		
TL641	Single-Circuit – 1,033 kcmil aluminum-clad steel reinforced (ACSR)/AW	Single-Circuit – 1,750 kcmil Aluminum Extruded Dielectric
TL642	Split Phase-Circuit – 636 kcmil ACSS/AW	Bundle-Circuit – 3,000 kcmil Copper Extruded Dielectric
TL644	Split Phase-Circuit – 636 kcmil ACSR/AW	Double-Circuit – 3,000 kcmil Copper Extruded Dielectric
TL645	Split Phase-Circuit – 1,033 kcmil ACSR/AW	Single-Circuit – 1,750 kcmil Aluminum Extruded Dielectric
TL646	Split Phase-Circuit – 1,033 kcmil ACSR/AW	Single-Circuit – 1,750 kcmil Aluminum Extruded Dielectric
TL647	Single-Circuit – 1,033 kcmil ACSR/AW	Single-Circuit – 1,750 kcmil Aluminum Extruded Dielectric
138 kV Extension		
TL13815	Bundle-Circuit – 636 kcmil ACSR/AW	Single-Circuit – 2,500 kcmil Copper Extruded Dielectric
TL13823	Bundle-Circuit – 636 kcmil ACSR/AW	Single-Circuit – Not Applicable (NA)
TL13824	Bundle-Circuit – 636 kcmil ACSR/AW	Single-Circuit – NA

3.4.2 69 kV Relocation

Transmission Poles and Underground Duct Bank

In order to relocate these six existing 69 kV overhead transmission lines from the South Bay Substation to the Bay Boulevard Substation, approximately 18 new wood transmission poles would be installed, 23 wood transmission poles would be removed, and an additional 22 wood transmission poles would be replaced, as depicted in Attachment 3-A: Detailed Project Components Map. In addition to the transmission poles, approximately one wood distribution poles would be removed, and the existing 12 kV distribution circuit would be underbuilt onto the new adjacent 69 kV poles. Lastly, approximately six existing stub wood poles used for guying would be removed. Table 3-4: Overhead 69 kV Relocation Summary provides a summary of the types of poles that would be installed, removed, and replaced. A more detailed description of these poles, including their location and configuration is included as Attachment 3-D: Transmission Pole Summary.

Table 3-4: Overhead 69 kV Relocation Summary

Pole Type	Pole Quantity*		
	Install	Remove	Replace
69 kV Wood Tangent Pole	18	23	22
69 kV Steel Cable Riser Pole	5	--	--
Stub Wood Pole (for guying)	--	6	--
12 kV Wood Distribution Pole	--	1	--

* The pole installation, removal and replacement numbers are preliminary estimates and may change upon completion of the final engineering design.

As summarized in Table 3-4: Overhead 69 kV Relocation Summary, four types of transmission or guy poles would be installed as part of the project. Angle poles are typically installed in locations where the transmission line must change directions. In areas where the transmission line is generally straight, tangent poles are used. In areas where poles require additional stability due to the localized terrain or where the line tension at angle poles has dictated the need for more stability, stub wood poles and guy wires⁸ would be connected to the poles. In some instances, steel poles with concrete foundations would be installed, eliminating the need for stub poles and guy wires. No guy wires would be installed across any roads as part of the Proposed Project.

Where existing wood distribution poles would be removed, the 12 kV distribution circuit would be underbuilt on the new adjacent 69 kV poles. Typical drawings of all of the poles that would be removed or installed as part of the Proposed Project have been included in Attachment 3-C: Typical Drawings. As depicted in these typical drawings, tangent poles would utilize three insulators per circuit and angle poles would use six insulators per circuit to support the conductor.

⁸ Guy wires are tensioned wires that are used to maintain tension between structures.

The steel cable riser poles would be approximately 85 feet tall and have diameters ranging from three to four feet at the base to approximately 1.5 feet at the top. The direct-bury wood tangent poles would be approximately 2.5 feet and 1.5 feet in diameter at the base and top, respectively. These poles would be embedded to a depth of approximately 8 to 12 feet and would be installed at a height between approximately 60 feet and 70 feet. A summary of the dimensions of the proposed 69 kV poles has been included as Table 3-2: Transmission Pole Dimensions. As described previously, some of the existing poles that comprise the southern transmission lines would be vacated and used by the northern transmission lines as part of the relocation process. As depicted in Attachment 3-A: Detailed Project Components Map, approximately 24 poles would be replaced in order to ensure reliability and compatibility with the relocated line. These poles would be replaced within approximately 10 feet of the existing pole locations.

The 69 kV lines would change from overhead to underground at the five new steel cable riser poles that would be installed. From these points, approximately 4,100 feet of new underground ducts and approximately four new concrete splice vaults would be installed to bring the transmission lines into the Bay Boulevard Substation. The underground 69 kV activities are summarized in Table 3-5: Underground 69 kV Relocation Summary.

Table 3-5: Underground 69 kV Relocation Summary

Transmission Line	Approximate Underground Duct Bank Length (feet)	Approximate Vault Quantity
TL641	700	0
TL642	600	0
TL644	1,000	1
TL645	800	1
TL646	1,000*	2
TL647		
Total	4,100	4

* TL646 and TL647 would share a common underground duct bank for the majority of the underground getaway.

Each underground duct package would be comprised of six approximately six-inch-diameter and one approximately four-inch-diameter PVC conduits encased in concrete. A typical drawing of the proposed underground duct bank package has been included in Attachment 3-C: Typical Drawings. The proposed locations of these facilities with respect to the Bay Boulevard Substation are depicted in Figure 3-3: Bay Boulevard Substation Conceptual Site Plan. In addition to the underground duct banks, approximately four underground splice vaults would be installed to facilitate pulling and splicing during installation and inspection, maintenance, and repair during operation. The precast concrete vaults measure approximately 17.2 feet long, 9.2 feet wide, and 11.1 feet deep. A typical drawing of the proposed 69 kV underground splice vaults has been included in Attachment 3-C: Typical Drawings.

Conductor

Each transmission line circuit would require the installation of three separate conductors. All of the 69 kV lines would maintain their current pre-Proposed Project configuration. As a result, TL642 and TL644 would utilize a double-circuit configuration and the remainder of the lines would have a single-circuit configuration. A single 1,033 kcmil ACSR/AW conductor would be strung along the overhead portions of TL641. The overhead portions of TL642 and TL644 would be strung using bundled 636 kcmil ACSS/AW and bundled 636 kcmil ACSR/AW conductor, respectively. The overhead span lengths between poles would vary with terrain, but would generally be between approximately 300 and 500 feet. The distance from the ground to the lowest conductor would be at least 30 feet, and conductors' vertical spacing would range from approximately six feet to seven feet. Where 12 kV distribution lines would be underbuilt, the minimum clearance between the distribution circuit and the ground would be at least 25 feet. Horizontal spacing on double-circuit configured lines would range from approximately 8 feet to 12 feet. A summary of the conductors that would be installed as part of the proposed project has been included as Table 3-3: Circuit Configuration and Conductor Data.

All underground single-circuit lines would utilize 1,750 kcmil aluminum extruded dielectric cable and the split phase-circuit lines—TL642 and TL644—would utilize 3,000 kcmil copper extruded dielectric cables. In addition to the underground cables, existing communication cables would also be collocated on the relocated 69 kV lines.

3.4.3 138 kV Extension

Transmission Poles and Underground Duct Bank

Extension of the 138 kV line, TL13815, would require the removal of a three-pole wood riser structure and four steel lattice structures, and the installation of one new steel cable riser pole, approximately 3,800 feet of underground duct bank, and three concrete underground splice vaults. The existing lattice structures measure approximately 85 to 100 feet tall and are approximately 21 feet across at their base. The approximately 165-foot-tall new steel cable riser pole ranges in diameter from approximately four or five feet at the base and approximately two feet in diameter at the top. Typical drawings of the lattice structure and steel cable riser pole have been included in Attachment 3-C: Typical Drawings⁹ and Attachment 3-D: Transmission Pole Summary contains detailed location and configuration information. As depicted, the new steel cable riser pole would utilize three terminations on each side of the pole to accept the six existing conductors, three from both TL13823 and TL13824. The overhead conductors would maintain a vertical spacing of approximately 32 feet and the lowest conductor would maintain a minimum ground clearance of approximately 40 feet.

As described previously, approximately 3,800 feet of underground duct package and approximately three splice vaults would be installed to complete the 138 kV extension. Approximately 500 feet additional underground duct package would be installed between the extension and the Bay Boulevard Substation. The underground duct package would be

⁹ All 138 kV facilities constructed as part of the Proposed Project would be built to the 230 kV standard. As a result, the typical drawings provided in Attachment 3-C: Typical Drawings are identical for both the 230 kV loop-in and 138 kV extension.

comprised of six approximately eight-inch-diameter and one approximately four-inch-diameter PVC conduits encased in concrete. A typical drawing of the proposed underground duct bank package has been included in Attachment 3-C: Typical Drawings. The proposed locations of these facilities with respect to the Bay Boulevard Substation are depicted in Figure 3-3: Bay Boulevard Substation Conceptual Site Plan and Attachment 3-A: Detailed Project Components Map. In addition to the underground duct banks, approximately three underground splice vaults would be installed to facilitate pulling and splicing during installation and inspection, maintenance, and repair during operation. The precast concrete vaults measure approximately 26 feet long, 10 feet wide, and 10 feet deep. A typical drawing of the proposed 138 kV underground splice vaults has been included in Attachment 3-C: Typical Drawings.

Conductor

As described in Table 3-3: Circuit Configuration and Conductor Data, the underground portion of the extension would be installed using 2,500 kcmil copper extruded dielectric conductors. In addition to the underground cables, existing telecommunication cables would be rerouted and placed within the underground duct banks and collocated along the overhead section of line.

3.4.4 South Bay Substation Demolition

As part of the Proposed Project, upon the satisfaction of certain conditions precedent, including but not limited to the RMR Termination, the energization of the Bay Boulevard Substation and the cut over of the existing transmission lines, as described in Section 3.5 Permanent Land and Right-of-Way Requirements, the existing South Bay Substation would be demolished. Subject to the approval of a demolition and decommissioning plan by the Port District, as described in Section 3.5 Permanent Land and Right-of-Way Requirements, the demolition of the existing substation would involve the removal of the control house, steel support structures, and electrical substation equipment. The existing foundations would be removed to a depth of approximately six feet below the existing grade and the substation footprint would be graded to blend in with the surrounding topography.

SDG&E's understanding is that the demolition of the South Bay Substation could possibly coincide with the demolition of the SBPP. Some of Dynegy's associated equipment—including but not limited to circuit breakers, disconnect switches, structures, foundations, relay panels, cabling—is located inside of SDG&E's South Bay Substation. Removal of that equipment from the existing South Bay Substation site would be the sole responsibility of Dynegy, and SDG&E makes no representation herein about how or when Dynegy would remove its equipment from the existing South Bay Substation site. A detailed list of equipment owned by Dynegy that is located at the existing South Bay Substation site has been included as Attachment 3-E: Dynegy-Owned Equipment within the Existing South Bay Substation.

All substation demolition work would occur within the existing substation fence line and, subject to further coordination with the Port District, a temporary 50-foot-wide work area established around the existing fence line, as shown in Attachment 3-A: Detailed Project Components Map. A plan view depicting the existing South Bay Substation layout has been included as Figure 3-11: South Bay Substation Existing Arrangement.

3.5 PERMANENT LAND AND RIGHT-OF-WAY REQUIREMENTS

3.5.0 Bay Boulevard Substation

In October 2004, SDG&E and the City entered into an MOU regarding several energy issues. Under the MOU, SDG&E agreed to take steps intended to establish a cooperative relationship with the City to advance the City's goals of beautifying the Chula Vista Bayfront. The MOU stated that if the City provided to SDG&E a suitable site at no cost to SDG&E and certain other conditions were satisfied, then SDG&E would relocate the existing South Bay Substation to such site after the permanent retirement of the SBPP. The City requested that SDG&E negotiate directly with the Port District.

SDG&E has negotiated a Real Estate Exchange Agreement and Joint Escrow Instructions (Port Exchange Agreement) with the Port District and an Agreement for the Exchange of Lands in the City of Chula Vista (California State Lands Commission [CSLC] Exchange Agreement) with the CSLC. Pursuant to the Port Exchange Agreement and the CSLC Exchange Agreement, upon the satisfaction of several conditions precedent more fully described as follows:

1. The Port District will convey to the CSLC, and the CSLC will convey to SDG&E, the fee interest in the 12.42-acre Bay Boulevard Substation site, provided that the use of such site shall be restricted to utility uses (other than a power plant).
2. SDG&E will convey to the CSLC the easement interest in the 7.22-acre existing South Bay Substation site.
3. The Port will convey to SDG&E a leasehold interest in the 7.22-acre existing South Bay Substation site (Lease), for a term of up to 10 years, subject to early termination upon the completion of the demolition and removal of all substation improvements from the 7.22-acre existing South Bay Substation site, completion of the demolition and removal of the related transmission structures from the 10.47-acre adjacent site, and conveyance by SDG&E to the CSLC of the easement interests in the adjacent 10.47-acre transmission site.

The conditions precedent to the exchange of real property interests under the Port Exchange Agreement and the CSLC Exchange Agreement include but are not limited to the following:

1. The RMR Termination
2. Final approvals by the CPUC and the CSLC
3. Receipt by SDG&E of all required permits and approvals for the Bay Boulevard Substation
4. Receipt by SDG&E of access rights required in connection with the Bay Boulevard Substation
5. Agreement by the Port District and SDG&E on a decommissioning and demolition plan for the existing South Bay Substation and related transmission structures

6. Exclusion of the Bay Boulevard Substation site from the Chula Vista Bayfront Master Plan and Port Master Plan Amendment and references to the Bay Boulevard Substation site in the findings in support of certification of the Chula Vista Bayfront Master Plan and Port Master Plan Amendment Environmental Impact Report
7. No pending litigation
8. No material change in the condition of the lands to be exchanged
9. Acceptable title of the lands to be exchanged

Pursuant to the Lease, subject to the satisfaction of several conditions precedent, including but not limited to the RMR Termination and the energization of the Bay Boulevard Substation and the relocation of the existing 69 kV transmission lines, the existing South Bay Substation and related transmission structures would be decommissioned and demolished pursuant to the decommissioning and demolition plan agreed upon by the Port District and SDG&E. Pursuant to the CSLC Exchange Agreement, with respect to the easement interests conveyed by SDG&E to the CSLC, the Port District and the CSLC would expeditiously pursue necessary state legislation to authorize the CSLC to further convey such easement interests to the Port District, at which time such easement interests would terminate pursuant to the doctrine of merger of title.

3.5.1 Transmission Lines

The transmission lines that comprise the Proposed Project currently travel within three separate easements. The first easement is located directly adjacent to the west side of the unused SD&AE railroad and traverses the Proposed Project area in a generally north-to-south direction. From Marina Boulevard to the approximate intersection of L Street and Bay Boulevard, the easement is approximately 150 feet wide. From this point until the southern border of the LNG site, the easement expands to approximately 300 feet wide. The second easement is approximately 15 feet wide and is located directly adjacent to the east side of the unused SD&AE railroad. The third easement comprises an approximately 10.47-acre triangular-shaped area located directly northeast of the existing South Bay Substation. The eastern edge of this triangular-shaped area is located directly adjacent to the aforementioned easement. These easements are depicted on Figure 3-2: Project Overview Map.

All construction work related to the Proposed Project's transmission lines would generally occur within these existing easements and the 12.42-acre parcel secured for construction of the Bay Boulevard Substation. Additional easements would be obtained from the Metropolitan Transit System (MTS) and the Port District to allow for the installation of the underground duct banks and to provide primary and secondary access to the substation site. A total of three easements, each approximately 30 feet wide, would be obtained between Bay Boulevard and SDG&E's existing easement.

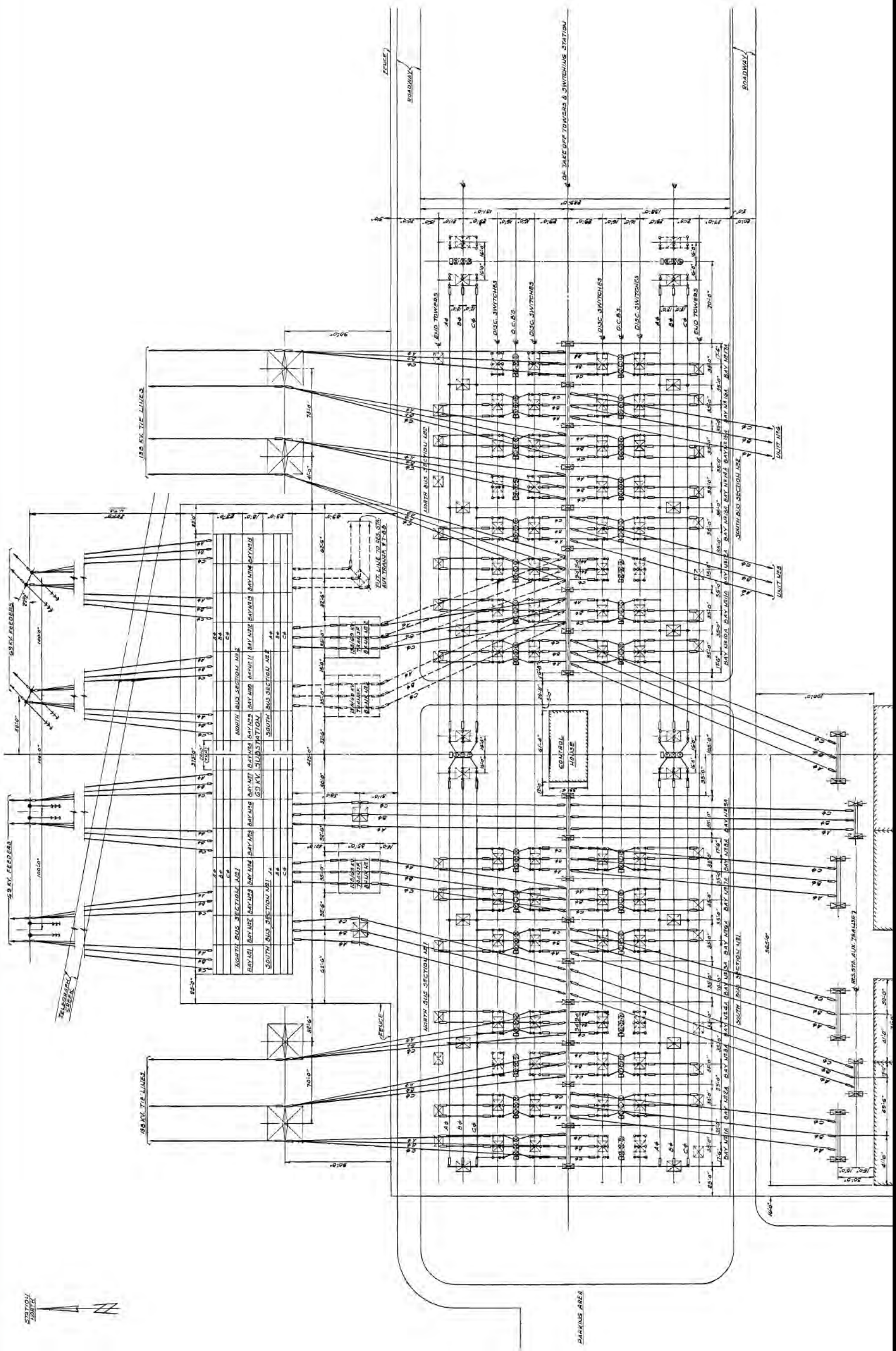


Figure 3-11: South Bay Substation Existing Arrangement

3.5.2 South Bay Substation

The existing South Bay Substation would be decommissioned and demolished as part of the Proposed Project subject to the satisfaction of several conditions precedent, including but not limited to the RMR Termination, the energization of the Bay Boulevard Substation, and the transfer of the existing transmission lines to the replacement substation. Upon the completion of the demolition of the existing South Bay Substation and the related transmission structures, SDG&E would convey to the CSLC the non-exclusive transmission and distribution easement interests in the 10.47-acre site, and the Lease of the 7.22-acre site would terminate.

3.5.3 Bay Boulevard Substation Access Driveways

As described in Section 3.4 Project Components, the new main access driveway and the existing LNG site access driveway would provide primary and alternate access to the substation during operation and maintenance activities, respectively. Each driveway would extend west crossing the existing drainage channel and railroad tracks. SD&AE and MTS have agreed in principal to these railroad crossings. SDG&E is coordinating with the Port District along with MTS to obtain permanent access rights for these crossings, including the required underground getaways. If required; SDG&E would also make a separate application to the CPUC to obtain permanent rights for these crossings.

3.6 CONSTRUCTION

This section describes the required access, anticipated temporary workspace requirements, and methods that would be employed to construct the facilities of the Proposed Project.

3.6.0 Staging Areas

Bay Boulevard Substation

During the decommissioning of the former LNG site and the subsequent site development phase at the Bay Boulevard Substation, SDG&E's existing easement would be used as a staging area. Following site development, the Bay Boulevard Substation footprint would be used as the staging area for the remainder of substation construction. This site would be used for the storage of equipment, staging of materials, and vehicle parking, as well as to house temporary office trailers during construction. As described in Section 3.6.3 Access, access to this site is planned to be provided by an existing driveway from Bay Boulevard. The entire former LNG site is currently enclosed by eight-foot-high chain-link security fencing topped with barbed wire. As a result, no temporary security fencing would be required during construction. The site would be gated and locked for security purposes. Following site development, the substation's concrete masonry wall would be installed to secure the site.

To provide electrical service to the site during construction, a temporary tap of an existing distribution line would be installed. This temporary power would be used for the operation of the construction trailer, construction lighting, and/or hand tools, until the installation of transformers occurs. Installation of the temporary distribution tap would be accomplished by installing approximately direct-bury wood distribution poles prior to construction. These poles would deliver power from the nearest tie-in point to the Bay Boulevard Substation site.

Transmission Easement

Following the site development activities at the proposed Bay Boulevard Substation, SDG&E's adjacent easement would continue to function as a staging area for the construction of the remaining Proposed Project components. As described previously, this site would be powered from a temporary distribution tap from SDG&E's existing facilities in the vicinity of the Proposed Project and the LNG site's existing fence would be used to secure the area.

H & Bay Yard

Additional staging would occur at the existing H & Bay Yard, located approximately 1.2 miles north of the proposed substation site, as depicted in Figure 3-12: H & Bay Yard Map. This approximately 280-foot by 310-foot disturbed area has been used by SDG&E for staging purposes during previous projects. This staging area would be used for the storage of construction materials and equipment during the construction of all of the Proposed Project components. The entire H & Bay Yard would be enclosed by an approximately six-foot-high chain-link security fence and locking gate. No power sources would be installed at this staging area and no additional improvements would be necessary.

3.6.1 Fly Yard

A flat fly yard, approximately 100 feet by 100 feet, is planned to be established within SDG&E's existing easement located directly adjacent and west of the H & Bay Yard. This paved area is depicted in Figure 3-12: H & Bay Yard Map, and would be used for refueling and picking up materials. Helicopters, as described in Section 3.6.5 Methods, would be used to string the sock line used during conductor pulling activities. Helicopter flight would be generally limited to within SDG&E's existing easement as described in Section 3.5 Permanent Land and Right-of-Way Requirements. Helicopter activities are anticipated to require up to 24 hours of total operation. SDG&E Best Management Practices (BMPs) would be implemented at the helicopter fly yard in order to reduce potential impacts to air quality, hazards and hazardous materials, and noise. These specific measures are discussed in detail in Section 4.3 Air Quality, Section 4.6 Hazards and Hazardous Materials, and Section 4.10 Noise.

3.6.2 Work Areas

In addition to the staging areas discussed in the previous section, temporary workspace would be required for each Proposed Project component in order to facilitate construction. These anticipated workspace requirements are described in detail in the following paragraphs, summarized in Table 3-6: Temporary Workspace Required, and depicted in Attachment 3-A: Detailed Project Components Map. All temporary work areas would be accessed by construction equipment using existing access roads or by overland travel. All work areas would be restored to pre-construction conditions to the extent practical following the completion of construction. Further discussion of the restoration process is provided in Section 4.4 Biological Resources.

Poles and Structures

To accommodate construction equipment and activities during the installation and removal of transmission poles and structures, temporary construction areas would be cleared and graded at each location. An approximately 150-foot by 150-foot workspace would be established at each



Figure 3-12: H & Bay Yard Map

South Bay Substation Relocation Project

- H & Bay Yard
- Fly Yard
- SDG&E Easement

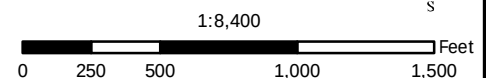


Table 3-6: Temporary Workspace Required

Associated Proposed Project Component/Workspace Description	Workspace Type¹⁰	Quantity	Required Improvements	Approximate Dimensions (feet)	Total Area (acres)
230 kV Loop-in	Pole Work Area	2	Clearing, Grading, and Excavation	150 by 150	1.0
	Underground Work Area	1	Clearing, Grading, and Excavation	1,000 by 50	1.1
	Pull Site ¹¹	1	Clearing	225 by 150	0.8
69 kV Relocation	Pole Work Area	68	Clearing, Grading, and Excavation	150 (diameter)	27.6
	Underground Work Area	1	Clearing, Grading, and Excavation	4,100 by 30	2.8
	Pull Site ^{11, 12}	4	Clearing	150 by 150	1.0
138 kV Extension	Structure/Pole Work Area	5	Clearing, Grading, and Excavation	150 (diameter)	1.0
	Underground Work Area	1	Clearing, Grading, and Excavation	4,300 by 50	4.9
	Pull Site ¹¹	1	Clearing	225 by 150	0.8
South Bay Substation	Staging Area	1	None	50 (buffer)	1.7
Underground Duct Banks ¹³	Jack-and-Bore Pit	10	Clearing, Grading, and Excavation	150 by 150	5.2
H & Bay Yard	Staging Area	1	None	280 by 310	2.0
	Fly Yard	1	None	100 by 100	0.2

¹⁰ Due to the fact that SDG&E would generally use their existing easements, as described in Section 3.5 Permanent Land and Right-of-Way Requirements, as work areas, these specific work areas have not been represented in the Proposed Project's GIS database.

¹¹ The underground work areas may be used during conductor and cable pulling activities

¹² Portions of the 69 kV pull sites would overlap with their associated pole work areas.

¹³ Telegraph Creek would be crossed using the jack-and-bore method. Up to four additional features have been identified that may be crossed using the jack-and-bore method of construction as an alternative to trenching.

of the two 230 kV poles that would be installed or removed. Approximately 150-foot-diameter workspaces would be established at the 68 69 kV and five 138 kV poles and structures that would be installed, removed, or replaced. A total of approximately 73 of these workspaces, totaling approximately 28.6 acres, would be required.

Underground Construction

To accommodate the installation of the underground duct banks, temporary workspaces centered on the duct bank alignments would be established. This area would be cleared and graded, as needed, to provide a safe working space for the operation of construction equipment. The 230 kV and 138 kV duct banks would require an approximately 50-foot-wide workspace while an approximately 30-foot-wide area would be used for the 69 kV duct banks. A total of approximately 9,400 linear feet of workspace requiring approximately 8.8 acres would be established prior to construction.

Pull Sites

Approximately six pull sites would be established to provide a safe working space for the installation and removal of overhead conductors and underground cables. These pull sites would generally be located adjacent to designated 230 kV, 138kV, and 69 kV poles. The 230 kV and 138kV pull sites would be approximately 225 feet long, 150 feet wide, and located directly in line or offset with the conductor. Pull sites required for the 69 kV relocation would be approximately 150 feet wide, and would extend approximately 150 feet from the base of the pole in line with the conductor's alignment. As a result, the approximately six pull sites would require approximately 3.7 acres of land. The temporary work areas used to install the underground duct banks would be used to facilitate pulling of the underground cables. Grading of the pull sites is not expected to be necessary.

3.6.3 Access

Bay Boulevard Substation

As described in Section 3.5 Permanent Land and Right-of-Way Requirements, receipt by SDG&E of access rights required in connection with the Bay Boulevard Substation is a condition precedent to the exchange of real estate interests with the Port District and the CSLC. An existing approximately 160-foot-long paved road provides access to the current LNG site, SDG&E's existing 300-foot-wide easement, and the Bay Boulevard Substation site from Bay Boulevard. Prior to the start of construction, subject to further coordination with the Port District and the MTS, this existing access route would be extended south to provide access for construction crews and heavy equipment to the proposed substation site. This access route is planned to be graded generally flat and approximately 30 feet wide. As construction progresses and the main access driveway is constructed, it would be used to access the substation site. Acquisition of permanent access rights for the Bay Boulevard Substation access driveways and associated transmission and distribution getaways has been discussed in Section 3.5.3 Bay Boulevard Substation Access Driveways.

Transmission Lines

SDG&E currently maintains a network of existing paved and unpaved access roads that are used to maintain and operate the existing transmission lines within their easements. Subject to further coordination with the Port District, this network of roads and the proposed substation access route would be used to access all temporary work areas required during construction.

Construction crews may travel overland within SDG&E's existing easement on an as-needed basis to access work areas located outside of the range of existing roads. Prior to construction, all sensitive resources would be flagged and these areas would be avoided by construction crews. No new permanent access roads would be constructed to access these Proposed Project components.

South Bay Substation Demolition

An approximately 2,100-foot-long, two-lane paved road provides access to the existing South Bay Substation. No new temporary or permanent access roads would be constructed to access the substation.

3.6.4 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 State Water Resources Control Board's (SWRCB) General Permit for Storm Water Discharges Associated with Construction Activity Order No. 2009-0009-DWQ (General Permit). To obtain coverage under the General Permit, Permit Registration Documents, including a Notice of Intent, Stormwater Pollution Prevention Plan (SWPPP), risk assessment, site map, certification, and annual fee must be submitted electronically to the SWRCB prior to initiating construction activities. The SWPPP would include:

- Identification of pollutant sources and non-stormwater discharges associated with construction activity
- Specifications for BMPs that would be implemented, inspected, and maintained during project construction to minimize erosion and the potential for accidental releases, and to minimize pollutants in the runoff from the construction areas, including pollutants from storage and maintenance areas and building materials laydown areas
- Specifications for spill response and implementation
- A record of training provided to persons responsible for implementing the SWPPP
- Reporting and record keeping requirements
- A plan for sampling and analysis of pollutants to ensure that the Numeric Action Levels are met and that Numeric Effluent Limitations are not exceeded

In addition, as the weather dictates, a specific Rain Event Action Plan would be prepared for all phases of construction. During construction, the San Diego Regional Water Quality Control Board would oversee and inspect for compliance with the Construction General Permit for the SWRCB. Refer to Section 4.7 – Hydrology and Water Quality for additional discussion. In

addition, a Hazardous Waste and Spill Prevention Plan would be prepared prior to Proposed Project construction, and would be implemented to ensure that any potential release or spill of hazardous materials during construction of the proposed facilities is properly handled to reduce potential impacts to the less-than-significant level. All non-hazardous soil and grub material that would be transported off site may be disposed of at Allied Otay Landfill, located approximately 5.1 miles east of the Bay Boulevard Substation.¹⁴ 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 through transport to an authorized landfill.

3.6.5 Methods

Construction methods for the Bay Boulevard Substation, the overhead and underground transmission lines, and the underground distribution getaways are described in this section. Construction methods used to demolish the existing South Bay Substation are also discussed. Refer to Section 4.6 Hazards and Hazardous Materials for information regarding handling and disposal of contaminated materials. A summary of the number of truck trips required to construct each of the Proposed Project's components has been provided as Table 3-7: Construction Truck Trip Summary.

Table 3-7: Construction Truck Trip Summary

Project Component	Approximate Truck Trips
Bay Boulevard Substation	12,520
230 kV Loop-in	80
69 kV Relocation	165
138 kV Extension	300
South Bay Substation Demolition	1,254

Bay Boulevard Substation

Clearing and Grading

Due to the disturbed/developed nature of the Bay Boulevard Substation site, extensive vegetation clearance is not anticipated as part of construction activities. Approximately 18.4 acres of on-site vegetation would be removed during the clearing and grading phase of Bay Boulevard Substation construction. Clearing activities would be accomplished through the use of mowers, excavators, front-end loaders, and/or D-9 bulldozers. Section 4.4 Biological Resources contains a detailed discussion of the vegetation clearing requirements for the construction of the Proposed Project.

No trees would be removed as part of the Proposed Project; however, the Bay Boulevard Substation site is located in an established industrial area that supports a limited number of trees

¹⁴ Allied Otay Landfill is located at 1700 Maxwell Road in the City of Chula Vista. The one-way truck trip distance required to access this facility is approximately 10.3 miles.

that may be periodically trimmed during maintenance activities. This trimming would serve to reduce the potential for any trees to come in contact with electrical lines, potentially resulting in power outages. As needed, tree trimming activities would be conducted utilizing a two-man crew, a one-man aerial lift truck, and a chipper trailer.

One of the first activities at the Bay Boulevard Substation would be to extend the existing driveway from Bay Boulevard to the substation site. Utilized as the secondary driveway after energization, this access road would be graded flat to a width of approximately 30 feet to allow for safe operation of construction equipment and delivery of materials, pending further coordination with the Port District. Figure 3-3: Bay Boulevard Substation Conceptual Site Plan depicts the location of this driveway and Section 3.6.3 Access further describes all of the Proposed Project's access roads.

Once access has been established, construction crews would decommission the site of its existing use. This process would involve removing the existing containment berm located within the former LNG site. The entire site would then be over excavated and the on-site soil would be recompacted to prepare the area for site development. Approximately 94,250 cubic yards (CY) of on-site soil would be over excavated during the decommissioning process.¹⁵

With the decommissioning complete, site development and remedial grading would ensue. The site development and remedial grading would be based on the recommendations of the geotechnical investigation that achieves the desired on-site pad elevation and foundation support while maintaining adequate site drainage. These activities are anticipated to generate approximately 7,500 CY of material for off-site disposal. An estimated 120,000 CY of Structural Fill would be required to raise the substation site to the conceptual design elevation, which ranges from approximately 16 to 21 feet above MSL. It is estimated that 20,000 CY imported Class II base material would be used for surfacing of the Bay Boulevard Substation and for the access roads. On-site material would be reused to the extent possible as recommended by the Geotechnical Engineer. Site grading would be accomplished primarily with bulldozers and back hoes, which would condition, cut and fill, and blend the native soil and imported material to the desired pad elevations. A summary of the anticipated grading quantities for the Bay Boulevard Substation is provided in Table 3-8: Estimated Grading Quantities.

Table 3-8: Estimated Grading Quantities

Import and Export Type	Quantity
Off-site Disposal of Clear and Grub Materials	7,500 CY
Over Excavation and Recompanction of Existing On-site Soils	94,250 CY
Import Structural Fill	120,000 CY
Import Class II	16,700 CY for Substation 3,300 CY for Access Roads

¹⁵ The anticipated over excavation quantities are based upon preliminary design data. Final excavation activities would be based on the recommendations of the geotechnical investigation.

Construction of the Bay Boulevard Substation would require approximately 140,000 CY, or an estimated 9,335 haul truckloads, of imported fill to develop the proposed substation site. Haul trucks would operate periodically, as needed, during the grading phase of construction. In general, no more than 27 truck trips per day for an estimated three to six months would be required to complete the proposed substation grading. In addition, approximately six additional trips per day are anticipated for the delivery of materials and equipment for the duration of construction.

SDG&E would prepare and implement a drainage plan to minimize surface water and erosion impacts. The substation pad area, which would be raised so that the finished surface of the pad is at a higher elevation than the surrounding area, would be finish graded from a high point elevation at the center of the pad to the perimeter at a slope of approximately one percent. The surrounding area would be regraded and the low points filled to provide positive surface drainage to the northwest. Currently, the property generally drains by sheet flow to a concrete lined ditch at the northwest corner of the site. This ditch connects to the Palomar Trench on the SBPP property, which discharges into San Diego Bay. Another discharge point is located at the southwest corner of the site; however, drainage from this point is presently prevented by a man-made perimeter berm along the south and west fence line of the former LNG site. As depicted in Figure 3-3: Bay Boulevard Substation Conceptual Site Plan, three water quality basins and a wetland would be constructed along the perimeter of the substation to direct the surface runoff to the existing concrete-lined ditch at the northwest corner of the property.

The permanent cut and fill slopes for the Bay Boulevard Substation and the permanent cut and fill for the access roads and water quality basins would be stabilized during construction with BMPs that are outlined in the Proposed Project SWPPP. Landscaping would also be installed as outlined in the Proposed Project Conceptual Landscape Plan, which is included in Section 4.1 Aesthetics. The SWPPP BMPs would remain in place and would be maintained until the landscaping has been established.

Foundation Construction

Following site preparation, construction of the substation equipment foundations (consisting of drilled pier, mat, and pad type foundations) and the grounding grid would commence. SDG&E would also conduct exploratory excavations (potholing) to verify the locations of existing underground facilities in the field prior to initiating excavation of foundation holes and other earthwork.¹⁶ Foundation construction would then commence with excavation activities that would be accomplished primarily by backhoes and drill rigs. Forms, reinforcing steel, and concrete would then be installed, as appropriate, to build the foundations for the substation equipment and the control shelter.

Dewatering of the foundation excavation may be necessary. Prior to construction, SDG&E would acquire a National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges of Storm Water Associated with Construction Activities (General Construction

¹⁶ SDG&E would notify Underground Service Alert (DigAlert) a minimum of 48 hours in advance of excavating or conducting other ground-disturbing activities throughout construction.

Permit) from the SWRCB and prepare a SWPPP. The NPDES Construction General Permit and the SWPPP would detail project information, dewatering procedures, stormwater runoff prevention control procedures, monitoring and reporting procedures, and BMPs that would be implemented to protect water quality. In addition, SDG&E would obtain a Conditional Waiver of waste discharge requirements or a Waste Discharge Permit as appropriate to discharge groundwater from the site.

In general, the following construction dewatering procedures would be implemented during construction:

- A submersible pump would be installed.
- Water within excavations would be pumped to a desiltation tank (baker tank) at one end for sedimentation and filtering. Baffles would be installed in the tank to increase sedimentation. Water in the tank would be allowed to flow out from the opposite end.
- Turbidity testing would be performed periodically to ensure compliance with relevant permit requirements. If turbidity measurements do not meet permit requirements, additional baker tanks or filtering may be required.
- The water would be discharged to an upload location under a controlled flow and potentially into a dissipation device, in accordance with the SWPPP requirements, to ensure no scour or erosion results.

Alternatively, the water may be discharged into a community sanitary sewage system. If this is the preferred disposal method, SDG&E would secure permission from the local sewage system authority in advance of any discharges.

Above Grade Construction

Once the foundation work has been completed, major equipment and the 230 kV control house would be installed on their respective foundations or structures, inclusive of anchoring in their final positions. The following steps would be taken to install the overhead equipment:

- The 230 kV bus dead-end structures and the bank and line dead-end structures would be erected and placed.
- The bus insulators and conductors would be installed.
- The bus supports, insulators, and conductors would be installed in the 230 kV bays.
- The 230 kV circuit breakers and disconnects would be installed on their foundations in 230 kV Bays 1, 4, and 5.
- The bus disconnects would be installed in 230 kV Bays 2 and 3; however, the bays would not be built out at this time.
- The 69 kV rack would be erected and insulators and conductors would be installed.

- The 69 kV circuit breakers would be installed on their foundations and the disconnects would be mounted on the 69 kV rack.
- The 230 kV control shelter would be constructed and relay panels, controls, batteries, and station light 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 two 230/69 kV transformers would be installed on their foundations, assembled, and filled with oil.
- The two 69 kV grounding transformers would be installed on their foundations, assembled, and filled with oil.
- The microwave communication tower and communication control house would be installed.
- The communication circuits would be installed to the 230 kV control shelter.

Equipment testing would be performed following the completion of the 230 kV control house and the installation of the relay panels, controls, batteries, and alternating current system.

Access Route and Driveway Construction

As described in Section 3.5 Permanent Land and Right-of-Way Requirements, receipt by SDG&E of access rights required in connection with the Bay Boulevard Substation is a condition precedent to the exchange of real estate interests with the Port District and the CSLC. As described previously in Section 3.6.3 Access, subject to further coordination with the Port District and MTS, the existing access point from Bay Boulevard is planned to be extended to the substation site. In addition, a new main access route and driveways are planned to be constructed following the installation of all underground duct banks. Equipment typically utilized in the construction of access roads is listed in Table 3-9: Access Road Construction Equipment. These newly paved areas would measure approximately 30 feet wide, and each side would be bordered by 3-foot-wide Class II aggregate shoulders. Access road construction is planned to begin by grading and compacting the required area in accordance with engineering standards and the geotechnical requirements. Following compaction, road base is planned to be imported, distributed on site, and compacted. Finally, conventional paving equipment is planned to be used to distribute the asphalt road material along the main access route and driveways.

Cleanup and Post-Construction Restoration

All areas that would be temporarily disturbed by the Bay Boulevard Substation construction activities would be restored to pre-construction conditions, to the extent practicable, following the completion of construction. Restoration is detailed in SDG&E's Landscape Plan, included in Section 4.1 Aesthetics as Figure 4.1–6: Bay Boulevard Substation Landscape Concept Plan, and would involve removal of all construction debris for recycling or disposal off site, grading areas to original contours, and reseeding as appropriate.

Table 3-9: Access Road Construction Equipment

Equipment Type	Activity	Approximate Quantity
Bulldozer	Final grade of access roads	1
Road grader	Final grade of access roads	1
Asphalt paver	Pave access roads	1
Asphalt emulsion truck	Pave access roads	1
Vibrating roller	Compact soil and asphalt	1
Asphalt Haul Trucks	Transport asphalt	5

Overhead Transmission Line Construction

Clearing and Grading

Removal and installation of transmission line poles and structures would require that up to approximately 32.2 acres of vegetation be cleared.¹⁷ Mowers and D-9 bulldozers would be used to clear the areas required for pole/structure installation and removal, and at pull sites.

Depending on the local topography, these areas may also be graded flat or in a terraced fashion. Soil may be imported, as necessary, to raise the elevation of the work areas. Material removed during the process or the subsequent excavation would be spread over existing access roads and work pads as appropriate, or disposed of off site in accordance with all applicable laws. More detailed information regarding the vegetation and habitat communities that would be impacted by clearing is provided in Section 4.4 Biological Resources. A summary of these work areas is provided in Table 3-6: Temporary Workspace Required. Access to these temporary work areas would be provided by the existing driveway or by overland travel within SDG&E's existing ROW, pending further coordination with the Port District.

Steel Pole Installation

Foundations

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

Each foundation hole would range from approximately six to nine feet in diameter and 20 to 45 feet deep, requiring the excavation of between approximately 20.9 and 106.0 CY of soil,

¹⁷ This calculation presents a worst-case scenario where all areas associated with overhead transmission line construction—pole work areas and pull sites—described in Table 3-6: Temporary Workspace Required would be cleared. The dimensions presented in Table 3-6: Temporary Workspace Required represent typical workspaces. When established during construction activities, these workspaces may be reduced in size to account for sensitive resources and local topography. Due to the fact that SDG&E would generally use their existing easements, as described in Section 3.5 Permanent Land and Right-of-Way Requirements, as work areas, these specific work areas have not been represented in the Proposed Project's GIS database

depending on conditions. Following 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. Following the cage installation, a form would be built and concrete would be poured to a height of approximately 6 to 24 inches above grade. Each foundation would require between approximately 21.4 and 110.7 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 10 CY. If access is limited, concrete may be pumped from several hundred feet away from the pole location. Table 3-10: Steel Pole Foundation Summary provides a summary of the foundation dimensions and concrete requirements for the poles that would be installed as part of the Proposed Project. Steel plating would be placed over excavated areas, where appropriate, to maintain vehicular and pedestrian traffic.

Table 3-10: Steel Pole Foundation Summary

Foundation Type	Approximate Diameter (feet)	Approximate Depth (feet)	Approximate Excavation Volume (CY)	Approximate Concrete Volume (CY)
230 kV Steel Pole	8 to 9	35 to 45	65.2 to 106.0	66.1 to 110.7
138 kV Steel Pole	7 to 8	35 to 45	49.9 to 83.8	50.6 to 87.5
69 kV Steel Pole	6 to 7	20 to 30	20.9 to 42.8	21.5 to 45.6

Pole Installation

Steel poles would be delivered in two or more sections to the pole site via flatbed truck and assembled on-site using a small truck-mounted crane. Single-circuit poles would typically have three crossarms, supporting one circuit on one side of the pole. Double-circuit poles would typically have six crossarms that would support one circuit on each side of the pole. The crossarms would be bolted to the pole, and the insulators would 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 imbedded in the concrete foundation. The nuts on the foundation would then be tightened and secured. A summary of the permanent footprint required to install the new transmission poles has been included as Table 3-11: Transmission Pole Permanent Footprint Summary.

Wood Pole Installation

Installation of direct-bury wood poles would begin with the excavation of holes measuring approximately three feet in diameter and approximately 8 to 12 feet deep, depending on the type and height of the pole. Holes would be drilled using a truck-mounted auger or similar equipment, and would excavate between approximately 2.1 and 3.1 CY of soil. New poles would then be delivered to the site and placed with a small crane. The annular space between poles and holes would then be backfilled with concrete. Any remaining excavated material would be placed around the holes, spread at adjacent areas, or disposed of off site at an approved facility. A summary of the proposed permanent footprint required to install each new transmission pole has been included as Table 3-11: Transmission Pole Permanent Footprint Summary.

Table 3-11: Transmission Pole Permanent Footprint Summary

Pole Type	Approximate Quantity	Approximate Individual Footprint (square feet)	Total Approximate Footprint (acres)
230 kV Angle Pole	1	63.6	0.001
138 kV Steel Cable Riser Pole	1	50.3	0.001
69 kV Steel Cable Riser Pole	5	38.5	0.004
69kV Wood Tangent Pole	40	4.9	0.004
Stub Wood Pole (for guying)	6	0.8	< 0.001
Total	--	--	0.01

Overhead Conductor Installation

Conductor installation procedures would be similar for all overhead portions of the Proposed Project. Prior to stringing the new overhead line, temporary guard structures typically consisting of vertical wood poles with cross arms would be installed at crossings of energized electric and communication facilities, preventing the conductors from sagging onto other lines during the conductor installation. In some cases, bucket trucks may also be used for guard structures. A typical drawing of the proposed temporary guard structures has been included in Attachment 3-C: Typical Drawings.

Following guard structure installation, SDG&E would coordinate with the CAISO to obtain all the necessary line clearances prior to beginning conductor installation. This would ensure that the existing transmission lines can be taken out of service and that power can be redistributed to service centers and customers. Conductor stringing operations would be facilitated with the installation of sheaves or “rollers” on the structure cross arms during structure installation, using aerial manlifts (bucket-trucks). The sheaves would allow the conductor to be pulled through each structure until the entire line is ready to be pulled up to the final tension position. Following installation of the sheaves, a sock line (a small cable used to pull the conductor) would be pulled onto the sheaves using a helicopter. 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 sites. This process would be repeated for each conductor.

In some cases, sleeves or splices may be installed on the transmission line. This might occur when the conductor is slightly damaged during stringing operations or if the conductor is not long enough and needs to be joined to another segment. If the conductor is damaged, a repair sleeve would be wrapped around the outside of the conductor and pressed into place in order to protect the conductor. Full tension splices, or compression splices, are utilized when the conductor is damaged too severely for a repair sleeve, when the conductor is not long enough to span between dead-end structures, or if stringing locations are spread too far apart. During full-tension splices, the two ends of the conductor are connected with the use of heavy-duty vices or

alternatively, a small engineered implosive charge is wrapped around a specially designed metallic sleeve, creating a controlled implosive compression connecting the two conductors.

Approximately six designated pull sites, as described earlier in Section 3.6.2 Work Areas, would be required in order to tension the conductor to a pre-calculated level. The sites would be needed to load the tractors and trailers with reels of conductors, and the trucks with tensioning equipment. These pull sites would also be used to collect conductor that would be removed from the existing lines onto reels for transport off site. Attachment 3-A: Detailed Project Components Map details the locations of all pull and tension sites. Each pull site would require clearing an area between approximately 0.5 acre and 0.7 acre. As described previously, depending on topography, some incidental grading may be required at pulling and tensioning sites to create level pads for equipment.

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 minimum ground clearances dictated by the surrounding land uses, as described in Table 3-12: Minimum Conductor Ground Clearance. 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 conductor installation procedure is provided in Attachment 3-C: Typical Drawings.

Table 3-12: Minimum Conductor Ground Clearance

Conductor Voltage	Minimum Ground Clearance (feet)	Minimum Ground Clearance with Pedestrian Access Only (feet)
230 kV	30	30
138 kV	30	25
69 kV	30	25
12 kV	25	25

The existing steel poles and lattice structures would be dismantled and removed by cranes and aerial manlifts into two or more sections. The sections would be transferred to a flatbed truck using a small truck-mounted crane. The steel poles would then be transported off site for recycling or disposal at an approved facility. The lattice structures would be further dismantled within SDG&E's utility easement or at the H & Bay Yard. Following disassembly, the individual steel members would be cut into smaller sizes, placed in recycling receptacles, and transported to an approved SDG&E recycling center.

Steel Pole and Lattice Structure Removal

Once all of the poles and structures have been removed, their associated reinforced concrete foundation pads and piers would be jack-hammered to approximately one to two feet below grade. All debris located near the vicinity of the foundations 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 would be restored.

Wood Pole Removal

Wood pole removal would begin with crews dismantling the hardware on the existing poles using cranes and aerial manlifts. The old poles would then be cut off at ground level and transported off site by flatbed truck for disposal at an approved facility. The base of the pole would be abandoned in place if it cannot be removed. If the base of the pole is removed, then the void would be backfilled and compacted with native soil.

Cleanup and Post-Construction Restoration

With the exception of areas around all 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 overhead transmission line installation. Restoration would include grading to original contours and reseeding as appropriate.

Underground Transmission Construction

Trenching

Unless alternate methods are required to cross existing facilities or sensitive resources, duct banks would be installed using open-cut trenching techniques. The majority of the duct banks would have a double duct bank vertical configuration, as shown in Attachment 3-C: Typical Drawings, with occasional transitions to a flat configuration to clear substructures in highly congested areas, or to fan out to termination structures at the transition area. Prior to trenching, SDG&E would notify other utility companies (via DigAlert) to locate and mark existing underground utilities along the proposed underground alignment. SDG&E would also conduct exploratory excavations (potholing) to verify the locations of existing facilities in the field. Excavators and other earth-moving equipment would be used to establish trenches approximately three to six feet deep and three to seven feet wide depending on the circuit voltage class and duct bank configurations. Depth 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 safety requirements. Dewatering is anticipated during trenching and underground duct bank installation activities conducted within proximity of the Bay Boulevard Substation. The proposed dewatering procedures would be similar to those required to dewater overhead transmission line excavations.

Trenching operations would be staged in intervals so that only a maximum of 300 to 500 feet of trench would be left open at any one time, or as allowed by permit requirements. This would generate between approximately 200 and 333.3 CY per day of excavated material. At any one time, open trench lengths would not exceed those required to facilitate the installation of the duct banks. A summary of the trenches that would be established to complete the installation of underground duct banks has been provided as Table 3-13: Underground Duct Bank Trench Summary.

Table 3-13: Underground Duct Bank Trench Summary

Circuit Voltage	Total Trench Length (feet)	Approximate Trench Width (feet)	Approximate Trench Depth (feet)	Approximate Excavation Volume (CY)
230 kV	1,000	3	6	666.7
138 kV	3,800	3	6	2,533.3
69 kV	4,100	3	6	2,733.3
12 kV	1,420	3	6	946.7
Total	10,320	--	--	6,880.0

Steel plating would be placed over the trenches, where appropriate, to maintain vehicular and pedestrian traffic across those areas that are not under active construction. Traffic controls would also be implemented to direct local traffic safely around work areas should they encroach on Bay Boulevard. SDG&E would coordinate provisions for emergency vehicle and local access with local jurisdictions as necessary to ensure access is maintained to emergency vehicles at all times. A discussion of the anticipated road closures and required traffic controls are further described in Section 4.11 Traffic and Transportation.

Throughout trench excavation and the installation of the duct bank and vaults, asphalt, concrete, and excavated materials would be hauled off site for disposal. All spoil would be tested in accordance with SDG&E standards for hazardous materials. All non-hazardous materials would be transported to Allied Otay Landfill. Should hazardous materials be found, SDG&E would transport this material to an approved disposal facility.¹⁸ Excavated materials would be tested and may be used as backfill if the material is deemed suitable. In the event that existing concrete must be removed to facilitate trenching activities, concrete saws and other pavement-breaking machines would be used. If this equipment is unable to access the required removal areas, jackhammers would be used on an as-needed basis to break up concrete.

Jack-and-Bore

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

Horizontal boring (jack-and-bore) is an augering operation that simultaneously pushes a casing under an obstacle and removes the spoil inside the casing with a rotating auger. Boring operations would begin with excavating bore pits at the sending and receiving ends of the bore. Boring and receiving pits would typically measure approximately 20 feet by 40 feet. The depth

¹⁸ SDG&E has identified two potential hazardous waste disposal facilities. The first is the Waste Management Kettleman Hills Facility, located approximately 280 miles north of the Proposed Project in Kettleman City. The second facility is Clean Harbor Environmental Services in Buttonwillow, which is located approximately 240 miles north of the Proposed Project.

of the proposed bore pits would be between 10 and 20 feet, depending on the facilities that would be crossed. It is anticipated that between approximately 590 and 1,180 CY of material would be excavated to facilitate each jack-and-bore installation required to complete the proposed project. Following the duct bank installation, the bore pits would be backfilled using native material and the duct bank would be covered with at least 36 inches of engineered or native fill, as appropriate. Soil not used for backfill would be hauled off site and disposed of at an approved facility, such as the Allied Otay Landfill.

After establishing the bore pits, boring equipment would be delivered to the site and then installed into the bore pit at the sending end. Jack-and-bore crossings involve pushing or boring a 36- to 42-inch steel casing through the earth, under the obstacle being crossed. Depending on soil conditions, water is often used to lubricate the auger during the boring process. The casings would be installed at least three to four feet below the obstacle, or as required by the relevant permitting agency. Once the casing is in place, the PVC cable ducts would be installed within the casing using spacers to hold them in place. The casings would be left in place to protect the conduit once it has been installed. An approximately 150-foot by 150-foot temporary construction area would be required at each bore pit location. A photograph of a typical jack-and-bore installation is included in Attachment 3-C: Typical Drawings. SDG&E would secure the necessary permits to conduct these specialized construction activities and would implement standard BMPs, including silt fencing and straw wattles, in accordance with the Proposed Project's SWPPP.

Duct Bank Installation

As the trenches for the underground duct banks are excavated, SDG&E would install the cable conduits (separated by spacers) and pour concrete around the conduits to form the duct banks. The duct banks would typically consist of six- to eight-inch-diameter PVC conduits, which would house the electrical cables. An approximately four-inch-diameter conduit would also be included to house communication cables. The dimensions of the duct banks would be approximately three feet wide and three feet high.

Once the PVC conduits are installed, engineered backfill would be imported, placed, and compacted. Each duct bank would have a minimum of 36 inches of cover. A road base backfill or slurry concrete cap would be installed and the disturbed road surface would be restored in compliance with local permits, if construction occurs within Bay Boulevard. A summary of the required engineering backfill material required to complete the duct bank installation has been included as Table 3-14: Underground Duct Bank Backfill Summary. As discussed previously, all non-hazardous soil and grub material that is transported off site may be disposed of at Allied Otay Landfill and material found to contain hazardous material would be disposed of at an approved facility. While the completed trench sections are being restored, additional trench line would be opened farther down the alignment. This process would continue until the entire duct bank is in place.

Where the electrical transmission duct bank would cross or run parallel to 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 and 24 inches would be required, respectively, with an ideal clearance being two to five feet, respectively. Where duct banks cross

or run parallel to substructures that operate at temperatures significantly exceeding normal soil temperature (other underground transmission circuits, primary distribution cables, steam lines, and heated oil lines), additional radial clearance may be required. Clearances and depths would meet requirements set forth in Rule 33.4 of CPUC General Order-128.

Table 3-14: Underground Duct Bank Backfill Summary

Circuit Voltage	Approximate Excavation Volume (CY)	Approximate Volume of Excavated Material Used for Backfill (CY)	Approximate Volume of Excavated Material Transported Off Site (CY)	Approximate Volume of Required Select Fill (CY)
230 kV	666.7	0.0	666.7	333.4
138 kV	2,533.3	0.0	2,533.3	1,266.7
69 kV	2,733.3	1,366.7	1,366.7	0.0
12 kV	946.7	473.4	473.4	0.0
Total	6,880.0	1,840.1	5,040.1	1,600.1

Where the electrical transmission duct bank would cross or run parallel to 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 and 24 inches would be required, respectively, with an ideal clearance being two to five feet, respectively. Where duct banks cross or run parallel to substructures that operate at temperatures significantly exceeding normal soil temperature (other underground transmission circuits, primary distribution cables, steam lines, and heated oil lines), additional radial clearance may be required. Clearances and depths would meet requirements set forth in Rule 33.4 of CPUC General Order-128.

Vault Installation

In order to facilitate the pulling and splicing of the cables, underground vaults would be installed in line with the 138 kV and 69 kV underground duct banks, as depicted in Attachment 3-C: Typical Drawings. These vaults would also provide access to the underground cables for maintenance, inspection, and repair during operation. Typical drawings of the 138 kV and 69 kV underground vaults have been included in Attachment 3-C: Typical Drawings. During the previously discussed trenching activities, the trench would be widened at the underground vault locations to allow approximately two feet of additional clearance. The pre-formed, steel-reinforced precast concrete splice vaults would be delivered to the Proposed Project site on flat-bed trucks and lowered into place using small truck-mounted cranes. The splice vaults would then be connected to the underground duct banks before being covered with at least three feet of compacted fill. The surface above the vaults would be repaved or restored as appropriate. The vaults would be designed to withstand heavy truck traffic loading (if within a roadway).

Cable Pulling, Splicing, and Termination

After installation of the conduit, SDG&E would install cables in the duct banks. Each cable segment would be pulled into the duct bank, spliced at each of the vaults along the route (if applicable), and terminated at the transition where the lines convert to overhead. 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 large rope would then be pulled into the duct using a fish line, and attached to the cable pulling eyes. The cable pulling eyes would then be attached to the conductor and the cable is then pulled through the duct. A lubricant would be applied to the cable as it enters the duct to decrease friction during pulling. A similar process would also be used to pull the associated communication cables into the duct banks.

The electric cables and the communication cables would be pulled through the individual ducts at the rate of up to two or three segments between vaults per day. A splice trailer would be positioned adjacent to the vault manhole openings to facilitate cable splicing at the vaults after the cables are pulled through the ducts. 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 12 to 16 hours per day to complete.

Clean-up and Post-Construction Restoration

All areas that are temporarily disturbed by Proposed Project activities would be restored to pre-construction conditions, to the extent practicable, following completion of construction. Restoration would involve removal of all construction debris for recycling or disposal off site, grading areas to original contours, and reseeded or repaving, as appropriate.

Demolition of South Bay Substation

As part of the Proposed Project, the existing South Bay Substation would be demolished once the Bay Boulevard Substation is energized and the transmission lines are cut over from the South Bay Substation to the Bay Boulevard Substation. Prior to demolition of the existing South Bay Substation, the soil, conduit, control house materials, equipment, and steel structures would be tested for environmental hazards, such as oil, polychlorinated biphenyls, lead-based paint, and asbestos. All hazardous materials would be abated prior to or as part of the demolition process. Demolition would include the disconnection and removal of all SDG&E-owned equipment, including transformers, circuit breakers, regulators, disconnect switches, insulators, overhead and underground cabling, and the reinforced concrete control house. All structural steel supporting the SDG&E-owned equipment and overhead conductors would be dismantled, tested, removed, and recycled at an approved facility. The steel structures on site include switch racks, take-off structures, dead-end structures, bus supports, and switch stands.

Once all of the overhead equipment and structures have been removed, all below-ground facilities, including direct buried control cables and reinforced concrete foundation pads and piers, would be removed, with the foundations being cut off and removed to a depth of approximately six feet below grade. The concrete and reinforcing steel would be separated. The reinforcing steel would be recycled as scrap metal at an approved facility and the concrete would be crushed for reuse as crushed aggregate fill material. All oil-containing equipment such as transformers, circuit breakers and regulators would be drained and processed in accordance with

SDG&E standard procedures, as described in Section 3.9 Environmental Standards and Applicant-Proposed Measures.

Throughout the demolition of the substation, all removed equipment and materials would be tested in accordance with federal, state, and local standards to determine appropriate recycle, reuse, or disposal alternatives. If contaminated soil is encountered that SDG&E is responsible for, it would be remediated, and the area would be graded to match the surrounding topography. Soil remediation and foundation removal would be performed in accordance with agreements between SDG&E and the Port District.

3.6.6 Construction Equipment and Personnel

The equipment that would be used to construct each Proposed Project component, along with its approximate duration of use, is provided in Attachment 3-B: Construction Equipment Summary. In addition to use of this equipment, pick-up trucks and construction worker vehicles are anticipated to travel on a daily basis to and from the work areas for each component of the Proposed Project. It is anticipated that additional maintenance and/or delivery trucks would travel to and from the staging areas between one and two times per week, or up to four times a week during peak activities.

Table 3-15: Peak Construction Personnel shows the anticipated number of personnel required during peak conditions for construction of each component of the Proposed Project. The table indicates the sequence in which the proposed activities would occur. Different phases of the construction and demolition processes require varying numbers of construction personnel. As shown in Table 3-15: Peak Construction Personnel, the number of personnel would range from seven to 36 for each phase of construction.

3.6.7 Construction Schedule

SDG&E anticipates that construction of the Proposed Project would take a total of approximately 32 months. Construction of the Bay Boulevard Substation is anticipated to begin in March 2011 with the site development activities, and would end in December 2012 with the energization of the substation by looping in the 230 kV transmission line. The 69 kV cutovers from the existing South Bay Substation would follow energization of the 230 kV bus, starting in February 2013. The 69 kV cutovers would require approximately two to 12 months to complete.¹⁹ Removal of the South Bay Substation would follow after the completion of the 138 kV extension.

Table 3-16: Proposed Construction Schedule summarizes the length of time anticipated to be required to construct each Proposed Project component. Construction activities would generally be limited to no more than 12 hours per 24-hour period (some activities like transformer oil processing would require continuous work 24 hours per day for three to five days per transformer), six days per week as needed, except during SDG&E's need to perform electrical

¹⁹ Cutting the transmission lines over from their current positions to their proposed positions would require taking the existing transmission lines out of service while the final termination and splicing activities are being completed. The construction schedule for this work is dependent upon receiving authorization from CAISO. As a result, the time required to complete this work can vary significantly. The construction schedule includes expected upper- and lower-bound estimates for this work.

Table 3-15: Peak Construction Personnel

Project Component	Position	Approximate Number
Bay Boulevard Substation	Superintendent	1
	Foremen	3
	Grade Checkers	4
	Operators	25
	Inspectors	2
	Construction Manager	1
	Below-Grade Construction	12
	Substation Construction	12
	Wiring Crew	3
	Circuit Breaker Crew	6
	Relay Crew	4
230 kV Loop-in	Operators	8
	Foremen	15
	Linemen	15
69 kV Facilities	Operators	8
	Foremen	15
	Linemen	15
138 kV Extension	Operators	8
	Foremen	15
	Linemen	15
South Bay Substation Demolition	Superintendent	1
	Foreman	1
	Operators	5
	Inspector	1

Table 3-16: Proposed Construction Schedule

Project Component	Activity	Approximate Duration (months)	Approximate Start Date
Bay Boulevard Substation	Site Development	6	March 2011
	Below Grade Construction ²⁰	12	May 2011
	Above Grade Construction	12	September 2011
	Access Road Construction	1	January 2012
	Relay Testing	5.5	May 2012
	230 kV Substation Cutover	1.5	November 2012
	Energization (230 kV)	Milestone	December 2012
	69 kV Substation Cutover	2 to 12	January 2013
230 kV Loop-in	Foundation Installation	0.5	February 2012
	Steel Pole Installation	0.5	April 2012
	Conductor Pulling and Tensioning	2	June 2012
	Riser Pole Removal	0.25	October 2012
	230 kV Transmission Cutover	1.5	November 2012
69 kV Relocation	Foundation Installation	0.75	June 2012
	Pole Removal, Installation, and Replacement	2	August 2012
	Conductor Pulling and Tensioning	1.5	October 2012
	69 kV Transmission Cutover	2 to 12	February 2013
138 kV Extension	Foundation Installation	0.5	July 2012
	Underground Duct Bank Installation	4	July 2012
	Steel Pole Installation	0.5	September 2012
	Structure Removal	0.75	September 2012
	138 kV Cutover	2	November 2012
South Bay Substation Demolition	Decommissioning	3	January 2013
	Equipment Removal	3	June 2013
	Oil Removal and Processing	0.5	June 2013
	Foundation Removal and Site Restoration	4	August 2013

²⁰ Includes 230 kV loop-in, 69 kV relocation, and 12 kV distribution underground duct bank installation

system transfers. These electrical system transfers would be performed at night to limit the number of customers that could be affected by an unintentional outage. On occasion, construction activities may be required at night or on weekends in order to minimize impacts on schedules, facilitate cutover work, and as required by other property owners or agencies, such as the CAISO, which would require outages of certain portions of the electric system. If construction during hours outside of those allowed by the City of Chula Vista is necessary, SDG&E would follow its established protocols by providing advance notice by mail to all property owners within 300 feet of construction activities. These proposed noticing requirements and conditions are described further in Section 4.10 Noise.

Bay Boulevard Substation

SDG&E anticipates that construction of the Bay Boulevard Substation would take approximately 22 months from site development beginning in approximately March 2011 until energization of the 230 kV bus in December 2012.

230 kV Loop-in

SDG&E anticipates that construction of the 230 kV loop-in, including site preparation, pole installation, and conductor stringing, would take approximately seven months to complete. Foundation work for the steel poles is scheduled to begin several months prior to the Bay Boulevard Substation energization, and would take approximately 1.5 months to complete. Once completed, installation of the steel poles and conductor stringing would require approximately two months to complete.

69 kV Relocation

It is anticipated that construction of the 69 kV transmission line would require approximately five months to complete. Foundation work for the poles is estimated to take approximately two months to complete. Once foundation work is completed, pole installation and conductor stringing are estimated to be completed in approximately three months. The 69 kV transmission lines would be cut over to the Bay Boulevard Substation beginning in February 2013 and would take between two and 12 months to complete.

138 kV Extension

It is anticipated that construction of the 138 kV extension would require approximately seven months to complete. The extension would cut over following the transfer of all 69 kV transmission lines to the Bay Boulevard Substation.

South Bay Substation Demolition

Demolition of the existing South Bay Substation would begin once the Bay Boulevard Substation is energized and the existing transmission lines have been relocated. It would require approximately 10 months to complete.

3.7 OPERATION AND MAINTENANCE

This following discussion describes the activities required for the long-term operation and maintenance of the Proposed Project once it is in service. A discussion of electric and magnetic

fields that may be associated with the Proposed Project is provided in Attachment 3-F: Electric and Magnetic Fields.

3.7.0 Bay Boulevard Substation

The Bay Boulevard Substation would be unmanned, monitored, and controlled by SDG&E's remote control center. Routine operations would require a single pick-up truck visiting the substation several times per week for switching, as well as several larger substation construction and maintenance trucks several times per year for equipment maintenance. Ongoing maintenance would involve testing, monitoring, and repair of the equipment, as well as emergency and routine procedures to enable efficient provision of SDG&E services.

Routine maintenance is expected to necessitate 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 weekly basis. It is anticipated that one annual major maintenance inspection would occur, requiring an estimated 20 personnel. This inspection is anticipated to take approximately one week to complete.

Routine maintenance for vegetation clearing would occur on an as-needed basis for purposes of safety and access. These activities would typically involve the presence of one or two maintenance vehicles and one or more employees to clear or trim vegetation in order to achieve the minimum working space around the substation facilities.

It is not anticipated that additional full-time SDG&E staff would be required for operation or maintenance purposes. Operation and maintenance activities at the Bay Boulevard Substation would occur in a similar manner to those which presently occur at the existing South Bay Substation.

3.7.1 Transmission Lines

SDG&E would maintain a 30-foot minimum (from edge to foundation) working space around all steel transmission structures and a 10-foot minimum working space around all wood poles. These areas would be kept clear of shrubs and other obstructions for inspection and maintenance purposes. In addition, vegetation that has a mature height of 15 feet or taller would not be allowed to grow within 10 horizontal feet of any conductor within the ROW for safety and reliability reasons.

The transmission facilities associated with the Proposed Project would continue to be inspected, maintained, and repaired following completion of the Proposed Project. Operation and maintenance activities would involve both routine preventive maintenance and emergency procedures to maintain service continuity. Aerial and ground inspections of Proposed Project facilities would be performed. Above-ground components would be inspected annually, at a minimum, for corrosion, equipment misalignment, loose fittings, and other common mechanical problems.

Pole or Structure Brushing

Although the proposed facilities would be located within a highly urbanized area, pole or structure brushing may be needed periodically to reduce the risk of fire or to allow for aerial

inspection. Inspection for brushing needs would typically occur on an annual basis. Such clearing activities would generally be achieved through the use of chain saws, weed trimmers, rakes, shovels, and/or brush clearing hooks. An area approximately 60 feet in diameter would be cleared around each new steel pole base and 20 feet around each new wood pole base, as applicable, using a three-man crew over a two-hour period.

Application of Herbicides

The use of herbicides may also be needed to prevent vegetation that is cleared during brushing activities from re-establishing itself. SDG&E would typically apply one or more of 16 standard herbicides that have been recommended by the United States (U.S.) Fish and Wildlife Service (USFWS) specifically for use by SDG&E. The application of herbicides generally involves one person in a pick-up truck and occurs over a period of a few minutes. The herbicides would generally be applied within a 10-foot radius around the base of each pole, as needed. It is anticipated that the person performing the work would either walk from the nearest available location to park or would drive a pick-up truck directly to each pole location, if such access is available.

Equipment Repair and Replacement

Conductors, insulators, switches, transformers, lightning arrest devices, line junctions, or other electrical equipment may be supported on various SDG&E poles or structures. Repairs or replacement activities to such components may be required in order to ensure that SDG&E is able to continually provide uniform, adequate, safe, and reliable service. Such repairs may include removal or replacement of certain components (i.e., existing transmission structures) with similar equipment that is larger or stronger, generally at the same location or a nearby location. Such repairs or replacements may be needed as the result of age, damage, or necessary change in the size of a conductor. Repair or replacement of such equipment would generally require a crew composed of four personnel with two to three trucks—a boom or line truck, an aerial lift truck, and an assist truck—to gain access to the area of the equipment in need of repair or replacement.

Insulator Washing

In areas where atmospheric moisture is typical (i.e., within close proximity to San Diego Bay), the potential for condensation combined with dust to settle on porcelain insulators can occur, creating an electrical discharge. This condition may result in “arcing,” which can lead to potential power outages. Such outages can be avoided by routine washing of the insulators. This process would require the use of a water truck, typically operated by a two-man crew, which allows a high-pressure hose to be used to spray deionized water on the insulators. This process generally requires access to the base of the structure and a working area of approximately 30 by 40 feet. Approximately 0.5 hour would generally be required to complete the washing of each insulator pole set. Inspection of the insulators typically occurs on an annual basis to identify the need for washing. Insulator washing may also occur at the Bay Boulevard Substation, depending on the type of insulators used and the potential level of contamination.

3.8 ANTICIPATED PERMITS AND APPROVALS

The CPUC is the lead California agency for the Proposed Project. SDG&E must comply with the CPUC's General Order No. 131-D Section III-B, which contains the permitting requirements for the construction of the Proposed Project. This Proponent's Environmental Assessment is being prepared as part of an application to obtain a Permit to Construct (PTC) for the Proposed Project.

In addition to the PTC, SDG&E is required to obtain a number of other permits from federal, state, and local agencies. Table 3-17: Permit, Approval, and Consultation Requirements lists the permits, approvals, and licenses that SDG&E anticipates obtaining from jurisdictional agencies.

3.9 ENVIRONMENTAL STANDARDS AND APPLICANT-PROPOSED MEASURES

In addition to the Proposed Project components previously discussed, SDG&E would incorporate Applicant-Proposed Measures (APMs) and Environmental Standards (included at the end of this Chapter), as well as BMPs for stormwater quality, into the Proposed Project design. SDG&E has internal policies and guidelines known as Environmental Standards that are an integral part of how SDG&E conducts projects. SDG&E's Environmental Standards address potential environmental issues with sound policies and procedures for avoiding, minimizing, and establishing consistent guidelines to reduce the potential for impacts. The Environmental Standards pertain to some, but not all of the resource areas (i.e., Hazardous Materials, but not Noise). SDG&E follows the Environmental Standards in all of its activities, irrespective of CPUC permitting of specific projects. In addition, SDG&E has proposed APMs specific to this Proposed Project to further minimize and reduce the potential for significant impacts.

SDG&E's Environmental Standards include:

- NCCP - Addresses management and conservation of multiple species and habitat and provides APMs for biological resources. The NCCP prescribes as "protocols" various protection and conservation measures which SDG&E must implement as part of its covered activities to ensure the survivability and conservation of protected species and their habitats according to applicable law to avoid and minimize impacts to sensitive areas.
- Water Quality Construction BMP Manual - Addresses measures to reduce potential impacts to water quality from runoff off during short-term construction or long-term operational activities.
- Management of Contaminated Equipment and Materials, Hazardous Materials Business Plan - Addresses the evaluation of potentially hazardous materials that may be present due to former or present on-site uses, as well as hazardous waste that may be generated during construction or operation of proposed land uses.
- Standard Traffic Control Procedures - Includes measures to address potential disruption of traffic circulation during construction activities and address safety issues.

Table 3-17: Permit, Approval, and Consultation Requirements

Permit/Approval/Consultation	Agency	Jurisdiction/Purpose
Federal Agencies		
Section 404 Nationwide Permit Program, Clean Water Act	U.S. Army Corps of Engineers	Dredge or fill of waters of the United States, including wetlands
Implementation of SDG&E's Subregional Natural Community Conservation Plan (NCCP)	USFWS	Activities within NCCP coverage areas that impact biological resources (required only for review of the Proposed Project, and no approval or permit is involved)
Helicopter Lift Plan	Federal Aviation Administration	Operation of a helicopter within 1,500 feet of residences
State Agencies		
Permit to Construct	CPUC	Overall project approval and California Environmental Quality Act (CEQA) review
NPDES General Construction Permit	SWRCB	Storm water discharges associated with construction activities disturbing more than one acre of land
Waiver or Waste Discharge Requirement Permit	RWQCB	Discharge of groundwater from excavations
Encroachment Permit	California Department of Transportation	Construction, operation, and maintenance within, under, or over state highway ROW
Section 401 Water Quality Certification	RWQCB	Certification of water quality for Waters of the U.S.
1600 Lake or Streambed Alteration Agreement	CDFG	Construction within or under a stream or channel
Implementation of SDG&E's NCCP	CDFG	Activities within NCCP coverage areas (required only for review of Proposed Project, no approval or permit is involved)
Federal Consistency Certification	California Coastal Commission	Activities within the coastal zone requiring a federal authorization

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Permit/Approval/Consultation	Agency	Jurisdiction/Purpose
Land Use Lease	CSLC	Activities (e.g., electric transmission line construction) that occur on lands under CSLC jurisdiction (Port District), including tidal and submerged lands along the coast
Local Agencies		
Permission to Construct	Port District	Activities that occur on lands under ownership of the Port District
Easement	Railroad	Construction, operation, and maintenance within, under, or over a railroad ROW
	MTS	
Coastal Development Permit	City of Chula Vista	New development within the coastal zone (required by the Chula Vista LCP)
Encroachment Permit	City of Chula Vista	Construction, operation, and maintenance within, under, or over city or county road ROW
Grading Permit	City of Chula Vista	On-site grading activities

SDG&E would conduct the design, construction, operation, and maintenance of the Proposed Project according to its Environmental Standards and APMs. SDG&E would also meet and confer with the City of Chula Vista, where feasible and consistent with the CPUC’s General Orders, construction standards, and industry practice affecting the design, construction, operation, and maintenance of the Bay Boulevard Substation.

Until final design, and in some cases until installation, utility projects remain more flexible in the definition of their ultimate configuration and placement than most non-linear, non-utility projects. The APMs and Environmental Standards take into consideration the potential for the Proposed Project to encounter unique conditions and enhance SDG&E’s ability to modify the final design during the installation phase to maximize overall Project feasibility, while avoiding or minimizing impacts to sensitive environmental resources, to the extent feasible. As defined in the CEQA, “feasible” means being “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors,” while attaining the Proposed Project’s basic objectives, purpose, and need.²¹

Table 3-18: Applicant-Proposed Measures identifies the pertinent Environmental Standards and APMs that are applicable to each resource area. The various discussions of resources in Chapter 4 – Environmental Impact Assessment detail how and when the APMs would be applied to avoid or minimize impacts to a less-than-significant level.

3.9.0 Natural Community Conservation Plan

In addition to SDG&E’s APMs and Environmental Standards, SDG&E established its NCCP in 1995 when it entered into an agreement with the USFWS and the CDFG. The NCCP serves as an incidental take permit under federal and state endangered species laws. The NCCP was developed according to the Federal and California Endangered Species Acts and the state’s Natural Community Conservation Planning Act. SDG&E’s NCCP establishes a comprehensive, long-term, habitat-based agreement among SDG&E, the USFWS, and the CDFG for the management and conservation of multiple species covered in the plan and their associated habitats. As such, the NCCP provides protection for those species, while allowing SDG&E to develop, install, maintain, operate, and repair necessary electric and gas utility facilities in the region. SDG&E has successfully completed thousands of utility projects under and in compliance with the NCCP, ranging from maintenance to new construction.

The NCCP prescribes as “protocols” various protection, mitigation, and conservation measures SDG&E must implement as part of its covered activities to ensure the survivability and conservation of protected species and their habitat, according to applicable law. The NCCP identifies 61 protocols that SDG&E routinely implements with every project to avoid and minimize impacts to sensitive areas. These 61 protocols are applicable to the Proposed Project, and would be implemented to avoid and minimize potential impacts to biological resources.

²¹ Public Resources Code, Section 21061.1 and California Code of Regulations Title 14, Section 15126.6.

3.9.1 Implementation of Applicant-Proposed Measures

SDG&E would be responsible for overseeing the assembly of the 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 project phase, as appropriate. All of 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. Table 3-18: Applicant-Proposed Measures contains a list of the Proposed Project APMs.

Environmental Compliance Management

Implementation of the proposed APMs would be the responsibility of the environmental compliance team that would include a team manager and environmental specialists and monitors. All APMs would be implemented in accordance with applicable federal, state, and local regulations. The environmental compliance team would be responsible for the daily inspection, documentation, and reporting on SDG&E compliance with all APMs as proposed. As needed, environmental specialists with expertise in water quality, hazardous materials, and natural resources would be retained to verify that all APMs are properly implemented during the construction phase. Implementation of the APMs would be monitored on-site on a daily basis and would be evaluated as to their status and effectiveness during regularly scheduled meetings of the construction team.

Monitoring and Inspection

During construction, environmental monitors and contract administrators would be required to be present on site to verify that the proposed APMs and other Proposed Project specifications are properly implemented. 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 administrators would have the authority to halt construction activities, if needed, 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 addressed on site, as applicable.

Reporting and Documentation

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

Table 3-18: Applicant-Proposed Measures

APM Number		Description	Justification	Proposed Project Component							
				Bay Boulevard Substation	230 kV Loop-in	69 kV Relocation	138 kV Extension	South Bay Substation Demolition			
Aesthetics											
APM-AES-01		Figure 4.1–6: Preliminary Landscape Concept presents a conceptual landscape mitigation plan for the Bay Boulevard Substation that would be implemented as part of the Proposed Project. The conceptual landscape plan would provide partial screening of views of the substation site and new utility poles from Bay Boulevard and locations further east. The landscaping would also partially screen views from the office park to the south. Landscaping includes informal tree and shrub groupings outside of the wall, east of the substation. Small native trees would also be used to extend plantings at the southern end of the mound to the east of the facility. Small trees would also line the entry drive. Figure 4.1–6: Preliminary Landscape Concept includes a list of recommended plant species. All suggested trees appear on the City of San Diego Street Tree Selection Guide. Plants listed in Chapter 12.32 of the City of Chula Vista Municipal Code as prohibited species are excluded. Drought-tolerant plants, including California native species, are suggested. Proposed Project landscaping would receive regular watering during the initial two years following installation in order to ensure the establishment of the plants. As noted on Figure 4.1–6: Preliminary Landscape Concept, landscaping under transmission lines would consist of smaller trees and/or shrubs to allow for overhead clearance. All planting would be consistent with SDG&E operational requirements for landscaping in proximity to electric transmission facilities.	The Bay Boulevard Substation landscaping would partially screen views of the new facility and help integrate its appearance within the bayfront setting, thus reducing any visual impacts.	✓							
APM-AES-02		The color of the substation perimeter wall would be chosen to blend with the existing site features (i.e., a dull grey, light brown, or dull green) and minimize visual contrast with the bayfront landscape setting.	Choosing a wall color that blends with existing site features would help to minimize visual contrast with the substation’s surroundings.	✓							
Air Quality											
APM-AIR-01		All active construction areas, unpaved access roads, parking areas, and staging areas would be watered or stabilized with non-toxic soil stabilizers as needed to control fugitive dust.	This measure would ensure that dust abatement is implemented as needed throughout construction to reduce adverse impacts to air quality. APM-AIR-01, in conjunction with the other APMs for air quality, would ensure that local air quality standards and plan thresholds for dust and particulate matter would not be exceeded.	✓	✓	✓	✓	✓	✓		
APM-AIR-02		Traffic speeds on unpaved roads and the ROW would be limited to 15 miles per hour.	This measure is intended to reduce fugitive dust by limiting vehicle speeds on unpaved access roads.	✓	✓	✓	✓	✓	✓		
APM-AIR-03		SDG&E would limit actively graded areas to a cumulative total of eight acres per day. The total area of disturbance can exceed this acreage so long as the actively graded portion is below this threshold.	This measure would control the amount of earth disturbance occurring simultaneously on different Proposed Project components in order to keep fugitive dust emissions below established thresholds.	✓	✓	✓	✓	✓	✓		

APM Number	Description	Justification	Proposed Project Component				
			Bay Boulevard Substation	230 kV Loop-in	69 kV Relocation	138 kV Extension	South Bay Substation Demolition
APM-AIR-04	APM-AIR-04: SDG&E would implement their existing sulfur hexafluoride (SF₆) mitigation strategies during the operation and maintenance of SF₆-containing equipment installed as part of the Proposed Project. These strategies include: • Recording company-wide SF₆ purchases for use in reporting annual GHG emissions under the California Climate Action Registry (CCAR) Power Utilities Protocol and as a member of the Environmental Protection Agency’s (EPA) SF₆ Partnership • Implementing SDG&E’s SF₆ leak detection and repair program. This program includes monthly visual inspections of each gas circuit breaker (GCB), which includes checking pressure levels within the breaker and recording these readings in SDG&E’s Substation Management System. During the installation or major overhaul of any GCB, the unit is tested over a 24-hour period to ensure no leaks are present. Minor overhauls of each GCB are conducted every 36 to 40 months to check overall equipment health. This process includes checking gas pressure, moisture ingress, and SF₆ decomposition. If the GCB fails any of these checks, the unit is checked for leaks and repaired. In addition, all GCBs are equipped with a gas-monitoring device and alarm that automatically alert SDG&E’s Grid Operations Center. If gas pressure approaches minimum operating levels, an alarm is immediately reported to SDG&E’s Substation Construction and Maintenance Department. The GCB is usually inspected for leaks within 24 hours of such an alarm. SDG&E’s leak detection practice includes the following three methodologies: – Spraying a leak-detection agent onto common leak points—including O-rings, gaskets, and fittings – Using a field-monitoring device (sniffer) to detect the presence of SF₆ gas – Using a laser-detection camera to detect the presence of SF₆ gas when the above two methods are unsuccessful in finding a leak • Implementing a SF₆ recycling program • Training employees on the safety and proper handling of SF₆ • Continuing voluntary reporting of GHG emissions with the CCAR or The Climate Registry	In accordance with the CPUC PEA Checklist, this APM requires that SDG&E implement a SF₆ monitoring plan, which would include carefully measuring the level of SF₆ in its equipment, identifying and repairing or replacing leaky equipment in a timely fashion, and training employees on the effects of SF₆. This measure is intended to assist the Environmental Protection Agency with monitoring and regulating greenhouse gas emissions and maintain compliance with applicable air quality regulations. It is anticipated that APM-AIR-04 would reduce emissions of SF₆ by approximately five percent.	✓				✓

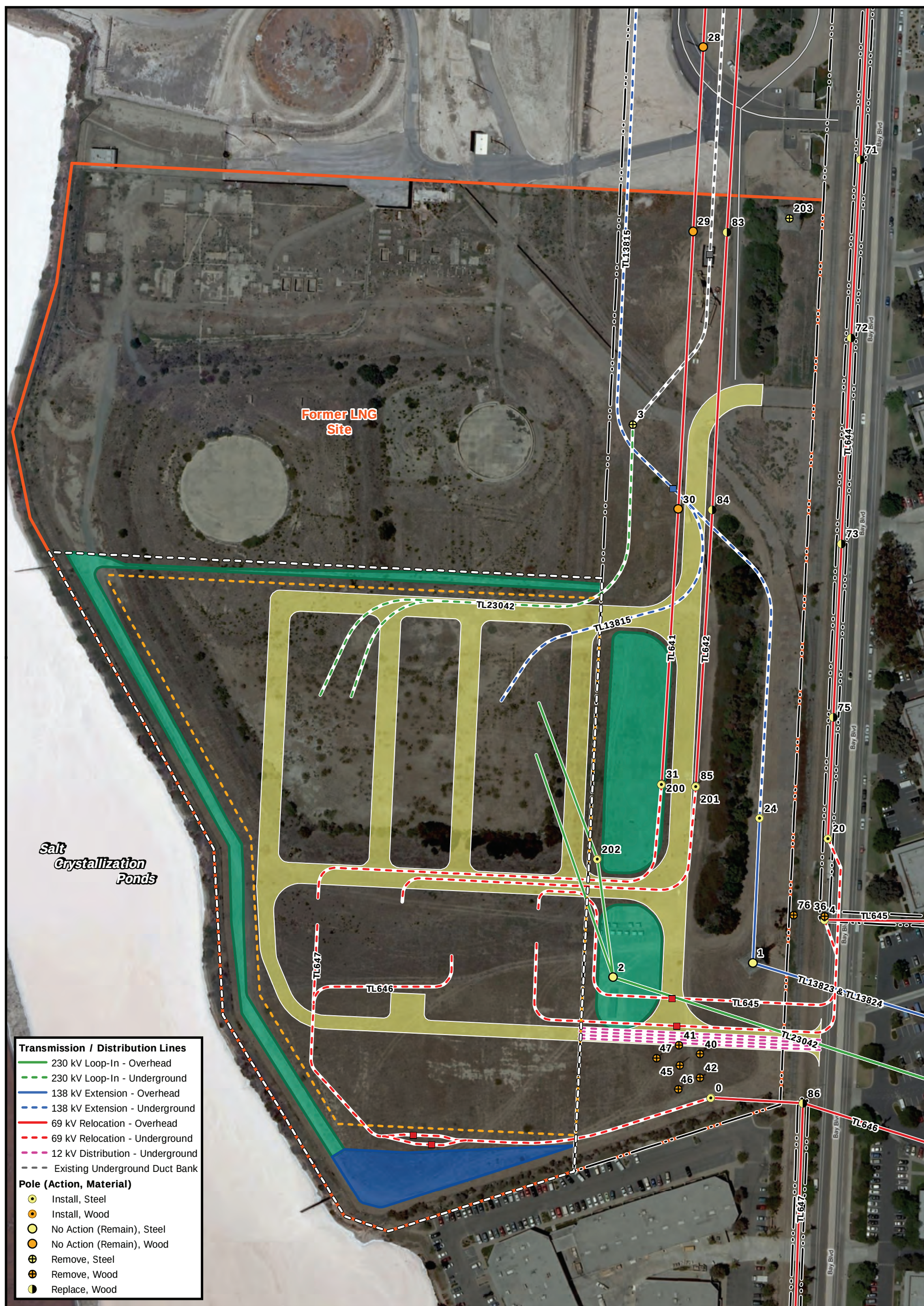
APM Number		Description	Justification	Proposed Project Component				
				Bay Boulevard Substation	230 kV Loop-in	69 kV Relocation	138 kV Extension	South Bay Substation Demolition
Biological Resources								
APM-BIO-01		SDG&E would conduct activities in accordance with NCCP Operational Protocols to avoid, minimize, or mitigate impacts to biological resources.	The NCCP identifies 61 Operational Protocols designed to avoid and minimize potential impacts to sensitive species and their habitats, to provide appropriate mitigation where such impacts are unavoidable, and to ensure survivability and conservation of protected species and their habitat. This measure would ensure that the Operational Protocols are implemented and impacts to biological resources are minimized.	✓	✓	✓		
APM-BIO-02		A biological monitor would be present during all vegetation removal activities. Within 14 days prior to vegetation removal, the biological monitor would survey the site to ensure that no sensitive species would be impacted.	This measure would ensure that mortality of sensitive species is avoided.	✓	✓	✓		
APM-BIO-03		If a raptor nest is observed during pre-construction surveys, a qualified biologist would determine if it is active. If the nest is deemed inactive, SDG&E, under the supervision of a biological monitor, would remove and dismantle the nest promptly from existing structures that would be affected by Proposed Project construction. Removal of nests would occur outside of the raptor breeding season (January to July). If the nest is determined to be active, it would not be removed and the biological monitor would monitor the nest to ensure nesting activities and/or breeding activities are not disrupted. If the biological monitor determines that Proposed Project activities are disturbing or disrupting nesting activities, the monitor would make recommendations to reduce the noise and/or disturbance in the vicinity of the nest.	This measure would avoid disruption of nesting activity that could occur during construction.	✓	✓	✓	✓	
APM-BIO-04		Structures would be constructed to conform to the Avian Power Line Interaction Committee’s Suggested Practices for Avian Protection on Power Lines to help minimize impacts to raptors.	This measure is intended to reduce accidental injury or mortality of avian species, which could occur from electrocution or wire collision during Proposed Project operations.	✓	✓	✓		
APM-BIO-05		Where impacts to wetlands and jurisdictional waters are unavoidable, SDG&E would obtain the authorizations from the appropriate jurisdictional agencies. Water features 1, 2, 3, and 4, as shown on Figure 4.4-3: Hydrological Features Map, are the only jurisdictional waters that would be permanently impacted. SDG&E would mitigate for the permanent impacts to these waters at a ratio of two to one in consultation with the jurisdictional agencies.	This measure would ensure that there is no permanent net loss of waters of the U.S. upon completion of the Proposed Project, in accordance with U.S. Army Corps of Engineers guidelines.	✓				

APM Number	Description	Justification	Proposed Project Component				
			Bay Boulevard Substation	230 kV Loop-in	69 kV Relocation	138 kV Extension	South Bay Substation Demolition
Cultural Resources							
APM-CUL-01	Prior to construction, all SDG&E, contractor, and subcontractor Project personnel would receive training regarding the appropriate work practices necessary to effectively implement the APMs and to comply with the applicable environmental laws and regulations, including the potential for exposing subsurface cultural resources and paleontological resources and to recognize possible buried resources. This training would include presentation of the procedures to be followed upon discovery or suspected discovery of archaeological materials, including Native American remains, and their treatment, as well as of paleontological resources.	This measure would ensure that construction personnel involved in the Proposed Project are trained to recognize subsurface cultural and paleontological resources and follow the appropriate work practices necessary to comply with relevant environmental laws and regulations, thereby avoiding impacts to these resources.	✓	✓	✓	✓	✓
APM-CUL-02	In the event that cultural resources are discovered, SDG&E's Cultural Resource Specialist and Environmental Project Manager would be contacted at the time of discovery. SDG&E's Cultural Resource Specialist would 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.	This measure would ensure that cultural resources discovered during construction are evaluated for significance and recovered, as appropriate, in compliance with relevant environmental regulations protecting these resources.	✓	✓	✓	✓	✓
APM-CUL-03	All collected cultural remains would be cleaned, cataloged, and permanently curated with an appropriate institution. All artifacts would be analyzed to identify function and chronology as they relate to the history of the area. Faunal material would be identified as to species.	This measure requires that collected cultural remains be appropriately analyzed, cataloged, and curated to ensure their protection and contribution to the understanding of the cultural and historical context of the bayfront area.	✓	✓	✓	✓	✓
APM-CUL-04	A qualified paleontologist would attend pre-construction meetings, as needed, to consult with the excavation contractor concerning excavation schedules, paleontological field techniques, and safety issues. A qualified paleontologist is defined as an individual with a Master of Science or Doctor of Philosophy in paleontology or geology who is experienced with paleontological procedures and techniques, who is knowledgeable in the geology and paleontology of San Diego County, and who has worked as a paleontological mitigation project supervisor in the region for at least one year. The requirements for paleontological monitoring would be noted on the construction plans.	This measure would ensure that a qualified paleontologist is consulted so that the potential impacts to any paleontological resources can be avoided or discovered resources can be properly evaluated and recovered, if appropriate.	✓	✓	✓	✓	

APM Number	Description	Justification	Proposed Project Component				
			Bay Boulevard Substation	230 kV Loop-in	69 kV Relocation	138 kV Extension	South Bay Substation Demolition
APM-CUL-05	A paleontological monitor, defined as an individual who has experience in the collection and salvage of fossil materials, would work under the direction of the qualified Project paleontologist and would be on site to observe excavation operations that involve the original cutting of previously undisturbed deposits with high paleontological resource sensitivity (i.e., Bay Point Formation). These impacts are likely to occur for all Project-related excavations that extend deeper than seven feet below present existing grades. For those Project-related excavation activities known to be restricted to depths shallower than seven feet, a paleontological monitor would not be needed on site. However, because the Pleistocene-age Bay Point Formation is locally covered by Quaternary alluvium and artificial fill deposits, careful monitoring of deeper excavations in these deposits (i.e., less than six to seven feet) would be necessary to ensure that overall monitoring of the Bay Point Formation is as complete as possible.	This measure would ensure that excavation in areas containing Pleistocene deposits of the Bay Point Formation is monitored so that impacts can be mitigated through proper investigation and recovery of cultural resources, consistent with APM-CUL-06.	✓	✓	✓	✓	
APM-CUL-06	In the event that fossils are encountered, the Project paleontologist would have the authority to divert or temporarily halt construction activities in the area of discovery to allow the recovery of fossil remains in a timely fashion. The paleontologist would contact SDG&E’s Cultural Resource Specialist and Environmental Project Manager at the time of discovery. The paleontologist, in consultation with SDG&E’s Cultural Resource Specialist, would determine the significance of the discovered resources. SDG&E’s Cultural Resource Specialist and Environmental Project Manager must concur with the evaluation procedures to be performed before construction activities are allowed to resume. Because of the potential for recovery of small fossil remains, it may be necessary to set up a screen-washing operation on site. When fossils are discovered, the paleontologist (or paleontological monitor) would recover them along with pertinent stratigraphic data. In most cases, this fossil salvage can be completed in a short period of time. Because of the potential for recovery of small fossil remains, such as isolated mammal teeth, recovery of bulk-sedimentary-matrix samples for off-site wet screening from specific strata may be necessary, as determined in the field. Fossil remains collected during monitoring and salvage would be cleaned, repaired, sorted, cataloged, and deposited in a scientific institution with permanent paleontological collections. A final summary report would be completed that outlines the results of the mitigation program. The report would discuss the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.	This measure would ensure that fossil resources and remains encountered during excavation activities are properly recovered, evaluated, cataloged, stored, and documented, as appropriate, for preservation of the resource.	✓	✓	✓	✓	

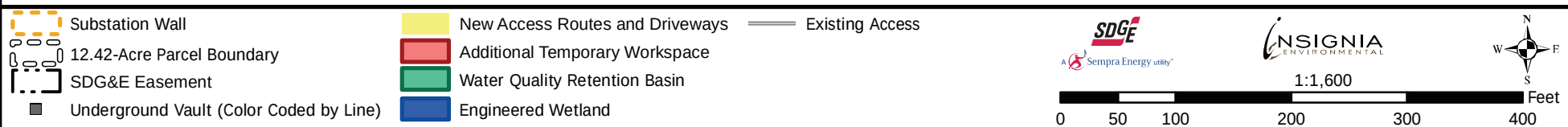
APM Number	Description	Justification	Proposed Project Component				
			Bay Boulevard Substation	230 kV Loop-in	69 kV Relocation	138 kV Extension	South Bay Substation Demolition
Geology, Soils, and Seismicity							
APM-GEO-01	SDG&E would consider the recommendations and findings of the Geotechnical Investigation prepared by GECOM Inc. and the contractor’s Geotechnical Engineer in the final design of all Proposed Project components to ensure that the potential for expansive soils and differential settling is compensated for in the final design and construction techniques. SDG&E would comply with all applicable codes and seismic standards. In addition, the Proposed Project would be configured according to the IEEE 693 “Recommended Practices for Seismic Design of Substations” in order to withstand anticipated ground motion. The final design would be reviewed and approved by a Professional Engineer registered in the State of California prior to construction	This measure would ensure that site-specific conditions are considered in the final design of the Proposed Project and would require verification by a Professional Engineer that the Proposed Project design meets all applicable regulations and safety standards.	✓	✓	✓	✓	
Hazards and Hazardous Materials							
APM-HAZ-01	SDG&E would prepare and implement a Project-specific Hazardous Substance Management and Emergency Response Plan during the construction period to reduce or avoid potentially hazardous materials, for the purposes of worker safety, protection from groundwater contamination, and proper disposal of hazardous materials.	This measure would reduce the potential for an accidental release of hazardous materials, ensure proper cleanup and handling of spilled material, as well as reduce unnecessary exposure of hazardous materials in order to protect the health of workers and the public.	✓	✓	✓	✓	✓
Transportation and Traffic							
APM-TRA-01	Heavy-duty construction vehicles and equipment would not utilize L Street during the p.m. peak hours (between 4:00 p.m. and 6:00 p.m. on weekdays). Alternate travel routes, such as J Street and Palomar Avenue, would instead be used during this time.	This measure would ensure that the existing Level of Service F standard is not exasperated as a result of construction of the Proposed Project during peak weekday periods by requiring heavy-duty construction vehicles and equipment to use alternate travel routes during these peak traffic periods.	✓	✓	✓	✓	✓

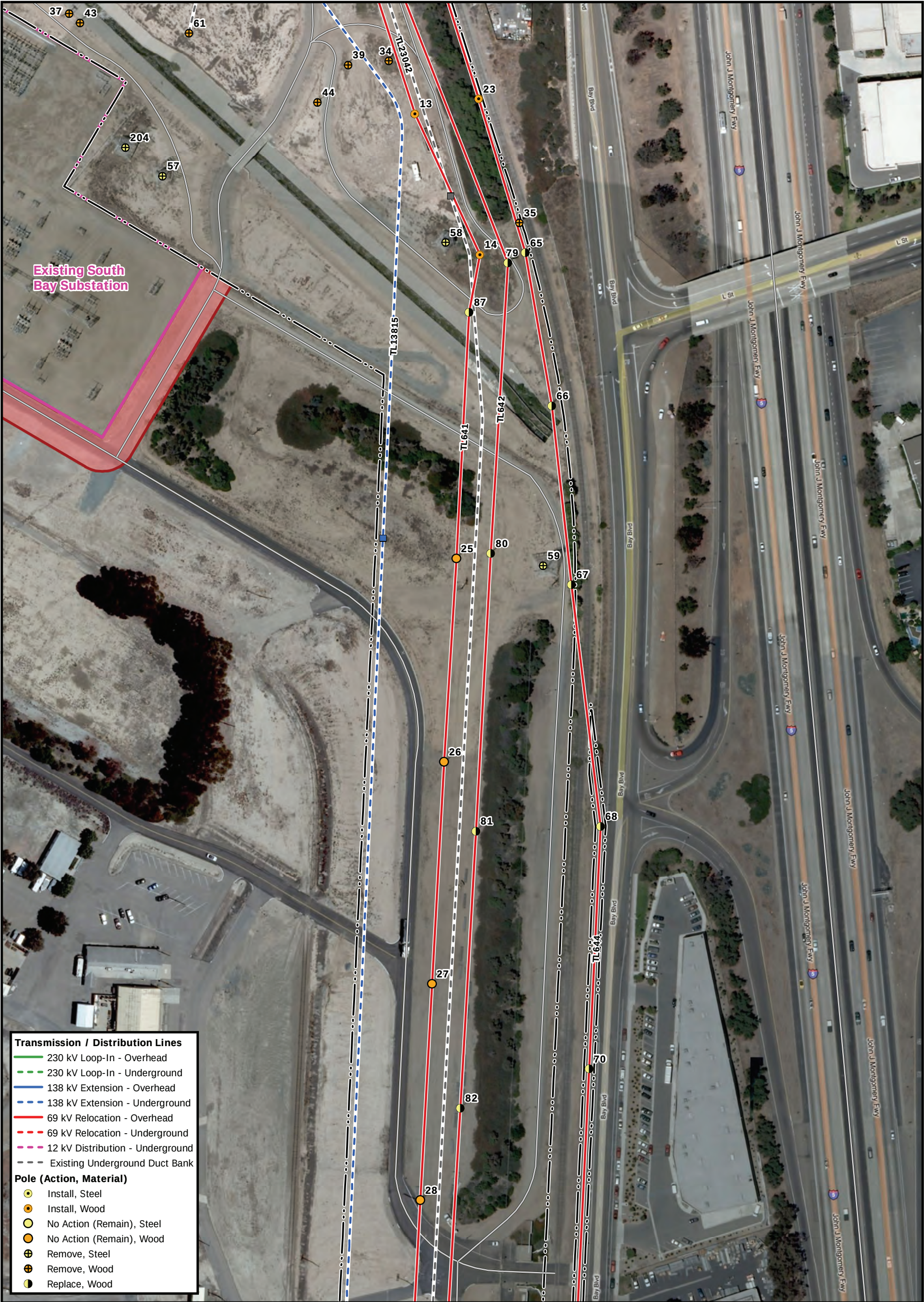
ATTACHMENT 3-A: DETAILED PROJECT COMPONENTS MAP



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

South Bay Substation Relocation Project





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

South Bay Substation Relocation Project

Substation Wall

12.42-Acre Parcel Boundary

SDG&E Easement

Underground Vault (Color Coded by Line)

New Access Routes and Driveways

Additional Temporary Workspace

Water Quality Retention Basin

Engineered Wetland

Existing Access

SDGE

Sempra Energy Utility

INSIGNIA

ENVIRONMENTAL

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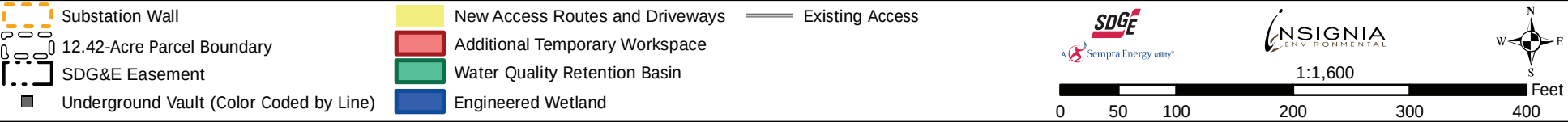
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Attachment 3-A: Detailed Project Components Map 3 of 3

South Bay Substation Relocation Project



ATTACHMENT 3-B: CONSTRUCTION EQUIPMENT SUMMARY

ATTACHMENT 3-B: CONSTRUCTION EQUIPMENT SUMMARY

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
Bay Boulevard Substation	General Construction ¹	¾-ton or 1-ton Pickup Truck	Transport and support construction personnel	6	NA	3
		Air Compressor	Operate air tools	2	NA	4
		Mechanic Truck	Maintain and refuel equipment	1	NA	2
		Bulldozer	Grade pads and access roads	2	6	8
	Site Development	Road Grader/Blade	Construct, maintain, and upgrade roads	1	6	8
		Scraper	Grade pads and access roads	2	6	8
		Compactor	Compact soil	2	6	8
		Loader	Load dump trucks and stockpile	2	6	8
		Backhoe	Trench Excavation	1	6	8
		Water Truck	Suppress dust	1	6	6
		Dump/Haul Truck	Transport import/export material	45	6	8

¹ Equipment associated with General Construction would be used throughout construction of the entire Proposed Project component.

San Diego Gas & Electric Company
South Bay Substation Relocation Project

June 2010
3-B-1

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
Bay Boulevard Substation (cont.)	Site Development (cont.)	Excavator	Excavate and load material	1	6	8
	Below Grade Construction	Concrete Truck	Pour concrete	6	8	2
		Drill Rig with Augers	Drill pier foundations	2	3	6
		Backhoe	Excavate pad foundations	1	12	6
		Fork Lift/Skid Steer Loader	Move rebar, equipment, masonry, and other materials	1	12	4
		Small Mobile Crane (12-ton)	Place material and set steel	1	12	4
		Trencher/Ditch Witch	Excavate trenches	1	3	6
		Loader	Move bulk material	1	6	6
		Water Truck	Suppress dust	1	12	2
		Handheld Compactor	Compact soil	2	8	4
		Dump/Haul Truck	Transport import/export material	2	8	6
	Above Grade Construction	¾-ton or 1-ton Pickup Truck	Transport and support construction personnel	2	12	3
		Bucket Truck/Manlift	Set steel and install equipment	4	12	8
		Large Crane	Place material and set steel	1	1	6

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
Bay Boulevard Substation (cont.)	Above Grade Construction (cont.)	Boom Truck	Place material and set steel	2	12	6
		Fork Lift/Skid Steer Loader	Unload and move material	2	12	4
		Line Truck	Assist with overhead conductor installation	1	12	3
		Cable Dolly (trailer)	Transport reels of conductor	1	3	6
		Stringing Rig (trailer)	Assist with conductor installation	1	3	8
		100-hp Oil Processing Truck	Process transformer Oil	1	1	24
	Access Road Construction	Bulldozer	Final grade of access roads	1	1	6
		Road grader/Blade	Final grade of access roads	1	1	6
		Asphalt Paver	Pave access roads	1	1	6
		Asphalt Emulsion Truck	Pave access roads	1	1	6
		Vibrating Roller	Compact soil and asphalt	1	1	6
	Relay Testing	Asphalt Haul Truck	Transport asphalt	5	1	10
		Relay/Telecommunication Van	Transport and support construction personnel	3	5.5	3

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
Bay Boulevard Substation (cont.)	230 kV Substation Cutover	Line Truck	Assist with overhead conductor installation	1	3	3
	230 kV Substation Cutover (cont.)	Relay/Telecommunication Van	Test relay and telecommunications devices	3	3	3
	69 kV Substation Cutover	Line Truck	Assist with overhead conductor installation	1	2	3
		Relay/Telecommunication Van	Test relay and telecommunications devices	3	2	3
230 kV Loop-In	General Construction	¾-ton or 1-ton Pickup Truck	Transport construction personnel	2	NA	2
		Maintenance Truck	Maintain and refuel equipment	1	NA	1
		Air Compressor	Operate air tools	2	NA	4
		Water Truck	Suppress dust	1	NA	8
	Foundation Installation	Concrete Truck	Pour Concrete	1	0.5	3
		Drill Rig with Augers	Foundation Construction	1	0.5	6
		Backhoe	Foundation Construction	1	0.5	6
		Dump/Haul Truck	Haul excavated materials and import backfill	2	0.5	4

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
230 kV Loop-In (cont.)	Foundation Installation (cont.)	Handheld Compactor	Compact soil around structure foundations	1	0.5	4
	Steel Pole Installation	2-ton Flatbed Truck	Deliver pole to site	1	0.5	2
		Large Crane	Tower Erection	1	0.5	6
		Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	0.5	8
	Conductor Pulling and Tensioning	Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	2	6
		Puller and Tensioner	Pull the conductor into position and secure it at the correct tension	2	2	8
		Reel Trailer	Feed new conductor to the pulling and tensioner or collect old conductor	2	2	8
		Splice Trailer	Store splicing supplies	1	2	NA
	Riser Pole Removal	2-ton Flatbed Truck	Remove pole sections and hardware from site	1	0.25	2
		Bucket Truck/Manlift	Tower Erection and Conductor Installation	1	0.25	6
		Excavator	Break foundations and load material	1	0.25	6
		Jackhammer	Break foundations	2	0.25	6

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
230 kV Loop-In (cont.)	Riser Pole Removal (cont.)	Dump/Haul Truck	Haul excavated materials and import backfill	2	0.25	4
		Large Crane	Lower pole sections and load onto trucks	2	0.25	8
	230 kV Cutover	Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	1.5	6
		Splice Trailer	Store splicing supplies	1	1.5	NA
69 kV Relocation	General Construction	¾-ton or 1-ton Pickup Truck	Transport construction personnel	2	NA	2
		Air Compressor	Operate air tools	1	NA	4
		Maintenance Truck	Maintain and refuel equipment	1	NA	1
		Water Truck	Suppress dust	1	NA	8
		Concrete Truck	Pour Concrete	1	0.75	3
	Foundation Installation	Drill Rig with Augers	Foundation Construction	1	0.75	6
		Backhoe	Foundation Construction	1	0.75	6
		Dump/Haul Truck	Haul excavated materials and import backfill	2	0.5	4
		Handheld Compactor	Compact soil around structure foundations	2	0.75	4

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
69 kV Relocation (cont.)	Pole Removal, Installation, and Replacement	2-ton Flatbed Truck	Deliver and remove poles to and from site	1	2	2
		Large Crane	Tower Erection	1	2	6
		Drill Rig with Augers	Excavate holes for pole installation	2	2	5
		Small Mobile Crane (12-ton)	Load and unload materials	2	2	5
		Backhoe	Excavate pole bases	1	2	5
		Compactor	Compact soil around structure	1	2	5
		Chainsaw	Cut existing poles	2	2	2
		Air Compressor	Operate air tools	4	2	4
		Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	2	8
		Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	1.5	6
		Puller and Tensioner	Pull the conductor into position and secure it at the correct tension	2	1.5	8

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
69 kV Relocation (cont.)	Conductor Pulling and Tensioning	Reel Trailer	Feed new conductor to the pulling and tensioner or collect old conductor	2	1.5	8
		Splice Trailer	Store splicing supplies	1	1.5	NA
	69 kV Cutover	Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	2	6
		Line Truck	Pull the conductor into position and secure it at the correct tension	2	2	8
138 kV Extension	General Construction	¾-ton or 1-ton Pickup Truck	Transport construction personnel	2	NA	2
		Mechanic Truck	Maintain and refuel equipment	1	NA	1
		Air Compressor	Operate air tools	2	NA	4
		Water Truck	Suppress dust	1	NA	8
	Foundation Installation	Concrete Truck	Pour Concrete	1	2	3
		Drill Rig with Augers	Foundation Construction	1	2	6
		Backhoe	Foundation Construction	1	2	6

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
138 kV Extension (cont.)	Foundation Installation (cont.)	Dump/Haul Truck	Haul excavated materials and import backfill	2	2	4
		Handheld Compactor	Compact soil around structure foundations	1	3	4
	Underground Duct Bank	Dump/Haul Truck	Transport excavated materials and import backfill	3	4	8
		Small Mobile Crane (12-ton)	Lift and place materials	1	4	4
		Backhoe	Excavate trenches	1	4	8
		Concrete Truck	Pour Concrete	5	4	8
		Drill Rig with Augers	Excavate trenches	1	4	6
		Compactor	Compact backfill within the trench	2	4	8
	Steel Pole Installation	2-ton Flatbed Truck	Deliver pole to site	1	1	2
		Large Crane	Tower Erection	1	1	6
		Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	1	8
	Structure Removal	2-ton Flatbed Truck	Remove pole sections and hardware from site	1	2	2
		Bucket Truck/Manlift	Tower Erection and Conductor Installation	1	2	6

Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
138 kV Extension (cont.)	Structure Removal (cont.)	Dump/Haul Truck	Haul excavated materials and import backfill	2	2	4
		Excavator	Break foundations and load material	1	2	6
		Jackhammer	Break foundations	2	2	6
		Large Crane	Lower pole sections and load onto trucks	2	2	8
	138 kV Cutover	Bucket Truck/Manlift	Tower Erection and Conductor Installation	2	2	6
		Puller and Tensioner	Pull the conductor into position and secure it at the correct tension	2	2	8
		Reel Trailer	Feed new conductor to the pulling and tensioner or collect old conductor	2	2	8
		Splice Trailer	Store splicing supplies	1	2	NA
		2-ton Flatbed Truck	Haul and unload materials	4	NA	6
		¾-ton or 1-ton Pickup Truck	Transport construction personnel	2	NA	3
		Rigging Truck	Haul tools and equipment	2	NA	2
South Bay Substation Demolition	General Construction					

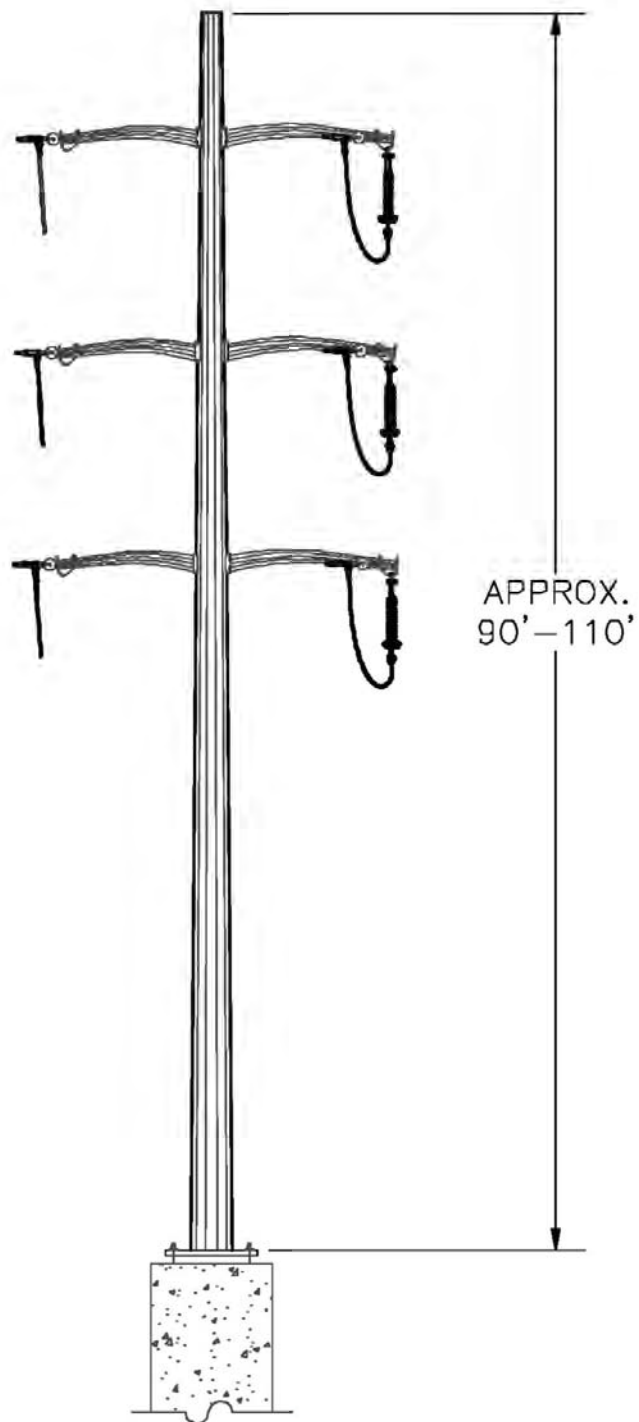
Attachment 3-B: Construction Equipment Summary

Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
South Bay Substation Demolition (cont.)	General Construction (cont.)	Mechanic Truck	Service and repair equipment	2	NA	2
		Water Truck	Suppress dust	2	NA	6
	Decommissioning	Line Truck	Remove the conductor from its position	1	3	3
		Relay/Telecommunication Van	Test relay and telecommunications devices	3	3	3
	Equipment Removal	Small Mobile Crane (12-ton)	Load and unload materials	2	3	8
		Fork Lift/Skid Steer Loader	Transport materials	2	3	8
		Boom Truck	Remove and load equipment	2	3	6
		Large Crane	Remove equipment and load onto trucks	1	3	8
		Loader	Remove and load equipment	1	3	8
	Oil Removal and Processing	100-hp Oil Processing Truck	Extract and remove oil	1	0.5	8
	Foundation Removal and Site Restoration	Backhoe	Break and remove concrete foundations and backfill	1	4	8

Attachment 3-B: Construction Equipment Summary

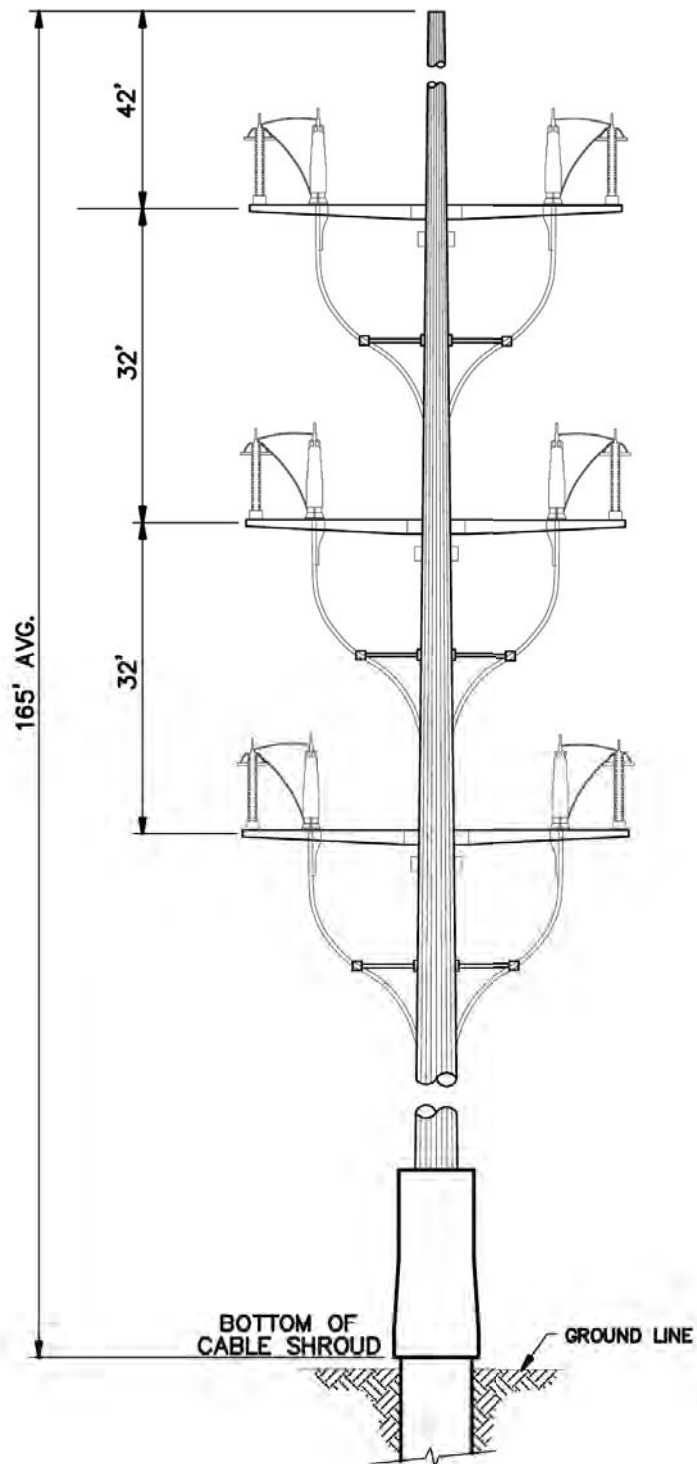
Project Component	Activity	Equipment	Use	Approximate Quantity	Approximate Duration On Site (months)	Average Duration of Use (hours per day)
South Bay Substation Demolition (cont.)	Foundation Removal and Site Restoration (cont.)	Dump/Haul Truck	Remove concrete from site	4	4	8
		Bulldozer	Grade and level existing site	1	4	6
		Compactor	Compact backfill	2	4	6

ATTACHMENT 3-C: TYPICAL DRAWINGS

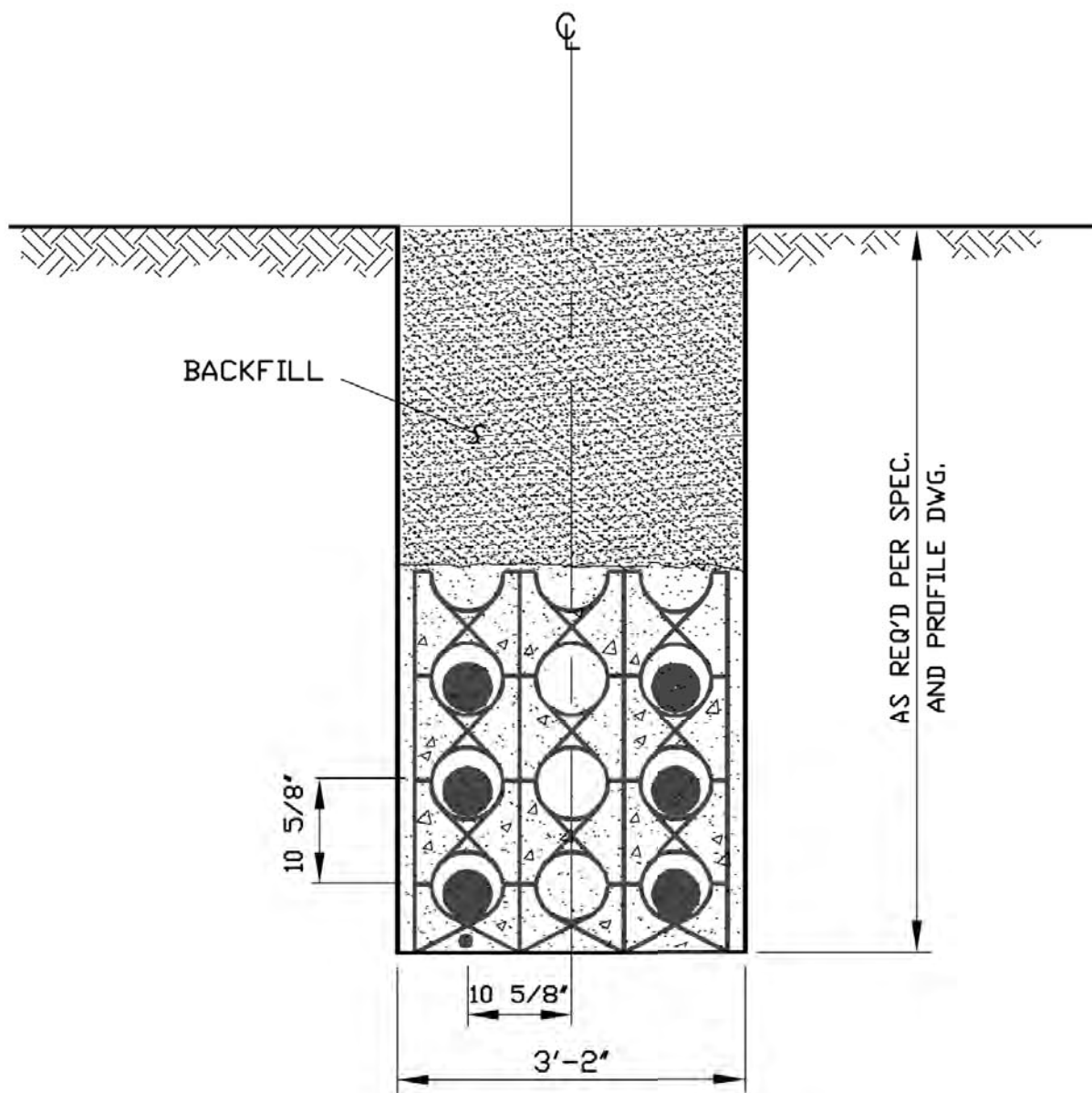


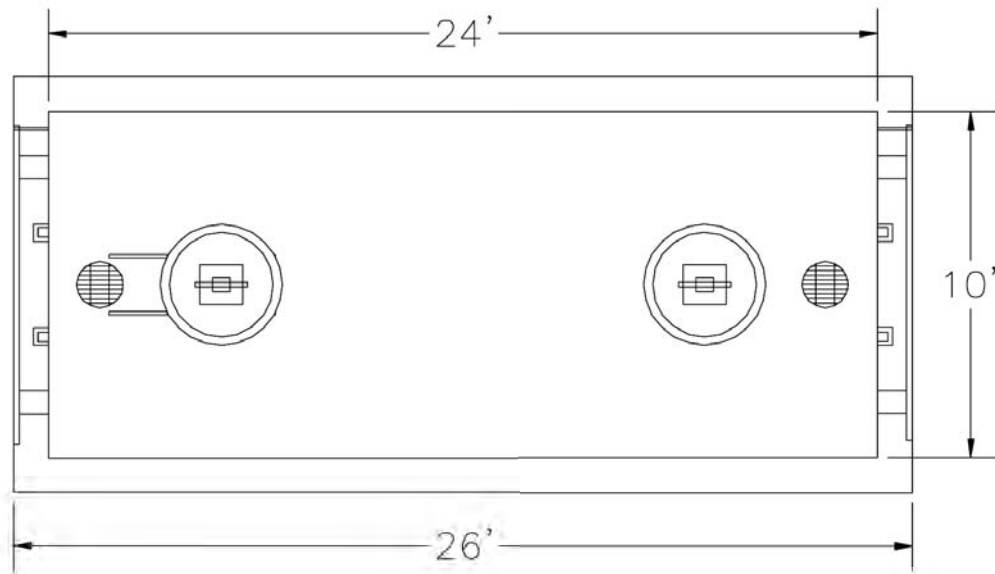
A Semptra Energy utility™

Typical 230 kV Steel Dead-End Structure

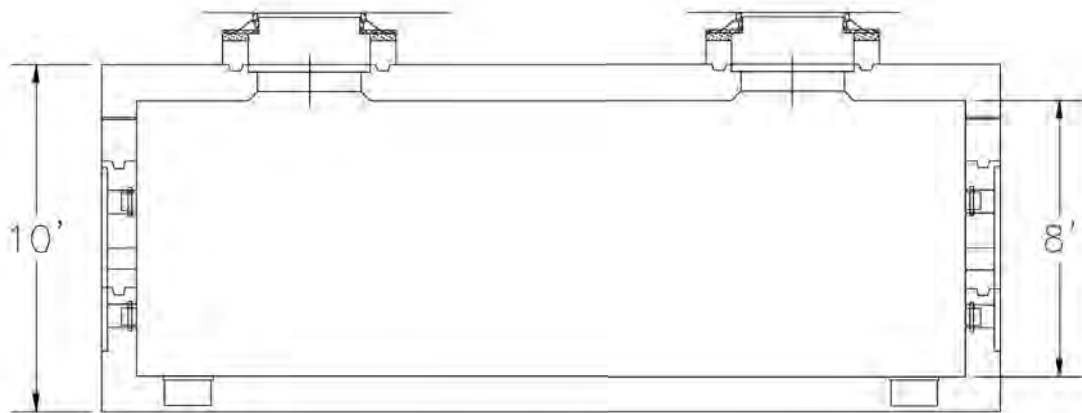


Typical 138 kV and 230 kV Steel Cable Riser Pole

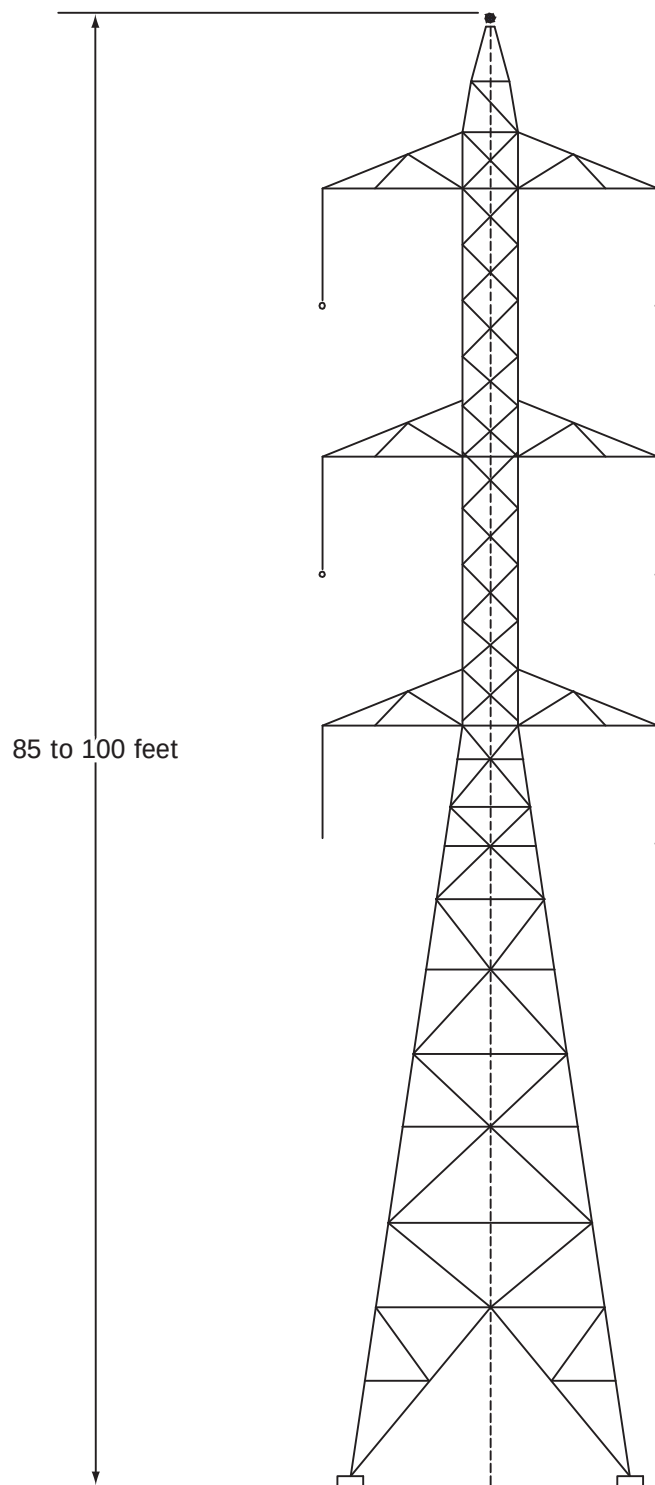




PLAN

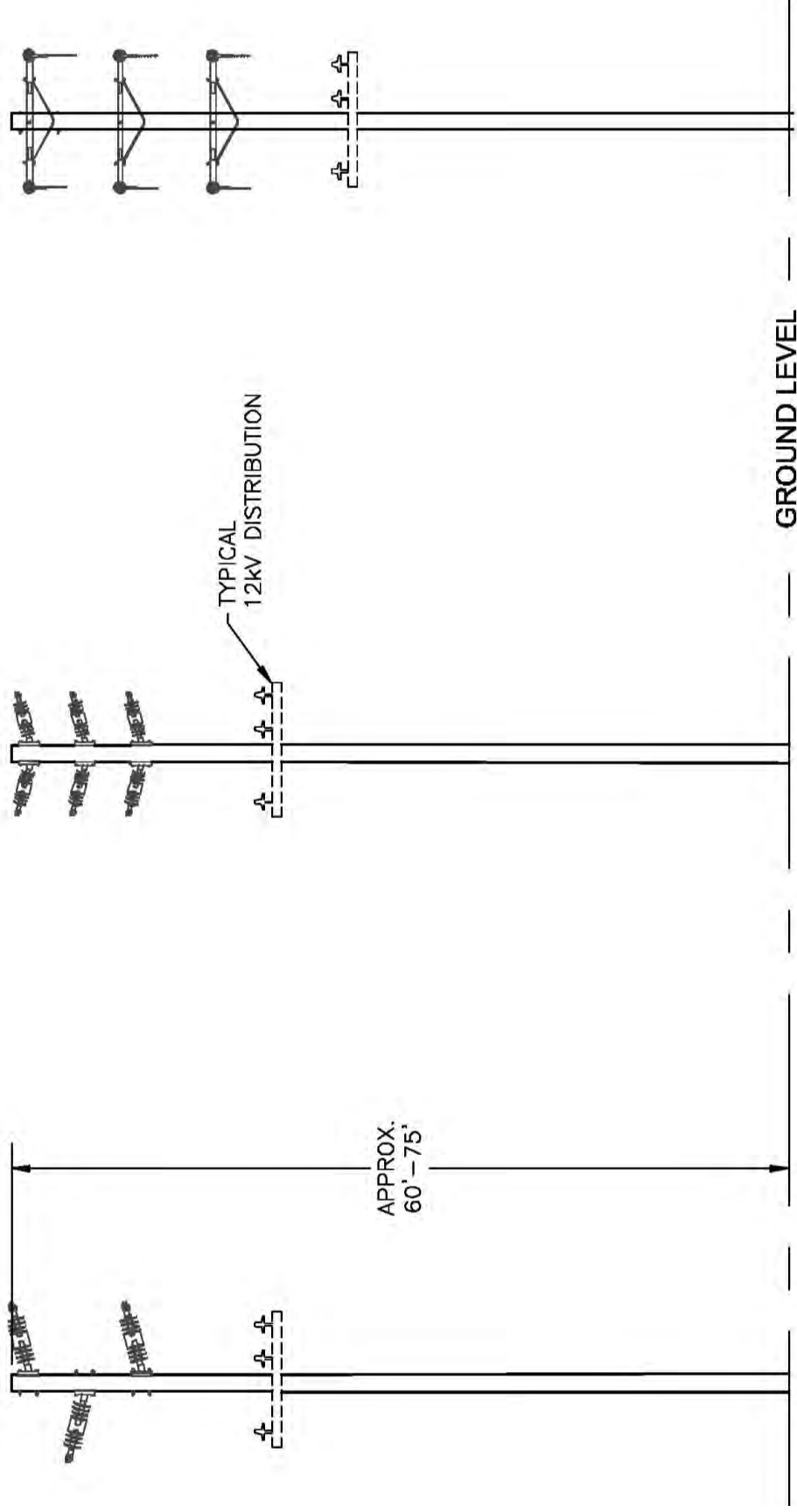


ELEVATION

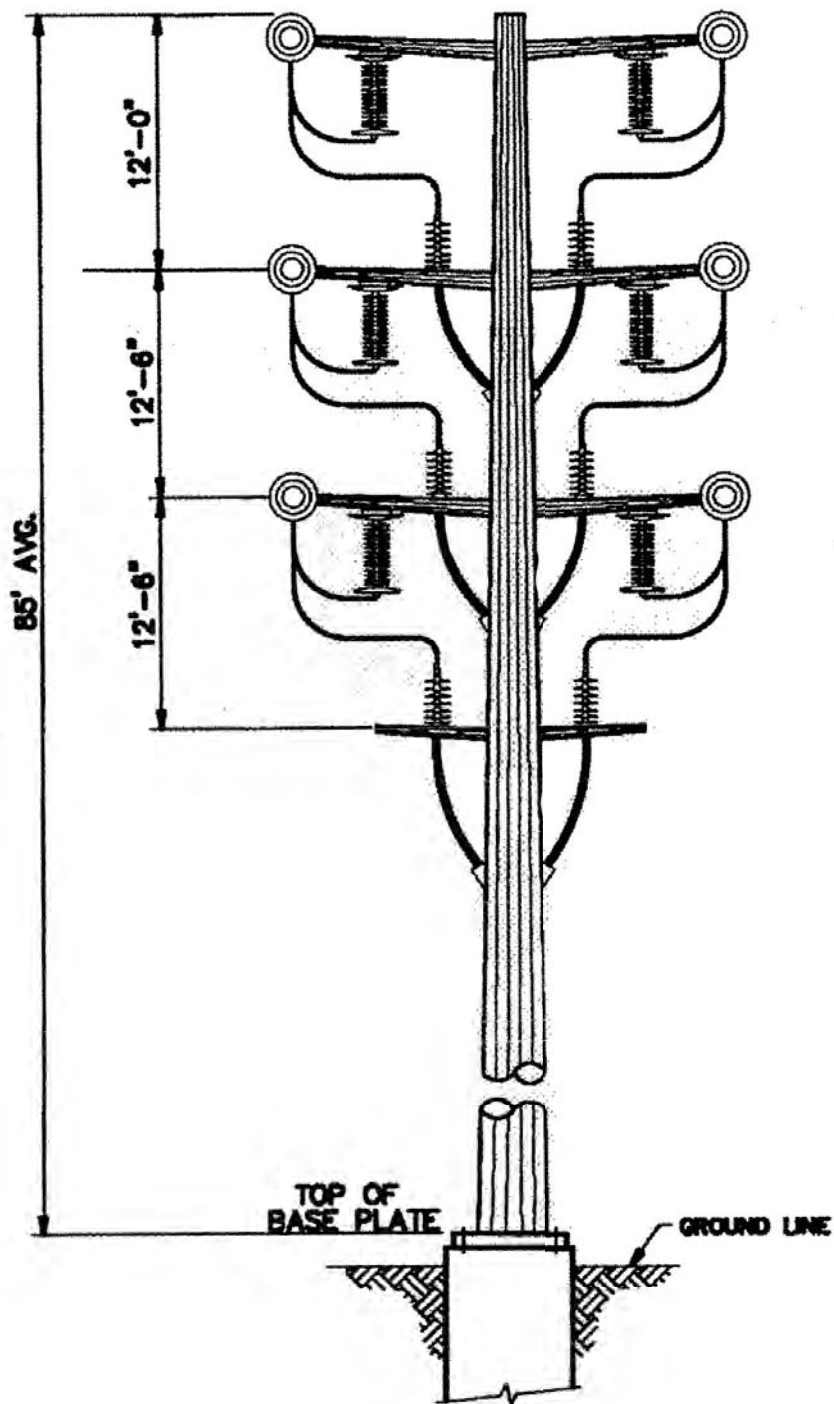


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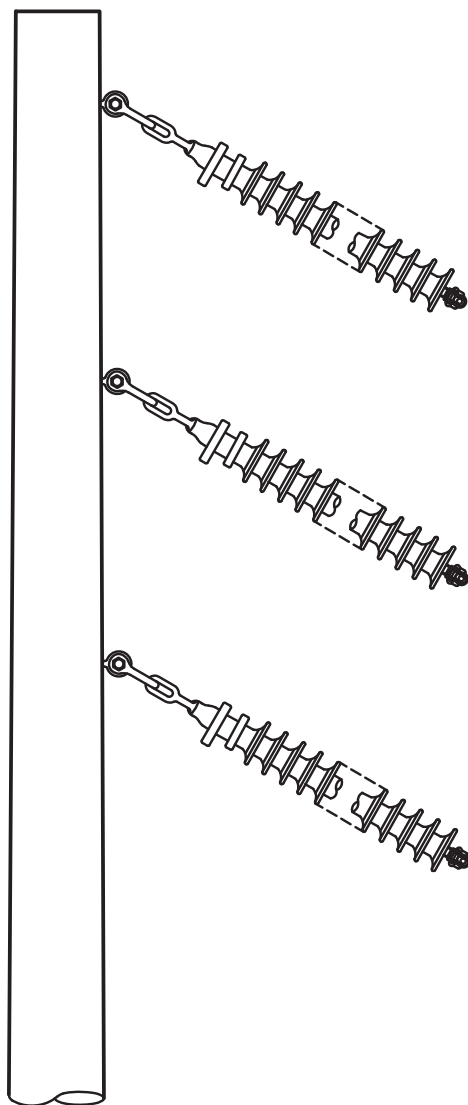
Existing 138 kV Steel Lattice Structure



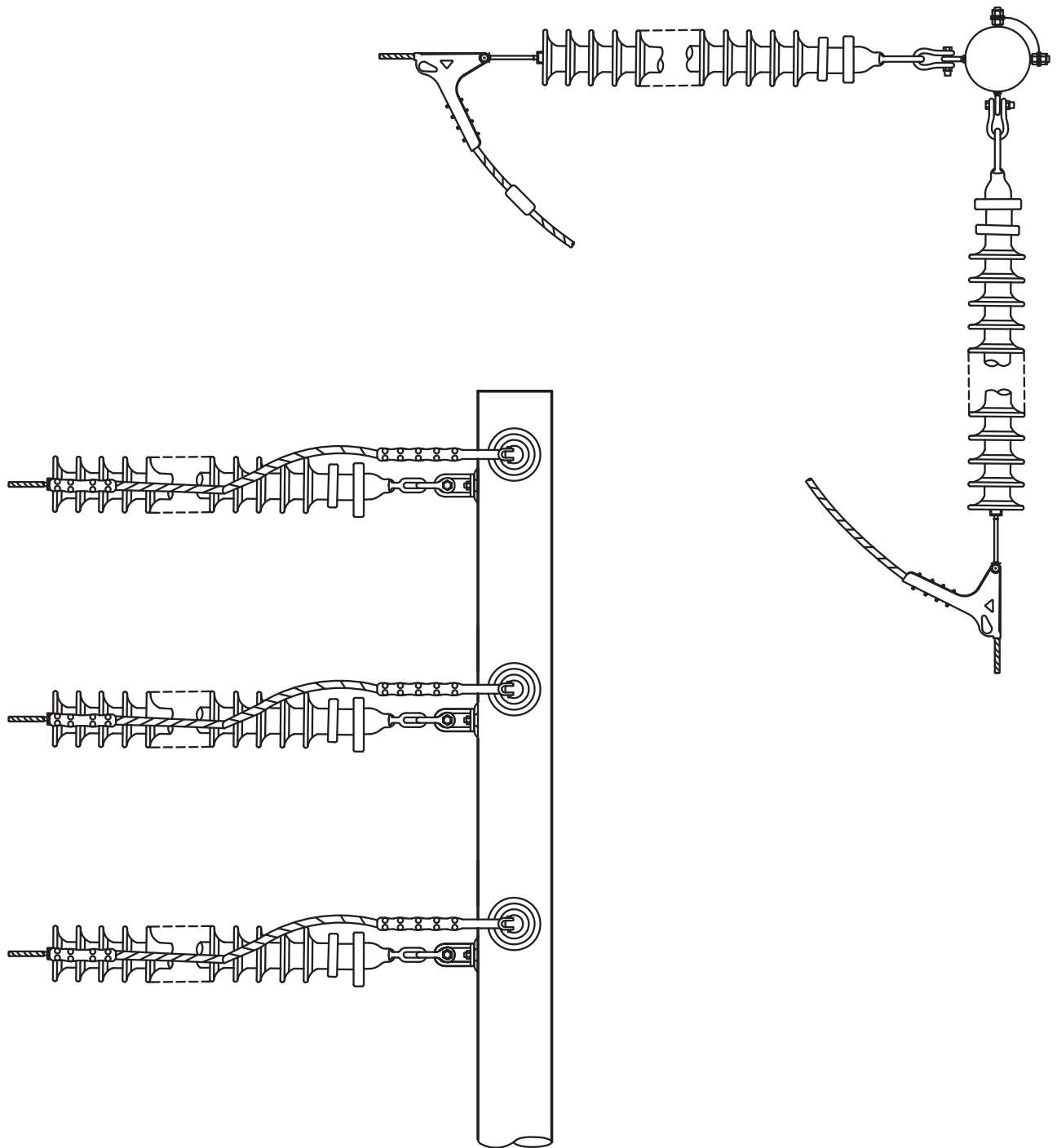
Typical 69 kV Wood Poles

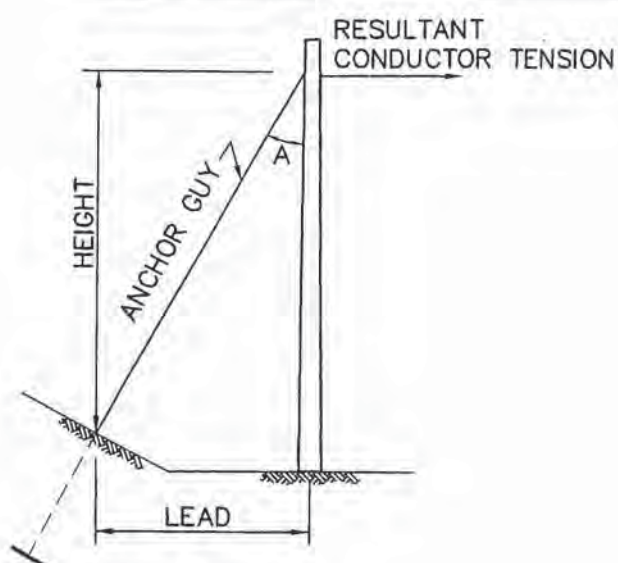
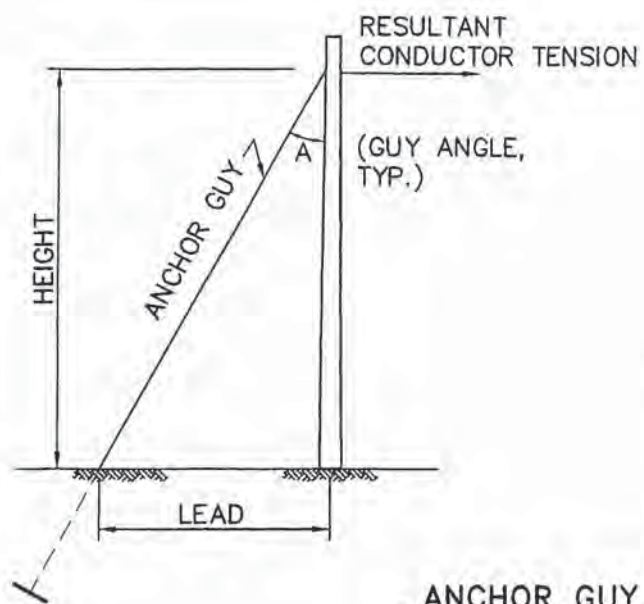


Typical 69 kV Steel Cable Riser Pole

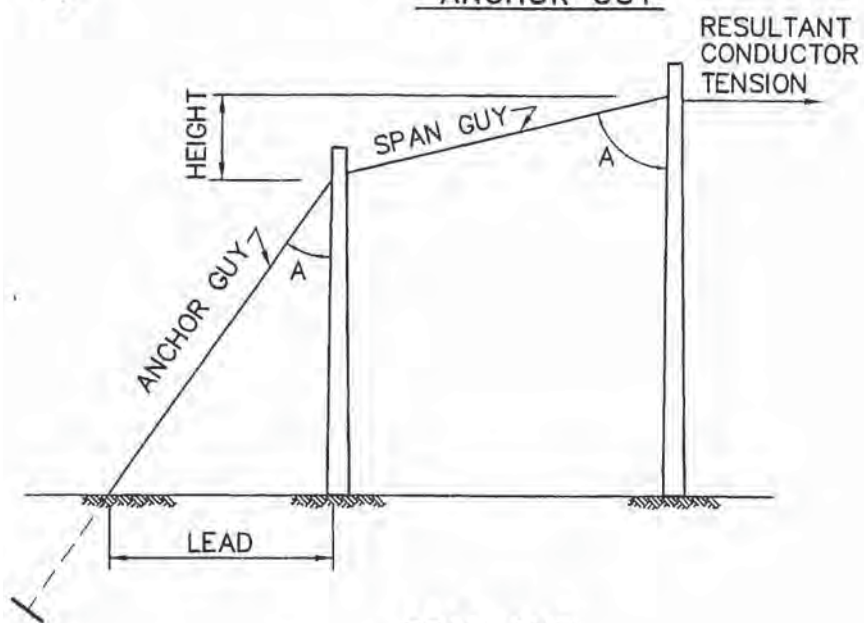


Typical Existing 69 kV Wood Pole
Z-Configuration

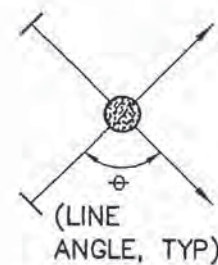




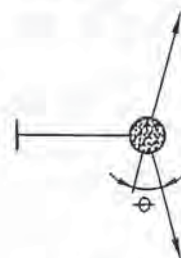
ANCHOR GUY



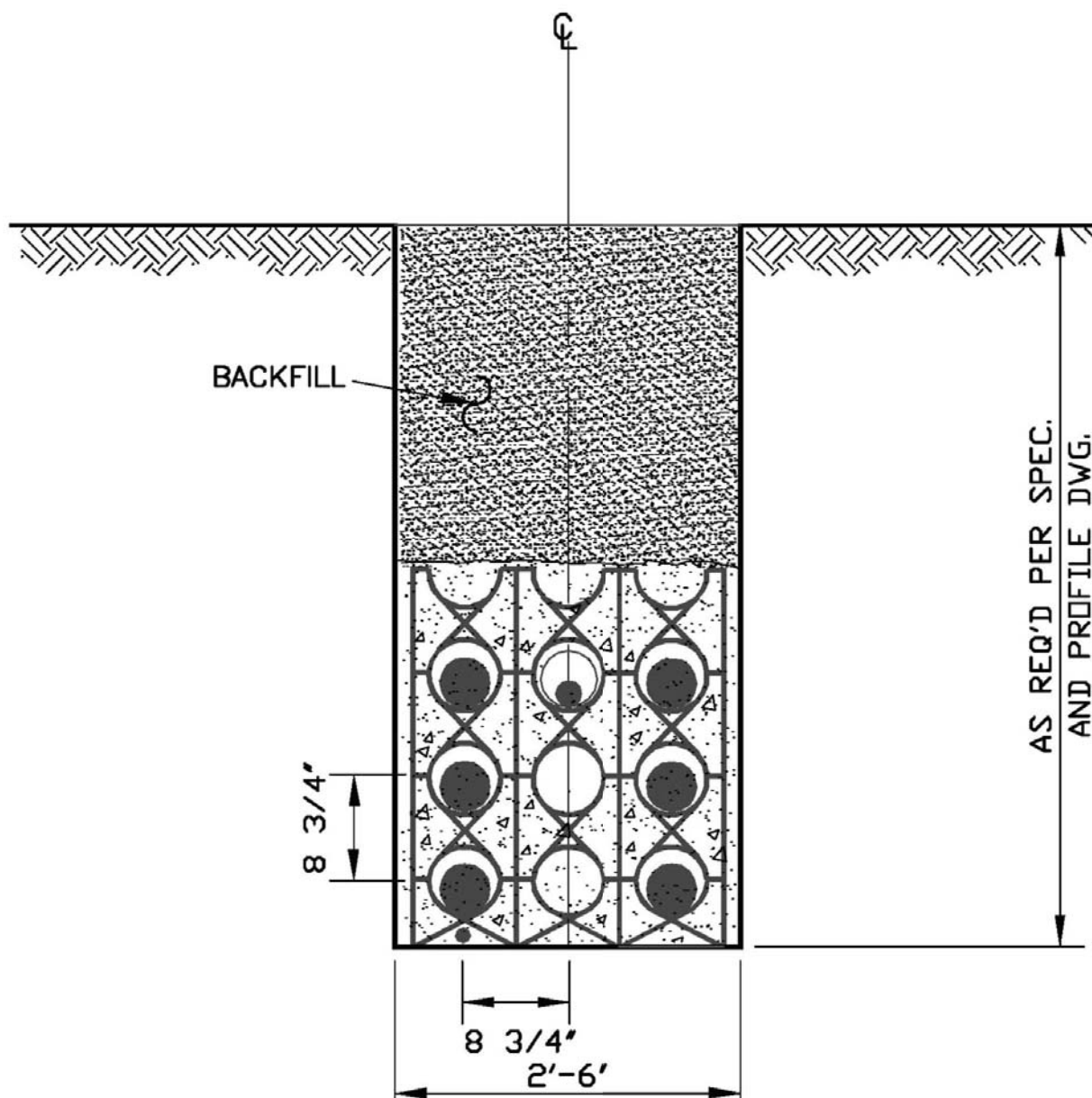
SPAN GUY

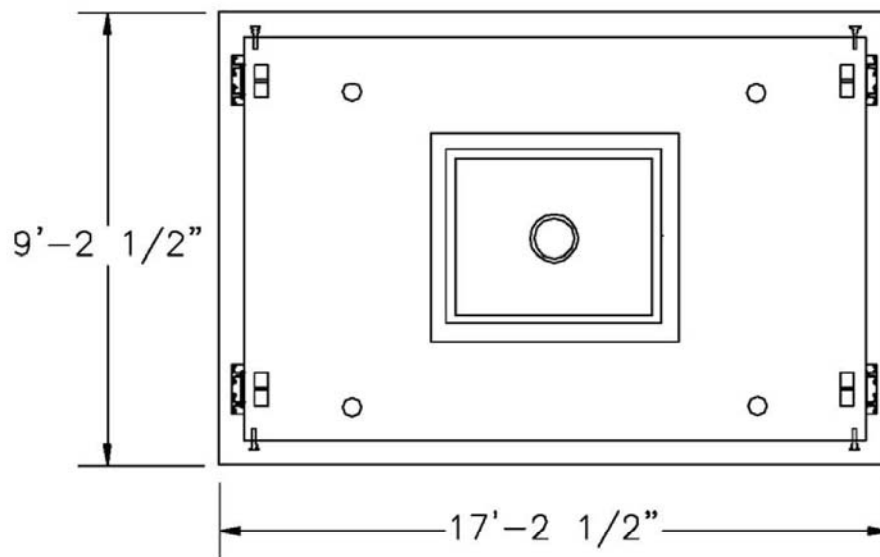


IN-LINE GUY

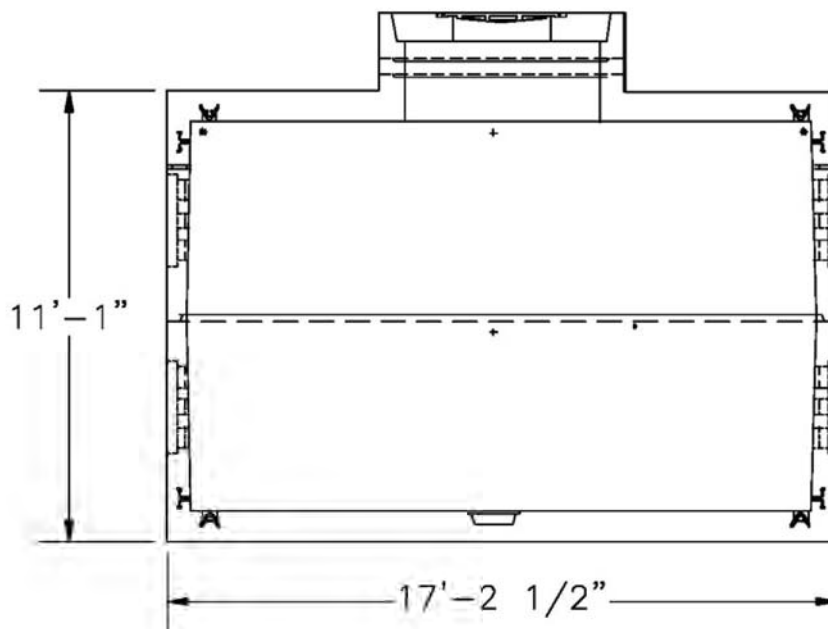


BISECTOR GUY



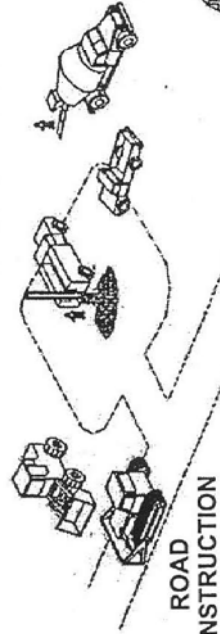


PLAN



ELEVATION

FOUNDATION INSTALLATION

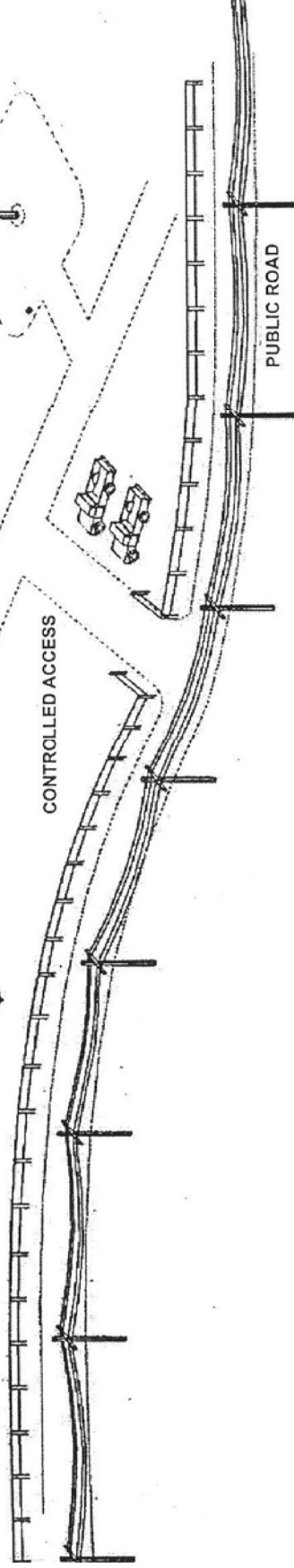


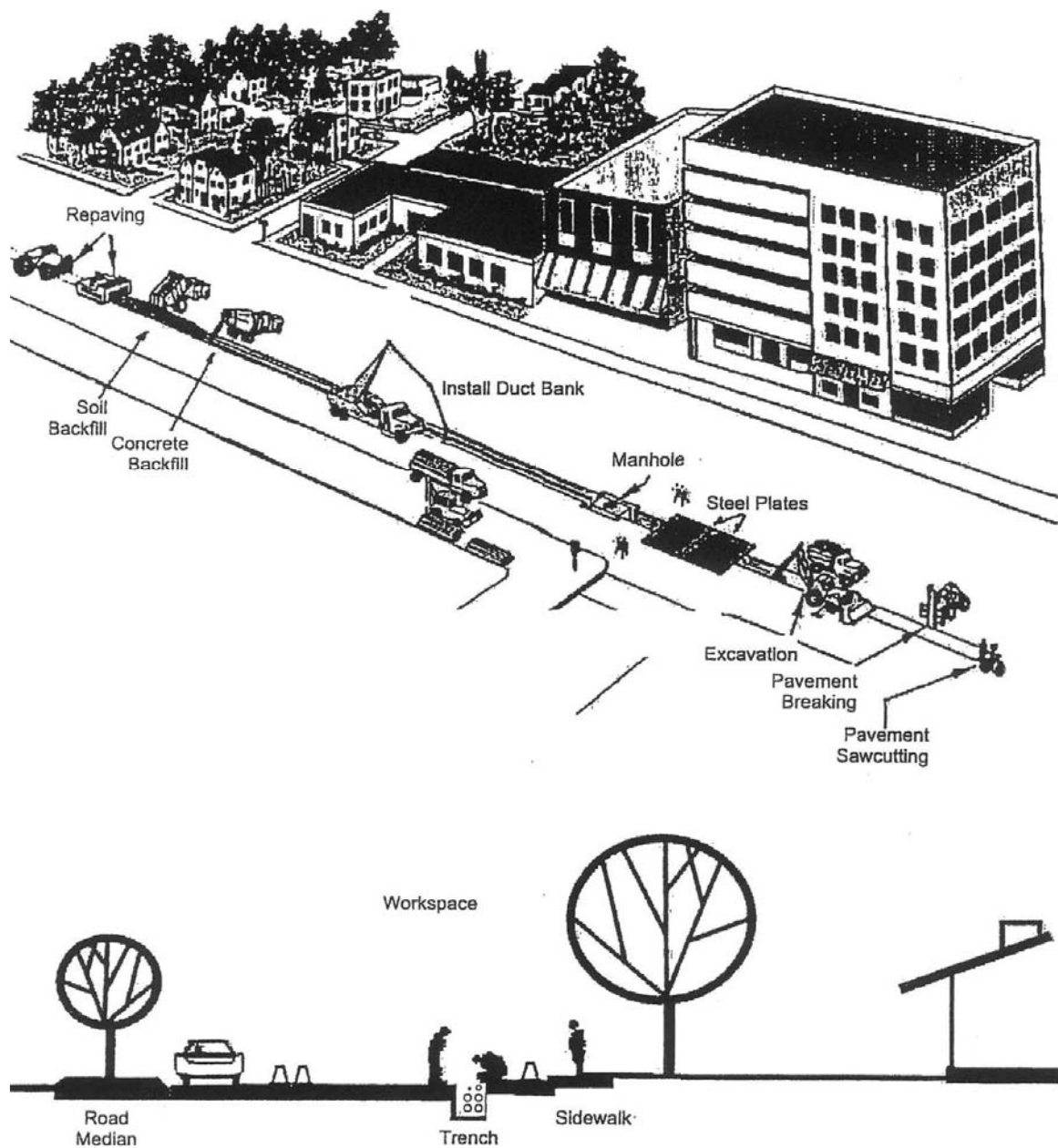
ROAD
CONSTRUCTION

STEEL POLE ASSEMBLY
AND ERECTION



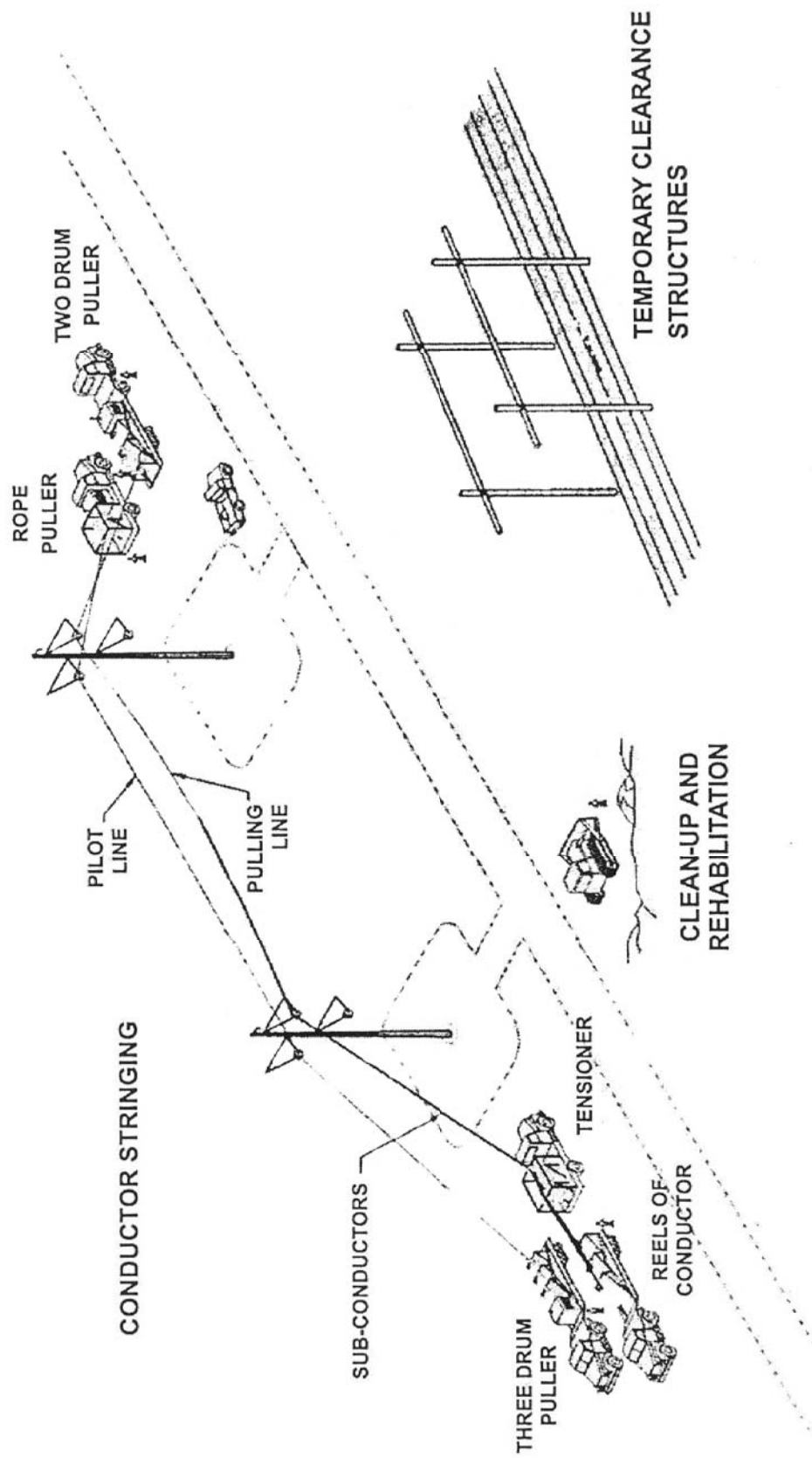
CONTROLLED ACCESS





Typical Underground Construction Process within a Roadway





Typical Overhead Conductor Installation Procedure Drawing

ATTACHMENT 3-D: TRANSMISSION POLE SUMMARY

ATTACHMENT 3-D: TRANSMISSION POLE SUMMARY

ID Number	Easting (feet)	Northing (feet)	Construction Action	Material	Current Type	Current Transmission Line	Future Type	Future Transmission Line
0	6302109.0	1801743.0	Install	Steel	Not Applicable (NA)	NA	Riser	646/647
1	6302171.0	1801942.0	No Action (Remain)	Steel	Lattice	13823/13824	Lattice	13823/13824
2	6301965.0	1801921.0	No Action (Remain)	Steel	Dead-end	23042	Dead-end	23042
3	6301994.0	1802737.0	Remove	Steel	Riser	23042	NA	NA
4	6302277.0	1802006.0	Install	Steel	NA	NA	Riser	645
9	6301630.0	1806197.0	Install	Wood	NA	NA	Tangent	641
10	6301789.0	1805725.0	Install	Wood	NA	NA	Tangent	641
11	6301882.0	1805479.0	Install	Wood	NA	NA	Tangent	641
12	6302002.0	1805169.0	Install	Wood	NA	NA	Tangent	641
13	6302090.0	1804898.0	Install	Wood	NA	NA	Tangent	641
14	6302186.0	1804690.0	Install	Wood	NA	NA	Dead-end	647
16	6301856.0	1805769.0	Install	Wood	NA	NA	Dead-end	642
17	6301934.0	1805484.0	Install	Wood	NA	NA	Tangent	642
18	6302030.0	1805180.0	Install	Wood	NA	NA	Tangent	642
20	6302282.0	1802126.0	Install	Steel	NA	NA	Riser	644
21	6302002.0	1805481.0	Replace	Wood	Distribution	Distribution	Dead-end	644
22	6302102.0	1805172.0	Install	Wood	NA	NA	Tangent	644

Attachment 3-D: Transmission Pole Summary

ID Number	Easting (feet)	Northing (feet)	Construction Action	Material	Current Type	Current Transmission Line	Future Type	Future Transmission Line
23	6302184.0	1804920.0	Install	Wood	NA	NA	Tangent	644
24	6302181.0	1802156.0	Install	Steel	NA	NA	Riser	13515
25	6302151.0	1804241.0	No Action (Remain)	Wood	Tangent	647	Tangent	641
26	6302133.0	1803941.0	No Action (Remain)	Wood	Tangent	647	Tangent	641
27	6302115.0	1803613.0	No Action (Remain)	Wood	Tangent	647	Tangent	641
28	6302098.0	1803294.0	No Action (Remain)	Wood	Tangent	647	Tangent	641
29	6302083.0	1803022.0	No Action (Remain)	Wood	Tangent	647	Tangent	641
30	6302061.0	1802612.0	No Action (Remain)	Wood	Tangent	647	Tangent	641
31	6302036.3	1802206.7	Remove	Wood	Tangent	647	NA	NA
32	6301541.0	1805079.0	Remove	Wood	Tangent	641	NA	NA
33	6301755.0	1805342.0	Remove	Wood	Dead-end	645	NA	NA
34	6302051.0	1804976.0	Remove	Wood	Tangent	645	NA	NA
35	6302244.0	1804737.0	Remove	Wood	Dead-end	645	NA	NA
36	6302277.0	1802011.0	Remove	Wood	Dead-end	645	NA	NA
37	6301579.0	1805046.0	Remove	Wood	Tangent	642	NA	NA
38	6301756.0	1805264.0	Remove	Wood	Dead-end	646	NA	NA
39	6301991.0	1804970.0	Remove	Wood	Tangent	646	NA	NA

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San Diego Gas & Electric Company
South Bay Substation Relocation Project

Attachment 3-D: Transmission Pole Summary

ID Number	Easting (feet)	Northing (feet)	Construction Action	Material	Current Type	Current Transmission Line	Future Type	Future Transmission Line
40	6302093.0	1801808.0	Remove	Wood	Dead-end	646	NA	NA
41	6302062.0	1801821.0	Remove	Wood	Stub	NA	NA	NA
42	6302093.0	1801773.0	Remove	Wood	Stub	NA	NA	NA
43	6301595.0	1805032.0	Remove	Wood	Tangent	644	NA	NA
44	6301946.0	1804915.0	Remove	Wood	Tangent	647	NA	NA
45	6302063.0	1801791.0	Remove	Wood	Dead-end	647	NA	NA
46	6302061.0	1801756.0	Remove	Wood	Stub	NA	NA	NA
47	6302029.0	1801802.0	Remove	Wood	Stub	NA	NA	NA
48	6301421.0	1805171.0	Remove	Wood	Tangent	641	NA	NA
49	6301588.0	1805493.0	Remove	Wood	Tangent	641	NA	NA
50	6301696.0	1805709.0	Remove	Wood	Tangent	641	NA	NA
51	6301658.0	1805902.0	Remove	Wood	Tangent	641	NA	NA
52	6301584.0	1806244.0	Remove	Wood	Tangent	641	NA	NA
53	6301503.0	1805113.0	Remove	Wood	Tangent	644	NA	NA
54	6301726.0	1805478.0	Remove	Wood	Tangent	644	NA	NA
57	6301717.0	1804806.0	Remove	Steel	Lattice	13823/13824	NA	NA
58	6302135.0	1804708.0	Remove	Steel	Lattice	13823/13824	NA	NA
59	6302279.0	1804231.0	Remove	Steel	Lattice	13823/13824	NA	NA
61	6301756.0	1805017.0	Remove	Wood	3-Pole Riser	13815	NA	NA
62	6301753.0	1805180.0	Remove	Wood	Dead-end	647	NA	NA
63	6301464.0	1805147.0	Remove	Wood	Tangent	642	NA	NA

Attachment 3-D: Transmission Pole Summary

ID Number	Easting (feet)	Northing (feet)	Construction Action	Material	Current Type	Current Transmission Line	Future Type	Future Transmission Line
64	6301676.0	1805483.0	Remove	Wood	Tangent	642	NA	NA
65	6302253.0	1804693.0	Replace	Wood	Tangent	645	Tangent	644
66	6302292.0	1804467.0	Replace	Wood	Tangent	645	Tangent	644
67	6302321.0	1804203.0	Replace	Wood	Tangent	645	Tangent	644
68	6302364.0	1803846.0	Replace	Wood	Tangent	645	Tangent	644
70	6302347.0	1803488.0	Replace	Wood	Tangent	645	Tangent	644
71	6302330.0	1803128.0	Replace	Wood	Tangent	645	Tangent	644
72	6302316.0	1802865.0	Replace	Wood	Tangent	645	Tangent	644
73	6302302.0	1802561.0	Replace	Wood	Tangent	645	Tangent	644
75	6302290.0	1802305.0	Replace	Wood	Tangent	645	Tangent	644
76	6302231.0	1802013.0	Remove	Wood	Stub	NA	NA	NA
79	6302227.0	1804678.0	Replace	Wood	Dead-end	646	Dead-end	642
80	6302202.0	1804249.0	Replace	Wood	Tangent	646	Tangent	642
81	6302180.0	1803839.0	Replace	Wood	Tangent	646	Tangent	642
82	6302157.0	1803430.0	Replace	Wood	Tangent	646	Tangent	642
83	6302133.0	1803021.0	Replace	Wood	Tangent	646	Tangent	642
84	6302111.0	1802611.0	Replace	Wood	Tangent	646	Tangent	642
85	6302086.8	1802203.8	Remove	Wood	Tangent	646	NA	NA
86	6302245.0	1801735.0	Replace	Wood	Dead-end	646/647	Dead-end	646/647
87	6302170.0	1804605.0	Replace	Wood	Tangent	647	Tangent	641
88	6301512.0	1806583.0	Replace	Wood	Tangent	641	Tangent	641

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San Diego Gas & Electric Company
South Bay Substation Relocation Project

Attachment 3-D: Transmission Pole Summary

ID Number	Easting (feet)	Northing (feet)	Construction Action	Material	Current Type	Current Transmission Line	Future Type	Future Transmission Line
90	6301897.0	1805829.0	No Action (Remain)	Wood	Dead-end	642	Dead-end	642
91	6301799.0	1806134.0	Replace	Wood	Tangent	642	Tangent	642
92	6301949.0	1805846.0	Replace	Wood	Dead-end	644	Tangent	644
93	6301968.0	1805787.0	Replace	Wood	Stub	NA	Dead-end	644
94	6301850.0	1806157.0	Replace	Wood	Tangent	644	Tangent	644
200	6302036.3	1802205.7	Install	Steel	NA	NA	Riser	641
201	6302086.8	1802202.8	Install	Steel	NA	NA	Riser	642
202	6301941.2	1802095.5	Install	Steel	NA	NA	Dead-end	23042
203	6302224.9	1803041.6	Remove	Steel	Lattice	13823/13824	NA	NA
204	6301662.5	1804848.0	Remove	Steel	Lattice	13815	NA	NA
205	6302109.0	1801743.0	Install	Steel	NA	NA	Riser	646/647

**ATTACHMENT 3-E: DYNEGY-OWNED EQUIPMENT WITHIN THE EXISTING SOUTH BAY
SUBSTATION**

ATTACHMENT 3-E: DYNEGY-OWNED EQUIPMENT WITHIN THE EXISTING SOUTH BAY SUBSTATION

San Diego Gas & Electric Company is not selling any transmission equipment or assets that are subject to the Federal Energy Regulatory Commission's jurisdiction. Without limiting the generality of the foregoing, the items listed below identify certain specific assets that shall be Excluded Assets.

Equipment or Facility Type	Location	Quantity	Belongs to	Maintained by	Used by/ Operated by	Comments
Transmission Towers, Conductors and Insulators	TL13823 & TL13824 from Switchyard rack to Tower 188701	5	Seller	Seller	Seller	Three transmission steel towers and associated conductors and insulators.
Transmission Towers, Conductors and Insulators	TL13815 from Switchyard rack to Tower 189491	3	Seller	Seller	Seller	Three transmission steel towers and associated conductors and insulators.
Transmission Towers, Conductors and Insulators	TL13813 & TL13814 from Switchyard rack to Tower 18491	4	Seller	Seller	Seller	Four transmission steel towers and associated conductors and insulators.
Transmission Wood Poles, Conductors and Insulators	TL647 from Switchyard rack to Pole No. 187480	12	Seller	Seller	Seller	Twelve transmission wood poles and associated conductors and insulators.
Transmission Wood Poles, Conductors and Insulators	TL646 from Switchyard rack to Pole No. 34136	11	Seller	Seller	Seller	Eleven transmission wood poles and associated conductors and insulators.
Transmission Wood Poles, Conductors and Insulators	TL644 from Switchyard rack to Pole No. Z187433	2	Seller	Seller	Seller	Two transmission wood poles and associated conductors and insulators.

Attachment 3-E: Dynegy-Owned Equipment within the Existing South Bay Substation

Equipment or Facility Type	Location	Quantity	Belongs to	Maintained by	Used by/ Operated by	Comments
Transmission Wood Poles, Conductors and Insulators	TL642 from Switchyard rack to Pole No. Z187455	7	Seller	Seller	Seller	Seven transmission wood poles and associated conductors and insulators.
Transmission Wood Poles, Conductors and Insulators	TL64 1 from Switchyard rack to Pole No. Z187421	7	Seller	Seller	Seller	Seven transmission wood poles and associated conductors and insulators.
Main Transformer # 1 Unit I, 69k Breakers	101 N - EM-985836, G.E. Type FK695000, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Main Transformer # 1 Unit I, 69k Breakers	101 N - EM-985835, G.E. Type FK695000, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Station Auxiliary Transformer 1-2B, 69kV Breakers	2N - EM-985851, G.E. Type FK695000, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Station Auxiliary Transformer 1-2B, 69kV Breakers	2S - EM-985850, G.E. Type FK695000, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Gas Turbine 69kV Breakers	3N - EM-985867, G.E. Type FK695000, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Gas Turbine 69kV Breakers	3S - EM-985828, G.E. Type FK695000, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Main Transformer Unit 2, 138kV Breakers	206N - EM-98591 0, G.E. Type FK-138-10000-3, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Main Transformer Unit 2, 138kV Breakers	206S - EM 985911, G.E. Type FK-138-10000-3, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295

Attachment 3-E: Dynegy-Owned Equipment within the Existing South Bay Substation

Equipment or Facility Type	Location	Quantity	Belongs to	Maintained by	Used by/ Operated by	Comments
Main Transformer Unit 3, 138kV Breakers	308N - EM-985987, West. Type 6M7B, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Main Transformer Unit 3, 138kV Breakers	308S - EM-985988, West. Type 6M7B, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Main Transformer Unit 4, 138kV Breakers	413N - EM-986256, McGraw-Edison, Type AHJ60,42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
Main Transformer Unit 4, 138kV Breakers	413S - EM-986257, McGraw-Edison, Type AHJ60, 42ka	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
101N & 101S Disconnect Switch	69kV, Type "RF", 2000A, TPST, 70,000A momentary, General Electric	4	Buyer	Buyer	Both	Drawing SY-RWN 11295
2N&2S Disconnect Switch	69kV, Type "RF", 1200A, TPST, 70,000A momentary, General Electric	4	Buyer	Buyer	Both	Drawing SY-RWN 11295
3N & 3S Disconnect Switch	69kV, Type "RF", 1200A, TPST, 70,000A momentary, General Electric	1	Buyer	Buyer	Both	Drawing SY-RWN 11295
3N & 3S Disconnect Switch	69 kV, Type "VMK-40", 1200A, TPST, 61,000A momentary, Delta Star	3	Buyer	Buyer	Both	Drawing SY-RWN 11295

Attachment 3-E: Dynegy-Owned Equipment within the Existing South Bay Substation

Equipment or Facility Type	Location	Quantity	Belongs to	Maintained by	Used by/ Operated by	Comments
206N & 206S Disconnect Switch	161kV, Type "RF-2", 1600A, TPST, 70,000A momentary, General Electric	4	Buyer	Buyer	Both	Drawing SY-RWN 11295
308N & 308S Disconnect Switch	161kV, Type "AGA", 1600A, TPST, 70,000A momentary	4	Buyer	Buyer	Both	Drawing SY-RWN 11295
413N & 413S Disconnect Switch	138kV, Type "TA" 1600A, TPST, 70,000A momentary, Allis-Chalmers	4	Buyer	Buyer	Both	Drawing SY-RWN 11295
69kV Disconnect Switch ISO Metering	69kV Yard	1	Buyer	Buyer	Both/ISO	Drawing SY-RWN 11295
Transformer 3-4 B Relays 87B/BDD (3) and 51 B/IAC (3)	Panel #405 in 138kV Yard Control House	6	Buyer	Buyer	Buyer	Wiring Diagram - SY-E-616 Panel Drawing - SY-E-610P
GT-1 Relays 87GT-1/BDD (3) and 86GT-1/HEA (1)	Panel #204 in 138kV Yard Control House	4	Buyer	Buyer	Buyer	Wiring Diagram - SY-E-636 Panel Drawing - SY-E-630-Y
Transformer 1-2B Relays 87A/BDD (3) and 51 A/IAC (3)	Panel #203 in 138kV Yard Control House	6	Buyer	Buyer	Buyer	Wiring Diagram - SY-E0635 Panel Drawing - SY-E-630-Y

ATTACHMENT 3-F: ELECTRIC AND MAGNETIC FIELDS

ATTACHMENT 3-F: ELECTRIC AND MAGNETIC FIELDS

1.0 ELECTRIC AND MAGNETIC FIELDS

1.0.0 Electrical Effects

This section describes potential effects from exposure to electric and magnetic fields (EMF) associated with the proposed South Bay Substation Relocation Project.

EMFs are present wherever electricity flows—around appliances and transmission lines, in offices, schools, and homes. Electric fields are invisible lines of force created by voltage and are shielded by most materials. Magnetic fields are invisible lines of force created by electric current, and magnetic fields are not shielded by most materials. These fields are low-energy, extremely low-frequency, and should not be confused with high-energy or ionizing radiation such as X-rays and gamma rays.

Some studies have reported a weak association between estimates of residential magnetic field exposure and childhood leukemia. These epidemiological (human statistical) studies have not shown that the exposure to magnetic fields from powerlines actually causes leukemia because other explanations for the association, such as study bias, cannot be ruled out. And virtually all controlled laboratory studies on animals, tissues and cells fail to support a causal association. Some studies on workers have also found associations between estimated magnetic field exposure and some forms of cancer and other disorders, but these results have been highly inconsistent.

1.0.1 Background

The transport of electricity is described in terms of both its voltage and current flow. Using these terms, the transport of electricity is analogous to the flow of water through a pipe. The pressure driving the water is the counterpart to the voltage on the powerline, and the amount of water flowing in the pipe is the counterpart to the amount of electric current on the line.

Electrical lines and equipment produce an electric field as a result of the voltage applied to their wiring. The strength of the electric field is expressed in volts per meter (V/m) or kilovolts per meter (kV/m). The electric field strength falls off sharply with distance from the source. Objects such as trees, houses, concrete and other building materials shield electric fields. Thus, even in proximity to powerlines or substations, the electric field in nearby residences is largely a result of internal sources; external sources of electric fields are effectively shielded from indoor environments.

The flow of current in electrical lines and equipment produces a magnetic field. The strength of the magnetic field is measured in units called Gauss (G) or Tesla (T). Because these units are much too large for expressing magnetic field intensities encountered in daily life, magnetic field intensities are most often expressed in milligauss (mG), which is one-thousandth of a Gauss, or microtesla (μ T), which is one-millionth of a tesla. Ten mG is equal to 1.0 μ T. The unit μ T generally is used internationally and in technical literature. The field intensity varies with the amount of current flow. Like electric fields, the intensity of the magnetic field decreases as

distance from the source increases. But unlike electric fields, magnetic fields are not shielded by buildings, trees, and most other objects.

Electrical transmission and distribution systems are not the only sources of magnetic fields. Within homes and workplaces, local sources of magnetic fields include building wiring and plumbing, electric blankets, electric stoves, computer terminals, bedside clocks, ceiling fans, and other appliances that people may use for prolonged periods. Indeed, some of the common sources of higher magnetic fields are appliances and electrical devices found within the home. The magnetic field levels from such sources in typical use can range up to thousands of mG or higher; however, the duration of exposure from many appliances is typically much shorter than that from other sources. Thus, exposure to both electric and magnetic fields occurs continuously and is not simply a function of living or working near a powerline or electrical facility. Exposure depends on the many sources and field strength present where a person lives, works, or otherwise spends time.

1.0.2 History

In the late 1960s and early 1970s, the possibility of adverse health effects resulting from exposures to electric fields received considerable attention. This attention was motivated by reports from the Soviet Union of various health complaints among utility workers in high-voltage switchyards. Subsequent research on electrical utility workers in Europe and North America failed to confirm the complaints; Soviet investigators later indicated that their concerns had been “overstated.”

In the 1980s, interest shifted primarily to magnetic fields for two major reasons. First, Wertheimer and Leeper in 1979 published a paper reporting a statistical association between childhood cancer and the apparent current-carrying capacity of the powerlines near the study residences. Second, it was recognized that exposure to electric fields from outside sources is limited because of effective shielding by most materials. This was confirmed in studies that failed to find associations between the capacity of outside powerlines and electric fields levels within homes. The shift away from electric field research has been further justified by subsequent residential studies that fail to report an association between measured electric fields and cancer in either children or adults.

1.0.3 Current Research

To assess potential health risks from an environmental agent such as power frequency EMF, interdisciplinary groups of scientist must consider the results from epidemiological investigations and laboratory research on cells, tissues, and a variety of animal species.

Epidemiology

Epidemiology investigates the distribution, patterns, and potential causes of disease within human populations. The objective of epidemiology is to evaluate and measure the association between exposures to environmental factors (e.g., asbestos, benzene) and health outcomes (e.g., lung disease, leukemia). Epidemiological studies look for associations between the exposure of a group of people to an agent (possible risk factor) and the occurrence of disease in that group. Epidemiology deals with people in their natural environments, so exposures cannot be controlled

or limited to the factors being studied. Thus, epidemiology addresses associations with disease outcomes; generally, it does not establish whether a particular agent causes disease.

Some documented epidemiological studies conducted in community settings have reported weak associations between childhood cancer and estimates of exposure to magnetic fields. Other epidemiological studies, equally well-designed and well-conducted, have reported no associations between proximity to powerline sources of magnetic fields and cancer. Those studies reporting associations are not consistent with respect to cancer type. Two pooled analyses, which combined data from multiple studies, reported an association between rates of childhood leukemia and measured magnetic fields above 3 or 4 mG, but found little or no association with so-called "wire codes" (proximity and current-carrying capacity of nearby powerlines). In earlier individual studies, the opposite pattern seemed to predominate: "wire codes" showed a significant association, while measured fields did not.

Exposure assessment is a universal deficiency in the epidemiological literature. The ability of surrogate measures—such as wire codes, proximity, and current-carrying capacity of powerlines—to predict power-frequency magnetic field exposures is limited. In the occupational setting, some studies have reported weak associations between work in electrical occupations and some health outcomes such as leukemia or brain cancer, but the findings are inconsistent. And, in many occupational studies, exposure is inferred from job title classifications.

Laboratory Studies

A wide range of magnetic field intensities at extremely low frequency (ELF) exposures have been studied in the laboratory to attempt to elicit biological responses and identify the conditions and mechanisms under which they can be produced. No accepted biophysical mechanism currently exists that can readily explain how a cell could respond to low-intensity, low-frequency magnetic fields. Any imposed external electric and magnetic fields must compete with fundamental physical fluctuations (e.g., thermal noise) and endogenous background biological fields (e.g., those generated by the normal activity of the heart, brain, skeletal muscle, and smooth muscle in the gut and airways). Most laboratory studies have involved exposures hundreds to thousands of times higher than those typically found in residential backgrounds and some occupational settings. From several thousand studies in the literature, relatively few biological responses are confirmed to occur with exposure to time-varying magnetic fields at intensities of less than 1,000 mG, and those that have been confirmed have not been linked to adverse health effects. Although there is considerable interest in determining whether there is any biological basis for a cause-and-effect relationship between exposure to power frequency magnetic fields and cancer, the available laboratory data have not provided substantive support for this hypothesis.

Research Conclusions

Nationally and internationally recognized scientific organizations and independent regulatory advisory groups have been organized to conduct scientific reviews of the EMF research and peer reviewed publications. Their ability to assemble experts from a variety of disciplines to review the full body of research on this complex issue gives their reports credibility. Without exception, these major reviews have reported that the body of data, as large as it is, does not demonstrate that exposure to power-frequency magnetic fields causes cancer or poses other health risks,

although the possibility cannot be dismissed. Because of the uncertainty, most reviews recommend further research, and, appropriately, research is ongoing worldwide. The weakness of the reported epidemiological associations, the lack of consistency among studies, and the severe limitations in exposure assessment in the epidemiological studies, together with the lack of support from laboratory research, were key considerations in the findings of the scientific reviews. Examples of these advisory groups and summaries of their findings are provided below.

1.0.4 International Reviews

In 2007, the World Health Organization (WHO) released its long-awaited review of EMF research, *Extremely Low Frequency Fields Environmental Health Criteria (EHC) Monograph No. 238*. In brief, the review updates and affirms the findings of the International Agency for Research on Cancer (IARC) in its 2002 classification of EMF as a "possible human carcinogen" with respect to childhood leukemia. The WHO document also affirms IARC's previous finding that evidence for all other childhood cancers and all adult cancers is "inadequate." Evidence for all other non-cancer diseases studied also is classified "inadequate."

The EHC reports that epidemiology (human statistical) studies show a "consistent" association between childhood leukemia and various surrogate measures of long-term residential exposure to low-level power frequency magnetic fields. This epidemiological evidence is classified as "limited" because other explanations, such as study bias, cannot be ruled out. And, "virtually all" controlled laboratory studies on animals, tissues and cells fail to support a causal association.

While rejecting exposure limits for ordinary residential environments, the WHO does recommend "precautionary approaches" to reduce exposure if it can be done without compromise to the "essential health, social and economic benefits of electric power." The EHC states, "Given the weakness of the evidence for a link between exposure to ELF ['extremely low frequency' includes power frequency] magnetic fields and childhood leukemia and the limited potential impact on public health, the benefits of exposure reduction on health are unclear and thus the cost of reducing exposure should be very low." More specifically, the EHC recommends that: "Changes to engineering practice to reduce EMF exposure from equipment or devices should be considered, provided that they yield other additional benefits, such as greater safety, or involve little or no cost."

In 2004, the National Radiological Protection Board (NRPB) in the United Kingdom published its *Review of the Scientific Evidence for Limiting Exposure to Electromagnetic Fields (0-300GHz)*. The report states:

"It is concluded that currently the results of these [epidemiological and experimental] studies on EMF's and health, taken individually or as collectively reviewed by expert groups, are insufficient either to make a conclusive judgment on causality or to quantify appropriate exposure restrictions."

The Health Council of the Netherlands released an Annual Update to the Dutch government in January 2004 on "the possible health effects of ELF electromagnetic fields".

The (Health Council of the Netherlands) Committee, like the IARC itself, points out that there is no evidence to support the existence of a causal relationship here. Nor has research yet uncovered any evidence that a causal relationship might exist. Nevertheless, new suggestions for possible mechanisms ... are regularly put forward. However, none of these hypotheses can presently explain how ELF magnetic fields exposure might lead to cancer.

The IARC, a part of the WHO, conducted a major EMF review. The organization's Fact Sheet No. 263 on that review states:

In June 2001, an expert scientific working group of IARC reviewed studies related to the carcinogenicity of static and ELF electric and magnetic fields. Using the standard IARC classification that weighs human, animal and laboratory evidence, ELF magnetic fields were classified as possibly carcinogenic to humans based on epidemiological studies of childhood leukemia. Evidence for all other cancer in children and adults, as well as other types of exposures (i.e., static fields and ELF electric fields) was considered not classifiable either due to insufficient or inconsistent scientific information.

"Possibly carcinogenic to humans" is a classification used to denote an agent for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals.

This classification is the weakest of three categories ("is carcinogenic to humans," "probably carcinogenic to humans," and "possibly carcinogenic to humans") used by IARC to classify potential carcinogens based on published scientific evidence.

Examples of "Possibly Carcinogenic to Humans" are: Coffee, styrene, gasoline engine exhaust, and welding fumes.

In March 2001, an independent advisory group to the NRPB in the United Kingdom (UK) published a wide-ranging and thorough review of scientific research on EMF. The review covers work published since the NRPB's first major review of the topic in 1992 and supplementary reports in 1993 and 1994. The report concludes that the possibility of an effect cannot be dismissed:

Laboratory experiments have provided no good evidence that extremely low frequency electromagnetic fields are capable of producing cancer, nor do human epidemiological studies suggest that they cause cancer in general. There is, however, some epidemiological evidence that prolonged exposure to higher levels of power frequency magnetic fields is associated with a small risk of leukemia in children. In practice, such levels of exposure are seldom encountered by the general public in the UK. In the absence of clear evidence of a carcinogenic effect in adults, or of a plausible explanation from experiments on animals or isolated cells, the epidemiological evidence is currently not strong enough to justify a firm conclusion that such fields cause leukemia in children. Unless, however, further research indicates that the finding is due to chance or some

currently unrecognized artifact, the possibility remains that intense and prolonged exposures to magnetic fields can increase the risk of leukemia in children.

1.0.5 Federal Electric and Magnetic Fields Program

In 1992, the U.S. Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program (EMF-RAPID Program) in the Energy Policy Act (PL 102-486, Section 2118). Congress instructed the National Institute of Environmental Health Sciences (NIEHS), National Institutes of Health and the U.S. Department of Energy (DOE) to direct and manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risk from exposure to extremely low-frequency electric and magnetic fields (ELF-EMF). The EMF-RAPID Program had three basic components: 1) a program focusing on health effects research, 2) information compilation and public outreach, and 3) a health assessment for evaluation of any potential hazards arising from exposure to ELF-EMF. This program was completed in December 1998.

In June 1999, NIEHS published its report, *Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, with its findings and conclusions from this program of research. The Executive Summary of the report concluded that:

“The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak ... The NIEHS concludes the ELF-EMF exposure cannot be recognized an entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern.” Panels charged with recommending exposure limits for electric and/or magnetic fields have concluded that there are no meaningful experimental data (e.g., no dose-response information is available) on which to base standards or limits to which the public is exposed.

In 1999, the National Academy of Sciences published a report *Research on Power-Frequency Fields Completed Under the Energy Policy Act of 1992*. In response to a request from the DOE, following the directives of the Energy Policy Act of 1992, the National Research Council (NRC) established a committee of scientists and engineers to review the activities conducted under the EMF-RAPID program.

The 1999 NRC report concluded that:

An earlier Research Council assessment of the available body of information on biologic effects of power-frequency magnetic fields (NRC 1997) led to the conclusion "that the current body of evidence does not show that exposure to these fields presents a human health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects". The new, largely unpublished contributions of the EMF-RAPID program are consistent with that conclusion. We conclude that no finding from the EMF-RAPID program alters the conclusions of the previous NRC

review on the Possible Effects of Electromagnetic Fields on Biologic Systems (NRC 1997).

1.0.6 California Electric and Magnetic Fields Policy

In January 1991, the California Public Utilities Commission (CPUC) issued an Order Instituting Investigation I.91-01-012 to develop policies and procedures for addressing potential health effect of magnetic fields from utility facilities. The CPUC formed the California Consensus Group (CCG), a committee of 17 stakeholders representing diverse interests and perspectives, to provide guidance on interim EMF measures the CPUC might adopt while waiting for resolution of scientific uncertainties.

In March 1992, the CCG issued its report. In part, the report recommended that the CPUC authorize utilities to implement magnetic field reduction techniques if those techniques could be implemented at little or no cost. In November 1993, the CPUC issued Decision D.93-11-013 adopting an interim policy regarding EMF. The CPUC found that the scientific community had not concluded that an EMF health hazard actually exists.

Further, the CPUC stated, “It is not appropriate to adopt any specific numerical standard in association with EMFs (sic) until we have a firm scientific basis for adopting any particular value.” However, “public concern and scientific uncertainty remain regarding the potential health effects of EMF exposure.” In response, California’s electric utilities were authorized to implement no-cost and low-cost field management techniques to reduce EMF levels from new and upgraded electrical facilities if a noticeable reduction could be achieved.

The CPUC’s Commission Advisory and Compliance Division (CACD) set and chaired informational EMF Design Guideline workshops to incorporate concepts and criteria addressed in the Order and to share information on field reduction options. San Diego Gas and Electric’s *EMF Design Guidelines for Electrical Facilities* describe engineering techniques for reducing exposure to magnetic fields created by its electrical facilities.

The CPUC acknowledged in its order that the feasibility and cost of implementing specific magnetic field reduction techniques vary among utility systems and from project to project. Therefore, the CPUC provided that the manner in which individual utilities apply design guidelines must be determined within the constraints of each new construction project.

The CPUC charged the California Department of Health Services (CDHS) with managing the California EMF Program. As a key work product of that program, the CDHS EMF Risk Evaluation report was issued in October, 2002. The report was written by three CDHS staff scientists whose opinions were expressed in terms of the degree to which each “believed” EMF was likely to cause various health effects. They report that “[t]o one degree or another all three of the CDHS scientists are inclined to believe that EMFs can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig’s Disease, and miscarriage.” The three epidemiologists report that “[t]hey strongly believe that EMFs are not universal carcinogens...” and that “[t]o one degree or another they are inclined to believe that EMFs do not cause an increased risk of breast cancer, heart disease, Alzheimer’s Disease, Depression, or symptoms attributed by some to a sensitivity to EMFs.”

The CDHS report is consistent with other agency reviews in that it concludes that an EMF health risk has not been scientifically established and that additional research is necessary to resolve the question. However, the CDHS differs from all other reviewing agencies in the increased likelihood it places on the existence of an EMF health risk for some diseases, and the CDHS report acknowledges this disparity. Other agencies find EMF health risks ‘possible’ but not ‘probable.’ Agencies that have expressed an opinion as to the strength of evidence for a risk have neither found EMF risks to be likely, nor the evidence to be strong.

In January, 2006, the CPUC issued its Decision D.06-01-042, *Opinion On Commission Policies Addressing Electromagnetic Fields Emanating From Regulated Utility Facilities*. The decision concludes that "a direct link between exposure to EMF and human health effects has yet to be proven despite numerous studies including a study ordered by this Commission and conducted by [C]DHS."

The Decision also affirms the Commission’s November 1993 decision on "low-cost/no-cost Policy" to reduce EMF levels from new utility transmission and substation projects. The Commission retained cost guidance, stating, "[a]s a measure of low-cost mitigation, we continue to use the benchmark of 4% of transmission and substation project costs for EMF mitigation, and combine linked transmission and substation projects in the calculation of the 4% benchmark." Finally, the ruling "adopted rules and policies to improve utility design guidelines for reducing EMF and called for a utility workshop to implement these policies and standardize design guidelines."

1.0.7 EMF Summary

After several decades of study regarding potential public health risks from exposure to power line EMF, research results remain inconclusive. Several national and international panels have conducted reviews of data from multiple studies and state that there is not sufficient evidence to conclude that EMF causes cancer or other adverse health effects. The IARC and the CDHS both classified EMF as a possible carcinogen. The WHO review, Environmental Health Criteria Monograph 238, affirms IARC's classification of EMF as a possible carcinogen regarding childhood leukemia and agrees that evidence for all other childhood cancers and all adult cancers is "inadequate." And the WHO classified evidence "inadequate" for all non-cancer diseases studied. Neither California nor the U.S. Federal government has developed EMF exposure guidelines, standards or regulations related to EMF levels from power lines. The WHO Environmental Health Criteria Monograph 238 recommends that: "changes to engineering practice to reduce EMF exposure from equipment or devices should be considered, provided that they yield other additional benefits, such as greater safety, or involve little or no cost ." CPUC Decisions D.93-11-013 and D.06-01-042 implemented rules and policies for low-cost and no-cost magnetic field reduction measures, and this project incorporates measures consistent with these decisions.

California Environmental Quality Act

Given the uncertainty of EMF effects and the inability of scientific investigations to identify any unsafe level or component of EMF exposure, potential EMF impacts are appropriately addressed

as speculative in accordance with the California Environmental Quality Act Guidelines, Section 15145:

"If after thorough investigation a particular impact is found to be too speculative for evaluation, the conclusion shall be noted, and the discussion terminated."

1.0.8 References

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