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February 5, 2009

Project Update: Creek restoration, startup & earthwork

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STEVENS CREEK RESTORATION PARK PROJECT

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Stevens Creek Corridor Creek Restoration Project

THE CONSTRUCTION STARTS

Construction of Stevens Creek Corridor Phase 1A, Creek Restoration commenced in June 2008. One of the first tasks was to clear the site and begin demolition. The western portion of the old parking lot had to be removed to make way for the new creek channel alignment. The creek restoration contractor, Ferma Corporation, started work with the removal of the parking lot asphalt in June.

CHANNEL CONSTRUCTION

By early July the creek flow diversion system was ready, after which biologists relocated the fish from the creek within the restoration zone— approximately the limits of Blackberry Farm. Once the fish were safely relocated the creek dewatering could proceed. The flow diversion system worked very well and the creek began to empty.

Creek water was pumped into a pipeline and returned to the channel near the south end of the golf course. At the downstream end of the diversion system, a specialized outfall structure served to dissipate energy from the flows exiting the pipeline and prevent scour as the water was returned to the natural channel. During this time, native plants were salvaged from the areas of the channel about to be modified by construction.

In the second half of July, the channel restoration and realignment began. The three low flow crossings were removed, as was the diversion dam. The cobbles and gravels in the existing creek bed were harvested and preserved for eventual replacement in the restored and realigned creek bed. Construction of the new channel through the former parking lot proceeded efficiently and smoothly, and continued into August.

For more of the Update see page 5

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STEVENS CREEK CORRIDOR UPDATE

By late 2007, paving in the Blackberry Farm parking lot had reached the end of its service life. The surface had extensive potholes and vegetation was growing through

In June 2008 construction started. An initial task was asphalt removal. The parking lot had to be cleared of asphalt early on since part of it was to become the new creek channel

After fish relocation and dewatering, another important task was removal of the low-flow crossings in the channel. Riprap was salvaged and reused

Concrete and asphalt paving was removed in other locations as well. The pool deck paving was in satisfactory condition and was retained

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In mid July, the creation of the new channel was started in the parking lot area

An excavator began the first step of digging the new channel

Excavation proceeded efficiently and on schedule

A NEW CHANNEL

- Returns the creek to an alignment that will be naturally stable
- Barriers to fish migration are removed
- Instream "benches" provide a healthy floodplain & excellent habitat
- 9 new pool-glide-riffle sequences are created
- Gravel & cobble bed supports fish spawning

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The creek channel was excavated, with an alignment tailored to the locations of trees. The entire team worked long hours during this time and the work progressed well

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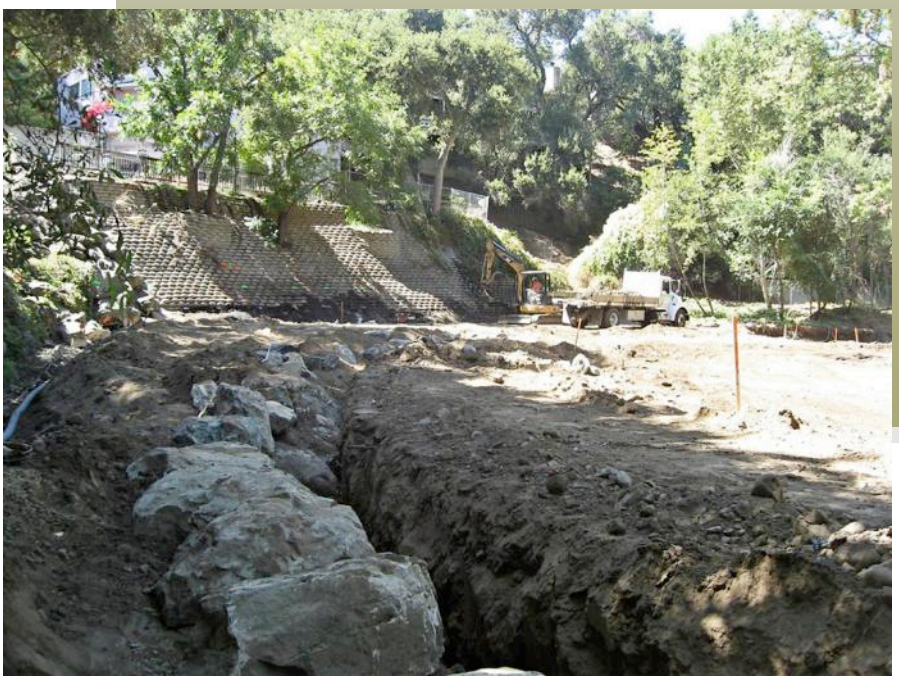
CHANNEL WIDENING AT HORSESHOE BEND

The new channel centerline was moved well away from the toe of the steep slope below Riviera Road, and away from the sacked concrete and riprap slope armoring. The new channel bed was anchored with a double-stacked row of large boulders weighing more than 1 ton each. New gentler creek bank slopes were created at Horseshoe Bend as planned. The new banks were adjusted and refined in the field to preserve young cottonwood and alder trees that had established on the west bank.

Construction of the new channel alignment through the west bank picnic area moved forward. The channel alignment was adjusted in the field and tailored around the locations and root systems of individual trees, described in an upcoming update. The project team was able to preserve several very large, mature trees in the west bank area and at Horseshoe Bend through this effort.



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REUSE OF MATERIAL

Some areas of the creek banks had been armored with riprap after flood events in the 1990's. Those spots had rock armoring but no vegetation. In those sections the riprap was removed then the banks were graded to a less steep, stable slope and revegetated. The removed riprap totaling over 800 cubic yards was "recycled" through on-site reuse. It was moved to areas where fill was needed and placed as a base for the fill material, or was used as boulder toe protection along the edge of the new channel.

REUSE IT!

- More than 2,000 cubic yards (CY) of gravel & cobble for the channel bed came from onsite
- 2,500 CY of soil was stockpiled for reuse, enough to fill 12 swimming pools.
- Existing riprap was used again as a base for areas that were filled & as a boulder toe at channel edges

Fill with particular qualities, known as "engineered fill", was needed to create the new channel and banks. The project designers estimated that more than 1,000 cubic yards of import might be needed to amend the onsite soil to make it suitable for this purpose. Ferma Corporation used specialized equipment during the earthwork process. The equipment sorted, screened and processed the excavated earth to maximize reuse of onsite soil. With use of this equipment, there was no need to import any amendments. The contractor was able to create enough engineered fill using the native soils from the site. In all, over 6,000 cubic yards of existing material was reused on site in the channel restoration process.

There was a large quantity of extra material left after digging the channel, as expected. We found that the excavated material was high quality soil and well worth saving. Rather than hauling this excellent soil offsite and disposing of it, we saved approximately 2,500 cubic yards and stockpiled it. Much of that stockpile has been used as topsoil in planting beds for the Mary Avenue bridge project; the balance is being held for Phase 1B and further restoration activities.

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BIOTECHNICAL RESTORATION ELEMENTS

As portions of the channel achieved the proper configuration, stone "cross vanes" were constructed. The cross vanes were created from large boulders weighing 1-1/2 to 2 tons each, placed in a U-shape configuration in a manner that does not require concrete. The cross vanes will maintain the channel bed at the correct elevation and ensure that fish migrating upstream will only need to jump approximately 6", versus the previous condition of as much as 4 feet at barriers. The reconfiguration created a sequence of pools, glides and riffles in the creek channel to provide healthy habit for fish and wildlife as well as a healthy, stable creek bed.

The new banks were also constructed in some areas with logs and rootballs placed in a manner to stabilize the slopes and channel. The channel restoration plan used logs and boulders as major engineered elements of the overall design, together with revegetation techniques, as part of the biotechnical approach to restoring Stevens Creek.

Here the first cross vane was constructed of boulders weighing as much as 2 tons, placed in a U-shape configuration that stabilizes the channel without use of concrete

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CHANNEL CONSTRUCTION

Cobbles and gravels of specific size and gradation were needed to line the creek channel. The low flow channel was constructed to the design elevations and the instream "bankfull benches" created. The previously-harvested cobble was replaced in the new channel. Additional channel bed fill was created by sorting out cobble from excavated material when the material contained cobble suitable for steelhead spawning. The benches received a layer of native topsoil and were sculpted to finish grades in preparation for planting. The benches will provide excellent habitat areas and an instream floodplain for high water flows during storms.

The new channel through the former parking lot took shape, and the bed was filled with graded gravel and cobble

A separate update describes rewatering of the channel and installation of riparian plantings