# Engineering Plans (aka Total Chance Plans); A Tool for Sustainable Resource Planning

Grant Sime, R.P.F.
Wes Bieber, R.P.F.

## Outline

- What is it?
- Why use them?
- Role of PEng/PGeo

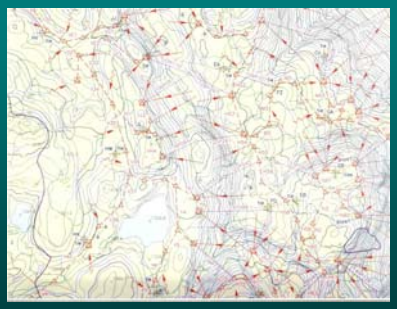
## Engineering Plan – What is it?

- An access plan that considers harvest system efficiency across the landscape.
- A tool to effectively manage permanent road decisions.
- A tool to manage inherent landscape risks and make other resource decisions.
- A tool to assist in sustainable development planning decisions.

## Engineering Plan – What is it?

- It can be very low tech…..

## Engineering Plan – What is it?



- It can be very high tech…

## Engineering Plan

## Why use an Engineering Plan

**Cost effective use of field crews.**

- Cannot allow field crews to spend time ineffectively when they cost a minimum of $750/day.
- Those who spend time in reconnaissance without accomplishing a contribution to road and/or landing location or harvest chance decisions are wasting resource. Can no longer afford the “brail system” of development.

## Why use an Engineering Plan

**Better field decisions lower cost.**

- Roads and landings are placed for effective harvest phase. One cable setting with production of 4 loads a day vs 1-2 loads/day could pay for the initial planning cost.
- Can reduce future road liabilities by making better permanent road location decisions. Manage harvest and road deactivation decisions to minimize future cost/environmental liability.
- Provides information to minimize permanent road on the landscape.

## Why use an Engineering Plan

**Better strategic planning decisions.**

- Location of Old Growth Management Areas, Wildlife Habitat
- Actions to mitigate Visual Impact.
- Rationale for temporary access strategies to timber behind engineering control points that the cost of a permanent access strategy would isolate the development opportunity.

## Why use an Engineering Plan

**Sustainable Forest Management Commitment – 3rd Party Registration**

- BC Interior Division of Weyerhaeuser Company Ltd. has commitment of total chance planning in a Road and Cutblock Layout Environmental Reliable Method (ERM); part of ISO 9001 3rd party certification.

## Why use an Engineering Plan

**Better Future Planning Tool**

- Future prediction of operational cost and timber volume planning.
- Can quickly deliver effective salvage plans. Eg. Elevator Fire – see picture on next slide. Entire salvage plan for ~300,000 m3 put on the ground and approved in Cutting Permit in 3 months.

## Elevator Fire Salvage 1998; Example of Temporary Road Access Strategy to Manage Landslide Risks

## Why use an Engineering Plan

**Deliver Results**

- Forest Range and Practices Code is a results based legislation. Engineering plans can improve confidence in delivering plan results.

## Obstacles to Engineering Plan Development

- Cost – especially in well roaded landscapes, the benefit is seen as not being great enough to offset the cost.
- Forest Tenure System – without security of landbase, forest licensees are not inclined to invest in long term planning tools. Further, overlapping operations (eg. non replaceable salvage forest licenses) can quickly undo any long-term landscape benefits derived from using these types of planning tools.
- Time – in the present emergency salvage planning environment, timelines from initial reconnaissance to Cutting Permit may be too short to accommodate development of long term strategic landscape planning tools.

## Role of PEng/PGeo

**Provide advise/rationale/support.**

- Many of the landscape engineering control points are terrain stability driven. Professional Engineers can assist in recognizing these and providing rational solutions and/or options.
- Support the development of landscape planning tools that support sustainable development both at the operational and strategic level.

## Planning Process

Following delineation of the plan area, geophysical and biophysical spatial information is collected and collated, including:

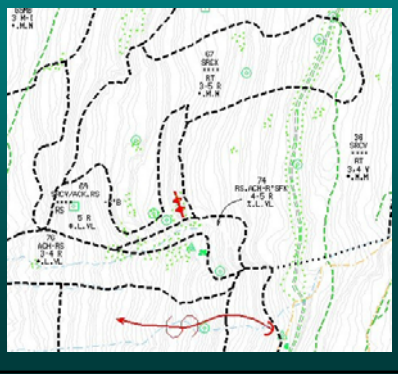
- Contour and planimetric mapping (detailed or TRIM)
- Aerial photography (low and high level)
- Forest Cover Mapping
- **Terrain Mapping (TSIL B, C, or D)**

## Engineering Control Points

Identify physical controls on access and harvesting developments, such as:

- Control points to avoid/minimize areas of potential slope/soil instability (TSIL B or C)
- Breaks in slope and terrain (contours, photos)
- Runoff patterns
- Barriers (rock, sensitive soils, wet ground, swamp, etc.)
- Stream crossings

## Terrain Intensity Survey Level B

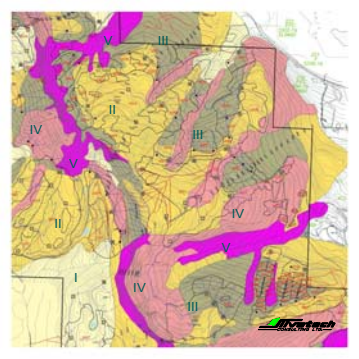


## Terrain Intensity Survey Level B

Quality contour and terrain mapping (supported by PEng./PGeo field checks), provides a sound foundation for determining “total chance” development patterns.

- Road locations
- Landings
- Crossings (sensitive sites, streams, rock, etc.)
- Setting Boundaries and harvesting systems

## Engineering Plan (TSIL C, 5 meter contours)




## Summary

The benefits of Terrain Stability Classification and input from PEng/PGeo in Total Chance Planning:

- Reduces the risk of development related landslide through better road and landing placement, and where appropriate the selection of sensitive harvesting methods and silviculture systems
- Reduces the footprint on the landscape
- Reduced costs: avoid the consequences of poor planning…landslides, impacts on other resources, high road construction and maintenance costs, lower harvest costs.