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A USER EXPERIENCE WITH HYDRAIN

Final Report
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Prepared in cooperation with the
U. S. Department of Transportation
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16. Abstract

This one-page report summarizes the beta testing, by a state transportation agency, of HYDRAIN. HYDRAIN is a personal-computer-based hydraulic design software package developed by GKY Consultants under FHWA Pool Fund Study HPR-2(126). Several versions of HYDRAIN were tested. Questions and problems were discussed with GKY Consultants, the FHWA contractor, and then documented in our quarterly reports to improve the software.

Some computer bugs were encountered and corrected through interaction with GKY Consultants, while other minor bugs still remain in the current Version 3. No accuracy problems were ever encountered after input errors were resolved. Version 4 may correct most of these remaining bugs.

IMPLEMENTATION:

HYDRAIN is an effective design tool and is recommended for use by hydraulic design engineers. Combined with ready access to a personal computer (PC) for each hydraulic designer, the program greatly improves speed, convenience, and accuracy. The computer hydraulic design software HYDRAIN should be continually maintained and upgraded as improvements are needed. An input editor similar to EDIT2 is needed to allow HYDRAIN to become more user friendly. HYDRAIN could become an AASHTO shareware product to keep the software current.

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HYDRAULIC DESIGN SOFTWARE REVIEW
Study No: 105.06

Activity Summary:

This study was used to beta test HYDRAIN, the hydraulic design software developed by GKY Consultants under FHWA Pool Fund Study HPR-2(126). This study started in 1986 about the time the personal computer (PC) was becoming the calculation work horse for engineering designers. Prior to HYDRAIN, most of our design calculations were performed by hand or by a Cyber main frame computer.

At first we needed to encourage our designers to use the new PC purchased for reviewing HYDRAIN . Once the designers became familiar with this "new" tool, its usage expanded exponentially. At first, we would do the design on a project by hand and then check the design with HYDRAIN to compare the results. We checked for reasonableness of the answers and not their accuracy. No accuracy problems were encountered after input errors were resolved.

Several versions of HYDRAIN were tested. Questions and problems were discussed with GKY Consultants, the FHWA contractor, and then documented in our quarterly reports to improve the software.

Some of the problems that we have had with HYDRAIN are:
1. The programs in the HYDRAIN shell often crash for no apparent reason. Often one needs to reboot the computer.
2. HYDRAIN will often stay resident in the computer memory after the program is terminated.
3. The graphic displays (i.e. culvert performance curves) do not have printer support. We have had to use print screen with DOS's graphics.com file. This does not work with our HP Laser Jet II. The culvert design program (HY8) won't allow the project number and location to be entered to provide documentation on the output.
4. The program will often fragment the computer disk and create cross linked files, especially when programs such as WSPRO (water surface profile program) terminate prematurely due to data input errors.
5. It is very difficult to find input errors when using WSPRO. An input editor such as HEC2's EDIT2 will make HYDRAIN more user friendly.

If version 4 resolves many of these problems, we will request that all our consultants use HYDRAIN for design. We are presently using the PC and HYDRAIN for most of our design work as was anticipated during the planning and development of HYDRAIN many years ago.

Recommendations:

Personal computers (PCs) should be readily available to each hydraulic designer as design speed, convenience and accuracy is greatly improved. The computer hydraulic design software HYDRAIN should be continually maintained and upgraded as improvements are needed. An input editor similar to EDIT2 is needed to allow HYDRAIN to become more user friendly. HYDRAIN could become an AASHTO shareware product to keep the software current.