



ALABAMA DEPARTMENT OF TRANSPORTATION

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Kay Ivey
Governor

John R. Cooper
Transportation Director

August 6, 2018

MEMORANDUM

To: Region Engineers & Bureau Chiefs

From: Steven E. Walker *S. E. Walker*
State Design Engineer

Re: Departmental Approved Hydrological/Hydraulic Software
(Exclusive of Stormwater controls)

The following programs are allowed for analysis of ALDOT projects. This letter supersedes the list provided July 14, 2008.

HYDROLOGY:

- HYDRO 13-A Excel Spreadsheets v2018
- HEC-HMS v4.2.1
- Watershed Modeling System (WMS) v10.1
- Gridded Surface/Subsurface Hydrologic Analysis (GSSHA) v7.12
- Storm Water Management Model (SWMM) v5.1.012
- US Geological Survey's StreamStats v4.

The HYDRO 13-A Excel Spreadsheets developed by the Department are the primary hydrologic program for estimating rainfall and runoff. The spreadsheets can be located on ALDOT's intranet hydraulic page.

Outside the limits of the Location survey, topographical data can be obtained from the supplemental programs Terrain Navigator Pro, Google Earth, Google Maps, Bing Maps, and the USDA's Web Soil Survey. The Web Soil Survey further contains surface and shallow soils data.

STORM DRAIN DESIGN:

- Bentley's STORMCAD V8i (Select Series 2)
- Basin Runoff Networking (BRN) v5.0
- Storm Water Management Model (SWMM) v 5.1.012

- FHWA's HYDRAIN - HYDRA v5.0 (Analysis Tool) DOS version.

The STORMCAD program is the primary software to use for storm drain design after inlets have been designed. The standard head loss method should be used at initial inlets and the HEC-22 method at downstream inlets.

The BRN program will compute the division of flows at a box.

CROSS DRAIN DESIGN:

- FHWA's HY-8 v7.50
- Bentley's (Haestad) CulvertMaster v3.3
- FHWA's HY-8 v 4.1(DOS version)
- US Army Corps of Engineers' HEC-RAS v5.0.3
- US Geological Survey's Water-Surface Profile (WSPRO) v95
- Surface-water Modeling System (SMS) v12.2.12.

The HY-8 v7.50 is currently the most used program for cross drain and side drain pipe design. The CulvertMaster program is also used as a cross drain design program and can model slope paved headwalls. The DOS HY-8 v4.1 is an alternate program which can reproduce old files.

UPSTREAM DETENTION POND DESIGN:

- FHWA's Hydraulic Toolbox v4.20 (Detention Basin Analysis calculator)
- Basin Runoff Networking (BRN) v5.0
- Bentley's PondPack v8i
- FHWA's HY-8 v4.1 (DOS)
- HydroCAD v10.

The Detention Basin Analysis calculator of the Hydraulic Toolbox v4.2 and BRN v5.0 are the primary software packages for detention pond design for the Department.

The Detention Basin Analysis calculator can be used for single detention basin design, while the BRN software can be used for single, series, or parallel detention basins design.

DOS HY-8 v4.1 is an alternate program for single detention pond design.

PondPack is acceptable for detention pond design if the designer imports an Alabama hydrograph.

ENERGY DISSIPATOR DESIGN:

- ALDOT's Excel Spreadsheets - Multibarreled Contra Costa v6.21.10
- ALDOT's Excel Spreadsheets - Multibarreled Riprap Basin v7.25.16
- ALDOT's spreadsheet of US Bureau of Reclamation's USBR Type VI v5.10.18
- FHWA's Hydraulic Toolbox v4.2 (Riprap Analysis calculator).

The ALDOT spreadsheets are the primary tool for the design of streambed level and riprap basin energy dissipaters. The spreadsheets are available on the Department's intranet hydraulic page. DOS HY-8 v4.1 is a secondary design tool.

The Windows HY-8 v7.50 dissipater module is not accepted unless the results are checked by the ALDOT spreadsheets or hand computations.

DITCH LINER DESIGN:

- North American Green (NAG) Company's Erosion Control Materials Software (NAG-ECMDS) v4.3
- HYDRAIN – Vol VII (HYCHL – Roadside Channels) v5.0
- FHWA's Hydraulic Toolbox v4.2 (Riprap & Channel Lining Design calculators).

NAG can be used for Class C & D vegetative liners, RECPs, and concrete lined ditches. Use HYCHL or the Hydraulic Toolbox for riprap and concrete liners.

CURB AND GRATE INLET DESIGN:

- INLETSOFTAL v1.00.06, HEC-12
- Haestead Quick HEC-12
- FHWA's Hydraulic Toolbox v4.2 (Curb and Gutter / Inlet Analysis calculator)

INLETSOFTAL is the preferred program, but all are acceptable.

SPECIAL HYDRAULIC PROGRAMS: 2-D water modeling programs.

- Bureau of Reclamation's Sedimentation & River Hydraulics – Two Dimensional (SRH-2D) v3.2.0
- Surface-water Modeling System (SMS) v12.2
- FHWA's Finite Element Water Modeling System FESWMS-2D

DRAFTING:

- MicroStation V8i (SELECT series 4) v08.11.09.867
- BENTLEY INROADS SUITE V8i (Select Series 2) v08.11.07.615.

SEW/scb

C:\ Mr. Tom Flournoy, P. E.
Mr. Paul Carter, P. E.
Design Section Leaders
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