

Bringing the power of HP's ink innovation to construction sites





In June 2020, McKinsey Global published a paper on ‘the next normal’ in construction that stated, forthrightly: “A changing market, technological progress, and disruptive new entrants will trigger industry overhaul.”¹ Fast-forward to 2023 and it’s hard to disagree.

The construction industry is in a state of flux and many factors—from labor shortages to price hikes and much more—are reshaping how construction leaders should proceed, if they want to win bids and deliver projects more efficiently.

Despite challenges still plaguing the industry, the opportunities are huge. Construction remains the second largest industry worldwide and is expected to grow at 4% annually.² If leaders want to better manage and maintain the growth of their construction firm, it’s crucial they explore every available opportunity to get ahead—and stay ahead. Adopting new digital technologies is one such way.

On-site layout, in particular, has evolved over the years as new digital technologies have been introduced, at every stage—from measuring tape and chalk to total station to robotic total station—delivering more project efficiencies for both on-site workers and construction leaders. So, what’s next?

The latest technological disruption in construction building layout is HP SitePrint, which boosts productivity by as much as 10x compared to manual layout. As a robotic solution for autonomous layout, it helps automate layouts to cover up to 4000ft²/h. For construction leaders, the efficiency, accuracy, and consistency this new tool offers can help realize a more productive and cost-efficient construction site. Not only that, but HP’s unique position as an ink innovator gives construction leaders a unique range of durability for different layout use cases, versatility, as well as increased employee satisfaction rates.

In this eBook we cover:

- The ink properties that make HP SitePrint perfect for any environment
- The versatile applications of HP SitePrint
- The labor and resource gains construction leaders can realize by implementing HP SitePrint

The ink properties of HP Siteprint

Rugged, roadworthy, and accurate, HP SitePrint offers quick layout and the opportunity to speed up construction work by autonomously printing plan lines, guidelines, and other indications straight from the blueprints onto the floor.³ It's here where HP's versatile inks with a different durability range become an important value-add, helping to minimize re-dos and increase project turnaround times—all to help construction leaders maintain and manage growth.

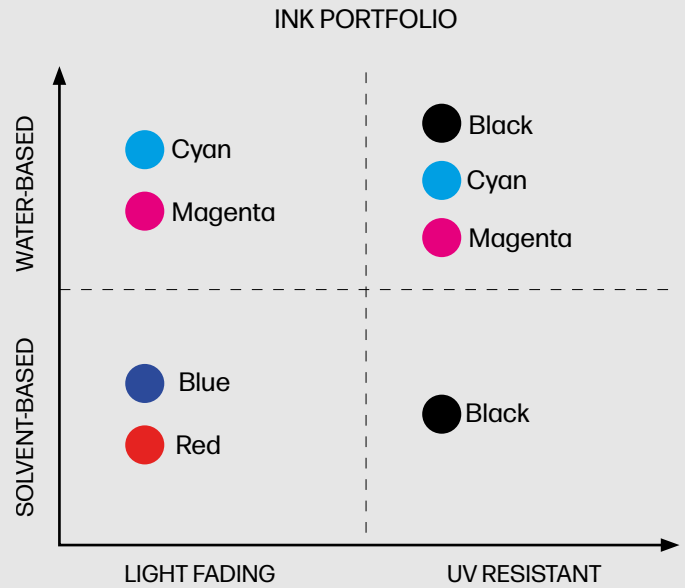
HP SitePrint improves layout productivity by as much as 10x.⁴



Versatility

Utilizing HP's extensive and versatile ink portfolio means HP SitePrint has the ability to print on a variety of surfaces and with a different durability range. The robot can print text, lines, and arcs on porous surfaces like concrete, tarmac, plywood, and pavement, as well as water-resistant ones like terrazzo, vinyl, metal decks, and epoxy.

HP offers both solvent-based and water-based inks, meaning HP SitePrint can even print in environments with very cold operating temperatures. Essentially, the robot works to print with pinpoint accuracy and speed, across practically any construction site environment.



Key Supported Materials

NON-POROUS



POROUS MATERIALS



Durability

HP SitePrint offers a wide selection of inks in terms of color and durability for different construction layout uses—with permanent and semi-permanent capabilities depending on the nature of the project. From fast fading (days) to medium fading (weeks) or slow fading (months), on-site workers are given all the freedom they need to make decisions to increase the efficiency of the overall project. There's the opportunity to layout all trades with one single solution, in part because of the wide range of colors and ink durability. For construction leaders, giving their team the tools to do more with less will make a big difference to their firm's ability to win and deliver new projects.

Replacing the ink cartridges in HP SitePrint can be done quickly and with ease. In fact, it's just as easy as changing the ink in your HP home printer.

The ink properties of HP SitePrint help leaders in construction to minimize layout delays to avoid costly knock-on obstructions of other aspects of construction projects. And work towards getting a real return on investment.

“I need to automate layout to be able to take on all the new work.”

—VALLEY INTERIORS, US

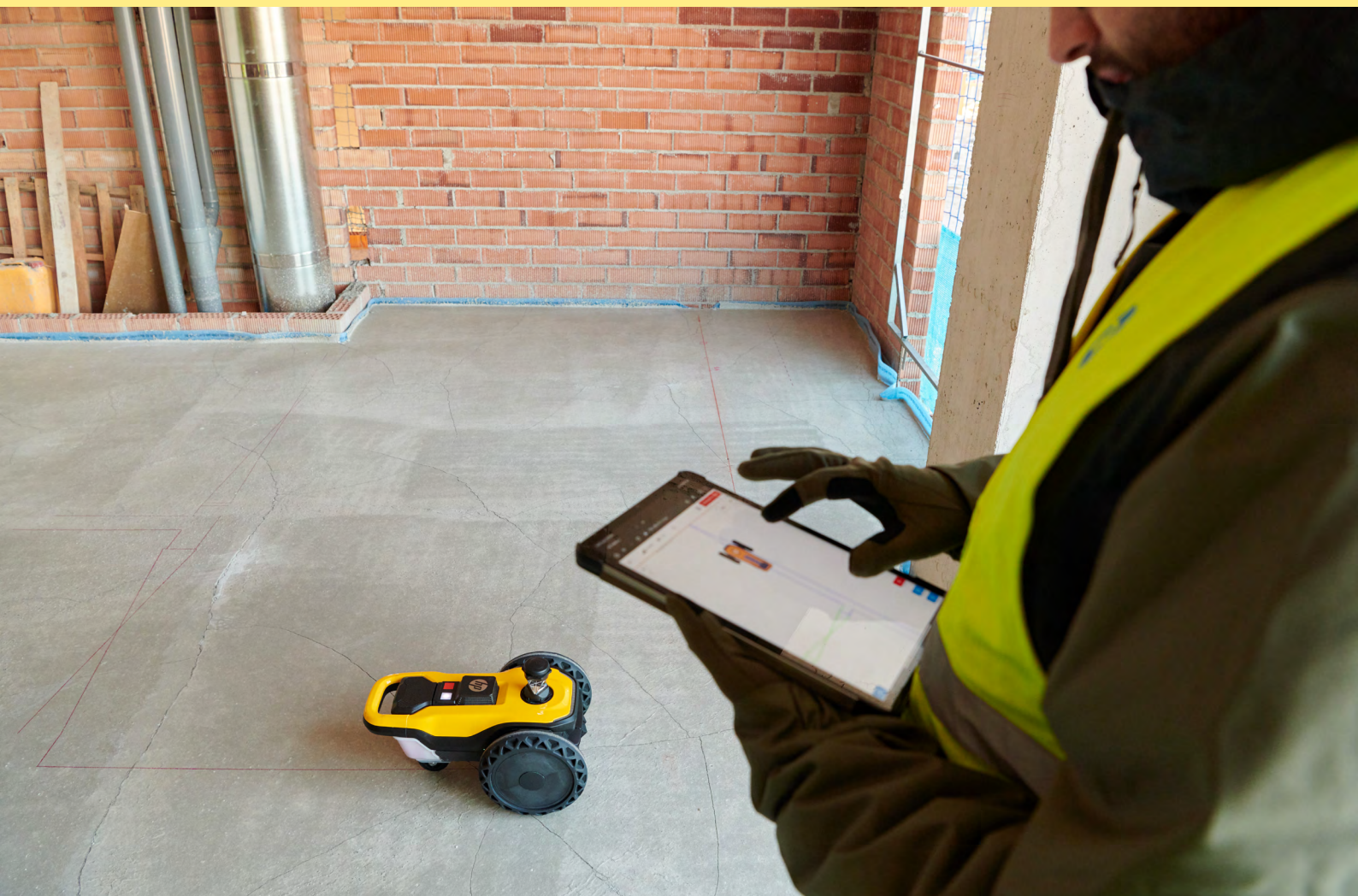
The versatile applications of HP Siteprint

The versatile applications of HP SitePrint all bring simple, fast, and accurate processes to construction site layout. But, really, HP SitePrint is far more than a layout tool. As well as layout lines, it's capable of printing useful information and guidance onto the floor too, thanks to its text printing capability. Using cloud-based tools, operators set it up for job preparation, fleet management, and job-progress tracking, and it's managed on site with any touch-screen tablet or mobile phone and a robotic total station.

With the combination of these unique capabilities, construction workers and leaders can begin to realize the true power of HP SitePrint—flexing to new project demands, working intricately and accurately, and improving the layout experience for the professionals tasked with carrying it out.

“HP has played a key role in bridging digital and physical worlds with print solutions for architects and engineers over the last 30 years. With HP SitePrint, we’re making it faster and easier than ever for construction professionals to bring an idea to life on site, while also providing layout accuracy and reducing costs derived from reworks.”⁵

—DANIEL MARTÍNEZ, VP AND GENERAL MANAGER, HP LARGE-FORMAT PRINTING





HP SitePrint's versatility in action

The ability to print intricate arcs and shapes: HP SitePrint can print lines, texts, arcs, and circumferences—saving time and costs for construction leaders looking to reduce project overruns and keep to timelines.

The ability to print on different surfaces: The versatile and robust design of HP SitePrint enables it to print on any construction surface. The tool's 3/4" printhead to floor distance means it can navigate over unsmooth surfaces with ease.

The ability to print written notes/instructions on a building site floor: With pinpoint accuracy, HP SitePrint prints notes and instructions on a building site floor by connecting to a CAD file. This helps spot inconsistencies and errors before it's too late, minimizing layout delays to avoid costly knock-on obstructions to the project.

HP's deep know-how in printing systems, user experience, and product industrialization make HP SitePrint a unique tool with versatile applications to help construction leaders drive efficiencies for their projects, now and in the future.

The labor and resource gains of using HP Siteprint

At \$11.4 trillion, the construction sector represents 13% of the world's GDP and shows a steady growth of 3.5% CAGR.⁶ Despite this, the industry faces challenges in productivity and human resourcing. While labor productivity in manufacturing has grown an average of 3.6% a year over the past two decades, labor productivity in the construction sector has only seen a 1% increase over the same time period, according to McKinsey.⁷

However, in the words of Daniel Martínez, VP and General Manager of HP Large-Format Printing: "Technology adoption and increased digitization can help construction firms realize productivity gains."⁸ So, how does HP SitePrint do just that?

Increasing productivity

HP SitePrint's versatility and automation means it can layout all trades at once, freeing up on site workers to focus on other value-creating tasks by allowing them to complete the same quality of work in a fraction of the time.

HP SitePrint can:

- Increase layout productivity by as much as 10x.
- Obstacle avoidance for autonomous operation.
- Avoid errors and reworks with text printing capabilities.



“Layout experts are a scarce resource who add a lot of value in terms of planning and strategy, but often end up dedicating most of their time to manual execution. HP SitePrint lets us do more with less, helping reduce schedules thanks to a much faster layout process, and allowing senior operators to focus on other critical activities like quality control.”

—DANIEL MARTÍNEZ, VP AND GENERAL MANAGER, HP LARGE-FORMAT PRINTING

Supporting a more harmonious construction site

HP SitePrint provides a consistent layout, with no mismatches between different trades. This consistency also helps support a more harmonious construction site which, in turn, works to minimize project delays and avoid costly obstructions. In essence, with HP SitePrint, leaders in construction are supported in connecting disparate

contractors and subcontractors, who often complete layout in different ways. The robot provides a single solution to help speed up completion times and reduce the need for re-dos, by minimizing the errors that naturally arise as workers juggle different ways of working.

“Savings coming from error prevention can easily be 10x higher than layout savings.”

—FERROVIAL, SPAIN



Boosting the employee experience

When the total station was first introduced to on-site layout, there were direct productivity gains realized. But more than that, by improving the employee experience, construction firms began realizing equally important, indirect productivity gains too. Now, HP SitePrint has built on these to help layout professionals work more consistently, more safely, and with more ease.

- Set up is easy and HP SitePrint can be up and running in less than 10 minutes.
- The reduction in manual labor the robot offers helps to minimize the risk of injury.
- Layout professionals can layout all trades at once, giving them more time to focus on other important tasks.
- The robot weighs less than 25 pounds, so can be easily transported across the construction site.
- HP SitePrint's cloud tools create a seamless end-to-end experience, making it easier to check progress of active projects, manage user roles and fleet management, and track usage, productivity, and accounting metrics.

Key features and benefits

Construction is changing. Construction leaders' processes, solutions, and attitudes must change with it, if they want to keep pace, win bids, and deliver projects more efficiently. By embracing HP's construction layout robot, these same leaders can transform how their construction site layouts get made—driving better return on investment, whilst minimizing costs and providing a better end-to-end experience for their on-site workers.

- Boost site productivity—Leverage autonomous technology to lower layout costs. Printing out information will save time, improve on-site information, and free up expertise to be used elsewhere.
- Precise site layouts—Complete each task accurately. With HP SitePrint you can rely on the precise, accurate execution of intricate layouts.
- Ease of use—Easily manage projects with a comprehensive construction layout management solution.
- Cloud capabilities—Cloud tools for managing the fleet, submitting and preparing jobs for printing, and tracking usage.
- Rugged and robust—A robust, autonomous robotic system built to function on a construction site. HP SitePrint includes a hard case that can fit in the solution components and is lightweight and portable.

References

- 1 <https://www.mckinsey.com/~media/McKinsey/Industries/Capital%20Projects%20and%20Infrastructure/Our%20Insights/The%20next%20normal%20in%20construction/The-next-normal-in-construction.pdf>
- 2 World Economic Forum, Turner and Townsend
- 3 <https://newatlas.com/robotics/hp-siteprint-building-blueprint/>
- 4 <https://press.hp.com/us/en/press-releases/2022/hp-new-siteprint-robotic-solution.html>
- 5 <https://press.hp.com/us/en/press-releases/2022/hp-new-siteprint-robotic-solution.html>
- 6 <https://press.hp.com/us/en/press-releases/2022/hp-new-siteprint-robotic-solution.html>
- 7 <https://www.mckinsey.com/business-functions/operations/our-insights/reinventing-construction-through-a-productivity-revolution>
- 8 <https://press.hp.com/us/en/press-releases/2022/hp-new-siteprint-robotic-solution.html>

