INTUITION & LOGIC

Canyon Creek Analysis

City of Lenexa, KS

The Canyon Creek Analysis was commissioned to investigate the possible effects of the 432-acre Canyon Creek Development on an undeveloped portion of the Cedar Creek Watershed. The existing development plan divided the area into eleven sub-watersheds, seven of which contained planned stormwater detention, four of which did not. The analysis included a geomorphic analysis encompassing 5,500 feet of Cedar Creek and 2,500 feet of two major tributaries in the City of Lenexa and a hydrologic analysis of pre- and post-development outflows for the system. By identifying potential problems and predicting stream responses, we developed appropriate management strategies to minimize damage to the Cedar Creek Watershed during and after development.

Based on our analysis, we discovered that by eliminating the interception and infiltration capability of the forest, the base flow of the stream would be reduced or eliminated, while stress during storm flows would increase. Coupled with the loss of mechanical stability afforded by mature tree roots, increased channel erosion would likely ensue. In addition to the increased sediment load caused by accelerated erosion, eliminating the filtering and treatment functions of infiltration would further impair water quality. The removal of riparian forest and the construction of hard points associated with the sanitary line deforestation and stream crossing are an unfortunate combination which placed virtually every variable associated with stream process and stability into play simultaneously. Driving forces for channel change are sharply increased and the resisting forces maintaining channel stability are sharply decreased. Twenty-one recommendations were developed, including detention pond outfall rates and channel structures to help minimize the potential adverse effects of the planned development.