URBAN DRAINAGE DESIGN

The Colorado Association of Stormwater and Floodplain Managers (CASFM) are pleased to offer a National Highway Institute course as a continuing education opportunity for all CASFM members.

Date & Time: July 13, 14, and 15th (8:00am until 4:30pm each day).

Food: Morning and afternoon refreshments.
Lunch is on your own, (ie. sack lunch or restaurants near by)

Location: Holiday Inn Northglenn
10 East 120th Avenue
(Southeast Corner of I-25 and 120th Avenue)

Room: Longs Peak (Holiday Inn Northglenn lower level)

Course Instructors: See Attached Descriptions

Course Outline: See Attached Description

Registration: Registration for the course is limited to the first 30 people who contact Kevin Gingery by phone or e-mail with their desire to attend the course and return a check for the registration amount as soon as possible thereafter. No registrations will be accepted by fax. No refunds will be made within 10 days before the course. Substitutions, before the course begins, are welcome.

Registration Fee: $ 375.00 per person (CASFM Members)
$ 450.00 per person (Non-CASFM Member)

Checks Payable To: **CASFM**

Mail Checks To: Kevin Gingery
City of Loveland
Fire & Administration Building
Public Works Department
410 E. 5th Street
Loveland, CO 80537

Questions: Contact Kevin Gingery
970-962-2771
gingek@ci.loveland.co.us

COURSE INSTRUCTORS

Mr. Johnny Morris has worked for Ayres Associates since 1998, after being with the Federal Highway Administration (FHWA) for 34 years. Throughout his career, Mr. Morris has been active in training and technology transfer activities. In addition to helping support the Urban Drainage Course through the years, he was a member of the project team that developed HEC-22, the current text for the Urban Drainage Course. He was also a key member of the project team that developed the highly successful Introduction to Highway Hydraulics and Culvert Design Courses, which incorporate demonstrations with the portable hydraulic flume. In 1990, he was designated as an FHWA national technical expert in hydraulics and assumed national responsibilities accordingly. Mr. Morris is a registered professional engineer in Georgia and the District of Columbia, and has been involved with drainage design projects throughout the country. He is a frequent instructor for the Urban Drainage Design Course (NHI 135027), the Culvert Design Course (NHI 135056) and Introduction to Highway Hydraulics (NHI 135065).

Mr. Chris Doherty is a registered professional engineer in Colorado, and has worked for Ayres Associates since 2000. He has more than 10 years of practical hydrologic and hydraulic engineering consulting experience, including many urban drainage design projects in Colorado. Mr. Doherty's experience in hydrologic analysis includes using the Rational Method, SWMM, HEC-1, TR-55, TR-20, and CUHP (Colorado Urban Hydrograph Procedure). He has designed approximately 20 detention ponds, including several with extended detention for water quality, and has analyzed more than 150 detention ponds as part of regional hydrologic analyses. He has extensive drainage master planning experience, and has designed numerous storm drainage projects. Mr. Doherty is a frequent instructor for both the Urban Drainage Design course (NHI 135027) and Introduction to Highway Hydraulics (NHI 135065), teaching at locations throughout the country.

Course Title: Urban Drainage Design

Course Number: 135027 (3 days – CEU: 1.8 Units)

Description: This course provides a detailed introduction to urban roadway drainage design. Design guidance for solving basic problems encountered in urban roadway drainage design is provided. Topics to be discussed include:

HYDROLOGY

- Rational Equation
- Soil Conservation Method
- Regression Equations
- Synthetic Hydrographs

ROADWAY DRAINAGE

- Gutter Flow
- Roadway Inlet Interception
- Storm Drainage Systems
- Energy and Hydraulic Grade Lines
- Detention Ponds
- Storm Water Management

Objective: Upon completion of the course, participants will be able to:

- Determine runoff (peak flows and volumes) from urban watersheds.
- Apply basic hydraulic principles to urban drainage design.
- Perform roadway drainage designs using various roadway inlets.
- Size and/or analyze storm drain conveyance systems.
- Establish the energy and hydraulic grade lines for storm drains.
- Design and/or analyze detention ponds.

Target Audience: Roadway designers with limited experience in drainage design, but familiar with mathematical concepts such as algebra and geometry and have some working background in hydrology and hydraulics.