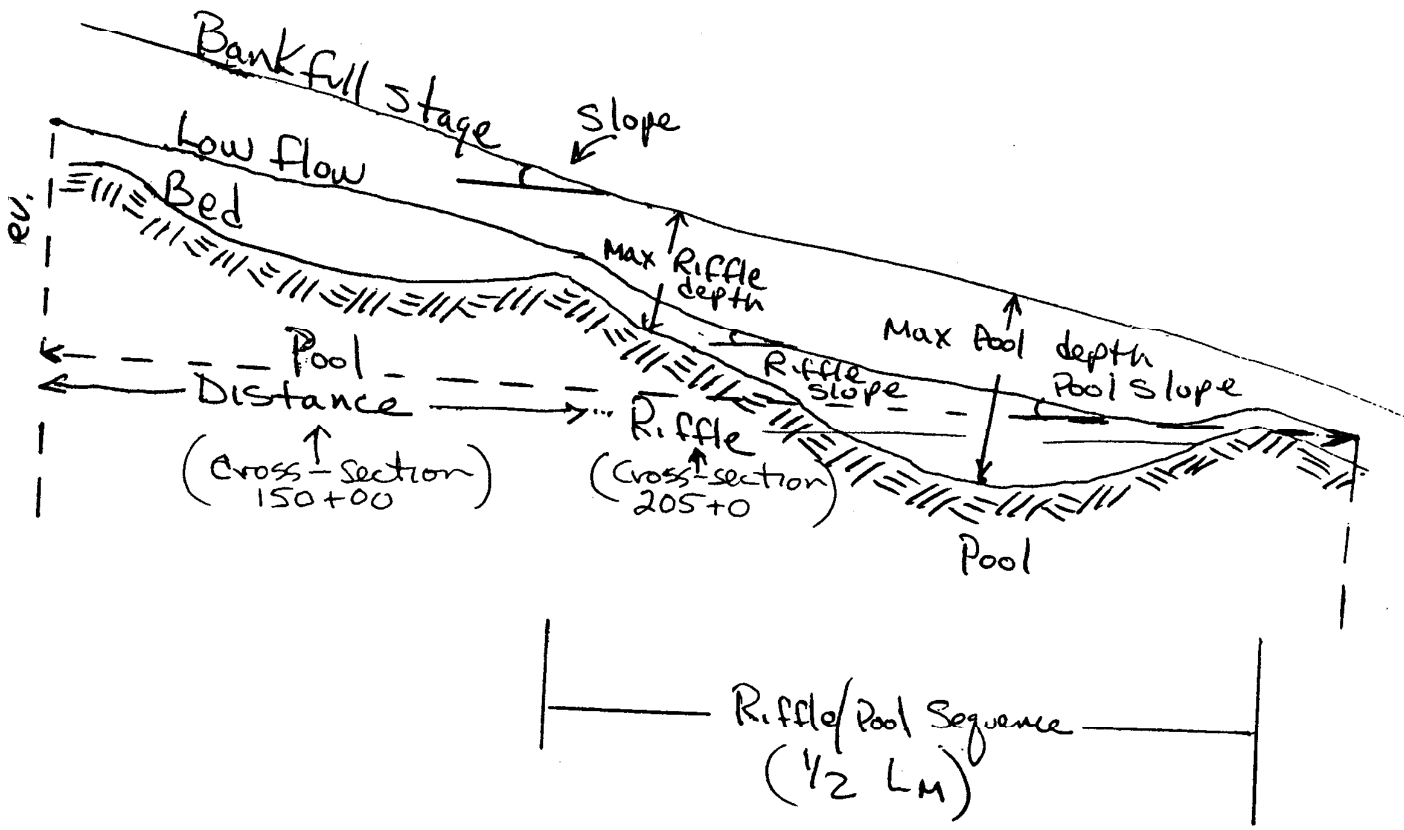
Cross-Section

The cross-section needs to show: Benchmark elevation and location
-Terraces and floodplain
-Flood prone area width and depth
-Bankfull stage (Both left and right banks)
-Existing left and right edge of water
-Variability in shape of cross-section
-Thalweg

Start Cross-Section with the zero end of tape on <u>left</u> bank (looking downstream)

5. The following information is obtained from the cross-section:
   a. Bankfull width
   b. Mean Bankfull depth (d) (cross sectional area (A_{bkf})/Bankfull width(W_{bkf})
   c. Width/depth ratio W_{bkf} / d_{bkf}
   d. Entrenchment ratio = W_{FPA} / W_{bkf}
   [Flood prone Area width (w_{FPA}) = (width at an elevation2x maximum bankfull depth)]
   e. Cross-sectional area at the bankfull stage (A_{bkf})
   Cross-sectional area is obtained by computing the sum of the products of The intervals of width times depth across the section. Wetted perimeter @ the bankfull stage
   f. wetted perimeter (P)
      a) measure from from plotted cross section or ;
      b) approximate by computation
      $P = [2(d_{bkf}) + \cancel{\text{average}}\ W_{bkf}]$ ~~Average width = (top width +bottom width/2)~~
      or:
      $$P = W_{bottom} + 2\sqrt{(\bar{d})^2 + (\bar{W} - W_{bottom})^2}$$
      where: $\bar{W} = W_{Top} + W_{bottom}/2$
   g. Compute bankfull hydraulic radius (mean hydraulic depth)
      $$\frac{A_{bkf}}{P} = R_{bkf}$$
   h. Estimate mean bankfull velocity (U_{bkf}) in ft/sec.
   i. Estimate bankfull discharge (Q_{bkf}) = $A_{bkf} \times U_{bkf}$.

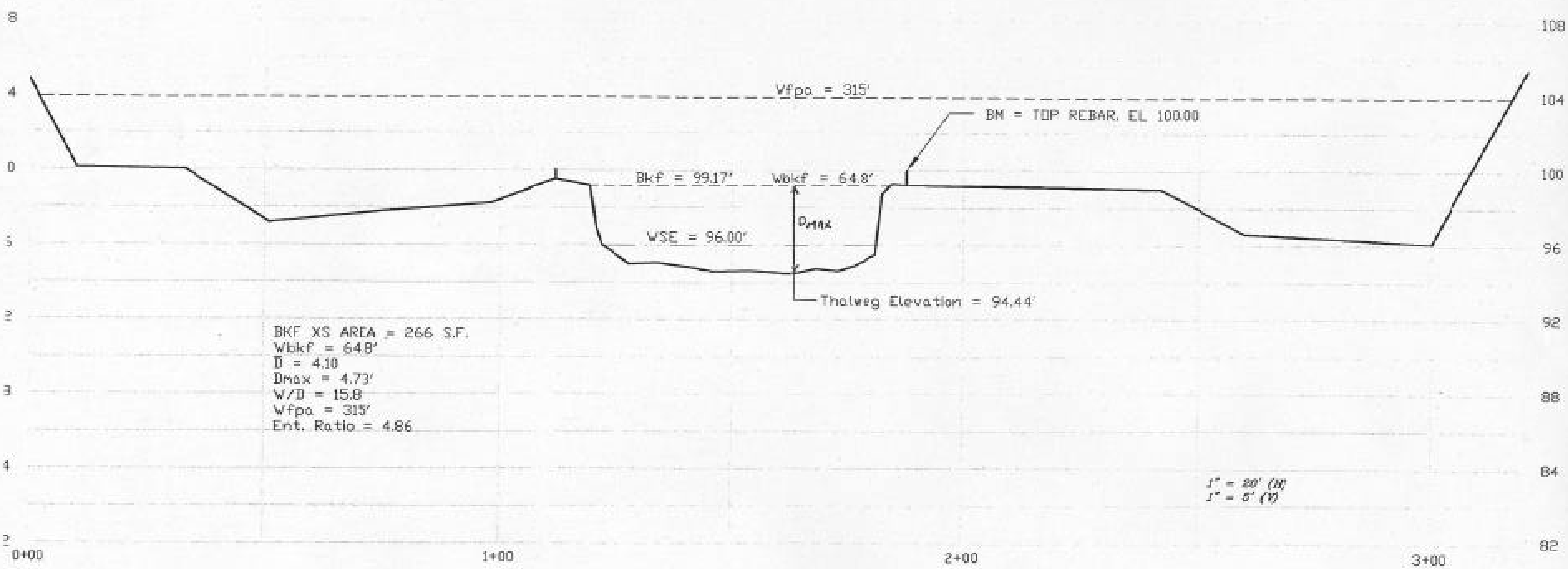
   j. Obtain drainage area (mi. ^{2}) from topographic map. Compare regional curves at the bankfull stage for; cross-sectional area, width, depth, velocity and discharge by drainage area.



Longitudinal Profile

SMITH RIVER GAGE NEAR BRISTOL, NH

RIFFLE CROSS-SECTION UPSTREAM OF GAGE (RYEA RESIDENCE)
SURVEYED 6/18/02
D.A. = 85.8 sq. mi.



PROFILE

1.) Start the longitudinal profile from first cross-section and tie-into a permanent elevation control for replicate measurements.

2.) Obtain the following elevations on the longitudinal profile:

* Bed surface
* water surface
* Bankfull stage
* Bank height (note left and /or right bank) (Optional)

3) Measure Thalweg position, stationing and distance,i.e. maximum depth. Make sure to measure changes in elevation that indicate the shape, depth, and length of pools and other features to accurately define the bed features along the profile.

4) Locate other cross-sections with longitudinal stationing as reach identifiers i.e. cross-section 3+50 is located 350 feet down from start of profile.

5) The number of points (elevations) obtained along the profile should be sufficient to describe the show the length and depth of pools and well as other bed features such as runs and glides.

6). The following data is obtained from the longitudinal profile.

* average slope (S) (using water surface)
* Bankfull slope (S_{bkf}) (for certain hydraulic and sediment computations.)
* Maximum riffle depth
* Ratio of maximum riffle depth/average depth (d_{maxrif} / d_{bkf})
* Riffle slope
* Ratio of riffle slope to average water surface slope (S_{riff} /S)
* Pool slope
* Ratio of pool slope to average water surface slope (S_{pool} / S)
* Maximum pool depth (d_{pool})
* Ratio pool depth to average bankfull depth (d_{pool} / d_{bkf})
* Riffle/pool spacing or pool to pool distance (r-p / w_{bkf})