

# From the Top Down

Innovative motorized solution delivers safe smokestack demolition

› Expanding a building can be tricky, especially when it involves demolishing old structures. Deconstruction needs to be carefully controlled so that getting rid of outdated segments doesn't damage what needs to be retained.

This was the challenge faced by Tate & Lyle, an international provider of food ingredients and ›

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**BRAND SAFWAY**

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olutions. One of their grain processing plants in the Midwest was being renovated, which entailed deconstructing and replacing an old boiler house. That facility had two concrete smokestacks, one 230 feet tall and the other 330, which were located next to the boiler house, and a third steel stack that rose out of the roof of the boiler house. All three needed to be taken down to accommodate the company’s long-term plan. Complicating matters, the towers also stood dangerously close to a pipe system that fed corn to the rest of the facility and could not be damaged.

option would have been time, labor and material intensive – as well as costly.

Another alternative might have involved using crane baskets to lift workers with jackhammers to the top and having them demolish the tower while suspended. But BrandSafway had yet another alternate approach, which would be both safer and more efficient.

With BrandSafway’s solution, Brokk® 90 robots – remote-controlled demolition machines with jackhammer-like tools attached to a controllable



SafRise® Mast Climbers are able to reach heights of over 500 feet with a single-mast capacity of 8,000 pounds. ^

### Safer, faster and less costly

To ensure that no debris would fall on the outside of the concrete smokestacks during demolition, which could damage the surrounding facilities and piping, the towers had to be dismantled starting at the top. This way any broken concrete could be pushed down through the center and carted out at the bottom via an existing debris hole.

However, providing access to a tower as it's being torn apart poses unique challenges. One traditional solution would have been fully scaffolding the tower and then dismantling it as each layer of the smokestack fell. But this

arm – were brought in and lifted to height on top of three SafRise® Mast Climbers, positioned around the smokestacks. With a single-mast capacity of 8,000 pounds and the ability to reach heights up to 500 feet, the mast climbers – which are typically used in metropolitan façade work – were perfect for this innovative strategy.

Next, custom “bridges,” which accommodated the width and weight of the robots, were engineered by Hydro Mobile by BrandSafway. These bridges were added to the mast climbers, granting the machines complete access all the way around each tower.

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Using robots was not only more efficient due to their destructive power, it was also safer as it meant that fewer workers had to be sent up to height.

“With this approach, there was no one hanging off the end of the stack and no major fall protection challenges,” said Bill Beaman, project manager for American Demolition, the general contractor for the project. “That made it a great solution from a safety standpoint.”

### **Maneuvering around piping**

While the use of mast climbers was safer and more efficient than a traditional solution, there were still obstacles to overcome. The first was that the piping around the towers limited the possible positions of the mast climbers. As it turned out, those limitations meant that a mast climber needed to be placed directly in front of the pre-cut debris hole of one of the smokestacks.

Unable to be moved left or right, the mast climber had to be moved up. Using Systems™ Scaffold, BrandSafway built a custom shoring platform capable of supporting the weight of a mast climber and a demolition bot as well as the reactive forces generated by the machines. With the mast climber resting on top of the platform, the underside was left open and allowed workers access to the debris hole to cart out rubble.

### **Securing the climbers**

Another challenge was keeping the mast climbers in place. The mast climbers needed to be tied to the smokestack for stability, but the force of the robots breaking through the concrete tower was greater than what standard clamp-style connections could handle. BrandSafway utilized Telespar ties, pin-style connections designed by the BrandSafway engineering team to withstand either long-tie applications or demanding conditions. These were then cut to size and attached, eventually being removed as each section of the smokestack fell. >



## Project Summary

Project:	Tate & Lyle Smokestack Demolition
Scope:	Provide access for demolition robots as towers are deconstructed
Location:	Midwest
Products/ Services:	SafRise® Mast Climbers, custom bridges, Systems™ Scaffold, custom shoring tower, telespar ties
Dates:	June 2019 to September 2020 <small>*Note: project was noncontinuous due to Covid 19.</small>
Safety:	Zero incidents
Value:	\$1.3 million

### › Rooftop Demolition

The mast climber solution wasn't viable for the third smokestack, which was located on the roof of the boiler house. Separate demolition work was being performed inside the building, and the structure wouldn't have been able to support the mast climbers and robot. Further, debris couldn't be pushed down through the center as it would land inside the building.

To provide access, the 165-foot tower was wrapped completely in Systems scaffold. From there, it was cut into 10-foot segments. As each piece was cut, a proportional amount of scaffold was dismantled, and the segment was removed and lowered to the ground by crane.

**“The project was a success, coming in on budget with zero safety incidents.”** 

As an additional protection during this phase, a protective barrier was erected around the corn feed pipe. This was made from Systems scaffold and ran the entire length of the boiler house – approximately 300 feet.

### On budget with zero incidents

The project was a success, coming in on budget with zero safety incidents. “It was the most efficient and cost-effective approach, and it enabled American Demolition to significantly reduce the labor and labor dollars that it would've taken to demolish the stack,” said Bill. “I couldn't be happier with the result.” 

