

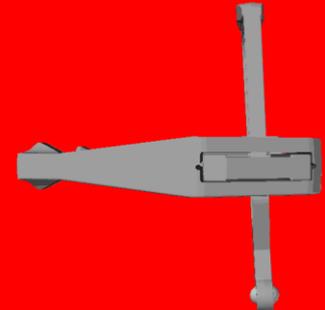


BIM IMPLEMENTATION WITH FORMWORK

MEVA FORMWORK SYSTEMS, INC.

NORTH AMERICA

ANDREW LLOYD, PE
ENGINEERING MANAGER



Summary:

- **Use of BIM at MEVA.**
- **Advantages of BIM for a formwork supplier.**
- **Lessons learned so far.**
- **BIM model expectations.**
- **Brief project overview.**
- **Future development of BIM at MEVA.**



USE OF BIM AT MEVA FORMWORK SYSTEMS, INC.

Adopted in 2013

Product Groups already modelled and in use with BIM;

- **CRANESET FORMWORK FOR WALLS AND COLUMNS**
- **HANDSET FORMWORK FOR WALLS AND COLUMNS**
- **SINGLE FACED FORMWORK**
- **CLIMBING FORMWORK**

Currently 25% of our engineering staff are using BIM to create formwork layouts.

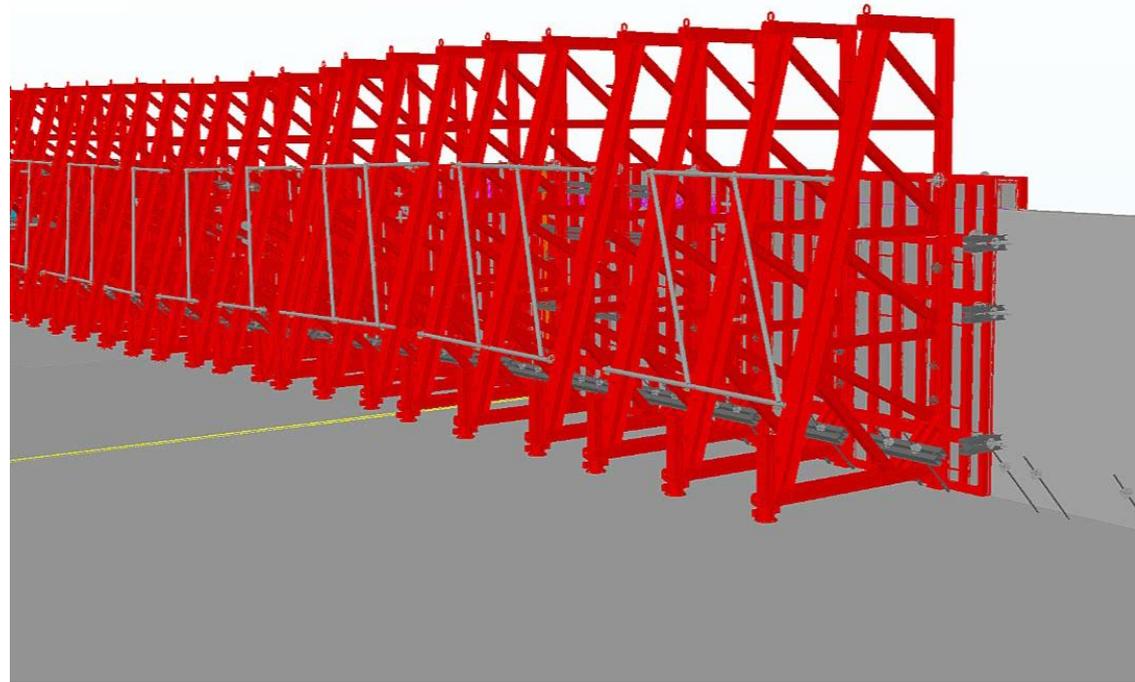
More of our staff have been trained and are in the process of transitioning to the use of BIM.



ADVANTAGES OF USING BIM FOR MEVA

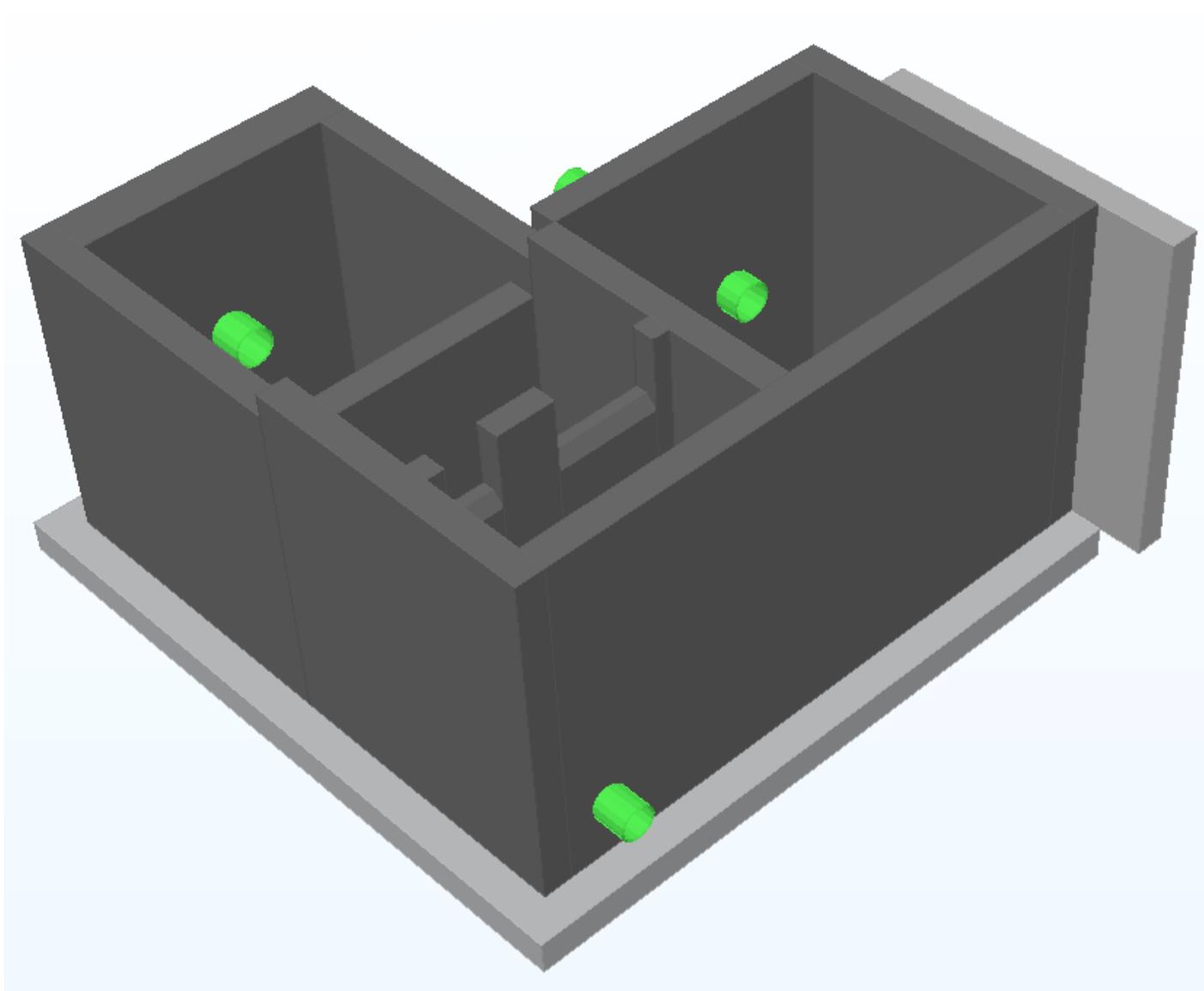
1. **Accuracy of automated quantity takeoffs**
 - Saves time in engineering
 - Reduces influence of human error when compared to manual method of creating takeoff
 - Saves cost by eliminating additional shipments or additions that create more overhead in our operations department

2. **Visualization in the 3D environment**
 - Helps us easily identify problematic areas of a layout that require more attention to detail
 - Understanding of how our equipment pieces together is much more easily communicated to our customers, through use of isometric views on paper plans and through sharing of .IFC files.

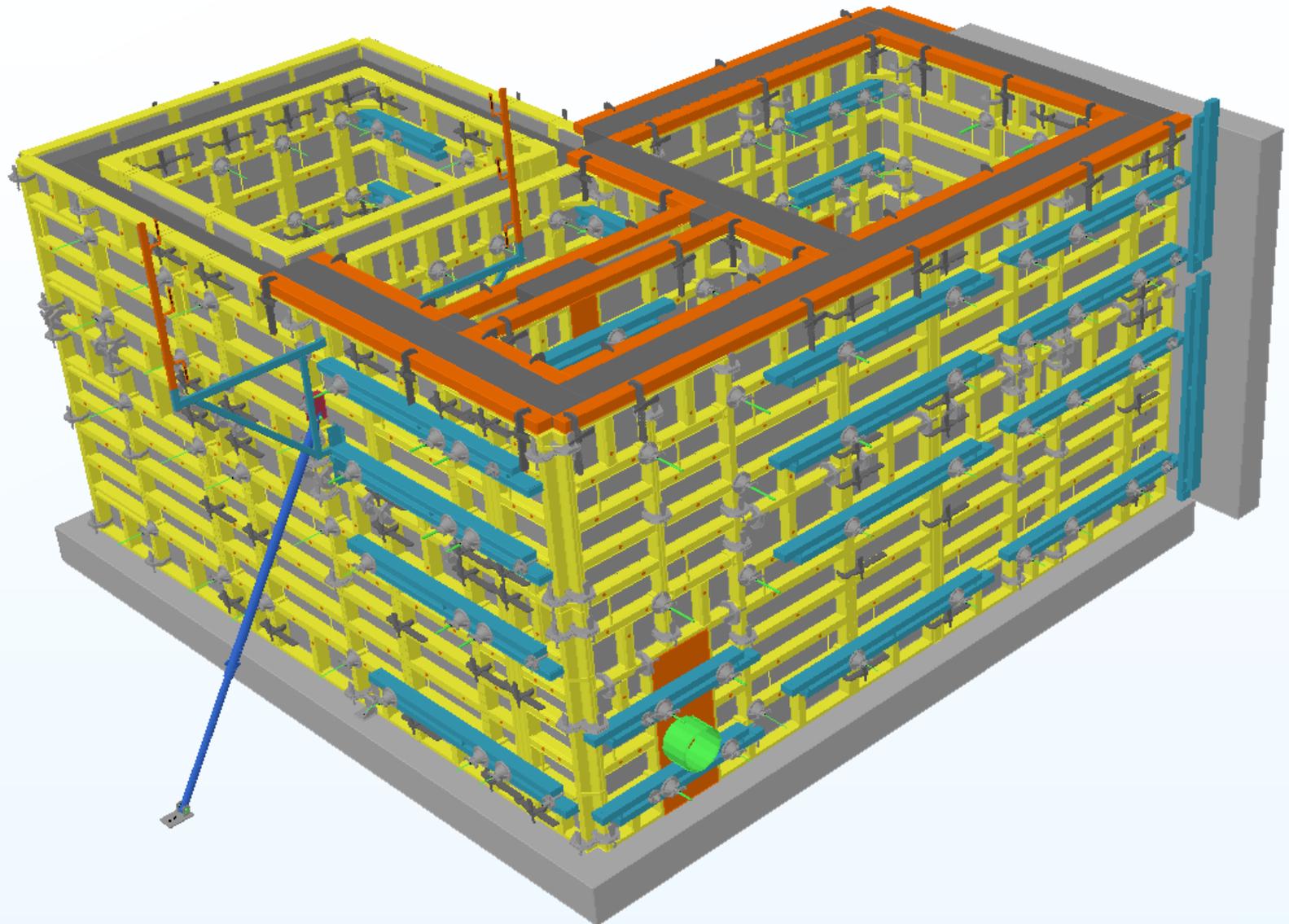


These combined advantages = cost effective solutions.

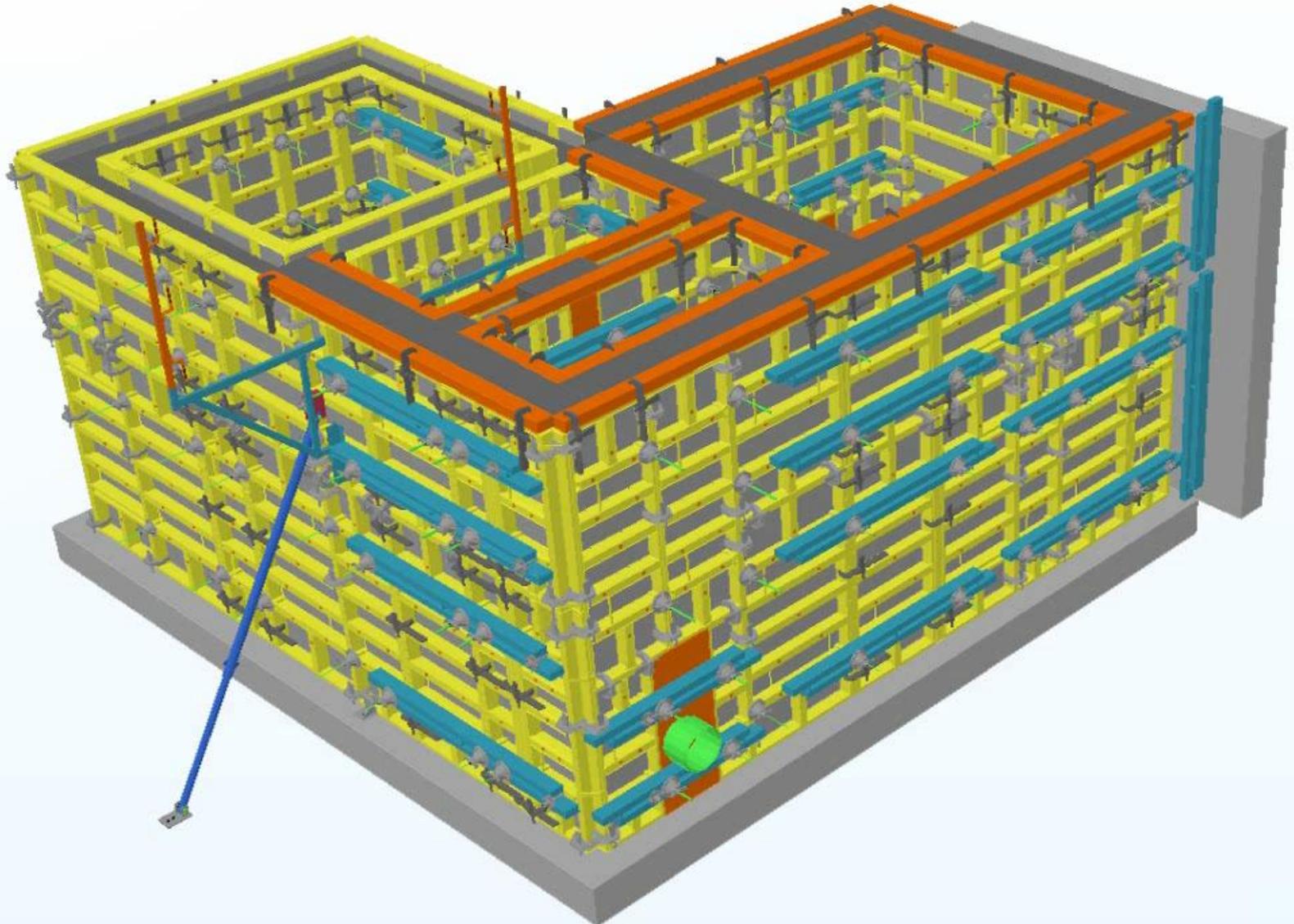
ADVANTAGES OF USING BIM



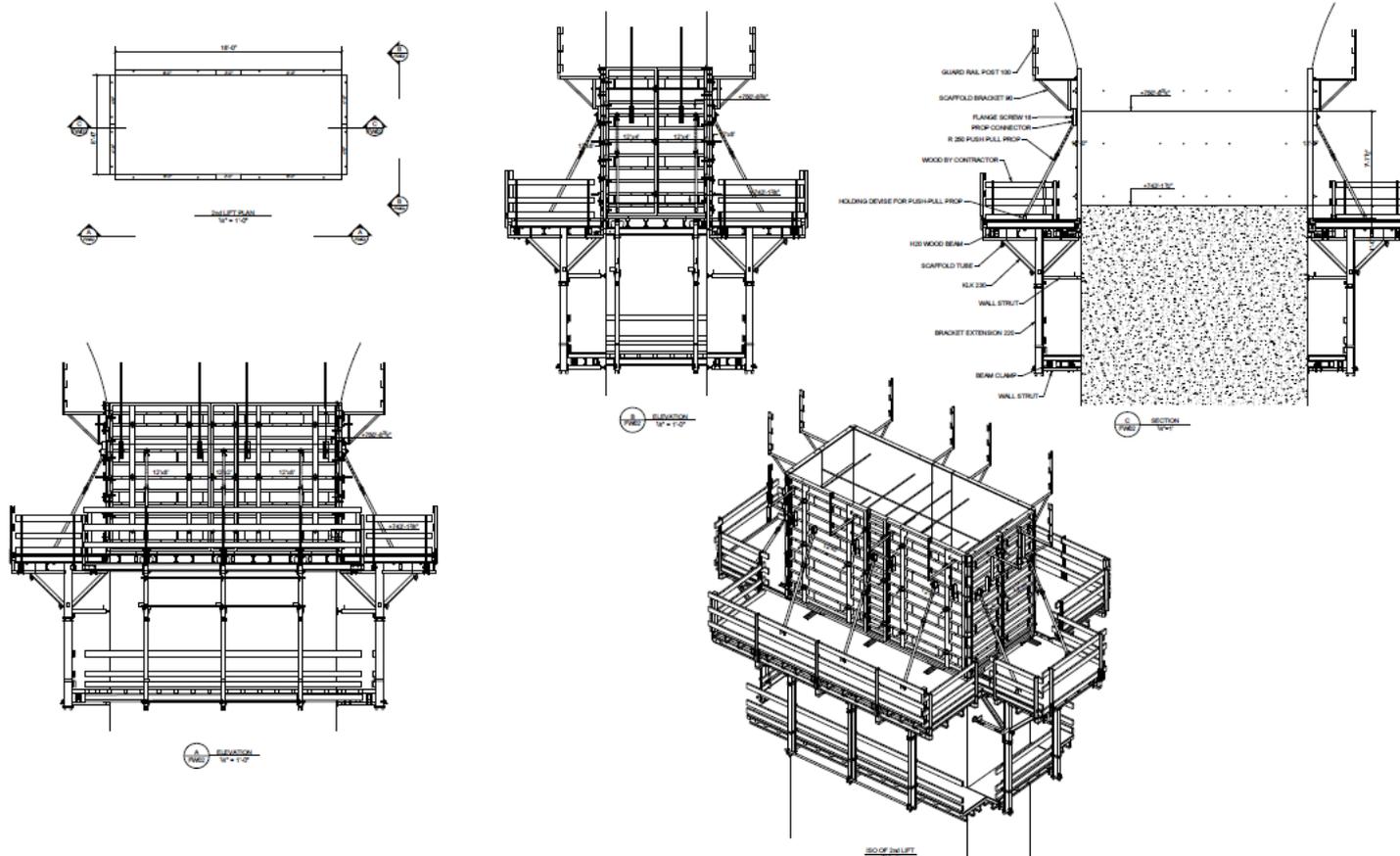
ADVANTAGES OF USING BIM



ADVANTAGES OF USING BIM



ADVANTAGES OF USING BIM



- MEVA SYSTEM**
1. MEVA FORMWORK SYSTEMS IS A REGISTERED TRADEMARK OF MEVA FORMWORK SYSTEMS, INC. ALL RIGHTS RESERVED. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS.
 2. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS.
 3. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS.
 4. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS.
 5. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS.
 6. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS. MEVA FORMWORK SYSTEMS, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY CAUSED BY THE USE OF MEVA FORMWORK SYSTEMS, INC. PRODUCTS.

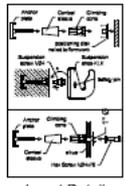
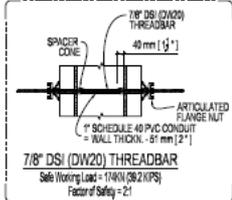
NOTE:
This drawing is meant to be viewed at full size indicated - 24" x 36"

Max. Allowable Fresh Concrete Pressure

2,025 PSF

Refer to "Rate of Placing"
Design Information in the IMPERIAL
Technical Information Manual pg. IM-13

Status
Preliminary
Not checked for erection



IMPERIAL ACCESSORIES

	SCAFFOLDING TUBE		WALL STRUT
	BRACKET		BEAM CLAMP
	FLANGE		PUSH-PULL PROP
	ARTICULATED FLANGE NUT		ARTICULATED ROOF PLATE
	ARTICULATED INSIDE CORNER		ARTICULATED OUTSIDE CORNER
	ARTICULATED MULTI-PURPOSE PANEL		ARTICULATED ROOF PLATE

LEGEND:

SCAFFOLDING BRACKETS SPACING < 8' (1.83M)			
ABBREV.	DESIGNATION	ABBREV.	DESIGNATION
OC	OUTSIDE CORNER	AR	ALIGNMENT RAIL FOR ALL-SYSTEM
IC	INSIDE CORNER	R	STEEL RAIL FOR ALL-SYSTEM
AOC	ARTICULATED OUTSIDE CORNER	SB 90	SCAFFOLDING BRACKET 90
AIC	ARTICULATED INSIDE CORNER	SB 125	SCAFFOLDING BRACKET 125
ISC	INSIDE STRIPPING CORNER	AF	ALUMINUM FILLER
MPP	MULTI-PURPOSE-PANEL	JBF	JOB BUILT FILLER
PP	PLASTER PANEL	CA	CORNER ANGLE 40/90

DISTANCES BETWEEN WALL BRACES/PUSH-PULL PROPS

FOR FORKWORK ALIGNMENT	≤ 12' (3.66M)
FOR ABSORBING LOAD DUE TO WIND PRESSURE	≤ 8' (2.44M)

CUSTOMER APPROVAL

We have reviewed this drawing and are returning it to MEVA FORMWORK SYSTEMS with the following approval for FIELD USE and MATERIAL SHIPMENT:

1. Approved

2. Approved as noted

3. Approved as noted, resubmission required.

4. Revise and resubmit

By: _____ Date: _____

It is noted that revisions may affect pricing and delivery schedule.

All dimensions have to be checked by the site management

meva

MEVA Formwork Systems, Inc. • 2000 South State • Houston, TX 77058

PROJECT NO.	DATE	SCALE
PROJECT NAME	PROJECT LOCATION	PROJECT NO.
PROJECT ADDRESS	PROJECT CITY	PROJECT STATE
PROJECT ZIP	PROJECT PHONE	PROJECT FAX

LESSONS LEARNED DURING DEVELOPMENT

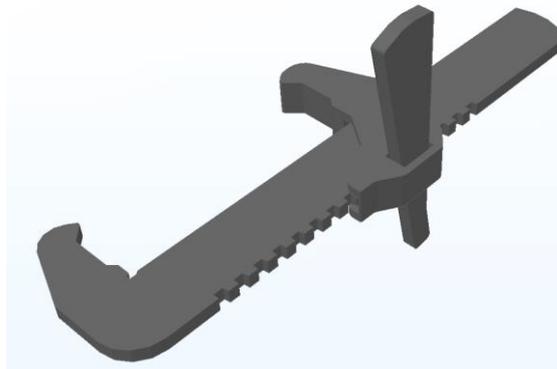
Simple formwork structures take longer to detail in BIM when compared to CAD.

Addition of layout automation tools is critical to improving speed on simple structures.

Automated layout tools have limited use on complex structures, difficult to program for all possible scenarios.

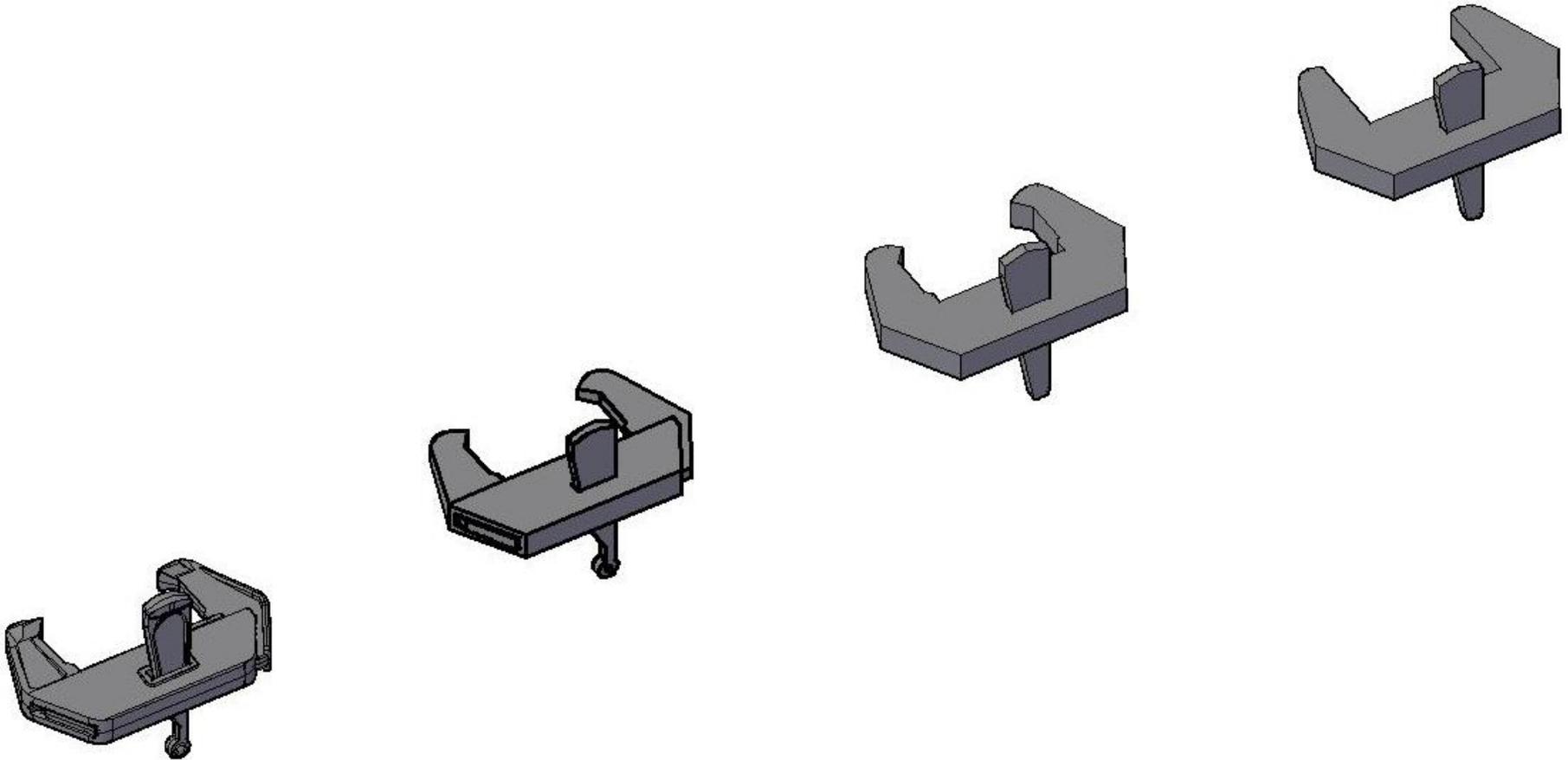
Time gains are more evident on complex structures.

Keeping components simple speeds up the layout process.



LESSONS LEARNED DURING DEVELOPMENT

Keeping components simple speeds up the layout process.



BIM MODEL EXPECTATIONS; A FORMWORK SUPPLIER'S PERSPECTIVE

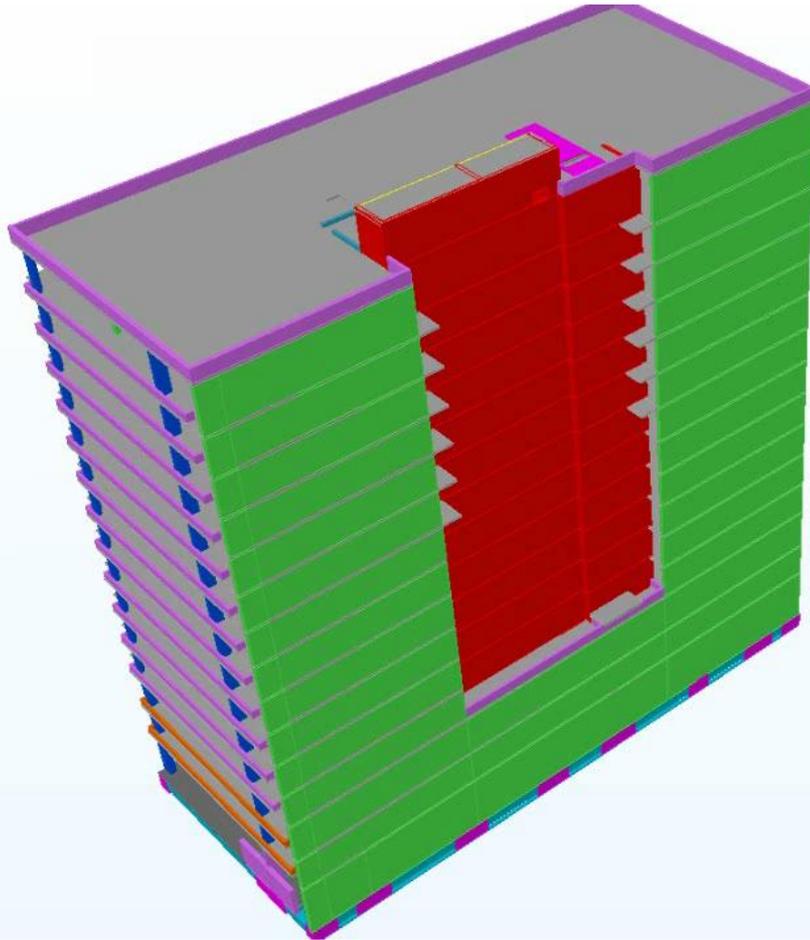
Who is responsible for the accuracy of the BIM model?

Models that do not match the Architectural and Structural drawings.

Contractors choose to start BIM models from scratch, sometimes assume the worst and create from scratch so they can be sure of accuracy.

Some customers realize this is an issue and do not expect suppliers to verify models.

PROJECT OVERVIEW – 1345 S Wabash Ave., Chicago



BIM challenge for MEVA

- Architectural walls
- 'On-the-fly' component development not ideal, however..
- Elevator and Stair Core

Draw Walls
 better development of our components in BIM
 BIM meant better;

- Understanding of how material would cycle from one area to another
- Highlighting of potential conflicts between equipment and existing or already poured structures
- Understanding of potential crange issues and planning thereof
- Takeoff accuracy

FUTURE DEVELOPMENT OF BIM AT MEVA

Add more software licenses and train remainder of engineering staff in use of BIM.

Add User Defined Attributes to components when extracted to IFC

Develop more ways to streamline the detailing process in BIM.

- **Grouping more components together**
- **Add more automated detailing tools**

Wider adoption globally within MEVA.

BIM mandates in several countries...

- **Dubai, UAE = Municipality mandated BIM in 2014 on large and specialized projects**
- **Singapore = mandatory for all public housing projects**
- **UK = 2016 on all central government infrastructure projects**



THANK YOU

MEVA FORMWORK SYSTEMS, INC.

NORTH AMERICA

ANDREW LLOYD, PE

ENGINEERING MANAGER

ALLOYD@MEVAFORMWORK.COM

