

**BART Agreement Number: 6M8121**

**Approval Date: 01/18/18**

**Work Plan No. B.05 - Slope Stabilization near Camino Diablo Road and MOW  
12 15TC002**

**Scope:**

### **Review of Existing Geological and Geotechnical Information**

Available existing geological and geotechnical information shall be reviewed to assess the existing conditions that may have contributed to the landslides at the two slopes. Available existing geotechnical information may include subsurface investigation data; geotechnical reports; as-built drawings of the slopes, including the associated surface and subsurface drainage systems; maintenance and survey records of the two slopes; and maintenance records of surface and subsurface drainage systems for the two slopes.

### **Review of Aerial Photogrammetry**

Available aerial photographs and records of geologic shall be reviewed to observe indications of the source and causes of erosion at the two slopes, to support development mitigation measures for erosion control. Specific activities include:

- Collection and review of information regarding the engineering of the existing slopes (e.g. cuts, slopes, drainage systems installed, if any) and the operational issues and history of slope erosion events;
- Compilation of geologic information to characterize the geologic materials exposed in the slopes; and
- Review of historical aerial photographs spanning the period since construction to assess visual evidence of surface drainage and erosion issues on the slopes in question.

### **Site Reconnaissance**

Site reconnaissance shall be performed to observe, recognize, and record/map those surficial features that may affect the stability of existing slopes, and to the drainage facilities. The site reconnaissance is used to supplement and check the accuracy of the information gathered from desk studies and aerial photos.

### **Geotechnical Investigation**

EMI will conduct a geotechnical investigation for the project. This investigation will include field investigation and laboratory testing.

## Field Investigation

A geotechnical investigation program, consisting of 10 borings (five each at a depth of 90 feet and five each at a depth of 30 feet for a total depth of 600 feet), will be conducted and boring logs will be prepared for use in determining the subsurface conditions of the two slopes for design of slope stabilization. High groundwater levels are anticipated which probably have caused the surficial sliding of slope face. Four piezometers will be installed in some of the geotechnical boreholes. Upon installation, the engineer will monitor and document the groundwater levels every month for a period of one year. In addition, three inclinometer casings will be installed to monitor the slope movement for a period of one year. The inclinometers will be monitored monthly or after heavy rains to detect any deep seated failure plane below the slope. The combination of groundwater levels and inclinometer readings will provide information about potential stability issues with the slope.

The boring locations and instrument locations will be determined after studying the available data. The borehole locations will be shown on a Boring Location Plan and will be submitted for Parsons and BART approval.

EMI field personnel will collect soil samples for laboratory testing. Subsurface material will be logged during the field investigation. Sampled will be wrapped in plastic bags, secured in core boxes, and transported to the EMI laboratory.

## Laboratory Testing

EMI will select representative rock/soil samples for laboratory testing. Various laboratory tests will be performed to determine or derive physical and engineering characteristics of the rocks/soils. The anticipated laboratory soil tests include: moisture and density, Atterberg limits, corrosion tests, consolidation test, direct shear test, triaxial and unconfined compression. Tests will be conducted in general accordance with California Test (CT) methods or American Society for Testing and Materials (ASTM) standards.

**Prime:** Parsons Transportation Group Inc.

Subconsultant	Amount	DBE (Y/N)	SBE (Y/N)
Earth Mechanics Inc.	\$228,968	Y	Y

**Total Work Plan Value:** \$262,332