**MIRADA ROAD PEDESTRIAN BRIDGE REPLACEMENT PROJECT**
**FREQUENTLY ASKED QUESTIONS**
January 2021

1. **Why is the bridge closed?**

   Significant corrosion of the steel bridge has compromised its structural integrity and it is no longer safe for use by pedestrians and bicyclists.

2. **Why is the bridge being replaced in the same location and not shifted inland?**

   The County of San Mateo (County) studied many options to replace the bridge including shifting it inland to Alameda Avenue or State Route 1. The principal benefits of maintaining the bridge in its current location is preserving and reusing the existing foundations, which are typically the largest cost of a bridge project and which will also reduce the construction impacts.

3. **Can the bridge be installed, and bluff protection installed later?**

   For constructability, the County prefers to install the bluff protection without the bridge in place. This will provide adequate room for personnel and equipment to install the anchors into the bluff. In addition, the County is concerned that placing the bridge without the bluff protection could potentially compromise the investment should erosion occur that undermines the existing foundation.

4. **Will the County have to relocate the bridge in the future due to sea level rise, effectively paying twice for a crossing?**

   The bridge replacement in its current location is intended to return the Coastal Trail into service as quickly as possible. If the most conservative estimates of sea level rise projections (that which has a 0.5% probability of occurrence) were to materialize, within the next 40 years, waves will begin overtopping Mirada Road. To plan for this scenario, the County is evaluating options to relocate the crossing of the Arroyo de en Medio to the east. This will require community outreach, planning, permitting and an environmental process. Replacing the bridge in its current configuration can get the trail open in 2021 and protect Mirada Road for worst case sea level rise projections over the next 40 years. This provides time for the County, community, and stakeholders to evaluate long term options to cross the Arroyo de en Medio

5. **If erosion south of Mirada Road closes the trail, what is the purpose of the new bridge?**

   The Arroyo de en Medio creates a physical barrier for bicyclists and pedestrians within the Miramar community. The only viable route across it for non-motorized access is the Coastal Trail and State Route 1. Thus, the current pedestrian bridge serves an important link for Miramar residents traveling north and south along the coast side.

6. **Why did the County select this option to protect the bluff?**
   The wave energy along this section of the San Mateo Coastline is high, producing a load of about 22,000 pounds per foot on the bluffs. The bluffs are geologically young and tend to erode. Thus, regardless of human activity and the impacts of sea level rise, the bluff will continue to erode destabilizing Mirada Road and the pedestrian bridge. The County evaluated several options to protect the bluff including a full height rip rap revetment, full height concrete wall with tie backs, full height concrete pile wall, and a hybrid solution.

   The full height rip rap revetment would place rock from the beach level to the top of the bluff in a similar condition as occurs along Mirada Road. This is not a preferred solution as it consumes beach area. A full height concrete wall with either tie backs or piles is a major structure that has a long life but very high construction cost. The hybrid system includes rock rip rap placed at the lower level and the concrete tie-back wall atop. This option provides a minimum design life of about 40 years but as much as about 60 years for the most likely estimates of sea level rise at a reasonable cost allowing the County and stakeholders additional time to plan for the future of Mirada Road.

7. **Why does the preferred bluff stabilization method include both rock and concrete?**
   To support this response, we will use elevation references that are based upon the North American Vertical Datum of 1988 (NAVD88). NAVD88 is an absolute elevation of the ground's surface. For reference, at this location the elevation of mean lower low water is about 0 feet (i.e. 0 MLLW ~ 0 NAVD88), while the elevation of Mirada Road is approximately 30 feet. Therefore, Mirada Road is about 30 feet higher when the tide is at mean lower low water.

   The proposed bluff stabilization has two components including rock rip rap placed at the base of the bluff and a concrete tie-back wall with anchors above. The rock rip rap is placed on the hard sediment located beneath the sand at an elevation of about +2 feet extending 8 feet high to an elevation of +10 feet in accordance with NAVD88. The concrete wall extends from elevation +8 to about +30 feet based upon NAVD88; the rock rip rap covers about 2 feet of the lower wall.

   During the year, the sand elevations at this location can vary from about 2 feet in the winter to more than 11 feet in the summer. Thus, during most of the year, visitors will not see the rock, effectively maximizing the usable beach area for most of the year.

8. **Will the project include drainage within the retaining wall to protect the bluff?**
   The rock rip rap and concrete wall includes features to reduce the potential that wave surges will dislodge soil behind the wall destabilizing the bluff. Prior to placing the rock rip rap, the project will install a geotextile fabric along the bluff's face that prevents fine soil particles from being dislodged. In addition,

the project will place a careful selection of rocks of varying sizes on the fabric to anchor it in-place stabilizing the slope. Finally, prior to placing the concrete wall, the project will install a geocomposite drain along the bluffs that will allow water to flow without disturbing soil.

**9. Has the rock installed by the County along Mirada Road bluff in 2017 created additional erosion near the bridge?**

The County has observed the performance of the rock rip rap, unprotected bluff, and concrete bridge and has observed no increase in erosion. See the following photographs illustrating conditions.

July 2018

December 2020

**10. Will the bluff stabilization reduce sand deposition and decrease beach area?**

Beaches are primarily generated by one or more of the following mechanisms:

1. Sand that moves offshore in the winter and returns in the summer;
2. Sand that is transported from up-coast or down-coast areas (depending on direction of net longshore transport), which deposits in the project area; and
3. Sand that is supplied from other sources such as bluff erosion or adjacent creeks/rivers.

Along this section of the San Mateo County coastline, sand sources for beaches are a combination of all three of the previously described mechanisms. Onshore-offshore processes dominate the stability of the beach fronting the Mirada Pedestrian Bridge. Placement of a sea wall or other shore armoring strategies can cause enhanced reflection of the waves destabilizing the beach. However, the proposed bluff stabilization technique is designed to minimize wave reflection.

In the current condition, the Mirada Road shoreline is presently armored with large riprap. The proposed bluff stabilization will result in the removal of the riprap above the summer dry beach and replacement with a smaller footprint structure that is a combination of rock rip rap placed below the summer dry beach and a concrete wall located above the summer dry beach. Thus, in the winter when sand levels are low, a beachgoer will see both the rock rip rap and the concrete wall. In the summer, the beachgoers will generally only see the concrete wall.

For the lower beach conditions that occur in the winter and spring seasons, the amount of reflected wave energy will not increase from the current condition. Additionally, as the rip rap will be located closer to the bluff, there will be a larger footprint of area available for sand accretion. For higher beach conditions during the summer and fall seasons, the removal of rock rip rap will offer a larger area of sand providing an additional buffer area resulting in a reduction of reflected wave energy.

Based upon a soil analysis of the bluffs along Mirada Road, the soil is a clayey sand with little to no medium-coarse grained material. As the bluff contains few coarse particles, it does not contribute significantly to beach building processes along the coastline. Thus, the installation of the bluff stabilization at this location is not expected to significantly alter the beach building processes.

**11. Will this wall create additional erosion along the coastline?**

Please see the response to item 10 above.

**12. What is the impact to the creek associated with the bluff stabilization?**

The proposed project removes the old concrete roadway bridge and replaces it with a more effective bluff stabilization system. This results in an increase in the flow area for the creek. The increase in flow area reduces velocity thus reducing the potential or erosion within the creek.