

10 steps to safe and efficient tower crane erection

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Manitowoc Crane Care's Didier Forest is a 32-year veteran of the company. He has co-authored several technical manuals on tower crane erection and trains Crane Care technicians at Manitowoc's Training Center in Saint Pierre de Chandieu, France. In early 2020 he developed a new program for top-slewing tower crane erection and here he lists his ten steps to getting it right on the job site.

1. Know your configuration. Before setting foot on the job site, erection teams must know the hook height and jib length of the tower crane to calculate the number of ballast blocks needed for the base and counter jib. Increasing the height or finding additional ballast mid-way through assembly will waste time and money and frustrate customers. Once the correct configuration is determined, the erection team can establish the task sequence and ensure each crew member is prepared, so things run smoother on site.
2. Secure the right assist crane. When teams understand the tower crane specifications, they can select the correct mobile crane. Too small or too large and the mobile crane will not be able to complete the job. Grove all-terrain cranes are ideal for tower crane assembly because they combine compact dimensions with a long boom and high capacity. Manitowoc also offers an online tool for quickly and easily selecting the right one.
3. Determine the optimum crane location. The tower crane must be located correctly from the start as it is difficult to move after assembly. Selecting the optimum location for the mobile crane will also save time and help prepare the site. With CRANIMAX CRANEbee Manitowoc offers a premium software solution which is perfect for this planning, as erection teams can simulate the cranes' position in 3D, and factor in surroundings such as trees, buildings or other obstacles.
4. Prepare the site. The ground at the site must be level and able to support the weight of the tower crane so that once it has been correctly set-up it is stable. This is essential for all cranes but increases in importance for bigger cranes with heavier components. The customer must level the ground before erection and the Crane Care teams will verify it. There is a two-step verification to assess the gradient – first with a laser lens and then with a ruler. Understanding ground pressure is also vital. If the ground is soft or uneven, it must be compacted or excavated and filled with steel reinforced concrete. The site owner must also provide power, site access, and (in some cases) permission for street closure. All of this must be discussed before starting the job.

5. Coordinate the logistics. Many city centers have limits on when roads can be closed, or heavy vehicles can drive downtown. In addition, each truck might require its own permit with fees for diverting the road to traffic. Both the tower and mobile crane need to arrive on site at the right time in the smallest available convoy sizes to avoid waste and waiting. That's why Potain tower cranes are designed for efficient transport in as few truckloads as possible, while Grove all-terrain cranes are easily roadable. The erection team and the customer must prepare the transport sequence and installation in advance.

6. Check the weather. Erection teams must keep an eye on the weather forecast and plan for a still day as tower cranes cannot be assembled in winds greater than 50 km/hr (31 mph). If teams begin assembly and the wind picks up, they must wait until it drops to acceptable levels (which might take hours, or in the worst cases, days). Grove mobile cranes are equipped with an anemometer to ensure the operator is constantly aware of the wind speed.

7. Respect the technical manual. With numerous heavy components, large hammers, moving pins and a secondary crane, tower crane erection requires vigilance and so procedure must always be strictly followed. In training sessions, erection teams are taught to follow every detail in the technical manuals. Potain tower cranes prioritize safe and efficient assembly, much of which can be completed at ground level, meaning fewer lifts to get the tower crane in the air. Having people harnessed in the air during assembly has inherent risks so we want to minimize this.

8. Maintain a safety perimeter. No ground crew should go within 6 m (19.7 ft) of the mast during erection, which erection teams also learn during their training. While every precaution should be taken on site, no tower crane assembly can ever be 100% risk-free – there is always a risk that objects may fall from height. As soon as ground crew see and hear the pin installation to signal the start of the process, they should keep their distance.

9. Make use of the slinging points. Every component that must be lifted on a Potain tower crane has slinging points for faster and more efficient assembly. These special loops are built into the tower crane structure so the mobile crane's lifting chains can hook onto them. Using the correct slinging points is especially important for jib erection as the components are long and heavy and must be kept horizontal. Erection teams should calculate the right slinging points for jib erection beforehand.

10. Stay calm and professional. All crews involved in the erection must be properly trained and equipped with the right tools and PPE (Personal Protective Equipment). Even with the best training and equipment, it is not always easy to stay calm on big job sites where pressure is high and challenges arise. Nevertheless, staying calm is crucial for safety. If a crane erector feels stressed or under pressure, their risk assessment and

decision-making may be compromised. This can put their safety, and that of others, in jeopardy. If crane erectors are not completely sure of themselves or have doubts about the ground level or wind, they must stop assembly and explain this to the customer. People's safety remains the number one priority and should never be put at risk for the sake of getting the job done quickly.

Source: Manitowoc