Memorandum

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HELIX Environmental Planning

Date: **February 6, 2017**

To: **Tina Sok, Calaveras County Public Works Department**

cc:

From: **Charles Terry, HELIX Environmental Planning, Inc.**

Subject: **Construction Noise Impact Planning for the Whiskey Slide Road over Jesus Maria Creek Bridge Replacement Project**

HELIX Project: **TYL-04.2**

Message:

At your request, HELIX Environmental Planning, Inc. (HELIX) has reviewed construction noise impact planning to nearby properties for the Whiskey Slide Road over Jesus Maria Creek Bridge Replacement Project (project).

Site Information

The County of Calaveras is planning to replace the existing bridge at Whiskey Slide Road over Jesus Maria Creek, bridge number 30C0062, located in unincorporated, central Calaveras County. The bridge is approximately 2.5 miles southeast of the intersection of Whiskey Slide Road with Jesus Maria Road, and approximately 3.5 miles northwest of the intersection of Whiskey Slide Road with Mountain Ranch Road in the town of Mountain Ranch, California. The project site is approximately 3.9 acres, with the entire site conservatively assessed as being disturbed during construction.

The existing roadway and bridge pass through privately owned property within an implied dedication easement. The property is a residential property with cleared pastures used for ranching and undeveloped forested land. Two single-family residences are on the property east of the project site. Both residences are accessed by a driveway that intersects Whiskey Slide Road from the east, north of Jesus Maria Creek.

The existing bridge is a single-span steel girder structure with a concrete deck and is approximately 42 feet long and 14.4 feet wide. From the south, the existing roadway approaches Jesus Maria Creek from the southwest and then goes across the bridge at a slight skew from the creek. North of the bridge, the roadway turns northwestward in an approximately 90 degree turn, and continues to the northwest. In the project area, Whiskey Slide Road is a rural local road in mountainous terrain with a 10- to 11-foot-

wide paved roadway and narrow shoulders. The project area is in a low traffic volume area that primarily serves local traffic, including local residents. The average daily traffic volume on the bridge is approximately 93 vehicles.

Project Description

The purpose of the project is to bring the bridge up to current geometric and structural standards. The proposed project consists of removing and replacing the existing bridge over Jesus Maria Creek and replacing it with a new bridge crossing the creek approximately 30 feet west of the existing bridge alignment as well as realigning and widening Whiskey Slide Road at the bridge approaches to accommodate the new bridge.

The new bridge would be an approximately 60-foot-long, 23.3-foot-wide cast-in-place or precast concrete single-span bridge or two-span standard slab bridge supported in the creek on a pier wall. The bridge would feature a 20-foot-wide travel way between two traffic barriers. The vertical profile of the new bridge would be approximately 6 feet higher than the existing bridge deck. Approach improvements would extend approximately 220 feet from the bridge to the south along a generally tangent alignment and 350 feet from the bridge to the north along the curved alignment. Whiskey Slide Road would be raised, widened, and realigned along the bridge approaches to accommodate the new bridge. The vertical profile and horizontal alignment would gradually conform back into the existing roadway at the project limits. The roadway width at the new approaches would transition from a 14-foot-wide to a 20-foot-wide travel way with guardrails along the edges of roadway. Refer to the attached map for the site design.

The project would be constructed over two construction seasons in multiple stages. No detours would be required during project construction, and the roadway and bridge crossing would remain open throughout construction. Traffic disruptions through the project limits would be minimized by staging construction of the roadway approaches to maintain, at a minimum, a single lane of through traffic throughout the duration of construction.

Ground disturbing activities include clearing and grubbing all work areas, grading and leveling of the staging areas, roadway excavation along the bridge approaches and driveway reconnections, placing fill into the channel along the regraded embankments, installing rock slope protection, and removal of the existing bridge. Deeper excavation associated with constructing the bridge abutments and retaining wall, rock slope protection keyway, and geotechnical borings will occur at the site of the bridge crossing. Excavation for the bridge abutments should not exceed 20 feet in depth.

Two staging areas are proposed and both would be located on the private property through which the road passes. An approximately 0.07 acre staging area is proposed in the northeast portion of the project site. It would consist of a partially cleared area south of the existing driveway. Another approximately 0.12 acre staging area is proposed east of Whiskey Slide Road, in a pasture/lawn.

Metrics

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}.

Calaveras County regulates construction noise through Chapter 9.02, Noise Control, of the Calaveras County Code of Ordinances. According to Chapter 9.02, noise from construction activities is exempt from the County's noise level standards provided that all construction in or adjacent to residential areas shall be limited to the daytime hours between 7:00 a.m. and 6:00 p.m., unless otherwise subject to conditions in a valid discretionary land permit that addresses construction noise associated with the project.

Calaveras County does not have any established performance standards regarding groundborne vibration levels from construction activities. Therefore, for purposes of this analysis, the "severe" impact criterion of 0.4 inches per second peak particle velocity (PPV) for vibration is utilized from the California Department of Transportation's (Caltrans') 2013 *Transportation and Construction Vibration Guidance Manual*.

Construction Equipment

Construction would require heavy equipment during foundation excavation for the bridge abutments. Construction equipment utilized during this phase would include an excavator and a dump truck and a tracked drill with concrete pumper and concrete truck. Clearing and grubbing would require the use of chainsaws to cut down trees. Construction equipment used at the staging location would include a front-end loader, dump truck, and a generator

Construction Noise Impacts

Construction noise would be greatest during excavation for the bridge abutment, removal of trees, and at the staging location. During excavation for the bridge abutment, an excavator and a dump truck would be expected to run separately from the tracked drill with concrete pumper and the concrete truck. A conservative estimate would have the excavator, dump truck, and concrete truck being operated for 40 percent of an 8-hour construction day, and the tracked drill with concrete pumper operating for 20 percent of an 8-hour construction day.

The use of a chainsaw to remove trees would be operated for 20 percent of an 8-hour construction day. At the staging location, the front-end loader and dump truck would be operated for 40 percent of an 8-hour construction day and the generator would be operated for 50 percent of an 8-hour construction day.

Noise levels were estimated without accounting for shielding or topography. Project construction noise was analyzed using the U.S. Department of Transportation's Roadway Construction Noise Model (RCNM), which utilizes estimates of sound levels from standard construction equipment.

The two residences east of the project site are considered to be noise sensitive land uses. Refer to the attached map for the locations of the two residences (the noise sensitive land use points on the map are placed at the point of the structure nearest to the project).

The residence nearest to the project site (Receiver 1) is located approximately 200 feet from the north end of the bridge where foundation excavation would occur and 180 feet from the nearest tree where chainsaw operation may occur. During foundation excavation, the operation of an excavator and dump truck would generate a noise level of 66.1 dBA L_{EQ} at 200 feet and the tracked drill with concrete pumper and concrete truck would generate a noise level of 67.2 dBA L_{EQ} at 200 feet. During tree removal, a chainsaw would generate a noise level of 65.6 dBA L_{EQ} at 180 feet. The residence located further east (Receiver 2) is located approximately 375 feet from the north end of the bridge and 325 feet from the nearest tree where chainsaw operation may occur, so noise levels would be reduced from those experienced at Receiver 1.

A staging area is proposed east of Whiskey Slide Road, north of the driveway accessing the residences. The staging area would be over 100 feet from Receiver 1 and 225 feet from Receiver 2. At the staging location, a front-end loader, dump truck, and generator[1] would generate a noise level of 74.3 dBA L_{EQ} at 100 feet.

Construction noise would be regulated by Chapter 9.02 of the Calaveras County Code of Ordinances, which states that construction activities are exempt from noise standards if they take place during daytime hours between 7 a.m. and 6 p.m. Project construction would only occur during these exempted hours. Therefore, construction noise impacts are less than significant and no mitigation would be required.

Construction Vibration Impacts

The nearest vibration-sensitive land use from project construction is a single-family residence, located approximately 100 feet from the closest extent of the project footprint. An on-site source of vibration during project construction would be a vibratory roller, which would be used for road compaction during modifications to Whiskey Slide Road. A vibratory roller would create approximately 0.210 inches per second PPV at a distance of 25 feet (Caltrans 2013[2]). Using the Caltrans criterion of 0.4 inches per second PPV at 25 feet, the approximately 0.210 inches per second PPV vibration impact would be less than what is considered a “severe” impact. Therefore, although vibration may be perceptible by nearby residences (the nearest of which would be 100 feet from the vibratory roller), temporary impacts associated with the vibratory roller (and other potential equipment) would be less than significant.

[1] It is recommended that a generator be positioned as far as possible from residences, and if possible, behind any job office structures to provide additional shielding from residences.

[2] Caltrans 2013. *Transportation and Construction Vibration Guidance Manual*, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office, September.

Conclusion

If project construction occurs during the exempted hours (7 a.m. to 6 p.m.) in the Calaveras County Code of Ordinances, impacts to noise-sensitive land uses from construction noise would be less than significant and no mitigation would be required. Impacts from construction-generated vibration would be less than significant.

Regards,

Charles Terry — February 6, 2017 Date

Attachments

Noise Sensitive Receiver Locations Map