



ATTACHMENT 1

ROLES AND RESPONSIBILITIES

Overview

An early and accurate project scope of work is essential for successful projects. This is obtained through effective communication throughout all phases of the project. It is imperative that the Structure Project Engineer, Specification Engineer, Geotechnical Professional, and Hydrology and Hydraulics Engineer maintain close communication throughout all phases of the project.

This section defines the roles and responsibilities to establish and maintain communication throughout the development of the project.

District Hydraulics Engineer

The District Hydraulics Engineer performs hydraulic and hydrologic studies as per the Caltrans Highway Design Manual for all roadway drainage facilities other than bridges. The District Hydraulics Engineer will evaluate the need for upgrading or replacing any existing storm drain system or the need for new facilities located within the Caltrans Right-of-Way (ROW).

The District Hydraulics Engineer is responsible for bank protection designs at the ends of structures; typically bridges. The District Hydraulics Engineer will collect and provide data for the design of bridges, large culverts, and pumping plants. They are also responsible for permit reviews for drainage structures within the Caltrans ROW by other agencies or private parties.

The responsibility for hydraulic design policies and procedures rests with the Division of Design; the unit that performs the project drainage design is responsible for their implementation. The highway engineer relies on hydraulics to adequately size drainage facilities to convey design flows, especially to convey stream flows across highways referred to as cross-drainage.

The largest cross-drainage facility that district hydraulics will design is a culvert using standard plan details. Any special design culvert must be designed by Structure Design (SD), and SD will consult with Structure Hydraulics & Hydrology for design flows.

Geotechnical Professional

The geotechnical professional provides Preliminary Geology and Seismicity Recommendations (PGR), Preliminary Structure Foundation Recommendations (PFR) and Final Structure



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Foundation Recommendations (FFR) to the Structure Project Engineer for new bridge projects, seismic retrofits and widenings. These reports include the geology, seismicity, recommended foundation type and bearing capacities, and/or specified pile tip elevations. The recommendations are based on design loads, site conditions and potential scour, both short term and long term.

Preliminary Investigations (PI)

Preliminary Investigations (PI) prepares and transmits preliminary reports and Foundation Plans which provide the designer with information needed to prepare contract plans, specifications, and estimates for proposed structures statewide for the Capital Outlay Support Program. Upon obtaining the Bridge Site Data Submittals (BSDS) from Districts, PI reviews the submitted information and generally visits proposed project sites to gather additional data as needed.

If the bridge is over water, PI may also gather hydraulic information when it is requested by Structures Hydraulics & Hydrology. A good practice is to coordinate the survey data collection to include Structure Hydraulics' input on channel survey limits. Producing a Foundation Plan involves gathering all physical information on the site through surveying, photographing and hand measuring. A Foundation Plan will include information such as the project site's contour topography, existing facilities, and surface/subsurface utilities.

Prior to collecting project surveys, channel survey limits should always be requested from Structure Hydraulics. A representative from PI is responsible for inviting Structure Hydraulics to pre-survey meetings. This will ensure that the topographic surveys to be collected will meet the needs for hydraulic modeling.

Structure Project Engineer (PE)

The Structure Project Engineer (PE) is responsible for the bridge portion of the project Structure Plans Specifications & Estimate (SPS&E) for new bridges over waterways and bridge widening, seismic retrofit, and scour mitigation/retrofit of existing bridges. Note that culverts classified as bridges are included as structures work.

The Structure PE interacts primarily with the Structures Hydraulic Engineer, the geotechnical professional and construction during the design phase of the project to ensure that the proposed design meets the design code and procedures relating to scour, has the proper foundation type appropriate for the site condition, and is constructable.

The PE is responsible for requesting Preliminary Hydraulics Report (PHR), the draft Final Hydraulics Report (dFHR) and the Final Hydraulics Report (FHR) from Structure Hydraulics,



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and agreeing with the Structure Hydraulics Branch Chief on a delivery schedule. Topographic surveys need to be completed and submitted to Structure Hydraulics prior to agreeing on a delivery schedule for the required reports. When PI is not collecting the topographic surveys, the PE is responsible for ensuring that District Surveys invites Structure Hydraulics to pre-survey meetings.

The PE is responsible for forwarding scour information obtained from Structure Hydraulics to the geotechnical engineer when requesting Foundation Reports (both Draft and Final) and soil springs from the Office of Geotechnical Design.

Structure Hydraulics Engineer

The Structure Hydraulics Engineer provides technical support and expertise to the structure designer as it relates to floodplain encroachments and bridge hydraulics (including culvert structures) using the latest Departmental and/or Federal policies, procedures and code regulations that may affect the design of new, replacement, or modification of state bridges.

The Hydraulics Engineer does the following:

- Reviews and evaluates bridge projects that are identified as scour critical by Structure Maintenance & Investigations (SM&I) and proposes scour mitigation alternatives.
- Performs hydrologic and hydraulic analyses and bridge scour analyses statewide for the Capital Outlay Support Program for bridges over waterways on the state highway network.
- Conducts oversight review of projects where design rests with the Local Program or Special Funded Projects to ensure that hydraulic design criteria is in compliance with standard design criteria statewide.
- Interacts with the Geotechnical Engineer for the evaluation of scour at calculated scour depths based on site materials.
- Provides hydraulic data and predicted scour data needed for proper placement of bridge components for capital projects. Hydraulic reports will comment on waterway adequacy, stream stability, channel degradation, gravel mining, grade control structures, drift, flood stage, backwater, scour, fish passage, and unusual hydraulic characteristics.
- Interacts with PI staff or District Surveys to provide channel survey limits necessary for development of a good hydraulic model.
- The Structure Hydraulic Engineer will need to coordinate with Preliminary Investigations or District Surveys to ensure the topographic surveys scheduled to be collected will meet the needs for hydraulic modeling. Channel survey limits should always be requested from Structure Hydraulics.



Structure Maintenance & Investigations (SM&I) Hydraulics

SM&I Hydraulics Engineers perform scour evaluations of existing bridges over waterways in order to preserve safety and structure stability. SM&I Hydraulics identifies potential unstable bridge foundations due to stream instability and scour. SM&I Hydraulics shall consult with the Geotechnical Scour Critical Branch to evaluate the geology and scourability of the soil/rock, the type of foundation used for supports, the bottom of footing and pile tip elevations, remaining pile bearing capacity after scour conditions, and any additional geotechnical issues related to the site. SM&I Hydraulics consults with the SM&I Loads Ratings group in order to assess the structural capacity of the existing bridge under scour conditions. Bridges that are susceptible to scour problems are identified and their National Bridge Inspection (NBI) Item 113 coding for Scour Critical Bridges is determined by SM&I Hydraulics. SM&I Hydraulics is required to prepare a Plan-Of-Action (POA) for every bridge on the SHS that is determined to be scour critical. Local agencies are responsible for developing their own POA for every local bridge in their jurisdiction determined to be scour critical.

A POA must provide a means for maintenance personnel to monitor at least one or a combination of 1) flood events that could scour bridge foundations, 2) scour depths during flood events, and 3) bridge movement indicative of extreme scour. The POA must include the names of responsible personnel that are required to take action to ensure public safety. The POA must clearly state the conditions under which a bridge must be closed to traffic. SM&I, through their own internal peer review process, typically recommends scour mitigation work and defines the scope of work for programming into the SHOPP plan.

Structure Maintenance & Investigations (SM&I) Load Ratings

The Load Ratings Branch is responsible for determining the Inventory and Operating live load carrying capacity of existing bridges. Responsibilities also include evaluating the structural stability of the bridge based on the foundation analysis for existing and/or future estimated scour depths provided by the SM&I Hydraulics Branch. The Load Ratings Branch, if needed, also makes a recommendation to the SM&I Hydraulics Branch for Geotechnical Services to perform a pile bearing capacity analysis for further review. The Load Rating engineer should communicate with the geotechnical professional about the geotechnical data as needed.