

## Day Two - Track One

Thursday, March 22<sup>nd</sup>, 2018

10:00 a.m. – 10:30 a.m.

## Addressing Stormwater in China with Low Impact Development

**Presenter:** Steven Trinkaus, Trinkaus Engineering, LLC.

### Biography



Steven Trinkaus is a licensed professional engineer in Connecticut and Maryland and has over 35 years experience in the land development field. He is an internationally recognized expert in the field of Low Impact Development (LID) and has been an invited presenter and consultant in Taiwan, China and South Korea multiple times since 2011. He was an invited presenter at the University of St. Andrews in Scotland on Sustainable Stormwater Management in October 2017. He has written multiple LID Design Manuals for five municipalities in Connecticut as well as being the principal author of a LID National Guidance document for EWRI. He has designed all types of LID treatment systems including Bioretention, Dry and Wet Swales, Permeable Asphalt and open cell paver systems. He has made many presentations on LID and water quality topics at many local, regional and international conferences. He has also taught day long workshops on stormwater and LID. He graduated from the University of New Hampshire with a Bachelor of Science in Forest Management in 1980.

## Abstract

In past ten years, the adverse impacts of stormwater from highly urbanized areas in China have drawn concern from the Chinese government. The primary impact is urbanized flooding, particularly in those areas in proximity to large rivers. China is calling their approach, "Sponge City" with the primary focus of utilizing Low Impact Development (LID) strategies from the US to infiltrate runoff from the densely developed and highly urbanized areas within the cities. This is a very difficult concept to implement in the Chinese cities as the underlying soils are mostly clay with very slow infiltrative rates and space to install typical LID systems such as Bioretention or Dry Swales are very limited. In addition to the soil and site constraints, the hydrologic requirements are also very demanding. To address water quality of non-point source runoff, LID systems must capture and treat the runoff from a 65 mm (2.55") rainfall event. Additionally the treatment/infiltration system must be able to contain the 150 mm (5.9") event without overtopping. To address urban flooding, the government has used the 210 mm (8.27") event. These hydrologic requirements are extremely difficult to meet especially with the soil and site constraints which exist in the Chinese cities. This presentation will not only discuss the Chinese government approach to addressing urbanized runoff, but will go through an actual design which was done by Trinkaus Engineering, LLC in a very dense residential area in the city of Zhenjiang on the Yangtze River.

## Learning Objectives

1. Learn how China is attempting to address water quality and runoff issues;
2. Learn how to overcome soil/site constraints to implement LID solutions in highly urbanized areas; and
3. Learn how to model LID systems to handle storm events greater than the water quality storm.