

## Earthworks Construction

### 1.2 Clearing and Stripping



It is engineering best practice that the construction of earth formations (*fills*) should be free of organic material. Organic material, such as tree stumps and roots, surface vegetation (grass and scrub), *slash* and branches, and topsoil is unable to be *compacted*, decays over time, and can be a point of water entry, resulting in weak and unstable *fills* that may collapse.

Regulation 30 (1) of the NES-PF requires that *fill* must contain no more than 5% (by volume) of vegetation and wood.

This guide is provided as a reference document and does not constitute a statutory obligation under the Resource Management Act 1991 or the National Environmental Standards for Plantation Forestry.

Please refer to the 'how to use' section of the introduction at <http://docs.nzfoa.org.nz/forest-practice-guides/> for advice on how to use this guide.

## Earthworks Construction

### 1.2 Clearing and Stripping



#### Scope

This guide covers preliminary earthworks processes of vegetation clearance and stripping. It also includes removal of trees from the road corridor and *landing* sites (*road-line salvage*) and *stumping*.

#### Where to use

Clearing and stripping must be carried out in advance of all bulk earthworks including cut and side-cast, and cut and bench formation (refer to FPG EC #3 Bulk Earthworks) and full bench construction (refer to FPG EC #4 Fill Placement and Compaction). The interrelationship with these other Forest Practice Guides should be considered, where appropriate, when developing earthworks prescriptions.

Borrow pits and *overburden* dumps should also be cleared and stripped of vegetation and organic material.



Excavator and bull dozer clearing stumps and stripping prior to bulk earthworks.



Excavators clearing vegetation and stripping topsoil ahead of *landing* construction.

## Earthworks Construction

### 1.2 Clearing and Stripping



#### Earthworks management

All clearing and stripping should be carefully planned and executed with attention to both the short and long term effects on potential soil erosion. Local conditions pertaining to the operation should be detailed on the earthworks prescriptions.

The extent of *road-line salvage*, site clearance and stripping should be determined as part of the planning and design process (refer to FPG EC #1 Planning and Design) and clearly specified in the *road-line salvage* and earthworks prescriptions provided to contractors.

#### Road-line salvage

The establishment of new harvest access roads into a forest typically requires the felling and removal of trees (roadside salvage). This is often carried out by a specialist harvesting contractor, prior to the earthmoving contractor taking possession of site.

Where separate harvesting and engineering contractors are engaged the hand-over of the site, from the harvesting to engineering contractor, on completion of the *road-line salvage* operation needs to be managed carefully. A site inspection should be carried out to confirm clearance widths are sufficient to construct the road or *landing* effectively.

**Note:** allowance needs to be made for cut and fill slopes.

Earthworks should not commence if insufficient trees have been cleared and there is a risk that the cut and fill *batters* will encroach into standing trees.



Road corridor after *road-line salvage* and prior to clearing and stripping.



Example of good *road-line salvage* with a sufficient number of trees removed providing adequate width road formation.



Example of poor *road-line salvage* where adequate allowance has not been made for road formation and *fill* has been run into standing trees.

## Earthworks Construction 1.2 Clearing and Stripping



### Health, safety and environmental considerations

The planning and execution of *road-line salvage* and clearing operations must consider safety and environmental impacts and not create or leave hazards that will affect future operations.

Hazards arising from *road-line salvage* and stripping operations are:

1. Poor placement of tree stumps on steep slopes where they may be dislodged by future log tree felling and extraction operations.
2. Leaving trees standing above *landing* sites or operational areas. These may present wind fall risk to road users and workers on *landings*.

Place stumps and debris in a stable location where they will not interfere or cause safety issues for other forestry operations or have adverse environmental effects.



An example of good stump placement. Stumps have been placed on a shallow bench away from standing trees and the construction *fill* during clearing and stripping.



Poor placement of stumps, left resting on hill slope amongst standing trees – this represents a significant hazard to tree fallers and breaker outs during harvest.



Trees left standing above a *landing* site present a significant hazard. This risk would have been eliminated if trees were removed during *road-line salvage*.

## Earthworks Construction

### 1.2 Clearing and Stripping



#### Summary of key requirements

1. Ensure the extent of *road-line salvage* and site clearing requirements is confirmed during the planning and design phase and these are clearly communicated in the relevant operational prescriptions. On steep sites ensure allowance is made for cut and fill *batter* slopes.
2. Ensure a forestry earthworks management plan for the site is in place prior to earthwork commencing – Refer to Schedule 3 of NES-PF.
3. For orange and red zone sites and all others on sloping ground the extent of cut and fill *batters* (plus *buffers*) should be marked on the ground prior to *road-line salvage* and site clearing commencing.
4. Prior to earthworks commencing ensure that required (sufficient) trees have been removed to enable safe construction of the road or *landing*.
5. Choose the right machinery size and combination for the terrain, stump size and soil type. Excavator/ dozer combinations can work best.
6. Strip all organic matter, including top soil and stumps, prior to constructing the road or *landing*, to minimise the vegetation and wood within the *fill*.
7. Place stumps on flat stable ground or a secure bench or beyond the toe of *fills*. Where there is no suitable placement option, cart to a safe disposal site.
8. Keep stripped material away from *water bodies* or any restricted areas.

#### Maintenance

Not applicable, as clearing and stripping is the first step in constructing a road or *landing*.

#### National Environmental Standards for Plantation Forestry

Relevant regulations for earthworks are 25 – 35.

#### Contact



Forest Owners Association  
Level 9, 93 The Terrace  
Wellington 6143



[www.nzfoa.org.nz](http://www.nzfoa.org.nz)

#### Other Practice Guides in this series



1.1 Planning and Design



**1.2 Clearing and Stripping**



1.3 Bulk Earthworks



1.4 Fill Placement and Compaction

Visit:  
<https://docs.nzfoa.org.nz/forest-practice-guides/>  
to view all guides