

Included in both the Diamond and Circle Drive options are extended bus bays on both sides of Richardson Avenue which would accommodate up to four buses each. The extended bus bays would keep the buses out of the main flow of traffic during stops, provide safer merging capability for the buses and would facilitate transfers between Golden Gate Transit, Muni and PresidiGo vehicles. Improved crosswalks to provide safer and enhanced pedestrian circulation in the area would be provided.

Retaining walls would be required at the Park Presidio Interchange to accommodate the reconstruction of the ramps. A retaining wall up to eight meters (26 feet) would be constructed along the south side of the facility between the Battery and Main Post tunnels. Retaining walls would also be required in the eastern end of the alignment primarily along the extended Girard Road. Fences would be required along the edge of the at-grade portions of the roadway to restrict pedestrian access.

2.5 Preferred Alternative: Refined Presidio Parkway

Following release of the DEIS/R in December 2005, individuals and agency staff provided almost eight hundred comments regarding the environmental analysis and project alternatives. Based on these comments and agency/public workshops, it was determined that Alternative 5: Presidio Parkway, would best meet the purpose and need of this Doyle Drive Project, if certain modifications to the proposed design were made.

2.5.1 Development of the Preferred Alternative: Refined Presidio Parkway Alternative

In response to these comments, and to address the communities' and agencies' concerns regarding traffic circulation, tidal inundation, and parking issues, the following refinements were made to the Presidio Parkway Alternative:

Traffic Circulation

- By redesigning the Richardson connection as ramps connecting to an urban street, rather than mainline segments, the traffic balance between Richardson Avenue and Marina Boulevard is more closely matched to the existing traffic patterns and street network.
- In response to the plans by the San Francisco Department of Recreation and Parks (SFDRP) for the rehabilitation of the Palace of Fine Arts and surrounding grounds, the refined alternative maintains Palace Drive as a two-way road and accommodates the proposed modifications planned by SFDRP at north and south ends where Palace Drive connects to Lyon Street. Based on comments from the Lyon Street residents, the Refined Presidio Parkway Alternative will also maintain Lyon Street as a two-way street with a connection to Bay Street.

- To enhance pedestrian safety and accessibility the proposed design would provide pedestrian access from the Gorgas warehouses to the Palace of Fine Arts and from the Palace of Fine Arts to the Mason Street warehouses.
- The Hook Ramp Option at the Park Presidio Interchange was modified to reuse portions of the existing ramps to reduce impacts to resources while achieving similar improvements to traffic safety.
- To eliminate potential cut-through traffic on Lyon Street the access between Gorgas Avenue and Lyon Street has been eliminated.

Tidal Inundation

- The proposed facility may be subject to coastal events such as storm surge and tsunamis. In order to meet serviceability design criteria the profile needed to be raised so the proposed structures would clear the 100-year tsunami elevation of 3.4 meters North American Vertical Datum 1988 (NAVD88)². To accommodate the revised mainline profile, the profile of Halleck Street would have to be raised by an additional 0.8 meters (2.6 feet) at the north face of Building 228, with the crest of Halleck Street at an elevation of ten meters (32.8 feet), similar to the previous alternative.

Parking

- The refinements to the alternative also include a parking concept that maintains a similar parking supply to the existing condition. The main features are:
 - elimination of underground parking below Doyle Drive;
 - redesign parking west of Palace Drive and south of Mason Street warehouses as surface parking rather than underground parking;
 - modification to Palace Drive to provide perpendicular parking on both sides of a two-way Palace Drive; provide surface parking behind the Gorgas warehouses; and provide on-street parking along Gorgas Avenue.

Other Design Modifications

- In order to simplify construction, a portion of the alignment west of the Battery tunnels was adjusted to accommodate single stage construction of each tunnel structure.

These modifications were developed through a collaborative process with community members, local and resource agencies, and project team members.

² NAVD88 is a vertical datum developed by the National Oceanic Atmospheric Administration. A vertical datum is a set of constants that define a system for comparison of elevations.

2.5.2 Selection of the Preferred Alternative

The Doyle Drive Subcommittee to the Citizens' Advisory Committee (CAC), the Doyle Drive Executive Committee (comprised of lead, cooperating and responsible agencies) and the Authority all held meetings in July 2006 to consider recommendations for a preferred alternative and design options. All three groups made identical recommendations for selection of a modified Presidio Parkway with certain design options.

The unanimous recommendation for the Preferred Alternative was: a refined Alternative 5, Presidio Parkway, with specific design elements including the modified Hook Ramp Option for the Presidio Parkway Interchange and the Diamond Option for Presidio Access. In addition to these recommendations and modifications, the subcommittee voted to support three additional design refinements:

- Move Girard Intersection south;
- Restrict Lyon Street connection for the Presidio; and
- Reserve additional right of way for the connection from Marina Boulevard to Doyle Drive.

The groups did not support including the Merchant Road Slip Ramp Option, the Loop Ramp Option, or the Circle Drive Option.

2.5.3 Context Sensitive Design and Sustainability

In order to be sensitive to the project's environment, the project team considered its context and physical location carefully during the project planning stage. Additionally, a sizable planning effort had already taken place over the past decade involving residents and other stakeholders in the area.

Working with stakeholders, the development, selection, and refinement of the Preferred Alternative was carried out mindful of the principles of CSD and sustainability, as well as the desire to minimize and/or avoid impacts through creative design. In comparison with the Presidio Parkway Alternative, the refined alignment (Preferred Alternative) respects natural contours so the facility sits comfortably within the landscape and minimizes cutting, filling and hauling. When compared to the existing facility, the Preferred Alternative is also a better complement to the spectacular natural environment the facility resides in and restores scenic views of the Presidio and San Francisco Bay by eliminating the existing tall concrete structure.

Although there is now consensus among the project stakeholders on the general geometric design of the Preferred Alternative, the project team has a strong desire to ensure that detailed design and construction decisions enhance the sustainability of the project throughout its life.

Through ongoing workshops held with community members and agencies, a sustainability policy statement was developed. The initial sustainability policy has targeted the following areas to guide the development of specific goals and strategies:

- Water;
- Energy;
- Habitat;
- Landscape;
- Materials and Waste; and
- Community Resources.

Several goals and strategies for meeting those goals are being developed for each of the identified areas. As the project moves into its next phase, the specific goals and strategies will be incorporated into the design, construction and maintenance/operations phases. In addition, the responsibilities for implementation of the strategies, as well as monitoring and assessing the success of the strategies, will be determined.

Working together with stakeholders and resource agencies, the project team has already incorporated many solutions into the design of the Preferred Alternative in order to reduce or eliminate potential impacts to the natural environment, the Presidio, and community resources. Some of these engineering solutions include:

- To reduce disturbance to the existing bluff, the refined alternative raises the original profile of the southbound lanes by up to three meters (ten feet). To further retain the cultural relationship between the upper and lower portions of the Presidio, the landscaping over the Main Post tunnels will recreate the bluff north of the tunnels.
- The revised profile of the mainline facilitated the creation of greater separation between the northbound and southbound roadways over the future marsh expansion area which provides an opportunity for increased light penetration to the ground. The additional curvature to the southbound roadway also enhances the traffic calming impact of the roadway, reducing traffic speeds before reaching city streets.
- In conjunction with the realignment of the southbound roadway, the intersection of the off-ramp to Girard Road was moved 20 meters south (66 feet). This moved the connection along Gorgas Avenue away from the Gorgas Avenue warehouses thereby preserving the streetscape in front of the buildings.
- The intersection for the northbound on-ramp was also moved 20 meters (66 feet) south. In conjunction with reducing the northbound off-ramp from two lanes to one lane, much of the landscaping area west of the Palace of Fine Arts was preserved.

- Refined the design to avoid and minimize impacts to cultural resources including historic buildings, the historic Halleck streetscape, and the historic bluff.

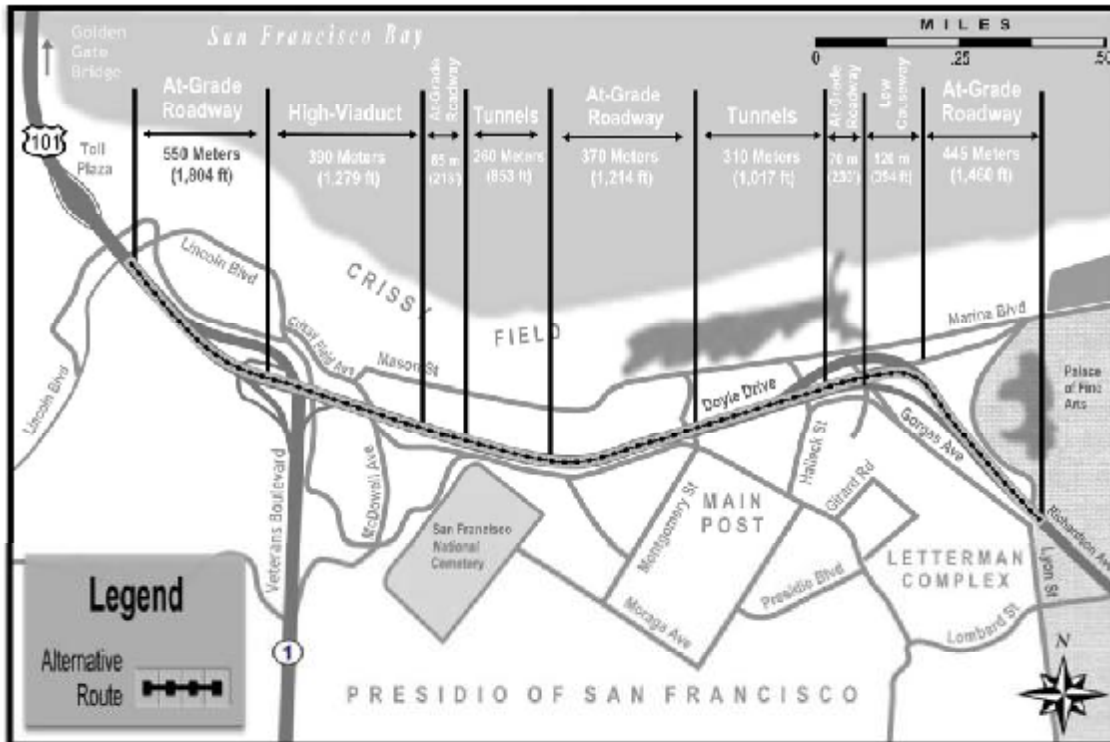
2.5.4 Description of the Preferred Alternative: Refined Presidio Parkway Alternative

The Refined Presidio Parkway Alternative, shown in **Exhibits 2-31 through 2-33** (on the following pages) would replace the existing facility with a new six-lane facility and a southbound auxiliary lane, between the Park Presidio Interchange and the new Presidio access at Girard Road. Detailed drawings showing the plan and profile of the Preferred Alternative in addition to the various design options can be found in **Appendix B**.

The new facility will consist of two 3.3-meter (11-foot) lanes and one 3.6-meter (12 foot) outside lane in each direction with three meter (10-foot) outside shoulders and 1.2-meter (four-foot) inside shoulders. The southbound direction will include a 3.3-meter (11-foot) auxiliary lane from the Park Presidio Interchange to the Girard Road exit ramp. The total roadway width will be 32.1 meters (105.3 feet) and the overall facility width including the median will vary from 37.1 to 44.6 meters (121.7 to 146.3 feet). The width of the proposed landscaped median will vary from five meters (16 feet) to 12.5 meters (41 feet). To minimize impacts to the park, the footprint of the new facility will overlap with a large portion of the existing facility's footprint east of the Park Presidio Interchange. This alternative will not preclude the Golden Gate Bridge Highway and Transportation District's parking of the moveable median barrier machine in the median of Doyle Drive south of the Toll Plaza. In some areas along the roadway, full restoration of mature natural species may take between 10 and 20 years.

A 390-meter (1,279-foot) long high-viaduct will be constructed between the Park Presidio Interchange and the San Francisco National Cemetery. The height of the high-viaduct will vary from 20 to 35 meters (66 to 115 feet) above the ground surface. Shallow cut-and-cover tunnels will extend 260 meters (853 feet) past the cemetery to east of Battery Blaney. The facility will then continue towards the Main Post in an open at-grade roadway with a wide heavily landscaped median. A retaining wall between 4 to 8 meters (13 to 26 feet) high will be constructed along the south side of the facility between the Battery and Main Post tunnels. A landscaped berm will be constructed along the north side of the facility to shield park visitors from the proposed facility.

Exhibit 2-31
Preferred Alternative: Refined Presidio Parkway



From Building 106 (Band Barracks) cut-and-cover tunnels up to 310 meters long (1,017 feet) will extend to east of Halleck Street. The amount of fill over the tunnels is being coordinated with the Trust based on requirements of the *Vegetation Management Plan*. The expected minimum depth to support native vegetation is two meters (six feet). The facility will then rise slightly on a low causeway 120 meters (394 feet) long over the site of the proposed Tennessee Hollow restoration and then pass over a depressed Girard Road. The low causeway will rise to approximately three meters (ten feet) above the surrounding ground surface at its highest point. East of Girard Road the facility would return to existing grade north of the Gorgas warehouses and connect to Richardson Avenue. The proposed facility will provide a transition zone starting from the Main Post tunnel to reduce vehicle speeds prior to entering city streets. A motor control and switch gear room to operate the tunnel life-safety equipment will be integrated with the Main Post tunnels.

The Park Presidio Interchange will be reconfigured due to the realignment of Doyle Drive to the south. The exit ramp from southbound Doyle Drive to southbound Veterans Boulevard will be replaced with standard exit ramp geometry and widened to two lanes. The loop of the northbound Doyle Drive

exit ramp to southbound Veterans Boulevard will be improved to provide standard exit ramp geometry. The northbound Veterans Boulevard connection to northbound Doyle Drive will be realigned to provide standard entrance ramp geometry. The northbound Veterans Boulevard connection to southbound Doyle Drive will be reconstructed in a similar configuration as the existing directional ramp with improved sight lines, and exit/entrance geometry.

The Preferred Alternative will provide direct access to the Presidio and indirect access to Marina Boulevard in both directions via access ramps from Doyle Drive connecting to an extension of Girard Road. East of the new Letterman garage, Gorgas Avenue is a one-way street with a signalized intersection at Richardson Avenue. North of Richardson Avenue, Lyon Street will remain in its existing configuration to provide access to Palace Drive. The surface parking spaces will be reconfigured to maintain the existing parking supply in the area and improve pedestrian access between the Presidio and the Palace of Fine Arts.

The Preferred Alternative will include extended bus bays on both sides of Richardson Avenue which will accommodate up to four buses each and improved crosswalks to provide safer and enhanced pedestrian circulation in the area. The extended bus bays will keep the buses out of the main flow of traffic during stops, provide safer merging capability for the buses, and will facilitate transfers between Golden Gate Transit, Muni and PresidiGo vehicles.

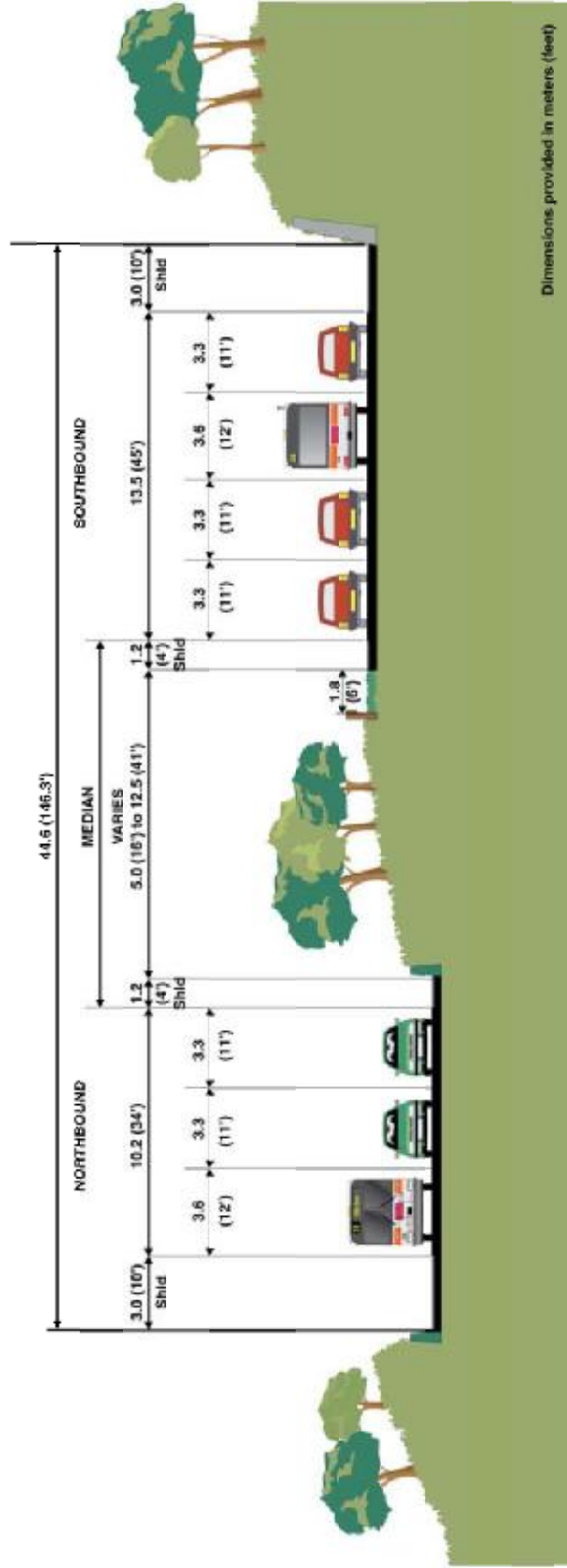
Retaining walls will be required at the Park Presidio Interchange to accommodate the reconstruction of the ramps. Retaining walls will also be required in the eastern end of the alignment primarily along the extended Girard Road. Fences will be required along the edge of the at-grade portions of the roadway to restrict pedestrian access onto the roadway.

Exhibit 2-32
Prefereed Alternative, Refined Presidio Parkway: Plan



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Exhibit 2-33
Preferred Alternative, Refined Presidio Parkway: Cross Section



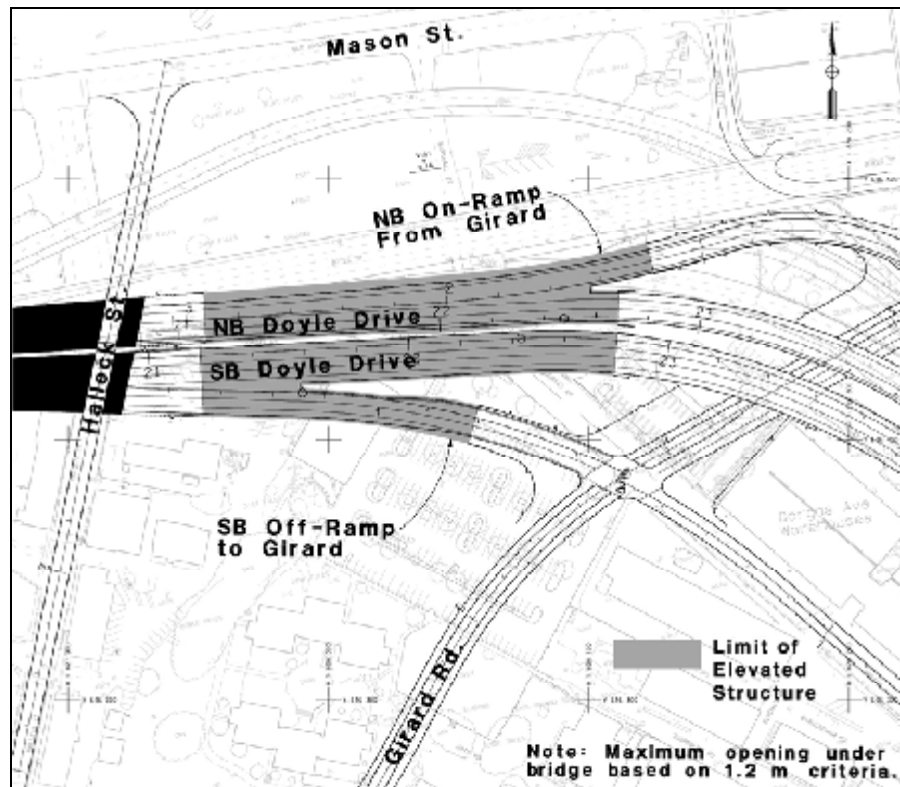
Note: Landscaping shown for illustrative purposes only.

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2.5.5 Tsunami Criteria

During the design of Alternative 5 - Presidio Parkway, a high tide water level was used to set the elevation of northbound and southbound Doyle Drive as well as the Girard Road on and off-ramps over Tennessee Hollow. The assumed high tide water level of 1.2 meters (3.9 feet) allowed for a 61 meter (200 foot) structure opening underneath the southbound off-ramp to Girard Road (see the gray shaded are in **Exhibit 2-34** below).

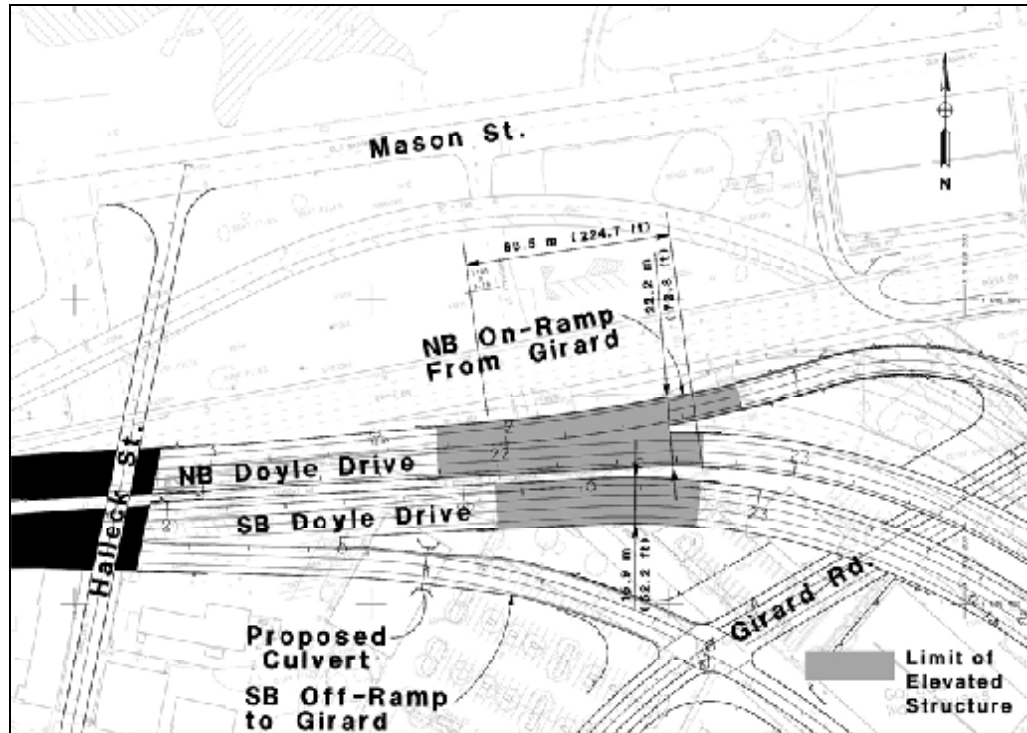
Exhibit 2-34
Alternative 5: Presidio Parkway - 1.2-Meter High Tide Criteria



During the development of the Preferred Alternative - Refined Presidio Parkway, a different criterion was used. This criterion is based on the fact that with the potential expansion of Crissy Marsh, the proposed facility may be subject to coastal events such as storm surge and tsunamis. In order to meet serviceability design requirements the bottom of the structures over Tennessee Hollow would need to clear the 100-year tsunami elevation of 3.4 meters (11.2 feet). This would also require raising Halleck Street an additional 0.8 meters (2.6 feet) at the north face of Building 228, thus setting the crest of Halleck Street at to an elevation of ten meters (32.8 feet). If this 100-year tsunami criterion were applied to Alternative 5 there would be no clear opening below the southbound

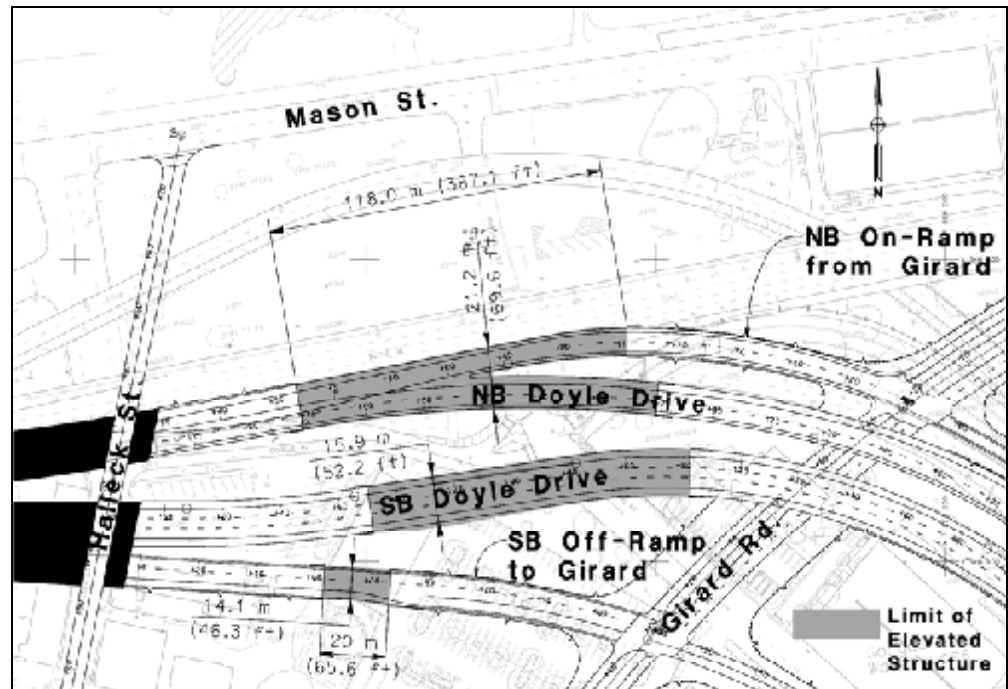
off-ramp. Flows from Tennessee Hollow would have to be conveyed into the marsh by way of a culvert below the off-ramp (see **Exhibit 2-35** below).

Exhibit 2-35
Alternative 5: Presidio Parkway - 3.4-Meter Tsunami Criteria



With the refinements made in the Preferred Alternative, applying the 100-year tsunami criterion will result in a maximum length of structure opening below the southbound Doyle Drive off-ramp of 20 meters (65.6 feet) (see **Exhibit 2-36**). For detailed descriptions of the relevant dimensions for each of the structures over Tennessee Hollow for each alternative based on the 100-year tsunami elevation of 3.4 meters (11.2 feet) please see Section 3.2.1 Land Use and Planning.

Exhibit 2-36
Preferred Alternative - 3.4-Meter Tsunami Criteria



2.5.6 Design Standard Compliance

The severe degradation of the existing structures, seismic vulnerability and the existing nonstandard design elements, especially the lack of shoulders and a median barrier, create a great urgency to remove and replace the existing facility with structures designed to current seismic standards while applying current geometric standards wherever feasible.

Agency Coordination

Given the extreme environmental sensitivity of the project's context and setting within the National Park and National Historic Landmark District, there is a need to develop consensus among the various participating agencies: FHWA, Caltrans, SFCTA, the cooperating agencies (Presidio Trust, NPS and VA), and the GGBHTD in order to advance this project under the guidelines of *49 U.S.C Section 303 (Department of Transportation Act, Section (40))* and implement the seismic and traffic safety improvements.

This urgency to address seismic and traffic safety and the need to develop a consensus among the agencies, requires flexibility in applying the design standards that are still considered safe and comfortable for users of the facility. Therefore, in consideration of the project's context and setting within a National Park/National Historic Landmark District and in order to develop the consensus

that is necessary to advance the project, several design exceptions are being considered. The project as proposed will provide tremendous seismic and traffic safety improvement over the existing facility.

The project team including the FHWA, Caltrans, SFCTA, the cooperating agencies (Presidio Trust, NPS and VA), the GGBHTD have worked closely together to develop a consensus for a design which will:

- seismically upgrade the structures and improve traffic safety;
- provide for the minimum requirements of traffic operations; and
- balance the design geometry.

In addition, they have worked together to minimize the overall footprint of the facility and impacts to the surrounding environmental and cultural resources while considering traffic handling/construction staging, cost effectiveness, and conforming to adjacent local street and state highway segments.

Constraints in Meeting Design Standards

The facility's existing nonstandard design elements, its context and setting within a National Park/National Historic Landmark District, and the need to develop consensus in order to advance the project all restrict a staged construction strategy and the proposed geometry of mainline Doyle Drive (Route 101), the Park Presidio Interchange, Veterans Boulevard (Route 1), and the Girard Road Interchange. Thus the overall footprint of the facility and, consequently, the cross-sectional width of Doyle Drive are restricted by the need to conform with nonstandard lane and shoulder widths at the Toll Plaza, Park Presidio Boulevard, and Richardson Avenue.

In addition, the existing compact geometry of the Park Presidio Interchange restricts the configuration of mainline Doyle Drive (Route 101) and mainline Veterans Boulevard (Route 1). This existing restrictive geometry limits operating speeds through the interchange to approximately 30 kilometers/hour (18 miles/hour) to 50 kilometers/hour (31 miles/hour). Compounding this existing restrictive geometry is the need for proposed grades to match the existing mainline Doyle Drive (Route 101) at a minimum of 300 meters (984 feet) to the east of the Toll Plaza. The GGBHTD uses this area to adjust the daily Toll Plaza operations by varying lane configurations to accommodate the morning and afternoon peak commutes.

Safety Improvements

The Preferred Alternative proposes to incorporate safety improvements wherever reasonably feasible within the setting and context of a National Park to the standards established in the Caltrans *Highway Design Manual*. The design of safety improvements also takes into account traffic handling, construction staging, cost effectiveness, and conformity to adjacent street and state highway segments. The proposed safety improvements include:

- seismic upgrading of structures;
- divided roadbeds for northbound and southbound Doyle Drive;
- improved structure vertical clearances and upgrading of bridge rails;
- improved geometry including horizontal and vertical curvature, stopping sight distances, deceleration lengths, ramp geometry, and superelevations;
- standard 3.6-meter (12-foot) lane widths wherever feasible with 3.3-meter (11-foot) lane widths at constrained locations; and
- standard shoulders wherever feasible.

2.6 Comparison of Earthwork/Excavation

Each build alternative will require earthwork and excavation. This work will result in disturbance of both artificial fill and native materials. **Exhibit 2-37** summarizes the total volumes of excavation for each alternative.

For Alternative 2, the No-Detour Option would require approximately 173,000 cubic meters (226,000 cubic yards) of imported fill in addition to 196,000 cubic meters (256,000 cubic yards) of excavation, of which 126,000 cubic meters (165,000 cubic yards) is not reusable. This would result in a total of 243,000 cubic meters (318,000 cubic yards) of fill. The With Detour Option would require approximately 99,000 cubic meters (130,000 cubic yards) of imported fill in addition to 156,000 cubic meters (204,000 cubic yards) of excavation, of which 85,000 cubic meters (111,000 cubic yards) is not reusable. This would result in a total of 170,000 cubic meters (222,000 cubic yards) of fill.

For Alternative 5, the Presidio Parkway Alternative, earthwork operations would result in approximately 296,000 cubic meters (387,000 cubic yards) of excess material for off-site disposal. The Presidio Parkway Alternative would have 487,000 cubic meters (637,000 cubic yards) of excavation and 191,000 cubic meters (250,000 cubic yards) of fill.

For Preferred Alternative, the Refined Presidio Parkway, earthwork operations would result in approximately 207,000 cubic meters (271,000 cubic yards) of excess material for off-site disposal. The Preferred Alternative would have 418,000 cubic meters (547,000 cubic yards) of excavation and 211,000 cubic meters (276,000 cubic yards) of fill.

There is the potential that hazardous materials would be encountered during excavation and would require appropriate disposal. Any hazardous materials encountered during construction of the Doyle Drive Project would be handled under the procedures described in the Avoidance, Minimization and/or Mitigation Measures of Section 3.3.3. In addition, Section 3.3.3 provides the estimated costs associated with hazardous material removal procedures.