



**PRUNUSKE CHATHAM, INC.**

M E M O

Date: September 14, 2007

To: David Kenly, Jenner Community Club

From: Denis Ruttenberg, P.E.

Copy: Dennis Fagent, ZFA Structural Engineers

Subject: Concept design of channel modifications for new bridge and estimated 100-year water surface elevation.

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During the winter of 2005-2006, significant flooding and bank erosion of Jenner Gulch Creek occurred, as well as damage to the Jenner Community Club's (JCC) bridge spanning the creek. The bridge damage occurred, in part, because of channel constriction and inadequate channel capacity at the bridge. Replacement of the bridge is essential for access to the fire truck that serves the Jenner community.

This transmittal describes Prunuske Chatham, Inc.'s (PCI) proposed new channel geometry at the bridge site, provides the 100-year water surface elevation, as calculated using HEC-RAS, and lists additional design constraints of the project site. It is assumed that the new bridge will be sited in approximately the same location and alignment.

Geomorphic principles and a study of reference reaches were used to develop new channel geometry and alignment at the bridge. This analysis indicates that the top-of-bank width on Jenner Gulch Creek ranges from 35 to 40 feet. Bankfull depth and width are about 1.5-feet and 20-feet, respectively. A site plan was developed to modify the channel according to these guidelines (Figure 1). The proposed cross sectional geometry is shown on Figure 2 and the long profile in Figure 3. The requisite channel geometry values and water surface elevations for bridge design are shown in Table 1.

Table 1. Channel parameters for bridge design (see Figures 2 and 3).

Top-of-bank width	37 feet
Top-of-bank elevation (avg. existing)	15 feet National Geodetic Vertical Datum (NGVD)
Bank slopes	1.5:1
Base channel width	22 feet
100-year water surface elevation at bridge with proposed channel geometry	14.2 feet NGVD

To maximize capacity and remove the existing channel constriction the channel was widened upstream and downstream of the existing bridge replacement site and a HEC-RAS hydraulic model was run. A 10-foot wide terrace was conceptually designed downstream to increase channel capacity and lower the 100-year water surface. The resulting HEC-RAS model of the proposed channel design estimated the 100-year water surface for a new bridge at 14.2-feet NGVD 1929.

Additional constraints to the bridge design are the elevation and grade limitations on the bridge approaches. Sufficient area and grade must be maintained on the overbank area between the creek and the Community Club for maneuvering of the fire truck in and out of the station. The finished elevation of the bridge deck will significantly affect the grading of the bridge approaches. To address this constraint, the bridge deck thickness should be kept to a minimum for a lower finished deck elevation. The bridge deck elevation is determined from the design soffit elevation, estimated as 15.2-feet minimum with the proposed channel design (1 foot above the estimated 100-year WSE), plus the structurally-designated thickness of the bridge deck. Once the bridge design is completed, a final site design will be required to address grading issues and design feasibility.

If you have any questions or need additional information, please contact Aimee Crawford, PCI Project Manager, at 707-874-0102 x49.