



How Redman Robotics Used HP SitePrint to Meet Floor Flatness Requirements in a Hyperscale Data Center

One of the world's leading data center operators required the main contractor, Christiani & Nielsen, on a data center project to use HP SitePrint to combine layout and floor level measurement. This enabled precise rack installation across a 120,000 sq ft data hall and delivered results that were 10× faster, more accurate, and scalable worldwide.

Highlights

Floor level measurement and layout done in one workflow

HP SitePrint was used not only to print bolt locations, but also to measure floor level deviations for every rack location – a critical requirement for data center installations.

Sub-3 mm accuracy achieved at scale

The project met extremely tight accuracy requirements across thousands of points, enabling precise rack alignment and shimming.

10× faster than traditional manual layout

What would typically take weeks using multiple crews was completed in just two days, while maintaining higher consistency and accuracy.

Project Scope

Redman Robotics was engaged to support the construction of a large hyperscale data center in Thailand. The scope focused on the layout and floor level verification required for server rack installation inside the data halls.

Facility size

~120,000 sq ft data hall (two halls)

Application

Server rack installation requiring extremely tight alignment and floor levelness

Layout elements

~4,500 anchor bolt drill locations

Redman Robotics is a specialized robotic layout service provider offering HP SitePrint as a service. Founded in 2023, the company was created with the belief that robotic layout technology would fundamentally change how construction layout is performed. By offering HP SitePrint as a service, Redman Robotics enables contractors to access advanced robotic layout without upfront investment in hardware, training, or additional human capital.

Redman Robotics is part of the HP SitePrint Service Provider Program, a global network of companies certified by HP to deliver best-in-class robotic layout services. Service Providers in this program are vetted and trained to meet HP's highest standards for accuracy, reliability, and on-site execution, giving contractors and owners confidence that SitePrint services are delivered at the highest professional level.

Although headquartered in the United States, Redman Robotics operates globally, leveraging air-travel-ready SitePrint systems and proximity to major international hubs to mobilize quickly and cost-effectively worldwide. Their projects range from high-end retail and hospitality to large, complex facilities – including hyperscale data centers – delivering SitePrint services wherever customers require the technology.

The Challenge

Manual layout in data centers presents a unique combination of challenges. Projects typically involve thousands of layout points that must be positioned with extreme accuracy, often within tolerances of just a few millimeters. Achieving this level of precision using traditional methods is highly labor-intensive, requiring multiple crews, total stations, and continuous quality control. As the scope grows, small inaccuracies can compound quickly across large areas, increasing the risk of rework. In addition, layout and floor level verification are usually handled as separate workflows, adding further time, coordination effort, and complexity to an already demanding process.

In this context, Christiani & Nielsen, the general contractor for a data center project in Thailand reached out to Redman Robotics to ask whether they could deliver the required layout using HP SitePrint. The project owner had explicitly mandated the use of SitePrint for the data hall layout. The requirement was driven by the fact that SitePrint is the only layout robot capable of integrating both layout and floor level measurement into a single, unified workflow.

In this project, floor flatness was not a “nice to have” – it was a fundamental requirement. Server racks must align precisely with adjacent wall-mounted systems. Knowing the exact high point of the floor before installation was therefore essential to ensure correct alignment and to avoid costly rework once installation began.

With a clear owner requirement and an aggressive schedule, Redman Robotics mobilized immediately. Christiani & Nielsen contacted Redman Robotics on a Tuesday. By the following Monday, Redman Robotics was mobilized and on site in Thailand, ready to execute the work.



“What made HP SitePrint the robot of choice for this project was that it’s the only layout robot that also performs floor level measurement. Being able to do layout and floor leveling in one single workflow was the main differentiator – everything else would have required separate processes and additional crews.”

David Redman
Redman Robotics

The Results with HP SitePrint



Redman Robotics was responsible for laying out all anchor bolt drill locations for the server rack systems while simultaneously capturing floor level data for each rack position. In total, the scope included approximately 4,500 anchor bolt locations across a 120,000 sq ft data hall, all requiring extremely tight positional and elevation accuracy.

Using HP SitePrint, Redman Robotics completed the work with two robots operating in parallel, covering two data halls in just two working days. Layout and floor level measurement were executed in a single integrated workflow, allowing elevation data to be captured directly at each rack location. This data enabled installers to identify the highest point in each rack row and plan shimming accurately and efficiently.

Accuracy was a critical factor in the success of the project. Achieving this level of precision manually across thousands of points is not only extremely tedious, but also highly difficult to sustain consistently. Manual layout at this scale requires large crews, constant verification, and significant physical effort, with technicians spending long hours on their knees marking, measuring, and rechecking points. Fatigue alone can impact both productivity and accuracy, increasing the likelihood of errors as work progresses.

The combination of speed, accuracy, and predictability proved critical. Quality control teams verified the layout after printing and reported high confidence in the results. Unlike manual workflows, errors did not compound over time, and the need for continuous oversight during layout was significantly reduced.

“The predictability is what really stands out. We can quote a project within 24 hours, mobilize within a week, and confidently tell a client that a data hall of this size will be laid out in days, not weeks – with consistent accuracy across the entire print.”

David Redman
Redman Robotics



The Results with HP SitePrint



From a schedule perspective, SitePrint fundamentally changed the process. Performing the same scope manually – including both layout and floor elevation data capture – would have required at least 20 days using multiple total station crews. With SitePrint, the work was completed in two days, making the process 10 times faster, while delivering higher consistency and accuracy.

By using HP SitePrint as a service, Christiani & Nielsen met the owner’s strict requirements, reduced project risk, and kept the construction schedule on track.



		Manual	HP SitePrint
Job Data	Data Hall Size (ft²)	120,000 ft²	
	Bolt Locations Marked	4,500	
	Crew Size	2	2
Time	Total Time (days)	20	2

