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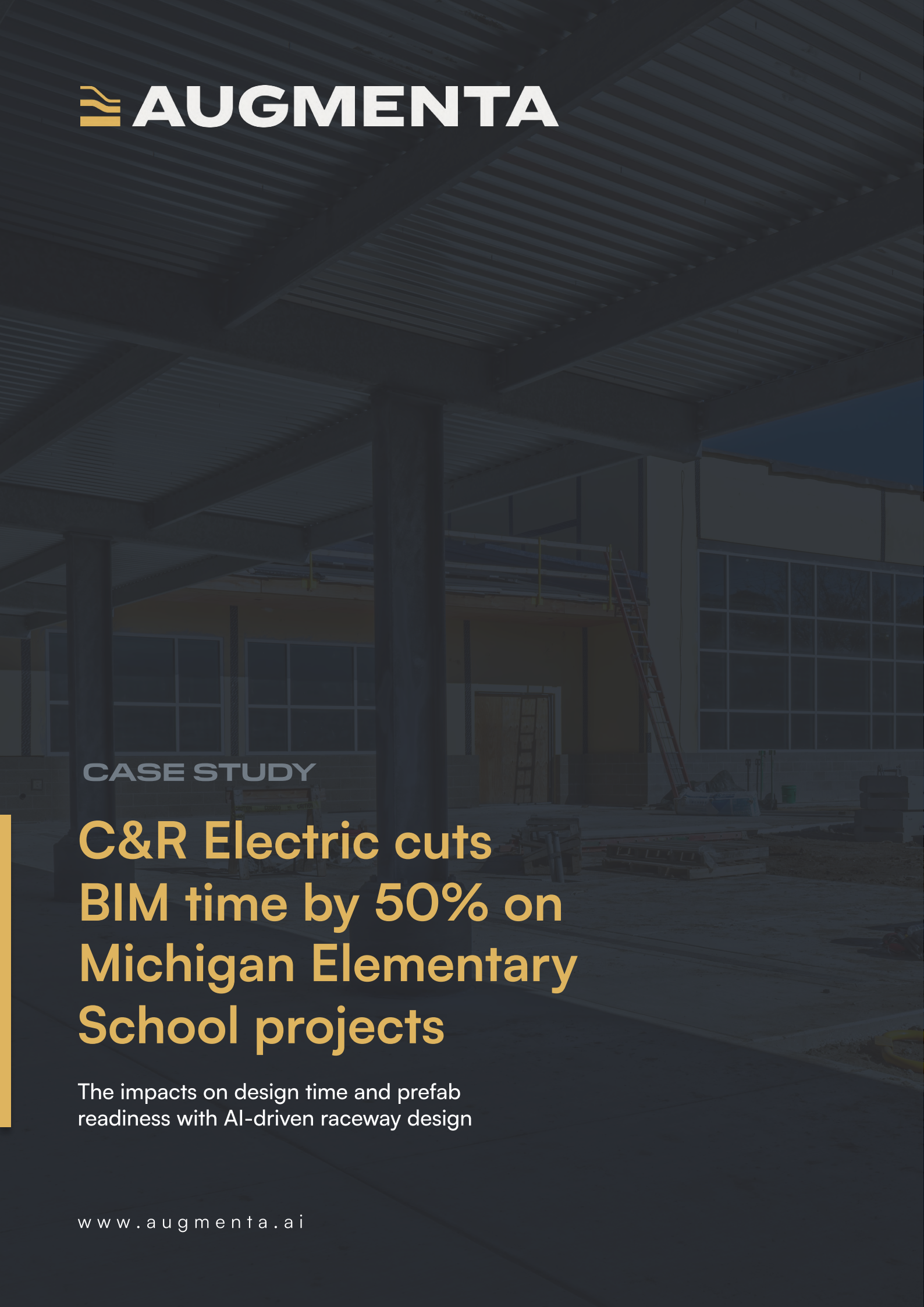

CASE STUDY

C&R Electric cuts BIM time by 50% on Michigan Elementary School projects

The impacts on design time and prefab readiness with AI-driven raceway design

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EXECUTIVE SUMMARY

Augmenta partnered with C&R Electric and The Christman Company to deliver the first U.S. educational facilities whose entire electrical systems were designed via AI-driven generative design. The projects took place in Lansing, Michigan. Pre-construction (BIM) work started in mid-2024, and doors first opened in August 2025.

After successfully deploying Augmenta Construction Platform (ACP) on Mt. Hope Elementary, C&R Electric committed to a second project to answer a critical question: Would the benefits plateau or accelerate?

Context

Traditional electrical design workflows create bottlenecks. Engineers place source and destination points, then contractors manually route everything in the field. VDC teams play catch-up with coordination, working through clashes one by one. Manual modeling can't scale with the influx of larger, more complex projects hitting the industry.

The Solution

Augmenta Construction Platform (ACP) automated the routing and coordination process, integrated directly into C&R's existing Revit workflow. The AI handled the heavy lifting of routing and spatial coordination, while the team maintained control over design decisions.

The Outcome

On Willow Elementary, the results were clear. The same VDC team completed electrical design **40%** faster than manual methods, up from 25% on their first project. Setup time was cut in half. The project that would have taken 6-8 weeks with manual modeling was completed in 2.5 weeks, saving **320**+ hours.

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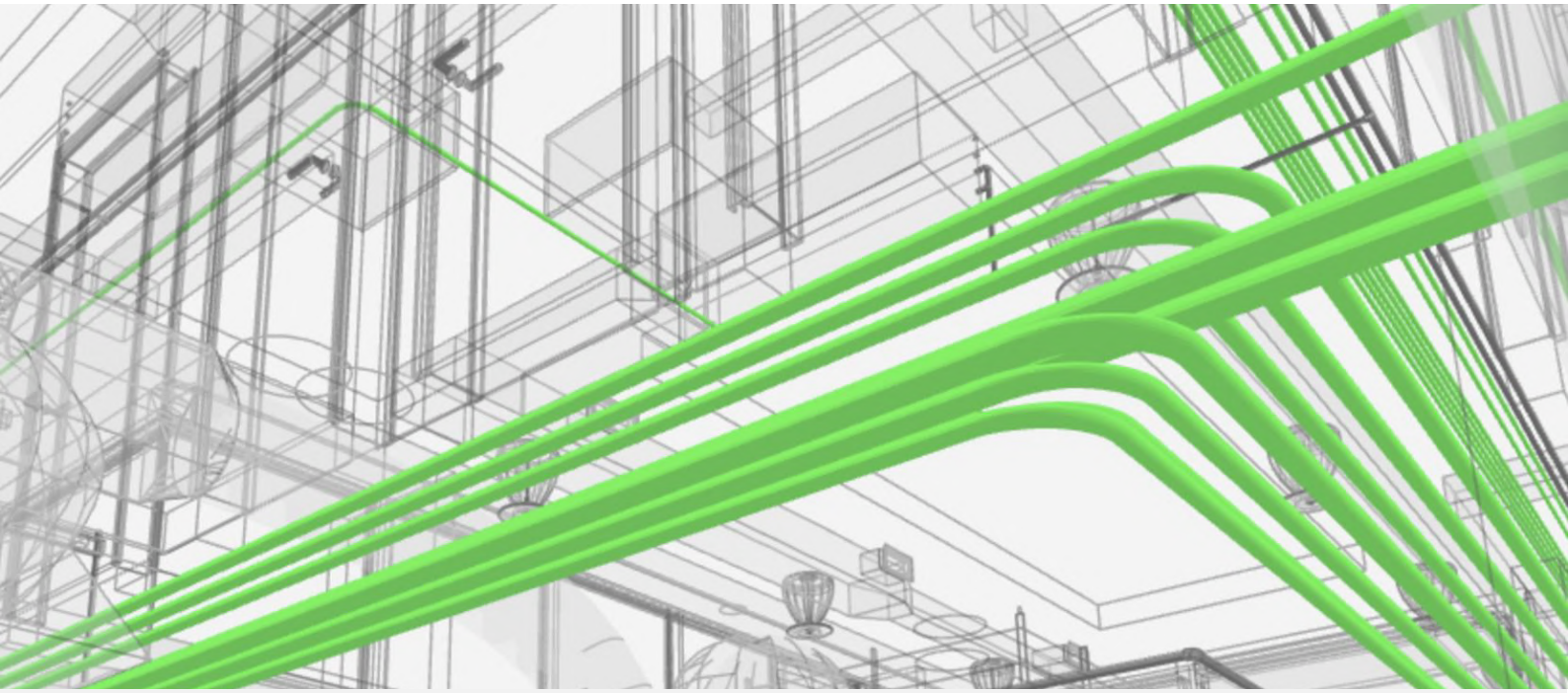

THE APPROACH

C&R's VDC Director, Travis Terrell, deployed ACP on Willow in August 2024, with the advantage of prior experience. Setup time dropped from 8 hours to 4 hours. The team knew how to configure project specs, effectively.

ACP integrated directly into C&R's existing Revit workflow. Real-time schedule validation caught errors before they became problems.

Overnight processing allowed the team to continue other work. A few hours of cleanup prepared the model for prefab.

The team also benefited from platform improvements between projects. ACP's conduit banking intelligence had evolved, automatically racking pipes together instead of requiring manual grouping.

Time Breakdown

Phase	Manual Estimate	ACP Actual	Savings
Routing/Modeling	300-400 hrs	7 hrs *	95%
QA/QC	Ongoing	63 hrs	70%
Total	400+ hrs	80 hrs	75%

*Cloud-based software, generated solutions overnight

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Project Overviews

Project Scope	Mt. Hope Elementary	Willow Elementary
Building Size	~50,000 sq ft	~80,000 sq ft
Building Configuration	Single K-5 building	K-5 split into 4 buildings, single service, solar
Conduit Linear Feet	11,000 feet	40,000 feet
Complexity	Standard overhead conduit routing	Racks with up to 30 pipes, ranging from 3/4" to 2.5"

THE CHALLENGE

Electrical contractors inherit incomplete designs. Engineers place source and destination points, but contractors must manually route thousands of feet of conduit, working around structural elements and coordinating with other trades.

For a project the size of Willow Elementary (80,000 sq ft, with 40,000 linear feet of conduit), this typically requires 6-8 weeks of VDC time.

The manual process doesn't scale. As projects get larger, coordination lifts grow exponentially. Every clash means hours of rework. C&R needed faster turnaround, reduced waste, earlier prefab readiness, and a workflow that could handle multiple large projects simultaneously.

After seeing 25% time savings on their first ACP deployment, C&R wanted to know if those benefits would compound on a second, more complex project.

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THE RESULTS

C&R estimated 400 hours for manual modeling. With ACP, they completed Willow in 80 hours total: 10 hours setup, 7 hours generation (overnight), and 63 hours refinement. This represented a 75% reduction in modeling time.

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Key Results Comparison

Metric	Mt. Hope Elementary	Willow Elementary
Setup Time	8 hours	4 hours
Initial ACP Generation	4.5 hours	4.5 hours
Cleanup/Editing Time	~200 hours	200-250 hours
Total Time with ACP	Not specified	80 hours (2-2.5 weeks)
Estimated Manual Time	Not specified	300-400 hours (6-8 weeks)
Time Savings	25% (100+ hours saved)	40-50% (320 hours saved)
Prefab Readiness	1 month earlier	1 month+ earlier

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BEYOND TIME SAVINGS

ACP's real-time schedule validation caught errors that would have become expensive field issues: conduit schedule mismatches, missed conduit runs, and inaccuracies in the model. Finding these model errors manually costs hours. Finding them in the field costs days and thousands of dollars.

The clash-free initial design eliminated hours of coordination meetings. Travis noted: "Definitely less coordination issues, because it found all the issues ahead of time for us."

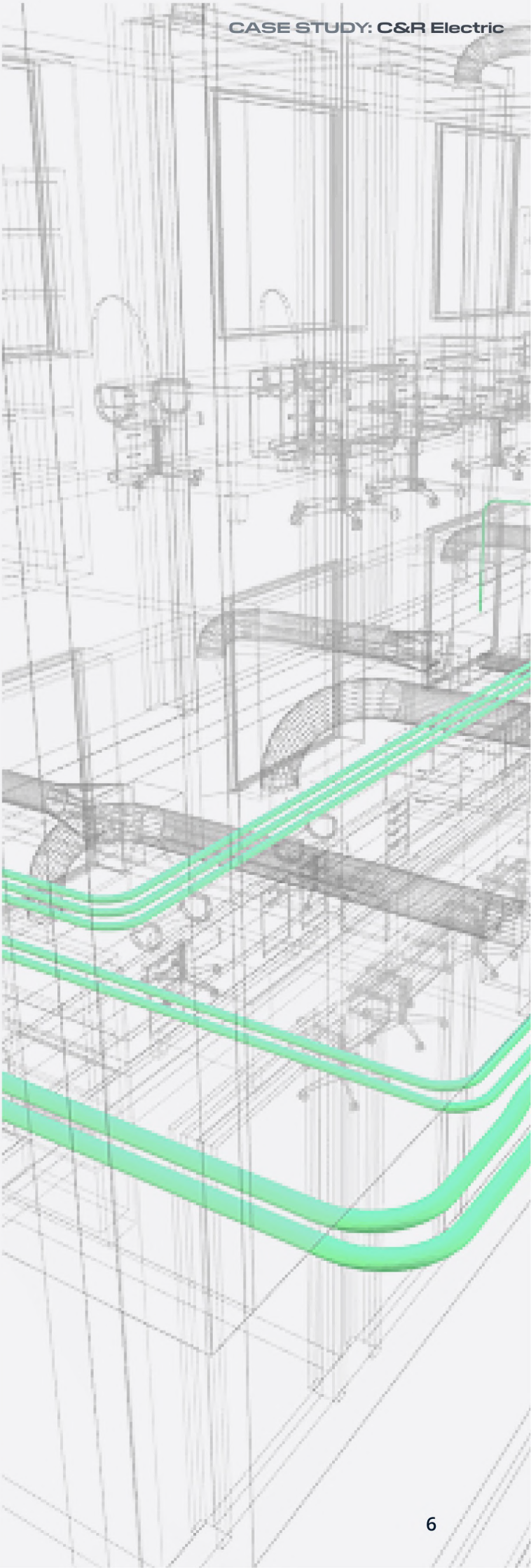
The time savings translated directly to capacity. C&R can bid on larger projects without expanding headcount, making the VDC team a profit center rather than overhead.

WITHOUT ACP

6-8 WEEKS

WITH ACP

2.5 WEEKS



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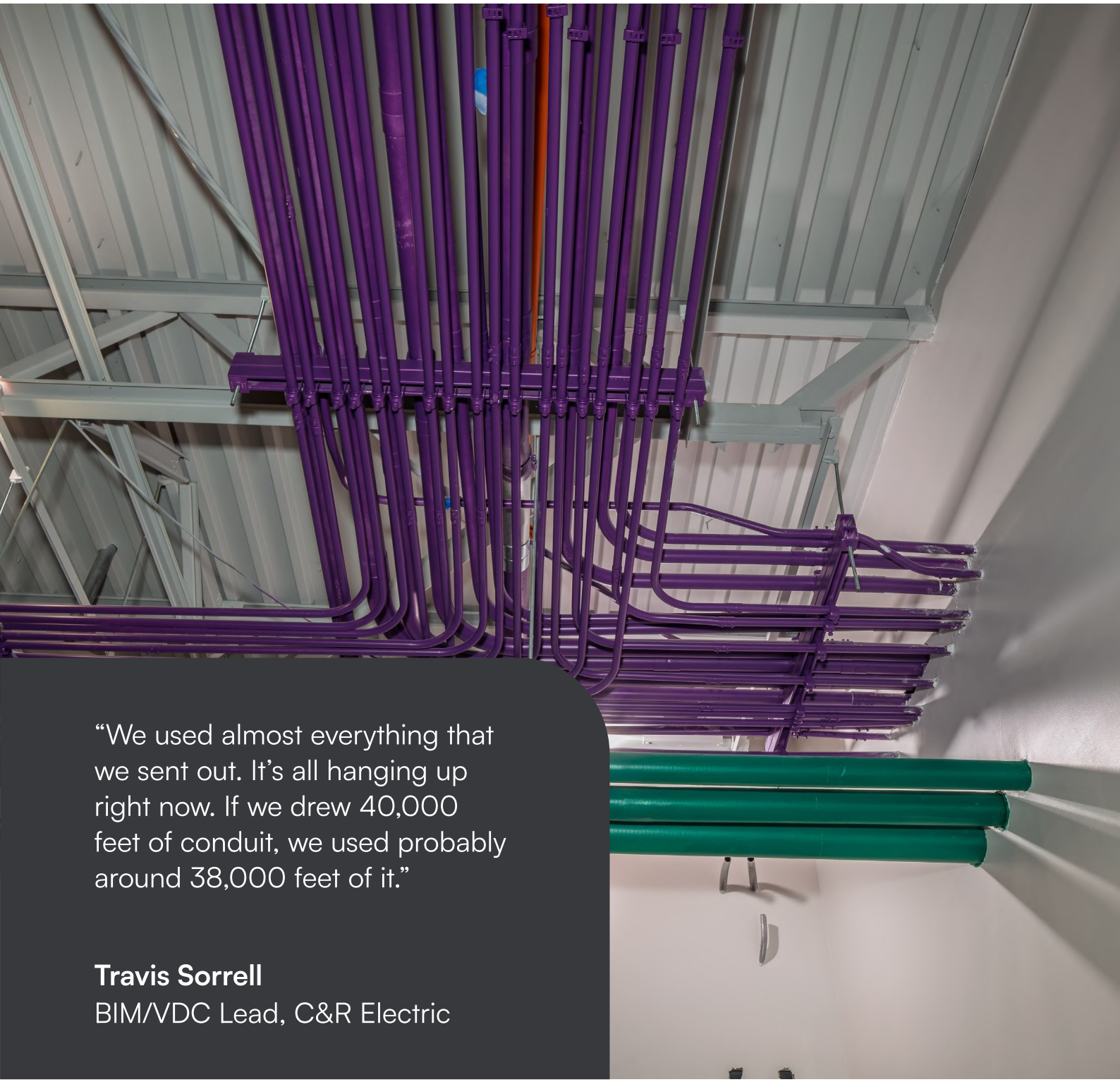
MATERIAL WASTE REDUCTION

The team specified 40,000 linear feet of conduit and used approximately 38,000 feet, a 95% utilization rate. This precision reduces material costs, minimizes waste, and streamlines prefabrication.



"We used almost everything that we sent out. It's all hanging up right now. If we drew 40,000 feet of conduit, we used probably around 38,000 feet of it."

Travis Sorrell
BIM/VDC Lead, C&R Electric

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WHY PERFORMANCE IMPROVED

Three factors drove the improvement in time savings:

USER PROFICIENCY:

The learning curve was behind them. Travis and his team knew how to structure input data, which tools to use when, and where to focus refinement efforts. Project setup time dropped from 8 to 4 hours.

PLATFORM EVOLUTION:

Between projects, ACP significantly improved, automatically grouping and racking conduits.

Travis noted: “The quality of what it’s putting out now is much more real world. It matches what someone’s actually going to install out in the field.”

WORKFLOW OPTIMIZATION:

C&R integrated ACP earlier in their process and structured quality review around ACPs strengths. They moved from "using new software" to "optimizing around new capabilities."

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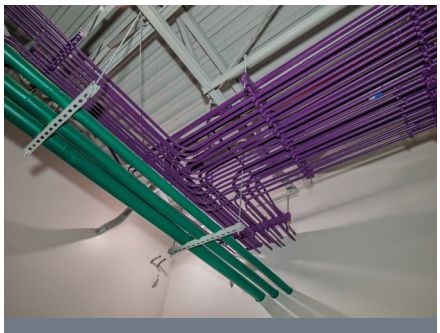
BUSINESS IMPACT

The hours saved create obvious value. The strategic advantages are more significant.

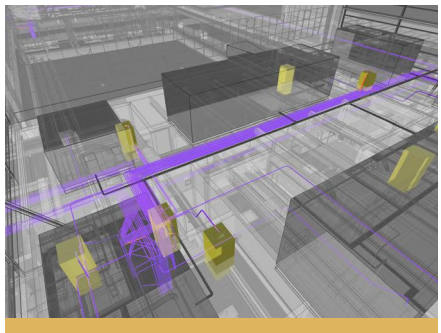
Competitive Positioning

C&R can now bid on more complex projects, commit to aggressive schedules competitors can't match, and take on additional work without expanding headcount. In markets where timelines determine winners, speed is a critical competitive advantage.



Risk Mitigation

Fixing errors in the field costs 10-100x. A routing conflict that takes 30 minutes to resolve in a model might require 2-3 days of field time and schedule delays. ACP's coordinated design output eliminates the majority of these expensive problems.



Repeatable Process

First project: 100+ hours saved. Second project: 320+ hours saved. C&R didn't change their team size. They just stopped doing the same work twice. The efficiency gains stack, project after project.

PROJECT COMPARISON

Metric	Mt Hope	Willow	Change
Conduit	11K ft	40K ft	+4x
Setup	8hrs	4 hrs	-50%
Editing	200 hrs	60-70hrs	+15%
Time Savings	25%	40%	60%
Waste Reduction	15%	24% *	+4 pts *

*Combination of ACP and Allied BIM fabrication software

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WHAT CONTRACTORS ARE SAYING

"We witnessed remarkable time savings of over 100 hours in the design phase, and our prefabrication-ready drawing time was cut down by a full month. Augmenta is a game-changer for efficiency. It's the next logical step to get fabrication out the door faster and more accurately.

Kyle Sponseller
President, C&R Electric

"The Mt. Hope Elementary School project represents a significant step forward in how we approach educational facility construction. We are always seeking innovative methods to deliver high-quality, efficient buildings for the communities we serve, and with Augmenta's help, this school is a shining example of that commitment."

Andrew Dobbs
PM, The Christman Company

"I think ACP is a game-changer for the electrical contracting industry. After using it on two projects, I would hope everyone would take the opportunity to implement it for their coordination. It makes things faster. It takes all this wasted time off their hands. You can figure out your time savings ahead of time. You can figure out how much you're going to need of everything and how much it's going to cost."

Travis Sorrell
BIM/VDC Lead, C&R Electric

HOW IT WORKS

Build and validate your conduit schedules

Fast schedule creation with real- time Revit integration. Catch schedule-to-model mistakes before they become expensive rework.

Set your routing preferences

Input your Revit model and use intuitive guidance tools to control routing. You maintain design authority while ACP handles clash avoidance and finds efficient routes.

Configure project specifications

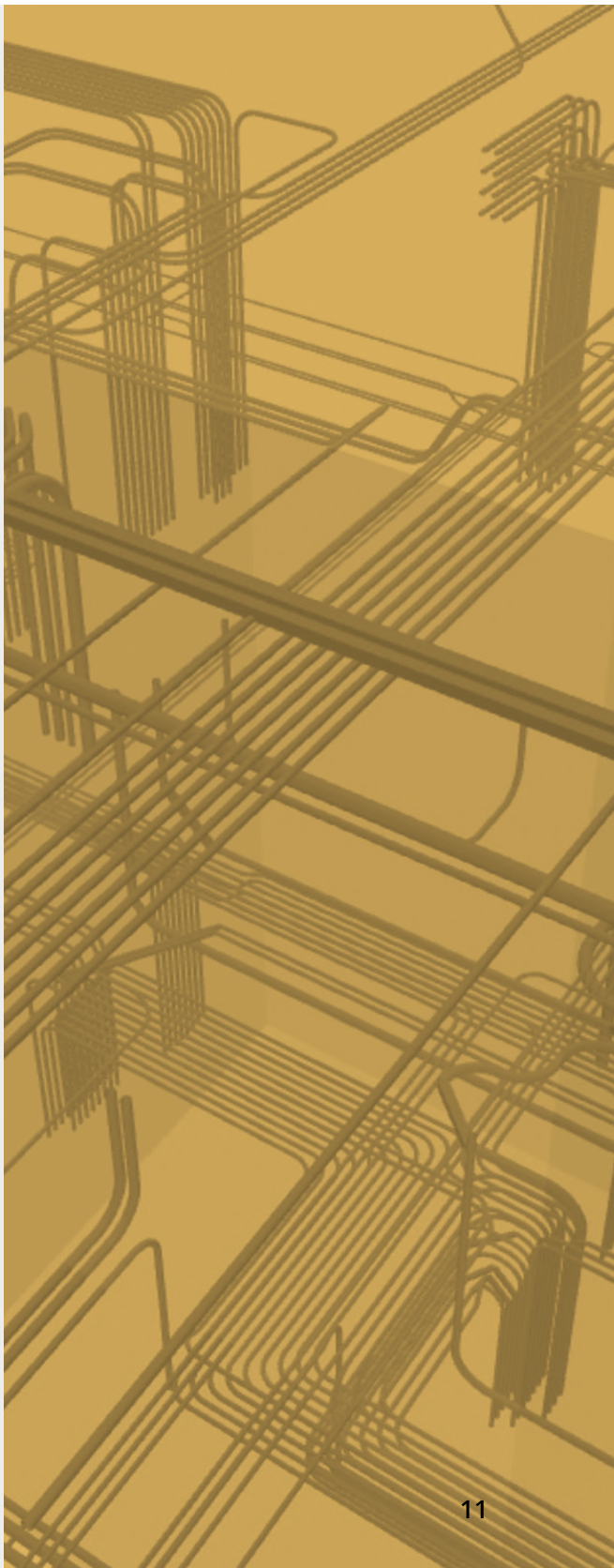
Specify supporting methods, clearances, spacing rules, and other project-specific requirements. When you're ready, hit Generate.

AI routes and coordinates your designs

ACP analyzes your BIM model, identifies supportable regions and penetrable walls, then generates multiple routing options. Routes are optimized to minimize length, bends, penetrations, cost, and installation.

Review solutions and export to Revit

Compare solutions using time and cost estimates. Preview designs in 3D, guide then export directly to Revit for further editing, coordination and rate detailing. In-Revit analysis tools make complex models easy to QA/QC.



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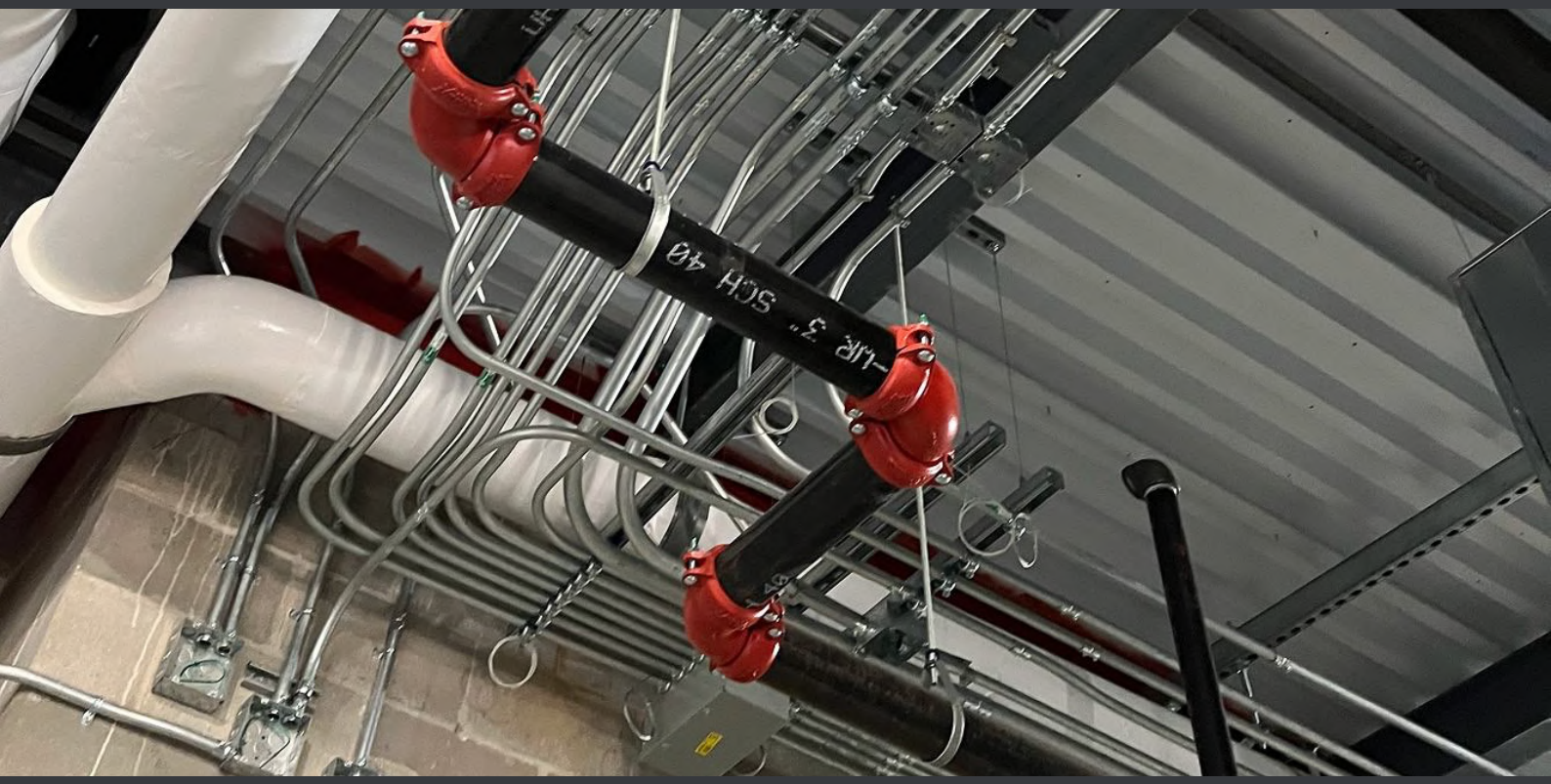

CONCLUSION

C&R Electric's journey from Mt. Hope to Willow Elementary demonstrates that first-project results are just the starting point. Performance improved across every metric: time savings increased from 25% to 40%, further reductions in material waste, and setup time halved.

Based on their success, C&R has integrated ACP into their standard workflow for all projects with overhead conduit requiring coordination.

Construction technology delivers maximum value when user proficiency increases, platform capabilities improve, and workflows optimize. C&R achieved all three. The improvement in time savings didn't require additional investment, just continued use of a tool that delivered immediate value.

For contractors evaluating AI-powered design tools, C&R's experience offers a model: measure results, commit to proficiency, expect accelerating returns.

Explore AI-driven design, pilot a project or try it on a real project.

Ready to cut your BIM time by 65%? Learn more at augmenta.ai