

## **Appendix D**

### **Avoidance, Minimization and/or Mitigation Summary**



# Avoidance, Minimization and/or Mitigation Summary

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The following is a list of potential avoidance/mitigation measures. Should a build alternative be selected the District and the Department will ensure that the appropriate avoidance/mitigation measures are included as a condition of project approval and responsibility assigned to the appropriate party.

Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
<b>AVOIDANCE/MINIMIZATION MEASURES</b>						
<b><u>VISUAL RESOURCES</u></b>						
<p>Construction of a physical suicide deterrent barrier is an action that would physically alter the visual appearance of the Bridge. The range of alternatives were developed to minimize the visual changes to the Bridge to the maximum extent possible, while providing feasible concepts that responded to the established criteria.</p> <p>Measures incorporated into the design of Alternatives 1A and 2A are the use of ½ inch vertical rods which remain consistent with the strong vertical line form created by the Bridge towers, suspender ropes, and light posts. Measures incorporated into the design of Alternatives 1B and 2B are the use of 3/8-inch horizontal cables, which are consistent with the design of the public safety railing and the horizontal line form established by horizon of the blue-green waters of the San Francisco Bay. These alternatives also include transparent panels at the belvederes and around the Bridge towers so as to continue to provide unobstructed viewing opportunities from the sidewalks.</p>	Section 2.2.4	District/ Department				

<b>Task and Brief Description</b>	<b>Reference</b>	<b>Responsible Party</b>	<b>Task Completed</b>		<b>Environmental Compliance</b>	
			<b>Initial</b>	<b>Date</b>	<b>Initial</b>	<b>Date</b>
<p>Alternative 3, the horizontal net system, represents the strongest contrast with the strong verticality of the Bridge but provides unobstructed views across the San Francisco Bay from the Bridge sidewalks. The net would disrupt a small portion of the views towards the San Francisco Bay looking down from the Bridge sidewalks.</p> <p>The Memorandum of Agreement (MOA) to be developed as part of the Section 106 consultation process will include photographic recordation of the existing features and views of and from the Bridge in order to partially mitigate visual impacts (see Section 2.3 Cultural Resources).</p>						
<b><u>CULTURAL RESOURCES</u></b>						
<p>In order to mitigate the adverse effect of the build alternatives on the historic property, a draft Memorandum of Agreement (MOA) will be developed for the project and will be coordinated with the Department.</p> <p>The MOA will stipulate various mitigation activities that will be conducted to address adverse effects this project would have on the Bridge. These measures will provide a visual and historic record of the Bridge that will be available to researchers, the public, and users of the Bridge. The Department will be responsible for carrying out these measures, insuring that: a) the Bridge is properly recorded through photography, written documentation, and educational/interpretive material; b) this documentation and educational/interpretive material is appropriately distributed; and c) other portions of the historic property within the project study are protected and monitored. Prior to the start of any work that could adversely affect any characteristics that qualify the Bridge as a historic property, the Department shall ensure that the recordation measures specified are completed. Mitigation measures proposed for the project include the following:</p>	Section 2.3.4	Department				
<p>Large-format (four- by five-inch, or larger, negative size) black-and-white photographs will be taken showing the Bridge in</p>	Section 2.3.4	Department				

<b>Task and Brief Description</b>	<b>Reference</b>	<b>Responsible Party</b>	<b>Task Completed</b>		<b>Environmental Compliance</b>	
			<b>Initial</b>	<b>Date</b>	<b>Initial</b>	<b>Date</b>
context, as well as details of its historic engineering features, contributing elements, and character-defining features. The views specifically will include the existing east and west outside railings, concrete railing at the north pylon, and exterior trusses of the Bridge as these are the features that would be adversely affected by one or more of the proposed alternatives.						
The photographs will be processed for archival permanence in accordance with Historic American Engineering Record (HAER) photographic specifications. If necessary, each view will be perspective-corrected and fully captioned. The recordation will follow the National Park Service's (NPS) HAER Guidelines, and the report format, views, and other documentation details will be coordinated with the Western Regional Office of the NPS, Oakland, California. Oblique aerial photography will be considered as a photographic recordation option in these coordination efforts. It is anticipated that the recordation of the Bridge will be completed to Level I or Level II HAER-written data standards, and will include archival and digital reproduction of historic images, plans, and drawings.	Section 2.3.4	Department				
Copies of the documentation will be offered to the San Francisco Public Library, Marin Public Library, Environmental Design Archives (UC Berkeley), Golden Gate National Recreation Area, Presidio Trust, Department District 4 Office of Cultural Resource Studies, and the Department's Transportation Library and History Center at Department Headquarters in Sacramento. The documentation also will be offered in printed and electronic form to any repository or organization upon which the District, the Department, and SHPO, through consultation, may agree. The electronic copy of the report could be placed on an agency or organization's Web site.	Section 2.3.4	Department				
Preparation of a historical and educational brochure presenting the history of suicide prevention efforts at the Bridge. The brochure will be made available on-site at the Bridge, Presidio National Historic Landmark, select Golden Gate National Recreation Area locations, and online at the District Web site ( <a href="http://www.goldengate.org">www.goldengate.org</a> ) during the construction period.	Section 2.3.4	Department				

Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
Installation of interpretive signs or display panels at the Round House Gift Center and the Vista Point to describe the project for the duration of construction. Signs will incorporate information from the contextual history prepared for the brochure.	Section 2.3.4	Department				
The District will ensure the protection of the remainder of the historic property within the project limits during construction of the suicide barrier, as well as the Fort Point National Historic Site, located below the Fort Point Arch component of the Bridge. The District will ensure against incidental damage to the remainder of the Bridge historic property and the Fort Point property by hiring an independent Environmental Compliance Monitor (ECM) who will periodically monitor the site during construction and will prepare monthly reports documenting compliance and protection. These reports will be submitted to the District and GGNRA.	Section 2.3.4	District				
<b><u>BIOLOGICAL RESOURCES</u></b>						
<p><b>Measure 1:</b> A qualified biologist or biologists will be retained by the District prior to the start of construction to act as a biological Environmental Compliance Monitor (ECM) and implement and oversee the below activities/measures.</p> <ul style="list-style-type: none"> <li>▪ The biological ECM will flag and stake native vegetation near the staging areas within GGNRA lands as “Environmentally Sensitive Areas” and will oversee the contractor’s installation of protective fencing around the designated ESA(s). Signs will be installed indicating that the fenced area is “restricted” and that all construction activities, personnel, and operational disturbances are prohibited.</li> <li>▪ The biological ECM will prepare and provide worker educational materials that describe the value and importance of the coastal scrub habitat bordering the staging areas and the importance of not disturbing the habitat.</li> <li>▪ The biological ECM will conduct regular visits of the staging areas to inspect if any damage to adjacent habitats has occurred, to evaluate if dust control measures need to be implemented or increased, to ensure that erosion control</li> </ul>	Section 2.4.1; 2.4.2; 2.4.4; 2.4.5; 2.6.8	District				

Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
<p>devices located near native vegetation and Environmentally Sensitive Areas (ESAs) are functioning properly, and to evaluate if weed control measures need to be implemented.</p> <ul style="list-style-type: none"> <li>Based on the findings of the site visits, the biological ECM will make recommendations to be implemented regarding weed control, re-vegetation of disturbed areas, the need for additional fencing, and other measures to protect biological resources.</li> <li>The biological ECM will prepare monthly monitoring reports for the District that will address the effectiveness of the avoidance measures being implemented and identify any other measures to be implemented.</li> </ul>						
<p><b>Measure 2:</b> The District will provide specifications for erosion and dust control to the Contractor, which will be implemented.</p>	Section 2.4.1; 2.4.2; 2.4.4; 2.6.8	District				
<p><b>Measure 3:</b> Contractor's vehicles traveling on access roads within GGNRA lands would be restricted to a maximum speed of 20 mph during the period of March 15 to July 4, which is the flight season for the Mission blue butterfly. The Contractor will post and enforce this speed limit.</p>	Section 2.4.4; 2.6.8	Contractor				
<p><b>Measure 4:</b> To prevent the introduction of non-native vegetation or other deleterious materials to GGNRA lands, the Contractor will inspect all construction equipment prior to accessing the staging areas. If any vegetation or deleterious materials are present, the Contractor will decontaminate its equipment with a high-pressure washer and properly dispose of the wastewater and debris prior to entering GGNRA lands.</p>	Section 2.4.5; 2.6.8	Contractor				
<p><b>Measure 5:</b> Prior to the implementation of construction activities the District will implement the following program to assess and avoid any impacts to peregrine falcon. This program will consist of the following activities.</p> <ul style="list-style-type: none"> <li>Prior to implementation of construction activities occurring during the nesting season of peregrine falcon (typically February through July), the District will consult with the Golden Gate Raptor Observatory (GGRO) and the Santa</li> </ul>	Section 2.4.4; 2.6.8	District				

Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
<p>Cruz Predatory Bird Group to obtain any existing information on the locations of breeding pairs of peregrine falcon potentially using the Bridge.</p> <ul style="list-style-type: none"> <li>▪ Focused surveys for nesting peregrine falcons would then be conducted by a qualified biologist to determine if nesting falcons are present in areas potentially affected by project implementation.</li> <li>▪ If nesting falcons are identified, then a construction exclusion zone would be established around the active eyrie. The size of the exclusion zone will be determined by the CDFG and will take into account existing noise levels at the nest location and the type of construction activities proposed near the eyrie.</li> <li>▪ Construction activities may commence within the exclusion zone only upon determination by a qualified biologist that the eyrie is no longer active. Alternatively, construction activities potentially affecting peregrine falcons nesting on the Bridge may be conducted outside of the nesting season of the species.</li> </ul>						
<p><b>Measure 6:</b> Prior to the commencement of construction activities occurring during the nesting season of native bird species (typically February through August), the biological ECM will conduct or oversee the following activities.</p> <ul style="list-style-type: none"> <li>▪ The biological ECM will conduct surveys for nesting birds protected by the Migratory Bird Treaty Act and/or California Fish and Game Code. The survey area will include potential nesting habitat within and bordering the staging and construction areas, as well as all areas that would be subject to elevated construction-related noise levels.</li> <li>▪ If an active nest is found, a construction exclusion zone would be established around the active nest. The size of the exclusion zone will be determined by the CDFG and will take into account existing noise levels at the nest location and the sensitivity to noise of the bird species present.</li> <li>▪ Construction activities may commence within the exclusion</li> </ul>	Section 2.4.3; 2.6.8	District				



Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
zone only upon determination by a qualified biologist that the nest is no longer active. The biological ECM will also survey for nesting birds during their regular site visits of the staging areas.						
<p><b>Measure 7:</b> Prior to the commencement of construction activities, the District will retain the services of a qualified avian biologist to conduct or oversee the following activities.</p> <ul style="list-style-type: none"> <li>▪ The avian biologist will further evaluate the potential of birds to collide with the transparent panels potentially used as part of the physical suicide deterrent system, and for the use of netting to harm bird species.</li> <li>▪ At a minimum, the expected flight patterns of migratory and resident birds relative to the installation locations of the transparent panels or netting will be evaluated, as well as the potential of the transparent panels and associated reflections to alter regular flight patterns and encourage collisions.</li> <li>▪ Should it be found that the use of the transparent panels or netting pose a substantial risk to birds, appropriate design modifications would be implemented. These measures may include, but are not limited to visual deterrents such as patterning the transparent material with a UV coating that birds can see but humans cannot; utilizing etching, fritting, and opaque patterned glass to reduce transparency; utilizing bird-legible patterns on the transparent material; limiting the amount of transparent panels or amount of panels without a visual deterrent; modifying the horizontal netting; or other effective means of deterring bird collisions or entrapment.</li> </ul>	Section 2.4.3	District				

Task and Brief Description	Reference	Responsible Party	Task Completed Initial      Date		Environmental Compliance Initial      Date	
<b><u>MITIGATION MEASURES (CEQA)</u></b>						
<b>VISUAL RESOURCES</b>						
<p>The range of alternatives was developed to minimize the visual changes to the Bridge to the maximum extent possible, while providing feasible concepts that responded to the established criteria. All of the build alternatives would be constructed primarily of steel that would be painted International Orange to match the material and color of the Bridge.</p> <p>There would be no visual impacts associated with the No Build Alternative.</p> <p>Measures incorporated into the design of Alternatives 1A and 2A are the use of ½ inch vertical rods which remain consistent with the strong vertical line form created by the Bridge towers, suspender ropes, and light posts. Measures incorporated into the design of Alternatives 1B and 2B are the use of 3/8-inch horizontal cables, which are consistent with the design of the public safety railing and the horizontal line form established by horizon of the blue-green waters of the San Francisco Bay. These alternatives also include transparent panels at the belvederes and around the Bridge towers so as to continue to provide unobstructed viewing opportunities from the sidewalks.</p> <p>Alternative 3, the horizontal net system, represents the strongest contrast with the strong verticality of the Bridge but provides unobstructed views across the San Francisco Bay from the Bridge sidewalks. The net would disrupt a small portion of the views towards the San Francisco Bay looking down from the Bridge sidewalks.</p> <p>The Memorandum of Agreement (MOA) to be developed as part of the Section 106 consultation process will include photographic</p>	Section 3.3.1	District/ Department				

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recording of the existing features and views of and from the Bridge in order to partially mitigate visual impacts.						
<b>CULTURAL RESOURCES</b>						
To mitigate the adverse effect of the project on the historic property a draft Memorandum of Agreement (MOA) will be developed for the project and will be coordinated with the Department. The MOA will stipulate various mitigation activities that will be conducted to address adverse effects this project would have on the Bridge. The MOA will be approved by the State Office of Historic Preservation (SHPO). The Department will be responsible for carrying out these measures, insuring that (1) the Bridge is properly recorded through photography, written documentation, and educational/interpretive material; (2) this documentation and educational/interpretive material is appropriately distributed; and (3) other portions of the historic property within the project study are protected and monitored. Prior to the start of any work that could adversely affect any characteristics that qualify the Bridge as a historic property, the Department shall ensure that the recordation measures specified are completed. Mitigation measures proposed for the project include the following:	Section 3.3.2	Department				
<ul style="list-style-type: none"> <li>▪ Large-format (four- by five-inch, or larger, negative size) black-and-white photographs will be taken showing the Bridge in context, as well as details of its historic engineering features, contributing elements, and character-defining features. The views specifically will include the existing east and west outside railings, concrete railing at the north pylon, and exterior trusses of the Bridge, as these are the features that would be adversely affected by one or more of the proposed alternatives.</li> <li>▪ The photographs will be processed for archival permanence in accordance with Historic American Engineering Record (HAER) photographic specifications. If necessary, each view</li> </ul>	Section 3.3.2	Department				

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			<b>Initial</b>	<b>Date</b>	<b>Initial</b>	<b>Date</b>
<p>will be perspective-corrected and fully captioned.</p> <ul style="list-style-type: none"> <li>▪ The recordation will follow the National Park Service's (NPS) HAER Guidelines, and the report format, views, and other documentation details will be coordinated with the Western Regional Office of the NPS, Oakland, California. Oblique aerial photography will be considered as a photographic recordation option in these coordination efforts. It is anticipated that the recordation of the Bridge will be completed to Level I or Level II HAER-written data standards, and will include archival and digital reproduction of historic images, plans, and drawings.</li> <li>▪ Copies of the documentation will be offered to the San Francisco Public Library, Marin Public Library, Environmental Design Archives (UC Berkeley), Golden Gate National Recreation Area, Presidio Trust, Department District 4 Office of Cultural Resource Studies, and the Department's Transportation Library and History Center at Department Headquarters in Sacramento. The documentation also will be offered in printed and electronic form to any repository or organization upon which the District, the Department, and State Historic Preservation Office (SHPO), through consultation, may agree. The electronic copy of the report could be placed on an agency or organization's Web site.</li> <li>▪ Preparation of a historical and educational brochure presenting the history of suicide prevention efforts at the Bridge. The brochure will be made available on-site at the Bridge, Presidio National Historic Landmark, select Golden Gate National Recreation Area locations, and online at the District Web site (<a href="http://www.goldengate.org">www.goldengate.org</a>) during the construction period.</li> <li>▪ Installation of interpretive signs or display panels at the Round House Gift Center and the Vista Point to describe the project for the duration of construction. Signs will incorporate information from the contextual history prepared for the</li> </ul>						

Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
brochure.						
<p>The District will ensure the protection of the remainder of the historic property within the project limits during construction of the physical suicide barrier, as well as the Fort Point National Historic Site, located below the Fort Point Arch component of the Bridge. The District will ensure against incidental damage to the remainder of the Bridge historic property and the Fort Point property by hiring an independent Environmental Compliance Monitor (ECM) who will periodically monitor the site during construction and will prepare monthly reports documenting compliance and protection. These reports will be submitted to the District and GGNRA.</p> <p>The impact to the Bridge historic property following implementation of these measures therefore remains significant.</p>	Section 3.3.2	District				
<b>LESS THAN SIGNIFICANT WITH MITIGATION</b>						
<b>BIOLOGICAL RESOURCES</b>						
<b>SENSITIVE SPECIES</b>						
<p>The following avoidance measures, which have successfully been implemented as part of the Golden Gate Bridge Seismic and Wind Retrofit Project, would continue to be implemented as part of the proposed project in order to prevent adverse affects to Mission blue butterfly, special-status plant species, and coastal scrub habitat. Avoidance measures will also be implemented for the peregrine falcon.</p> <p><b>Mission Blue Butterfly</b></p> <ul style="list-style-type: none"> <li>▪ The District will provide specifications for erosion and dust control to the contractor, which will be implemented.</li> <li>▪ Contractor's vehicles traveling on access roads within GGNRA lands would be restricted to a maximum speed of</li> </ul>	Section 3.3.3	District				

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<p>20 mph during the period of March 15 to July 4, which is the flight season for the Mission blue butterfly. The contractor will post and enforce this speed limit.</p> <ul style="list-style-type: none"> <li>To prevent the introduction of non-native vegetation or other deleterious materials to GGNRA lands, the District and contractor will inspect all construction equipment prior to accessing the staging areas. If any vegetation or deleterious materials are present, the contractor will decontaminate its equipment with a high-pressure washer and properly dispose of the wastewater and debris prior to entering GGNRA lands.</li> </ul>						
<p><b>Plant Species</b></p> <ul style="list-style-type: none"> <li>A qualified biologist or biologists will be retained by the District prior to the start of construction to act as a biological Environmental Compliance Monitor (ECM) and implement and oversee the below activities/measures.</li> <li>The biological ECM will flag and stake native vegetation near the staging areas within GGNRA lands as "Environmentally Sensitive Areas" and will oversee the contractor's installation of protective fencing around the designated ESA(s). Signs will be installed indicating that the fenced area is "restricted" and that all construction activities, personnel, and operational disturbances are prohibited.</li> <li>The biological ECM will prepare and provide worker educational materials that describe the value and importance of the coastal scrub habitat bordering the staging areas and the importance of not disturbing the habitat.</li> <li>The biological ECM will conduct regular visits of the staging areas to inspect if any damage to adjacent habitats has occurred, to evaluate if dust control measures need to be implemented or increased, to ensure that erosion control devices located near native vegetation and ESA(s) are functioning properly, and to evaluate if weed control measures need to be implemented.</li> </ul>	Section 3.3.3	District				

Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
<ul style="list-style-type: none"> <li>Based on the findings of the site visits, the biological ECM will make recommendations to be implemented regarding weed control, re-vegetation of disturbed areas, and other measures to protect biological resources.</li> <li>The biological ECM will prepare monthly monitoring reports for the District that will address the effectiveness of the avoidance measures being implemented and identify any other measures to be implemented.</li> </ul>						
<p><b>NATIVE OR WILDLIFE SPECIES</b></p> <p>Potential impacts could occur to nesting peregrine falcon, other nesting birds, and various bird species from bird collisions. The below avoidance measures would be implemented to address these potential impacts.</p>	Section 3.3.3	District				
<ul style="list-style-type: none"> <li>The District will retain the services of a qualified avian biologist to further evaluate the potential of birds to collide with the transparent panels potentially used as part of the suicide deterrent system. At a minimum, the expected flight patterns of migratory and resident birds relative to the installation locations of the transparent panels will be evaluated, as well as the potential of the transparent panels and associated reflections to alter regular flight patterns and encourage collisions. Should it be found that the use of the transparent panels or netting pose a substantial risk to birds, appropriate design measures would be implemented. These measures may include, but are not limited to visual deterrents such as patterning the transparent material with a UV coating that birds can see but humans cannot; utilizing etching, fritting, and opaque patterned glass to reduce transparency; utilizing bird-legible patterns on the transparent material; limiting the amount of transparent panels or amount of panels without a visual deterrent; modifying the horizontal netting; or other effective means of deterring bird collisions or entrapment.</li> </ul>	Section 3.3.3	District				

Task and Brief Description	Reference	Responsible Party	Task Completed		Environmental Compliance	
			Initial	Date	Initial	Date
<ul style="list-style-type: none"> <li>Prior to the implementation of construction activities occurring during the nesting season of peregrine falcon (typically February through July), the District will consult with the Golden Gate Raptor Observatory (GGRO) to determine if breeding pairs of peregrine falcon are currently nesting in the vicinity of the Bridge and may be disturbed by the proposed project. This consultation will also serve to determine if surveys for nesting peregrine falcon should be conducted prior to project implementation. If nesting pairs are identified by the GGRO or by site surveys, then a construction exclusion zone would be established around the active nest. The size of the exclusion zone will be determined by the CDFG and will take into account existing noise levels at the nest location. Construction activities may commence within the exclusion zone only upon determination by a qualified biologist that the nest is no longer active.</li> </ul>	Section 3.3.3	District				
<ul style="list-style-type: none"> <li>Prior to the implementation of construction activities occurring during the nesting season of native bird species, the biological ECM will conduct surveys for nesting birds. The survey area will include potential nesting habitat within and bordering the staging and construction areas, as well as all areas that would be subject to elevated construction-related noise levels. If active nests are found, then a construction exclusion zone would be established around the active nest. The size of the exclusion zone will be determined by the CDFG and will take into account existing noise levels at the nest location. Construction activities may commence within the exclusion zone only upon determination by a qualified biologist that the nest is no longer active. The biological ECM will also survey for nesting birds during their regular site visits of the staging areas.</li> </ul> <p>Implementing these measures would reduce impacts to biological resources to a less than significant level.</p>	Section 3.3.3	District				