PURPOSE: To set forth the Guidelines Used By The Office Of State Aid Road Construction In The Design Of Bridges and Culverts.

1. BRIDGE DESIGN GUIDELINES:

The structural and geometric design of bridges shall be in accordance with AASHTO Standard Specifications for Highway Bridges, current edition and Chapter XIII of the MDOT Roadway Design Manual, current edition.

1.1. The maximum span available as a standard bridge sheet is 110'-0". When longer spans are necessary, a special design will be developed using either prestressed concrete beams or structural steel, whichever is applicable, for the crossing.

These special designs are best handled through a consulting firm familiar with bridge design, hydraulics, etc.

2. HYDRAULICS: In developing length and finish grade requirements for bridges over streams, it is necessary to investigate the stream discharge at the bridge location using the following methods:

2.1. Highwater Marks: Determined by County Engineer from elevations taken in field, or drift, water marks, etc. It is recommended that local residents near the site be consulted to determine dates that highwater occurred along with the corresponding highwater elevation.

2.2. Drainage Area: The drainage area is determined from U.S.G.S. Quad Maps which are available in a size of 7 ½ min. for most of the state.

2.3. Determination of Discharge: The U.S. Geological Survey Office in Jackson, Mississippi has published, and each County Engineer has been furnished a copy of a book titled "Flood Characteristics of Mississippi Streams," current edition. This edition contains regression equations for the different frequencies. Our policy is to calculate the discharge for a 25 year frequency with checks on the 50 year and 100 year frequencies. The book outlines the limitations of the regression equation along with instructions for developing the equation (see S.O.P. No. SA I-1-9 for LSRP projects).

The County Engineer may be required to furnish the State Aid District Engineer a valley profile of the stream crossing taken approximately 75 feet upstream from the proposed crossing. The "Valley Cross-Section" will begin at a known highwater mark on one side of the valley and proceed to a known highwater mark on the opposite side of the valley. This valley profile will be taken at right angles to the flood plain.

This profile would be in addition to the normal roadway profile showing the stream crossing and proposed bridge layout. The drainage area, discharges, and highwater marks will be shown on the proposed bridge layout sheet when sent to State Aid prior to the Plan-In-Hand Inspection.

In most cases it is recommended that a maximum velocity of 5 ft./sec. be used for determining required opening under bridges. This opening furnished will be calculated from a 25 year stage as best determined in Subsection 2.1.

3. BOX AND PIPE CULVERTS: Both hydraulic and physical design determinations for box and pipe culverts will be those set forth in Chapter 7 of the Design Manual adopted by the Mississippi Transportation Commission, current edition. It is recommended that a maximum velocity of 8 ft./sec. be used in determining opening required for box and pipe culverts.

4. DESIGN STANDARD DRAWINGS: Standard drawings for construction and installation of drainage structures are those contained in the current, approved manual titled "Mississippi Department of Transportation Roadway Design Standard Drawings".

5. ENCROACHMENTS ON FLOOD PLAINS: All drainage structures which pass water outside the highway cross section should show the flow and high water elevations for the design, 100 year, and the greatest flood of record. This data should be developed for 24" pipe and greater, and the schedule can be shown on the project plans similar to form SAP HD-1.

   Hydraulic design of encroachments on flood plains will be in accordance with S.O.P. No. SA II-1-33A.

SAP HD-1

SUMMARY OF HYDRAULIC DESIGN DATA

			*DESIGN FLOOD YEAR ( )		*BASIC FLOOD YEAR (100)		FLOOD OF RECORD YEAR( )	
SH. NO.	STATION	CULV. SIZE	DIS. (C.F.S.)	HEAD W. (ELEV.)	DIS. (C.F.S.)	HEAD W. (ELEV.)	DIS. (C.F.S.)	HIGH W. (ELEV.)

*HEAD WATER ELEVATION VALUES SHOWN ON THESE PLANS ARE THEORETICAL AND MAY VARY FROM ACTUAL CONDITIONS."