



United States Department of the Interior  
NATIONAL PARK SERVICE  
Yosemite National Park  
P.O. Box 577  
Yosemite, California 95389

IN REPLY REFER TO:  
L7617 (YOSE-PM)

**Memorandum**

**To:** Michael J. Tollefson, Superintendent

**Through:** Bill Delaney, Division Chief, Project Management <sup>WD</sup>

**From:** Mark Butler, Branch Chief, Environmental Planning and Compliance <sup>MB</sup>

**Subject:** Compliance Determination for Project 2006-044 Happy Isles Footbridge Replacement (PEPC 15156)

**Background**

The historic Happy Isles Footbridge has experienced several iterations over the past century. The first wood-truss bridge, made of massive milled timbers, was constructed in 1883. Replacement bridges were constructed in 1910 and 1929. The concrete reinforced bridge, often referred to as the "Old Happy Isles Footbridge," remained in place until 2001. It was removed as a result of being damaged beyond repair by the 1997 flood and a subsequent rockfall from Glacier Point.

Since the removal of the Happy Isles Footbridge in 2001, access to the John Muir and Half Dome Trailheads, by way of the Yosemite Valley Loop Trail, is no longer available. As a result, circulation in the Happy Isles area has become confusing. River banks between the Happy Isles Vehicle Bridge and the site of the old Happy Isles Footbridge have become damaged and are experiencing accelerated erosion due to visitors trying to access the John Muir Trailhead

As specified in the *Final Yosemite Valley Plan/Supplemental Environmental Impact Statement (YVP)*, the footbridge at Happy Isles, damaged by the flood of 1997 and a later rockfall from Glacier Point, was removed during the fall-winter season, 2001-2002. Because the bridge removal process entailed extensive work within the bed and banks of the river, a detailed impacts analysis was completed in the *Happy Isles Gauging Station Bridge Removal Project Environmental Assessment*, August 2001.

Both the YVP and its *Record of Decision (ROD)* specify that "a replacement footbridge at Happy Isles near the Nature Center" would be constructed (ROD, page 6).

**Project Information**

The Happy Isles and project areas are presented in Map 1 and Map 2 of Attachment A of this Compliance Determination.

The YVP stipulated specifications and required tasks the National Park Service must take prior to constructing a replacement bridge. The impacts associated with those specifications and required tasks were analyzed in the YVP and are presented in Attachment B of this Compliance Determination.

Additionally, the YVP stipulated that design alternatives considered for the new footbridge would be guided by *A Sense of Place: Design Guidelines for Yosemite Valley*, as well as meet the character of the Happy Isles area. A description of the design process and the design alternatives considered are presented in Attachment C of this Compliance Determination. Further, design alternatives will be presented to the public; however public comments on the replacement footbridge were received during the public review period for the YVP. Comments are also presented in Attachment C.

Construction activities and "best management practices" to mitigate potential environmental impacts associated with construction of the replacement footbridge are presented in Attachment D of this Compliance Determination.

### **Wild and Scenic Rivers Act Compliance**

"Pursuant to the Wild and Scenic Rivers Act, the National Park Service must carry out a Section 7 determination on all proposed water resources projects to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated... Projects that are within the bed and banks of the Merced River are subject to the Section 7 process... To the extent possible, the National Park Service would (1) redesign projects to avoid the bed and banks of the Merced River; and (2) redesign projects to avoid direct and adverse impacts on the Outstandingly Remarkable Values." (IB, 4.2-178)

The National Park Service completed and approved an evaluation of the Happy Isles Footbridge Replacement project in accordance with the Wild and Scenic Rivers Act Section 7 determination process, which accompanies this Compliance Determination. The purpose of a Section 7 determination is to evaluate the impacts a proposed project would have on the free-flowing condition of the river, as well as the affect on the Merced River's Outstandingly Remarkable Values (ORVs). The National Park Service is in the process of receiving concurrence from the US Army Corps of Engineers regarding the Section 7 determination.

### **National Historic Preservation Act Compliance**

In compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Park Service is implementing the mitigation measures set forth on page 6 in Appendix A of the YVP ROD (see Attachment B), in accordance with the 1999 Programmatic Agreement (PA) Among The National Park Service at Yosemite, The California State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Planning, Design, Construction, Operations, and Maintenance, Yosemite National Park, California. Guided by *A Sense of Place: Design Guidelines for Yosemite Valley*, footbridge design and construction is being developed in consultation with the park Historic Architect, the park Landscape Architect, and the park Historic Preservation Officer to ensure the footbridge is compatible in architectural style, elements, scale, massing, materials, and orientation with the Happy Isles area and the Yosemite Valley Historic District. Archeological monitoring and treatment of any resources discovered during ground disturbance will be conducted in accordance with the 1999 PA.

### **Floodplain Management**

In 1977, President Jimmy Carter issued Executive Order (EO) 11988, Floodplain Management. The purpose of this EO is to provide guidance to Federal agencies in minimizing flood impact on human safety, health and welfare, avoid adverse impacts associated with development of floodplains, and avoid support of floodplain development when practicable alternatives exist. "Practicable alternatives" include carrying out the proposed action at a location outside the 100-year floodplain (called the base floodplain).

Each of the four advanced design alternatives (including the selected alternative) considered for the Happy Isles Footbridge Replacement Project, were all designed to free-span the 100-year floodplain.

### **Protection of Wetlands**

In 1977, President Jimmy Carter issued Executive (EO) 11990, Protection of Wetlands. This EO stipulates that Federal agencies take a leadership role in the protection of wetlands and "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

No wetlands exist within immediate project area and location of the replacement footbridge. The Happy Isles fen, located to the southwest of the Happy Isle Nature Center and project area, will have no direct or indirect impacts caused by the Happy Isles Footbridge Replacement Project.

### **Permitting**

The National Park Service is in the process of consulting with the appropriate California and federal agencies such as the California Regional Water Quality Control Board and the US Army Corps of Engineers. Stipulations, required by these agencies, regarding construction activities will be a requirement of the construction contract.

### **Public Involvement**

The National Park Service received public comments regarding the replacement of the Happy Isles Footbridge during the public review and comment period associated with the Draft Yosemite Valley Plan Supplemental Environmental Impact Statement. These comments are presented in Attachment B which accompanies this Compliance Determination. Since then, the National Park Service has selected a steel-girder with wood decking structural design for the new replacement footbridge. The National Park Service is in the process of developing variations of design details for a steel-girder with wood decking footbridge. These variations will be presented to the public at the regularly scheduled, monthly Open Houses during the fall/winter of 2006.

**Compliance Determination**

Given the above review of the planning and compliance process completed for replacement of the Happy Isles Footbridge in the *Final Yosemite Valley Plan Environmental Impact Statement*, and satisfaction of those subsequent design requirements called for in the YVP, it is therefore concluded that the planning and public disclosure requirements of the National Environmental Policy Act (NEPA) for the Happy Isles Footbridge Replacement Project have been completed.

Commensurate with completing NEPA requirements, the National Park Service has also fulfilled its obligations under the Wild and Scenic River Act's Section 7 determination process, in that it has been determined that, although the proposed project is within the bed and banks of the Merced Wild and Scenic River, this project will not intrude on, or unreasonably diminish, the scientific, scenic, geologic processes/conditions, recreation, biological, cultural, or hydrologic processes ORVs.

The National Park Service has fulfilled its obligations under Section 106 of the National Historic Preservation Act, in coordination with the NEPA review process and documentation in the YVP and ROD. Preservation and protection measures that were developed in accordance with the 1999 PA are detailed on page 6 of Appendix A of the ROD. New construction design in historic districts and historic settings and adjacent to historic structures or sites will have compatible architectural style, elements, scale, massing, materials, and orientation. Archeological monitoring and treatment of any resources discovered during ground disturbance will be conducted in accordance with the 1999 PA. This project will not have an adverse effect on the historic setting of the Yosemite Valley Historic District.

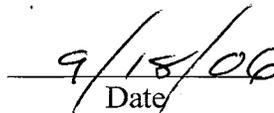
Because the replacement footbridge is sited to free-span the 100-year floodplain, no further floodplain analysis is required to implement this project. No wetlands exist within the project area, nor would the Happy Isles Fen, located to the southwest of the project area and the Happy Isles Nature Center, would be either directly or indirectly impacted.

Therefore, no further NEPA or NHPA compliance is necessary for construction of the new Happy Isles Footbridge.

**APPROVED**

**DISAPPROVED**

  
\_\_\_\_\_  
Michael J. Tollefson

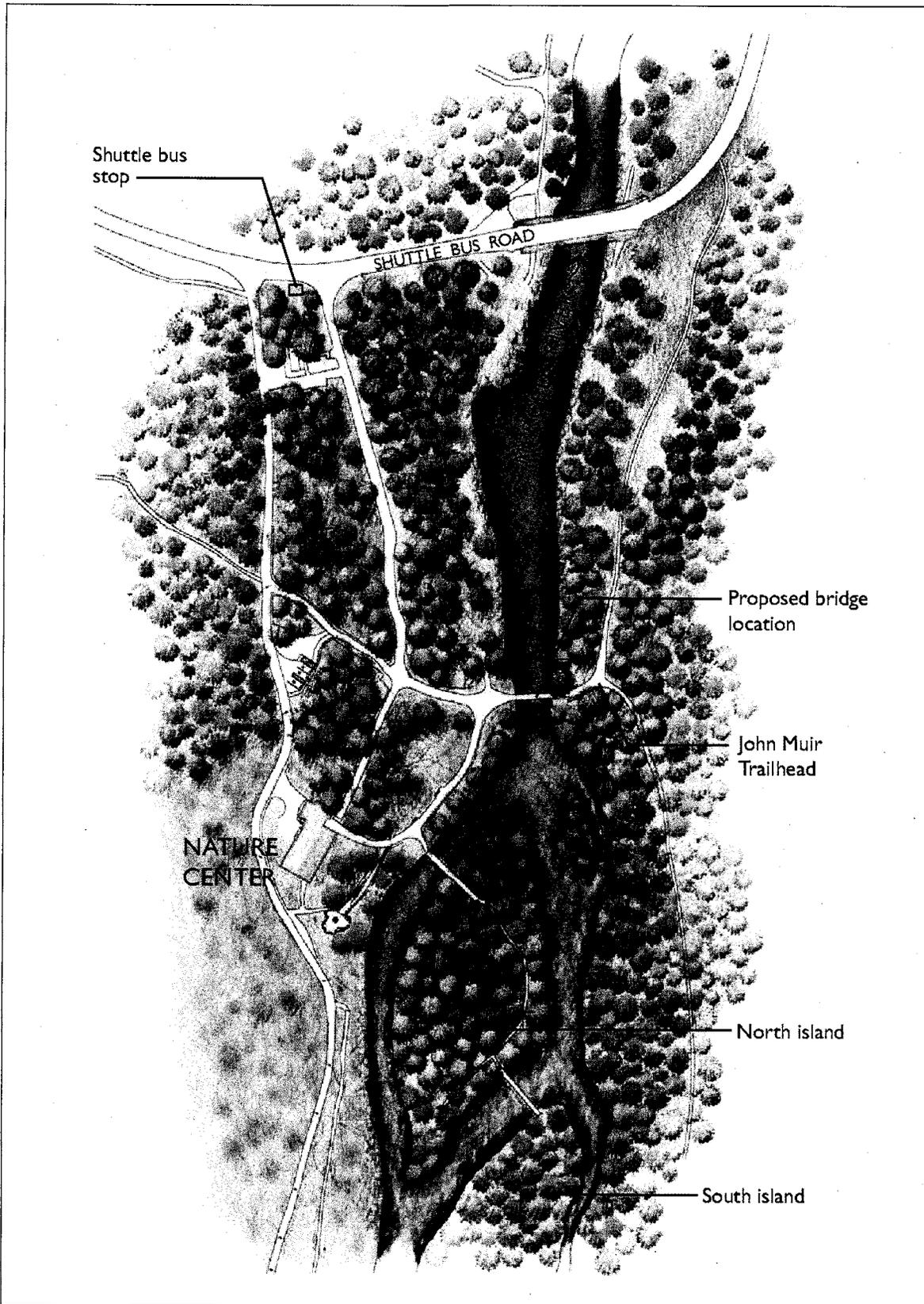
  
\_\_\_\_\_  
Date

## Attachment A

Map 1 East Yosemite Valley showing the Happy Isles area<sup>1</sup>



<sup>1</sup> From *Happy Isles - Bridge to Wilderness: Happy Isles Area Circulation Plan*, Yosemite National Park, prepared by Royston Hanamoto Alley & Abey and C+D Consulting Structural and Civil Engineers, for National Park Service and The Yosemite Fund; REVISED DRAFT, May 22, 2006.



**Map 2 Happy Isles area showing the site for the proposed replacement of the Happy Isles Footbridge at the location of the old Happy Isles Footbridge (see Footnote 1 above).**

## Attachment B

### YOSEMITE VALLEY PLAN REQUIREMENTS AND IMPACTS ANALYSIS FOR THE HAPPY ISLES FOOTBRIDGE REPLACEMENT

The following information provides excerpts from the *Yosemite Valley Plan*, and the accompanying volume and page number citation. Volumes IA and IB include the Alternatives and Environmental Consequences chapters in which the replacement of the Happy Isle Footbridge is called for, and impacts were analyzed. Volume III includes the Public Comments and Responses from the *Draft Yosemite Valley Plan Supplemental Environmental Impact Statement*. Mitigation measures stipulated in the *Yosemite Valley Plan Record of Decision* that pertain to National Historic Preservation Act requirements are also presented.

#### Volume IA – Alternatives

- “Access to the John Muir Trail at Happy Isles would be re-established at its historic location near the Nature Center by replacement of the historic Happy Isles Footbridge, damaged beyond repair during the 1997 flood” (IA, page 2-63)
- “Bridge Summary: Happy Isles – construct replacement footbridge.” (IA, page 2-76)

#### Volume IB – Environmental Consequences

- “The removal of the Happy Isles footbridge that is in imminent danger of failure, and construction of a newly designed bridge that would have a smaller footprint in the river channel and accommodate flood flow, would be a moderate, beneficial impact to the hydrology and floodplain values. Local, short-term, minor, and adverse impacts to hydrology may occur as a result of construction activities in the main channel.” (IB, page 4.2-3)
- “Removal of Happy Isles footbridge [would be a] Long-term, Minor, beneficial [impact to the] Scenic ORV [because it] potentially improves view of waterfalls, cliffs, and forest/meadow interface from the river by encouraging restoration.” (IB, page 4.2-162)
- “The removal of the Happy Isles footbridge before its imminent failure would protect the river channel, and the newly designed bridge would have a smaller footprint in the river channel and accommodate flood flow.” Impact duration, type, and magnitude is described as a Long-term, Moderate, beneficial impact to the Hydrologic Processes ORV.” (IB, page 4.2-169)
- “[T]he newly designed [Happy Isles foot]bridge would have a smaller footprint in the river channel and accommodate flood flow [and] is described as a Long-term, Moderate, beneficial [impact to the] Hydrologic Processes ORV.” (IB, page 4.2-169)
- “[T]he replacement of the Happy Isles footbridge would result in short-term impacts caused by increased erosion during demolition activities. However, the beneficial effects of the long-term restoration of the natural river hydrologic processes would outweigh these adverse impacts.” (IB, page 4.8-1)

#### Volume III – Public Comments and Responses

**475. Public Concern: The Yosemite Valley Plan should include mitigation measures for the removal and construction of bridges in Yosemite Valley.**

**Response:** To ensure that a high standard of protection of resources and values occurs, all potential future actions that could occur under each of the action alternatives proposed in the *Final Yosemite Valley Plan/SEIS* would apply a consistent set of measures to mitigate for potential environmental and social impacts. Mitigation measures relevant to the removal and construction of bridges in Yosemite

Valley are included in Vol. IA, Chapter 2, Alternatives, Mitigation Measures Common to all Action Alternatives...Sustainable design is particularly important for construction of new facilities, such as bridges. If a new bridge were constructed in Yosemite Valley it would be designed to accommodate flood flows and to the greatest degree possible allow the Merced River to meander and change course. New bridges in El Portal for the multi-use paved trail would be constructed and designed to accommodate flood flows, particularly flows of high velocity like those experienced in January 1997. (III-90)

**11. Public Concern: The Yosemite Valley Plan should require the retention of bridges in Yosemite Valley.**

“I do strongly object to removing the Stoneman, Sugar Pine, and Housekeeping Bridges across the Merced River. The Happy Isles foot bridge should be replaced. If an emergency occurs, to get people out of the upper end of Yosemite Valley, the Stoneman bridge and road will be needed. One road is not enough to get people out with their cars and camping gear from the Upper and Lower Pines campgrounds.” (Individual, Mariposa, CA - #20271)

**GAUGING STATION BRIDGE**

“Replace the damaged gauging station bridge in the same location with a classic back-country ‘parkitecture’ style steel beam-supported wooden bridge.” (Individual, Lafayette, CA - #4499)

**Response:** In the *Final Yosemite Valley Plan/SEIS*, the decisions to retain or remove bridges from Yosemite Valley were based on an analysis of roadway capacities, hydrologic impacts, cultural resource impacts, and biological impacts. Several bridges in Yosemite Valley would be retained or replaced. Specifically, Clark’s, Ahwahnee, Housekeeping, Sentinel, Superintendent’s, El Capitan, and Pohono Bridges would be retained. Happy Isles Bridge and Swinging Bridge would be replaced ...The damaged bridge at Happy Isles would be replaced with a new bridge in the same location. Although the style of construction would be determined during the site design process, the bridge would be designed to harmonize with the existing architectural styles in Yosemite Valley. (III-297)

**308. Public Concern: The Yosemite Valley Plan should ensure that new bridges accommodate pedestrians.**

“Bridge Design: Given that any new bridge in the Valley floor must be designed primarily to accommodate flood waters and not adversely impact the environment of the river scope, it is important that thought must be given to the experience of pedestrians. Design so that an adult can easily lean on the parapet and a child can step on a ledge so as also be able to lean on the top—in that way being able to watch for fish, floating leaves, and water ouzels.” (Individual, La Mesa, CA - # 1314)

**Response:** When new bridges are constructed in Yosemite Valley, they would be designed to accommodate both pedestrian and vehicle traffic (when both are appropriate uses) and in accordance with safety and accessibility standards, and within those standards to accommodate optimum pedestrian experiences. Exact design specifications are outside the scope of the *Yosemite Valley Plan*, but this concern would be considered during subsequent design activities. (III-300)

**519. Public Concern: The Yosemite Valley Plan should require the construction of a footbridge at Happy Isles.**

“The construction of a footbridge at Happy Isles to provide direct access to John Muir Trail and Mist Trail is a must for any Yosemite Valley Plan adopted.” (Individual, No Address - #6998)

**Response:** The Preferred Alternative in the *Final Yosemite Valley Plan/SEIS* (see Vol. IA, Chapter 2, Alternatives, Visitor Experience—Recreation—Trail Use) proposes to replace the Happy Isles Bridge, which was damaged by rockfall and flood. It would be replaced with an appropriately constructed (so as not to impede stream flow) pedestrian bridge in order to maintain historic trailhead access and to provide an alternative for pedestrians to the vehicle bridge on the shuttle bus road further downstream. (III-300)

**1124. Public Concern: The National Park Service should maintain and restore bridges in Yosemite National Park.**

“Any rational plan to allow access to both sides of the valley to accommodate park administration and visitors will require bridges. All bridges have finite life spans, and hence must be replaceable. The present bridge’s effect on the river except for persistence in one location may not be grossly different than that of large down woody debris. In addition, except during construction, a different type of bridge could minimize effects on the river and still allow access to both sides of the river. It is critical to any alternative chosen that tasteful and practical bridge maintenance, restoration and replacement be allowed.” (Individual, Julian, CA - #37)

**Response:** The National Park Service agrees that proper maintenance of infrastructure and stewardship of cultural resources, such as historic bridges, is necessary. Most bridges would remain in the Valley under all alternatives. The historic bridges proposed for removal are those that have the most adverse impact on the natural flow of the Merced River and are not critical links in the traffic circulation system. The remaining bridges would receive the proper maintenance to maximize their useful lifespans and, when it becomes necessary, restoration would be considered as a viable option. In particular, all the historic bridges are considered culturally significant, and any maintenance, rehabilitation or restoration work would be performed in an appropriately sensitive manner in conformance with the Secretary of Interior’s Standards for Archeology and Historic Preservation. Any new bridges constructed in Yosemite Valley would be designed to avoid impacts to the free-flowing condition of the Merced Wild and Scenic River and to the river’s Outstandingly Remarkable Values. (III-465)

**Yosemite Valley Plan: Record of Decision**

The National Park Service would preserve and protect, to the greatest extent possible, resources that reflect human occupation of Yosemite. Specific mitigation measures include:

- **Programmatic Agreement:** The National Park Service has developed a Programmatic Agreement in consultation with the California State Historic Preservation Officer, the Advisory Council on Historic Preservation, culturally associated American Indian tribes, and the public. This agreement stipulates a process for the treatment of historic properties, including identification, evaluation, and, if necessary, mitigation of adverse effects. Standard mitigation measures may be used in situations where an undertaking would adversely affect a historic property. These include documentation, interpretation, materials salvage, and National Register re-evaluation.
- Conduct additional background research, resource inventory, and National Register evaluation where information about the location and significance of cultural resources is lacking. Incorporate the results of these efforts into site-specific planning and compliance documents.
- Incorporate mitigation measures into site-specific planning and design, including protecting archeological deposits from disturbance, designing new construction in historic settings using compatible architectural style, and screening modern facilities from historic districts and ethnographic use areas. Develop specific design guidelines for all areas.
- Protect known human burials from disturbance, and prepare emergency discovery plans to deal with any unanticipated discoveries.
- Mitigate impacts to archeological resources through data recovery excavations and construction monitoring in keeping with the *Archeological Synthesis and Research Design, Yosemite National Park* (Hull and Moratto 1999), and as specified in the Programmatic Agreement.

- The park will consult with tribes throughout site-specific design planning and project implementation to avoid or mitigate damage to ethnographic resources.
- Mitigate impacts to ethnographic resources through actions developed in consultation with culturally associated American Indian tribes. Develop a parkwide gathering plan and continue to consult with Indian people, as specified in the Programmatic Agreement. Mitigation measures could include designating alternative gathering areas, continuing to provide access to traditional and spiritual locations, and screening new development from traditional use areas.
- In cases where historic structures are proposed for removal, first consider options for rehabilitation and adaptive reuse or for relocation to another area of the park. Prior to any removal, document structure in accordance with stipulations of the Programmatic Agreement and salvage historic building materials for reuse within the park.
- Design all new construction within historic districts or adjacent to historic structures or sites to be compatible in terms of architectural elements, scale, massing, materials, and orientation.
- Undertake all treatments to historic structures or within cultural landscapes in keeping with the *Secretary of Interior's Standards for the Treatment of Historic Properties*. (ROD, Appendix A, page 6).

## Attachment C

### HAPPY ISLES FOOTBRIDGE REPLACEMENT ALTERNATIVE DESIGN PROCESS

#### Alternative Design Process

The National Park Service, in partnership with the Yosemite Fund, plans to design and construct the Happy Isles Footbridge. Two consultants have been hired by the National Park Service and Yosemite Fund to develop conceptual schematic design alternatives for the replacement footbridge and the future restoration Happy Isles; Royston, Hanamoto, Alley & Abey and C+D Consulting Structural and Civil Engineers.

A series of onsite agency workshops with the consultants were conducted with park staff to develop conceptual alternatives for the new footbridge's structure. Four structural styles were ultimately reviewed and evaluated by park staff to gauge consistency with *A Sense of Place: Design Guidelines for Yosemite Valley*.

Based upon the evaluation against the above criteria, a preferred conceptual structural design alternative was presented to and approved by park management. The National Park Service intends to continue moving forward with design development, vetted through a Value Analysis process, to determine the design element details of the new steel-girder with wood decking footbridge. As the design details evolve, the public will be presented with the footbridge alternatives at park monthly Open Houses during the fall/winter 2006.

#### Alternative Design Concepts

The National Park Service preliminarily considered a total of seven bridge design concepts, and advanced four bridge design concepts that best satisfied the requirement to emphasize satisfying the guidance provided in *A Sense of Place: Design Guidelines for Yosemite Valley* as well as meeting the character of the Happy Isles area. The bridge design is intended to blend into the Yosemite landscape and not call undue attention to itself. This can be done through the use of natural materials. Guidance provided to achieve those goals includes the following:

- *New bridges should not impede the flow of water. The hydrological processes of rivers, streams, and tributaries should be protected during both low and high water periods.*
- *Footbridges should be located at crossings that are documented as historic or along trail routes.*
- *Footbridge abutments and superstructures should have a character of being built by hand.*
- *Abutments for footbridges should be constructed of dry staked or deep rake mortared stone. Use stone veneer or form board surface for exposed concrete.*
- *Decking for free span bridges should make use of heavy, rough-sawn planks. Log sub-structures should be used where feasible. Weathered steel or concrete girders maybe used and should not be disguised.*
- *Guardrails for non-historic bridges should be constructed out of sanded timbers or peeled logs mounted on sturdy supports. The use of natural weathering steel for components of the structure is optional. The handrail and cap should be wood.*

#### Footbridge Alternatives Considered<sup>2</sup>

This section describes each of the final four bridge alternatives considered and presents a photo simulation depicting a river view and landing approach view (Simulations 1-8, below) for each

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<sup>2</sup> The text, photo simulations, and drawings in this section on Bridge Alternatives is taken and adapted from the report *Happy Isles - Bridge to Wilderness: Happy Isles Area Circulation Plan*, Yosemite National Park; Prepared by: Royston Hanamoto Alley & Abey and C+D Consulting Structural and Civil Engineers; For: National Park Service and The Yosemite Fund; REVISED DRAFT, May 22, 2006.

alternative design. Each set of photo simulations is following by a set of drawings showing profile-grade, elevation, plan, and typical section drawings for each bridge design. At the end of the section, Table 1 presents a summary of the compatibility of each of the four bridge designs with the Design Guidelines for Yosemite Valley.

### 1. Suspension Bridge with Wood Log Towers

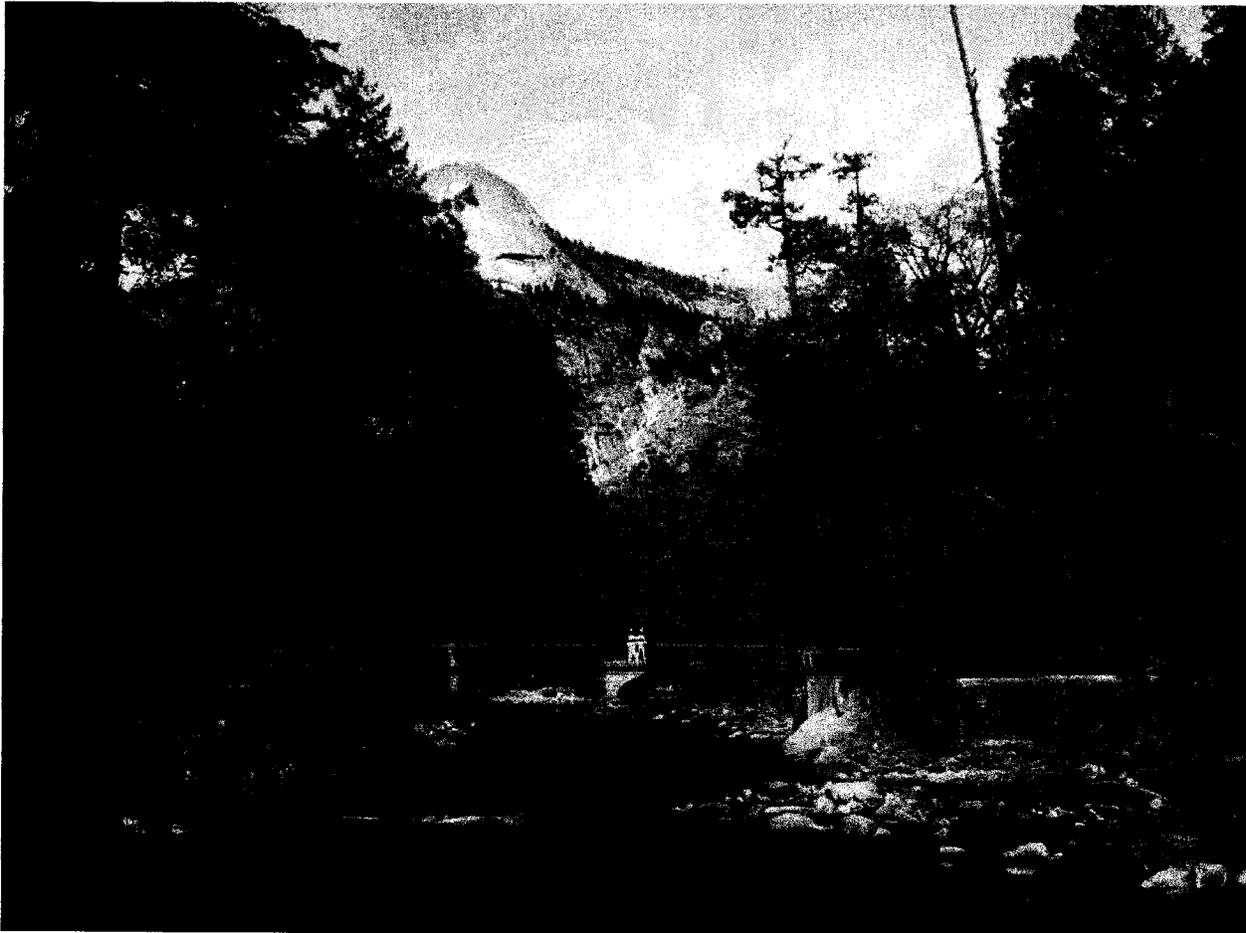
This design integrates wood logs, stone elements, and metal hardware into a classic suspension bridge design. The use of rustic stone and wood give this bridge a hand-made look compatible with the surrounding forest trees and granite boulders along the river. The towers do have a considerable form when viewed from the path approaches, but this is mitigated with the use of the rustic materials. The bridge, with its efficient structural design, has the least visual impact when viewed along the isles.

#### Pros:

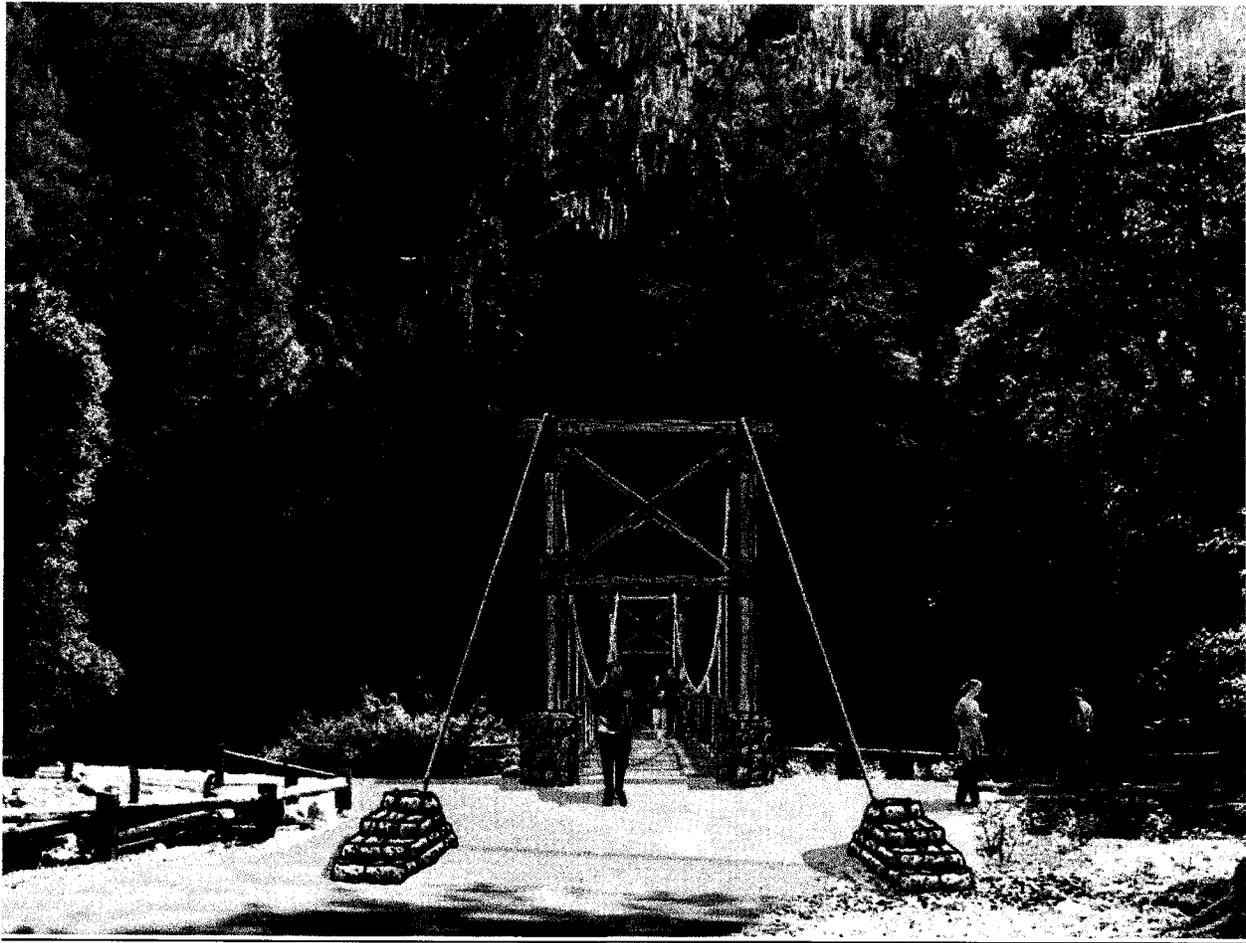
- minimal visual impact from up and down river
- lowest deck elevation requiring minimal grading changes at landings
- rustic design with wood and stone appropriate for Yosemite Valley and consistent with Design Guidelines for Yosemite Valley
- Contributes to John Muir Trail arrival experience

#### Cons:

- larger visual impact on landing approach view
- different from other current Yosemite Valley bridges



Simulation 1. Suspension bridge with log towers, river view



Simulation 2. Suspension bridge with log towers, landing approach view

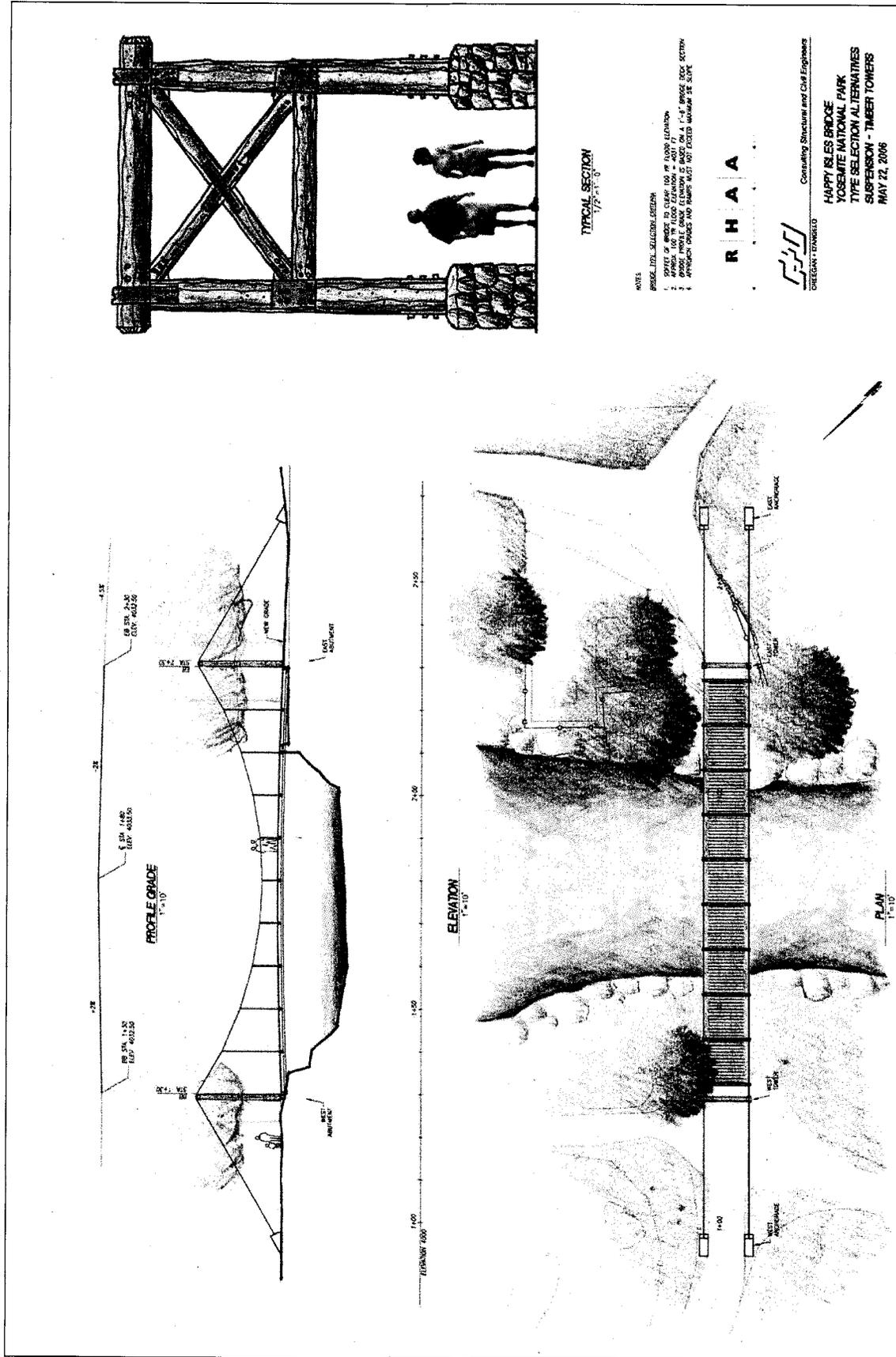


Figure 1 Suspension Bridge: profile grade, elevation, plan, and typical section drawings

## 2. Wood Truss Bridge

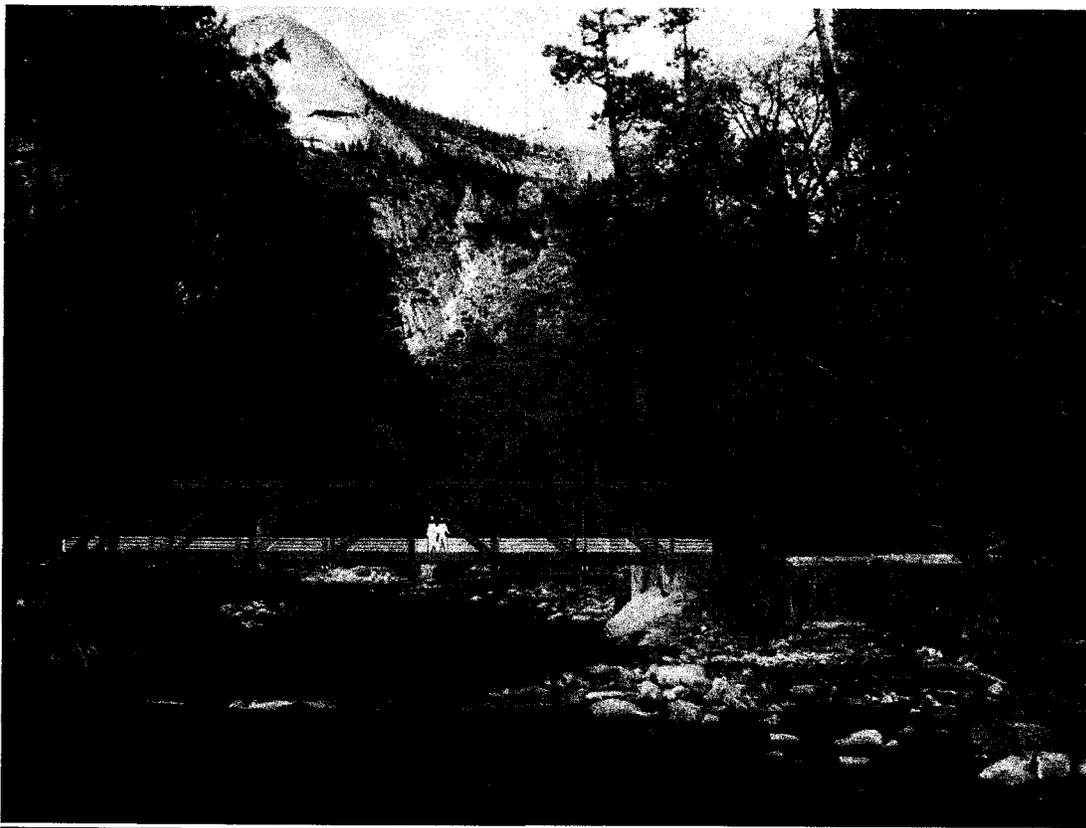
This bridge is made of large milled timbers reminiscent of the original truss bridge built at this site in the 1870s (but requiring a longer span). This bridge is a simple, classic design that has a timeless quality. Due to the classic design, we chose not to embellish the bridge with other materials or architectural details. The bridge does have a substantial visual impact from all angles and while on the bridge. The use of wood structural members gives the bridge a rustic quality.

### Pros:

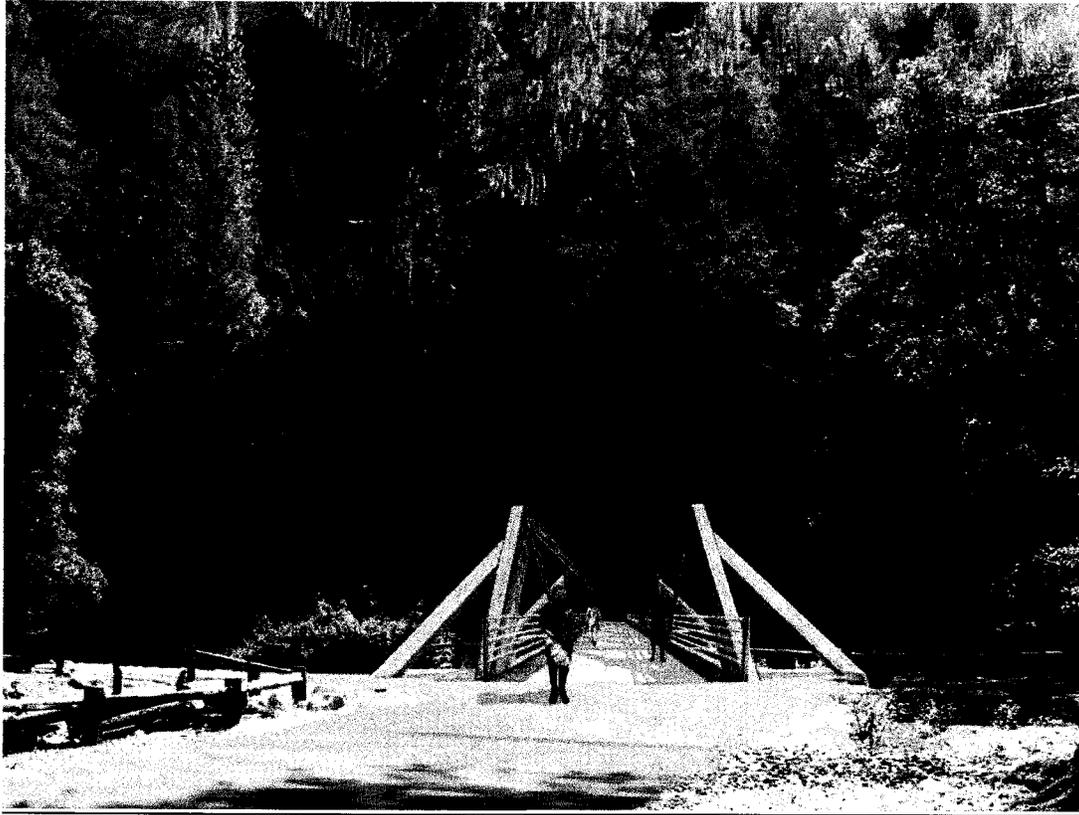
- design similar to historic bridge on site (also similar to the Wawona bridge and other past Yosemite bridges)
- use of wood structural members

### Cons:

- visual impact from all angles
- different from other current Yosemite Valley bridges
- higher bridge deck requires grading at landings



**Simulation 3. Wood through truss bridge, river view**



Simulation 4. Wood through truss bridge, landing approach view

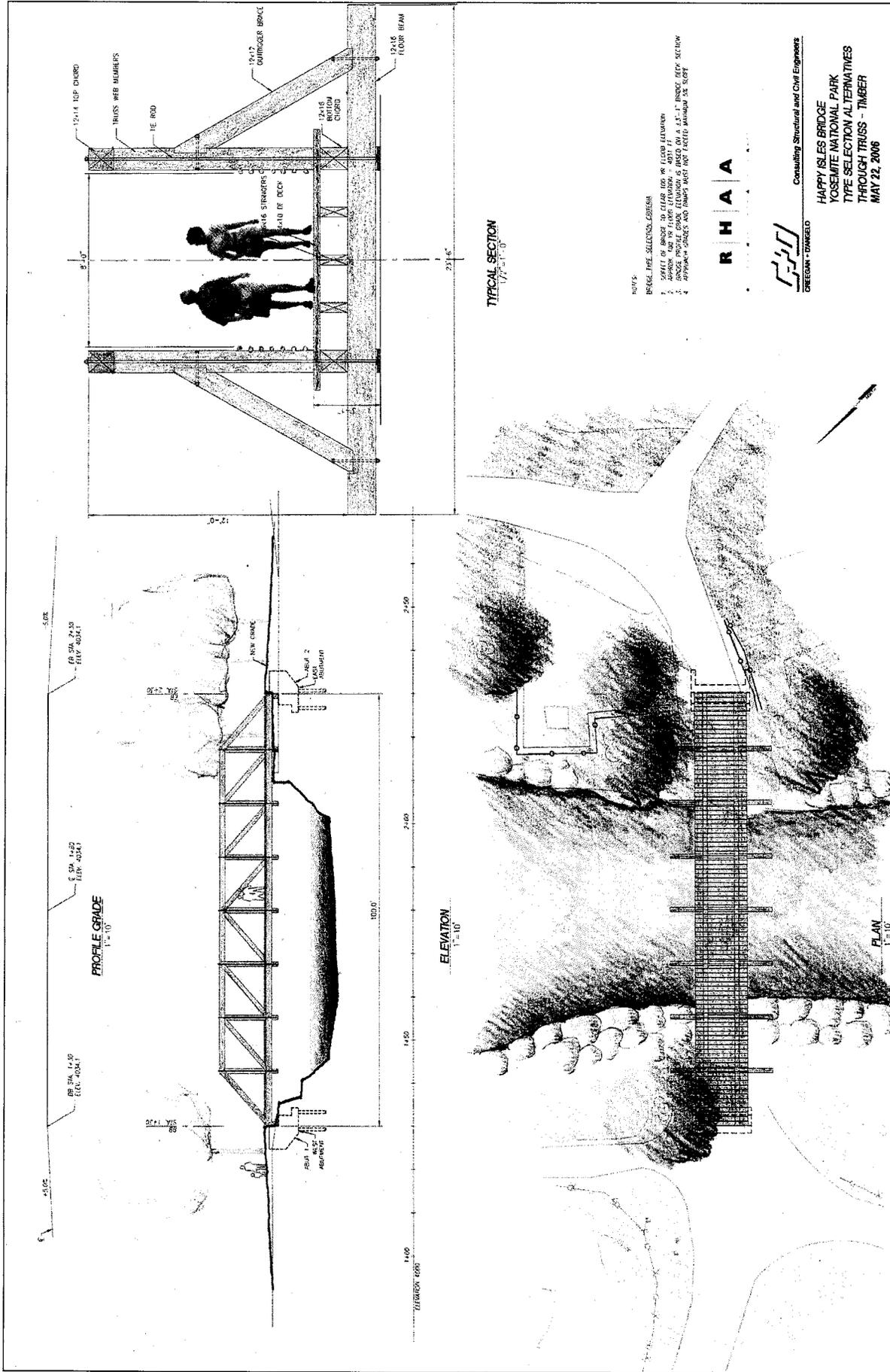


Figure 2 Wood Truss Bridge: profile grade, elevation, plan, and typical section drawings

### 3. Steel Girder with Mid-level Deck

This bridge utilizes steel girder structural members with a suspended deck between the girders. The most appropriate color for visual and maintenance considerations would be naturally weathering steel. The design incorporates a half-round wood cap and the design has two log posts at each end of the bridge. The wood details are an attempt to provide some rustic details to an otherwise non-rustic structure. Some degree of cutouts can be used to open the steel sides and lighten the visual effect. With an overall height of about 5 feet, the bridge has a more substantial visual impact from the south isle than the suspension bridge, but a smaller visual impact from the bridge approach.

#### Pros:

- low visual impact on landing approach view

#### Cons:

- visual use of steel not typical for Yosemite Valley, contrary to Design Guidelines
- visual impact from river views



Simulation 5. Steel girder bridge with mid-level deck, river view



Simulation 6. Steel girder bridge with mid-level deck, landing approach view

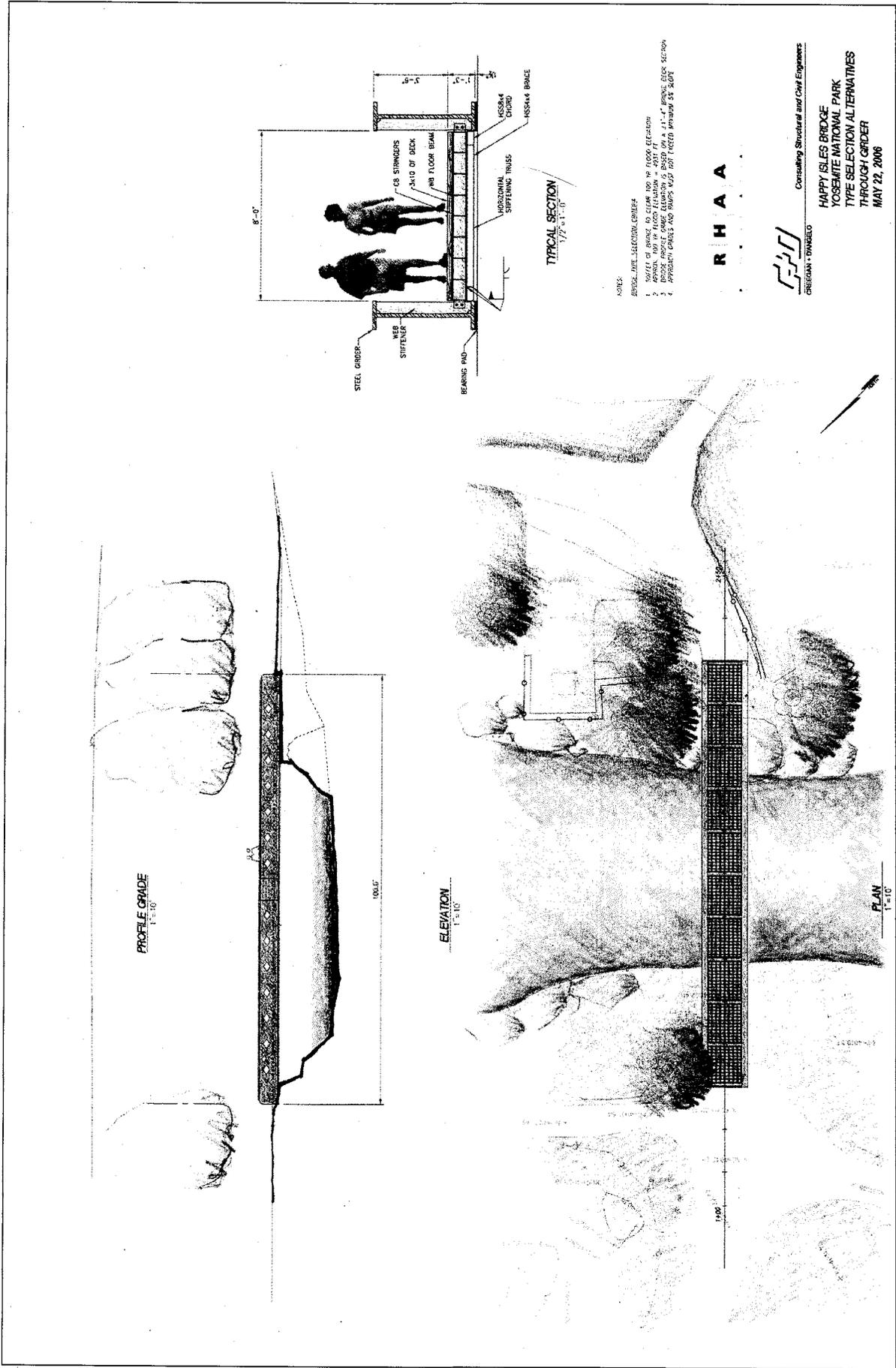


Figure 3 Steel Girder Bridge with Mid-level Deck: profile grade, elevation, plan, and typical section drawings

#### 4. Steel Girder with Wood Deck

This bridge is of similar design to several other bridges (all having much shorter spans) in Yosemite Valley. A simple wood deck and railing sit on top of steel girders. The main drawback to this bridge is that the deck elevation is higher requiring substantial grading and walls to bring the deck back down to grade.

##### Pros:

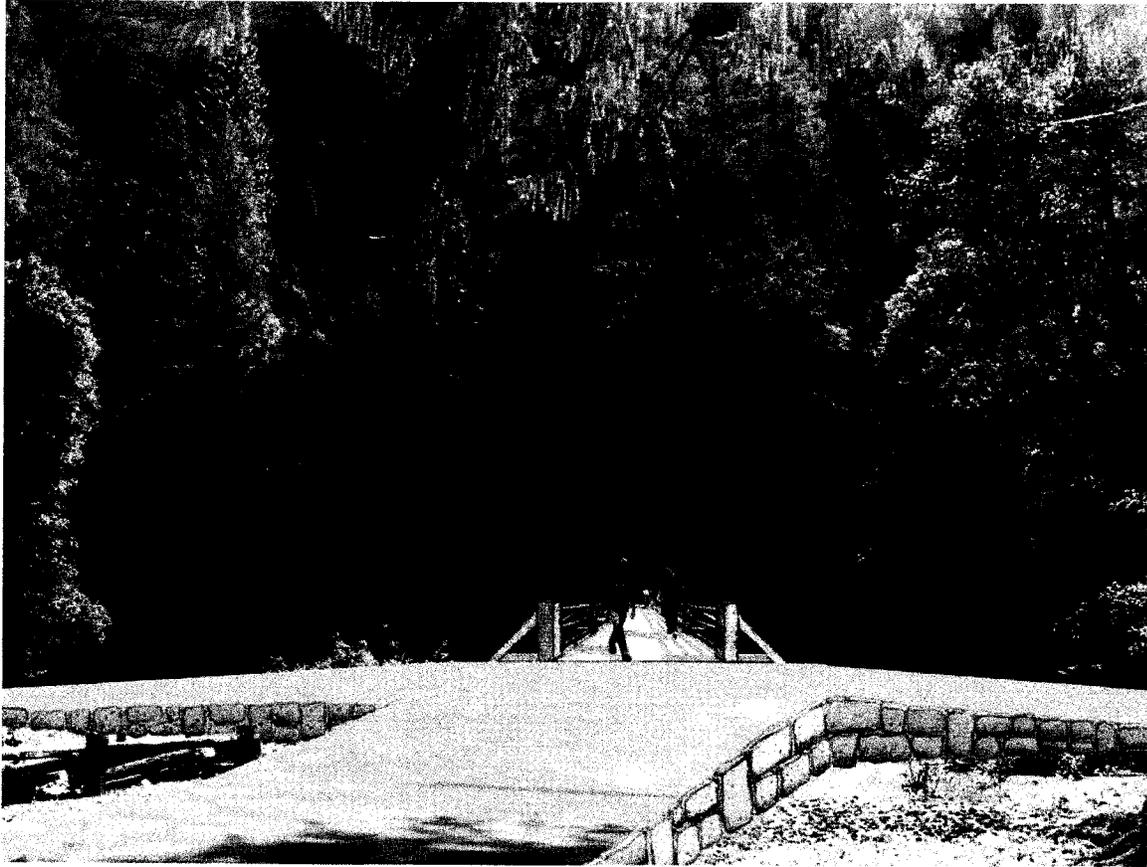
- low visual impact on landing approach view
- similar to other Yosemite Valley bridges, consistent with Design Guidelines

##### Cons:

- longer span than other Yosemite bridges requiring larger steel girders
- visual impact from river views
- highest deck level requires extensive grading at landings, challenging access to historic gauging station site.



Simulation 7. Steel girder bridge with wood deck, river view



Simulation 8. Steel girder bridge with wood deck, landing approach view

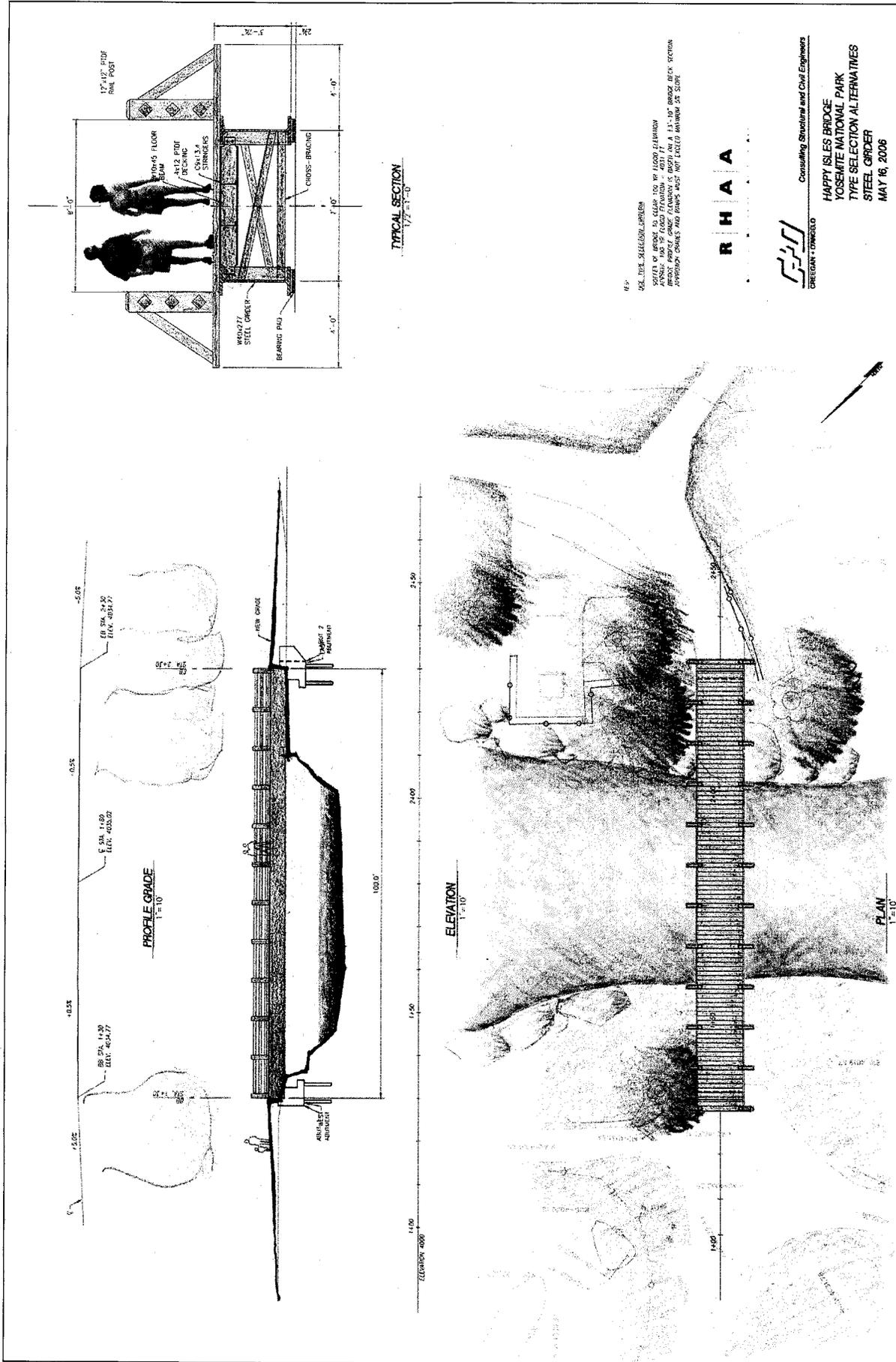


Figure 4 Steel Girder Bridge with Wood Deck: profile grade, elevation, plan, and typical section drawings

Guidelines for Footbridges from the Design Guidelines for Yosemite Valley	1. Suspension Bridge with Wood Log Towers	2. Wood Truss Bridge	3. Steel Girder with Mid-level Deck	4. Steel Girder with Wood Deck
New bridges should not impede the flow of water. The hydrologic processes of rivers streams, and tributaries should be protected during both low and high water periods.	Yes	Yes	Yes	Yes
Footbridges should be located at crossings that are documented as historic or along historic trail routes.	Yes	Yes	Yes	Yes
Footbridges abutments and superstructures should have a character of having been built by hand.	Yes	Yes	No - due to prominence of steel girders	Yes
Abutments for footbridges should be constructed of dry stacked or deep raked mortared stone. Use stone veneer or form board surface for exposed concrete.	Yes	Yes	Yes	Yes
Decking for free-span bridges should make use of heavy, rough-sawn planks. Log sub-structures should be used where feasible. Weathered steel or concrete girders may be used and should not be disguised.	Yes, including log substructure	Yes	Yes	Yes
Guardrails for non-historic bridges should be constructed out of sanded timbers or peeled logs mounted on sturdy supports. The use of natural weathering steel for components of the structure is optional. The handrail and cap should be of wood. (Western red, Port Orford, or Alaska yellow cedars are appropriate choices for handrails as they do not splinter easily.)	Yes	Yes	Yes	Yes
Other Criteria				
Visual Impact - River views	Low	High	Medium	Medium
Visual Impact - Landing approach views	Medium (for use of rustic materials)	Medium	Low	Low

**Table 1 Compatibility of Bridge Designs with Design Guidelines for Yosemite Valley**

**Selected Footbridge Alternative**

The new, steel girder with wood decking, Happy Isles Footbridge would be approximately 130-feet long and 10-feet wide, and will accommodate 100 psf (pounds per square foot) of compressive strength. The height of the footbridge would be similar to that of other existing Yosemite Valley foot bridges, although the height of the hand rail and support railings will be slightly higher (42") to meet current safety standards. As previously described, the new footbridge would free-span the entire Merced River and its 100-year floodplain; thus eliminating the need for center support piers. The appearance of the footbridge would be made similar to that of existing footbridges in Yosemite Valley by incorporating a natural river cobble around approach walls and a river rock pattern on the face of the abutments, wingwalls, and exterior approach walls.

The new footbridge will be designed in accordance with the American Association of State Highway Transportation Officials Bridge Standards, in addition to complying with applicable laws and regulations for accessibility; specifically, the 1968 Architectural Barriers Act (Public Law [PL] 90-480), the 1973 Rehabilitation Act (PL 93-112), and the 1984 Uniform Federal Accessibility Standards.

The underside of the wood decking would be formed to allow for bat roosting habitat by providing cover and footholds and the approaches to the new footbridge would be an asphalt pavement surface. Retaining walls associated with new approaches to the footbridge would be constructed of historic style stone masonry.

## Attachment D

### HAPPY ISLES FOOTBRIDGE REPLACEMENT CONSTRUCTION ACTIVITIES AND BEST MANAGEMENT PRACTICES

#### Construction Schedule

The Happy Isles Footbridge Replacement Project is anticipated to begin construction activities September 2007. Construction activities are expected to last approximately 8 months. During construction of the new footbridge, traffic signs or message boards would be installed to inform the public of any temporary detours or delays. Fencing would be installed around the entire work area so that resources and operations would not be disturbed outside the work limits. A chain link fence would be installed around the proposed staging area. Appropriate winter and high-water emergency action plans would be required for this project.

Footbridge components would be separated into pieces that can safely be transported to the site by truck and removed by crane, or other applicable equipment located at the site.

The abutments for the new footbridge will be placed outside of the 100-year floodplain. Construction activities would include subsurface excavation or drilling into the bedrock below the abutments.

#### Temporary Containment System

A temporary containment system consisting of a reinforced tarp, netting, or cage would be positioned beneath the bridge and abutments to prevent errant pieces of material (mostly concrete, rock, and steel) entering into the Merced River. No materials or equipment would be placed within the Merced River's bed and banks, to place the temporary containment system.

#### Temporary Structural Support System

A temporary, structural support system may be installed to anchor the containment system described above. The temporary support structure would be anchored either to the footbridge itself, or the footbridge's abutments. Materials and equipment used for footbridge construction would be lifted onto the footbridge's support structure (i.e. steel girder) either by crane and or be driven up a ramp from the approach area to the bridge. No materials or equipment would be placed within the Merced River's bed and banks to place the temporary support structure system.

#### Equipment Used for Footbridge Construction

Several different types of construction equipment would be used in construction of the new foot bridge. The range of potential equipment that would be used includes: cranes, excavators, backhoes, skid loaders, trucks, boulder buster, graders, jack hammers, concrete saws, jacks, and oxy-acetylene torches.

#### Construction Activities

Construction activities associated with the Happy Isles Footbridge Replacement Project includes the following:

- Excavation and placement of the two new, reinforced concrete, footbridge abutments and wingwalls would occur on both sides of the Merced River (i.e. river right and left).
- Temporary false work (i.e., forms, molds, supports) would be built to provide structural support of the steel girder as well as the wood decking during construction. All false work would be removed prior to the completion of construction.
- Grading activities would be required to construct the new footbridge approaches.
- A utility chase (i.e., a location to install network cables) would be incorporated into the

understructure of the new footbridge to allow for placement of future communication lines such as those used by the Happy Isles Gauging Station.

- The project area will be revegetated and restored to natural conditions upon completion of the new footbridge construction.

### **Best Management Practices during Construction**

- Obtain appropriate certifications or permits from the California Regional Water Quality Control Board and the United States Army Corps of Engineers prior to any ground disturbing activities. Activities that have the potential to impact delineated wetlands shall be identified and appropriate measures to protect these resources during construction shall be employed.
- Ensure that Natural and Cultural Resource monitors are on site during ground disturbing activities. All sensitive areas shall be fenced and/or protected prior to construction
- Prepare a discovery plan to handle unanticipated exposure of buried human remains, treatment and reporting procedures as well as allow for specific construction monitoring by culturally associated Indian people.
- Implement standard noise, dust, and noxious weed abatement strategies as well as a spill prevention and pollution control program for hazardous materials. Inspect equipment for hydraulic and oil leaks prior to use on construction sites, and implement inspection schedules to prevent contamination of soil and water. Keep absorbent pads, booms, and other materials on site, during projects that utilize heavy equipment, to contain oil, hydraulic fluid, solvents, and hazardous material spills.
- After placement of all concrete, trucks would be cleaned out into sedimentation basins.
- Use silt fences, sedimentation basins, etc. in construction areas to reduce erosion, surface scouring, and discharge to water bodies.
- Develop revegetation plans for the disturbed area and require the use of native species. Salvage vegetation should be used to the extent possible.
- Select base course and fill materials for compatibility with native granitic soils to minimize risk of introducing non-native plant seeds. Monitor areas where fill is imported from outside the park, and eradicate non-native plants. Apply standard techniques to prevent non-native plant encroachment.
- Confine all construction operations to specified project work limits. Install temporary barriers to protect natural surroundings (including trees, plants, and root zones) from damage. Repair or replace damaged trees and plants, and avoid fastening ropes, cables, or fences to trees. Install fencing to minimize use of highly sensitive sites such as river edges and wetlands, and install signs as needed to direct use to more appropriate areas.
- When possible, schedule disruptive activities of construction to occur when effects on wildlife would be less (e.g., after nesting season of birds, and when bats are neither hibernating nor have young). Preserve, where possible, natural features with obvious high value to wildlife, such as tree snags.
- Provide bear-proof garbage containers in all developed areas. Install bear-proof food lockers at all campsites and overnight parking areas. Require construction personnel to adhere to park regulations concerning food storage and refuse management.

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## **Wild and Scenic Rivers Act – Section 7 Determination**

(Version: AUG06)

Compliance Tracking Number: **2006-044**

PEPC Project Number: **15156**

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### *Merced WILD AND SCENIC RIVER*

#### *Happy Isles Footbridge Replacement, Merced River, Yosemite National Park*

The Merced River in Yosemite National Park is a component of the National Wild and Scenic Rivers System. Projects that involve construction in the bed or on the banks of the Merced River are water resources projects that require review under Section 7 of the Wild and Scenic Rivers Act. The river bank sites for the placement of bridge abutments are within the bed and banks of the Main Stem-Valley (East Valley) segment of the Merced Wild and Scenic River; therefore, construction of the bridge abutments for the replacement footbridge must not intrude upon or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area on the date the Merced River was designated as a component of the Wild and Scenic Rivers System.

#### **A. PROJECT INFORMATION**

**Title:** Happy Isles Footbridge Replacement (Bridge to Wilderness)

**Location:** Yosemite Valley, Mariposa County, California

**Project Manager:** Steve Quimby, Project Management, Yosemite National Park

**Project Manager:** Kirstie Kari, Yosemite Fund

**Project Description:** The historic Happy Isles Footbridge has experienced several iterations over the past century. The first wood-truss bridge, made of massive milled timbers, was constructed in 1883. Replacement bridges were constructed in 1910 and 1929. The concrete reinforced bridge, often referred to as the “Old Happy Isles Footbridge,” remained in place until 2001. It was removed as a result of being damaged beyond repair by the 1997 Flood and a subsequent rockfall from Glacier Point.

Since the removal of the Happy Isles Footbridge in 2001, access to the John Muir and Half Dome Trailheads, by way of the Yosemite Valley Loop Trail, is no longer available. As a result, circulation in the Happy Isles area has become confusing. River banks between the Happy Isles Vehicle Bridge and the site of the old Happy Isles Footbridge have become damaged and are experiencing accelerated erosion due to visitors trying to access the John Muir Trailhead.

The proposed action would replace the Happy Isles Footbridge in its original location using the selection alternative, a steel-girder bridge with a wood deck (see the accompanying Compliance Determination Memo-to-File), thus re-establishing the historic connection, from the Yosemite Valley Loop Trail and Happy Isles Nature Center, to the John Muir Trail and Yosemite Wilderness. The new footbridge would span the 100-year floodplain—i.e., new bridge abutments would be placed above the Ordinary Highwater Mark thereby protecting and enhancing the free-flowing condition of the Merced River. No construction equipment would be used within the bed and banks of the river.

**B. ANALYSIS OF POTENTIAL IMPACTS**

Impacts and Mitigations:

*This section identifies each potential impact, emphasizing those affecting river "Outstandingly Remarkable Values", and discusses its relationship to and potential impact on the river and how each impact will be avoided or mitigated.*

A comprehensive management plan for the Merced Wild and Scenic River has not yet been completed for the Merced Wild and Scenic River. However, the Merced Wild and Scenic River planning effort to date indicates that the likely classification of Main-Stem Yosemite Valley segment would be "Recreational," and identifies a complete range of Outstandingly Remarkable Values, as follows:

- Scientific
- Scenic
- Geologic Processes/Conditions
- Recreation
- Biological
- Cultural
- Hydrological Processes

Summary of Impacts

**Table 1. Project Impacts on the River's Free Flow and Water Quality**

Section 7 Considerations	Short Term Impacts	Long Term Impacts
<b>Free flow characteristics</b> <ul style="list-style-type: none"> <li>• Channel width/depth</li> <li>• Vertical drop</li> <li>• Channel form</li> </ul>	<ul style="list-style-type: none"> <li>• None: all new construction would be done outside of the Ordinary High Water Mark.</li> </ul>	<ul style="list-style-type: none"> <li>• The free-flowing condition of the river would be protected and enhanced by construction of the bridge and its abutments above the Ordinary Highwater Mark.</li> </ul>
<b>Water Quality</b> <ul style="list-style-type: none"> <li>• Turbidity</li> <li>• Temperature</li> <li>• Nutrient availability</li> </ul>	<ul style="list-style-type: none"> <li>• None: no construction would take place and no construction equipment would work below the Ordinary Highwater Mark; best management practices would be used to ensure construction activities do not affect water turbidity, temperature, or nutrient availability.</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality would be protected and enhanced by removal of bridge related structures from the river and construction of the new bridge above the Ordinary Highwater Mark.</li> </ul>

**Table 2. Project Impacts on the Outstandingly Remarkable Values for which the River was Designated Wild and Scenic**

River ORVs	Project Impacts
<i>Scenic</i>	<ul style="list-style-type: none"> <li>Scenic resources would be protected and enhanced because the new bridge would follow the guidance provided in <i>A Sense of Place: Design Guidelines for Yosemite Valley</i>.</li> </ul>
<i>Geologic Processes/Conditions</i>	<ul style="list-style-type: none"> <li>There would be no effect on geologic processes or conditions.</li> </ul>
<i>Recreation</i>	<ul style="list-style-type: none"> <li>Recreation resources would be protected and enhanced by re-establishing the direct connection from the Yosemite Valley Loop Trail and the Happy Isles Nature Center to the John Muir Trail and Yosemite Wilderness.</li> </ul>
<i>Biological</i>	<ul style="list-style-type: none"> <li>Terrestrial biological resources would be protected and enhanced by allowing direct access to the John Muir Trail and removing the incentive for hikers to cut down the riverbanks and across the river itself. Aquatic biological resources would be protected and enhanced by having the bridge and abutments constructed above the Ordinary Highwater Mark.</li> </ul>
<i>Cultural</i>	<ul style="list-style-type: none"> <li>Cultural resources would be protected and enhanced by replacing the historic connection between the Yosemite Valley Loop Trail and Happy Isles Nature Center with the John Muir Trail and Yosemite Wilderness with a bridge designed to fit the historic landscape.</li> </ul>
<i>Hydrologic Processes</i>	<ul style="list-style-type: none"> <li>Hydrologic processes would be protected and enhanced by constructing the new footbridge above the Ordinary Highwater Mark.</li> </ul>

**C. SECTION 7 DETERMINATION**

Although within the bed and banks and designated corridor of the Merced Wild and Scenic River the proposed project will not intrude on or unreasonably diminish the scenic, geologic process, recreational, biological, cultural, or hydrologic process values present in the area on the date the Merced River was designated a component of the Wild and Scenic Rivers System.

Mark A. Butler  
 Recommended by Mark Butler, Compliance Program Manager

9/18/06  
 Date

Michael J. Tollefson  
 Approved by Michael J. Tollefson, Superintendent

9/18/06  
 Date