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6.0 FOREST ACCESS ROAD DEVELOPMENT

Access roads are required to transport personnel and equipment into the field where forest management operations will be taking place, in order to meet the ongoing fibre supply requirements within Corner Brook Pulp and Paper Woodlands' management areas. Access road development is an important factor for **sustainable forest management**, - to balance the harvest within **annual allowable cut** volumes for each individual **Forest Management District**.

In order to conduct its forest management activities, Corner Brook Pulp and Paper Woodlands constructs approximately 50 kilometers of primary forest access road (Class 1, 2, & 3) and an additional 60 kilometers of secondary forest access road (Class 4) each year.

This section provides an overview of road and watercourse crossing construction on Corner Brook Pulp and Paper Woodlands' limits. The general guidelines presented are intended to enhance existing regulations and policies associated with road construction. Strict adherence to procedures and guidelines ensures that all road and stream crossing projects are implemented with a minimum of disturbance to the natural environment. All construction personnel must be familiar with relevant legislation and be in possession of all permits and approvals.



Figure 6-1. Main Company roads provide access to forestry operations and are open to the general public year-round.

Forest access road development can be broken down into four categories; planning, construction, maintenance and de-activating. Planning focuses on locating the roads as close as possible to merchantable timber, with special consideration given to watercourses

and known sensitive areas (e.g. nest sites). Construction encompasses building new or upgrading existing forest roads and constructing watercourse crossings. Maintenance is the upkeep of the existing road network by grading, ballasting, repairing watercourse crossings or clearing brush along roads. De-activating is the removal of an existing road or bridge from active service.

6.1 Forest Access Road Planning

To minimize the cost of construction, roads are routed directly to merchantable timber and then traverse as close as possible while considering local conditions and **topographical** features. When locating roads, special consideration is given to rivers, lakes, and known sensitive areas in adherence to environmental guidelines.

The government's ***Environmental Protection Guidelines for Ecologically Based Forest Resource Management (Stand Level Operations), Nov. 1998*** provides management direction for planners. These guidelines are designed to protect the environment and provide a set of specific rules and regulations for forestry activity such as road construction. This document can be viewed in Appendix 3.

6.1.1 Annual Operating Plans

The location of all Roads to be constructed must be shown in an ***Annual Operating Plan*** and approved by the **Newfoundland Forest Service**. Additional information may be included depending on site-specific conditions or when planned activities deviate from the standard operating practices as described further in this section.

Legislation requires contractors to obtain an "Operating Permit" for any work carried out during the designated Forest Fire season. These permits must be obtained from the local district Newfoundland Forest Service office. This permit must be kept on site at all times.

6.1.2 Primary Roads (Class 1, 2, & 3)

Corner Brook Pulp and Paper Woodlands' all-season access roads are called primary roads. Getting a primary road from the map stage in the ***Annual Operating Plan*** to the construction phase involves several steps, described in the following sections.

Layout

All proposed roads are identified on maps and included in the ***Annual Operating Plan***. Information identified on the map includes road corridors and watercourse crossings. The proposed road corridors indicate the approximate location based on the best information available at an early stage in the planning process. Locations are based on aerial photography and reconnaissance and are sometimes supplemented with field investigations. All major watercourse crossings which require special approval, or which have known fisheries values, are also identified. The centerline for each road is usually located on the ground by the planner responsible for the road; however in some cases the planner may delegate this to another technician.

Profiling

After primary roads are laid out in the field by the Planning Department, a Roads Department staff surveys the road. Profiling is then done wherever large stream crossings are necessary or grades are an issue. The profiling procedure is usually as follows:

- Measure the centerline distance
- Measure the percent of the grade and side slopes
- Note transmission lines and other relevant information
- Mark buffer zones
- Gather information on watercourse crossings required for design purposes

Road Design

Field data is used by Roads Department staff to design new roads and watercourse crossings. Roads are designed using *RoadEng Computer Software*. Watercourse crossings are designed based upon flow predictions for a 25-year return period, then classed as minor (culvert) or major (arch or bridge). Flood prediction methods, ***Rational Method*** and in addition ***Regional Flood Frequency Analysis*** are sometimes used in designing watercourse crossings.

Applications

Every primary road project requires, where applicable, the completion of applications to various government and other agencies including the Department of Environment, the Department of Works, Services and Transportation, Fisheries and Oceans Canada (Habitat Management), Canadian Coast Guard (Navigable Waters Protection), Newfoundland and Labrador Hydro, Aliant, and possibly others. Details regarding each application can be referenced in the ***Roads Sample Application Binder***.

Purchasing

Purchases for road construction may include bridges, culverts, or anything else required for the annual primary roads program. Any purchases over \$100 must go through the Mill Purchasing Department. They request quotes from a minimum of three bidders and the results are returned to the Roads Department for review. If a bid is acceptable, a purchase order requisition is made for the item from the lowest bidder. Complete details of Corner Brook Pulp and Paper Woodlands' purchasing procedure are found in ***Kruger Inc. Standard Practice Instructions***.

Tendering

All road construction projects must go through a tendering process. Tenders prepared by Roads Department staff include a copy of the tender document, a culvert schedule, a location map and the stream crossing drawings. Tender invitees are selected from a bidders list of suitable contractors. The tenders are returned to the Purchasing Department and opened in conjunction with the Roads Department, where usually the lowest bidder is awarded the contract.

Contracts

For every construction project, a standard roads contract is prepared by the Roads Department. The tender document is used to complete the schedule of items in the contract. The successful bidder is notified and a pre-work meeting arranged in order to distribute the various approvals, sign and witness the contract, and discuss the upcoming project. The contract is then circulated through the required Company officials for signatures, and returned to the Roads Department.

A memo advising of the successful bidder is sent to the Woodlands Manager, Planning and Development Superintendent, Planners, General Operations Superintendent, District Superintendents, Payroll, and the Communications Energy and Papermakers Union office in Grand Falls.

6.1.3 Secondary Roads (Class 4)

Corner Brook Pulp and Paper Woodlands also build secondary (Class 4) roads, also referred to as operational roads (see ***Standard Operating Procedures, Roads***). Secondary roads are built to much lower standards than primary roads, and therefore require less planning.

Secondary roads are included in the ***Annual Operating Plan*** and are laid out by Corner Brook Pulp and Paper Woodlands staff or the contractor responsible for building the road. They are not profiled, tendered, or contracted, and the price per kilometer is set by Corner Brook Pulp and Paper Woodlands. Secondary roads are subject to the same application process required of primary roads. For further details on planning standards for secondary roads refer to the ***Standard Operating Procedures, Roads***.

6.1.4 Winter Roads

A third type of road built by Corner Brook Pulp and Paper Woodlands is the winter road. This road is constructed for short-term use during the winter season, using a combination of gravel, mud, logging, debris, snow, and ice.

6.2 Forest Access Road Construction

6.2.1 Primary Roads (Class 1, 2, & 3)

Job Site Requirements

Corner Brook Pulp and Paper Woodlands' roads contractors are required to meet the same environmental requirements as harvesting contractors. These requirements include information on documentation, standard operating procedures, spill kits, first aid kits, proper fuel and lubricant storage, and siltation control devices. In addition, for any stream crossings, the contractor must have on the job site at all times, a copy of the *Department of Environment Approval* and a *Letter of Advisement* from Fisheries and Oceans Canada

(Habitat Management).

Construction

Roads and watercourse crossings are constructed according to the practices outlined in ***Standard Operating Procedures, Roads***. The right-of-way is cut first, with the harvested timber stockpiled for future delivery to the Mill. Next the duff and organic material is usually stripped and windrowed to the side. However sometimes, in wet boggy areas for example, the contractor will avoid disturbing the root mat and simply place fill over the existing terrain. The **subgrade** is then constructed using mineral soil obtained from the ditches. Drainage culverts are installed as required, and turnarounds are constructed at periodic intervals on main roads. Road construction is done primarily with excavators (Figure 6-2). Standards and specifications for road construction are shown in Table 6-1. All Company roads are constructed as per the ***Environmental Protection Guidelines for Ecologically Based Forest Resource Management (Stand Level Operations), Nov. 1998***. This document can be seen in Appendix 3.



Figure 6-2. All forest access roads are constructed using excavators, which minimize **site disturbance**.

Table 6-1. Road classification standards and specifications.

Standard	Class			
	I	II	III	IV
Expected volume to be hauled (m3)	500,000 +	120,000 - 500,000	36,000 - 100,000	0 - 36,000
Cleared right-of-way	46.0 m.	46.0 m	30.0 m	30.0 m
Stripped right-of-way	30.0 m	23.0 m	18.0 m	15.0 m
Width of road - shoulder to shoulder	8.5 m	7.5 m	5.5 m	5.0 m
Ballast Depth, average compacted	10.0 cm	10.0 cm	10.0 cm	---
Ballast width	8.0 M	6.5 m	5.0 m	---
Maximum Degree of Horizontal Curve	10°	20°	30°	30°
Maximum adverse grade Maximum favorable grade	6% 10%	8% 12%	10% 12%	12% 24%
Minimum Horizontal Sight Distance	152.0 m	122.0 m	92.0 m	46.0 m
Minimum Depth of Ditch	1.0 m	0.6 m	0.6 m	0.3 m
Maximum Depth of Ditch	1.2 m	1.2 m	1.2 m	1.2 m
Cross slope of Grade	.0/4 m/m 20 cm crown	.0/4 m/m 18 cm crown	.0/4 m/m 13 cm crown	.0/4 m/m 13 cm crown
Superelevation on Curves	.0/4 m/m.	.0/4 m/m.	.0/4 m/m	.008 m/m
Fill Slope: rock or gravel clay silt	1 : 1 1 - 1 / 2 : 1 2 - 1 / 2 : 1	1 : 1 1 - 1 / 2 : 1 2 - 1 / 2 : 1	1 : 1 1 - 1 / 2 : 1 1 - 1 / 2 : 1	1 : 1 1 - 1 / 2 : 1 1 - 1 / 2 : 1
Cut Slope: silt rock others	1 - 1 / 2 : 1 1 : 5 1 : 1	1 - 1 / 2 : 1 1 : 5 1 : 1	1 - 1 / 2 : 1 1 : 5 1 : 1	1 - 1 / 2 : 1 1 : 5 1 : 1

Watercourse Crossings

Watercourse crossings provide a number of benefits, including:

- Safe transport of personnel and equipment during harvesting activities
- Minimization of soil erosion
- Protection of water quality
- Maintenance of stream flow and provision of adequate fish passage

Location and design are critical elements in the construction of watercourse crossings. All Company watercourse crossings are planned and constructed as per the ***Environmental Protection Guidelines for Ecologically Based Forest Resource Management (Stand Level Operations)***, Nov. 1998. This document can be seen in Appendix 3.

Inspections

The Roads Department utilizes three different inspections throughout the year as a form of operational control: *Progress Inspections*, *Final Inspections*, and *Safety and Environmental Inspections*. *Progress inspections* are conducted periodically and are used to complete progress payments, and monitor quality, stream crossings, and environmental or public concerns. *Final inspections* are conducted jointly by Roads Department personnel and the contractor when the project is complete. Any problems are noted and the final inspection sheet is signed by the contractor. A follow-up inspection may be required if the work cannot be completed while Roads personnel are present. More details on *Progress Inspections* and *Final Inspections* can be found in ***Standard Operating Procedures, Roads***.

A minimum of two *Safety and Environmental Inspections* are carried out on each contractor per year, the goal being to perform an inspection at each job site. Detailed procedures on performing *Safety and Environmental Inspections* can be found in the ***Jobsite Health and Safety Inspection Guidelines*** and ***Harvest/Roads EMS Compliance Inspection Guidelines*** respectfully.

Environmental Incidents

Any environmental incidents, such as a buffer disturbance or fuel spill, are to be reported immediately by the contractor to the Roads Department. The incident report is forwarded to the Environmental Management Representative and an investigation is initiated. The course of action could be penalty or site rehabilitation.

Blasting

Whenever blasting is required, rock volumes are measured by Roads Department staff using cross-sectional methods. Blasting operations are carried out by one of the roads contractors at a per-cubic-metre rate set by Corner Brook Pulp and Paper Woodlands. If blasting is required in or near fish habitat during stream crossing construction, contractors must adhere to the following:

- Consult with Fisheries and Oceans Canada before any blasting is undertaken.
- Do not undertake any blasting within 400 metres of known fish spawning grounds when eggs or alevins are still in the gravel.
- Reduce the area of high blast concussion by reducing the shot charge or by using blast mats or blast deflectors.

Payments

There are two types of payments made for road and watercourse construction, progress payments and final payments. Progress payments are made to the contractor based on weekly inspections and progress reports. Final payment is made after the project is completed and final inspection approved. Sometimes it is necessary to hold back the final payment until changes are made that will then allow the job to pass final inspection. Work completed outside of the contract, such as the hiring of a dump truck or machine, is invoiced and included in the final payment.

6.2.2 Secondary Roads (Class 4)

Job site Requirements

Job site requirements for secondary roads are the same as for primary roads.

Construction

Secondary roads are constructed to a lower standard than primary roads (Table 6-1). More information is provided in ***Standard Operating Procedures, Roads***.

Inspections

Secondary road inspections are conducted by Corner Brook Pulp and Paper Woodlands Operations Superintendents upon road completion. Roads are inspected to ensure they meet specifications outlined in the ***Standard Operating Procedures, Roads***.

Environmental Incidents

Environmental incident reporting is the same as for primary roads; more information can be found in Section 6.2.1.

Payments

Payments are made through invoices submitted by the contractor responsible for building the road. Payments are not made until the Operations Superintendent has inspected the road and deemed it acceptable.

6.2.3 Winter Roads

Winter roads, are treated the same as secondary roads with respect environmental concerns, inspections and payment methods.

6.3 Forest Access Road Maintenance

Corner Brook Pulp and Paper Woodlands is responsible for the ongoing maintenance of all roads constructed to an all-weather standard while such roads are required for **Company operations**. Road and watercourse crossings require periodic maintenance to:

- Ensure the continued safe use by Company personnel and the public
- Prevent the degradation of road surfaces
- Prevent erosion and subsequent blockage of culverts
- Prevent the deposition of sediment into watercourses

6.3.1 Inspections

Regular maintenance of Company roads and watercourse crossings is the responsibility of the District Operations Superintendent and includes an inspection to determine road surface condition, culvert blockage, excessive erosion, and condition of watercourse crossings. In areas where harvesting has been completed, similar periodic inspections are carried out.

6.3.2 Maintenance Operations

Grading

Roads are graded periodically to prevent excessive rutting of the road surface. Grading is done as required and is assessed by Corner Brook Pulp and Paper Woodlands, Operations Superintendents or Roads Department staff.

Ballasting / Topping

Ballasting is applying a lift of granular material to the running surface of the established subgrade, to depths as indicated in the ***Standard Operating Procedures, Roads***. Existing **borrow pits** are used whenever possible, but if required, new borrow pits can be established as per guidelines in ***Standard Operating Procedures, Roads***, and also as per the ***Environmental Protection Guidelines for Ecologically Based Forest Resource Management (Stand Level Operations), Nov. 1998***.

Snow Clearing

The need for snow clearing and sanding is determined by Corner Brook Pulp and Paper Woodlands, Operations Superintendents. Graders, flyers, loaders, or tractors are hired at rates set by Corner Brook Pulp and Paper Woodlands.

Brush Clearing

Road sight distances are maintained on active roads by removing encroaching brush through mechanical means, thinning crews, and/or approved **herbicides**. Herbicides are

not applied on slopes leading to watercourses nor without the necessary permits from the Department of Environment.

Watercourse Crossings

Watercourse crossings are inspected regularly for condition and safety by Corner Brook Pulp and Paper Woodlands staff. Accumulated debris is removed from watercourse crossings, plugged culverts are re-opened to maintain road drainage, and erosion control is maintained. Crossings are repaired or replaced when necessary.



Figure 6-3. An example of old (log) and new (concrete) construction techniques for watercourse crossings.

Access Management

Roads constructed and maintained by Corner Brook Pulp and Paper Woodlands are available for public use, but may be closed when safety, fire hazards, or other conditions dictate. Where the protection of non-timber values has been identified as a specific concern, the control of public access on Company roads is sometimes warranted. In these instances, Corner Brook Pulp and Paper Woodlands, in co-operation with the **Newfoundland Forest Service**, will determine the appropriate means of access control. Gates provide one means of access control when forest management activities are ongoing. Another means is the removal of access at the point of entry, when the road is no longer required by the Company.

6.4 Forest Access Road De-activating

On a site-specific basis, roads may be deactivated and/or rehabilitated. De-activating is defined as limiting access by barricading the road at one or more places. The intent is to prevent normal vehicle traffic as much as possible, however in certain cases other individuals may later remove these barricades and continue using these roads. Some of the actions taken in de-activating are; removing culverts or bridges, and stabilizing the stream banks to minimize erosion and washouts. On the approaches to stream crossings, trenches are utilized to intercept and deflect water. De-activated roads are clearly marked with proper signage before and after each barricade to ensure public safety. All road de-activating is done as per the ***Environmental Protection Guidelines for Ecologically Based Forest Resource Management (Stand Level Operations)***, Nov. 1998, which can be viewed in Appendix 3.