Site Survey and Design Requirements

In all FRBC-funded Watershed Restoration Program projects, the contractor must adhere to the provisions of a Standards Agreement that is administered by the Ministry of Environment, Lands and Parks. The Standards Agreement describes four categories of projects from Type I through Type IV. A Site Survey and Design must meet the requirements described in the Standards Agreement for the appropriate Type of project.

Type I Site Survey and Design Requirements
The requirements given in the 1998 Standards agreements are given below for a Type I project where the length of the project is less than 50 m.

The Site Survey and Design for a Type I project will include the following requirements at a minimum:

- A detailed drawing of the position of the structures over the restoration reach, including chainage. This will include either a hand drawn sketch, or an enlarged aerial photograph or ground photograph, with an overlain sketch of the structure. (Scale is to be depicted).
- Level survey cross section plots are to be produced at typical project site locations.
- (See Newbury and Gaboury (1993), pg. 171, Fig. 4-53). Cross sections are to encompass the floodplain height, extending beyond top of bank. Restoration project details are to be overlain on the cross sectional plot.
- Methods for design including design criteria, assumptions and calculations.
- Specifications for development of structures to a 1 in 50 year flood event are to be
- incorporated into the final design package.
- Methods and specifications for construction including a detailed description of the methods to be used to construct each structure. This information should be provided to all operators and workers involved in the actual restoration work. Estimate of quantities of all materials required for restoration structures, for cost estimate purposes. This will include the number and sizes of boulders, trees and other construction materials, as well as the proposed source of these materials.

In addition to these minimal requirements listed in the Standards Agreement from 1998, the following suggestions are recommended by the authors of this report to be included with the above terms of reference in any Type I Site Survey and Design.

- This work will require the services of a qualified environmental monitor.
- A plan for monitoring the effectiveness of the restoration works in terms of their effect on fish habitat and fish, along with 'before construction' data that is sufficient to measure effectiveness when compared to similar data gathered in years after construction.

Type II Site Survey and Design Requirements

In addition to the requirements of the Standards Agreement listed above for a Type I Site Survey and Design, a Type II project, one of more than 50 m in length, will require the following.

- A level survey to obtain a stream bed and water surface profile plot over the restoration reach plus a minimum distance of 200m above and 200m below the reach. (See Newbury and Gaboury (1993), pg. 170, Fig. 4-52). This plot will also include design water surface elevations for the 7 day low flow, bankfull discharge and 1:50 year flood event for the existing channel and with the proposed channel controls.
- Location and elevations of restoration structures are to be depicted on the profile (See Newbury and Gaboury (1993), pg. 176, Fig. 4-57).

In addition to these minimal requirements listed in the Standards Agreement from 1998 for a Type II project and the suggestions for inclusion offered above, the following suggestion is recommended by the authors of this report to be included with the above terms of reference in any Type II Site Survey and Design.

- The survey described above should be conducted with a total station for improved accuracy and resolution. The purpose of obtaining this degree of accuracy is to allow effective monitoring of changes in installed works and changes in the stream morphology.

Type III Site Survey and Design Requirements

In addition to the requirements of the Standards Agreement listed above for a Type I and II Site Survey and Design, a Type III project, one involving off-channel or side channel development, will require the following.

- Detailed construction drawings of the inlet and outlet structures, including elevations, construction materials, design flow and corresponding inlet and outlet water surface elevations for the 7 day low flow, bankfull discharge and 1:50 year flood event.
- Side channel cross sections relative to a specified design flow.
- Considerations on design of inlet/outlet structures and side channel to accommodate or be protected during periods of high river discharge.
- If groundwater fed pond, a description of the expected average discharge volumes over a one year period
- Details as described in Type I and II above, for in-channel complexing that may occur in the side channel.

In addition to these minimal requirements listed in the Standards Agreement from 1998 for a Type III project and the suggestions for inclusion offered above, the following suggestion is recommended by the authors of this report to be included with the above terms of reference in any Type II Site Survey and Design.

- Prior to the work described above in the Standards Agreement requirements, the Site Survey and Design should include an initial topographic survey of the project area's floodplain using a total station. A series of reference bench marks should be established throughout the project area. A contour map should be produced and this should be used as a basis for any further design work. The purpose of obtaining this degree of accuracy is primarily enable reasonable decisions to be made regarding volumes of excavations required as well as to allow effective monitoring of changes during construction.