

25TH ANNUAL



25TH LCI CONGRESS
OCTOBER 24-27, 2023

Revolutionizing the (Modular) EV Depot Experience

David Rhoda, Faith Technologies | Romano Nickerson, Boulder Associates | Jenny Han, Boldt

25 YEARS OF LEARNING: SUPERCHARGE YOUR LEAN JOURNEY IN THE MOTOR CITY

October 25, 2023 | 3:30pm

Team Intros – Innovation/Lean



INTEGRATED TEAM REPRESENTATIVES



DAVID RHODA

Regional Vice President - EPC
Faith Technologies



ROMANO NICKERSON

Principal
Boulder Associates



JENNY HAN

Director
Design Integration
The Boldt Company

25 YEARS OF LEARNING: SUPERCHARGE YOUR LEAN JOURNEY IN THE MOTOR CITY

ABOUT FAITH TECHNOLOGIES



© LEAN CONSTRUCTION INSTITUTE



2022 SAFETY

TRIR

Total Recordable
Incident Rate

0.10

LTIR

Lost Time Incident Rate

0.03

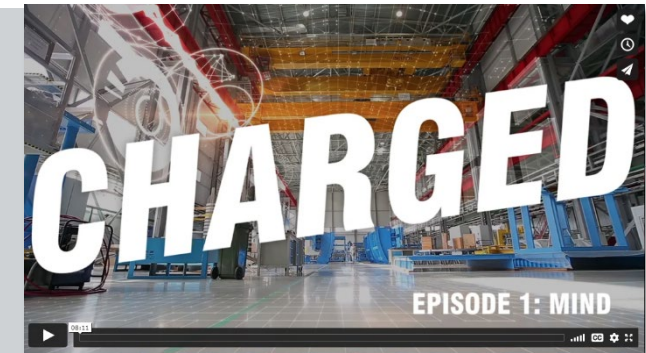
**SAFETY
AUDITS**

33,439

2020 Safety Excellence
GRAND AWARD



AGC
THE CONSTRUCTION
ASSOCIATION

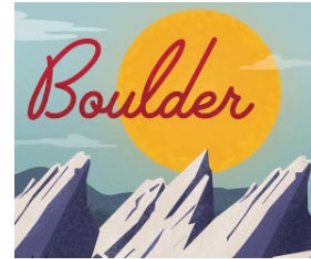


FTI
FAITH TECHNOLOGIES
INCORPORATED



ABOUT BOULDER ASSOCIATES

- 40 years of experience focused on healthcare, senior living, and life science design
- 210 staff in 9 offices nationwide
- 20-year journey in lean and IPD
- Building a practice in productized prefabricated modular industrialized construction



25 YEARS OF LEARNING: SUPERCHARGE YOUR LEAN JOURNEY IN THE MOTOR CITY

ABOUT THE BOLDT COMPANY



INDUSTRIAL / MANUFACTURING



HEALTHCARE



POWER & ENERGY



EDUCATION



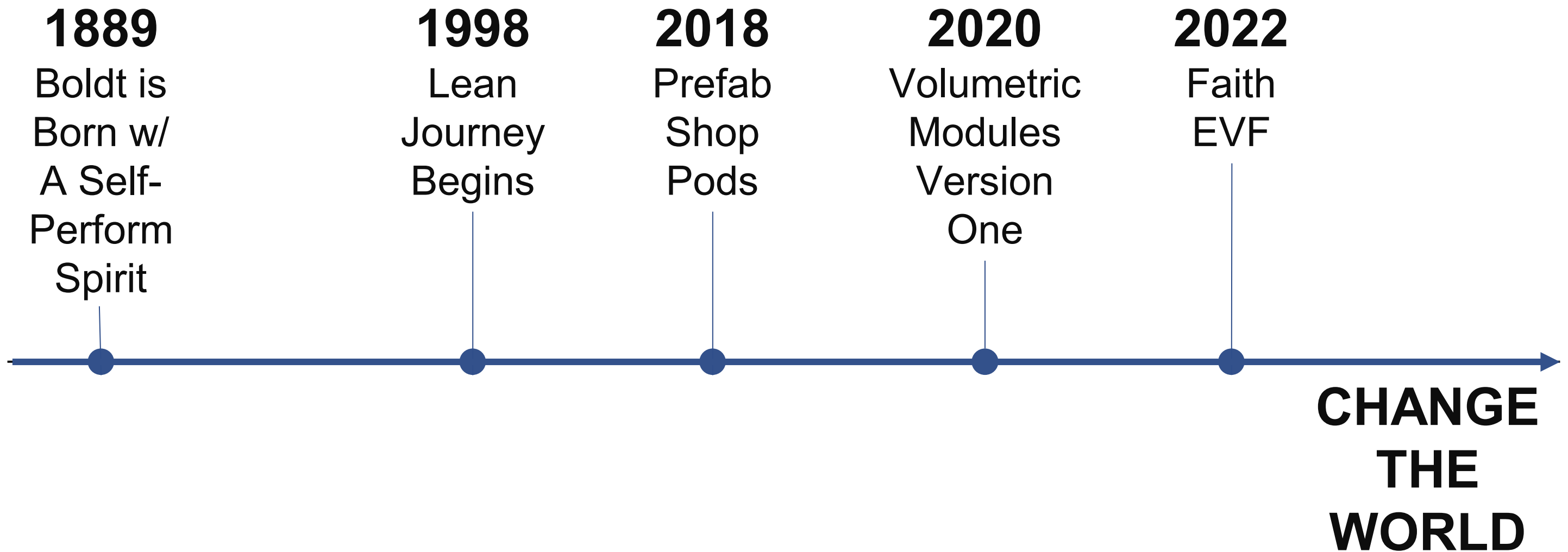
COMMERCIAL



COMMUNITY / CULTURAL



BOLDT'S INDUSTRIALIZED CONSTRUCTION JOURNEY



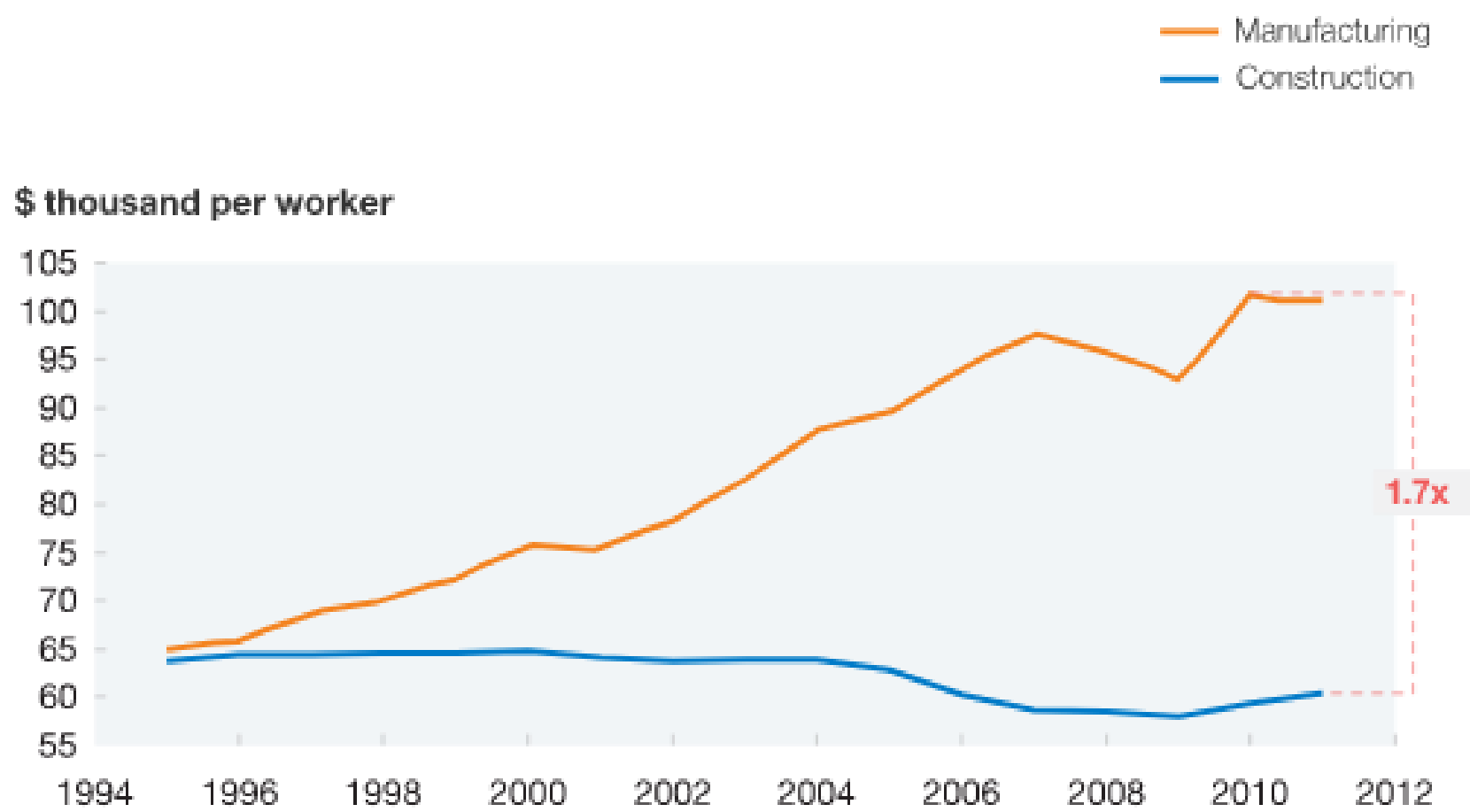
PROBLEM STATEMENT

- What do we mean by **INDUSTRIALIZED CONSTRUCTION**?
- What is the issue with **ELECTRIC VEHICLE DEPOTS**?
- How do you build a **MODULAR PROGRAM**?
- How do we radically improve the **BUYING EXPERIENCE** for our clients?
- What does any of this have to do with **LEAN PRACTICE**?



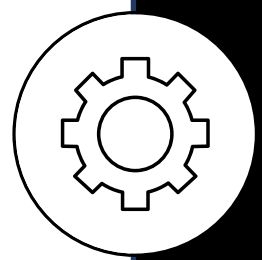
The Industry's Challenges

OVERVIEW OF PRODUCTIVITY OVER TIME

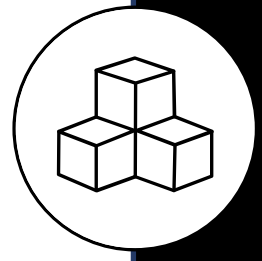


Source: Expert interviews; IHS Global Insight (Belgium, France, Germany, Italy, Spain, United Kingdom, United States); World Input-Output Database

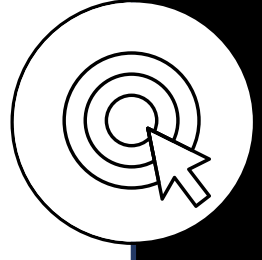
McKinsey&Company



CONSTRUCTION INDUSTRY'S PRODUCTIVITY DEADLOCK

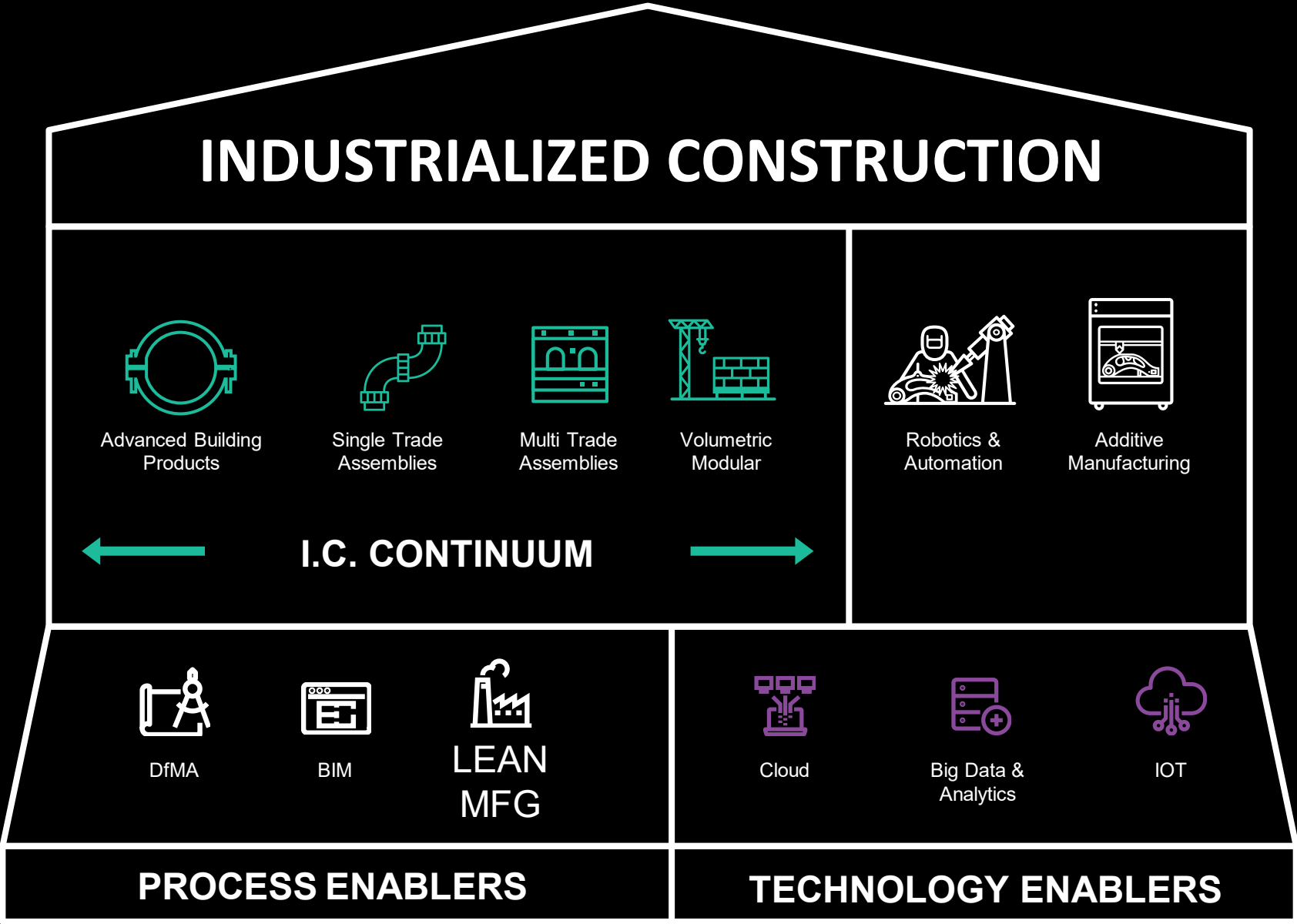


SHORTAGE OF SKILLED WORKERS



CONSTRUCTION WASTE TO ALMOST DOUBLE BY 2025

HOUSE OF INDUSTRIALIZED CONSTRUCTION



COURTESY OF AUTODESK



What We Did – How It Was Different



WHAT IS AN EVF?



CHALLENGE: WEARING TWO HATS



Process
and Flow



Plan | Value
Generation



Respect for
people | Team



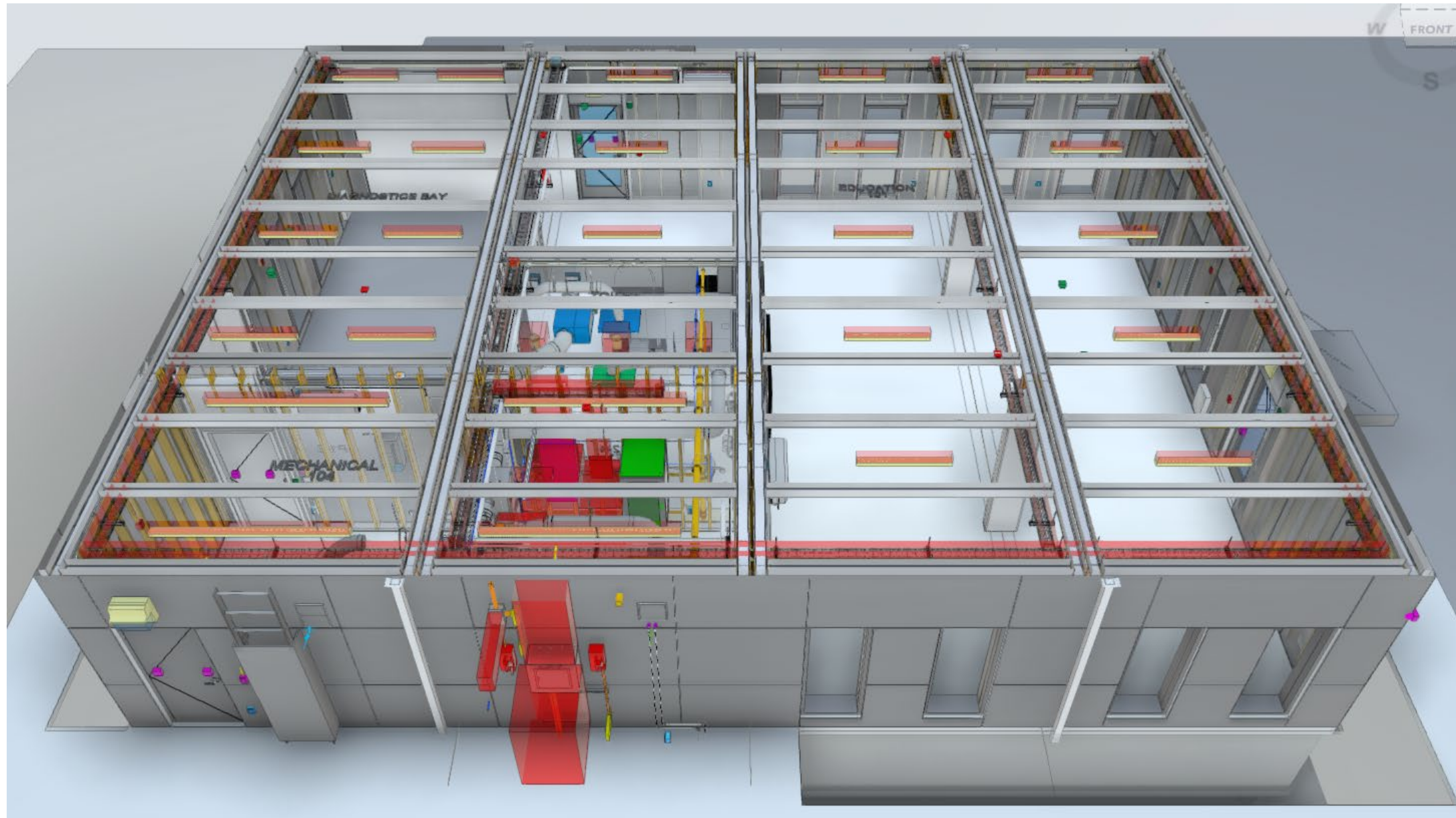
EVF MODULE LAYOUT



Process
and Flow



Plan | Value
Generation



NO SUCH THING AS DESIGN PHASE

**CONCEPT
PACKAGE**

**SPRINT 1 –
ONBOARD, ALIGN,
DECIDE**

**SPRINT 2 –
DETAILED DESIGN,
PROCUREMENT**

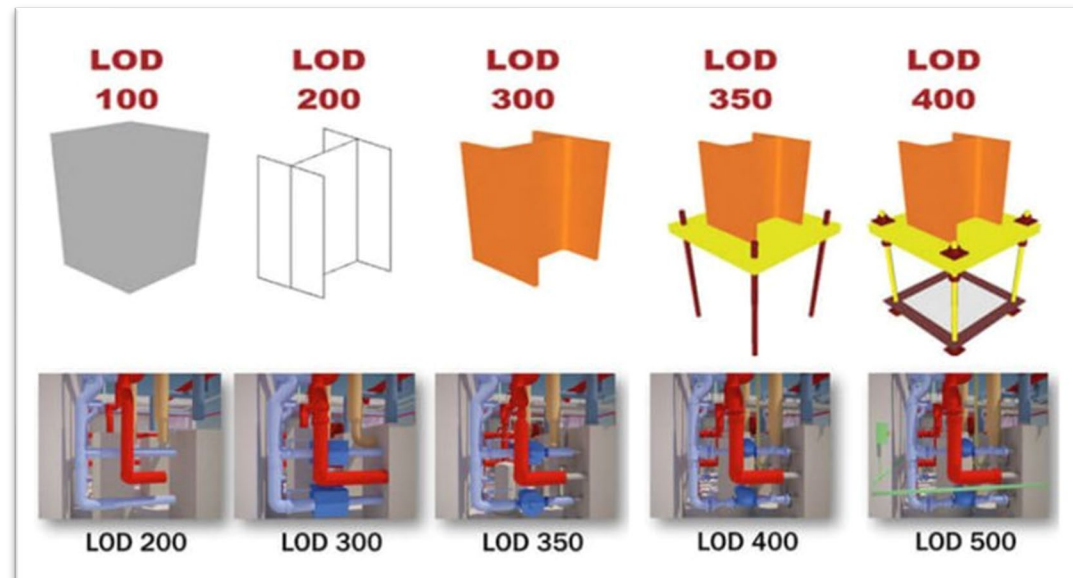
PROCUREMENT / WORK INSTRUCTIONS





SCHEDULE COMPRESSION

DESIGN COMPRESSION =



TRADES DRAW WHAT
THEY BUILD

BUILD COMPRESSION =



DEVELOP SITE AND
FABRICATE BUILDING
SIMULTANEOUSLY

BUILDERS MODEL, THEN THEY SPOOL



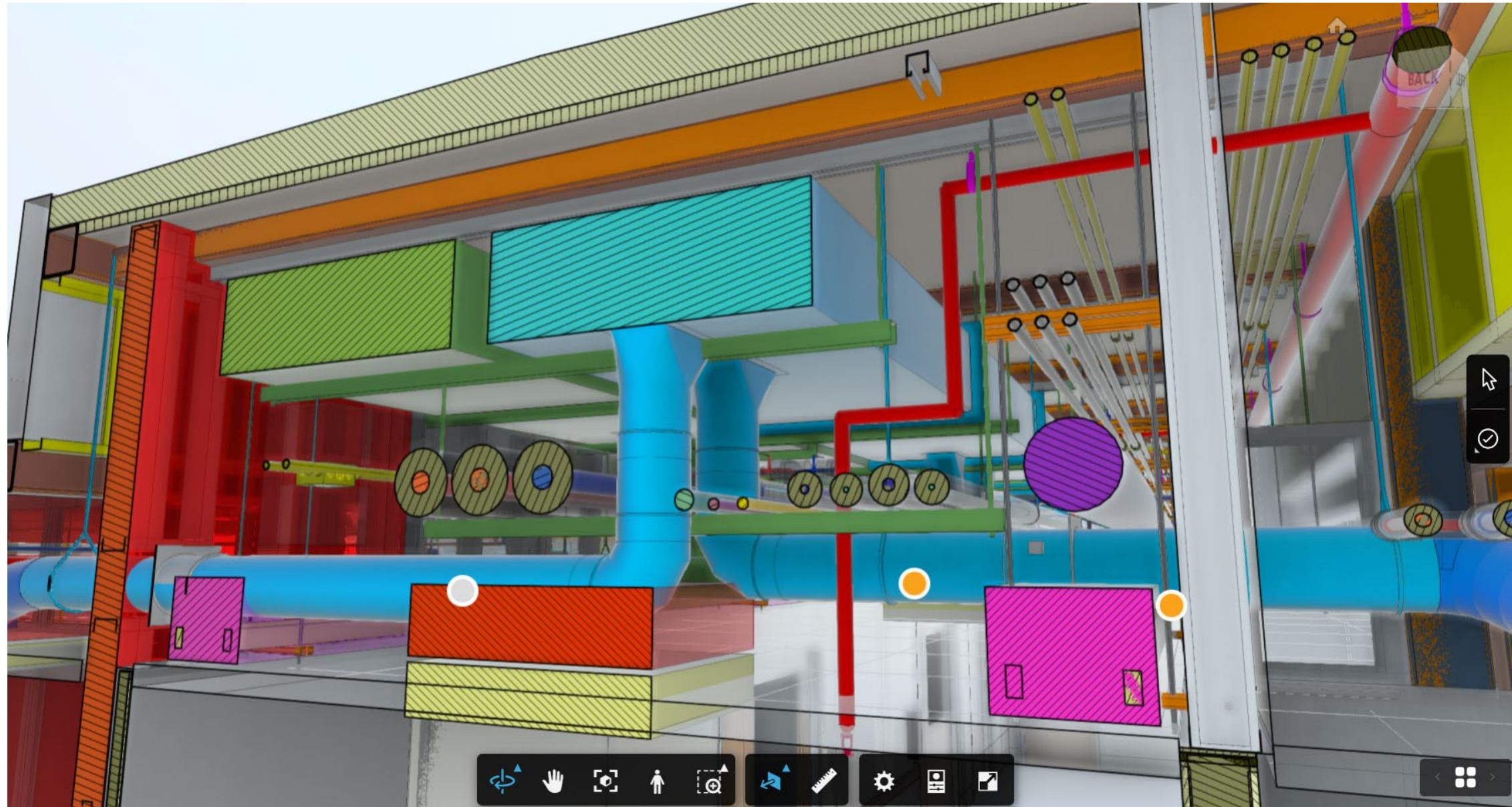
Removal of
Waste



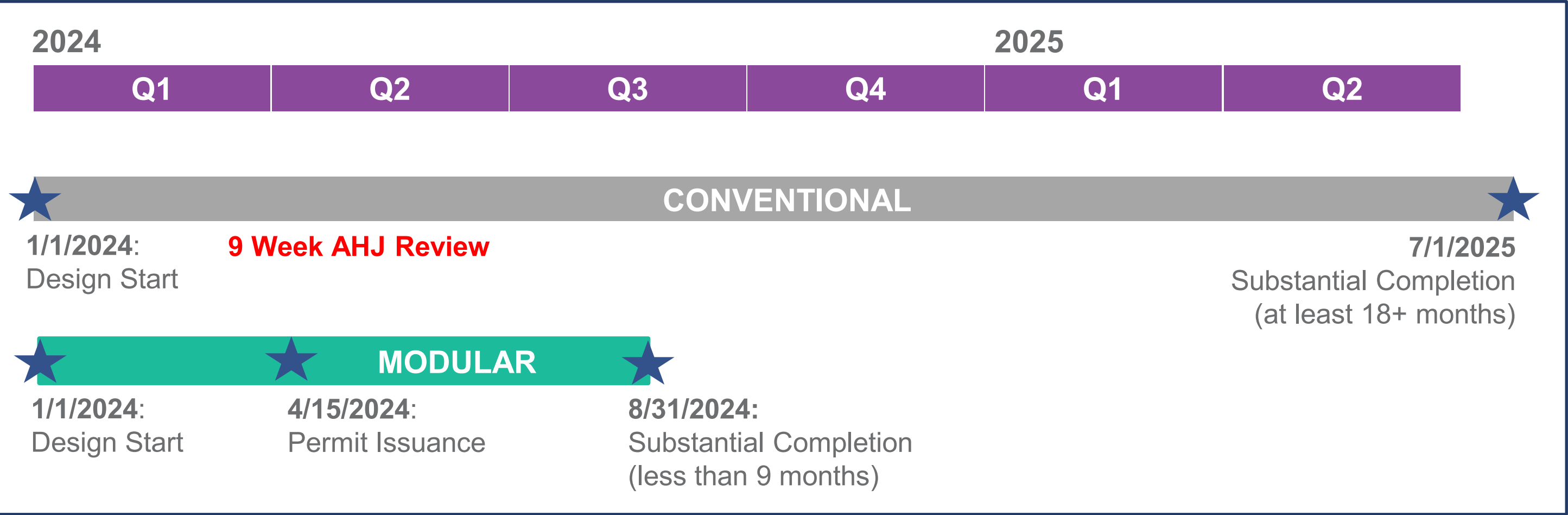
Tools



Collaboration




FEELING THE NEED FOR SPEED






Removal of
Waste


BUILDING AS PRODUCT




2024 Crosstrek
Base




2024 Crosstrek
Premium



2024 Crosstrek
Sport



2024 Crosstrek
Limited



2024 Crosstrek
Wilderness

Length/Width/Height

| | | | | |
|--------------------------------------|--|--|--|--|
| 176.4 inches/70.9 inches/62.8 inches | 176.4 inches/70.9 inches/63 inches (with roof rails) | 176.4 inches/70.9 inches/63 inches (with roof rails) | 176.4 inches/70.9 inches/63 inches (with roof rails) | 176.4 inches/71.7 inches/63.6 inches (with roof rails) |
|--------------------------------------|--|--|--|--|

Wheelbase

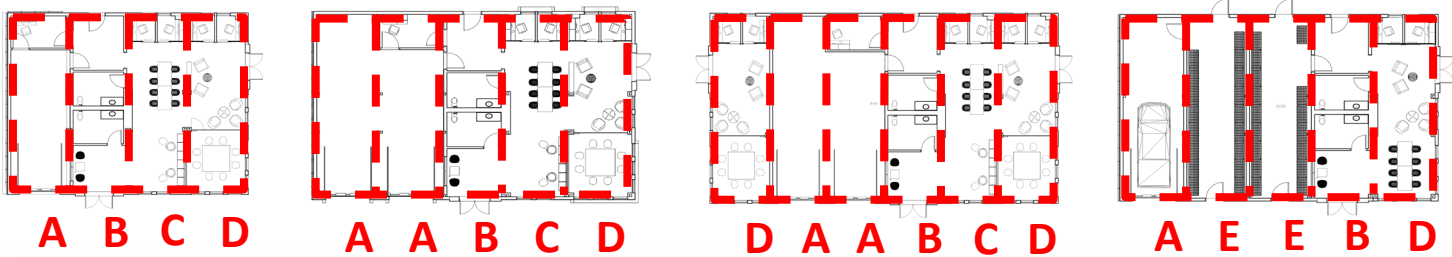
| | | | | |
|--------------|--------------|--------------|--------------|--------------|
| 105.1 inches | 105.1 inches | 105.1 inches | 105.1 inches | 104.9 inches |
|--------------|--------------|--------------|--------------|--------------|

Track (front/rear)

| | | | | |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 61.2 inches/61.2 inches | 61.2 inches/61.2 inches | 61.2 inches/61.2 inches | 61.2 inches/61.2 inches | 60.9 inches/60.8 inches |
|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|

Base curb weight

| | | | | |
|-----------|-----------|-----------|-----------|-----------|
| 3276 lbs. | 3296 lbs. | 3333 lbs. | 3349 lbs. | 3369 lbs. |
|-----------|-----------|-----------|-----------|-----------|



| ABCD | AABCD | DAABCD | AEEBD |
|----------------------|----------------------|----------------------|--------------------|
| | | | |
| | | MEETING, SEATING | |
| | | | |
| | SERVICE BAY | SERVICE BAY | SERVICE BAY |
| | | | |
| SERVICE BAY + OFFICE | SERVICE BAY + OFFICE | SERVICE BAY + OFFICE | |
| | | | |
| MEP, TOILETS | MEP, TOILETS | MEP, TOILETS | MEP, TOILETS |
| | | | |
| OPEN, OFFICES | OPEN, OFFICES | OPEN, OFFICES | OPEN, OFFICES |
| | | | |
| OPEN, OFFICES, CONF | OPEN, OFFICES, CONF | OPEN, OFFICES, CONF | |
| | | | |
| | | | COLD STORAGE/RACKS |





Respect for
people | Team



Removal of
Waste



Continuous
Improvement

WHAT DO WE MEAN BY PRODUCT

**BLOOD
SWEAT
TEARS
RINSE
REPEAT**





Plan | Value
Generation



Removal of
Waste

REVERSION: WHERE WE GET STUCK



GETTING IT WRONG THE FIRST TIME



What We Aced / How We Dropped the Ball



MISSED: PROCUREMENT - CLADDING



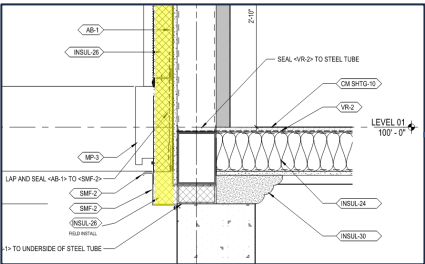
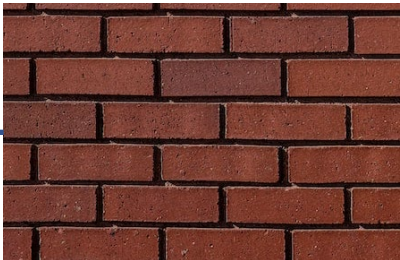
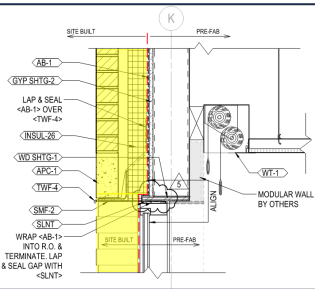
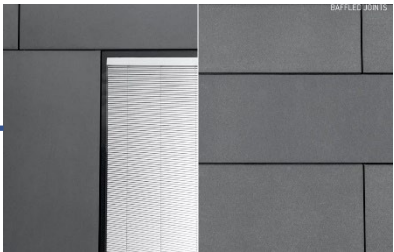
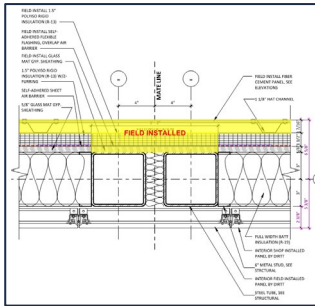
**EVENING
NEWS**

MASSIVE SWARM OF MAYFLIES AT N.C. LAKE

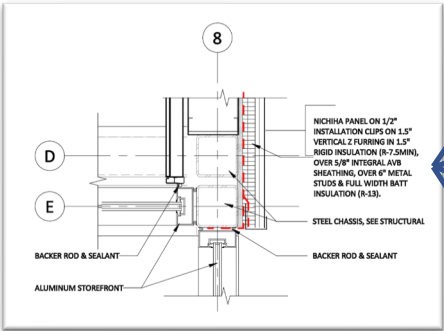
WGN9
44° 4:54 PM

NAILED: CLADDING PROGRAM IMPROVEMENT

MULTIPLE DETAILS / MULTIPLE LOOKS



ONE DETAIL | MULTIPLE LOOKS





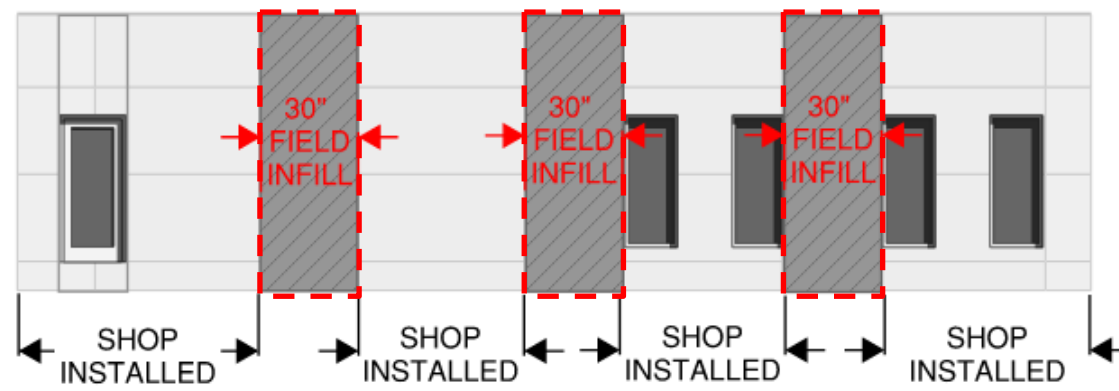
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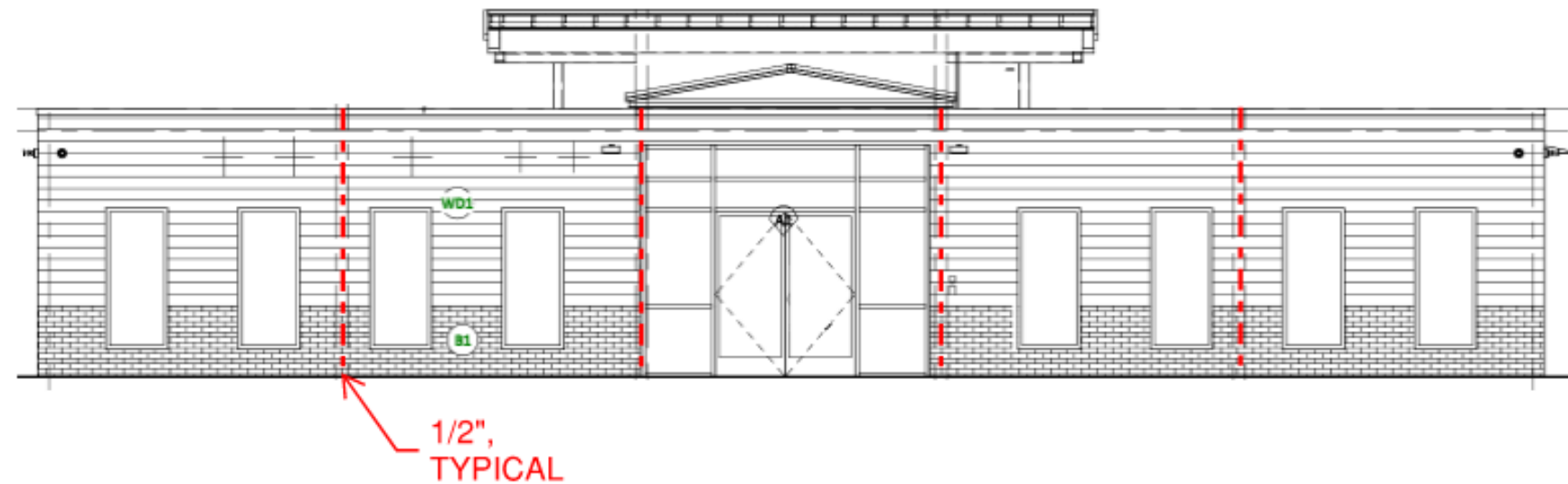


NAILED: CLADDING PROGRAM IMPROVEMENT

MORE SWISS



THAN CHEESE

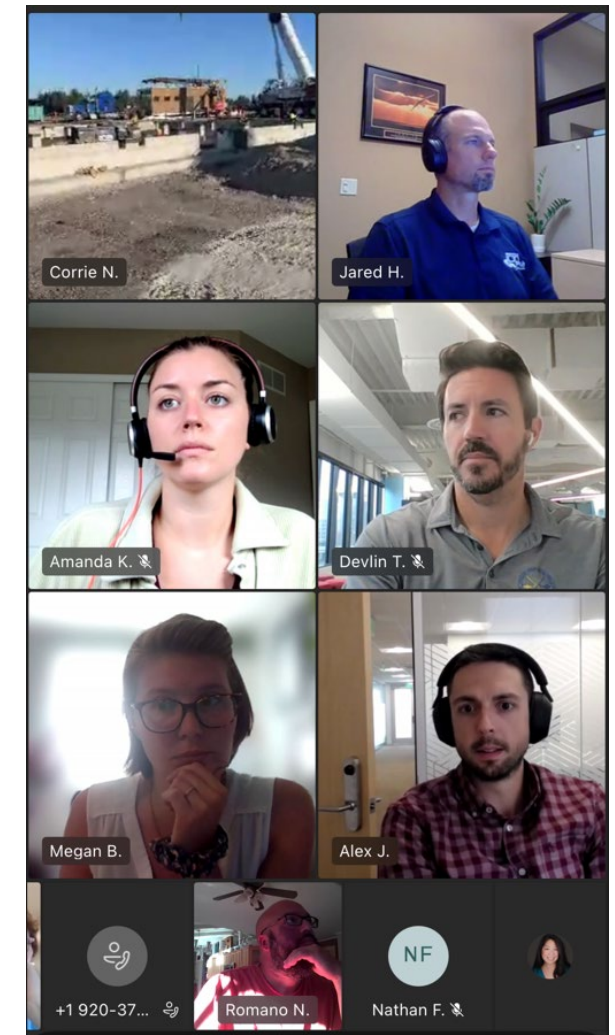


SHORT CYCLE FEEDBACK LOOPS

SHOP FABRICATION TEAM



DESIGN TEAM



FEEDBACK LOOP BETWEEN PROJECTS

- Collected **150+ Lessons Learned...**
- ...and Applied Them to The **Next Product...**
- With **The Same Team** on Between Multiple Projects



The EV Product



FABRICATION OF MODULES



FABRICATION OF MODULES



SHIPPING AND SETTING



SETTING AND CONNECTING



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HIGH QUALITY, PERMANENT BUILDING



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HIGH QUALITY, PERMANENT BUILDING



KEY TAKEAWAYS

- Understanding of **Industrialized Construction**
- Understanding of **Productized Approach** to Design/Construction
- A Way to Advance **Beyond IPD**
- You Cannot Industrialize Construction without **Lean**
- Don't Let **Perfection** Get in the Way of **Progress**

THANK YOU

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In the spirit of continuous improvement, we would like to remind you to complete this session's survey! We look forward to receiving your feedback.



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Thank you for attending this presentation. Enjoy the rest of the 25th Annual LCI Congress!