1 Introduction

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1.1.1 Background

The design of highway drainage features requires a hydrologic analysis to determine the magnitude and frequency of flows, and a hydraulic analysis to locate and size drainage facilities. Drainage facilities must not only be hydraulically efficient, but also consistent with the importance of the road, safety, initial cost, aesthetics, environmental considerations, maintenance and legal responsibilities. The *CDOT Drainage Design Manual* has been developed to provide guidance and establish criteria for engineers performing hydrologic and hydraulic analysis and design.

Photo 1.1

This manual is intended for use by CDOT hydraulics and roadway design engineers, and consultants and local entities involved in projects administered by CDOT. Designs of drainage features on CDOT projects must be in accordance with the methods, guidelines and criteria presented in this manual and its references. Local agency projects shall follow this guidance if financed by state or federal funds.

This manual does not take the place of sound engineering judgment, nor does it relieve the user of the responsibility to keep abreast of the current state of practice in hydrologic analysis and hydraulic design. It is intended to aid the designer with drainage problems and arrive at solutions appropriate for different environments. Guidelines are included to establish consistency and to help choose optimal, economic solutions.

1.1.2 References and Computer Programs

References to specific publications, computer programs, FHWA, US Army Corps of Engineers, FEMA and AASHTO guidelines, manuals and regulations are noted within this manual. It is expected that the designer is knowledgeable in the use of the referenced items. Designers should identify questions and apparent discrepancies between these documents and CDOT's design requirements as early in the design process as practicable and refer them to the CDOT Staff Hydraulic Engineer for resolution. In this way clarifying language can be incorporated into these documents and uniform policies and procedures maintained.

It is intended that the procedures and criteria outlined in this manual will be updated as new engineering techniques are developed, and, when necessary, modified according to the judgment of the designer. It is the designer's responsibility to keep abreast of new or revised program methods and regulations approved by the appropriate state and federal agencies.

References are provided in sections of this manual if the designer needs more detailed source material. The reference section at the end of each chapter has been organized to include source documents as well as a short listing of documents recommended to be added to the designer's library of references.

1.1.3 Updates

CDOT plans to regularly issue updates to this manual. Notification of revisions will be made by e-mail, public announcements, and on the CDOT website (https://www.codot.gov). Consultants must complete a registration form to be notified of updates.

CDOT Staff Branches publishes an assortment of manuals vital for the engineer to properly work on and complete a project. It is the intent of the Staff Branches to add all manuals to the CDOT website (https://www.codot.gov/business/designsupport/bulletins_manuals) as the manual is updated and revised.

Comments regarding the content of this document are welcome and should be addressed to the State of Colorado, Department of Transportation, Project Development Branch, Staff Hydraulic Engineer, 2829 W. Howard Place, 3rd Floor, Denver CO 80204.