

## **Problem Title: HY-12 Storm Drain Hydraulic Analysis Program – Phase Two of Development Efforts**

### **Research Problem Statement**

HY-12 is a computerized implementation of FHWA pavement drainage and storm drain hydraulic design approaches and methodologies. The primary technical references for this software are the FHWA publications “Hydraulic Engineering Circular 22: Urban Drainage Design Manual, Third Edition” [publication FHWA-NHI-10-009], “Hydraulic Design Series 2, Highway Hydrology, Second Edition” [Publication FHWA-NHI-02-001], “Hydraulic Design Series 4, Introduction to Highway Hydraulics” [Publication FHWA-NHI-08-090, 2008 Revision], and “Hydraulic Engineering Circular 24, Highway Storm Water Pump Station Design” [Publication FHWA-NHI-01-007, 2001 Edition].

In 2009 FHWA contracted with AQUAVEO to develop a 32-bit non-proprietary software product, designated as HY-12, for the analysis and design of storm drains associated with transportation systems. This HY-12 software will replace older out-of-date storm drain programs. The contract with AQUAVEO did not require development of a graphical user interface, GUI, as part of software development.

A stand-alone BETA version of HY-12 has been completed and successfully tested using the required input format of a text document using Notepad. The myriad of situational applications and user controlled options available through HY-12 provides a difficult and lengthy learning curve for efficient implementation with the current text document input format. Numerous State DOT Hydraulic Engineers have voiced their needs for a stand-alone HY-12 product with a graphical user interface to ensure an effective and efficient implementation.

FHWA anticipated the HY-12 software would be implemented with only one phase to the development process; however, State DOT's have requested initiation of a second phase to develop a GUI for a more efficient and successful implementation.

### **Objectives, Scope, and Tasks**

The objective of this research effort is to develop a graphical user interface, GUI, for the HY-12 storm drain software. The effort would be funded by FHWA and other State DOT contributors (PFP members).

The anticipated scope of work consists of continued development efforts on the HY-12 software and an accompanying GUI.

The project will consist of the tasks described below. Where possible the tasks may be developed concurrently. Some tasks may require technical review and approval by PFP members before any programming efforts.

Task 1 – Project Meeting

Task 2 – Develop Conceptual Prototype

Task 3 – Develop Draft Product

Task 4 – Final Draft Product and & Documentation

Task 5 – Final Release

Task 6 – Continued Maintenance and Enhancement of HEC-12 GUI

### **Estimate of Project Funding and Research Period**

**Recommended Funding:** \$100,000

**Suggested Contribution:** \$10,000/year

**Research Period:** 12 months

### **Comments**

The Federal Highway Administration will serve as the coordinator for this pooled-fund project. State DOT's will be solicited for their interest and participation in this study. FHWA will issue a task order contract under the NHI IDIQ contract to conduct the study. Periodic reviews will be arranged to keep participating states and agencies up-to-date on current developments.

### **Persons Developing the Problem Statement**

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Dr. Kerenyi will serve as the FHWA liaison to the pooled fund study members. Mr. Ghere will serve as the technical manager.