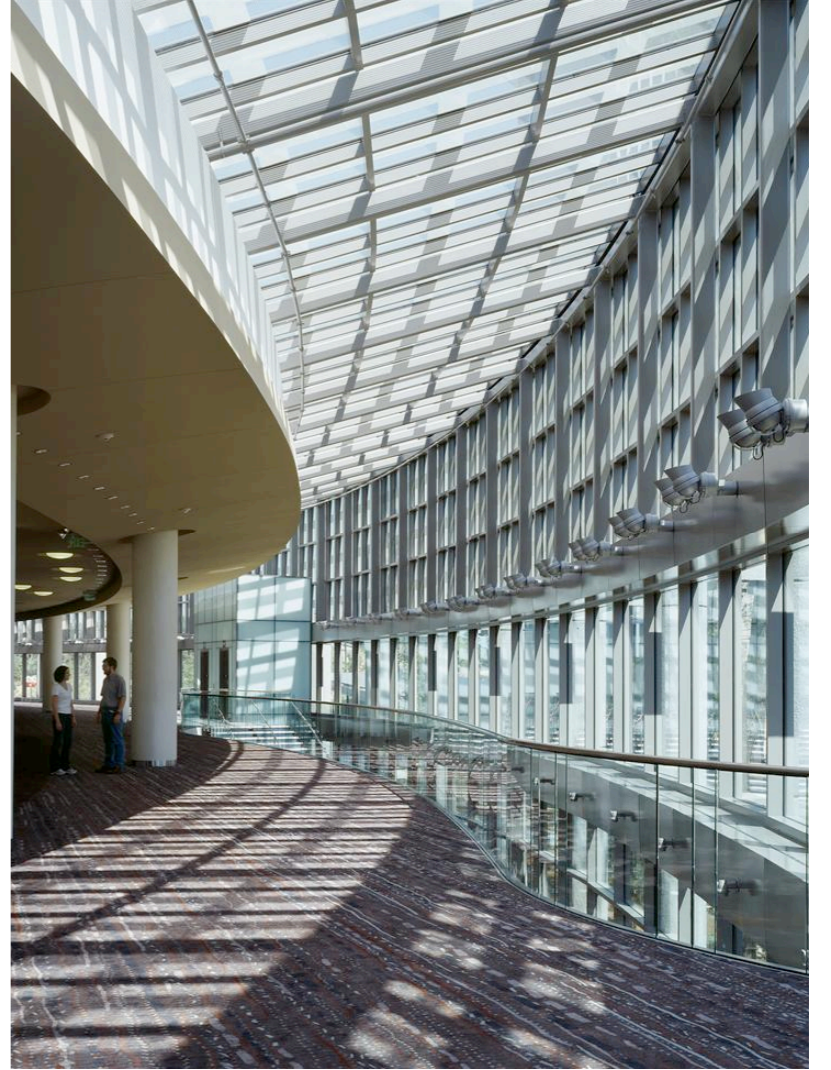


Building Information Modeling

Teresa Edmisten AIA, LEED AP
VP Information Design and Technology
TVS



showroom





Workplace



media

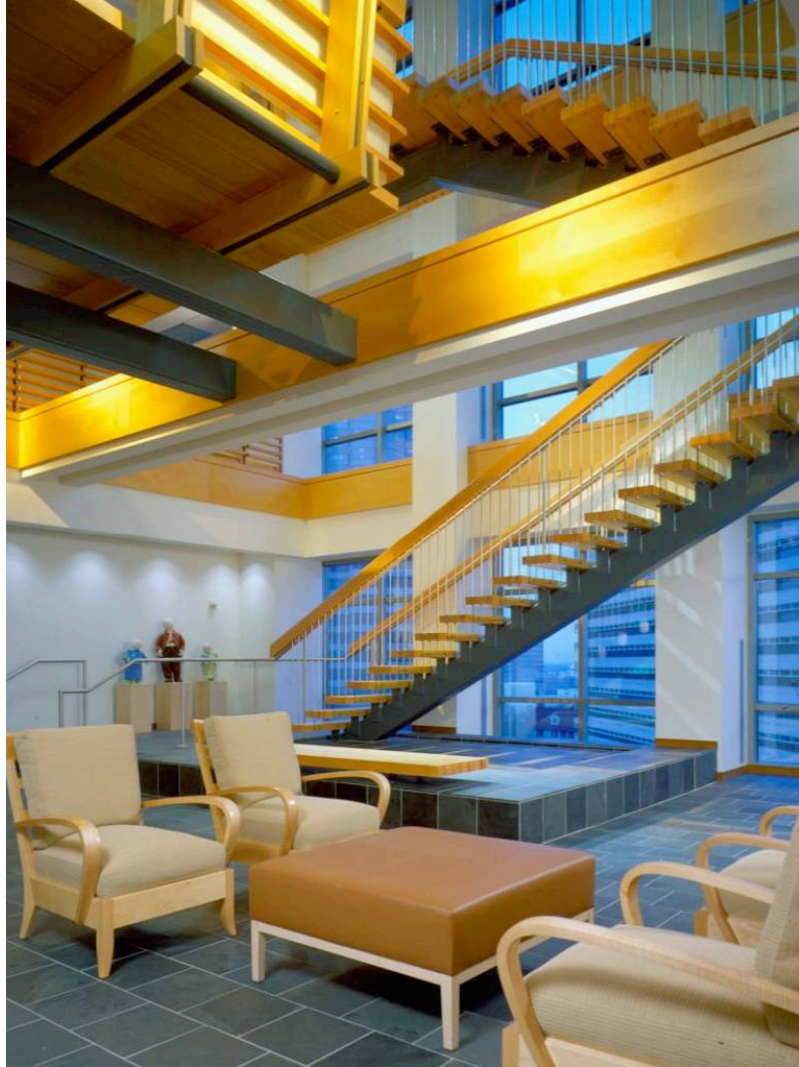


convention





convention





planning

on our plate today

- BIM defined – how is it different from current CADD practices?
- BIM's business drivers – why change?
- BIM opportunities and challenges through all phases of the project
- The importance of interoperability in the design / construction / management cycle



recording decisions

- Scale models
- Drawings
- Computer Drawings
- Computer Models
- Building Information Models
- ? [we want Wiki-BIM]



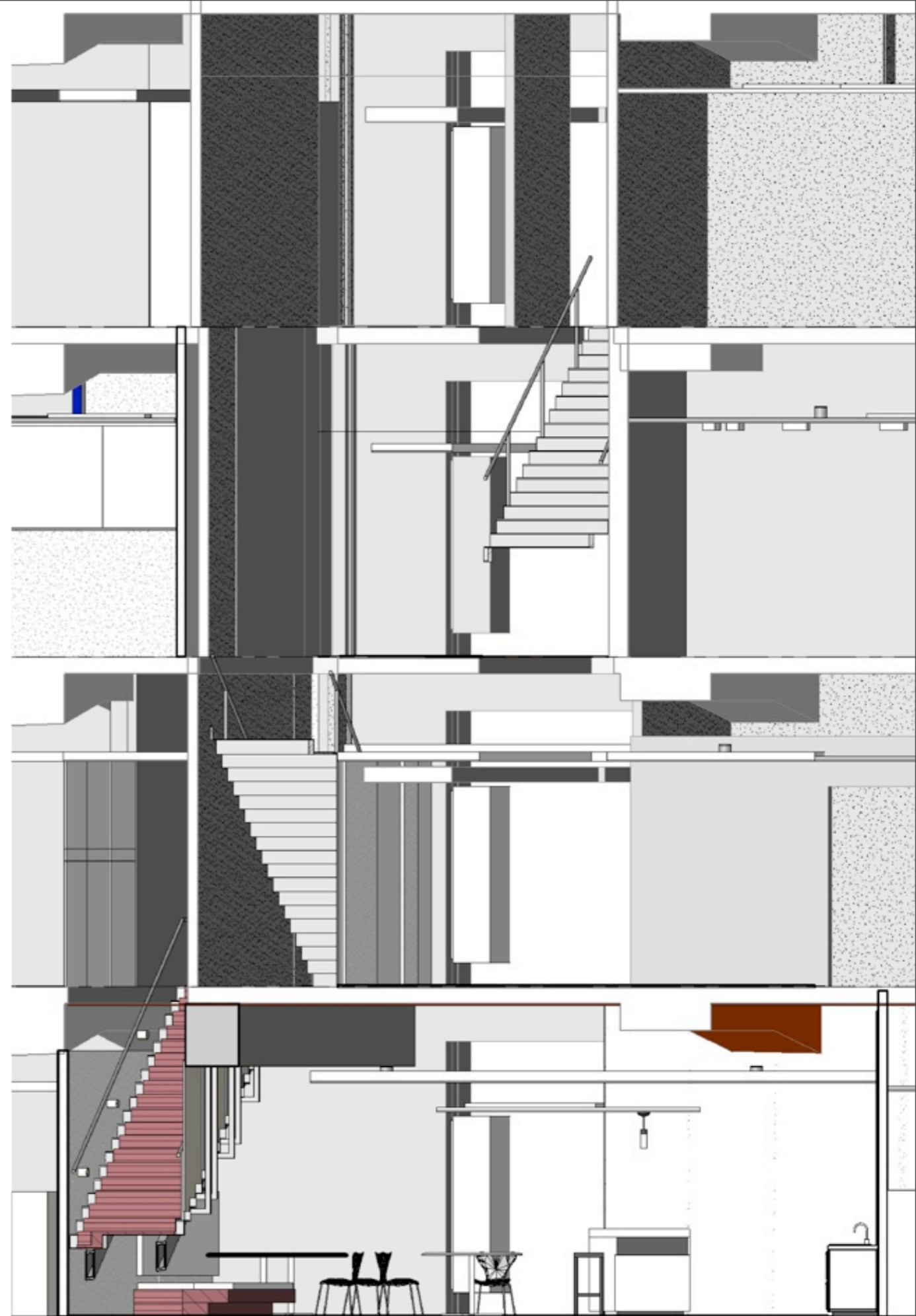
BIM

- The assembled information, both graphical and non-graphical, necessary to DESIGN, CONSTRUCT, AND OPERATE a building project.
- Virtual Building - drawings are views of the virtual building, not disconnected graphics.



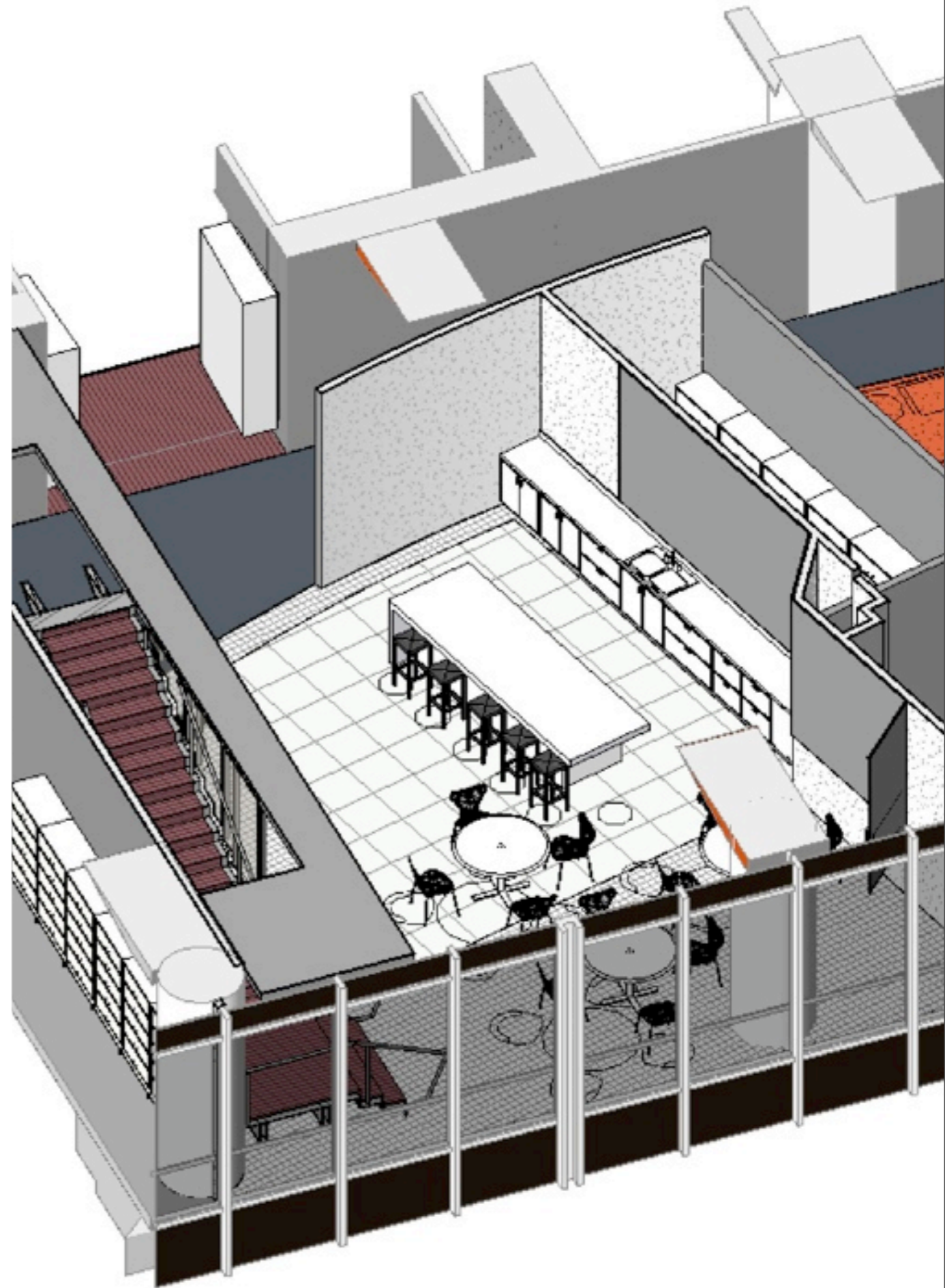
BIM - Used by:

- Contractors
- Subcontractors
- Designers
- Clients / Owners
- Consultants
- Code Officials
- Manufacturers / Suppliers



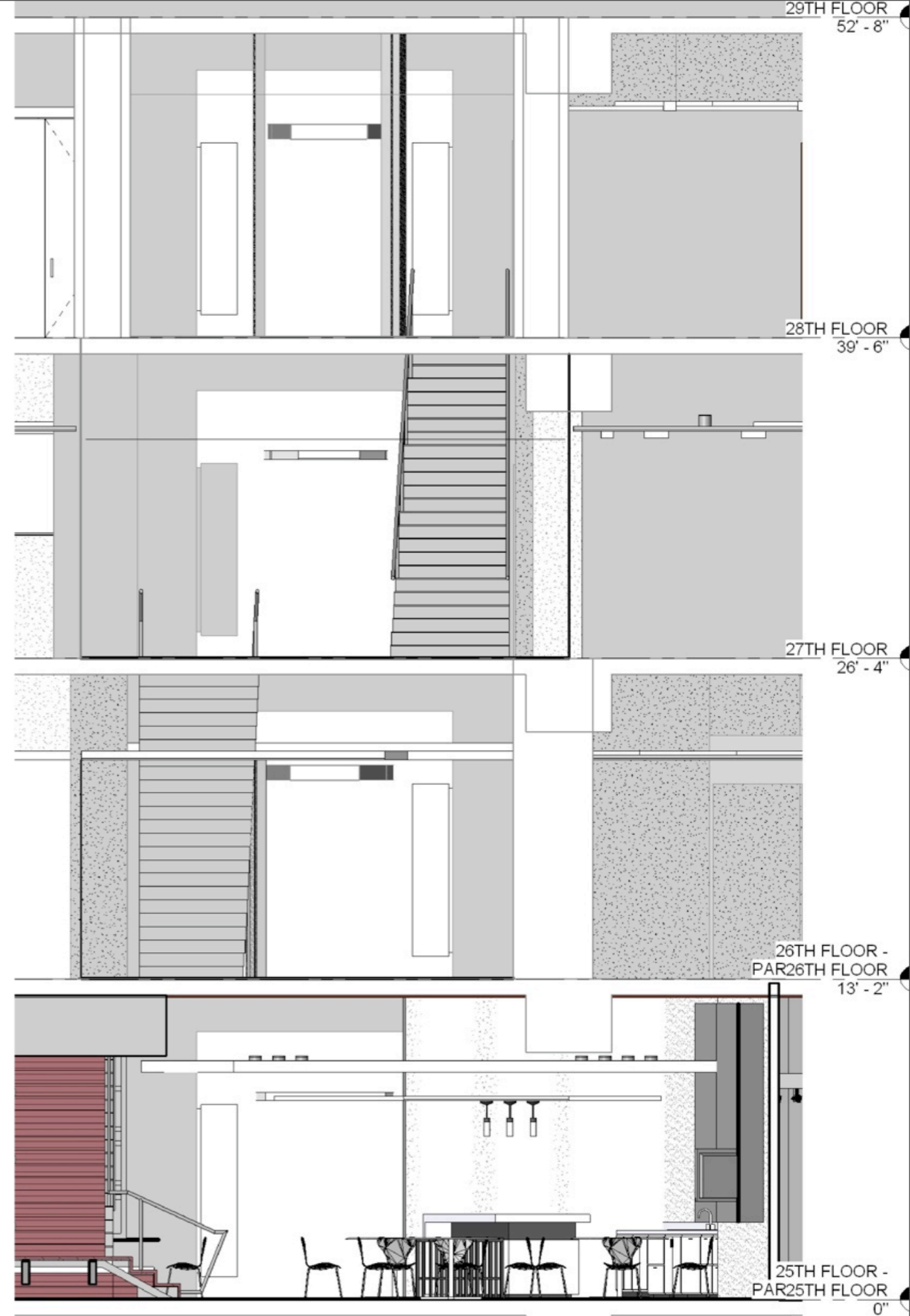
Building Tools

- Autodesk - Revit Architecture
- Graphisoft - Archicad
- Bentley - Bentley Architecture
- Bentley - Generative Components
- Gehry Technologies Digital Project



Analysis Tools

- Navisworks
- Ecotect
- IES
- Constructor
- STAAD
- RAM Steel



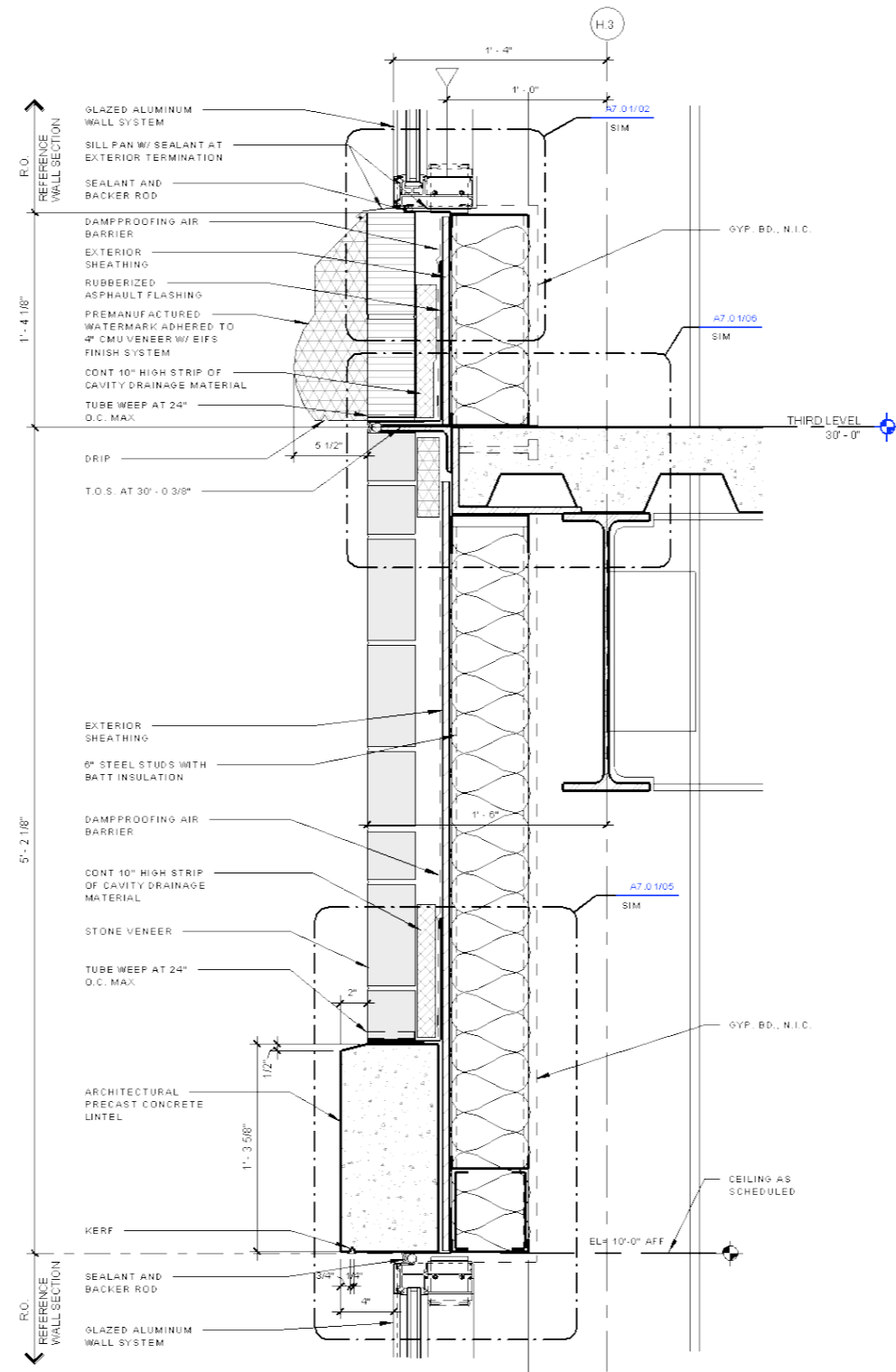
not your Dad's CADD

- 3D [4D *time*] [5D *cost*] [6D *carbon footprint?*]
- Walls know they are walls - less abstraction
- Non-graphical information can be stored and retrieved as schedules and quantities
- Drawings are coordinated at all times
- Systems are more readily integrated
- Implications of decisions are seen earlier and can be understood by more stakeholders
- Foundation for analysis
- Automation allows more time for design and less time for documentation
- More embedded information - more useful throughout building lifecycle
- Use of color and 3D will improve understanding reducing field errors

not vaporware

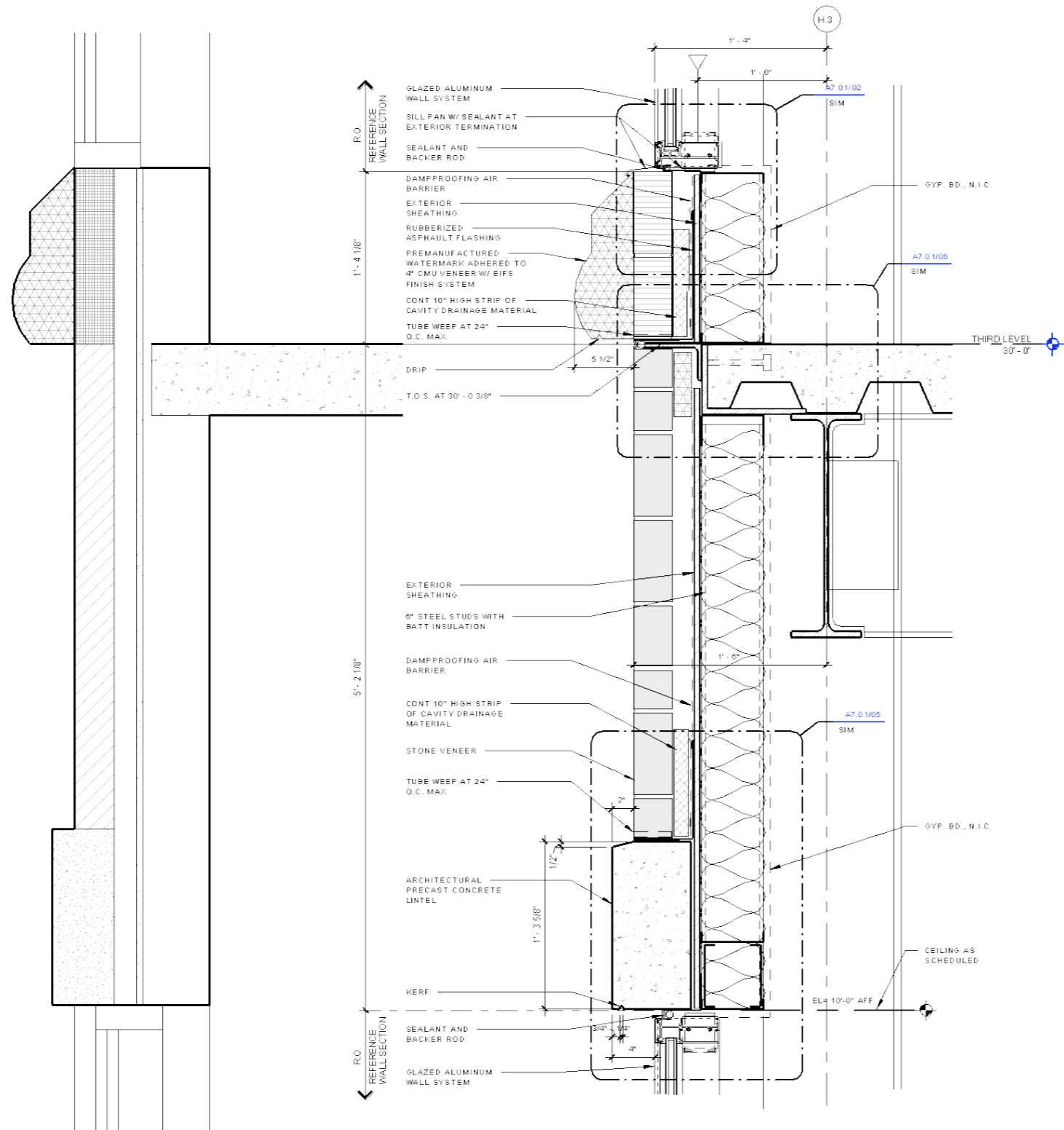
not yet “practically perfect in every way”

- Some buildings are too big or complex for current software and hardware
- Components must be built - libraries are incomplete and non-standardized
- Rich standards have not emerged
- Interoperability between BIM tools, analysis packages, fabrication tools, presentation tools, and facilities tools is lacking or absent
- No ubiquitous reader - need Wiki-BIM
- WAN collaboration difficult
- Constant need to strategize and monitor the granularity of the model
- Slow adoption of all players
- Need to retool work force, contracts, and business processes



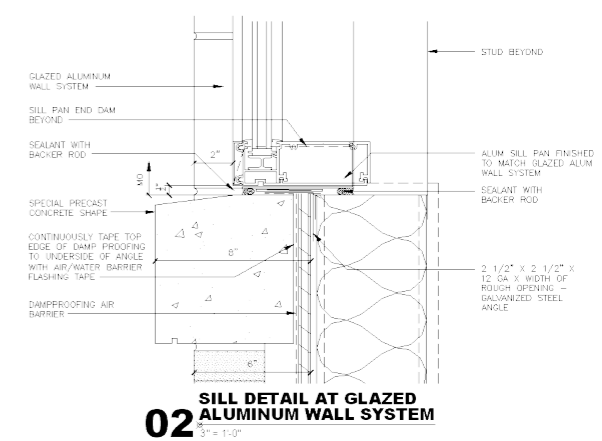
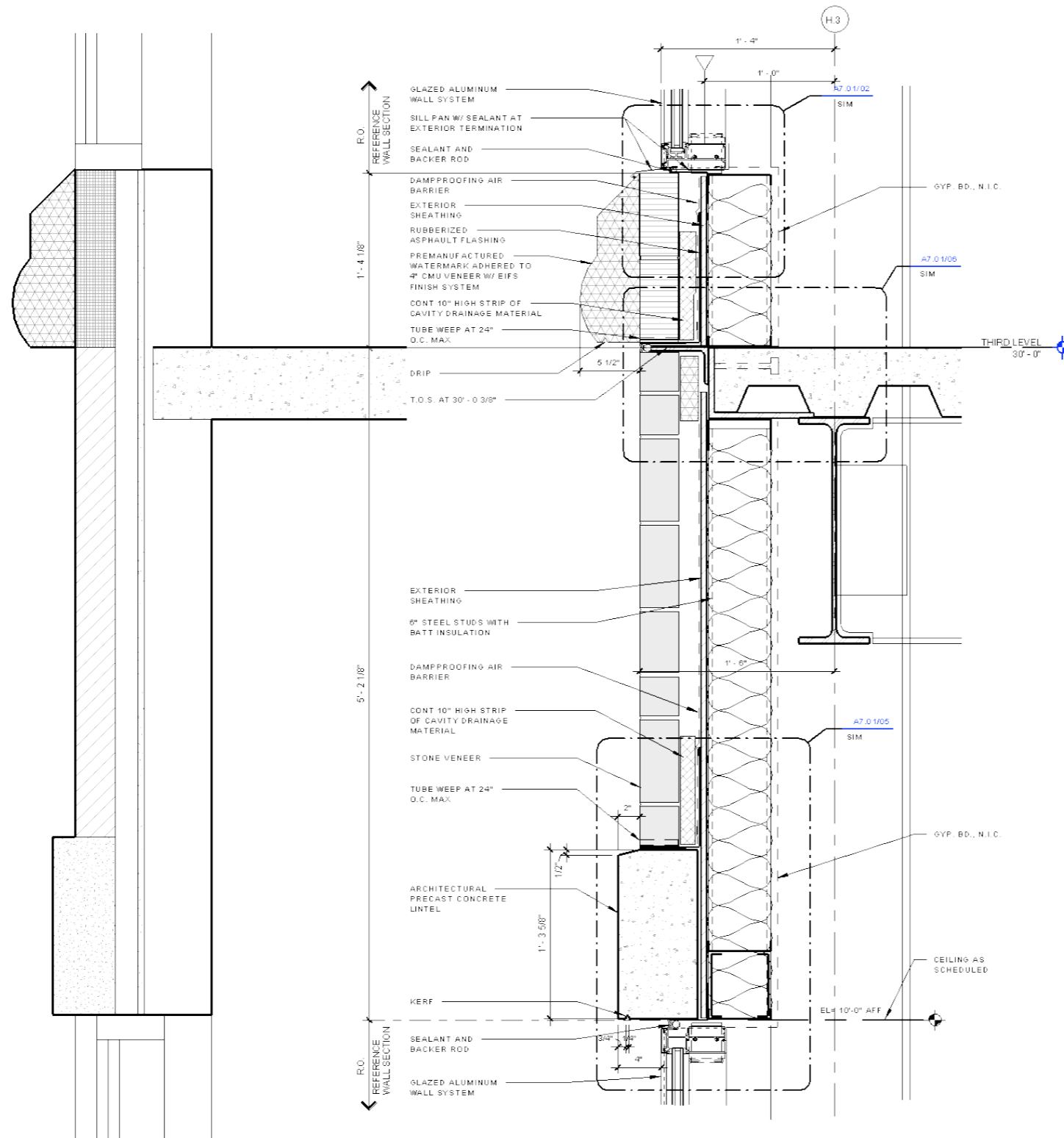
Details from Model

Courtesy HKS - AGC Presentation

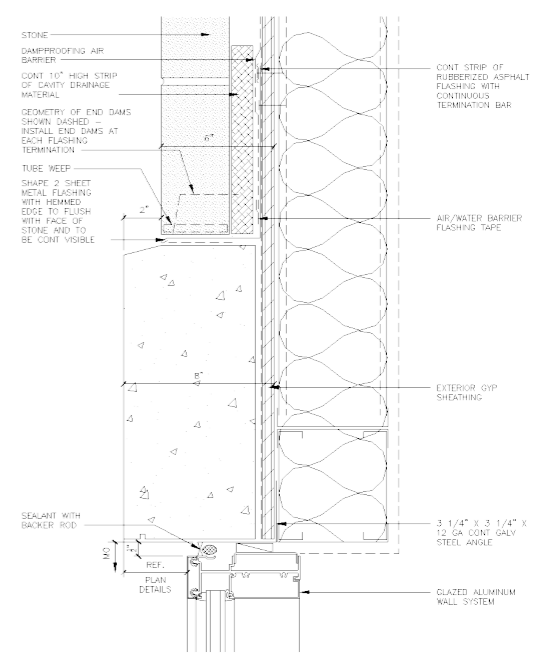


Details from Model

Courtesy HKS - AGC Presentation



02 SILL DETAIL AT GLAZED ALUMINUM WALL SYSTEM
3/8" = 1'-0"



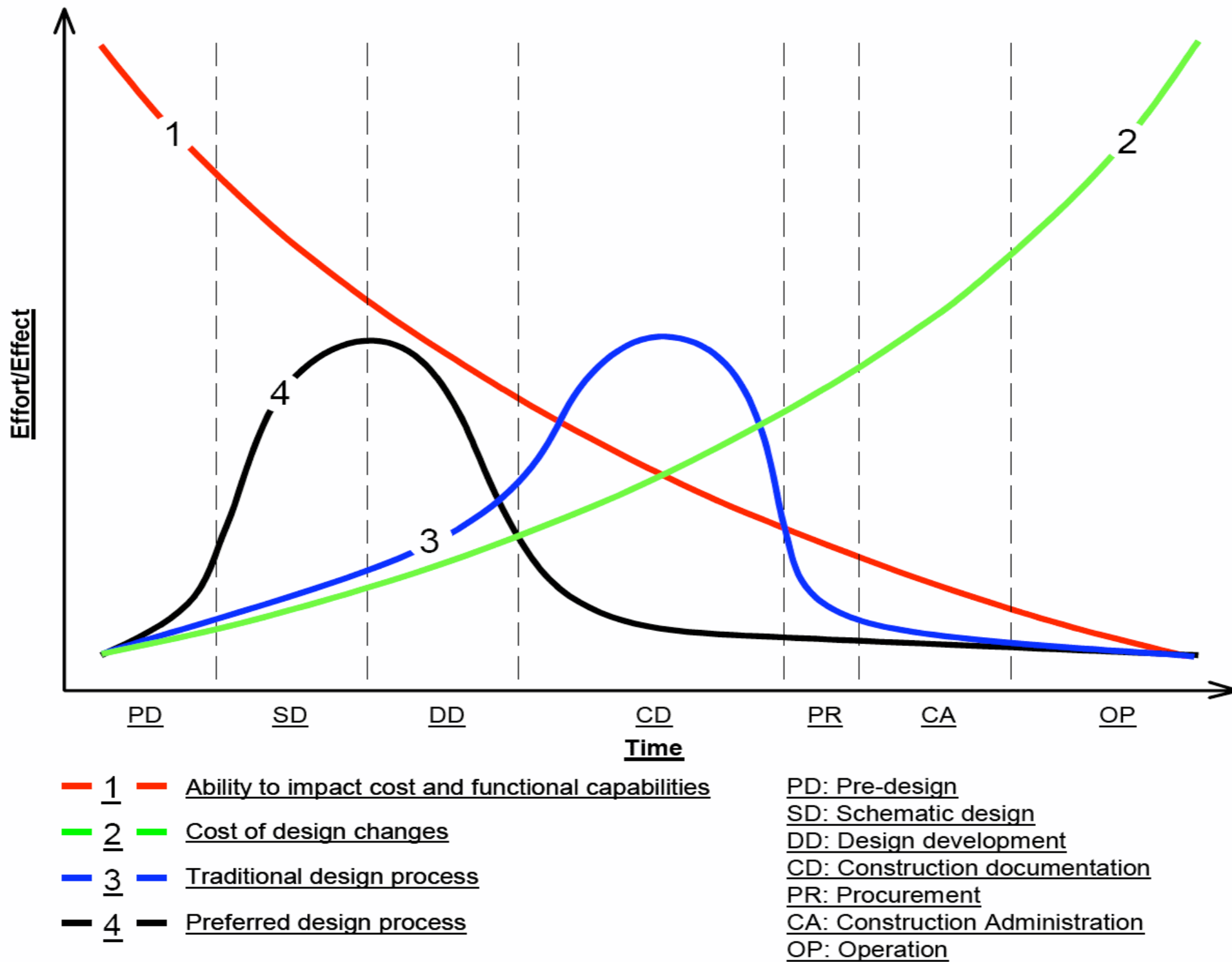
05 HEAD DETAIL AT GLAZED ALUMINUM WALL SYSTEM - LOOSE LINTEL
3/8" = 1'-0"

EDITOR'S NOTE:
FOR PRE-ASSEMBLED PUNCHED WINDOWS 10 FEET OR LESS IN WIDTH

Details from Model

Courtesy HKS - AGC Presentation

why change?



“The BIM Graph”

Graph Courtesy HOK

why change?

- global competition
- sustainability
- shop productivity up,
field productivity down
- manpower shortage

change is good

- better decisions, earlier
- platform for just-in-time expertise
- fewer construction changes
- more universal understanding
- potential for as-built drawings on steroids
- captures key information for facility management and operation
- potentially quicker to market
- better cost control - more real-time quantitative information
- performance analysis - more options
- simulation - manufacture

how will we get there?

integrated practice

- A collaborative, integrated design and building process encompassing all project stakeholders with the goal of **MAXIMIZING BUILDING PERFORMANCE.**



perspective matters

- designers - appearance and performance
- consultants - analysis and performance
- owners - financial, operations, and asset management
- contractors - cost and scheduling
- subcontractors - fabrication and installation
- code officials - compliance



it takes a village...

- buildings are not constructed directly from architect's drawings

workflow in an integrated practice

- Traditional delivery phases may change
- Program requirements solidify early
- Benefits from expertise early in the process
- Efficient and effective feedback loop required
- Interoperability important

...reducing latency and ambiguity in decision making is key

interoperability

- The goal of interoperability is a relatively loss-less transfer of intelligent building objects and information between software tools for analysis, collaboration, and simulation.
- One BIM tool does not fit all [yet]
- Two heads [or thousands of heads] are better than one
- We need to lengthen the useful life of our building information

interoperability initiatives

- Standards based - IFC, others
- User community based - AGC, AIA, CURT, IFMA
- Software based - open file formats

top things an owner should know

- BIM will result in better buildings
- Manage Expectations - BIM is not a Silver Bullet

From a 2006 presentation by popular software company:

BIM software eliminates defects caused by un-coordinated or poorly detailed drawings

Coordination is assured by the system

Document sets are more complete and understandable

Document sets are higher quality reducing construction costs

- BIM process is front-end loaded - timely decisions are critical
- BIM is very early in its adoption and development cycle

what can you do?

- Support BIM standards groups
- Get involved with other industry players
- Encourage the use of BIM on your projects
- Encourage software vendors to open their formats
- Push FM software vendors you may use to adopt standards and leverage BIM information