

Guide 3.10 Planning the Safe Stacking of Timber

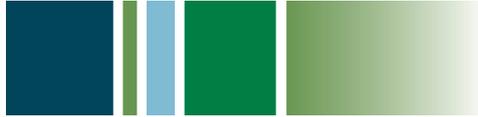
Background

There are several industry documents that give guidance on the stacking of timber including guidance from HSE, FISA and the Timber Transport Forum. However, guidance is sometimes contradictory, confusing, or based on idealised situations. This guide aims to give advice on how to ensure timber stacking is safe, secure and does not contribute to environmental problems.



Pre-operational Planning

When planning a timber harvesting job, it is necessary to consider timber stacking requirements at an early stage. The Landowner (or his representative) and the Harvesting Manager should create a stacking plan as part of the pre-operational planning. Within Scottish Woodlands this would be between the Forest Manager and the Harvesting Manager as part of the Harvesting Advanced Planning Checklist (HAPC). Involve the contractor at the planning stage if possible, to ensure they have adequate input. Budget for additional upgrading and creating stacking areas at this point.

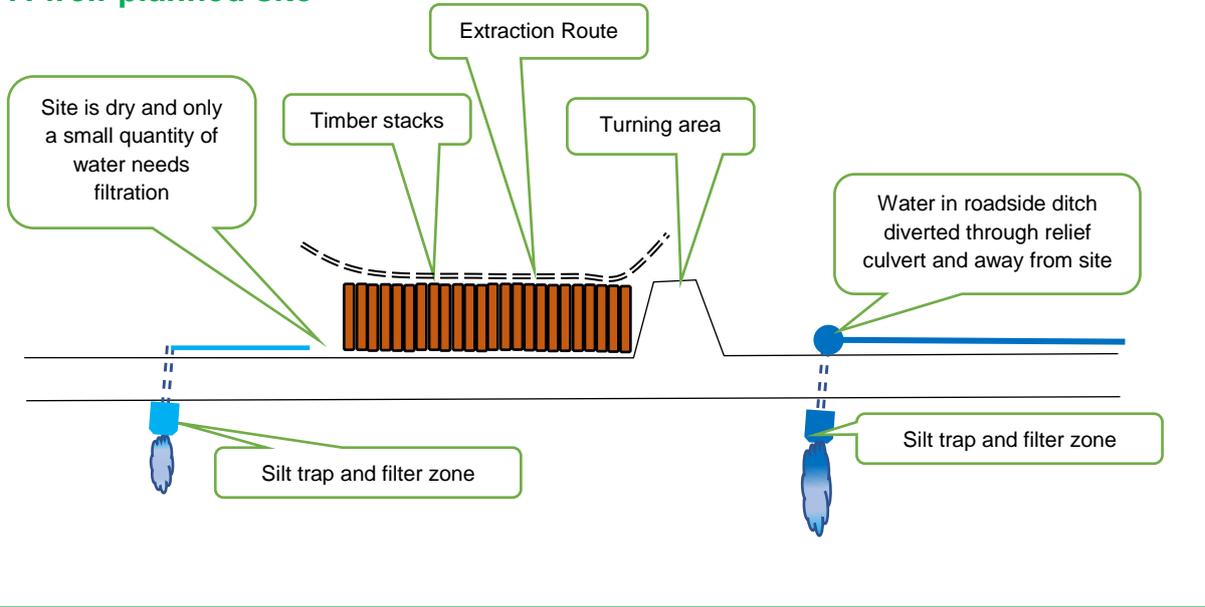


Factors to consider when planning timber stacking are:

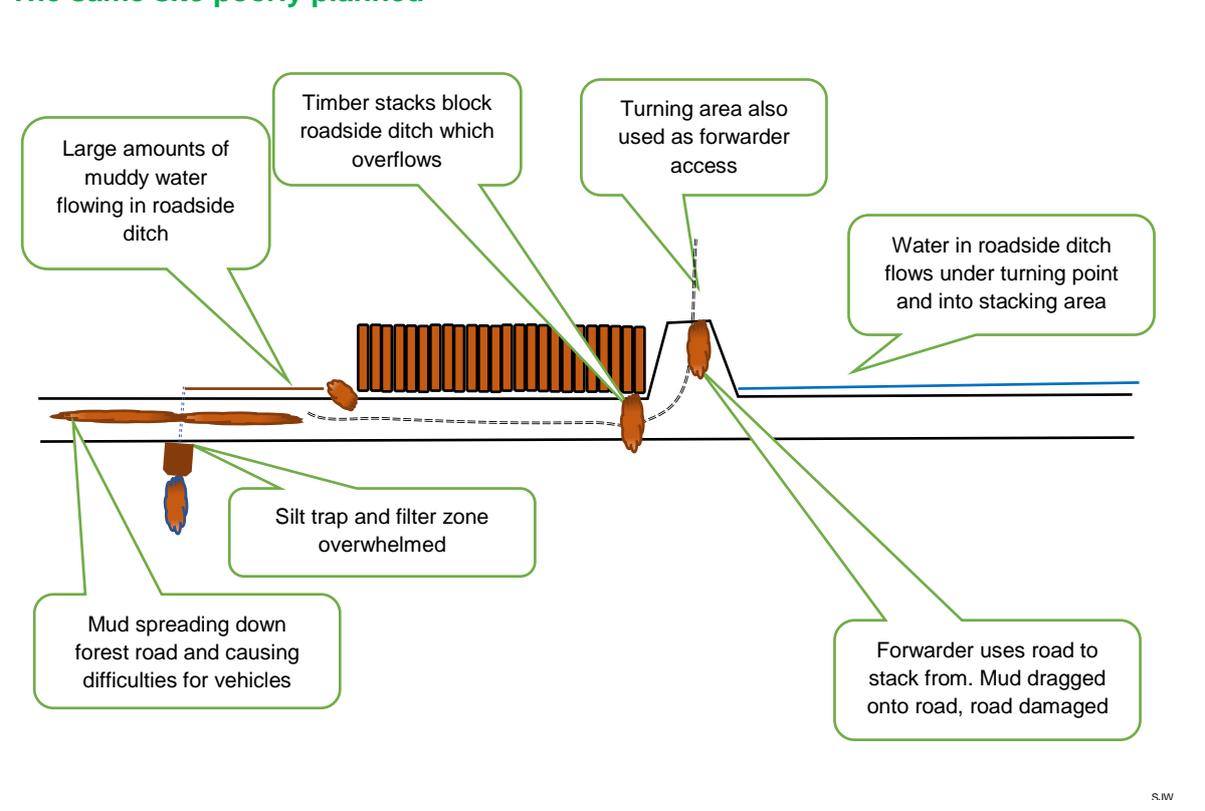
- The location of overhead power lines and telephone cables, and underground services such as gas pipelines, water supplies (especially private supplies) etc. Establish the safe working distance for these and ensure this is maintained.
- Is there sufficient space to cope with the anticipated production and dispatch rates? Allow roughly 125m of stacking space for every 1000t of timber awaiting despatch at roadside. Timber will normally move more slowly from a non-certified forest causing a buildup of produce. Sites where timber is being sent out by sea will require significant stacking space in order to build stocks for the ship. Holiday periods or snow may cause delays.
- Where will stacking take place relative to roadside ditches and culvert ends. Is it necessary to insert new relief culverts, to lead any water in roadside ditches away from the stacking site? This will help to reduce the potential for diffuse pollution, arising from the site, being washed into adjacent watercourses, and help to isolate the stacking area if there is any fuel or oil contamination.
- How will the forwarder access the stacking site? Ideally this should be from a level area to the rear of the stack, but this is not always possible. Is a suitable bench required for the forwarder to run on? Is it safe for the forwarder to turn across the hill in order to run along behind the timber stacks? Is the batter below the forwarder stable or is it undermined? Where the forwarder comes downhill towards the timber stack, ensure that silt mitigation measures are put in place to prevent the forwarder bringing excessive mud down onto the stacking and loading area. Shed this into a safe area well before the stacking site.
- Do not allow the forwarder to come onto the road unless the site is so steep that this is unavoidable. This should be allowed only in exceptional circumstances and provision must be made to armour the road and for additional running road repairs.
- Consideration should also be given to the location of timber stacks relative to lorry turning space, visibility, refueling and fuel storage areas. Maintain sufficient space and separation for these areas.
- Ensure that any necessary silt mitigation measures are put in place before the operation starts, along with any additional road works, forwarder ramps or benches. The location of the area designated for timber stackings should be shown on the contract map and a copy if the timber stacking risk assessment provided to the timber contractor.



A well-planned site



The same site poorly planned





Safe Stacking

Basic Principle - A good timber stack should always be made and maintained in a safe and stable condition and should not contribute to environmental problems.

It is everyone’s responsibility to ensure that timber stacking is safe. Both the forwarder driver in building the stack, and the lorry driver removing timber, have major roles to play in ensuring the stack remains safe. The stability of the timber stack should always be visually assessed after stacking on it or loading timber from it. Make any necessary adjustments to keep the stack stable. **Leaving a stack in an unsafe condition is not acceptable.**

- The height of the log stacks should always be justified by the site risk assessment. This should state the maximum stacking height for each product.
- The height should however be kept to within the safe range of the timber loader and take into account the cab position and protection it affords for both the Forwarder and the Lorry driver. The operator must be able to see the grab to assess if the grapple load is safely within the grab. A maximum height of 5m between the road surface and the top of the stack should always be observed as this is the maximum height at which the lorry driver can see the grab. Use the length of a 4.9m log to estimate this.
- The maximum stacking angles at the ends of stacks should be 45° i.e. the slope has 1.0m of base for every 1.0m of stack height. If it is not possible to keep stacks separate from workers or members of the public, then the angle should not exceed 35° or 1.4m of base to the slope for every 1.0m of height.
- To maintain stack stability, stacks should be at least twice as long as they are high.
- Build stacks neatly with an even front face and logs parallel. Add loads evenly to maintain a more or less level top to the stack.
- Stacks should be free from branches, stones, and other material.
- Stacking should be carried out so as not to cause or exacerbate siltation. i.e by blocking the roadside drain without alternative mitigation, such as a silt trap and filter zone, in place. Water should be either piped under or diverted away from the stack
- No stacking should be done within the buffer zone of a natural watercourse



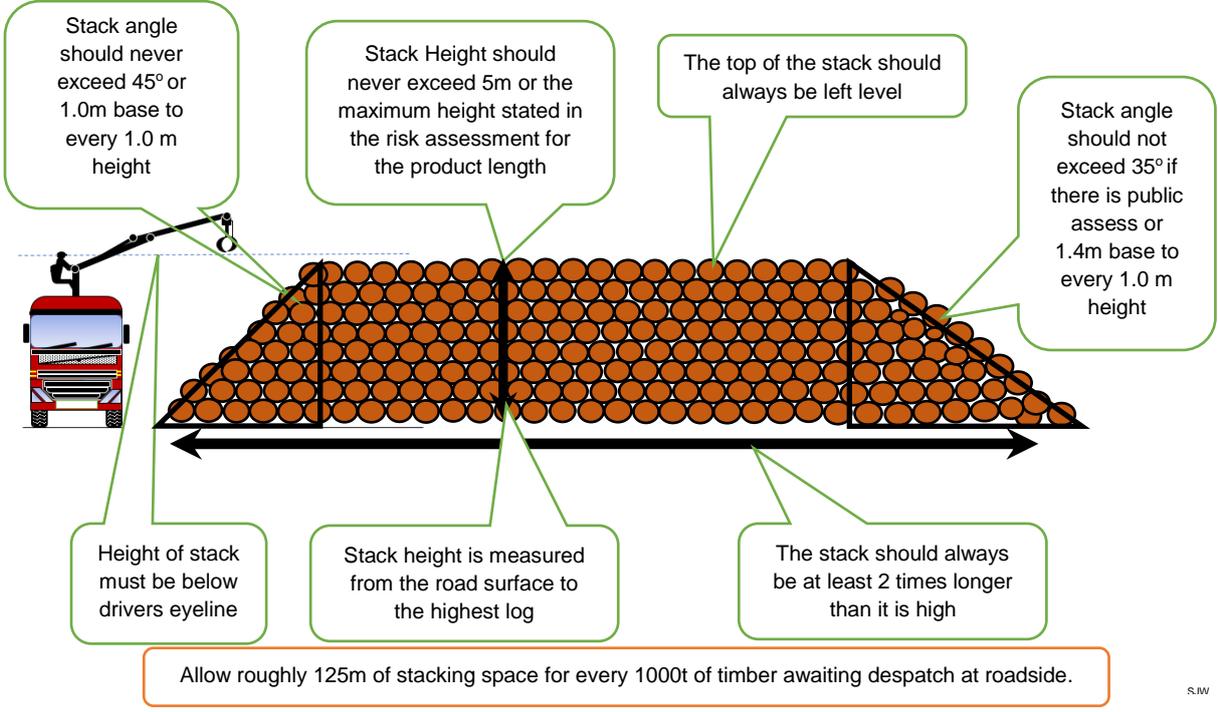
Too steep stack angles and height to length ratio is wrong leading to an unstable stack



Keep stacks level when loading timber. Don't leave unstable edges.

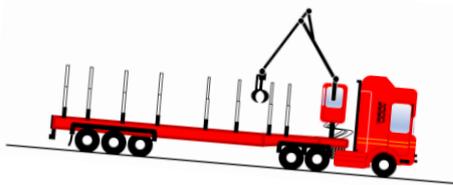
Buffer Width	Situation
10m	Along permanent watercourses less than 2m wide. (narrower widths may be allowable along watercourses less than 1m wide, especially on steep ground)
20m	Along watercourses more than 2m wide and along the edges of lakes, reservoirs, ponds and wetlands
50m	Around abstraction points for public or private water supplies, such as springs, wells, boreholes and surface water intakes

Timber Stack Parameters

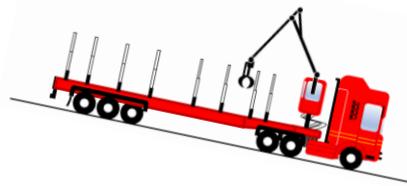


Slopes

Forest roads should not be constructed with gradients of more than 10%. Short sections of less than 200m of up to 12.5% are permissible. If timber has to be stacked on slopes, ensure stacks are positioned to allow the lorry to load facing downhill. Historically some roads were made with steeper sections than the recommended maximum. If loading on gradients more than 10° a specific risk assessment should be made with regard to how stack stability is to be achieved and the safety of loading and unloading on steep gradients.



Up to 10% - Load Downhill



Over 10% - Requires a Risk Assessment

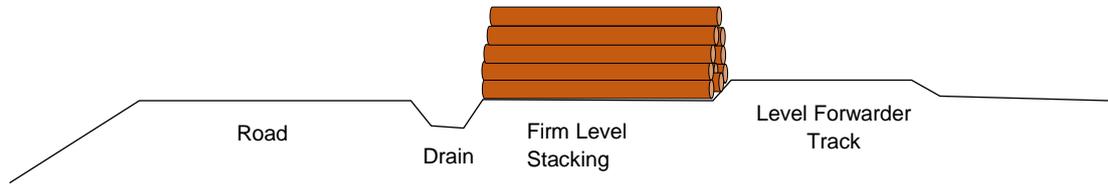
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Signs

Signs must be erected either side of the stacking area, and at any other potential access points, to warn of the dangers of timber stacks and of passing machinery while it is loading or unloading. Warning signs must be left in place until all timber has been removed from site. Remove signs as soon as the last timber has been dispatched

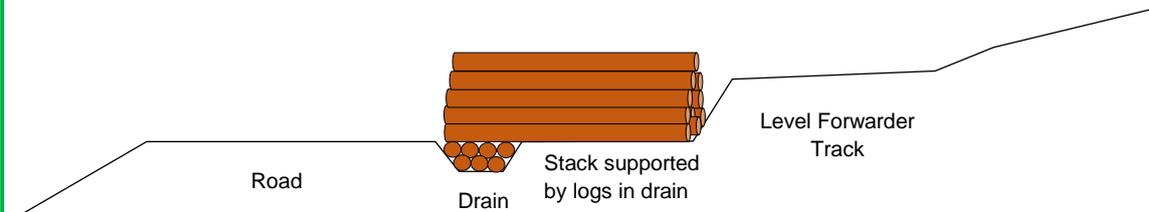


1. Ideal Level Site



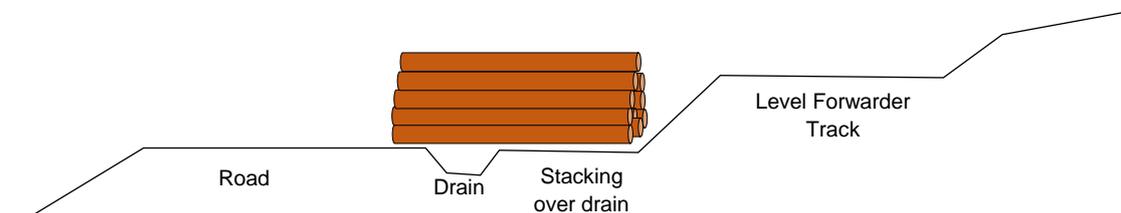
This is the ideal site where everything falls into place. Unfortunately, this is rarely the situation we are faced with. The essential elements are, a clear road surface, unobstructed drain, firm level stacking for all lengths of timber and level access for the forwarder.

2. Stacking in the Drain



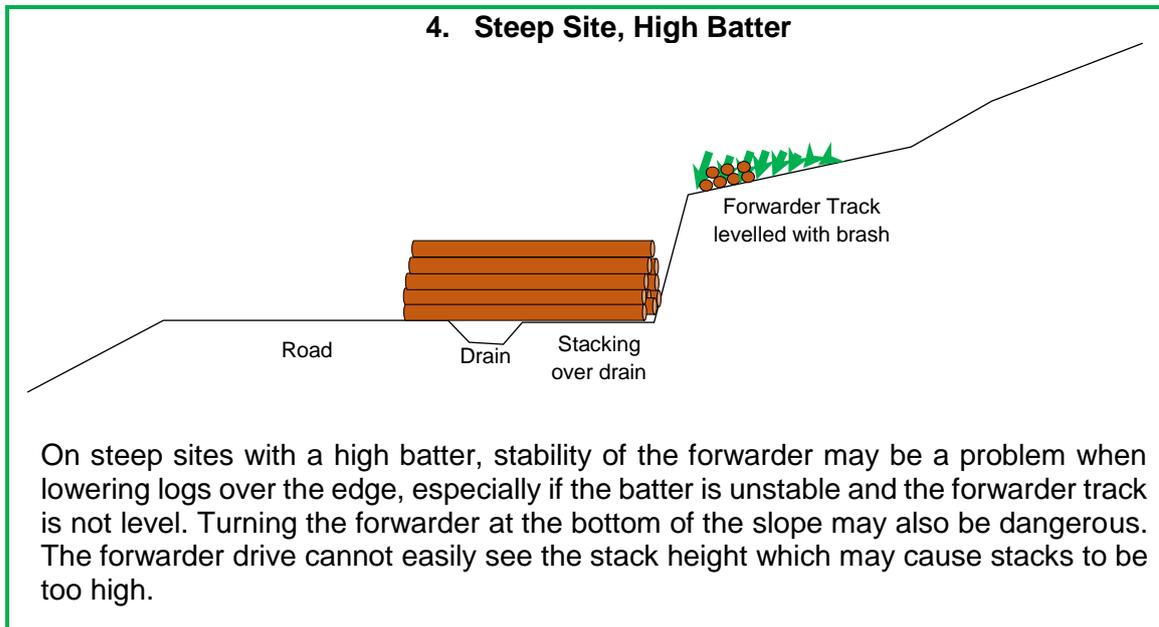
Where there is little room between the bottom of the bank and the road, filling the drain with chip or logs is an option to help keep the stack safe and stable. However, this will cause problems when it rains as the drain will not cope with the run-off, causing diffuse pollution and flooding of the loading area. Your plan will need to address this. Consider inserting a relief culvert above the stacking area to lead the water away from this point. Alternatively, a pipe in the roadside drain under the logs may be suitable if this is kept clear and can cope with the water volumes expected during heavy rain.

3. Stacking Over the Drain



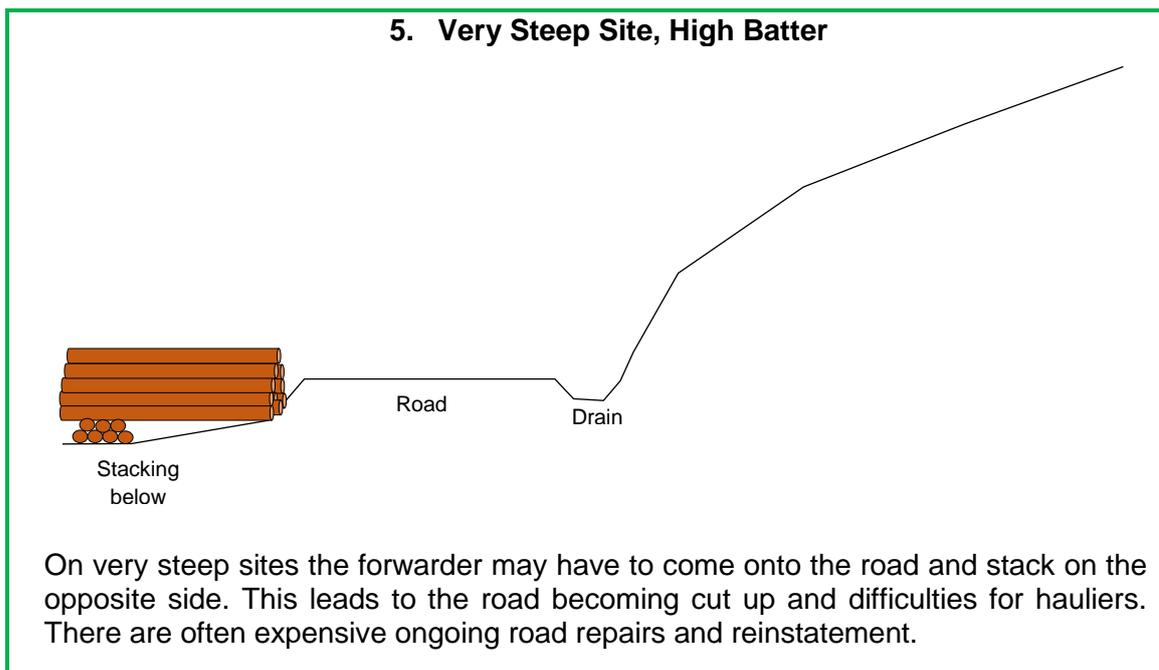
Stacking over the drain is a better option as it allows the free flow of water, under the stack. However, this narrows down the road surface and pushes timber traffic nearer to the far edge. The stabilisers on the timber crane may then damage the soft road edge and fail to provide good support. Stacks may reduce safe sightlines. You will still need to address the potential of silt and mud entering the ditch during periods of heavy rain. Mitigate this by ensuring the drain empties into a silt trap and then a filter zone.

4. Steep Site, High Batter



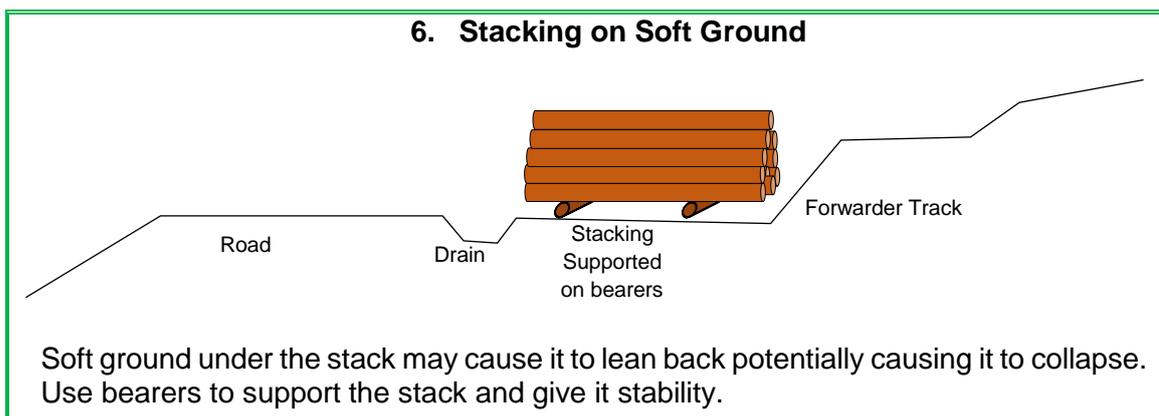
On steep sites with a high batter, stability of the forwarder may be a problem when lowering logs over the edge, especially if the batter is unstable and the forwarder track is not level. Turning the forwarder at the bottom of the slope may also be dangerous. The forwarder drive cannot easily see the stack height which may cause stacks to be too high.

5. Very Steep Site, High Batter



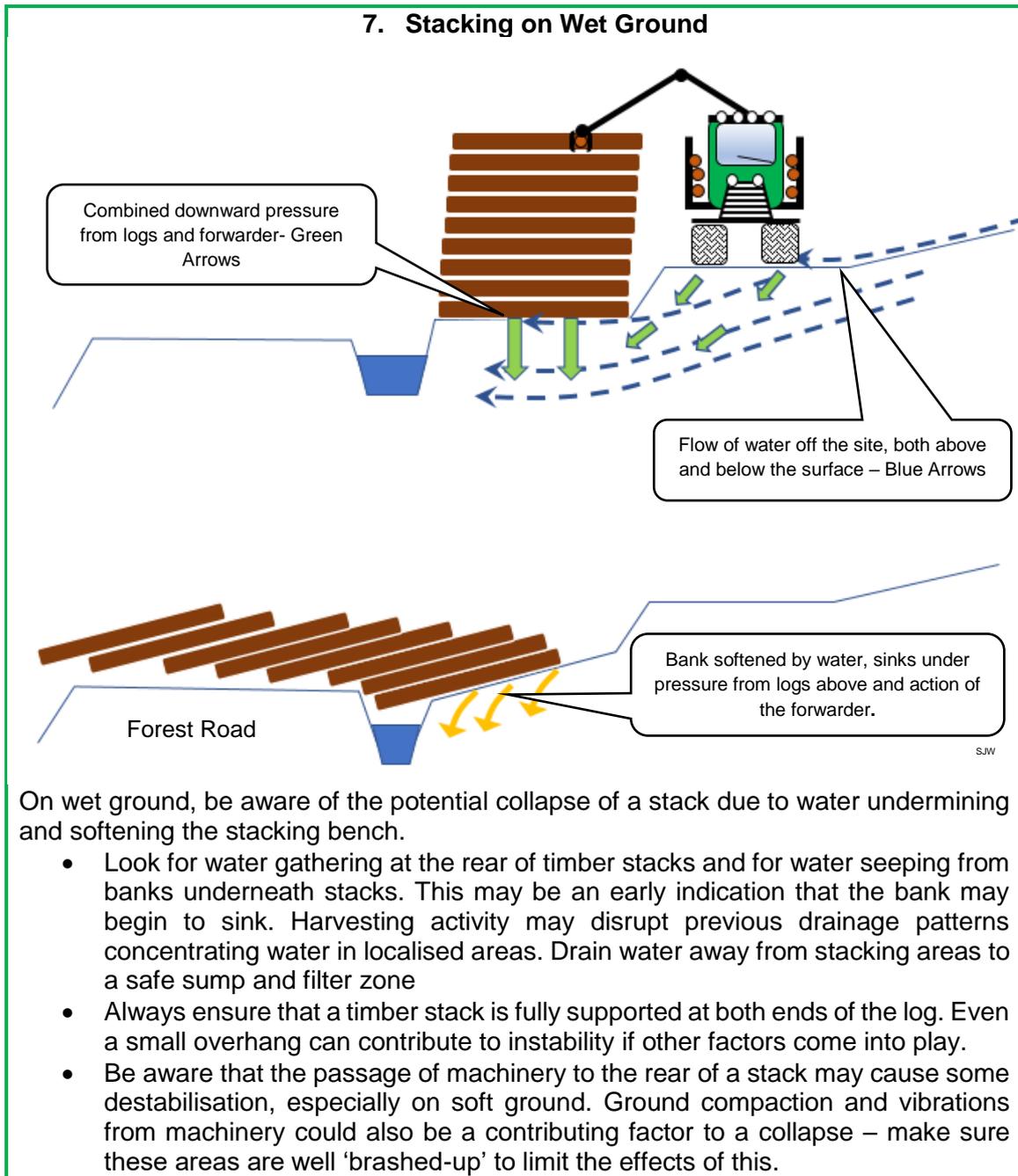
On very steep sites the forwarder may have to come onto the road and stack on the opposite side. This leads to the road becoming cut up and difficulties for hauliers. There are often expensive ongoing road repairs and reinstatement.

6. Stacking on Soft Ground



Soft ground under the stack may cause it to lean back potentially causing it to collapse. Use bearers to support the stack and give it stability.

7. Stacking on Wet Ground



8. Overhangs

