

Office of Bridge Design

Technical Memorandum

Date: July 12, 2013

To: All Hydraulic Staff

From: Kevin P. Marton, PE
Bridge Hydraulics Engineer

Subject: Technical Memorandum BTM13.3
Hydrologic/Hydraulic (H/H) Design Quality Control/Quality Assurance (QC/QA)
Practice

This Technical Memorandum is intended to formally document the SDDOT Office of Bridge Design (OBD) H/H design QC/QA practice. This practice applies to all H/H design performed in-house as well as all H/H design for the Department performed by outside consultants.

The purpose of the SDDOT OBD QC/QA practice is to ensure that quality H/H designs and deliverables are produced. To that end, the QC/QA practice includes several checks and reviews. This process, by its very nature, can become adversarial and care must be taken to focus on the end goal of producing a quality product.

Quality Control

The H/H design engineer plays a vital role in quality control. The design engineer is responsible for ensuring that SDDOT H/H design criteria, practices, and procedures are applied in an appropriate and accurate manner. The design engineer is also responsible for checking the accuracy of the H/H design assumptions, input parameters, computations, and deliverables before distribution to ensure they are complete and without error. In addition, the design engineer is responsible for checking the complete project plans to ensure that the plans correctly depict the design intent.

Quality Assurance

Quality assurance consists of a thorough independent check and review of the H/H design assumptions, input parameters, computations, and deliverables.



The thorough independent check and review is to be performed by a second design engineer and is intended to ensure that the H/H design assumptions, input parameters, computations, and deliverables are correct, error free, and consistent with SDDOT criteria, practices, and procedures. It is vital that the independent check not be simply a check of the initial designer's calculations, but an independent check and review of design assumptions, input parameters,

design calculations, and computer analysis, if applicable. Each sheet of the design and check design computations should be thoroughly checked and initialed by the designer and design checker. After completion of the design and check, it is the responsibility of the two design engineers to resolve any differences in design assumptions, input parameters, design calculations, and details to provide a consistent set of calculations and deliverables. Differences that cannot be resolved by the design engineer and check design engineer shall be taken to the Bridge Hydraulics Engineer for resolution.

General

Inherent in the preparation of quality H/H design and deliverables is well qualified engineering personnel. The H/H designer and check designer should have a level of experience commensurate with the complexity of the drainage structure being designed. Less experienced personnel should be under the direct supervision of experienced H/H engineers. For consultant designed drainage structures, all rules and regulations as set forth by the SD State Commission of Engineering, Architectural and Land Survey Examiners shall be followed.

Design and check design computations should include the design criteria, design assumptions, input parameters, and computer program input and output. Calculations may be longhand calculations or computer generated design calculations; both are acceptable. All calculations, whether longhand or computer generated shall be marked with the project number, structure number if applicable, and dated. In addition, the designer and check designer must initial their calculations. For all drainage structures, it is important that the above information be arranged in logical order and be neat and orderly. Project correspondence should not be copied and made part of the design calculations. A copy of consultant design and check design calculations shall be included with the final deliverables.

Reviewed by:  Date: 7/12/13
Approved by: , Chief Bridge Engineer, Date: 7-12-2013

cc: File