CROSS SECTION DATA FOR FLOODPLAIN MAPPING—BC Water Surveys

The BC Water Surveys Section obtained cross sections of the channel portion of rivers, streams and creeks with minimal over bank detail, for use in floodplain surveys. The standard format of output for these channel sections are in two parts.

The first part is a ***written profile*** of each cross section, from the left bank to the right bank as viewed looking downstream. Unless otherwise noted, the unit of measurement is metres, with elevations referred to Geodetic Survey of Canada datum. The written profile consists of seven columns of data .

Example of a Written Profile:

ELK RIVER (FERNIE) XS16A 9131F040 SEP/OCT 1991

STATIONS	DISTANCE	CHAINAGE	ELEV	NO.	NAME OR REMARKS
199 399	0.00	988.33		1	DUMMY XSREF 1995
	2003.54				
200 400		2003.54	988.27	2	BP
	1.68				
201 401		2005.22	988.10	3	BLT-LB-XS-16A
	2.70				
202 402		2007.92	988.35	4	BP
	3.91				
203 403		2011.83	988.35	5	BP
	4.06				
204 404		2015.89	988.17	6	BP
	5.57				
205 405		2021.46	987.44	7	TOP-DITCH
	2.50				
206 406		2023.96	986.77	8	TOE-DITCH

The following is a brief description of data contained in each column shown in the preceding example.

Each cross section starts with a header card which identifies the watercourse, cross section number, project number and date of survey. Some variations in this header layout may occur for specific floodplain mapping projects.

The header information is followed by a column header row and thereafter, cross section profile data.

Column 1 → under the heading “STATIONS” is the identification number assigned to each topographic point obtained in the field, for which coordinates in the form of position and elevation have been previously calculated.

Column 2 → also under the heading “STATIONS” is the identification number assigned each cross section point for which an accumulated distance (from the first point) and elevation has been calculated, using the coordinates associated with the corresponding identification number in column 1.

Column 3 →under the heading “DISTANCE” is the horizontal distance between cross section points, calculated from the positions associated with the corresponding identification numbers in column 1.

Column 4 →under the heading “CHAINAGE” is the accumulated horizontal distance at the point identified in column 2. This is an accumulation, of all distances in column 3, from the first point in column 2 (at chainage 0.0) and passing through each subsequent point in the cross section up to the desired point number in column 2. The data in this column is used to produce the cross section geometry or “GR” card data output in part two.

Column 5 → under the heading “ELEV” is the elevation above datum for the cross section point identified in column 2 and at the chainage shown in column 4. The data in this column is used with that in column 4 for output in part two. Unless otherwise noted, elevations referred to **Geodetic Survey of Canada datum**

Column 6 →under the heading “NO.” is simply a sequential unit count of the number of points in a cross section. It may optionally replace, on plotted output of this data, the identification number normally used from column 2.

Column 7→under the heading “NAME OR REMARKS”, as implied is any additional information describing the cross section point .

To allow for additional overbank data to be added from available mapping and at the same time avoid negative chainages for these additions, a “DUMMY” station was usually added to the beginning (leftbank) of a cross section.

The procedure used was to repeat the elevation of the first point of the cross section and assign the “dummy” station a large even distance from this first point, for example 2,000 metres. The occurrence of this “dummy” station can be easily recognized by the fact that the first two points of the cross section are at the same elevation and the horizontal distance between them is unusually large. Remarks usually identified the point as “DUMMY”. Where cross sections may have been rerun in subsequent years, the same “Dummy” station coordinate is used to align the chainage for all years to allow for comparison of the channel configuration.

The second part is a computer generated ***GR Data*** file of 80 column records. These records contain the written profile for all the cross sections, in the form of cross section geometry or “GR” cards using the “ELEV “ and “CHAINAGE” data from the written profile. This data may then be used as input variables to the HEC-2 program.

Example of a GR Data file:

X1 XS16A 1995

GR988.33 0.00 988.33 2000.00 988.12 2005.22 988.35 2010.56 988.26 2015.42

GR987.79 2019.31 987.52 2021.49 986.77 2023.82 986.71 2025.06 987.71 2026.32

GR987.91 2030.46 987.89 2036.60 987.82 2040.71 987.62 2044.37 987.26 2046.71

GR987.00 2047.65 986.64 2051.14 986.56 2053.23 986.37 2055.71 986.29 2059.84

GR986.12 2064.72 985.83 2069.61 985.36 2075.64 985.08 2081.54 984.25 2088.24

GR984.50 2094.77 985.15 2096.07 984.91 2096.31 985.29 2097.66 985.12 2098.02

GR985.26 2099.11 985.58 2100.62 985.87 2102.43 986.17 2103.87 986.54 2104.82

GR987.43 2105.70 988.70 2106.37 989.21 2107.36 990.12 2108.62 990.15 2109.83

GR989.99 2114.86 990.03 2134.46 0.00 0.00 0.00 0.00 0.00 0.00

Coordinate Files:

Horizontal control:

Floodplain Surveys were carried out under varied conditions and terrain usually with limited survey control available. For earlier surveys, position of the cross section was identified on air photographs , subsequently transferred to topographic or photo mosaic map sheets and assigned arbitrary (assumed) horizontal coordinates (e.g. 5000.0, 10,000.0).

Where BC Control were available, positioning of cross sections were obtained using standard traverse procedures in place and referred to NAD27 datum. Traverse data computed in geographical, based on the Clarke 1866 spheroid and converted to UTM Coordinates. Coordinates listed in Northings (y), Eastings (x) and Elevation(z) format.

Vertical control

Unless otherwise noted, elevations referred to **Geodetic Survey of Canada datum- CGVD 1928**.