The Value of Color in the Construction Industry

REDDUCING HUMAN ERROR RATES WITH COLOR PRINTING

When looking for ways to increase profitability and productivity, construction executives and project managers are more frequently identifying the “human error factor” as an opportunity to reduce costs, and are finding success after converting traditional black and white plans to color. Doing so increases contractors’ and subcontractors’ effective communication in the field. In fact, studies have shown that every $1 invested in color can yield $4 in cost savings for a given project.

RETHINKING PRODUCTIVITY

Low productivity has been a constant drumbeat in the construction industry, raising costs and adding risk and waste across project lifecycles. Industry leaders are looking for ways to drive risk and waste out of their own project-delivery processes, and they see many opportunities for improvement across the range of engagements. Based on The Economist, “Rethinking productivity across the construction industry: The challenge of change,” (2015), a survey revealed that:

• 74 percent of construction professionals surveyed indicate that lagging productivity is a major challenge;
• 48 percent believe that their firms have failed to come up with a coherent strategy to address this problem; and
• 32 percent cite poor communication and collaboration as one of the leading obstacles to partner-related productivity, underscoring the need for better partnership models among contractors, clients, and investors.

ERRORS AND WASTE ARE COMMON IN THE INDUSTRY

Waste Is Costly

According to the Lyra Research Inc. article “Color Construction Documents: A Simple Way to Reduce Costs,” general industry estimates that between 10 percent and 30 percent of all building project costs can be attributed to wasted activities, such as schedule overruns due to inaccurate coordination scheduling, wasted labor and management time, wasted materials and unnecessary litigation. Based on U.S. Department of Commerce building estimates for 2009, a 10 percent waste factor is equal to approximately $94 billion.
Unforced Human Error Results in Consequences
• Wasted material when building
• Wasted operator time
• Wasted time for manager to make corrections
• Time delay of the project due to the error
• Reprint of the plot with the corrections
• Litigation with the project lead

Studies suggest that between 70 percent and 90 percent of projects exceed the original planned cost, and the overrun commonly reaches between 50 percent and 100 percent of the budget. Twenty-one percent of the time, poor exchange of information and communication causes errors at work.

AEC INDUSTRY TRENDS
Low-productivity Consequences
• Project owner: A major concern is closing the project on time with no extra costs. Any delay in the project delivery is most likely to result in extra costs.
• Architect: Focused on transmitting attractive ideas and appealing designs when planning and designing. Providing misleading information can delay the entire project execution.
• General contractor: A primary task is monitoring and controlling the implementation of the project. Any error when transmitting information can result in litigation, as well as additional costs and delays with the project owner.
• Subcontractor: The focus is on delivering on requests as quickly and accurately as possible, minimizing errors. Information errors can result in rework and time delays and penalties from the general contractor.

THE ADVANTAGES OF PRINTING IN COLOR
Color printing has become an important component in projects because it can decrease human error rates. It has been proven that color documents are more easily understood and the information is retained at higher rates versus monochrome documents. The use of color documents reduces errors and allows a team to easily understand the sections of a plan for which they are responsible. During the bidding phase, color documents make a more professional impression than monochrome documents. Throughout the project, the use of color in documents can help keep the project on time and on budget.

The HP Advantage for Construction Professionals
HP enables construction executives and project managers to add color printing into their workflow by offering devices that make color printing more productive and cost effective. Their portfolio ranges from compact HP DesignJet T-Series 24 & 36" Wi-Fi enabled printers, designed for CAD and general-purpose applications, all the way up to the high-volume HP PageWide XL printers that can print 30 D-Size (24x36") plans in one minute, with integrated scanning capabilities. With excellent reliability and ease of use, HP DesignJet and PageWide XL printers have helped many construction companies reduce jobsite errors by enabling quick print revisions, color drawings and onsite multi-function scanning capabilities.

COLOR’S EFFECTIVENESS BY THE NUMBERS:

<table>
<thead>
<tr>
<th>Color’s Effectiveness</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of the cases, color documents are more easily understood and the information is retained at higher rates versus monochrome documents</td>
<td>65</td>
</tr>
<tr>
<td>Error reduction due to the use of color documents</td>
<td>80</td>
</tr>
<tr>
<td>Color drafts reduce failure cost on building site</td>
<td>3.9</td>
</tr>
<tr>
<td>Around 0.25% of the costs of the project typically are for construction documentation costs</td>
<td>4</td>
</tr>
</tbody>
</table>

$1 invested in color printing can yield $4 in savings for a given project.

2 “Why Color Matters,” by Bill Motron, 2010
3 “Color For Impact,” by Jan V. White, 1996.