

# ASSISTANT BRIDGE ENGINEER

## **Job Description:**

Perform design of structures. Design includes:

- Perform geometric design and layout. Includes determining bridge type, lengths, widths, span, column and footing configurations. Determine retaining wall length, height and type.
- Perform finite element analysis of steel truss bridges utilizing multi-purpose finite element programs, such as CSI SAP2000. Analysis includes generating model with beam and shell elements with dead and traveling live load. Seismic analysis includes utilizing multi-purpose finite element program to perform multi-modal response spectrum analysis. Perform seismic time-history analysis.
- Perform seismic analysis of bridges. Determine displacement demands from equivalent static analysis and/or multi-modal response spectrum analysis. Determine displacement capacities from moment-curvature and pushover analysis. Calculate ductility demands.
- Design bridge superstructures using bridge design programs such as VBridge, PGSuper, and SAP2000. Determine load demands from live, dead, wind, temperature, etc. Determine prestressing and reinforcement needed for cast-in-place posttensioned prestressed concrete bridges, precast prestressed concrete bridges, and reinforced concrete bridges. Design member sizes and bracing for steel members.
- Design bridge substructure footing, column, bent cap and abutment elements using VBent, spreadsheets, and/or SAP2000. Determine member sizes and reinforcement required, and number and configuration of footing piles.
- Analyze and design large diameter concrete cast-in-drilled-hole piles, utilizing LPile for soil-structure interaction and SAP2000 for force demands and seismic pushover displacements.
- Design soldier pile walls with and without ground anchors. Make engineering decisions including retaining wall layout, steel pile size, number of ground anchor. Calculate ground anchor forces, structural bid item quantities.
- Design sign structures. Determine the structure layout based on required minimum clearance. Determine the dimension of structural elements. Calculate structural elements demands using engineering program SAP2000. Calculate elements capacity.
- Oversee the development of structure plans and ensure the design is properly represented.
- Coordinate with road, geotechnical and hydraulic engineers:
- Work closely with geotechnical engineers to develop foundation supports. Provide geotechnical engineer structure configuration and foundation loading. Participate in selection of foundation type considering constructability, environmental impacts, scour and costs. Review and comment on foundation reports.
- Provide hydraulic engineers structure geometric data. Determine bridge configuration and stream conveyance area needed. Coordinate with hydraulic engineer to design bridge elevation, lengths, and span configuration. Incorporate into structure design anticipated scour depths and rock slope protection size and limits. Oversee the development of structure plans and ensure the design is properly represented. Review and comment on hydraulic reports.
- Coordinate with road engineers for structure horizontal and vertical alignments and to ensure needed utilities and drainage systems are accommodated on the structure. Oversee the development of structure plans and ensure the design is properly represented.
- Design structure supports and connections for structure lighting as required. Oversee the development of structure plans and ensure the design is properly represented.
- During construction:
- Review construction submittals and prepare draft responses to RFIs (request for information).
- Review, comment on and approve shop plans for prestressed concrete, structural steel members, bridge railings, and ground anchor systems.

## **Job Requirement:**

- Master's degree in Civil Engineering or Civil and Environmental Engineering

**Jobsite & Interview:** Folsom, CA

