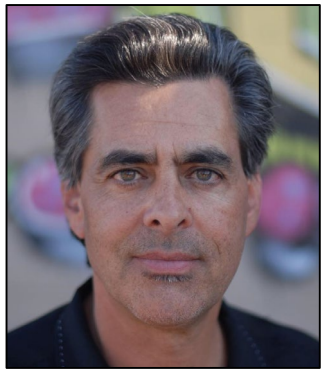

NASHVILLE, TN
BEC
CONFERENCE
MARCH 1-3,2020
NGA
NATIONAL GLASS ASSOCIATION with GANA

Navigating the World of Delegated Design

Jacob Gaddis
United Architectural Metals



Steve Siciliani
Woodbridge Glass

Roberto Bichiarelli
Permasteelisa NA

Jeff Haber
W&W Glass

Session Objectives

- Discuss the key differences between delegated design and design assist.
- Explain a subcontractor's engagement and approach to design assist.
- Review specific examples of both collaboration methods: delegated design and design assist.

delegated DESIGN *assist*

- Reallocating design responsibility, traditionally within the scope of the architect of record, to a contractor or specialty subcontractor.
- **Specialty subcontractor** will become “engineer of record” in official building documents.

- Procurement method whereby one or more subcontractors are engaged prior to the completion of the design by the architect and engineer to collaborate and mitigate cost and schedule issues for the client.
- **Architect/engineer** are the design professionals of record in official building documents.

delegated DESIGN *assist*

- Accomplished by specifying performance and design criteria by the architect/engineer in design documents and sub/specialty contractor agreeing to provide a system that complies with said criteria at a certain price and schedule with responsibility for performance resting with this contractor.

- Leverages strengths and expertise of key trade contractors early in the process, which can enhance:
  - Quality
  - Cost effectiveness
  - Schedule responsiveness
  - Coordination with MEP and structural systems

delegated DESIGN *assist*

- Benefits:
  - Tighter coordination with surrounding trades
  - Fewer cost and schedule overruns
  - Owner will receive a smoother permitting process

- Benefits:
  - Design in constructability to the systems
  - Minimize design overlap with architect, consultants and other contractors
  - Reduce changes during construction
  - Help contain cost and schedule for all parties

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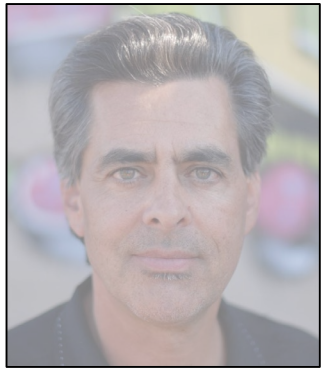

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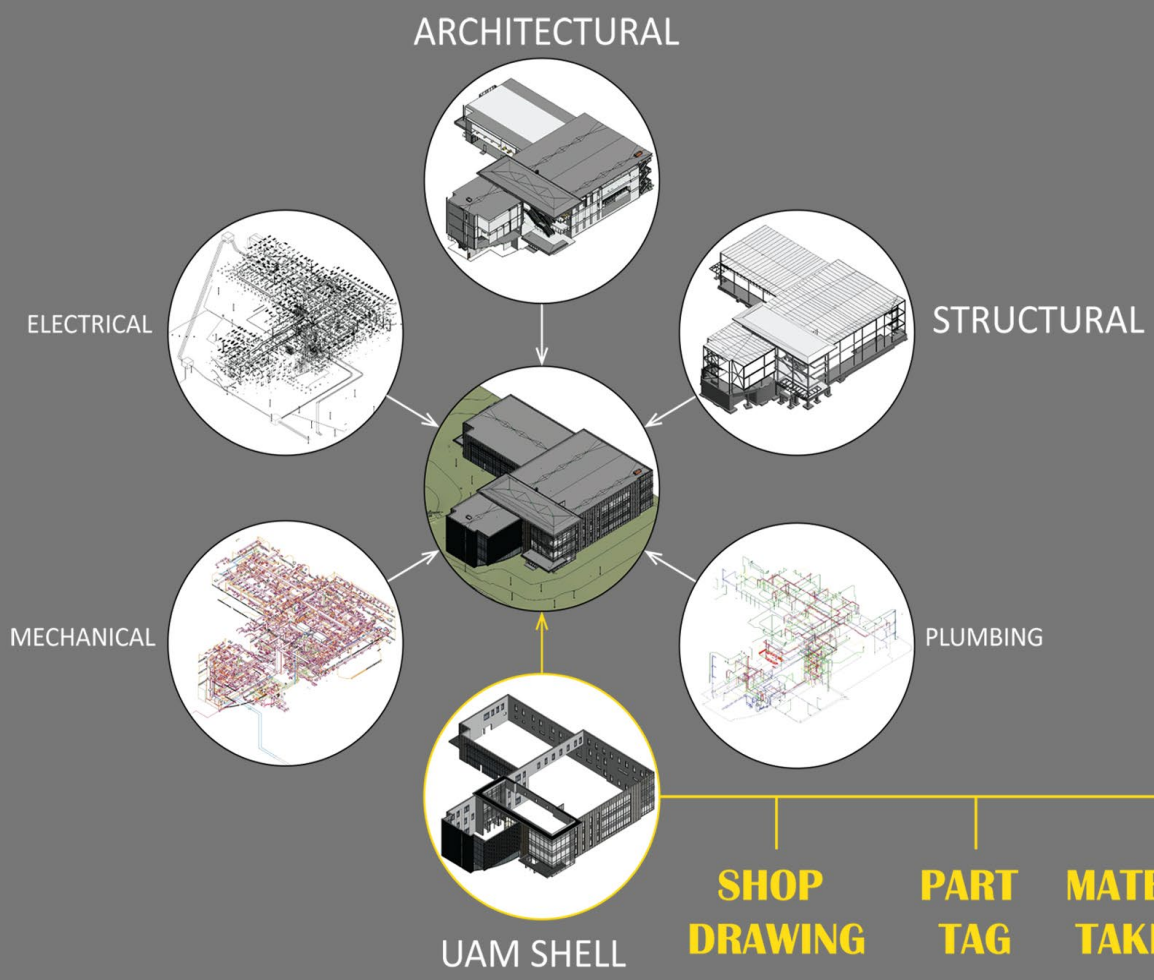
INTEGRATED BIM COLLABORATION

UAM SHELL MODEL INTEGRATED INTO DESIGN PROCESS

NO DUPLICATE INFORMATION PRODUCED BETWEEN ARCHITECTURAL DESIGN DOCUMENTS AND SHOP DRAWINGS



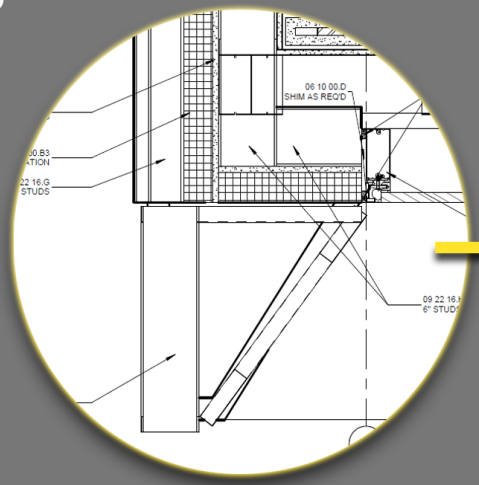
IS THIS DESIGN ASSIST?

DUPLICATE EFFORTS BETWEEN DESIGN TEAM AND CONTRACTOR

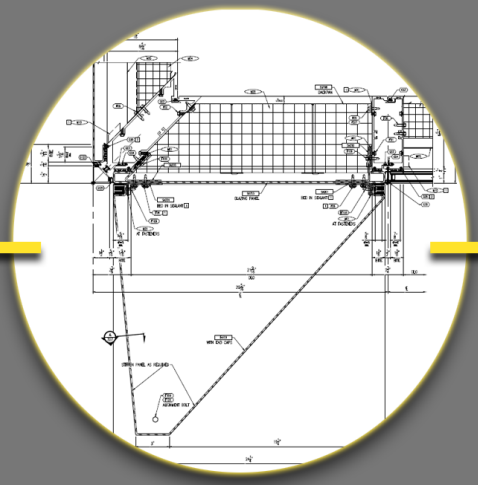
REACTIVE

2-D LINEWORK MAY NOT MATCH 3-D CONTENT

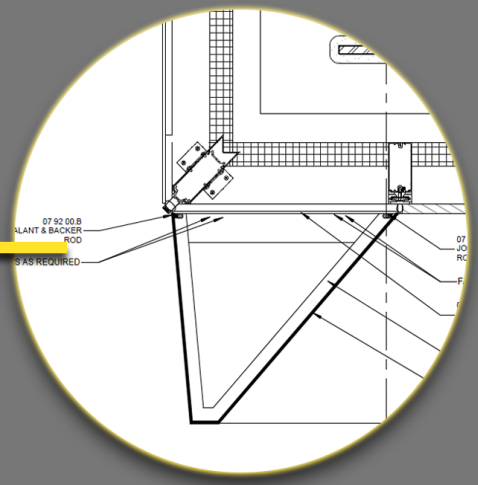
LAG BETWEEN DESIGN CHANGES, PRICING, AND COORDINATION



ARCHITECTURAL DD



UAM DETAIL

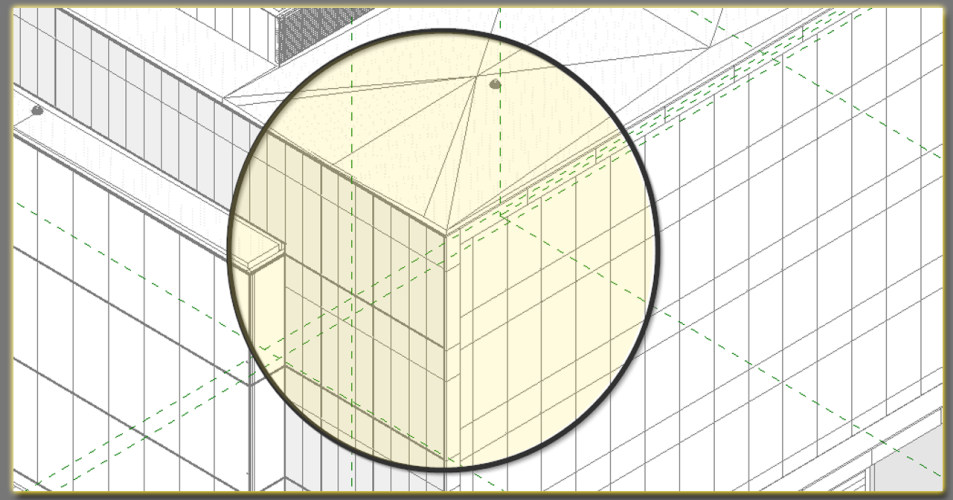


ARCHITECTURAL CD

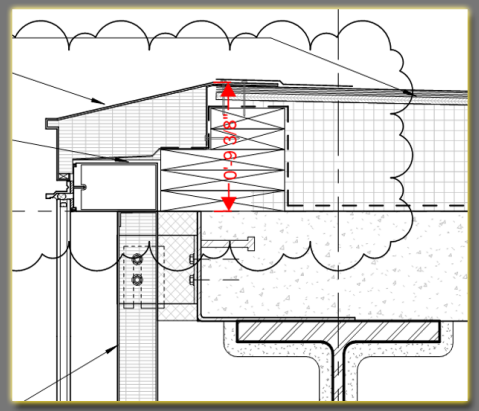
ARCHITECTURAL CD'S ≠ ARCHITECTURAL REVIT MODEL ≠ UAM SHOP DRAWINGS

MIX OF 2D AND 3D COMPONENTS
UN-COORDINATED ELEMENTS
DUPLICATE EFFORTS
INCREASED TIME FOR RFI'S AND COORDINATION
INCREASED RISK DUE TO INCONSISTENT INFORMATION

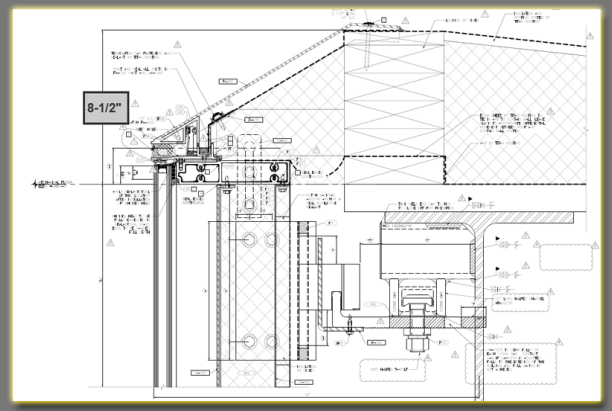
THE MOST INACCURATE INFORMATION IS THE MOST BINDING



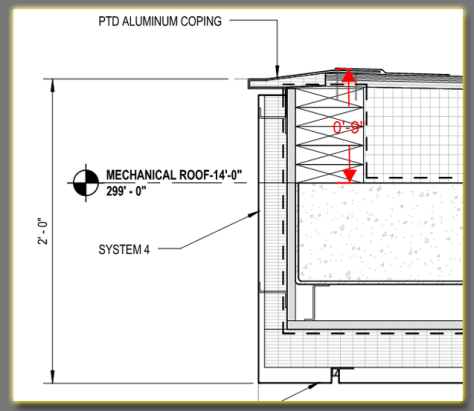
ARCH CD DETAIL
9-3/8" FROM MECH LEVEL TO TOP OF COPING



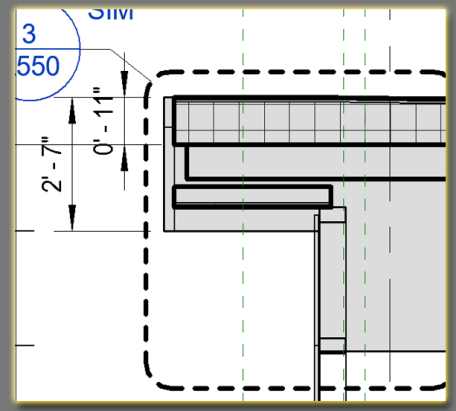
UAM APPROVED SHOP DRAWINGS
8-1/2" FROM MECH LEVEL TO TOP OF COPING



ARCH CD DETAIL
9" FROM MECH LEVEL TO TOP OF COPING



ARCH REVIT MODEL
11" FROM MECH LEVEL TO TOP OF COPING



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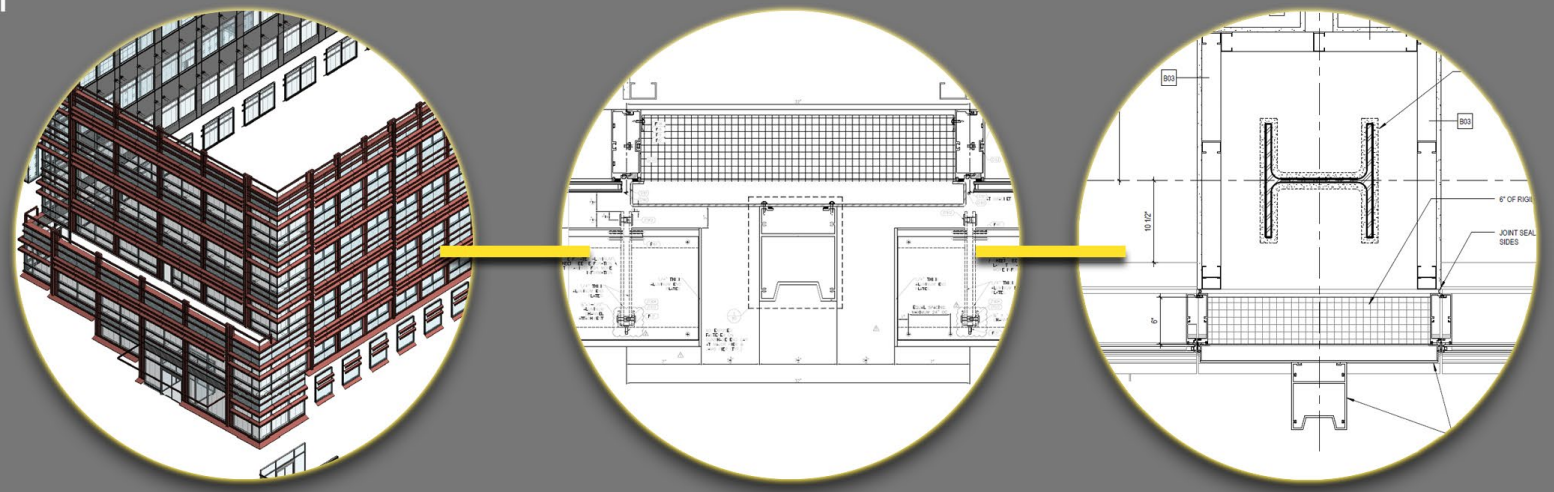
INTEGRATED BIM COLLABORATION

SINGLE SOURCE FOR DETAIL DEVELOPMENT

PROACTIVE

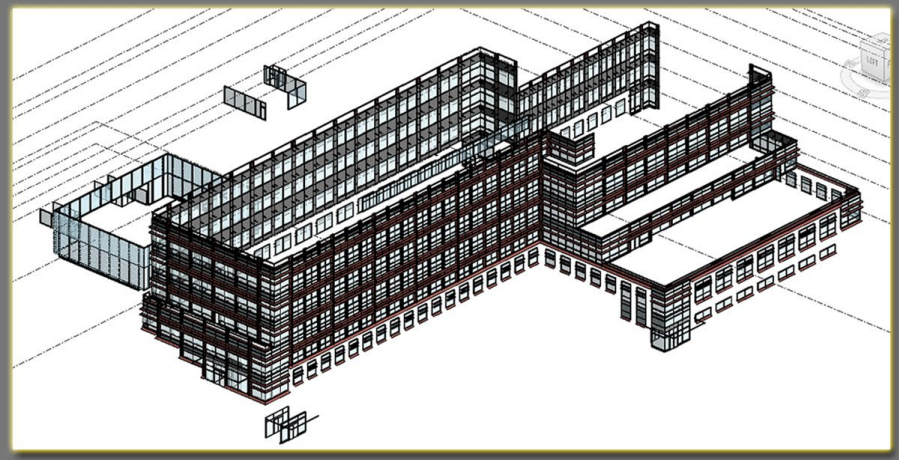
REVIEW OF DETAILS IN 3D CONTEXT



UAM SHELL MODEL = UAM DETAIL = ARCHITECTURAL CD

YALE UNIVERSITY SCIENCE BUILDING

NEW HAVEN, CT

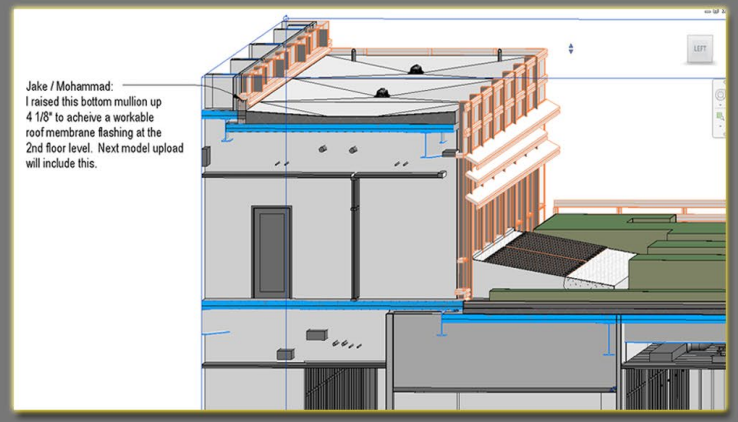


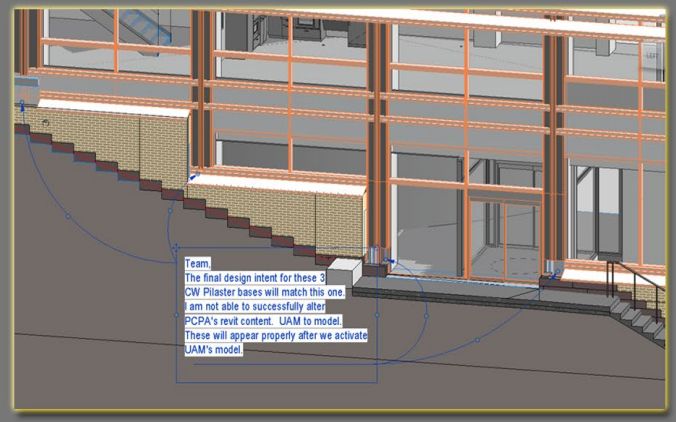
DESIGN COORDINATION

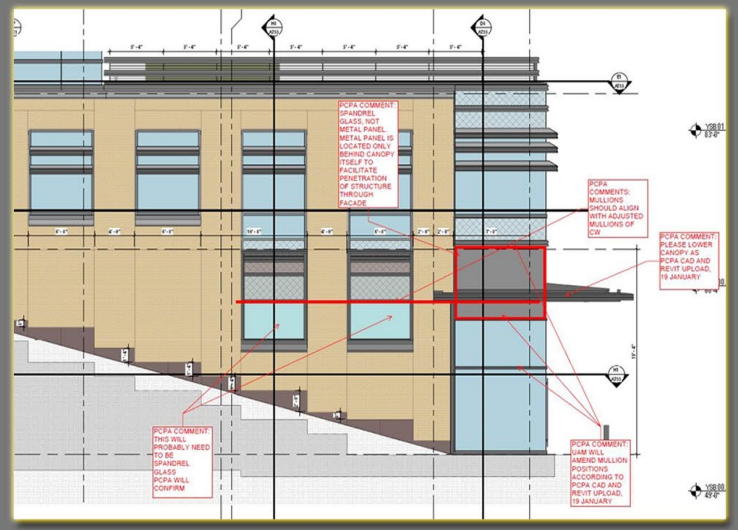
YALE UNIV SCIENCE BUILDING

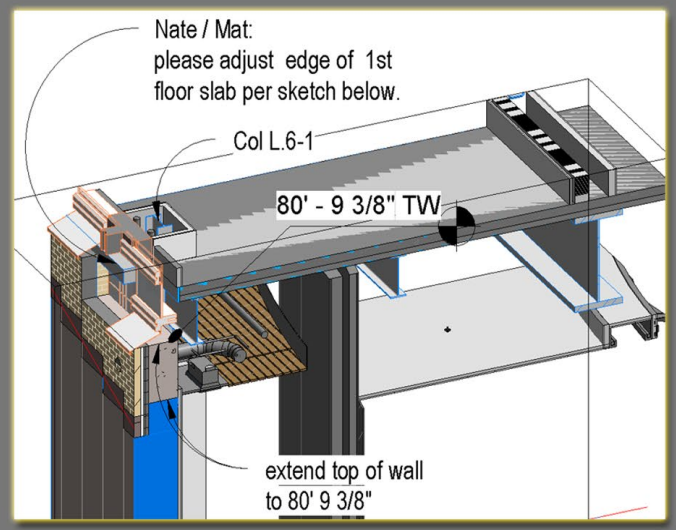
COORDINATION TAKES PLACE PRIOR TO PUBLISHING CONSTRUCTION DOCUMENTS

INFORMATION IS REAL TIME. NO LAG BETWEEN DESIGN DECISIONS, PRICING AND COORDINATION









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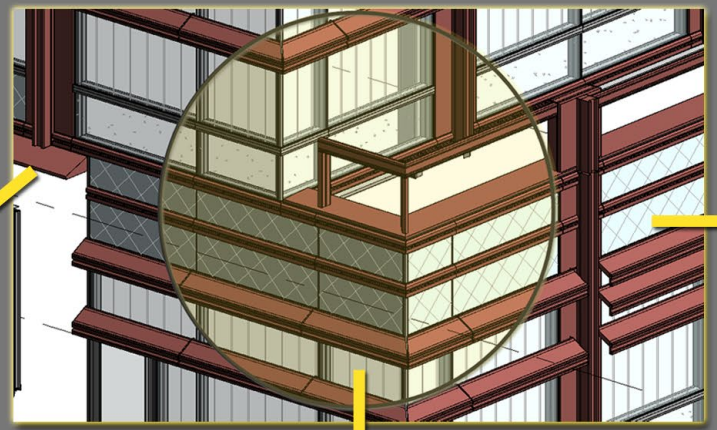
ARCHITECTURAL CD'S = UAM SHOP DRAWINGS

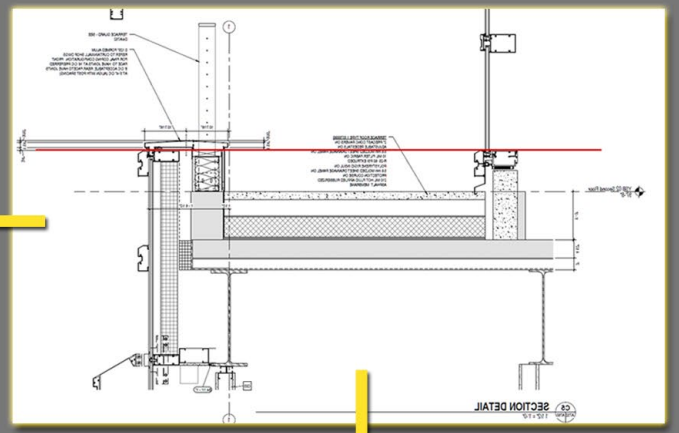
COORDINATED ELEMENTS

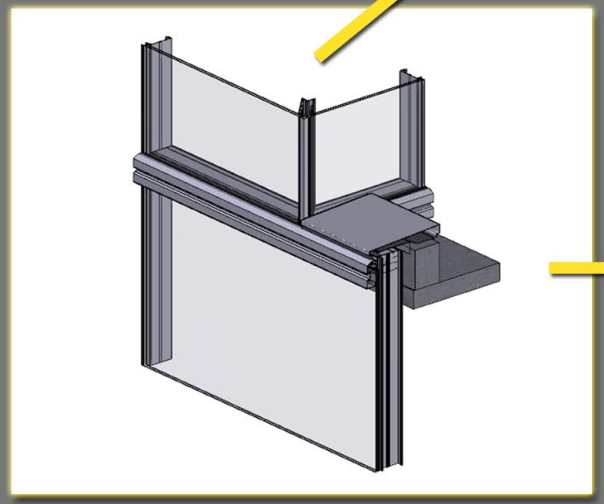
CD CONTENT = SHOP DRAWING CONTENT

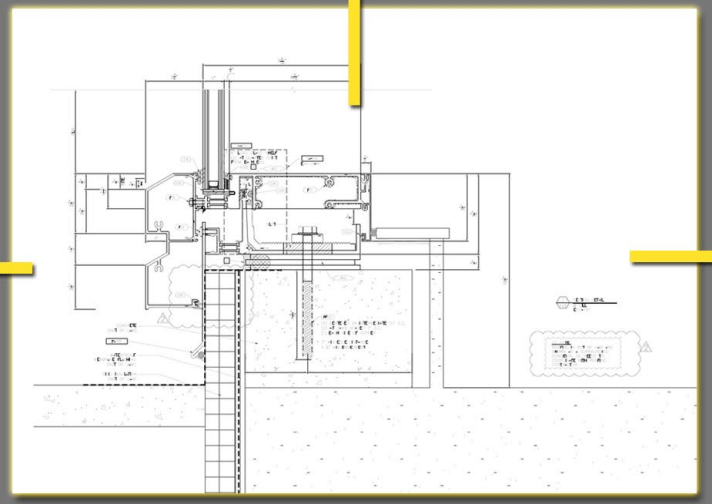
ALL MAJOR COMPONENTS ARE 3D

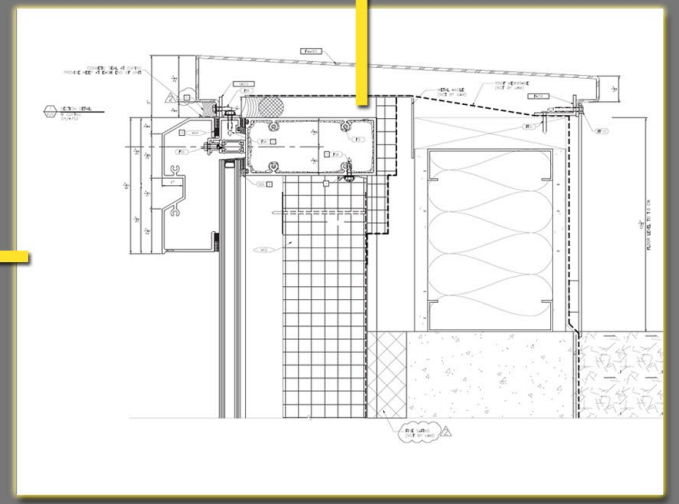
REDUCED TIME SPENT ON RFI'S





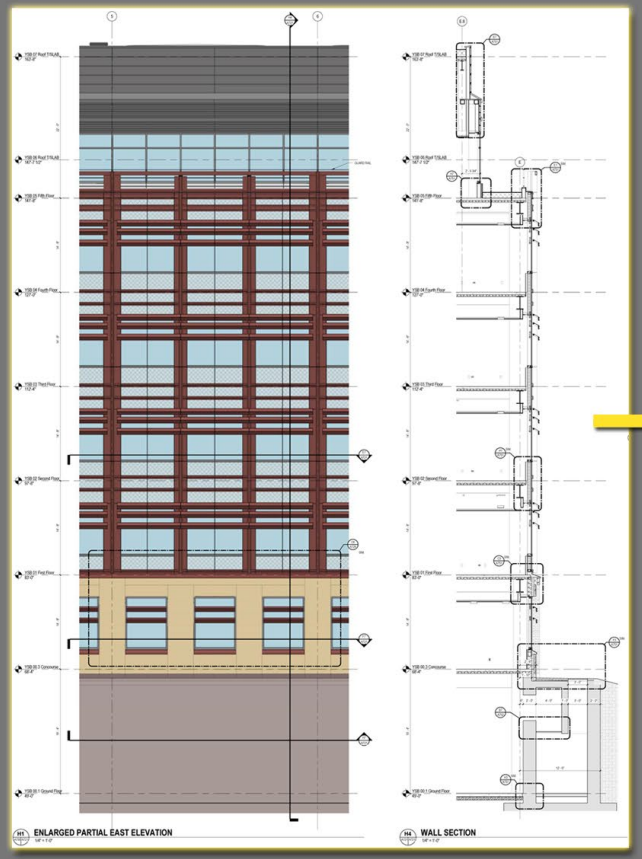




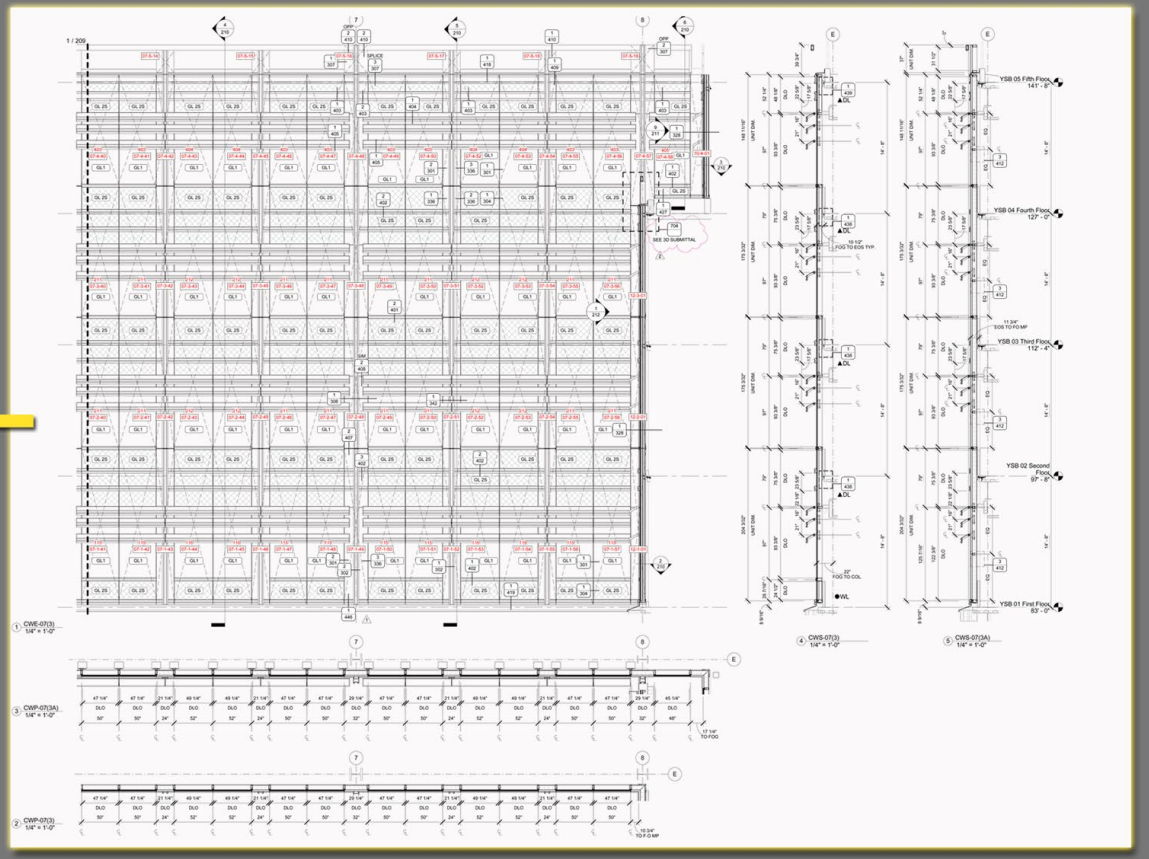


ARCHITECTURAL CD'S = UAM SHOP DRAWINGS

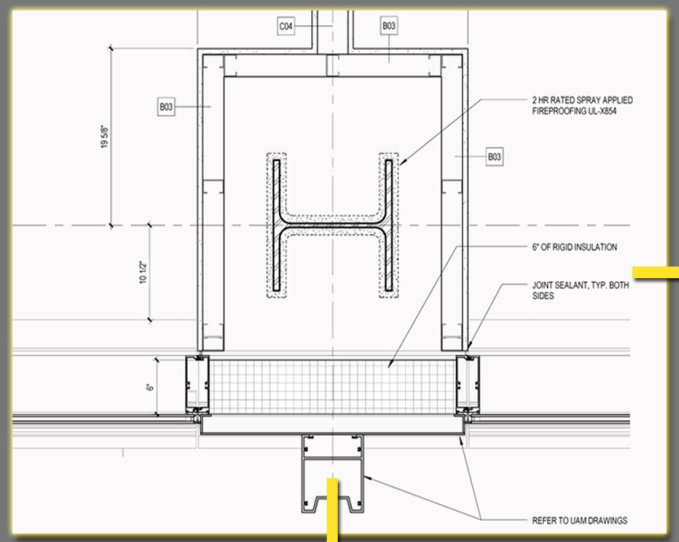
UAM REVIT MODEL LINKED WITH OTHER DESIGN MODELS TO PRODUCE CD DOCUMENTS

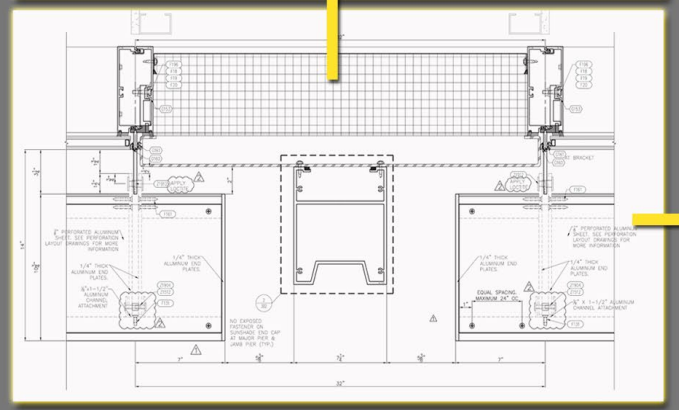


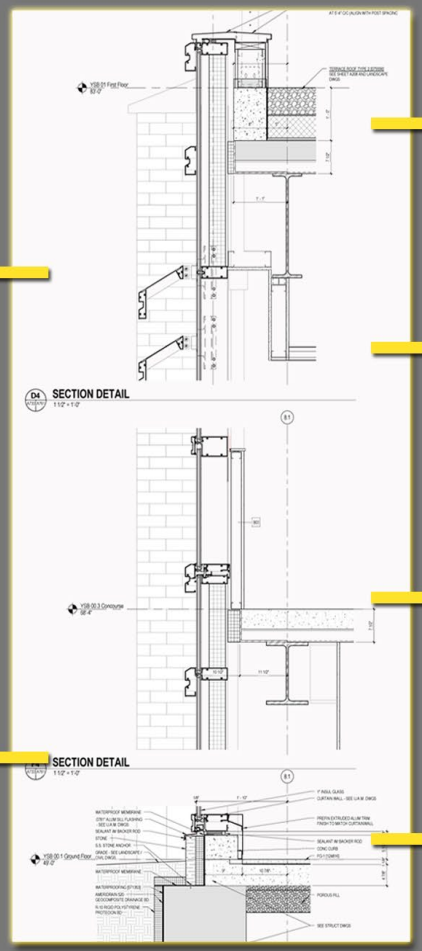
SAME UAM REVIT MODEL TO PRODUCE SHOP DRAWINGS

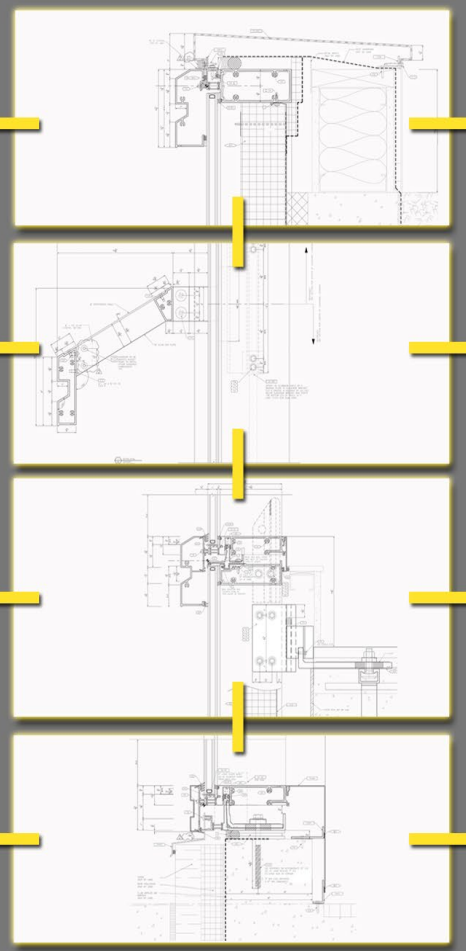


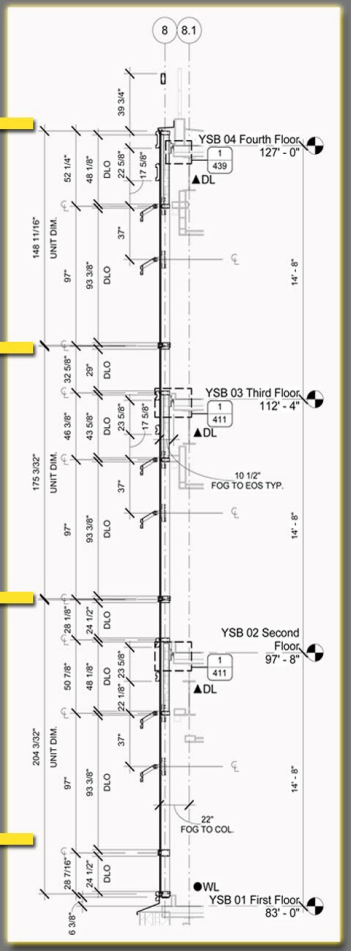
ARCHITECTURAL CD'S = UAM SHOP DRAWINGS











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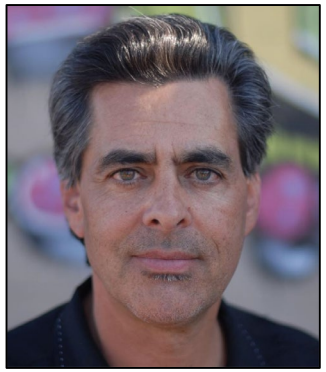

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Delegated Design Process

Subcontract Agreement

Your subcontract agreement will place design responsibility on you, as the delegated design subcontractor to provide a code compliant façade while meeting the performance and design criteria set forth in the contract documents.

As the delegated design subcontractor, you will sometimes be part of a deferred submittal to the building authority. Your drawing and calculation package will often be used to obtain the building permit for your specific scope(s) of work.

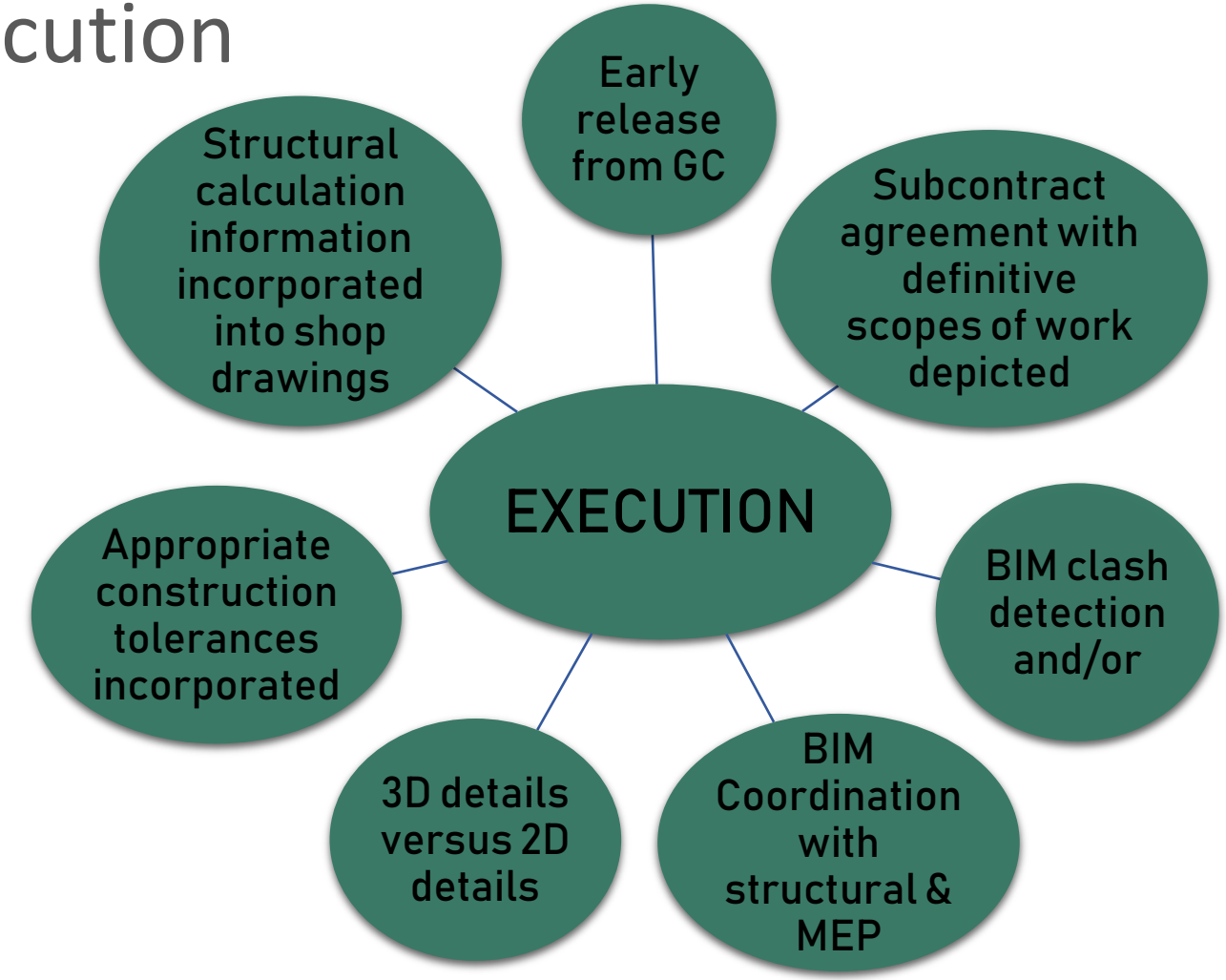
Delegated Design Process

Project Insurance

- **Professional Liability Insurance**
- **General Policy (Acceptable?) or**
- **Project Specific (Duration?)**

Delegated Design Process

Execution



Delegated Design Process

ARTIC, Anaheim CA- HOK/Burohappold/ KPFF/Scott Wallace/Werner Systems

Project photos & examples of coordination with design team:

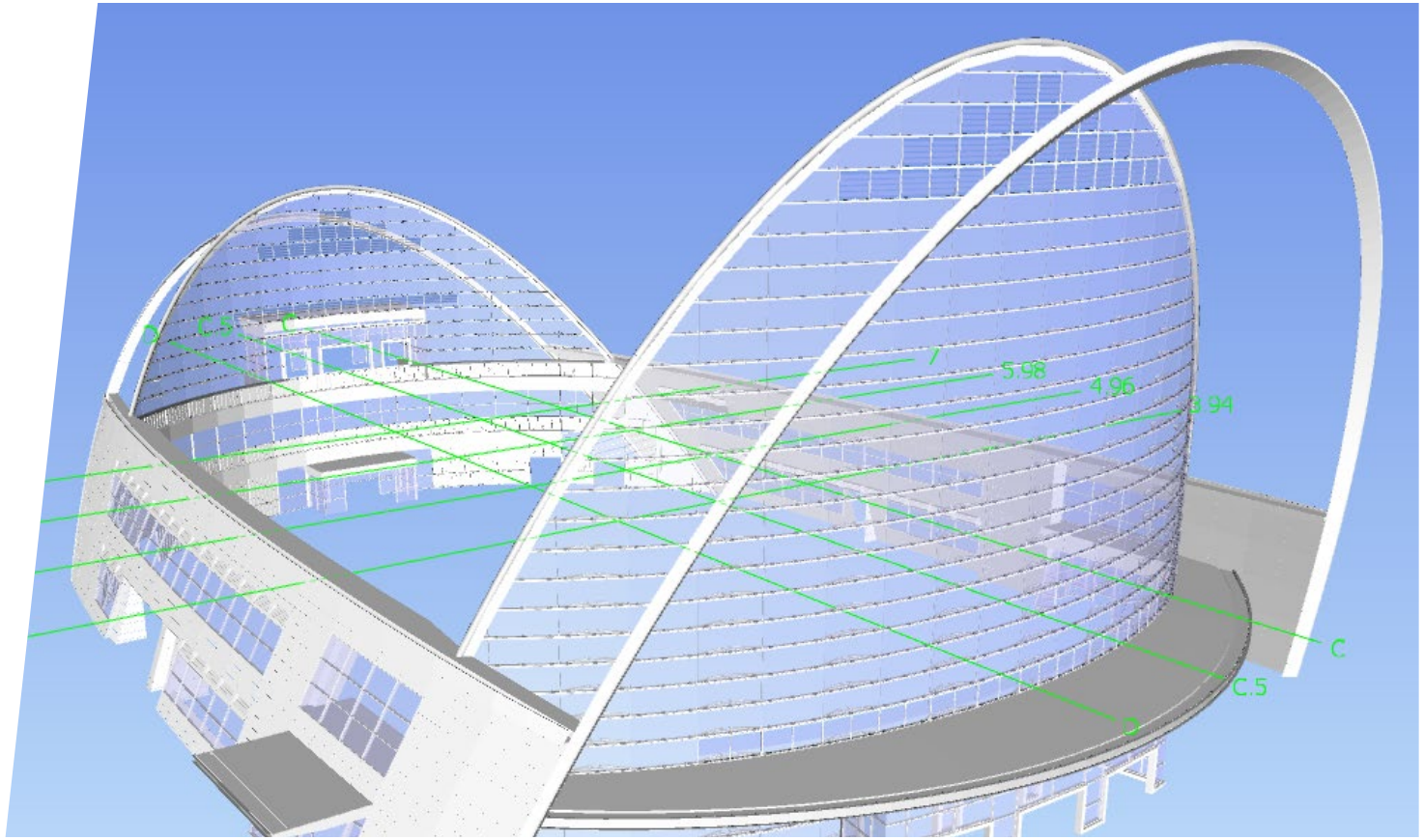
- ARTIC – North Exterior Elevation
- ARTIC – Northeast Exterior Elevation – Night
- ARTIC – Overall View
- ARTIC – Head Connection
- ARTIC – Sill Embed with Springs
- ARTIC – Armature

Questions

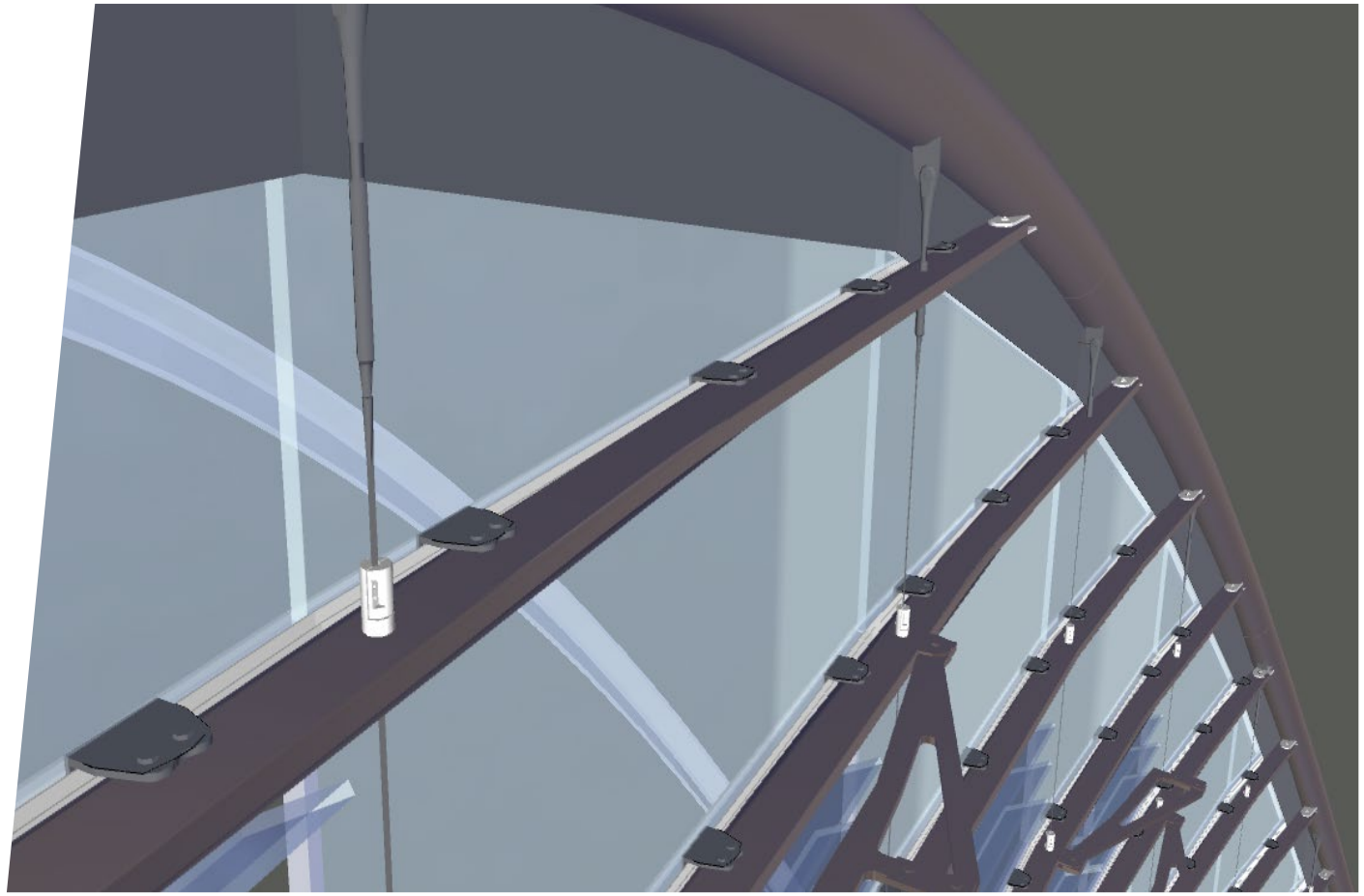
ARTIC-North Exterior Elevation

ARTIC – Northeast Exterior Elevation - Night

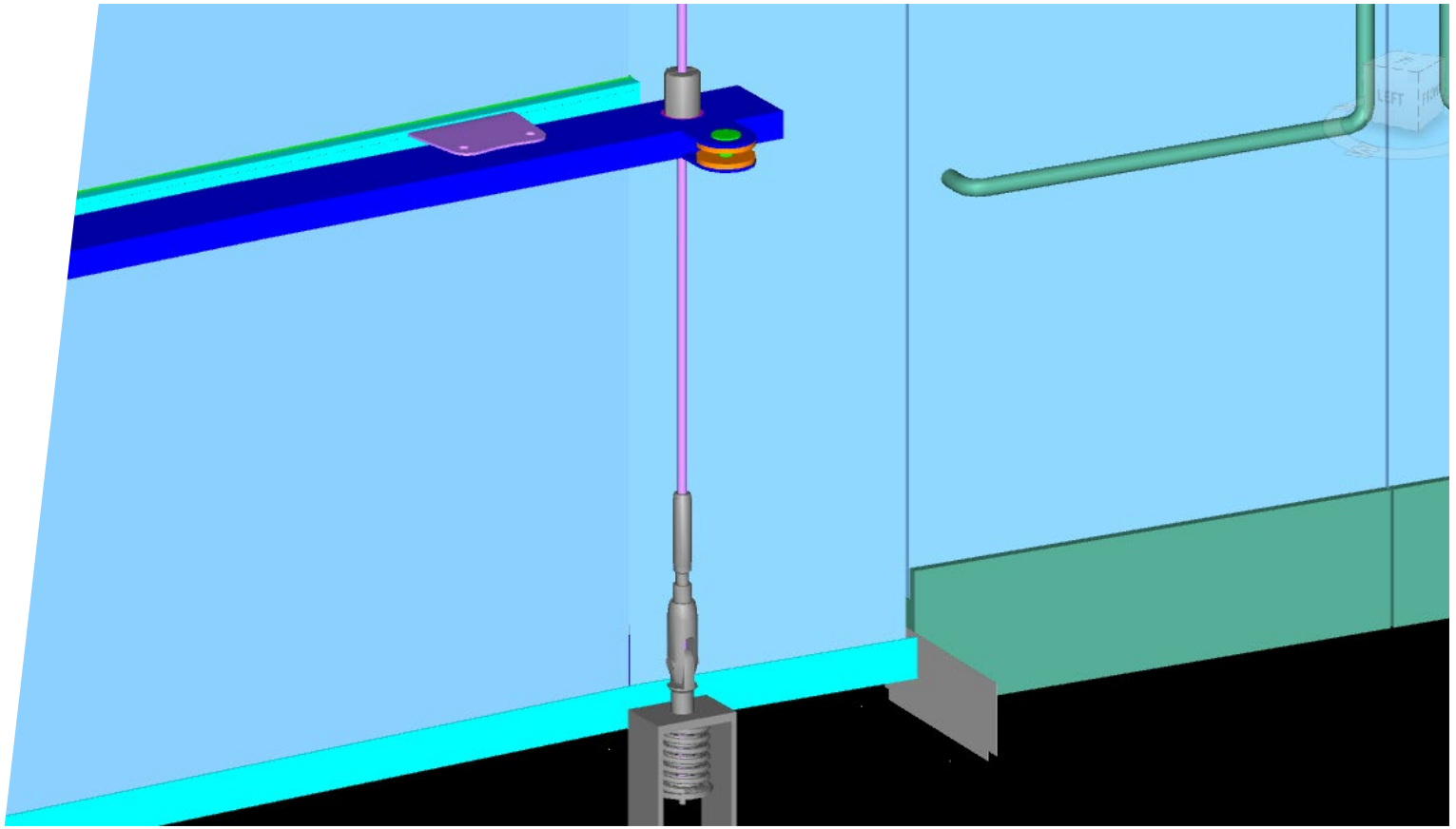
ARTIC – Overall View



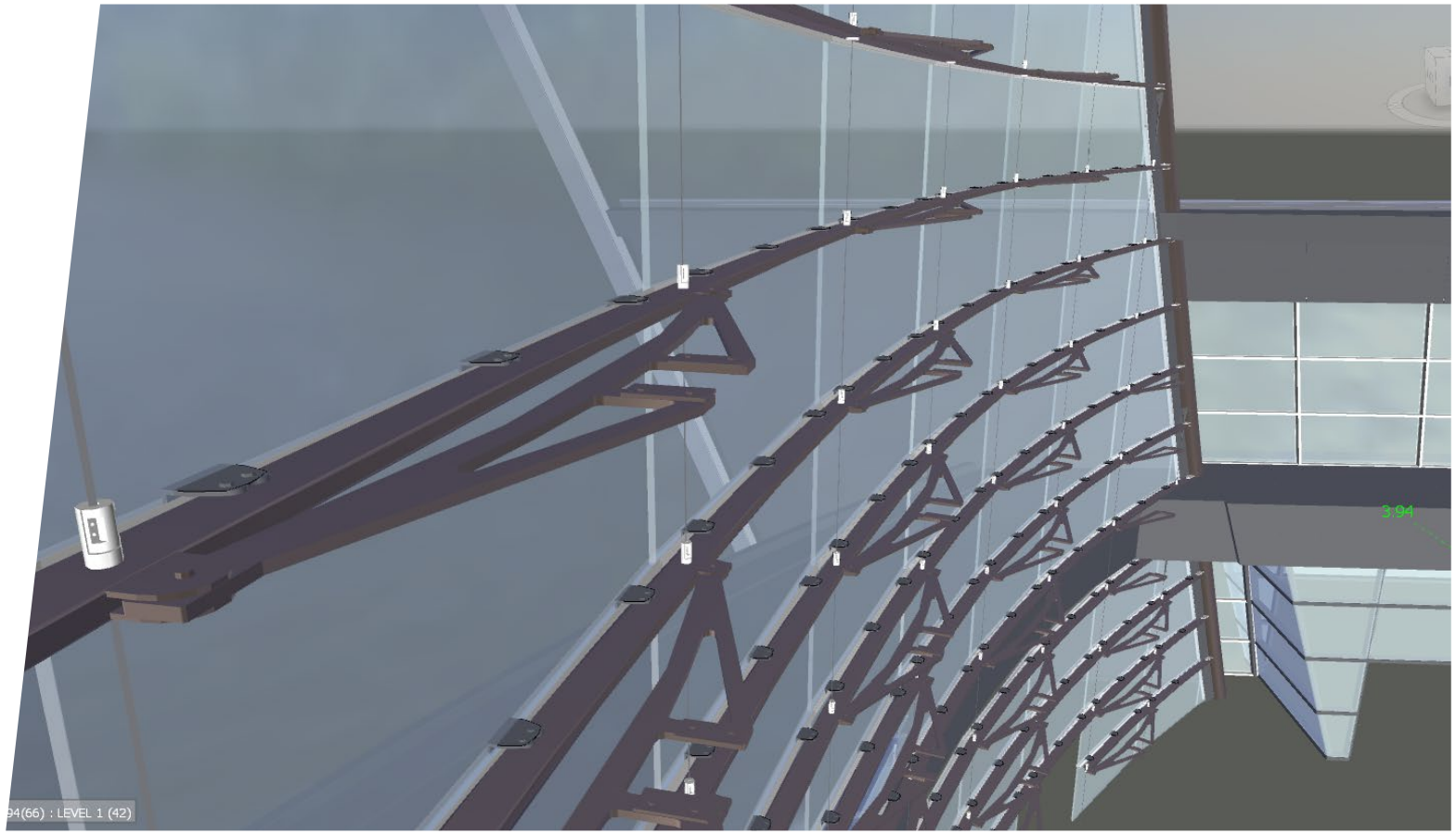
ARTIC – Head Connection



ARTIC – Sill Embed with Springs



ARTIC – Armature



Delegated Design Process

Questions

Delegated Design

ARTIC | HOK and Clark Construction

Delegated Design

UCI Medical Center

Delegated Design

UCI Medical Center

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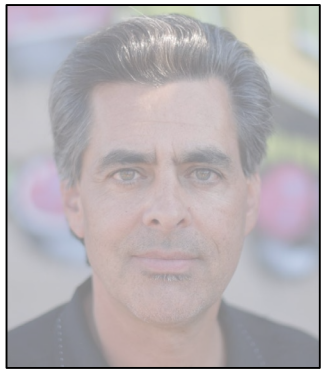

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The Tower at PNC Plaza

The Goal

the Client challenged the design team at Gensler with an audacious goal:

"design the greenest skyrise in the world"

The Tower at PNC Plaza

The Concept

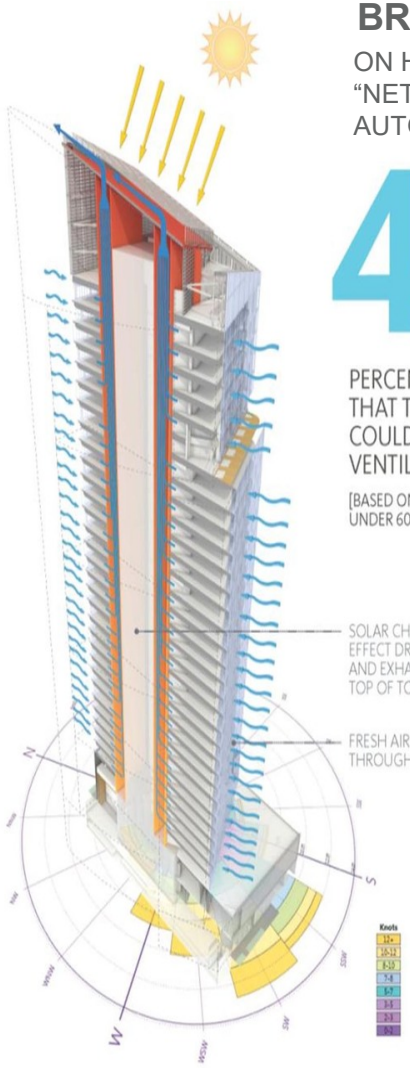
BREATHABLE FACADE

ON HOT & COLD DAYS: CLOSED FAÇADE
"NET ZERO" DAYS: AIR GATES OPEN AUTOMATICALLY

42%

PERCENT OF WORKING HOURS THAT THE BUILDING IN PITTSBURGH COULD BE RUN ON PASSIVE NATURAL VENTILATION MODE.

[BASED ON TEMPERATURES BELOW 62F AND HUMIDITY UNDER 60%]



TWO LONG PERIODS SUITED FOR NATRURAL VENTILATION:
MARCH-JUNE AND **SEPTEMBER-NOVEMBER**
ANALYSIS OF FINE PARTICLES, AIR QUALITY INDEX AND POLLEN

SOLAR COLLECTOR

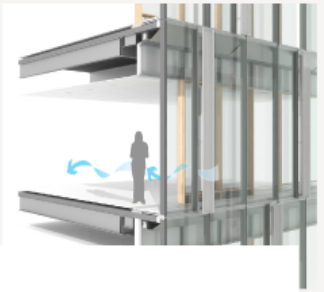
The solar collector draws warm air out of the tower and pulls refreshing air in through automated air gates and open dampers in the inner skin.

50%

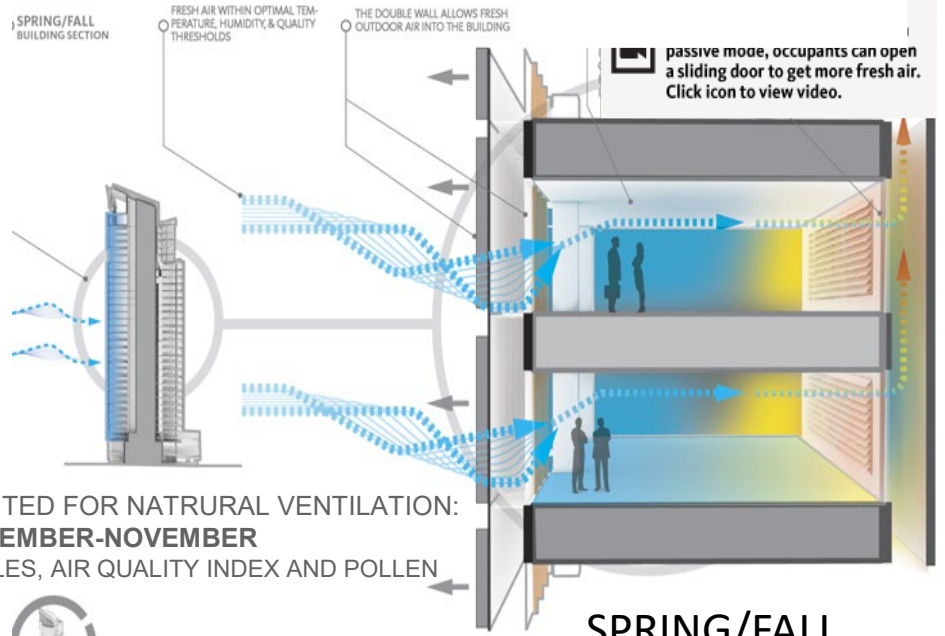
Reduction in energy use that is achieved with innovative MEP systems and passive strategies *

* compared with ASHRAE 90.1 2007 baseline

A BREATH OF FRESH AIR



passive mode, occupants can open a sliding door to get more fresh air. Click icon to view video.

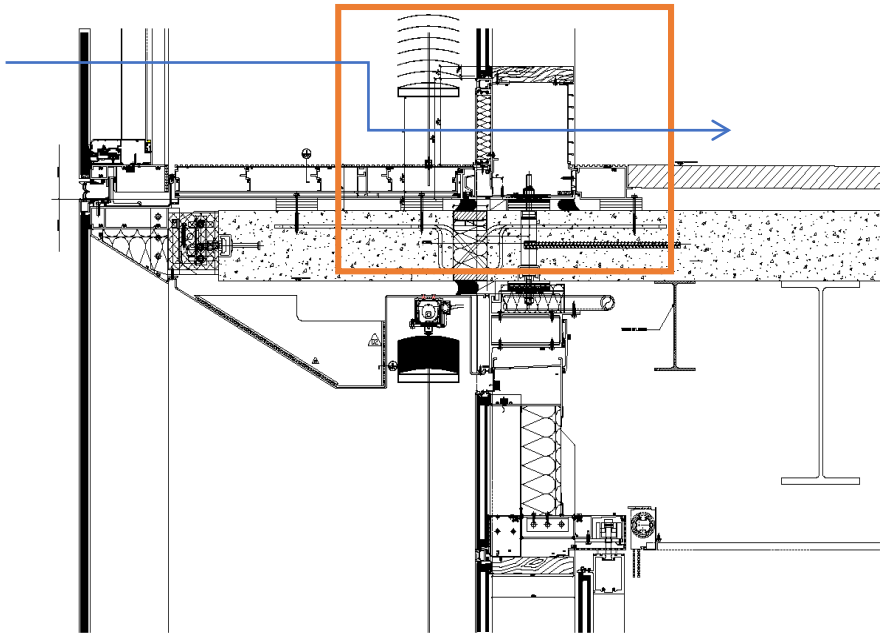


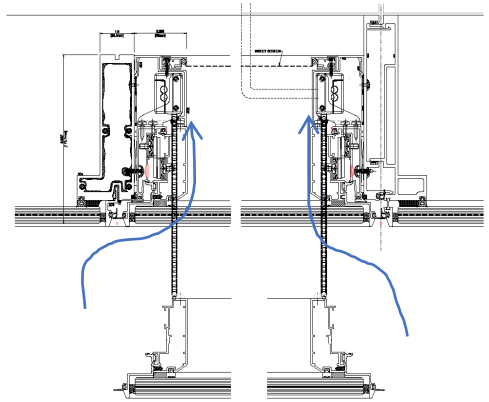
SPRING/FALL

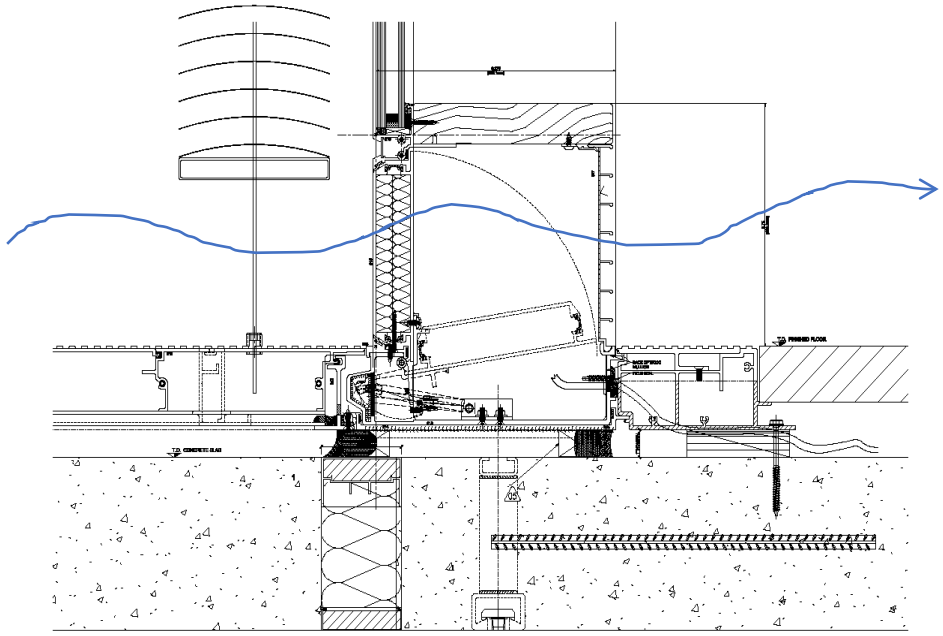
PASSIVE MODE
DOUBLE SKIN FACADE

The Tower at PNC Plaza

The Breathing Concept





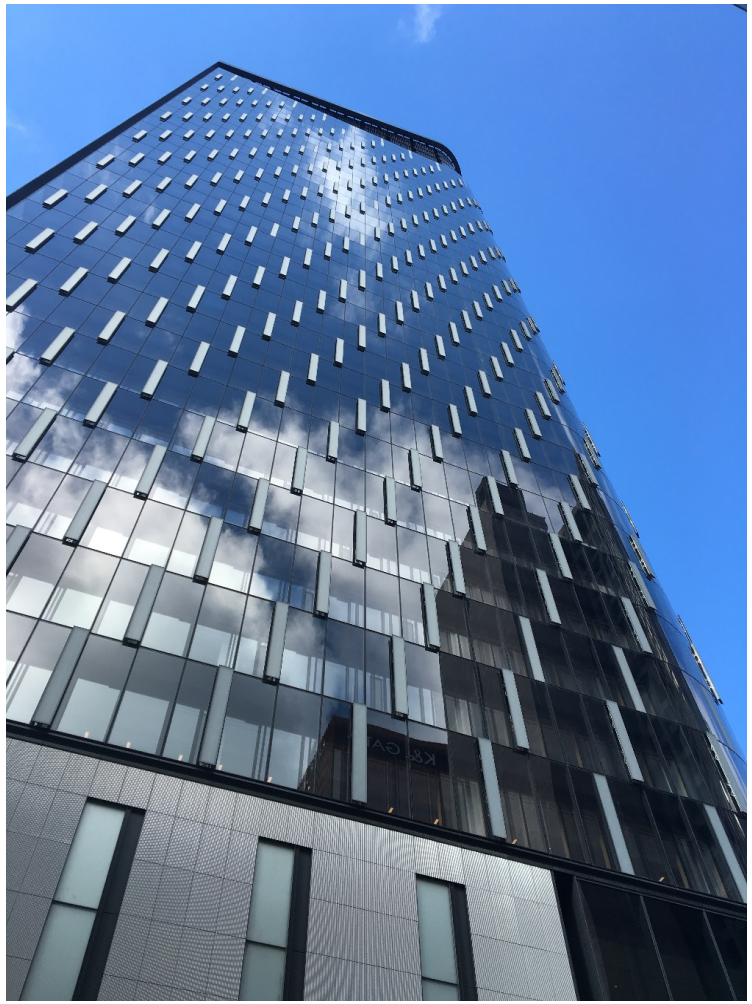


The Tower at PNC Plaza

The BETA Mock-up

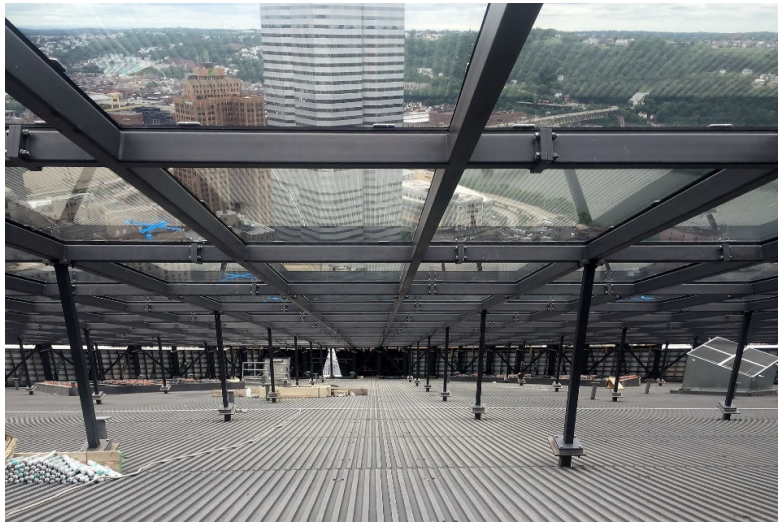
The Tower at PNC Plaza

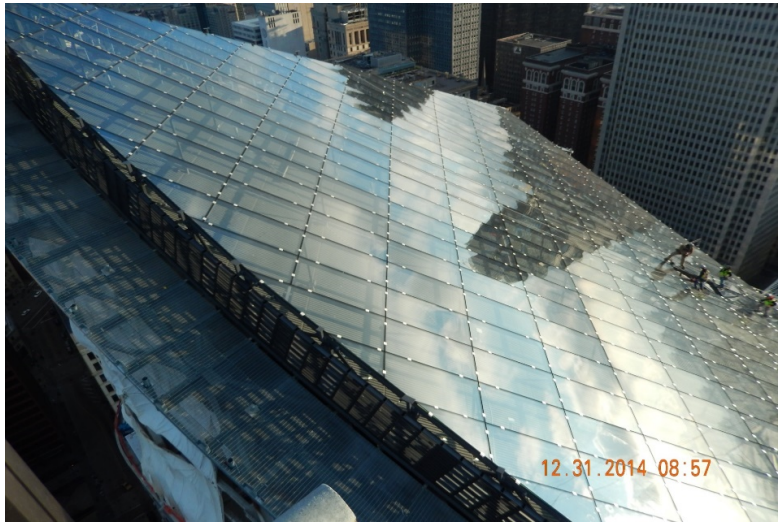
The Ventilation



The Tower at PNC Plaza

The Power and Water





The Tower at PNC Plaza

Fresh Air, Views, Daylight

The Tower at PNC Plaza

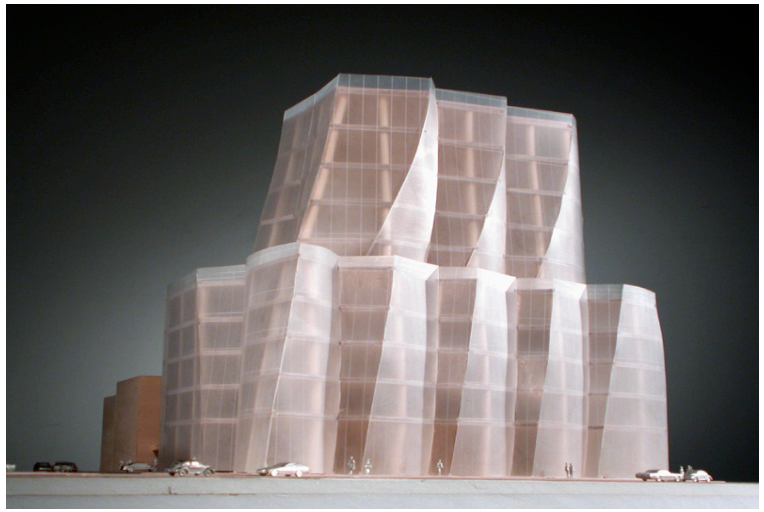
The Iconic Landmark

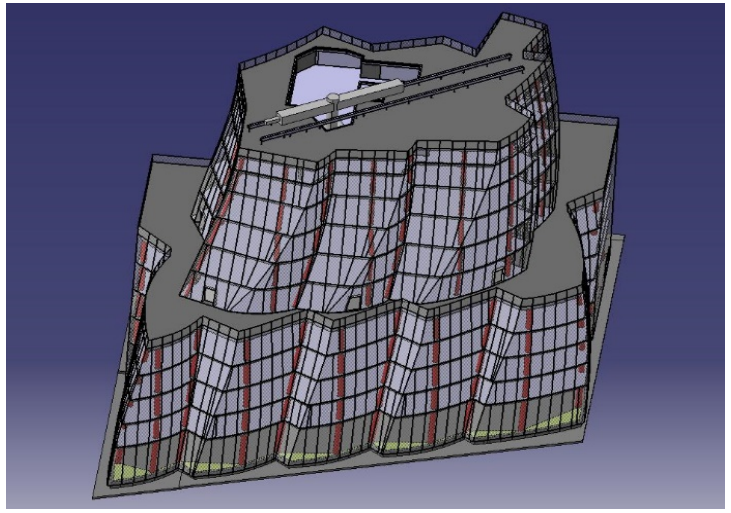
Free Form Buildings: Concept to Construction

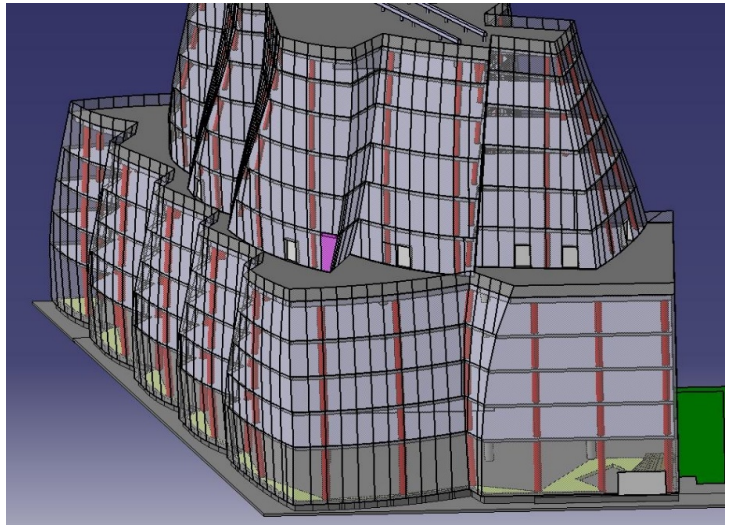
Interactive Corp, NYC

Free Form Buildings: Concept to Construction

Interactive Corp, NYC







Free Form Buildings: Concept to Construction

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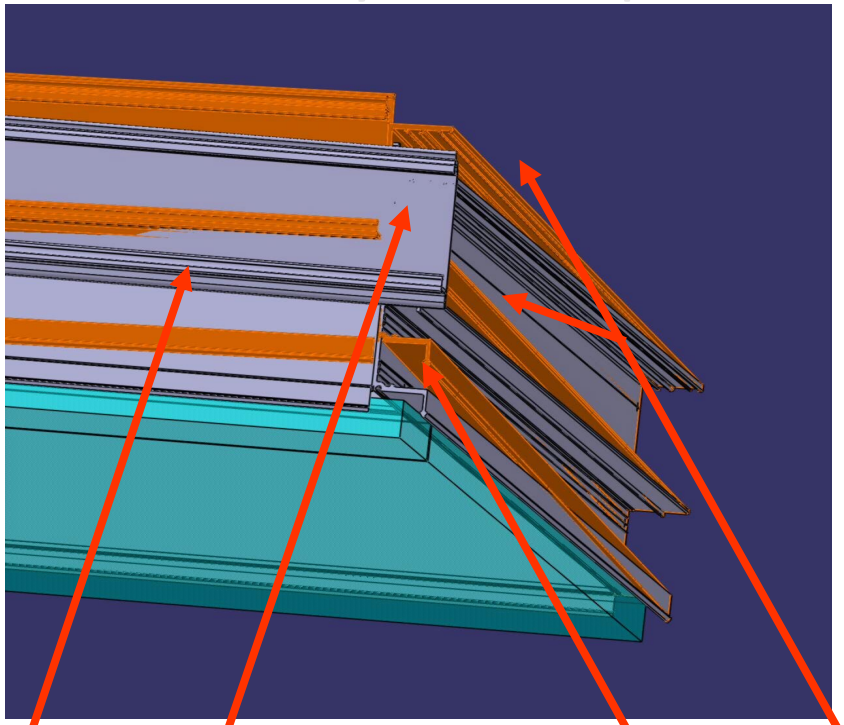
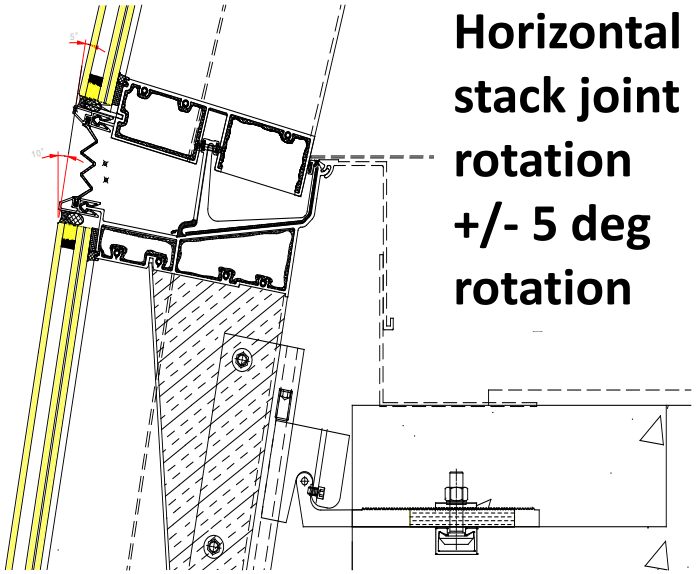
Curtainwall System Development

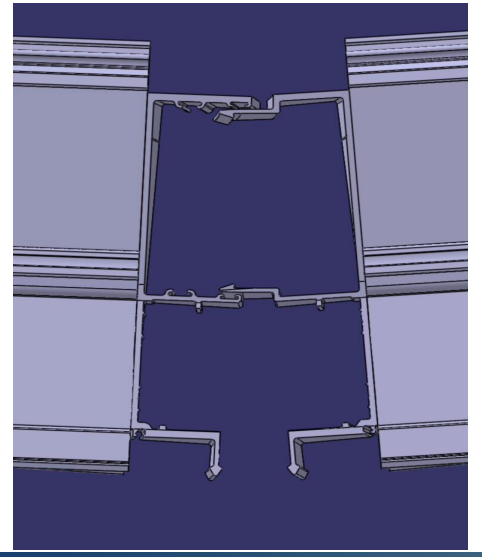


Flat For Production

Deformed Follows the Geometry



Horizontal stack joint rotation +/- 5 deg rotation



Two sets mullion pairs -3 deg + 14 deg rotation

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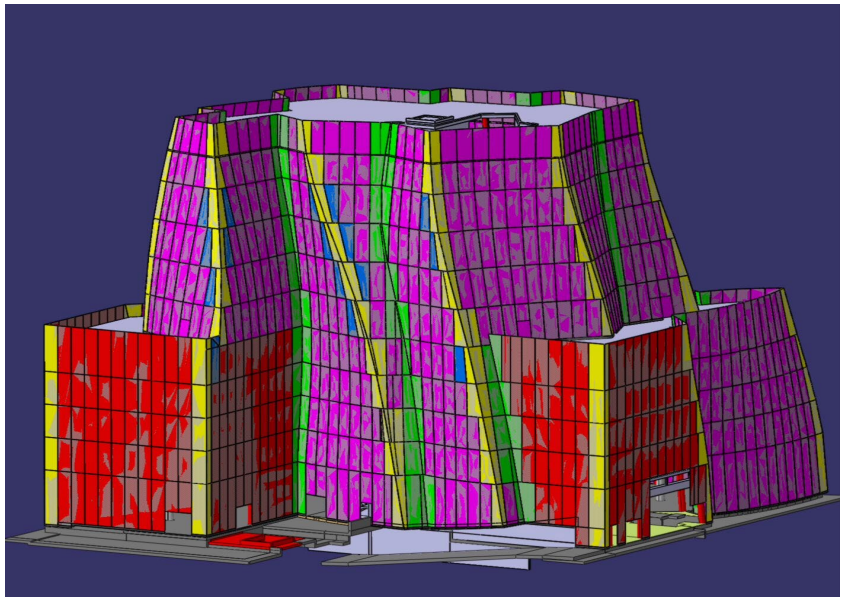
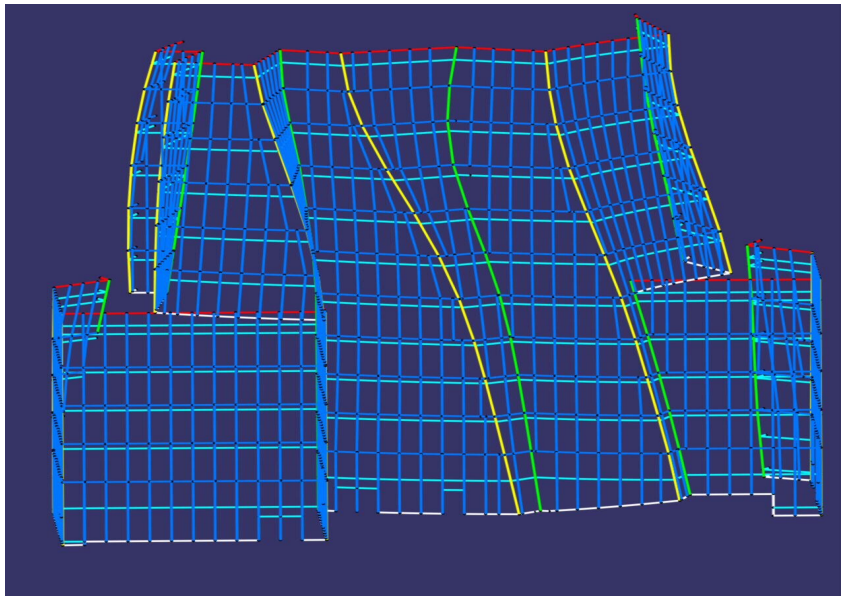
Finalize Surface Geometry and Wireframe based on Established Rules





- Maximum “twist” of the mullions
- Allowable angular range for vert. mullion
- Maximum rotation at stack horizontal
- Required glass layout
- No twisted triangular units

- Maximum/minimum glass sizes
- Requirements for 3D wireframe/model dev.
- Modulation & relationship CW/structure
- Maximum slope of the wall
- …and so on.

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98,096 sq ft curtain wall

35 custom extrusions

Two sets of mullion pairs -3 deg to + 14 deg rotation

Horizontal stack joint rotation +/- 5 degrees

1442 units total: 1330 unique, 112 duplicates

21,123 main components: 15,184 unique, 5,939 duplicates

86,335 total components: 18,290 unique, 68,045 duplicates

318,794 unique machining parameter values

146 Gigabytes of Data

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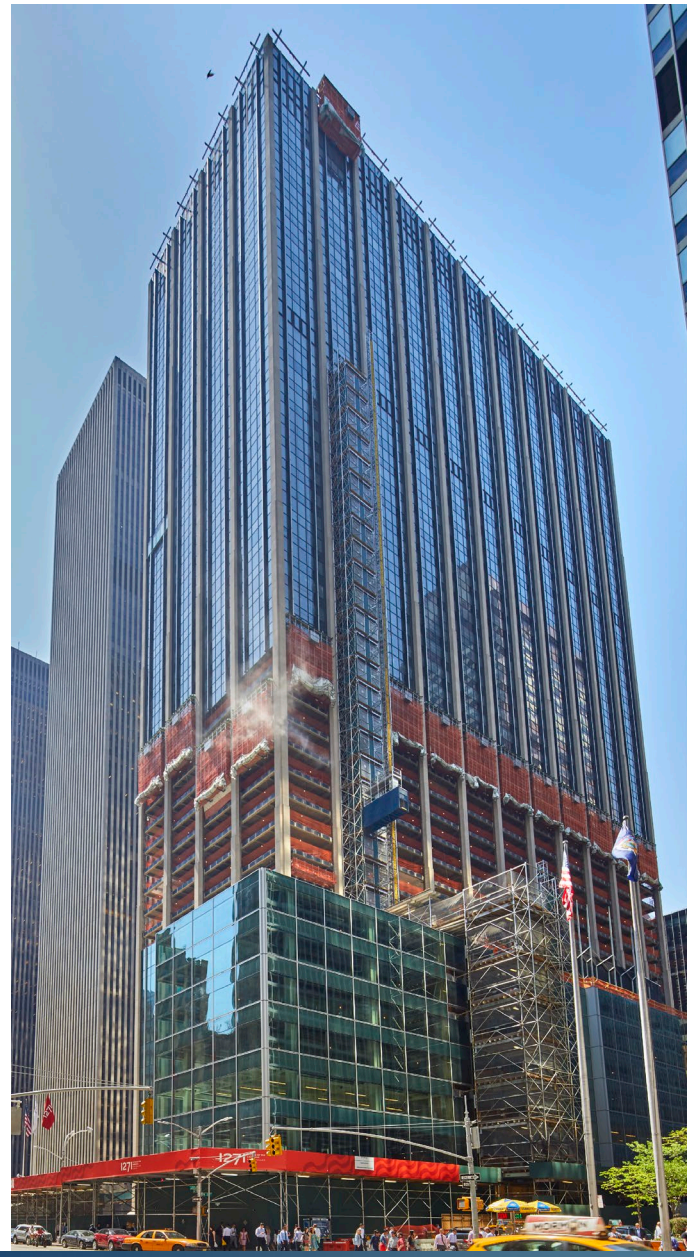
Interactive Corp, NYC

Thank you for your attention!

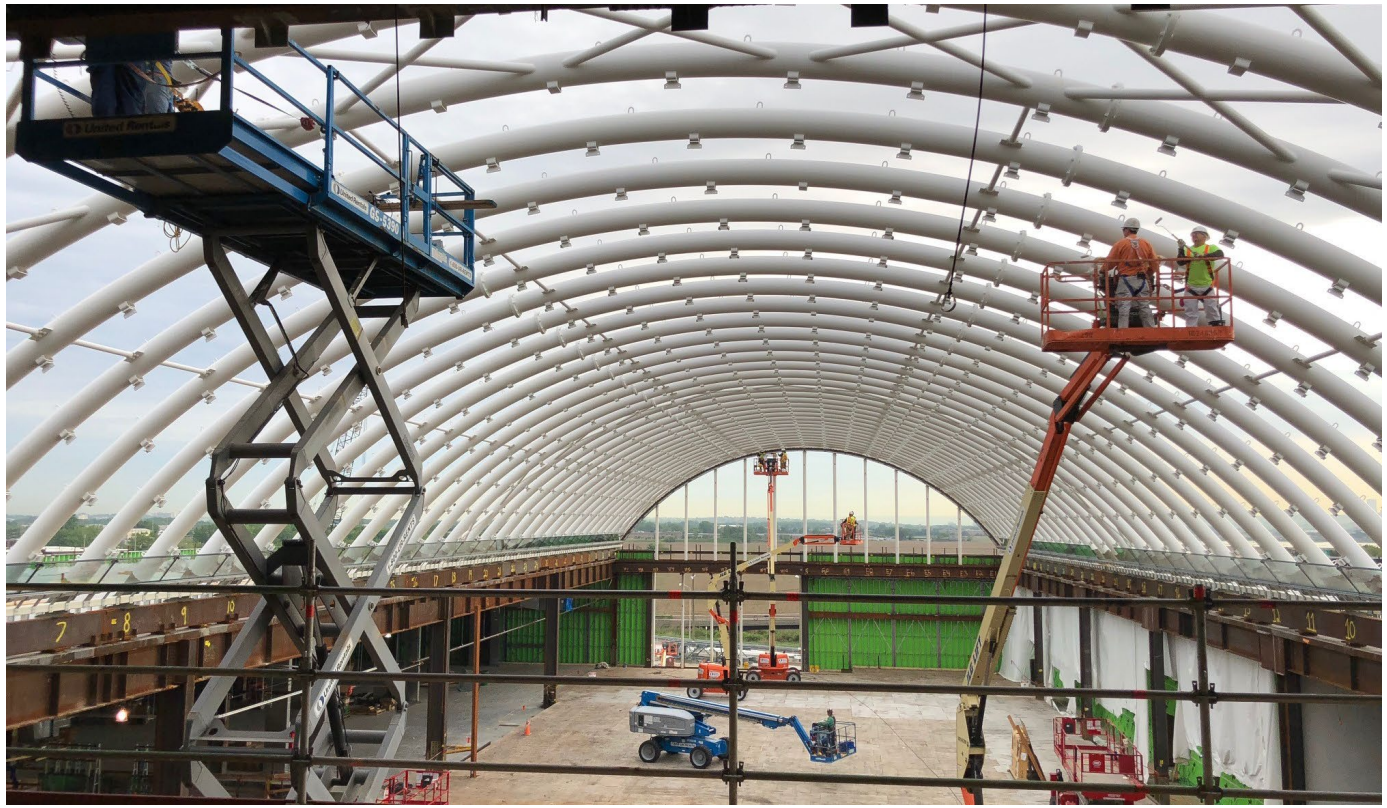
Lessons Learned



that have led to process improvement

Team Composition

project-specific, department-specific approaches



Best Approach

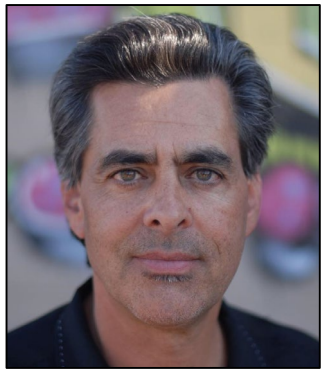
for a subcontractor related to delegated design or design assist

Q&A

THANK YOU

Navigating the World of Delegated Design

Jacob Gaddis
United Architectural Metals



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