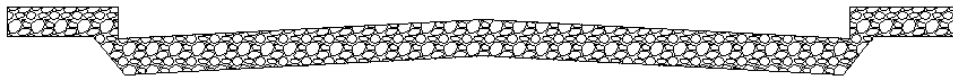


Characteristics of a City Street/State Highway

Step 1



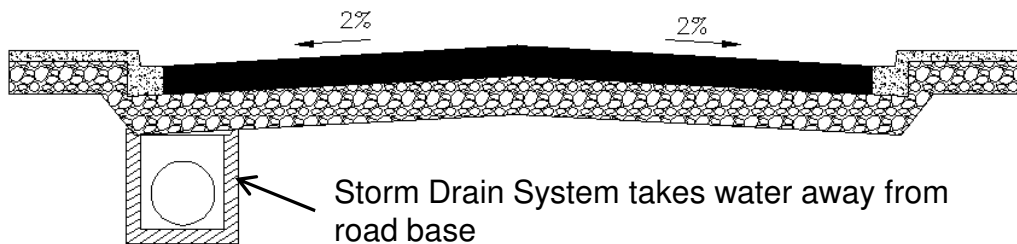
Remove native material and replace it with compacted gravel road base

Step 2



Place asphalt concrete between concrete curb/gutter

Typical City Street



Storm Drain System takes water away from road base

Completed road with storm drainage

Most, if not all, city streets and state routes were constructed with conventional road construction methods. These methods include the removal of the unstable native material under the road (good for nuts and alfalfa but not roads), which is replaced with a stable, 12-24 inch thick layer of compacted gravel material that can withstand heavy vehicle loads.

Next, a 4-12 inch layer of hot asphalt concrete pavement (the black-top) or concrete pavement placed to provide a smooth ride surface.

A combination of concrete curbs and gutters, along with an underlying closed storm sewer system generally collects and diverts seasonal storm water away from the road base. All of these design features result in roads with longer lifecycles and lower maintenance costs than other types of roads.

Characteristics of a Typical County Road

Step 1



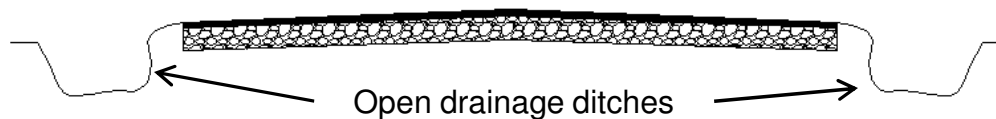
Loosely leveled gravel over the existing unsuitable soil

Step 2

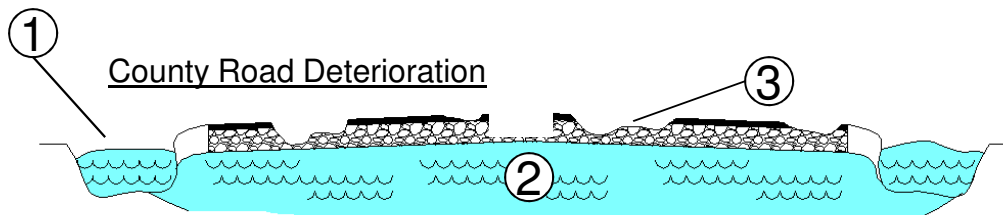


Thin layer of chip seal or asphalt

Typical County Road:



Open drainage ditches



1. Water inundation from surrounding fields fills drainage ditches.
2. Water undermines the gravel road base.
3. Road surface develops cracks and potholes.

Repairing the damage created by these factors present different challenges for the county. City repair crews have a compact geographical area, which allows them to reach and travel between repair sites in minutes. Yolo County crews have a wider geographical area to cover. It may take crews as long as one hour before they can reach a repair site within the vast 1,021 square mile network of county roads, and another 20-40 minutes of travel time to the next repair site.

Most county roads are former wagon trails following the section lines (one mile apart), built on rich farm soil. In the early 1900's, the primary cost for road maintenance in Yolo County was watering roads to reduce dust. As transportation modes evolved, these wagon trails were modified to accommodate two-way motor vehicle traffic. In many instances, the native materials were leveled, the road widened and in some areas loose gravel from area creeks was placed on the native material to eliminate wheel ruts and seasonal muddy roads. As a more durable form of dust control, oil instead of water was sprayed on the un-compacted gravel.

Later, these roads were coated with a very thin layer of asphalt oil (a thicker oil product) to improve dust control and smooth the travel surface. During routine maintenance some of the rural roads were later chip sealed. Chip seals are constructed by evenly distributing a thin base of hot asphalt oil and then embedding finely graded gravel into the asphalt oil. The gravel is evenly distributed over the oil, and then rolled into a smooth surface. Many "paved" road surfaces in Yolo County are in fact a 1/2 to 2 inch thick accumulation of chip seals applied over time. Chip seals are typically used on rural roads carrying lower traffic volumes, because chip seals do not have the binding and strength properties of the asphalt pavement or concrete.

Instead of a closed storm sewer system (as in city settings), open ditches adjacent to the county roads convey storm run-off. From late spring to early fall, many of the roadside storm drainage ditches in the rural areas are flowing full with irrigation water for adjacent fields.

Unlike closed storm sewer systems, open ditches allow infiltration of the water into the road base. Water is the biggest enemy of road pavements; saturated road bases are the main reason for premature pavement failures. Water seeps into the lower layers from the edge of the road and weakens the support; the pavement flexes under heavy vehicle loads and then cracks or ruts.

Once cracking starts, storm water infiltrates the cracks and the rate of damage rapidly increases.

Rural roads tend to have a faster deterioration rate than city streets for several reasons: First, the construction is substandard for the current loads. Second, the continued saturation of the road sides and water infiltration into the road bed weaken the road. Finally, the heavier and more frequent truck loads damage the road by producing pot holes, ruts and cracks.