

Delivering Mass Timber Projects Through Competitive Bidding

Stephen Curtis
Buro Happold



Andrew Sniderman
KSS Architects



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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



Course Description

Mass timber projects often rely on early manufacturer involvement through design-assist or negotiated delivery. In contrast, publicly bid and other competitively procured projects require a different approach—one that accommodates multiple manufacturers with varying species, panel sizes, and layup limitations.

This session examines practical strategies for delivering mass timber projects under design-bid-build and competitive procurement frameworks. Using real project experience, presenters will discuss specification, detailing, and coordination techniques that support competitive bidding while maintaining performance, code compliance, and design intent. Attendees will gain actionable insights into reducing risk and increasing flexibility when bringing mass timber to public-sector projects.

Learning Objectives

1. Identify key challenges associated with delivering mass timber projects through design-bid-build and other competitive procurement methods, particularly in public-sector work.
2. Evaluate strategies for developing performance-based specifications and details that accommodate multiple mass timber manufacturers with varying species, panel sizes, and layup limitations.
3. Apply design and documentation approaches that support competitive bidding while maintaining structural performance, fire resistance, and code compliance for mass timber systems.
4. Recognize coordination best practices between architects, engineers, contractors, and manufacturers that reduce procurement risk and improve constructability in publicly bid mass timber projects.

Speakers List

- Stephen Curtis, Principal, Buro Happold Consulting Engineers
- Andrew Sniderman, Principal, KSS Architects



Acknowledgements/Credits

Amy Gutmann Hall

- Owner – University of Pennsylvania
- Architect – KSS Architects
- Architect – Lake|Flato
- MEP/FP – Buro Happold
- Structural – Buro Happold
- Civil – Pennoni
- Envelope – RWDI
- Landscape – Ground Control
- CM – Gilbane
- Mass Timber – Nordic Structures

Edelman Fossil Park & Museum

- Owner – Rowan University / GCIA
- Architect – KSS Architects
- Architect – Ennead Architects
- MEP/FP – Buro Happold
- Structural – Buro Happold
- Civil – Marathon
- Exhibit – Gallagher & Associates
- Landscape – SEEDdesign
- CM/GC – Jingoli / Dobco
- Mass Timber – Western Archrib

Introduction

Amy Gutmann Hall



Edelman Fossil Park & Museum



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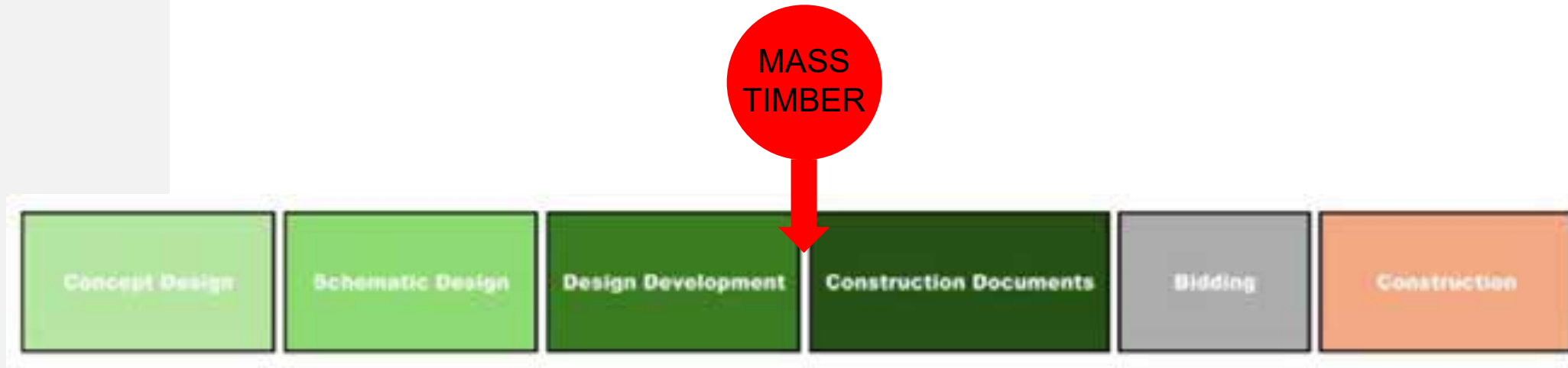
AGH **Design Assist, CM with GMP** **Publicly Bid, Low Bid Contractor** **EFM**



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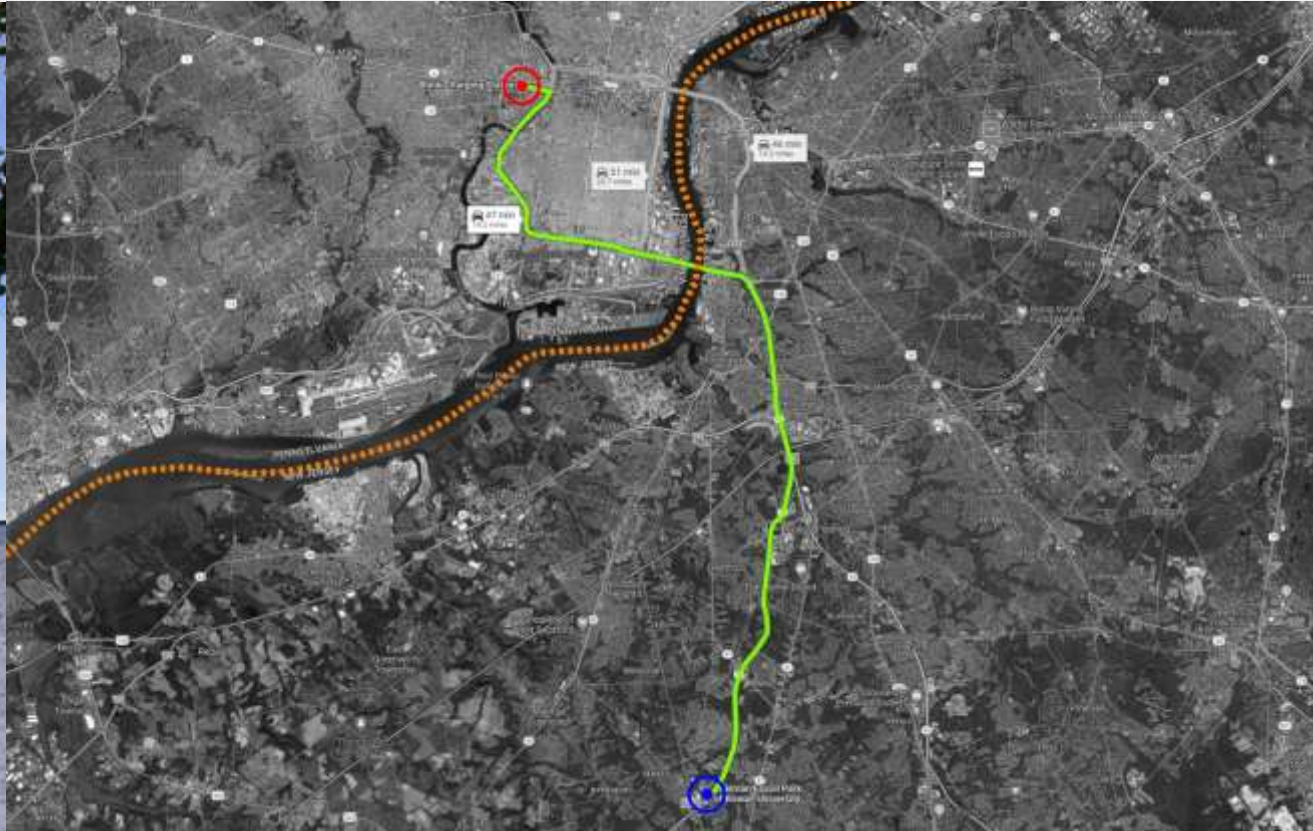


Project Information

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Pennsylvania New Jersey

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Data Science Museum

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Urban Rural

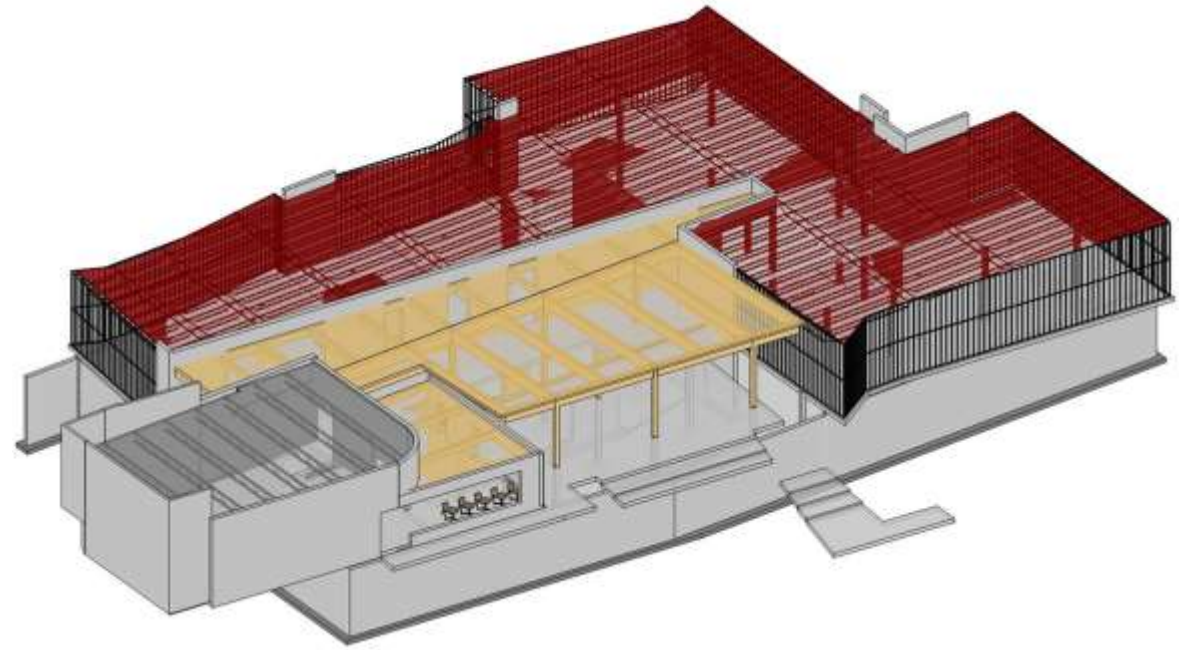
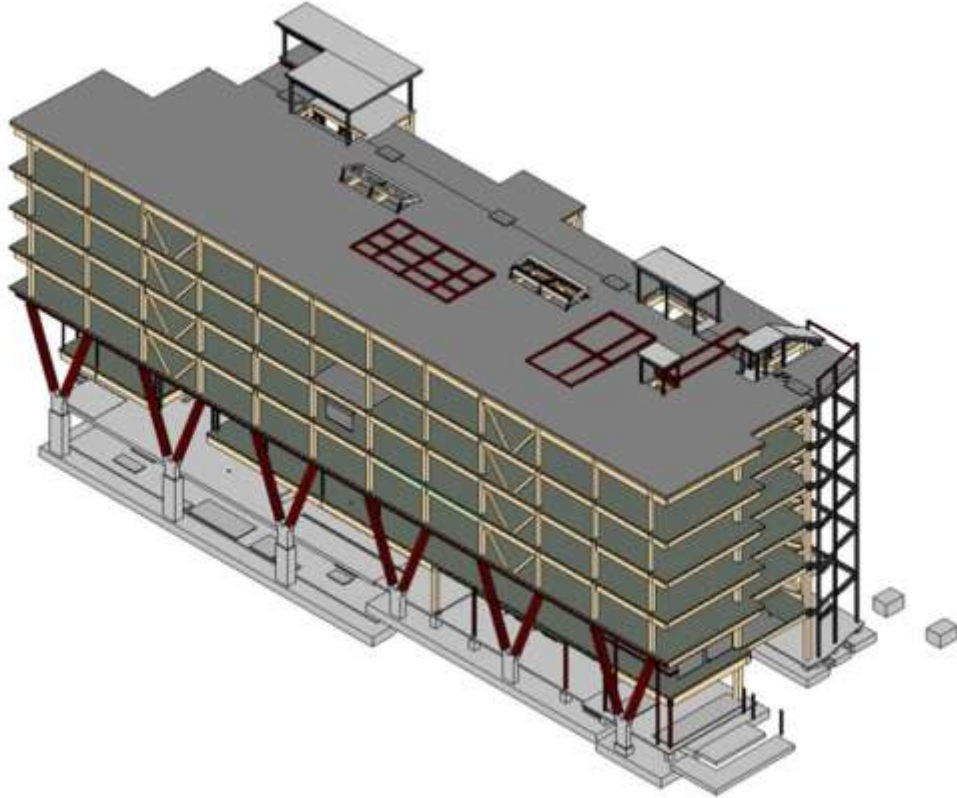
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117,000 SF 44,000 SF

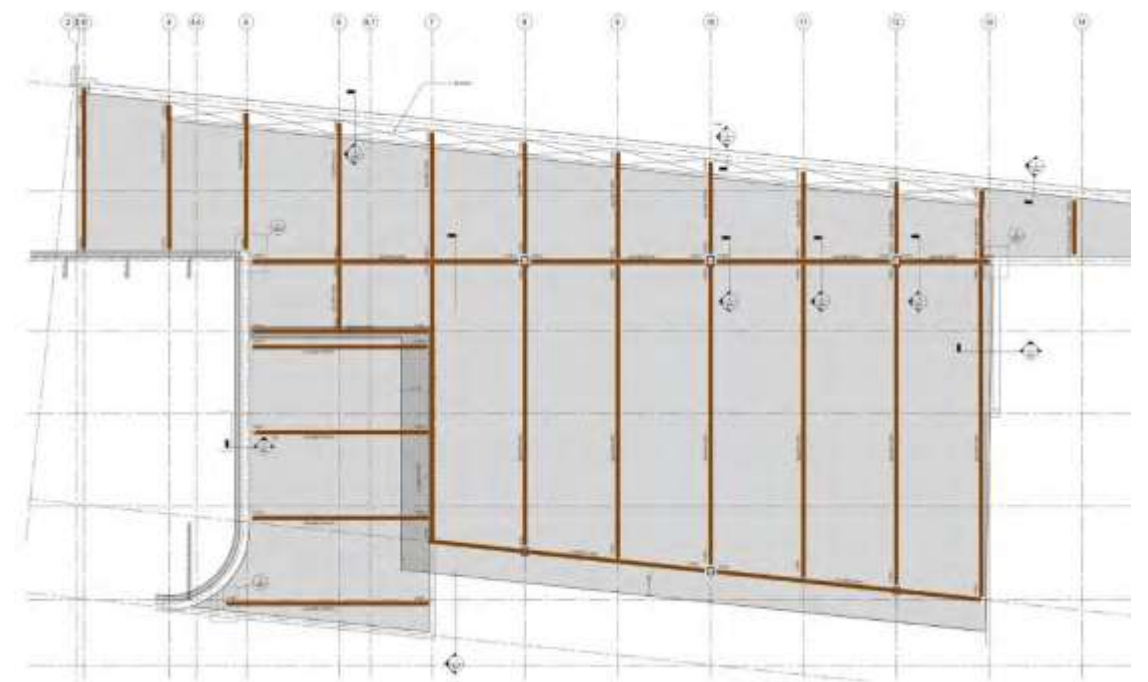
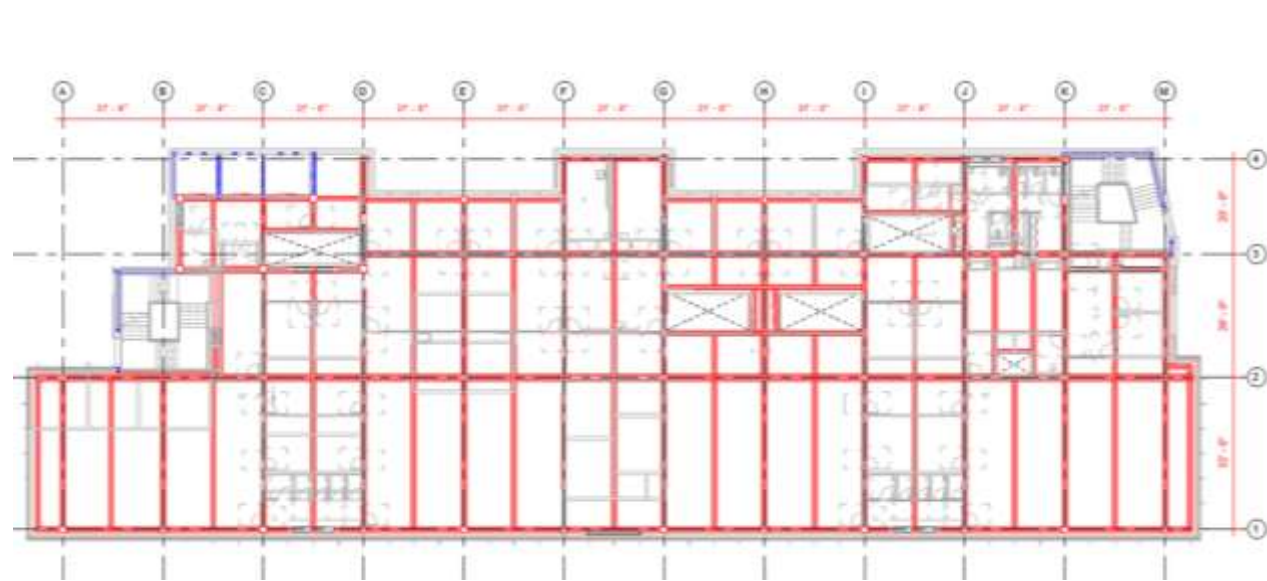
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Regular Irregular

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3A (IBC 2018)

5A (IBC 2018)

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Type IV	Heavy Timber	NO	due to concealed spaces
Type V	Any Material	NO	due to height/stories
Type III	Noncomb. Ext. Walls	YES	

- Construction Type: III-A
 - Primary structure: 1hr fire
 - Shafts and support frame: 2hr fire
- Occupancy Group: A & B
- Maximum Height to Roof: 85ft
 - Does not include overruns, RTUs
- Maximum stories:
 - Group A-3: 4
 - Group B: 6
 - Horizontal fire separation at Level 5
- Maximum Area: 42,000 sq ft / floor

Type IV	Heavy Timber	NO	due to hybrid structure
Type III	Noncomb. Ext. Walls	NO	due to FTO 14 specific to NJ DCA bearing walls to be masonry
Type IIB	Noncomb. Ext/Int	NO	due to wood columns at int.
Type VB	Any material	NO	due to height/floor area
Type VA	Any material	YES	

- Construction Type: V-A
 - Primary structure: 1hr fire
 - Bearing Walls: 1hr fire
- Occupancy Group: A-1, A-2, A-3, B, M
- Maximum Height to Roof: 44ft (70ft allowable)
- Maximum stories: Group A: 2
- Maximum Area: 34,500 sq ft / floor

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LEED ILFI

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Diagram illustrating the Living Building Challenge (LBC) certification process, showing the hierarchy of imperatives and the required performance levels for each.

LIVING BUILDING CHALLENGE

PETAL CERTIFICATION

One pillar of deep regenerative design built on a holistic high-performance foundation.

All Core Imperatives are required, plus the remaining Imperatives to complete either the Water, or Energy or Materials Petal.

CORE IMPERATIVES

Responding to climate change with holistic high performance.

Required Imperatives:

- C1 01 Ecology of Place
- C2 04 Human Scaled Living
- C3 05 Responsible Water Use
- C4 07 Energy + Carbon Reduction
- C5 09 Healthy Interior Environment
- C6 12 Responsible Materials
- C7 17 Universal Access
- C8 18 Inclusion
- C9 19 Beauty + Biophilia
- C10 20 Education + Inspiration

Water

- 06 Net Positive Water

Energy

- 08 Net Positive Carbon

Materials

- 13 Red List
- 14 Responsible Sourcing
- 15 Living Economy Sourcing
- 16 Net Positive Waste

Summit of holistic aspiration and attainment; fully regenerative.

All Imperatives must be achieved to certify.

Imperatives:

- 01 Ecology of Place
- 02 Urban Agriculture
- 03 Heat/Net Exchange
- 04 Human Scaled Living
- 05 Responsible Water Use
- 06 Net Positive Water
- 07 Energy + Carbon Reduction
- 08 Net Positive Carbon
- 09 Healthy Interior Environment
- 10 Healthy Interior Performance
- 11 Access to Nature
- 12 Responsible Materials
- 13 Red List
- 14 Responsible Sourcing
- 15 Living Economy Sourcing
- 16 Net Positive Waste
- 17 Universal Access
- 18 Inclusion
- 19 Beauty + Biophilia
- 20 Education + Inspiration

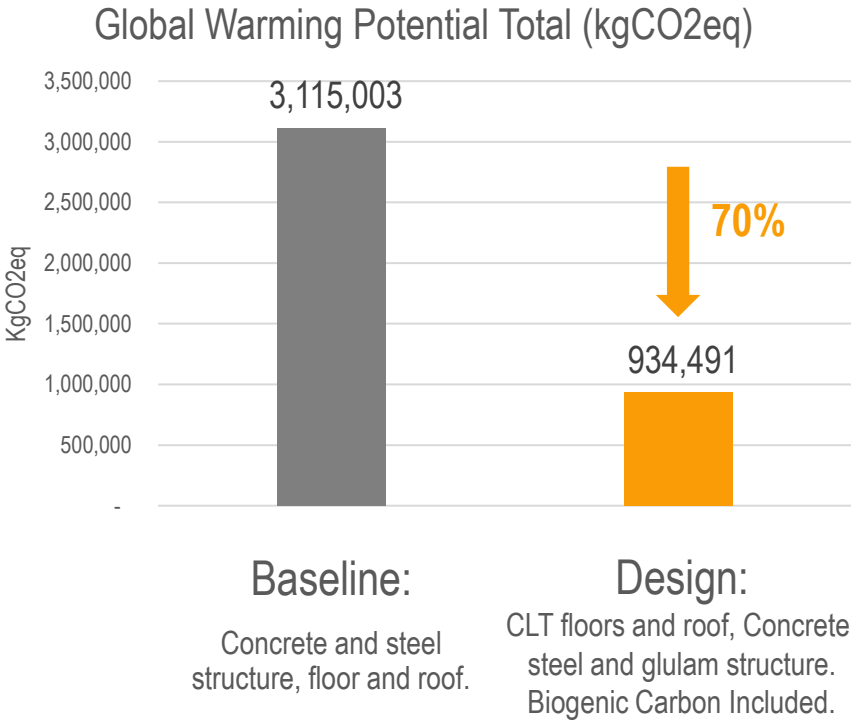


Figure 8. Benchmarking for LBC (kgCO₂e/m²)

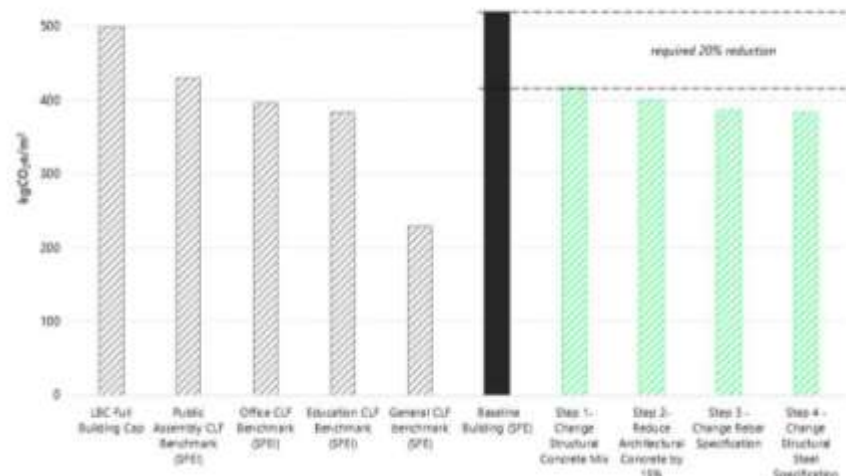


Table 3. High Priority Embodied Carbon Reduction Strategies

Strategies	Typical kgCO ₂ e/kg	Alternative kgCO ₂ e/kg	Compliant Provider
Step 1 - Change Structural Concrete Mix	0.2	0.14	Eastern Concrete
Step 2 - Reduce Architectural Concrete by 15%	-	-	N/A
Step 3 - Change Rebar Specification	0.9	0.73	Victory Steel
Step 4 - Change Structural Steel Specification	2.5	0.74	Gerdau

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Classroom Lobby

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Procurement

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Public Bidding

GLOUCESTER COUNTY IMPROVEMENT AUTHORITY NOTICE TO BIDDERS

Notice is hereby given that sealed bids will be received by the Gloucester County Improvement Authority on **Tuesday, April 6, 2021 at 1:00 PM**, prevailing time at the Gloucester County Improvement Authority Administrative Office, located at 109 Budd Boulevard, Woodbury, NJ 08096, All Bids must be deposited in the Drop Box at GCIA. Bids will be opened and read via Zoom by GCIA, same day on April 6, 2021 at 2:00 PM. for:

**Contract # 21-00001 – Jean & Ric Edelman Fossil Park of Rowan University
General Construction**

Due to COVID-19 restrictions, the bid opening will be virtual and can be accessed via the GCIA's website: <https://www.gcia.nj.com/>. All those who will be attending the virtual opening will be required to sign in to the website, and will not have access to microphone and video. All those who access the public virtual opening via the GCIA's website, acknowledge and certify that by obtaining access they will not be using the video or information contained in the live stream virtual opening for an improper or illegal purpose. Further, viewers certify that they will not disseminate the information contained therein to any third parties for profit or misuse by the viewer. The GCIA reserves all rights associated with the virtual opening of the bids on this Project.

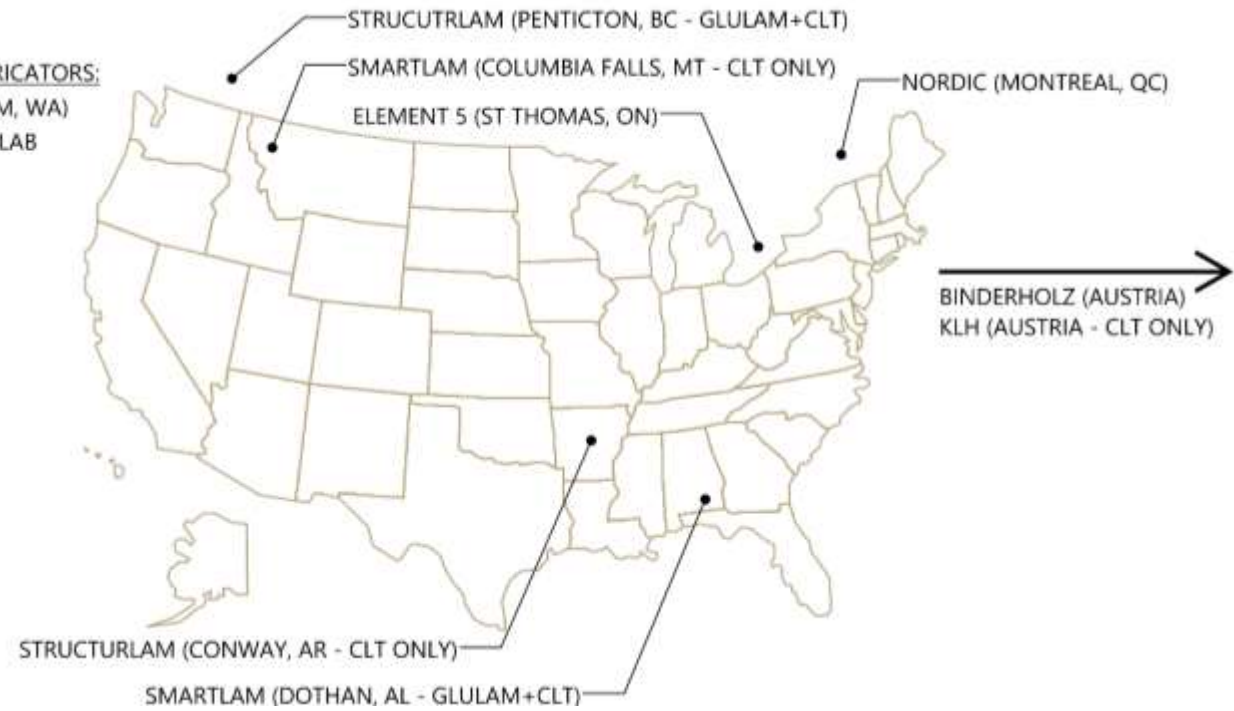
Specifications, instructions to bidders and proposal forms may be obtained at the office of the Gloucester County Improvement Authority, 109 Budd Boulevard, Woodbury, NJ 08096; upon a non-refundable payment of \$100.00 for a disk (Bidders are responsible for the cost of all reproductions). Payments (non-refundable) should be made via certified check or money order, made payable to the GCIA. Plans and specifications will be available beginning on **Tuesday, February 9, 2021**, between the hours of 9:00am and 4:30pm, Monday through Friday, except legal holidays. Bids will be made on the proposal form provided, in the manner designated therein and required in the specifications, enclosed in an opaque sealed envelope and plainly marked on the outside with the date, time and Contract being bid.



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Design Assist

CONTRACTORS / FABRICATORS:
SEAGATE (BELLINGHAM, WA)
SWINERTON / TIMBERLAB
(PORTLAND, OR)



MASS
TIMBER

Concept Design

Schematic Design

Design Development

Construction Documents

Bidding

Construction

AGH

Design Assist

REQUEST FOR PROPOSAL (RFP)
Mass Timber Design Assist Pre-Construction and Construction Services

August 13, 2025

1. PROJECT

A. Title:

University of Pennsylvania SEAS Data Sciences Building

B. Project Site Location:

3366 Chestnut St
Philadelphia, Pa. 19104

C. Project Team:

Owner: University of Pennsylvania (UPENN)
Construction Manager/General Contractor: Gilbane
Architect: Lohan/Flato Architects
Austin, TX
Structural Engineers: Buro Happold

D. Project Schedule:

RFP Response & Proposals Due: 03/26/25 2pm
Schematic Design Phase: Complete
Design Development Phase: September 2025 – December 2025
50% CD's: May 2025 – September 2025
Construction Documents Phase: November 2025 – February 2026
Construction Phase: April 2026 – March 2028

E. Project Description:

120,000 Square foot - 8 Story dry lab research, office and teaching building. This building will be the final point for data science and engineering, bringing all schools on campus. Project LEED requirements to Silver with a goal to reach Platinum

	MASS TIMBER
1	BASE PRICE
2	Design / Assist - Phase 1
3	Design / Assist - Phase 2
4	Mass Timber - Glulams
5	V-Columns
6	CLT
7	139mm/143mm CLT Panels H.O 175mm
8	Connections - Timber to Timber
9	Concealed Connectors
10	Fire Rated Connectors
11	Lifting Inserts
12	Connections Megant Connectors
13	Brace Frame Hardware, Drag Strut Metals, Screws, Misc Metals
14	Beam Penetrations
15	Scaler - Glulam Scaler (6) Sides
16	Scaler - CLT Scaler (5) Sides
17	Erection
18	Tower Crane

Budget
Design Assist
Shop Draw
Fabricate, deliver and install
Engineering
Erection Subcontractor
Mass Timber - Glulam
CLT Product
CLT - PRG 300 Certified
CLT - Fire Testing
Company History/Experience
Species (see below)
Structural Characteristics
Appearance Quality
Cost Transparency
Relevant Project Experience (See below)
- Number of mass timber buildings 5 stories and higher
- Number of mass timber buildings constructed in an urban setting
- Number of mass timber buildings for a University client
- Number of mass timber buildings designed and constructed in the U.S.
- Number of mass timber buildings more than 100,000 GSF
- Number of mass timber buildings with a mass timber value greater than \$4M US
Harvesting
Shop Drawings including review/approval
Fabrication (Harvest to Delivery)
Erection
Glulams / Photo Contract
Insurance per contract Documents
Financial Strength (See below)



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Design Assist



	Architect	Structural EOR	Timber Fabricator (GC)
Group / Occupancy	Select per code and program	Advise on selection	-
Fire rating	Establish requirements	Design members for fire rating	Consider in connection design
Material / Species	Specify appearance and finish	Advise on design implications, specify species, use in design	Provide specified material or acceptable substitute
Member design	Advise on sizes and layouts	Specify loads and criteria, provide basis of design member sizes	Confirm member sizes with actual material provided
Connections	Advise on appearance	Provide forces, schematic details	Design, detail, and stamp
Drawings	Provide fire rating drawings and details, other critical details	Provide stamped permit set	Provide stamped layout drawings and connection details
Interface with other STR trades	-	Design steel / concrete members, provide forces and details	Design timber components and coordinate through GC

Documentation

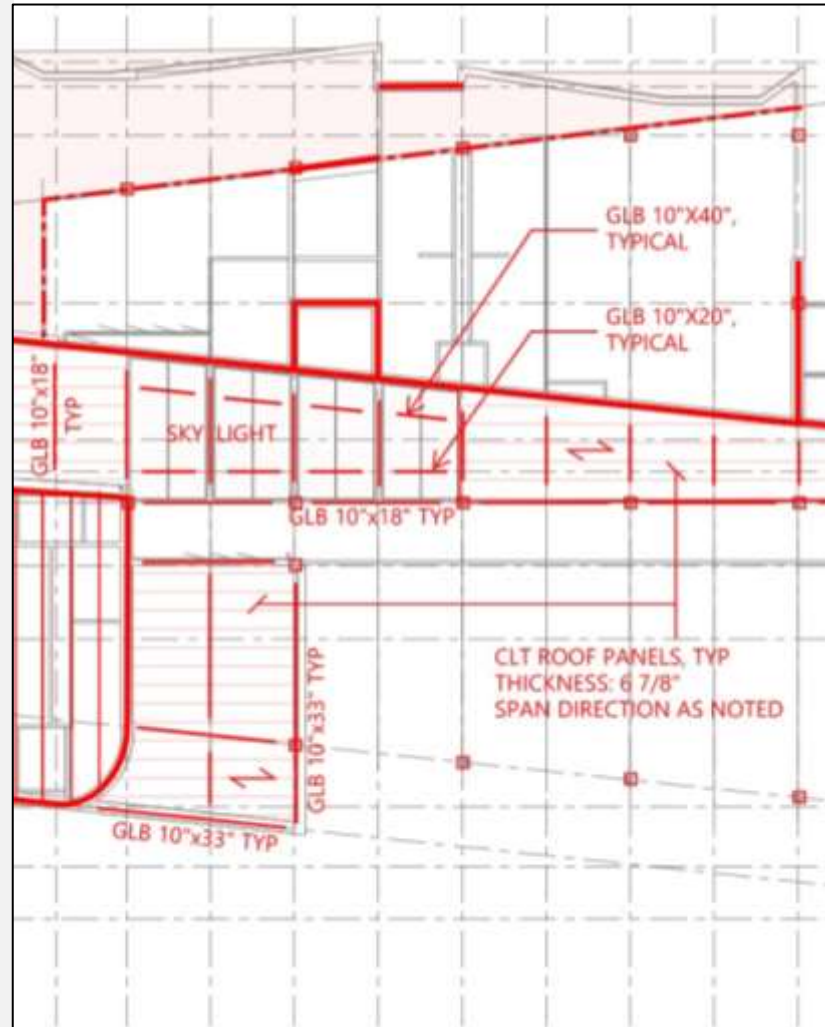
EFM

Framing & Deck Documents

SD = 6 7/8"

CD = 6 7/8"

CA = 5 1/8"



AGH

Framing & Deck Documents


SD = 6 7/8"




CD = 5 5/8"



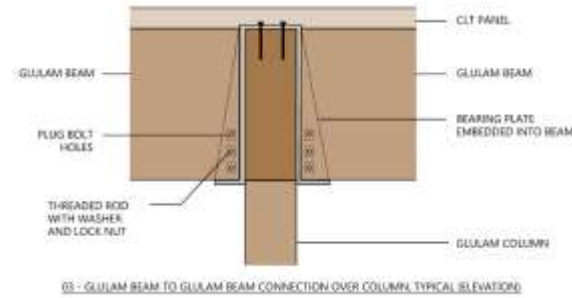
CA = 5 5/8"



EFM

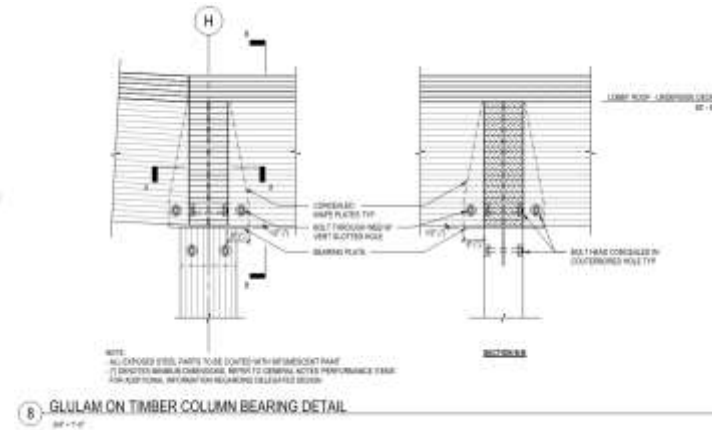
Connection Details

SD



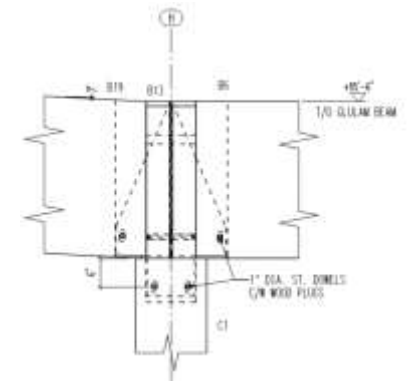
03 - GLULAM BEAM TO GLULAM BEAM CONNECTION OVER COLUMN, TYPICAL ELEVATION

CD



04 - GLULAM ON TIMBER COLUMN BEARING DETAIL

CA

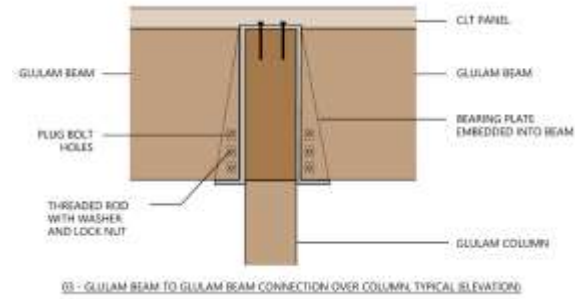


SIZES INDICATED ON DRAWINGS ARE BASIS OF DESIGN AND ARE TO BE CONFIRMED BY CONTRACTOR'S ENGINEER. SIZES ARE BASED ON GRADE V1. CONTRACTOR MAY USE ANY SPECIES OR GRADE THAT CONFORMS WITH THE PERFORMANCE SPECIFICATION AND DOES NOT INCREASE THE SIZES INDICATED ON THE DRAWINGS. SEE SPECIFICATIONS FOR FURTHER INFORMATION ON SPECIES.

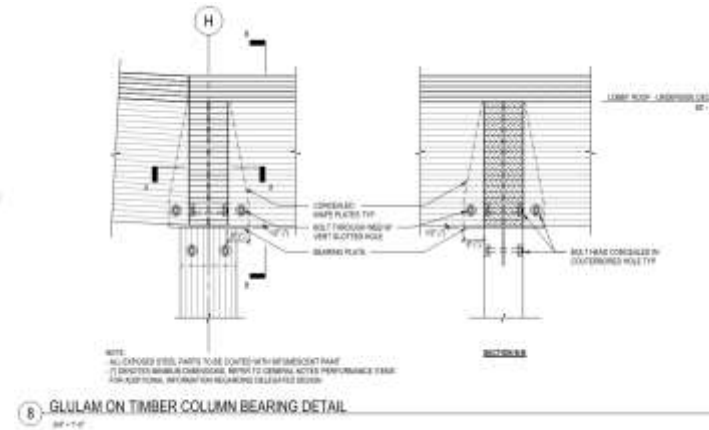
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Connection Details

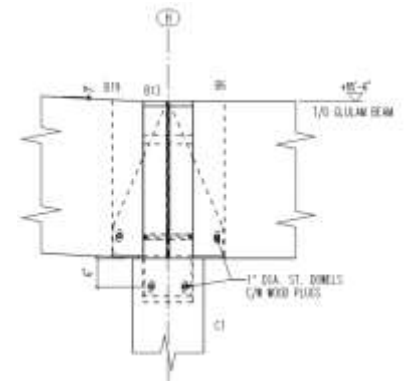
SD



CD



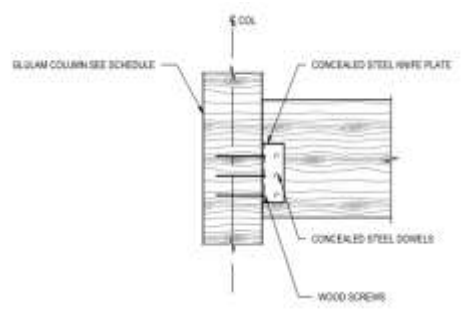
CA



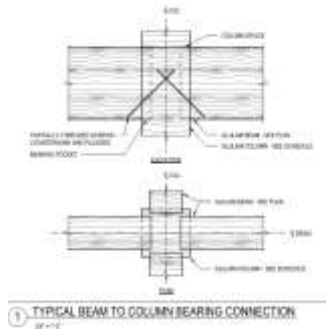
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Connection Details

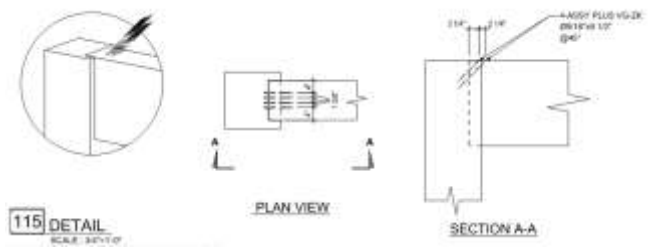
SD



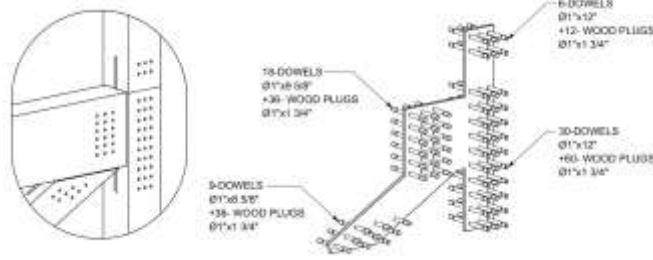
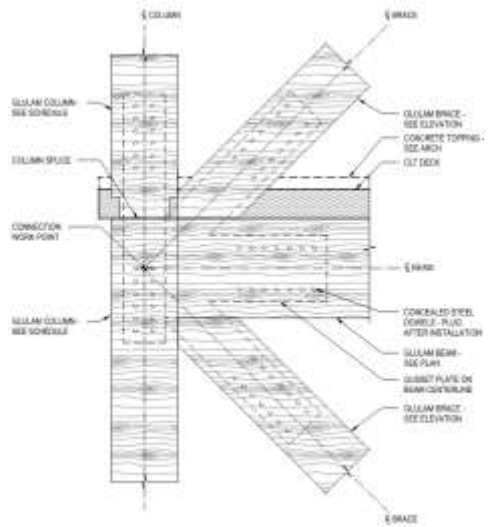
CD



CA



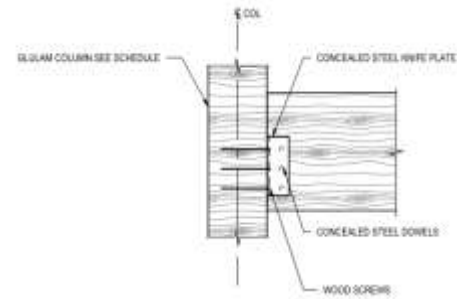
TYPICAL GLULAM BEAM TO COLUMN SHEAR CONNECTION



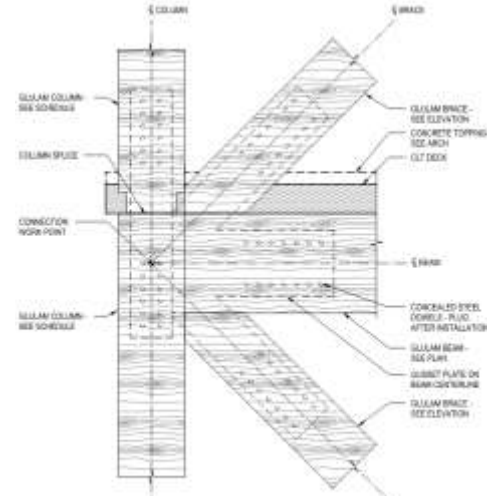
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Connection Details

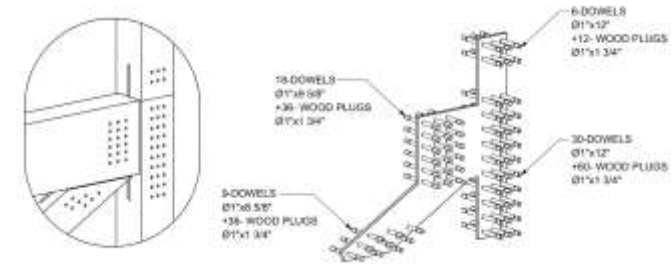
SD



CD



CA



TYPICAL GLULAM BEAM TO COLUMN SHEAR CONNECTION



Wood Species Selection

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Douglas Fir



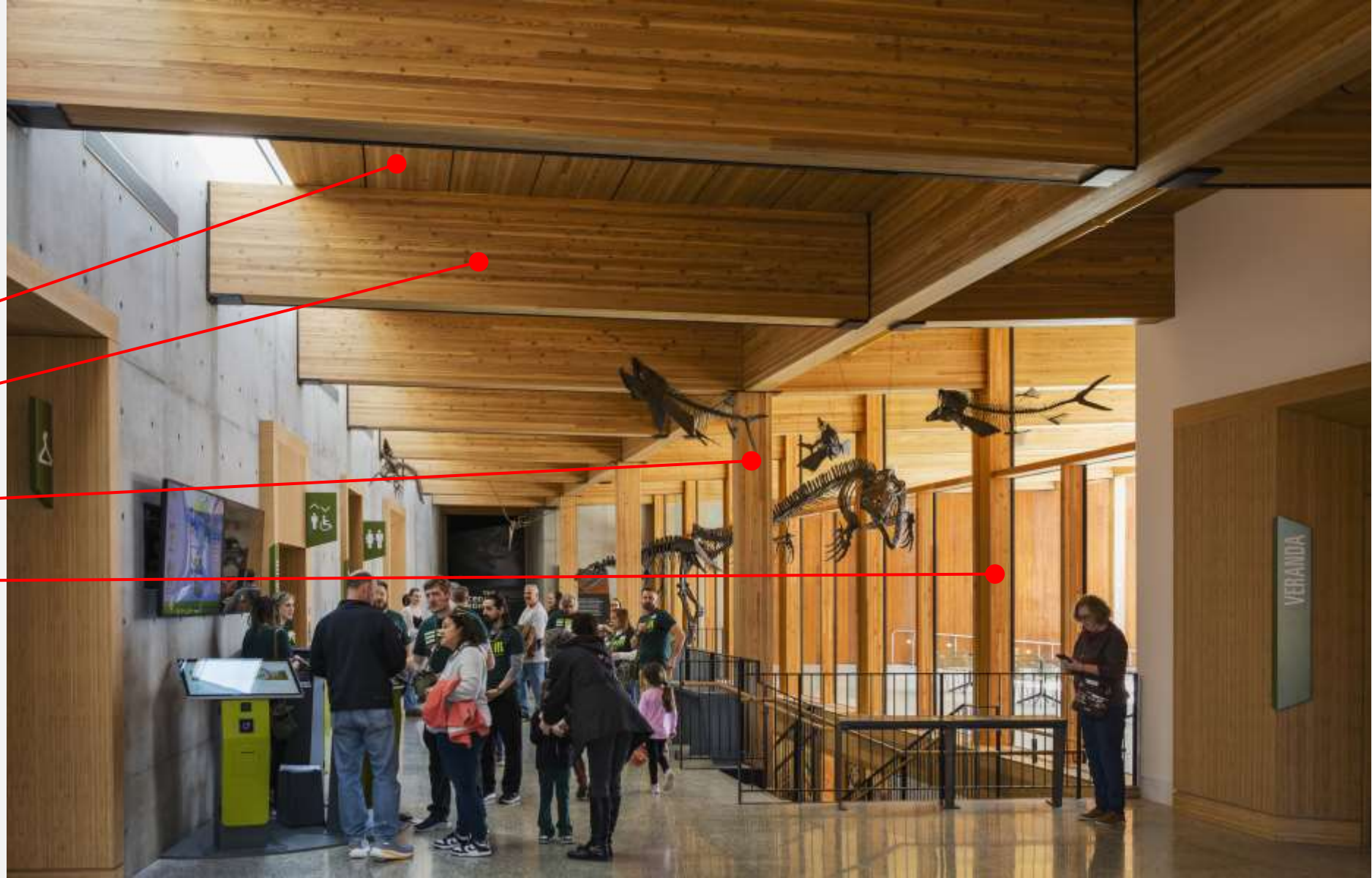
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Decking

Beams

Columns

Curtainwall



EFM

Decking

Beams

Columns

Curtainwall

061800 – Glue Laminated Timber Construction

C. Species and Grades for Structural Glued-Laminated Timber: Douglas Fir, grades must comply with “Performance Requirements” Article.

PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer to design structural glued-laminated timber and connectors. Design of glulam members and their connections shall be performed by a qualified engineer licensed in the state of the project. At the library, include a comprehensive engineering analysis, using the loads and criteria indicated on the drawings.

061801 – Cross Laminated Timber

F. Species: Douglas Fir or Southern Yellow Pine

PERFORMANCE REQUIREMENTS

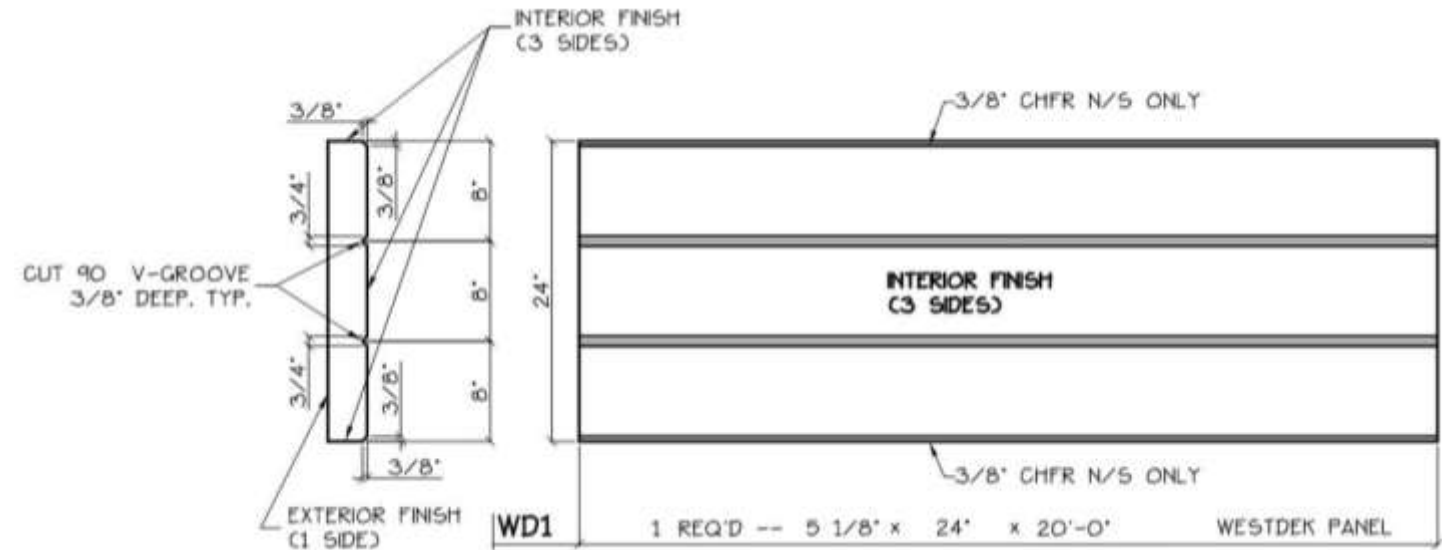
A. Delegated Design: Engage a qualified professional engineer to design structural cross-laminated timber connections. Design of cross laminated timber connections shall be performed by a qualified engineer licensed in the state of the project. Connections shall be designed for the forces indicated on the drawings and be in conformance with ASCE 7, AWC NDS and ICC IBC standards.

084411 – Glazed Wood Curtain Walls

a. Douglas Fir glue-laminated, 2400 psi fiber stress.

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CLT to GLT



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CLT to GLT



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Black Spruce



AGH

Beams

Decking

Slats

Columns



AGH

Beams

Decking

Slats

Columns

061800 – Glue Laminated Timber Construction

Manufacturers: Subject to compliance with requirements, provide products by:

1. Nordic Structures.

SIZES INDICATED ON DRAWINGS ARE BASIS OF DESIGN AND ARE TO BE CONFIRMED BY CONTRACTOR'S ENGINEER. CONTRACTOR MAY USE ANY SPECIES OR GRADE THAT CONFORMS WITH THE PERFORMANCE SPECIFICATION AND DOES NOT INCREASE THE SIZES INDICATED ON THE DRAWINGS.

ALL MEMBERS CALLED OUT AS GLULAM BEAMS ARE BASED ON THE FOLLOWING PROPERTIES:

A. SPECIES: SPRUCE-PINE-FIR

061801 – Cross Laminated Timber

Manufacturers: Subject to compliance with requirements, provide products by:

1. Nordic Structures.

ALL DECKS CALLED OUT AS CROSS LAMINATED TIMBER ARE BASED ON THE FOLLOWING PROPERTIES:

A. SPECIES: SPRUCE-PINE-FIR

B. STRESS GRADE: E1

C. SERVICE GRADE: INTERIOR

064023 – Architectural Woodwork, 095426 – Linear Wood Ceilings

Wood Slat Panels: 9Wood Inc., 1100 Cross Piece Grille, same as wood ceiling product specified in Section 095426.

1. Species:

a. Finish 1: Western Hemlock, maple stain

b. Finish 2: Western Hemlock, black opaque.

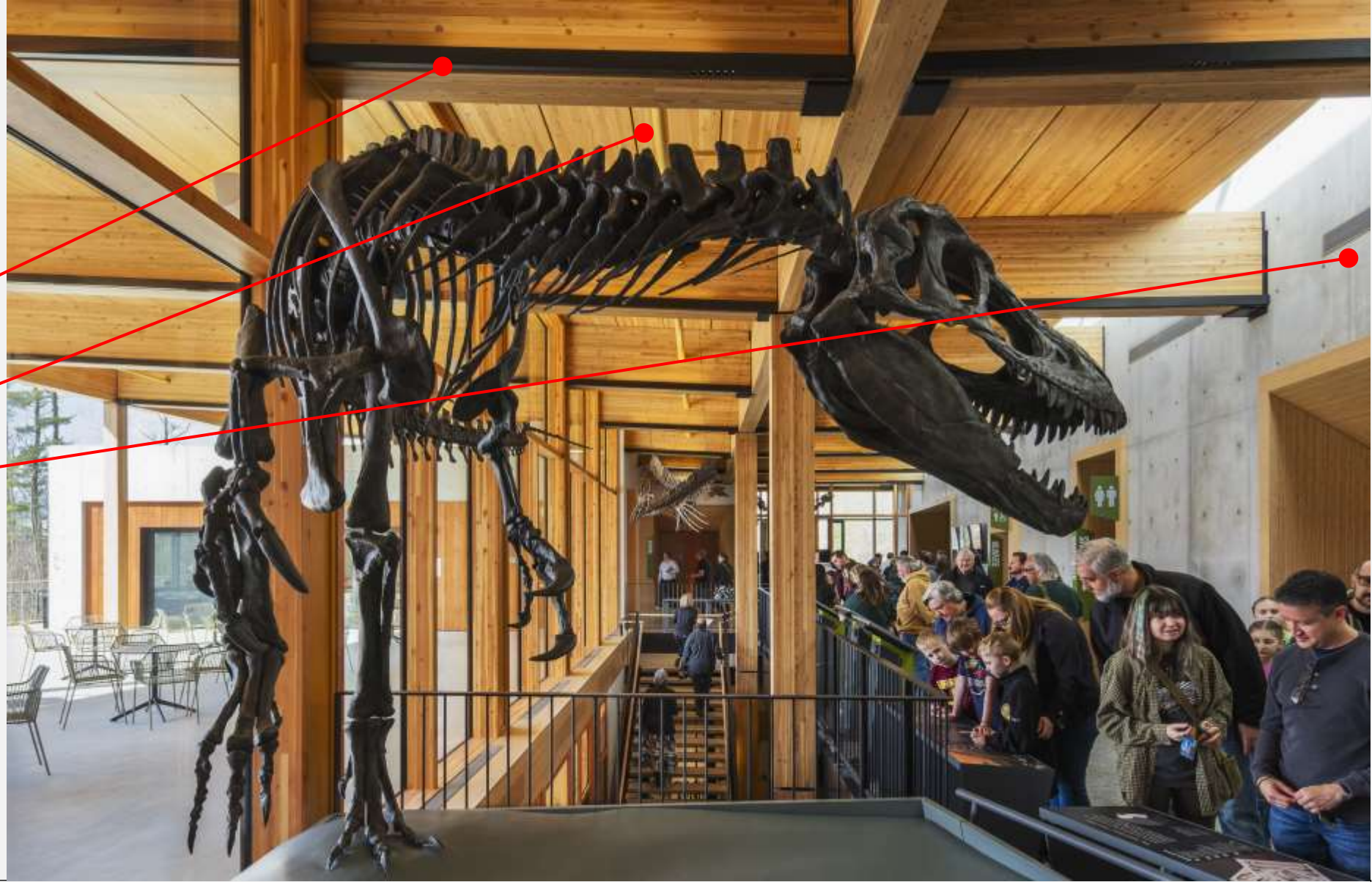
Coordination

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Lighting

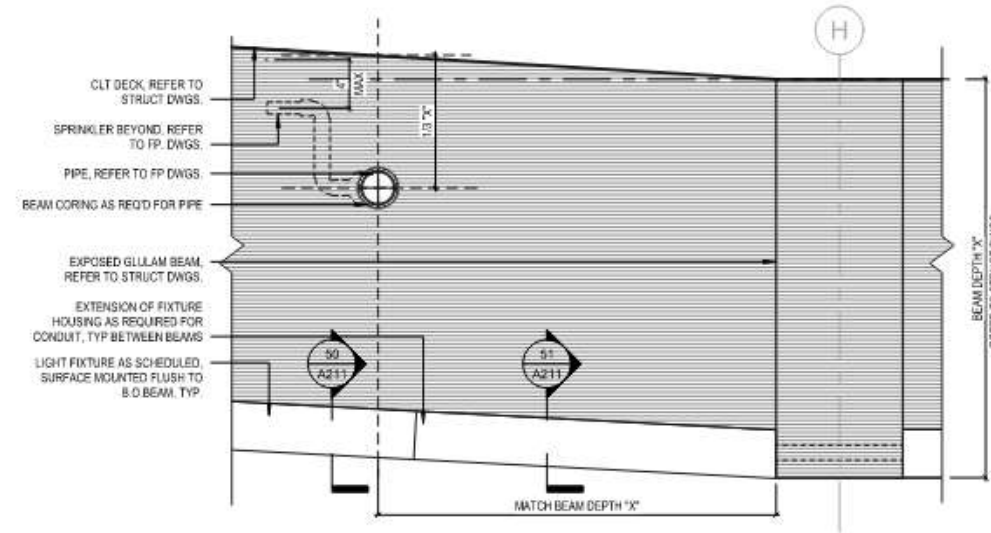
Sprinklers

HVAC

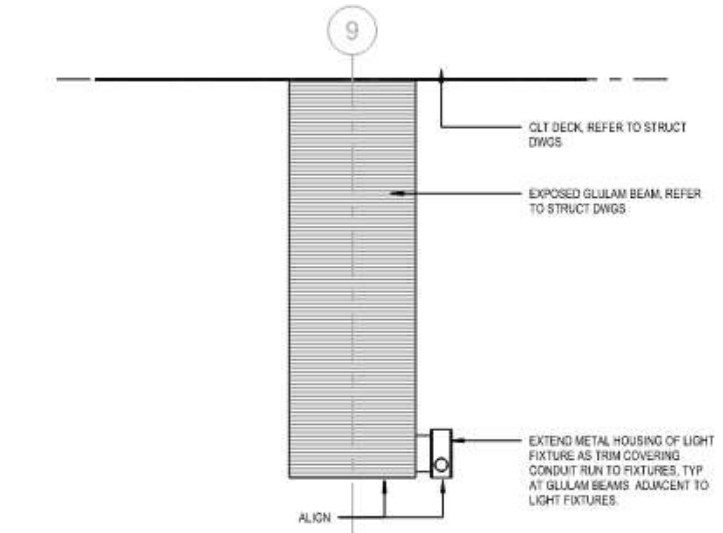
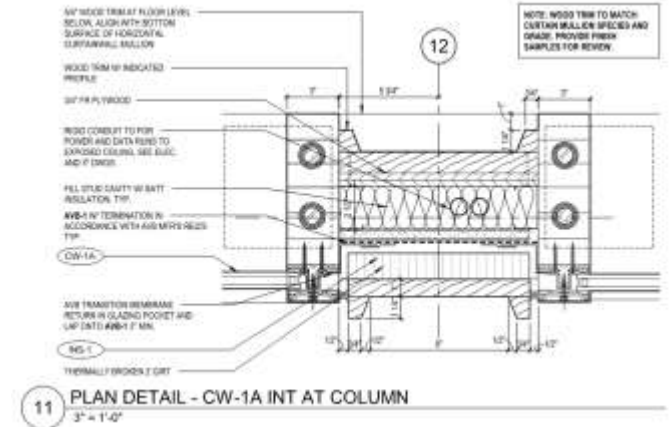


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Documents



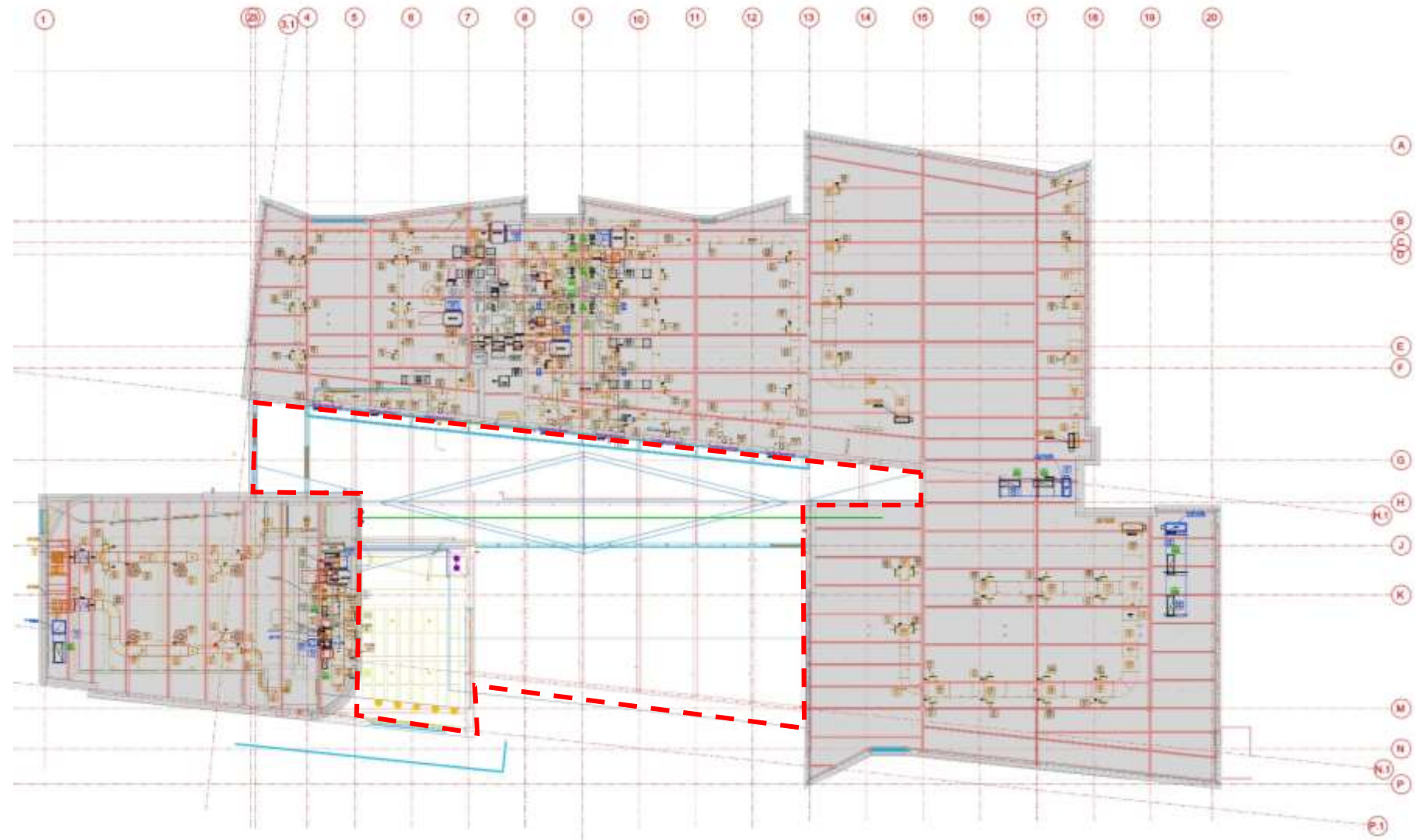
52 SECT DETAIL - L1 LOBBY - SPRINKLER PEN. OF GLULAM
1 1/2" = 1'-0"



51 SECT DETAIL - L1 LOBBY - CONDUIT @ GLULAM
1 1/2" = 1'-0"

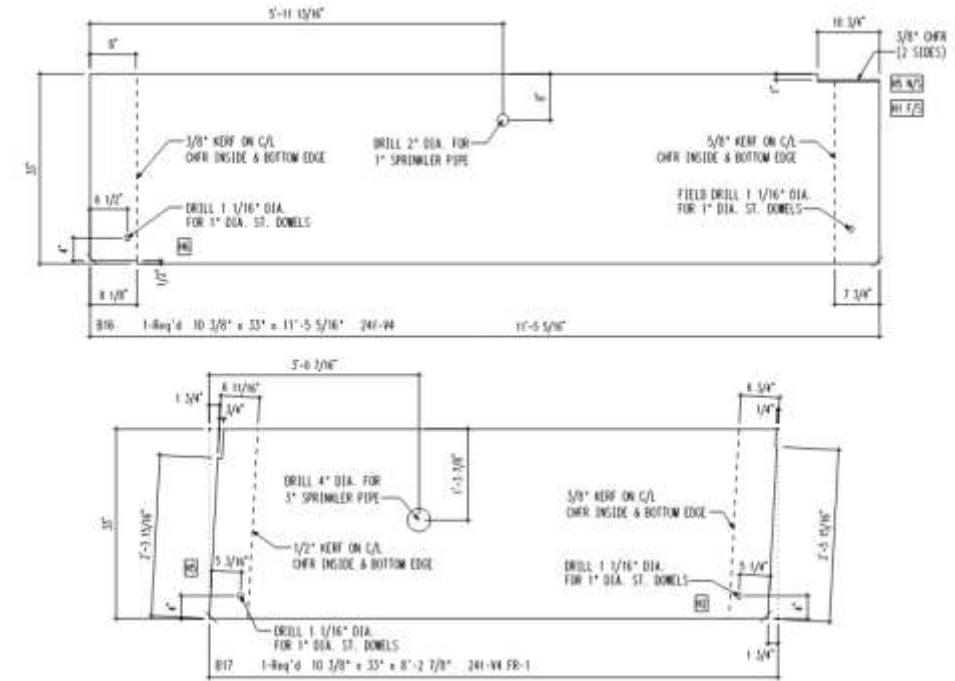
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Coordination Drawings in CA



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Coordination in Shop Drawings



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Lighting

Sprinklers

HVAC

Low Voltage



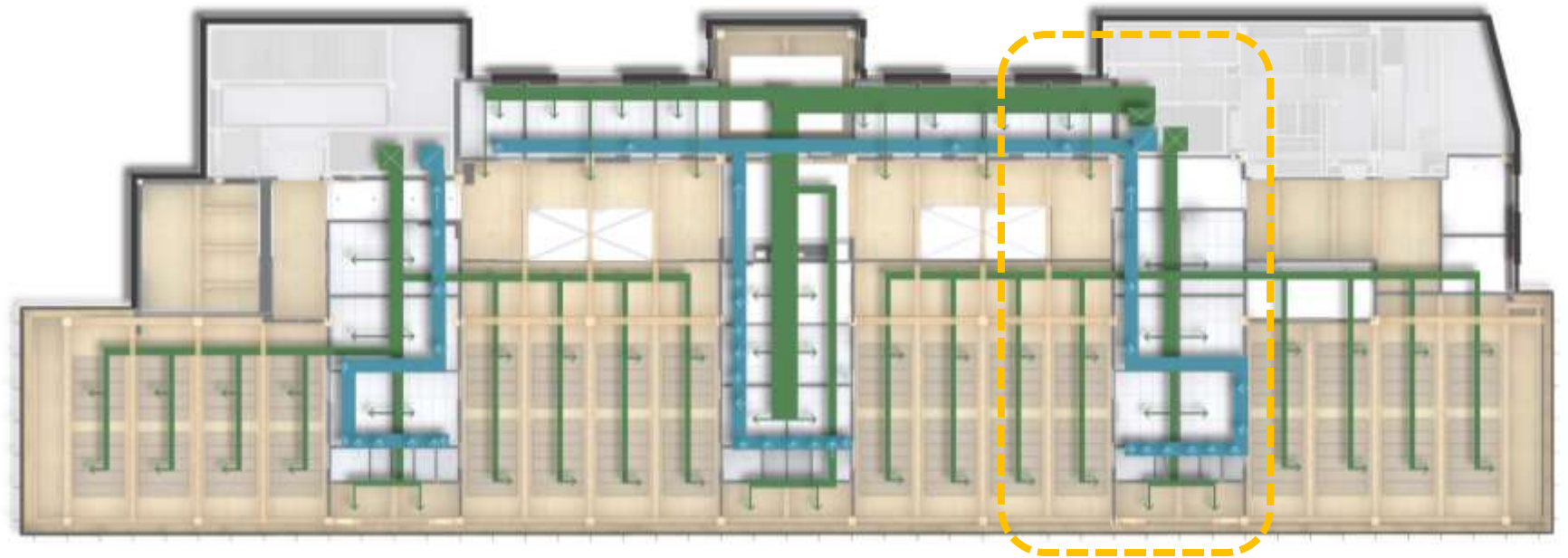
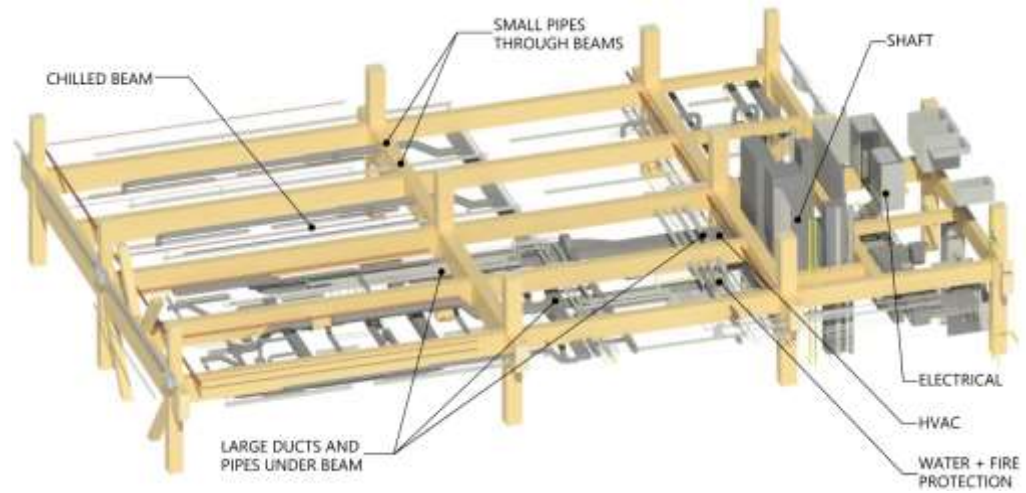
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Design Assist
Mass Timber



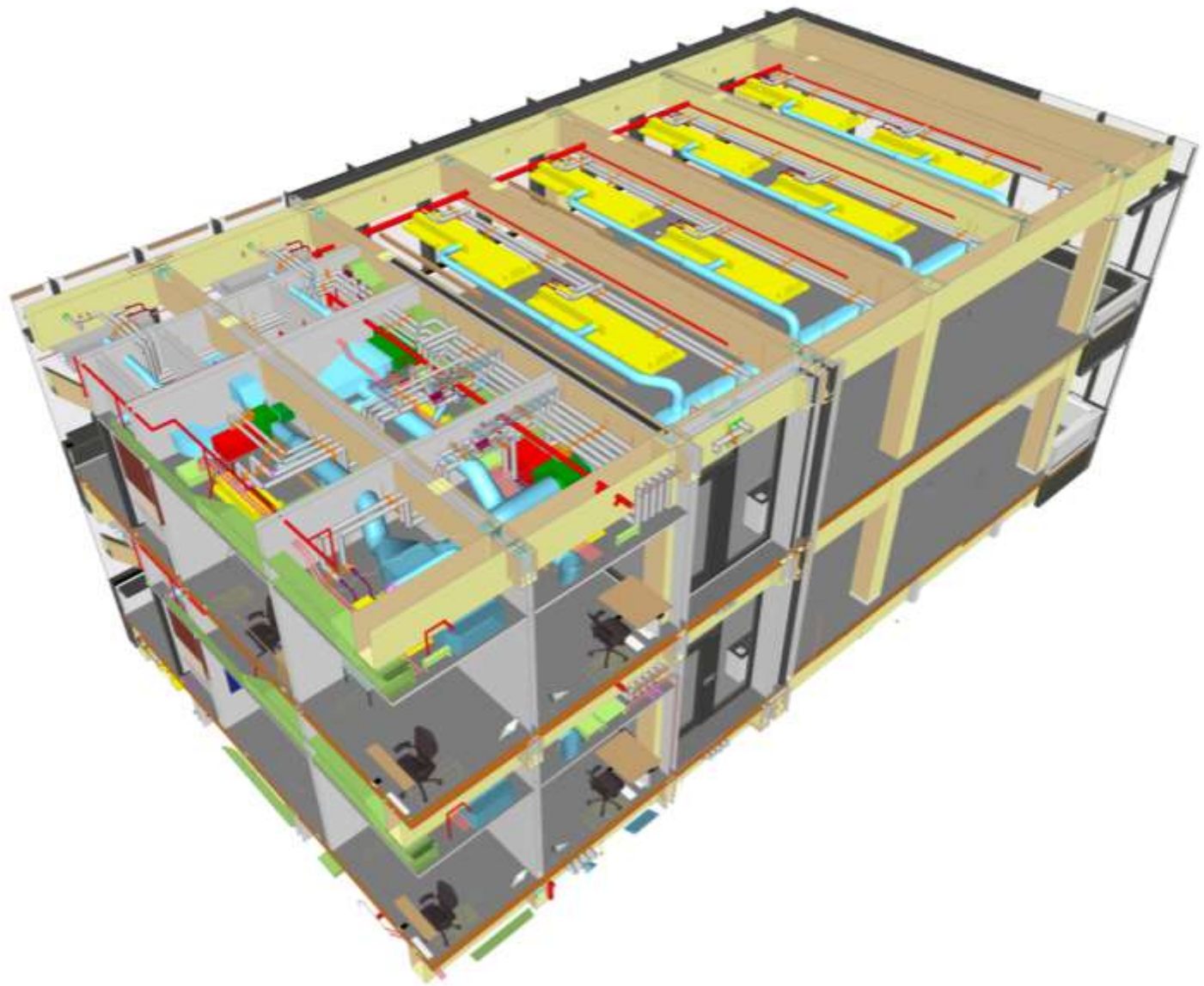
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Design Assist Coordination



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CA
Coordination



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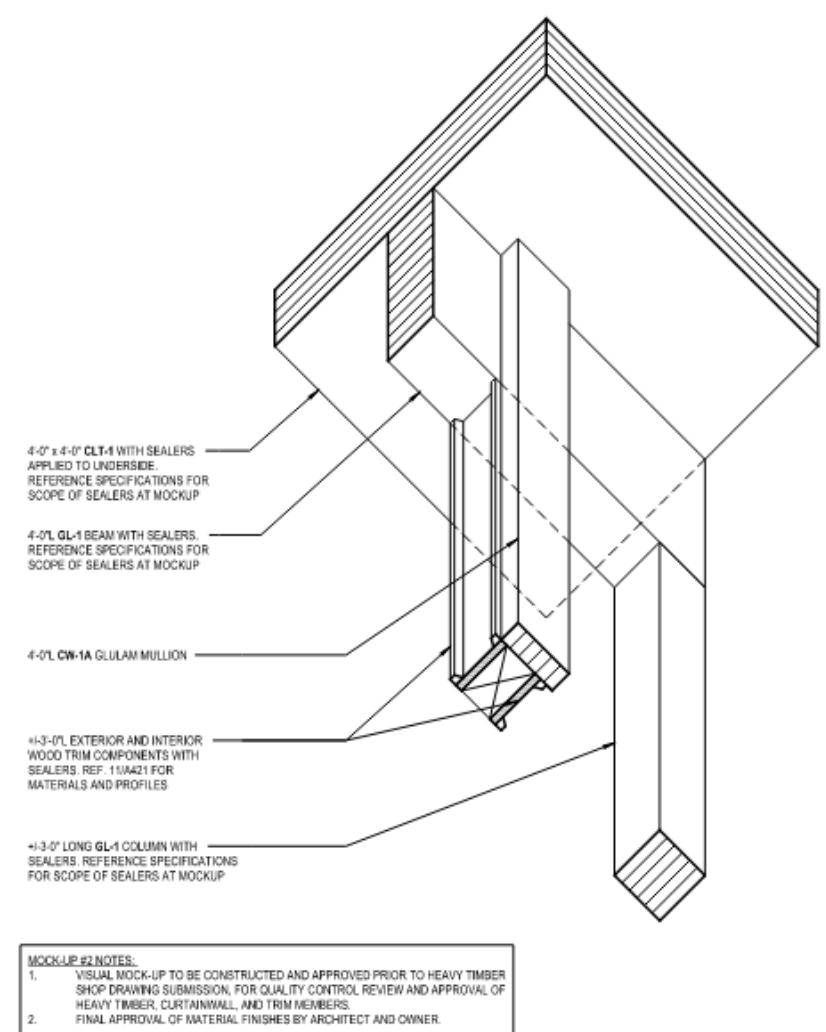
CA
Coordination



Mockup

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Mockup



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Mockup



Installation

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Installation



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Installation



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Installation



Project Photography

Amy Gutmann Hall



Edelman Fossil Park & Museum



Amy Gutmann Hall



Edelman Fossil Park & Museum



Amy Gutmann Hall



Edelman Fossil Park & Museum



Amy Gutmann Hall



Edelman Fossil Park & Museum



Amy Gutmann Hall



Edelman Fossil Park & Museum



Contact Information

Stephen Curtis PE, CEng MICE
Principal
Buro Happold
100 Broadway
New York, NY 10005
T: 1 212-334-2025
D: 1 212-616-0202
E: stephen.curtis@burohappold.com

Andy Sniderman, AIA
Principal
KSS Architects
1100 Ludlow Street, Suite 502
Philadelphia, PA 19107
T: 1 215-320-3000
D: 1 646-764-3458
E: asniderman@kssarchitects.com

➤ QUESTIONS?

This concludes The American
Institute of Architects Continuing
Education Systems Course

Stephen Curtis PE, CEng MICE

Principal

Buro Happold

100 Broadway

New York, NY 10005

T: 1 212-334-2025

D: 1 212-616-0202

E: stephen.curtis@burohappold.com

Andy Sniderman, AIA

Principal

KSS Architects

1100 Ludlow Street, Suite 502

Philadelphia, PA 19107

T: 1 215-320-3000

D: 1 646-764-3458

E: asniderman@kssarchitects.com