


Optimizing Your Execution

Tips for Driving Electrical Fabrication Success

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TRADE SHOW EDUCATION



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- Have your badge scanned at the door
- Attend 90% of this presentation
- Fill out the online evaluation for this session





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Skilled Labor Shortage

- US has been experiencing a shortage of electricians!
- 10K electricians leaving the workforce, yet only 7K entering
- Market demand for electricians increasing dramatically
- Workforce greatly reduced during the pandemic
- Infrastructure Investment & Jobs Act and the Inflation Reduction Act - Clean Energy Sector
 - 250,000 + electricians short of what is needed to do all this work.
- “Electrification” of everything!

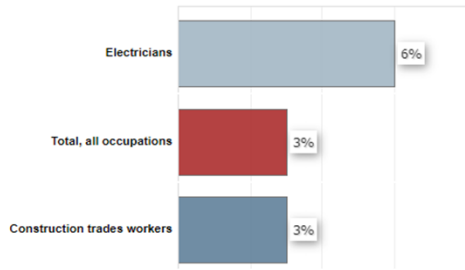
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U.S. Bureau of Labor Statistics


Electricians



Percent change in employment, projected 2022-32

- Electrician employment growth - 6% YoY 2022-2032
- 49,200 electricians needed over last year
- 73,500 electrician openings on average YoY over the coming decade

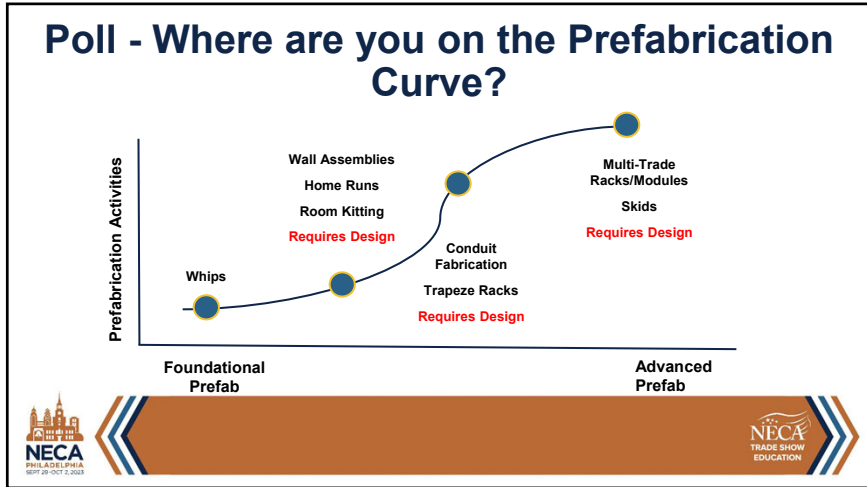


Occupation	Percent change in employment, projected 2022-32
Electricians	6%
Total, all occupations	3%
Construction trades workers	3%



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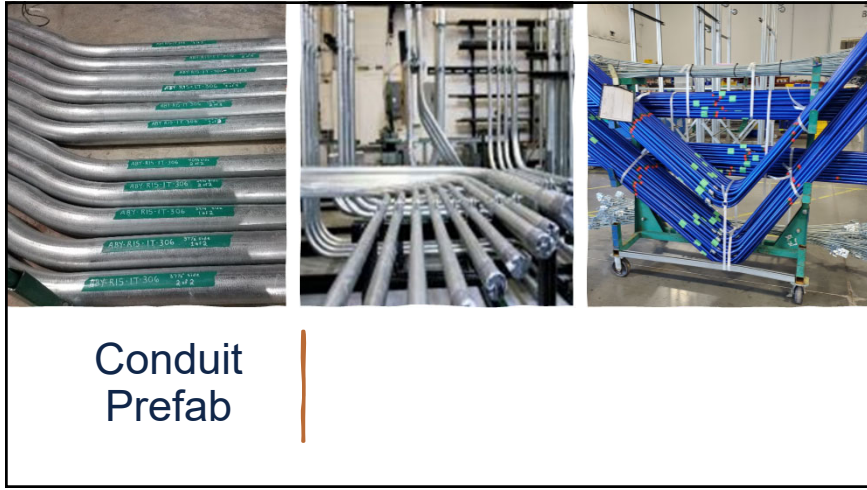
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In-wall
Assy's Prefab

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Underground
Prefab

10



Panelboard
Prefab

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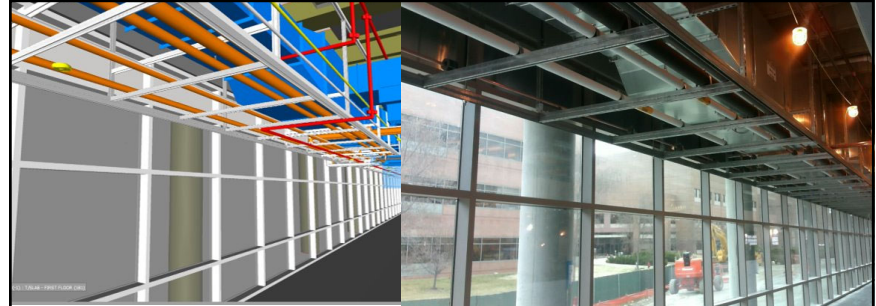
Transformer
Prefab

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Temp
Power Prefab

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Multi-Trade
Prefab

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Multi-Trade
Prefab

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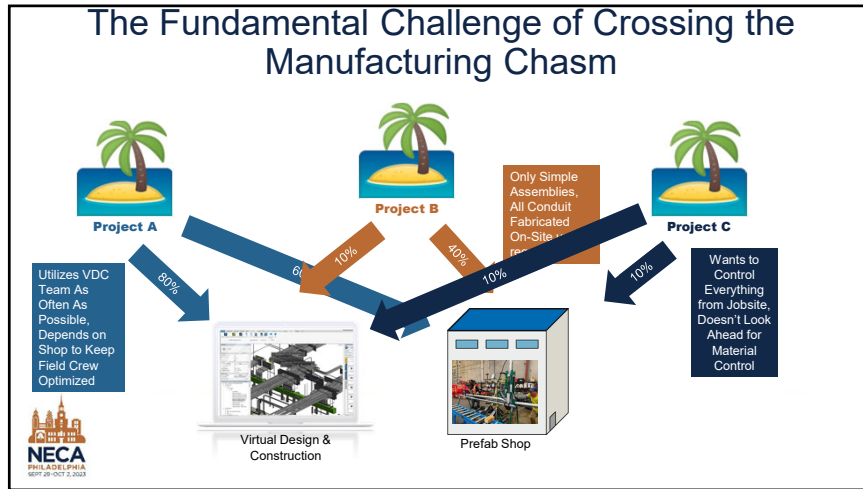
Transforming From Electrical Contracting to Electrical
Construction Manufacturing



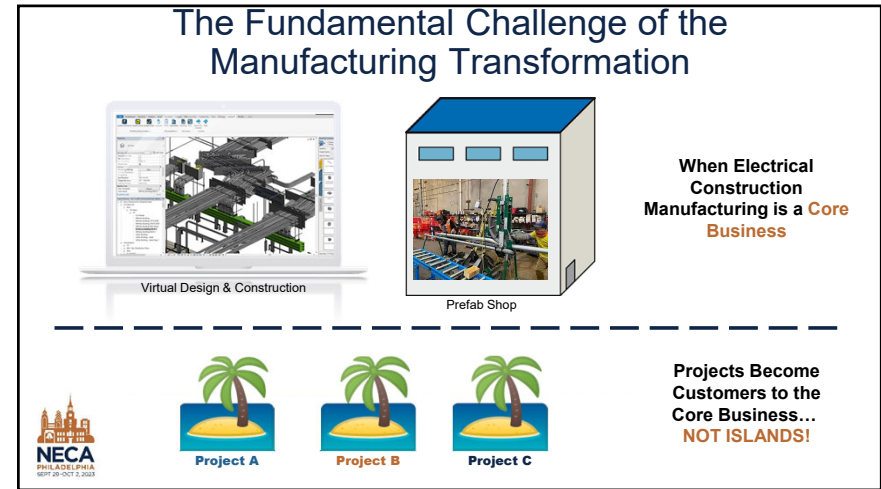
*"If you need a new process and don't install it,
you pay for it without getting it"* - Ken Stork,
President, Association of Manufacturing Excellence

"What gets measured, gets managed." - Peter
Drucker, Austrian American Management Consultant

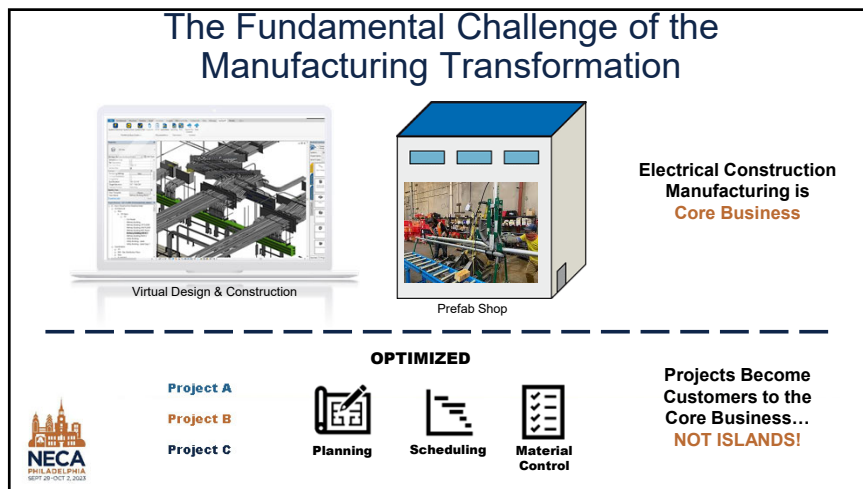
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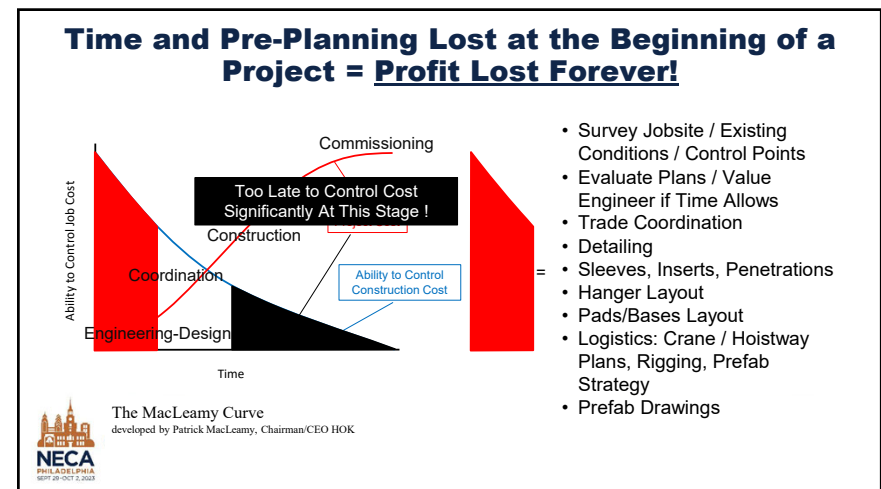
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Project Execution Plans

Involvement of everyone in the company and communication is paramount!

- Clearly Define Scope and Responsibilities for All Roles
- Set Budgets and Production Expectations
- All Things Must Be Measurable
- SIMPLE
- ACCESSIBLE ON COMMON DATA ENVIRONMENT (...Think BIM)

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Essential Components of a PxP

Team Alignment is the Key to a Successful Project Execution Plan!

1. What work will be Prefabricated?
2. What are the requirements of your VDC Team?
3. What is the Budget of Hours for VDC?
4. What is the Budget of Hours for Fab Shop?
5. What Platform(s) will be used to communicate?
6. How Frequently can you Measure and Communicate Project Health?

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Constructing your Project Execution Plan

1. What work will be Prefabricated?

External

Seek Buy-in from Project Stakeholders

- Construction Manager
- Other Trades: Mechanical, Plumbing, Carpenter, etc
- Owner / Commissioning Agent

Internal

Seek-Buy in from Internal Stakeholders

- Labor / Shop Management
- Procurement / Expediting
- Field Supervisors

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Constructing your Project Execution Plan

2. What will be the requirements of your VDC Team?

Modest Requirements	Advanced Requirements	Deliverables
<ul style="list-style-type: none"> • 2D Plans • List & Counts of Assemblies • Fixture Counts & Whip Details 	<ul style="list-style-type: none"> • 3D Coordination Plans • Room Kits • Skid Details • Duct Bank Details • 3D Model / AR Model for Field Collaboration 	<ul style="list-style-type: none"> • Build (Spool) Sheets • Spool / Kit Maps • Room Kits • Skid Details • Duct Bank Details • Share AR Model Segments

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Constructing your Project Execution Plan

3. What is the Budget of Hours for VDC?

% of Direct Labor Manhours




Variables:

- Deliverables (Paper vs Paperless)
- Coordination / Owner Requirement
- 7% - 18% are low and high end of VDC calculations

Company Standards

Advanced VDC Budgeting can be determined by Quantities:

- Fixture Counts
- Bend Counts
- Skid Counts
- Panels Counts

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Constructing your Project Execution Plan

4. What is the Budget of Hours for Fab Shop?

% of Direct Labor Manhours




Variables:

- Complexity / Density of Project
- Prefab can comprise 40% - 60% of NECA Hours

Company Standards

Advanced Shop Manufacturing is Utilized by:

- Assemblies / Kits / Fixtures
- Bends
- Wire Pulling Optimization
- Multi-Trade Racks

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Constructing your Project Execution Plan

5. What Platform(s) will be used to communicate?




Types of Communication Platforms

Options

- Paper
- Cloud Service (hosting flat files)
- 3D Model Viewing
- Support Prefab Workflows
- Support Augmented Reality

Considerations

- Difficult to Manage Changes
- Better, but still flat files
- Good for spatial information sharing
- Best for keeping teams aligned, and adding additional metadata to models like progress, delivery, change order comms...

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Constructing your Project Execution Plan

6. How Frequently can you Measure and Communicate Project Health?

How Frequently Can you Measure Earned Value / Cost?
... Measured Mile

Challenges:

- Earned Value must consider the jobsite and the shop... adds complexity
- Must Align with same date range (committed costs / payroll / progress snapshot)
- Minimum Checkpoints are 25% - 50% - 75%

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What Are Some of the Most Common Challenges in a PxP?

- Common contributors to project weakness or failure:
 - Non-Standardized Practices (the Project Islands)
 - Lack of resources with the correct skills
 - Lack of change
 - Different technology utilized on every Project
 - Financial



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Common PxP Weaknesses (Software Related)

- Common contributors to project weakness or failure:
 - Older generation - don't move my cheese
 - Software too complex
 - Software not scalable
 - Software lacking features
 - Muscle memory - small objections can lead you back to old ways
 - Usually not the technology that fails - it's the people



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What Is the Most Important Enabler of a PxP?

Connected Technology

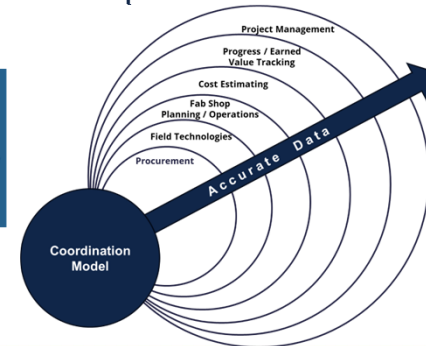
- Communication is Fast and Easy to Access
- Available on Mobile Devices as well as Desktops
- Information Flows Through Workflows
- Data Entry and Visualization Bottlenecks are Minimized



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What Is the Most Important Enabler of a PxP?

Connected Technology



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Plan for Manufacturing not “Trade Coordination”

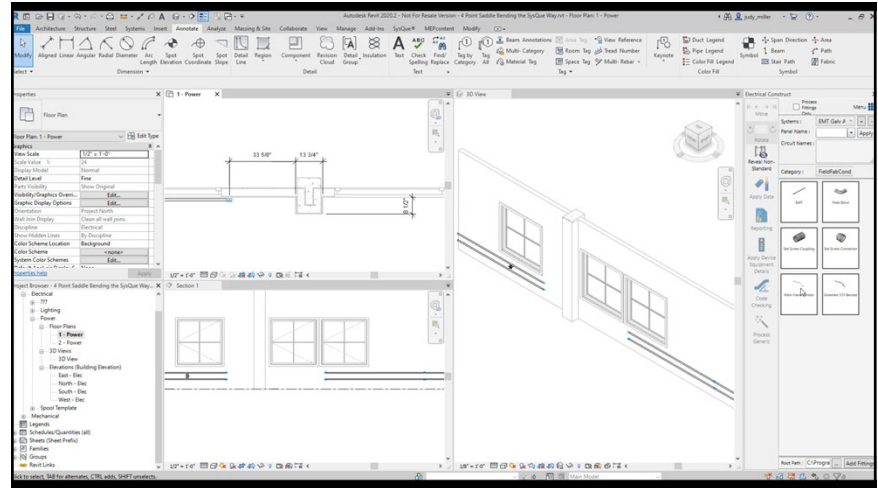
Modeling for coordination serves the entire project team!

Additional focus to provide build sheets and kits to get work manufactured

Don't limit yourself with tools



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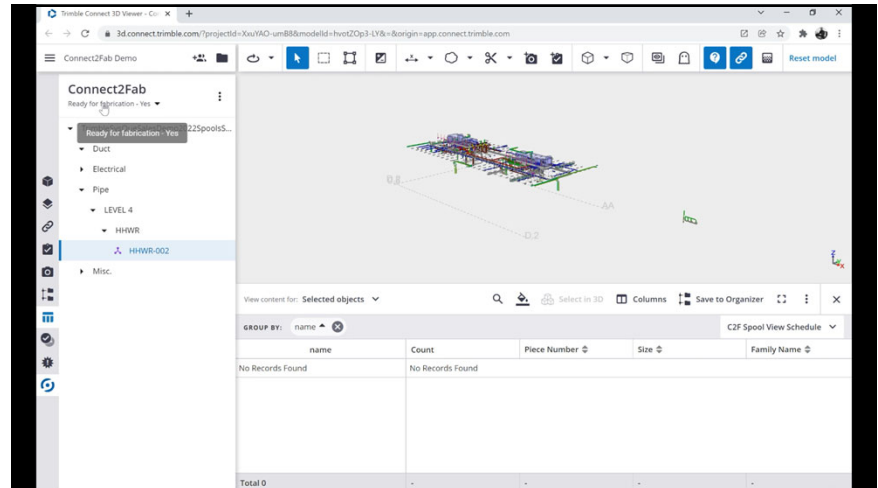
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Engage everyone on the project team into the manufacturing process

Empower the Field Supervisors to Drive Prefab!



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Engage everyone on the project team into the manufacturing process


Use Model Visualization to Avert Field Issues and QC!



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Scan Marker to Place Model

Approach the Marker until you see the progress circle. Complete the progress circle by shifting from left to right, to view the Marker from a range of angles.



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Standardize on Assemblies

Make Assemblies internal SKU's in your Company



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Modeling Electrical Assemblies with Trimble SysQue



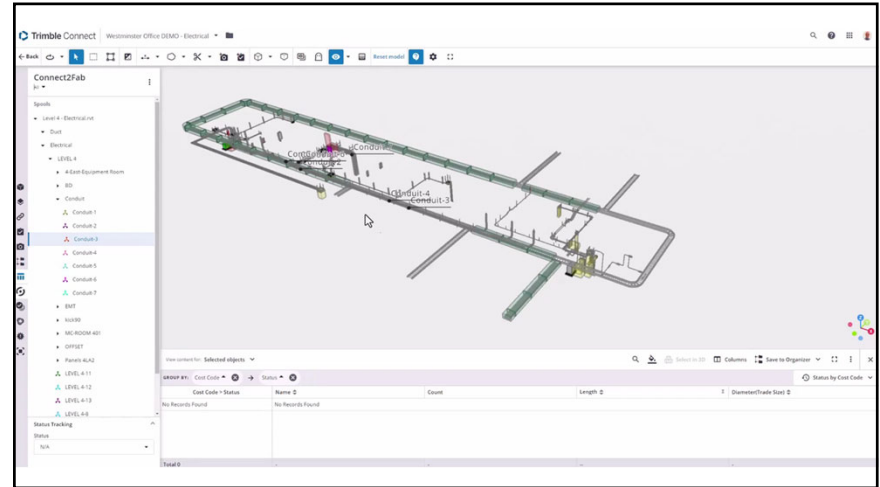
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Use your Common Data Environment to Install Feedback Loops to Project Teams

Gather Data & Feedback from Everywhere to Understand Project Health!



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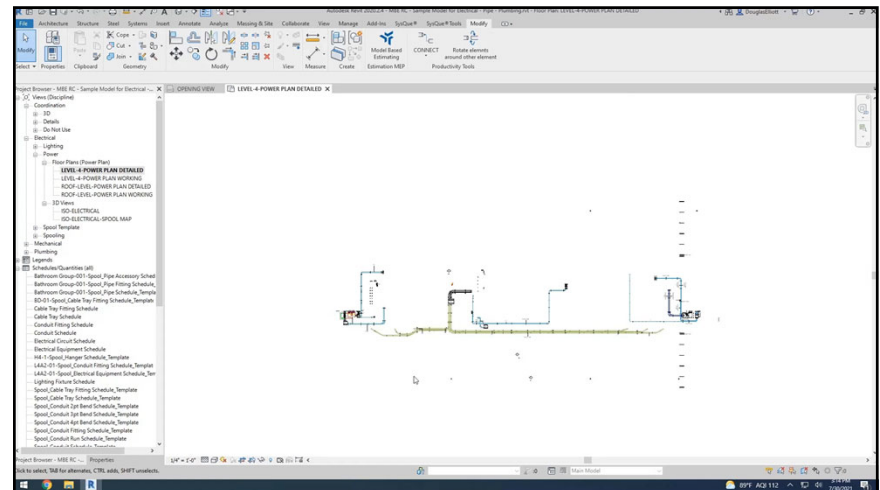
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Track Cost the 4th Dimension of your Projects

Derive Cost from the Model, not the Estimate



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Conclusion

- The skilled labor shortage is real, but little we can control
- Need to do more with less
- Plan for manufacturing, not trade coordination
- Engage and empower the entire project team
- Standardize on Assemblies
- Install feedback loops
- Add cost dimension to the manufacturing operation
- Remember the Red Zone! That's where the money is made!



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Questions ?



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Dimensions
User Conference

Grab your seat

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building your agenda

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Complete the Online NECA Evaluation



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