

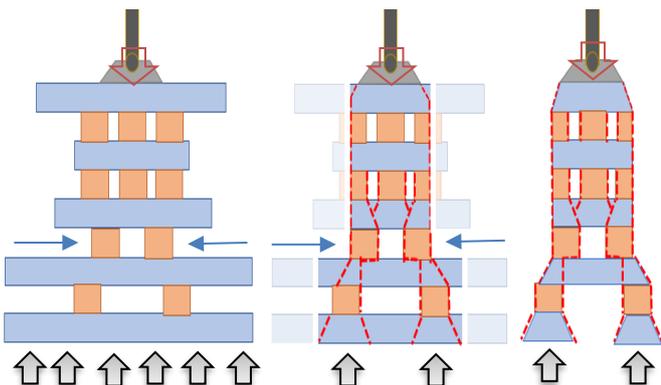
Greetings all. Today's Bulletin is about Outrigger Timber Stacking.

For the crane to be stable, regardless of what it's lifting, it needs a solid base. I talked about the area of timbers you need for a given ground bearing capacity in Bulletin 251, but equally important is the way the outrigger load is transferred to the ground through the timbers themselves.

When the ground is uneven or the crane needs to be raised, a timber stack is usually created and depending on the environment and materials available, there are some very 'creative' timber stacks photographed from time to time. While many of these stacks survive the physical forces and then the public ridicule on social media, it's important to point out some facts that show that just because it worked, doesn't mean it was a good idea.



The stack is only as strong and stable as the weakest/narrowest point, which in this case, is 4 beams up from the ground. Forces are dispersed diagonally at 45deg so much of the timber is not actually helping you. Let's copy and simplify the timber layout from the photo above. The RH diagram is the reality after negating all non load bearing sections of timber. The photo is far less stable than it looks and vulnerable to lateral forces!



The second blue beam from the ground is subjected to a high amount of shear force as there is minimal overlap between the orange beams above and below it. Remember the timber stack has a second axis which could be even less supportive and stable than the visible axis we see! In an ideal world, the timber stack takes only vertical loads. Some real-world examples of where this is not the case are:

- Wind causing load swing or blowing on the crane structure.
- Incorrectly picking up or laying down a panel.
- An impact to the crane from other plant.
- Impacting the boom on a fixed structure.
- Jerky movements by inexperienced operators or poorly maintained hydraulics.
- Ground movement.

The odds of one or more of the events above occurring are high, therefore timber stacks need adequate resistance to lateral forces. Part of being a good crane driver is being able to think outside the box and make the best of difficult setup locations. So how do we stay out of trouble when jacking the crane up?

1. Use hardwood timbers Min 200mm W by 75mm D.
2. Eliminate gaps between the timbers where possible.
3. Don't mix and match timber size in the same stack.
4. Use steel bog-mat(s) as the base if available.
5. Ensure the ground beneath is flat, of sufficient bearing capacity and away from trenches.
6. Don't built the stack to a height more than 3 times the width.
7. If something does not look right, rethink it.

You may not be able to incorporate all the recommendations above, 100% of the time, however they all help ensure the stability of the setup. The setup below is a good example.



Stay Safe -CICA