APPENDIX A: MITIGATION MONITORING PROGRAM

MITIGATION MEASURES PRESENTED AND ANALYZED IN FINAL EIS/EIR AS ADOPTED

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1. WIND

See discussion of wind impacts in Section 5.1.2 of the Final EIS/EIR. Mitigation measures include:

W 1 – The San Francisco Redevelopment Agency (Agency) shall consider potential wind effects of an individual project for the Redevelopment area. If necessary, perform wind tunnel testing in accordance with City Planning Code Section 148. If exceedences of the wind hazard criterion should occur for any individual project, require design modifications or other mitigation measures to mitigate or eliminate these exceedences. Tailor mitigation measures to the individual needs of each project. Examples of mitigation measures include articulation of building sides and softening of sharp building edges.

2. PROPERTY ACQUISITION/RELOCATION

See discussion of property acquisition impacts, Section 5.2 of the Final EIS/EIR. Mitigation measures include:

Prop 1 – TJPA shall apply federal Uniform Relocation Act (Public Law 91-646) and California Relocation Act (Chapter 16, Section 7260 et seq. of the Government Code) and related laws and regulations governing both land acquisition and relocation. All real property to be acquired will be appraised to determine its fair market value before an offer is made to each property owner. (Minimum relocation payments are detailed in the laws, and include moving and search payments for businesses.) Provide information, assistance, and payments to all displaced businesses in accordance with these laws and regulations.

3. SAFETY AND EMERGENCY SERVICES

See discussion of safety and emergency services, Section 5.4 of the Final EIS/EIR. Mitigation measures include:

Saf 1 – TJPA shall provide Project plans to the San Francisco Fire Department for its review to ensure that adequate life safety measures and emergency access are incorporated into the design and construction of Project facilities.

Saf 2 – TJPA shall prepare a life safety plan including the provision of on-site measures such as a fire command post at the Terminal, the Fire Department's 800-megahertz radio system and all necessary fire suppression equipment.

Saf 3 – TJPA shall prepare a risk analysis to accurately determine the number of personnel necessary to maintain an acceptable level of service at Project facilities.

4. NOISE – OPERATIONS

See discussion of noise impacts, Section 5.8 of the Final EIS/EIR. Mitigation measures include:

NoiO 1 – TJPA shall apply noise mitigation at the following locations adjacent to the bus storage facility:

- Provide sound insulation to mitigate noise impacts at the residences north of the AC Transit Facility at the corner of Perry and Third Street. At a minimum, apply sound insulation to the façade facing the bus storage facility (the south façade).
- Construct two noise barriers to mitigate noise impacts to Residences south of the AC Transit Facility along Stillman Street. The first noise barrier would be approximately 10-12 feet high and run along the southern edge of the AC Transit storage facility. The second noise barrier would be approximately 5-6 feet high and would be located on the portion of the ramp at the southwestern corner of the AC Transit facility. Treat the noise barriers with an absorptive material on the side facing the facility to minimize the potential for reflections off the underside of the freeway.
- Construct a noise barrier to mitigate noise impacts to residences south of the Golden Gate Transit Facility along Stillman Street. The barrier would be approximately 10-12 feet high and run along the southern and a portion of the eastern edge of the Golden Gate Transit storage facility. Treat the noise barriers with an absorptive material on the side facing the facility to minimize the potential for reflections off the underside of the freeway.

NoiO 2 – TJPA shall landscape the noise walls. Develop the actual design of the walls in cooperation with area residents.

NoiO 3 – TJPA shall construct noise walls prior to the development of the permanent bus facilities.

5. NOISE – CONSTRUCTION

See discussion of construction noise impacts, Section 5.21.10 of the Final EIS/EIR. Mitigation measures include:

NoiC 1 – TJPA shall comply with San Francisco noise ordinance. The noise ordinance includes specific limits on noise from construction. The basic requirements are:

- Maximum noise level from any piece of powered construction equipment is limited to 80 dBA at 100 ft. This translates to 86 dBA at 50 feet.
- Impact tools are exempted, although such equipment must be equipped with effective mufflers and shields. The noise control equipment on impact tools must be as recommended by the manufacturer and approved by the Director of Public Works.
- Construction activity is prohibited between 8 p.m. and 7 a.m. if it causes noise that exceeds the ambient noise plus 5 dBA.

The noise ordinance is enforced by the San Francisco DPW, which may waive some of the noise requirements to expedite the Project or minimize traffic impacts. For example, along Townsend Street where much of the land use is commercial, business owners may prefer nighttime

construction since it would reduce disruption during normal business hours. The DPW waivers usually allow most construction processes to continue until 2 a.m., although construction processes that involve impacts are rarely allowed to extend beyond 10 p.m. This category would include equipment used in demolition such as jackhammers and hoe rams, and pile driving. It is not anticipated that the construction documents would have specific limits on nighttime construction. There may be times when nighttime construction is desirable (e.g., in commercial districts where nighttime construction would be less disruptive to businesses in the area) or necessary to avoid unacceptable traffic disruptions. Since the construction would be subject to the requirements of the San Francisco noise regulations, in these cases, the contractor would need to work with the DPW to come up with an acceptable approach balancing interruption of the business and residential community, traffic disruptions, and reducing the total duration of the construction.

NoiC 2 – TJPA shall conduct noise monitoring. The purpose of monitoring is to ensure that contractors take all reasonable steps to minimize noise.

NoiC 3 – TJPA shall conduct inspections and noise testing of equipment. This measure will ensure that all equipment on the site is in good condition and effectively muffled.

NoiC 4 – TJPA shall implement an active community liaison program. This program would keep residents informed about construction plans so they can plan around periods of particularly high noise levels and would provide a conduit for residents to express any concerns or complaints about noise.

NoiC 5 – TJPA shall minimize use of vehicle backup alarms. Because backup alarms are designed to get people's attention, the sound can be very noticeable even when their sound level does not exceed the ambient, and it is common for backup alarms at construction sites to be major sources of noise complaints. A common approach to minimizing the use of backup alarms is to design the construction site with a circular flow pattern that minimizes backing up of trucks and other heavy equipment. Another approach to reducing the intrusion of backup alarms is to require all equipment on the site to be equipped with ambient sensitive alarms. With this type of alarm, the alarm sound is automatically adjusted based on the ambient noise. In nighttime hours when ambient noise is low, the backup alarm is adjusted down.

NoiC 6 – TJPA shall include noise control requirements in construction specifications. These should require the contractor to:

- Perform all construction in a manner to minimize noise. The contractor should be required to select construction processes and techniques that create the lowest noise levels. Examples are using predrilled piles instead of impact pile driving, mixing concrete offsite instead of onsite, and using hydraulic tools instead of pneumatic impact tools.
- Use equipment with effective mufflers. Diesel motors are often the major noise source on construction sites. Contractors should be required to employ equipment fitted with the most effective commercially available mufflers.

- Perform construction in a manner to maintain noise levels at noise sensitive land uses below specific limits.
- Perform noise monitoring to demonstrate compliance with the noise limits. Independent noise monitoring should be performed to check compliance in particularly sensitive areas.
- Minimize construction activities during evening, nighttime, weekend and holiday periods. Permits would be required before construction can be performed in noise sensitive areas during these periods.
- Select haul routes that minimize intrusion to residential areas. This is particularly important for the trench alternatives that will require hauling large quantities of excavation material to disposal sites.

Controlling noise in contractor work areas during nighttime hours is likely to require some mixture of the following approaches:

- Restrictions on noise producing activities during nighttime hours.
- Laying out the site to keep noise producing activities as far as possible from residences, to minimize the use of backup alarms, and to minimize truck activity and truck queuing near the residential areas.
- Use of procedures and equipment that produce lower noise levels than normal. For example, some manufacturers of construction equipment can supply special noise control kits with highly effective mufflers and other materials that substantially reduce noise emissions of equipment such as generators, tunnel ventilation equipment, and heavy diesel power equipment including mobile cranes and front-end loaders.
- Use of temporary barriers near noisy activities. By locating the barriers close enough to the noise source, it is possible to obtain substantial noise attenuation with barriers 10 to 12 feet high even though the residences are 30 to 40 feet higher than the construction site.
- Use of partial enclosures around noisy activities. It is sometimes necessary to construct shed-like structures or complete buildings to contain the noise from nighttime activities.

6. VIBRATION – OPERATIONS

See discussion of vibration impacts, Section 5.8.8 of the Final EIS/EIR. Mitigation measures include:

VibO 1 – TJPA shall use high-resilience track fasteners or a resiliently supported tie system for the Caltrain Downtown Extension for areas projected to exceed vibration criteria, including the following locations: (1) Live/Work Condos, 388 Townsend Street (Hubbell and Seventh), (2) San Francisco Residences on Bryant (Harrison Parking Lot Site), (3) Clock Tower Building, and Second Street High Rise and (4) new Marriott Courtyard (Marine Firefighter's Union).[1]

[1] After mitigation, groundborne noise impact at 388 Townsend Street and vibration impact at the Clocktower Building would still exceed the FTA impact threshold by one decibel. This level of impact would not constitute a substantial adverse change requiring further mitigation, in terms of FTA guidance. The next level of vibration buffering that would be effective would be to install floating slab under the Caltrain alignment trackage for 600 to

7. VIBRATION – CONSTRUCTION

See discussion of construction vibration impacts, Section 5.21.10 of the Final EIS/EIR. Mitigation measures include:

VibC 1 – TJPA shall limit or prohibit use of construction techniques that create high vibration levels. At a minimum, processes such as pile driving would be prohibited at distances less than 250 feet from residences.

VibC 2 – TJPA shall restrict procedures that contractors can use in vibration sensitive areas. (It is often possible to employ alternative techniques that create lower vibration levels. For example, unrestricted pile driving is one activity that has considerable potential for causing annoying vibration. Using the cast-in-drilled-hole piling method instead will eliminate most potential for vibration impact from the piling.)

VibC 3 – TJPA shall require vibration monitoring during vibration intensive activities.

VibC 4 – TJPA shall restrict the hours of vibration intensive activities such as pile driving to weekdays during daytime hours.

VibC 5 – TJPA shall investigate alternative construction methods and practices to reduce the impacts in coordination with the construction contractor if resident annoyance from vibration becomes a problem.

VibC 6 – TJPA shall include specific limits, practices and monitoring and reporting procedures for the use of controlled detonation. Control and monitor use of controlled detonation to avoid damage to existing structures. Include specific limits, practices, and monitoring and reporting procedures within contract documents to ensure that such construction methods, if used, would not exceed safety criteria.

8. SOILS/GEOLOGY

See discussion of geologic impacts in Section 5.9 and construction impacts and approaches in Sections 5.20 and 5.21.17 of the Final EIS/EIR. Mitigation measures include:

SG 1 – TJPA shall monitor adjacent buildings for movement and, if movement is detected, take immediate action to control the movement.

SG 2 – TJPA shall apply geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels

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800 feet on either side of each building (at a construction cost of $1,000 per linear foot), which would add installed costs approaching one million dollars or even more per building. Such high costs would not be a prudent and reasonable expenditure to eliminate the last one decibel of impact at these two sites. Per FTA guidelines, "to be feasible, the measure, or combination of measures, must be capable of providing a significant reduction of the vibration levels, at least 5 dB, while being reasonable from the standpoint of the added cost."

throughout the downtown area. Apply design measures and utilize pile supported foundations to mitigate potential settlement of the surface and underground stations.

SG 3 – TJPA shall design and construct structural components of the Project to resist strong ground motions approximating the maximum anticipated earthquake (0.5g). The cut-and-cover portions will require pile supports to minimize non-seismic settlement in soft compressible sediments (Bay Mud). The underground Caltrain station at Fourth and Townsend will require pile-supported foundations due to the presence of underlying soft sediments.

SG 4 – TJPA shall underpin existing building, where deemed necessary, to protect existing structures from potential damage that could result from excessive ground movements during construction. Design the tunneling and excavation procedures (and construction sequence), and design of the temporary support system with the objective of controlling ground deformations within small enough levels to avoid damage to adjacent structures. Where the risk of damage to adjacent structures is too great, special measures will be implemented such as: (1) underpinning, (2) ground improvement, and/or (3) strengthening of existing structures to mitigate the risks.

As part of the initial studies performed in 1996, preliminary plans were developed to protect/strengthen existing structures to mitigate the risk of adverse impacts of tunneling on existing structures. Underpinning, if it is deemed necessary, is one of the options for mitigating adverse effects of tunneling on the existing buildings. Underpinning involves modification of the foundations of the building so that the superstructure loads can be transferred beyond the zone of influence of tunneling. Underpinning may include internal strengthening of the superstructure, bracing, reinforcing the existing foundations, or replacing existing foundations with deep foundations embedded outside the tunnel zone of influence. Alternatives, in lieu of underpinning, involve strengthening the rock between the building and the crown of the tunnel. Grouting in combination with inclined pin piles can be used not only to strengthen the rock but make the rock mass over the tunnel act as a rigid beam, allowing construction of tunnels with no adverse effects on the buildings supported on shallow foundations over the tunnel.

Preliminary plans for underpinning have been developed that allow cost estimates to be made for underpinning. During the detailed design phase of the Project, underpinning plans will be developed specific to each of the buildings that may require it. It is not necessary at this stage of the Project to develop detailed underpinning plans.

These issues will be addressed on a case by case basis, along the alignment, during the detailed design phase of the Project. The methodology that is proposed for the Caltrain Downtown Extension, i.e. to design the support system to control ground deformations within tolerances and selectivity strengthen structures that may be too weak to resist even small deformations, was successfully used for the Muni Metro Turnback project, and are deemed to be effective for the Caltrain Downtown Extension Project as well.

SG 5 – TJPA shall assure proper design and construction of pile supported foundations for structures to control potential settlement of the surface. Stability of excavations and resultant impacts on adjacent structures can be controlled within tolerable limits by proper design and implementation of the excavation shoring systems.

9. UTILITIES

See discussion of utility impacts, Sections 5.12 and 5.21.12 of the Final EIS/EIR. Mitigation measures include:

Util 1 – TJPA shall coordinate with utility providers during preliminary engineering, continuing through final design and construction. Utilities would be avoided, relocated, and/or supported as necessary during construction activities to prevent damage to utility systems and to minimize disruption and degradation of utility service to local customers.

10. CULTURAL AND HISTORIC RESOURCES

See discussion of cultural and historic resources impacts, Section 5.14 of the Final EIS/EIR. Mitigation measures include:

CH 1 – TJPA shall comply with the provision of the signed Memorandum of Agreement (MOA) between the Federal Transit Administration (FTA), the State Historic Preservation Officer (SHPO), and the TJPA.[2] Provisions of the memorandum of agreement include the measures below.

CH 2 – Assure supervision of all activities regarding historic preservation, historical archaeology and prehistoric archaeology is carried out by professionals meeting Secretary of the Interior's professional qualifications standards (48 FR 44738-9).

CH 3 – Permanent Interpretive Exhibit at the Terminal – TJPA will direct the design and engineering team for the Project to integrate into the design of the new terminal a dedicated space for a permanent interpretive exhibit. The interpretive exhibit will include at a minimum, but is not necessarily limited to: plaques or markers, a mural or other depiction of the historic terminal, and Key System, or other interpretive material.

CH 4 – TJPA will consult with the California Department of Transportation (Department) regarding the availability of historical documentary materials and the potential use of salvaged items from the existing Transbay Terminal for the creation of the permanent interpretive display of the history of the original Transbay Terminal building and its association with the San Francisco-Oakland Bay Bridge and the potential salvaged items from the existing Terminal.

In addition, TJPA will also invite the Oakland Heritage Alliance, the San Francisco Architectural Heritage, the California State Railroad Museum, and the Western Railway Museum to participate in this consultation. TJPA, while retaining responsibility for the development of the exhibit, will consider jointly with Department, the participating invitees' recommendations when finalizing the exhibit design. TJPA will produce, install, and maintain the exhibit.

CH 5 – TJPA will also consult with the City of Oakland about its interest in having a similar interpretive exhibit in the East Bay. If agreement is reached prior to completion of final design

[2] A copy of the Memorandum of Agreement is included as Appendix G of the Final EIS/EIR.

of the Transbay Terminal, TJPA will provide and deliver exhibit materials to a venue designated by the City of Oakland.

CH 6 – Salvage – TJPA, in consultation with Department, will identify elements of the existing Transbay Terminal that are suitable for salvage and interpretive use in the exhibit in the new Terminal or by museums. Within two years of signing of the MOA, TJPA will offer these items to San Francisco Architectural Heritage, the California State Railroad Museum, Sacramento, the Western Railway Museum, the Oakland Museum, and any other interested parties. Acceptance of items by interested parties must be completed at least 90 days prior to demolition of the Transbay Transit Terminal. TJPA will remove the items selected in a manner that minimizes damage and will deliver them with legal title to the recipient. Items not accepted for salvage or interpretive use will receive no further consideration under the agreement.

CH 7 – Oakland Museum of California Exhibit – TJPA will consult with Department and the Oakland Museum about contributing to Department's exhibit at the Oakland Museum relating to the history and engineering of the major historic state bridges of the San Francisco Bay Area. TJPA will propose contributions to such an exhibit that may include an interpretive video including the history of the Transbay Terminal and the Key System. Components to such an exhibit may include photographs, drawings, videotape, models, oral histories, and salvaged components from the terminal.

CH 8 – In addition, TJPA will assist the Museum by contributing to the cost of preparing and presenting the exhibit, interpretive video, as well as the costs of an exhibit catalog or related museum publication in conjunction with the exhibit, in a manner and to the extent agreed upon by TJPA, Department, and the Oakland Museum of California if consultation results in agreement between TJPA and Oakland Museum prior to demolition of the existing Transbay Transit Terminal. TJPA has established a maximum budget of $50,000.00 for the Oakland Museum of California exhibit and the interpretive video.

CH 9 – Documentation – Prior to the start of any work that would have an adverse effect on historic properties, TJPA will consult with the California SHPO, to ensure that the Transbay Terminal has been adequately recorded by past efforts. Collectively, these past studies, which include Department's past recordation of a series of remodeling and seismic retrofit projects that have occurred since 1993, may adequately document the building, making Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) documentation unnecessary. In addition, TJPA, assisted by Department, will seek to obtain the original drawings of the Transbay Transit Terminal by the architect Timothy Pflueger. If the drawings cannot be copied and included in the documentation, then TJPA will consult with SHPO regarding recordation level and specifications for completing additional documentation. When the SHPO finds the documentation to be adequate, then TJPA will compile this documentation into a comprehensive record.

All documentation will be submitted to SHPO and Department Headquarters Library with a xerographic copies to the History Center at the San Francisco Public Library, San Francisco Architectural Heritage, the Oakland History Room of the Oakland Public Library, the Oakland Museum of California, the Western Railway Museum, and Department District 4 Office.. TJPA

will ensure that these records are accepted by SHPO prior to demolition of the Transbay Transit Terminal.

CH 10 – TJPA will develop and implement measures, in consultation with the owners of historic properties immediately adjoining the construction sites, to protect the contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District from damage by any aspect of the Project. Such measures will include, but are not necessarily limited to those identified in this Mitigation Monitoring Plan.

CH 11 – HABS/HAER Documentation – Prior to the start of any work that would have an adverse effect on historic properties, TJPA will ensure that the three historic properties to be demolished are recorded in accordance with HABS/HAER standards, as appropriate. These buildings are:

- 191 2nd Street, (APN: 3721-022),
- 580-586 Howard Street, (APN: 3721-092 through 3721-106), and
- 165-173 2nd Street, (APN: 3721-025).

All documentation will be submitted to SHPO, with xerographic copies to the History Center at the San Francisco Public Library, San Francisco Architectural Heritage, and the Oakland History Room of the Oakland Public Library. TJPA will ensure that these HABS/HAER records are accepted by NPS prior to carrying out any other treatment.

CH 12 – Repair of Inadvertent Damage – TJPA will ensure that any damage to contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District resulting from the Project will be repaired in accordance with the Secretary of the Interior's Standards for Rehabilitation. The condition of the contributing properties will be photographed prior to the start of the Project to establish the baseline condition for assessing damage. To record these existing conditions, TJPA will consult with property owner(s) about the appropriate level of photographic documentation of building interiors and exteriors. A copy of this photographic documentation will be provided to the property owner(s), and will be retained on file by TJPA. If repair of inadvertent damage is necessary, TJPA will submit plans to the SHPO for review and comment to ensure conformance with the Secretary of the Interior's Standards for Rehabilitation.

CH 13 – TJPA shall Prepare a comprehensive Research Design/Treatment Plan for archeological resources prepared by a qualified consultant. The Research Design/Treatment Plan will be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the ACHP publication, Treatment of Archaeological Properties: A Handbook (ACHP 1980), and SHPO guidelines.

The Research Design/Treatment Plan will include, at a minimum:

i **An Historical Context for the Area of Potential Effects for Archaeological Resources (APEAR).** The Historical Context will present prehistoric and historic-era overviews of the Project area. The Historical Context should incorporate data developed in the Archaeological Research Design and Treatment Plan for SF-480 Terminal Separation

Rebuild (Praetzellis and Praetzellis, 1993) and the San Francisco-Oakland Bay Bridge, West Approach Replacement: Archaeological Research Design and Treatment Plan (Ziesing, 2000) for the portions of the APEAR within the scope of these documents.

ii **A Research Context for the APEAR.** The Research Context will identify expected archeological property types and develop research themes, questions, and data needs. To the extent applicable to expected property types, the Research Context will incorporate the research framework developed in the Revised Historical Archaeology Research Design for the Central Freeway Replacement Project (Thad M. Van Bueren, Mary Praetzellis, Adrian Praetzellis, Frank Lortie, Brian Ramos, Meg Scantlebury and Judy D. Tordoff).

iii **Testing/Data Recovery Plan** that will specify, at minimum:

- The properties or portion of properties where evaluation and/or data recovery are to be carried out;
- The properties, if any, that will be affected by the Project but for which no data recovery will be carried out;
- The manner in which inadvertent discoveries will be treated;
- The methods to be used for data recovery, with an explanation of their relevance to the research questions/themes;
- The methods to be used in cataloguing, analysis, data management, and dissemination of data;
- The proposed disposition of recovered materials and records, including discard and deaccession;
- The manner in which any human remains and associated/unassociated funerary objects, including those of Native American or Native Hawaiian origin, will be treated;
- The security procedures to be undertaken to protect the archeological testing/data recovery site from vandalism, theft, or unintended damage;
- The final report summarizing, describing and interpreting the results of testing/data recovery;
- The measures to be undertaken to ensure curation of recovered data determined to have appropriate research potential.
- Research Design/Treatment Plan Review

CH 14 – TJPA will submit the Research Design/Treatment Plan to all parties to the MOA for a thirty (30) calendar day review following receipt of the Plan. If any party fails to submit their comments within thirty (30) days, TJPA may assume that party's concurrence with the Research Design/Treatment Plan. TJPA will take any review comments into account, revise the Research Design/Treatment Plan accordingly, and will notify any party whose comments were not incorporated into the Plan.

CH15 –In consultation with FTA and SHPO, re-evaluate the Bay Bridge, a property listed on the NRHP, and determine whether the National Register nomination should be amended or whether the bridge no longer qualifies for listing and should be removed from the National Register.

CH16 –In consultation with FTA and SHPO, re-revaluate the Second and Howard Streets Historic District and determine whether the National Register nomination should be amended or whether the district no longer qualifies for listing and should be removed from the National Register.

11. HAZARDOUS MATERIALS/WASTE - OPERATIONS

See discussion of hazardous material and waste impacts, Section 5.15 of the Final EIS/EIR. Mitigation measures include:

HWO 1 – The Peninsula Corridor Joint Powers Board (JPB) – the agency responsible for operating Caltrain – shall construct and operate any fueling facility in compliance with local, state and Federal regulations regarding handling and storage of hazardous materials.

HWO 2 – JPB shall equip diesel fuel pumps with emergency shut-off valves and, in compliance with U.S. EPA requirements, fuel Underground Storage Tanks (USTs) would be equipped with leak detection and monitoring systems.

HWO 3 – JPB shall employ the use of secondary containment systems for any aboveground storage tanks.

HWO 4 – JPB shall store cleaning solvents in 55-gallon drums, or other appropriate containers, within a bermed area to provide secondary containment.

HWO 5 – JPB shall slope paved surfaces within the fueling facility and the solvent storage area to a sump where any spilled liquids could be recovered for proper disposal.

HWO 6 – JPB shall follow California OSHA and local standards for fire protection and prevention for the handling and storage of fuels and solvents.

HWO 7 – JPB shall prepare a Hazardous Materials Management/ Business Plan and file with the San Francisco Department of Public Health.

12. HAZARDOUS MATERIALS/WASTE – CONSTRUCTION

See discussion of hazardous material and waste impacts during construction, Section 5.21.15 of the Final EIS/EIR. Mitigation measures include:

HMC 1 – TJPA shall follow California OSHA and local standards for fire protection and prevention. Handling and storage of fuels and other flammable materials during construction

will conform to these requirements, which include appropriate storage of flammable liquids and prohibition of open flames within 50 feet of flammable storage areas.

HMC 2 – TJPA shall perform detailed investigations of the potential presence of contaminants in soil and groundwater prior to construction, using conventional drilling, sampling, and chemical testing methods. Based on the chemical test results, a mitigation plan will be developed to establish guidelines for the disposal of contaminated soil and discharge of contaminated dewatering effluent, and to generate data to address potential human health and safety issues that may arise as a result of contact with contaminated soil or groundwater during construction. The investigation and mitigation plan will follow the requirements of the City and County of San Francisco's Article 22A in the appropriate areas along the alignment.

With construction projects of this nature and magnitude, there are typically two different management strategies that can be employed to address contaminated soil handling and disposal issues. Contaminated soil can be excavated and stockpiled at a centralized location and subsequently sampled and analyzed for disposal profiling purposes in accordance with the requirements of the candidate disposal landfill. Alternatively, soil profiling for disposal purposes can be done in-situ so when soil is excavated it is loaded directly on to trucks and hauled to the appropriate landfill facility for disposal based on the in-situ profiling results. A project of this nature could also combine both strategies.

HMC 3 – TJPA shall cover with plastic sheeting soils removed during excavation and grading activities that remain at a centralized location for an extended period of time to prevent the generation of fugitive dust emissions that migrate offsite.

HMC 4 – TJPA shall use a licensed waste hauler, applying appropriate manifests or bill of lading procedures, as required to haul soil for disposal at a landfill or recycling facility.

HMC 5 – TJPA shall use chemical test results for groundwater samples along the alignment to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works as well as to evaluate requirements for pretreatment prior to discharge to the sanitary sewer. Effluent produced during the dewatering of excavations will be collected in onsite storage tanks and periodically tested, as required under discharge permit requirements, for potential contamination to confirm the need for any treatment prior to discharge. If required, treatment may include:

- Settling to allow particulate matter (total suspended solids) to settle out of the effluent in order to reduce the sediment load as well as reduce elevated metal and other contaminant concentrations that may be associated with suspended sediments; and/or
- Construction of a small-scale batch waste water treatment system to remove dissolved contaminants (mainly organic constituents such as petroleum hydrocarbons (gas, diesel, and oils), BTEX, and VOCs) from the dewatering effluent prior to discharge to the sanitary sewer. A treatment system would also likely employ the use of filtration to remove suspended solids.

HMC 6 – TJPA shall develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater prior to starting Project construction.

HMC 7 – TJPA shall design dewatering systems to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions. As necessary, shallow soils with detected contamination would be dewatered first using wells screened only in those soils. Dewatering of deeper soils would then be performed using wells screened only in the zone to be dewatered. Dewatering wells would be installed using drilling methods that prohibit shallow contaminated soils from being carried deeper into the boreholes.

HMC 8 – TJPA shall require that workers performing activities on site that may involve contact with contaminated soil or groundwater have appropriate health and safety training in accordance with 29 CFR 1910.120.

A Worker Health and Safety Plan (HSP) will be developed for the Project and monitored for the implementation of the plan on a day-to-day basis by a Certified Industrial Hygienist (CIH). The HSP will include provisions for:

- Conducting preliminary site investigations and analysis of potential job hazards;
- Personnel protective equipment;
- Safe work practices;
- Site control;
- Exposure monitoring;
- Decontamination procedures; and
- Emergency response actions.

The HSP will specify mitigation of potential worker and public exposure to airborne contaminant migration by incorporating dust suppression techniques in construction procedures. The plan will also specify mitigation of worker and environmental exposure to contaminant migration via surface water runoff pathways by implementation of comprehensive measures to control drainage from excavations and saturated materials excavated during construction.

HMC 9 – TJPA shall review existing asbestos surveys, abatement reports, and supplemental asbestos surveys, as warranted. Perform and asbestos survey for buildings to be demolished, as required. Asbestos-containing building materials (ACM) will require abatement prior to building demolition. Removal and disposal of ACM will be performed in accordance with applicable local, state, and federal regulations.

HMC 10 – TJPA shall perform a lead-based paint survey for buildings to be demolished to determine areas where lead-based paint is present and the possible need for abatement prior to demolition.

13. PEDESTRIANS

See discussion of pedestrian impacts, Section 5.19.6.1 of the Final EIS/EIR. Mitigation measures include:

Ped 1 – Agency and City shall use future construction or redevelopment as opportunities to increase building set-backs thereby increasing sidewalk widths. Particular areas where such widening is most needed include:

- Southeast corner Fremont/Mission Street;
- Northeast corner First/Mission Street;
- North side of Mission Street between First and Fremont; and
- Sidewalks south of Howard Street along Folsom, First, Fremont, and Beale that are less than 10 feet wide.

Ped 2 – Agency and City shall eliminate or reduce sidewalk street furniture such as newspaper boxes and magazine racks in the immediate Transbay Terminal area on corners.

Ped 3 – City shall retime traffic light signalization. This could improve pedestrian levels of service at each of the intersections studies that fall into LOS F.

Ped 4 – City shall provide crosswalk signalization at intersections where they do not exist already, such as Folsom and Beale Streets.

Ped 5 – City shall provide cross-walk count-down signals at intersections and cross-walks immediately surrounding the new Transbay Terminal.

Ped 6 –TJPA shall ensure that Transbay Terminal design increases corner and sidewalk widths at the four intersections immediately surrounding the Transbay Terminal.

Ped 7 – TJPA shall provide lights within crosswalks to warn when pedestrians are present in the crosswalk, such as at the cross-walk associated with the mid-block bus loading area.

14. PRE-CONSTRUCTION ACTIVITIES

See discussion of construction impacts, Section 5.20.1 of the Final EIS/EIR. Mitigation measures include:

PC 1 – TJPA shall complete a pre-construction building structural survey to determine the integrity of existing buildings adjacent to and over the proposed Caltrain Downtown Extension. Use this survey to finalize detailed construction techniques along the alignment and as the baseline for monitoring construction impacts during and following construction.

PC 2 – TJPA shall contact and interview individual businesses along the Caltrain Extension alignment to gather information and develop an understanding of how these businesses carry out

their work. This survey will identify business usage, delivery/shipping patterns, and critical times of the day or year for business activities. Use this information to assist in: (a) the identification of possible techniques during construction to maintain critical business activities, (b) analyze alternative access routes for customers and deliveries to businesses, (c) develop traffic control and detour plans, and (d) finalize construction practices.

PC 3 – TJPA shall complete detailed geotechnical investigation, including additional sampling (drilling and core samples) and analyses of subsurface soil/rock conditions. Use this information to design the excavation and its support system to be used in the retained cut, cut-and-cover, and tunnel portions of the Caltrain Downtown Extension.

PC 4 – TJPA shall establish community construction information/outreach program to provide on-going dialogue among the TJPA and the affected community regarding construction impacts and possible mitigation/solutions. Include dedicated personnel for an outreach office in the construction area to deal with construction coordination.

PC 5 – TJPA shall establish site and field offices located along the Caltrain Downtown Extension alignment. Field office staff, in conjunction with other staff, will:

- Provide the community and businesses with a physical location where information pertaining to construction can be exchanged,
- Enable TJPA and JPB to better understand community/business needs during the construction period,
- Allow TJPA and JPB to participate in local events in an effort to promote public awareness of the Project,
- Manage construction-related matters pertaining to the public,
- Notify property owners, residences, and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks),
- Provide literature to the public and press,
- Promote and provide presentations on the Project via a Speakers Bureau,
- Respond to phone inquires,
- Coordinate business outreach programs,
- Schedule promotional displays, and
- Participate in community committees.

PC 6 – TJPA shall implement an information phone line to provide community members and businesses the opportunity to express their views regarding construction. Review calls received and, as appropriate, forward the message to the necessary party for action (e.g., utility company, fire department, the Resident Engineer in charge of construction operations). Information available from the telephone line will include current Project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction

complaints and general information. Phone service would be provided in English, Cantonese, and Spanish and would be operated on a 24-hour basis.

PC 7 – TJPA shall develop traffic management plans. Traffic management plans to maintain access to all businesses will be prepared for areas affected by surface or cut-and-cover construction. In addition, daily cleaning of work areas would be performed by contractors for the duration of the construction period. Provisions would be contained in construction contracts to require the maintenance of driveway access to businesses to the extent feasible.

15. GENERAL CONSTRUCTION MEASURES

See discussion of construction staging and methods and construction impacts, Sections 5.20 and 5.21 of the Final EIS/EIR. Mitigation measures include:

GC 1 – TJPA shall disseminate information to community in a timely manner regarding anticipated construction activities.

GC 2 – TJPA shall provide signage. Work with establishments affected by construction activities to develop appropriate signage for display that directs both pedestrian and vehicular traffic to businesses via alternate routes.

GC 3 – TJPA shall install level deck. Install decking at the cut-and-cover sections to be flush with the existing street or sidewalk levels.

GC 4 – TJPA shall provide for efficient sidewalk design and maintenance. Wherever feasible, maintain sidewalks at the existing width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), restore it to its original width during the majority of construction period. (In some places this may require placing the temporary sidewalk on the deck.) Each sidewalk design should be of good quality and approved by the Resident Engineer prior to construction. Handicapped access will be maintained during construction where feasible.

GC 5 – TJPA shall provide construction site fencing of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. Where covered walkways or other solid surface fencing is installed, establish a program to allow for art work (e.g., by local students) on the surface(s).

16. AIR EMISSIONS – CONSTRUCTION

See discussion of air emission impacts from construction, Section 5.21.9 of the Final EIS/EIR. The following mitigation measures are derived from the "basic control measures" and the "enhanced control measures" recommended by the Bay Area Air Quality Management District (BAAQMD). Mitigation measures include:

AC 1 – TJPA shall assure that, as part of the contract provisions, the Project contractor is required to implement the measures below at all Project construction sites.

AC 2 – TJPA shall water all active construction areas at least twice daily. Ordinance 175-91, passed by the San Francisco Board of Supervisors on May 6, 1991, requires that non-potable water be used for dust control activities; therefore the Project contractor would be required to obtain reclaimed water from the City's Clean Water Program or other appropriate sources.

AC 3 – TJPA shall cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.

AC 4 – TJPA shall pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.

AC 5 – TJPA shall sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.

AC 6 – TJPA shall sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

AC 7 – TJPA shall install sandbags or other erosion control measures to prevent silt runoff to public roadways.

AC 8 – TJPA shall replant vegetation in disturbed areas as quickly as possible.

AC 9 – TJPA shall minimize use of on-site diesel construction equipment, particularly unnecessary idling.

AC 10 – TJPA shall shut off construction equipment to reduce idling when not in direct use.

AC 11 – TJPA shall, where feasible, replace diesel equipment with electrically powered machinery.

AC 12 – TJPA shall locate diesel engines, motors, or equipment as far away as possible from existing residential areas.

AC 13 – TJPA shall properly tune and maintain all diesel power equipment.

AC 14 – TJPA shall suspend grading operations during first and second stage smog alerts, and during high winds, i.e., greater than 25 miles per hour.

AC 15 – TJPA, shall, upon completion of the construction phase, buildings with visible signs of dirt and debris from the construction site shall be power washed and/or painted (given that permission is obtained from the property owner to gain access to and wash the property with no fee charged by the owner).

17. VISUAL/AESTHETICS – CONSTRUCTION

See discussion of visual/aesthetic impacts from construction, Section 5.21.16 of the Final EIS/EIR. Short-term visual changes as a result of construction activities are a common and accepted feature of the urban environment, and generally mitigation is not required. Nonetheless, mitigation measures include:

VA 1 – TJPA shall assure that construction crews working at night direct any artificial lighting onto the work site in order to minimize "spill over" light or glare effects on adjacent areas.

VA 2 – TJPA shall assure that contractors make all efforts possible to minimize specific aesthetic and visual effects of construction identified by neighborhood businesses and residents.

TRANSBAY TERMINAL/ CALTRAIN DOWNTOWN EXTENSION/ REDEVELOPMENT PROJECT MITIGATION MONITORING AND REPORTING PROGRAM

INTRODUCTION

Assembly Bill (AB) 3180 was enacted by the State Legislature to provide a mechanism to ensure that mitigation measures adopted through the California Environmental Quality Act ("CEQA") process are implemented in a timely manner and in accordance with the terms of project approval. Under AB 3180, local agencies are required to adopt a monitoring or reporting program designed to ensure compliance during project implementation.

The Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project Mitigation Monitoring and Reporting Program ("Mitigation Monitoring Program"), pursuant to AB 3180, CEQA Section 21081.6 and CEQA Guidelines Section 15091, provides the basic framework through which adopted mitigation measures will be monitored to ensure implementation.

ORGANIZATION

The Mitigation Monitoring Program is organized in a table format, keyed to each adopted Final EIS/EIR mitigation measure. For each measure, the table: (1) lists the mitigation measure; (2) specifies the party responsible for implementing the measure; (3) establishes a schedule for mitigation implementation; (4) assigns mitigation monitoring responsibility; and (5) establishes monitoring actions and a schedule for mitigation monitoring.

IMPLEMENTATION

While the Mitigation Monitoring Program generally outlines the actions, responsibilities and schedule for mitigation monitoring, it does not attempt to specify the detailed procedures to be used to verify implementation (e.g., interactions between the Project Sponsor – the Transbay Joint Powers Authority, the San Francisco Redevelopment Agency and City departments, use of private consultants, signed-off on plans, site inspections, etc.). Specific monitoring procedures are either contained in approval documents or will be developed at a later date, closer to the time the mitigation measures will actually be implemented.

The majority of the measures will be monitored primarily by the Transbay Joint Powers Authority (TJPA), in consultation with other City and non-City agencies, as part of the site permit, building permit processes or other report.

TRANSBAY TERMINAL/ CALTRAIN DOWNTOWN EXTENSION/ REDEVELOPMENT PROJECT
FEIS/FEIR MITIGATION MONITORING AND REPORTING PROGRAM

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
Wind				
W 1 – Consider potential wind effects of an individual project for the Redevelopment area. If necessary, perform wind tunnel testing in accordance with City Planning Code Section 148. If exceedences of the wind hazard criterion should occur for any individual project, require design modifications or other mitigation measures to mitigate or eliminate these exceedences. Tailor mitigation measures to the individual needs of each project. Examples of mitigation measures include articulation of building sides and softening of sharp building edges.	San Francisco Redevelopment Agency (Agency)	During environmental review process preceding approval of each individual project in Transbay Redevelopment Area	Agency	Apply project review procedures for wind when projects are developed by or proposed to Agency
Property Acquisition/Relocation				
Prop 1 – Apply federal Uniform Relocation Act (Public Law 91-646) and California Relocation Act (Chapter 16, Section 7260 et seq. of the Government Code) and related laws and regulations governing both land acquisition and relocation. All real property to be acquired will be appraised to determine its fair market value before an offer is made to each property owner. (Minimum relocation payments are detailed in the laws, and include moving and search payments for businesses.) Provide information, assistance, and payments to all displaced businesses in accordance with these laws and regulations.	**City and County of San Francisco (CCSF), Agency, and TJPA**	Prior to & during property acquisition & relocation activities	TJPA	TJPA to report to Board on compliance during acquisition & relocation activities
Safety and Emergency Services				
Saf 1 – Provide project plans to the San Francisco Fire Department for its review to ensure that adequate life safety measures and emergency access are incorporated into the design and construction of Project facilities.	**Transbay Joint Powers Authority (TJPA)**	Prior to project facility permitting & during construction	TJPA	Project facility plans to be forwarded to CCSF Fire Department prior to permit issuance Inspect installation during construction

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
Saf 2 – Prepare a life safety plan including the provision of on-site measures such as a fire command post at the Terminal, the Fire Department's 800-megahertz radio system and all necessary fire suppression equipment.	**TJPA**	Prior to project facility permitting	TJPA	TJPA to develop life safety plan during facility design phases & implement during testing & startup up phase
Saf 3 – Prepare a risk analysis to accurately determine the number of personnel necessary to maintain an acceptable level of service at Project facilities.	**TJPA**	Prior to project facility permitting	TJPA	TJPA to develop risk analysis during facility design phases
Noise - Operations				
NoiO 1 – Apply noise mitigation at the following locations adjacent to the bus storage facility: o Provide sound insulation to mitigate noise impacts at the residences north of the AC Transit Facility at the corner of Perry and Third Street. At a minimum, apply sound insulation to the façade facing the bus storage facility (the south façade). o Construct two noise barriers to mitigate noise impacts to Residences south of the AC Transit Facility along Stillman Street. The first noise barrier would be approximately 10-12 feet high and run along the southern edge of the AC Transit storage facility. The second noise barrier would be approximately 5-6 feet high and would be located on the portion of the ramp at the southwestern corner of the AC Transit facility. Treat the noise barriers with an absorptive material on the side facing the facility to minimize the potential for reflections off the underside of the freeway. o Construct a noise barrier to mitigate noise impacts to residences south of the Golden Gate Transit Facility along	**TJPA**	During construction	TJPA	TJPA to design detailed noise mitigation during preliminary & final design phases. TJPA engineering staff to inspect installation and/or construction of mitigation measures

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
Stillman Street. The barrier would be approximately 10-12 feet high and run along the southern and a portion of the eastern edge of the Golden Gate Transit storage facility. Treat the noise barriers with an absorptive material on the side facing the facility to minimize the potential for reflections off the underside of the freeway.				
NoiO 2 – Landscape the noise walls. Develop the actual design of the walls in cooperation with area residents.	**TJPA**	During preliminary and final design	TJPA	TJPA to work with area residents during design of noise walls
NoiO 3 – Construct noise walls prior to the development of the permanent bus facilities.	**TJPA**	During schedule development, construction document preparation & construction	TJPA	TJPA to develop program schedule and contract documents to implement this construction sequencing requirement
Noise – Construction				
NoiC 1 – Comply with San Francisco noise ordinance. The noise ordinance includes specific limits on noise from construction. The basic requirements are: o Maximum noise level from any piece of powered construction equipment is limited to 80 dBA at 100 ft. This translates to 86 dBA at 50 feet. o Impact tools are exempted, although such equipment must be equipped with effective mufflers and shields. The noise control equipment on impact tools must be as recommended by the manufacturer and approved by the Director of Public Works.	**TJPA**	During preparation of construction contract documents & construction	TJPA	TJPA to work with CCSF Department of Public Works (DPW) regarding construction noise mitigation program

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
o Construction activity is prohibited between 8 p.m. and 7 a.m. if it causes noise that exceeds the ambient noise plus 5 dBA. The noise ordinance is enforced by the San Francisco DPW, which may waive some of the noise requirements to expedite the project or minimize traffic impacts. For example, along Townsend Street where much of the land use is commercial, business owners may prefer nighttime construction since it would reduce disruption during normal business hours. The DPW waivers usually allow most construction processes to continue until 2 a.m., although construction processes that involve impacts are rarely allowed to extend beyond 10 p.m. This category would include equipment used in demolition such as jackhammers and hoe rams, and pile driving. It is not anticipated that the construction documents would have specific limits on nighttime construction. There may be times when nighttime construction is desirable (e.g., in commercial districts where nighttime construction would be less disruptive to businesses in the area) or necessary to avoid unacceptable traffic disruptions. Since the construction would be subject to the requirements of the San Francisco noise regulations, in these cases, the contractor would need to work with the DPW to come up with an acceptable approach balancing interruption of the business and residential community, traffic disruptions, and reducing the total duration of the construction.				
NoiC 2 – Conduct noise monitoring. The purpose of monitoring is to ensure that contractors take all reasonable steps to minimize noise.	**TJPA**	During construction	TJPA	Monitoring data to be provided to CCSF DPW
NoiC 3 – Conduct inspections and noise testing of equipment. This measure will ensure that all equipment on the site is in good	**TJPA**	During construction	TJPA	Perform monitoring during construction

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
condition and effectively muffled				
NoiC 4 – Implement an active community liaison program. This program would keep residents informed about construction plans so they can plan around periods of particularly high noise levels and would provide a conduit for residents to express any concerns or complaints about noise.	**TJPA**	During construction	TJPA	TJPA to develop & initiate community liaison program during final design prior to construction. Program will continue during construction
NoiC 5 – Minimize use of vehicle backup alarms. Because backup alarms are designed to get people's attention, the sound can be very noticeable even when their sound level does not exceed the ambient, and it is common for backup alarms at construction sites to be major sources of noise complaints. A common approach to minimizing the use of backup alarms is to design the construction site with a circular flow pattern that minimizes backing up of trucks and other heavy equipment. Another approach to reducing the intrusion of backup alarms is to require all equipment on the site to be equipped with ambient sensitive alarms. With this type of alarm, the alarm sound is automatically adjusted based on the ambient noise. In nighttime hours when ambient noise is low, the backup alarm is adjusted down.	**TJPA**	During construction document preparation & construction	TJPA	Review contract specifications during final design & inspect construction
NoiC 6 – Include noise control requirements in construction specifications. These should require the contractor to: o Perform all construction in a manner to minimize noise. The contractor should be required to select construction processes and techniques that create the lowest noise levels. Examples are using predrilled piles instead of impact pile driving, mixing concrete offsite instead of onsite, and using hydraulic tools instead of pneumatic impact tools.	**TJPA**	Final Design & construction	TJPA	TJPA to develop detailed noise control requirements during preliminary engineering & final design. Insure contractor obtains permits if necessary. Inspect construction activities for compliance & monitor noise levels. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
o Use equipment with effective mufflers. Diesel motors are often the major noise source on construction sites. Contractors should be required to employ equipment fitted with the most effective commercially available mufflers. o Perform construction in a manner to maintain noise levels at noise sensitive land uses below specific limits. o Perform noise monitoring to demonstrate compliance with the noise limits. Independent noise monitoring should be performed to check compliance in particularly sensitive areas. o Minimize construction activities during evening, nighttime, weekend and holiday periods. Permits would be required before construction can be performed in noise sensitive areas during these periods. o Select haul routes that minimize intrusion to residential areas. This is particularly important for the trench alternatives that will require hauling large quantities of excavation material to disposal sites. Controlling noise in contractor work areas during nighttime hours is likely to require some mixture of the following approaches: o Restrictions on noise producing activities during nighttime hours. o Laying out the site to keep noise producing activities as far as possible from residences, to minimize the use of backup alarms, and to minimize truck activity and truck queuing near the residential areas. o Use of procedures and equipment that produce lower noise				as CCSF Department of Parking & Traffic (DPT) and DPW

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
levels than normal. For example, some manufacturers of construction equipment can supply special noise control kits with highly effective mufflers and other materials that substantially reduce noise emissions of equipment such as generators, tunnel ventilation equipment, and heavy diesel power equipment including mobile cranes and front-end loaders. o Use of temporary barriers near noisy activities. By locating the barriers close enough to the noise source, it is possible to obtain substantial noise attenuation with barriers 10 to 12 feet high even though the residences are 30 to 40 feet higher than the construction site. o Use of partial enclosures around noisy activities. It is sometimes necessary to construct shed-like structures or complete buildings to contain the noise from nighttime activites.				

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
Vibration – Operations				
VibO 1 – Use high-resilience track fasteners or a resiliently supported tie system for the Caltrain Downtown Extension for areas projected to exceed vibration criteria, including the following locations: (1) Live/Work Condos, 388 Townsend Street (Hubbell and Seventh), (2) San Francisco Residences on Bryant (Harrison Parking Lot Site), (3) Clock Tower Building, and Second Street High Rise and (4) new Marriott Courtyard (Marine Firefighter's Union).	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA to develop locations/use of resilience track fasteners or resiliently supported tie system during preliminary engineering & final design. Review construction documents & inspect installation. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as CCSF Department of Building Inspection (DBI) and DPW.
Vibration – Construction				
VibC 1 – Limit or prohibit use of construction techniques that create high vibration levels. At a minimum, processes such as pile driving would be prohibited at distances less than 250 feet from residences.	**TJPA**	During preliminary engineering , final design & construction	TJPA	TJPA to ensure preliminary design, final design & contract documents preclude use of pile driving equipment within 250 feet of residences. Construction management & inspection will monitor contractors' activities to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
VibC 2 – Restrict procedures that contractors can use in vibration sensitive areas. (It is often possible to employ alternative techniques that create lower vibration levels. For example, unrestricted pile driving is one activity that has considerable potential for causing annoying vibration. Using the cast-in-drilled-hole piling method instead will eliminate most potential for vibration impact from the piling.)	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA to establish construction vibration design standards during final design. Include provisions in contract documents & monitor contractors' activities to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW
VibC 3 – Require vibration monitoring during vibration intensive activities.	**TJPA**	During construction	TJPA	TJPA to include provisions for vibration monitoring in construction contract documents or perform monitoring under a separate contract. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW
VibC 4 – Restrict the hours of vibration intensive activities such as pile driving to weekdays during daytime hours.	**TJPA**	During design & construction	TJPA	TJPA to include provisions in contract documents & monitor contractors' activities to insure compliance
VibC 5 – Investigate alternative construction methods and practices to reduce the impacts in coordination with the construction contractor if resident annoyance from vibration becomes a problem.	**TJPA**	During final design & during construction	TJPA	TJPA to include provisions in contract documents & monitor contractors' activities to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW
VibC 6 – Include specific limits, practices and monitoring and reporting procedures for the use of controlled detonation. Control and monitor use of controlled detonation to avoid damage to existing structures. Include specific limits, practices, and monitoring and reporting procedures within contract	**TJPA**	During final design & during construction	TJPA	TJPA to establish detailed limits, practices, and monitoring program for controlled detonation during final design. Include provisions in contract documents & monitor contractors'

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
documents to ensure that such construction methods, if used, would not exceed safety criteria.				activities to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW
Soils/Geology				
SG 1 – Monitor adjacent buildings for movement and, if movement is detected, take immediate action to control the movement.	**TJPA**	During construction	TJPA	TJPA to include provisions in contract documents requiring such monitoring and corrective measures and inspect contractors' activities to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW
SG 2 – Apply geotechnical and structural engineering principles and conventional construction techniques similar to the design and construction of high-rise buildings and tunnels throughout the downtown area. Apply design measures and utilize pile supported foundations to mitigate potential settlement of the surface and underground stations.	**TJPA**	During preliminary engineering and final design	TJPA	TJPA to review design and contract documents to insure implementation. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW
SG 3 – Design and construct structural components of the project to resist strong ground motions approximating the maximum anticipated earthquake (0.5g). The cut-and-cover portions will require pile supports to minimize non-seismic settlement in soft compressible sediments (Bay Mud). The underground Caltrain station at Fourth and Townsend will require pile-supported foundations due to the presence of underlying soft sediments.	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA to design structural components to meet seismic standards during preliminary engineering & final design. Review design, contract documents & construction activities to insure implementation. Where applicable, coordinate with JPB and CCSF departments with jurisdiction over activities, such as DBI and DPW

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
SG 4 – Underpin existing building, where deemed necessary, to protect existing structures from potential damage that could result from excessive ground movements during construction. Design the tunneling and excavation procedures (and construction sequence), and design of the temporary support system with the objective of controlling ground deformations within small enough levels to avoid damage to adjacent structures. Where the risk of damage to adjacent structures is too great, special measures will be implemented such as: (1) underpinning, (2) ground improvement, and/or (3) strengthening of existing structures to mitigate the risks. Underpinning may include internal strengthening of the superstructure, bracing, reinforcing existing foundations, or replacing existing foundations with deep foundations embedded outside the tunnel zone of influence. Alternatives, in lieu of underpinning, involve strengthening the rock between the building & crown of tunnel. Grouting in combination with inclined pin piles can be used not only to strengthen the rock but make the rock mass over the tunnel act as a rigid beam, allowing construction of tunnels with no adverse effects on the buildings supported on shallow foundations over the tunnel.	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA to design tunneling, excavation procedures, underpinning, strengthening existing structures or ground improvement to protect existing structures from damage Include provisions in contract documents requiring contractors to implement measures during construction. Monitor construction activities to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DBI and DPW
SG 5 – TJPA shall assure proper design and construction of pile supported foundations for structures to control potential settlement of the surface. Stability of excavations and resultant impacts on adjacent structures can be controlled within tolerable limits by proper design and implementation of the excavation	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA to insure foundations & excavation shoring systems are designed & constructed to minimize & control settlement & impacts on adjacent structures. Where applicable, coordinate with CCSF departments

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
shoring systems.				with jurisdiction over activities, such as DBI and DPW
Utilities				
Util 1 – Coordinate with utility providers during preliminary engineering, continuing through final design and construction. Utilities would be avoided, relocated, and/or supported as necessary during construction activities to prevent damage to utility systems and to minimize disruption and degradation of utility service to local customers.	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA to identify utilities; design relocations or protection measures where required; & include requirements in contract documents. Monitor construction activities to insure implementation of all required measures
Cultural and Historic Resources				
CH 1 – Comply with the provision of the signed Memorandum of Agreement (MOA) between the Federal Transit Administration, the State Historic Preservation Officer, and the TJPA.	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA will assure compliance with MOA provisions during preliminary engineering, final design & construction, as described below
CH 2 – Assure supervision of all activities regarding historic preservation, historical archaeology and prehistoric archaeology is carried out by professionals meeting Secretary of the Interior's professional qualifications standards (48 FR 44738-9).	**TJPA**	During preliminary engineering, final design & construction	TJPA	Prior to initiation of design & construction activities, TJPA will require submission of & review qualifications of professionals performing the MOA activities to assure that Secretary of Interior standards are met

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
CH 3 – Integrate into the design of the new terminal a dedicated space for a permanent interpretive exhibit. The interpretive exhibit will include at a minimum, but is not necessarily limited to: plaques or markers, a mural or other depiction of the historic terminal, and Key System, or other interpretive material.	**TJPA**	During preliminary engineering & final design	TJPA	TJPA will include space for interpretive exhibit in terminal during design. Review contract documents & construction submittals & activities to insure implementation
CH 4 – Consult with the State Department of Transportation (Department) regarding the availability of historical documentary materials and the potential use of salvaged items from the existing Transbay Terminal for the creation of the permanent interpretive display of the history of the original Transbay Terminal building and its association with the San Francisco-Oakland Bay Bridge and the potential salvaged items from the existing Terminal. Invitation to the Oakland Heritage Alliance, the San Francisco Architectural Heritage, the California State Railroad Museum, and the Western Railway Museum to participate in this consultation. While retaining responsibility for the development of the exhibit, TJPA will jointly consider the Department's and participating invitees' recommendations when finalizing the exhibit design. TJPA will produce, install, and maintain the exhibit.	**TJPA**	During preliminary engineering & final design	TJPA	TJPA will consult with Department regarding availability of documentary materials & potential use of salvaged items. TJPA will invite participation in this review from the other designated parties. TJPA will produce, install, & maintain the exhibit in the new Transbay Terminal
CH 5 – Consult with the City of Oakland about its interest in having a similar interpretive exhibit in the East Bay. If agreement is reached prior to completion of final design of the Transbay Terminal, TJPA will provide and deliver exhibit materials to a venue designated by the City of Oakland.	**TJPA**	During preliminary engineering & final design	TJPA	During preliminary engineering & final design, TJPA will consult with City of Oakland regarding its interest in establishing an exhibit. TJPA will provide & deliver exhibit materials to a venue in the City of Oakland should such an exhibit be developed
CH 6 – Identify, in consultation with Department, elements of the existing Transbay Terminal that are suitable for salvage and	**TJPA**	During preliminary	TJPA	Acceptance of items by interested parties must be completed at least 90

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
interpretive use in the exhibit in the new Terminal or by museums. Within two years of signing of this agreement, TJPA will offer these items to San Francisco Architectural Heritage, the California State Railroad Museum, Sacramento, the Western Railway Museum, the Oakland Museum, and any other interested parties. TJPA will remove the items selected in a manner that minimizes damage and will deliver them with legal title to the recipient. Items not accepted for salvage or interpretive use will receive no further consideration.		engineering & final design		days prior to demolition of the Transbay Terminal
CH 7 – Consult with Department and the Oakland Museum about contributing to Department's exhibit at the Oakland Museum relating to the history and engineering of the major historic state bridges of the San Francisco Bay Area. TJPA will propose contributions to such an exhibit, which may include an interpretive video that would include the history of the Transbay Terminal and the Key System. Components to such an exhibit may include photographs, drawings, videotape, models, oral histories, and salvaged components from the terminal.	**TJPA**	During preliminary engineering & final design	TJPA	TJPA will produce & deliver to the Oakland Museum agreed-upon materials for such an exhibit
CH 8 – Assist the Oakland Museum by contributing to the cost of preparing and presenting the exhibit, as well as the costs of an exhibit catalog or related museum publication in conjunction with the exhibit, in a manner and to the extent agreed upon by TJPA, Department, and the Oakland Museum of California. TJPA has established a maximum budget of $50,000.00 for the Oakland Museum of California exhibit and the interpretive video.	**TJPA**	During preliminary engineering & final design	TJPA	TJPA will work with Oakland Museum & assist in the preparation of an exhibit & an interpretive video if consultation results in agreement between TJPA & Oakland Museum prior to demolition of the existing Transbay Terminal
CH 9 – Consult, prior to the start of any work that would have an adverse effect on historic properties, with the California SHPO to ensure that the Transbay Terminal has been adequately recorded by past efforts. Collectively, these past studies, which include	**TJPA**	During preliminary engineering & final design	TJPA	TJPA will consult with the SHPO regarding adequacy of prior recordation efforts. TJPA will work with Department to seek original

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
Department's past recordation of a series of remodeling and seismic retrofit projects that have occurred since 1993, may adequately document the building, making Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) documentation unnecessary. In addition, TJPA, assisted by Department, will seek to obtain the original drawings of the Transbay Transit Terminal by the architect Timothy Pflueger. If the drawings cannot be copied and included in the documentation, then TJPA will consult with SHPO regarding recordation level and specifications for completing additional documentation. When the SHPO finds the documentation to be adequate, then TJPA will compile this documentation into a comprehensive record.				drawings of the Transbay Transit Terminal. If drawings cannot be copied & included in documentation, TJPA will consult with SHPO regarding recordation level & specifications for completing additional documentation
Submit all documentation to SHPO, and Department Headquarters Library, with xerographic copies to the History Center at the San Francisco Public Library, San Francisco Architectural Heritage, the Oakland History Room of the Oakland Public Library, the Oakland Museum of California, the Western Railway Museum, and Department District 4 Office.				TJPA will ensure that these records are accepted by SHPO prior to demolition of the Transbay Transit Terminal
CH 10 – Develop and implement measures, in consultation with the owners of historic properties immediately adjoining the construction sites, to protect the contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District from damage by any aspect of the Undertaking. Such measures will include, but are not necessarily limited to those identified in this Mitigation Monitoring Plan.	**TJPA**	During preliminary engineering final design, & construction	TJPA	As part of its overall outreach efforts, TJPA will contact owners of record of historic properties that will be affected (but that will not be acquired & demolished) by the Project. TJPA will provide & review this mitigation monitoring program with the owners via correspondence and/or public and face-to-face meetings. TJPA will coordinate these efforts with the CCSF Planning Department

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
CH 11 – Assure, prior to the start of any work that would have an adverse effect on historic properties, that the three historic properties to be demolished are recorded in accordance with HABS/HAER standards, as appropriate. These buildings are: o 191 2nd Street, (APN: 3721-022), o 580-586 Howard Street, (APN: 3721-092 through 3721-106), and o 165-173 2nd Street, (APN: 3721-025) All documentation will be submitted to SHPO, with xerographic copies to the History Center at the San Francisco Public Library, San Francisco Architectural Heritage, and the Oakland History Room of the Oakland Public Library. TJPA will ensure that these HABS/HAER records are accepted by NPS prior to carrying out any other treatment.	**TJPA**	During preliminary engineering & final design	TJPA	TJPA shall prepare recordation documents in accordance with HABS/HAER standards. TJPA will coordinate these efforts with the CCSF Planning Department. TJPA shall contract the HABS/HAER branch of the National Park Service to obtain guidance regarding level of recordation & specifications for completing the documentation
CH 12 – Repair, in accordance with the Secretary of the Interior's Standards for Rehabilitation, of any damage to contributing elements of the Second and Howard Streets Historic District and the Rincon Point/South Beach Historic Warehouse Industrial District resulting from the Undertaking. If repair of inadvertent damage is necessary, TJPA will submit plans to the SHPO for review and comment to ensure conformance with the Secretary of the Interior's Standards for Rehabilitation.	**TJPA**	Prior to, during, and following construction	TJPA	Condition of contributing properties will be photographed prior to the start of the Project to establish the baseline condition for assessing damage. TJPA will coordinate these efforts with the CCSF Planning Department. To record existing conditions, TJPA will consult with property owner(s) about the appropriate level of photographic documentation of building interiors and exteriors. A copy of this photographic documentation will be provided to the property owner(s), & will be retained on file by TJPA

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
CH 13 – Prepare a comprehensive Research Design/Treatment Plan for archeological resources prepared by a qualified consultant. The Research Design/Treatment Plan will be consistent with the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37) and take into account the ACHP publication, Treatment of Archaeological Properties: A Handbook (ACHP 1980), and SHPO guidelines. The Research Design/Treatment Plan will include, at a minimum: o An historical context for the Area of Potential Effects for Archaeological Resources (APEAR). o A research context for the APEAR, identifying expected archeological property types and developing research themes, questions, and data needs.	**TJPA**	During preliminary engineering	TJPA	TJPA will assure completion of comprehensive research design/treatment plan consistent with the content required in the MOA. TJPA shall transmit this plan to the signatories of the MOA. TJPA will also coordinate these efforts with the CCSF Planning Department
o A testing/data recovery plan that will specify, at minimum: ➢ The properties or portion of properties where evaluation and/or data recovery are to be carried out; ➢ The properties, if any, that will be affected by the Undertaking but for which no data recovery will be carried out; ➢ The manner in which inadvertent discoveries will be treated; ➢ The methods to be used for data recovery, with an explanation of their relevance to the research questions/themes; ➢ The methods to be used in cataloguing, analysis, data management, and dissemination of data;	**TJPA**	During design & construction	TJPA	TJPA will assure compliance with the testing/data recovery plan once finalized. TJPA will coordinate these efforts with the CCSF Planning Department

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
➢ The proposed disposition of recovered materials and records, including discard and deaccession; ➢ The manner in which any human remains and associated/unassociated funerary objects, including those of Native American or Native Hawaiian origin, will be treated; ➢ The security procedures to be undertaken to protect the archeological testing/data recovery site from vandalism, theft, or unintended damage; ➢ The final report summarizing, describing and interpreting the results of testing/data recovery; ➢ The measures to be undertaken to ensure curation of recovered data determined to have appropriate research potential. ➢ Research Design/Treatment Plan Review **CH 14** – Submit the Research Design/Treatment Plan to all parties to the MOA for a thirty (30) calendar day review following receipt of the Plan.	**TJPA**	During preliminary engineering phase	TJPA	TJPA will submit the Research Design/Treatment Plan to the signatories of the MOA. TJPA will coordinate these efforts with the CCSF Planning Department. If any party fails to submit their comments within thirty (30) days, TJPA may assume that party's concurrence with the Research Design/ Treatment Plan. TJPA will take any review comments into account, revise the Research Design/Treatment Plan accordingly, & will notify any party whose comments

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
				were not incorporated into the Plan
CH15 – In consultation with FTA and SHPO, re-evaluate the Bay Bridge, a property listed on the NRHP, and determine whether the National Register nomination should be amended or whether the bridge no longer qualifies for listing and should be removed from the National Register.	**TJPA**	Within 180 days after FTA determines that the Project has been completed	FTA/SHPO	As appropriate, TJPA will prepare and submit to the FTA and SHPO either an amended nomination or petition for removal, to be processed according to the procedures set forth in 36 CFR Part 60(60.14 and 60.15)
CH16 – In consultation with FTA and SHPO, re-evaluate the Second and Howard Streets Historic District and determine whether the National Register nomination should be amended or whether the district no longer qualifies for listing and should be removed from the National Register.	**TJPA**	Within 180 days after FTA determines that the Project has been completed	FTA/SHPO	As appropriate, TJPA will prepare and submit to the FTA and SHPO either an amended nomination or petition for removal, to be processed according to the procedures set forth in 36 CFR Part 60(60.14 and 60.15). TJPA will coordinate these efforts with the CCSF Planning Department
Hazardous Materials/Waste – Operations				
HWO 1 – Construct and operate any Caltrain fueling facility in compliance with local, state and Federal regulations regarding handling and storage of hazardous materials.	**Caltrain Joint Powers Board (JPB)**	During construction and operation	TJPA	Review design and contract documents to insure compliance with all applicable regulations. Obtain all applicable permits. Inspect construction to insure compliance with contract documents and regulations. Inspect operations, & comply with all permitting & reporting requirements
HWO 2 – Equip diesel fuel pumps with emergency shut-off valves and, in compliance with U.S. EPA requirements, fuel Underground Storage Tanks (USTs) would be equipped with leak detection and monitoring systems.	**JPB**	During operation	TJPA	Review design & contract documents to insure compliance with all applicable regulations. Obtain all applicable permits. Inspect construction to insure compliance with

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
				contract documents and regulations. Inspect operations, & comply with all permitting & reporting requirements
HWO 3 – Employ the use of secondary containment systems for any aboveground storage tanks.	**JPB**	During operations	TJPA	Secondary containment to be included in facility design & construction & maintained during operations
HWO 4 – Store cleaning solvents in 55-gallon drums, or other appropriate containers, within a bermed area to provide secondary containment.	**JPB**	During operations	TJPA	Inspect operations, & comply with all permitting & reporting requirements
HWO 5 – Slope paved surfaces within the fueling facility and the solvent storage area to a sump where any spilled liquids could be recovered for proper disposal.	**JPB**	During construction & operations	TJPA	Sloped paved surfaces and sump to be included in facility design
HWO 6 – Follow California OSHA and local standards for fire protection and prevention for the handling and storage of fuels and solvents.	**JPB**	During operation	TJPA	Review design & contract documents to insure compliance with all applicable regulations. Obtain all applicable permits. Inspect construction to insure compliance with contract documents & regulations. Inspect operations, & comply with all permitting & reporting requirements
HWO 7 – Prepare a Hazardous Materials Management/ Business Plan and file with the CCSF Department of Public Health.	**JPB**	During final design	TJPA	JPB to prepare and TJPA to file Hazardous Materials Management/ Business Plan with CCSF Department of Public Health (DPH)
Hazardous Materials/Waste – Construction				
HMC 1 – Follow California OSHA and local standards for fire protection and prevention. Handling and storage of fuels and other flammable materials during construction will conform to	**TJPA**	During construction	TJPA	Review design & contract documents to insure compliance with all applicable regulations. Obtain all

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
these requirements, which include appropriate storage of flammable liquids and prohibition of open flames within 50 feet of flammable storage areas.				applicable permits. Inspect construction to insure compliance with contract documents & regulations
HMC 2 – Perform detailed investigations of the potential presence of contaminants in soil and groundwater prior to construction, using conventional drilling, sampling, and chemical testing methods. Based on the chemical test results, a mitigation plan will be developed to establish guidelines for the disposal of contaminated soil and discharge of contaminated dewatering effluent, and to generate data to address potential human health and safety issues that may arise as a result of contact with contaminated soil or groundwater during construction. The investigation and mitigation plan will follow the requirements of the City and County of San Francisco's Article 22A in the appropriate areas along the alignment.	**TJPA**	During construction	TJPA	Review design & contract documents to insure compliance with all applicable regulations. Obtain all applicable permits. Inspect construction to insure compliance with contract documents & regulations. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DPH and DPW
With construction projects of this nature and magnitude, there are typically two different management strategies that can be employed to address contaminated soil handling and disposal issues. Contaminated soil can be excavated and stockpiled at a centralized location and subsequently sampled and analyzed for disposal profiling purposes in accordance with the requirements of the candidate disposal landfill. Alternatively, soil profiling for disposal purposes can be done in-situ so when soil is excavated it is loaded directly on to trucks and hauled to the appropriate landfill facility for disposal based on the in-situ profiling results. A project of this nature could also combine both strategies.				

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
HMC 3 – Cover with plastic sheeting soils removed during excavation and grading activities that remain at a centralized location for an extended period of time to prevent the generation of fugitive dust emissions that migrate offsite.	**TJPA**	During construction	TJPA	Review design & contract documents to insure compliance. Obtain all applicable permits. Inspect construction to insure compliance with contract documents & regulations
HMC 4 – Use a licensed waste hauler, applying appropriate manifests or bill of lading procedures, as required to haul soil for disposal at a landfill or recycling facility.	**TJPA**	During construction	TJPA	Review design & contract documents to insure compliance. Obtain all applicable permits. Inspect construction to insure compliance with contract documents & regulations
HMC 5 – Use chemical test results for groundwater samples along the alignment to obtain a Batch Discharge Permit under Article 4.1 of the San Francisco Department of Public Works as well as to evaluate requirements for pretreatment prior to discharge to the sanitary sewer. Effluent produced during the dewatering of excavations will be collected in onsite storage tanks and periodically tested, as required under discharge permit requirements, for potential contamination to confirm the need for any treatment prior to discharge. If required, treatment may include: o Settling to allow particulate matter (total suspended solids) to settle out of the effluent in order to reduce the sediment load as well as reduce elevated metal and other contaminant concentrations that may be associated with suspended sediments; and/or o Construction of a small-scale batch waste water treatment	**TJPA**	During construction	TJPA	Review design & contract documents to insure compliance. Obtain all applicable permits. Inspect construction to insure compliance with contract documents & regulations. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DPH and DPW

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
system to remove dissolved contaminants (mainly organic constituents such as petroleum hydrocarbons (gas, diesel, and oils), BTEX, and VOCs) from the dewatering effluent prior to discharge to the sanitary sewer. A treatment system would also likely employ the use of filtration to remove suspended solids.				
HMC 6 – Develop a detailed mitigation plan for the handling of potentially contaminated soil and groundwater prior to starting project construction.	**TJPA**	During final design	TJPA	Review detailed mitigation plan, include provisions in contract documents & inspect construction to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DPH and DPW. Obtain all applicable permits
HMC 7 – Design dewatering systems to minimize downward migration of contaminants that can result from lowering the water table if necessary based on environmental conditions. As necessary, shallow soils with detected contamination would be dewatered first using wells screened only in those soils. Dewatering of deeper soils would then be performed using wells screened only in the zone to be dewatered. Dewatering wells would be installed using drilling methods that prohibit shallow contaminated soils from being carried deeper into the boreholes.	**TJPA**	During final design & construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DPH and DPW

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
HMC 8 – Require that workers performing activities on site that may involve contact with contaminated soil or groundwater have appropriate health and safety training in accordance with 29 CFR 1910.120. A Worker Health and Safety Plan (HSP) will be developed for the project and monitored for the implementation of the plan on a day-to-day basis by a Certified Industrial Hygienist (CIH). The HSP will include provisions for: o Conducting preliminary site investigations and analysis of potential job hazards; o Personnel protective equipment; o Safe work practices; o Site control; o Exposure monitoring; o Decontamination procedures; and o Emergency response actions. The HSP will specify mitigation of potential worker and public exposure to airborne contaminant migration by incorporating dust suppression techniques in construction procedures. The plan will also specify mitigation of worker and environmental exposure to contaminant migration via surface water runoff pathways by implementation of comprehensive measures to control drainage from excavations and saturated materials excavated during construction.	**TJPA**	During construction	TJPA	Provide health and safety training prior to start of & at timely intervals during construction. Include requirements in contract documents & monitor construction activities to insure compliance
HMC 9 – Review existing asbestos surveys, abatement reports, and supplemental asbestos surveys, as warranted. Perform and	**TJPA**	During preliminary	TJPA	Determine extent of ACM throughout project site. Perform abatement work

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
asbestos survey for building to be demolished, as required. Asbestos-containing building materials (ACM) will require abatement prior to building demolition. Removal and disposal of ACM will be performed in accordance with applicable local, state, and federal regulations.		engineering, final design & construction phases		prior to demolition. Include all regulatory requirements in contract documents & inspect construction to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DPH. Obtain all applicable permits
HMC 10 – Perform a lead-based paint survey for buildings to be demolished to determine areas where lead-based paint is present and the possible need for abatement prior to demolition.	**TJPA**	During preliminary engineering prior to building demolitions	TJPA	Determine extent of lead contamination throughout project site. Perform abatement work prior to demolition if necessary. Include all regulatory requirements in contract documents & inspect construction to insure compliance. Where applicable, coordinate with CCSF departments with jurisdiction over activities, such as DPH. Obtain all applicable permits
Pedestrians				
Ped 1 – Use future construction or redevelopment as opportunities to increase building set-backs thereby increasing sidewalk widths. Particular areas where such widening is most needed include: o The southeast corner of Fremont and Mission Streets, o The northeast corner of First and Mission Streets, o The north side of Mission Street between First and Fremont, and o Sidewalks south of Howard Street along Folsom, First,	**Agency and CCSF**	During future project reviews in Transbay Terminal area	Agency & CCSF	TJPA will forward guidance to Agency, CCSF Planning Department and DPW

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
Fremont, and Beale that are less than 10 feet wide.				
Ped 2 – Eliminate or reduce sidewalk street furniture such as newspaper boxes and magazine racks in the immediate Transbay Terminal area on corners.	**Agency & CCSF**	Prior to opening of new Transbay Terminal	Agency & CCSF	TJPA will forward guidance to Agency, CCSF Planning Department and DPW
Ped 3 – Retime traffic light signalization. This could improve pedestrian levels of service at each of the intersections studies that fall into LOS F.	**CCSF**	Prior to opening of new Transbay Terminal	CCSF	TJPA will forward guidance to CCSF DPT
Ped 4 – Provide crosswalk signalization at intersections where they do not exist already, such as Folsom and Beale Streets.	**CCSF**	Prior to opening of new Transbay Terminal	CCSF	TJPA will forward guidance to CCSF DPT
Ped 5 – Provide cross-walk count-down signals at intersections and cross-walks immediately surrounding the new Transbay Terminal.	**CCSF**	Prior to opening of new Transbay Terminal	CCSF	TJPA will forward guidance to CCSF DPT
Ped 6 – Ensure that Transbay Terminal design increases corner and sidewalk widths at the four intersections immediately surrounding the Transbay Terminal.	**TJPA & CCSF DPW**	During Transbay Terminal design phase	TJPA	TJPA and CCSF DPW, where applicable, to include sidewalk width expansion during preliminary & final design of new Transbay Terminal
Ped 7 – Provide lights within crosswalks to warn when pedestrians are present in the crosswalk, such as at the cross-walk associated with the mid-block bus loading area.	**TJPA**	Prior to opening of new Transbay Terminal	TJPA	TJPA to work with CCSF DPT to install cross-walk warnings
Pre-Construction Activities				
PC 1 – Complete a pre-construction building structural survey to determine the integrity of existing buildings adjacent to and over the proposed Caltrain Downtown Extension. Use this survey to finalize detailed construction techniques along the alignment and as the baseline for monitoring construction impacts during and following construction.	**TJPA**	Prior to preliminary engineering, final design and construction	TJPA	TJPA to perform building surveys during preliminary engineering. TJPA to include measures to protect existing buildings in final design & construction documents TJPA to review design submittals,

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
				contract documents and construction activities to insure implementation
PC 2 – Contact and interview individual businesses along the Caltrain Extension alignment to gather information and develop an understanding of how these businesses carry out their work. This survey will identify business usage, delivery/shipping patterns, and critical times of the day or year for business activities. Use this information to assist in: (a) the identification of possible techniques during construction to maintain critical business activities, (b) analyze alternative access routes for customers and deliveries to businesses, (c) develop traffic control and detour plans, and (d) finalize construction practices.	**TJPA**	During preliminary engineering, final design & construction		TJPA to perform business activity survey during preliminary engineering. TJPA to include measures to maintain business activities & access in final design and construction documents TJPA to review design submittals, contract documents and construction activities to insure implementation
PC 3 – Complete detailed geotechnical investigation, including additional sampling (drilling and core samples) and analyses of subsurface soil/rock conditions. Use this information to design the excavation and its support system to be used in the retained cut, cut-and-cover, and tunnel portions of the Caltrain Downtown Extension.	**TJPA**	During preliminary engineering & final design	TJPA	TJPA to obtain necessary permits from CCSF prior to performing drilling. TJPA to perform detailed geotechnical investigation during preliminary engineering TJPA to review design submittals, contract documents & construction activities to insure proper utilization of information obtained during investigation
PC 4 – Establish community construction information/ outreach program to provide on-going dialogue among the TJPA and the affected community regarding construction impacts and possible mitigation/solutions. Include dedicated personnel for an outreach office in the construction area to deal with construction coordination.	**TJPA**	During construction	TJPA	TJPA to establish program during final design prior to construction

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
PC 5 – Establish site and field offices located along the Caltrain Downtown Extension alignment. Field office staff, in conjunction with other staff, will: o Provide the community and businesses with a physical location where information pertaining to construction can be exchanged, o Enable TJPA and JPB to better understand community/business needs during the construction period, o Allow TJPA and JPB to participate in local events in an effort to promote public awareness of the project, o Manage construction-related matters pertaining to the public, o Notify property owners, residences, and businesses of major construction activities (e.g., utility relocation/disruption and milestones, re-routing of delivery trucks), o Provide literature to the public and press, o Promote and provide presentations on the project via a Speakers Bureau, o Respond to phone inquires, o Coordinate business outreach programs, o Schedule promotional displays, and o Participate in community committees.	**TJPA & JPB**	During construction	TJPA	TJPA to establish program during final design & continue during construction

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PC 6 – Implement an information phone line to provide community members and businesses the opportunity to express their views regarding construction. Review calls received and, as appropriate, forward the message to the necessary party for action (e.g., utility company, fire department, the Resident Engineer in charge of construction operations). Information available from the telephone line will include current project schedule, dates for upcoming community meetings, notice of construction impacts, individual problem solving, construction complaints and general information. Phone service would be provided in English, Cantonese, and Spanish and would be operated on a 24-hour basis.	**TJPA**	During construction	TJPA	TJPA to establish informational "Hot Line" during final design & continue during construction
PC 7 – Develop traffic management plans. Traffic management plans to maintain access to all businesses will be prepared for areas affected by surface or cut-and-cover construction. In addition, daily cleaning of work areas would be performed by contractors for the duration of the construction period. Provisions would be contained in construction contracts to require the maintenance of driveway access to businesses to the extent feasible.	**TJPA**	During preliminary engineering, final design & construction	TJPA	TJPA to forward traffic management plans to CCSF DPT for review & approval. Include all requirements in construction documents & inspect implementation during construction

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
General Construction Measures				
GC 1 – Disseminate information to community in a timely manner regarding anticipated construction activities.	**TJPA**	During construction	TJPA	TJPA to initiate program during final design & continue during construction
GC 2 – Provide signage. Work with establishments affected by construction activities to develop appropriate signage for display that directs both pedestrian and vehicular traffic to businesses via alternate routes.	**TJPA**	Prior to & during construction	TJPA	TJPA to initiate signage program during final design and monitor contractors' installation during construction
GC 3 – Install level deck. Install decking at the cut-and-cover sections to be flush with the existing street or sidewalk levels.	**TJPA**	During construction	TJPA	TJPA to design flush decking during preliminary & final design, include in construction documents & insure installation during construction
GC 4 – Provide for efficient sidewalk design and maintenance. Wherever feasible, maintain sidewalks at the existing width during construction. Where a sidewalk must be temporarily narrowed during construction (e.g., deck installation), restore it to its original width during the majority of construction period. (In some places this may require placing the temporary sidewalk on the deck.) Each sidewalk design should be of good quality and approved by the Resident Engineer prior to construction. Handicapped access will be maintained during construction where feasible.	**TJPA**	During preliminary engineering & construction	TJPA	TJPA to work with CCSF DPW on design of sidewalk plans during preliminary & final design & insure installation during construction
GC 5 – Provide construction site fencing of good quality, capable of supporting the accidental application of the weight of an adult without collapse or major deformation. Where covered walkways or other solid surface fencing is installed, establish a program to allow for art work (e.g., by local students) on the surface(s).	**TJPA**	During design & construction	TJPA	TJPA to work with CCSF DPW, incorporate requirements in construction documents and inspect installation during construction

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Air Emissions – Construction				
AC 1 – Assure that, as part of the contract provisions, the project contractor is required to implement the measures below at all project construction sites.				
AC 2 – Water all active construction areas at least twice daily. Ordinance 175-91, passed by the San Francisco Board of Supervisors on May 6, 1991, requires that non-potable water be used for dust control activities; therefore the project contractor would be required to obtain reclaimed water from the City's Clean Water Program or other appropriate sources.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 3 – Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 4 – Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 5 – Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 6 – Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 7 – Install sandbags or other erosion control measures to prevent silt runoff to public roadways.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 8 – Replant vegetation in disturbed areas as quickly as possible.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
				activities to insure compliance
AC 9 – Minimize use of on-site diesel construction equipment, particularly unnecessary idling.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 10 – Shut off construction equipment to reduce idling when not in direct use.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 11 – Where feasible, replace diesel equipment with electrically powered machinery.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 12 – Locate diesel engines, motors, or equipment as far away as possible from existing residential areas.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 13 – Properly tune and maintain all diesel power equipment.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 14 – Suspend grading operations during first and second stage smog alerts, and during high winds, i.e., greater than 25 miles per hour.	**TJPA**	During & following construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
AC 15 – Upon completion of the construction phase, buildings with visible signs of dirt and debris from the construction site shall be power washed and/or painted (given that permission is obtained from the property owner to gain access to and wash the property with no fee charged by the owner).	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance
Visual/Aesthetics – Construction				
VA 1 – Assure that construction crews working at night direct any artificial lighting onto the work site in order to minimize	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction

MITIGATION MEASURE	Responsibility for Implementation	Mitigation Schedule	Monitoring Responsibility	Monitoring Actions/Schedule
"spill over" light or glare effects on adjacent areas.				activities to insure compliance
VA 2 – Assure that contractors make all efforts possible to minimize specific aesthetic and visual effects of construction identified by neighborhood businesses and residents.	**TJPA**	During construction	TJPA	Include requirements in contract documents & monitor construction activities to insure compliance