

What is the Near-Term Future for Robotic Construction of Tall Buildings?



Thomas Oetterli,
Schindler Group

CTBUH is currently engaged in a two-year research project, “Robots in Tall Building Construction,” kindly sponsored by Schindler. The main research question is, “Why haven’t robots become a major contributor in the tall building construction industry yet?” As the project gets underway, we asked Schindler CEO Thomas Oetterli what he foresees as the next steps in robotic tall building construction.

About the Author

Thomas Oetterli is CEO of Schindler Group, a leading global provider of elevators, escalators and related services, headquartered in Switzerland and founded in 1874.

For decades, robotics has been in widespread use in the automotive and food manufacturing industries. The construction industry is still one of the least automated industries, because tasks in construction are often highly complex. Yet as labor shortages increase and technology and digitization advances, the construction industry is turning increasingly to robotics to improve efficiency and quality in many of its repetitive but demanding tasks.

In the past, robots were primarily machines operating in static environments within factories. With today’s new technologies in sensors, computer vision and artificial intelligence, robots can also operate in more dynamic settings, such as construction sites. These latest technologies also allow mobile robots to make decisions based on any new situations encountered. As a result, robotics can help solve many of the industry’s challenges.

One such challenge is installing an elevator: it’s a repetitive and physically demanding task that nonetheless requires great accuracy, and so is a good starting point for robotics. Our recently premiered Robotic Installation System for Elevators (R.I.S.E.) couples artificial intelligence with elevator technology to make human work safer, more efficient, and more accurate by automating the preparation of the work site to install

elevator guiderails (see *What Makes for Tall Building Innovation?*, page 18). R.I.S.E., currently in its industrialization phase, is being deployed on several construction sites, and is set to launch in the market with selected customers in the near-term future.

Digitization is also progressing the tall building industry, with innovations such as building information modeling (BIM). Robots can directly obtain digital data from BIM models to complete a job, avoiding the manual and error-prone transfer of data to construction workers. For example, with R.I.S.E, the drilling position is uploaded to the robot as digital data. As the robot scans the position of the walls and rebar, it can compare the uploaded digital data with the actual data the shaft and make the necessary adjustments. It can, for example, shift a drilling position if it detects rebar in the way. Also, data on the robot’s actions are electronically documented and can be fed back into digital building models.

The opportunity for robotics in construction industry is much wider than elevator installation. Imagine, for example, bricklaying robots, painting robots, robots that mount façades, or even robots that produce entire 3D-printed buildings. Or picture this: robots that enable the construction of completely new building designs and shapes made from

totally new materials. Robotics is also helping to drive prefabrication and modular construction initiatives in the building industry: here, robots are not only used in mobile factories to produce elements, but also for assembling those elements within buildings. This vast range of new technologies and opportunities may also lead to a re-thinking across the construction industry about incorporating technology providers earlier into the design process for buildings, in order to deliver best-in-class holistic solutions for customers. We want to be at the forefront of the latest advances in construction technology and actively shape how tomorrow’s buildings are designed, constructed and operated.

We have taken our first step in demonstrating our capabilities in breakthrough construction technologies for elevator installation. Together with CTBUH, we are driving research in robotics in the construction industry on a broader level. And we are in constant dialogue with our customers on how new construction technologies can shape tomorrow’s construction sites and buildings. ■

Thomas Oetterli presents in Session 1: Opening Plenary on Tuesday, April 9, 9:00 a.m. at the Tall + Urban Innovation Conference; Robotic Installation System for Elevators (R.I.S.E.) is presented in Session 3A at 1:45 p.m.

