

Combating Streambank Erosion in Fountain Creek

Pueblo County, CO – Embankment erosion of Fountain Creek was threatening the roadway in Chinook, an area in the city of Pueblo. “When this creek floods, basically this whole area is inundated with water,” said Earl Wilkinson, director of Public Works.

“Approximately 928 square miles of the drainage district drains down to Pueblo,” according to Daryl Wood, stormwater coordinator for Pueblo County.

The erosion of stream banks is a natural process that occurs in lakes, streams, and rivers, and although it can be rapid, more often it involves the gradual removal of sediments from the shoreline. Erosion is caused by a number of factors, including storms, wave action, rain, ice, winds, runoff, and the lack of trees and other vegetation.

In the spring of 1999, rain fell most of the day over Colorado Springs, Manitou Springs, Pueblo, and the surrounding areas. The rain intensified that evening and continued to come down heavily until the afternoon of April 30. Many areas received as many as eight inches in 40 hours, with some receiving more than 13 inches in 48 hours. The heavy rain in the Arkansas River basin led to widespread river flooding along Fountain Creek in El Paso and Pueblo Counties.

“We saw significant erosion in Fountain Creek after the 1999 flood, especially in the area of Creek Side at Velmount,” said Wood. “We had to act fast and also consider cost. We determined that using hardpoints was the way to go.”

Hardpoints are an erosion-control technique consisting of stone fills spaced along an eroding bank line. The fills protrude only short distances into the river channel and are supplemented with a root section extending landward into the bank to preclude flanking if excessive erosion persists. The majority of the structure cannot be seen. The lower part consists of rock placed underwater, and the upper part is covered with topsoil and seeded with native vegetation. The structures are especially adaptable in long, straight reaches not subject to direct attack.

“Five areas in Fountain Creek were targeted by the City of Pueblo to be mitigated using hardpoints,” said Wood. “We funded the project ourselves. It was inexpensive.”

Vegetation is the most natural method for protecting stream banks. It is relatively easy to establish and maintain, in addition to being visually attractive. However, vegetation alone should not be considered as a countermeasure against severe bank erosion where a highway facility, such as a roadway, is at risk. At such locations, vegetation can best serve to supplement other countermeasures such as hardpoints.

According to the U.S. Department of Transportation, hardpoints are most effective along straight or relatively flat convex banks where the streamlines are parallel to the bank lines and velocities are not greater than 10 feet per second within 50 feet of the bank. Thus, hardpoints may be appropriate for use in long, straight reaches where bank erosion occurs mainly from a wandering line defining the lowest points along the length of the watercourse.

As rain continued to pummel flood-ravaged Colorado in September, 2013, Fountain Creek continued



to take a beating.

“After this year’s flooding, we noted other areas within the creek that needed to be stabilized. Paramount on the list is the area near 40th Street,” said Wood. “We plan to place hardpoints there because they work. They really do.”

For additional information, visit:

http://www.fhwa.dot.gov/engineering/hydraulics/library_arc.cfm?pub_number=23&id=142 and www.pueblo.org