

EXHIBIT A

Mirada Road Bridge Replacement Workplan

UNDERSTANDING

In the early 1940's Mirada Road was the original coastal highway that linked Half Moon Bay with Pacifica. The concrete arch bridge that crosses the Arroyo de en Medio, which remains visible today, served motorists until the completion of Highway 1 in the 1960's. Due to severe deterioration of the concrete bridge and the popularity of the Half Moon Bay Coastal Trail, San Mateo County installed a pre-fabricated pedestrian bridge crossing the Arroyo de en Medio in 2004.

Although the bridge is only 14 years old, it has severe corrosion given it is constructed of weathering steel, which is not appropriate for a marine environment. The County retained Cornerstone Structural Engineering Group to prepare recommendations to replace the bridge. Their report includes several alternatives with the preferred approach being replacement with a clear span prefabricated aluminum truss bridge. While this bridge is lighter than the existing unit, the project will need to replace the abutments as the connection geometry varies.

From 1941 to 1970, the coastal bluff within the area has retreated about one foot per year according to a "Geologic Report of Seal Cove – Moss Beach Area" prepared by F Beach Leighton and Associates in October 1971. Alternatively, the Corp of Engineers estimates a rate of about 1.64 foot per year. However, the El Nino storm of 2016 caused rapid retreat of the bluff; in certain locations, this was as much as 8 feet. The erosion occurring north and south of the existing pedestrian bridge is threatening collapse of the concrete arch bridge.

The bridge replacement must address the threat of coastal erosion and the impact of Sea-Level Rise. According to the California Ocean Protection Council's 2018 report, anticipated sea levels by 2100 at this location could be 4.4 to 6.9 feet higher than elevations in 2000. With higher sea levels, bluff erosion will increase as wave energy will reach the toe of the bluff and higher.

To address the bluff erosion, the County completed a preliminary assessment to construct a concrete soil nail wall north and south of the pedestrian bridge. During the permitting process with the Coastal Commission, the County determined that the mitigation costs associated with replacing sand could be more expensive than the actual repairs. Thus, the County seeks an analysis that contemplates a long-term solution, which reduces erosion and preserves coastal access.

The Coastal Trail is an incredibly popular destination for residents and tourists along the San Mateo Coast. The segment between Magellan Avenue and Mirada Road can have hundreds of users on a weekend. However, this segment does not meet a Class 1 standard with walkers and bikers conflicting with vehicles. While the bluff between Medio and Magellan Avenue is armored with rip-rap, waves in heavy storms frequently overtop Mirada Road, heavily damaging the pavement. The County has studied options to reinforce the slope and enhance the trail along this segment. The Coastal Commission reviewed the project and is interested in a comprehensive project that address a long-term solution, which protects coastal access.

One potential solution could be to maintain the pedestrian crossing of the Arroyo de en Medio, reinforce the bluff along Mirada Road, and provide a Class 1 facility along the coastline.

An alternative solution is to relocate the trail to the east crossing of the Arroyo de en Medio at Alameda Avenue. At Mirada Road, the trail could continue along Alameda or an acquisition of an easement through private property. This option offers the longest design life as the threat to sea level rise and erosion is small. However, the cost to construct and acquire right of way would be very high. Our proposed approach evaluates these alternatives to develop recommendations to continue trail connectivity along the San Mateo coastline.

APPROACH

The Parisi CSW Design Group has developed a scope of work to advance the planning to replace the Mirada Road pedestrian bridge. The following summarize our proposed tasks.

TASK 1: PLANNING STUDY TO EVALUATE BRIDGE REPLACEMENT

Objective: During this initial phase, our team will complete several studies to confirm the location and type of pedestrian bridge as well as develop an approach to stabilize the bluff.

1.1 Kickoff and Assemble the Project Development Team. We will collaborate with County staff and project stakeholders to review potential alternatives to replace the bridge and protect the bluff. This will include the following:

- A.** Public agency, public utility, and their authorized representatives stakeholder outreach
 - i. County of San Mateo
 - ii. City of Half Moon Bay
 - iii. Denise Duffy and Associates (County's Environmental Consultant)
 - iv. Representatives from public works, police, and fire
 - v. Public utilities including Granada Community Services District, AT&T, and PG&E
 - vi. California Coastal Commission
 - vii. California State Parks
- B.** Informal meetings with stakeholders
 - i. Representative from Supervisor Horlsey's Office
 - ii. Representative from BPAC
 - iii. Residents/ homeowners of 2, 201, and 445 Mirada Road

1.2 Trail Planning. Relocation of the Coastal Trail to the east along Alameda Avenue could be the preferred long-term solution given future sea level rise and coastal erosion, which threaten the structure. Our team will evaluate alternative scenarios to develop a Class 1 trail and pedestrian bridge crossing Arroyo de en Medio. Our assessment will include the cost to develop the trail including a preliminary evaluation of right of way costs as well as a cost to benefit analysis.

1.3 Bridge Assessment. The County prefers to replace the pedestrian bridge with a clear span prefabricated aluminum truss bridge. The existing bridge foundation cannot be wholly re-used due to revisions in applicable design codes and geometric differences between the proposed aluminum truss bridge and the existing steel truss bridge. Cornerstone will confirm and summarize the bridge type, and foundation strategy including providing up to three alternative strategies and summarizing the basis for the preferred approach. Our team will also begin coordination with AT&T, PG&E, and the Granada Community Services District for modifications to utility systems

1.4 Bank Stabilization. The coastal bluffs north and south of the pedestrian bridge eroded severely during the 2016 storm, retreating by more than 8 feet in certain locations. The use of rip-rap is

a temporary measure and the Coastal Commission will require the installation of a permanent feature such as a soil nail wall. Moffatt and Nichol will develop an approach to protecting the bluff as well as recommended limits providing up to three alternative techniques such as but not limited to, soil nail or secant pile walls. For the soil nail or tie back wall alternatives, we will complete a preliminary assessment of tie-back length to assess easement requirements.

1.5 Hydraulic Assessment. Moffatt and Nichol will perform a hydraulic assessment along the Arroyo de en Medio to assess hydrology, hydraulics, scour, and bank protection.

1.6 Initial Outreach – “Project Introduction” Our team will conduct an outreach process to solicit public comment regarding the development process. This will include the following:

- A. Stakeholders.** We will hold a meeting with public agency and utility stakeholders as defined in Task 1.1 to review the existing conditions and define the process for informal site walks as well as process to hold community meetings.
- B. Informal Site Walk.** As necessary, we will organize a site walk with stakeholders to review specific conditions along the Coastal Trail.
- C. Community Meeting.** We will prepare advertisements and presentation materials to host a public meeting to review the project. During the first meeting, we will introduce the project to replace the bridge and discuss potential options to relocate the trail. We recommend the meeting be in workshop format to provide maximum feedback.

1.7 Basis of Design: Our team will prepare a Basis of Design report summarizing the results of the preliminary investigation phase including discussions with stakeholders. The report will include alternatives for each project element including bridge location, type, and bluff stabilization methods. We will provide a basis for recommending the preferred alternative for each element. The report will include an assessment of bluff stabilization methodology, creek hydraulic assessment, basis for bridge location, trail routing, and required utility relocations. Additionally, the report will provide an opinion of probable construction cost.

1.8 Project Management and Coordination: Parisi CSW will be responsible for overall management of our design team including the following:

- A Project Management:** Parisi CSW will manage the design team as well as track progress, schedule, and budget. We will be responsible for documenting all design decisions and keeping an official record of the project. Furthermore, we will submit monthly progress reports identifying tasks completed, budget status, and issues status.
- B Quality Control/ Assurance:** An independent member of our team will perform a quality control review of the team's documents prior to submittal.
- C** We will attend up to three meeting with County staff during this phase of the project.

Deliverables: The following summarizes deliverables we will provide during this task:

- i Basis of Design Report including supporting documentation
- ii Notes related to community comment
- iii Meeting notes and progress schedule

TASK 2: EXISTING CONDITIONS ASSESSMENT AND PRELIMINARY ENGINEERING

Objective: Our team will collect existing conditions data within the project area to refine the bridge's alignment and bluff stabilization.

2.1 Existing Conditions Mapping. Parisi CSW will complete research and field data collection to prepare design level base mapping for the project.

- A Set Control: We will establish horizontal control using Global Positioning (GPS) equipment based on NAD83. We will establish vertical control based on NAVD 88. We will use the 2010.00 EPOCH.
- B Utility Information: Parisi CSW will collect utility information located within and near the project area which may be affected during construction.
- C Field Survey: A Parisi CSW field crew will acquire topographic data along the bluff and creek.
- D Boundary: We will prepare a boundary survey around the project area to find localized control.
- E Mapping: We will prepare an existing conditions map illustrating elevations and contours at 1-foot intervals. We will provide the data in AutoCAD Civil 3D 2018 (or in any format requested by the County) and Adobe Acrobat formats.

2.2 Geotechnical Analysis: Although Parikh completed a geotechnical investigation in 2001, the two soil borings are likely inadequate for foundation design of the bridge replacement meeting current AASHTO LRFD standards. Parikh will complete a site geotechnical investigation including completing the following:

- A Pre-Field Activities.** We will coordinate with San Mateo County to obtain the required encroachment permits necessary to access the trail and public right-of-way areas. Our explorations will be backfilled with cement grout in accordance with the County's standards. This will include utility notifications through Underground Service Alert.
- B Field Investigation.** We will complete two rotary wash borings to characterize the subsoil conditions to a depth of about 70 to 80 feet below the ground's surface. The upper 45 feet will be "drilled through" and the drilling and sampling is to acquire information at a deeper depth.
- C Laboratory Testing.** We will complete laboratory testing on representative soil/ rock samples such as moisture density, unconfined compression, gradation analysis, corrosion tests, and Plasticity Index
- D Engineering Analysis and Report Preparation.** Parikh will develop geotechnical design recommendations for the foundation system of the proposed bridge replacement and bluff stabilization near the abutments. All seismic design criteria will follow the CALTRANS seismic design criteria.

2.3 Preliminary Plan (35%). Using the approved Basis of Design Report, geotechnical assessment, and discussions with stakeholders, we will provide the following:

- A Trail layout and cross section plan
- B Bridge alignment and conceptual foundation plan
- C Construction staging and layout plan
- D Wall recommendations to stabilize the bluff

2.4 Outreach - Review Preliminary Plan. We will complete an outreach effort as defined in Task 1.6 to inform stakeholders and residents of the preferred bridge and coastal protection plans.

2.5 Project Management and Coordination. We will complete project management as defined in Task 1.8. We will complete up to three (3) meetings during this phase.

Deliverables: The following summarizes deliverables we will provide during this task:

- i Existing Conditions Mapping
- ii Geotechnical assessment
- iii Preliminary plans
- iv Notes related to community comment
- v Meeting notes and progress schedule

TASK 3: CONSTRUCTION DOCUMENTS

Objective: The team will prepare construction documents for use in permitting, bidding, and construction.

3.1 Construction Documents: The team will prepare Plans, Specifications, and Estimate at the 65%, 95%, and 100% level including:

- A Title Sheet
- B Existing Conditions Plan
- C Pedestrian and Bicycle Detour Plan
- D Site Access Plan
- E Demolition Plan
- F Bridge Layout General Plan
- G Abutment Details 1 and 2
- H Utility Plan
- I Wall Layout Plan
- J General Details
- K Erosion Control Plans
- L Specifications
- M Bid Schedule and Opinion of Probable Construction Cost

3.2 Approval. Consistent with our outreach approach in the 35% and 65% submittals, we will use the 95% submittal to coordinate approval with the following agencies:

- A City of Half Moon Bay Encroachment Permit
- B Public Utility Relocations
- C Presentation to the Midcoast Community Council

We will provide documents to Denise Duffy and Associates to secure approval with the following agencies:

- A California Department of Fish and Wildlife - Section 1600 Streambed Alteration Agreement
- B Regional Water Quality Control Board - Clean Water Act Section 401 Permit
- C California Coastal Commission - Coastal Development Permit
- D United States Army Corps of Engineers Section 404

3.3 Project Management and Coordination. We will complete project management as defined in Task 1.8. We will complete up to three (3) meetings during this phase.

Deliverables: The following summarizes deliverables we will provide during this task:

- i We will provide electronic (CAD and PDF) and hardcopies (mylar, bond, and/or venum) of all documents as requested by the County.
- ii Meeting notes, progress schedule, and schedule

TASK 4: BIDDING AND CONSTRUCTION SUPPORT

4.1 Bidding Support. During the bidding phase, we will provide the following:

- A. Pre-bid Meeting.** We will attend a pre-bid meeting scheduled by the County to answer questions from prospective bidders.
- B. Issue Addenda and Clarifications.** Our team will respond to bidder's questions with addenda and/or written clarifications.

4.2 Construction Support. During construction, we will provide the following support:

- A. Review Submittals:** Our team will review up to twenty contractor submittals.
- B. Respond to Requests for Information (RFI):** The design team will respond to up to twenty Requests for Information from the contractor – if necessary, we will prepare modifications or revisions related to the project's original scope of work.
- C. Field Visits / Meetings:** Paris CSW will attend a pre-construction conference to respond to questions concerning the plans, specifications and estimates. Additionally, we assume up to four (4) construction meetings as requested by the County in response to questions regarding the progress of the construction activities.
- D. Punch List:** Near the completion of construction, our team will review the project in coordination with staff to develop a list of items that do not comply with the project documents and require correction.

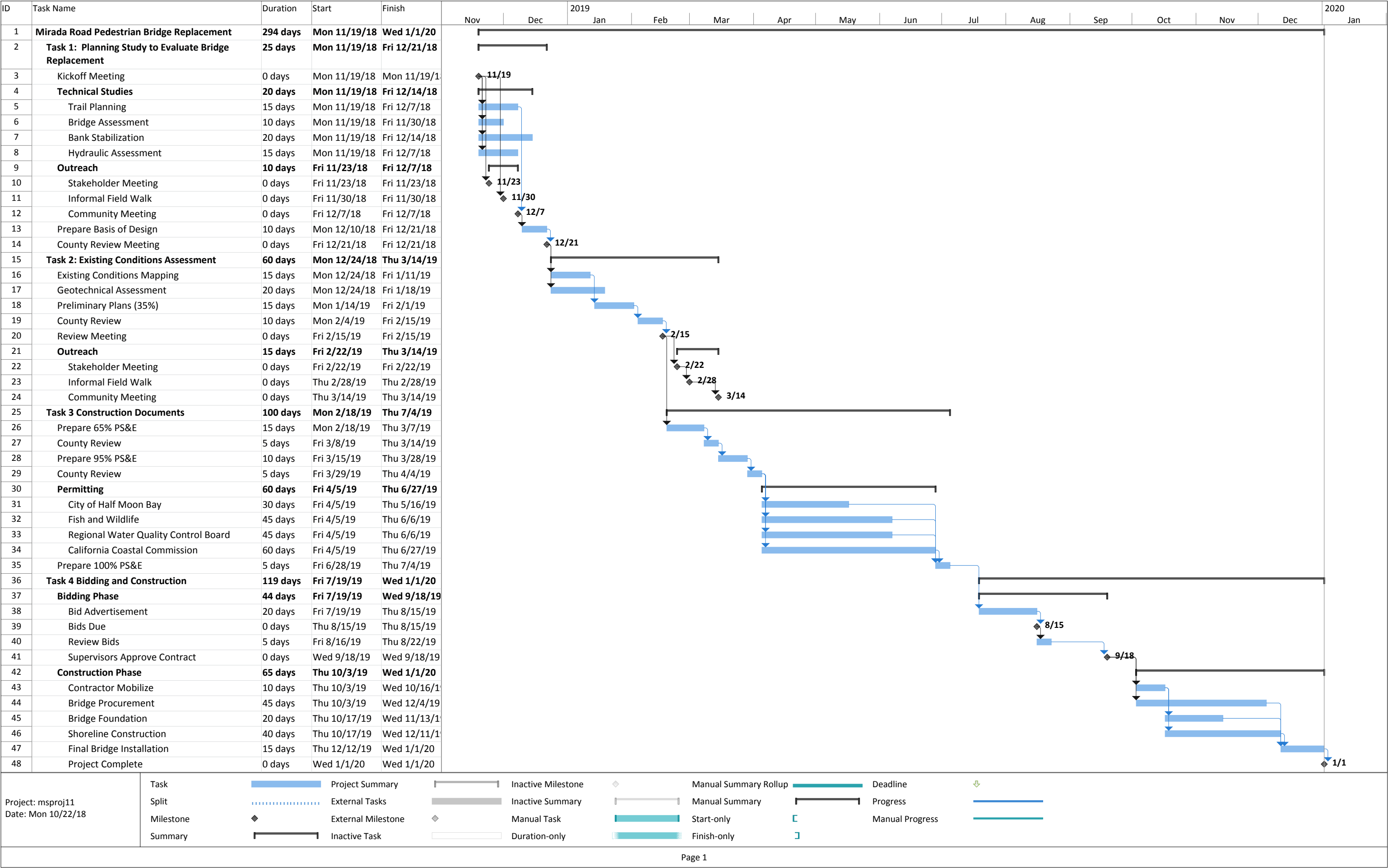
Deliverables: The following summarizes deliverables we will provide during this task:

- i Bid addenda
- ii Response to Contractor Submittals and RFIs
- iii Punch List and final record drawings

ASSUMPTIONS

We have made the following assumptions in preparing our work plan:

1. The project will be the replacement of the existing Mirada Road Bridge and bank stabilization will be limited to protecting the bridge abutments and adjoining bluff failure.
2. The County's environmental consultant will be responsible for coordinating all agency permits as well as preparing the environmental document. Our team will provide a project description, drawings, and technical details to support the application.
3. The project will not require a hydraulic analysis of the alternative bridge location.
4. The project will generally follow the design schedule detailed in our proposal.



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MIRADA ROAD PEDESTRIAN BRIDGE		Parisi CSW Design Group							Cornerstone Structural Engineering Group					Moffat and Nichol			Parikh Consultants					
		Project Manager, Surveyor, and Engineer							Bridge Engineer					Coastal Engineer			Geotechnical Engineer					
SUMMARY OF LABOR EFFORT		Robert Stevens Project Manager	Rich Souza Project Engineer	Paul Nagengast Outreach	Varies Staff Engineer	Varies Surveyor	Total Hours	Total Parisi CSW Fee	Tom Swayze Principal	Bobby Zermeno Project Engineer	Serjic Lalehzarian Staff Engineer	Shawn Cullers QC/QA Manager	Mark Weaver QC/QA Engineer	Dilip Trivedi Principal	Neil Nichols Coastal Engineer	Varies Designer	David Wang Principal	Varies Project Engineer	Varies Staff Engineers	Varies Field Engineer	Total Hours	Total Fee
<div><div>Parisi</div><div>CSW DESIGN GROUP</div></div> <div>10.22.2018</div> <div>Billable Rate (\$/ hour)</div>		205.00	200.00	190.00	145.00	240.00			215.00	130.00	105.00	160.00	145.00	266.00	229.00	167.00	270.00	130.00	100.00	130.00		
Task 1 Planning Study to Evaluate Bridge																						
1.1	Assemble the Project Development Team	4		4			8	\$1,580													8	\$1,580
1.2	Trail Planning	30	34	8	45		117	\$20,995													117	\$20,995
1.3	Bridge Assessment						0	\$0	2	6											8	\$1,210
1.4	Bank Stabilization						0	\$0						4	16	40					60	\$11,408
1.5	Hydraulic Assessment						0	\$0						2	8	12					22	\$4,368
1.6	Initial Outreach - Project Introduction																					
	Stakeholder Meetings	4					4	\$820						2	8						14	\$3,184
	Informal Site Walk	4		4			8	\$1,580													8	\$1,580
	Community Meeting	5		5	4		14	\$2,555	4	12	16										46	\$6,655
1.7	Basis of Design	4	10		16		30	\$5,140	2	6				8	16	24					86	\$16,150
1.8	Contract Management																					
	Project Management	12					12	\$2,460	2	4											18	\$3,410
	QA/QC	4					4	\$820	2	4		2	4								16	\$2,670
	Meetings	6					6	\$1,230	4	8											18	\$3,130
Task 1 Planning Study to Evaluate Bridge		73	44	21	65	0	203	\$37,180	16	40	16	2	4	16	48	76	0	0	0	0	421	\$76,340
Task 2 Existing Conditions Assessment																						
2.1	Existing Conditions Mapping	2	4		20	10	36	\$6,510													36	\$6,510
2.2	Geotechnical Analysis						0	\$0									28	60	90	30	208	\$28,260
2.3	Preliminary Plan (35%)	6	16		20		42	\$7,330	2	6	12			16	40	64					182	\$33,904
2.4	Outreach - Review Preliminary Plan																					
	Stakeholder Meetings	4					4	\$820						4	8						16	\$3,716
	Informal Site Walk	4		4			8	\$1,580													8	\$1,580
	Community Meeting	4		4			8	\$1,580													8	\$1,580
2.5	Contract Management																					
	Project Management	10					10	\$2,050													10	\$2,050
	QA/QC	4					4	\$820				2									6	\$1,140
	Meetings	6					6	\$1,230													6	\$1,230
Task 2 Existing Conditions Assessment Subtotal:		40	20	8	40	10	118	\$21,920	2	6	12	2	0	20	48	64	28	60	90	30	480	\$79,970
Task 3 Construction Documents																						
3.1	Prepare Construction Documents																					
	65% PS&E	4	16		30		50	\$8,370	9	28	60			24	80	140					391	\$68,329
	95% PS&E	2	10		20		32	\$5,310	2	12	16			16	40	80					198	\$35,756
	100% PS&E	2	8		10		20	\$3,460	2	10	12			4	16	40					104	\$17,858
3.2	Coordination with Stakeholders and Approval	8	16	6			30	\$5,980													30	\$5,980
3.3	Contract Management																					
	Project Management	10					10	\$2,050													10	\$2,050
	QA/QC	8					8	\$1,640				6	12								26	\$4,340
	Meetings	6					6	\$1,230													6	\$1,230
Task 3 Construction Documents Subtotal:		40	50	6	60	0	156	\$28,040	13	50	88	6	12	44	136	260	0	0	0	0	765	\$135,543
Task 4 Bidding and Construction Support																						
4.1	Bidding Support																					
	Pre Bid Meeting	2					2	\$410													2	\$410
	Issue Addenda and Clarifications	1	6				7	\$1,405	1	2					4	12					26	\$4,800

MIRADA ROAD PEDESTRIAN BRIDGE		Parisi CSW Design Group Project Manager, Surveyor, and Engineer						Total Parisi CSW Fee Fee	Cornerstone Structural Engineering Group Bridge Engineer					Moffat and Nichol Coastal Engineer			Parikh Consultants Geotechnical Engineer				Total Hours	Total Fee
		Robert Stevens Project Manager	Rich Souza Project Engineer	Paul Nagengast Outreach	Varies Staff Engineer	Varies Surveyor			Tom Swayze Principal	Bobby Zermeno Project Engineer	Serjic Lalehzarian Staff Engineer	Shawn Cullers QC/QA Manager	Mark Weaver QC/QA Engineer	Dilip Trivedi Principal	Neil Nichols Coastal Engineer	Varies Designer	David Wang Principal	Varies Project Engineer	Varies Staff Engineers	Varies Field Engineer		
SUMMARY OF LABOR EFFORT		205.00	200.00	190.00	145.00	240.00			215.00	130.00	105.00	160.00	145.00	266.00	229.00	167.00	270.00	130.00	100.00	130.00		
10.22.2018 Billable Rate (\$/ hour)																						
4.2 Construction Support																						
Review Submittals			2				2	\$400	2	16	36				8	16					80	\$11,194
Review RFIs			2				2	\$400	4	8	8				8	16					46	\$7,644
Field Visits		4					4	\$820	4	16					16	8					48	\$8,760
Punch list		1					1	\$205	1	2											4	\$680
Task 4 Bidding and Construction Support Subtotal:		8	10	0	0	0	18	\$3,640	12	44	44	0	0	0	36	52	0	0	0	0	206	\$33,488
Total Labor Expenses:		161	124	35	165	10	495	\$90,780	43	140	160	10	16	80	268	452	28	60	90	30	1872	\$325,341
Reimbursable Expenses																						
Postage, Printing, and Travel								\$500	\$1,500					\$1,200								\$3,200
Geotechnical Assessment																	\$7,700					\$7,700
Total Reimbursable Expenses:								\$500	\$1,500					\$1,200			\$7,700					\$10,900
Total Parisi CSW Design Group Fee:								\$91,280	\$49,665					\$159,336			\$35,960					\$336,241