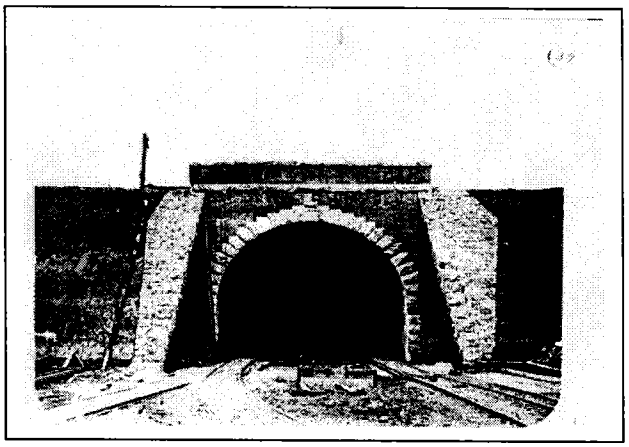
PENINSULA CORRIDOR ELECTRIFICATION PROJECT

SAN FRANCISCO TUNNELS



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AND

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July 2017

ICF International. 2017. Peninsula Corridor Electrification Project. San Francisco Tunnels, San Francisco, CA. Prepared for San Francisco Historic Preservation Commission and Peninsula Corridor Joint Powers Board, San Francisco, CA and San Carlos, CA.

This document summarizes the Peninsula Corridor Electrification Project (PCEP or project), the project's effects and mitigation relative to the historic San Francisco Tunnels, and consultation with the State Historic Preservation Office (SHPO) for the project relative to Section 106 of the National Historic Preservation Act (NHPA).

Project Description.

The Project is the electrification of the Peninsula Corridor which is owned by the Peninsula Corridor Joint Powers Board (JPB). The JPB is a public transportation agency, funded jointly by the City and County of San Francisco, the San Mateo County Transit District and the Santa Clara Valley Transportation Authority. The purpose of the project is to provide electrification improvements to commuter rail service within a corridor between San Francisco and the City of San Jose. The JPB is seeking funding for construction and rolling stock from the Federal Transit Administration (FTA), which is the lead Federal agency for the undertaking.

The Project consists of electrifying the Peninsula Corridor (also referred to as the "Caltrain Corridor") between 4th and King Street Station in San Francisco (Mile Post [MP] 0.0) and to approximately one mile south of the Tamien Station in San Jose (MP 50.5) in order to allow conversion of the Caltrain commuter fleet from diesel trains to Electrical Multiple Units (EMUs). The Project would require the installation of 130 to 140 single-track miles of overhead contact system (OCS) for the distribution of electrical power to the electric rolling stock. The OCS would be powered from a 25 kilovolt (kV), 60 Hertz (Hz), single-phase, alternating current (AC) supply system consisting of two traction power substations (TPSs), one switching station (SWS), and seven paralleling stations (PSs). Additional project features required for right-of-way (ROW) electrification include overbridge protection structures, at grade crossing warning devices, and replacement of the current rolling stock.

Figures in the Finding of Effect Document (attached) shows the entire project corridor and the general location of stations and the project's traction power facility sites.

The overhead contact system will be installed in the four San Francisco tunnels by bolting to the ceiling of the tunnels. At three of the tunnels (Tunnels 2, 3 and 4), the Project includes potential tunnel and track modifications necessary to provide adequate vertical clearances for the OCS for both passenger and existing freight operations. The amount of additional clearance, depending on location, varies from 0.25 to 1.75 feet. These improvements include potential "notching" (i.e., minor excavation of the tunnel wall) of the tunnel and horizontal realignment of tracks to maximize vertical clearance.

CEQA and NEPA Review

The JPB is the lead agency for CEQA. The JPB originally prepared an EIR from 2002 to 2009, but that EIR was not certified at the time. The JPB decided to prepare a new EIR in 2012 and it issued a Notice of Preparation (NOP) for an Environmental Impact Report (EIR) in 2013 and the City of San Francisco submitted scoping comments that were considered by the JPB in preparation of the EIR. A Draft EIR was released in 2014 and multiple San Francisco departments submitted comments which were responded to in the Final EIR which was certified in early 2015.

The Federal Transit Administration (FTA) is the lead agency under NEPA. The FTA prepared an Environmental Assessment in 2009 and adopted a Finding of No Significant Effect (FONSI). The FTA completed Section 106 consultation during the prior NEPA process. The FTA completed a NEPA

re-evaluation in 2016 following additional Section 106 review in 2015 to address changes in the project since 2009.

Area of Potential Effects

The area of potential effects for historic architectural resources (APE) (See Attachment A for APE map in San Francisco and Attachment B for SHPO concurrence with the APE) includes the railroad right-of-way in which Caltrain operates, which stretches from the San Francisco train station at Fourth and King streets (Mile Post –MP 00.00) south through San Mateo County into Santa Clara County ending in San Jose near Curtner Avenue (MP 50.50). The railroad features include stations (modern and historic), signal bridges, tunnels, grade separations, culverts, bridges, viaducts and overpasses. The boundary of the APE also extends beyond the railroad right-of-way at certain locations where the JPB is considering construction of traction power facilities including one substation and connections between the substations and PG&E substations, one paralleling station, and certain areas for steel poles for the OCS that will provide electricity to the line. In addition, the APE includes those properties affected by tree trimming within the railroad's Electrical Safety Zone (ESZ). For the San Francisco historic tunnels, the APE includes the entire tunnel length and width.

Historic Resource Inventories

Previous studies include the 2002 and 2008 inventory and evaluation reports by JRP and the 2013 and 2015 inventory and evaluation reports by ICF International (ICF) to satisfy California Environmental Quality Act (CEQA) requirements as well as NHPA requirements.

In 2015, ICF prepared a Historical Resources Inventory and Evaluation Report (Attachment C includes relevant excerpts from the HRIER including the DPR forms for the tunnels) to assess the potential for the project, as refined in 2015, to affect built environment resources for the purposes of the NEPA and NHPA. Historic properties included are buildings, structures, objects, districts, and linear features eligible for listing in the National Register of Historical Places (NRHP) or any resources considered historic for the purposes of NHPA. NHPA requires federal agencies to take into consideration the effects of federally funded undertakings on historic properties.

Archaeological properties have been addressed by the 2009 Programmatic Agreement among the Peninsula Joint Powers Board, the Federal Transit Administration, and the California State Historic Preservation Officer Regarding Implementation of the Caltrain Electrification Program, San Francisco San Mateo, and Santa Clara Counties, California. As such, the Joint Powers Board (JPB) and FTA are implementing phased identification and evaluation for archaeological resources pursuant to 36 CFR § 800.4(b)(2) and 800.14(b).[1]

ICF prepared DPR 523 Primary Record (PR) and Buildings, Structures, and Objects Record (BSO) and update forms, as appropriate, for the historic resources included in the current study. DPRs for resources evaluated in 2002 and 2008 that were field checked in 2013 and 2014 and did not appear to have been altered were not updated.

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[1] Programmatic Agreement Among the Peninsula Joint Powers Board, the Federal Transit Administration, and the California State Historic Preservation Officer Regarding Implementation of the Caltrain Electrification Program, San Francisco, San Mateo, and Santa Clara Counties, California. 2009.

Minimization Measures identified in the CEQA process.

The following minimization measures were adopted through the CEQA process and are being implemented in the design process.

CUL-1a: Evaluate and minimize impacts on structural integrity of historic tunnels. A structural investigation shall be conducted prior to the removal of any historic fabric to evaluate probable effects on each tunnel's structural integrity, followed by the development of a design approach and construction methods to avoid affecting structural integrity. While the notching would remove historic fabric, retained structural integrity will ensure that this historic method of construction will retain integrity.
CUL-1b: Minimize impacts on historic decorative tunnel material. Prior to any removal of decorative tunnel portal material during crown mining of historic Tunnels 1, 3, and 4, a structural investigation shall be conducted to evaluate the probable effects on the structural integrity of the tunnel portals. Also prior to the removal of the historic material, depending upon the extent of the material to be removed, the portal may be recorded to the Historic American Engineering Record (HAER) standards level III (refer to http//www.nps.gov/history/hdp/). Additionally, also depending upon the extent of the material to be removed, the Secretary of the Interior's standards (SOIS) for the rehabilitation of historic properties may be followed in the design and implementation of the adaptation of the tunnels to accommodate the larger rolling stock (refer to http//www.nps.gov/tps/standards.htm). A structural investigation shall be conducted to identify construction disturbance to the decorative portals. If it is determined that more than 4 inches of material must be removed from the portals of any of the tunnels, a visual simulation depicting the removal shall be prepared to assess the visual impacts and to determine if the portal(s) will need to be recorded according to HAER standards and if the SOIS need to be applied. If the maximum amount of material to be removed is 4 inches or less, removal of the decorative tunnel material shall be "feathered" from the maximum removal at the keystone to the sides of the tunnels, maintaining the round arch.
CUL-1c: Install project facilities in a way that minimizes impacts on historic tunnel interiors. The OCS design for the tunnels shall minimize the removal of historic brick fabric as much as is feasible. Power system supports for the Proposed Project inside Tunnels 1, 2, 3 and 4 shall be placed sufficiently far back to not be readily visible, and attached to the tunnels' interiors in shotcrete instead of historic brick. At Tunnels No. 1, 2, and 3, the OCS shall be attached to the interior roof surface of the tunnel by brackets inserted into shotcrete. In addition, pole sets shall be installed at the portals of each tunnel. For Tunnel Nos. 1–3, side poles at the portals shall be used with power systems over the individual tracks that the poles power. The brackets within the tunnel interiors shall be set inside the tunnel mouth sufficiently far back that they would not be readily visible to passers-by or to those standing on the passenger platforms. At Tunnel No. 4, the system shall also be attached to the interior roof surface of the tunnel by brackets inserted into shotcrete. In addition, pole sets shall be installed at the portals of each tunnel. The brackets within the tunnel interiors shall be set inside the tunnel mouth sufficiently far back that they will not be readily visible to passers-by or to those standing on the passenger platforms (particularly at Tunnel No. 4's southern portal, the Bayshore Station).

Effects to Historic San Francisco Tunnels

The four extant tunnels (No. 1, 2, 3 &4) were installed by Southern Pacific Railroad (SPRR) along the route of the Bayshore Cutoff project between Potrero Hill and the ridge west of Candlestick Point. The tunnels were constructed by SPRR crews and contractors hired by SPRR between 1904 and 1907. The tunnels are distinctive for their engineering qualities including drift and core-bracing method of construction, as well as architecturally for their decorative portal arches.

Changes to the tunnels after their period of significance, 1904 to 1907, include industrial and residential development closer to the portals and the installation of shotcrete on inside walls and vaulted ceilings in 2004 for stability. Tunnel Nos. 1, 2, 3, & 4 are determined eligible for listing in the

NRHP under Criteria A and C and the CRHR (California Register of Historical Resources) 1 and 3. Tunnel Nos. 1 & 2 are also listed as contributors to the Central Waterfront Historic District.

The JPB and FTA prepared a Findings of Effect (FOE) Report for the project (Attachment D includes relevant excerpts from the FOE report) and the SHPO concurred with those findings in 2015 (Attachment E). For the four historic railroad tunnels in San Francisco (Tunnel Nos. 1, 2, 3, & 4), three effects were identified but none were found to be adverse effects by the JPB and FTA, and SHPO concurred in these findings which are summarized below:

1. Installation of electrical infrastructure attached to the shotcrete[2]-clad, vaulted tunnels' ceilings (for all four tunnels) will require the removal of some historic bricks where the shotcrete is not sufficiently deep to anchor the electrical infrastructure bolts. Historic brick inside the tunnels may also be removed due to raising the vault height at Tunnels No. 1 and No.2 by 0.25' and at Tunnel No. 4 by up to 1.75' (no raising of the vault height is necessary at Tunnel No. 3). The total amount of existing historic brick liner to be removed by the project will be as follows: Tunnel 1 (3%), Tunnel 2 (3%), Tunnel 3 (2.5%), and Tunnel 4 (5%). The depth of brick removal would range up to 6 inches for Tunnels 1 to 3 and up to 19 inches in certain locations in Tunnel 4 (the majority of brick encroachment in Tunnel 4 would be less than 12 inches). The historic bricks inside the tunnel were covered in shotcrete in 2004 as part of a safety improvement project which was not associated with the Project Installation of electrical infrastructure structural supports. This modification will alter some brick work that is already obscured by shotcrete and is not visible to the public from the vantage of a train or by other means. Therefore, the brick feature in the tunnels is not able to convey association with the tunnels' historical significance under current or proposed conditions. The proposed modification is **not an adverse effect.**
2. Increasing the vault height of Tunnel No. 4 by up to 1.75' will also result in the removal of some of the tunnel portals' voussoir-set stones and keystones. The proposed structural system at the portals involves full brick liner removal for a transition area of 5 to 10 feet away from the portals just inside of the headstone. The existing brick liner in this area will be replaced with a reinforced concrete arch. Caltrain anticipates the concrete arch will be approximately 18 inches thick and will be shaped to provide the necessary clearance. The proposed process for removal and relocation of the portal stone includes the steps described below (which may also be adopted for the other tunnel portals as well depending on necessary encroachment depths).

   Step 1: Cut and store 4 inches off of the face of the historic arch. Install angle ledgers to support the brick above the headstone. Remove one width of brick layer above the arch stones (approx. 4 inches including the mortar).

   Step 2: Cut and remove the underside of the historic arch to a depth of the maximum encroachment depth plus an additional 1-inch. The additional inch of the stone shall be removed (cut side) and will be replaced with mortar when the underside of the stone is replaced.

   Step 3: Install the facing of the stones which were removed from Step 1 at the new arch elevation and install the reduced underside stones to the existing stone as a veneer with ties. Pour a concrete block at each side of the arch base.

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[2] Shotcrete is concrete applied pneumatically by hose at high velocity onto a surface, as a construction technique. It is reinforced by conventional steel rods, steel mesh, and/or fibers. Fiber reinforcement is also used for stabilization in applications such as tunneling.

Step 4: Restore the brick exterior with the saved bricks

See Appendix C – Portal Modification Drawing Set in the PCEP Findings of Effect (FOE) report (Attachment C includes excerpts from the FOE, including this drawing set) for a graphic of the tunnel portal construction method. The retention of the original facing stones of the portal arches and their reinstallation and, where necessary, replacement in kind at approximately 1.75' higher resolves the adverse effect of their removal. The historical design materials are maintained, as is the historic properties' ability to convey its historical associations and significance. The proposed modification is **not an adverse effect.**

3. Installation of Overhead Contact System (OCS) poles near the mouth of the tunnel portals (all four tunnels) will have no direct physical effect but will affect the visual setting of the tunnel portals, although they are not readily visible to the public under existing or proposed conditions. The installation of OCS poles near each portal represents an insignificant change to the setting of the historic properties. The proposed modification is **not an adverse effect.**

ATTACHMENTS:

A: Peninsula Corridor Electrification Project, Area of Potential Effect, San Francisco Excerpt.

B: SHPO Concurrence with APE

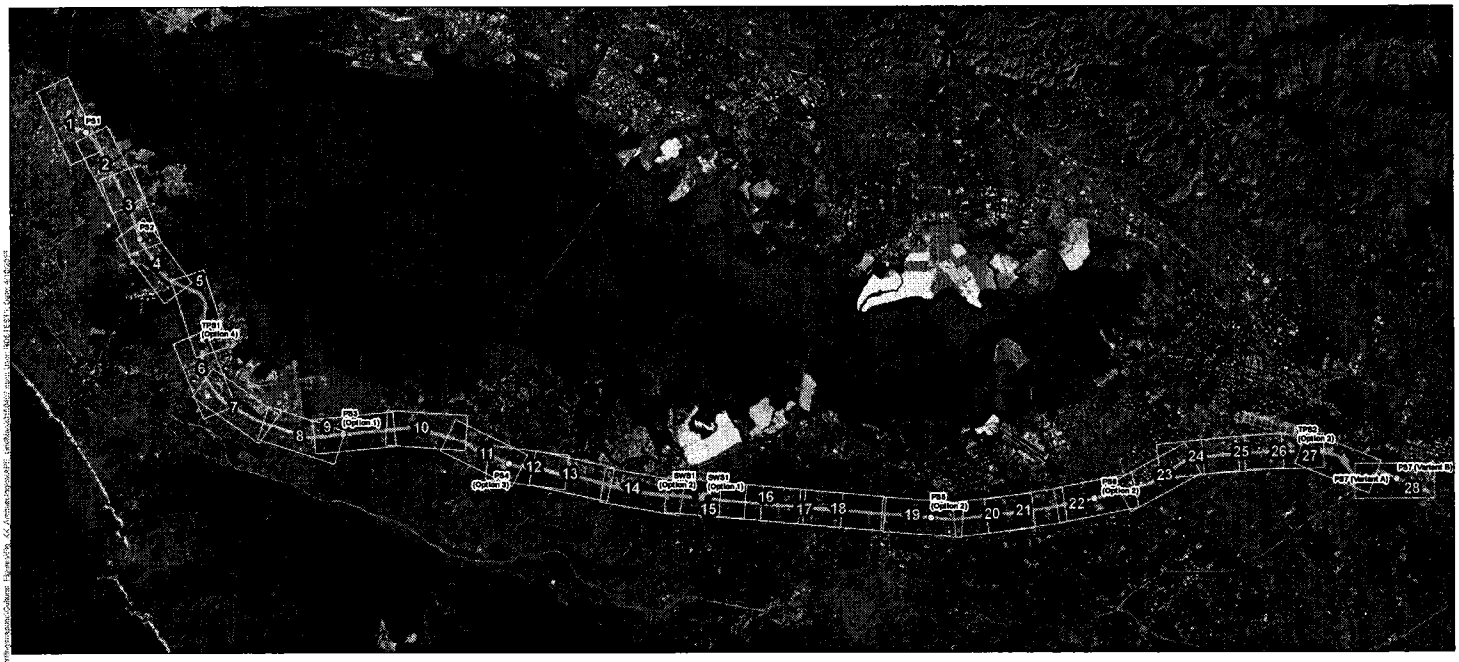
C: Peninsula Corridor Electrification Project, Excerpts from the Historic Resources Inventory and Evaluation Report (including Tunnel DPRs)

D: Peninsula Corridor Electrification Project, 3rd Addendum Findings of Effect Report (Excerpts)

E: SHPO Concurrence with FOE

ATTACHMENT A:

Peninsula Corridor Electrification Project, Area of Potential Effect, San Francisco Excerpt.



Legend

- Archaeological APE
- Map Page
- Paralleling Station
- Switching Station
- Traction Power Substation

0 4 8
Miles

Signature FTA	Date
Signature JPB	Date

Archaeological Area of Potential Effects Map
Cover Sheet

Legend

- Caltrain Station
- Track Mile Post
- Archaeological APE
- Archaeological Resources
- Paralleling Station
- Switching Station
- Traction Power Substation

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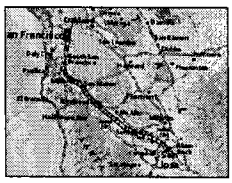

ICF

Archaeological Area of Potential Effects Map
Page 1 of 28

Legend

- Caltrain Station
- Track Mile Post
- Archaeological APE
- Archaeological Resources
- Paralleling Station
- Switching Station
- Traction Power Substation

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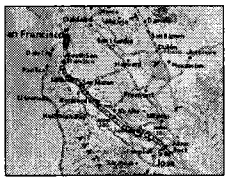

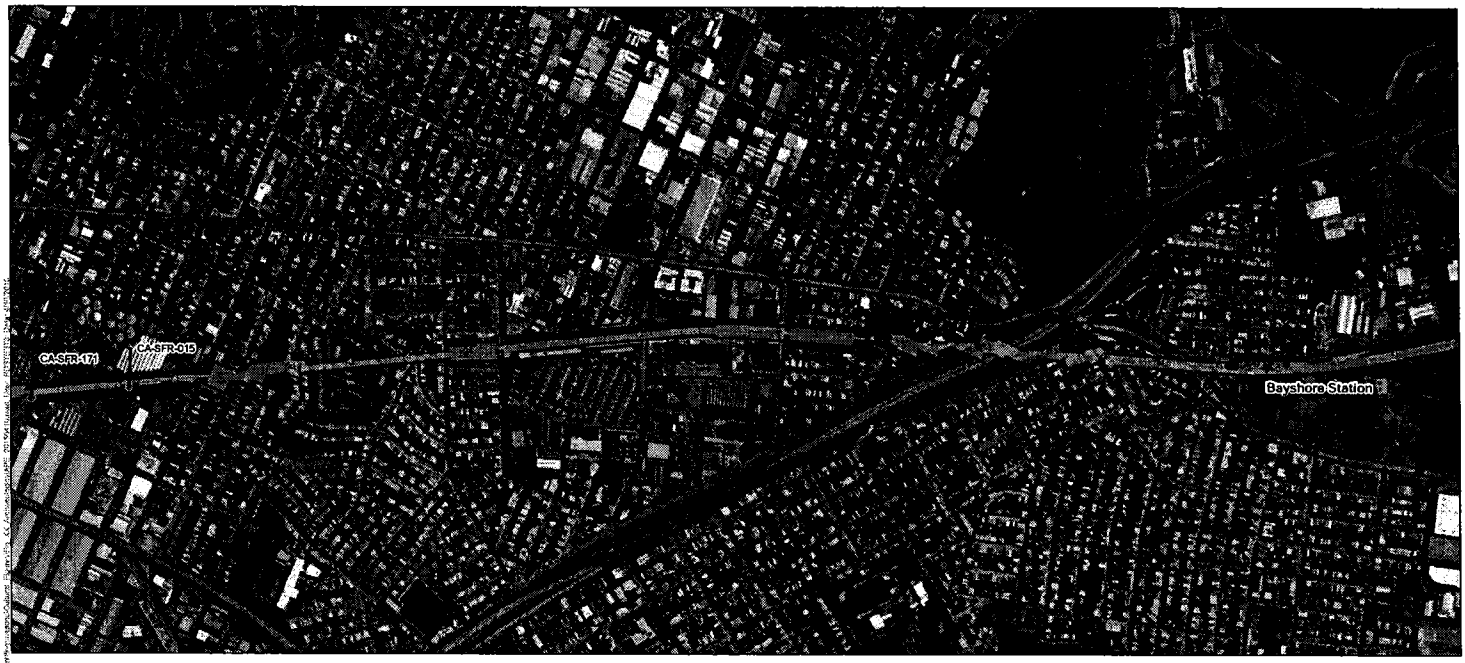

Legend

- Caltrain Station
- Track Mile Post
- Archaeological APE
- Archaeological Resources
- Paralleling Station
- Switching Station
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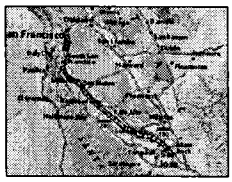

Archaeological Area of Potential Effects Map

Legend

- Caltrain Station
- Track Mile Post
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- Paralleling Station
- Switching Station
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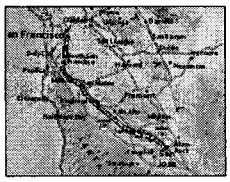

ATTACHMENT B

SHPO Concurrence with APE

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August 11, 2015 Reply To: FTA021021A

Leslie Rogers
Regional Administrator
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Re: Section 106 Consultation for the Peninsula Corridor Electrification Project (PCEP) Modifications, Berkeley, Counties of San Francisco, San Mateo, and Santa Clara, CA

Dear Mr. Rogers:

Thank you for your letter of June 30, 2015, continuing the Federal Transit Administration's (FTA) consultation for the above-referenced undertaking in order to comply with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulation at 36 CFR Part 800. Included with your letter were the following documents:

- *Historical Resources Inventory and Evaluation Report Update, Peninsula Corridor Electrification Project* (HRIER, June 2015), prepared by ICF International for the Peninsula Corridor Joint Powers Board (JPB) and the FTA
- The *Programmatic Agreement Among the Peninsula Joint Powers Board, the Federal Transit Administration, and the California State Historic Preservation Officer Regarding Implementation of the Caltrain Electrification Program San Francisco, San Mateo, and Santa Clara Counties, California* (executed December, 2009)

As described in your letter, the PCEP is the electrification of the Peninsula Corridor railway, owned by JPB. The JPB is a public transportation agency, funded jointly by the City of San Francisco, the County of San Mateo and the Santa Clara Valley Transportation Authority. The overall purpose of the project is to provide electrification improvements to commuter rail service within a corridor between San Francisco and the City of San Jose.

FTA has previously consulted with my office regarding this project resulting in a finding of no adverse effect for the undertaking in 2003. The project was amended in 2008, and resulted in the above-mentioned programmatic agreement for archaeological resources.

The project has been further refined since the previous consultation resulting in an expansion of the Area of Potential Effect (APE). The APE was originally limited to the JPB right-of-way (ROW). The JPB has identified a number of areas where the Overhead Contact System (OCS), Electrical Safety Zone (ESZ), and Traction Power Facilities (TPFs) will extend outside of the existing ROW. These areas are shown in Attachment C of your letter. The project design has also been revised, including changes to the design of the OCS pole design and the installation of the OCS inside the San Francisco Tunnels.

The HRIER Update surveyed the areas that had not been previously inventoried for this undertaking. ICF field verified all of the properties that already had OHP Status Codes of 1, 2, or 3, as well as recorded any additional properties over 45 years old or older. These properties are listed in Tables 6-1 and 6-2 of the HRIER. Two newly recorded properties were evaluated and

recommended as eligible for the National Register of Historic Places (NRHP), El Palo Alto and the Jules Francard Grove.

El Palo Alto is located in the city of Palo Alto on the east bank of San Franciscquito Creek, and is listed as a California Historical Landmark (No. 2) as the site of the end of Portola's journey in 1769. El Palo Alto is 1,075 years old, and was recommended as eligible for the NRHP under Criterion A for its associations with the Portola expedition and as an enduring cultural landmark. It was also used as a landmark by the region's native inhabitants and was frequented as a site of ceremony.

The Jules Francard Eucalyptus Grove is a grove of blue gum eucaplytus trees on the east side of California Drive, from Burlingame Avenue to Palm Drive in the city of Burlingame. It was likely planted between 1876 and 1886 and was designed by John McLaren. McLaren was a master landscape designer and the primary designer of both Golden Gate Park and The Presidio of San Francisco approaches and forest.

The FTA has requested my comments on the revised APE and additional identification efforts for the undertaking, and has determined that El Palo Alto and the Jules Francard Eucalyptus Grove are eligible for listing on the NRHP.

After reviewing the information submitted with your letter, I offer the following comments:

- I concur that the Area of Potential Effect (APE) as represented in the attachments to your letter is appropriate.
- I do not concur that FTA's identification and evaluation efforts are sufficient for this undertaking. As mentioned in the evaluation of El Palo Alto, it was used as a landmark by the region's native inhabitants and frequented as a site of ceremony. As we discussed previously, FTA should consult with affiliated Native American groups to determine whether or not El Palo Alto is of cultural significance and may be eligible as a Traditional Cultural Property.
- I concur that El Palo Alto is eligible for listing in the NRHP under Criterion A for its associations with the Portola expedition and as an enduring cultural landmark.
- I concur that the Julian Francard Eucalyptus Grove is eligible for listing on the NRHP under Criteria A and C at the local level of significance with the period of significance from 1874-1910. It is eligible under Criterion A for its association with the early settlement of the area and the founding of Burlingame, and Criterion C as an important example of the early work of John McLaren.

Thank you for continuing consultation on the identification efforts for this undertaking and considering historic properties in your planning process. I look forward to continuing consultation on this project with the FTA. If you have any questions, please contact Kathleen Forrest of my staff at (916) 445-7022 or e-mail at kathleen.forrest@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

ATTACHMENT C

Peninsula Corridor Electrification Project, Excerpts from the Historic Resources Inventory and Evaluation Report (incl. Tunnel DPRs)

HISTORICAL RESOURCES INVENTORY AND EVALUATION REPORT UPDATE

PENINSULA CORRIDOR ELECTRIFICATION PROJECT

DIRECTIVE # WD 7428

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June 2015

Summary of Findings (Abstract)

The Peninsula Corridor Joint Powers Board (JPB) and the Federal Transit Administration (FTA) are re-consulting with the State Historic Preservation Officer (SHPO), under Section 106 of the National Historic Preservation Act of 1966 and its implementing regulation found in 36 CFR Part 800, regarding the Peninsula Corridor Electrification Project undertaking (PCEP or project). JPB is proposing refinements to the PECP based on further detailed design. The Project is still expected to be a Federal undertaking because of financial assistance from FTA. FTA is requesting SHPO concurrence with a revised Area of Potential Effect (APE) and concurrence on the Historic Resources Inventory and Evaluation Report (HRIER) Update.

The original finding of effect (FOE) was prepared in September 2002, the first Amendment FOE was prepared in May 2003, and the second amendment FOE was prepared in August 2008.[1,2,3] The prior FOE, as amended, concluded that the project would have no adverse effect on historic properties identified within the Area of Potential Effect (APE) for the project, as defined at the time. The SHPO concurred with the prior FOE, as amended in relation to built environment resources.[4,5] Archaeological properties were addressed by a Programmatic Agreement in 2009.[6]

The PCEP is the electrification of the Peninsula Corridor which is owned by JPB. The JPB is a public transportation agency, funded jointly by the City of San Francisco, the County of San Mateo and the Santa Clara Valley Transportation Authority. The overall purpose of the project is to provide electrification improvements to commuter rail service within a corridor between San Francisco and the City of San Jose.

The JPB has developed the engineering design further for the project. As a result of that further design, the following changes have been made to the APE relative to the prior APE:

- Overhead Contact System (OCS): The prior APE presumed that all of the overhead contact system would be within the JPB ROW. Subsequent engineering evaluation has identified a number of areas where the OCS would need to be partially outside the JPB ROW.

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[1] JRP Historical Consulting, "Finding of No Effect and No Adverse Effect: Caltrain Electrification Project," prepared by Rand F. Herbert for Parsons Transportation Group, September 2002.

[2] JRP Historical Consulting, "1st Amendment Finding of No Effect and No Adverse Effect: Caltrain Electrification Project," prepared by Meta Bunse for Peninsula Corridor Joint Powers Board, May 2003.

[3] JRP Historical consulting, "Addendum Finding of Effect, Caltrain Electrification Project", prepared by Meta Bunse for Parsons Transportation Group and Federal Transit Administration. August, 2008.

[4] Office of Historic Preservation, Reply to FTA021021A re: Caltrain Electrification Program, San Francisco, San Mateo and Santa Clara Counties, December 9, 2002.

[5] Office of Historic Preservation, Reply to FTA021021A re: Amended Finding of Effect for the Caltrain Electrification Program, San Francisco, San Mateo and Santa Clara Counties, July 15, 2003.

[6] *Programmatic Agreement among the Peninsula Joint Powers Board, Federal Transit Administration, and the California State Historic Preservation Office Regarding Implementation of the Caltrain Electrification Program, San Francisco San Mateo, and Santa Clara Counties, California* (see Attachment B).

- Electrical Safety Zone (ESZ): The OCS requires an electrical safety zone nominally within 10 feet of the electrified elements that is clear of vegetation and an area of 6 feet that is clear of structures. The prior APE presumed that all of the ESZ would be within the JPB ROW. Subsequent engineering evaluation has identified a number of areas where the ESZ would need to be partially outside the JPB ROW. The revised ESZ area would require vegetation removal or pruning outside the JPB ROW in certain areas but would not require any building removal.

- Traction Power Facilities (TPFs): Further evaluation by the JPB has added several additional locations for traction power facilities (substations, switching stations, and paralleling stations) and eliminated several previously proposed stations. Most of these are within the prior APE, but portions of two options for one paralleling station are outside the prior APE.

In addition, the project design has also been revised since the prior consultation with SHPO, as follows:

- San Francisco Tunnels: The design for the OCS in the tunnel and at the tunnel portals has been further developed which has minimally changed the nature of project effects.

- OCS pole design: The preliminary design presumed widespread use of headspan-type OCS poles and suspension wires. Headspans are more appropriate for use in low-speed areas. Thus headspans are now limited to the San Jose Diridon station and Caltrain's maintenance facility only. In addition, the specific types of poles have been modified at a number of stations, underpasses, and overpasses. These changes have minimally changed the nature of project effects at historic stations, underpasses and overpasses.

The enclosed HRIER Update addresses changes in the APE, project description, design commitments, and further investigation that was performed for the undertaking.

The purpose of this HRIER Update is to assess the potential for the project to affect historical archaeological resources and built environment resources for the purposes of the National Environmental Policy Act (NEPA). These resources include buildings, structures, objects, districts, and linear features eligible for listing in the National Register of Historical Places (NRHP) or any resources considered historic for the purposes of NEPA. This report satisfies Section 106 of the National Historic Preservation Act (NHPA), which requires federal agencies to take into consideration the effects of federally funded undertakings on historic properties. The FTA is the lead agency under NEPA.

This report focused on potential historic structures and does not address archaeological resources. Archaeological resources potentially affected by the project are addressed in a prior Programmatic Agreement between the SHPO, FTA, and the JPB established in 2009.

The area of potential effects for historic architectural resources (APE) (Appendix B) includes the railroad right-of-way in which Caltrain operates, which stretches from the San Francisco train station at Fourth and King Streets (Mile Post –MP 00.00) south through San Mateo County into Santa Clara County ending in San Jose near Curtner Avenue (MP 50.50). The railroad features include stations (modern and historic), signal bridges, tunnels, grade separations, culverts, bridges, viaducts and overpasses. The boundary of the APE also extends beyond the railroad right-of-way at certain locations where the JPB is considering construction of traction power facilities including one substation and connections between the substations and PG&E substations, one paralleling station, and certain areas for steel poles for the OCS that will provide electricity to the line. In addition, the APE includes those properties affected by tree trimming within the railroad's ESZ. Some of these

additional sites outside of the right-of-way are vacant land and some contain buildings, the status of which is addressed in this report.

ICF prepared DPR 523 Primary Record (P) and Buildings, Structures, and Objects Record (BSO) and update forms, as appropriate, for the historic resources included in the current study. DPRs for resources evaluated in 2002 and 2008 that were field checked in 2013 and 2014 and did not appear to have been altered were not updated.

The APE includes 26 resources listed in the NRHP or previously determined eligible. The conditions of the five NRHP-listed train stations were not documented in the 2008 study and therefore, for the purposes of this report, were recorded on DPR update forms. The DPR forms and updates for these resources are included in Table 6-1, Cultural Resources Listed or Determined Eligible, in Chapter 6 and are attached to this report in Appendix A. Two (2) of the 26 NRHP eligible resources in the APE were documented and evaluated as part of the current study, the El Palo Alto Tree in Palo Alto and the Jules Francard Grove in Burlingame. The El Palo Alto redwood tree is listed as a California Historical Landmark (No.2) as the site of Portola's journey's end in 1769. The City of Burlingame Park Department designated the Jules Francard Grove of blue gum (*Eucalpytus globulus*) trees as a heritage grove in 1976. The heritage designation form states that the trees were probably planted between 1876 and 1886 and potentially associated with master landscape architect and horticulturalist, John McLaren. ICF found that the Jules Francard Grove is NRHP/CRHR eligible for association with the founding and landscape character of Burlingame (criteria A/1) and as the work of a master designer, John McLaren (criteria C/3).

The APE also includes properties evaluated that did not appear eligible for listing in the NRHP.

- A total of 74 bridges, culverts and grade separations were recorded and evaluated for the project efforts from 2002 to 2015 that do not appear eligible for listing in the NRHP. Eighteen (18) of these were constructed between 1964 and 1970 and not previously recorded and one signal bridge recorded in 2002 had been demolished as of 2015. ICF used DPR 523 forms to record and evaluate and update the additional railroad structures (see Table 6-2, Properties Not Eligible – Bridges and Culverts Over 45 years, in Chapter 6 of this report).
- In addition to the 74 structures, a total of 15 buildings were recorded and evaluated for the project efforts from 2002 to 2015 that do not appear eligible for listing in the NRHP. Seven (7) of these buildings were constructed between 1964 and 1970 and not previously evaluated. Three (3) of the buildings evaluated in 2002 have been demolished as of 2015. ICF used DPR 523 forms to record and evaluate and update the additional railroad buildings (see Table 6-3, Properties Not Eligible – Buildings Over 45 years, in Chapter 6 of this report).
- The APE also includes eight (8) post-World War II tract houses within the same subdivision, built in or before 1970, that have been exempted from individual evaluation under the current study after sufficient historical research determined that neither the individual buildings nor the housing tract have demonstrable potential to meet any of the criteria for listing in the NRHP (see Table 6-4, Properties Exempt from Evaluation, in Chapter 6 of this report).
- Lastly, properties less than 45 years old were inventoried. They did not, however, require evaluation because they do not appear to have exceptional importance, in accordance with NRHP Criteria Consideration G (see Table 6-5, Properties Less than 45 Year Not Evaluated, in Chapter 6 of this report).

reports. The following research methods details ICF's research efforts for the project from 2013 to the present.

ICF architectural historians researched the history of the newly evaluated properties from 2013-2014, and incorporated, as appropriate, all relevant previous documentation of historic resources found in the 2002 and 2008 studies. ICF collected and reviewed the NRHP nomination forms for the listed train stations within the entire project APE and reviewed current listings of the NRHP, CRHR, California Historical Landmarks, and Points of Historical Interest publications and updates. ICF searched these inventories, as well as the Office of Historic Preservation's (OHP) "Directory of Properties in the Historic Property Data File" for San Francisco County, San Mateo County, and Santa Clara County. ICF reviewed the California HRI, the Caltrans Historic Bridge Inventory, and previously prepared historic architectural resources documents for projects along the Caltrain line. ICF also examined local historic resources inventories, where available, for several cities and the three peninsula counties. To verify addresses, dates of construction and footprint changes, ICF conducted parcel record searches through Google Earth Pro, Sanborn Fire Insurance Maps, County Assessor Maps and historicaerials.com.

In an effort to identify historically important individuals, historic events and settlement and architectural trends associated with the current survey population (2012–2014) including the railroad properties built between 1965 to 1970, properties affected under the proposed construction of traction power facilities, and tree trimming on properties within the railroad's electrical safety zone (ESZ), an ICF architectural historian conducted archival research from December 2013 to February 2015. Research was undertaken at the California Room and the Government Publications section of the California State Library to view City Directories for all the new survey properties; permit centers in the Cities of Belmont, Burlingame, Redwood City, Palo Alto, Sunnyvale and San Jose; the San Mateo County Archives, and public libraries including the San Francisco Public Library, San Mateo County Library, and San Jose Public Library. Online research efforts included a review of vital records and census data available at Ancestry.com; historical aerial imagery at Historicaerials.com; Sanborn Fire Insurance Maps from the San Francisco Public Library; and local city registers and historic inventories. Additional efforts included phone, email and/or in person conversations with Steve Hill, environmental compliance staff at SamTrans for questions regarding railroad properties, Mark Nolfi, building official at the City of Belmont, and Marion Oster, Coordinator of the Atherton Heritage Association.

Chapter 3
Field Methods

3.1 Survey Efforts in 2002 and 2008

In 2002 and again in 2008, JRP Consulting (JRP) undertook survey efforts for the Caltrain Electrification Project (JRP 2002: 6-8; JRP 2008: 3-4). After preliminary review of the Caltrain route's historical background, JRP visually inspected and recorded properties within the project APE in 2002 that appeared to have been constructed in or before 1955 and then again in 2008 for those properties constructed between 1956 and 1964. JRP relied on the Caltrain Track Diagram, dated March 1, 2000, and other inventories of the line to locate buildings and structures while conducting the survey. JRP's survey work included a "Hyrail" tour of the Caltrain line from Fourth and King to Diridon Station, and on-foot examinations of the resources. Most of the resources were visible or accessible from the edge of the railroad right-of-way. At times, JRP entered the JPB right-of-way which ends at 50.50, just north of Curtner Avenue (after receiving safety training from Caltrain and using proper safety precautions) to photograph or examine a building or structure.

During the 2007 survey, JRP surveyed all the previously inaccessible areas, revisited all resources located between MP 00.00 and MP 52.00 that were previously found eligible for listing in the NRHP, and any resource within the APE that had not been previously evaluated, such as resources that become 45 years (1956–1964) since the time of the previous survey.

3.2 Current Survey Efforts

For the current survey beginning in 2013, ICF employed the same survey methodologies as used previously by JRP. ICF surveyors received safety training from Caltrain for entering JPB right-of-way to record properties. An ICF professionally qualified architectural historian conducted a built resources field survey on June 2013. This survey included field verification of all resources previously recorded as appearing eligible for, determined eligible for, and/or listed in the NRHP to document any visible changes, alterations and additions to the resources subsequent to their last recordation and recordation of all properties within the APE that became 45 years old since the previous survey (i.e., those properties constructed between 1965 to 1968). In November 2013, an ICF architectural historian recorded the properties in the APE affected by tree trimmings within the railroad ESZ. By the completion of the current project survey efforts, additional properties were recorded by an ICF architectural historian from December 2014 to February 2015. This survey included the recordation of railroad and non-railroad properties within the APE that became 45 years old since the previous survey (i.e., those properties constructed between 1969 to 1970), all new properties in the APE affected by new traction power facilities and tree removal within the ESZ, and updates to any properties within the APE previously evaluated that experienced alterations and changes. ICF's survey work included a cursory survey through Google Earth Pro's street view to determine any alterations or changes to previously recorded properties and to determine construction dates for all new survey populations, and on-foot examinations of these properties with photographs and written notes.

3.3 Area of Potential Effects Development (APE)

Planners and engineers for the Peninsula Joint Powers Board (JPB) and their consultants, Parsons and JRP, developed the APE in 2002 and expanded it in 2008 to accommodate newly identified alternative infrastructure. The APE maps were delineated by the JPB in consultation with FTA and the State Historic Preservation Officer (SHPO), in accordance with section 106.

The 2002 APE for archaeological resources was defined as the extent of proposed construction for the Caltrain Electrification Program (i.e., the project "footprint"). This included the Caltrain railroad right-of-way, for a total length of approximately 51 miles. The archaeological APE varied in width along the Caltrain route, but typically incorporated approximately 40 feet on either side of the centerline of the two or more sets of railroad tracks, which included all facility components and a 20-foot buffer. At separate locations, the APE was expanded in 2008 to include proposed traction power facility sites that are located outside of the Caltrain right-of-way, and three ductbank routes where underground electrical connectors would be laid to supply power from service connections to the power stations.

The 2002 APE for historic architectural resources included the Caltrain ROW, including all of the railroad features within and along the right-of-way, such as stations (modern and historic), signal bridges, tunnels, grade separations, culverts, bridges, viaducts, and overpasses. It was expanded in 2008 to include the first row of parcels surrounding each of the newly proposed traction power facility sites. The SHPO concurred with that APE and the evaluation findings of that study in December 2002. A SHPO concurrence letter was never received for the amended APE and evaluation findings of the 2008 study.

The APE under the current study beginning in 2013 includes the JPB right-of-way which includes MP 00.00, at the Fourth and King station in San Francisco, to MP 50.50, which is just north of Curtner Avenue in San Jose. Additional changes to the APE under the current study include new properties in Belmont, Redwood City, Sunnyvale and San Jose affected by the construction of steel poles to provide power to the overhead contact system (OCS) and properties affected by tree trimming within the railroad ESZ.

The current study undertaken by ICF includes the addition of new options for the former proposed paralleling stations, all within the Caltrain ROW:

- Paralleling Station 3, Option 2 (PS3, Opt.2) in Burlingame, located within the Caltrain ROW north of the Bayshore Station on the east side opposite PS3, Option 1;
- Paralleling Station 4, Option 3 (PS4, Opt.3) in San Mateo, located within the Caltrain ROW south of Hillsdale Boulevard, between El Camino Real and the Caltrain tracks, adjacent to the Hillsdale Station which was determined to be ineligible in 2002 (JRP 2002);
- Switching Station, Option 2 (SWS, Opt.2), in Redwood City, located on Samtrans owned property on the north side of Redwood Junction between the main tracks and adjacent commercial property;
- Paralleling Station 5 Option 2 (PS5, Opt.2) in Palo Alto, located within the Caltrain ROW south of Page Mill Road, between the Caltrain tracks and an undeveloped parcel;
- Paralleling Station 6 Option 2 (PS6, Opt.2) is in Sunnyvale, located within the Caltrain parking lot south of Mathilda Avenue, between West Evelyn Avenue and the Caltrain tracks, in a surface parking lot adjacent to a modern parking garage; and

- Paralleling Station 7, Variants A and B (PS7, Variants A and B) located partially in the Caltrain ROW and partially in the Caltrans ROW for SR 87 along West Alma Road in San Jose south of the Tamien Station.

Chapter 5
Description and Evaluation of Historic Resources

The resources and properties described in this chapter are mainly taken and summarized from the previous JRP reports, Inventory and Evaluation of Historic Resources, Caltrain Electrification Program (2002), and the Addendum Inventory and Evaluation of Historic Resources, Caltrain Electrification Program (2008) supplemented by additional information from ICF. These resources are mostly related to the railroad; however, there are also non-railroad buildings, structures, and landscape features found outside of the JPB right-of-way in the APE where traction power facility structures are proposed and tree trimming outside of the railroad ESZ is proposed. The properties inventoried under the current study are described cumulatively with the resources inventoried and evaluated in the previous reports. All of the resources and properties within the project APE are listed in tables in Chapter 6 of this report.

The historic resources found along the JPB railroad right-of-way between San Francisco and San Jose fall into eight general categories:

- Stations,
- other buildings(i.e., not stations),
- bridges,
- grade separations (overpasses and underpasses),
- tunnels,
- culverts,
- signal bridges,
- other properties (landscape features)

Stations were categorized separately from other buildings because they often encompassed multiple buildings and/or structures and were usually designed as complexes. All of the stations that are more than fifty years old had been previously inventoried and evaluated or listed in the NRHP. Auto and pedestrian grade separations, discussed below as a group, were divided into overpasses and underpasses indicating whether the structure went over or under the rail line.

The historic context of these railroad properties that appears in Chapter 4 of this report addresses the original design and construction of the line, but not all components of the line were inventoried and evaluated as separate resources. JRP and ICF did not examine at-grade separations, or the track structure itself (including the roadbed, tracks, ballast, railroad ties or switches), nor examine signal masts or signal boxes. All of these features have been subject to heavy regular maintenance, repair, modernization and replacement in the years since the line was originally constructed in the 1860s and 1870s.

The APE includes a total of 10 underpasses and overpasses that have been listed or previously determined eligible for listing in the NRHP. See Table 6-1 in Chapter 6 of this report. The current study includes approximately 50 underpasses and overpasses that have either been previously determined ineligible for the NRHP or that appear not be eligible for listing in the NRHP.

5.5 Tunnels

Four of the original five tunnels installed by Southern Pacific along the route of the Bayshore Cutoff project between 1904 and 1907 are still in use and are the only railroad tunnels along the approximately 50 miles of track surveyed in this report, all of which were evaluated by JRP in 2002 and 2008 and found to appear eligible for listing in the NRHP as contributors to a historic district and the findings concurred by the SHPO.

Southern Pacific crews were responsible for constructing most of the cutoff structures, including the cuts, filling, bridges, tunnels, and trestles, although contractors were hired to perform the grading and to build Tunnels No. 2 and No. 5. The five tunnels had a combined length of almost 10,000 feet and were excavated through Potrero Hill (two separate tunnels), Hunter's Point hill, the ridge at Candlestick Point, and the hill at Sierra Point. Engineers designed the tunnels to carry two tracks and the railroad company had also acquired enough land to allow for future expansion to four tracks. Tunnels No. 1, 3, 4, and 5 were single bore openings wide enough for double track, while Tunnel No. 2 was designed as a two bore tunnel that could handle up to four tracks. The nearby city streets and anticipated construction in the area immediately around Tunnel No. 2 made it cost effective to build this tunnel to twice the capacity of the others.

The City of San Francisco largely left the design and construction of the tunnels to Southern Pacific's engineers, but the city did mention the tunnels in its January 1904 franchise to the company for construction of the Bayshore Cutoff. Ultimately, the five tunnels opened for service in 1907 were among the most impressive elements of the Bayshore Cutoff. Southern Pacific complied with the city's construction requirements, using steel framing and lining the tunnels with brick and concrete, and industry trade journals reported that core-bracing technique employed on the tunnels was somewhat unusual.

The completed tunnels ranged in length from 1,086 feet (Tunnel No. 2), to 3,457 (Tunnel No. 4) and each measured about 30 feet wide and 22 feet high from the finished tracks to the ceiling. The arches of the tunnels were lined with between four and six wythes of brick, while the floor and first eight to ten feet of the walls were poured concrete. A layer of packing (either gravel or concrete) separated the rock surface and the layers of common hard-burned red brick lining, which were centered on 10-inch wide steel I-beams joined at the top of the arch. The appearance of the tunnel portals is unified by the use of red brick and quarry-faced buff sandstone trim on the header wall and retaining walls that flank the openings. Each differs in the treatment of additional retaining walls near the openings and the use of various materials for erosion control on the hillsides immediately around the portals. Crews installed irregular courses of square cut stone, for example, to hold back the earth on either side of the Tunnel No. 4 retaining walls, while tall board-formed concrete walls were constructed on the east side of each end of Tunnel No. 1.

Chapter 6
Findings and Conclusions

ICF used the same strategy employed in the previous identification, survey and evaluation efforts for the project since 2001. The goal was to provide a complete inventory and evaluation of all properties within the APE. For much of the project area, the APE follows the existing railroad right-of-way, which includes the tracks, stations, signal bridges, grade crossings and other railroad properties. In addition, ICF surveyed areas off the right-of-way where the construction of traction power facilities and tree trimming outside of the ESZ are proposed.

6.1 Cultural Resources Listed or Determined Eligible

There are a number of historic resources within the project APE that were already listed in the NRHP and CRHR (OHP status code "1"). Some properties were previously evaluated, found eligible, and received SHPO concurrence (OHP status code "2"), as a result of the previous survey for this project or resulting from other project surveys and local inventories. Some properties evaluated in 2008 for the project appear eligible for listing (OHP status code "3") and remain as status code 3 because SHPO did not respond as concurring with these findings. Listed and previously determined eligible resources are listed in Table 6-1 below.

ICF field verified all of the properties that were OHP status code 1, 2, or 3, and prepared a DPR 523 Update Sheet for any property that appeared to have been altered in some way since last inventoried. Properties updated are indicated by asterisk, below. In addition, two NRHP eligible resources were surveyed as part of the areas of potential effect for tree trimming or removal from properties within the ESZ, the El Palo Alto redwood tree in Palo Alto which is California Historical Landmark No.2 and the Jules Francard Grove of blue gum eucalyptus trees in Burlingame which was designated as a heritage grove by the City of Burlingame in 1976. The below properties continue to appear eligible for the NRHP. All evaluations and updates are attached to this report in Appendix A.

6.2 Properties Not Eligible – Bridges and Other Structures Over 45 Years

Properties 45 years or older in 2015 within the APE were subject to survey for this project. JRP previously evaluated all properties within the APE that were constructed in or prior to 1957 as part of the 2002 survey, and then again evaluated or field checked all properties built in or prior to 1964 as part of the 2008 survey. Some updates were necessary for these 2002 and 2008 survey facilities due to alterations, and those are indicated by asterisk, below. The current survey evaluated all structures that became 45 years old since that time, i.e., all bridges and culverts built between 1965 and 1970. These properties are listed in Table 6-2 below. None of these properties appear eligible for listing in the NRHP. All newly prepared DPR 523 forms and update forms as well as all the previous evaluations are attached to this report in Appendix A.

6.3 Properties Not Eligible - Buildings Over 45 Years

Properties 45 years or older in 2015 and within the APE were subject to survey for this project. JRP previously evaluated all properties within the APE that were constructed in or prior to 1957 as part of the 2002 survey, and then again evaluated or field checked all properties built in or prior to 1964 as part of the 2008 survey. Some DPR updates were necessary for these facilities after field checking during the current study. Properties updated are indicated by asterisk, below. The current survey evaluated all the buildings listed below that became 45 years old since that time, i.e., all buildings built between 1965 and 1970. These properties are listed in Table 6-3 below. None of these properties appear eligible for listing in the NRHP. All newly prepared DPR 523 forms and update forms as well as all the previous evaluations are attached to this report in Appendix A.

6.4 Properties Exempt from Evaluation

Post-World War II builders' houses and housing tracts built in or before 1970 within the APE were subject to survey. As part of this study, the houses below were exempt from individual evaluation after sufficient historical research determined that neither the individual buildings, the housing tracts as a whole, nor portions of the housing tracts have demonstrable potential to meet any of the NRHP criteria for individual listing or as part of a historic district. These properties are listed in Table 6-4 below. These buildings were recorded in DPR A forms and evaluated in this HRER as part of a multiple property within a housing tract. See the multiple property evaluation in Chapter 6, Description and Evaluation of Cultural Resources, in this report. All DPR 523 A forms are attached to this report in Appendix A.

6.5 Properties Less than 45 Years Not Evaluated

Resources less than 45 years old did not require evaluation. None of the properties built in 1971 or later appeared to have exceptional importance that would have made them eligible for listing in the NRHP under Criterion G. These properties are listed in Table 6-5 below.

Table 6-1. Properties listed in, determined eligible for, or that appear eligible for listing in the NRHP

Mile Post	Resource Name (and OHP status code) (NRHP criteria)	Property Type	City	County	Year built
01.33	Tunnel No. 1 (3D)	Tunnel	San Francisco	San Francisco	1907
01.72	22nd Street Overpass (3D)	Overpass	San Francisco	San Francisco	1906
01.90	23rd Street Overpass (3D)	Overpass	San Francisco	San Francisco	1906
01.93	Tunnel No. 2 (3D)	Tunnel	San Francisco	San Francisco	1907 / 1936
03.19	Tunnel No. 3 (2)	Tunnel	San Francisco	San Francisco	1904-1907,1999
04.27	Tunnel No. 4 (2)	Tunnel	San Francisco	San Francisco	1904-1907
04.95-A	Schlage Lock Factory (2)	Building	San Francisco	San Francisco	1926
09.59	Airport Boulevard Underpass (3S)	Underpass	South San Francisco	San Mateo	1927/1935
13.70^	Millbrae Station (1)	Station	Millbrae	San Mateo	1907
15.60 – 16.30*	Jules Francard Grove (3S)	Tree Grove	Burlingame	San Mateo	1876-1886
16.30^	Burlingame Station (1)	Station	Burlingame	San Mateo	1894
17.20	East Poplar Avenue Underpass (2)	Underpass	San Mateo	San Mateo	1903
17.34	East Santa Inez Avenue Underpass (2)	Underpass	San Mateo	San Mateo	1903
17.45	Monte Diablo Avenue Underpass (2)	Underpass	San Mateo	San Mateo	1903
17.53	Tilton Avenue Underpass (2)	Underpass	San Mateo	San Mateo	1903
23.20^	San Carlos Station (1)	Station	San Carlos	San Mateo	1888
27.80	Atherton Station (3S)	Station	Atherton	San Mateo	1913
28.90^	Menlo Park Station (1)	Station	Menlo Park	San Mateo	1867, 1890s,1917
29.69	San Francisquito Bridge (2)	Bridge	Palo Alto	Santa Clara	1902
29.70*	El Palo Alto (5S1)	Tree	Palo Alto	Santa Clara	940
30.10	Palo Alto Station (1)	Station	Palo Alto	Santa Clara	1940
30.13	University Avenue Underpass (2)	Underpass	Palo Alto	Santa Clara	1941
30.70	Embarcadero Underpass (2)	Underpass	Palo Alto	Santa Clara	1936
44.60^	Santa Clara Tower at Benton and Railroad Street (1)	Station	Santa Clara	Santa Clara	1927
44.70^	Santa Clara Station (1)	Station	Santa Clara	Santa Clara	1863-64, 1877, 1885
47.35	Santa Clara Street / Alameda Underpass (part of San Jose / Cahill Station) (1)	Underpass	San Jose	Santa Clara	1933
47.50	San Jose / Cahill Station (1)	Station	San Jose	Santa Clara	1935

Total: 25 properties listed, determined eligible, or appear eligible for listing
Source: JRP, 2002 and 2008 and ICF (This study)
* DPR 523 DPR Forms prepared under current study
^ DPR 523 Update Forms prepared under current study
OHP Status Code 1: Listed in the NRHP
OHP Status Code 2: Determined eligible for listing in the NRHP
OHP Status Code 3S: Appears eligible for separate listing in the NRHP
OHP Status Code 3D: Appears eligible for listing in the NRHP as a contributor to a historic district
OHP Status Code 5S1: Individual property recognized as historically significant by local government

Table 6-2. Properties Not Eligible – Bridges and Other Structures Over 45 Years

Mile Post	Resource Name	City	County	Year Built	Year Evaluated for NRHP	Construction Type
0.52	Signal Bridge South of 6th Street Ramp	San Francisco	San Francisco	1946	2002	Steel riveted bents on concrete foundation and wood and metal walkway
1.27*	Mariposa Street Overpass	San Francisco	San Francisco	1968	2013	12.8m concrete bridge continuous with multiple box beams
02.26	Army Street Underpass	San Francisco	San Francisco	1936	2002	Through plate girder
02.35*	Marin Street Underpass	San Francisco	San Francisco	1965	2015	Concrete girder with flared concrete columns
02.40	Napoleon Street Underpass	San Francisco	San Francisco	1947/ 1965	2002	Deck plate girder (1947); 2 concrete girder viaducts on concrete and steel bents (1965)
02.54	Evans Avenue Underpass	San Francisco	San Francisco	1964	N/A	Steel girder and floor beam system
02.58*	I-280 Overpass	San Francisco	San Francisco	1966	2015	Concrete box girder with concrete columns and deck
02.70*	Army Street off Ramp Overpass	San Francisco	San Francisco	c. 1966	2015	Concrete box girder
02.85	Jerrold Avenue Underpass	San Francisco	San Francisco	1907	2002	Steel through girder and deck plate girder, supported by riveted steel support bents with cross bracing
03.00	Quint Street Underpass	San Francisco	San Francisco	1907	2002	Deck plate girder and through plate girder supported by bents with cross bracing
03.66	Williams Avenue Overpass	San Francisco	San Francisco	1907/ 1936	2002	Steel girder with concrete deck
04.15	Paul Avenue Overpass	San Francisco	San Francisco	1907/ 1930	2002	Steel through plate girder
06.18*	Tunnel Avenue Culvert	San Francisco	San Francisco	c.1960s	2015	Concrete culvert
06.64*	Tunnel Avenue Overpass	Brisbane	San Mateo	1970	2015	Concrete box girder.
06.74	Signal Bridge	Brisbane	San Mateo	1961	2008	Riveted steel bents with a concrete foundation
07.66	US-101 Overpass (South Bound)	Brisbane	San Mateo	1956	2008	Steel girder with concrete deck and column supports
07.69	US-101 Overpass (North Bound)	Brisbane	San Mateo	1956	2008	Steel girder with concrete deck and column supports
09.07	Signal Bridge north of Grand Avenue Overpass	South San Francisco	San Mateo	1905	2002	Steel beam with cross bracing, supported by bents and concrete footings

Mile Post	Resource Name	City	County	Year Built	Year Evaluated for NRHP	Construction Type
09.40	US-101 Viaduct Overpass	South San Francisco	San Mateo	1948	2002	Steel girder with reinforced concrete deck, supported by concrete beam bents
09.64	Bridge South of Airport Blvd Underpass	South San Francisco	San Mateo	1907	2002	20' bridge deck plate trestle supported by concrete abutments and central concrete support wall
09.72	Trestle bridge over Colma Creek	South San Francisco	San Mateo	1907	2002	46' trestle Bridge with deck plate
10.44	Culvert north of Scott Street	San Bruno	San Mateo	1910	2002	Concrete culvert with cast iron pipe
11.75	Bridge near Georgia and Huntington Avenues	San Bruno	San Mateo	1907	2002	11' concrete deck with concrete abutments and wingwalls.
13.05	San Mateo Avenue Culvert	Millbrae	San Mateo	1927	2002	Concrete culvert with corrugated metal pipe
13.90	Bridge south of Millbrae Avenue Overpass	Millbrae	San Mateo	1902	2002	Bridge deck trestle with concrete abutments, timber deck, and wood railing and sidewalls
14.31	Bridge south of Millbrae Avenue Overpass	Millbrae	San Mateo	1902	2002	Bridge deck trestle with concrete abutments. Has timber deck, side walls, and railings.
14.84	California Drive Culvert	Burlingame	San Mateo	1954	2002	Dual box concrete culvert
19.71	Culvert south of 25th Avenue	San Mateo	San Mateo	1903	2002	Concrete headwall with cast iron and concrete pipe
20.30*	Hillsdale Blvd Underpass	San Mateo	San Mateo	1965	2015	concrete box girder
20.45*	Laurel Creek Culvert	San Mateo	San Mateo	1964	2015	Concrete culvert
21.20	Dale View Avenue Culvert	Belmont	San Mateo	1964	2002	Concrete culvert with steel grates
24.27	Brewster Street Culvert	Redwood City	San Mateo	1917	2002	Grade crossing culvert, with small pipe
24.51	Cordilleras Creek Concrete Arch Culvert	Redwood City	San Mateo	1902	2002	Board-formed concrete with a board-formed concrete wingwall
25.92	Beech Street Culvert	Redwood City	San Mateo	1910/ 1922	2002	Concrete culvert with steel grate
25.97	Cedar Street Culvert	Redwood City	San Mateo	1931	2002	Cast iron pipe laid into pavement
26.03^	Signal Bridge south of Chestnut Street	Redwood City	San Mateo	1943	2002	2015 Update: signal bridge demolished
26.05	Pine Street Culvert	Redwood City	San Mateo	1931	2002	Concrete culvert with steel grate
26.07	Buckeye Street Culvert	Redwood City	San Mateo	1931	2002	Concrete culvert with steel grate
26.15*	SR-84 (Woodside Freeway) Overpass	Redwood City	San Mateo	1965	2015	Steel box beam girder

Mile Post	Resource Name	City	County	Year Built	Year Evaluated for NRHP	Construction Type
26.77	Culvert south of Woodside Freeway	Redwood City	San Mateo	1924	2002	Concrete deck culvert
27.90	Maple Avenue Culvert	Atherton	San Mateo	1903	2002	Concrete headwall with cast iron pipe
31.60	Pedestrian Underpass	Palo Alto	Santa Clara	1959	2008	Reinforced concrete box culvert with poured concrete ramps
31.80	Oregon Expressway Underpass	Palo Alto	Santa Clara	1959	2008	Reinforced concrete deck supported by steel girders and concrete bents
32.31	Bridge at Matadero Creek	Palo Alto	Santa Clara	1903	2002	12' Timber Bridge Deck Trestle
34.00	San Antonio Road Overpass	Mountain View	Santa Clara	1962	2008	Concrete continuous slab supported by reinforced concrete abutments
35.12	Bridge over Permanente Creek	Mountain View	Santa Clara	1903	2002	13' timber bridge deck trestle, supported by concrete abutments and crosses new channelized drainage.
35.60*	Shoreline Blvd Overpass	Mountain View	Santa Clara	1970	2015	Concrete box girder.
36.46	Stevens Creek culvert adjacent Evelyn Avenue	Mountain View	Santa Clara	1903	2002	Board-formed concrete arch
36.50*	SR-85 Overpass	Mountain View	Santa Clara	1965	2015	concrete box beam/girder
36.80*	Whisman Road Overpass	Mountain View	Santa Clara	1967	2015	concrete box beam/girder
37.10*	SR-237 Overpass	Sunnyvale	Santa Clara	1965	2015	concrete box beam/girder
38.60*	Matilda Avenue Overpass	Sunnyvale	Santa Clara	1970	2015	Concrete box girder.
39.31*	Fair Oaks Avenue Overpass	Sunnyvale	Santa Clara	1967	2015	Pre-stressed concrete box beam/girder
40.75	Lawrence Expressway Overpass	Santa Clara	Santa Clara	1962	2008	Reinforced concrete bridge deck supported by steel I-beam girders
42.34*	San Tomas Aquino Creek Bridge	Santa Clara	Santa Clara	1966	2015	concrete slab railroad bridge
42.50*	San Tomas Expressway Overpass	Santa Clara	Santa Clara	1967	2015	steel box beam/girder
42.59	Culvert south of San Tomas Expressway	Santa Clara	Santa Clara	1905	2002	Concrete culvert
42.90	Scott Blvd Overpass	Santa Clara	Santa Clara	1963	2008	Reinforced concrete deck supported by steel girders
43.65	Pedestrian Overpass at Lafayette Street	Santa Clara	Santa Clara	1963	2008	Reinforced concrete deck supported by two reinforced concrete bents
43.99	De La Cruz Blvd Overpass	Santa Clara	Santa Clara	1960	2008	Reinforced concrete

Mile Post	Resource Name	City	County	Year Built	Year Evaluated for NRHP	Construction Type
46.20	Hedding Street Overpass	Santa Clara	Santa Clara	1959	2008	Reinforced concrete deck supported by steel girders
46.52	Taylor Street Underpass	San Jose	Santa Clara	1940	2002	Concrete girder with exposed I-beam stringers
47.15	Julian Street Underpass	San Jose	Santa Clara	1934	2002	Concrete and steel through girder
47.89	San Carlos Street Overpass	San Jose	Santa Clara	1934	2002	Concrete and steel through girder
47.95	Bridge over Los Gatos Creek	San Jose	Santa Clara	1935	2002	118' Bridge Deck
48.10*	I-280 Underpass	San Jose	Santa Clara	1969	2015	Steel box girder bridge.
48.35	Bird Avenue Underpass	San Jose	Santa Clara	1935/ 1971	2002	Two segments - through girder with concrete deck, and pre-stressed concrete box girder
48.62	Delmas Avenue Underpass	San Jose	Santa Clara	1935	2002	Concrete through girder, with concrete deck
48.75	Prevost Street Underpass	San Jose	Santa Clara	1935	2002	Concrete through girder, with concrete deck section and wood deck section, supported by transverse I-beams
48.80	Guadalupe Creek Bridge	San Jose	Santa Clara	1935	2002	51' Bridge Deck, east approach
48.99	Willow Pass Road Underpass	San Jose	Santa Clara	1935/ 1970	2002	Two sections, through girder with concrete deck and pre-stressed concrete box girders with concrete deck
49.45	Alma Avenue Underpass	San Jose	Santa Clara	1957	2008	Concrete deck supported by concrete abutments, concrete bents and steel I-beam stringers
49.88	Almaden Road Underpass	San Jose	Santa Clara	1936	2002	Through plate-girder with steel deck
50.49	Curtner Avenue Overpass	San Jose	Santa Clara	1962	2008	Reinforced concrete deck supported by steel girders

Total: 74 bridges and culverts over 45 years that do not appear eligible for listing in the NRHP
Source: JRP, 2002 and 2008 and ICF (this study)
* DPR 523 DPR Forms prepared; for Caltrans Local Agency listed bridges, 523 DPR forms prepared for bridges constructed in 1965 and later. Evans Avenue Overpass was not evaluated due to accessibility limitations. It is a common type of construction and assumed not to be eligible for listing in the NRHP for the purposes of this report.
^ DPR 523 Update Forms prepared

Table 6-3. Properties Not Eligible – Buildings Over 45 Years

Mile Post	Resource Name	City	County	Year Built	Year Evaluated	Construction Type
00.60^	Southern Pacific Building at 7th and King	San Francisco	San Francisco	1946	2002	2015 Update: building demolished.
04.95-B	200-B Sunnyvale Avenue and 222 Tunnel Avenue	San Francisco	San Francisco	1961	2008	Commercial building part of former Schlage Lock Factory. 2008 Update: building demolished. 4 small outbuildings part of Schlage Lock Factory.
15.20	Broadway Station	Burlingame	San Mateo	1917	2002	Mission Revival with two buildings and a connector
20.30	Hillsdale Station	San Mateo	San Mateo	1941	2002	Classical Revival
22.05*	1110 Old County Road	Belmont	San Mateo	1907	2015	Residence: Craftsman.
22.08	1150 Old County Road	Belmont	San Mateo	c. 1960	2015	Commercial: Modern
22.10*	1160 Old County Road	Belmont	San Mateo	c. 1923	2015	Commercial: Modern
22.14*	1290 Old County Road	Belmont	San Mateo	1954	2015	Industrial: Modern buff brick
38.80^	Sunnyvale Station	Sunnyvale	Santa Clara	1952	2002	2015 Update: building demolished, new building constructed 2010
39.90*	100 San Lucar Court	Sunnyvale	Santa Clara	1964	2015	Industrial: Mid-Century Modern office with accordion roof and a Modern warehouse
40.00*	932 Kifer Rd	Sunnyvale	Santa Clara	1954	2015	Mid Century Modern Industrial property.
46.40	College Park Station	San Jose	Santa Clara	c. 1910	2002	Small one-story hipped roof open shelter
46.50^	716-720 Stockton Avenue	San Jose	Santa Clara	1956	2002	2015 Update: building demolished
48.00*	741 Auzerais Avenue	San Jose	Santa Clara	1957	2015	Industrial: Metal clad Utilitarian building
48.10*	432 Gregory Street	San Jose	Santa Clara	1900	2015	Residence: one-story vernacular

Total: 15 buildings over 45 years that do not appear eligible for listing in the NRHP
Source: JRP, 2002 and 2008 and ICF (this study)
* DPR 523 DPR Forms prepared
^ DPR 523 Update Forms prepared

Table 6-4. Properties Exempt from Evaluation

Mile Post	Resource Name	City	County	Year Built	Subdivision
26.91	200 Berkshire Avenue	Redwood City	San Mateo	1953	Dumbarton Plat
26.93	3010 William Avenue	Redwood City	San Mateo	1952	Dumbarton Plat
26.98	3030 William Avenue	Redwood City	San Mateo	1952	Dumbarton Plat
27.00	3050 William Avenue	Redwood City	San Mateo	1953	Dumbarton Plat
27.04	3070 William Avenue	Redwood City	San Mateo	1953	Dumbarton Plat
27.06	3090 William Avenue	Redwood City	San Mateo	1953	Dumbarton Plat
27.08	3110 William Avenue	Redwood City	San Mateo	1954	Dumbarton Plat
27.10	3140 William Avenue	Redwood City	San Mateo	1950	Dumbarton Plat

Total: 8 buildings over 45 years exempt from formal review and do not appear eligible for NRHP criteria G listing. DPR A forms prepared.
Source: ICF (this study)

Table 6-5. Properties Less than 45 years Not Evaluated

Mile Post	Resource Name	Property Type	City	County	Year Built
00.00	San Francisco Station	Station	San Francisco	San Francisco	1998
00.48	6th Street Ramp	Overpass	San Francisco	San Francisco	1971
00.62	7th and King Street Signal Bridge	Signal Bridge	San Francisco	San Francisco	1999
00.86	I-280 Overpass	Overpass	San Francisco	San Francisco	1971
01.70	22nd Street Station	Station	San Francisco	San Francisco	2008
01.85	Signal Bridge north of 23rd Street Overpass	Signal Bridge	San Francisco	San Francisco	c. 2000
03.14	Oakdale Avenue Overpass	Overpass	San Francisco	San Francisco	1998
03.63	Culvert south of Tunnel No. 3	Culvert	San Francisco	San Francisco	2000
04.10	Paul Avenue Station	Station	San Francisco	San Francisco	2009
05.20	Bayshore Station	Station	San Francisco	San Francisco	2003
06.68	Bridge south of Tunnel Avenue Overpass	Bridge	Brisbane	San Mateo	2003
07.80	Sierra Point parkway Overpass	Overpass	South San Francisco	San Mateo	1983
08.67	Oyster Point Overpass	Overpass	South San Francisco	San Mateo	1994
09.10	201 Gateway Blvd	Building	South San Francisco	San Mateo	1998
09.22	East Grand Avenue Overpass	Overpass	South San Francisco	San Mateo	1984
09.30	South San Francisco Station	Station	South San Francisco	San Mateo	1990
11.50	San Bruno Station	Station	San Bruno	San Mateo	2013
10.82	I-380 Overpass	Overpass	San Bruno	San Mateo	1972
13.32	Hillcrest Blvd Underpass	Underpass	Millbrae	San Mateo	c. 2002
13.51	Highline Canal Culvert	Culvert	Millbrae	San Mateo	2003
13.60	Overpass north of Millbrae Avenue Overpass	Overpass	Millbrae	San Mateo	2000
13.70	Millbrae Avenue Overpass	Overpass	Millbrae	San Mateo	c. 2000
15.37	Bridge south of Broadway	Bridge	Burlingame	San Mateo	2000
15.50	Bridge north of Morrell Avenue	Bridge	Burlingame	San Mateo	2000
15.60	Pedestrian Crossing at Morrell Avenue	Bridge	Burlingame	San Mateo	c. 1990s
17.68	San Mateo Creek Culvert	Culvert	San Mateo	San Mateo	2000

Mile Post	Resource Name	Property Type	City	County	Year Built
17.70	San Mateo Station	Station	San Mateo	San Mateo	2000
17.80	355 2nd Street	Building	San Mateo	San Mateo	c. 2000
17.90	320 2nd Street	Building	San Mateo	San Mateo	c. 2000
18.06	5th Avenue Culvert	Culvert	San Mateo	San Mateo	c. 1999
18.87	Bridge south of 9th Avenue	Bridge	San Mateo	San Mateo	2000
19.10	Hayward Park Station	Station	San Mateo	San Mateo	2003
19.45	Bridge north of 25th Avenue	Bridge	San Mateo	San Mateo	2000
20.00	Bay Meadows Station	Station	San Mateo	San Mateo	2006
21.00	42nd Avenue Underpass	Underpass	San Mateo	San Mateo	1989
21.90	Belmont Station	Station	Belmont	San Mateo	1999
22.00	Ralston Avenue Underpass	Underpass	Belmont	San Mateo	c. 1990s
22.20	Harbor Blvd Underpass	Underpass	Belmont	San Mateo	c. 1990s
22.64	F Street Pedestrian Underpass	Underpass	San Carlos	San Mateo	c. 1990s
23.20	Holly Street Underpass	Underpass	San Carlos	San Mateo	c. 1990s
23.60	Arroyo Avenue Pedestrian Underpass	Underpass	San Carlos	San Mateo	c. 1990s
23.81	Culvert south of Arroyo Avenue Pedestrian Underpass	Culvert	San Carlos	San Mateo	2000
23.90	Brittan Avenue Underpass	Underpass	San Carlos	San Mateo	c. 1990s
24.10	Howard Avenue Underpass	Underpass	San Carlos	San Mateo	c. 1990s
25.40	Redwood City Station	Station	Redwood City	San Mateo	2003
25.60	Jefferson Avenue Underpass	Underpass	Redwood City	San Mateo	c. 1999
26.70	2710 Middlefield Road	Building	Redwood City	San Mateo	1981
27.20	5th Avenue / Middlefield Road Underpass	Underpass	Menlo Oaks	San Mateo	c. 1990s
28.06	Bridge south of Watkins Avenue	Bridge	Atherton	San Mateo	2000
31.80	California Avenue Station	Station	Palo Alto	Santa Clara	1980s
32.76	Bridge over Barron Creek	Bridge	Palo Alto	Santa Clara	1990s
33.55	Bridge over Adobe Creek	Bridge	Palo Alto	Santa Clara	1992
34.10	San Antonio Station	Station	Mountain View	Santa Clara	2003
34.20	Pedestrian Crossing Underpass at San Antonio Station	Underpass	Mountain View	Santa Clara	1988
36.10	Mountain View Station	Station	Mountain View	Santa Clara	2003
36.48	Pedestrian Bridge at Stevens Creek	Overpass	Mountain View	Santa Clara	c. 2000
36.81	Pedestrian underpass at Evelyn Station (SCVTA)	Underpass	Mountain View	Santa Clara	c. 1990s
39.40	182 S Fair Oaks Avenue	Building	Sunnyvale	Santa Clara	1986

Mile Post	Resource Name	Property Type	City	County	Year Built
39.71	Wolfe Road Overpass	Overpass	Sunnyvale	Santa Clara	1982
39.80	0 N Wolfe Road	Water Tower	Sunnyvale	Santa Clara	2001
39.82	800 Kifer Road	Building	Sunnyvale	Santa Clara	1985
40.10	950 Kifer Road	Building	Sunnyvale	Santa Clara	1986
40.35	1035 Aster Avenue	Building	Sunnyvale	Santa Clara	1985
40.55	1154 Sonora Court	Building	Sunnyvale,	Santa Clara	1975
40.70	Pedestrian Bridge at Lawrence Expressway	Overpass	Sunnyvale	Santa Clara	1981
40.80	Lawrence Station	Station	Santa Clara	Santa Clara	2003
41.0	106 Lawrence Station Road	Building	Lawrence	Santa Clara	1992
41.25	Calabazas Creek Overflow Culvert	Culvert	Santa Clara	Santa Clara	1978 /1994
41.85	Bowers Avenue Underpass	Underpass	Santa Clara	Santa Clara	1973
44.60	351 Brokaw Road	Water Tower	Santa Clara	Santa Clara	c. 1975
45.90	I-880 Overpass	Overpass	Santa Clara	Santa Clara	1992
46.45	790 Stockton Avenue	Building	San Jose	Santa Clara	1978
47.00	Signal Bridge south of Lenzen Avenue	Signal Bridge	San Jose	Santa Clara	1990s
47.05	308 Stockton Avenue	Building	San Jose	Santa Clara	c. 1980s
47.20	250 Stockton Avenue	Building	San Jose	Santa Clara	2000
47.26	Signal Bridge north of Santa Clara Street	Signal Bridge	San Jose	Santa Clara	1995
47.32	HP Pavilion Parking Lot, 525 W Santa Clara Street	Parking Lot/Building	San Jose	Santa Clara	c. 2010
47.68	120 Laurel Grove Lane	Underpass	San Jose	Santa Clara	c. 2000
47.73	Park Avenue Underpass	Water Tower	San Jose	Santa Clara	1971
48.08	782 Auzerais Avenue	Building	San Jose	Santa Clara	1986
48.80	SR-87 Underpass	Underpass	San Jose	Santa Clara	1989
49.10	Tamien Station	Station	San Jose	Santa Clara	1992
49.10	Signal Bridge at Tamien Station	Signal Bridge	San Jose	Santa Clara	1992
50.10	Almaden Expressway Overpass	Overpass	San Jose	Santa Clara	1990 (replaced 1959 OP)

Source: JRP, 2002 and 2008 and ICF (this study)

Appendix A

DPR 523 Forms

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
UPDATE SHEET

Primary #
HRI #
Trinomial
NRHP Status Code 3D, 3D, 2S2, and 2S2

 *Resource Name or # (Assigned by recorder) MP 01.33, 01.93, 03.19, and 04.27
*Recorded by Mark A. Beason / Rebecca Flores *Date March 5, 2008 ☐ Continuation ☑ Update

P1. Other Identifier: Tunnel No. 1 (M.P. 01.33), Tunnel No. 2 (M.P. 01.93), Tunnel No. 3 (MP 03.19), and Tunnel No. 4 (MP 04.27)
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County** San Francisco
***b. USGS 7.5' Quad** San Francisco North **Date** 1956, revised 1973 **T** ___; **R** ___; ___ ¼ **of Sec** ___; _____ **B.M.**
c. Address [No street number] City San Francisco Zip 94107
e. Other Locational Data:

P3a. Description (continued): These four railroad structures (Tunnels 1, 2, 3, and 4) have been field checked and remain in the same condition as when the previous form was completed. Copies of the previous inventory and evaluation forms for these structures prepared in 2002 by JRP are attached.

***P8. Recorded by:** JRP Historical Consulting, LLC, 1490 Drew Ave., Suite 110, Davis, CA 95618

***P9. Date Recorded:** March 5, 2008

***P11. Report Citation:** JRP Historical Consulting, LLC, Inventory and Evaluation of Historic Resources, Caltrain Electrification Project, San Francisco to San Jose (MP 0.0 to 52.0), July 2002.

B10. Significance:

JRP Historical Consulting, LLC (JRP), previously surveyed Tunnels 1, 2, 3, and 4 in 2002 for the Inventory and Evaluation of Historic Resources, Caltrain Electrification Project, San Francisco to Gilroy (MP 0.0 to 77.4). These four railroad structures are associated with the significant and expansive improvement projects of E.H. Harriman, who gained control of Southern Pacific in 1901. Five tunnels were constructed by Southern Pacific as part of the Bayshore Cutoff project between 1904 and 1907 -- an important development in Southern Pacific's system-wide modernization at the turn of the twentieth century – and the fifth tunnel was later abandoned in place. The four tunnels addressed in this update still exist as part of the Caltrain system.

JRP concluded in 2002 that these structures appeared to have significance under NRHP Criterion A (CRHR Criterion 1) for their association with the Bayshore Cutoff project, as well as Criterion C (CRHR Criterion 3) for their distinctive architectural and engineering qualities. JRP also concluded that only Tunnels 3 and 4 appeared to retain enough integrity to convey their historic significance for eligibility under Criteria A and C. The 2002 evaluation was prepared in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code. SHPO concurred with these conclusions in a letter dated December 9, 2002, which is included in the current survey report listed in P11, above. As a result, Tunnels 1 and 2 were listed in the California Historical Resources Inventory System with a 6Y status (determined ineligible for NRHP by consensus through Section 106 process – not evaluated for CRHR or local listing) and Tunnels 3 and 4 were listed with a 2S2 status (individual property determined eligible for NRHP by a consensus through Section 106 process; listed in CRHR.).[1]

In 2002, the San Francisco Planning Department conducted an inventory and evaluation of the Central Waterfront area, concluding that the area appeared to be eligible for the NRHP as a historic district. As part of this effort, the department concluded that Tunnels 1 and 2 appeared to meet the criteria for listing in the NRHP as contributors to

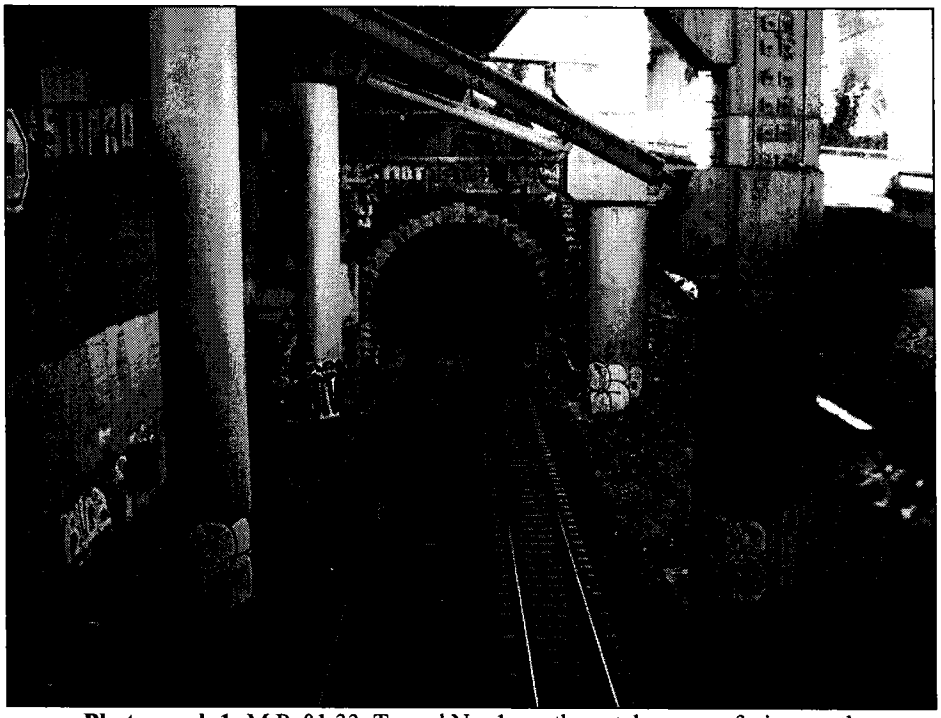
[1] Office of Historic Preservation, Directory of Properties in the Historic Property Data File for San Francisco County, December 4, 2007.

this historic district. As a result, Tunnels 1 and 2 were listed together in the California Historical Resources Inventory System as Bayshore Cutoff Tunnels 1 and 2 with a 3D status (appear eligible for NRHP as contributors to a NRHP eligible district through survey evaluation).[2]

When the conclusions and SHPO concurrence of the JRP and San Francisco surveys are both taken into consideration, all four tunnels have either been determined eligible for listing in the NRHP and CRHR, or appear eligible for listing in the NRHP and CRHR. They are all considered historical resources for the purposes of CEQA.[3]

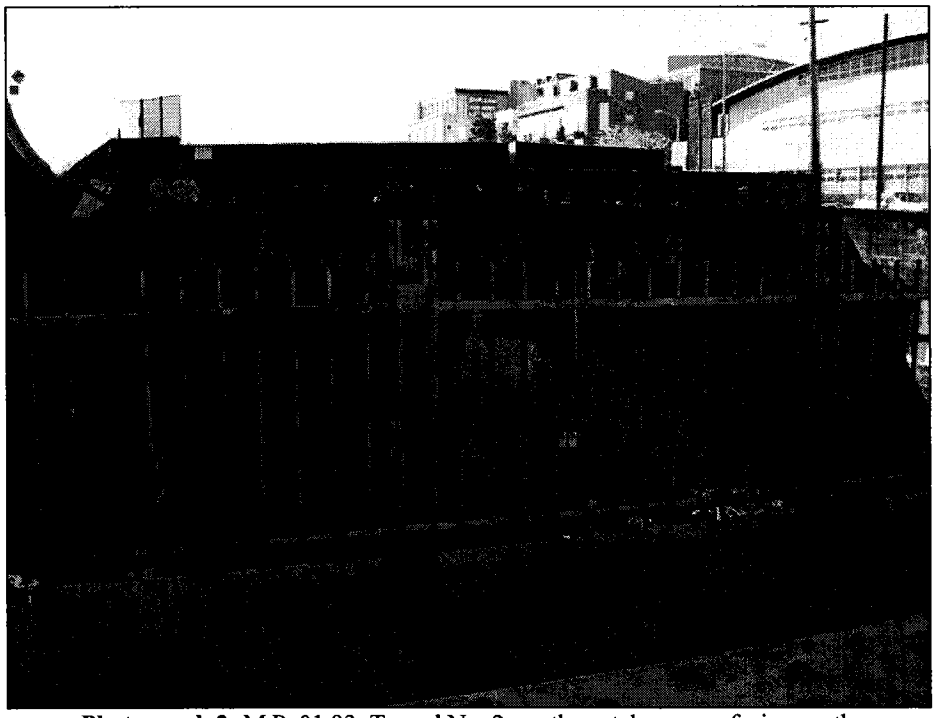
***B14. Evaluator:** Meta Bunse / Mark A. Beason

***Date of Evaluation:** May 2008

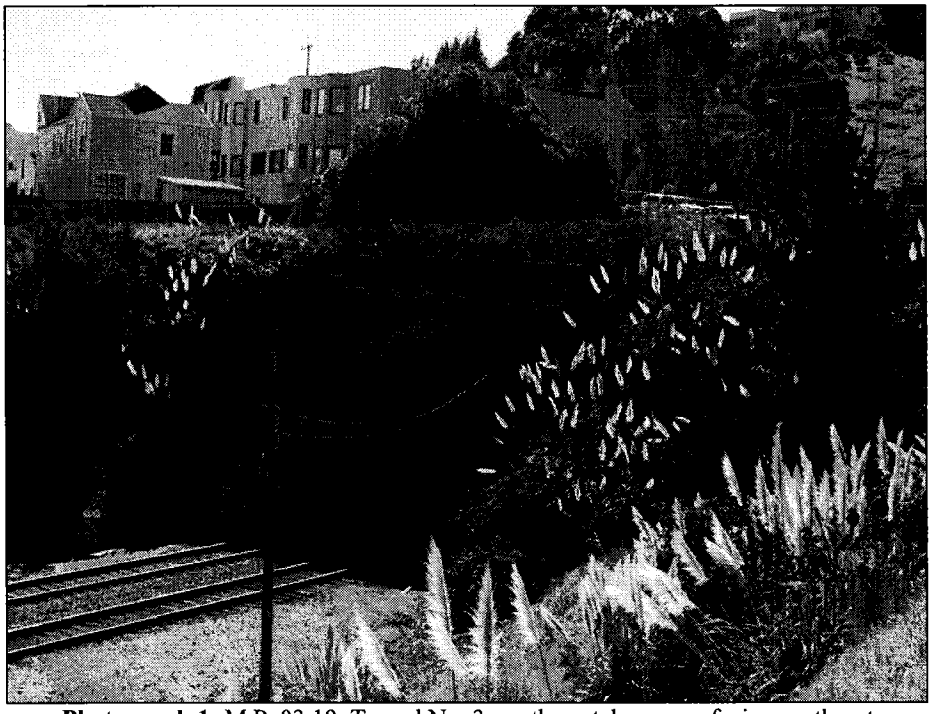


Photograph 1: M.P. 01.33, Tunnel No. 1, north portal, camera facing south, March 5, 2008.

[2] Office of Historic Preservation, Directory of Properties in the Historic Property Data File for San Francisco County, December 4, 2007.
[3] See also Section 15064.5(a)(2)-(3) of the CEQA Guidelines and the criteria outlined in Section 5024.1 of the California Public Resources Code.



Photograph 2: M.P. 01.93, Tunnel No. 2, north portal, camera facing south, March 5, 2008.



Photograph 1: M.P. 03.19, Tunnel No. 3, north portal, camera facing southeast, March 5, 2008.

Photograph 2: M.P. 04.27, Tunnel No. 4, north portal, camera facing south, March 5, 2008.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) M.P. 01.33 and 01.93

P1. Other Identifier: Tunnel No. 1 (M.P. 01.33) and Tunnel No. 2 (M.P. 01.93)

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Francisco
and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Francisco North **Date** 1956, revised 1973 **T** ___; **R** ___; __ ¼ **of Sec** ___; _____ **B.M.**

c. Address [No street number] City San Francisco Zip 94107

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

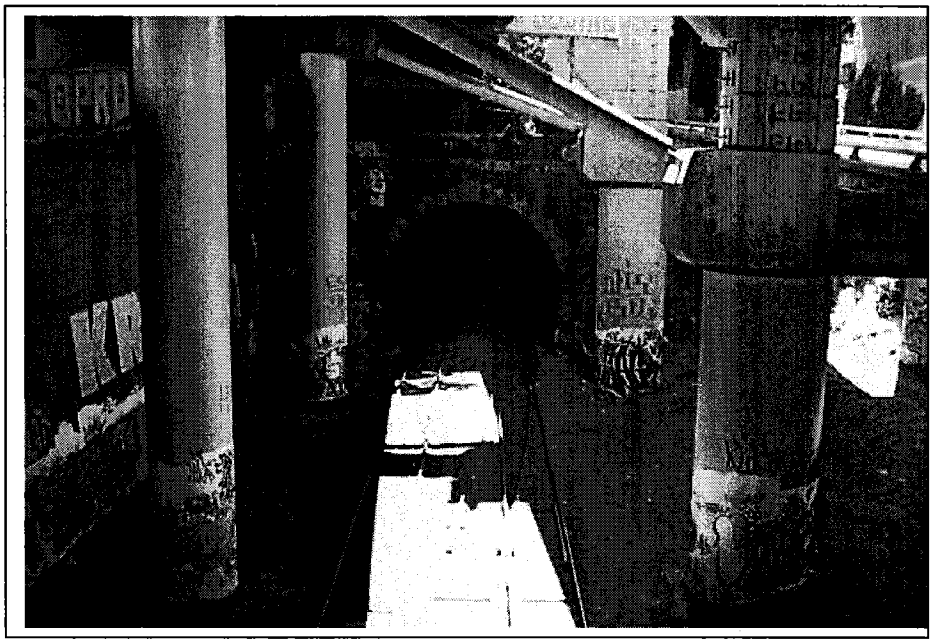
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This form address two railroad structures (Tunnel Nos. 1 and 2) that are located in the City of San Francisco on the Caltrain railroad alignment. These tunnels are two of the original five tunnels installed by Southern Pacific along the route of the Bayshore Cutoff project between Potrero Hill and the ridge near Candlestick Point. Four of the tunnels are in use today. The northern end of Tunnel No. 1 is located at MP 01.33 and the southern end of Tunnel No. 4 (addressed on a separate form) is located at MP 04.27. Tunnel No. 5 was located in the hill at Sierra Point, but was abandoned in the 1950s with the realignment of Highway 101. Southern Pacific crews, as well as contractors hired by the railroad, built the tunnels between 1904 and 1907 as part of the company's ambitious Bayshore Cutoff project. (See Continuation Sheet).

***P3b. Resource Attributes:** (List attributes and codes) HP11 (Railroad Tunnels)

***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photo 1, Tunnel #1, north portal, September 11, 2000

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1905-1907, JPB Bridge Book

***P7. Owner and Address:**
Peninsula Corridor Joint Powers Board, P.O. Box 3006
1250 San Carlos Avenue
San Carlos, CA 94070

***P8. Recorded by:** (Name, affiliation, address)
Meta Bunse/Rand Herbert
JRP Historical Consulting Services
1490 Drew Ave, Suite 110
Davis, CA 95616

***P9. Date Recorded:** September 2000

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Inventory and Evaluation of Historic Resources, Caltrain Electrification Project, San Francisco to Gilroy (MP 0.0 to 77.4)

***Attachments:** NONE ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

B1. Historic Name: Tunnel Nos. 1 and 2
B2. Common Name: Tunnel Nos. 1 and 2
B3. Original Use: Railroad Tunnel B4. Present Use: Railroad Tunnel
***B5. Architectural Style:** Utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1904-1907
***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** **Original Location:**
***B8. Related Features:** None
B9. Architect: Southern Pacific Company b. Builder: Southern Pacific Company (Tunnel No. 1); Private contractor, unknown (Tunnel No. 2)
***B10. Significance: Theme** _____ **Area** _____
Period of Significance _____ **Property Type** _____ **Applicable Criteria** _____
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Southern Pacific constructed five tunnels as part of its Bayshore Cutoff project between 1904 and 1907. Four of these tunnels still exist as part of the Caltrain system and the two that do not appear to meet the criteria for listing on the National Register of Historic Places are evaluated on this form. While all four are associated with the expansive improvement projects of E. H. Harriman who gained control of Southern Pacific in 1901, Tunnel Nos. 1 and 2 do not retain sufficient historic integrity to convey their significance within that context. (Tunnel Nos. 3 and 4 appear to meet the significance criteria for eligibility under Criteria A and C and are addressed on a separate form.) All of the remaining tunnels were constructed as elements of the Bayshore Cutoff, which was an important development in Southern Pacific's system-wide modernization at the turn of the twentieth century, and most of them are important for their unusual drift and core-bracing method of construction as well. The following statement presents the historical context of the tunnels, followed by an evaluation of their historical significance, specifically addressing the loss of integrity suffered by Tunnel Nos. 1 and 2. (See Continuation Sheet).

B11. Additional Resource Attributes: (List attributes and codes) N/A

***B12. References:** California Railroad Museum, Bay Shore Railroad Photograph Files; John R. Signor, *Southern Pacific's Coast Line* (Wilton: Signature Press, 1994); Caltrain, Track Diagram (March 1, 2000); Amtrak West Engineering Services, 1999 Annual Inspection of Structures; JPB, Bridge Book: San Francisco to Lick, (1990).

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 2001

(This space reserved for official comments.)

P3a. Description (continued):

The Bayshore Cutoff project consisted of the construction of a new segment of double main line track between San Francisco and San Bruno with almost 10,000 feet of tunnels, as well as major earthwork (both cuts and fills), steel bridges, and timber trestles. The five original tunnels were excavated through Potrero Hill (Tunnel Nos. 1 and 2), Hunter's Point hill, the ridge at Candlestick Point, and the hill at Sierra Point. The railroad company had acquired enough land to allow for future expansion to four tracks, but engineers designed the most of the tunnels as single bore openings to carry the two tracks of the new main line (Tunnels No. 1, 3, 4, and 5). Tunnel No. 2 was designed as a two bore tunnel that could handle up to four tracks because the nearby city street configuration and anticipated construction in the area immediately around Tunnel No. 2 made it more cost effective to build this tunnel to twice the capacity of the others. The length of each of the four existing tunnels is as follows:[1]

Bridge Inspection Report (1990)

Tunnel No. 1	1,817 feet
Tunnel No. 2	1,086 feet
Tunnel No. 3	2,364 feet
Tunnel No. 4	3,547 feet[2]

The five tunnels built for the Bayshore Cutoff were among the most impressive elements of the project. These brick, concrete and stone structures bring the tracks through the steep hills and bluffs that make up rough coastline of the northeastern peninsula while remaining at an even, low gradient that never reaches an elevation of more than 20.3 feet above sea level. Crews excavated four of the five tunnels through various types of earth and rock, carting the debris away and delivering mortar and concrete using temporary narrow gauge tracks and ore carts. Industry trade journals reported on the project, noting that the construction technique employed on the tunnels was unusual. The bored tunnels were started by cutting several drifts beginning at the base of the tunnel opening and rising up to create an arch-shaped space around a center core of earth. Although the remaining core (roughly 18 feet high and 13 feet wide) did not directly support the newly created tunnel walls, the core served as a stable base against which false timbering could be braced during the construction process. The core was removed when the tunnel lining was finished. Tunnel No. 2 was the only one not built in this manner and it is the only double bore tunnel in the project. It was built by using the "cut-and-fill" method: cutting a trench through the hillside, building the two brick lined tunnels, and then filling the earth back in over the completed arches.[3]

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[1] Southern Pacific Bureau of News, "Historical Outline," typescript, [ca. 1932], 77; Board of Supervisors, *San Francisco Municipal Reports for the Fiscal Year 1903-1904, Ending June 30, 1904* (San Francisco: J. B. McIntyre, Printer and Bookbinder, 1905), 679-709; Steele, "The Spread of San Francisco: The New City ...," 116-118; "Construction on the Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* (October 20, 1906): 807-809; "The Bay Shore and Dumbarton Cut-Offs of the Southern Pacific," *The Railroad Gazette* 42 (March 15, 1907): 329; John R. Signor, *Southern Pacific's Coast Line* (Wilton: Signature Press, 1994), 32.

[2] JPB, "PCJPB Bridge Book: San Francisco to Lick" (printed November 29, 1990).

[3] Louis R. Miller, "The History of the San Francisco and San Jose Railroad," Master's thesis, UC Berkeley (1947), 100-104; "The Bay Shore and Dumbarton Cut-Offs of the Southern Pacific," *The Railroad Gazette* 42 (March 15, 1907): 329; "Construction on the Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* (October 20, 1906): 807-809.

When the crews finished the tunnels in late 1907, they ranged in length from 1,086 feet (Tunnel No. 2), to 3,547 (Tunnel No. 4) and each measured about 30 feet wide and 22 feet high from the finished tracks to the ceiling. The arches of the tunnels were lined with between four and six wythes of brick, while the floor and first eight to ten feet of the walls were poured concrete. A layer of packing (either gravel or concrete) separates the rock surface and the layers of common hard-burned red brick lining, which were centered on 10-inch wide steel I-beams joined at the top of the arch. The appearance of the tunnel portals is unified by the use of red brick and quarry-faced buff sandstone trim on the header wall and retaining walls that flank the openings. Each entrance differs in the treatment of additional retaining walls near the openings and the use of various materials for erosion control on the hillsides immediately around the portals. Crews installed irregular courses of square cut stone, for example, to hold back the earth on either side of the Tunnel No. 4 retaining walls, while tall board-formed concrete walls were constructed on the east side of each end of Tunnel No. 1.[4]

The current appearance of the tunnels varies from structure to structure, although each has varying amounts of spray-painted graffiti. The original brick and stone work of the portals is also visible in each of the four tunnels (**Photographs 1-2**). The northern and southern portals of Tunnel No.1 are surrounded and partially obscured by the massive piers supporting the I-280 viaduct. Piers for the viaduct are also located immediately adjacent to the northern portal of Tunnel No. 2, which has a construction staging area in place directly over the tunnel, as well as concrete masonry unit walls infilling both portals of the western bore. The current condition of the tunnels is also discussed below in the discussion of historic integrity.[5]

B10. Significance (continued):

E. H. Harriman and the Southern Pacific Railroad

Tunnel Nos. 1, 2, 3, and 4 are associated with the expansive infrastructure development policies of Edward Henry Harriman who gained control of Southern Pacific in 1901. Harriman was from New York and had quit school to work in a Wall Street brokerage at the age of fourteen. He rose through the ranks of the brokerage fast enough to buy himself a seat on the New York Stock Exchange by the age of 22 in 1870. His marriage, in 1879, to the daughter of the president of the Ogdensburg & Lake Champlain Railroad introduced Harriman to railroad ownership and he soon turned his assertive business style to that industry. By 1887 he was vice president of the Illinois Central Railroad and ten years later he was a director of the Union Pacific Railroad, one of Southern Pacific's toughest competitors. When the last of Southern Pacific's founders, Collis P. Huntington, died in 1900, Harriman immediately made a bid for the railroad stock held by the his estate. It took the better part of a year to convince the various shareholders and associates to sell, but by March 1901 Harriman's Union Pacific had acquired 38% of Southern Pacific, a figure that would later rise to 46%.[6]

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[4] "The Bay Shore and Dumbarton Cut-Offs of the Southern Pacific," *The Railroad Gazette* 42 (March 15, 1907): 329-331; Rufus Steele, "The Spread of San Francisco: The New City ..." *Sunset Magazine* 19 (June 1907): 117-120; "Bayshore Cutoff," construction photographs, Southern Pacific Collection, Railroad Museum Library, Sacramento, CA.

[5] For safety and operational reasons JRP did not conduct a field inventory of the interior of the tunnels. The description of their current condition is based on field inspection of each of the portals and that portion of each tunnel visible from the exterior.

[6] Don Hofsommer, "For Territorial Dominion in California and the Pacific Northwest: Edward H. Harriman and James J. Hill," *California History* (Spring 1991): 31; Donovan L. Hofsommer, *The Southern Pacific, 1901-1985* (College Station, TX: Texas A&M

C. P. Huntington had left the Southern Pacific system in relatively good condition and had, in fact, been in the process of modernizing and improving both rolling stock and infrastructure when he died. Harriman was able to simply continue many projects that Huntington's engineers had already scheduled. Versions of the Bayshore Cutoff had, in fact, been suggested since the 1870s, but the railroad could not justify the high cost of its construction along rugged shoreline until thirty years later, just as Harriman took over the company. His contribution to system-wide improvements during his control (1901-1909), as well as the scale of the projects he directed, proved to be unprecedented. He added 960 route miles, more than 120 miles of second track, and almost 1,100 miles of sidings during his tenure. This work included impressive changes to the Overland Route from Roseville, California, to Ogden, Utah, including a huge "cutoff" project designed to minimize travel time, grades, and track curvature – and therefore reduce operating expenses – between Lucin and Ogden, by crossing the Great Salt Lake. This Lucin Cutoff, and two similar projects in California, the Montalvo Cutoff (skirting the south side of the Santa Susana Mountains in Ventura and Los Angeles counties) and the Bayshore Cutoff just south of San Francisco, were some of the most remarkable of his undertakings. Like many of Harriman's accomplishments, these plans had all been studied for years, but Harriman was able to push the projects through quickly, completing the Lucin and Montalvo cutoffs in 1904, and the Bayshore in 1907.[7]

The idea of building a cutoff that ran along the shore of San Francisco Bay had been considered since the railway was first constructed and Southern Pacific had even performed feasibility studies in 1873 and again in 1878. The railroad purchased some land for the right-of-way, but concluded that traffic volume at that time would not justify the large expenditure of building the by-pass. Over the years, the numbers of rail passengers and the amount of freight shipped steadily increased and Southern Pacific used longer trains and carried progressively heavier loads on its Ocean View line to meet the demand. Helper engines were necessary for trains climbing San Bruno Mountain to Ocean View, the line's high point at 293 feet in elevation, but the company got no sympathy from San Franciscans who complained bitterly about the length and frequency of the freight trains that barreled through their neighborhoods, as well as the soot and smoke they brought. By 1901 29 first class trains traveled the Ocean View line every day. With this amount of traffic, congestion was inevitable because it was a single-track line, except for a short distance between 19th and Harrison and the terminal. Finally in 1899, C. P. Huntington decided to construct the segment that became known as the Bayshore Cutoff, but these plans were delayed again when he passed away the following year, leaving implementation to Harriman.[8]

Harriman, as noted above, immediately committed the company to several improvement projects throughout the west and in preparation for the Bayshore, he ordered a second track installed on the existing main line between San Jose and San Bruno. The 39 miles of new track, including new grade separations and other structures, was ready by late 1903.[9] With this improved infrastructure in place, the company began the extensive work necessary

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University Press, 1986), 9-11. Collis Potter Huntington, the last of the "Big Four," died on August 13, 1900. Hopkins had died in 1878, followed by Crocker in 1888 and Stanford in 1893.

[7] Hofsommer, *The Southern Pacific, 1901-1985*, 15-19, 50.

[8] "S. P. Ocean View Line" *The Western Railroader* 41 (September 1978): 3; Signor, *Southern Pacific's Coast Line,* 32-33.

[9] "S. P. Ocean View Line," 3; Signor, *Southern Pacific's Coast Line,* 32-33. Examples of structures built during this period of modernization on the line between San Bruno and San Jose are located in the City of San Mateo. Situated along Railroad Avenue at the north end of town, north of San Mateo Creek, there are four single-span through girder underpasses that carry the double tracked rail line over local roads: East Poplar Avenue, East Santa Inez Avenue, Monte Diablo Avenue, and Tilton Avenue. The American Bridge Company of New York designed these four nearly identical underpasses and Southern Pacific installed them in 1903 as part of its double-tracking project. The American Bridge Company became one of the most influential steel manufacturers and constructors in the

for the cutoff, including the trestles, cuts, fills, and tunnels. The City of San Francisco largely left the engineering and construction of the tunnels to Southern Pacific's engineers during the design phase, but the city did mention the tunnels in its January 1904 franchise to the company for construction of the Bayshore Cutoff:

> ...Tunnel for double track or an additional tunnel or tunnels for an additional double track or additional double tracks, shall be suitably lined, wherever required by the nature of the ground through which such tunnel or tunnels are constructed, with a suitable thickness of stone or brick or concrete masonry or by combinations of said kinds of masonry.[10]

Southern Pacific's own "Bureau of News," described the Bayshore Cutoff project several years later in a summary of the company's history produced in house in about 1932:

> The most important single piece of construction on the main line, and one of the most expensive pieces of railroad ever built, was the Bayshore Cutoff, 9.81 miles between San Francisco and San Bruno, completed at a cost of almost a million dollars a mile. The cut-off replaced the old line built in 1863 over the San Bruno hills through Colma, shortening the distance 2.65 miles, reducing maximum grade from 158 to less than 16 feet per mile, and eliminating nearly 600 degrees of curvature ... It provided Southern Pacific with adequate terminal facilities and easy access to the heart of San Francisco ... The expenditure of $20 million on the Lucin, Bayshore and Montalvo cut-offs may seem extravagant for improvements in only three places, but the savings in operating expenses made possible by these betterments was equal to from 8 to 10 percent on the money invested in them.[11]

Tunnel Construction

The history of railroad tunnel construction in the United States began in 1834 when the first such structure was completed in Pennsylvania. By the turn of the century, tunnels were a relatively common structure in railroad systems worldwide. In fact, some of the longest tunnels in the world were constructed before 1930, such as the Simplon I and II linking Switzerland and Italy in 1906 and 1922 respectively via two 12.3 mile long bores, the Cascade tunnel in Washington state (completed in 1929 with a length of 7.8 miles), and the 6.2 mile long Moffat tunnel in Colorado that was finished in 1928. At the time that Southern Pacific was constructing the Bayshore Cutoff (1904-1907), railroad engineers had mastered the process well enough that they were able to design complex and technologically advanced tunnels that minimized the steep grades of alignments installed during the early years of railroading. The Spiral Tunnels on the Canadian Pacific Railway main line in British Columbia exemplify this type of accomplishment. These two tunnels enabled the line to cross Cathedral Mountain and Mt.

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country and in California, the company was responsible for between 25 to 45 percent of metal truss bridges between the 1910s and 1930s. See California Department of Transportation, *Historic Highway Bridges of California* (1990), 43; and American Bridge Company, "100 Years of Innovation," www.americanbridge.net/html/history.htm, (n.d.), accessed October 2000.

[10] Board of Supervisors, *San Francisco Municipal Reports for the Fiscal Year 1903-1904*, 704.

[11] Southern Pacific Bureau of News, "Historical Outline," typescript, [ca. 1932], 77-78.

Ogden on a 2.2% grade, eliminating the original 5.5% grade, and each completes a full turn to exit 48 to 50 feet below its own entrance.[12]

Southern Pacific was also engaged in other tunnel projects at the turn of the twentieth century, with its own crews and hired contractors working elsewhere in California. In order to complete its Coast Line, which was nearly completed except for a gap between Paso Robles and Santa Barbara, the company had to install seven tunnels in the rugged Santa Lucia Mountains near San Luis Obispo. Constructed during the 1890s, the tunnels ranged from 270 feet to 3,700 feet long. Further south, Southern Pacific's new director H. E. Harriman also oversaw the completion of the Santa Susana (later the Chatsworth) Tunnel northwest of Los Angeles, just before he authorized the Bayshore Cutoff. The tunnel was excavated through the Santa Susana Mountains for a distance of about 7,400 feet, which made it the longest tunnel on the Pacific Coast when the first train passed through it in 1904. At that time only a few tunnels in the world were longer. Like four of the five tunnels of the Bayshore Cutoff, crews excavated the Santa Susana tunnel through rock and approached the project from both ends to meet in the center.[13]

Work on the Bayshore Cutoff began in 1904 and continued for three years, opening for traffic in December 1907. Although the keystones read 1905 and 1906, Tunnel Nos. 1 and 4 were essentially completed in 1905, Tunnel Nos. 3 and 5 in 1906 and Tunnel No. 2 in late 1907. Southern Pacific's chief engineer, William Hood, oversaw the design and construction of the project, along with assistant engineer W. E. Marsh.[14] Both of these men had extensive experience in railroad engineering and just wrapped up work on the series of Santa Lucia tunnels that had helped Southern Pacific close the gap in its Coast Line in the 1890s and the Montalvo Cutoff in 1904. The Bayshore Cutoff construction crews consisted mostly of company forces, including the cuts, filling, bridges, tunnels, and trestles, except for contractors hired to perform the grading and to build Tunnels No. 2 and No. 5. At a cost of nearly $1 million per mile, the 9.81-mile cutoff was one of the most expensive pieces of railroad ever built. The shoreline route between San Bruno and San Francisco shortened the distance, reduced curvature, and reduced the maximum grade from 158 feet per mile to less than 16. As noted above, the five tunnels had a combined length of almost 10,000 feet and additional earthwork had been necessary in the large cut at Visitacion Point where about 750,000 yards of soil and rock were removed. This excavated material augmented dredged fill material from the bottom of bay, both of which were used to create a large, flat area just north of the point for construction of the Bayshore freight yard. The new Bayshore route had far fewer grade crossings than the old line and included new passenger stations at 23rd Street, Army Street, Paul Avenue, Bayshore, Visitacion, and South San Francisco before joining the old alignment at San Bruno.[15]

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[12] Ernest H. Robl, "Longest Railroad Tunnels in the World," revised June 15, 2000, www.robl.w1.com, accessed October 26, 2000; "Today in American History," americanhistory.about.com, accessed October 26, 2000; "The Spiral Tunnels," *Engineering News* Vol. 1 (1907): 424.

[13] Loren Nicholson, *Rails Across the Ranchos,* Centennial Edition (San Luis Obispo, CA: California Heritage Publishing Associates, 1993), 133-138; Robert Charlton, "The Story of a Great Tunnel," *Sunset* (July 1904): 219-224; Southern Pacific Bureau of News, "Historical Outline," 77-78.

[14] William Hood started working for Southern Pacific's predecessor, the Central Pacific, in 1867 and helped design that company's early routes in the Central Valley and throughout the west as the system expanded. Hood had overseen not only the formative years of the company, but Harriman placed him at the head of the improvement program during his tenure as well (Hoffsommer, *The Southern Pacific, 1901-1985*, 26-27).

[15] Southern Pacific Bureau of News, "Historical Outline," 77; "Bayshore Cutoff," construction photographs, Southern Pacific Collection, Railroad Museum Library, Sacramento, CA; Board of Supervisors, *San Francisco Municipal Reports for the Fiscal Year 1903-1904, Ending June 30, 1904* (San Francisco: J. B. McIntyre, Printer and Bookbinder, 1905), 679-709; Nicholson, *Rails Across the Ranchos,* 133-138; Rufus Steele, "The Spread of San Francisco: The New City ..." *Sunset Magazine* 19 (June 1907): 116-117; "Construction on

Before the Bayshore Cutoff was completed, San Francisco suffered the worst natural disaster in California history, the great earthquake of April 18, 1906. The quake struck at just after 5 o'clock in the morning and although crews were working at many locations along the cutoff, none of the 1,000 to 1,500 men were hurt. Accounts differ regarding the condition of the construction itself, however, work resumed to rebuild Tunnel No. 2 in 1907 and it was completed by November of that year.[16]

Sunset Magazine, a promotional publication for Southern Pacific, also reported that, "little material was jarred down ... not a brick or a piece of concrete fell."[17] Several railroad photographs taken in June, 1907 show the "break," but make no mention of the cause of the failure. Other accounts contradict this report and claim that Tunnel No. 2 (the least stable, exposed tunnel) collapsed during the temblor. It is also possible that the tunnel arches failed at some point after the initial quake. Nevertheless, work resumed to rebuild Tunnel No. 2 in 1907 and it was completed by November of that year.[18]

Regardless of the condition of the incomplete cutoff project, the intact original main tracks (the Ocean View Line) had suffered no serious damage in the quake and provided a crucial link between the fire-ravaged city in the days following the disaster. Southern Pacific lost its own main office building at Fourth and Townsend and with it valuable company records, but Harriman and other company officials responded immediately to bring in relief supplies and humanitarian aid. As the fires worsened Southern Pacific brought thousands people out of harms way, both by ferry and by train – 1,073 carloads of San Franciscans on April 19th alone. The company also put crews to work laying temporary track directly on the surface of streets and began hauling away debris. Harriman announced that his company would do everything it could to help restore and rebuild the city, and he made good on the promise. Southern Pacific carried 224,000 passengers and hauled in about 35,000 tons of relief supplies free of charge for two weeks following the disaster, as well as carrying passenger traffic on the peninsula without charge for over a month.[19]

Southern Pacific saw the opening of the Bayshore Cutoff in late 1907 as proof of its commitment to the restoration of the city. While the old Ocean View route was soon in decline, the new cutoff immediately improved passenger train times into the city. A peninsula commuter tradition began at this time that continues today. The passenger service between San Francisco and San Jose had always been popular, but the new line substantially improved travel time between the two cities and the smaller communities in between where many quake victims had resettled. Southern Pacific's *Sunset Magazine* raved about the project that would allow

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the Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* (October 20, 1906): 807-809; "S. P. Ocean View Line" *The Western Railroader* 41 (September 1978): 3.

[16] "Construction on Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* 46 (October 20, 1906): 809; Steele, "The Spread of San Francisco: The New City ...," 120; "Bayshore Cutoff," construction photographs, SP Collection, Railroad Museum Library, Sacramento, CA; Signor, *Southern Pacific's Coast Line*, 37; Stindt, "Peninsula Service," 19.

[17] Steele, "The Spread of San Francisco: The New City ...," 120.

[18] "Bayshore Cutoff," construction photographs, SP Collection, Railroad Museum Library, Sacramento, CA; Signor, *Southern Pacific's Coast Line*, 37; Stindt, "Peninsula Service," 19.

[19] Fred A. Stindt, "Pennisula (sic) Service: A Story of Southern Pacific Commuter Trains," *The Western Railroader* 20 (1957): 17-19; Hofsommer, *The Southern Pacific, 1901-1985*, 34-37. Southern Pacific employees Alvin Speer, a conductor, and Tom Cantwell, an engineer, were based in San Francisco when the quake hit. They ran the first train out of the city on April 19th in search of water for steam trains and survivors, but found that "every wooden water tower between San Francisco and Soledad had been flattened." [Bob Donohue, "Earthquake Express from San Francisco," *Westways* (April 1961): 14-15].

businessmen to make the trip in just over an hour and promoted the general benefits of 30 to 40 daily commuter trains. The boasting of the railroad's magazine was often excessive, but demonstrated the significance of the company's investment, and the importance of showing that San Francisco was a modern city, successfully recovering from the disastrous quake and fire:

> The man who never has more than three figures in his bankbook has not been slow to grasp his opportunity, and now ... the music of his welcome will be the glad greeting of his wife and babes at the door of a cottage, and he will be carried thither, together with scores of his friends each as happily possessed as himself, over a highway of steel that runs straight from his workshop in the city to his home in a wood. He is no longer a prisoner within municipal gates because of the time which it takes to travel to and from the beloved country.[20]

Application of National Register Criteria of Significance

No matter how effusively his company described the project, Harriman's Bayshore Cutoff was impressive. The double track alignment included 10,000 feet of tunnels, six iron bridges, six timber trestles (one stretching 3,500 feet from Army Street to about Jerrold Avenue), and a new hump yard created on the newly filled Visitacion Bay site. The cutoff was the shortest of his three major route bypass projects at under 10 miles long (the Lucin Cutoff was more than 100 miles long), but it was the most expensive per railroad mile constructed until that time at nearly $1 million per mile. It had also survived the one of the largest natural disasters to ever hit California. Southern Pacific's Chief Engineer, William Hood, had worked for the Central Pacific during the construction of its initial Central Valley route in the 1870s, had stayed with the company when it was taken over by Southern Pacific, and had just completed the Coast Line before overseeing the Bayshore Cutoff. Hood admired Harriman's contributions to the physical plant and felt that his legacy of expansion and modernization ensured that Southern Pacific would retain its prominence in western transportation. The cutoff also represented an important step in the development of transportation in the City of San Francisco, as well as the passenger and freight rail service on the peninsula and southern Bay Area. Furthermore, the project as a whole exemplifies the accomplishments of early railroad engineers like Hood and the tunnels themselves are the components of the cutoff that made it possible to maintain the even grade that was the goal of the project. As historian Carl Condit noted, "the physiography of the American continent stimulated most powerfully the ingenuity of engineers and builders" during the nineteenth and early twentieth centuries and the original tunnels, trestles, and earthwork used to make the Bayshore Cutoff possible are no exception. For these reasons, the tunnels appear to be historically significant under Criterion A, as a resource associated with an important event or historic trend. Not all of the tunnels, however, appear to retain historic integrity (see below).[21]

Most of the tunnels embody the distinctive characteristics of a method and type of construction (except for Tunnel No. 2) and for this reason appear to meet the criteria of significance under Criterion C. The railroad press

[20] Quote from: Rufus Steele, "The Spread of San Francisco: The Story of the Enchanted Garden down the Peninsula ..." *Sunset Magazine* 19 (September 1907): 440. Also: Rufus Steele, "The Spread of San Francisco: The New City ..." *Sunset Magazine* 19 (June 1907); Larry Green, "San Francisco to San Jose: SP's Commuter Operation is a One of a Kind," *Rail Classics* 9 (January 1980): 53.

[21] Hoffsommer, *The Southern Pacific, 1901-1985,* 14; Carl W. Condit, *American Building Art: The Nineteenth Century* (New York: Oxford University Press, 1960), 5; National Park Service, "How to Apply the National Register Criteria for Evaluation," *National Register Bulletin No. 15* (Washington, D.C.: 1991), 12.

reported that the Southern Pacific crews who installed the tunnels used an unusual construction method that involved excavating an arch-shaped tunnel and leaving a core of earth in place along the center. The builders used this core as a stable base for false timbering that helped to support the walls and ceiling of the tunnel during the application of the brick lining. Research conducted thus far has not revealed other railroad tunnels constructed in this manner, however, it is important to note that this distinction applies only to the original Tunnel Nos. 1, 3, 4, and 5 and does not apply to Tunnel No. 2, which was produced through the cut and fill method. In terms of the type of construction, the lining itself appears to be an unusual choice because most of Southern Pacific's tunnels from this time period had timber frame lining. Furthermore, the tunnels are also distinctive in that the portals are accentuated by parapeted brick header walls and retaining walls edged with quarry faced buff sandstone. Most of the other tunnels in the Southern Pacific system constructed during this period were unadorned, probably due to their remote and isolated locations, while the tunnels of the Bayshore Cutoff received more aesthetic attention because they were located in and near the more populated vicinity of the City of San Francisco. The tunnels appear to meet the criteria for significance under Criterion C because they embody distinctive characteristics of a method and type of construction. Not all of the tunnels, however, appear to retain historic integrity (see below).[22]

Although the tunnels are important within the historical context of early twentieth century railroading, and the H. E. Harriman era of the development of the Southern Pacific Railroad (1901-1909), Tunnel Nos. 1 and 2 do not appear to retain enough historic integrity to support eligibility for the National Register of Historic Places (**Photographs 1-2**). (Tunnel Nos. 3 and 4 appear to retain enough historic integrity to support eligibility for the National Register and are addressed on a separate form). The seven aspects of historical integrity are: location, design, setting, materials, workmanship, feeling, and association. A resource can only convey its historic significance if it retains enough integrity in these areas, however, determining the degree to which a resource meets these aspects can be a subjective judgment. Because the tunnels were designed and constructed as part of a larger unit, namely the Bayshore Cutoff from San Francisco to San Bruno, their integrity should also be considered within this context. The seven aspects of integrity are addressed below:

Location. The tunnels have not been moved and retain their integrity of location.

Design. Tunnel Nos. 1 and 2 served as part of Southern Pacific's peninsula commute and freight line from the time they opened to traffic in 1907 until Caltrans took over operation of the line in the 1980s. Despite various changes to the operating agencies during the 1990s, they continue to serve as railroad tunnels. The engineering features of the tunnels have been modified since they were originally installed. At some point prior to 1966 shotcrete was applied to the surface of the interiors of the tunnels where the original surface had been the exposed red brick and concrete of the walls and arches. Tunnel No. 1 is now braced by 30 concrete and steel frames that keep it in place under the stresses caused by the freeway construction above completed in the late 1960s.[23]

[22] By the 1930s, the Southern Pacific system included 196,260 linear feet of tunneling, or about 37 miles of its nearly 13,000 route miles. Most of the tunnels were timber lined, but in the 1920s the company began a concrete lining program and had completed about 27,000 feet of lining by 1931. "Fourteen Years of Tunnel-Lining Work on the Southern Pacific," *Railway Engineering and Maintenance* (July 1931): 632-637; Hofsommer, *The Southern Pacific, 1901-1985*, 116, 120.

[23] The California Division of Highways began planning the construction of Highway 280 into downtown San Francisco in the early 1960s and choose to bring the alignment in over the top of Tunnel No. 1. This choice reflected the agency's efforts to reduce the cost of property acquisition in the highly developed residential and industrial areas nearby. About a year after construction started in August 1966, Southern Pacific discovered rough track conditions in the tunnel and inspections revealed that the track had shifted and that the center drain in the floor of the tunnel had also shifted and heaved upwards. Inspectors also noted that "a large crack in the west wall 570

Tunnel No. 2 was not constructed using the same unusual technique as the others. Its design also differs in that it was built with two bores to allow expansion to a four track system, but this plan was never realized. The entrances to the second tunnel (west) have also been walled in with concrete masonry units and chain link fencing. The tracks in Tunnel No. 2 were reconstructed in 1999. The cumulative effect of these modifications leads to the conclusion that Tunnel No. 1 does not retain integrity of design because it has suffered substantial alterations to its original design. The modifications to Tunnel No. 2 are somewhat less severe, however, its does not represent important characteristics of a construction method (such as the multiple drifts around a central earth core used in the other tunnels) and its design was never fully implemented.

Setting. Industrial and residential development have compromised the integrity of setting for all of the tunnels, but the realignment of existing highways as well as new road construction have severely impaired the integrity of Tunnel Nos. 1 and 2. (Tunnel No. 5 was abandoned when the railroad was rerouted at Sierra Point to make way for new Bayshore freeway construction in the 1950s; it is no longer part of the peninsula rail line and is not part of this survey).

Materials and Workmanship. The steel and concrete frames installed around Tunnel No. 1, the concrete block infilling in Tunnel No. 2, the shotcrete surfacing of the tunnel interiors, and the rebuilding of the tracks in Tunnel No. 2 each contribute to varying degrees of integrity loss. The fact that most of each tunnel is underground and not readily visible, puts more emphasis on the portals, where materials and workmanship are apparent. Here the tunnels retain most of the brick and decorative stonework of the original construction. Neither Tunnel No. 1, nor Tunnel No. 2 appears to retain integrity of materials and workmanship.[24]

Feeling and Association. These aspects are the most subjective of the seven and for this reason cannot be the only aspects to support a resource's eligibility. Original materials and workmanship are evident at each of the tunnel portals and this lends to the historic feeling of the resources, but this feeling is overwhelmed by the compromised setting and design of Tunnel Nos. 1 and 2. The association, or link between a resource and the historic events and people of its context, "requires the presence of physical features that convey a property's historic character," and again, Tunnel Nos. 1 and 2 fail to retain demonstrate this association, because they do not retain enough setting, materials, workmanship and feeling to convey a link with railroad engineering and their distinctive property type.

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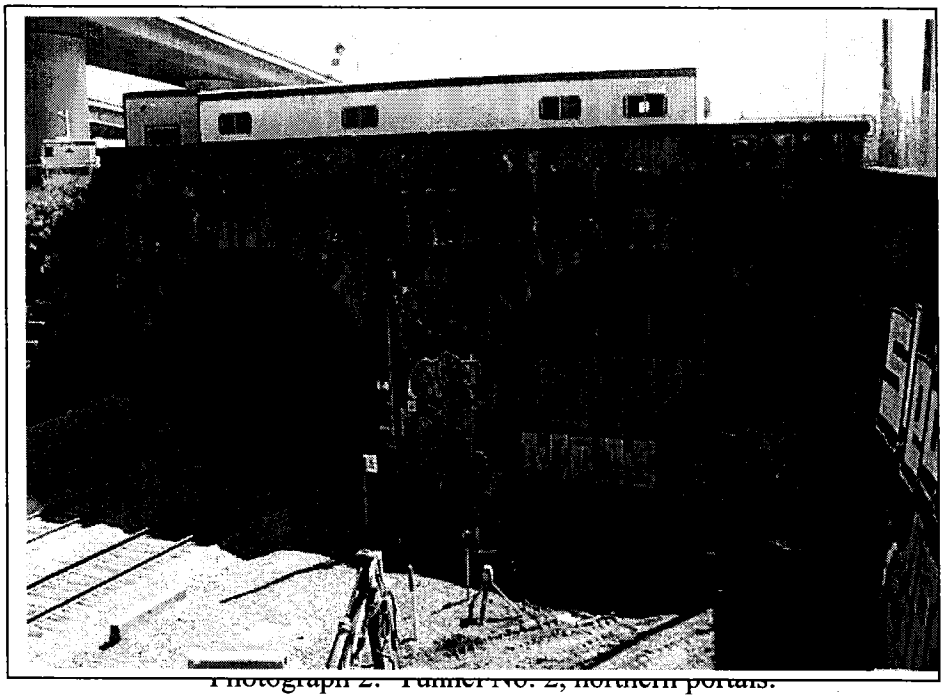
feet south of the northerly portal that was first noticed in 1927 appeared to be opening more, and along the crown of the tunnel the gunite and brick were spalling." A heavy retaining wall constructed on the hill above and slightly west of the tunnel had increased stresses on the structure, so the railroad and Caltrans cooperated to create a solution. In 1968, crews drove a series of 30 steel I-beam and concrete frames into the earth around the tunnel in order to transfer the load created by the heavy wall above and the highway construction project proceeded. H. M. Williamson, "Trouble at SP's Potrero Hill Tunnel Part I: The Problem," *Railway Track and Structures* (December 1968): 20-22; H. M. Williamson, "Trouble at SP's Potrero Hill Tunnel Part II: The Solution," *Railway Track and Structures* (January 1969): 25-27).

[24] *San Francisco Chronicle* (July 30, 1999): A20; Caltrain, "Quarterly Capital Program Status Report, Jan. 1 - March 31, 2001," http://www.caltrain.com/caltrain/quart_rapid.html.

In conclusion, Tunnel Nos. 1 and 2 do not appear to retain enough integrity of design, setting, materials, or workmanship to convey feeling or association with their historic context or to merit eligibility for the National Register of Historic Places.

The San Francisco Planning Department has recently conducted an inventory and evaluation of resources located in the Central Waterfront area. As part of this effort, the department also surveyed Tunnels Nos. 1 and 2 and concluded that the tunnels appeared to be historical resources. Because they have been found eligible as part of a local survey, these two tunnels are considered to be historical resources for the purposes of CEQA even though they do not appear to meet the criteria for listing on the National Register.[25]

Photographs



Photograph 2: Tunnel No. 2, northern portals.

[25] San Francisco Landmarks Preservation Advisory Board, 2002 Minutes, Minutes of Regular Meeting, May 15, 2002, http://www.sfgov.org/planning/lpab/m051502.htm. See also Section 15064.5(a)(2)-(3) of the CEQA Guidelines and the criteria outlined in Section 5024.1 of the California Public Resources Code.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) M.P. 03.19 and 04.27

P1. Other Identifier: Tunnel No. 3 (M.P. 03.19); and Tunnel No. 4 (M.P. 04.27)

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** San Francisco

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Francisco North **Date** 1956, revised 1973 **T** ___; **R** ___; __ ¼ **of Sec** ___; _____ **B.M.**

c. Address [No street number] City San Francisco Zip 94107

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

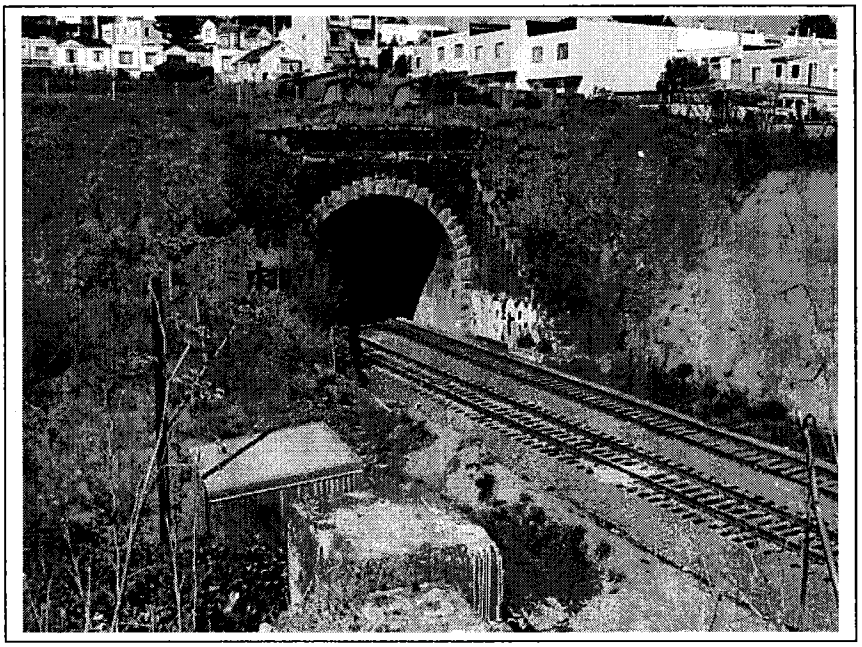
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This form address two railroad structures (Tunnel Nos 3 and 4) that are located in the City of San Francisco on the Caltrain railroad alignment. These tunnels are two of the original five tunnels installed by Southern Pacific along the route of the Bayshore Cutoff project between Potrero Hill and the ridge near Candlestick Point. Four of the tunnels are in use today. The northern end of Tunnel No. 1 (addressed on a separate form) is located at MP 01.33 and the southern end of Tunnel No. 4 is located at MP 04.27. Tunnel No. 5 was located in the hill at Sierra Point, but was abandoned in the 1950s with the realignment of Highway 101. Southern Pacific crews, as well as contractors hired by the railroad, built the tunnels between 1904 and 1907 as part of the company's ambitious Bayshore Cutoff project. (See Continuation Sheet).

***P3b. Resource Attributes:** (List attributes and codes) HP11 (Railroad Tunnels)

***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #) Photo 1, Tunnel #3, south portal, September 11, 2000

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1905-1907, JPB Bridge Book

***P7. Owner and Address:**
Peninsula Corridor Joint Powers Board,
P.O. Box 3006
1250 San Carlos Avenue
San Carlos, CA 94070

***P8. Recorded by:** (Name, affiliation, address)
Meta Bunse/Rand Herbert
JRP Historical Consulting Services
1490 Drew Ave, Suite 110
Davis, CA 95616

***P9. Date Recorded:** September 2000

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") Inventory and Evaluation of Historic Resources, Caltrain Electrification Project, San Francisco to Gilroy (MP 0.0 to 77.4)

***Attachments:** NONE ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list) _____

*NRHP Status Code 3

*Resource Name or # (Assigned by recorder) M.P. 03.19 and 04.27

B1. Historic Name: Tunnel Nos. 3 and 4

B2. Common Name: Tunnel Nos. 3 and 4

B3. Original Use: Railroad Tunnel B4. Present Use: Railroad Tunnel

***B5. Architectural Style:** Utilitarian

***B6. Construction History:** (Construction date, alteration, and date of alterations) 1904-1907

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** **Original Location:**

***B8. Related Features:** None

B9. Architect: Southern Pacific Company b. Builder: Southern Pacific Company

***B10. Significance: Theme** _____ **Area** _____
Period of Significance _____ **Property Type** _____ **Applicable Criteria** _____
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Southern Pacific constructed five tunnels on the San Francisco Peninsula as part of its Bayshore Cutoff project between 1904 and 1907. Four of these tunnels still exist as part of the Caltrain system and the two that appear to meet the criteria for listing on the National Register of Historic Places are evaluated on this form. While all four remaining tunnels are associated with the expansive improvement projects of E. H. Harriman who gained control of Southern Pacific in 1901, only Tunnel Nos. 3 and 4 appear to retain enough integrity to meet the significance criteria for eligibility under Criteria A and C. They appear to meet Criterion A as key elements of the Bayshore Cutoff, which was an important development in Southern Pacific's system-wide modernization at the turn of the twentieth century. They also appear to meet Criterion C for their distinctive architectural and engineering qualities. The tunnels are important for their unusual drift and core-bracing method of construction, as well as their use of decorative building materials in each portal's design. The following statement presents the historical context of the tunnels, followed by an evaluation of their historical significance. (See Continuation Sheet).

B11. Additional Resource Attributes: (List attributes and codes) N/A

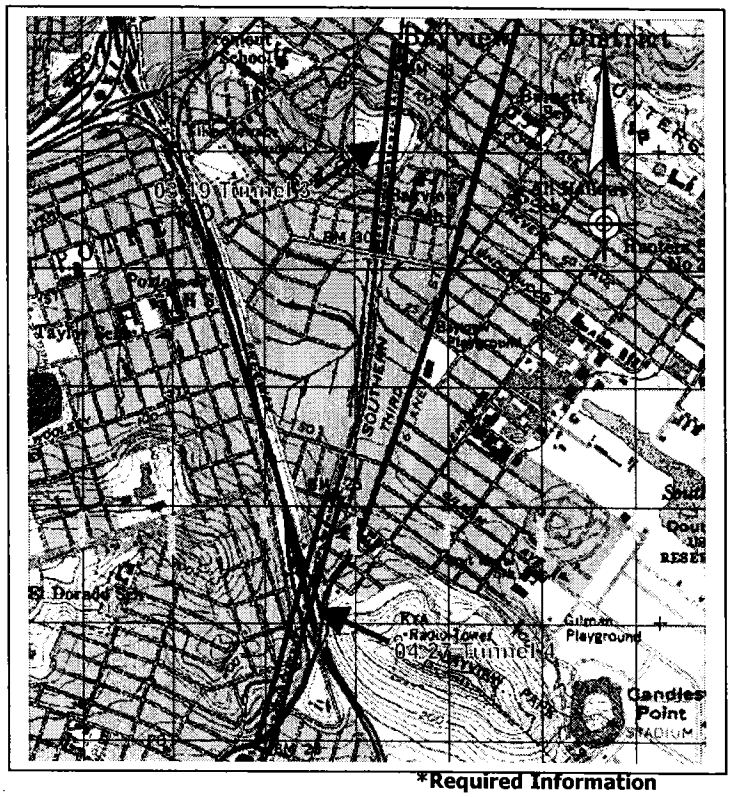
***B12. References:** California Railroad Museum, Bay Shore Railroad Photograph Files; John R. Signor, *Southern Pacific's Coast Line* (Wilton: Signature Press, 1994); Caltrain, Track Diagram (March 1, 2000); Amtrak West Engineering Services, 1999 Annual Inspection of Structures; JPB, Bridge Book: San Francisco to Lick, (1990).

B13. Remarks:

***B14. Evaluator:** Meta Bunse

***Date of Evaluation:** November 2001

(This space reserved for official comments.)



P3a. Description (continued):

The Bayshore Cutoff project consisted of the construction of a new segment of double main line track between San Francisco and San Bruno with almost 10,000 feet of tunnels, as well as major earthwork (both cuts and fills), steel bridges, and timber trestles. The five original tunnels were excavated through Potrero Hill (Tunnel Nos. 1 and 2), Hunter's Point hill, the ridge at Candlestick Point, and the hill at Sierra Point. The railroad company had acquired enough land to allow for future expansion to four tracks, but engineers designed the most of the tunnels as single bore openings to carry the two tracks of the new main line (Tunnels No. 1, 3, 4, and 5). Tunnel No. 2 was designed as a two bore tunnel that could handle up to four tracks because the nearby city street configuration and anticipated construction in the area immediately around Tunnel No. 2 made it more cost effective to build this tunnel to twice the capacity of the others.[1] The length of each of the existing tunnels is as follows:

Bridge Inspection Report (1990)

Tunnel No. 1	1,817 feet
Tunnel No. 2	1,086 feet
Tunnel No. 3	2,364 feet
Tunnel No. 4	3,547 feet[2]

The five tunnels built for the Bayshore Cutoff were among the most impressive elements of the project. These brick, concrete and stone structures bring the tracks through the steep hills and bluffs that make up rough coastline of the northeastern peninsula while remaining at an even, low gradient that never reaches an elevation of more than 20.3 feet above sea level. Crews excavated four of the five tunnels through various types of earth and rock, carting the debris away and delivering mortar and concrete using temporary narrow gauge tracks and ore carts. Industry trade journals reported on the project, noting that the construction technique employed on the tunnels was unusual. The bored tunnels were started by cutting several drifts beginning at the base of the tunnel opening and rising up to create an arch-shaped space around a center core of earth. Although the remaining core (roughly 18 feet high and 13 feet wide) did not directly support the newly created tunnel walls, the core served as a stable base against which false timbering could be braced during the construction process. The core was removed when the tunnel lining was finished. Tunnel No. 2 was the only one not built in this manner and it is the only double bore tunnel in the project. It was built by using the "cut-and-fill" method: cutting a trench through the hillside, building the two brick lined tunnels, and then filling the earth back in over the completed arches.[3]

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[1] Southern Pacific Bureau of News, "Historical Outline," typescript, [ca. 1932], 77; Board of Supervisors, *San Francisco Municipal Reports for the Fiscal Year 1903-1904, Ending June 30, 1904* (San Francisco: J. B. McIntyre, Printer and Bookbinder, 1905), 679-709; Steele, "The Spread of San Francisco: The New City ...," 116-118; "Construction on the Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* (October 20, 1906): 807-809; "The Bay Shore and Dumbarton Cut-Offs of the Southern Pacific," *The Railroad Gazette* 42 (March 15, 1907): 329; John R. Signor, *Southern Pacific's Coast Line* (Wilton: Signature Press, 1994), 32.

[2] JPB, "PCJPB Bridge Book: San Francisco to Lick" (printed November 29, 1990).

[3] Louis R. Miller, "The History of the San Francisco and San Jose Railroad," Master's thesis, UC Berkeley (1947), 100-104; "The Bay Shore and Dumbarton Cut-Offs of the Southern Pacific," *The Railroad Gazette* 42 (March 15, 1907): 329; "Construction on the Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* (October 20, 1906): 807-809.

When the crews finished the tunnels in late 1907, they ranged in length from 1,086 feet (Tunnel No. 2), to 3,547 (Tunnel No. 4) and each measured about 30 feet wide and 22 feet high from the finished tracks to the ceiling. The arches of the tunnels were lined with between four and six wythes of brick, while the floor and first eight to ten feet of the walls were poured concrete. A layer of packing (either gravel or concrete) separates the rock surface and the layers of common hard-burned red brick lining, which were centered on 10-inch wide steel I-beams joined at the top of the arch. The appearance of the tunnel portals is unified by the use of red brick and quarry-faced buff sandstone trim on the header wall and retaining walls that flank the openings. Each entrance differs in the treatment of additional retaining walls near the openings and the use of various materials for erosion control on the hillsides immediately around the portals. Crews installed irregular courses of square cut stone, for example, to hold back the earth on either side of the Tunnel No. 4 retaining walls, while tall board-formed concrete walls were constructed on the east side of each end of Tunnel No. 1.[4]

The current appearance of the tunnels varies from structure to structure, although each has varying amounts of spray-painted graffiti. The original brick and stone work of the portals is also visible in each of the tunnels (**Photographs 1-2**). The openings of Tunnel Nos. 3 and 4 are relatively unchanged, although residential and commercial construction is denser in the area around the tunnels than when they were first installed. The current condition of the tunnels is also discussed below in the discussion of historic integrity.[5]

B10. Significance (continued):

E. H. Harriman and the Southern Pacific Railroad

Tunnel Nos. 1, 2, 3, and 4 are associated with the expansive infrastructure development policies of Edward Henry Harriman who gained control of Southern Pacific in 1901. Harriman was from New York and had quit school to work in a Wall Street brokerage at the age of fourteen. He rose through the ranks of the brokerage fast enough to buy himself a seat on the New York Stock Exchange by the age of 22 in 1870. His marriage, in 1879, to the daughter of the president of the Ogdensburg & Lake Champlain Railroad introduced Harriman to railroad ownership and he soon turned his assertive business style to that industry. By 1887 he was vice president of the Illinois Central Railroad and ten years later he was a director of the Union Pacific Railroad, one of Southern Pacific's toughest competitors. When the last of Southern Pacific's founders, Collis P. Huntington, died in 1900, Harriman immediately made a bid for the railroad stock held by the his estate. It took the better part of a year to convince the various shareholders and associates to sell, but by March 1901 Harriman's Union Pacific had acquired 38% of Southern Pacific, a figure that would later rise to 46%.[6]

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[4] "The Bay Shore and Dumbarton Cut-Offs of the Southern Pacific," *The Railroad Gazette* 42 (March 15, 1907): 329-331; Rufus Steele, "The Spread of San Francisco: The New City ..." *Sunset Magazine* 19 (June 1907): 117-120; "Bayshore Cutoff," construction photographs, Southern Pacific Collection, Railroad Museum Library, Sacramento, CA.

[5] For safety and operational reasons JRP did not conduct a field inventory of the interior of the tunnels. The description of their current condition is based on field inspection of each of the portals and that portion of each tunnel visible from the exterior.

[6] Don Hofsommer, "For Territorial Dominion in California and the Pacific Northwest: Edward H. Harriman and James J. Hill," *California History* (Spring 1991): 31; Donovan L. Hofsommer, *The Southern Pacific, 1901-1985* (College Station, TX: Texas A&M University Press, 1986), 9-11. Collis Potter Huntington, the last of the "Big Four," died on August 13, 1900. Hopkins had died in 1878, followed by Crocker in 1888 and Stanford in 1893.

C. P. Huntington had left the Southern Pacific system in relatively good condition and had, in fact, been in the process of modernizing and improving both rolling stock and infrastructure when he died. Harriman was able to simply continue many projects that Huntington's engineers had already scheduled. Versions of the Bayshore Cutoff had been suggested since the 1870s, but the railroad could not justify the high cost of its construction along rugged shoreline until thirty years later, just as Harriman took over the company. His contribution to system-wide improvements during his control (1901-1909), as well as the scale of the projects he directed, proved to be unprecedented. He added 960 route miles, more than 120 miles of second track, and almost 1,100 miles of sidings during his tenure. This work included impressive changes to the Overland Route from Roseville, California, to Ogden, Utah, including a huge "cutoff" project designed to minimize travel time, grades, and track curvature – and therefore reduce operating expenses – between Lucin and Ogden, by crossing the Great Salt Lake. This Lucin Cutoff, and two similar projects in California, the Montalvo Cutoff (skirting the south side of the Santa Susana Mountains in Ventura and Los Angeles counties) and the Bayshore Cutoff just south of San Francisco, were some of the most remarkable of his undertakings. Like many of Harriman's accomplishments, these plans had all been studied for years, but Harriman was able to push the projects through quickly, completing the Lucin and Montalvo cutoffs in 1904, and the Bayshore in 1907.[7]

The idea of building a cutoff that ran along the shore of San Francisco Bay had been considered since the railway was first constructed and Southern Pacific had even performed feasibility studies in 1873 and again in 1878. The railroad purchased some land for the right-of-way, but concluded that traffic volume at that time would not justify the large expenditure of building the by-pass. Over the years, the numbers of rail passengers and the amount of freight shipped steadily increased and Southern Pacific used longer trains and carried progressively heavier loads on its Ocean View line to meet the demand. Helper engines were necessary for trains climbing San Bruno Mountain to Ocean View, the line's high point at 293 feet in elevation, but the company got no sympathy from San Franciscans who complained bitterly about the length and frequency of the freight trains that barreled through their neighborhoods, as well as the soot and smoke they brought. By 1901 29 first class trains traveled the Ocean View line every day. With this amount of traffic, congestion was inevitable because it was a single-track line, except for a short distance between 19th and Harrison and the terminal. Finally in 1899, C. P. Huntington decided to construct the segment that became known as the Bayshore Cutoff, but these plans were delayed again when he passed away the following year, leaving implementation to Harriman.[8]

Harriman, as noted above, immediately committed the company to several improvement projects throughout the west and in preparation for the Bayshore, he ordered a second track installed on the existing main line between San Jose and San Bruno. The 39 miles of new track, including new grade separations and other structures, was ready by late 1903.[9] With this improved infrastructure in place, the company began the extensive work necessary

[7] Hofsommer, *The Southern Pacific, 1901-1985*, 15-19, 50.

[8] "S. P. Ocean View Line" *The Western Railroader* 41 (September 1978): 3; Signor, *Southern Pacific's Coast Line,* 32-33.

[9] "S. P. Ocean View Line," 3; Signor, *Southern Pacific's Coast Line,* 32-33. Examples of structures built during this period of modernization on the line between San Bruno and San Jose are located in the City of San Mateo. Situated along Railroad Avenue at the north end of town, north of San Mateo Creek, there are four single-span through girder underpasses that carry the double tracked rail line over local roads: East Poplar Avenue, East Santa Inez Avenue, Monte Diablo Avenue, and Tilton Avenue. The American Bridge Company of New York designed these four nearly identical underpasses and Southern Pacific installed them in 1903 as part of its double-tracking project. The American Bridge Company became one of the most influential steel manufacturers and constructors in the country and in California, the company was responsible for between 25 to 45 percent of metal truss bridges between the 1910s and 1930s. See California Department of Transportation, *Historic Highway Bridges of California* (1990), 43; and American Bridge Company, "100 Years of Innovation," www.americanbridge.net/html/history.htm, (n.d.), accessed October 2000.

for the cutoff, including the trestles, cuts, fills, and tunnels. The City of San Francisco largely left the engineering and construction of the tunnels to Southern Pacific's engineers during the design phase, but the city did mention the tunnels in its January 1904 franchise to the company for construction of the Bayshore Cutoff:

> ...Tunnel for double track or an additional tunnel or tunnels for an additional double track or additional double tracks, shall be suitably lined, wherever required by the nature of the ground through which such tunnel or tunnels are constructed, with a suitable thickness of stone or brick or concrete masonry or by combinations of said kinds of masonry.[10]

Southern Pacific's own "Bureau of News," described the Bayshore Cutoff project several years later in a summary of the company's history produced in house in about 1932:

> The most important single piece of construction on the main line, and one of the most expensive pieces of railroad ever built, was the Bayshore Cutoff, 9.81 miles between San Francisco and San Bruno, completed at a cost of almost a million dollars a mile. The cut-off replaced the old line built in 1863 over the San Bruno hills through Colma, shortening the distance 2.65 miles, reducing maximum grade from 158 to less than 16 feet per mile, and eliminating nearly 600 degrees of curvature ... It provided Southern Pacific with adequate terminal facilities and easy access to the heart of San Francisco ... The expenditure of $20 million on the Lucin, Bayshore and Montalvo cut-offs may seem extravagant for improvements in only three places, but the savings in operating expenses made possible by these betterments was equal to from 8 to 10 percent on the money invested in them.[11]

Tunnel Construction

The history of railroad tunnel construction in the United States began in 1834 when the first such structure was completed in Pennsylvania. By the turn of the century, tunnels were a relatively common structure in railroad systems worldwide. In fact, some of the longest tunnels in the world were constructed before 1930, such as the Simplon I and II linking Switzerland and Italy in 1906 and 1922 respectively via two 12.3 mile long bores, the Cascade tunnel in Washington state (completed in 1929 with a length of 7.8 miles), and the 6.2 mile long Moffat tunnel in Colorado that was finished in 1928. At the time that Southern Pacific was constructing the Bayshore Cutoff (1904-1907), railroad engineers had mastered the process well enough that they were able to design complex and technologically advanced tunnels that minimized the steep grades of alignments installed during the early years of railroading. The Spiral Tunnels on the Canadian Pacific Railway main line in British Columbia exemplify this type of accomplishment. These two tunnels enabled the line to cross Cathedral Mountain and Mt. Ogden on a 2.2% grade, eliminating the original 5.5% grade, and each completes a full turn to exit 48 to 50 feet below its own entrance.[12]

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[10] Board of Supervisors, *San Francisco Municipal Reports for the Fiscal Year 1903-1904*, 704.

[11] Southern Pacific Bureau of News, "Historical Outline," typescript, [ca. 1932], 77-78.

[12] Ernest H. Robl, "Longest Railroad Tunnels in the World," revised June 15, 2000, www.robl.wl.com, accessed October 26, 2000; "Today in American History," americanhistory.about.com, accessed October 26, 2000; "The Spiral Tunnels," *Engineering News* Vol. 1 (1907): 424.

Southern Pacific was also engaged in other tunnel projects at the turn of the twentieth century, with its own crews and hired contractors working elsewhere in California. In order to complete its Coast Line, which was nearly completed except for a gap between Paso Robles and Santa Barbara, the company had to install seven tunnels in the rugged Santa Lucia Mountains near San Luis Obispo. Constructed during the 1890s, the tunnels ranged from 270 feet to 3,700 feet long. Further south, Southern Pacific's new director H. E. Harriman also oversaw the completion of the Santa Susana (later the Chatsworth) Tunnel northwest of Los Angeles, just before he authorized the Bayshore Cutoff. The tunnel was excavated through the Santa Susana Mountains for a distance of about 7,400 feet, which made it the longest tunnel on the Pacific Coast when the first train passed through it in 1904. At that time only a few tunnels in the world were longer. Like four of the five tunnels of the Bayshore Cutoff, crews excavated the Santa Susana tunnel through rock and approached the project from both ends to meet in the center.[13]

Work on the Bayshore Cutoff began in 1904 and continued for three years, opening for traffic in December 1907. Although the keystones read 1905 and 1906, Tunnel Nos. 1 and 4 were essentially completed in 1905, Tunnel Nos. 3 and 5 in 1906 and Tunnel No. 2 in late 1907. Southern Pacific's chief engineer, William Hood, oversaw the design and construction of the project, along with assistant engineer W. E. Marsh.[14] Both of these men had extensive experience in railroad engineering and just wrapped up work on the series of Santa Lucia tunnels that had helped Southern Pacific close the gap in its Coast Line in the 1890s and the Montalvo Cutoff in 1904. The Bayshore Cutoff construction crews consisted mostly of company forces, including the cuts, filling, bridges, tunnels, and trestles, except for contractors hired to perform the grading and to build Tunnels No. 2 and No. 5. At a cost of nearly $1 million per mile, the 9.81-mile cutoff was one of the most expensive pieces of railroad ever built. The shoreline route between San Bruno and San Francisco shortened the distance, reduced curvature, and reduced the maximum grade from 158 feet per mile to less than 16. As noted above, the five tunnels had a combined length of almost 10,000 feet and additional earthwork had been necessary in the large cut at Visitacion Point where about 750,000 yards of soil and rock were removed. This excavated material augmented dredged fill material from the bottom of bay, both of which were used to create a large, flat area just north of the point for construction of the Bayshore freight yard. The new Bayshore route had far fewer grade crossings than the old line and included new passenger stations at 23rd Street, Army Street, Paul Avenue, Bayshore, Visitacion, and South San Francisco before joining the old alignment at San Bruno.[15]

Before the Bayshore Cutoff was completed, San Francisco suffered the worst natural disaster in California history, the great earthquake of April 18, 1906. The quake struck at just after 5 o'clock in the morning and although crews were working at many locations along the cutoff, none of the 1,000 to 1,500 men were hurt. Accounts differ

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[13] Loren Nicholson, *Rails Across the Ranchos,* Centennial Edition (San Luis Obispo, CA: California Heritage Publishing Associates, 1993), 133-138; Robert Charlton, "The Story of a Great Tunnel," *Sunset* (July 1904): 219-224; Southern Pacific Bureau of News, "Historical Outline," 77-78.

[14] William Hood started working for Southern Pacific's predecessor, the Central Pacific, in 1867 and helped design that company's early routes in the Central Valley and throughout the west as the system expanded. Hood had overseen not only the formative years of the company, but Harriman placed him at the head of the improvement program during his tenure as well (Hoffsommer, *The Southern Pacific, 1901-1985*, 26-27).

[15] Southern Pacific Bureau of News, "Historical Outline," 77; "Bayshore Cutoff," construction photographs, Southern Pacific Collection, Railroad Museum Library, Sacramento, CA; Board of Supervisors, *San Francisco Municipal Reports for the Fiscal Year 1903-1904, Ending June 30, 1904* (San Francisco: J. B. McIntyre, Printer and Bookbinder, 1905), 679-709; Nicholson, *Rails Across the Ranchos,* 133-138; Rufus Steele, "The Spread of San Francisco: The New City ..." *Sunset Magazine* 19 (June 1907): 116-117; "Construction on the Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* (October 20, 1906): 807-809; "S. P. Ocean View Line" *The Western Railroader* 41 (September 1978): 3.

regarding the condition of the construction itself, however, work resumed to rebuild Tunnel No. 2 in 1907 and it was completed by November of that year.[16]

Regardless of the condition of the incomplete cutoff project, the intact original main tracks (the Ocean View Line) had suffered no serious damage in the quake and provided a crucial link between the fire-ravaged city in the days following the disaster. Southern Pacific lost its own main office building at Fourth and Townsend and with it valuable company records, but Harriman and other company officials responded immediately to bring in relief supplies and humanitarian aid. As the fires worsened Southern Pacific brought thousands people out of harms way, both by ferry and by train – 1,073 carloads of San Franciscans on April 19th alone. The company also put crews to work laying temporary track directly on the surface of streets and began hauling away debris. Harriman announced that his company would do everything it could to help restore and rebuild the city, and he made good on the promise. Southern Pacific carried 224,000 passengers and hauled in about 35,000 tons of relief supplies free of charge for two weeks following the disaster, as well as carrying passenger traffic on the peninsula without charge for over a month.[17]

Southern Pacific saw the opening of the Bayshore Cutoff in late 1907 as proof of its commitment to the restoration of the city. While the old Ocean View route was soon in decline, the new cutoff immediately improved passenger train times into the city. A peninsula commuter tradition began at this time that continues today. The passenger service between San Francisco and San Jose had always been popular, but the new line substantially improved travel time between the two cities and the smaller communities in between where many quake victims had resettled. Southern Pacific's *Sunset Magazine* raved about the project that would allow businessmen to make the trip in just over an hour and promoted the general benefits of 30 to 40 daily commuter trains. The boasting of the railroad's magazine was often excessive, but demonstrated the significance of the company's investment, and the importance of showing that San Francisco was a modern city, successfully recovering from the disastrous quake and fire:

> The man who never has more than three figures in his bankbook has not been slow to grasp his opportunity, and now ... the music of his welcome will be the glad greeting of his wife and babes at the door of a cottage, and he will be carried thither, together with scores of his friends each as happily possessed as himself, over a highway of steel that runs straight from his workshop in the city to his home in a wood. He is no longer a prisoner within municipal gates because of the time which it takes to travel to and from the beloved country.[18]

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[16] "Construction on Bay Shore Line of the Southern Pacific Co.," *The Railway and Engineering Review* 46 (October 20, 1906): 809; Steele, "The Spread of San Francisco: The New City ...," 120; "Bayshore Cutoff," construction photographs, SP Collection, Railroad Museum Library, Sacramento, CA; Signor, *Southern Pacific's Coast Line*, 37; Stindt, "Peninsula Service," 19.

[17] Fred A. Stindt, "Pennisula (sic) Service: A Story of Southern Pacific Commuter Trains," *The Western Railroader* 20 (1957): 17-19; Hofsommer, *The Southern Pacific, 1901-1985*, 34-37. Southern Pacific employees Alvin Speer, a conductor, and Tom Cantwell, an engineer, were based in San Francisco when the quake hit. They ran the first train out of the city on April 19th in search of water for steam trains and survivors, but found that "every wooden water tower between San Francisco and Soledad had been flattened." [Bob Donohue, "Earthquake Express from San Francisco," *Westways* (April 1961): 14-15].

[18] Quote from: Rufus Steele, "The Spread of San Francisco: The Story of the Enchanted Garden down the Peninsula ..." *Sunset Magazine* 19 (September 1907): 440. Also: Rufus Steele, "The Spread of San Francisco: The New City ..." *Sunset Magazine* 19 (June 1907); Larry Green, "San Francisco to San Jose: SP's Commuter Operation is a One of a Kind," *Rail Classics* 9 (January 1980): 53.

Application of National Register Criteria of Significance

No matter how effusively his company described the project, Harriman's Bayshore Cutoff was impressive. The double tracked alignment included 10,000 feet of tunnels, six iron bridges, six timber trestles (one stretching 3,500 feet from Army Street to about Jerrold Avenue), and a new hump yard created on the newly filled Visitacion Bay site. The cutoff was the shortest of his three major route bypass projects at under 10 miles long (the Lucin Cutoff was more than 100 miles long), but it was the most expensive per railroad mile constructed until that time – nearly $1 million per mile. It had also survived the one of the largest natural disasters to ever hit California. Southern Pacific's Chief Engineer, William Hood, who had worked for the Central Pacific during the construction of its initial Central Valley route in the 1870s, stayed with the company when it was taken over by Southern Pacific, and had just completed the Coast Line before overseeing the Bayshore Cutoff. Hood admired Harriman's contributions to the physical plant and felt that his legacy of expansion and modernization ensured that Southern Pacific would retain its prominence in western transportation. The cutoff also represented an important step in the development of transportation in the City of San Francisco, as well as the passenger and freight rail service on the peninsula and southern Bay Area. Furthermore, the project as a whole exemplifies the accomplishments of early railroad engineers like Hood and the tunnels themselves are the components of the cutoff that made it possible to maintain the even grade that was the goal of the project. As historian Carl Condit noted, "the physiography of the American continent stimulated most powerfully the ingenuity of engineers and builders" during the nineteenth and early twentieth centuries and the original tunnels, trestles, and earthwork used to make the Bayshore Cutoff possible are no exception. For these reasons, the tunnels appear to be historically significant under Criterion A, as a resource associated with an important event or historic trend. Not all of the tunnels, however, appear to retain historic integrity (see below).[19]

The tunnels embody the distinctive characteristics of a method and type of construction and for this reason appear to meet the criteria of significance under Criterion C. The railroad press reported that the Southern Pacific crews who installed the tunnels used an unusual construction method that involved excavating an arch-shaped tunnel and leaving a core of earth in place along the center. The builders used this core as a stable base for false timbering that helped to support the walls and ceiling of the tunnel during the application of the brick lining. Research conducted thus far has not revealed other railroad tunnels constructed in this manner, however, it is important to note that this distinction applies only to the original Tunnel Nos. 1, 3, 4, and 5 and does not apply to Tunnel No. 2, which was produced through the cut and fill method. In terms of the type of construction, the lining itself appears to be an unusual choice because most of Southern Pacific's tunnels from this time period had timber frame lining. Furthermore, the tunnels are also distinctive in that the portals are accentuated by parapeted brick header walls and retaining walls edged with quarry faced buff sandstone. The peninsula tunnels are not the only Southern Pacific tunnel to be decorated in this manner, but most of the other tunnels in the Southern Pacific system dating to this period were unadorned, probably due to their remote and isolated locations. The tunnels of the Bayshore Cutoff probably received more aesthetic attention because they were located in and near the more populated vicinity of the City of San Francisco. The tunnels appear to meet the criteria for significance under Criterion C

[19] Hoffsommer, *The Southern Pacific, 1901-1985,* 14; Carl W. Condit, *American Building Art: The Nineteenth Century* (New York: Oxford University Press, 1960), 5; National Park Service, "How to Apply the National Register Criteria for Evaluation," *National Register Bulletin No. 15* (Washington, D.C.: 1991), 12.

because they embody distinctive characteristics of a method and type of construction. Not all of the tunnels, however, appear to retain historic integrity (see below).[20]

Although the four remaining tunnels are important within the historical context of early twentieth century railroading, and the E. H. Harriman era of the development of the Southern Pacific Railroad (1901-1909), only Tunnels 3 and 4 appear to retain enough historic integrity to support eligibility for the National Register of Historic Places (**Photographs 1-2**). The seven aspects of historical integrity are: location, design, setting, materials, workmanship, feeling, and association. A resource can only convey its historic significance if it retains enough integrity in these areas, however, determining the degree to which a resource meets these aspects can be a subjective judgment. Because the tunnels were designed and constructed as part of a larger unit, namely the Bayshore Cutoff from San Francisco to San Bruno, their integrity should also be considered within this context. The seven aspects of integrity are addressed below:

Location. Tunnel Nos. 3 and 4 have not been moved and retain their integrity of location.

Design. Tunnel Nos. 3 and 4 served as part of Southern Pacific's peninsula commute and freight line from the time they opened to traffic in 1907 until Caltrans took over operation of the line in the 1980s. Despite various changes to the operating agencies during the 1990s, both continue to serve as railroad tunnels. The engineering features of the tunnels have been somewhat modified since they were originally installed. At some point prior to 1966 shotcrete was applied to the surface of the interiors of the tunnels where the original surface had been the exposed red brick and concrete of the walls and arches. The tracks in Tunnel 3 were reconstructed in 1999. The cumulative effect of these modifications leads to the conclusion that while Tunnel Nos. 3 and 4 have suffered some insults to their design, the changes made have not altered the structures' essential physical feature that contribute to their historic integrity.

Setting. To some degree, industrial and residential development have compromised the integrity of setting for all of the tunnels, (Tunnel No. 5 was abandoned when the railroad was rerouted at Sierra Point to make way for new Bayshore freeway construction in the 1950s; it is no longer part of the peninsula rail line and is not part of this survey). This development is not immediately adjacent to the portals of Tunnel Nos. 3 and 4, and its presence nearby does not appear to have substantially destroyed the original setting of these two tunnels.

Materials and Workmanship. The shotcrete surfacing of the tunnel interiors and the rebuilding of the tracks in Tunnel No. 3 represent a minor loss of integrity, but the fact that most of each tunnel is underground and not readily visible, puts more emphasis on the portals, where materials and workmanship are apparent. Here the tunnels retain most of the brick and decorative stonework of the original construction. Tunnel Nos. 3 and 4 have good levels of integrity in this area.[21]

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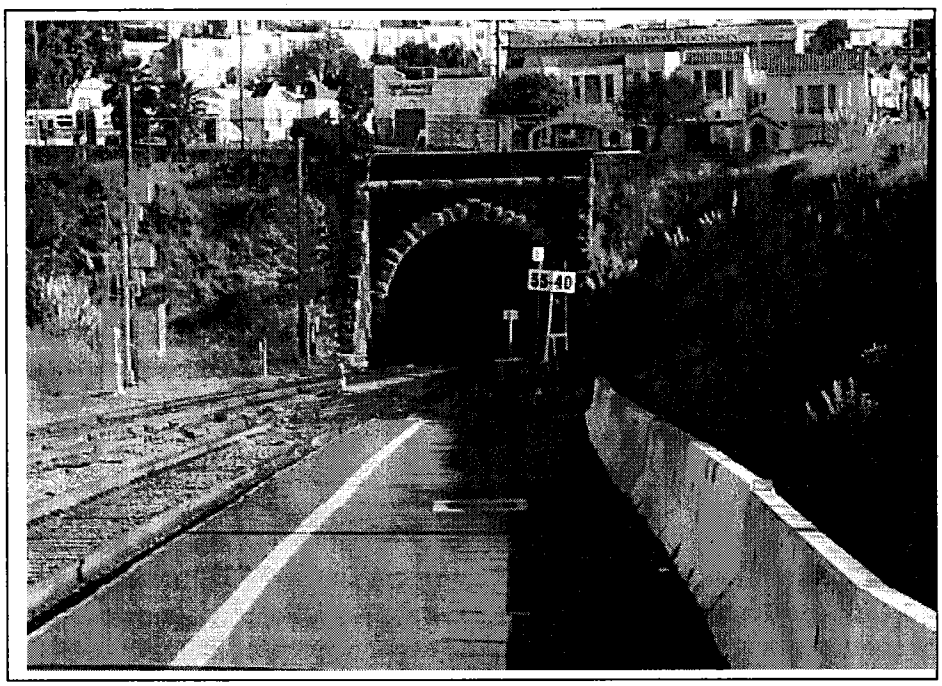
[20] By the 1930s, the Southern Pacific system included 196,260 linear feet of tunneling, or about 37 miles of its nearly 13,000 route miles. Most of the tunnels were timber lined, but in the 1920s the company began a concrete lining program and had completed about 27,000 feet of lining by 1931. "Fourteen Years of Tunnel-Lining Work on the Southern Pacific," *Railway Engineering and Maintenance* (July 1931): 632-637; Hofsommer, *The Southern Pacific, 1901-1985*, 116, 120.

[21] *San Francisco Chronicle* (July 30, 1999): A20; Caltrain, "Quarterly Capital Program Status Report, Jan. 1 - March 31, 2001," http://www.caltrain.com/caltrain/quart_rapid.html.

Feeling and Association. These aspects are the most subjective of the seven and for this reason cannot be the only aspects to support a resource's eligibility. Original materials, design, and workmanship are evident at the tunnel portals and this lends to the historic feeling of Tunnel Nos. 3 and 4. The association, or link between a resource and the historic events and people of its context, "requires the presence of physical features that convey a property's historic character," and again, Tunnel Nos. 3 and 4 retain enough setting, materials, workmanship and feeling to convey the association with railroad engineering and their distinctive property type.

In conclusion, Tunnel Nos. 3 and 4 have suffered some insults to their integrity, but these changes are not extensive. Tunnel Nos. 3 and 4, therefore, appear to meet the significance criteria for eligibility for listing on the National Register of Historic Places under Criteria A and C. Furthermore, these structures have been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and both tunnels appear to meet the significance criteria as outlined in those guidelines.

Photographs



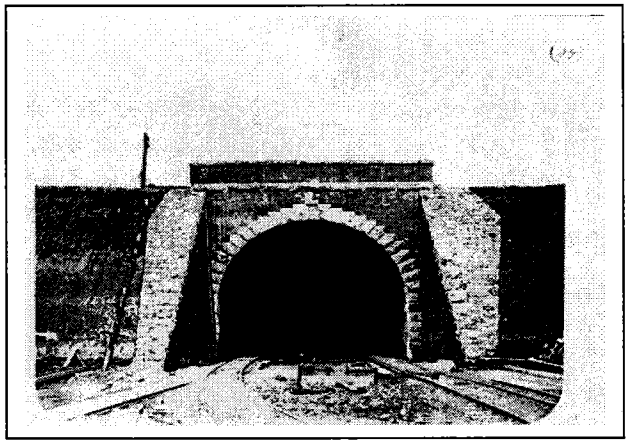
Photograph 2. Tunnel No. 4, southern portal.

ATTACHMENT D

Peninsula Corridor Electrification Project, 3rd Addendum Findings of Effect Report (Excerpts)

3RD ADDENDUM FINDING OF EFFECT
PENINSULA CORRIDOR ELECTRIFICATION PROJECT

DIRECTIVE # WD 7428



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September 2015

Chapter 1
Executive Summary

This document is the third addendum to the Finding of Effect (FOE) for the Peninsula Corridor Electrification Project (PCEP). The original FOE was prepared in September 2002, the first Amendment FOE was prepared in May 2003, and the second amendment FOE was prepared in August 2008.[1, 2,3] The prior FOE, as amended, concluded that the project would have no adverse effect on historic properties identified within the Area of Potential Effect (APE) for the project, as defined at the time.

The Project is the electrification of the Peninsula Corridor which is owned by the Peninsula Corridor Joint Powers Board (JPB). The JPB is a public transportation agency, funded jointly by the City and County of San Francisco, the San Mateo County Transit District and the Santa Clara Valley Transportation Authority. The purpose of the project is to provide electrification improvements to commuter rail service within a corridor between San Francisco and the City of San Jose. The JPB is seeking funding for construction and rolling stock from the Federal Transit Administration (FTA), which is the lead Federal agency for the undertaking.

This addendum addresses effects to a number of National Register of Historic Places (NRHP) eligible properties due to certain changes in the APE, project description, design commitments, and further investigation. Changes in the APE were documented in a revised Historic Resources Inventory and Evaluation Report (HRIER) prepared by ICF and submitted to the State Historic Preservation Office (SHPO) by FTA earlier in 2015. This Addendum FOE presents conclusions of analysis based upon application of the Criteria of Effect and Adverse Effect as they appear in 36 CFR 800.5 and follows the guidelines for documentation in 36 CFR 800.11. It is concluded that the project will have no adverse effects on the identified historic properties within the revised APE.

For four historic railroad tunnels in San Francisco (Tunnel Nos. 1, 2, 3, & 4), three effects are proposed but none are found to be adverse effects:

1. Installation of electrical infrastructure attached to the shotcrete[4]-clad, vaulted tunnels' ceilings (for all four tunnels) will require the removal of some historic bricks where the shotcrete is not sufficiently deep to anchor the electrical infrastructure bolts. Historic brick inside the tunnels may also be removed due to raising the vault height at Tunnels No. 1 and No.2 by 0.25' and at Tunnel No. 4 by up to 1.75' (no raising of the vault height is necessary at Tunnel No. 3). The total amount of existing historic brick liner to be removed by the project will be as follows: Tunnel 1 (3%), Tunnel 2 (3%), Tunnel 3 (2.5%), and Tunnel 4 (5%). The depth of brick removal would range up to 6 inches for Tunnels 1 to 3 and up to 19 inches in certain locations in Tunnel

[1] JRP Historical Consulting, "Finding of No Effect and No Adverse Effect: Caltrain Electrification Project," prepared by Rand F. Herbert for Parsons Transportation Group, September 2002.

[2] JRP Historical Consulting, "1st Amendment Finding of No Effect and No Adverse Effect: Caltrain Electrification Project," prepared by Meta Bunse for Peninsula Corridor Joint Powers Board, May 2003.

[3] JRP Historical consulting, "Addendum Finding of Effect, Caltrain Electrification Project", prepared by Meta Bunse for Parsons Transportation Group and Federal Transit Administration. August, 2008.

[4] Shotcrete is concrete applied pneumatically by hose at high velocity onto a surface, as a construction technique. It is reinforced by conventional steel rods, steel mesh, and/or fibers. Fiber reinforcement is also used for stabilization in applications such as tunneling.

4 (the majority of brick encroachment in Tunnel 4 would be less than 12 inches). The historic bricks inside the tunnel were covered in shotcrete in 2004 as part of a safety improvement project which was not associated with the Project Installation of electrical infrastructure structural supports. This modification will alter some brick work that is already obscured by shotcrete and is not visible to the public from the vantage of a train or by other means. Therefore, the brick feature in the tunnels is not able to convey association with the tunnels' historical significance under current or proposed conditions. The proposed modification is **not an adverse effect.**

2. Increasing the vault height of Tunnel No. 4 by up to 1.75' will also result in the removal of some of the tunnel portals' voussoir-set stones and keystones. The proposed structural system at the portals involves full brick liner removal for a transition area of 5 to 10 feet away from the portals just inside of the headstone. The existing brick liner in this area will be replaced with a reinforced concrete arch. Caltrain anticipates the concrete arch will be approximately 18 inches thick and will be shaped to provide the necessary clearance. The proposed process for removal and relocation of the portal stone includes the steps described below (which may also be adopted for the other tunnel portals as well depending on necessary encroachment depths).

   Step 1: Cut and store 4 inches off of the face of the historic arch. Install angle ledgers to support the brick above the headstone. Remove one width of brick layer above the arch stones (approx. 4 inches including the mortar).

   Step 2: Cut and remove the underside of the historic arch to a depth of the maximum encroachment depth plus an additional 1-inch. The additional inch of the stone shall be removed (cut side) and will be replaced with mortar when the underside of the stone is replaced.

   Step 3: Install the facing of the stones which were removed from Step 1 at the new arch elevation and install the reduced underside stones to the existing stone as a veneer with ties. Pour a concrete block at each side of the arch base.

   Step 4: Restore the brick exterior with the saved bricks

   See Appendix C – Portal Modification Drawing Set for a graphic of the tunnel portal construction method. The retention of the original facing stones of the portal arches and their reinstallation and, where necessary, replacement in kind at approximately 1.75' higher resolves the adverse effect of their removal. The historical design materials are maintained, as is the historic properties' ability to convey its historical associations and significance. The proposed modification is **not an adverse effect.**

3. Installation of Overhead Contact System (OCS) poles near the mouth of the tunnel portals (all four tunnels) will have no direct physical effect but will affect the visual setting of the tunnel portals, although they are not readily visible to the public under existing or proposed conditions. The installation of OCS poles near each portal represents an insignificant change to the setting of the historic properties. The proposed modification is **not an adverse effect.**

In addition, two historic landscape features evaluated as NRHP-eligible are El Palo Alto and the Jules Francard Grove. Although the trunks of El Palo Alto and the Jules Francard Grove trees lie outside the railroad right-of-way (ROW), the limbs of these trees reach into the ROW. Project effects include trimming of El Palo Alto and up to 30 trees in the Francard Grove where branches that encroach within the Electrical Safety Zone (ESZ) which is nominally 10 feet from the OCS pole. In addition, at the Jules Francard Grove, providing ESZ clearance may require removal of one of the trees in the

grove but the JPB will require replanting of a blue gum eucalyptus in the grove nearby to replace the removed tree. Previous NHPA processes failed to evaluate or identify effects to El Palo Alto or the Jules Francard Grove. Trimming the lower branches of the El Palo Alto redwood tree and of the Jules Francard Grove's blue gum eucalyptus trees and removal and replacement of one of the Francard Grove trees would pose an insignificant change to these growing, living historic landscape features. The proposed action within the ESZ does not diminish either property's ability to convey its historical associations or significance and effects on both historic properties are **not adverse effects.**

The JPB has advanced the design of the OCS further and has modified the specific pole design accordingly which results in minor changes in the characterization of effects to certain historic stations, overpasses and underpasses.

Proposed pole design commitments relative to eight historic stations (from north to south: Millbrae, Burlingame, San Carlos, Atherton, Menlo Park, Palo Alto, Santa Clara and San Jose Diridon) have changed. Headspan poles were presumed in the prior FOE at some of the historic stations but are no longer proposed in mainline sections of the project corridor. Headspan poles result in greater fluctuation in operating wire height and as such are now only proposed for use in slow speed areas, namely the San Jose Diridon Station and at the Central Equipment Maintenance and Operations Facility (CEMOF, not a historic structure). In addition, through the CEQA historic resources review, the specific placement of poles near historic stations has been better defined in order to minimize the placement of poles in front of or near historic station structures, thereby reducing potential effects to the settings of the historic properties. None of the proposed poles would require modification of any of the historic elements at the historic stations. The current proposed design as specified by the design commitments adopted through the CEQA process would not diminish the historic stations' ability to visually convey their historic associations or significance and effects to the historic stations are **not adverse effects.**

Proposed pole design commitments relative to certain historic overpasses and underpasses have also changed. Headspan poles were presumed in the prior FOE at some of the historic structures but are no longer proposed in mainline sections of the project corridor. Some of the proposed non-headspan pole designs have also changed. None of the proposed poles would require modification of any of the historic elements at the historic overpasses and underpasses in a way that would diminish their historical integrity and their NRHP eligibility or their ability to contribute to a historic district (for certain resources). The current proposed design as specified by the design commitments adopted through the CEQA process would not diminish the historic structures' ability to convey their historic associations or significance and effects to the historic overpasses and underpasses and are **not adverse effects.**

Previous studies include the 2002 and 2008 inventory and evaluation reports by JRP pursuant to NHPA and the 2013 inventory and evaluation by ICF International (ICF) to satisfy California Environmental Quality Act (CEQA) requirements. In 2015, ICF prepared a Historical Resources Inventory and Evaluation Report (HRIER) to assess the potential for the project, as refined in 2015, to affect built environment resources for the purposes of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act of 1966 as Amended (NHPA). Historic properties included are buildings, structures, objects, districts, and linear features eligible for listing in the National Register of Historical Places (NRHP) or any resources considered historic for the purposes of NHPA. NHPA requires federal agencies to take into consideration the effects of federally funded undertakings on historic properties.

Archaeological properties have been addressed by the 2009 Programmatic Agreement Among the Peninsula Joint Powers Board, the Federal Transit Administration, and the California State Historic Preservation Officer Regarding Implementation of the Caltrain Electrification Program, San Francisco San Mateo, and Santa Clara Counties, California. As such, the Joint Powers Board (JPB) and FTA have chosen to implement a phased identification and evaluation pursuant to 36 CFR § 800.4(b)(2) and 800.14(b). Therefore, the FOE and both FOE amendments do not address effects to archaeological resources.[5]

[5] Programmatic Agreement Among the Peninsula Joint Powers Board, the Federal Transit Administration, and the California State Historic Preservation Officer Regarding Implementation of the Caltrain Electrification Program, San Francisco, San Mateo, and Santa Clara Counties, California. 2009.

Chapter 4

Historic Properties Descriptions and Effects Analysis

The 3rd Addendum FOE addresses effects to certain NRHP-eligible properties. The properties are four railroad tunnels in the City of San Francisco, the El Palo Alto redwood tree in Palo Alto, the Jules Francard Grove in Burlingame, eight historic stations and a number of historic overpasses and underepasses.

4.1 Tunnel Nos. 1, 2, 3, & 4

4.1.1 Resource Descriptions

Effects are proposed for historic railroad tunnels Nos. 1, 2, 3, & 4 in San Francisco. These tunnels are amongst the five tunnels installed by Southern Pacific Railroad (SPRR) along the route of the Bayshore Cutoff project between Potrero Hill and the ridge west of Candlestick Point. The tunnels were constructed by SPRR crews and contractors hired by SPRR between 1904 and 1907. The tunnels are distinctive for their engineering qualities including drift and core-bracing method of construction, as well as architecturally for their decorative portal arches.

Changes to the tunnels after their period of significance, 1904 to 1907, include industrial and residential development closer to the portals. All four tunnels were reinforced with shotcrete on inside walls and vaulted ceilings in 2004. Tunnel Nos. 1, 2, 3, & 4 are evaluated as eligible to the NRHP under Criteria A and C. (HRIER, ICF International. April 2015.)

4.1.2 Effects Analysis

The Project includes potential tunnel and track modifications necessary to provide adequate vertical clearances for both passenger and existing freight operations. The amount of additional clearance, depending on location, varies from 0.25 to 1.75 feet. These improvements could include potential "notching" of the tunnels' vaults (i.e., minor removal of shotcrete and tunnel vault bricks), in Tunnel 4 full brick liner removal for a transition area of 5 to 10 feet away from the portals just inside of the headstone with the existing brick liner replaced with a reinforced concrete arch, the insertion of a concrete arch approximately 18 inches thick where the bricks are removed, horizontal realignment of tracks to maximize vertical clearance, and potential lowering of the track grade. Installation of OCS attached to the shotcrete-clad, vaulted tunnels' ceilings will require the removal of some historic bricks where the shotcrete is not sufficiently deep to anchor the electrical infrastructure bolts. The historic bricks inside the tunnel were covered in shotcrete in 2004, an alteration not associated with the Project. The total amount of existing historic brick liner to be removed by the project will be as follows: Tunnel 1 (3%), Tunnel 2 (3%), Tunnel 3 (2.5%), and Tunnel 4 (5%). The depth of brick removal would range up to 6 inches for Tunnels 1 to 3 and up to 19 inches in certain locations in Tunnel 4 (the majority of brick encroachment in Tunnel 4 would be less than 12 inches). This modification will alter some brick work that is already obscured by shotcrete and is not visible to the public from the vantage of a train or by other means. Therefore, the brick features in the four tunnels is not able to convey association with the tunnels' historical significance under current or proposed conditions. Proposed modifications to the interior of the tunnels poses **no adverse effect.**

Increasing the vault height of the portals of Tunnel No. 4 up to 1.75' will result in the removal of some of the portals' voussoir-set stones and keystones. The 4" deep facing stones, veneer stonework, will be retained and reinstalled in the same manner but higher up, raising the vertical and horizontal clearance of the vaulted tunnels and arched portals. Ledgers will be installed above the portal intrados to support brick above before reinstallation of the decorative stone arches. The impost stones will not be altered. (See Appendix C – Portal Modification Drawing Set). The retention of the original facing stones of the portal arches and their reinstallation and, where necessary, replacement in kind at approximately 1.75' higher resolves the adverse effect of their removal. The historical design materials are maintained, as is the historic properties' ability to convey its historical associations and significance. The modification of Tunnel No. 4 portals poses **no adverse effect**.

Installation of OCS poles near the mouth of the tunnel portals will have no direct physical effect but will affect the visual setting of the tunnel portals, although they are not readily visible to the public under existing or proposed conditions. The particular type of OCS support on a given segment is dependent upon the track segment's exact configuration (e.g., number of tracks) and other site-specific requirements and constraints. Figure 4 shows a portal arrangement, where the central wires are supported over multiple tracks by means of a solid steel beam and cantilever brackets. The installation of OCS poles, beam, and brackets near the portals of the four tunnels represents a visual effect. However, the effect is an insignificant change to the setting of the historic properties. The addition of OCS poles near the mouth of the tunnel portals poses **no adverse effect.**

4.2 El Palo Alto and Jules Francard Grove

4.2.1 Resource Descriptions

The two historic landscape features evaluated as NRHP-eligible are El Palo Alto and the Jules Francard Grove. Previous NHPA processes failed to evaluate or identify effects to El Palo Alto or the Jules Francard Grove as potential historic properties but the 2015 HRIER identifies and evaluates the resources as NRHP-eligible.

The El Palo Alto is located in El Palo Alto Park, at the intersection of Palo Alto Avenue and Alma Street in the City of Palo Alto. It is a Coast Redwood (*Sequoia Sempervirens*). The tree is found on the east bank of the San Franciscquito Creek and east of the San Francisquito Creek Bridge carrying the railroad tracks (bridge constructed in 1902 by the Southern Pacific Railroad). El Palo Alto is now an estimated 1,075 years old. Historic photographs of the El Palo Alto account for a second trunk, which by the 1880's disappeared due to unknown causes. The existing tree trunk is 90 inches in diameter, 110 feet in height and a crown spread of 40 feet. In 1951, the tree's height was recorded at 134.6 feet. In 1977 the dead top was removed reducing its height to 126 feet, and again 1999 where it was reduced to 110 feet. The arborist for the City of Palo Alto, in the 1999 heritage tree designation report, estimated the remaining life expectancy of El Palo Alto to be an additional 300 years.

The Jules Francard Grove of blue gum eucalyptus trees (*Eucalpytus globulus*) is on the east side of California Drive and the west side of the railroad tracks, from Burlingame Avenue going north to approximately Larkspur Drive in the city of Burlingame. The grove was planted by noted landscape gardener, John McLaren, between the years 1874 and 1880 on the properties of prominent Peninsula land owners, George H. Howard and Ansel Easton. The approximately 3,400 feet long

Chapter 5
Conclusion

The PCEP will result in no adverse effects to the properties addressed by this 3rd Addendum FOE and shown in the table below. These properties are eligible for listing in the National Register of Historic Places.

Table 5-1: Summary of Findings

Resource Name	NRHP	Mile Post	City	County	Year built	Effect
Historic Tunnels						
Tunnel No. 1	3D	1.33	San Francisco	San Francisco	1907	Not adverse
Tunnel No. 2	ED	1.93	San Francisco	San Francisco	1907/1936	Not adverse
Tunnel No. 3	2	3.19	San Francisco	San Francisco	1904-1907, 1999	Not adverse
Tunnel No. 4	2	4.27	San Francisco	San Francisco	1904-1907	Not adverse
Historic Trees and Tree Groves						
Jules Francard Grove	2	15.60 to 16.30	Burlingame	San Mateo	1876-1886	Not adverse
El Palo Alto	2	29.70	Palo Alto	Santa Clara	1940	Not Adverse
Historic Stations						
Millbrae Station	1	13.70	Millbrae	San Mateo	1907	Not Adverse
Burlingame Station	1	16.30	Burlingame	San Mateo	1894	Not Adverse
San Carlos Station	1	23.20	San Carlos	San Mateo	1888	Not Adverse
Atherton Station	1	27.80	Atherton	San Mateo	1913	Not Adverse
Menlo Park Station	1	28.90	Menlo Park	San Mateo	1867, 1890s, 1917	Not Adverse
Palo Alto Station	1	30.10	Palo Alto	Santa Clara	1940	Not Adverse
Santa Clara Station and Tower	1	44.70	Santa Clara	Santa Clara	1863-4, 1877, 1885	Not Adverse
San Jose Diridon Station (including Santa Clara St./Alameda underpass)	1	47.35	San Jose	Santa Clara	1935	Not Adverse
Historic Underpasses/Overpasses						
22nd Street Overpass	3D	1.72	San Francisco	San Francisco	1906	Not Adverse
23rd Street Overpass	3D	1.90	San Francisco	San Francisco	1906	Not Adverse
Airport Blvd. Underpass	3S	09.59	South San Francisco	San Mateo	1927/1935	Not Adverse
East Poplar Avenue Underpass	2	17.20	San Mateo	San Mateo	1903	No Effect
East Santa Inez Ave. Underpass	2	17.34	San Mateo	San Mateo	1903	No Effect
Monte Diablo Ave. Underpass	2	17.45	San Mateo	San Mateo	1903	No Effect
Tilton Ave. Underpass	2	17.53	San Mateo	San Mateo	1903	No Effect
University Ave. Underpass	2	30.13	Palo Alto	Santa Clara	1941	Not Adverse
Embarcadero Underpass	2	30.70	Palo Alto	Santa Clara	1936	Not Adverse

Office of Historic Preservation status codes: (1) Listed in the NRHP; (2) Properties previously evaluated, found eligible, and received SHPO concurrence; (3D) SHPO concurrence of eligibility assumed as a contributor to a district; and (3S) SHPO concurrence of eligibility assumed as individually eligible.

Appendix A
Figures

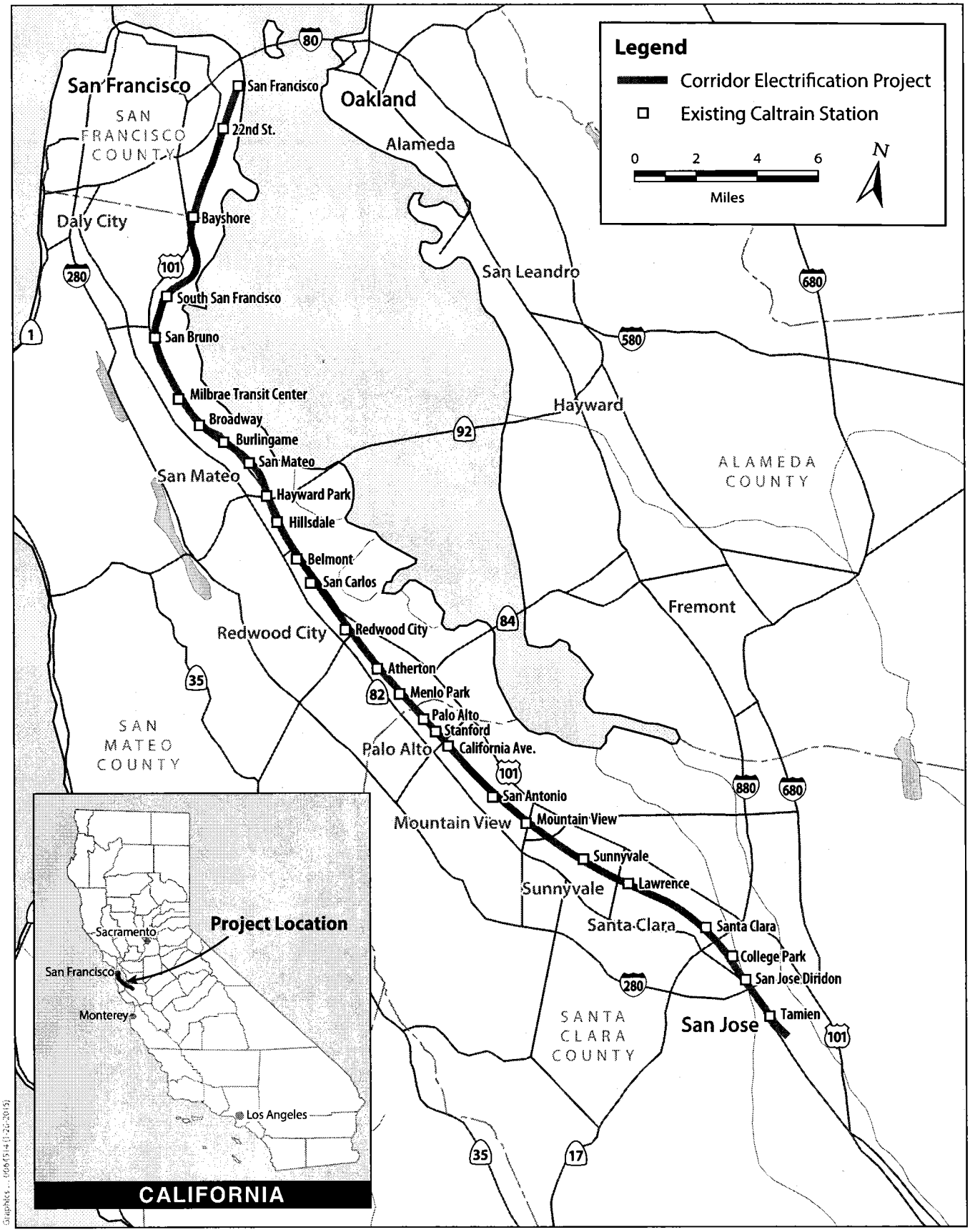


Figure 1
Project Location
Peninsula Corridor Electrification Project

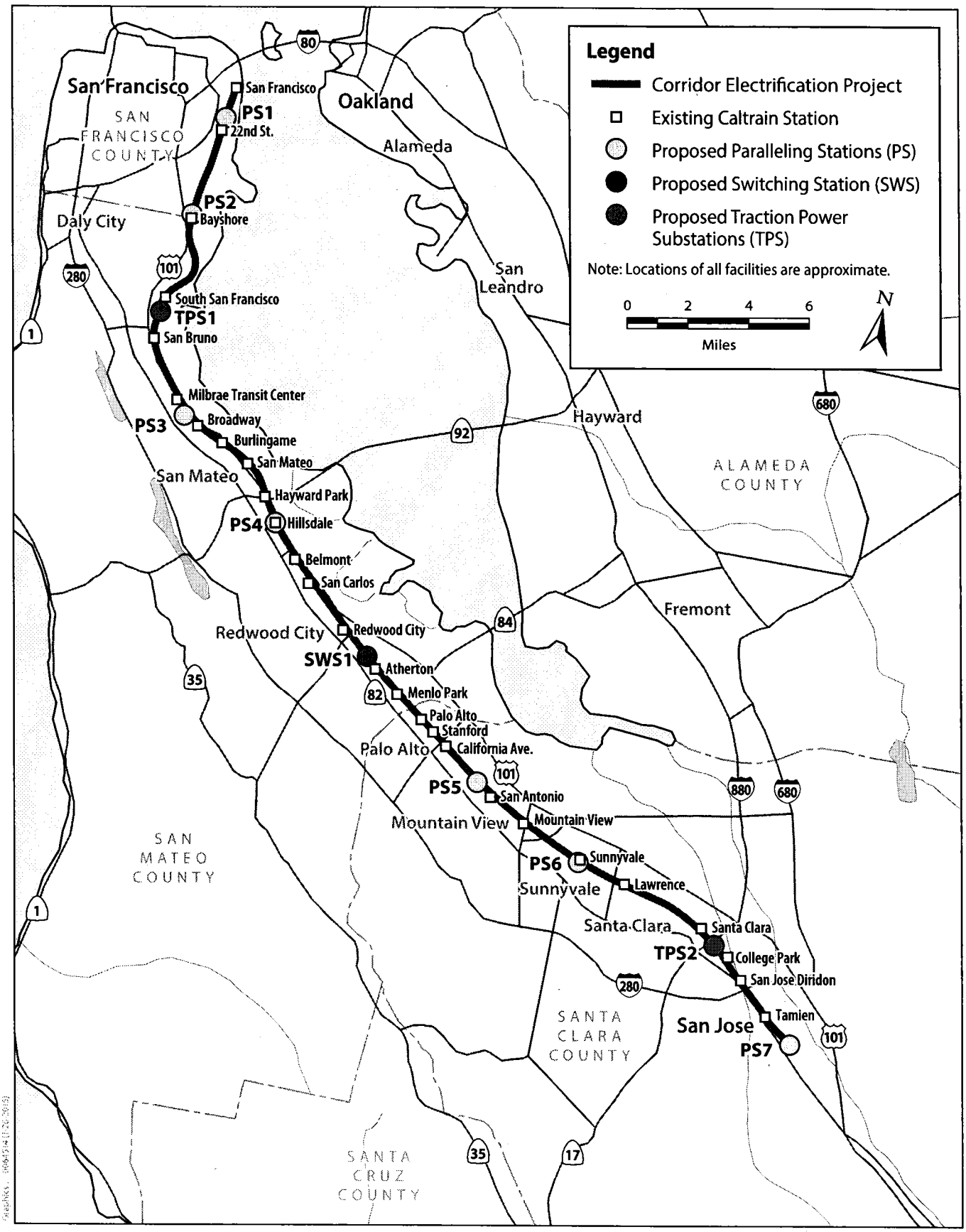
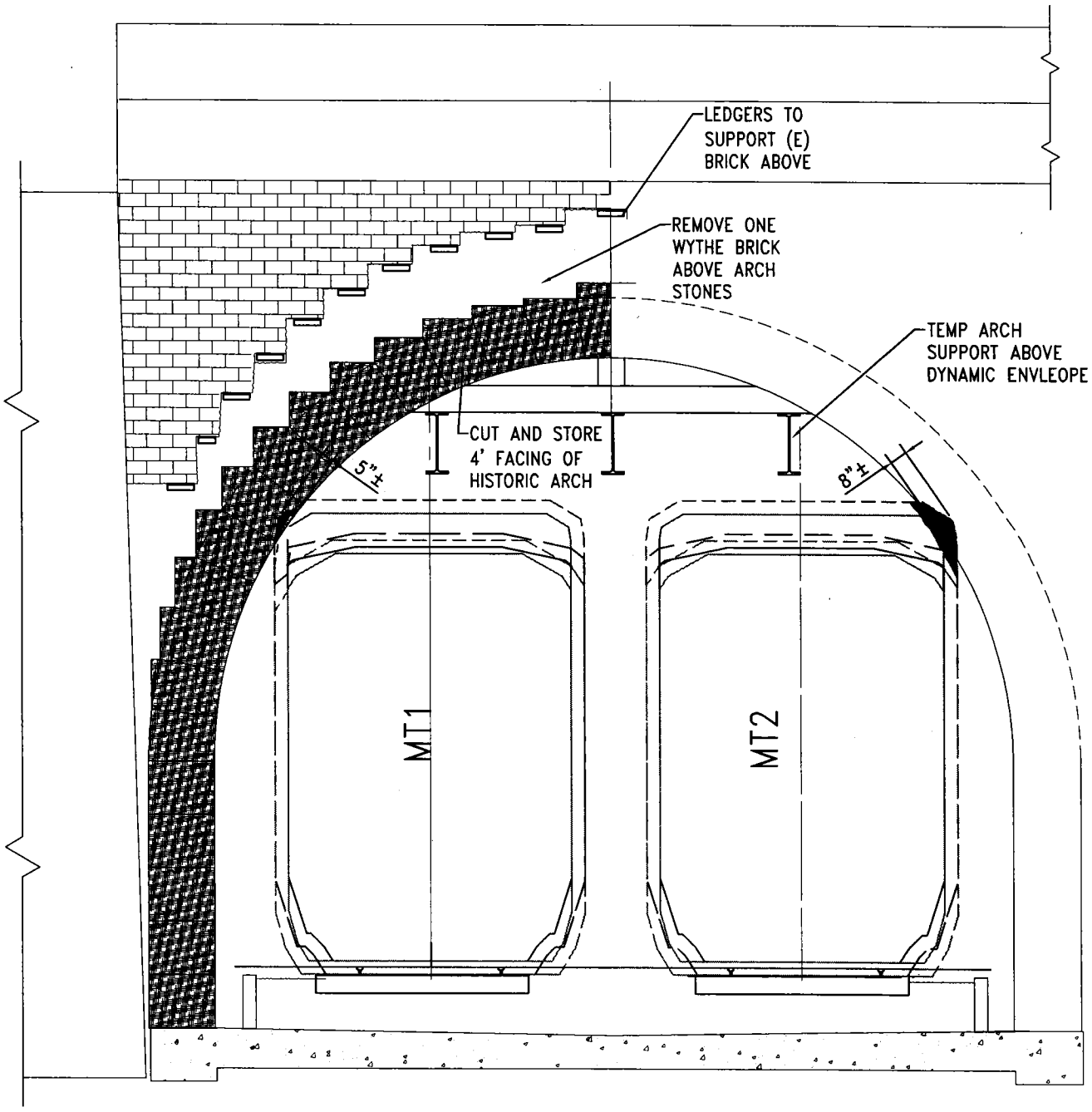


Figure 2
Project Vicinity
Peninsula Corridor Electrification Project

Appendix C

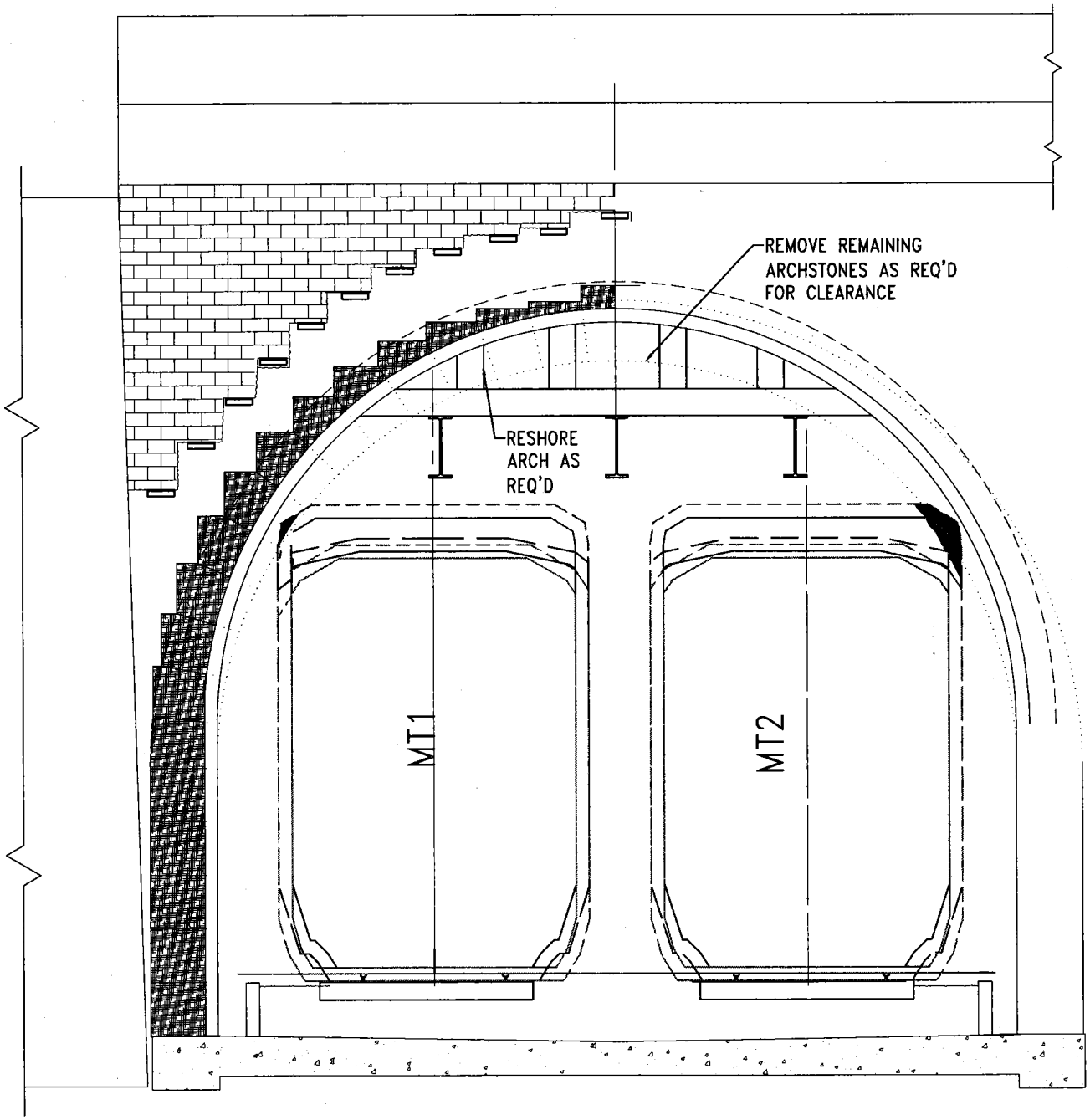
Portal Modification Drawing Set

JACOBS ASSOCIATES Engineers/Consultants 49 Stevenson St, 3rd Flr. San Francisco, CA 94105	Project CALTRAIN ELECTRIFICATION		Sheet SK1
	Subject PORTAL MODIFCATION		Date 02-05-2015
	By KEA	Checked	Project No. 5248.0



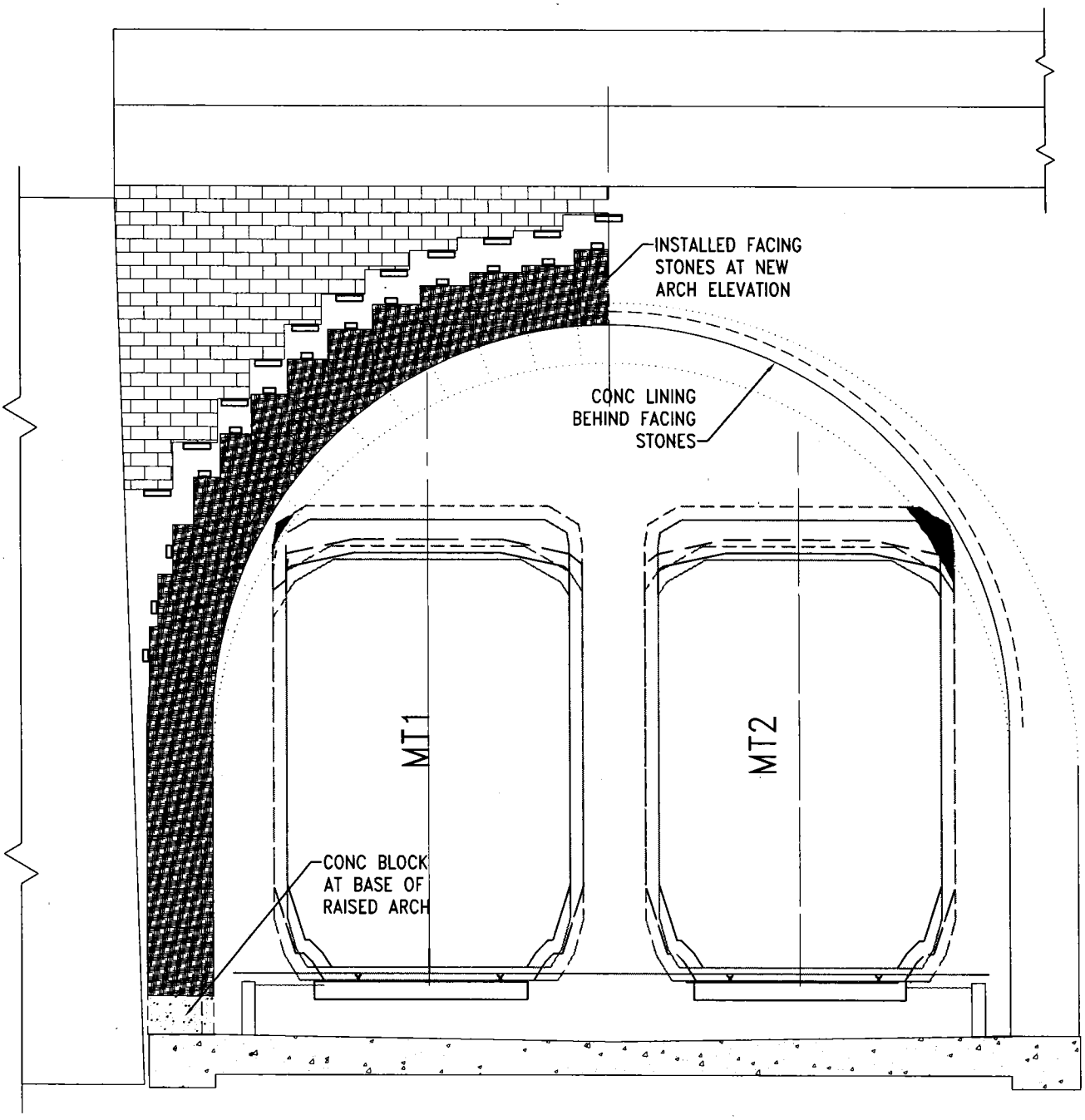
PORTAL MODIFICATION STEP 1

JACOBS ASSOCIATES Engineers/Consultants 49 Stevenson St, 3rd Flr. San Francisco, CA 94105	Project CALTRAIN ELECTRIFICATION		Sheet SK2
	Subject PORTAL MODIFCATION		Date 02-05-2015
	By KEA	Checked	Project No. 5248.0



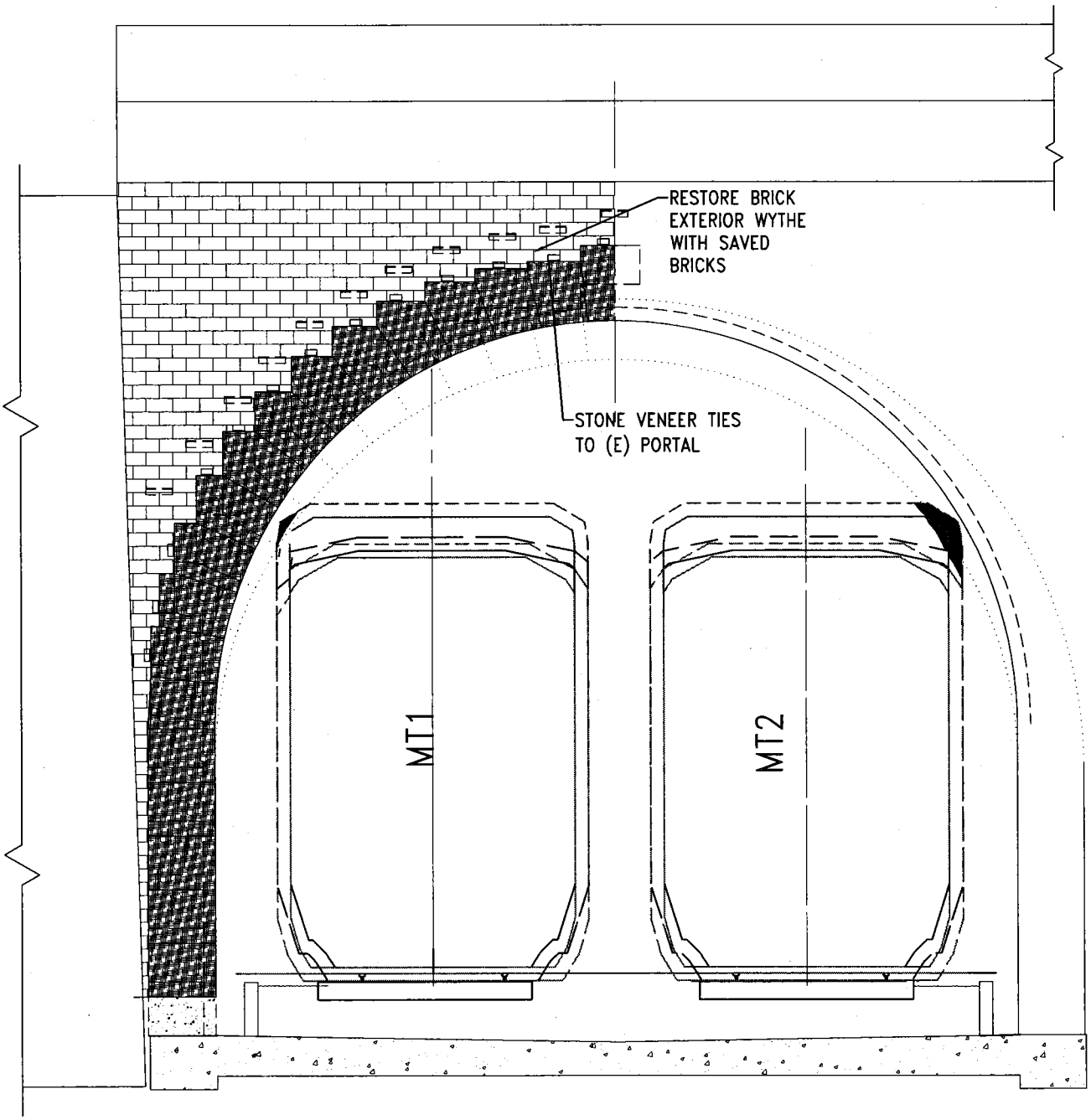
PORTAL MODIFICATION STEP 2

JACOBS ASSOCIATES Engineers/Consultants 49 Stevenson St, 3rd Flr. San Francisco, CA 94105	Project CALTRAIN ELECTRIFICATION		Sheet SK3
	Subject PORTAL MODIFCATION		Date 02-05-2015
	By KEA	Checked	Project No. 5248.0



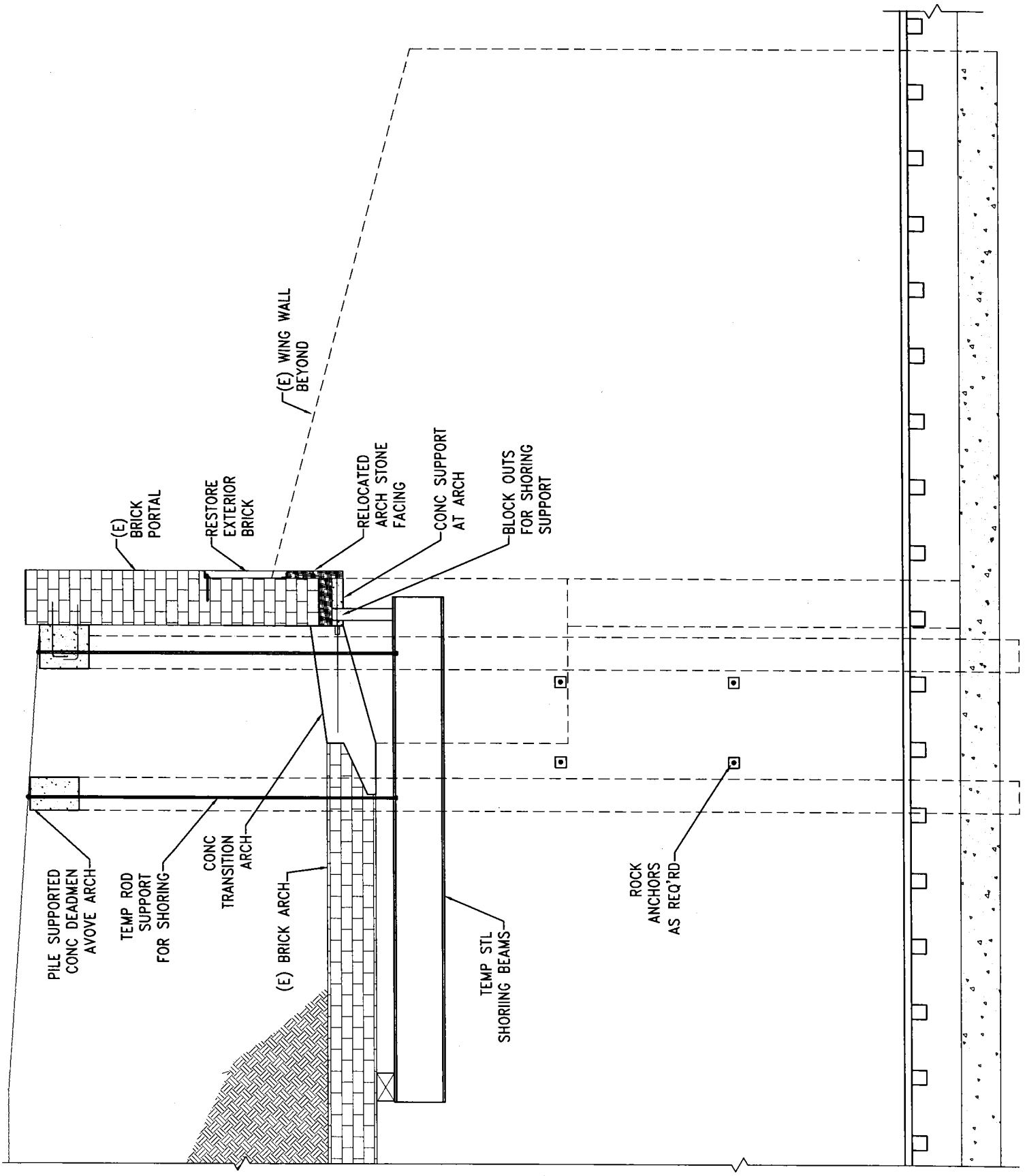
PORTAL MODIFICATION STEP 3

JACOBS ASSOCIATES Engineers/Consultants 49 Stevenson St, 3rd Flr. San Francisco, CA 94105	Project CALTRAIN ELECTRIFICATION		Sheet SK4
	Subject PORTAL MODIFCATION		Date 02-05-2015
	By KEA	Checked	Project No. 5248.0



PORTAL MODIFICATION STEP 4

JACOBS ASSOCIATES Engineers/Consultants 49 Stevenson St, 3rd Flr. San Francisco, CA 94105	Project CALTRAIN ELECTRIFICATION		Sheet SK5
	Subject PORTAL MODIFCATION		Date 02-05-2015
	By KEA	Checked	Project No. 5248.0



ATTACHMENT E

SHPO Concurrence with FOE

STATE OF CALIFORNIA – THE RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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www.ohp.parks.ca.gov

October 19, 2015 Reply To: FTA021021A

Leslie Rogers
Regional Administrator
Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

Re: Section 106 Consultation for the Peninsula Corridor Electrification Project (PCEP) Modifications Finding of Effect (FOE), Counties of San Francisco, San Mateo, and Santa Clara, CA

Dear Mr. Rogers:

Thank you for your letter of September 24, 2015, continuing the Federal Transit Administration's (FTA) consultation for the above-referenced undertaking in order to comply with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulation at 36 CFR Part 800. Included with your letter were the following documents:

- *3rd Addendum Finding of Effect, Peninsula Corridor Electrification Project* (FOE, September 2015), prepared by ICF International for the Peninsula Corridor Joint Powers Board (JPB) and the FTA

As described in your letter, the Peninsula Corridor Electrification Project (PCEP) is the electrification of the Peninsula Corridor railway, owned by JPB. The JPB is a public transportation agency, funded jointly by the City of San Francisco, the County of San Mateo and the Santa Clara Valley Transportation Authority. The overall purpose of the project is to provide electrification improvements to commuter rail service within a corridor between San Francisco and the City of San Jose.

FTA has previously consulted with my office regarding this project resulting in a finding of no adverse effect for the undertaking in 2003. The project was amended in 2008, and resulted in a programmatic agreement for archaeological resources. The project has been further refined and FTA began consultation on this amendment in June, 2015. My letter of June 30, 2015, offered comments on the Area of Potential Effect (APE) and historic properties identification for this amendment.

The previously submitted Historic Resources Inventory Evaluation Report (HRIER) Update surveyed the areas that had not been previously inventoried for this undertaking. ICF field verified previously surveyed properties and recorded any additional properties over 45 years old or older. Two newly recorded properties were evaluated and recommended as eligible for the National Register of Historic Places (NRHP), El Palo Alto and the Jules Francard Grove. FTA also conducted additional Native American consultation regarding El Palo Alto. I concurred with FTA's determinations of eligibility for these two resources in my letter of June 30, 2015.

Additional project modifications include Overhead Contact System (OCS) poles partially outside of the existing JPB right-of-way (ROW); vegetation removal outside of the Electrical Safety Zone (ESZ) for the ROW; additional locations for traction power facilities and elimination of previously

proposed stations; further development of the design of the OCS in the San Francisco Tunnels; and a change in the type of OCS pole proposed. These modifications are fully described in the FOE. The FTA has determined that the project modifications as described will have no adverse effect on historic properties.

After reviewing the information submitted with your letter, I offer the following comments:

- I concur that FTA's identification and evaluation efforts are sufficient for this undertaking. However, I would recommend that in the future more intensive Native American consultation may be necessary on FTA's part to identify potential Traditional Cultural Properties and address any concerns raised by the undertaking.
- I concur with FTA's finding that the modifications to the undertaking described above will have no adverse effect on historic properties.

Thank you for continuing consultation on the identification efforts for this undertaking and considering historic properties in your planning process. I look forward to continuing consultation on this project with the FTA. If you have any questions, please contact Kathleen Forrest of my staff at (916) 445-7022 or e-mail at kathleen.forrest@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer