Chapter 6: Environmental Guidelines for Fording

Water Resources Management Division
Water Rights, Investigations, and Modelling Section
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Newfoundland Labrador

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6.0 FORDING

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6.1 General

Under certain circumstances, properly designed and constructed fords may be used as watercourse crossings. *Chapter 3, "Watercourse Crossings"* provides information on choosing between a fording installation and other methods of watercourse crossing. The use of a fording site is usually limited to periods when low flow conditions prevail. The appropriateness of fording may depend upon the type of vehicle using the site. While vehicles with low pressure tires may ford a stream with little disruption, tracked machinery may cause severe environmental damage and as such may not be generally suited for fording watercourses.

Installation of a fording site should entail minimal disturbance to the stream channel and surrounding vegetation. Concerns normally associated with culverts or bridges, such as size of waterway opening, provisions for debris passage and the need for channel or embankment rip-rap are largely avoided. In addition, the degree of maintenance required is normally less than for other types of crossings. In hilly or mountainous terrain, fords are particularly useful for crossing streams subject to dramatic increases in water level or flash floods, where installation of a rarely used bridge or culvert would be very expensive.

There are, however, several disadvantages of fording a stream. Crossing on an unstable stream bed or unstable approaches will cause direct disturbance of the stream. Mud holes can form on the approaches and subsequent rains combined with traffic travel will discharge sediment into the stream. In addition, the washing of pollutants from equipment travelling through streams can cause water quality degradation. Very frequent use can result in channel destabilization and problems of bank or bed erosion and siltation of the watercourse.

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6.2 Selection of Fording Sites

Fording sites chosen for crossings should be least vulnerable to disruption of land, vegetation, and physical features of the channel.

6.2.1 Choose a Location with Stable Bed Material

A channel bed consisting of bed rock is preferred but a stable channel bed consisting of cobbles or coarse gravel may be satisfactory. Areas containing sandy or silty deposits are not considered satisfactory locations for fording.

6.2.2 Choose a Location with Low Graded Banks

Choose a location where existing approach grades and bank slopes are low, to permit movement of equipment into and out of the channel without extensive excavation or alteration of the channel banks and riparian land.

6.2.3 Confine Fording to Specific Locations

All fording should be confined to specific locations which have been identified as appropriate sites and have been approved. The fording sites should be made clearly visible to equipment operators by markings and the equipment should be confined to within those narrow corridors which have been identified.

6.3 Enhancing a Fording Site

A certain amount of work may be required to prepare a fording site. Such work is intended to make the crossing easier, to protect the stream from disturbance and to simplify restoration measures that may be required.

6.3.1 Preparing Access to The Watercourse

Access to the fording site should be approached at right angles to the stream. Any clearing of vegetation should be restricted to a width of not more than 3m within 15m of the stream bank. All slash must be removed from the area and under no circumstances should it be disposed of near the watercourse. It is important to try to maintain as much vegetative ground cover on the approach area as possible.

6.3.2 Approach Roads

Should grading of the approach be required, a back-blading technique should be used but only to the extent absolutely necessary. The approach road, especially if it is on a steep incline to the watercourse, should be cross ditched to prevent surface runoff along the travelling surface which could cause severe erosion and sedimentation problems.

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6.3.3 Stabilize and Protect Vulnerable Areas

Where areas such as bank sections or approach roads contain loose material that could be subject to erosion, adequate stabilization and erosion protection should be carried out. Brush mats, log ramps or placement of rock may be appropriate depending on the circumstances and the type of material readily available.

6.3.4 Use of In-Stream Rock

If in-stream rock placement is required for fording sites, the crossing should not constrict flow in the river to cause flooding conditions upstream. The material used should be clean blasted rock free of fines. Under no circumstances may such rock be excavated from the stream. Furthermore all material placed in the stream must be completely removed from the channel when the fording site is no longer required.

6.3.5 Avoid Infilling of Channel

Avoid pushing bank sections into the channel or any infilling of the channel which could constrict flow or contribute to flooding, erosion, or siltation.

6.4 Proper Use of Fording Sites

6.4.1 Condition of Vehicles Using Fording Sites

All vehicles using fording sites must be kept reasonably clean and free of mud to prevent siltation or water quality deterioration. The vehicles should also be maintained in good repair, free of oil, gasoline, hydraulic fluids or other deleterious substances which could impair water quality. It may be necessary to have vehicles steam cleaned prior to fording.

6.4.2 Avoid Channel Disturbance and Downstream Siltation

Fording must be carried out in such a manner as to cause the least amount of disturbance of channel bed and bank material which could cause erosion, siltation and pollution of downstream areas. The channel should be approached and forded by vehicles moving slowly in low gear.

6.4.3 Limit Use of Fording Sites

Fording sites should be used as infrequently as possible. If frequent use is required, a bridge or culvert installation may be necessary.

6.4.4 Fording During Low Flow Conditions

Fording should be carried out only during low flow conditions to avoid unnecessary disturbance of the channel or siltation. It may be necessary to undertake an assessment of the flow conditions for a stream to ensure that the water depth and the flow velocity will be such that the stream can be safely

forded without having the vehicles stall due to flooding of the engine or even having the vehicle overturned by the current.

6.5 Removal of Fording Works

When fording sites are no longer required all constructed works such as in stream structures, rock fill, approach ramps, corduroys, etc. should be dismantled and removed from the site.

6.5.1 Site Restoration

In far as possible fording sites should be returned to their previous condition. Low bank sections should be reconstructed and stabilized through placement of rip-rap and revegetation. See *Chapter 11, "Restoration and Stabilization"*.

6.5.2 Ensure Fording Site is Left Inaccessible

Further to the removal of fording works, measures should be taken to ensure the site is not left readily accessible to illegal fording. Such measures should include cross ditching the access road and placement of large boulders across the road.