COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

James C. Porter
Director

County Government Center
555 County Center, 5th Floor
Redwood City, CA 94063
650-363-4100 T
650-361-8220 F
www.smcgov.org

June 03, 2020

Erik Martinez
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105

Re: Soil Nail Wall and Pedestrian Bridge Replacement Project on Mirada Road in Unincorporated San Mateo County (CDP Application Number 2-17-0289)

Dear Mr. Martinez,

This County of San Mateo Department of Public Works (County) is submitting the additional information identified in an Incomplete Filing Status letter dated May 22, 2017 for the Mirada Road Soil Nail Wall and Pedestrian Bridge Replacement Project (Project) in unincorporated San Mateo County and Half Moon Bay, CA.

The County submitted an application for a Coastal Development Permit on April 3, 2017 to construct soil nail reinforced, sculpted shotcrete walls to address the eroding shoreline at three locations along Mirada Road in the vicinity of the pedestrian bridge over Arroyo de en Medio. Since that time, corrosion and deterioration of the pedestrian bridge has been exasperated to the point that the County has determined it will need to be replaced as part of this project. The existing pedestrian bridge is a weathering steel truss bridge with wooden plank deck mounted on an abandoned concrete arch bridge. The concrete arch bridge foundation consists of cast-in-place reinforced concrete seat type abutments that were constructed using 24-inch diameter cast-in-drilled hole (CIDH) concrete piles. The abandoned arch bridge has experienced significant damage from wave action and bluff erosion that have resulted in partial collapse of the wingwalls and cracks in the arch that could result in large pieces on concrete falling onto the beach below.

The County would like to withdraw Permit Number 2-17-0289, and submit the enclosed new Coastal Development Permit application for the Mirada Road Soil Nail Wall and Pedestrian Bridge Replacement project in unincorporated San Mateo County.

The County proposes to complete the Project in two phases. Phase 1 will consist of constructing a channel access route that would be used for both Phases, constructing soil nail walls at three locations north and south of the existing bridge, demolishing the abandoned concrete arch bridge, and installing RSP at the base of the soil nail walls.

Phase 2 will consist of removing the existing steel truss pedestrian bridge, temporary shoring of the bluff on the northern bank of Arroyo de en Medio, demolition of the existing abutments, construction of two supplemental piles (one for each abutment), reconstruction of abutments and wingwalls, installation of two additional sections of soil nail wall to wrap around the exposed bluff sections, installation of pre-fabricated aluminum truss bridge, and construction of a safety barrier at the top of the bluff along Mirada Road on the north side of the pedestrian bridge.

Please find the following enclosures to address your incomplete filing letter and deem the San Mateo County Coastal Development Permit Application complete:

- Sand Supply Study
- Mirada Road Project Benefits and Alternatives Analysis
- Geotechnical Investigation
- 65 % Design Plans to Scale that include Staging and Access Areas and Drainage Plans
- Visual Simulations

If you have any questions regarding this submittal, please contact Theresa Engle at (650) 599-1448 or tengle@smcgov.org.

Very truly yours,

MC

Mark Chow
Principal Civil Engineer
Utilities-Flood Control-Watershed Protection

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G:\Users\utility\watershed_protection\PERMITS\WPS2016-004 Mirada Road Soil Nail Wall Project\CDP\CDP Application Package
Attachments:

cc: Krzysztof Lisaj, P.E., Senior Civil Engineer, Utilities-Flood Control-Watershed Protection
Theresa Engle, Resource Conservation Specialist, Utilities-Flood Control-Watershed Protection

Background

During El Nino storms early in the 2015-16 rainy season, the area immediately to the south of the Project area experienced extensive, rapid erosion due to high waves, king tides, and storm surges. Extensive erosion and failure of the bluff face occurred immediately north of the existing pedestrian bridge where an informal stairway had been built in an area where there was a gap in the existing shoreline revetment. On January 19, 2016, the County of San Mateo Department of Public Works (County) notified the United States Army Corps of Engineers (USACE) and San Francisco Bay Regional Water Quality Control Board (Water Board) of essential emergency slip-out repairs on Mirada Road, in Half Moon Bay, California. The City of Half Moon Bay initiated emergency permitting with the California Coastal Commission (CC) and received verbal approval from Nancy Cave on January 19, 2016. The proposed emergency repair work was titled the Mirada Road Emergency Slope Protection Project (Project) in the notification. On January 20, 2015, the County initiated emergency slope protection repairs which consisted of the placement of large diameter angular rock (rip-rap) at the base of the eroded bluff below Mirada Road as a temporary measure to prevent further failure of the bluff during the remainder of the storm season (See enclosed post-Construction Report). Although this rock helped to reduce damaging wave breaking energy, it did not prevent the continued loss of fine materials from the eroded bluff and roadway base.

In the winter of 2016-17, the County performed additional emergency repairs to the existing revetment structure protecting Mirada Road (Coastal Development Emergency Permit File Number G-2-16-0066). The existing shoreline revetment begins approximately 100 feet north of Magellan Road and ends approximately 100 feet south of Medio Avenue. Most areas along the revetment have large angular boulders which serve as energy dissipaters for oncoming waves. Over time, high energy waves and coastal conditions have caused boulders to shift from their original location towards the beach, leaving areas along Mirada Road unprotected from crashing waves. Gaps within the revetment allowed waves at undiminished energy levels to erode the bluff below Mirada Road between Medio Road and the existing Mirada Road Pedestrian Bridge and crash over Mirada Road resulting in deep undercutting along the roadway. The County identified 13 voids in the boulder revetment structure between Medio Road and Magellen Avenue that varied in length from approximately 20 to 60 linear feet, totaling approximately 432 linear feet. Repairs were made using an excavator, operated from the roadway, to strategically place the approximately 500 tons (355 cubic yards) of two- to four-foot diameter angular boulders within existing gaps of the revetment. The addition placement of boulders occurred primarily near the crest of the revetment but extended approximately 10 feet downslope in some areas. Rock was only added to portions of the revetment above the mean high tide line. Repairs did not affect the current aesthetic and scenic values of the area as the added rock was similar in shape, color, and size to the existing revetment boulders. The revetment repair activities took place for approximately 15 days. Emergency repair work on the revetment structure was conducted between October 24, 2016 and February 20, 2017.

On April 03, 2017, County applied for a Coastal Development Permit (CDP) to construct soil nail walls at three locations as a long-term solution along the eroding bluff below Mirada Road. On May 22, 2017, County received a letter from CC stating that application No. 2-17-0289 was incomplete. The letter listed additional information that would be required for a complete application and a submittal deadline of November 22, 2017.

On April 17, 2017, Ms. Engle sent an email to the CC explaining that the project footprint falls within the jurisdiction of San Mateo County and the city of Half Moon Bay, authorizing the CC to prepare a consolidated permit for the Mirada Road Soil Nail Wall Project in Half Moon Bay, CA. John Doughty, City of Half Moon Bay, sent a follow up email on April 17, 2017 supporting a consolidated permit and delegating filing and processing of the CDP to the County. In June 2017, the County emailed Renee Ananda to inquire about appropriate retreat rates for use in the Sand Supply Study for the project. In July 2017, the CC provided retreat rate guidance for the Sand Supply Study. During a site visit in September 2017, the County determined the existing concrete arch bridge had deteriorated so much it was posing a danger to public safety and would also need to be removed as part of the project.

On November 08, 2017, Ms. Engle emailed the CC to explain that the scope of the project had expanded to include replacing the pedestrian bridge over Arroyo de en Medio. Ms. Engle explained that since the original CDP application was submitted, the bluffs to the north and south of the pedestrian bridge had eroded considerably, causing the wingwalls of the pedestrian bridge to crack and large pieces to fall to the beach below. The County determined if the piers continued to be undermined, the structural integrity of the bridge would be compromised, and public safety could be threatened. Ms. Engle conveyed that the County was re-evaluating the design and requested an extension for the CDP application #17-0289 to modify the Project Description and provide a revised scope. Once the revised Project Description and Design were finalized, the supporting documents and permit applications would be updated accordingly and submitted to the CC. On December 11, 2017, Renee Ananda, emailed Ms. Engle an extension to submit revised application materials by April 20, 2018.

In 2018, progress on the project was slow for various reasons. The County had to program additional funding for the expanded scope, initiate the Request for Proposals (RFP) process to designate a design contractor, and award the project to a contractor. Once awarded, the design contractor conducted an alternatives analysis to determine the preferred alternative for the project. The County would like to withdraw the current application (No. 2-17-0289) and submit a new CDP that encompasses the emergency repairs previously completed along Mirada Road (ECDP No. G2-16-066) as well as the proposed long-term solution consisting of soil nail walls and rock slope protection and replacement of the pedestrian bridge.

Proposed Long-term Solution

County proposes to stabilize an eroding bluff, that experienced extensive erosion associated with storms during the 2015-16 and 2016-17 rainy seasons, using a combination of soil nail walls and rock slope protection (RSP) and the replacement of a deteriorating pedestrian bridge along Mirada Road in the unincorporated area of San Mateo County. The proposed project is located approximately 0.15 miles west of State Route 1 near the current pedestrian bridge that crosses Arroyo De En Medio Creek. The project will include removal of the existing pedestrian bridge, the concrete arch bridge beneath the current pedestrian bridge, and partial removal of the abutments and piles, as necessary, to install the new bridge system. The project will also include relocation of utilities supported by the existing bridge. The project will be broken into two phases of work based on the work window restrictions.

Project Description

To serve the Coastal Trail, the County proposes to remove the existing concrete arch bridge and metal pedestrian bridge as well as place a new aluminum pedestrian bridge crossing the Arroyo de en Medio. To protect the bridge, trail, roadway, utilities, and properties, the project would install shotcrete walls with tieback anchors as well as rock slope protection (RSP) along the bluff face and sections of the north and south banks of the Arroyo de en Medio. The project will also include relocation of existing utilities supported by the existing bridge.

The project will be constructed in two phases to maintain user access of the pedestrian bridge for as long as possible. The project elements including the pedestrian bridge, bluff stabilization, and utility improvements are shown in Figure 2. The general bridge plan is presented in Figure 3. The bluff stabilization plan and concept plan are illustrated in Figures 4 and 5. Details of the project are described below.

Description of Phase I Work

The Phase 1 work includes all the tasks necessary to stabilize the bluffs and prepare for the placement of the new pedestrian bridge. During this phase, the Coastal Trail will remain open to pedestrians and bicyclists. Prior to the contractor mobilizing on the site, public utilities including Pacific Gas and Electric (PG&E) and Granada Community Services District (GCSD) that possess infrastructure on the existing pedestrian bridge, will relocate their facilities. The demolition plan for the project is presented in Figure 6.

PG&E has both primary and secondary circuits in conduits crossing the pedestrian bridge. For the temporary relocation, PG&E will install utility poles on either side of the pedestrian bridge to facilitate the placement of overhead electrical cables. Once the project is complete, PG&E will deactivate the circuits and remove both the poles and conductors.

GCSD is currently working to re-route the 2-inch force main currently located on the pedestrian bridge. If this cannot be completed prior to the bridge's removal, GCSD may install a temporary bypass, which could include a hose or pipe routed across the Arroyo de en Medio. The force main currently serves about 25 homes located along and near Mirada Road.

To allow access for construction equipment to the beach, the project will install a temporary access road from the Mirada Road cul-de-sac into the Arroyo de en Medio. The access road will require approximately 30 to 40 cubic yards of temporary fill consisting of variously graded rocks to create a pathway approximately 15 feet wide and 60 feet long for construction equipment. If the creek is flowing during the construction period, water will be diverted from the work area through an appropriately sized pipe, which will be buried in sand.

Once equipment can access the beach, the contractor will remove the RSP placed in January 2016 as an emergency action to protect the eroding slope allowing access for the installation of the shotcrete walls. RSP would be temporarily relocated to an area on the beach approximately 15 feet from the bluff face to deflect wave action and prevent inundation of the work area if sand levels at the time of construction are low. If sand levels are high, preventing waves from striking the bluff, the RSP will be stockpiled on the beach.

To begin preparing for the construction of the shotcrete wall, the contractor will clear and grub the slope face to remove loose material and vegetation along the bluff north and south of the creek. Additionally, the contractor will remove concrete debris from the beach and creek. The contractor will dispose all debris in a facility capable of accepting the material. The walls would be about 170 feet and 110 feet in length along the north and south sides of the pedestrian bridge respectively. During this phase, the contractor will work along the exposed bluff but not under the existing pedestrian or concrete bridge.

Once the bluff is cleared, the contractor will drill tie back anchors into the bluff at intervals of 5 feet on center to a depth of no more than 25 feet. The base of wall will be at an absolute elevation of 8 feet based upon the North American Vertical Datum of 1988 (NAVD 88), which could require excavation into the existing sand depending upon its height at the time of construction. The top of the wall will be set slightly higher than the existing bluff elevation. The wall will be about 23 feet in height, which will vary as sand elevation changes at different times during the year.

The contractor will tie the anchors together with steel reinforcement and will spray the first layer of concrete. The final layer is the surfacing material, which will be sculpted and stained to match the coloring of the surrounding bluffs. However, this final layer will be installed once the entire wall including the phase 2 section is complete to facilitate a uniform appearance.

The contractor will integrate the existing 18-inch in diameter corrugated metal pipe which serves a drain inlet located within the Mirada Road cul-de-sac as well as the existing 6-inch storm drain on the north side of the bridge into the shotcrete wall. There are three locations where grout installation and/or shotcrete (sprayed on concrete) application will require a concrete containment plan. The three locations and containment plan details for each are described below.

- On the slope: Shotcrete will be applied by an American Concrete Institute (ACI) Certified Nozzleman. ACI training instructs specific procedures to mitigate against shotcrete sloughing during installation. As an added precaution, a tarp containment system will be placed under the shotcrete area to capture any shotcrete rebound or unintentional sloughing. The contents of the tarp catchment system will be removed and disposed of at an appropriate disposal facility offsite.
- At the concrete truck: After the concrete truck has been emptied, the contractor will either clean out the truck within itself (if supplier provides self-cleaning trucks) or within a concrete washout. If a concrete washout is used, all captured material will be removed and disposed of offsite.
- At the grout pump: The contractor will underlay the grout pump with a vinyl catchment system. Any grout material that is captured in the system will be removed and disposed of offsite.

The anticipated duration of all construction activities for Phase I will be approximately 45 working days: 3 days for the access road; 2 days to relocate RSP; 5 days for clearing and grubbing and 35 days for the soil nails. Work would only occur on non-holiday weekdays between the hours of 7 am – 4 pm, during times when the work area is dry (low tide). Construction equipment and materials storage are proposed to be stored along the Mirada Road cul de sac south of the current pedestrian bridge.

Description of Phase 2 Work

Phase 2 will include relocation of existing utilities, removal of the concrete bridge, removal of the existing pedestrian bridge, placement of the final shotcrete walls, installation of RSP, installation of the pedestrian bridge, and placement of final finishes including trail approaches.

The existing bridge will be lifted off of the existing abutments with a 400-ton seven axle crane (Liebher LTM 1400-7.1 or similar) staged immediately south of the southern abutment in parking area of 2 Mirada Road, resulting in an estimated pick radius of 110 feet. Once the bridge is lifted off the abutments, it will be lowered onto a flatbed trailer parked on Mirada Road and removed from the project site.

The removal of the existing concrete arch bridge would include use of an excavator with a breaker arm in addition to jack hammers. Track mounted equipment would be used to breakup the concrete bridge. A tarp containment system will be installed within the creek channel to capture any debris from the bridge demolition. Monitors will be present to ensure no debris leaves the project area and is left on the beach or within the channel at the end of each day. Debris will be loaded into dump trucks using a long reach excavator from the top of the bluff or using loaders that bring the debris to Mirada Road. Upon completion of the bridge demolition the tarp containment system will be removed and disposed of.

Once the concrete bridge is removed, the contractor would clear and grub the slope to prepare for the installation of the shotcrete concrete wall as described in Phase 1. Upon completion of the first layer of concrete the contractor will install the final textured and colored layer along the entire wall face.

Once the shotcrete walls have sufficiently cured, the contractor will reset the RSP at the base of the walls, which will include a backing layer of small rock (#2 or #3), an engineering fabric, and finally the armor rock (1/4 to 1/2 ton) facing the ocean. The base of the RSP will be set to an elevation of 2 feet and rise to about an elevation of 10 feet. Depending upon the depth of sand at the time of construction, the project may need to excavate, which could require about 4 feet of excavation. If excavation is required, upon completion of setting the RSP, the sand would be spread on the RSP.

The GCSD will trench and place a sanitary sewer pipeline north and south of the bridge re-routing the existing pipeline from the east side of the concrete bridge to approximately the centerline of the new pedestrian bridge. This will require routing the pipeline below and beyond the existing bridge abutments. Alternatively, GCSD will not install the sewer pipeline under the new bridge, but install infrastructure to re-route flows to their existing pump station in the Miramar neighborhood. Additionally, PG&E will complete limited trenching north and south of the bridge to connect the existing two 4-inch conduits to the new casings placed on the bridge.

In order to reuse the existing bridge abutments for the new pedestrian bridge, the contractor will clean and inspect the concrete and mounting hardware to confirm the as-built condition. The project will modify the abutments, which will include revising the bridge bearing material and installing a shear key on the southern abutment to improve seismic stability. The new prefabricated aluminum bridge will be installed using the same sized crane that was used for the removal of the existing bridge. The bridge will be picked up and positioned in place onto the modified bridge abutments and connected in place by either welding or fasteners.

Once the bridge is in place, the GCSD will suspend an 8-inch in diameter ductile iron sewer pipeline on anchors mounted under the new pedestrian bridge and connect to the pipeline buried below the abutments. This will not be done if GCSD re-routes sanitary sewer flows as previously described. PG&E will place two, 4-inch in diameter steel conduits on the bridge and route conductors through the conduits.

Upon completion of the work, any fill used for the access road will be removed and the slope re-graded to its original contours. The disturbed areas on the bank and shoulder will be stabilized with erosion control materials and seeded and/or planted with a native plant mix appropriate for the area. Due to disturbance to the trail approaches to the bridge, the project will remove and replace the asphalt concrete pavement. Finally, the project will install a cable rail fence that is approximately 36 inches in height on the northwest and southwest approaches to the bridge for public safety and to prevent pedestrians from accessing the slope.

The anticipated duration of all construction activities during Phase 2 is 40 working days: this includes 2 days for the pedestrian bridge removal; 5 days to remove the concrete bridge; 4 days for the sanitary sewer installation; 2 days for the electrical conduits installation; 15 days for the shotcrete walls; 5 days for RSP; 3 days for the new bridge installation; 2 days to place pavement and fencing; and 2 days to install the electrical conductors. Work will only occur on non-holiday weekdays between the hours of 7 am – 4 pm. Construction equipment and materials storage is proposed along the Mirada Road cul de sac south of the current pedestrian bridge.

Mitigation

Currently, the Mirada Road Bridge provides connectivity for the California Coastal Trail on the San Mateo Coastline. The County contends that the Mirada Road Bank Stabilization and Pedestrian Bridge Replacement Project is self-mitigating by preserving existing public access to the Coastal trail. The County conducted an Analysis Alternatives of four bridge designs to determine the preferred design. The preferred alternative was chosen because it satisfies the purpose and need of the project and maintains public access to the California Coastal Trail. Alternatives that were removed from consideration would require extensive environmental studies, significant right of way acquisitions, and substantial delays in replacing the deteriorated bridge. The proposed project would stabilize the actively eroding bluffs and replace the deteriorating bridge with a new pedestrian bridge that maintains public access to the Coastal Trail.

The County is looking at long-term solutions for maintaining the eroding section of Mirada Road from the bridge over Arroyo de en Medio north to Magellan Road. This effort is in the early planning stages and will require feasibility studies prior to moving forward with a design. One option being considered includes installing sheet piles along this eroding section of Mirada Road, backfilling behind the sheet piles to restore roadway width, and installing RSP in front of the sheet piles to deflect wave action. Another alternative under consideration would be changing Mirada Road to a single lane, one way road and maintaining the existing RSP.