LAMORINDA WEEKLY
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**Published August 26th, 2015**

# Creek Culverts: The Weakest Links of the Moraga Storm Drain System

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Las Trampas Creek crossing at Bollinger Canyon Road Photo provided

After reviewing the storm drain pipes for corrosion and damage at the beginning of the year, the town of Moraga worked with consulting civil engineers Schaaf and Wheeler to study the capacity of the drainage system to handle a 10-year storm without overflow and property damage. The combined outcome of the studies resulted in the Storm Drain Master Plan that was adopted by the council this summer. The plan highlights the weaknesses of the system: narrow, obstructed or damaged pipes and under-capacity culverts. The plan does not say, however, how the town will finance the $8.9 million of high priority work, let alone the $26 million to completely address the issues.

At the beginning of the year, Schaaf and Wheeler conducted a televised study of drains to assess possible corrosion and wear. The study determined that $363,000 out of $513,000 worth of work was high priority repair and recommended including it as part of the pavement project. The highest of all priorities as far as repairs are concerned is the large 8-foot diameter Rheem Center culvert that conveys water from Laguna Creek. It runs under a privately owned parcel, and it is unclear if a public drainage easement exists.

Schaaf and Wheeler's recent study focused on the capacity of the drainage system - gutters, inlets, pipes, culverts, and creeks - to handle a 10-year flood. A 10-year flood has a 10 percent probability of happening every year. The creeks that run in daylight have enough capacity, provided that the neighbors do their cleanup work, but it is not the case for creek segments running in culverts. Dan Schaaf, who presented the report to the town, said that out of the 35 culverts analyzed, 17 are undersized. Out of the 17 needing improvements, five are a high priority, including those under St. Andrews Drive, Camino Pablo, Woodford Drive, and the Hacienda de las Flores property.

"An alternative to the replacement of existing undersized systems is day-lighting," said Schaaf. "This will involve replacing buried networks with vegetated earthen channels, with cross culverts or bridges at roadway crossings. This alternative would discourage unwise development encroachment, improve access and safety, enhance water quality, reduce sediment, and increase aesthetics compared to traditional pipe replacement projects." The cost of improving the undersized culverts represents about half of the high-priority $8.9 million of work estimated by the consultant.

A large chunk of the needed improvements also includes pipes that collect neighborhood runoff to creeks, and that do have enough capacity to handle a 10-year storm. Located throughout town, they are sometimes quite small, but create difficult bottlenecks, with risks of flooding.

Schaaf touched on the issue of future housing developments that will increase the amount of impervious surfaces, leading to more runoff, which will impact the entire drainage system. He recommended the town ask their fair share from developers to finance increases in drainage capacity, and that it include guidelines requiring either retention basins or pervious pavement. The plan also recommended $240,000 of annual drainage system maintenance.

Schaaf noted that over half of the costs of the high and moderate priority projects ($20 million) are located on parcels at least partially private. He recommended that the town begin

investigating property ownership and existing easements to further evaluate rights and responsibilities.

The council members approved the plan, but there are little funds at this time to address the issues, including the high priority ones. The first order of business will be determining ownership of pipes and culverts.

Rheem Shopping Center culvert for Laguna Creek Images provided

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