Hinkson Creek

Collaborative Adaptive Management

Name: Open Cutting Sewer Installations vs. Boring

Open Cutting:

In general, the approach taken when open-cutting a sewer under a creek has improved over the last ~10 years, lessening the potential negative impacts.

We do a better job now of setting up the crossings to prevent sediment from entering the stream from the construction corridor, and we're making that better all the time.

We do a better job of phasing the stabilization than we did in the past, so that we don't wait for the whole project to be done to require the contractor to start seeding the parts that are complete.

We minimize the use of stream crossings as part of a haul-road for the project now; once the pipe is laid under the creek, and the stream bed is stabilized, the impact stops.

Also, in preliminary planning of the Upper Hinkson Outfall Extension we lined up creek crossings to occur on riffle sections, which is less risky with respect to geomorphology and thus minimizes long term impacts.

In general, open cutting tends to go pretty quickly and the impact that is caused is relatively short and discreet. This helps get the project done and the ground stabilized in a timely fashion so that the people and the machinery can get out of the stream corridor.

Boring:

Boring under the stream is less disruptive to the streambed itself, but it is riskier to the extent that it takes longer and leaves construction activity adjacent to the creek for a longer period of time. Staff and the consultant for the Upper Hinkson project did look at boring crossings under Hinkson Creek when in the preliminary design phase, but it was hard for us to support something that costs up to 6 times more* and may not work.

Most large bores (more than 8-inch) that have been done under City contracts have had problems that caused delays

A few examples:

The bore of Hominy sewer under Hwy 63 took a full year. The boring contractor encountered a surprising amount of water in the bore which made it much more difficult than expected. During that time, the creek overflowed and flooded the bore pit at least once.

The bore under Broadway on the east side of Hinkson in the mid-2000s took 2-3 months during which time the boring machine got stuck, and two excavators became stuck so deeply in Hinkson Creek (in the effort to free the boring machine) that water was flowing through the cabs.

On the bore under Stadium near County House Branch the tunnel was along the interface of soil and rock so that much of it was hand-dug making it a lengthy process.

In general large trunk sewers are built on relatively flat slopes such that the pipe slopes are typically less than 6 inches of rise in 100 feet of run. It is very difficult for a bore to be done to a slope specification this flat. When unforeseen conditions are encountered such as a soil/rock interface, meeting the specification is even more difficult and time-consuming.

One recent instance where boring worked relatively well was a bore under the creek for the Hinkson Siphon Elimination Project. The pipe was relatively small (15 inch), and the slope relatively steep (10 inches rise in 100 feet of run).

The technology of boring is getting better and we need to continually re-evaluate the efficacy of boring versus open cutting, and, where it works well with project parameters, boring can be used effectively.

**Using bid prices from the contractor who had the lowest base bid for Hinkson Creek, we found that one of the six crossings would cost ~$50,750 if open cut (including rock excavation, pipe installation, rock to stabilize the crossing, etc.). The cost for a bore for the same length (150 feet) was $321,750.*