a. Bridge length, and justification for the length, including locations (stations) of abutments
b. Channel excavation requirements
c. Minimum vertical clearance
d. Minimum horizontal clearance
e. Abutment type and orientation
f. Pier orientation
g. Scour depths for the design flood, 100-year flood and maximum probable flood (usually the 500-year flood).
h. Scour protection requirements for abutments, piers and channel
i. Deck drainage

5. Documentation of large culvert hydraulic designs shall include hydraulic calculations and recommendations for the following:

a. Culvert Size, and justification for the size, barrel length and location
b. Peak water surface profiles and cross-section velocity profiles for the design flood, the 100 yr flood and the maximum probable flood for a distance 150 meters upstream, through the culvert to a distance 150 metres downstream.
c. Upstream and downstream invert elevations.
d. Endwall type for entrance and outlet, including the need for an improved inlet.
e. Skew
f. Inlet end and outlet end scour protection requirements

6. Final project plans shall show the peak stages, peak discharges, peak velocities, and peak scour predictions for the design flood, the 100 year flood and the maximum probable flood that can be expected to flow through the structure.

B. Report Outline: An outline of items that should typically be considered in the preparation of a BLHR is given below. Non-applicable items should be so indicated rather than omitted without comment. Additional information may be appropriate at unusual sites.

The BLHLR should be divided into two basic sections: Preliminary Information and Design Data. These sections are then broken down into the subsections identified below. Rather than a formal item by item approach, a narrative description of the site and the hydraulics recommendations is suggested.

Preliminary Information

A. General Site Location

1. Highway Description

a. Type (expressway, main, secondary, rural, urban, etc.)
b. Lanes (two, four, divided, limited across, etc.)
c. Importance (main access between towns and borders, military route, alternate routes available, etc.)

2. Topography of site and basin
3. Location: small scale map with site located

B. Potential Site Problems

1. Land Use (obtain from responsible Department)

a. Encroachment on the flood plain
b. Recreational use
c. Domestic water supply
d. Security area

2. Channel Stability

a. Bank stability
b. Bends and meanders
c. Potential for natural change of channel
d. Aggradation or degradation of bottom
e. Scour history

3. Potential Water Stages

a. Flood history (dates; stages; source of information; extent of flooding; approximate frequency; damage to structure, embankment or highway)
b. Potential backwater from other streams or rivers
c. Reservoirs of flood control projects (Department and status)
d. Tidally affected (mean high and low water)