e. Location of overflow areas
f. Appurtenance structures (i.e., energy dissipaters rip rap, etc.)

6. Note significance, if any, of stream ecology and/or wildlife habitat.

Sec. 7.08 **Storm Sewers**

When the survey includes an existing storm sewer system, invert elevations should be determined on all pipes, drop inlets, catch basins, manholes, etc. It is essential that all utilities in the area of the existing be located and their elevations given in order to avoid conflicts between the existing utilities and future storm sewer system. This information should be extended well beyond the limits of the proposed project, both laterally and longitudinally, at least to the next access structure. The invert elevation of each pipe entering and leaving a drop inlet and/or manhole must be shown. The location of storm sewer outfalls should be determined. This data should conform to applicable items of **Sec. 7.06** and **Sec. 7.07.**

Sec. 7.09 **Major Structures Over Waterways and Major Flood Plain Surveys**

(Structures with clear span or diameter greater than 20 feet)

The purpose of a survey is to provide an accurate picture of the site conditions. The quality of the final design is heavily dependent on the accuracy and thoroughness of the survey data. This is particularly true in the case of major structures where the cost and the consequence of error can be quite significant.

All surveys for major structures must be coordinated with the District Hydraulic Unit. This will ensure that all needed data is obtained and, in many cases, will eliminate certain standard survey requirements that are not needed for the particular site.

Each item of requested information described in this section is needed for a specific reason. While the survey party must exercise some discretion in securing the requested information, they should endeavor to fully comply with the instructions in this section as modified through coordination with the District Hydraulic Unit.

Sec. 7.09.1 **General Considerations**

A reconnaissance of the stream should be made in order to select the most desirable structure site. The best location is a point where the flood plain is narrowest and where a reasonable foundation is available at a favorable elevation. Skewed crossings should be avoided when possible, but where skewed crossings are unavoidable, they should not exceed 45° unless conditions make other angles imperative.

Alignment should be adjusted to avoid horizontal curvature and transitions on bridges. When this cannot be done, it is usually preferable to place the entire structure on a horizontal curve with transitions beyond the end of the bridge. Structure locations that would involve a heavy gradient on the structure should also be avoided, when possible.