

Final Environmental Impact Report/  
Final Environmental Impact Statement

Volume V: Technical Appendices

June 1996

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# BART-SAN FRANCISCO AIRPORT EXTENSION

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**BART—San Francisco Airport Extension Project**

**Biological Assessment for the San Francisco  
Garter Snake and the California Red-legged Frog**

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*Submitted to:*

**U.S. Fish and Wildlife Service  
Sacramento Field Office  
Endangered Species Division  
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Sacramento, California 95825**

*Submitted by:*

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*and*

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*On behalf of*

**Federal Transit Administration (FTA)**

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existing lattice towers immediately north and south of the proposed BART aerial wye stubs would require a bucket truck and manual line trucks. The footings for each tubular tower would be approximately 15 feet square or 225 square feet each. All construction access to the site would be via the existing paved and dirt access roads on the west-of-Bayshore parcel south of the construction site. Depending upon when the construction is to occur, it may be necessary to improve and convert the dirt roads to all weather roads to the construction site by adding gravel to the existing roads.

Total construction time is estimated to be 7 months. The construction of the shoo-fly would require 1 month and each of the three tower lines would need approximately 2 months to complete. The tower lines have to be built consecutively.

### **Project Construction Activities**

**Aerial Wye-Stub.** The Alternative VI Aerial Design Option would run east across the west-of-Bayshore parcel in an aerial configuration. The first step in the construction of the BART aerial structure (referred to as the aerial wye-stub) would be the clearing of all woody vegetation from a 70- to 100-foot-wide construction corridor along the alignment on the west-of-Bayshore parcel. The vegetation clearing would start at the westerly end of the north and south wye-stub legs. All tree and brush vegetation removed from the construction corridor would be hauled away by the contractor. Vegetation clearing activities are expected to be completed within a period of approximately three months.

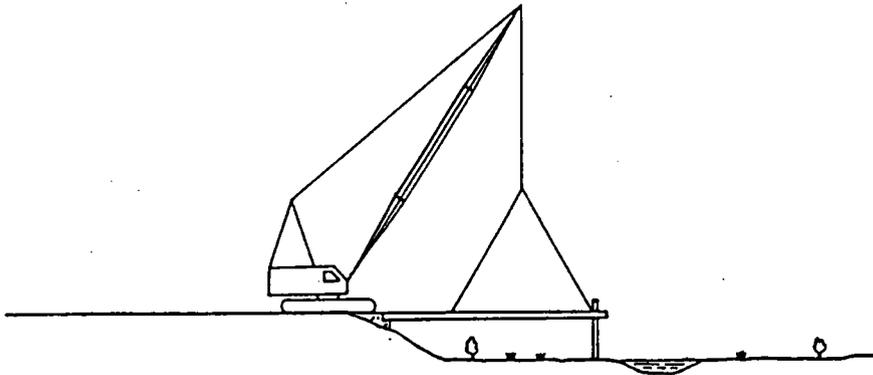
BART would provide access along the construction corridor in support of the building of the aerial wye-stubs on a 40-foot-wide (approximate) temporary trestle bridge. The temporary trestle bridges (one for each wye-stub leg) would be supported on pilings driven into the earth. The bridge platform upon which construction equipment would travel would be elevated above the ground surfaces to allow for free movement of water and wildlife during the time the bridges are in place. A platform would be installed on the pilings for the heavy equipment to travel upon. Figures 2-2 through 2-4 illustrate the sequence of trestle bridge construction. The temporary trestle bridges are expected to be in place for approximately one and a half years (18 months).

The BART aerial wye-stubs and their support columns would be built from the temporary construction trestle bridges. Figures 2-5 through 2-10 illustrate the construction sequence for the aerial wye-stubs. Construction would commence from the westerly end of the alignment, adjacent to the existing CalTrain tracks, and proceed easterly across the west-of-Bayshore parcel. All excavated material would be removed and disposed of off-site. The aerial wye-stubs would be supported by columns, spaced an average of 80 feet apart, with concrete and rebar caisson foundations supporting the columns. Concrete cap footings will be formed and poured on top of the caissons below the existing ground surface. Construction of the caisson foundations is expected to take approximately eight (8) months.

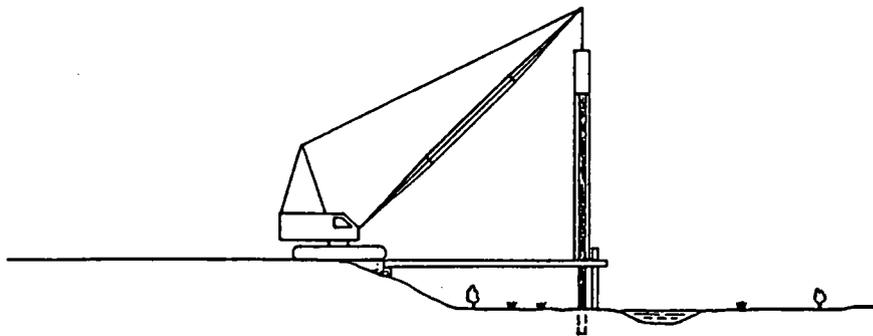
After the construction of foundations and support columns, the aerial superstructure (trackway deck) would be constructed utilizing either prefabricated steel girders, precast concrete box girders using segmental construction, or cast-in-place concrete box girders. All materials as required for the alternative superstructure schemes would be handled by special dollies designed for use on the temporary construction trestle and lifted in place by cranes operating on the construction trestle. For the cast-in-place scheme, the falsework would be supported on the concrete footings only; erection



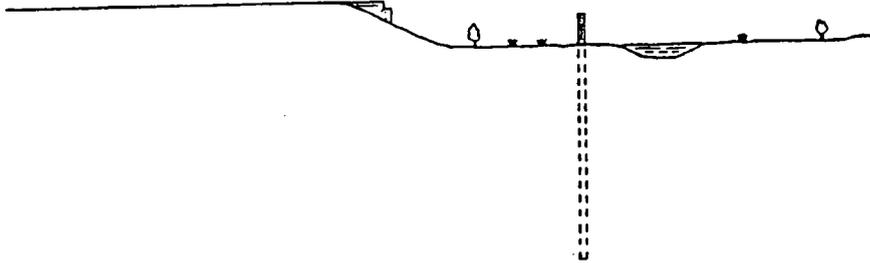
**Step 1: Construct Launching Ramp**



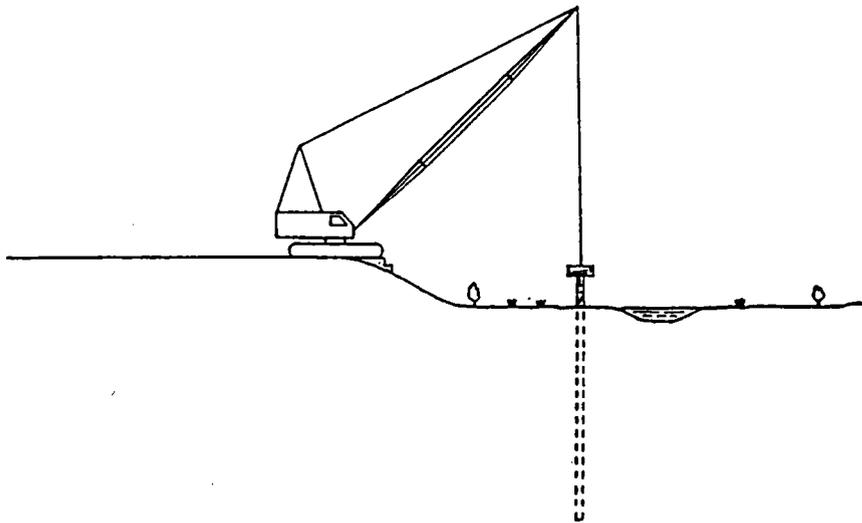
**Step 2: Place Pile Template**



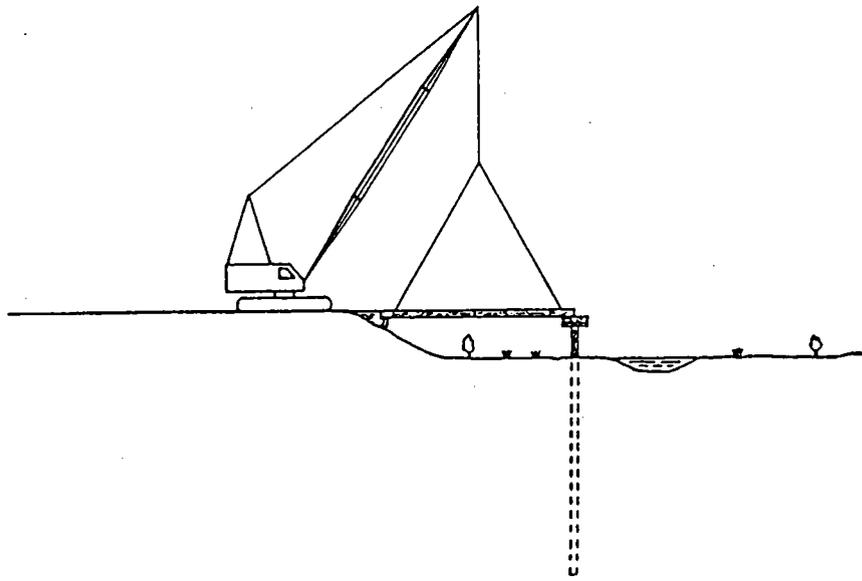
**Step 3: Drive Temporary Trestle Support Piles**



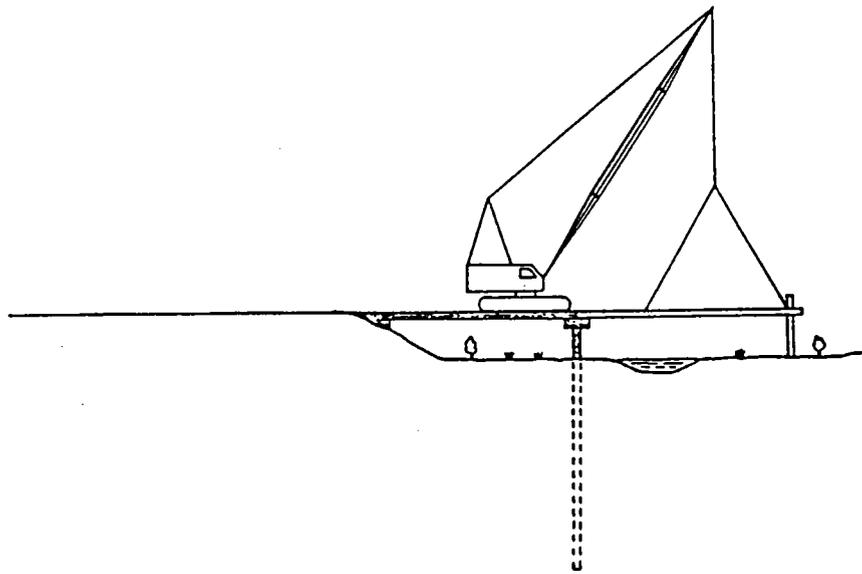
**Step 4: Remove Pile Template**



**Step 5: Place Temporary Trestle Pile Cap**



**Step 6: Place Temporary Trestle Girders**



**Step 7: Move on to Temporary Trestle Span  
and Repeat Steps 2 through 6**

and removal of falsework would be accomplished from the construction trestle. Native soil will be backfilled over the footings after the superstructure is in place.

The construction trestles would remain in place 18 months during construction but would be removed prior to system installations and testing. After the BART aerial wye-stubs have been erected, all vegetation would be allowed to reestablish within the corridor with the exception of large trees adjacent and underneath the aerial structures.

**At-Grade Line Sections.** Typical activities for at-grade construction include track bed preparation, consisting of tree and shrub removal, clearing and grubbing, relocation of existing utilities, excavation and grading for foundations, placement and compaction of fill material, and placement of sub-ballast, ballast, trackwork, and power and control equipment. Generally, at-grade line construction can be expected to progress 500 feet per week and would be supported from a temporary construction road along the easterly side of the new BART tracks. Based on the preliminary schedule for completion of Segment 2, the estimated time of construction for the at-grade mainline section is approximately 7 months.

**Retained Fill Sections.** Retained fill sections are similar to at-grade sections except that small to medium height reinforced concrete walls are used to “retain” the fill material used to elevate the tracks higher than the existing grade. After clearing and grubbing and utility relocation, the reinforced concrete retaining walls would be constructed, followed by the importing and compacting engineered fill material to bring the level up to subgrade height. From this point on, the remainder of construction activity, sub-ballast, ballast, trackwork, etc., is the same as for at-grade construction.

**Cut-and-Cover Subway Section.** A typical cut-and-cover box section will be 10 feet below surface, in order to accommodate underground utilities and landscaping. Cut-and-cover construction is planned to occur at the north and south ends of the mainline alignment next to the west-of-Bayshore parcel. At the northern end this construction technique will extend from Angus Avenue to approximately 500 feet South of Cupid Row Canal. The southern end of the cut-and-cover construction will extend south from a point approximately 300 feet north of Madrone Street.

Following shoring and excavation operations, the line section subgrade would be compacted and graded, and underground subdrains installed as necessary. This process would be followed by placing concrete for the bottom slab foundation. Frequent concrete pours (every two to five days) of 60 to 600 cubic yards or more (six to 60 ready-mix truck loads) can be expected as work proceeds.

The shoring system may be able to serve as the outside form for the concrete box. Panels would be nailed to the shoring system if required to waterproof the walls. Rebars would be placed, collapsible formwork installed, and concrete poured for the sides and roof of the box. Waterproofing may be provided over the roof of the subway structure and a concrete mix poured on top to protect the waterproofing during backfill. The roof and sides of the box would cure for approximately three to seven days (concrete must reach 70 percent of design strength) before the traveling forms are collapsed and moved ahead to the next sections. The box can be backfilled after the section has reached 90 percent of full 28 day design strength. The construction rate for shallow cut-and-cover subway section is approximately 100 feet per week. Based on the rate of construction progress, the estimated time of construction for the cut-and-cover sections is approximately 18 months.

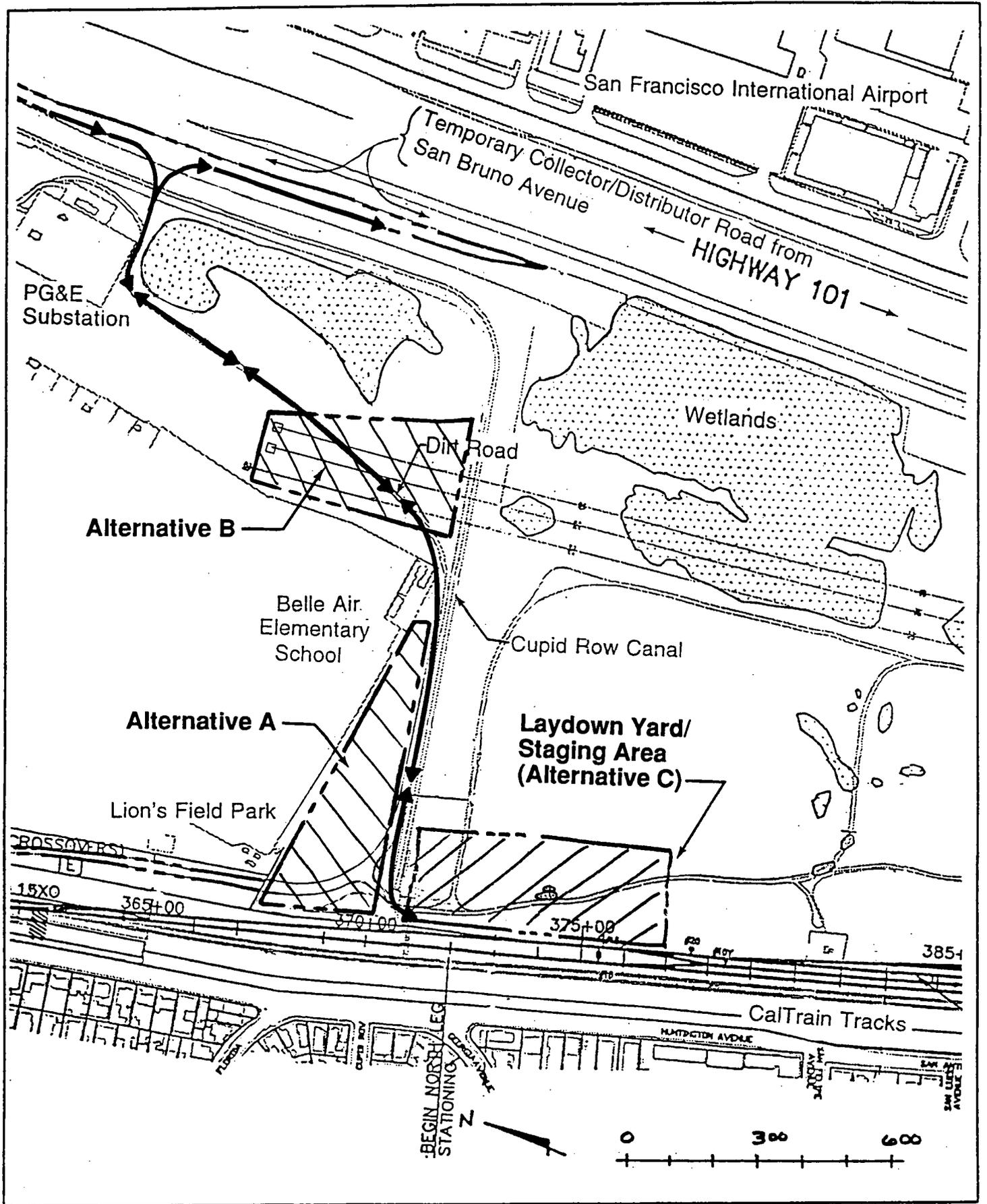
**Retained-Cut or Transition Sections.** The retained-cut, or sections of the alignment that transition between cut-and-cover subway and at-grade track alignments, are planned to occur at two points along the alignment next to the west-of-Bayshore parcel. The northern section will extend south from the end of the cut-and-cover section approximately 600 feet to a point between San Felipe and San Luis Avenues. The southern section will extend south from a point approximately 500 feet north of the southern cut-and-cover section described above. It is expected that nearly all proposed retained-cut line sections would be U-shaped concrete structures placed an average 20 feet below ground. Construction of this type of structure is similar to that of subway lines, except there is no top slab. For shallow depths, open cut instead of shoring would be utilized. In deeper depths, temporary shoring walls constructed of sheet piling or soldier beams and lagging would be employed. Generally, retained-cut sections require more utility relocation work than cut-and-cover sections, because utilities can not be suspended above the retained cut as they can be suspended above the cut-and-cover box during construction. Utilities (such as sewer lines) spanning retained-cut segments would have to be rebuilt or relocated in most cases. Because of the need to relocate utility lines in these retained-cut sections, the construction period is expected to last approximately seven months.

**Storage Yards and Staging Areas.** As shown in Figure 2-11, BART has considered three alternative locations for a temporary storage yard and staging area to support construction of the BART mainline from Angus Avenue to just north of Center Street, and the aerial wye stubs between the mainline and the west side of Highway 101. After considering the three alternative locations, BART has selected Alternative Site C for the following reasons:

- Alternative Site C avoids the need to displace the San Bruno Community Garden during the construction period which would be necessary if Alternative Site A were selected.
- Alternative Site C avoids the dangers of working under, or in close proximity to, the PG&E high voltage transmission lines, using cranes or hoists for lifting or moving various equipment and materials as would be the case if Alternative B was selected.
- Alternative Site C is closer to the construction sites and thus requires a shorter access route to construction sites and less travel time for transport of equipment and materials.

Alternative Site C does represent the worst-case scenario in terms of habitat disturbance when compared to the other two alternative sites because in addition to disturbing the wetlands on the access route it would disturb an additional small amount of wetland habitat within the proposed site.

Alternative Site C is approximately 3.0 acres in area and would be located in the undeveloped upland area west of Highway 101, just south of the Cupid Row Canal and just east of the existing CalTrain tracks and proposed BART mainline alignment. Access to this yard and staging area would be via a new, temporary road running east from the site along the south side of the Community Gardens. The access road would then continue north along an existing dirt road through a section of the west-of-Bayshore parcel toward the existing PG&E substation. Turning east, the road would then connect to an existing Caltrans collector-distributor road along the westerly side of Highway 101 which is tied to the San Bruno Avenue Interchange. Caltrans will have to approve this connection to the San Bruno collector/distributor road. The existing collector-distributor road has enough area along the west side to allow for the construction of temporary deceleration and acceleration lanes required for supply trucks and safe merging with other Highway 101 traffic.



Temporary Laydown Yard/Staging Area and Access Route

FIGURE  
2-11

**Construction Truck Traffic Volume.** The volume of construction truck traffic was estimated based upon the quantities of required construction materials and other activities contained in Appendix B of the *Construction Scenario Report*. Truck activity includes removal of brush, trees and excess excavated earth; delivery of ready-mix concrete, reinforcing steel, and other construction materials; and delivery of ballast ties, rail and other railway construction materials.

The estimated total volume of truck traffic in and out of this area is approximately 14,400 trips over the 45-month construction period. This volume covers all truck activity to and from the San Bruno temporary storage yard and staging area. The majority of truck traffic will take place over a shorter, 24 month period, when the bulk of the excavation and structural construction will take place. The proposed truck access route to the storage yard and staging area is presented in Figure 2-11.

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### 3. CONSULTATION TO DATE

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BART, SamTrans, and the FTA have consulted with the USFWS and the California Department of Fish and Game (CDFG) regularly regarding the possible biological impacts of the proposed project and suitable mitigation measures for these impacts. In addition to phone conversations and meetings that were only indirectly associated with the Section 7 process, the project sponsors have conducted meetings with the USFWS on the following dates in preparation of the DEIR/SDEIS, FRDEIR/S#2DEIS, and Section 7 consultation:

- October 8, 1993 (initial interagency meeting with CDFG);
- January 26, 1994 (second interagency meeting);
- April 25, 1994 (USFWS did not attend third interagency meeting);
- January 3, 1995 (initial meeting USFWS and CDFG on all alternatives including Alternative VI);
- March 2, 1995 (meeting with SFIA and the San Francisco Water Department (SFWD) on possible mitigation options);
- March 16, 1995 (meeting with USFWS on potential mitigation measures);
- July 21, 1995 (informal consultation with CDFG introducing Alternative VI Aerial Design Option);
- July 28, 1995 (FTA Environmental Issues Meeting);
- August 15, 1995 (informal consultation with USFWS only);
- September 21, 1995 (conference call to USFWS);