Article 150

Technical Note #50 from Watershed Protection Techniques. 1(4): 198-202

Parallel Pipe Systems As a Stream Protection Technique

Blown-out streams, channelization, rip rap, eroded streambanks are all familiar conditions within the urban stream network. Recent stream enhancement activities have concentrated on bioengineering and instream habitat structures to correct past abuses and preserve existing conditions.

An alternative approach for some small headwater streams involves employing a parallel pipe storm drainage system (parallel to the natural stream channel), that conveys frequent storm flows past the existing natural channel, eventually discharging to a more stable downstream location. Parallel pipe systems are designed to maintain low flows within the existing stream channel, bypass the frequent erosive storms around sensitive portions of a stream, and allow large, less frequent storm events to remain within the stream channel or its floodplain.

This concept recognizes that urban streams are subject to flow events equaling bank-full conditions as often as three to five times per year or more, whereas undeveloped natural streams may be subjected to bank-full flows once every other year or so (Hollis, 1975). These smaller, more frequent storms are thought to cause much of the stream channel erosion since high velocity flows are working on the entire channel cross-section. In non-urbanized channels, more extreme storm events (i.e., greater than the 1.5- to two-year storm) spill over the banks and into the adjacent floodplain and are less erosive.

Parallel pipe systems have been installed for many reasons. For example, they can protect sensitive portions of natural stream channels, or convey urban runoff to downstream stormwater management facilities, or aid in stabilizing the hydraulic regime to existing "blown-out" channels as part of stream protection efforts. Parallel pipe systems are appropriate for highly urbanized stream systems where biological stabilization techniques are not likely to withstand excessive erosive velocities, upstream stormwater management facilities are not feasible or practical, and structural

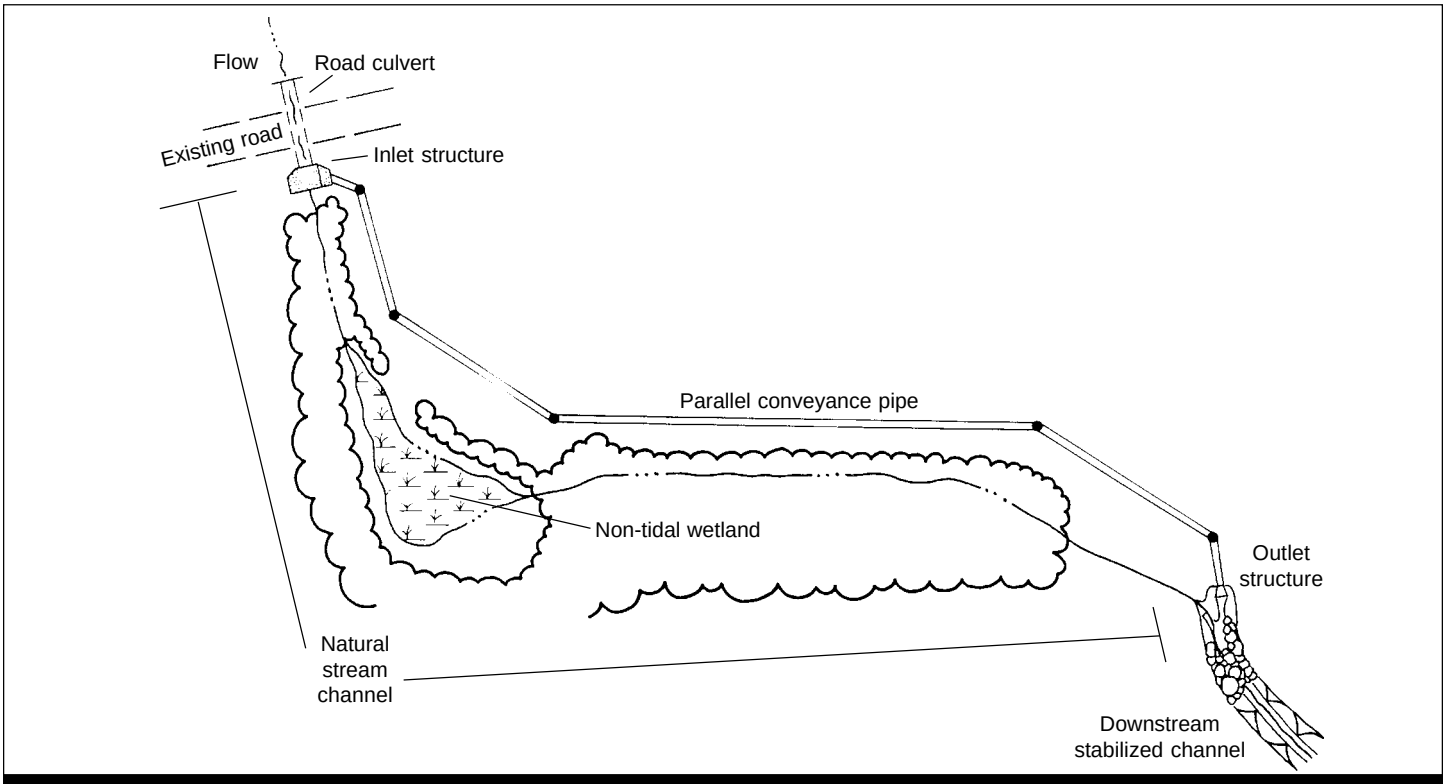

Figure 1: Parallel Pipe System Components