North Coast Highway
Bridge Replacement Project

Final Visual Impact Assessment

February 2024

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF CHARTS

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VISUAL IMPACT ASSESSMENT

North Coast Highway Bridge Replacement Project

I. PURPOSE OF STUDY

The purpose of this visual impact assessment (VIA) is to document potential visual impacts caused by the proposed project and propose measures to lessen any detrimental impacts that are identified. Visual impacts are demonstrated by identifying visual resources in the project area, measuring the amount of change that would occur as a result of the project, and predicting how the affected public would respond to or perceive those changes.

II. PROJECT DESCRIPTION

The City of Oceanside (City) proposes to replace the existing structurally deficient North Coast Highway (formerly Hill Street) Bridge (Br. No. 57C-0322). The bridge is located approximately 0.3 miles south of Harbor Drive, immediately west of and parallel to Interstate 5 (I-5), in the City of Oceanside, San Diego County, California (Figure 1 and Figure 2).

The San Luis Rey River is a perennial river flowing roughly east to west through the San Luis Rey valley, discharging into the Pacific Ocean just south of the Oceanside Harbor. The bridge currently carries vehicular and pedestrian traffic on the North Coast Highway over the river. North Coast Highway begins north of the bridge at the Harbor Drive exit from the I-5 freeway and continues south of the bridge through downtown Oceanside to Mission Avenue. South of Mission Avenue the road becomes South Coast Highway and continues on to the City of Carlsbad. This section of North Coast Highway connects numerous businesses with the freeway and downtown Oceanside. The North Coast Highway bridge includes an asphalt roadway, curbs and a sidewalk only on the west side. There is no on-street parking allowed on the bridge.

The project is funded by the federal-aid Highway Bridge Program (HBP) administered by the Federal Highway Administration (FHWA) through California Department of Transportation (Caltrans) Local Assistance. The replacement bridge will meet current applicable City, American Association of State Highway and Transportation Officials (AASHTO), and Caltrans design standards. The bridge would be replaced close to the same location or immediately west of the current bridge alignment to maintain the existing approach alignments.

The existing bridge was built in 1929, and is in poor structural condition. At 94 years old, the bridge is past its useful service life. The bridge is a “Fracture Critical” steel truss type bridge. This design is structurally non-redundant and has steel members loaded in tension - if one of these members fractured, it could cause a collapse of a span.

The purpose of this project is to remove the deteriorated, structurally deficient, fracture critical and seismically vulnerable existing structure and replace it with a new bridge designed to current structural and geometric standards while minimizing adverse impacts on the San Luis Rey River and the surrounding riparian area. The replacement bridge will conform to local, state, and federal environmental and planning policies using HBP funds.

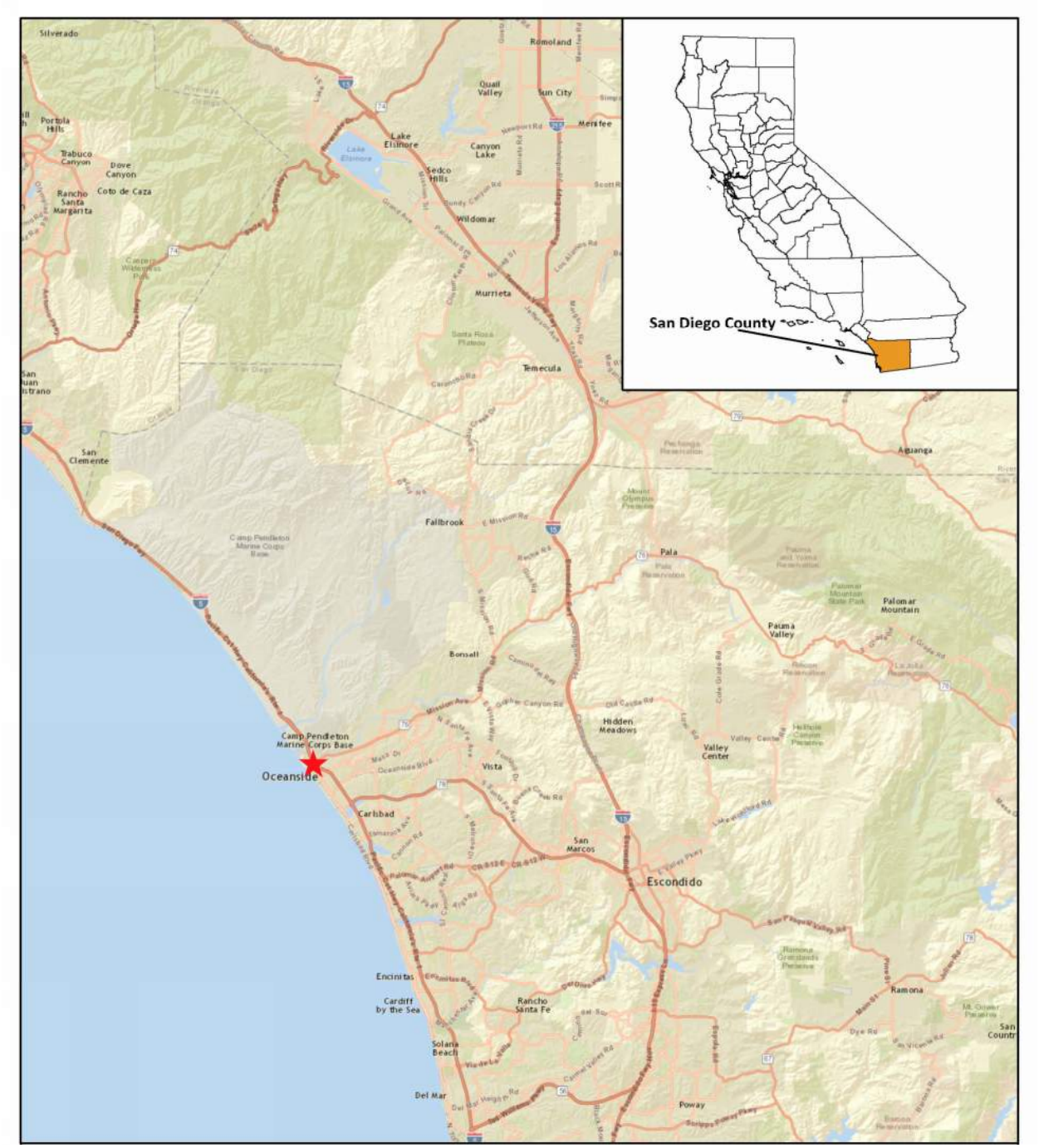
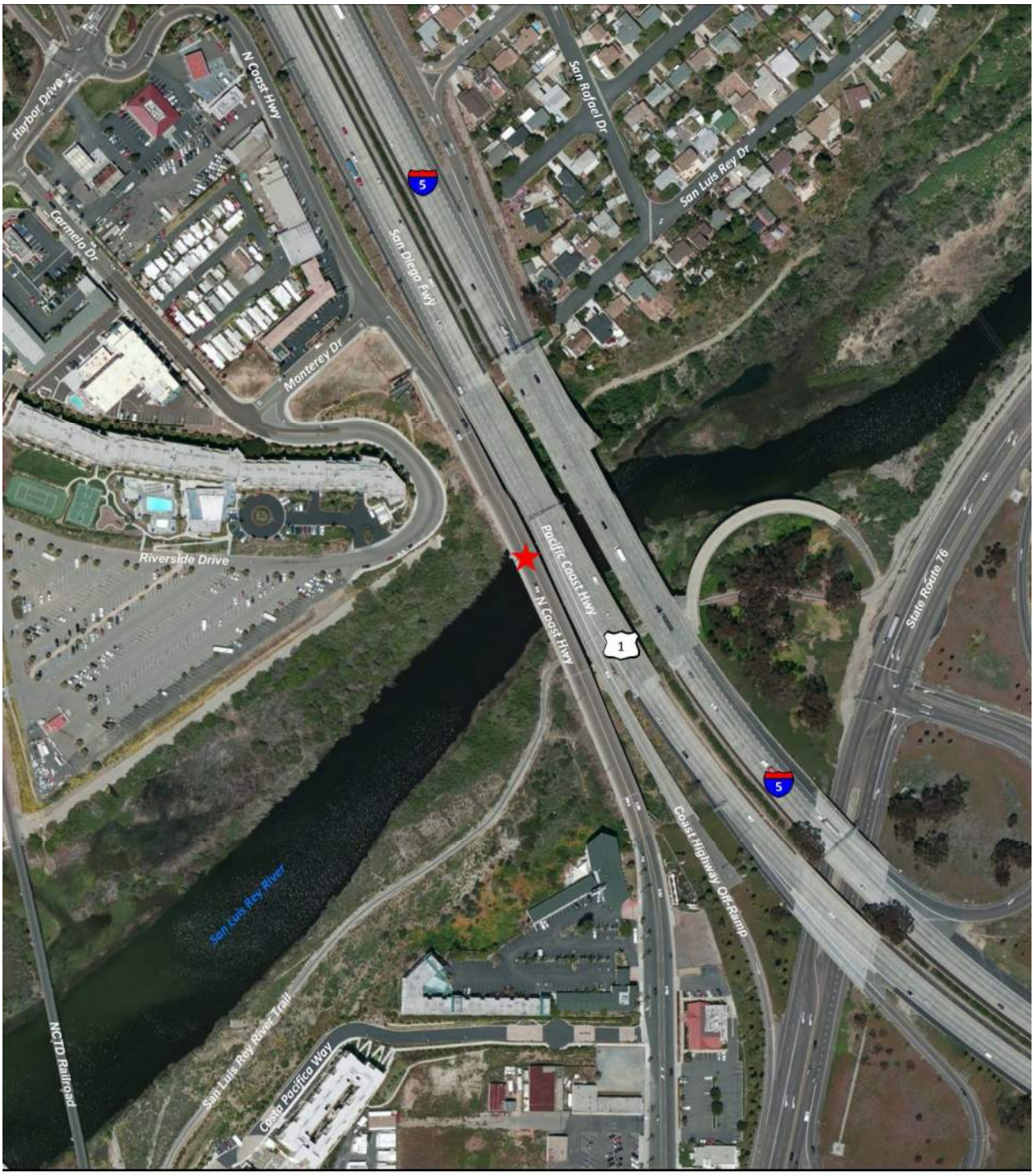


FIGURE 1: REGIONAL MAP



Project Location - North Coast Highway Bridge

FIGURE 2: PROJECT VICINITY MAP

The project objectives are defined as:

- Remove the existing structural deficient, fracture critical, and seismically vulnerable bridge from service, and replace it with a new bridge built to current structural and geometric standards
- Improve public safety and pedestrian circulation through the addition of an 8-foot-wide sidewalk on the western side of the bridge
- Avoid adverse changes in traffic circulation and the community cohesion
- Minimize right-of-way take
- Minimize impacts to the river and riparian zone
- Offset the majority of project costs through State and Federal funding
- Facilitate and/or incorporate bike path connections to the San Luis Rey Trail
- Make the bridge more pedestrian and bicycle friendly
- Improve the user experience for pedestrians and bicyclists on the trail below the bridge
- Reduce visual impacts and optimize scenic resources including the views of the Pacific Ocean and the San Luis Rey River
- Provide a context sensitive design solution appropriate for the scenic setting
- Give the bridge its own character as a city street, separate from the I-5 Freeway

The North Coast Highway Bridge runs from southeast to northwest at approximately a 30-degree angle to true north. For purposes of this Project Description, the North Coast Highway is assumed to run north to south and the San Luis Rey River flows from east to west.

Existing Bridge

The existing North Coast Highway Bridge was constructed in 1929. It is a 950-foot long five-span bridge with a cast-in-place concrete deck. The approach spans (Spans 1 and 5) are rolled steel girders. Spans 2, 3, and 4 are each 268-foot-long steel truss spans. The truss spans have a total depth of approximately 40 feet, constructed of dual simple span riveted steel trusses. Piers 3 and 4 are located in the main river supported on piles. Piers 2 and 5, located near the edges of the river are supported on spread footings. The existing abutments are seat type concrete abutments on spread footings. The bridge was widened to the east in 1952. The widening was removed in 1971 when the I-5 freeway was built, and the bridge was restored to its original configuration. The bridge is a total of 49 feet wide, with a curb-to-curb width of 40 feet providing two 12-foot traffic lanes plus 8-foot shoulders. It has a raised sidewalk along the west edge of the deck.

The following utilities are attached to the bridge:

- 12-inch gas line – attached to the lower portion of the truss along the east side of the bridge
- Two 12-inch waterlines – attached to the lower portion of the truss; one on the east and one on the west of the bridge
- 10-inch waterline – attached to the lower portion of the truss; along the west side of the bridge
- Electrical and telecommunications lines – attached under the top deck; along the west side of the bridge

There are also two sewer lines in the bridge vicinity, but not on the bridge, one runs down the center of The North Coast Highway, and terminates approximately 40 feet south of the bridge and does not cross the San Luis Rey River. The second sewer line runs east-west under the bridge, along the north side of the San Luis Rey River.

The San Luis River Trail runs along the southern river bank and provides recreational and commuter uses for bicyclists and pedestrians. Access along this trail will be maintained during and after construction.

On the north side of the river, there is a paved concrete pedestrian path near the top of the slope, which crosses under the I-5 bridges and under the existing North Coast Highway Bridge. This path from San Luis Rey Drive east of the bridges to North Coast Highway on the west side of the bridges, provides coastal access to the residential neighborhoods to the east. This path will likely need to be modified to extend it under the new North Coast Highway Bridge. It is to be determined if pedestrian access on this path needs to be maintained during construction.

Project Design and Alternatives

In May 2021 a Draft Type Selection Report for North Coast Highway Bridge Replacement was prepared by Moffatt & Nichol The report identified a common bridge design section and lane configuration, assessed five bridge structure type alternatives and assessed two bridge alignment alternatives.

Replacement Bridge Design Section

The deck width on the new 52-foot-wide bridge will match the existing roadbed with two 12-foot-wide travel lanes and two 8-foot-wide shoulders for a curb-to-curb width of 40 feet. This roadway section is consistent with City and AASHTO standards for a facility of this type, and also matches the existing curb and gutter line along the North Coast Highway.

South of the bridge there are sidewalks on each side of the street. However, north of the bridge there is only a sidewalk on the west side of the street. New bridges and streets constructed to the city standard would generally have 6-foot-wide sidewalks on each side, and the HBP program would generally include two 6-foot-wide sidewalks for a total sidewalk width of 12 feet on the bridge. To provide the necessary pedestrian circulation, to align with the sidewalk north of the bridge, and to address the project objectives of improving the user experience for pedestrians and optimizing views of scenic resources, a single 8-foot-wide sidewalk is proposed for the west side of the new bridge. The 2-foot-wide bridge barriers and railings will meet current requirements for vehicular and pedestrian railings. The preferred bridge lane configuration and dimensions are shown in (Figure 3).

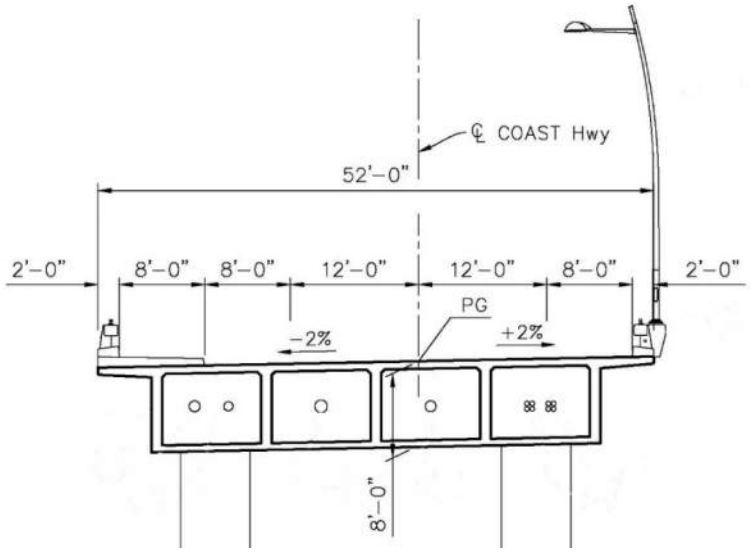


FIGURE 3: PROPOSED BRIDGE LANE CONFIGURATION

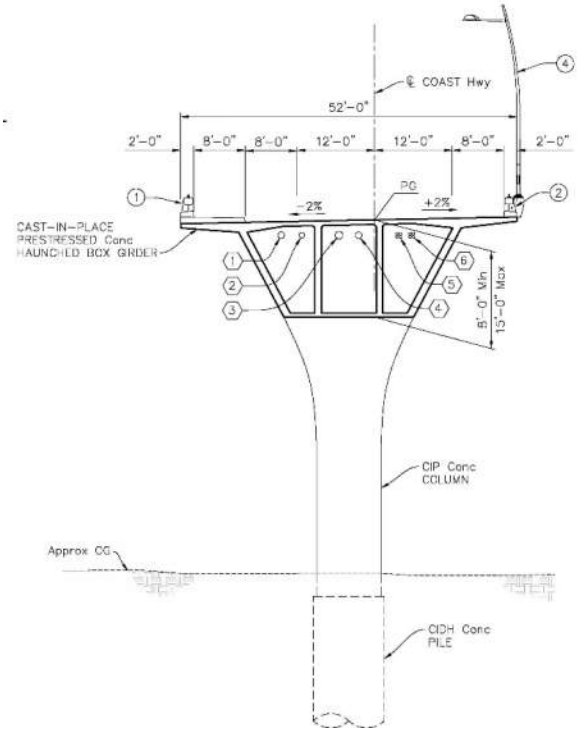
Replacement Bridge Type Alternatives

The Draft Type Selection Report for North Coast Highway Bridge Replacement assessed five bridge structure alternatives. The four non-preferred structure design alternatives include:

- Benchmark Cast-in-Place post-Tensioned Concrete Box Girder – The Benchmark Box Girder design uses a multi-cell, cast-in-place, prestressed concrete box girder for the superstructure. The features and details of this bridge follow the guidelines in the Caltrans Bridge Design Manuals and standard Caltrans design practice. The exterior shape of the box is rectangular and 8 feet deep with spans of 90 feet to 200 feet, five pairs of 6'-6" diameter columns support the structure with two on the river edge and the remaining columns on the valley floor. The Benchmark Box Girder design looks like a standard freeway bridge.
- Haunched Cast-in-Place Post-Tensioned Concrete Box Girder on Two-Column Piers – This design is similar to the Haunched Box Girder preferred design alternative described later. However, it is supported by pairs of columns instead of single columns, which has greater impact on the valley floor and is more visually obstructive.
- Cast-in-Place Post-Tensioned Arch – The Arch design also uses a cast-in-place, prestressed concrete box girder, 7'-6" deep, for the superstructure. However, the superstructure is supported by concrete arches and vertical supports, instead of only vertical columns. Three concrete arches span the river valley and support the superstructure. This reduces the area of disturbance in the valley bottom. There's a main 297-foot arch over the river, and two side arch spans of 275 and 266 feet. Each arch span consists of two arch ribs that join the superstructure at mid-span. The base of the arch ribs frame into a pile cap, which is supported by CIDH piles. The pile cap and piles would be below ground. At the center of the pile cap are two columns that provide vertical support for the superstructure. The Arch design has a unique, elegant and interesting appearance. However, the additional structural elements reduce the visibility of the natural landscape beyond the bridges and this design is the most expensive of the five to construct.
- Haunched Precast Prestressed Post-Tensioned Girders – This bridge design type would be constructed using Accelerated Bridge Construction methods. The bridge would consist of five spans of up to 220 feet in length. The structure would be supported on four 9-foot diameter columns. The 7-foot minimum, 11-foot maximum deep precast, pre-stressed girders would be delivered to the site in segments, assemble on site and installed. While this bridge design type requires less falsework construction and utilizes Accelerated Bridge Construction methods, it is the second most expensive option.

Haunched Box Girder Bridge (Preferred Alternative)

The preferred Haunched Box Girder design also uses a cast-in-place, prestressed concrete box girder for the superstructure. A typical section of the bridge is shown to the right.



- The bridge has a single 260-foot span over the river. On each side of the main span are 205-foot transitions spans and 145 to 165-foot end spans.
- The structure depth varies from 8 feet at mid-span to 15 feet above the columns. This increases structural efficiency and allows the bridge to span longer distances.
- The shape of the box girder is refined for the longer span.
- The deck overhangs are lengthened to 9 feet and the exterior girders are tapered.
- A single flared column is used at each pier to support the entire width of the girder. The columns vary from 10 to 11 feet in width at the base to 10- to 20 feet in width at the top.
- With five-spans, the bridge only has four columns total, and none of the columns are in the river.

As can be seen in the Figure 4 below, the Haunched Girder design has an improved appearance with the long central span over the river with only four columns total, and is more visually open than the other alternatives.

FIGURE 4: Haunched Box Girder Type Bridge - Computer Rendering

Other Bridge Features

Barriers and Railings – Concrete Barrier (Type 85) is proposed at the edges of the bridge. The Type 85 is a crash tested barrier developed by Caltrans for use on bridges in coastal and other scenic areas. It is 32 inches tall and has 12-inch-tall by 8-foot-wide openings, which help to preserve views through the barrier. The barriers would be natural concrete or integrally colored to match the color and texture of the overall bridge structure for each alternative. The barrier design includes a top handrail to provide an overall pedestrian guardrail height of 42 inches.

Bridge Lighting – Pole mounted lights are proposed for the bridge to light the roadway and sidewalk. The light poles would be located on the sidewalk behind the vehicular barrier. They would be spaced at approximately 140 to 260 feet. The shape of the light pole will be chosen to be compatible with the bridge type and other features of the bridge.

Color Scheme – Portions of the bridge structure may be enhanced with integral concrete coloring or a staining agent. The color scheme will be context sensitive and fit within the City of Oceanside's design aesthetic. Selection of the final color scheme will be made with input from the City of Oceanside and Caltrans Local Assistance.

Summary – The five bridge types considered would all provide the same functionality and meet the purpose and need of the project. The total length, width and footprint are the same. All five are feasible to construct. All five will be durable and require minimal maintenance. All five structures can accommodate the utilities. The preferred haunched girder design provides the balance between aesthetics and cost.

Replacement Bridge Alignment Alternatives

In the Draft Type Selection Report for North Coast Highway Bridge Replacement, two bridge alignment alternatives were considered for the proposed project:

- Alignment 1 – This alternative would keep the new bridge on an alignment similar to the existing North Coast Highway alignment. The existing bridge would be closed to traffic during construction of the new bridge, requiring a detour for the anticipated 24-month duration of construction. Utilities on the existing bridge would need to be relocated twice in order to remain in service: once to move them off the existing bridge before the bridge is demolished, and a second time to move them onto the new bridge once construction is complete. Closure of the North Coast Highway Bridge for a long duration is expected to negatively impact businesses along North Coast Highway.
- Alignment 2 – This alternative (Figures 6 and 7) would construct the new bridge on a new alignment adjacent to the existing North Coast Highway Bridge, allowing the existing bridge to remain open during construction of the new bridge, minimizing closures and traffic disruptions. The new structure would be constructed immediately adjacent to the existing bridge, with a gap between the two structures as small as 7 feet in some locations.

In May of 2019, the replacement bridge Project Design Team voted unanimously in favor of Alternative 2 as documented in the 2021 North Coast Highway Bridge Replacement Type Selection Report prepared by Moffatt & Nichol for the City of Oceanside.

Other Bridge Replacement Work

Roundabout at Monterey Drive

Monterey Drive is a short connector street from North Coast Highway to Carmelo Drive to the west. It is the primary access from northbound North Coast Highway to the hotels and marinas. There is also a hotel, a gas station and a number of small businesses on North Coast Highway north of Monterey Drive, as well as Harbor Drive and an on-ramp to southbound I-5. To improve traffic flow, a roundabout is proposed for the intersection of North Coast Highway and Monterey Drive. Figure 5 provides a bird's eye view of the roundabout at Monterey Drive. Figures 6 and 7 illustrate the proposed bridge alignment in comparison to the existing bridge and the connection from the bridge to the roundabout.

Roadway Approach Work

The project will include new pavement, curbs, gutters, and sidewalks adjacent to the replacement bridge. The project will conform back to the existing street/sidewalks within approximately 200 feet from each side of the bridge if the realignment to the west option is selected. The curb-to-curb clear width of the street will match the width of the existing street and bridge. The sidewalk approaches will transition as necessary to conform to the width of the sidewalks on the bridge.

Utility Relocation

The utilities currently supported by the existing bridge will be relocated onto the new bridge. These utilities will remain in service during construction. If the existing bridge is removed before the new bridge is constructed, the utilities can be relocated onto a temporary construction trestle. Once the new bridge is complete, the utilities will be relocated to their final locations in the new bridge.

FIGURE 5: PROPOSED ROUNDABOUT AT NORTH COAST HIGHWAY AND MONTEREY DRIVE

Right-of-Way

The existing right-of-way for the North Coast Highway is 74 feet wide north of the bridge and 80 feet wide south of the bridge. Additional permanent right-of-way is required along the west side of the existing bridge. There are also several areas identified as potential construction staging areas that may require temporary construction easements (TCEs) or encroachment permits from the Caltrans.

Detour Route

If the alternative is selected to close the bridge and roadway to reconstruct the bridge on the existing alignment, North Coast Highway will be closed between Costa Pacifica Way and Monterey Drive, except for local traffic accessing commercial establishments. To bypass the construction site, traffic will be detoured to the west at Harbor Drive to Pacific Street, south to Surfrider Way and east on Surfrider Way to North Coast Highway. The total detour length on city streets is approximately one and one quarter mile to travel around the bridge from North Coast Highway to North Coast Highway, or two miles from one end of the closed bridge to the other. Detailed detour signage plans will be reviewed and approved by the City's traffic engineer. City staff will provide public outreach brochures and meetings prior to construction to keep residents informed of the project.

Demolition Activities

Demolition of the existing bridge will be performed in accordance with the Caltrans Standard Specifications modified to meet environmental permit requirements. All concrete and other debris resulting from the demolition of the existing bridge will be removed from the project site and properly disposed of or recycled by the contractor according to the approved bridge demolition plan and in conformance with environmental permits. All demolition plans will be reviewed and approved by the Resident Engineer. Equipment used for demolition will include backhoes, excavators, hoe rams, hydraulic hammers, loaders, dump trucks, debris bins, and flatbed trucks with cranes, air compressors, jackhammers, chipping guns, cutting torches, and saws.

Construction Activities

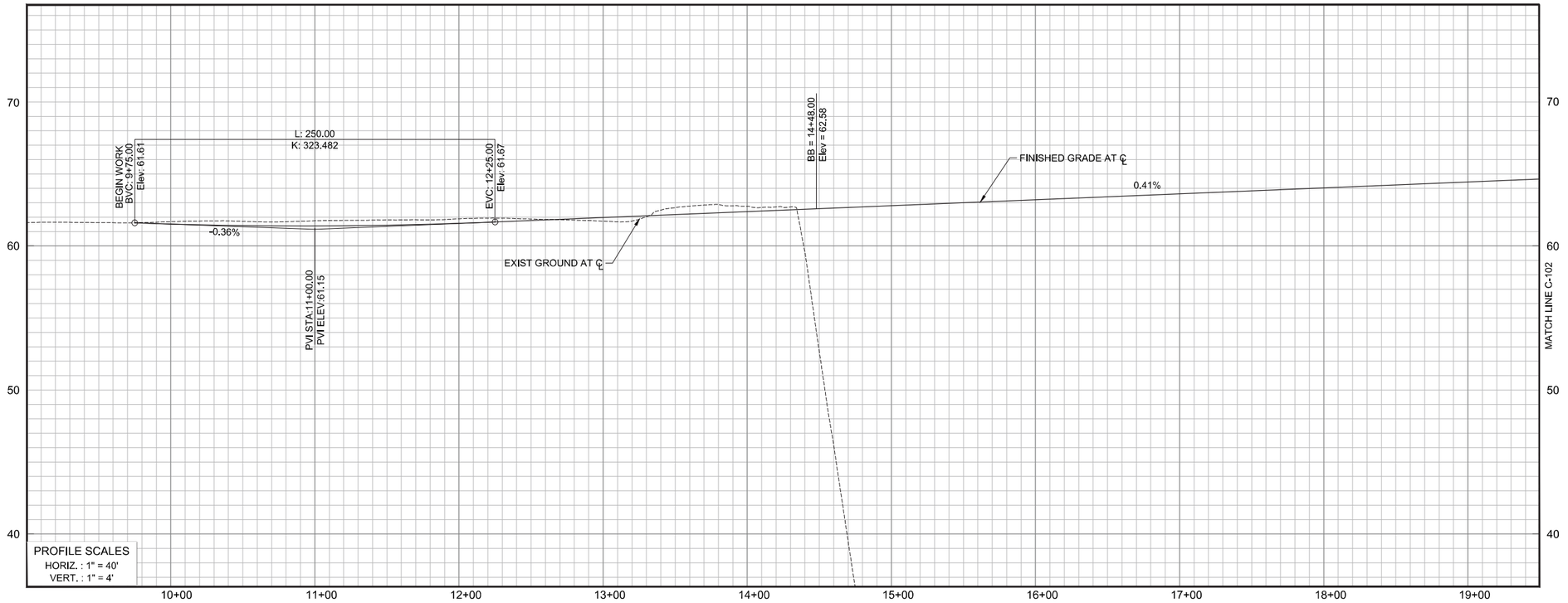
Construction will consist of the following activities in this general order:

<u>Clearing, Grubbing, and Tree Removals</u>

Portions of existing roadway, sidewalks, curbs, gutters, hardscape and landscaping in conflict with new construction would be removed. Areas around the corners of the new bridge would be cleared of vegetation, fencing, and planter beds to gain access for constructing the new bridge. Vegetation and trees in the river within the footprint of the new bridge and construction trestle would be removed. Equipment used would be backhoes, loaders, dump trucks, debris bins, and flatbed trucks with cranes, air compressors, jackhammers, chipping guns, cutting torches, and saws.

<u>Construction Staging Areas/Site Access</u>

Contractor lay down areas will be in portions of the existing road closed to traffic. Other flat unused areas, such as the vacant lot south of Monterey Drive or parking lot along Riverside Drive might also be used. Access to the bridge site within the river will could be achieved from SR-76 west of the project site.



COAST HIGHWAY PROFILE
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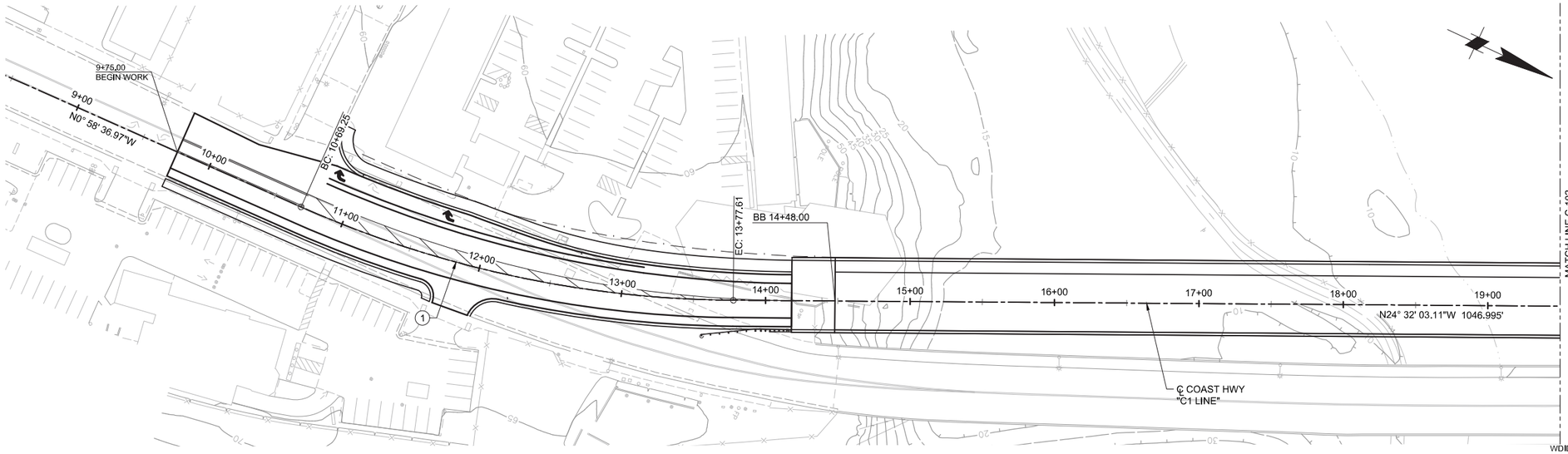

PLAN
1" = 40'-0"

CURVE DATA TABLE				
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Figure 6

40' 0' 40' 80'
SCALE: 1"=40'

WDID NO. PROJECT FILE NO.

SHEET	CITY OF OCEANSIDE ENGINEERING DIVISION	SHEETS

PLANNING STUDY FOR
COAST HIGHWAY BRIDGE
OVER SAN LUIS REY RIVER

ALTERNATIVE 2
PLAN & PROFILE -1

ENGINEER OF WORK
Sign:
NAME: DATE:

Designed by: N. VELAZQUEZ	Date: 11/22/22
Drawn by: J. CALDERON	Date: 11/22/22
Reviewed by: T. POYER	Date: 11/22/22

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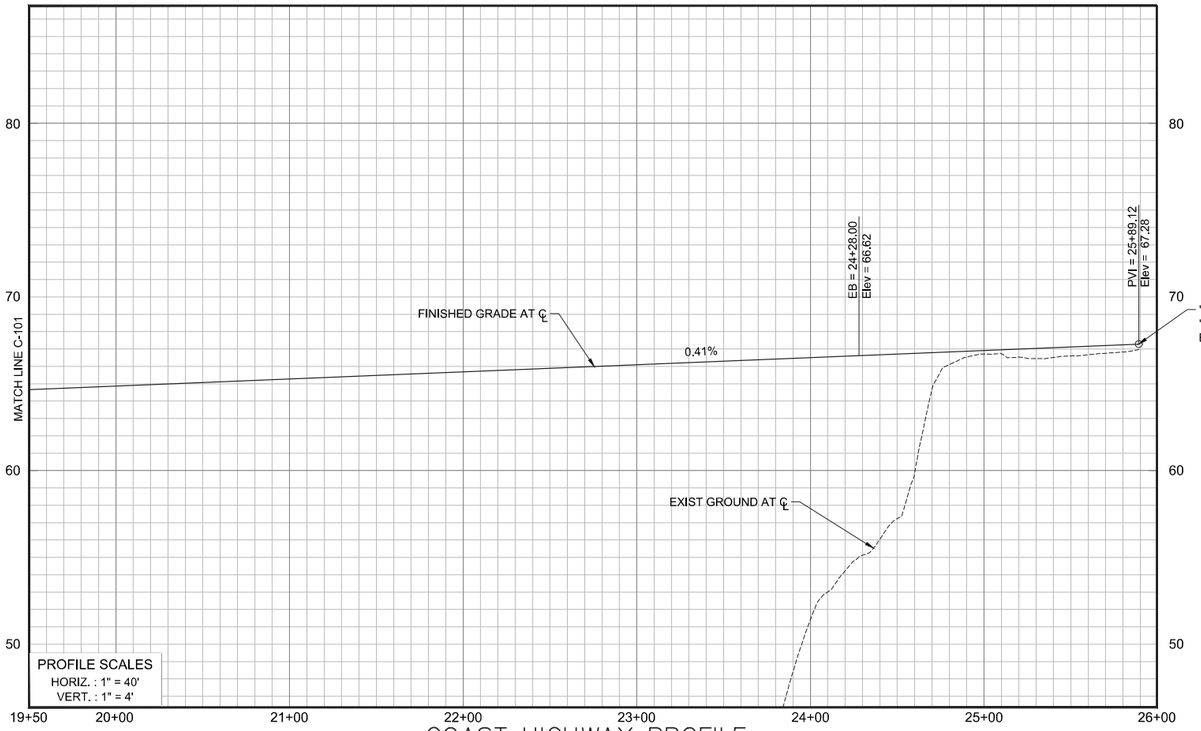
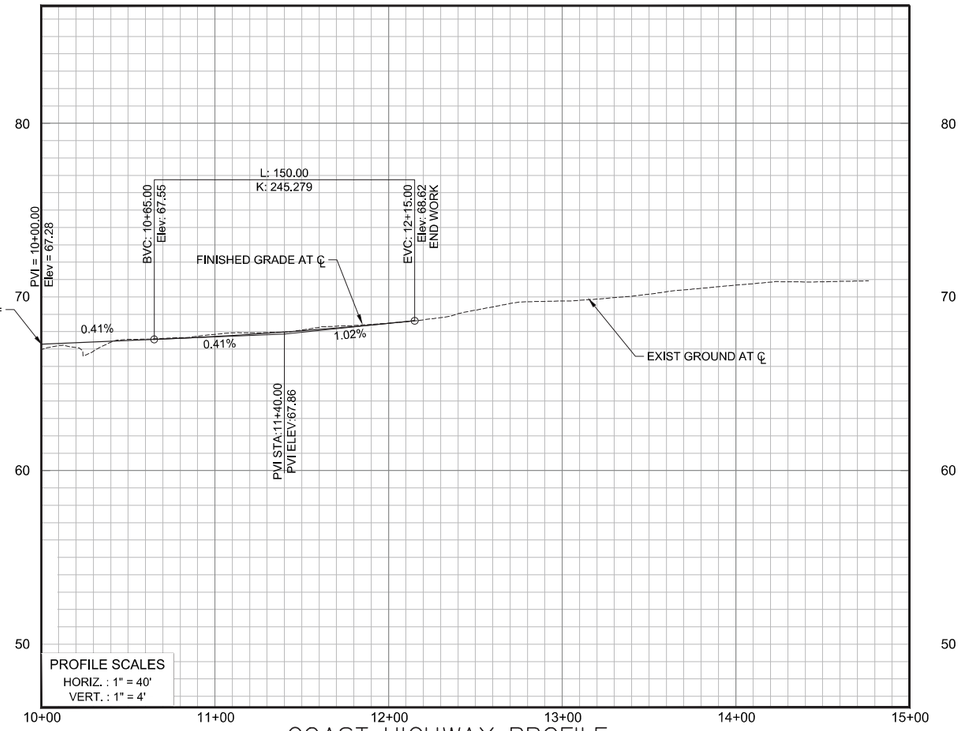
San Diego, Ca. 92108



COAST HIGHWAY PROFILE
"C1" LINE



COAST HIGHWAY PROFILE
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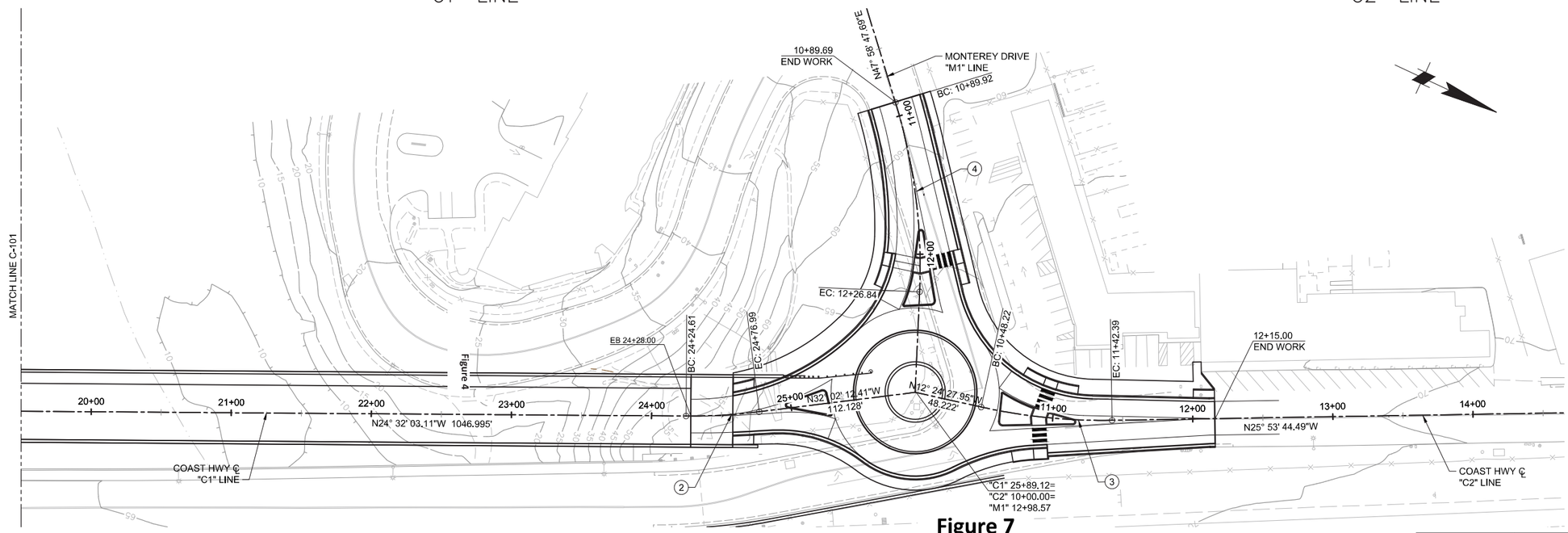

PLAN
1" = 40'-0"

CURVE DATA TABLE				
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4	400.00	19°36'44"	136.92	69.14

40' 0' 40' 80'
SCALE: 1"=40'

Figure 7

WDID NO. PROJECT FILE NO.

SHEET	CITY OF OCEANSIDE ENGINEERING DIVISION	SHEETS

PLANNING STUDY FOR
COAST HIGHWAY BRIDGE
OVER SAN LUIS REY RIVER

ALTERNATIVE 2
PLAN & PROFILE - 2

Designed by: N. VELAZQUEZ	Date: 11/22/22		
Drawn by: J. CALDERON	Date: 11/22/22		
Reviewed by: T. POYER	Date: 11/22/22		
ENGINEER OF WORK Sign: NAME: DATE:		Checked By: Approval Date:	PLAN NUMBER C-102 Rxx-xxxxx

moffatt & nichol
1660 Hotel Circle North, Ste. 500
San Diego, Ca. 92108

A temporary access road could be cut into the slope at SR-76, and follow the San Luis River Trail under the I-5 bridges. This path would provide good access from the SR-76 and provide a relatively gradual slope for the access road.

Construction Access Across the River

Stream flow in the San Luis Rey River will be maintained during construction. It is envisioned that a temporary construction trestle would be used to provide access over the river. Along the river banks, some temporary grading will be necessary to provide access for construction equipment. Work will be in conformance with City and County specifications as well as California Department of Fish and Wildlife, Regional Water Quality Control Board, U.S. Fish and Wildlife Service, and National Marine Fisheries Service regulatory requirements. Materials to construct the trestle may consist of steel pilings, steel cap beams and stringers, and timber decking. All work will be contained within the approved project area of disturbance. Equipment used may include: light trucks, track mounted cranes, pile driving equipment, excavators, and loaders.

New Bridge Foundations

Due to the scour and liquefaction potential of the soils down to elevation of approximately 50 feet, the foundations for the replacement bridge will be supported by large diameter piles. Cast-In-Drilled-Hole (CIDH) piles are recommended in the Preliminary Foundation Report for the project. These piles will likely be in the range of 72-inch diameter at the abutments and 90 to 132-inch diameter at the piers. Groundwater will be encountered during drilling for the CIDH piles. The CIDH pile construction may require the use of high-density drilling slurry. Prior to construction, a pile installation plan will be prepared by the contractor for approval by the City, in conformance with applicable permits and environmental measures and conditions. All drilling slurry from the CIDH pile construction will be contained and properly disposed of offsite.

Equipment used may include: a crane or excavator mounted drill rig for the piles, a crane to set the rebar cages in the drilled holes, dump trucks, compaction equipment, and a concrete pump truck. If slurry is used, there will be mixing tanks, recirculating pumps, and holding tanks for the waste slurry to be trucked offsite.

New Bridge Construction

Cast-in-place concrete construction, which places concrete in-situ using temporary shoring called “falsework,” is generally the preferred, most economical, and by far the most common construction method for highway bridges in California. It is feasible for this site, was used for the I-5 bridges to the east, which were built in the early 1970’s, and more recently for the Pacific Street Bridge to the west, which was completed in 2008. As such, cast-in-place is the most likely construction method for this project, and will be assumed for evaluating environmental impacts. The basic construction sequence is described below.

The piers and abutments will be constructed on site by installing rebar, placing forms, and pouring concrete. Once the piers and abutments are complete, falsework will be constructed to support the wet concrete for the superstructure. As temporary works, the falsework is designed by the Contractor. It generally consists of timber or steel posts, steel cap beams, and steel stringers. Timber joists and plywood forms are placed on top of the steel stringers. Falsework spans are typically 20 to 60 feet long. However, longer spans are possible. The active river channel is approximately 150 feet wide, so it is likely that falsework supports will be installed within the river. At these locations the falsework will be supported

on piles, which are vibrated and driven into the ground. Falsework supports which are susceptible to flooding will be designed for stream flow and scour in case a flood event occurs during construction. Equipment used for the falsework construction may include: light trucks, track mounted cranes, pile driving equipment, excavators, and loaders.

Once the falsework is complete, the vast majority of the work commences from above on top of the falsework. The girders are formed, rebar is placed, and the concrete is poured. Concrete is typically placed from the ends of the bridge using crane mounted concrete pumps. Since this bridge will be approximately 950 feet long, concrete to the center of the bridge may need to be pumped using a concrete pump located on the access road or construction trestle below the bridge. For a multi-cell concrete box girder, the superstructure is placed in two pours, with the top deck placed in the second pour. Between the two concrete pours, utilities are installed in the cells. After the deck is complete and has reached the required strength, the superstructure is typically prestressed from abutment to abutment. Equipment used may include: light trucks, small cranes to lift rebar and forms into place, concrete trucks, and crane mounted concrete pumps.

After the bridge is prestressed, backfill is placed behind the abutments and roadway base materials are placed along the roadway approaches. The roadway will be prepared for final surfacing and the barriers and railings will be installed. Equipment used may include light trucks, small cranes and fork lifts, loaders, dump trucks, and compaction equipment.

Landscaping

Below the bridge, the river will be restored to its existing condition, with minimal changes to slopes and grades. Some rock slope protection may be required along the slopes to protect the abutments. Areas that are disturbed during construction will be restored using local native riparian landscaping to revegetate the slopes and river banks. Minor landscaping improvements may occur within the street corridor along the reconstructed bridge approaches. The proposed roundabout at Monterey Drive will include a landscaped center island, repair of existing landscaping, and landscaping of disturbed areas to prevent erosion.

Typical Project Site Improvements

Graded Slopes - Cut and fill slopes are anticipated to have a maximum gradient of 2:1. The erosive nature of soils in the project area may prevent the use of steeper gradients in either cut or fill conditions to reduce the project footprint without the use of mechanical slope reinforcement such as a geo-grid system.

Drainage Facilities - Storm water management facilities such as vegetated swales and drainage systems, if needed, would be constructed with the project within the existing right-of-way. These improvements are proposed at the toe of slope areas or at low points between two slopes, or at bridge abutment locations.

Roadway Lighting, Signage, and Related Appurtenances - Street lighting will be coordinated with existing street light improvements at both north and south streetscapes on North Coast Highway. Lighting facilities would consider solutions sensitive to light and glare and overall safety of the neighborhoods. Recessed lights in bridge barrier supports will improve the bridge sidewalk lighting.

Landscape Restoration – Bridge construction will result in disturbance of natural and other landscapes for drilling and installing new piles, constructing bridge falsework, over excavation and backfilling for new abutment walls, and repairing temporary construction access roads. In addition, the old bridge approach alignments will be restored after the pavements and structures are removed.

III. PROJECT LOCATION AND SETTING

The project location and setting provide the context for determining the type and severity of changes to the existing visual environment. The terms *visual character* and *visual quality* are defined below and are used to further describe the visual environment. The project setting is also referred to as the corridor or project corridor which is defined as the area of land that is visible from, adjacent to, and outside the highway right-of-way, and is determined by topography, vegetation, and viewing distance.

As illustrated in Figure 8, the project site is located immediately west of the Interstate 5 freeway bridges when crossing over the San Luis Rey River in the City of Oceanside, in San Diego County, California. The project is located approximately one-half mile from the surf. The landscape is characterized by coastal valleys, marine aquatic, coastal scrub and riparian communities. The land use within the corridor is primarily urban, but includes areas of public open space, recreational, commercial and residential uses. The site is also located just south of the Oceanside city limits bordering Marine Corps Base Camp Pendleton.

The regional setting is urban, located approximately 39 miles north of downtown San Diego along Interstate 5. Traveling from the north, the project begins on the north side of the valley and spans the approximated distance of 1,100 feet across the valley to the south rim. The map below identifies the project area.

Scenic Resources

The I-5 corridor passes through the San Luis Rey River valley with views of the ocean, beach, surf, river bottom and distant mountain ranges to the east. The project is not located within a designated State Scenic Highway nor does it pass through an Agency-defined scenic resource.

FIGURE 8: PROJECT SITE MAP

IV. ASSESSMENT METHOD

This visual impact assessment generally follows the guidance outlined in the publication *Visual Impact Assessment for Highway Projects* published by the Federal Highway Administration (FHWA) in March 1981.

The following steps were followed to assess the potential visual impacts of the proposed project:

A. Define the project location and setting.
B. Identify visual assessment units and key views.
C. Analyze existing visual resources, resource change and viewer response.
D. Depict *(or describe)* the visual appearance of project alternatives.
E. Assess the visual impacts of project alternatives.
F. Propose measures to offset visual impacts.

Site photos were taken with a digital camera utilizing GPS technology. The exact locations of the key observation points were input into a digital terrain model of the proposed alternative to gain the Key View points in the 3D model with the proposed improvements. The 3D surface was then exported and overlaid upon the photo and physical features rendered for the simulation.

This visual analysis is based on a combination of site observations (driving and walking), a photographic survey, and analysis of the existing conditions and the proposed project. Site observations were performed periodically in February and March of 2017. Photographs for key view simulations were taken in February and March of 2017. The visual analysis was conducted in conformance with the guidelines itemized below.

The May 2021 Draft Type Selection Report assessed five bridge structure alternatives and concluded that the haunched cast in place post-tensioned box girder type bridge was the preferred alternative. This Visual Impact Assessment evaluates via the use of simulated key views only two alternatives – the existing bridge and site conditions as a No Build alternative and the Haunched Box Girder Bridge as the Preferred Alternative. Text summaries are provided below for these two alternatives.

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V. VISUAL ASSESSMENT UNITS AND KEY VIEWS

A visual assessment unit has its own visual character and visual quality. It is typically defined by the limits of a particular viewshed. The proposed project corridor is short in length and was determined to encompasses a single visual assessment unit, San Luis Rey River Valley. For this project, the following visual assessment unit and its associated key views have been identified:

San Luis Rey River Valley Visual Assessment Unit.

- The northern and southern limits of the project are the San Luis Rey River valley, defined by the built commercial and residential buildings and features along the canyon rim. This also includes the visual limits from the I-5 roadway as the traveler approaches the bridge crossing over the river valley with views to the west and east.
- The eastern limits are defined by coastal canyons and residential developments atop the canyon rim in the distance, approximately 1.5 miles east of the project location.
- The western limits are defined by the Pacific Ocean horizon line in the distance.

The Viewshed is comprised of:

- Natural river bottom marshes, coastal scrub and riparian landscapes, and coastal canyon slopes along the San Luis Rey River.
- Distant foothill ranges toward the east.
- Commercial and residential buildings along the river valley rims.
- Distinct roadway features, including the I-5 bridges, off-ramp structures and roadways, State Route (SR) 76 roadway, the North Coast Highway Bridge structure and roadway, Pacific Street Bridge, and the rail bridge located west of the project site.
- Regional bikeway route along the southern edge of the San Luis Rey River corridor.
- Paved pedestrian path under the north end of the I-5 and North Coast Highway bridges from San Luis Rey Drive east of the bridges to North Coast Highway west of the bridges.

Key Views include the following:

- **Key View #1** – Viewing west from SR-76 just east of the project site. This view provides a clear vantage point of the scene with the proposed replacement bridge behind the Caltrans bridges in the middle ground of the view.
- **Key View #2** – Viewing southwest from the I-5 bridge roadway. This view provides a vantage point for viewing the new replacement bridge location from the freeway.
- **Key View #3** - Viewing west from the North Coast Highway off-ramp toward the replacement bridge location. This view provides a vantage point for showing a representative idea of the new replacement bridge structure.
- **Key View #4** - Viewing east from Pacific Street Bridge. The view from this vantage point gives a representative idea of the proposed bridge replacement improvements in the context of all the existing view features.
- **Key View #5** - Viewing northeast from the regional bike path toward the proposed replacement bridge structure. This view provides an unobstructed vantage point of nearly the entire proposed bridge structure and features as visible from the bike path.

Figure 9 illustrates the locations of the key views and delineates the general area of the San Luis Rey viewshed.

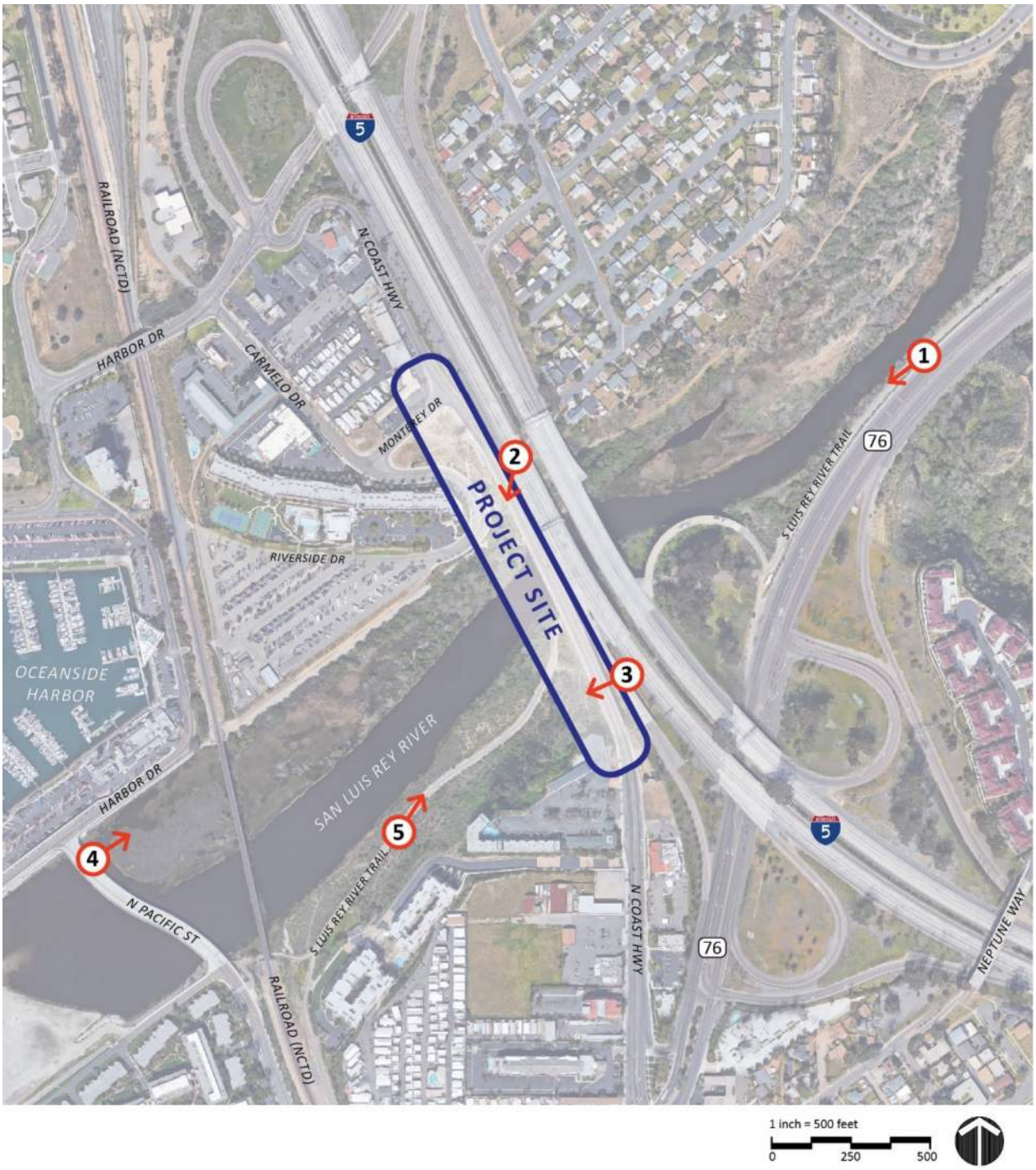

FIGURE 9 – SAN LUIS REY VISUAL ASSESSMENT UNIT AND KEY VIEW LOCATIONS

VI. VISUAL RESOURCES AND RECOURCE CHANGE

Resource change is assessed by evaluating the ***visual character*** and the ***visual quality*** of the ***visual resources*** that comprise the project corridor before and after the construction of the proposed project. Resource change is one of the two major variables in the equation that determine visual impacts. The other is ***viewer response***, discussed below in *Section VII Viewers and Viewer Response*. The visual impacts of project alternatives are determined by assessing the visual resource change caused by the project, and predicting viewer response to the change.

Method of Rating Visual Character and Visual Quality

Visual resource change is measured as the combination of the change in visual character and change in visual quality. The first step in determining visual resource change is to assess the compatibility of the proposed project with the visual character of the existing landscape. The second step is to compare the visual quality of the existing resources with projected visual quality after the project is constructed. The third step is to evaluate viewer response to project changes. This is the average of viewer exposure and viewer sensitivity to the project from the specific key viewpoint. The fourth step is to determine the visual impact by combining the severity of resource change with the degree to which people are likely to oppose the change.

Chart 1 below illustrates the visual impact assessment procedure used to analyze each key view by combining the evaluation of Visual Resources with Viewer Response.

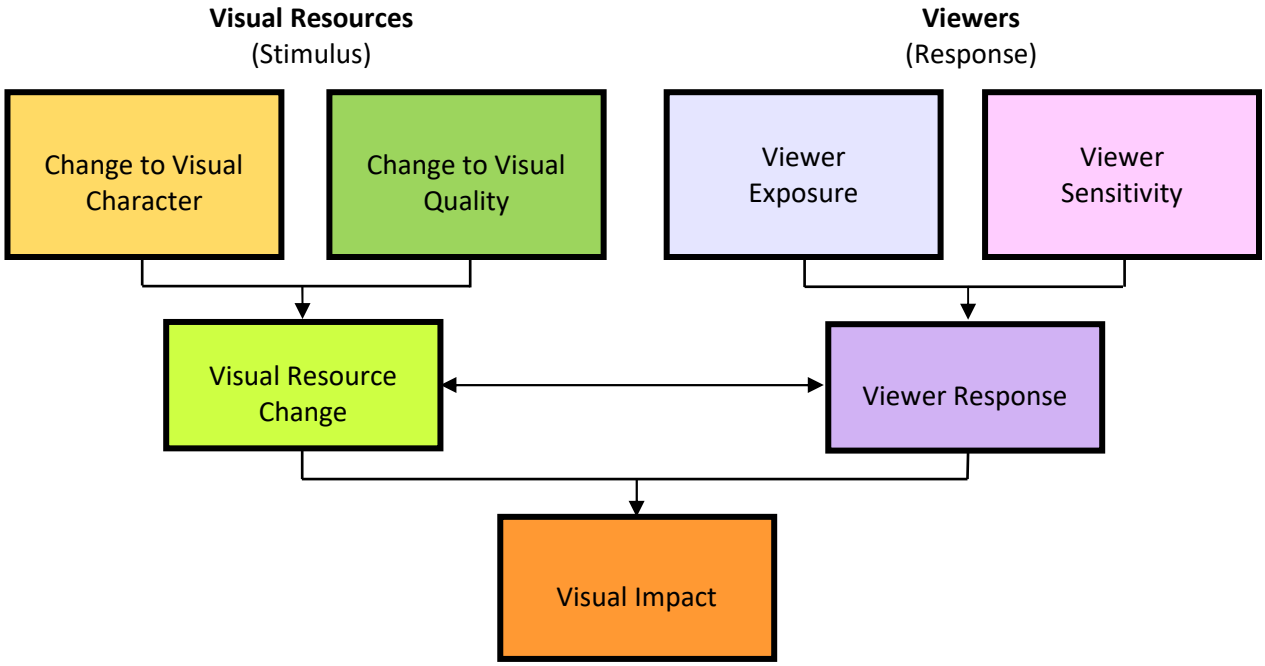

CHART 1 – VISUAL IMPACT ASSESSMENT PROCEDURE

The four-step process for Visual Impact Assessment for each key view is illustrated in detail below:

Step One: Assess Change to Visual Character

Because visual character is descriptive and non-evaluative, change alone is assessed at this stage. The change likely to be caused by the project is assessed according to the visual attributes of objects (Pattern Elements) and the relationships between those objects (Pattern Character) in the visual environment before and after the project is constructed. A two sided "pendulum" scale (3 to 0 to -3, with 5 units of change possible) is used to measure contrasting qualities in each category. For example, the existing and proposed view would each be assessed for the qualities "curvilinear" and "rectilinear" under the category "line" in the pattern elements analysis. The amount of change between the existing and proposed view for each category is determined, then the degree of change is expressed as a percentage of maximum change possible. The overall level of change to visual character is then assigned a value that ranges from low to high.

Change to Visual Character	
Degree of Change (Δ / 5 = %)	Level of Change
41% - 100%	High
31% - 40%	Moderately High
21% - 30%	Moderate
11% - 20%	Moderately Low
0 - 10%	Low

Step Two: Assess Change to Visual Quality

The second step of the process is to compare the visual quality of the existing resources with projected visual quality after the project is constructed. Existing and proposed intactness, unity and vividness are scored from one to five (five being highest). The amount of change in quality between the existing and proposed view for each category is determined (with four units of change possible), then the degree of change is expressed as a percentage of maximum change possible. The overall level of change to visual quality is then assigned a value that ranges from low to high.

Change to Visual Quality		
Amt. of Change (Δ = E-P)	Deg. of Chang (Δ / 4 = %)	Level of Change
1.64 – 4.0	41% - 100%	High
1.24 – 1.63	31% - 40%	Moderately High
0.84 – 1.23	21% - 30%	Moderate
0.44 – 0.83	11% - 20%	Moderately Low
0 – 0.43	0 - 10%	Low

Step Three: Predict Viewer Response

Viewer response to changes in the visual environment is predicted by using existing viewer exposure and viewer sensitivity values, which are assumed to remain constant before and after the project is implemented. The viewer response to project changes is the average of viewer exposure and viewer sensitivity to the project.

Viewer Response	
Averaged Response Score	Level of Response
4.5 – 5.0	High
3.5 – 4.4	Moderately High
2.5 – 3.4	Moderate
1.5 – 2.4	Moderately Low
0 – 1.4	Low

Step Four: Synthesis – Determine the Level of Visual Impact

As illustrated in Chart 2 below, the resulting level of visual impact is determined by averaging the degree of change to visual resources (stimulus), with the extent to which people are likely to be affected by the change (viewer response).

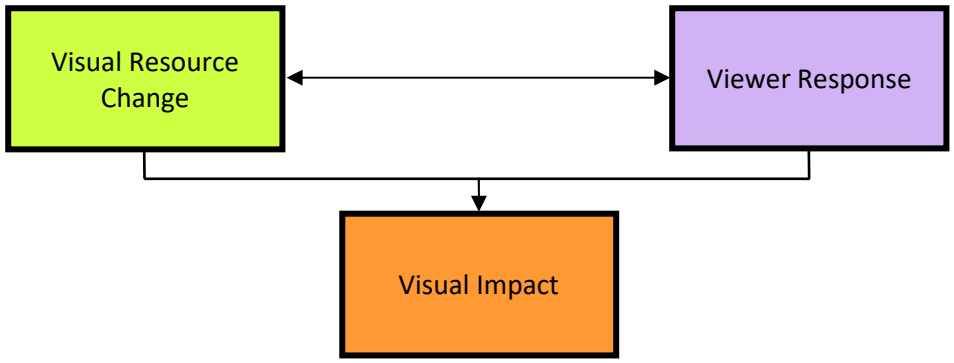

CHART 2 – LEVEL OF VISUAL IMPACT ASSESSMENT PROCEDURE

Visual Resources

Visual resources of the project setting are defined and identified below by assessing visual character and visual quality in the project corridor.

Visual Character

Visual character includes attributes such as form, line, color, texture, and is used to describe, not evaluate; that is, these attributes are neither considered good nor bad. However, a change in visual character can be evaluated when it is compared with the viewer response to that change. Changes in visual character can be identified by how visually compatible a proposed project would be with the existing condition by using visual character attributes as an indicator. For this project the following attributes were considered:

- **Form** - visual mass or shape
- **Line** - edges or linear definition
- **Color** - reflective brightness (light, dark) and hue (red, green)
- **Texture** - surface coarseness
- **Dominance** - position, size, or contrast
- **Scale** - apparent size as it relates to the surroundings
- **Diversity** - a variety of visual patterns
- **Continuity** - uninterrupted flow of form, line, color, or textural pattern

<u>Existing Visual Character</u>

The existing viewshed is a combination of natural and built elements, where urban residential and commercial developments have encroached up to the upper edges of the natural valley slopes. The river valley retains its natural character with river flowing through marshlands, coastal sage and riparian plant communities until it reaches Pacific Street where riparian vegetation ends and common beach character

becomes dominant before emptying into the Pacific Ocean. The north and south edges of the river valley have been encroached upon by commercial and residential development, where very little of the western San Luis Rey River Valley remains natural. To the east of the Interstate 5 interchange, the State Route 76 roadway defines the southern edge of the river. And, to the west of the Interstate 5 bridges, a levee exists along the north edge, containing the river to an engineered straight alignment. The levee separates the river from the Oceanside marina and harbor area, featuring maritime boating marina, hotels, restaurants, retail shops, parking areas and beach frontage roads.

Several built roadway features span the San Luis Rey River valley from north to south, including the I-5 bridges, off-ramp structures and roadways that are of high prominence within the viewshed. The North Coast Highway Bridge is the second roadway feature to the west of the I-5 bridges that spans the valley and is also of high prominence due to the green-painted metal truss structure that supports the roadway deck. A railroad bridge and Pacific Street bridge also span the river, 1,200 and 1,600 feet to the west respectively, but at lower elevations than the freeway corridor bridges and of shorter spans.

The built elements dominate the natural features in the viewshed. The bridges and roadway features disrupt the linear forms of the river valley and bisect the natural topography of the landform in a symmetrical manner. The “kelly” green, gray and dark brown colors of the various bridges contrast with the natural tan and green colors of the river valley during the summer months. These built features have less contrast with the green landscape in the winter and spring seasons. The textures of the viewshed change seasonally. In the summer months the texture appears harder and smoother. In the winter months the texture becomes soft with the new growth on the plant communities.

The existing bridges and roadways are monumental and located with prominence at a higher elevation, visually bisecting the views within the river valley and contrast highly with the natural elements. Bridges, roadways, rail bridges, levees, commercial and residential buildings, highly contrast with the soft, green marsh bottom of the river valley, sage scrub slopes, and natural-looking landscape upon native slopes. The continuity of the existing viewshed is highly interrupted as the bridges and roadway features in the view bisect the flow of form, line, color and textural patterns in the view. The visual character of the existing viewshed is considered to be moderately low (2.0 on a scale of 1 to 5).

Change to Visual Character

The visual character of the proposed project preferred alternative to replace the existing North Coast Highway Bridge green truss structure would be mostly compatible with the existing visual character of the corridor. Change to visual character is measured from low to high on a 1.0 to 5.0 scale.

The Preferred Haunched Box Girder Bridge structure type is an improvement over the existing bridge structure. It has only four columns to support the entire bridge length and a simpler span structure that is consistent with the adjacent I-5 bridges resulting in a much simpler appearance and less obstructive to views. The span to column proportion is also an improvement, where the 260-foot center span is in proportion with the height and width of the river valley. The column spacing creates an improved rhythm within the context of the overall mass of the structure. Slender curves of the undersides of the bridge deck forms long smooth transitions between columns that provide an enhanced architectural theme.

In composition with the Interstate 5 bridges, the horizontal lines of the superstructure are compatible with those of the I-5 bridges. The bridge columns are aligned with the existing pier walls of the Caltrans bridges, creating a harmonized composition of built features. The column spacing of the proposed design avoid the river bottom, spans the river corridor and also creates a harmonized composition with the natural features. Overall, this design is simple, elegant and context sensitive, resulting in a moderately

low improvement to the overall composition in the view. The removal of the existing bridge structure alone will improve the existing visual environment.

The proposed replacement bridge would moderately reduce the massing of built features that dominate the landscape elements in the view, improve the lines, colors and textures of built structures in the overall composition of elements in the view, and improve the balance between the built and natural features in the viewshed. The replacement bridge structure would also improve the diversity of features in the view by reducing the number of different bridge structure types by using modern concrete materials, colors and textures. The project alternatives will replace but not create new light sources that would change the character of the view during the day and night.

The proposed bridge alignment would replace the existing bridge structure but it would be located 65' to the west, allowing the existing bridge to remain while the new bridge is constructed. The proposed alignment would be very similar in form, line and scale as the existing bridge, with slightly different transitions connecting the bridge deck and roadway to city streets at either end. However, the location of the new bridge alignment increases the dominance, diversity and continuity of the bridge structure in the overall composition of bridge structures in the view. While the bridge alignment would have little effect on the views to the bridge from most viewpoints west of the project area, there will be a slight change to the visual character from roadway views on Interstate 5 and the Coast Highway off-ramp traveling southbound. The new alignment further to the west would obstruct portions of the view to the river bottom and water flowing to the ocean from these locations. The proposed alignment of the replacement bridge would have a low (1.0) level of change to the existing visual character.

Visual Quality

Visual quality is evaluated by identifying the ***vividness***, ***intactness***, and ***unity*** present in the project corridor. Public attitudes validate the assessed level of quality and predict how changes to the project corridor can affect these attitudes. This process helps identify specific methods for addressing each visual impact that may occur as a result of the project. The three criteria for evaluating visual quality are defined below:

- **Vividness** is the extent to which the landscape is memorable and is associated with distinctive, contrasting, and diverse visual elements.
- **Intactness** is the integrity of visual features in the landscape and the extent to which the existing landscape is free from non-typical visual intrusions.
- **Unity** is the extent to which all visual elements combine to form a coherent, harmonious visual pattern.

Visual Quality is measured from low to high on a 1.0 to 5.0 scale.

<u>Existing Visual Quality</u>

The visual quality of the existing corridor will be altered by the proposed project. The San Luis Rey River corridor expresses a moderately low degree of vividness as it is a somewhat unmemorable scene within the immediate view from either side of the roadway bridge structures that bisect the viewshed. The natural river valley character is appealing to the viewer for the green and brown colors and uncontrived natural forms of the landscape features. The eastern side of the roadway bridges allows foreground views of the river bottom and immediate valley slopes, with distant views of the eastern hill top ranges that define the sky line. The closer river valley slopes are lined by residential developments that define the

ridge of the slopes and boundary of the river valley. From the western side, the multiple roadway and railway bridges distract the view, leaving only remnants of natural river bottom for contract of forms, colors, and textures in the scene. The existing bridge's lower footing wall features only slightly detract from the overall view from afar. However, are more dominant and over scale when crossing under the bridge on the bicycle pathway. The river corridor and coastal valley slopes are diverse natural landscape features that contrast highly with the residential and commercial developments at the top of slope, roadways and multiple bridge structures in the view. The existing bridge structures abruptly bisect the river valley and are dominant within the scene. The overall vividness rating is moderately low (2.0).

The San Luis Rey River Valley corridor displays a moderate level of intactness as there is moderate intrusion of built elements upon the landscape features in the view. The primary distractions in the view are the roadways and bridge structures that bisect and disrupt the land forms and views through the valley corridor. Railway and roadway bridges with articulated railings and patterns contribute to the distractions in the view. Bluff-top homes and businesses also reduce intactness of the valley. The existing intactness rating is moderately low (2.0).

The visual elements in the view create a moderately low level of visual unity. The existing roadway and railway bridges highly disrupt the composition of built and natural elements in the view, bisecting the river corridor and limiting views. The intrusion of built forms upon the landscape features is evident along all perimeters of the natural features. The overall unity rating is moderately low (2.0).

Combining vividness, unity and intactness, the resulting overall visual quality of the existing view can be defined as moderately low (2.0).

Change to Visual Quality

Generally, the proposed bridge structure will have the same features as the existing bridge such as a similar width, two travel lanes, pedestrian walkway, safety railing, lighting and horizontal profile, however with a much simpler structure. The removal of the existing bridge structure alone will improve the existing visual quality. The removal of the existing bridge alone will improve the overall aesthetics in the viewshed and create an improved scene. Vividness would be improved. The removal of the existing truss structure would lessen the distractions in the view. Intactness would be slightly improved with the replacement of the existing bridge structure. The replacement of the truss structure forms and lines with a narrow bridge superstructure deck and simplified support columns will improve the composition of built forms in the view. The replacement bridge will create a more balanced relationship between built and natural features in the view. The proposed bridge will also improve the diversity of built features by reducing the variety to more similar forms and lines. Unity would be improved within the view.

The proposed bridge alignment would be very similar in form, line and scale as the existing bridge, with slightly different transitions connecting the bridge deck and roadway to city streets at either end. The proposed alignment alone will have little change to the memorability of the view from most viewpoints. Vividness would remain unchanged. However, the relocation of the bridge further west will obstruct some views from the southbound I-5 and Coast Highway off-ramp, blocking portions of the river bottom features. Intactness would be slightly improved. Unity would be slightly improved. Alignment of the replacement bridge would have little change to the existing visual quality. The implementation of this alternative would have a moderately low positive change to the existing visual quality.

Change to Visual Resources

The proposed bridge alignment would move the bridge west approximately 65-feet, resulting in partially blocked views to the river bottom from Interstate 5 southbound lanes and the Coast Highway off-ramp. This alignment alternative would have a low change (a 10% change) to the existing visual character and low change (a 10% change) to visual quality solely based on the alignment of the replacement bridge. The change to the existing visual environment would be considered low.

The Haunched Girder Bridge type design would have a moderately low change (a 18% change) to the existing visual character and moderate level of change (a 25% change) to existing visual quality within the visual assessment unit.

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VII. VIEWERS AND VIEWER RESPONSE

The population affected by the project is composed of ***viewers***. Viewers are people whose views of the landscape may be altered by the proposed project—either because the landscape itself has changed or their perception of the landscape has changed.

Viewers, or more specifically the response viewers have to changes in their visual environment, are one of two variables that determine the extent of visual impacts that would be caused by the construction and operation of the proposed project. The other variable is the change to visual resources discussed earlier in *Section VII Visual Resources and Resource Change*.

Types of Viewers

There are two major types of viewer groups for highway projects: highway ***neighbors*** and highway ***users***. Each viewer group has their own particular level of *viewer exposure* and *viewer sensitivity*, resulting in distinct and predictable visual concerns for each group which help to predict their responses to visual changes.

Highway Neighbors (Views *to* the Road) - Highway neighbors are people who have views *to* the project. They can be subdivided into different viewer groups – *fixed* viewers and *transient* viewers. For example, fixed viewers would include those at a stationary location, typically a residential, commercial, retail, or recreational property near the project that may generate viewers with distinct reasons for being in the viewshed, and therefore, having distinct responses to changes in visual resources. Likewise, transient viewers such as local road motorists, transit riders, bicyclists and pedestrians have differing perspectives and levels of exposure of the project corridor that may affect their response to changes in visual resources in a different manner from the fixed viewers. For this project the following highway neighbors were considered:

- Residents to the north and south in the residential areas of Oceanside.
- Commercial businesses within the viewshed.
- Vacationers, including hotel users and beach-goers.
- Local motorists / tourists
- Regional travelers / transit riders
- Bicyclists / pedestrians

Highway Users (Views *from* the Road) - Highway users are people who have views *from* the road. They can be subdivided into different viewer groups in two different ways—by mode of travel or by reason for travel. For example, subdividing highway users by mode of travel may yield pedestrians, bicyclists, transit riders, car drivers and passengers, and truck drivers. Dividing highway users or viewer groups by reason for travel creates categories like tourists, commuters, and haulers. For this project the following highway users were considered:

- Local motorists / tourists
- Regional travelers / transit riders
- Bicyclists / pedestrians

Viewer Response

Viewer response is a measure or prediction of the viewer's reaction to changes in the visual environment and has two dimensions as previously mentioned, viewer exposure and viewer sensitivity. Viewer response is measured from low to high on a 1.0 to 5.0 scale.

VIEWER EXPOSURE

Viewer exposure is a measure of the viewer's ability to see a particular object. Viewer exposure has three attributes: ***location***, ***quantity***, and ***duration***.

- **Location** relates to the position of the viewer in relationship to the object being viewed. The closer the viewer is to the object, the more exposure.
- **Quantity** refers to how many people see the object. The more people who can see an object or the greater frequency an object is seen, the more exposure the object has to viewers.
- **Duration** refers to how long a viewer is able to keep an object in view. The longer an object can be kept in view, the more exposure.

High viewer exposure helps predict that viewers would have a response to a visual change.

<u>Highway Neighbors (Views to the Road):</u>

Highway Neighbors would have direct views of the project due to the location and their relationship from where they are viewing. The topography of the area, with the project in the bottom of a valley, focuses views towards project site as most viewers are located along the valley rims, river bottom or from bridges that cross the valley. The quantity of fixed viewer Highway Neighbors who would have views of the project is approximately 1,500 viewers from residences, hotels and vacation rentals or businesses at the edge of the neighborhoods overlooking the project area. These viewers would have views of the project from backyards, patios, hotel windows, balconies, parking areas, and beaches. The duration of time that residents, businesses or vacationers would view the project would range from several minutes to several hours at a time.

The quantity of transient Highway Neighbors varies greatly by mode of transportation.

- I-5 – 170,000 vehicles per day pass the bridge per day but exposure is low due to the closeness of the North Coast Highway bridge to I-5, the speed of the vehicles and driver focus on the road.
- SR-76 Eastbound – 26,000 vehicles per day approach from the east but exposure is estimated as low due to vehicle speed and partial screening from the I-5 bridges.
- SR-76 Westbound – The bridge is not visible due to buildings, topography and vegetation.
- North Pacific Street/Harbor Drive – Approximately 4,000 vehicles per day transit through the area with the proposed bridge at a distance and partially screened by the railroad bridge. Exposure is rated moderately low.
- Riverside Drive – Approximately 1,000 vehicles per day drive near the bridge site. While close to the bridge in some locations, exposure is anticipated to be moderate due to short duration and partial screening from vegetation and the river levee.
- San Luis Rey River Trail and North Access Path – In relation to the roadways, the quantity of trail users is low. However, the location and duration will be high as the viewers have both distant and close-up views over a ten-to-twenty-minute period. Exposure is anticipated to be high.

The average exposure rating for fixed and transient viewers is considered to be moderately high: 4.0 on a scale of 1 to 5.

Highway Users (Views from the Road):

Approximately 12,000 vehicles per day use the existing North Coast Highway bridge. The number of pedestrians and bicyclists that use the bridge is unknown, but it is expected to be low. The duration of exposure for users would be a short length of time for approximately 15 seconds at the posted speed of 25 MPH to a minute for pedestrians. In addition, little of the bridge structure will be visible to users approaching the bridge from the north. Those approaching the bridge from the south or driving on the bridge will have no view of the bridge structure. Only the bridge deck, sidewalk, barriers and lighting will be visible. Users would have an exposure rating of low: 1.0 on a scale of 1 to 5. Collectively, viewers would have an exposure rating considered moderate: 3.33 on a scale of 1 to 5.

VIEWER SENSITIVITY

Viewer sensitivity is a measure of the viewer's recognition of a particular object. It has three attributes: ***activity***, ***awareness***, and ***local values***.

- **Activity** relates to the preoccupation of viewers—are they preoccupied, thinking of something else, or are they truly engaged in observing their surroundings. The more they are actually observing their surroundings, the more sensitivity viewers will have of changes to visual resources.
- **Awareness** relates to the focus of view—the focus is wide and the view general or the focus is narrow and the view specific. The more specific the awareness, the more sensitive a viewer is to change.
- **Local values** and attitudes also affect viewer sensitivity. If the viewer group values aesthetics in general or if a specific visual resource has been protected by local, state, or national designation, it is likely that viewers will be more sensitive to visible changes.

High viewer sensitivity helps predict that viewers will have a high concern for any visual change.

Highway Neighbors (Views to the Road):

Fixed viewers would likely have a moderate to moderately high sensitivity as there are many direct views of the project from close to moderate proximity. These viewers would be viewing the scene from residential and commercial property balconies, living room windows, outdoor patios and spaces that overlook the valley. Residences to the east of the bridge will have a limited view of the structure due to screening by the I-5 bridges. Residences, hotels and commercial properties to the west would have a high awareness of the project as it would be highly visible in their views. Fixed Local Highway Neighbors would be sensitive to the project as their values and attitudes reflect support for the replacement of the existing North Coast Highway Bridge. Overall fixed viewers sensitivity rating is considered to be moderately high: 4.0 on a scale of 1 to 5.

Transient Highway Neighbors, due to their activity, would be focused on the roadway and traffic conditions in which they are traveling. Awareness of the project would depend on proximity to the bridge, whether local or visitor, and the speed of the roadway from which they are viewing the bridge. Pedestrians and bicyclists would have the highest awareness of the project. Locals would have high sensitivity, and visitors and commercial/delivery drivers would have low sensitivity to the project. Average viewer

sensitivity for this group would be moderate. Sensitivity rating is considered to be moderate: 3 on a scale of 1 to 5.

Highway Users (Views from the Road):

Highway users, due to their activity, would be focused on the roadway and traffic conditions in which they are traveling, but would have a high awareness of the project in their immediate foreground as they travel through the project on a daily basis and would be aware of the changes in their immediate community. This group would also have awareness to the project as their values and attitude generally support the replacement of the North Coast Highway Bridge. However, the structure design would not be visible to the user and therefore would have no impact in the viewer's sensitivity. Viewer sensitivity for this group would be moderately high. Sensitivity rating is considered to be moderately high: 4 on a scale of 1 to 5. Viewers would have a cumulative sensitivity rating considered to be moderately high: 3.7 on a scale of 1 to 5.

General Community Sensitivity

The Public Scoping Meeting held for this project on March 30, 2017 gained the local public's input for preferred bridge style and project improvements. Generally, the residents are supportive of the project. Viewer sensitivity for this group would be moderately high. Sensitivity rating is considered to be moderately high: 4 on a scale of 1 to 5. Viewers would have a cumulative sensitivity rating considered to be moderately high: 3.7 on a scale of 1 to 5.

GROUP VIEWER RESPONSE

The narrative description of the view exposure and viewer sensitivity for each viewer group was merged to establish a collective viewer response of each group. The analysis provides an average of the merged narratives for viewer exposure and sensitivity and applied a composite analysis to arrive at a weighted average for the viewer groups. The combination of moderate (3.33) viewer exposure and high (3.7) viewer sensitivity is equivalent to an overall group viewer response of (3.5) moderately high. The resulting weighted average of 3.5 indicates a moderately high viewer response to the proposed change in the visual environment.

VIII. VISUAL IMPACT

As previously discussed, visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. These impacts can be beneficial or detrimental. Cumulative impacts and temporary impacts due to the construction operations are also considered. A generalized visual impact assessment process is illustrated in the following diagram:

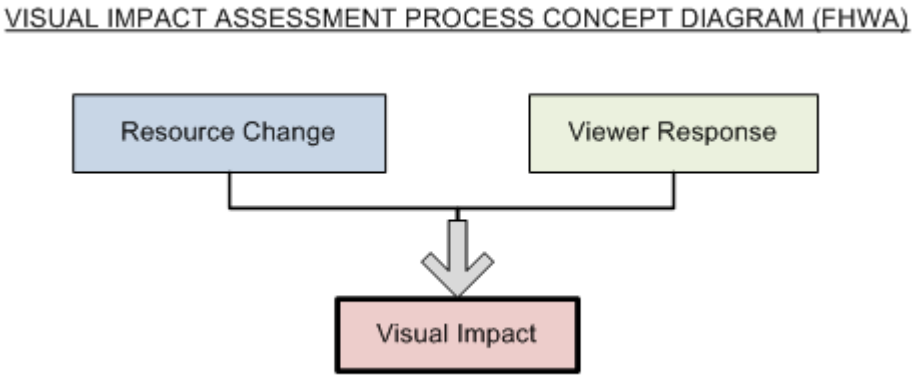


Table 1 below provides a reference for determining levels of visual impact by combining resource change and viewer response.

Table 1
Visual Impact Ratings Using Viewer Response and Resource Change

		Viewer Response				
		Low (L)	Moderately Low (ML)	Moderate (M)	Moderately High (MH)	High (H)
Resource Change	Low (L)	L	ML	ML	M	M
	Moderately Low (ML)	ML	ML	M	M	MH
	Moderate (M)	ML	M	M	MH	MH
	Moderately High (MH)	ML	M	MH	MH	H
	High (H)	ML	MH	MH	H	H

Visual Impacts by Visual Assessment Unit and Alternative

Because it is not feasible to analyze all the views in which the proposed project would be seen, it is necessary to select a number of key views associated with visual assessment units that would most clearly demonstrate the change in the project's visual resources. Key views also represent the viewer groups

that have the highest potential to be affected by the project considering exposure and sensitivity. These key views will be analyzed for the proposed Haunched Box Girder Bridge design.

The following section describes and illustrates visual impacts to the project's only visual assessment unit, the San Luis Rey River Valley visual assessment unit. It compares No Build alternative, existing conditions, to the proposed Haunched Box Girder Bridge design, and includes the predicted viewer response.

KEY VIEW #1 – Viewing from State Route 76 Westbound Lanes Approaching the Interstate 5 Corridor.

Figure 10: Key View #1 (Existing Condition)

Existing Visual Character / Quality

As previously discussed, the existing view is a complex composition of built and natural features, comprised of fine textured roadway features (pavement and structures) and soft irregular textural forms of the landscape on each side of the roadway (Figure 10). Generally, the roadway form and alignment follow the topography through the scene, with exception of the bridge structures that span the valley and bisect the view. The green truss structure of the existing North Coast Highway Bridge provides added distraction to the view. Overhead power transmission wires traverse the roadway and are visible to all travelers. The river, riparian areas and valley slopes are covered with green and brown earthtones that contrast with the gray monotones of the highway features. Vividness is moderately low (2.0) as there are few memorable features in the view. Intactness is moderately low (2.0) due to the distraction of bridge structure features, roadside barrier and power lines in the middle ground. The continuity of the landscape and built features in the view have a dissonant relationship as the bridges bisect the middle ground of the

view, resulting in a moderately low rating for Unity, (2.0). Combining vividness, intactness, and unity, the resulting overall visual quality can be rated as moderately low (2.0 on a scale of 1 to 5).

Resource Change

The proposed bridge design introduces fluid architectural lines and forms and improves the view by using only a few columns (Figure 11). The subtle arching of the underside of the bridge girder and flared columns introduces enhanced forms to the view. The replacement of the existing bridge form and the introduction of the few simplistic columns reduce distractions in the view, resulting in improved overall intactness. This bridge design is context sensitive and harmonizes with the natural elements in the view, improving the overall composition of built and natural features in the view. The project proposes smooth textures and earth-toned and white colored concrete that would replace the green steel girder bridge, improving the harmony between built and natural features in the view. However, from this view point, the new bridge is mostly hidden by the existing I-5 bridges. The freeway bridges minimize the positive aesthetics and detail of the new bridge. The implementation of this alternative would have a moderately low positive change to the existing visual character.

Figure 11: Key View #1– Haunched Box Girder Bridge (Proposed Condition)

This project introduces a simple yet enhanced bridge structure that improves memorability of the view. Vividness would improve to moderate (3.0). The replacement of the bridge and the use of few bridge columns results in a decrease in distractions overall. Intactness would improve to moderate (3.0). The bridge support columns harmonize with the natural features within the project. Unity would improve to moderate (3.0). The implementation of this alternative would have a moderate positive change to the existing visual quality. The moderately low (13%) change to existing visual character combined with the moderately low (20%) change to existing visual quality would result in a moderately low (17%) resource change.

Viewer Response

The primary viewer groups will be regional travelers that typically commute along State Route 76 headed westward. These viewers would view this scene for a very short duration, typically for less than a minute, while traveling at a high rate of speed (approximately 65 mph) along the river valley corridor. The quantity of viewers would be high, between 40,000 and 50,000 viewers per day. As a result, viewer exposure would be moderate (3.3).

Specific to sensitivity, viewers would likely be preoccupied with driving (activity) with a focus on the highway corridor, but with a general sense (awareness) of the wider view and features within. Viewer awareness to changes due to the project would be moderate. Additionally, the viewer group would not have a high interest in the project. Viewer sensitivity would be moderate (2.3). As a result, the overall viewer response would be moderate (2.8).

Resulting Visual Impact

The construction of this project would result in a moderately low change to the visual resources (character and quality). The viewer response to the proposed project would be moderate (2.8). As a result, the visual impact for this bridge would be considered moderate. Refer to Charts 3 and 4: Key View #1 - Proposed Haunched Box Girder Bridge for visual impact analysis detail.

CHART 3: KEY VIEW #1 – Proposed Haunched Box Girder Bridge Visual Character & Visual Quality

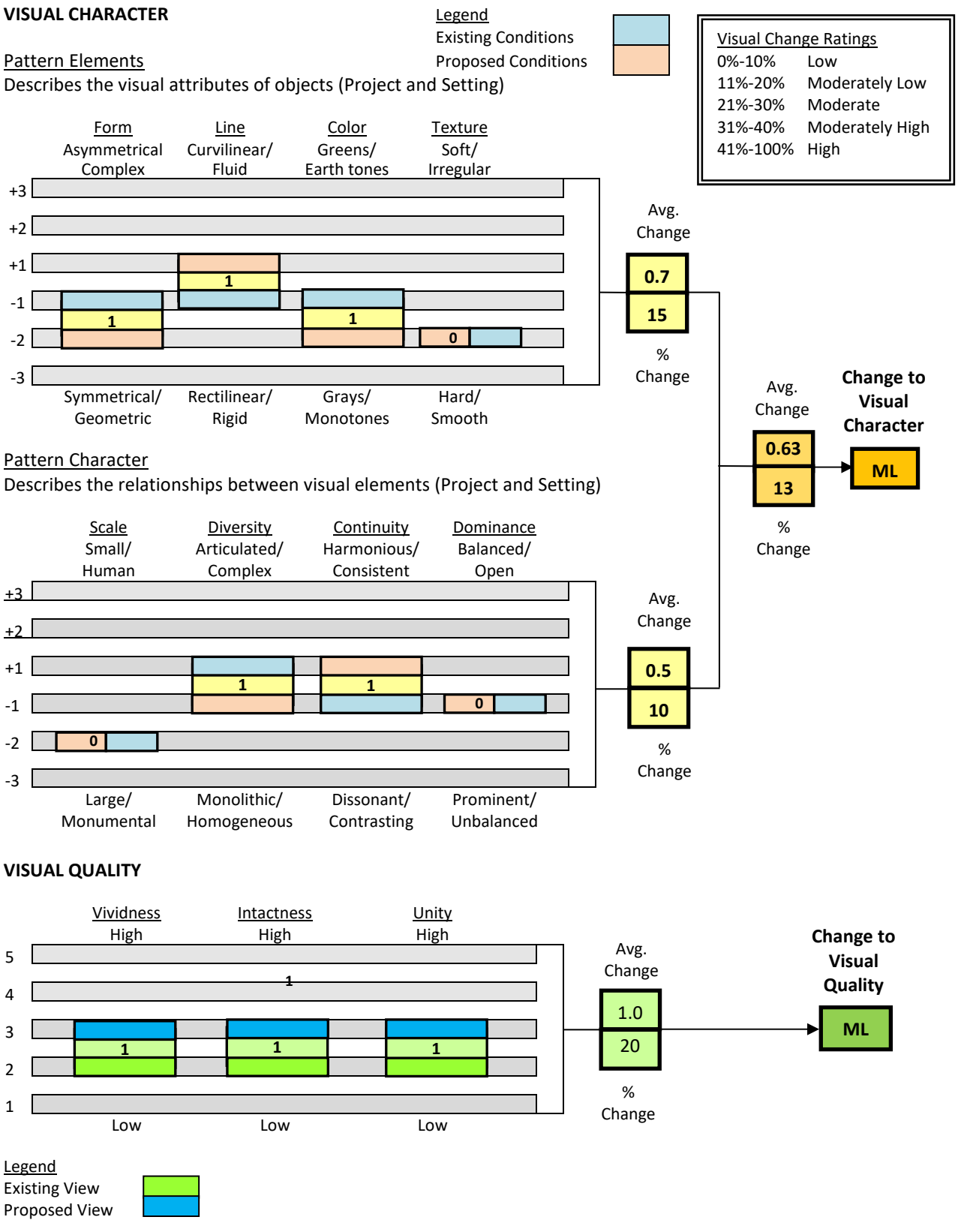
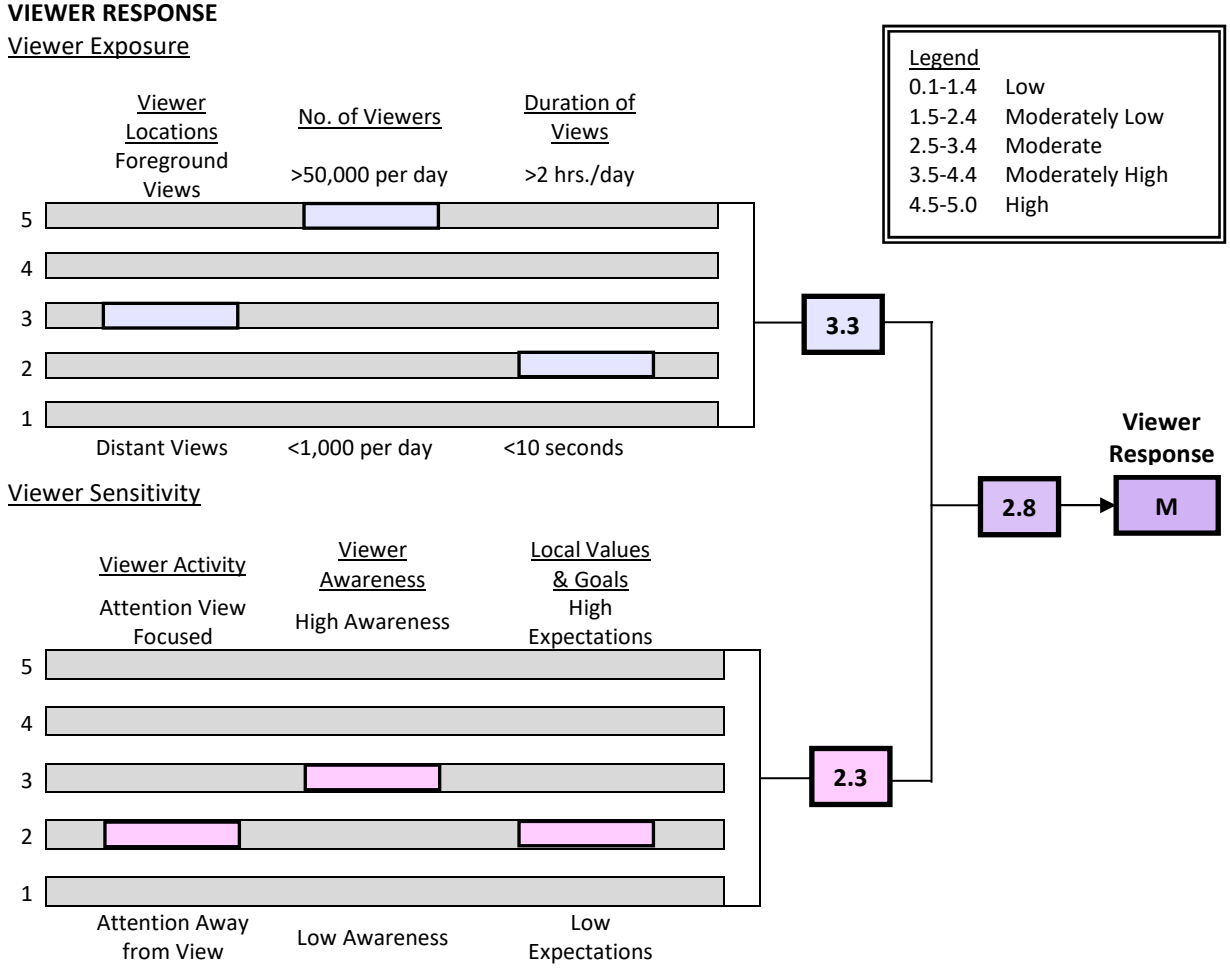
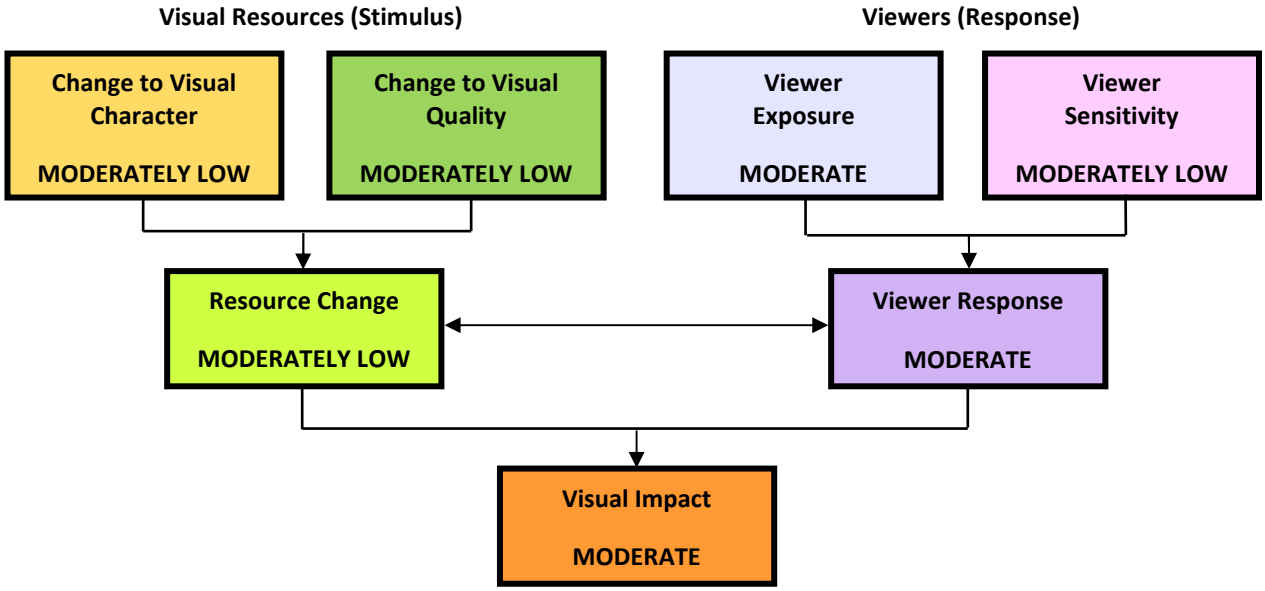


CHART 4: KEY VIEW #1 –Proposed Haunched Girder Bridge Viewer Response & Analysis Summary

VIEWER RESPONSE



ANALYSIS SUMMARY



KEY VIEW #2 – Viewing West from the Interstate 5 Southbound Lanes

Figure 12: Key View #2 (Existing Condition)

Existing Visual Character / Quality

The existing view is comprised of a linear, fine-textured forms of the existing bridge, roadway surface, walkways, safety curbs and railings (see Figure 12). The existing bridges include the North Coast Highway bridge in the foreground, the railway bridge and Pacific Street Bridge in the middle ground, and Pacific Ocean at the background of the view. Portions of the natural river bottom and riparian areas can be glimpsed between the bridges. Commercial and high-density residential buildings are visible along both edges of the river corridor that contrast with the natural features of the river bottom. There is a high diversity of built features in the view that are dominant over the landscape elements.

Vividness of the view is moderately low (2.0 on a scale of 1 to 5) as there is little that is memorable other than the open view to the ocean. The intactness is moderately low (2.0) as the bridges are highly distracting in the view. Unity is moderately low (2.0) as the view is highly disrupted by the bridges and surrounding developed areas, resulting a disharmonious relationship between the built and natural elements in the view. Combining vividness, unity and intactness, the resulting overall visual quality can be defined as low (0.7).

Resource Change

In this view (see Figure 13), the existing bridge structure would be replaced by the proposed haunched girder bridge structure that includes the roadway, concrete barriers, railings and light fixtures. The linear features of the bridge would be very visible in the immediate view to viewers traveling southbound on the I-5 bridge. The bridge structure would increase in width by 3 feet to accommodate a wider pedestrian walkway, resulting in a slightly larger scale of the bridge deck. However, overall, the replacement bridge is of lesser stature and bulk, resulting in a less dominant bridge structure. The bridge structure would also move 65 feet to the west, visually closing the gaps between the southbound I-5 bridge and the Pacific Street bridge, thus further blocking middle ground views of any natural features below. Although only the upper portion of the bridge is seen in this view, the understory of the bridge would begin to reveal the enhanced graceful architectural arch bottom of the "haunched" box girder and the flared columns. The project proposes smooth textures and earth-toned and white colored concrete that would replace the green steel girder bridge, improving the harmony between built and natural features in the view.

Figure 13: Key View #2 – Haunched Box Girder Bridge (Proposed Condition)

From this viewpoint, the project would be slightly more memorable view due to the introduction of the architectural bridge features, although only partially seen. However, this improvement is balanced by the loss of visible natural elements of the river bottom that provide a more balanced composition of built and

natural elements in the view. The implementation of the project would maintain the view of the ocean and horizon line in the distance.

Vividness would be improved to moderate (3.0). Intactness would remain moderately low (2.0) as the new bridge block views of the natural elements below. with lighter whitewash color would enhance the view. Unity would improve slightly to moderately low (3.0) due to the visibility of the more harmonious curved bridge elements and the earth-tone and white bridge color scheme.

The change to the existing visual character would be a moderately low 13% change. The change to existing visual quality would be a moderately low 17% change. Combining both change to existing visual character and visual quality would result in a moderately low change to existing visual resources.

Viewer Response

The anticipated quantity of viewers would be a high volume, estimated at between 50,000 and 70,000 per day. However, viewers would be exposed to this scene s for only a few seconds for a glimpse of the bridge and extended view to the ocean while traveling at 65 mph along the I-5 roadway. In addition, viewers will be exposed to only the upper portion of the bridge. As a result, viewer exposure would be moderate (3.3).

Viewers would generally drivers focused on the roadway with only a general awareness of the scene. Awareness would be moderate. Viewer sensitivity would be moderately low (1.7). Overall viewer response would be moderate (2.5).

Resulting Visual Impact

The construction of the project would result in a moderately low (1.7) change to the visual resources (character and quality). The collective viewer response to changes in the setting would be moderate (2.5). As a result, the visual impact would be considered moderate. Refer to Charts 5 and 6: Key View #2 - Proposed Haunched Box Girder Bridge for visual impact analysis detail.

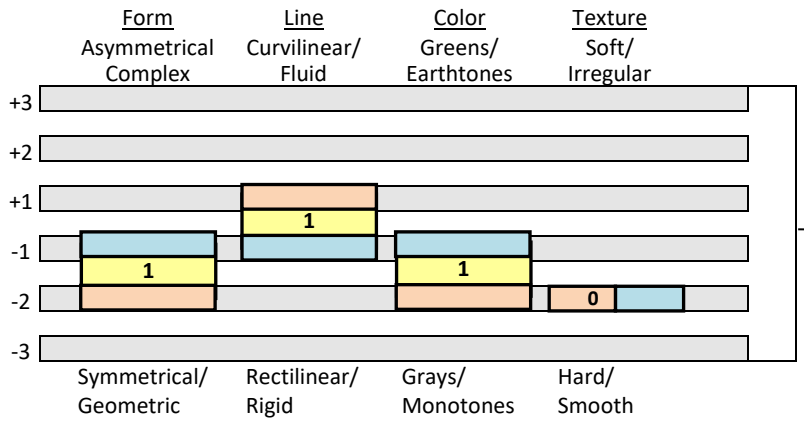
CHART 5: KEY VIEW #2 – Proposed Haunched Box Girder Bridge Visual Character & Visual Quality

VISUAL CHARACTER

Legend
Existing Conditions
Proposed Conditions

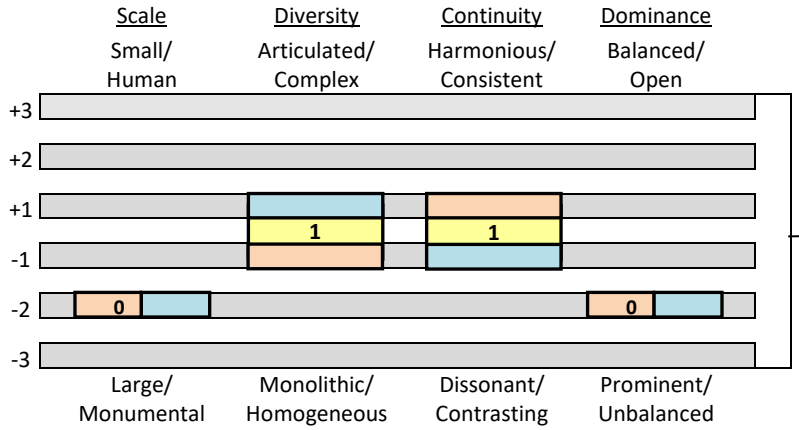
Visual Change Ratings	
0%-10%	Low
11%-20%	Moderately Low
21%-30%	Moderate
31%-40%	Moderately High
41%-100%	High

Pattern Elements
Describes the visual attributes of objects (Project and Setting)



Avg. Change: 0.7
% Change: 15

Pattern Character
Describes the relationships between visual elements (Project and Setting)

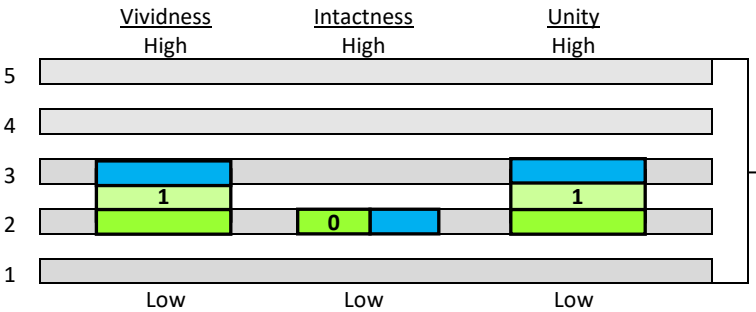


Avg. Change: 0.5
% Change: 10

Avg. Change: 0.63
% Change: 13

Change to Visual Character: ML

VISUAL QUALITY



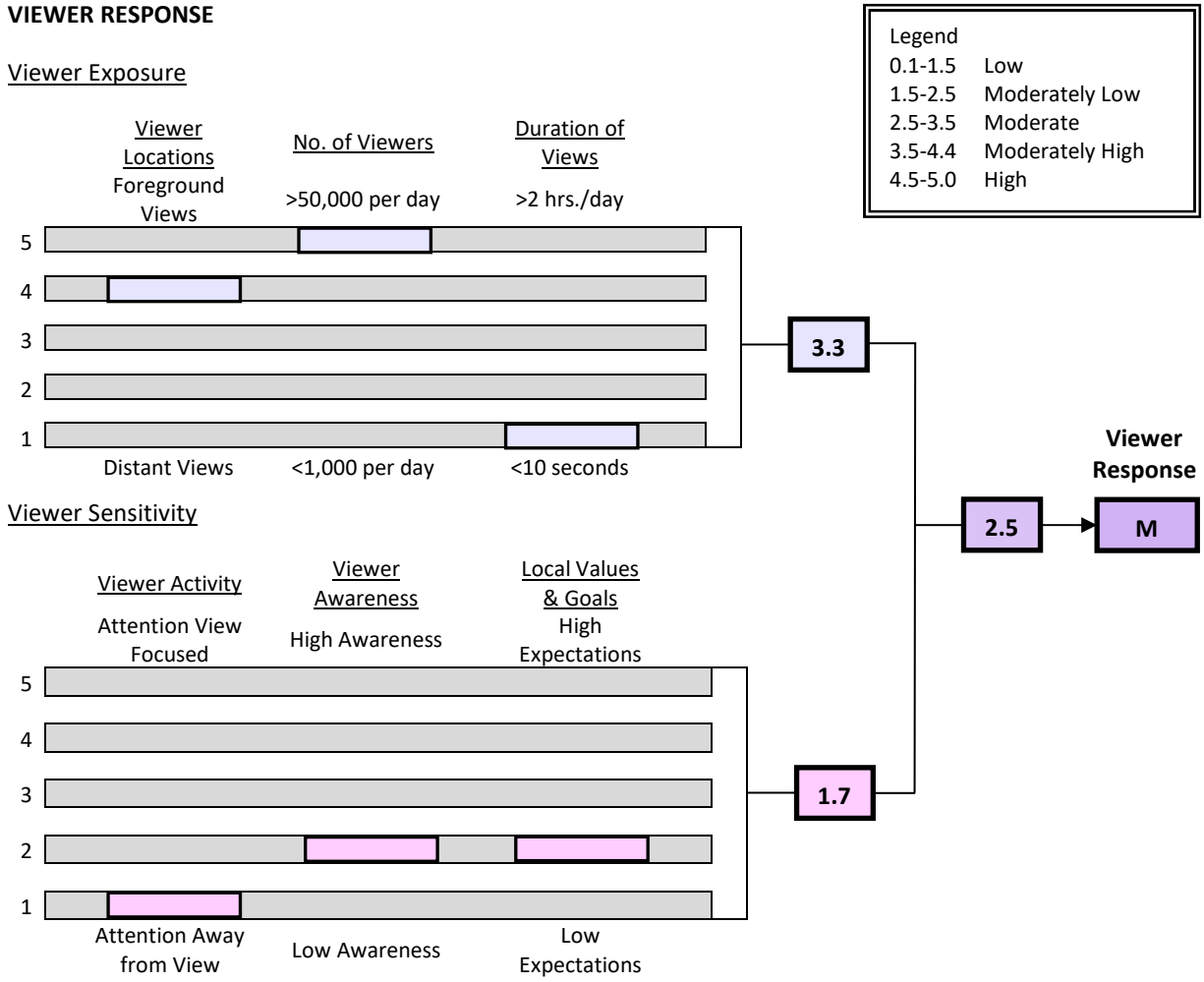
Avg. Change: 0.7
% Change: 17

Change to Visual Quality: ML

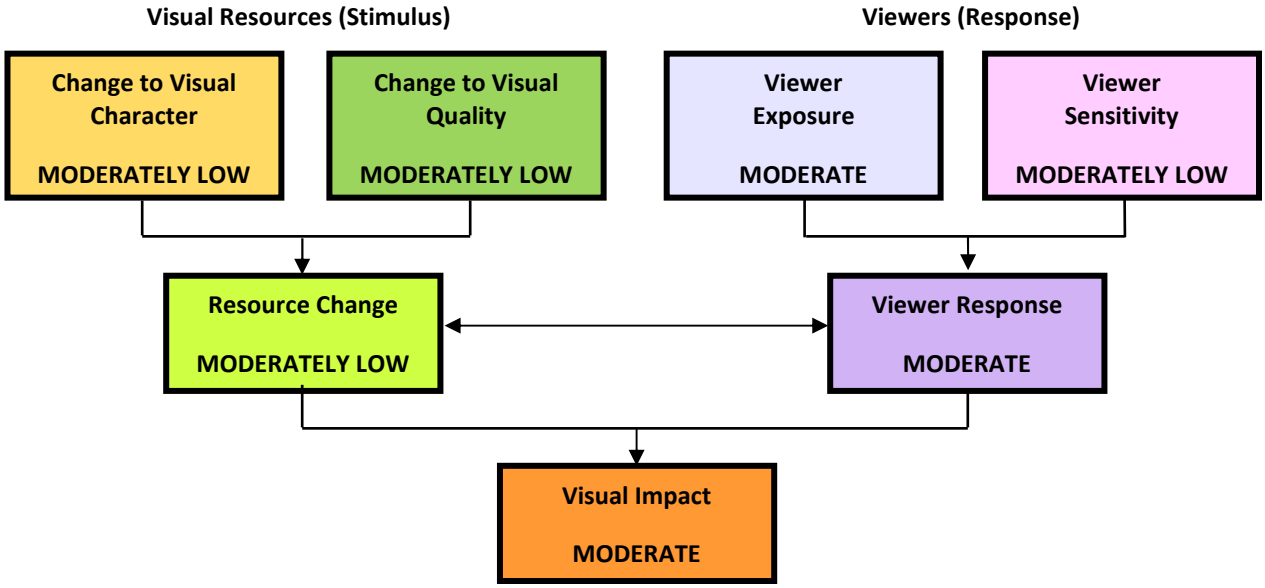
Legend
Existing View
Proposed View

CHART 6: KEY VIEW #2 – Proposed Haunched Girder Bridge Viewer Response & Analysis Summary

VIEWER RESPONSE



ANALYSIS SUMMARY



KEY VIEW #3 - Viewing West from the Coast Highway Off-Ramp Between North Coast Highway Bridge and Southbound Interstate 5 Bridge

Figure 14: Key View #3 (Existing Condition)

Existing Visual Character / Quality

The existing view, south and west of Key View #2, is comprised of a linear, fine-textured forms of the existing bridge, roadway surface, walkways, safety curbs and railings (see Figure 14). The existing bridges include the North Coast Highway bridge in the foreground, the railroad bridge and the Pacific Street bridge in the middle ground, and Pacific Ocean at the background of the view. Note that the North Coast Highway off-ramp from I-5 is part of the southbound I-5 bridge and parallels the existing North Coast Highway bridge. The off-ramp intersects Coast Highway 1/2 mile south of the bridge.

Portions of the natural river bottom and riparian areas can be glimpsed between the bridges. Commercial and high-density residential buildings are visible along both edges of the river corridor that contrast with the natural features of the river bottom. There is a high diversity of built features in the view that are dominant over the landscape elements.

Vividness of the view is moderately low (2.0 on a scale of 1 to 5) as there is little that is memorable other than the open view to the ocean. The intactness is moderately low (2.0) as the bridges are highly distracting in the view. Unity is moderately low (2.0) as the view is highly disrupted by the bridges and surrounding developed areas, resulting a disharmonious relationship between the built and natural elements in the view. Combining vividness, unity and intactness, the resulting overall visual quality can be defined as low (0.7).

Resource Change

In this view (see Figure 15), the existing bridge would be replaced by the project preferred haunched box girder bridge that includes the roadway, concrete barriers, railings and light fixtures. The linear features of the bridge would be very visible in the immediate view to viewers traveling southbound on the I-5 off-ramp bridge.

Figure 15: Key View #3 –Haunched Box Girder Bridge (Proposed Condition)

The bridge structure would increase in width by 3 feet to accommodate a wider pedestrian walkway, resulting in a slightly larger scale of the bridge deck. However, overall, the replacement bridge is of lesser stature and bulk, resulting in a less dominant bridge structure. The new bridge alignment moves farther to the west than in Key View #2 and would allow greater views to natural features below the bridge in the foreground at this location. Also, the enhanced graceful flared columns and arch forms that support the bridge deck would be more visible from this viewpoint. The project proposes smooth textures and earth-toned and white colored concrete that would replace the green steel girder bridge, improving the harmony between built and natural features in the view.

From this viewpoint, the view would be slightly more memorable due to the introduction of the architectural bridge features. The visibility of the natural features is replaced from middle ground to foreground, however results in a loss of visible natural elements of the river bottom that provide a more balanced composition of built and natural elements in the view. The implementation of the project would maintain the view of the ocean and horizon line in the distance.

Vividness would be improved to moderate (3.0) as the new bridge features the graceful flared column and girder arch elements with earth-toned and lighter whitewash color palette. Intactness would remain a

moderately low 2.0. Unity would increase to moderate (3.0) due to the greater view of the graceful bridge architectural elements.

The change to the existing visual character would be moderately low (a 13% change). The change to existing visual quality would also be moderately low (a 13% change). Combining both change to existing visual character and visual quality would result in a moderately low change to existing visual resources.

Viewer Response

The primary viewers are local and commuter motorists that would experience this scene in their foreground and middle ground views for less than one minute while traveling at 45-55 mph while exiting the freeway into Oceanside's downtown district. The quantity of viewers would be moderate between 8,000 and 10,000 per day. As a result, viewer exposure would be moderate (2.7). Viewers would likely be focused on the roadway and traffic conditions; however, they would have a moderate awareness of the scene. Viewers would generally be aware of elements in the view however may only get 6-10 seconds to get a sense of the scene will driving. These local and commuter motorists are likely to have a moderately low sensitivity to the project. As a result, viewer sensitivity would be moderately low (2.0). Averaging viewer exposure and sensitivity would result in a moderately low (2.4) viewer response to the visual change.

Resulting Visual Impact

The construction of the project would result in a moderately low change to the visual resources (character and quality). The viewer response to the proposed project would be moderately low (2.4). As a result, the visual impact would be considered moderately low. Refer to Charts 7 and 8: Key View #3 - Proposed Haunched Box Girder Bridge for visual impact analysis detail.

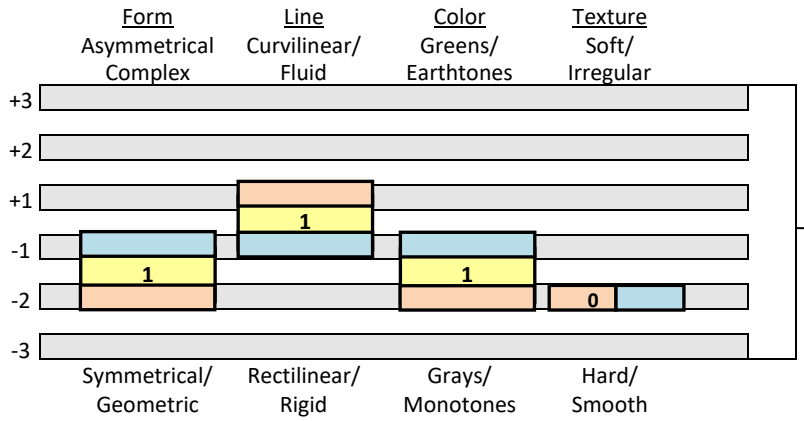
CHART 7: KEY VIEW #3 – Proposed Haunched Box Girder Bridge Visual Character & Visual Quality

VISUAL CHARACTER

Legend
Existing Conditions
Proposed Conditions

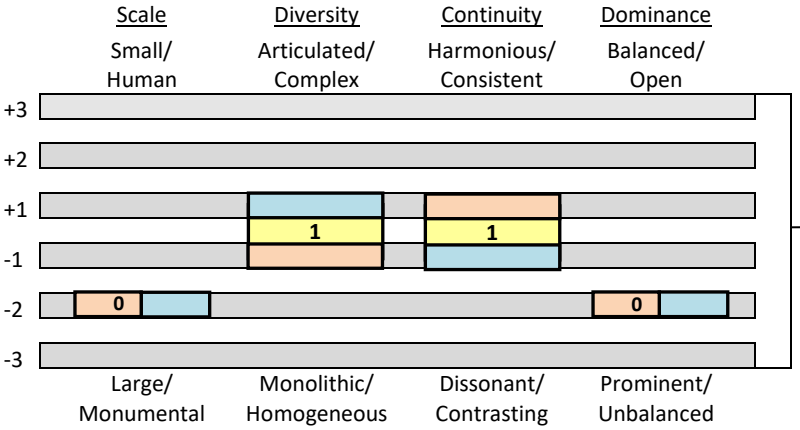
Visual Change Ratings	
0%-10%	Low
11%-20%	Moderately Low
21%-30%	Moderate
31%-40%	Moderately High
41%-100%	High

Pattern Elements
Describes the visual attributes of objects (Project and Setting)



Avg. Change: 0.7
15
% Change

Pattern Character
Describes the relationships between visual elements (Project and Setting)

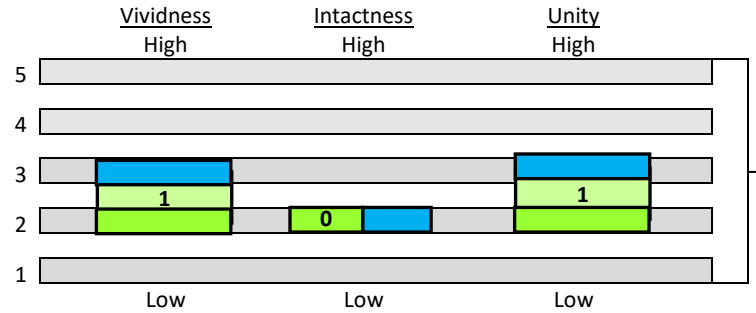


Avg. Change: 0.5
10
% Change

Avg. Change: 0.63
13

Change to Visual Character: ML

VISUAL QUALITY



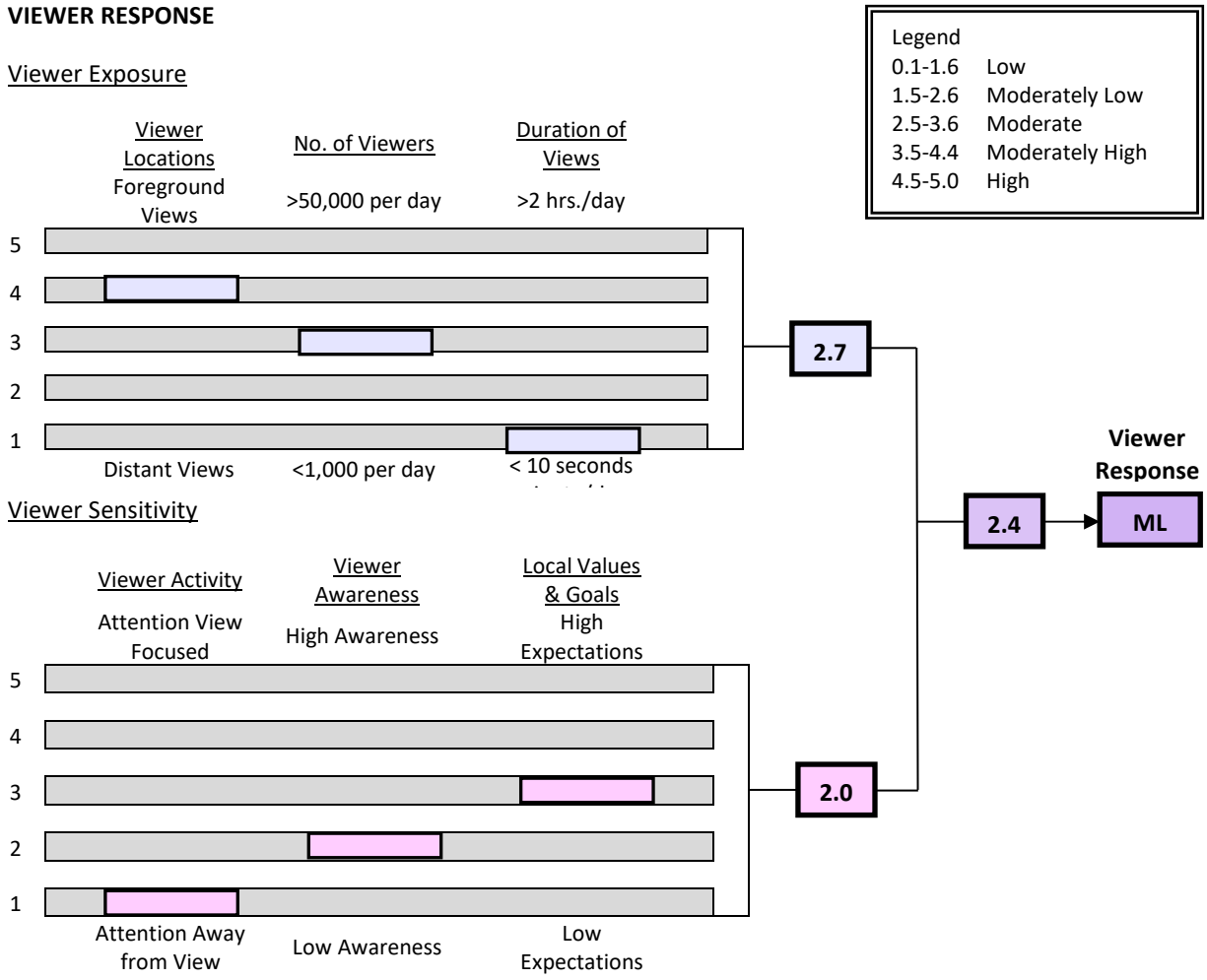
Avg. Change: 0.7
13
% Change

Change to Visual Quality: ML

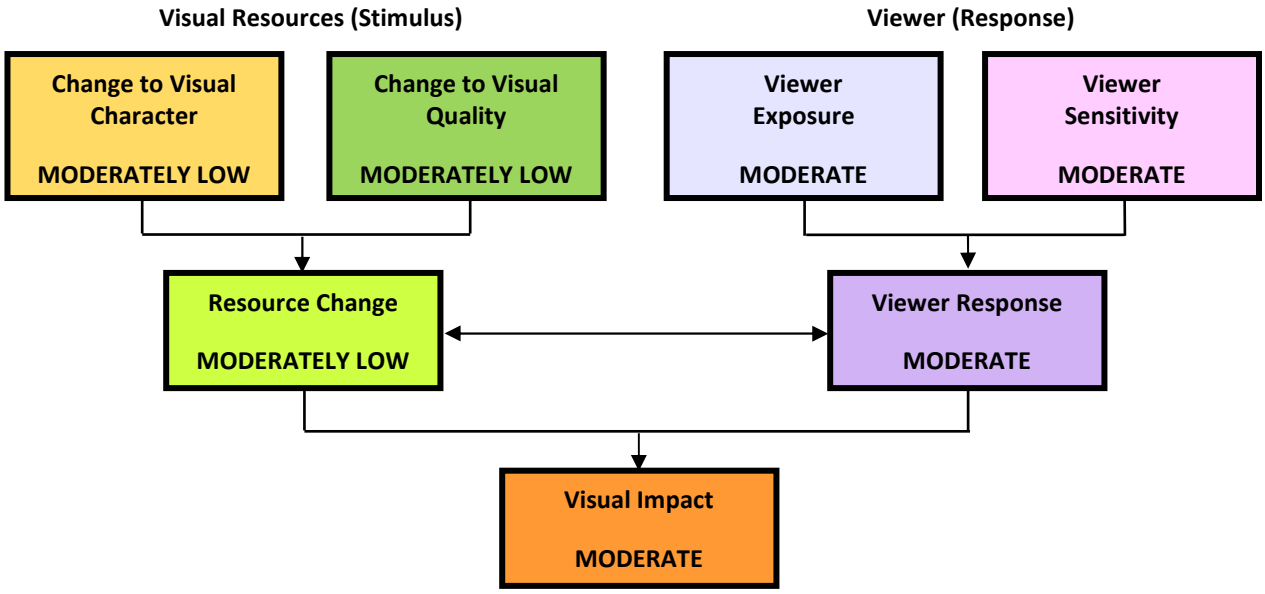
Legend
Existing View
Proposed View

CHART 8: KEY VIEW #3 – Proposed Haunched Girder Bridge Viewer Response & Analysis Summary

VIEWER RESPONSE



ANALYSIS SUMMARY



KEY VIEW #4 –Viewing East from Pacific Street Bridge

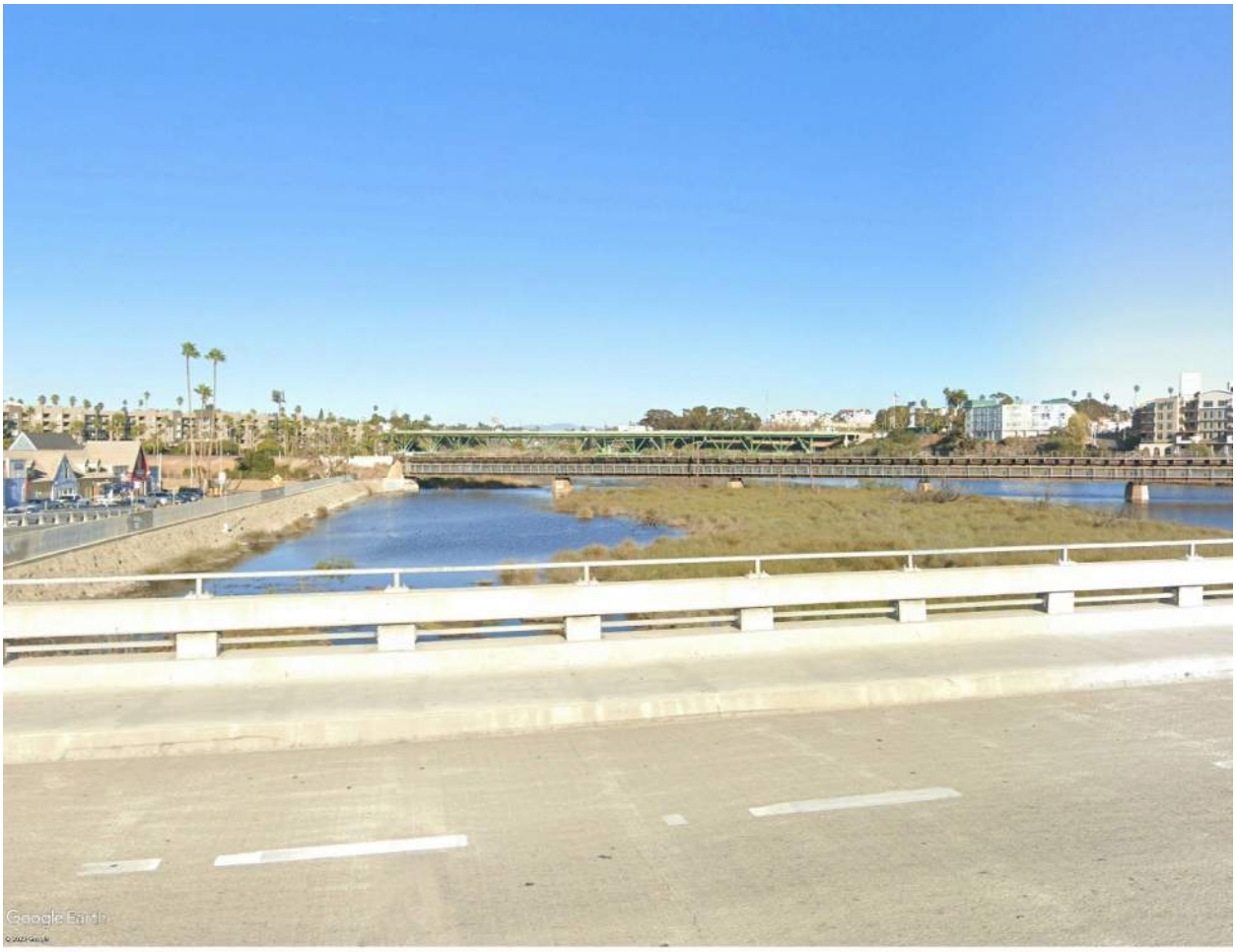


Figure 16: Key View-#4 (Existing Condition)

Existing Visual Character / Quality

The existing view (Figure 16) is a complex composition of fine textured bridge features and soft irregular textural forms of the landscape along the edges and bottom of the river valley. The bridge forms are linear structures that span the valley and bisect the view, creating a dissonant relationship between the built and natural features. The bulk and texture of the green truss bridge structure between the I-5 and railroad bridges is visually lighter weight than the existing, contrasting with the natural features and contributing to the distraction to the view. Additionally, the Interstate 5 bridge structure and supports below further disrupt the view to the east. The river's riparian areas and valley slopes are covered with green and brown earthtones that contrast with the green and gray monotones of the bridge features.

Vividness is moderately low (2.0 on a scale of 1 to 5) as there are few memorable features in the view. Intactness is moderate (3.0) due to the distraction of bridge structure features in the middleground, moderated by the natural river bottom and the slopes beyond. The continuity of the landscape and built features in the view have a dissonant relationship as the bridges bisect the the view, resulting in a moderate (3.0) rating for unity. Combining vividness, intactness, and unity, the resulting overall visual quality can be rated as moderately low (2.66).

Resource Change

Figure 17 depicts the proposed bridge replacement. In this view, the existing bridge structure would be replaced by the project preferred alternative haunched box girder bridge structure that includes the roadway, concrete barriers, railings and light fixtures. The linear features of the bridge would be very visible in the foreground to middle ground of the view to viewers traveling in the immediate vicinity of Pacific Street and Harbor areas at slower speeds of 25 to 30 MPH. The bridge structure would increase in width by 3 feet to accommodate a wider pedestrian walkway, resulting in a slightly larger scale of the bridge deck. However, the overall the replacement bridge decking thickness is of thinner stature and bulk, resulting in a visually less dominant bridge structure. The bridge structure would also move 65 feet to the west, slightly closer to the Pacific Street and railway bridges, but hardly noticable in this view.

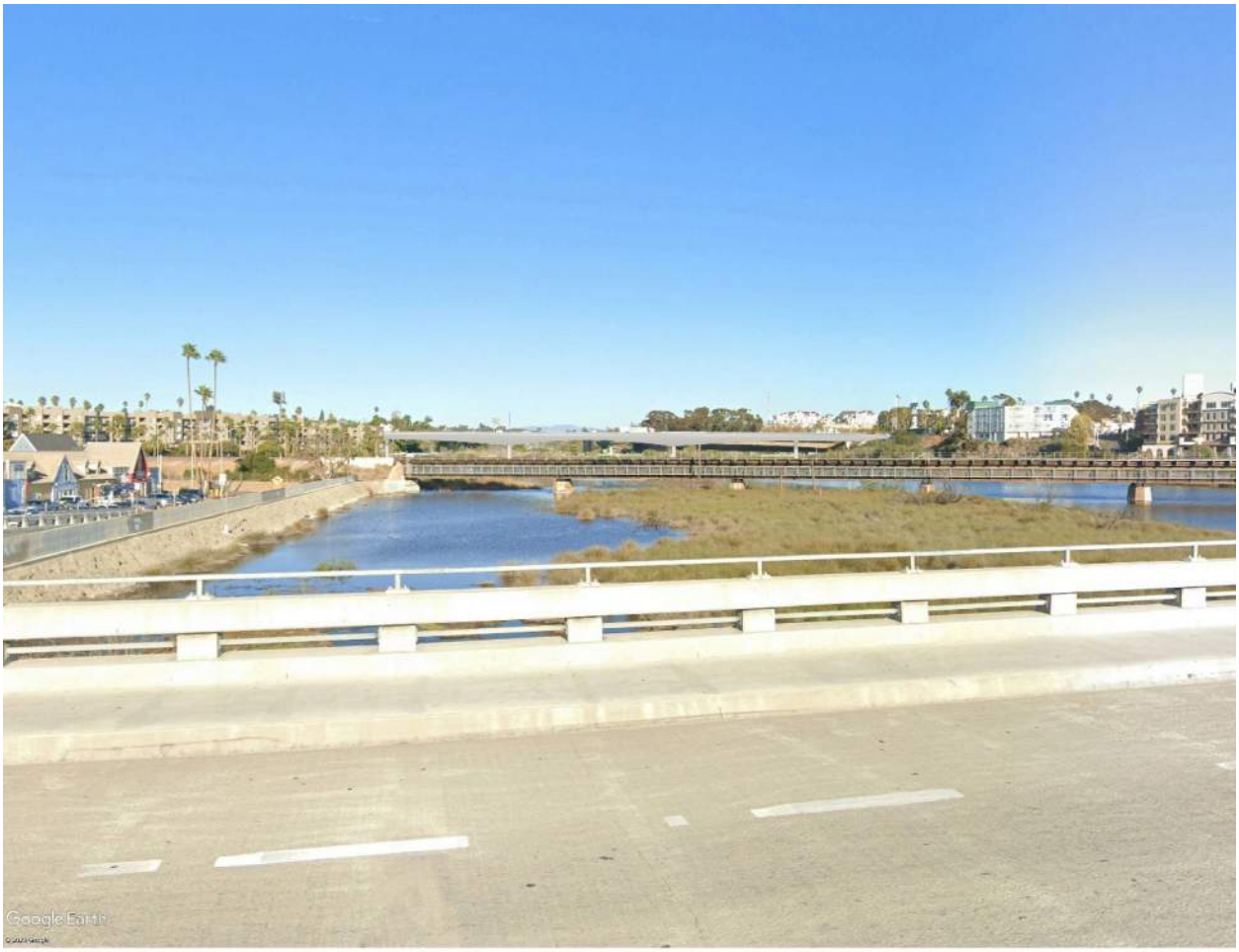


Figure 17: Key View #4 - Haunched Box Girder Bridge (Proposed Condition)

The new bridge would allow greater views to natural features beyond the bridge in at this location as the removal of the green-painted steel girder bridge opens the view. The enhanced graceful architectural arched girders and flaired column forms that support the bridge deck would be highly visible from this viewpoint. The project proposes smooth textures and earth-tone and white colored concrete palette that would replace the green steel girder bridge, improving the harmony between built and natural features in the view. The architectural forms of the new bridge introduce more complex and diverse elements to the scene for added interest.

From this viewpoint, the view would be more memorable due to the introduction of the architectural bridge features. The improved visibility of the natural features beyond the bridge structure results in an increase in the visible natural elements of the slopes and river bottom that provide a more balanced composition of built and natural elements in the view.

Vividness would improve to moderate (3.0) as the new bridge features the graceful arching elements with the earth-tone and whitewash color. Intactness would remain a moderate (3.0) as the simplified structure would lessen the distractions in the view. Unity would increase to moderately high (4.0) due to the improved visual continuity of natural visual elements below the new bridge structure.

The change to the existing visual character would be moderately low (13%). The change to existing visual quality would be moderately low (13%). Combining both change to existing visual character and visual quality would result in a moderately low change to existing visual resources.

Viewer Response

The primary viewer groups will be residents, businesses, vacationers and local motorists that live, work or commute in the project area. These viewers would view this scene from close to moderate proximity for several minutes to several hours at a time while viewing from balconies, living room windows, outdoor patios and spaces that overlook the valley. Viewers may be traveling in vehicles through the area at a low rate of speed (approximately 25-35 MPH) or walking or riding bicycles within the project area. The quantity of viewers would be moderate, approximately 5,000 and 7,000 viewers per day. As a result, viewer exposure would be moderate (3.3).

Specific to sensitivity, resident, business and vacationer viewers would likely view the scene from direct views and project highly visible. Driving local motorists would be more focused on the roadway but would have a general sense (awareness) of the wider view and features within. Viewer awareness to changes due to the project would be moderately high. Additionally, the viewer group would have a moderately high interest in the project within their immediate environment. Viewer sensitivity would be moderately high (3.7). As a result, the overall viewer response would be moderately high (3.5).

Resulting Visual Impact

The construction of the project would result in a moderately low change to the visual resources (character and quality). Viewer response would be moderately-high. As a result, the visual impact would be considered moderately-high. Refer to Charts 9 and 10: Key View #4 - Haunched Box Girder Bridge for visual impact analysis detail.

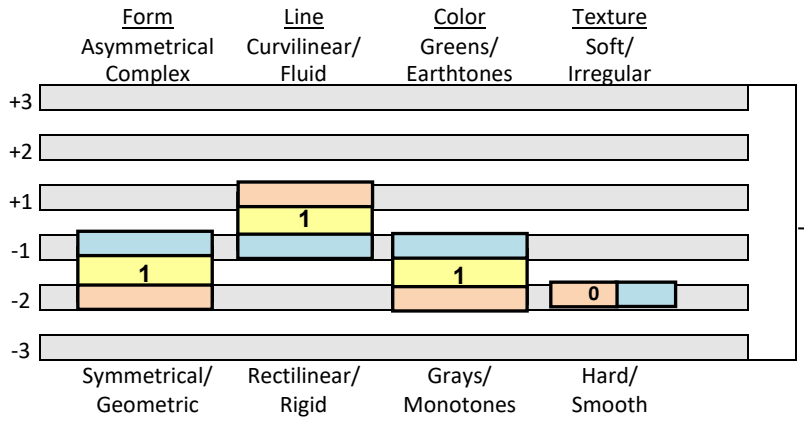
CHART 9: KEY VIEW #4 – Proposed Haunched Box Girder Bridge Visual Character & Visual Quality

VISUAL CHARACTER

Legend
Existing Conditions
Proposed Conditions

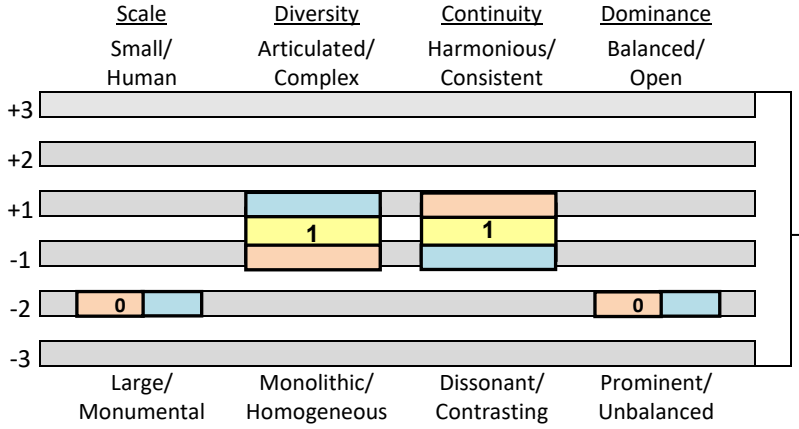
Visual Change Ratings	
0%-10%	Low
11%-20%	Moderately Low
21%-30%	Moderate
31%-40%	Moderately High
41%-100%	High

Pattern Elements
Describes the visual attributes of objects (Project and Setting)



Avg. Change: 0.7
% Change: 15

Pattern Character
Describes the relationships between visual elements (Project and Setting)

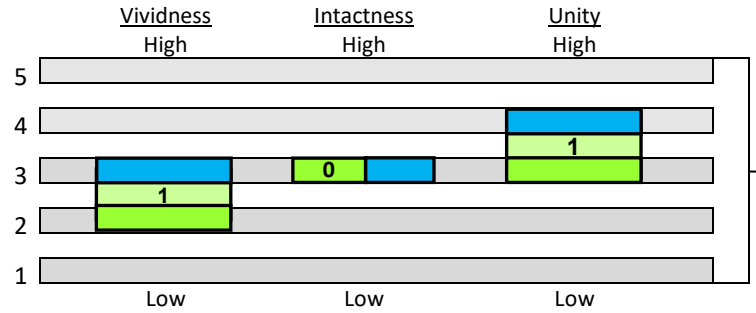


Avg. Change: 0.5
% Change: 10

Avg. Change: 0.63
% Change: 13

Change to Visual Character: ML

VISUAL QUALITY



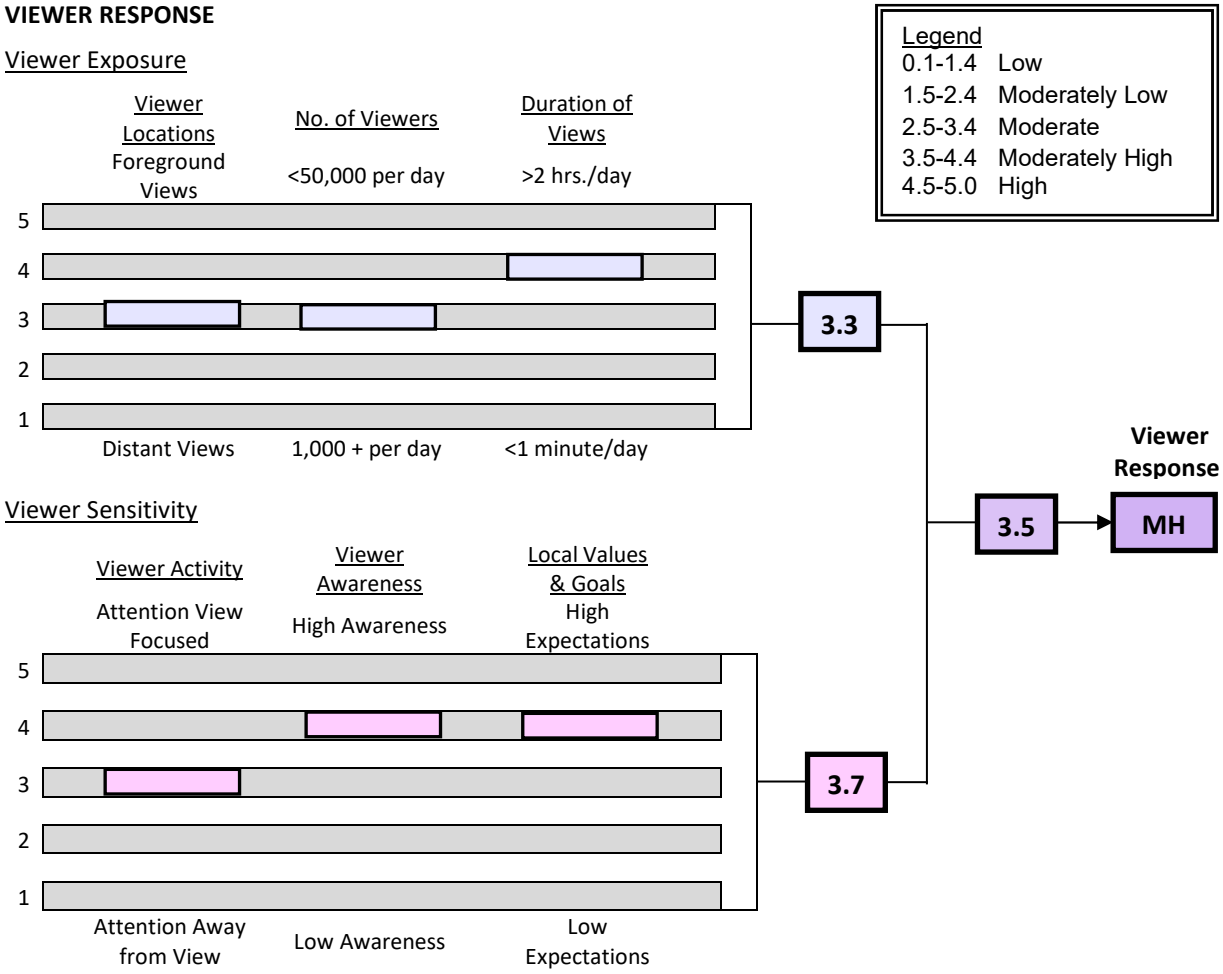
Avg. Change: 0.7
% Change: 17

Change to Visual Quality: ML

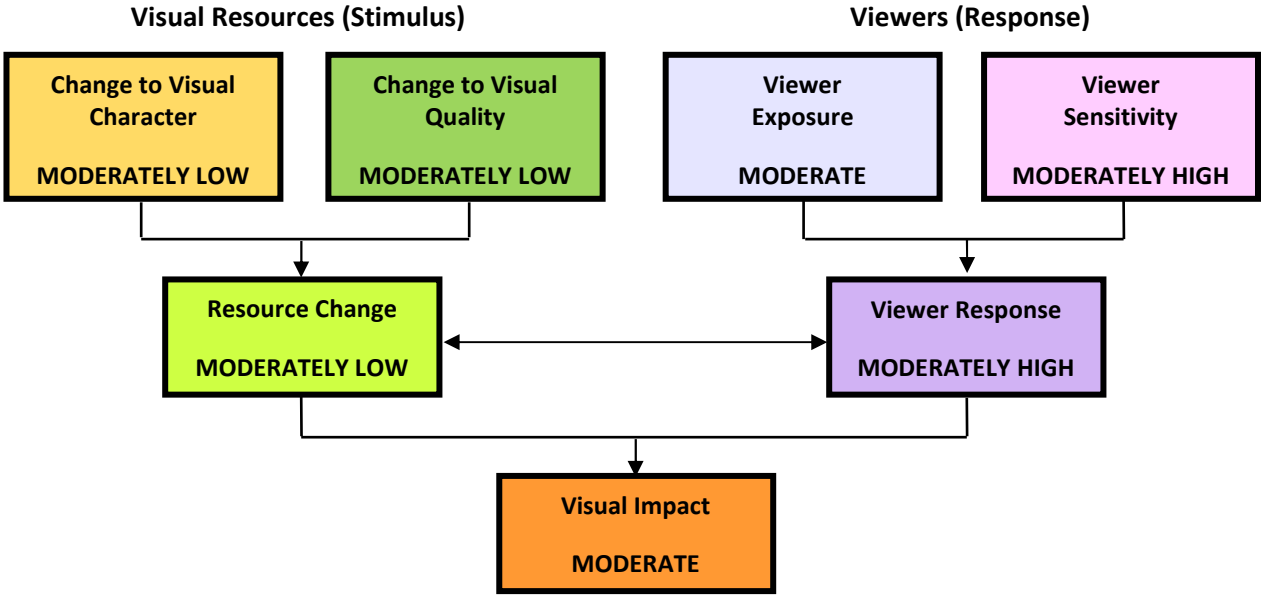
Legend
Existing View
Proposed View

CHART 10: KEY VIEW #4 – Proposed Haunched Girder Bridge Viewer Response & Analysis Summary

VIEWER RESPONSE



ANALYSIS SUMMARY



KEY VIEW #5 - Viewing East from the San Luis Rey Bike Path from East of the Railroad Bridge

Figure 18: Key View #5 (Existing Condition)

Existing Visual Character / Quality

The existing view (Figure 18) is a complex composition of fine textured bridge features and soft irregular textural forms of the landscape along the edges and bottom of the river valley. The bridge forms are lineal structures that span the valley and bisect the view, creating a dissonant relationship between the built and natural features. The I-5 bridge structure and supports below further disrupt the view to the east. The river's riparian areas and valley slopes are covered with green and brown earthtone vegetation that contrast with the green and gray monotones of the bridge features.

Vividness is moderately low (2.0) as there are few memorable features in the view. Intactness is moderately low (2.0) due to the distraction of bridge structure features in the middle ground. The continuity of the landscape and built features in the view have a dissonant relationship as the bridges bisect the the view, resulting in a moderately low (2.0) rating for Unity. Combining vividness, intactness, and unity, the resulting overall visual quality can be rated as moderately low (2.0 on a scale of 1 to 5).

Resource Change

The simulation (Figure 19) depicts the proposed bridge replacement. In this view, the existing bridge structure would be replaced by the project preferred haunched box girder bridge design that includes the roadway, architectural arch supports, concrete barriers, railings and light fixtures. The linear features of the bridge deck with the arched box girdeers and flaired column supports would be very visible in the foreground to middle ground of the view to viewers traveling the regional pathway located along the

south side of the San Luis Rey river valley. The bridge structure would increase in width by 3 feet to accommodate a wider pedestrian walkway, resulting in a slightly larger scale of the bridge deck. However, overall the replacement bridge decking thickness is of thinner stature and bulk, resulting in a less dominant bridge structure. The bridge structure would also move 65 feet to the west, slightly closer to the viewer but hardly noticable from this vantage point. The new preferred alternative bridge would allow greater views to natural features below and beyond the bridge in the foreground at this location as the removal of the green-painted steel girder bridge opens the view. The enhanced architectural arched and flared forms that support the bridge deck would be highly visible from this viewpoint. The project proposes smooth textures and earth-toned and white colored concrete palette that would replace the green steel girder bridge, improving the harmony between built and natural features in the view. The added architectural forms of the new bridge introduce more complex and diverse elements to the scene for added interest.

Figure 19: Key View #5 - Haunched Box Girder Bridge (Proposed Condition)

With the implementation of this project, the view would be more memorable due to the introduction of the architectural bridge features. The improved visibility of the natural features below the bridge structure results in an increase in the visible natural elements of the river bottom that provide a more balanced composition of built and natural elements in the view.

Vividness would improve to moderately high (4.0) as the new bridge features the graceful arch elements with the eart-tone and whitewash color palette would enhance the view. Intactness would improve to moderate (3.0) as the simplified structure would lessen the distractions in the view. Unity would increase to moderate (3.0) due to the improved visual continuity of natural visual elements below the new bridge structure.

The change to the existing visual character would be moderately low (a 18% change). The change to existing visual quality would be moderate (a 27% change). Combining both change to existing visual character and visual quality would result in a moderate change to existing visual resources.

Viewer Response

The primary viewer group will be pedestrians and bicyclists that travel the regional bike path for recreation or regional commuting through the project area. These viewers would view this scene from close to moderate proximity for timeframes ranging from 20-40 minutes at a time while traveling at a speed rangin from 3 to 25 MPH. The quantity of viewers would be low, approximately 200 to 300 viewers per day. As a result, viewer exposure would be moderate (3.0).

Specific to sensitivity, bicyclists would have a high awareness of the proejct improvements as they would be traveling in close proximity and beneath the replacement bridge structure and have an acute awareness as they are able to view the improvements for longer periods. Viewer awareness to changes due to the project would be high. Additionally, the viewer group would have a high interest in the project within their immediate environment as the project might disrupt their route of travel during construction. Viewer sensitivity would be moderately high (4.7). As a result, the overall viewer response would be moderately high (3.9).

Resulting Visual Impact

The construction of the project would result in a moderate change to the visual resources (character and quality). Viewer response would be moderately-high. As a result, the visual impact would be considered moderate. Refer to Charts 11 and 12: Key View #5 - Haunched Box Girder Bridge for visual impact analysis detail.

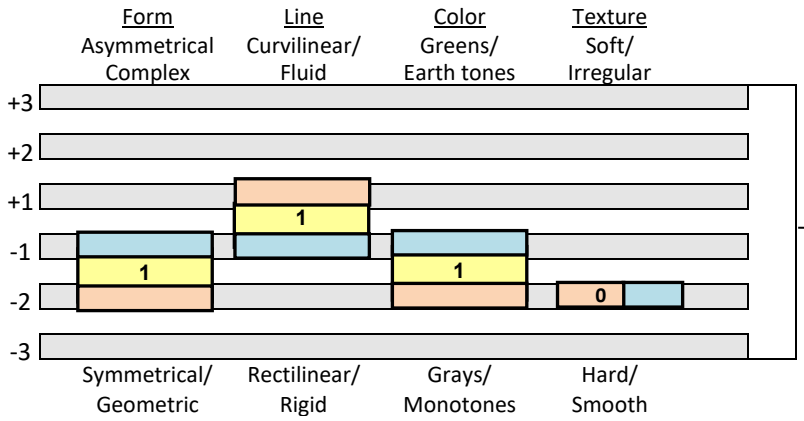
CHART 11: KEY VIEW #5 – Proposed Haunched Box Girder Bridge Visual Character & Visual Quality

VISUAL CHARACTER

Legend
Existing Conditions
Proposed Conditions

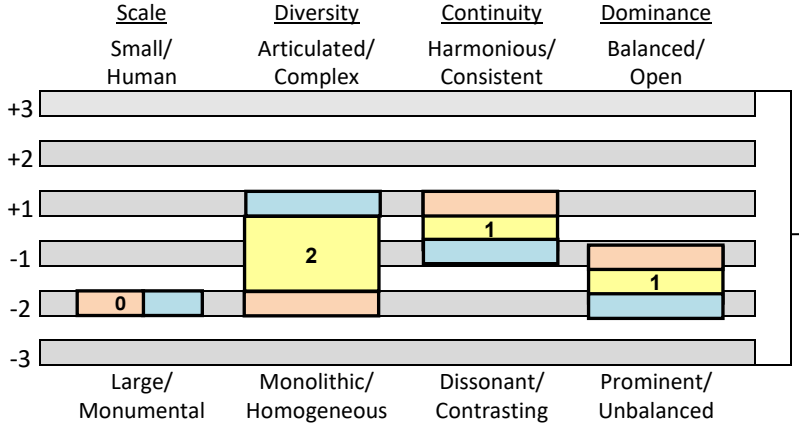
Visual Change Ratings	
0%-10%	Low
11%-20%	Moderately Low
21%-30%	Moderate
31%-40%	Moderately High
41%-100%	High

Pattern Elements
Describes the visual attributes of objects (Project and Setting)



Avg. Change: 0.7
15
% Change

Pattern Character
Describes the relationships between visual elements (Project and Setting)

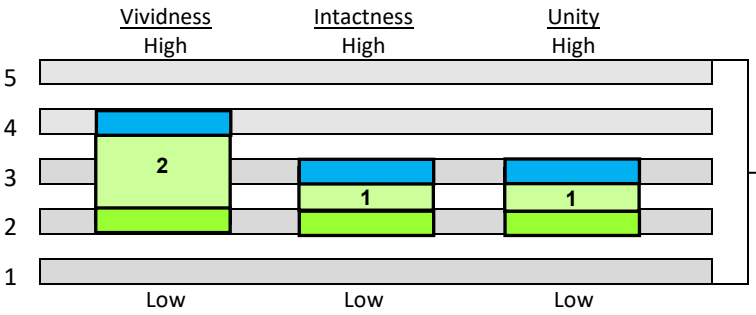


Avg. Change: 1.0
20
% Change

Avg. Change: 0.88
18
% Change

Change to Visual Character: ML

VISUAL QUALITY



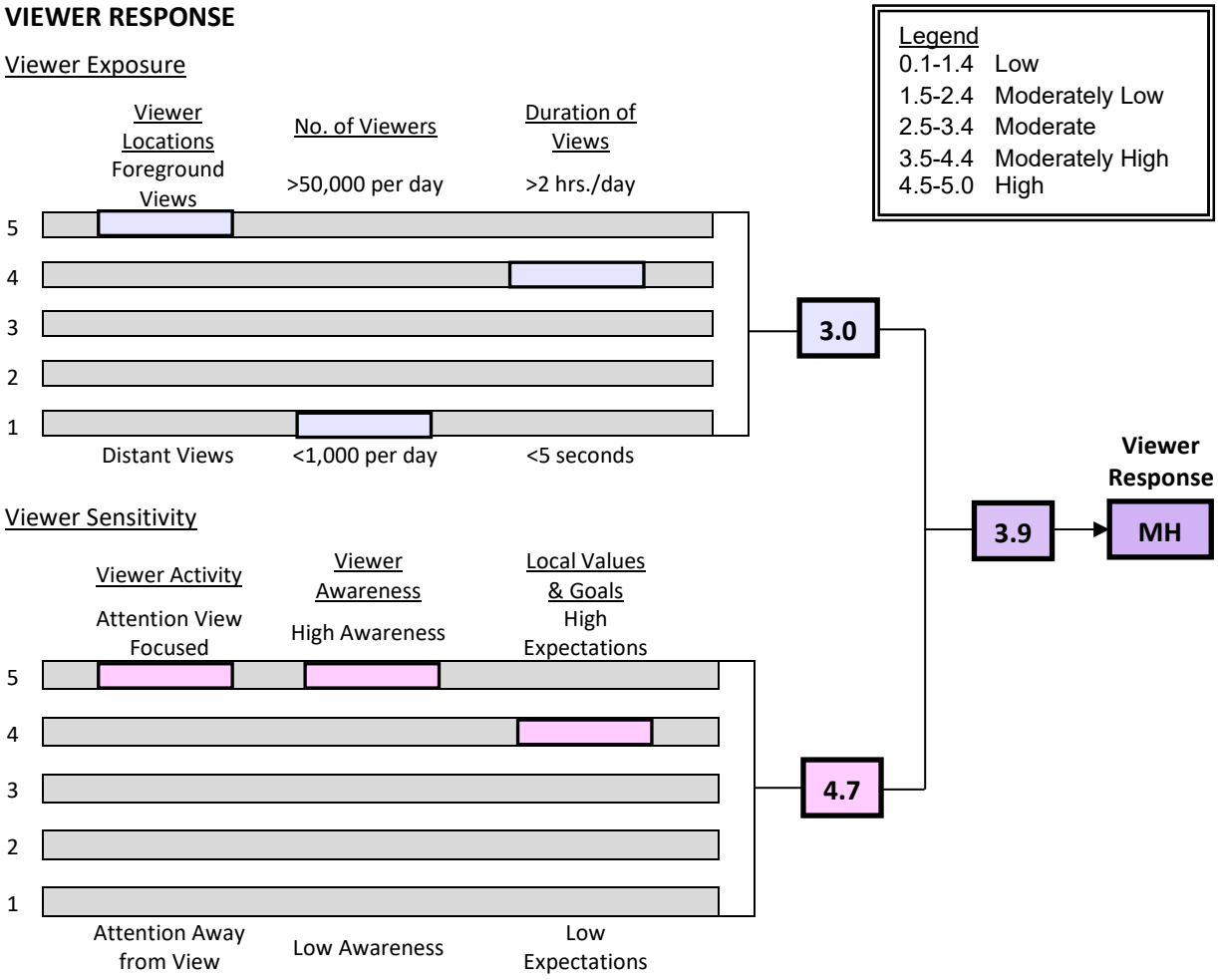
Avg. Change: 1.3
27
% Change

Change to Visual Quality: M

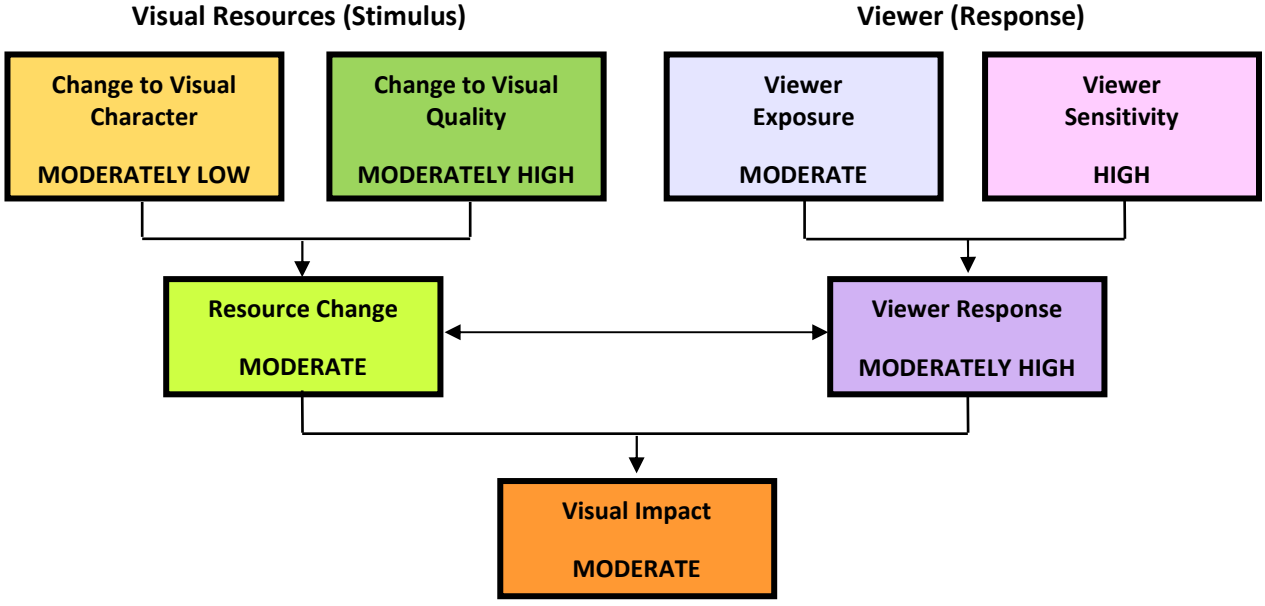
Legend
Existing View
Proposed View

CHART 12: KEY VIEW #5 – Proposed Haunched Girder Bridge Viewer Response & Analysis Summary

VIEWER RESPONSE



ANALYSIS SUMMARY



Summary of Visual Impacts by Assessment Unit

A summary of visual impacts has been prepared for the San Luis Rey River Valley visual assessment unit and is summarized in Table 2. Cumulatively, the change to existing visual character would be moderate. The change to existing visual quality would be moderate. The cumulative change to existing visual character and quality would be moderate. Viewer response would be moderate to moderately high. The visual impact would be considered moderate to moderately high. Visual impacts for the San Luis Rey River Valley Assessment Unit include the following:

- Project features become more dominate in the view with the architectural design features of the bridge forms and colors.
- Loss of some natural features at some key view points from Interstate 5.

TABLE 2
Summary of Key View Narrative Ratings

VISUAL ASSESSMENT UNIT	KEY VIEW	PROPOSED HAUNCHED BOX GIRDER BRIDGE		
		Resource Change	**Viewer Response**	**Visual Impact**
San Luis Rey River Valley	1	**ML**	**M**	**M**
	2	**ML**	**M**	**M**
	3	**ML**	**M**	**M**
	4	**ML**	**MH**	**M**
	5	**M**	**MH**	**M**

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IX. PROJECT VISUAL IMPACT SUMMARY

The visual effects of the project would change the existing rural character of the San Luis Rey River Valley to a slightly more urban environment. Generally, the proposed project would have a moderate degree of change to the existing visual character and visual quality due to the addition of new project improvements that include the replacement bridge structure, roadway, pedestrian walkway, column supports, concrete barriers, railings and light fixtures. The proposed bridge and associated construction would create a moderate change to the existing visual environment from all the key views. This project alternative intends to introduce some bridge features that have architectural interest. The proposed bridge design uses context sensitive design principles with the use of few columns that work well with the natural and existing man-made features in the project area. The implementation of the project would change the visual character of the view by introducing new built features within the viewshed. The project would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. The project would affect the existing visual resources; therefore, avoidance and minimization measures are proposed.

Temporary Construction Visual Impacts

Temporary visual impacts would occur during the project construction. Limits of construction impacts and staging areas would need to be clearly defined to limit the impacts of construction operations. Temporary construction impacts would include temporary structures, contractor staging areas, dust, night lighting, hauling of materials, and roadway and bikeway detours. Construction impacts would cease following completion of the project. Visual mitigation for the construction period would not be considered necessary due to the changing and temporary nature of these impacts. The permanent project enhancement features would be implemented as construction is completed. The duration of construction would be approximately 18 to 24 months.

X. CUMULATIVE VISUAL IMPACT

Cumulative impacts are those resulting from past, present and reasonably foreseeable future actions, combined with the potential visual impacts of this project. For this project, it has been determined that the following cumulative visual impacts may occur.

The potential cumulative impact that could occur is the replacement of the Interstate 5 roadway bridges and the implementation of the North Coast Corridor Freeway Widening project. The project and the implementation of Interstate 5 freeway future projects could result in further changes to the existing visual environment.

XI. AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Caltrans and the FHWA mandate that a qualitative/aesthetic approach should be taken to address visual quality loss in the project area. This approach fulfills the letter and the spirit of FHWA requirements because it addresses the actual cumulative loss of visual quality due to a project. This approach also results in avoidance, minimization, and/or mitigation measures that can lessen or compensate for a loss in visual quality. The inclusion of aesthetic features in the project design, discussed in *Section II*, can help generate public acceptance of a project. This section describes additional avoidance, minimization, and/or mitigation measures to address specific visual impacts. These would be designed and implemented with concurrence of the District Landscape Architect.

The primary measure to avoid or minimize visual impacts would be to utilize native plant materials for the proposed planting restoration along the replacement bridge alignment and regional bikeway. A vegetative cover of native shrubs and/or groundcover planting would be provided to areas disturbed for the proposed project. The replacement planting would have an aesthetic complementing the context of the local native plant material community.

Additional measure to minimize visual impacts would include landscaping the southern approach and the roundabout/northern bridge approach with ornamental native and naturalizing plants. This landscaping would help minimize the visual impacts of the construction, soften the extensive amount of pavements, and frame views of the bridge.

As this project has few impacts requiring mitigation and is incorporating minimization measures, no mitigation measures are recommended for incorporation into the project.

Summary of Avoidance, Minimization and/or Mitigation Measures by Alternative

Table 3 below summarizes the numbered avoidance, minimization, and/or mitigation measures from above for each alternative.

Table 3
Summary of Avoidance, Minimization and/or Mitigation Measures by Alternative

ALTERNATIVE	AVOIDANCE AND MINIMIZATION	MITIGATION
Proposed Condition	2.0	None.

XII. CONCLUSIONS

Incorporation of the recommended minimization, avoidance and mitigation measures would provide a low reduction in the visual impacts anticipated with the proposed project. It is intended that these measures would reduce the minimal impacts anticipated for the proposed changes to the existing visual character and quality.

The proposed project would introduce common roadway bridge features that would moderately alter the appearance of the viewshed. The replacement of the existing bridge structure would introduce a simplified bridge structure that will improve the balance between built and landscape elements in the view. Collectively, the overall change to the existing visual character would be considered moderate, resulting in an improved visual character. Similarly, the change to existing visual quality is anticipated to be moderate, resulting in improved visual quality within the project viewshed. As a result, the resource change associated with the project implementation would be moderate. The proposed build alternative would result in a moderate positive change to the existing visual character and quality of the project area.

The degree of change could be minimally improved with the implementation of the proposed minimization measures. With the minimization measures in place, it is considered that the proposed project's build alternative would result in a moderate detrimental change to the existing visual character and quality of the project area.