E. Additional Survey Data of Proposed Site

1. Data sufficient to prepare a contour map (intervals at 30 cm or 60 cm depending on scale); required distance upstream and downstream will vary with site
2. In lieu of (1), a minimum of three cross sections will suffice for some cases (upstream, at, and downstream of site)
3. Vegetation, estimated bed load, bottom soil material and soil properties, and other general site parameters

F. Departmental Coordination

1. Contact Departments involved and identify what other projects may be affected by the culvert/bridge
2. Investigate possibility or necessity for a cooperative project

It is also suggested that a checklist of required items for each site be prepared and given to the survey crew to ensure complete data will be obtained with a minimum of supplemental or unnecessary effort.

311.05.02 Bridge Hydraulics Recommendations Sheet (BHRS)

The BLHR is a full size drawing, to be included with the BLHR. It is divided into several information blocks, which must be as completely filled out as is appropriate for the design and location. The BHRS must always include the Project Number and the Bridge Number as per the drainage map in the title box.

The information requested for existing bridge or large culverts near the site includes foundations, overall length, span length, type of construction, area of opening at high water, roadway width, and the low member elevation. The area of opening at high water generally refers to the flow area available through the existing structure below the water surface determined for a design storm frequency.

The BHRS hydraulic design data section should include water surface elevations and several categories of flood data for various events, including the maximum event of record, the design flood, the base (or 100-year) flood, and either the overtopping or maximum probable flood, whichever occurs first. The overtopping flood is the one in which flow crosses the highway, or spills into another watershed or through a relief structure. The max. probable flood is normally a 500-year event. Flood data includes stage elevation, discharge, average velocity (on larger crossings a velocity profile across key cross-section is usually needed) and exceedance probability.

Water surface elevations are classified as normal high water for non-tidal areas and as mean low and mean high water for tide-influenced areas. Normal high water is defined as the 2-year event; mean low water and mean high water data can be obtained from the admiralty charts.

Hydraulic recommendations should include the beginning and ending bridge stations, data on the channel section (including any excavation), navigation and drift clearances, scour prediction, slope protection, and deck drainage.

Space should be provided for a small scale location map outlining the drainage area. A plan view of the existing and proposed bridge area must also be included. The scale should adequately depict the area adjacent to the structure, including existing and proposed contours. Drainage areas for very flat sites warrant careful delineation since only one or two contours may occur. For a bridge, a profile of the channel section should be shown; for a large culvert, the culvert centreline should be profiled. The profile should show channel work and bridge end treatment. If necessary for clarity, bridge ends should be drawn at a larger scale.

The assumed configuration, deck drainage, and scour recommendations need to be approved by the Municipality before plans are completed. This review provides an opportunity to evaluate the impact of substantial changes on the hydraulic design conditions.