and date of occurrence, if available, and present water elevations with the dates of the readings, as appropriate.

2. Existing drainage structures, showing type, size, flow line, flow direction, and any other pertinent data.

3. Drainage divides and information, where applicable, to indicate the overland flow of water. Drainage areas on maps of urban and rural sections should be shown to the accuracy necessary, depending on the system involved. A guide to the appropriate accuracy for a non-critical system is provided. Critical systems usually require a drainage area determination within 2 to 3 percent.

Size	***Accuracy***	
Drainage Area (Hectares)	***Mainly Impervious (Hectares)***	***Mainly Pervious (Hectares)***
0.0 - 0.2	0.02	0.04
0.2 - 2	0.04	0.08
2 - 4	0.08	0.2
4 - 8	0.2	0.4
8 - 20	0.4	0.8
20 - 40	0.8	2
40 - 80	2	4
>80	4	10

Inserts are used to show areas of such magnitude that the boundaries cannot be plotted at the regular scale. Proposed drainage structures are plotted by symbol only in the plan portion and noted by structure number.

4. Aerial photography is desirable because it will document the development and often the drainage pattern which existed at the time of design.

5. Design, base, and overtopping (or maximum probable flood) discharge and stage values are required on all expressway and mainroad projects for all cross structures that would back floodwater outside the project limits, regardless of structure size.

6. In the report, the various cross-drain culverts should be summarized by station, size, invert elevation and minimum culvert backfill values for pH, resistivity, sulphates, and chlorides for the various alternate culvert materials.

The profile portion of the map should include the following data:

1. Plot of the existing ground, done in a light solid line to the same horizontal scale as was used for the plan portion.

2. Drainage map sheets with the profile blocks deep enough to sufficiently show the necessary profiles and cross-drain profiles.

3. Plot of the proposed profile grade line.

4. Plots of all proposed special ditches, except median, when horizontal and vertical scales permit.

5. Plots of proposed cross drains, except median drains. Skew and pipe slope are not shown.

6. For urban projects, plot only the storm drain and mainline structures. Laterals are not plotted. Flow line elevations are posted along the main.

E. Existing Features Survey: In areas draining to a project site, all streams, wadis, ditches, reservoirs, drainage structures, and other possible conflicting utilities should be shown. Flow lines, controlling grade elevations, and high water stages should be documented for existing structures. The concept report should note record the estimated reliability of flow and high water observations.

1. Survey Notes: The drainage survey notes should show all pipe lines, culverts, and bridges in place on the existing roadway. Pipe length, size, type, and conditions should be given. The design for alternate culvert materials requires accurate information on the condition and length of service for existing culverts. Data on corrugated pipe should include material (steel or aluminium), coatings, size, and type (annular or