

TECHNICAL REPORT TITLE PAGE

1. REPORT NO.

TR-504

2. REPORT DATE

April 2005

3. TITLE AND SUBTITLE

Extensions to the Iowa Culvert Hydraulics
Software – The Design of Energy Dissipators
(Iowa DOT Culvert Program - Version 2.0)

4. TYPE OF REPORT & PERIOD COVERED

Final Report
November 2003 – March 2005

5. AUTHOR(S)

L. Jones
President

6. PERFORMING ORGANIZATION ADDRESS

Organization
Digital Control, Inc.
225 Hickory Dr.
Ames, IA 50014

7. ACKNOWLEDGMENT OF COOPERATING ORGANIZATIONS/INDIVIDUALS

8. ABSTRACT

Iowa Highway Research Board Project TR-504, "Iowa DOT Culvert Program - Version 2.0" is used by the Iowa DOT, Counties and Consultants for the hydraulic design of culverts. The software incorporates methods for computing design discharges and sizing culverts for both inlet and outlet control.

The program has been updated to include three methods of designing energy dissipators at the outlet of culverts. The methods include HEC-14, riprap basins, U.S. Army Corps of Engineers scour hole design and U.S. Bureau of Reclamation plunge basin design. These are also identified as the "Nebraska" scour hole and plunge basin design since they were obtained from Nebraska's Design Manual.

The program has also been updated to include the USGS 87-4132 equations, improved graphics, inclusion of the inlet invert elevation, ability to export results into an Excel spreadsheet and an on-line user manual.

The Iowa DOT Culvert Program was updated in English only. The web site to download the program is located at <http://www.dot.state.ia.us/bridge/polframe.html>. First select "Prelim. Design Software" on the left, and then make selection under "Iowa DOT Culvert Program - Version 2.00" on the right.

9. KEY WORDS

drainage, culverts, hydraulic design

10. NO. OF PAGES