MASS TIMBER

GRID OPTIMIZATION

Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.

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AIA Approved Continuing Education

Course Description

Mass timber is transforming how designers approach construction, requiring a deep understanding of material selection, structural efficiency, and detailing. This presentation explores grid optimization strategies for mass timber projects, comparing them to traditional methods and highlighting key design considerations. Attendees will gain insights into market trends, coordination with project stakeholders, and best practices for fire safety, structural performance, and acoustics to ensure project success.

Learning Objectives

1. Review the increasing use of mass timber products in commercial and multi-family project types and summarize a clear process roadmap for project success.
2. Understand techniques for detailing mass timber structures to create cost-effective solutions that meet code requirements related to fire and life safety, structural performance, and acoustics.
3. Explore the unique design criteria associated with mass timber office buildings, including layout, code compliance, and sustainability benefits.
4. Learn strategies for interactions between owners, designers, and building officials to realize successful and code-compliant mass timber projects.

01 | TIMBER

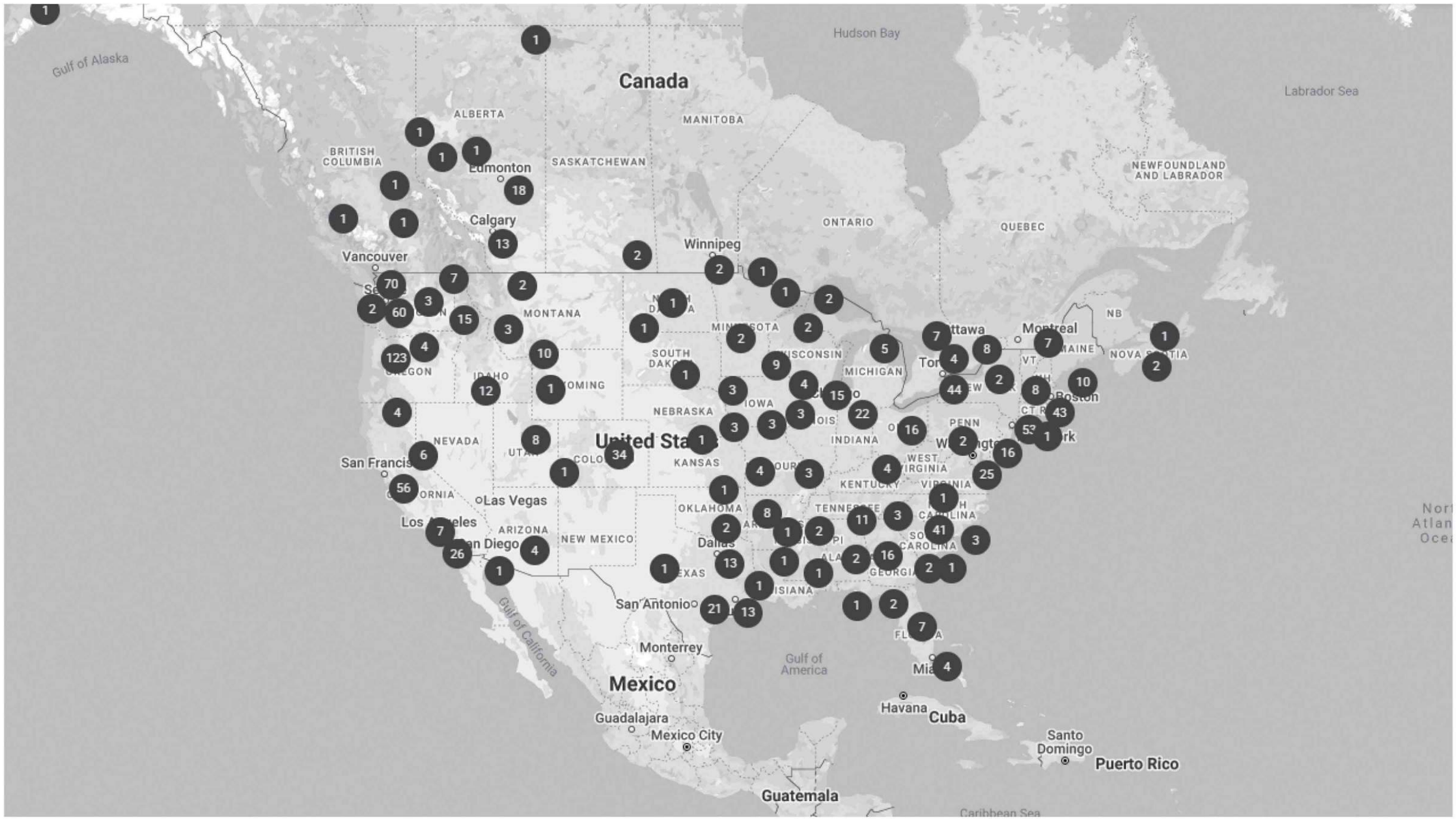
02 | PROCESS

03 | COMPLETE

TIMBER

01

NORTH AMERICA MASS TIMBER PROJECTS



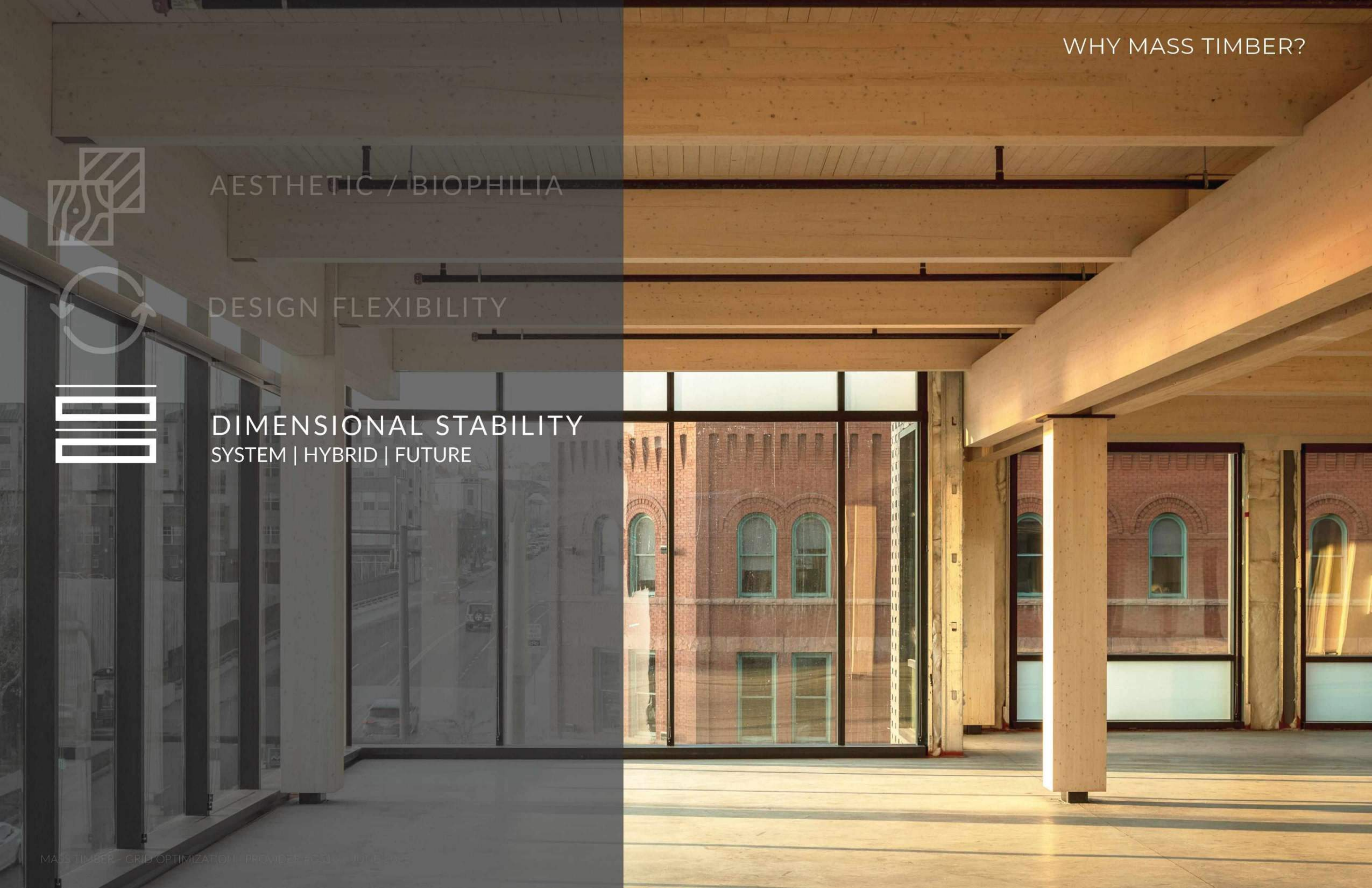
HTTPS://WWW.WOODWORKSINNOVATIONNETWORK.ORG/ (JUNE 2025)

WHY MASS TIMBER?

AESTHETIC / BIOPHILIA

AESTHETIC / BIOPHILIA

DESIGN FLEXIBILITY


WHY MASS TIMBER?
AESTHETIC / BIOPHILIA
DESIGN FLEXIBILITY
DIMENSIONAL STABILITY
SYSTEM | HYBRID | FUTURE
MASS TIMBER - GRID OPTIMIZATION

AESTHETIC / BIOPHILIA

DESIGN FLEXIBILITY

DIMENSIONAL STABILITY

SYSTEM | HYBRID | FUTURE

PREDICTABLE FIRE PERFORMANCE

TESTING | 2021/2024 IBC

AESTHETIC / BIOPHILIA

DESIGN FLEXIBILITY

DIMENSIONAL STABILITY
SYSTEM | HYBRID | FUTURE

PREDICTABLE FIRE PERFORMANCE
TESTING | 2021/2024 IBC

PREFABRICATION
CNC | EFFICIENT | QUALITY

WASTE REDUCTION
MATERIAL OPTIMIZATION

WASTE REDUCTION
MATERIAL OPTIMIZATION

FAST INSTALLATION

WASTE REDUCTION
MATERIAL OPTIMIZATION

FAST INSTALLATION

LIGHTER
SEISMIC | FOUNDATIONS

WASTE REDUCTION
MATERIAL OPTIMIZATION

FAST INSTALLATION

LIGHTER
SEISMIC | FOUNDATIONS

THERMAL / ACOUSTICS

WASTE REDUCTION
MATERIAL OPTIMIZATION

FAST INSTALLATION

LIGHTER
SEISMIC | FOUNDATIONS

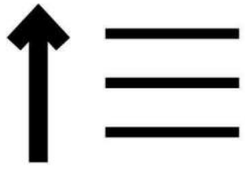
THERMAL / ACOUSTICS

SUSTAINABILITY

TIMBER TRENDS

CODE ADOPTIONS & APPLICATIONS

CODE ADOPTIONS
& APPLICATIONS



TALL WOOD

CODE ADOPTIONS
& APPLICATIONS

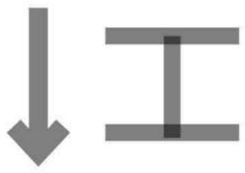
TALL WOOD

STEEL / CONCRETE
REDUCTION / REPLACEMENT

CODE ADOPTIONS
& APPLICATIONS

TALL WOOD

PROVIDERS



STEEL / CONCRETE
REDUCTION / REPLACEMENT

CODE ADOPTIONS
& APPLICATIONS

PROVIDERS

TALL WOOD

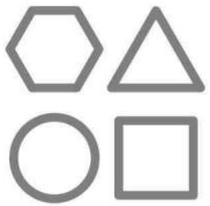
INDUSTRY USES

STEEL / CONCRETE
REDUCTION / REPLACEMENT

CODE ADOPTIONS
& APPLICATIONS

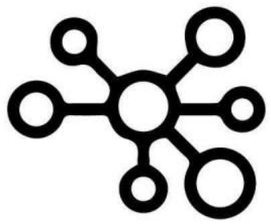
PROVIDERS

TALL WOOD



INDUSTRY USES

STEEL / CONCRETE
REDUCTION / REPLACEMENT



HYBRID + CREATIVITY

PROCESS

01

TYPE OF CONSTRUCTION

ASSEMBLY + GRID

TIMBER SYSTEM

PARTNERS

COST IMPACTS

PREFAB + DETAILING

I

TYPE OF CONSTRUCTION

2024 IBC - CONSTRUCTION TYPE / ASSEMBLY

TYPE III		TYPE IV				TYPE V	
A	B	A	B	C	HT	A	B
6 85'	**4** 75'	**18** 270'	**12** 180'	**9** 85'	**6** 85'	**4** 70'	**3** 60'
85,500 SF	57,000 SF	324,000 SF	216,000 SF	135,000 SF	108,000 SF	54,000 SF	27,000 SF

BUSINESS (B) OCCUPANCY, SPRINKLERED

2024 IBC - CONSTRUCTION TYPE / ASSEMBLY

TYPE III		TYPE IV				TYPE V		
A	B	A	B	C	HT	A	B	
6 85'	**4** 75'	**18** 270'	**12** 180'	**9** 85'	**6** 85'	**4** 70'	**3** 60'	
1 HR	0 HR	3 HR	3 HR	3 HR	HT	1 HR	0 HR	FRAME
1 HR	0 HR	2 HR	2 HR	2 HR	HT	1 HR	0 HR	FLOOR
1 HR	0 HR	1.5 HR	1 HR	1 HR	HT	1 HR	0 HR	ROOF

18 STORIES

BUILDING HEIGHT	270’
ALLOWABLE BLDG AREA	972,000 SF
AVG AREA PER STORY	54,000 SF

100% PROTECTION WOOD ELEMENTS

12 STORIES

BUILDING HEIGHT	180’
ALLOWABLE BLDG AREA	648,000 SF
AVG AREA PER STORY	54,000 SF

20% CEILINGS, 40% WALLS EXPOSED

9 STORIES

BUILDING HEIGHT	85’
ALLOWABLE BLDG AREA	405,000 SF
AVG AREA PER STORY	45,000 SF

FULLY EXPOSED WOOD ELEMENTS

6 STORIES

BUILDING HEIGHT	85’
ALLOWABLE BUILDING AREA	324,000 SF
AVG AREA PER STORY	54,000 SF

FULLY EXPOSED WOOD ELEMENTS

TYPE IV-A | **TYPE IV-B** | **TYPE IV-C** | **TYPE IV-HT**

IBC 2021 | **IBC 2015**

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IBC 2021 | **IBC 2015**

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TYPE IV-A

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ALLOWABLE BLDG AREA 648,000 SF
AVG AREA PER STORY 54,000 SF

INCREASED EXPOSURE OF MT

TYPE IV-B

9 STORIES
BUILDING HEIGHT 85'
ALLOWABLE BLDG AREA 405,000 SF
AVG AREA PER STORY 45,000 SF

FULLY EXPOSED WOOD ELEMENTS

TYPE IV-C

6 STORIES
BUILDING HEIGHT 85'
ALLOWABLE BUILDING AREA 324,000 SF
AVG AREA PER STORY 54,000 SF

FULLY EXPOSED WOOD ELEMENTS

TYPE IV-HT

IBC 2024

IBC 2015

BUSINESS (B) OCCUPANCY, SPRINKLERED

PRIMARY FRAME	3HR
EXT BEARING	3HR
INT BEARING	3HR
ROOF	1.5HR
ROOF - PRIMARY FRAME	2HR
FLOOR	2HR

TYPE IV-A

PRIMARY FRAME	2HR
EXT BEARING	2HR
INT BEARING	2HR
ROOF	1HR
ROOF - PRIMARY FRAME	1HR
FLOOR	2HR

TYPE IV-B

PRIMARY FRAME	2HR
EXT BEARING	2HR
INT BEARING	2HR
ROOF	1HR
ROOF - PRIMARY FRAME	1HR
FLOOR	2HR

TYPE IV-C

PRIMARY FRAME	HT
EXT BEARING	2HR
INT BEARING	1HR
ROOF	HT
ROOF - PRIMARY FRAME	HT
FLOOR	HT

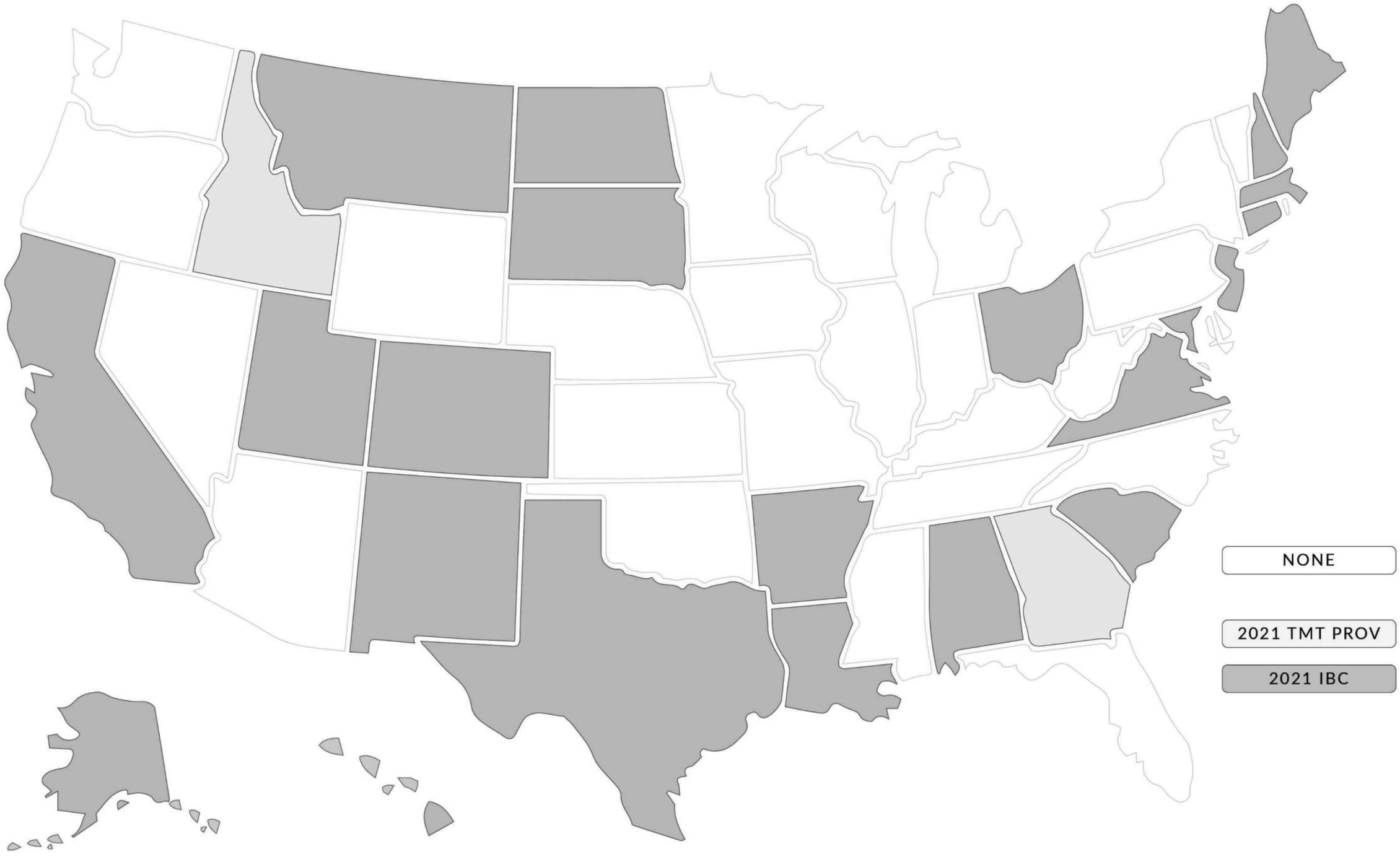
TYPE IV-HT

IBC 2024

IBC 2015

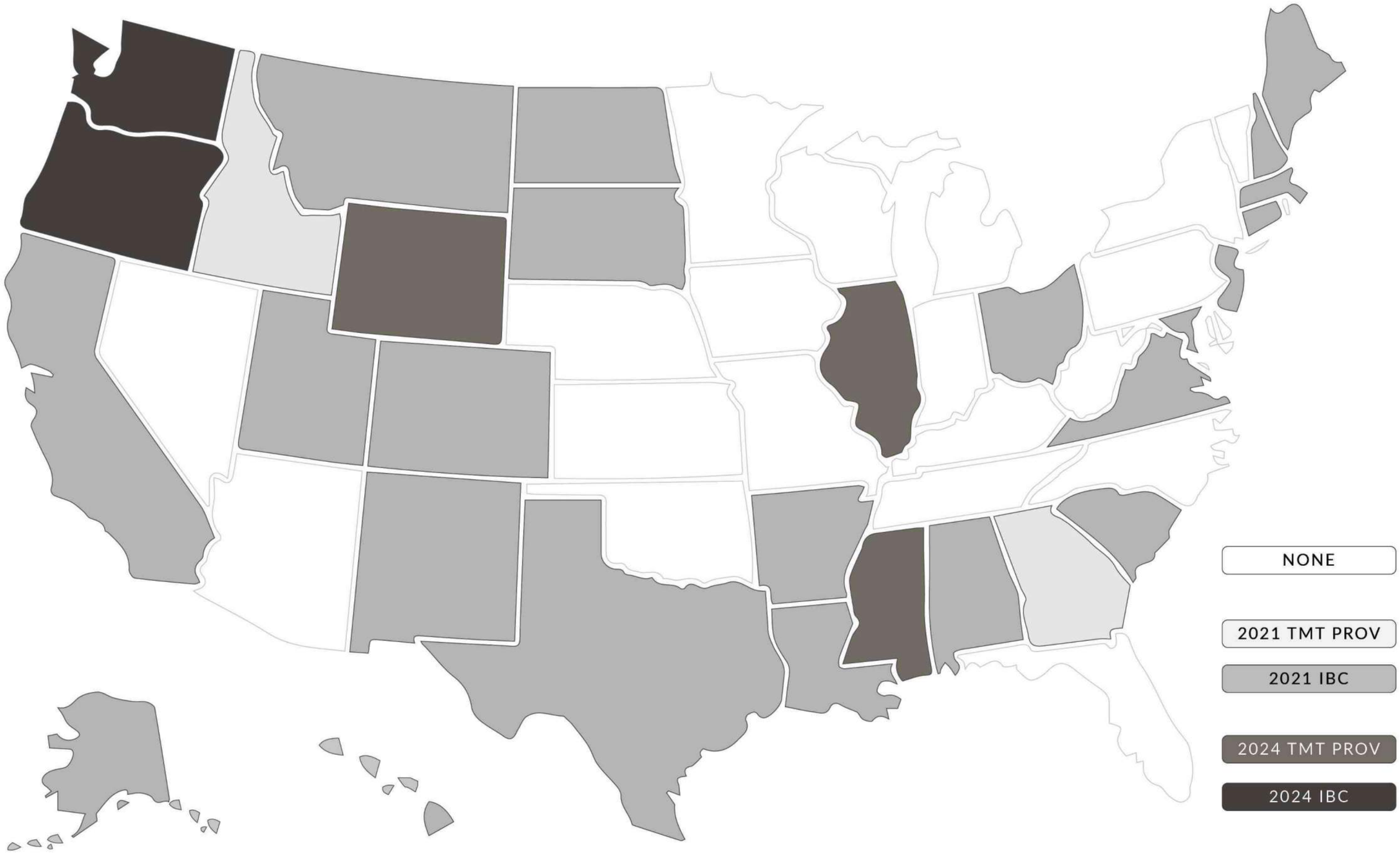
BUSINESS (B) OCCUPANCY, SPRINKLERED

US TALL WOOD ADOPTION



HTTPS://WWW.WOODWORKS.ORG/RESOURCES/STATUS-OF-BUILDING-CODE-ALLOWANCES-FOR-TALL-MASS-TIMBER-IN-THE-IBC/ (JUNE 2025)

US TALL WOOD ADOPTION



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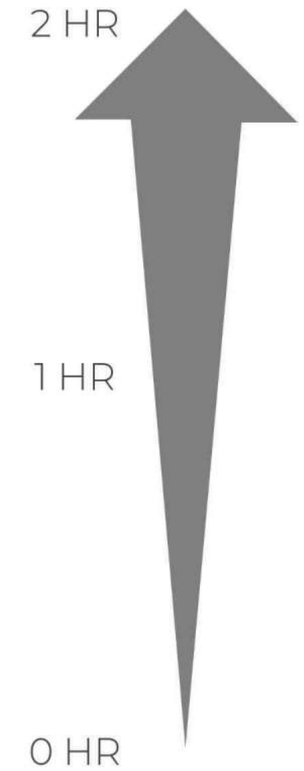
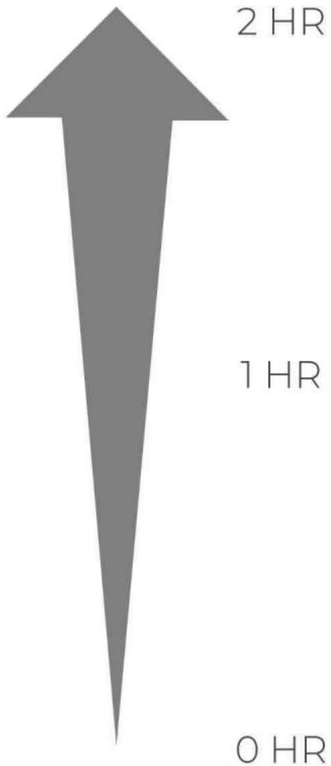
AS FIRE RESISTANCE RATING INCREASES.... COST INCREASES

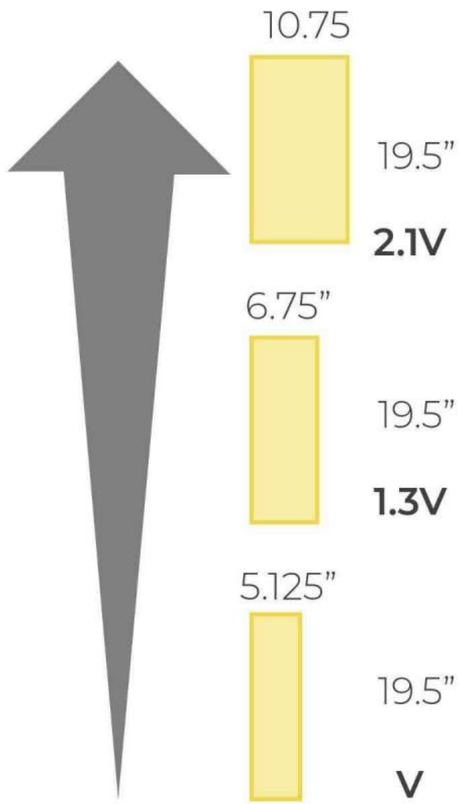


FIRE RESISTANCE
RATING

AS FIRE RESISTANCE RATING INCREASES.... COST INCREASES

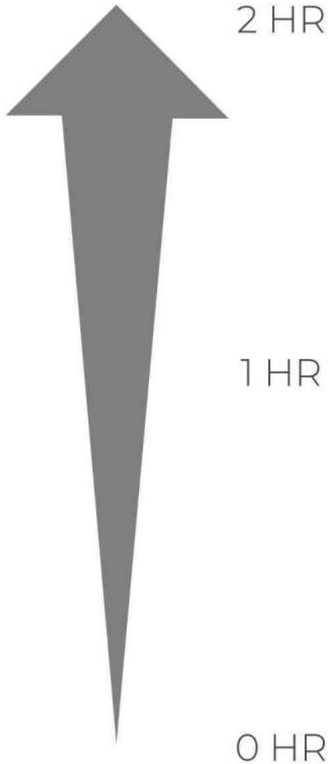


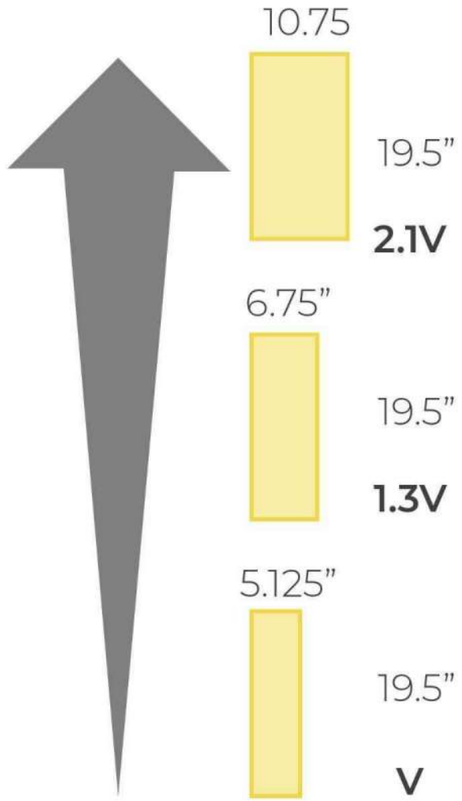
FIRE RESISTANCE RATING

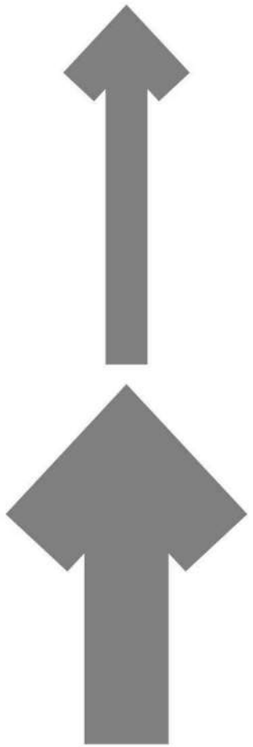


TIMBER VOLUME

AS FIRE RESISTANCE RATING INCREASES.... COST INCREASES

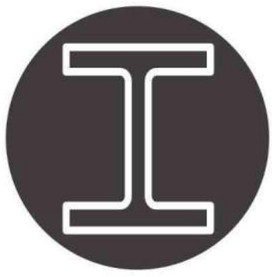






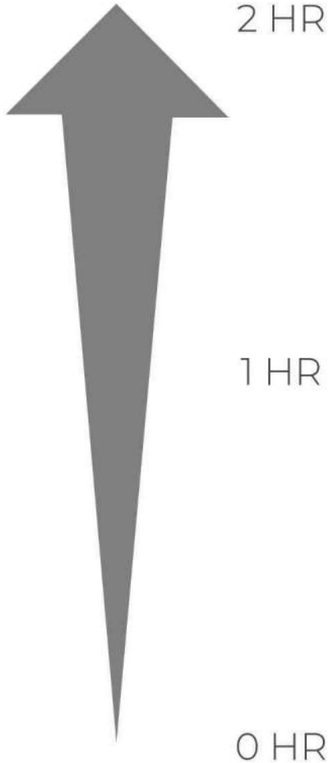
FIRE RESISTANCE RATING

TIMBER VOLUME

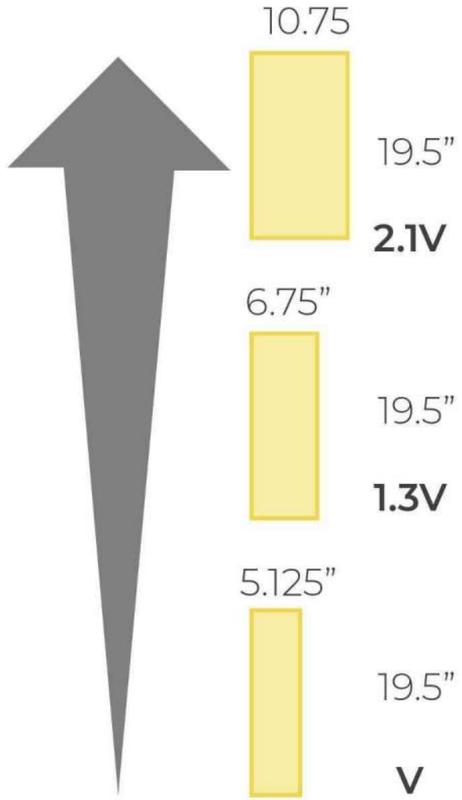


CONNECTION FIRE RESISTANCE

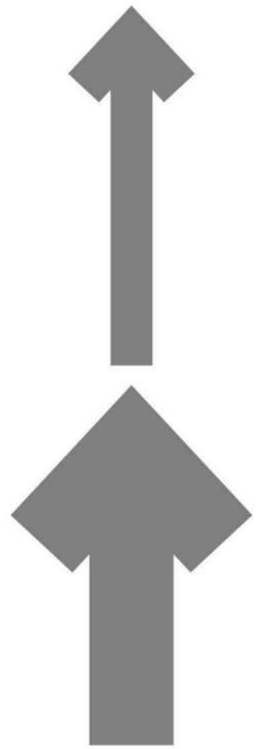
AS FIRE RESISTANCE RATING INCREASES.... COST INCREASES



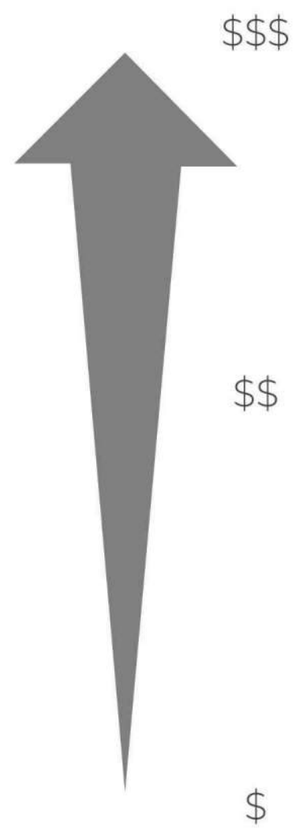
FIRE RESISTANCE RATING



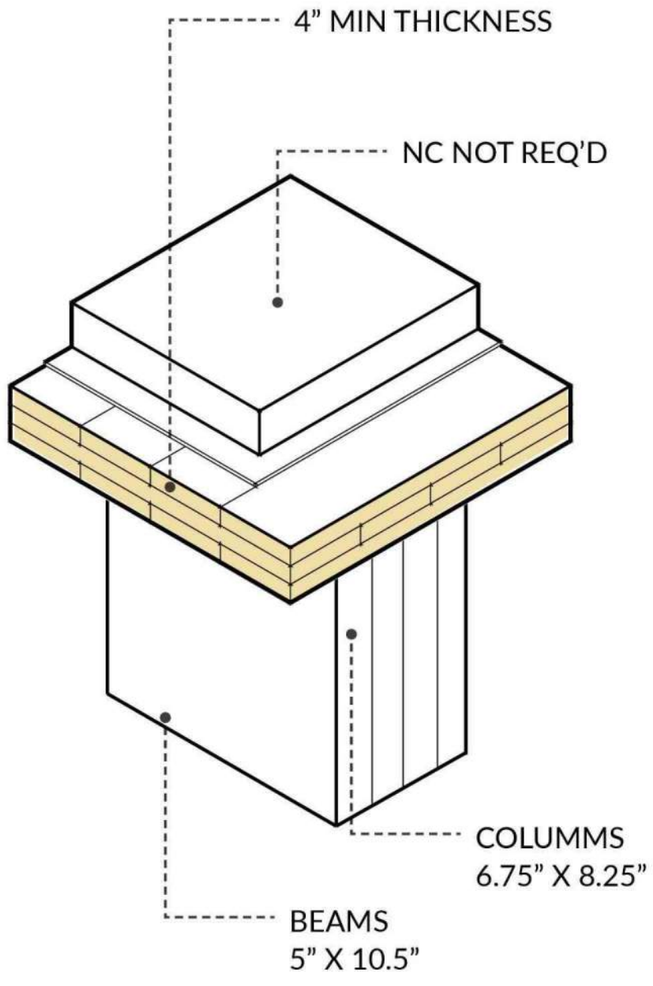
TIMBER VOLUME



CONNECTION FIRE RESISTANCE



COST



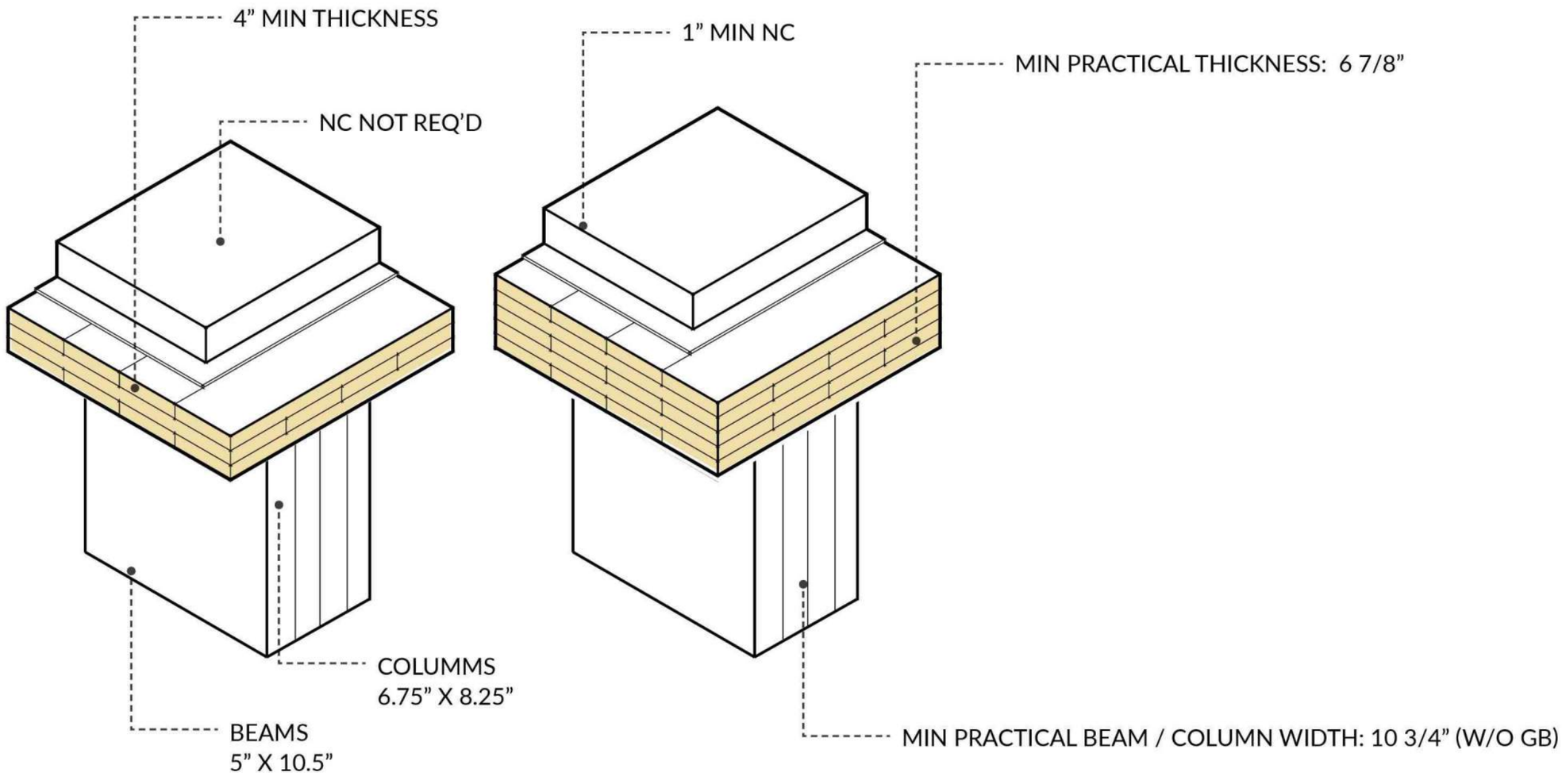
PRESCRIBED RATING, ~1HR

TYPE IV-HT

IBC 2015

HR (HOUR FIRE RATING), M (MINUTE FRR), GB (GYP. BD TYPE X LAYERS), FRR (HOURLY FIRE RATING REQUIREMENT, IBC 703), NC (NON COMBUSTIBLE)

CLT ASSEMBLY EXAMPLES | IBC FIRE RATING REQUIREMENTS



PRESCRIBED RATING, ~1HR

TYPE IV-HT

IBC 2015

2HR FRAME, 2HR FLOOR

TYPE IV-C

IBC 2024

*IBC 2021 - TABLE 2304.11 - CLT FLOOR/FRAME DATA ONLY, SPRINKLERED

HR (HOUR FIRE RATING), M (MINUTE FRR), GB (GYP. BD TYPE X LAYERS), FRR (HOURLY FIRE RATING REQUIREMENT, IBC 703), NC (NON COMBUSTIBLE)

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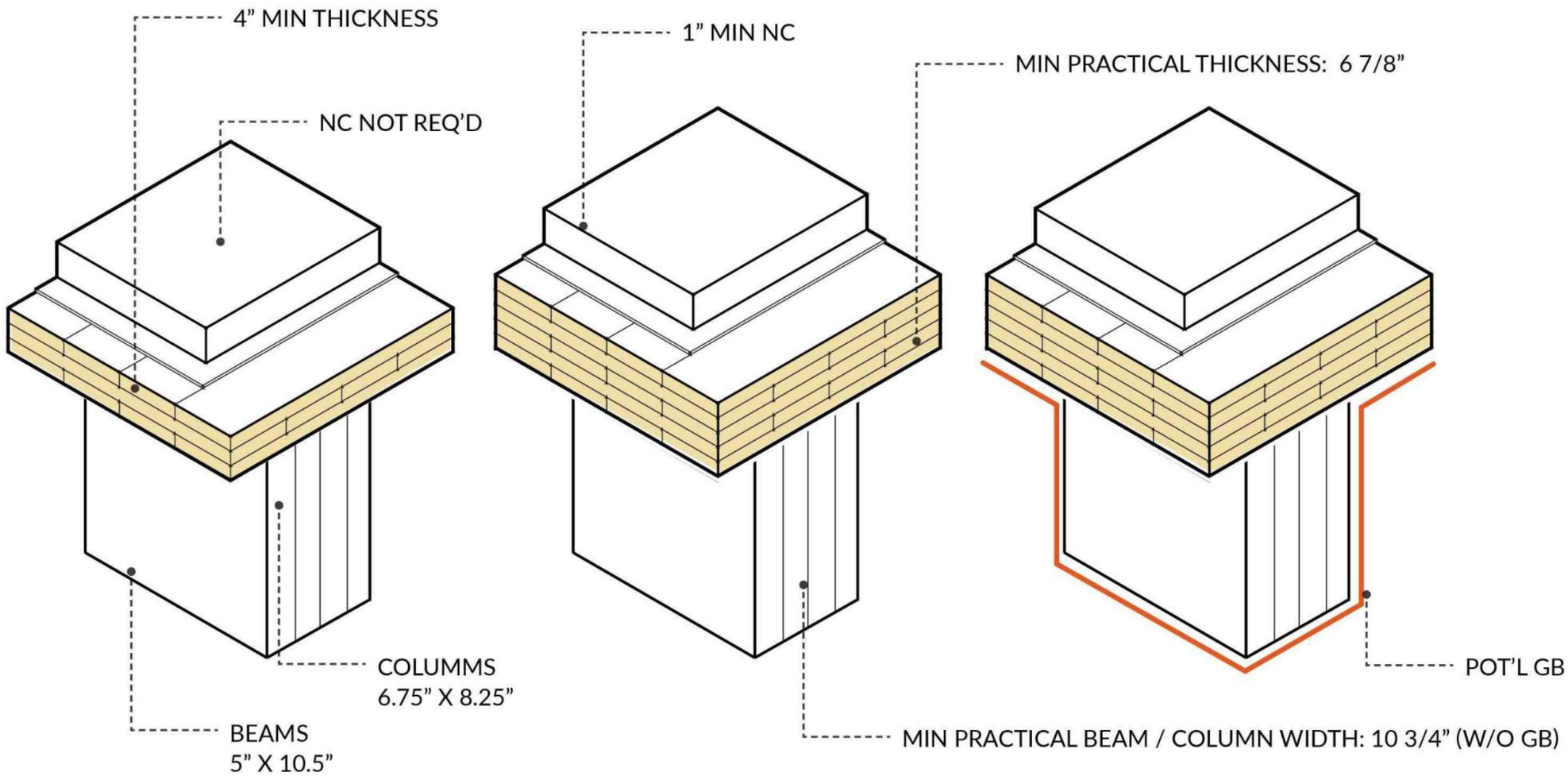

PRESCRIBED RATING, ~1HR | 2HR FRAME, 2HR FLOOR | 2HR FRAME, 2HR FLOOR

TYPE IV-HT	TYPE IV-C	TYPE IV-B
IBC 2015	IBC 2024	

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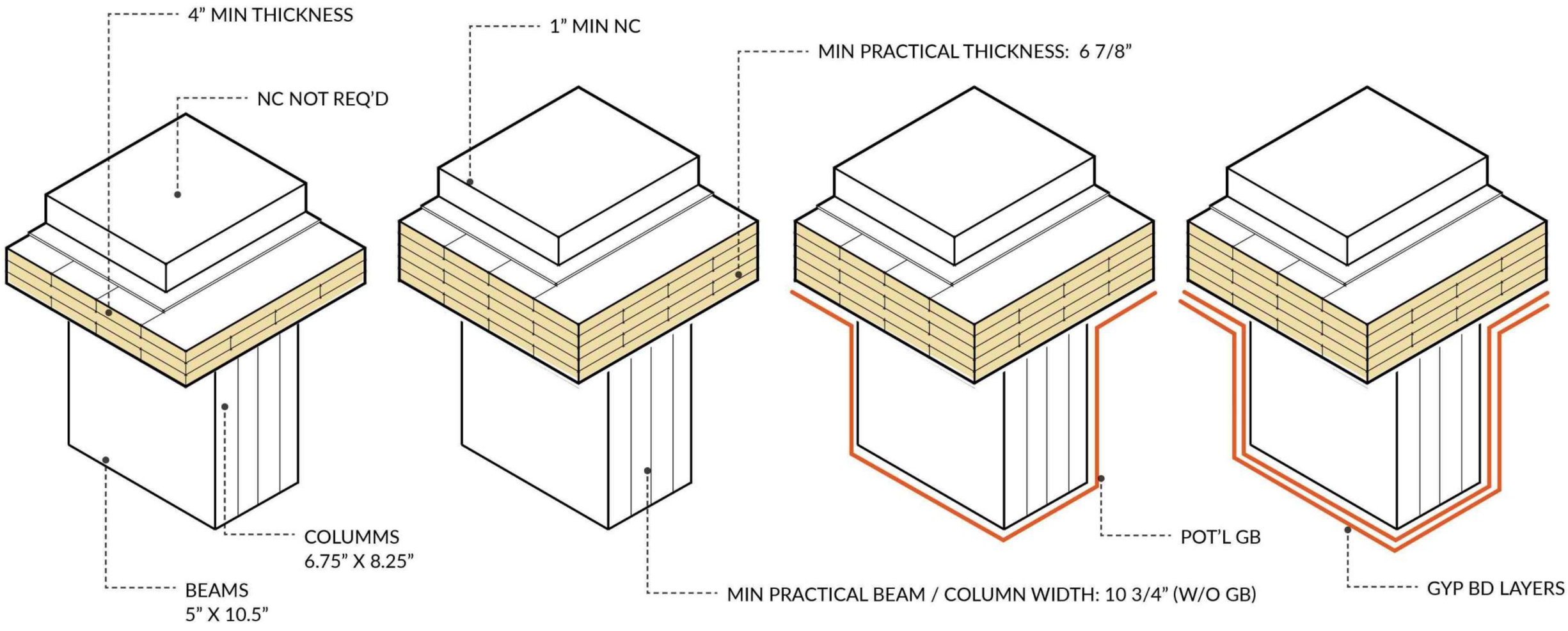

PRESCRIBED RATING, ~1HR	2HR FRAME, 2HR FLOOR	2HR FRAME, 2HR FLOOR	3HR FRAME, 2HR FLOOR
TYPE IV-HT	TYPE IV-C	TYPE IV-B	TYPE IV-A
IBC 2015	IBC 2024		

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2021 IBC - TYPE IV-B EXPOSED TIMBER

2021 IBC - TYPE IV-B EXPOSED TIMBER

80% CEILING COVERED

2 HR FLOOR RATING
20% CEILING EXPOSED
OR 40% WALLS CAN BE EXPOSED

BEAMS ARE INCLUDED IN CEILING PROTECTION REQUIREMENTS IF THEY ARE "INTEGRAL TO CEILINGS"

2021 IBC - TYPE IV-B EXPOSED TIMBER

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2HR RATING
NOT INTEGRAL COLUMNS TO WALLS ARE EXEMPT FROM PROTECTION REQUIREMENTS (THEY CAN BE FULLY EXPOSED)

15'-0"

2HR FLOOR RATING

2021 IBC - TYPE IV-B EXPOSED TIMBER

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2HR RATING
NOT INTEGRAL COLUMNS TO WALLS ARE EXEMPT FROM PROTECTION REQUIREMENTS (THEY CAN BE FULLY EXPOSED)

15'-0"

WHERE NC PROTECTION IS REQ'D:

FRR	MIN NC Protection*	
PRIMARY FRAME	FRR = 2 HR	80 min
PRIMARY FRAME ROOF	FRR = 1 HR	40 min
EXT / INT BEARING WALL	FRR = 2 HR	80 min
FLOOR	FRR = 2 HR	80 min
ROOF	FRR = 1 HR	40 min

*1/2" TYPE X GWB = 25 MIN , *5/8" TYPE X GWB = 40 MIN

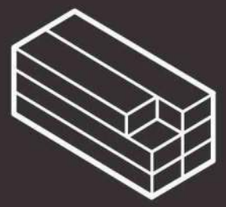
2HR FLOOR RATING

2024 IBC - TYPE IV-B EXPOSED TIMBER

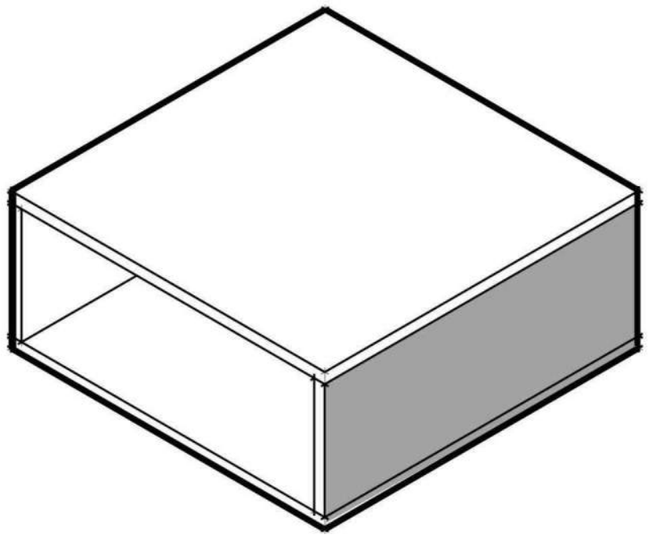
INCREASED MT EXPOSURE

INCREASED

TYPE OF CONSTRUCTION

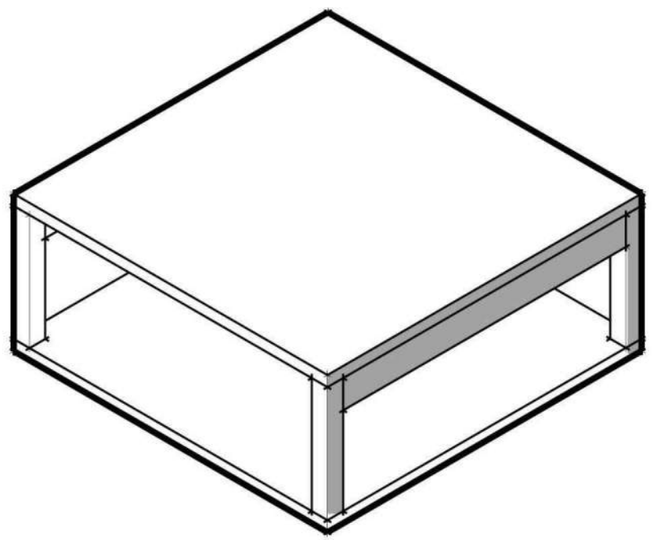


TIMBER SYSTEM



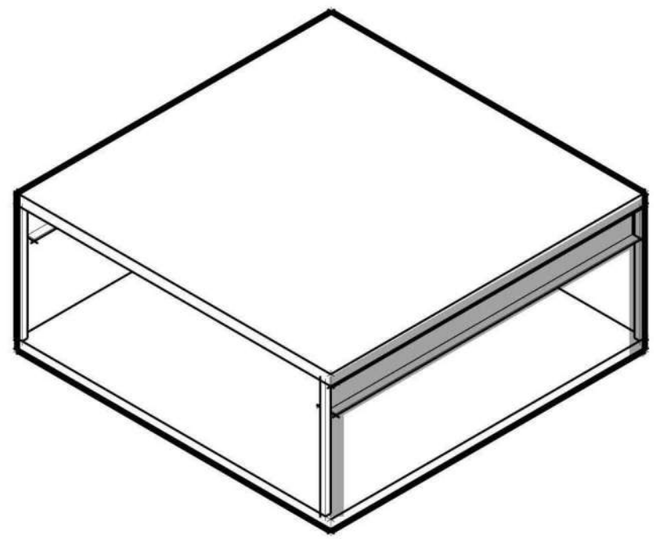
PANELIZED SYSTEM

MASS TIMBER PANELS FOR ALL PRIMARY STRUCTURAL ELEMENTS



TIMBER FRAME

MASS TIMBER FLOOR PANEL SLABS W/ A PRIMARY STRUCTURE OF GLULAM COLUMNS AND BEAMS



HYBRID SYSTEM

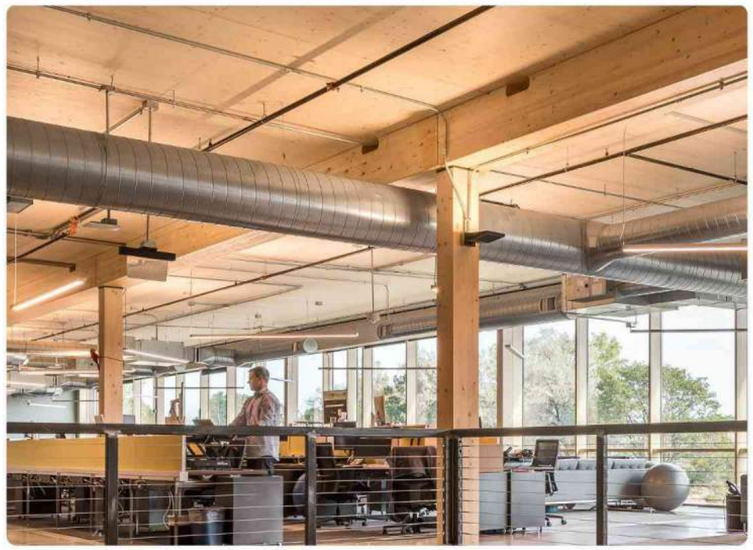
MASS TIMBER FLOOR SLABS SUPPORTED BY STEEL OR CONCRETE

PANELIZED SYSTEM

WOOD VOLUME IS CRITICAL ASPECT

BUILDING HEIGHT LIMITED BY PANEL COMPRESSION CAPACITY AT FLOOR TO WALL INTERFACE

LIMITS ARCHITECTURAL PROGRAM



PANELIZED SYSTEM

WOOD VOLUME IS CRITICAL ASPECT

BUILDING HEIGHT LIMITED BY PANEL COMPRESSION CAPACITY AT FLOOR TO WALL INTERFACE

LIMITS ARCHITECTURAL PROGRAM

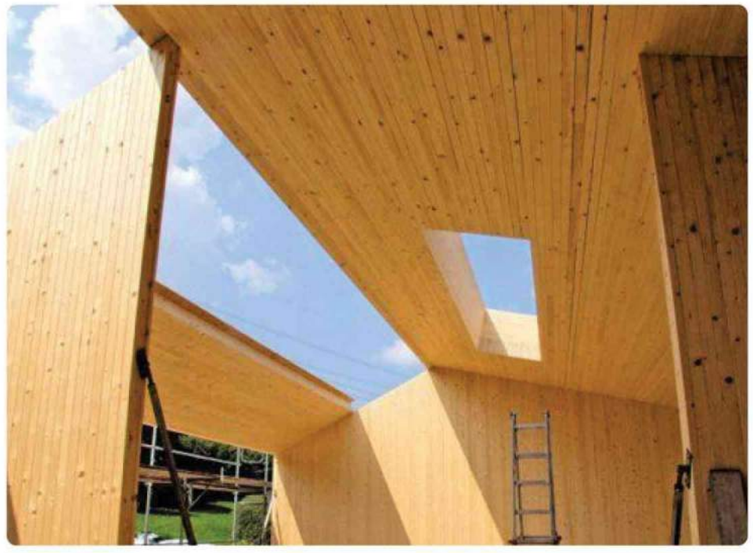
TIMBER FRAME

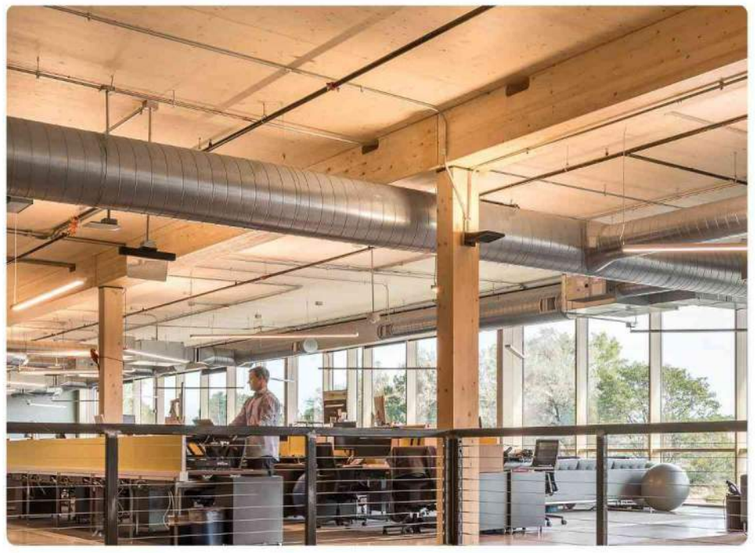
WOOD VOLUME IS CRITICAL

↑ COST UP W/ SPAN

↑ COST UP W/ STEEL CONNECTIONS

↑ DEPTH INCREASES RAPIDLY W/ SPAN





PANELIZED SYSTEM

WOOD VOLUME IS CRITICAL ASPECT

BUILDING HEIGHT LIMITED BY PANEL COMPRESSION CAPACITY AT FLOOR TO WALL INTERFACE

LIMITS ARCHITECTURAL PROGRAM

TIMBER FRAME

WOOD VOLUME IS CRITICAL

↑ COST UP W/ SPAN

↑ COST UP W/ STEEL CONNECTIONS

↑ DEPTH INCREASES RAPIDLY W/ SPAN

HYBRID SYSTEM

STEEL PIECE COUNT IS CRITICAL

↓ COST DOWN W/ SPAN

SELECT BUILDING TYPE WITH ‘UNRATED’ FRAME

MASS TIMBER TYPES

GLT (GLULAM)
GLUE-LAMINATED TIMBER

COLUMNS, BEAMS, PANELS

CLT
CROSS-LAMINATED TIMBER

NLT / DLT
NAIL-LAMINATED TIMBER

DOWEL-LAMINATED TIMBER

MPP
MASS PLYWOOD PANEL

GLT (GLULAM)

GLUE-LAMINATED TIMBER

COLUMNS, BEAMS, PANELS

CLT

CROSS-LAMINATED TIMBER

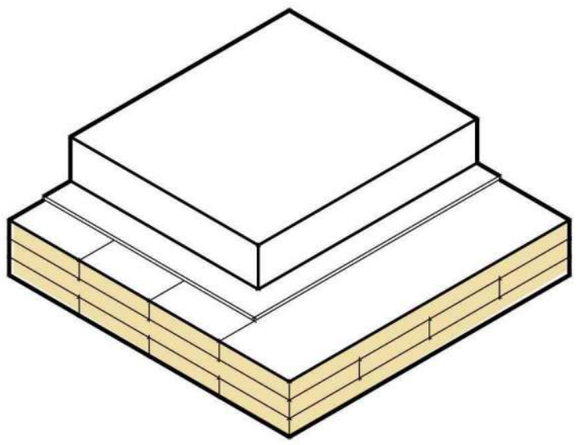
NLT / DLT

NAIL-LAMINATED TIMBER

DOWEL-LAMINATED TIMBER

MPP

MASS PLYWOOD PANEL



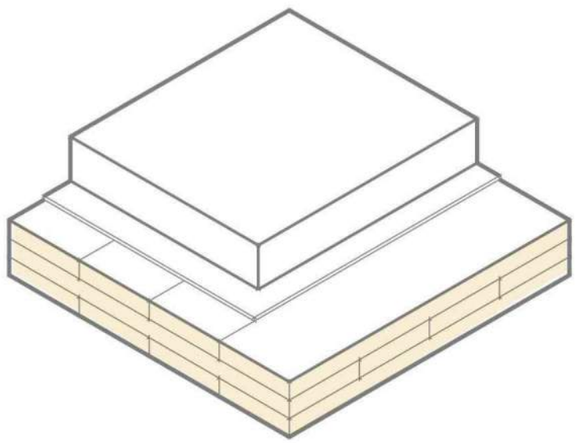
CLT

3-7 LAMINATIONS

TWO-WAY BEHAVIOR

EXCELLENT DIMENSIONAL STABILITY

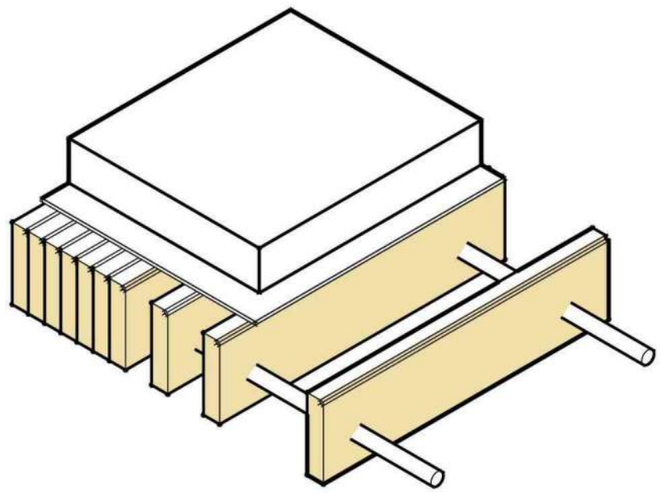
SUPPLY OPTONS



CLT

3-7 LAMINATIONS

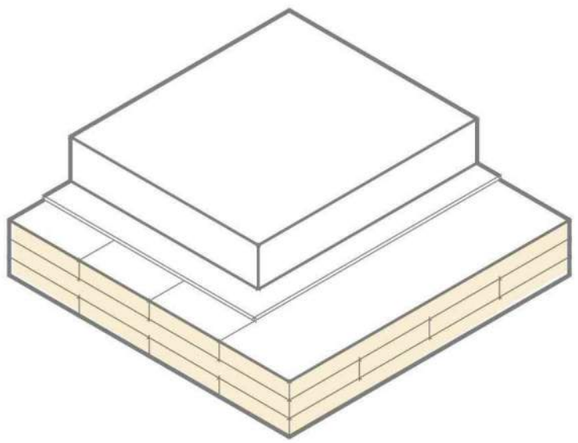
TWO-WAY BEHAVIOR
EXCELLENT DIMENSIONAL STABILITY
SUPPLY OPTONS



DLT

2X4, 2X6, 2X8, 2X10

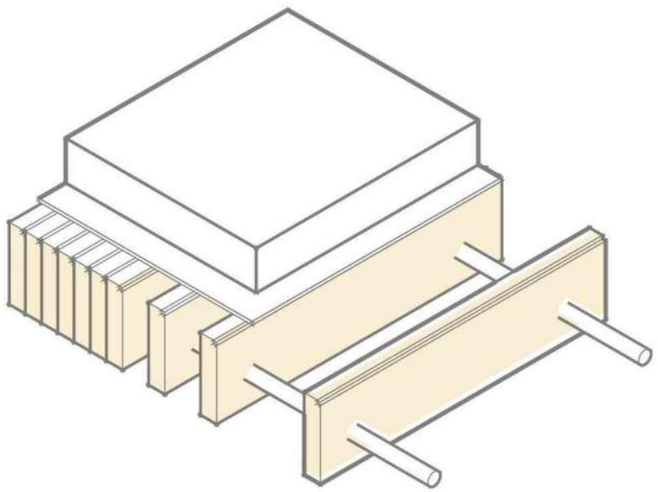
ONE-WAY BEHAVIOR
INCREASED SPAN LENGTHS
IMPROVED FIRE PERFORMANCE
LIMITED SUPPLY
REDUCED DIMENSIONAL STABILITY



CLT

3-7 LAMINATIONS

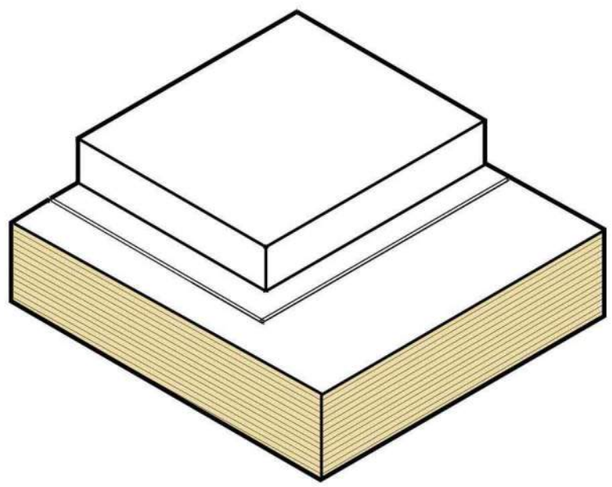
TWO-WAY BEHAVIOR
EXCELLENT DIMENSIONAL STABILITY
SUPPLY OPTONS



DLT

2X4, 2X6, 2X8, 2X10

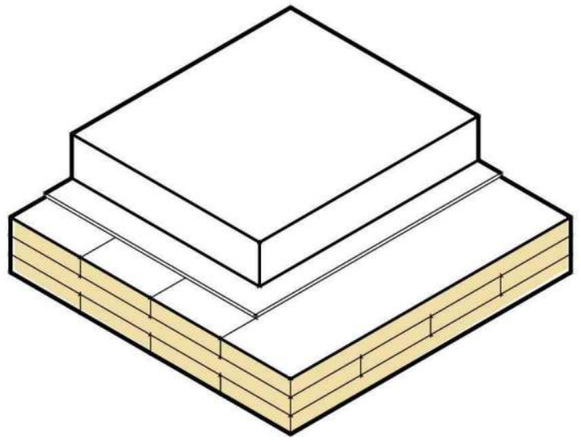
ONE-WAY BEHAVIOR
INCREASED SPAN LENGTHS
IMPROVED FIRE PERFORMANCE
LIMITED SUPPLY
REDUCED DIMENSIONAL STABILITY



MPP

2-12 PLIES

HIGHER MATERIAL STRENGTH
IMPROVED FIRE PERFORMANCE
EXCELLENT DIMENSIONAL STABILITY
LIMITED SUPPLY
UNIQUE AESTHETIC



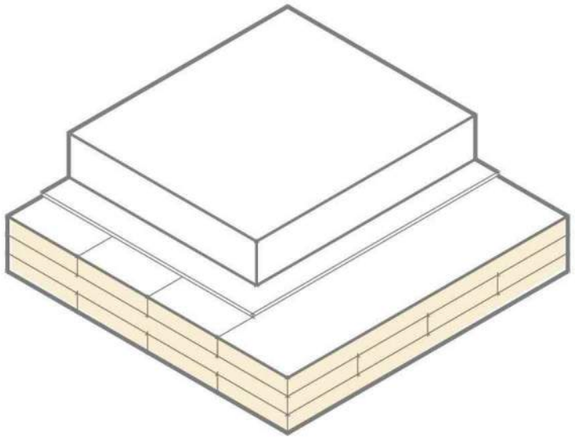
3 LAM

THICKNESS		SPAN (FT)	VOLUME (FT3/FT2)
89 MM	3 1/2”	10’-11.5’	0.29
105 MM	4 1/8”	11.5’-13’	0.34
		(6.5’-10’) 1 HR CHAR	

NOTES:

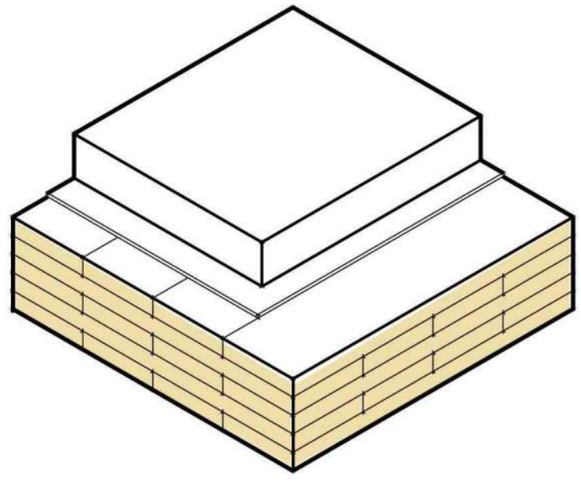
SPANS INDICATED CONSIDER FLOOR LIVE LOADING OF 65 PSF (50PSF + 15 PSF PARTITIONS) AND FLOOR VIBRATION CRITERIA.
SPANS ARE BASED ON TWO SPAN CONTINUOUS PANELS MINIMUM.
PANEL MATERIAL GRADES INCLUDE V2 AND E1.
SELECTED PANELS SHOW POST CHAR SPANS FOR 1 AND 2 HOUR RATINGS AS APPLICABLE

CLT FLOOR ASSEMBLIES



3 LAM

THICKNESS		SPAN (FT)	VOLUME (FT3/FT2)
89 MM	3 1/2”	10’-11.5’	0.29
105 MM	4 1/8”	11.5’-13’ (6.5’-10’) 1 HR CHAR	0.34



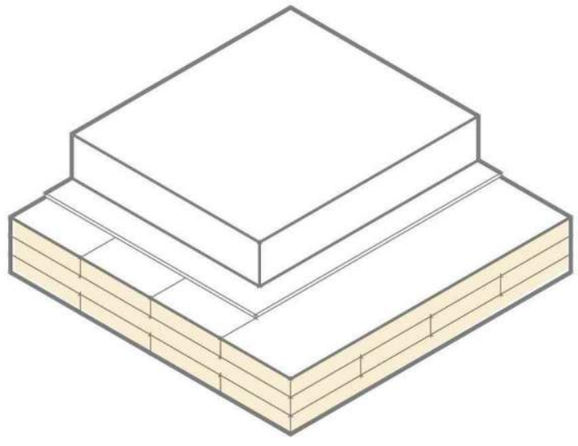
5 LAM

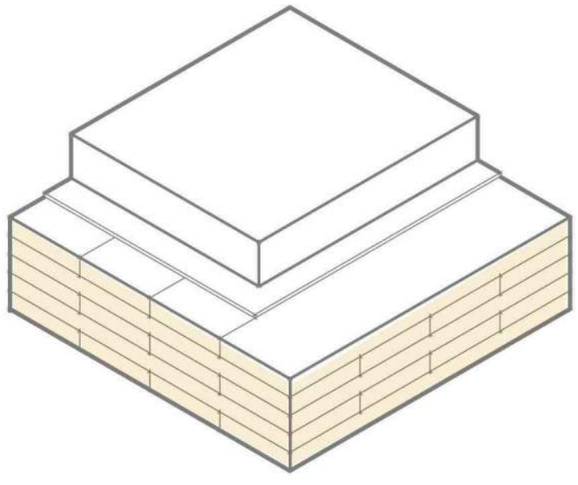
THICKNESS		SPAN (FT)	VOLUME (FT3/FT2)
143 MM	5 5/8”	15’-16’	0.47
175 MM	6 7/8”	17-18’ (10’-15.5’) 2 HR CHAR	0.57

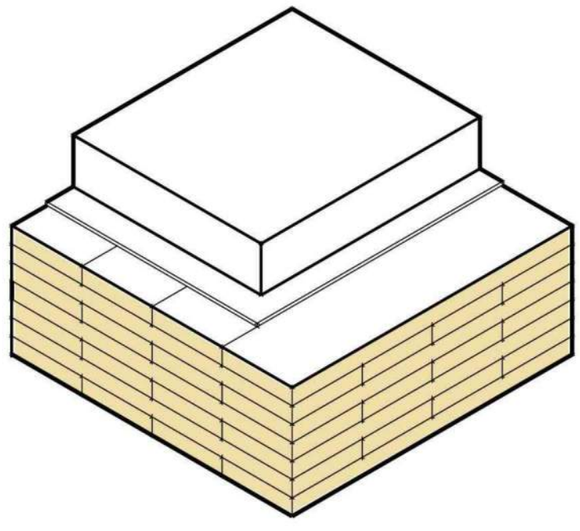
NOTES:

SPANS INDICATED CONSIDER FLOOR LIVE LOADING OF 65 PSF (50PSF + 15 PSF PARTITIONS) AND FLOOR VIBRATION CRITERIA.
SPANS ARE BASED ON TWO SPAN CONTINUOUS PANELS MINIMUM.
PANEL MATERIAL GRADES INCLUDE V2 AND E1.
SELECTED PANELS SHOW POST CHAR SPANS FOR 1 AND 2 HOUR RATINGS AS APPLICABLE

CLT FLOOR ASSEMBLIES







3 LAM

THICKNESS		SPAN (FT)	VOLUME (FT3/FT2)
89 MM	3 1/2"	10'-11.5'	0.29
105 MM	4 1/8"	11.5'-13'	0.34
		(6.5'-10') 1 HR CHAR	

5 LAM

THICKNESS		SPAN (FT)	VOLUME (FT3/FT2)
143 MM	5 5/8"	15'-16'	0.47
175 MM	6 7/8"	17-18'	0.57
		(10'-15.5') 2 HR CHAR	

7 LAM

THICKNESS		SPAN (FT)	VOLUME (FT3/FT2)
197 MM	7 3/4"	19.5'-20.5	0.65
245 MM	9 5/8"	21.5'-23	0.80
		(19.5'-23') 2 HR CHAR	

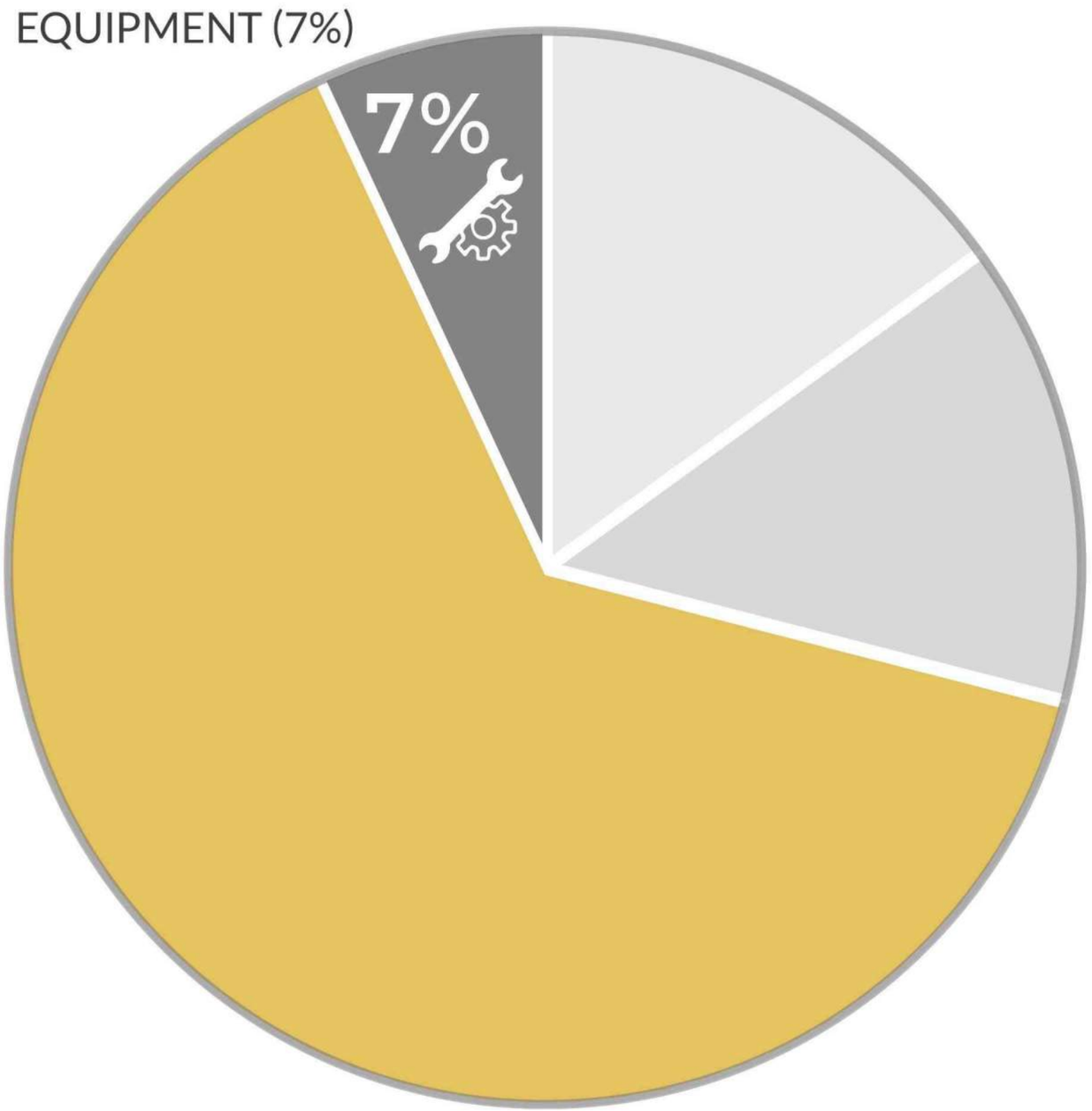
NOTES:

SPANS INDICATED CONSIDER FLOOR LIVE LOADING OF 65 PSF (50PSF + 15 PSF PARTITIONS) AND FLOOR VIBRATION CRITERIA.
SPANS ARE BASED ON TWO SPAN CONTINUOUS PANELS MINIMUM.
PANEL MATERIAL GRADES INCLUDE V2 AND E1.
SELECTED PANELS SHOW POST CHAR SPANS FOR 1 AND 2 HOUR RATINGS AS APPLICABLE

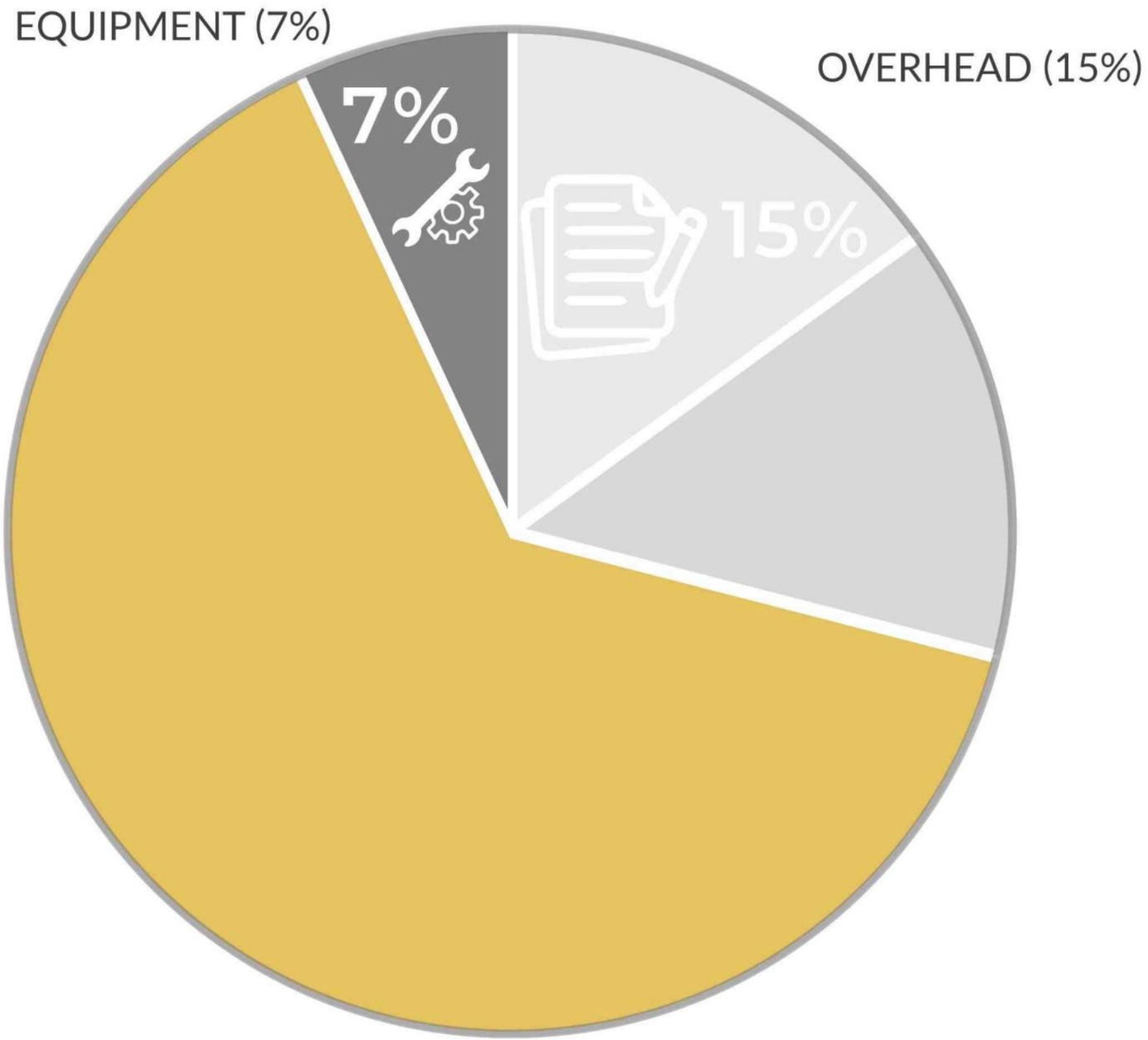
TYPE OF CONSTRUCTION

TIMBER SYSTEM

COST IMPACTS



SOURCE: SWINERTON



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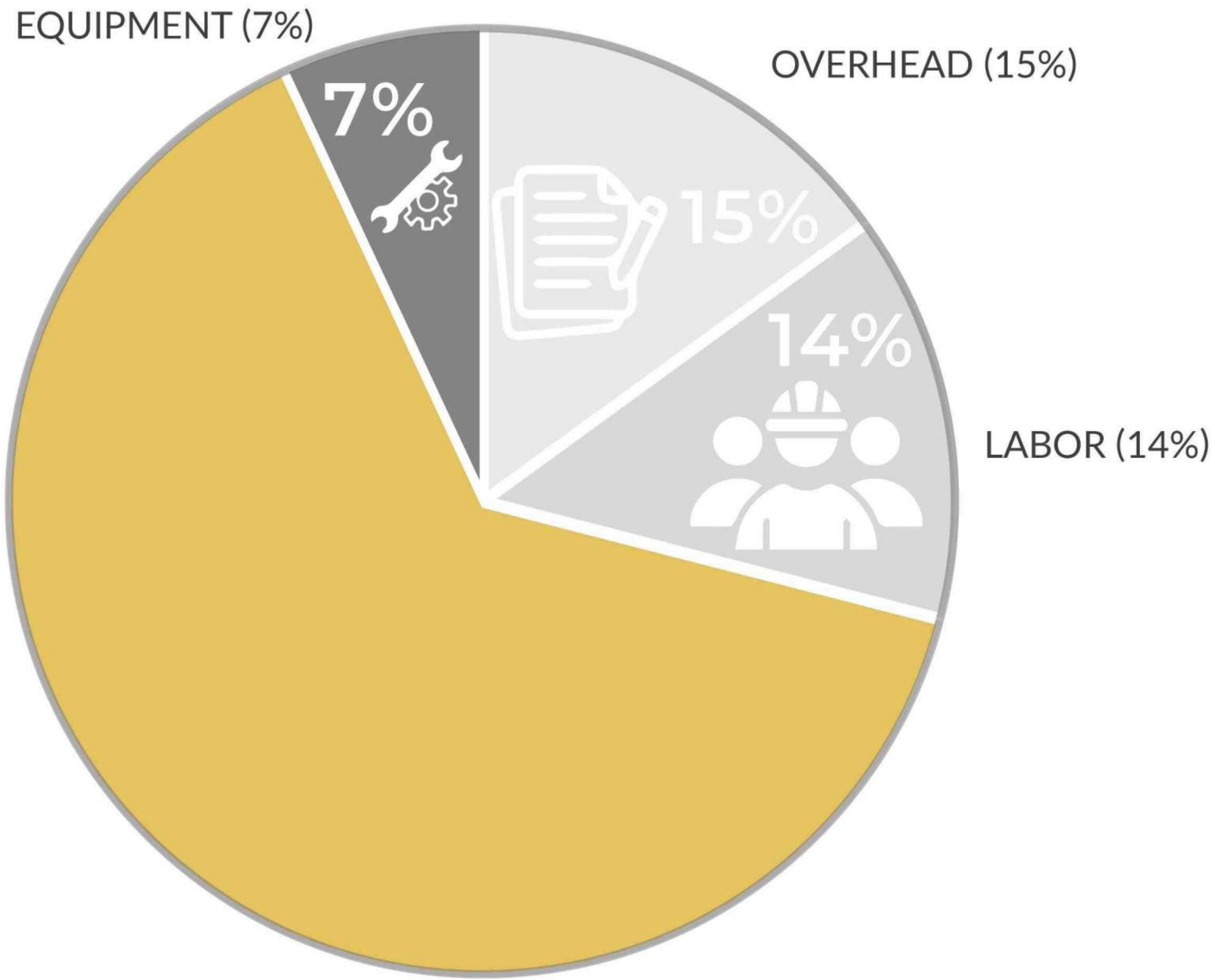
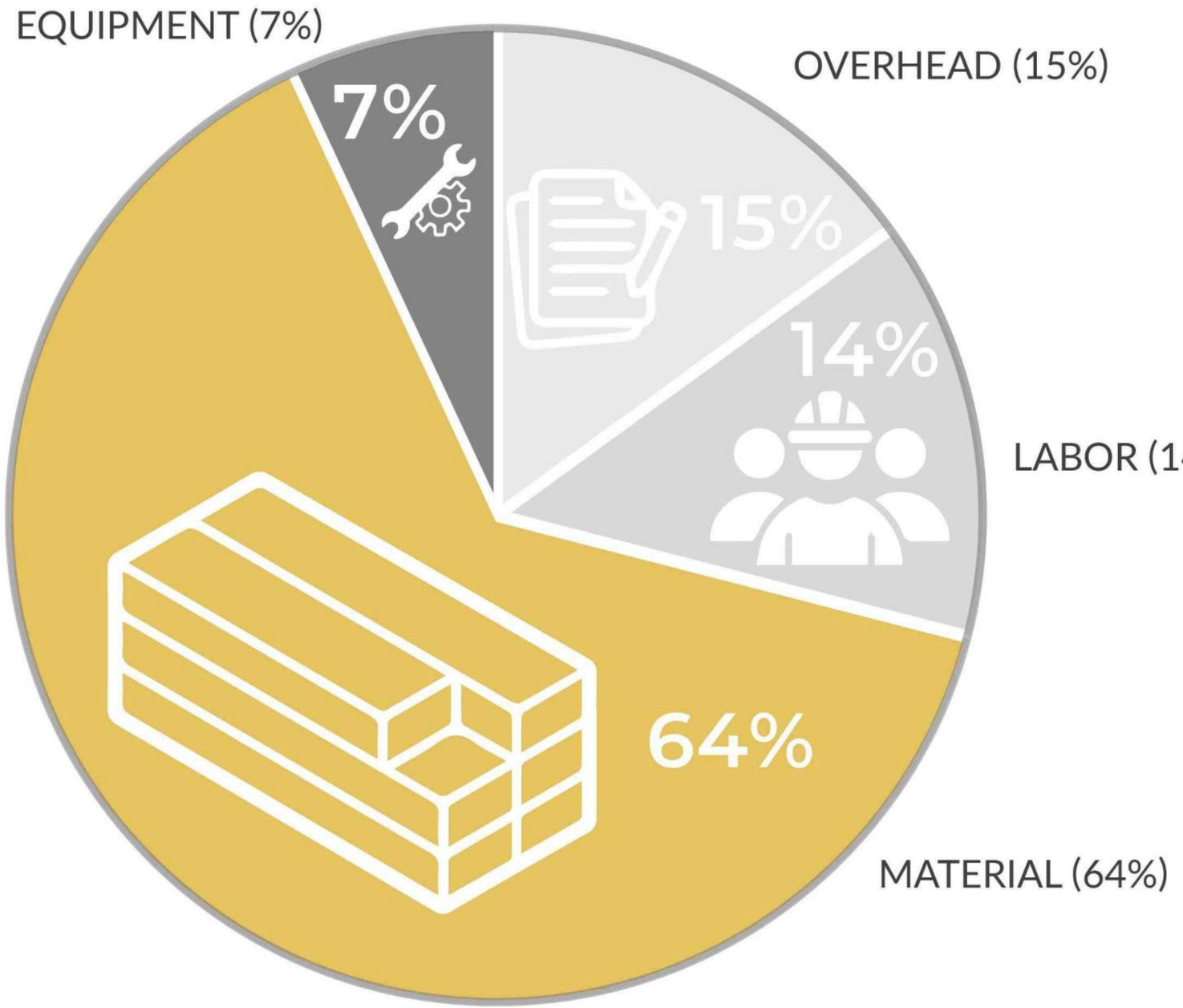


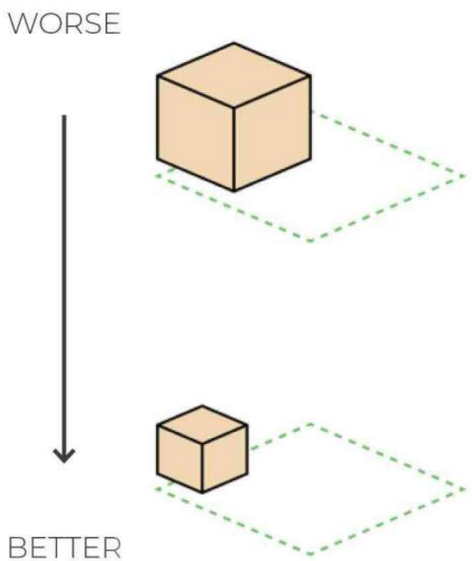
SOURCE: SWINERTON



SOURCE: SWINERTON

VOLUME / AREA RATIO
(VAR)

$$\frac{\text{TOTAL TIMBER VOLUME}}{\text{FLOOR AREA}}$$



VOLUME

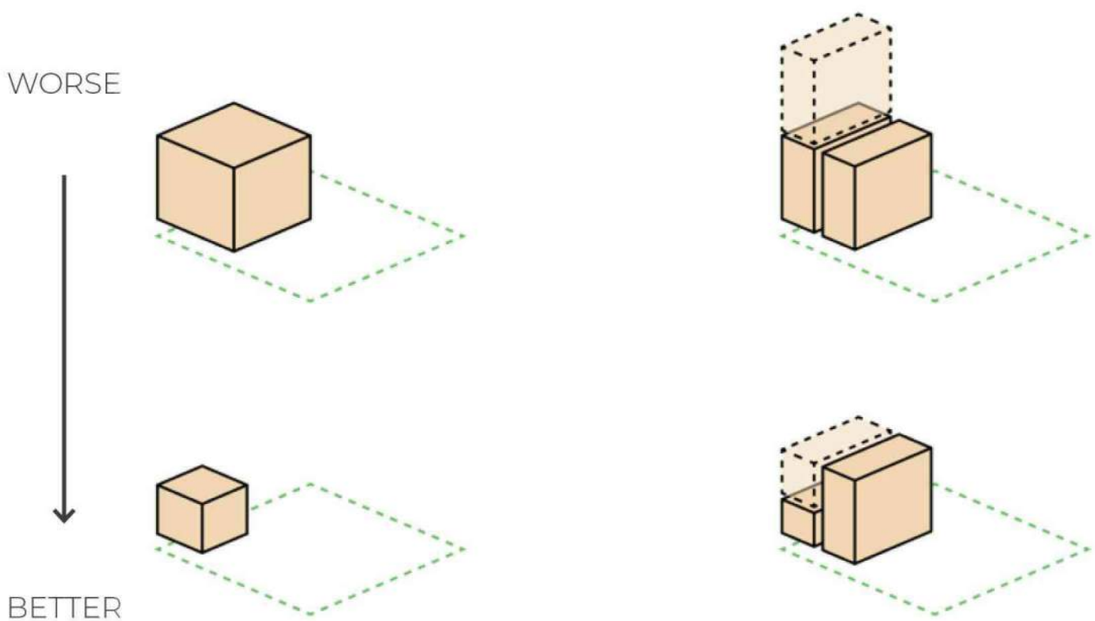
COURTESY OF JOHN FECHTEL AND JOHN KLEIN, GENERATE

VOLUME / AREA RATIO
(VAR)

$$\frac{\text{TOTAL TIMBER VOLUME}}{\text{FLOOR AREA}}$$

COST ADJUSTED VOLUME/AREA RATIO
(VAR)

$$\frac{\text{'A' X GLB + CLT VOLUME}}{\text{FLOOR AREA}}$$



VOLUME

GLULAM VS CLT

COURTESY OF JOHN FECHTEL AND JOHN KLEIN, GENERATE

VOLUME / AREA RATIO
(VAR)

$$\frac{\text{TOTAL TIMBER VOLUME}}{\text{FLOOR AREA}}$$

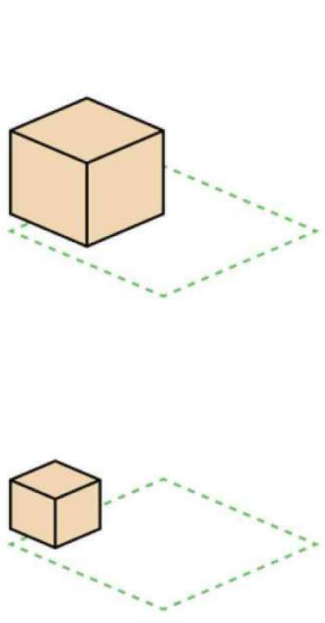
COST ADJUSTED VOLUME/AREA RATIO
(VAR)

$$\frac{\text{'A' X GLB + CLT VOLUME}}{\text{FLOOR AREA}}$$

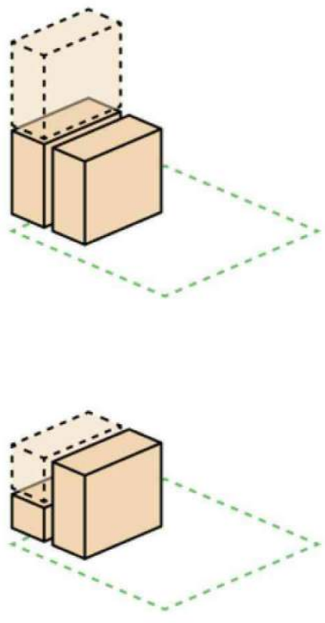
PIECE/AREA RATIO
(PAR)

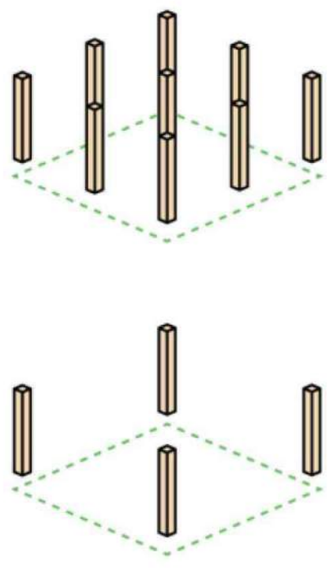
$$\frac{\text{\# PIECES}}{\text{FLOOR AREA}}$$

WORSE



BETTER





VOLUME

GLULAM VS CLT

PIECES

COURTESY OF JOHN FECHTEL AND JOHN KLEIN, GENERATE

COST RELATED INDICES

VOLUME / AREA RATIO
(VAR)

$$\frac{\text{TOTAL TIMBER VOLUME}}{\text{FLOOR AREA}}$$

COST ADJUSTED VOLUME/AREA RATIO
(VAR)

$$\frac{\text{'A' X GLB + CLT VOLUME}}{\text{FLOOR AREA}}$$

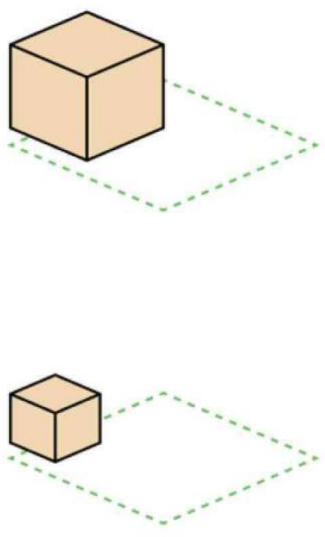
PIECE/AREA RATIO
(PAR)

$$\frac{\text{\# PIECES}}{\text{FLOOR AREA}}$$

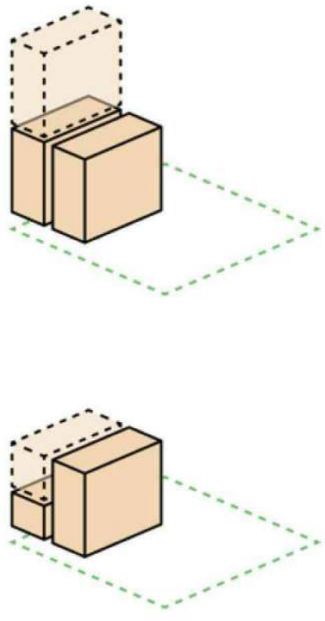
RELATIVE COMPLEXITY RATIO
(RCR)

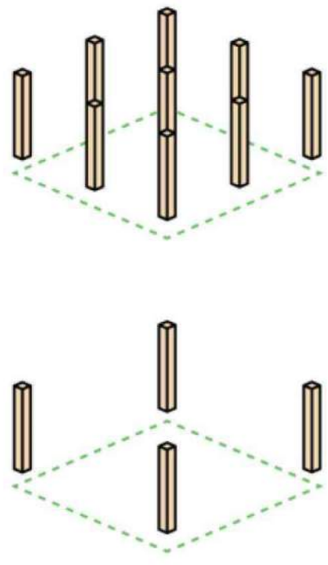
$$\frac{\text{\# UNIQUE PIECES}}{\text{TOTAL \# PIECES}}$$

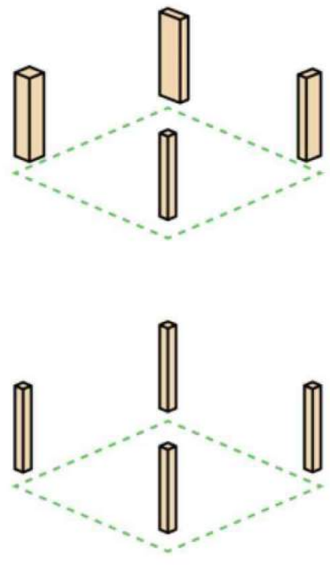
WORSE



BETTER







VOLUME

GLULAM VS CLT

PIECES

COMPLEXITY

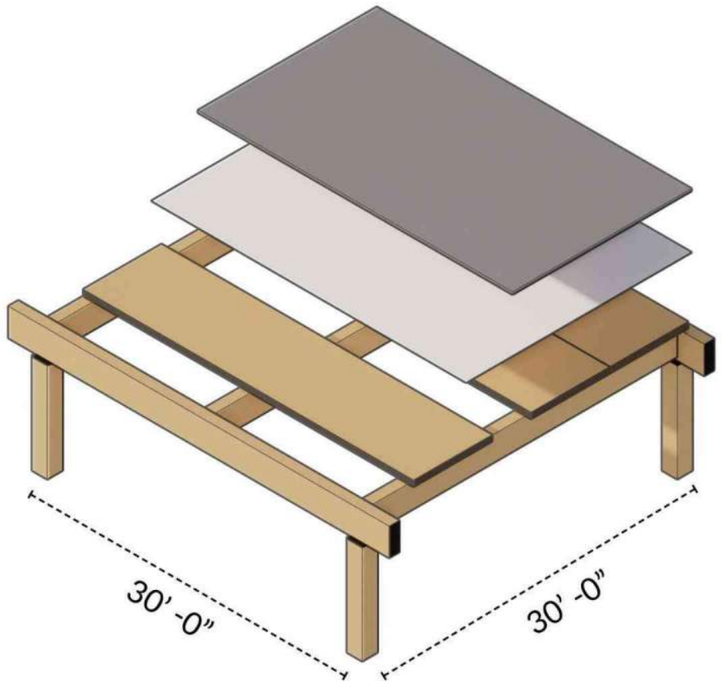
COURTESY OF JOHN FECHTEL AND JOHN KLEIN, GENERATE

TYPE OF CONSTRUCTION

ASSEMBLY + GRID

TIMBER SYSTEM

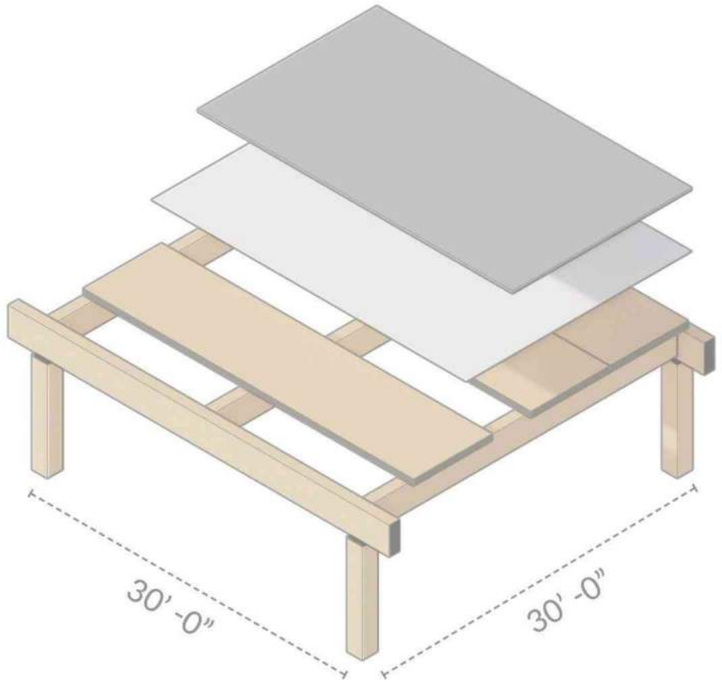
COST IMPACTS



30’ X 30’ 5LAM

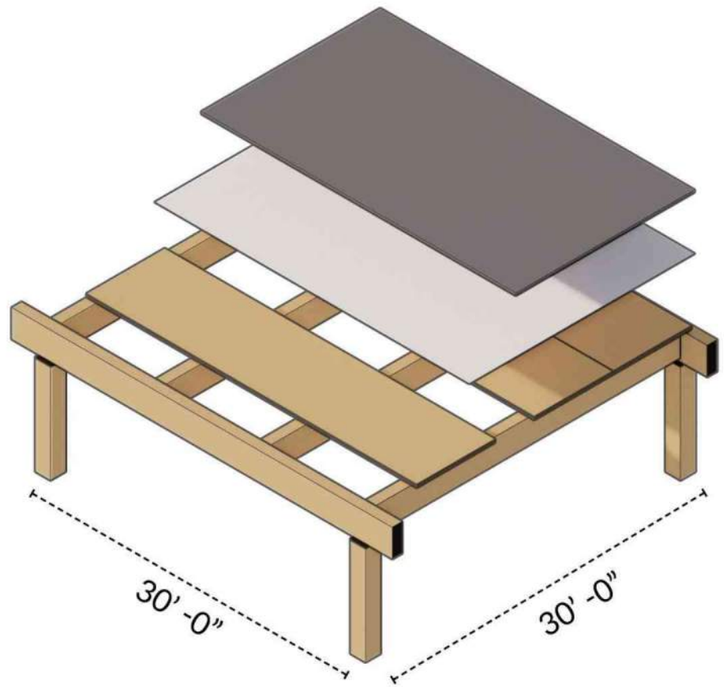
PANEL THICKNESS	5.5” - 6.875”
BEAM SIZE	12.25” X 27”
GIRDER SIZE	14.25” X 28.5”
TIMBER VOLUME	0.90 FT3 / FT2
CLEAR HEIGHT*	10’ - 8.5”

NOTE: CLEAR HEIGHT BASED ON FLOOR TO FLOOR HEIGHT OF 14’*-0” AND 4” TOPPING BUILDUP OVER TIMBER PANELS



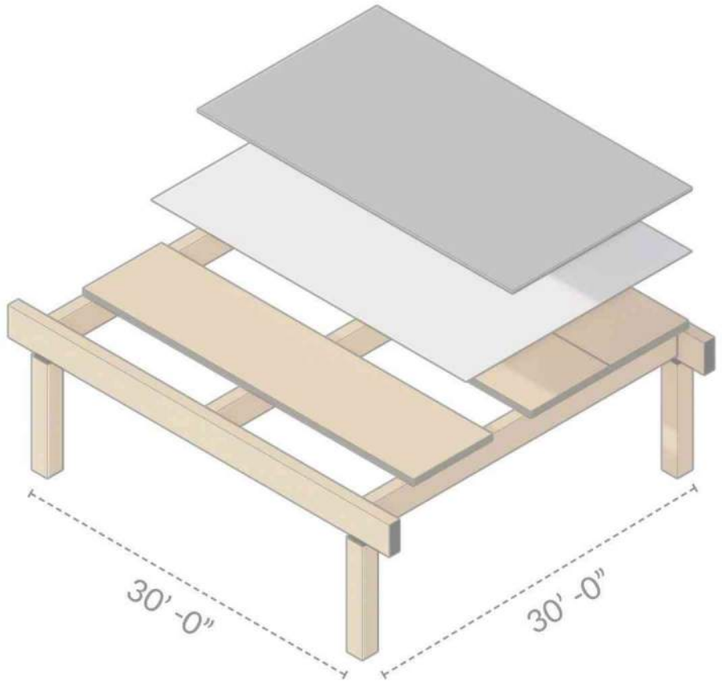
30’ X 30’ 5LAM

PANEL THICKNESS	5.5” - 6.875”
BEAM SIZE	12.25” X 27”
GIRDER SIZE	14.25” X 28.5”
TIMBER VOLUME	0.90 FT3 / FT2
CLEAR HEIGHT*	10’ - 8.5”



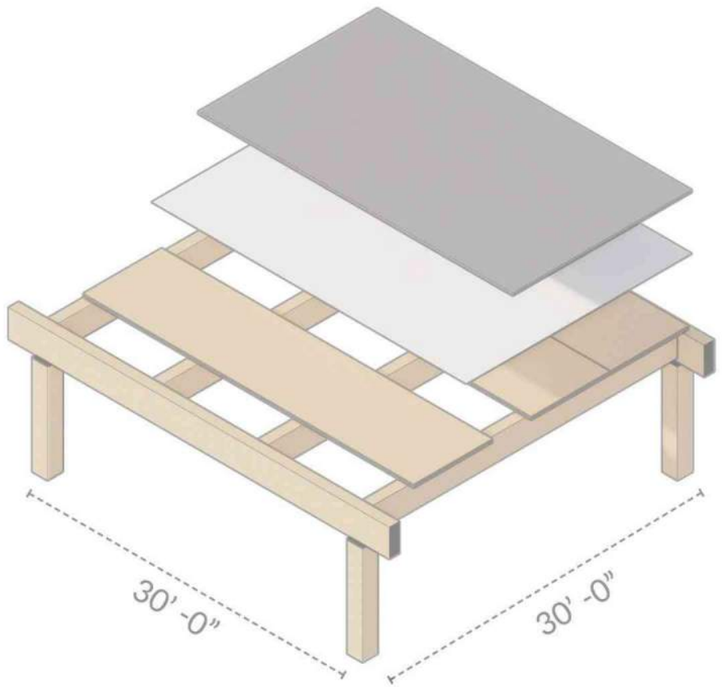
30’ X 30’ 3LAM

PANEL THICKNESS	3.5” - 4.125”
BEAM SIZE	10.75” X 25.5”
GIRDER SIZE	14.25” X 28.5”
TIMBER VOLUME	0.69 FT3 / FT2
CLEAR HEIGHT	10’ - 11”



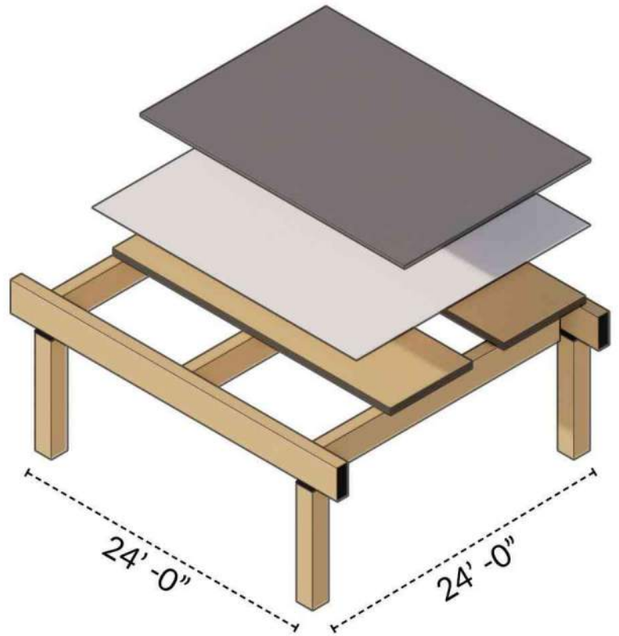
30' X 30' 5LAM

PANEL THICKNESS	5.5" - 6.875"
BEAM SIZE	12.25" X 27"
GIRDER SIZE	14.25" X 28.5"
TIMBER VOLUME	0.90 FT3 / FT2
CLEAR HEIGHT*	10' - 8.5"



30' X 30' 3LAM

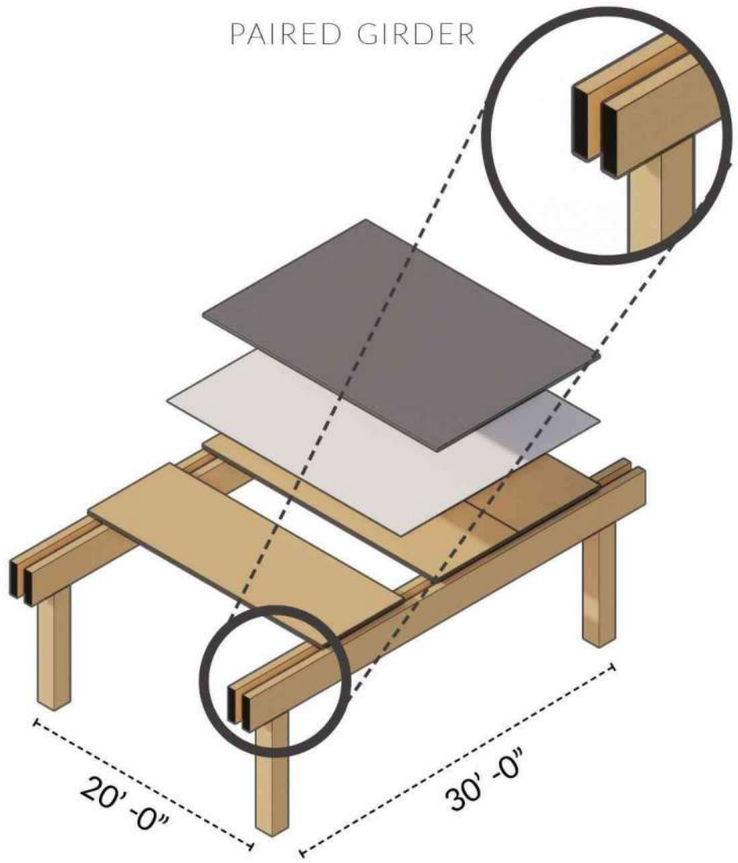
PANEL THICKNESS	3.5" - 4.125"
BEAM SIZE	10.75" X 25.5"
GIRDER SIZE	14.25" X 28.5"
TIMBER VOLUME	0.69 FT3 / FT2
CLEAR HEIGHT	10' - 11"



24' X 24' 3LAM

PANEL THICKNESS	4.125"
BEAM SIZE	8.75" X 22.5"
GIRDER SIZE	10.75" X 24"
TIMBER VOLUME	0.74 FT3 / FT2
CLEAR HEIGHT	11' - 3.5"

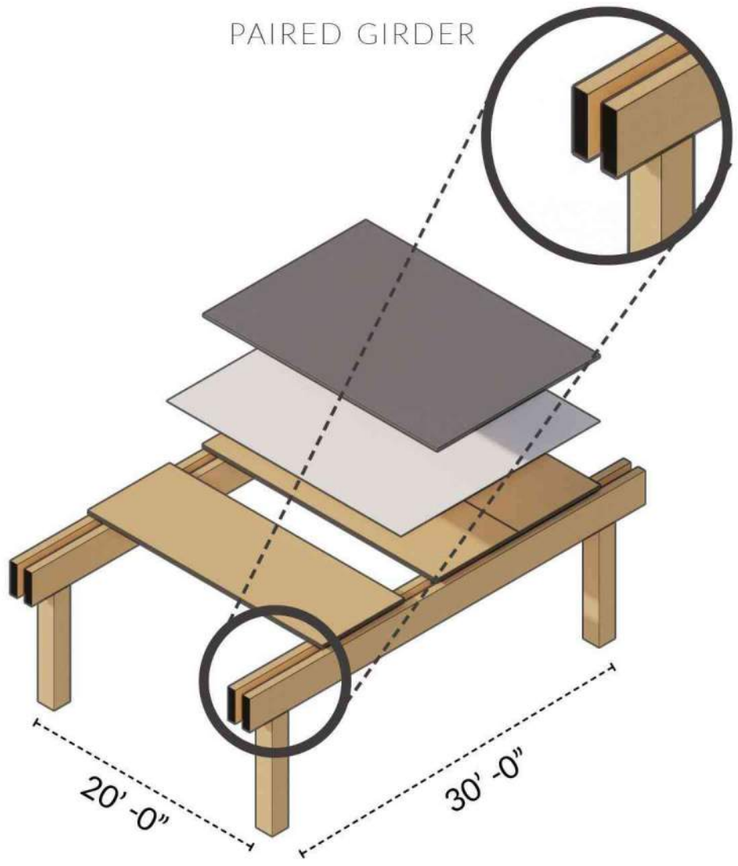
PAIRED GIRDER



20’ X 30’ 5LAM+

PANEL THICKNESS	6.875”
BEAM SIZE	10.75” X 27”
TIMBER VOLUME	0.93 FT3 / FT2
CLEAR HEIGHT	10’ - 10”

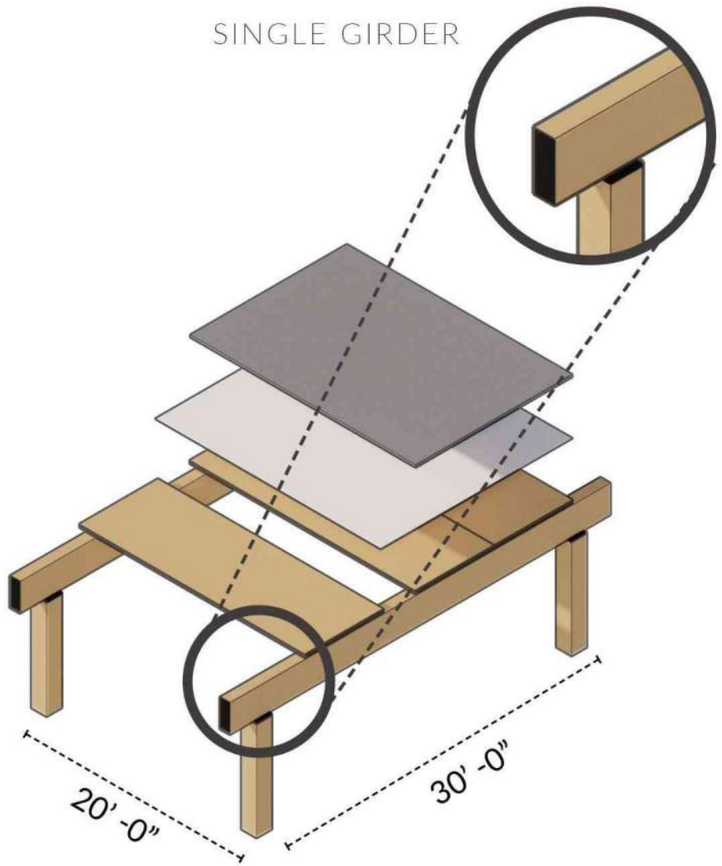
PAIRED GIRDER



20’ X 30’ 5LAM+

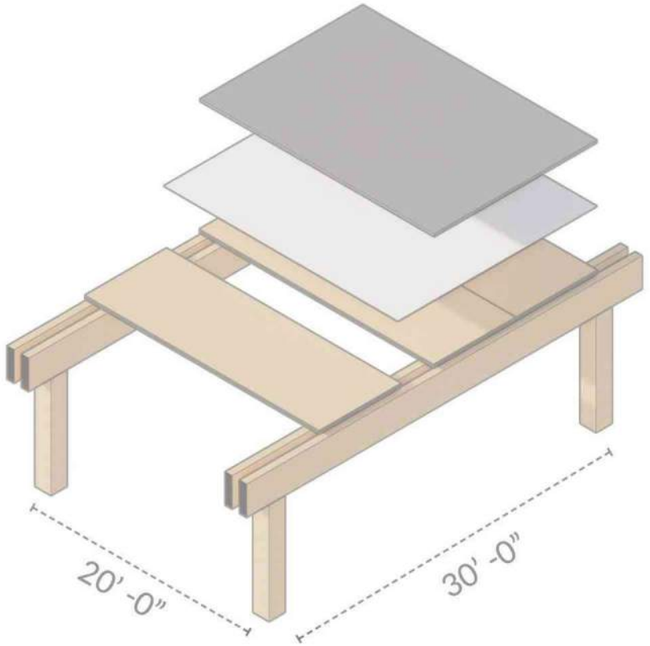
PANEL THICKNESS	6.875”
BEAM SIZE	10.75” X 27”
TIMBER VOLUME	0.93 FT3 / FT2
CLEAR HEIGHT	10’ - 10”

SINGLE GIRDER



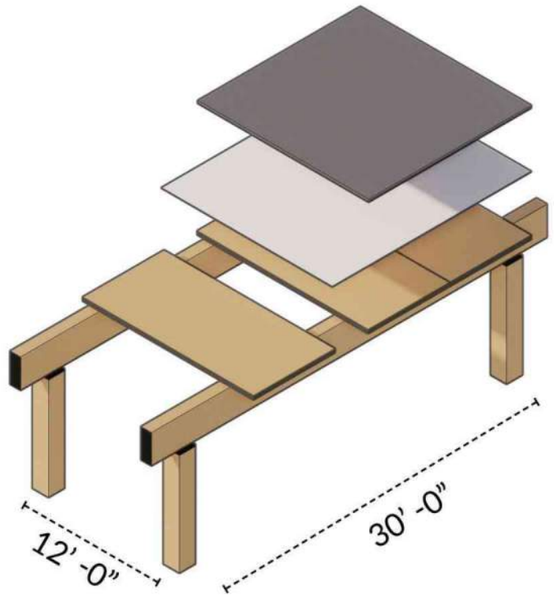
20’ X 30’ 7LAM

PANEL THICKNESS	7.75”
BEAM SIZE	14.25” X 28.5”
TIMBER VOLUME	0.96 FT3 / FT2
CLEAR HEIGHT	10’ - 7.75”



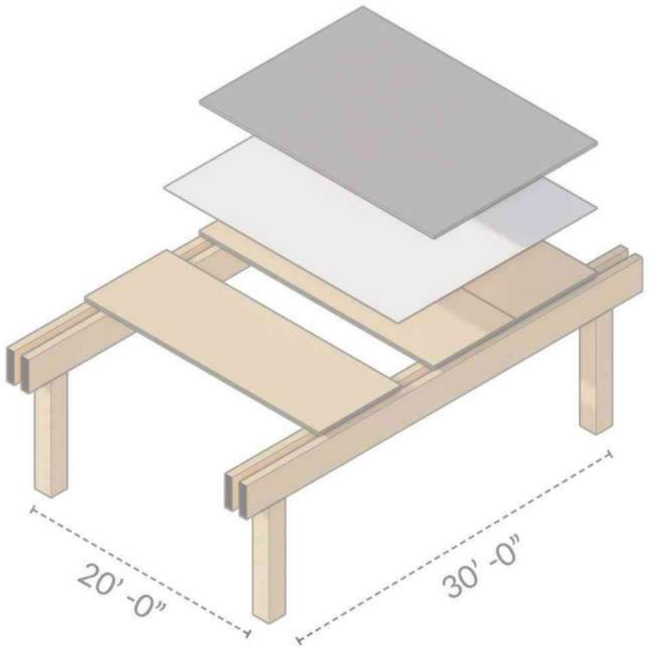
20’ X (VARIES) 5LAM+

PANEL THICKNESS	6.875”
BEAM SIZE	10.75” X 27”
TIMBER VOLUME	0.93 FT3 / FT2
CLEAR HEIGHT	10’ - 10”



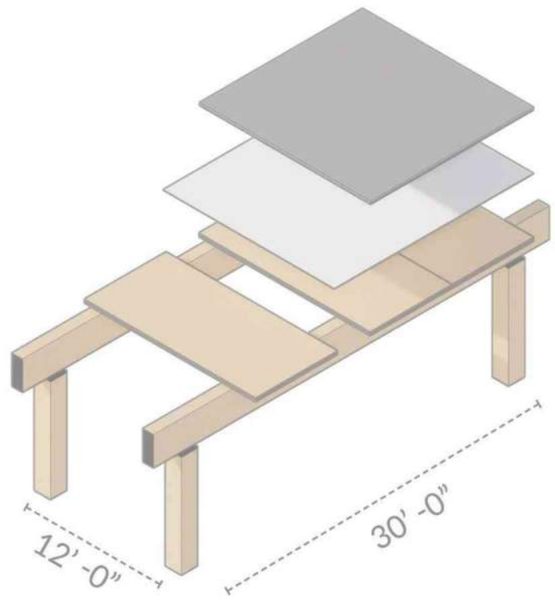
10’ - 12’ X 30’ 3LAM

PANEL THICKNESS	4.125”
BEAM SIZE	10.75” X 25.5”
TIMBER VOLUME	0.68 FT3 / FT2
CLEAR HEIGHT	11’ - 2”



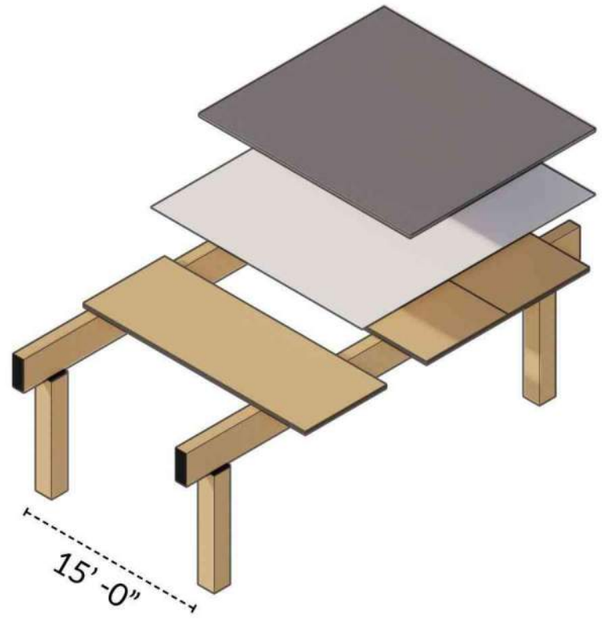
20’ X 30’ 5LAM+

PANEL THICKNESS	6.875”
BEAM SIZE	10.75” X 27”
TIMBER VOLUME	0.93 FT3 / FT2
CLEAR HEIGHT	10’ - 10”



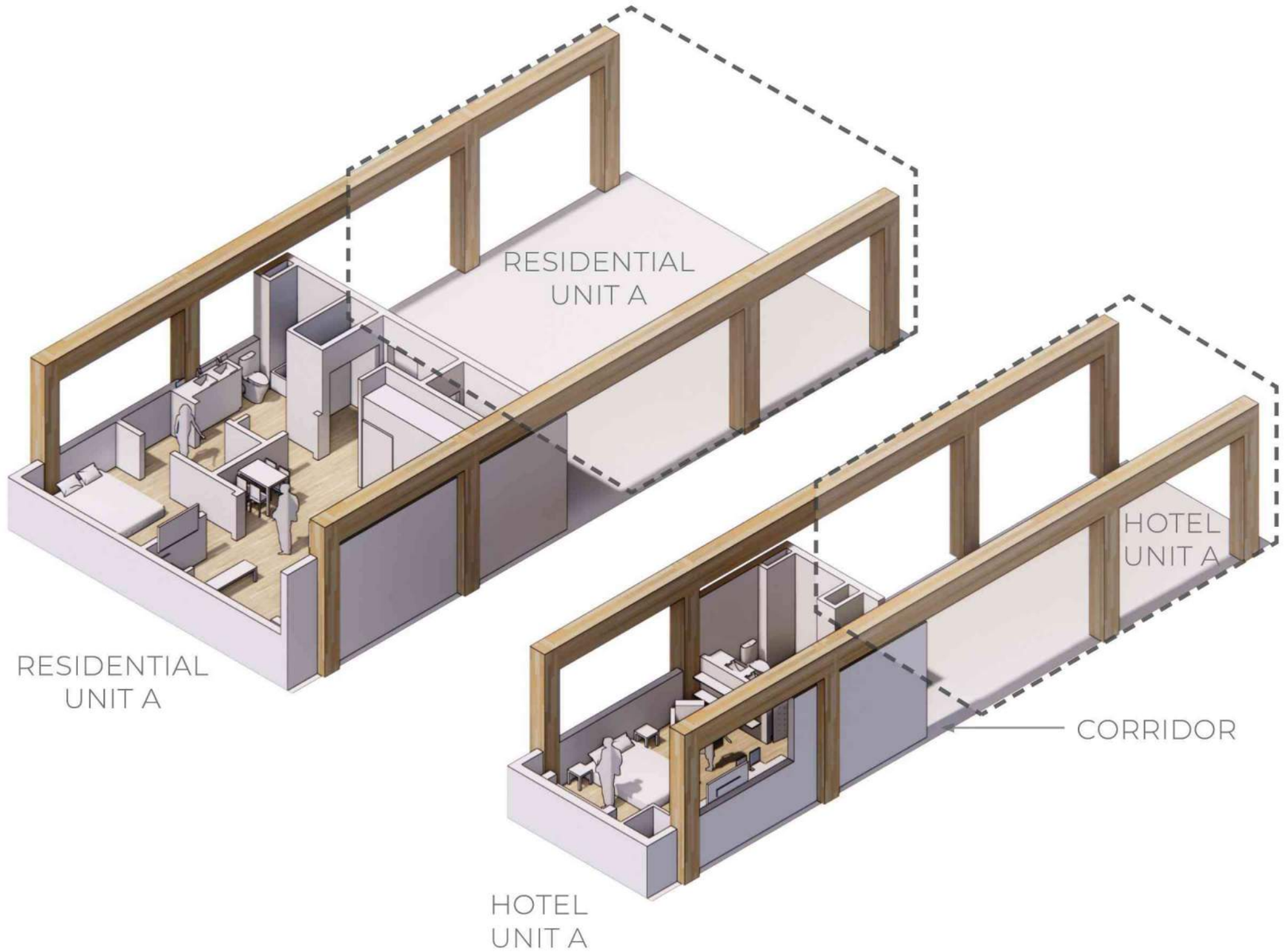
10’ - 12’ X 30’ 3LAM

PANEL THICKNESS	4.125”
BEAM SIZE	10.75” X 25.5”
TIMBER VOLUME	0.68 FT3 / FT2
CLEAR HEIGHT	11’ - 2”

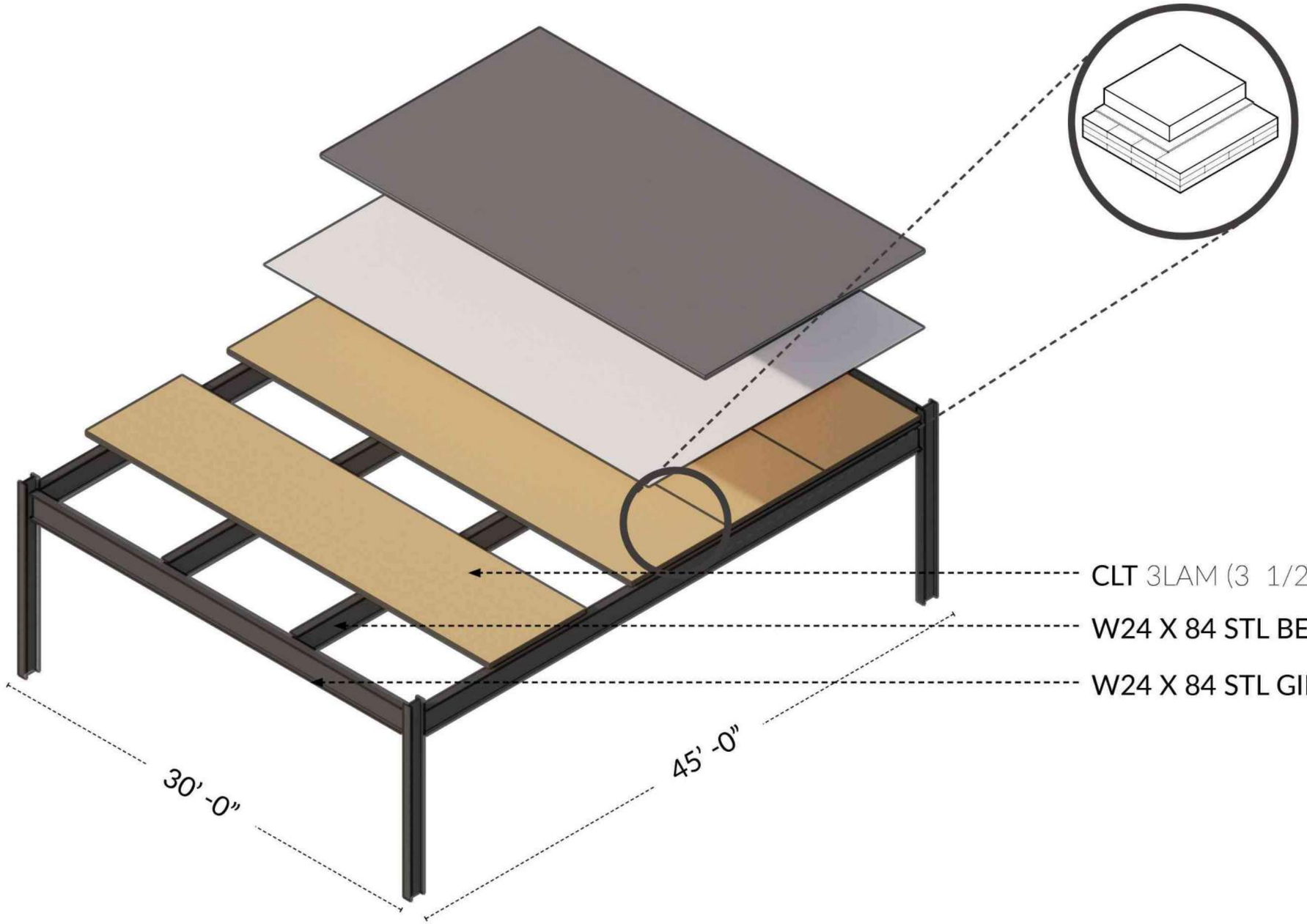


15’ - 18’ (VARIES) 5LAM

PANEL THICKNESS	6.875”
BEAM SIZE	10.75” X 24”
TIMBER VOLUME	0.84 FT3 / FT2
CLEAR HEIGHT	11’ - 1”


RESIDENTIAL
UNIT A
RESIDENTIAL
UNIT A
HOTEL
UNIT A
CORRIDOR
HOTEL
UNIT A

STEEL HYBRID GRID BAY

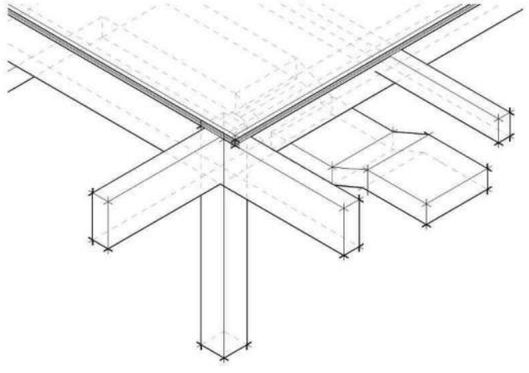


VAISALA PROJECT EXAMPLE

OZ ARCHITECTURE (STEPHAN WERK PHOTOGRAPHY)

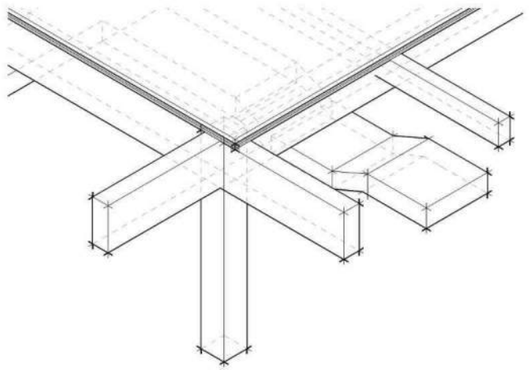
MASS TIMBER - GRID OPTIMIZATION | PROVIDER AGNO | JUNE 2021

OPTION 01 | SINGLE GIRDER

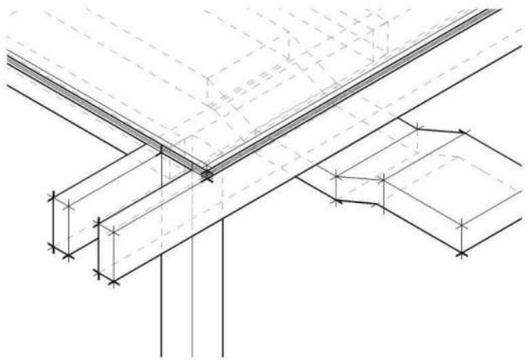


COST	BASELINE
TIME	BASELINE
HEIGHT (B.O.)	9’-9 1/2” (LARGEST GIRDER)
MECH HEIGHT	8’-6 1/2”
FLOOR	3 PLY
COORDINATION	COMPLICATED CANTILEVER SPRINKLER / ELECTRICAL

OPTION 01 | SINGLE GIRDER

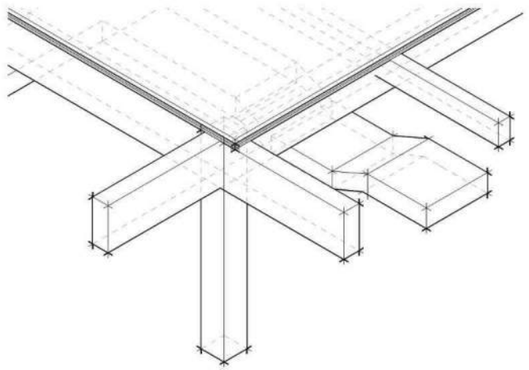


OPTION 02 | DOUBLE GIRDER

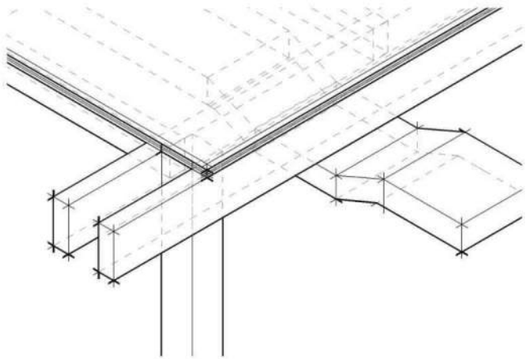


COST	BASELINE	↑	+180K
TIME	BASELINE	↑	GREATER
HEIGHT (B.O.)	9’-9 1/2” (LARGEST GIRDER)	↑	10’-2” (SMALLER GIRDER)
MECH HEIGHT	8’-6 1/2”	↑	8’’-11” (HIGHER)
FLOOR	3 PLY		3 PLY
COORDINATION	COMPLICATED CANTILEVER SPRINKLER / ELECTRICAL	↓	+SIMPLER CANTILEVER +SPRINKLER IN GLULAM

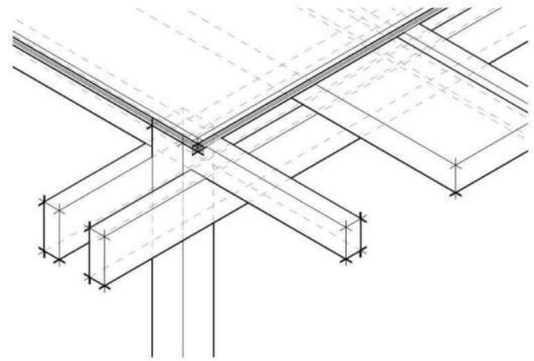
OPTION 01 | SINGLE GIRDER



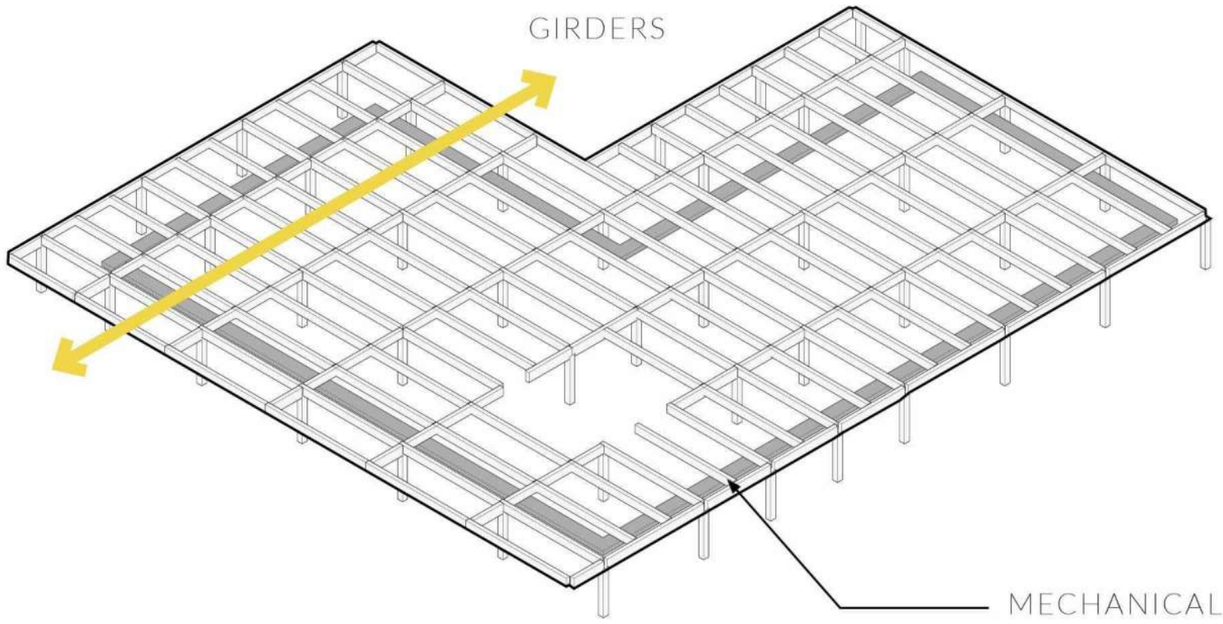
OPTION 02 | DOUBLE GIRDER



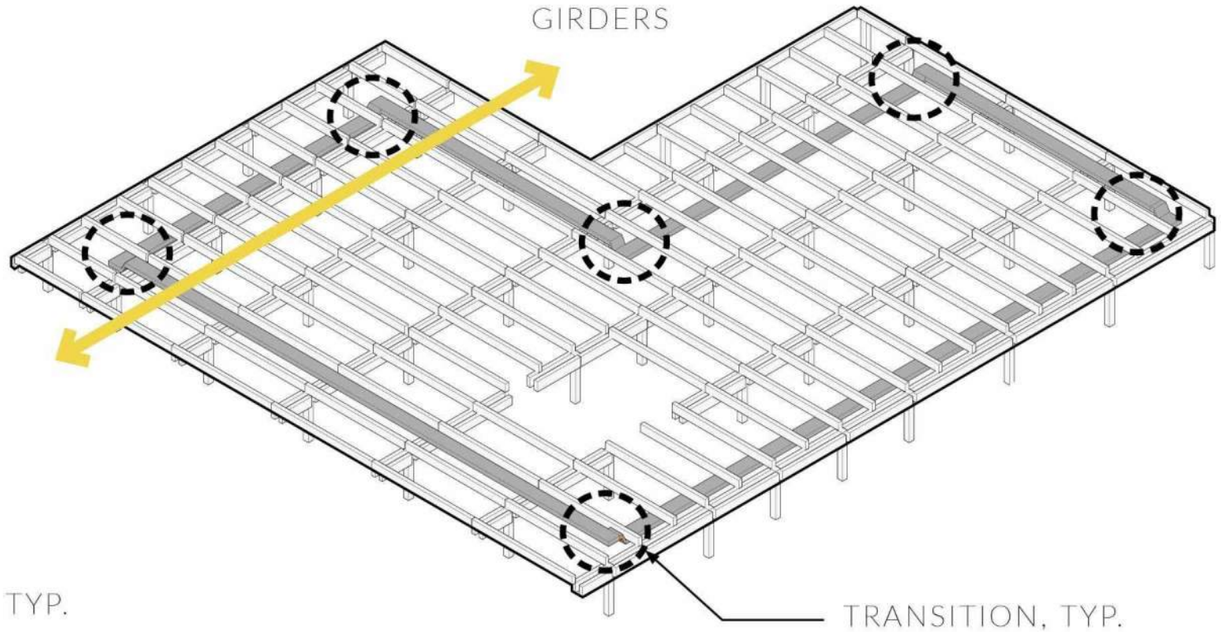
OPTION 03 | STACKED



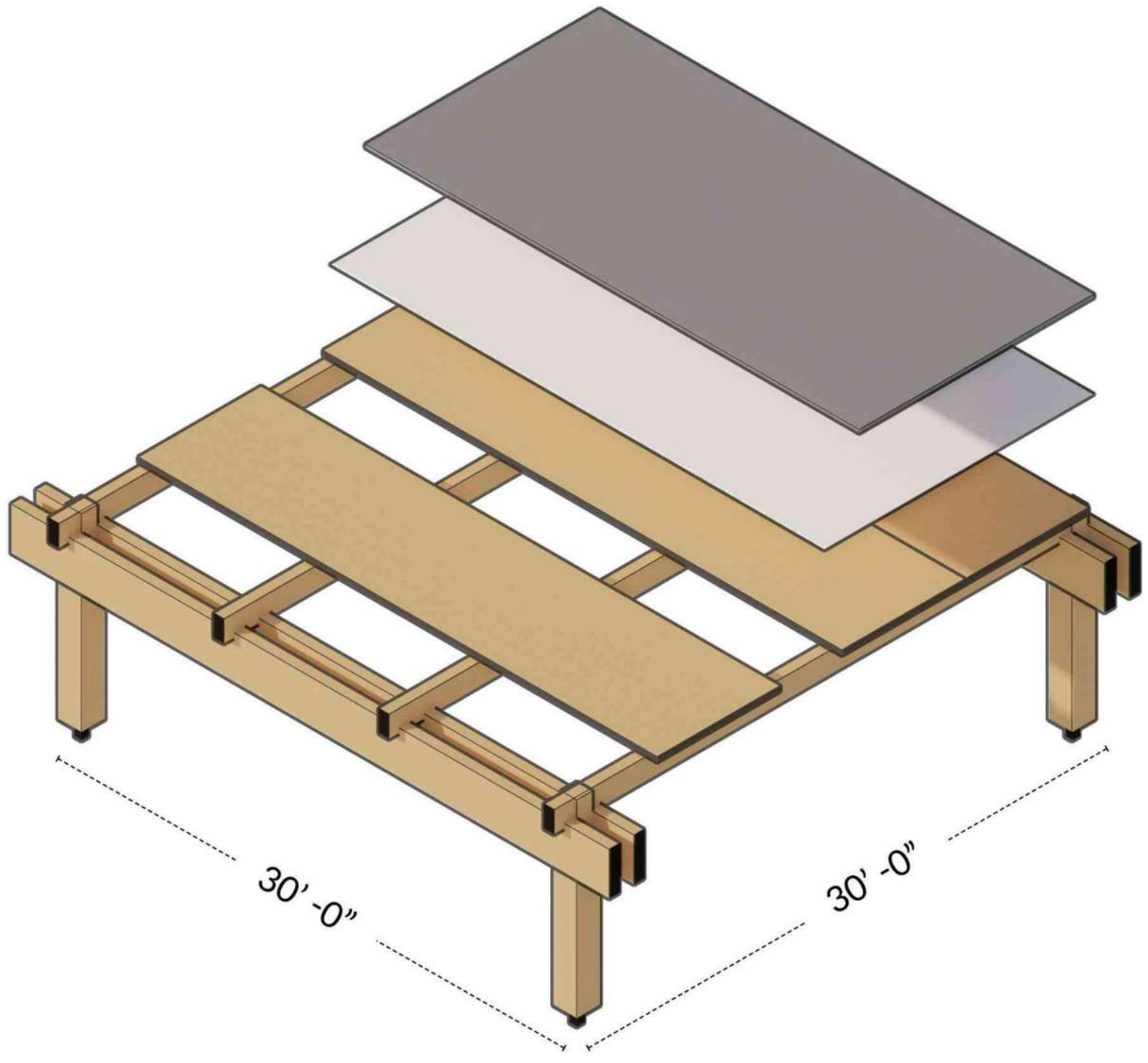
COST	BASELINE	↑	+180K	↑	+50K -STEEL + INSTALL TIME
TIME	BASELINE	↑	GREATER	↓	+ GIRDERS - GLULAM - TIME
HEIGHT (B.O.)	9'-9 1/2" (LARGEST GIRDER)	↑	10'-2" (SMALLER GIRDER)	↓	8'-6" (LOWER GIRDER)
MECH HEIGHT	8'-6 1/2"	↑	8''-11" (HIGHER)	↑	9'-0" (HIGHER)
FLOOR	3 PLY		3 PLY		3 PLY
COORDINATION	COMPLICATED CANTILEVER SPRINKLER / ELECTRICAL	↓	+SIMPLER CANTILEVER +SPRINKLER IN GLULAM	↓	+SIMPLER CANTILEVER +FUTURE FLEXIBILITY

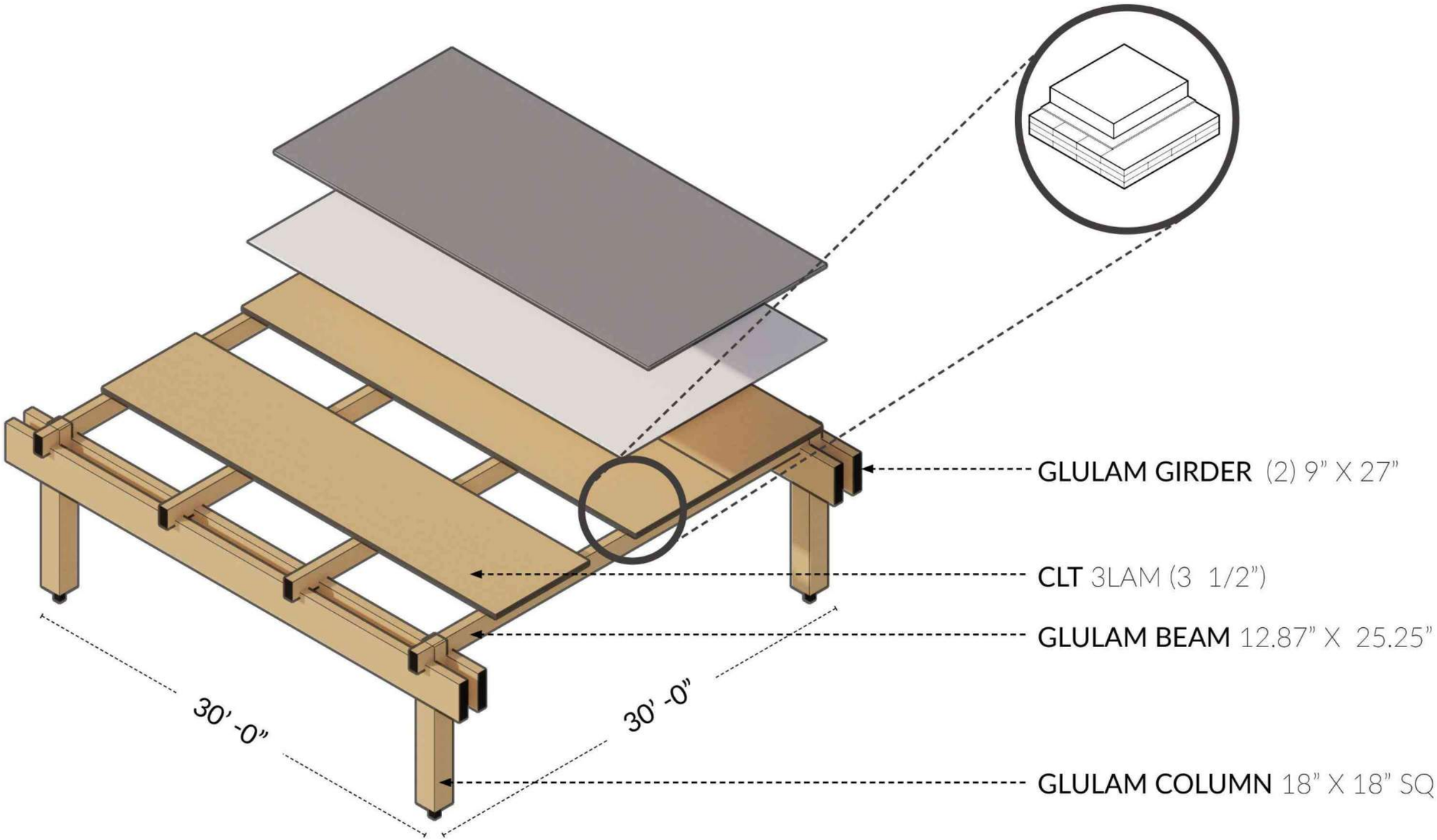


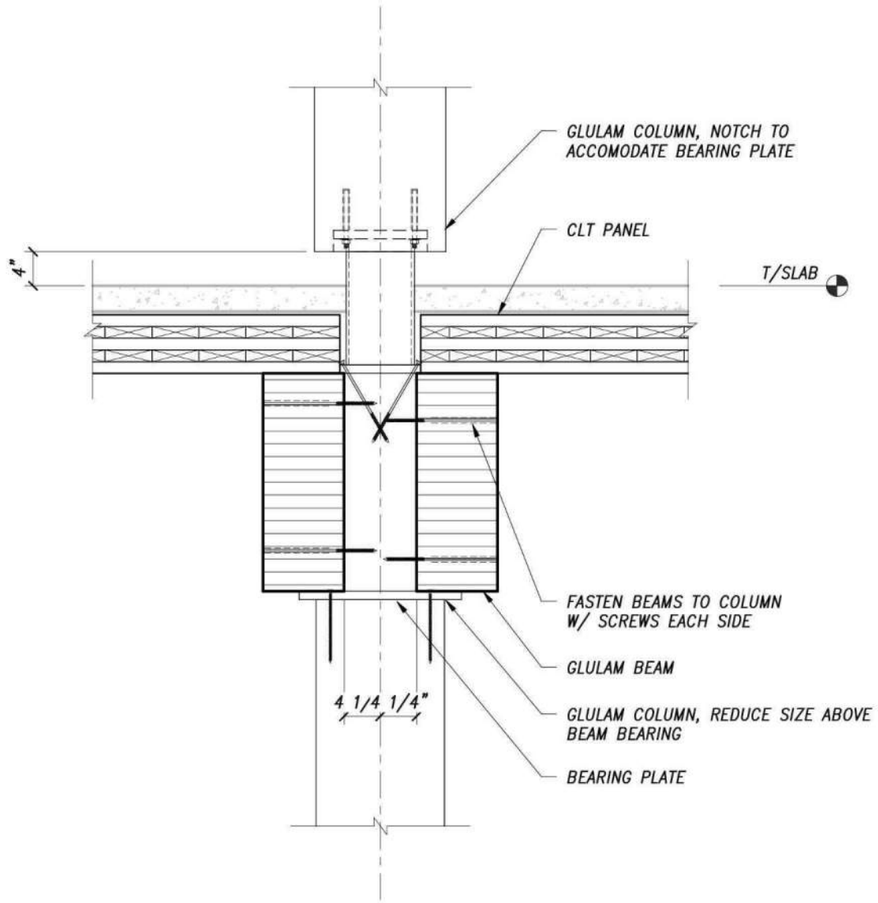
01 | SINGLE GIRDER

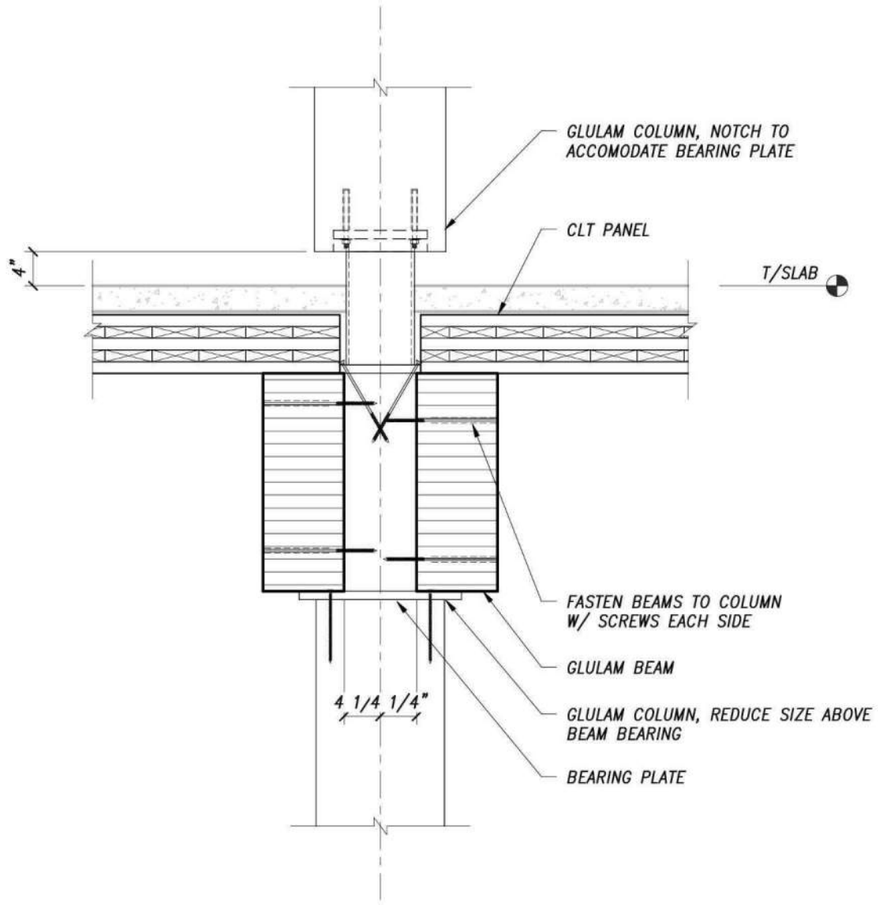


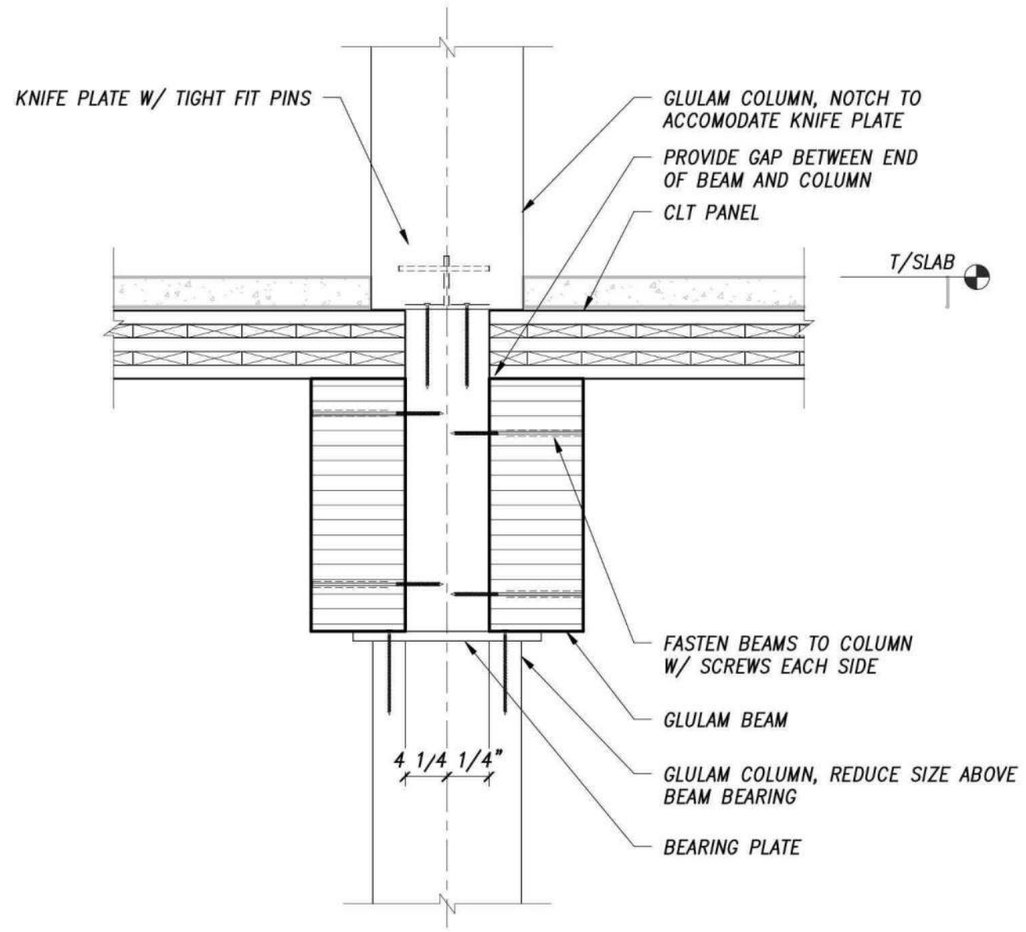
02 | DOUBLE GIRDER STACK


30’ -0”
30’ -0”


GLULAM GIRDER (2) 9" X 27"
CLT 3LAM (3 1/2")
GLULAM BEAM 12.87" X 25.25"
GLULAM COLUMN 18" X 18" SQ
30' -0"
30' -0"


GLULAM COLUMN, NOTCH TO ACCOMODATE BEARING PLATE
CLT PANEL
T/SLAB
4"
FASTEN BEAMS TO COLUMN W/ SCREWS EACH SIDE
GLULAM BEAM
GLULAM COLUMN, REDUCE SIZE ABOVE BEAM BEARING
BEARING PLATE
4 1/4 1/4"


GLULAM COLUMN, NOTCH TO ACCOMODATE BEARING PLATE
CLT PANEL
T/SLAB
4"
FASTEN BEAMS TO COLUMN W/ SCREWS EACH SIDE
GLULAM BEAM
GLULAM COLUMN, REDUCE SIZE ABOVE BEAM BEARING
BEARING PLATE
4 1/4 1/4"

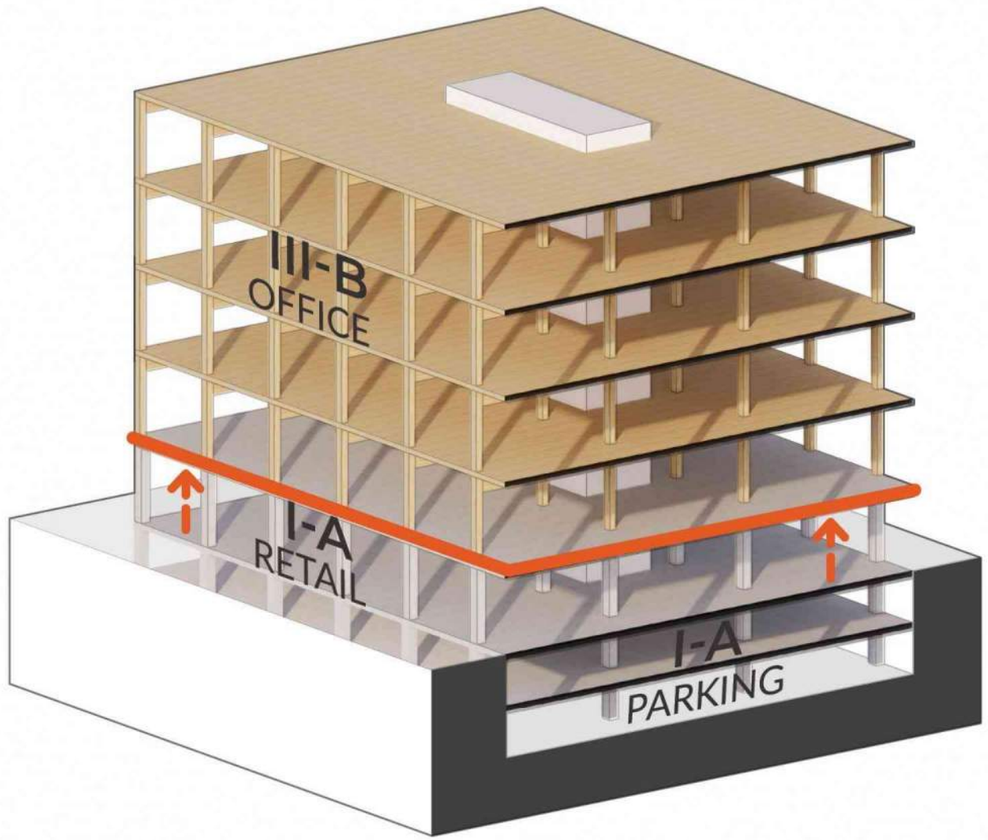

KNIFE PLATE W/ TIGHT FIT PINS
GLULAM COLUMN, NOTCH TO ACCOMODATE KNIFE PLATE
PROVIDE GAP BETWEEN END OF BEAM AND COLUMN
CLT PANEL
T/SLAB
FASTEN BEAMS TO COLUMN W/ SCREWS EACH SIDE
GLULAM BEAM
GLULAM COLUMN, REDUCE SIZE ABOVE BEAM BEARING
BEARING PLATE
4 1/4 1/4"

PLATTE15 | OZ ARCHITECTURE | KEN SCHROEPPEL PHOTOGRAPHY

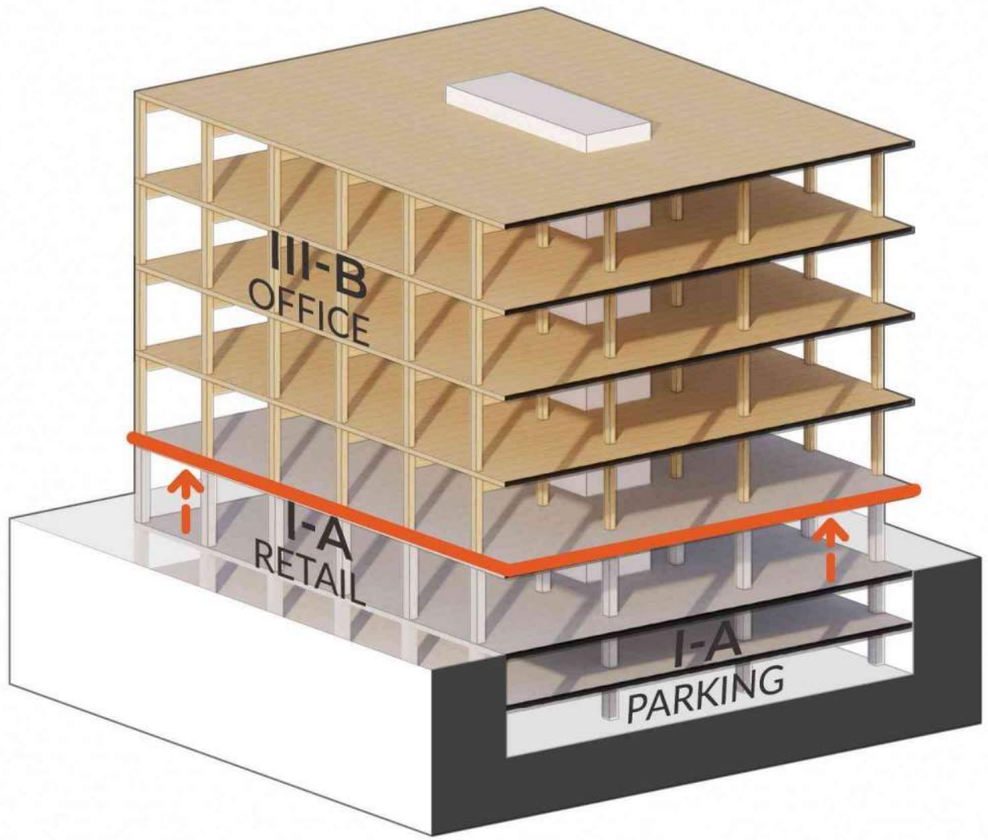
MASS TIMBER - GRID OPTIMIZATION | PROVIDER #G516 | JUNE 2025

PLATTE15 | OZ ARCHITECTURE | KEN SCHROEPPEL PHOTOGRAPHY

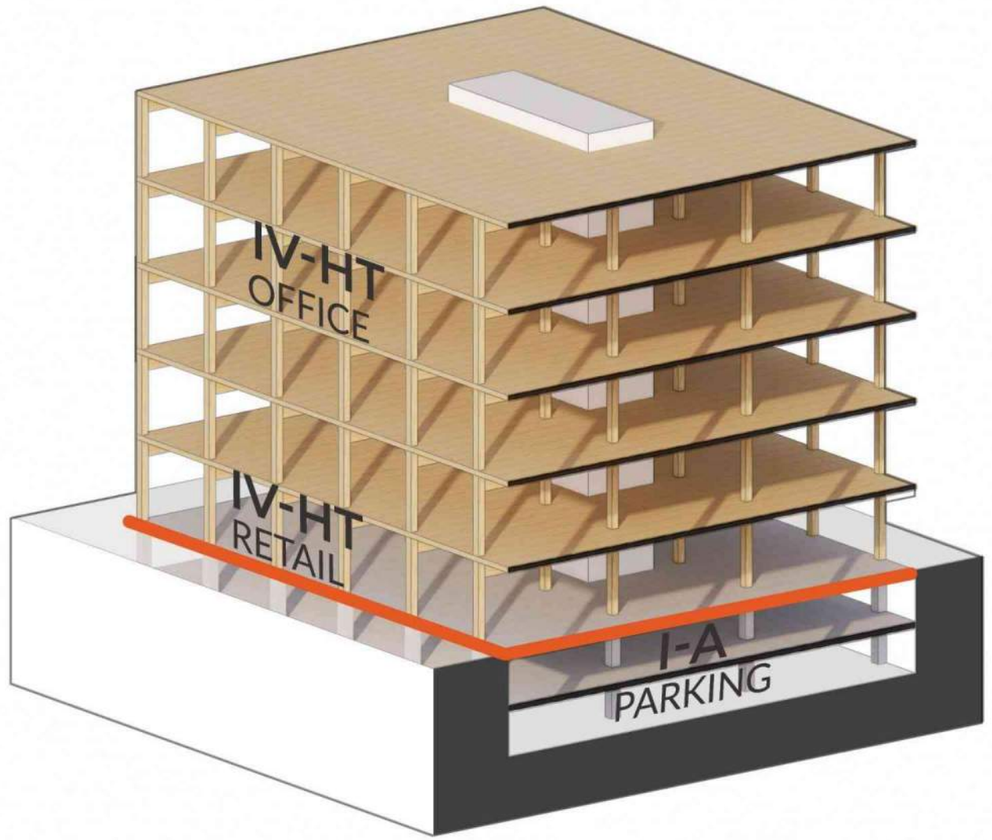
MASS TIMBER - GRID OPTIMIZATION | PROVIDER #G516 | JUNE 2025



TYPE III-B



TYPE III-B



TYPE IV-HT

R
05
04
03
02
01
P1
P2

TYPE OF CONSTRUCTION

ASSEMBLY + GRID

TIMBER SYSTEM

PARTNERS

COST IMPACTS

DISTANCE

Mass Timber Manufacturer & Fabricator Locations

As a non-profit, WoodWorks is supported by these manufacturers and fabricators through our Partner Program. They represent the mass timber industry, and it is through their support that WoodWorks offers technical resources, educational programming, and free project assistance to teams building with wood.

Visit the woodworksinnovationnetwork.org (WIN) to get company contact information and to see their projects built or under construction.

DowelLam
(DLT, fabricator)
Abbotsford, BC

Element5 | HASSLACHER Group
(CLT, GLT, Glulam, fabricator)
St.Thomas, ON

Freres Engineered Wood
(CLT, LVL beams/columns, fabricator)
Lyons, OR

Kalesnikoff
(CLT, GLT, Glulam, fabricator)
Castlegar, BC

Mercer
(CLT, GLT, Glulam, fabricator)
Conway, AR; Okanagan Falls, BC; Spokane, WA

Sauter Timber
(fabricator)
Rockwood, TN; Estacada, OR

SmartLam
(CLT, GLT, Glulam, fabricator)
Dothan, AL; Columbia Falls, MT

Sterling Solutions
(CLT, fabricator)
Phoenix, IL

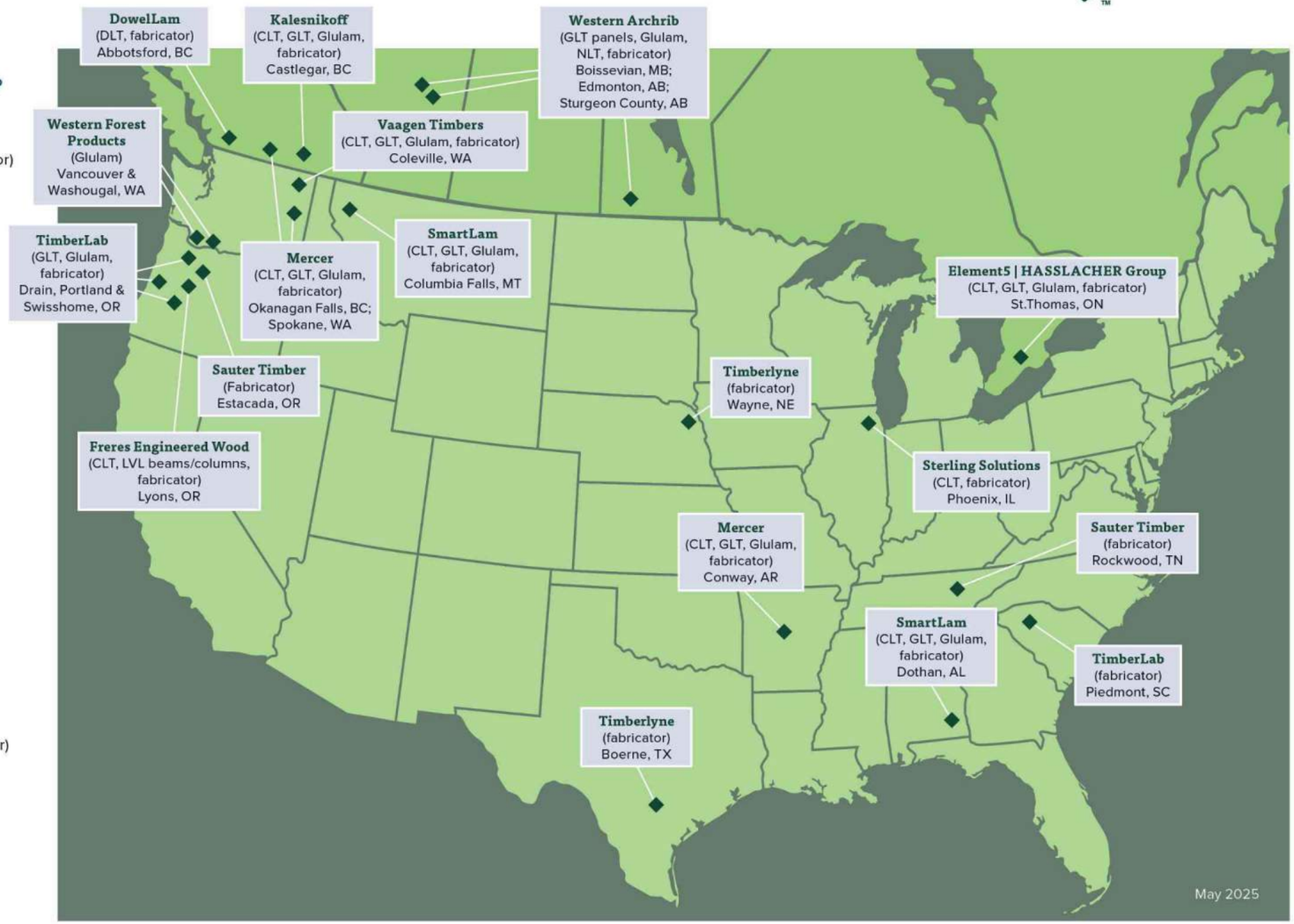
TimberLab
(GLT, Glulam, fabricator)
Drain, Portland & Swisshome, OR; Piedmont, SC

Timberlyne
(fabricator)
Wayne, NE; Boerne, TX

Vaagen Timbers
(CLT, GLT, Glulam, fabricator)
Coleville, WA

Western Archrib
(GLT panels, Glulam, NLT, fabricator)
Boissevian, MB; Edmonton, AB; Sturgeon County, AB

Western Forest Products
(Glulam)
Vancouver & Washougal, WA

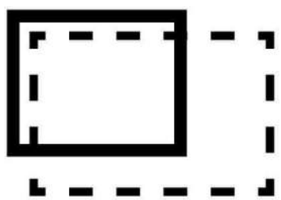


DISTANCE

LOCAL COORDINATION

DISTANCE

LOCAL COORDINATION



MODULE LIMITS

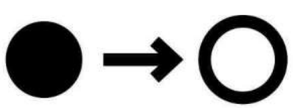
BAY DESIGN | FAB LIMITS | SHIPPING

DISTANCE

LOCAL COORDINATION

MODULE LIMITS

BAY DESIGN | FAB LIMITS | SHIPPING



MATERIAL SOURCE

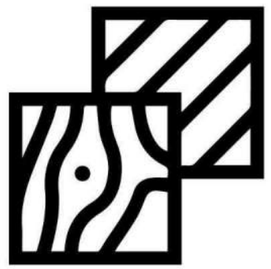
DISTANCE

LOCAL COORDINATION

MODULE LIMITS

BAY DESIGN | FAB LIMITS | SHIPPING

MATERIAL SOURCE



AESTHETIC / MATERIAL

WOOD SPECIES

AESTHETIC | LOCATION | SPAN

DOUGLAS-FIR LARCH

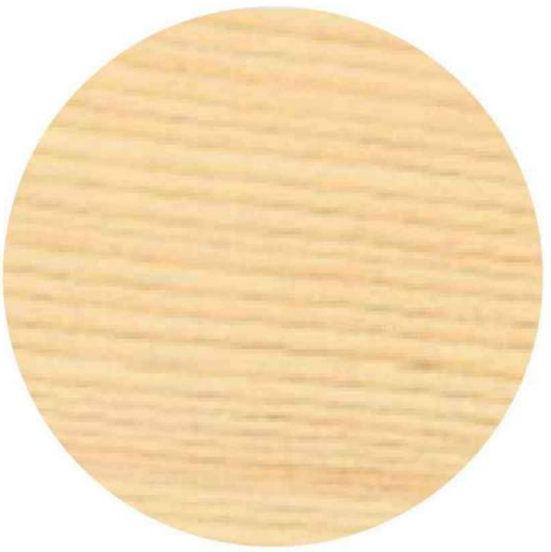
(DF)

S. YELLOW PINE

(SYP)

SPRUCE PINE FIR

(SPF)



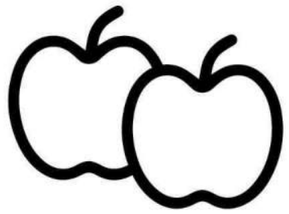
HEM-FIR

(HF)

DISTANCE

LOCAL COORDINATION

AESTHETIC / MATERIAL



COST

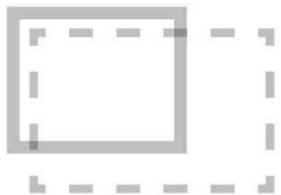
MODULE LIMITS

BAY DESIGN | FAB LIMITS | SHIPPING

MATERIAL SOURCE

DISTANCE

LOCAL COORDINATION



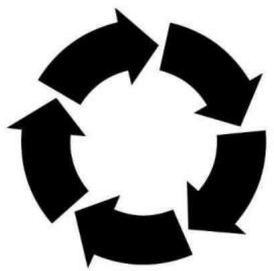
MODULE LIMITS

BAY DESIGN | FAB LIMITS | SHIPPING

MATERIAL SOURCE

AESTHETIC / MATERIAL

COST



EXPERTISE

MGFR TO INSTALL

DISTANCE

LOCAL COORDINATION

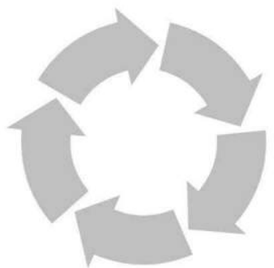
MODULE LIMITS

BAY DESIGN | FAB LIMITS | SHIPPING

MATERIAL SOURCE

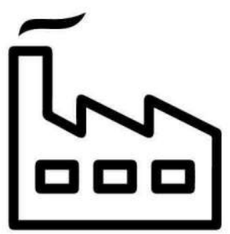
AESTHETIC / MATERIAL

COST



EXPERTISE

MGFR TO INSTALL



FACILITY

TYPE OF CONSTRUCTION

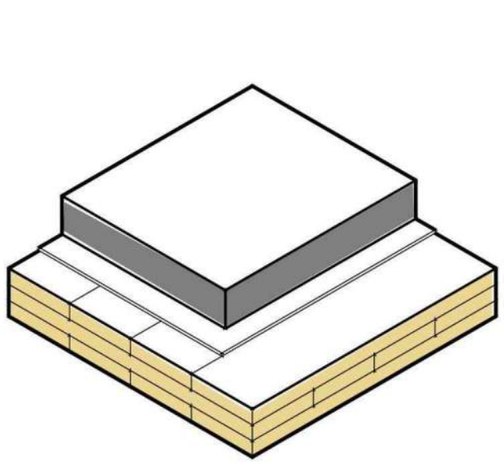
ASSEMBLY + GRID

TIMBER SYSTEM

PARTNERS

COST IMPACTS

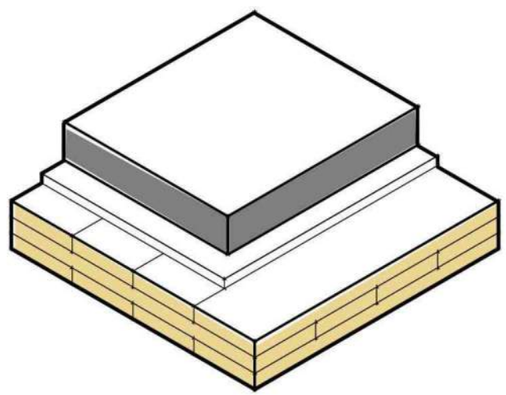
PREFAB + DETAILING



01

3 LAYER CLT 9-10PSF (3.90")
MAXXON ACOUSTIMATT II (1/4")
3" NORMAL WEIGHT CONCRETE

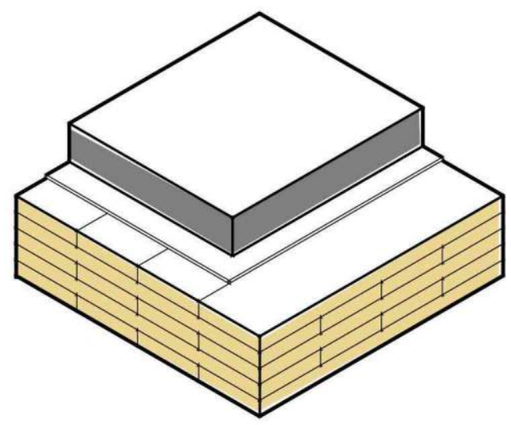
STC: 54-56
IIC: <48



02

3 LAYER CLT 9-10PSF (3.5")
MAXXON ACOUSTIMATT III (3/4")
3" NORMAL WEIGHT CONCRETE

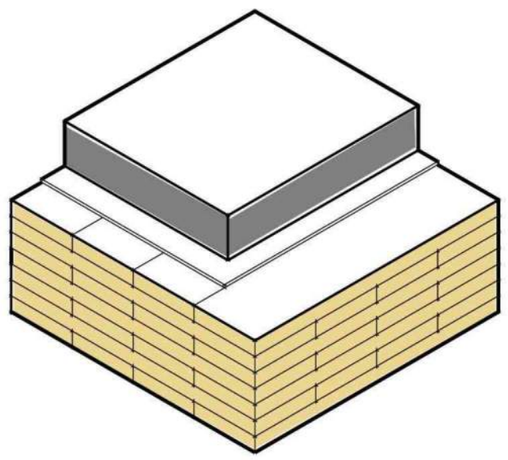
STC: 53 (ASTC*)
IIC: 45 (FIIC*)



03

5 LAYER CLT 9-10PSF (6.875")
MAXXON ACOUSTIMATT PREM/SBR (3/4")
2" NORMAL WEIGHT CONCRETE

STC: 52
IIC: 52

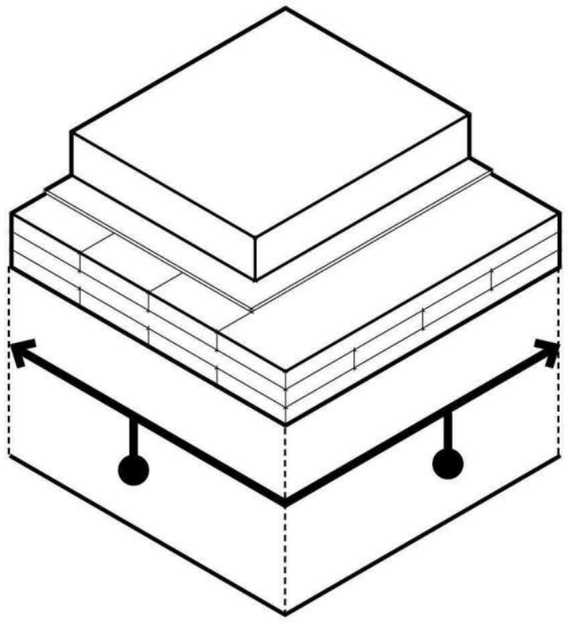


04

7 LAYER CLT 9-10PSF (11.02")
MAXXON ACOUSTIMATT II (1/4")
3.5 NORMAL WEIGHT CONCRETE

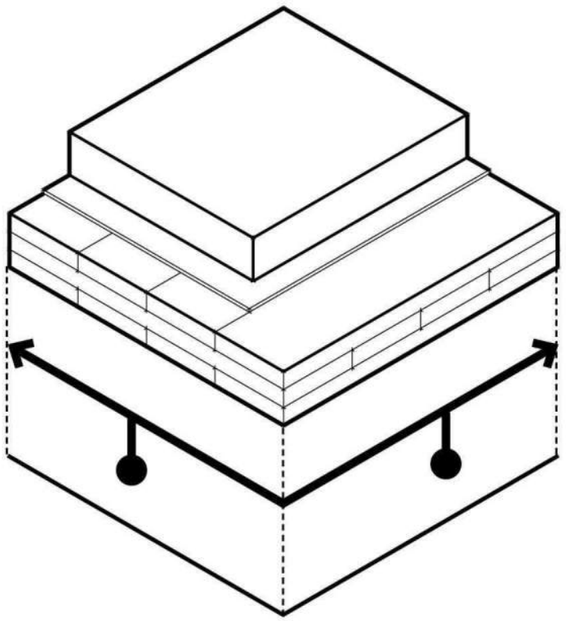
STC: 55-58
IIC: <49

STC: SOUND TRANSMISSION CLASS, ASTC: APPARENT SOUND TRANSMISSION CLASS IIC: IMPACT INSULATION CLASS, FICC: FIELD IMPACT INSULATION CLASS



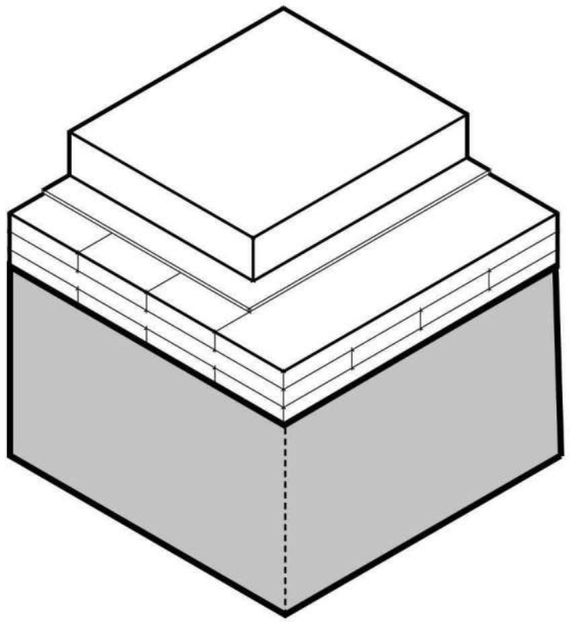
OPTION 01

SPRINKLER SPACES



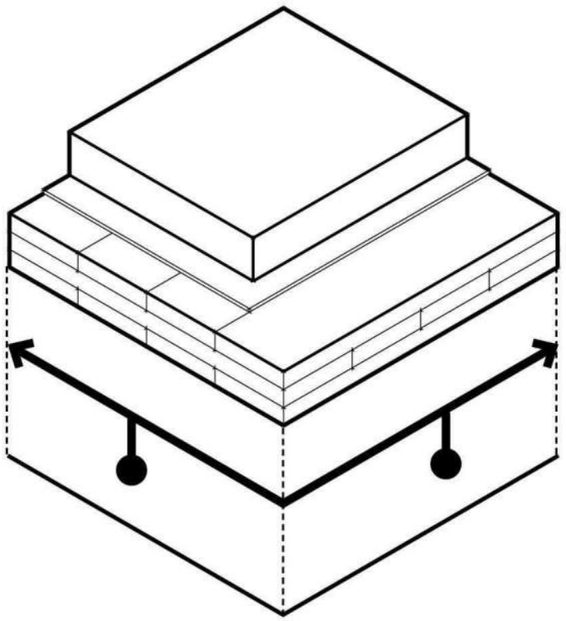
OPTION 01

SPRINKLER SPACES



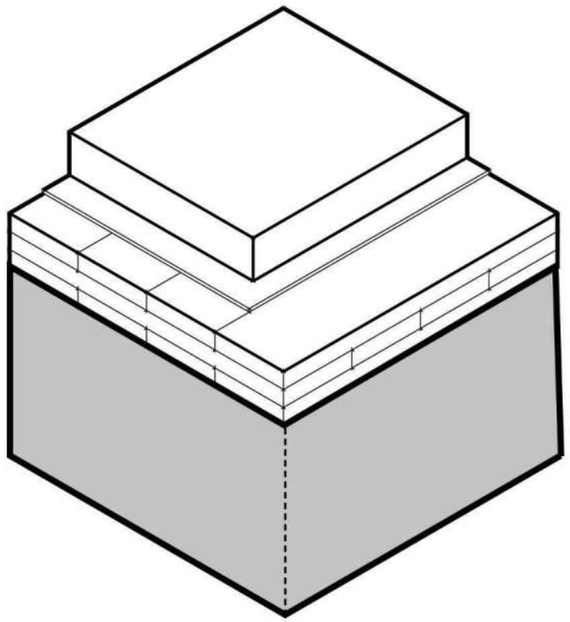
OPTION 02

NONCOMBUSTIBLE INSULATION



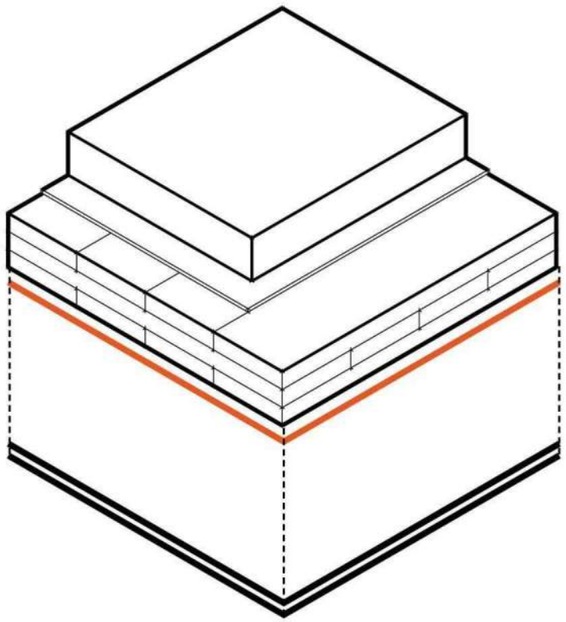
OPTION 01

SPRINKLER SPACES



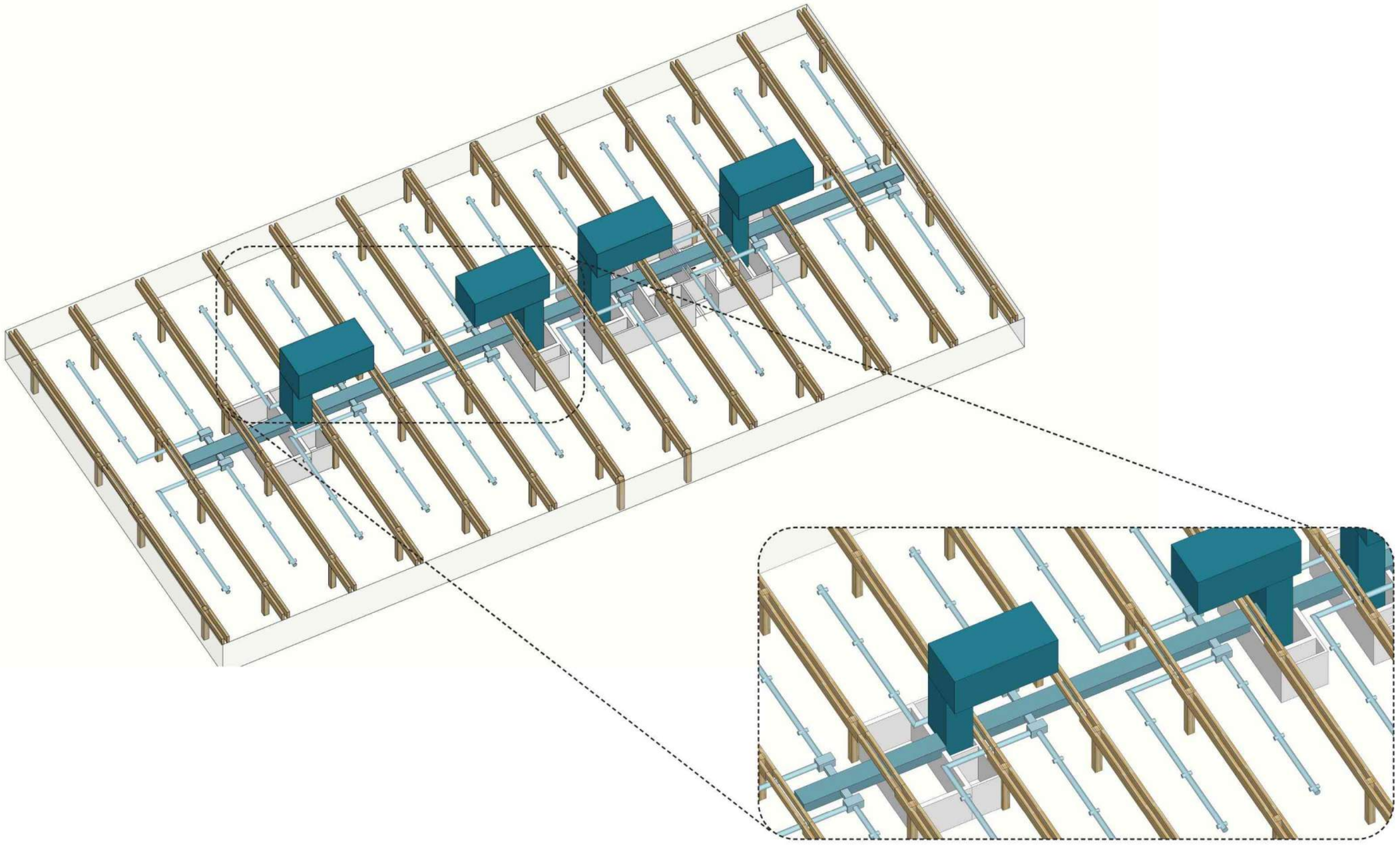
OPTION 02

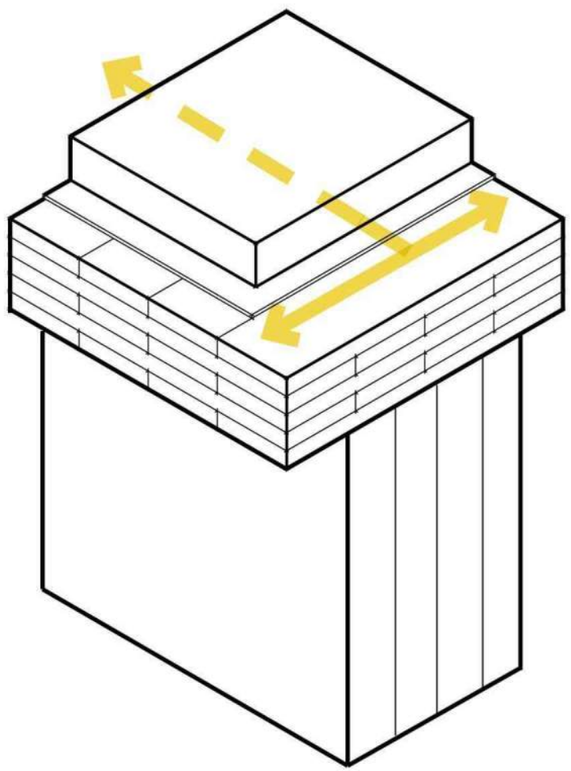
NONCOMBUSTIBLE INSULATION



OPTION 03

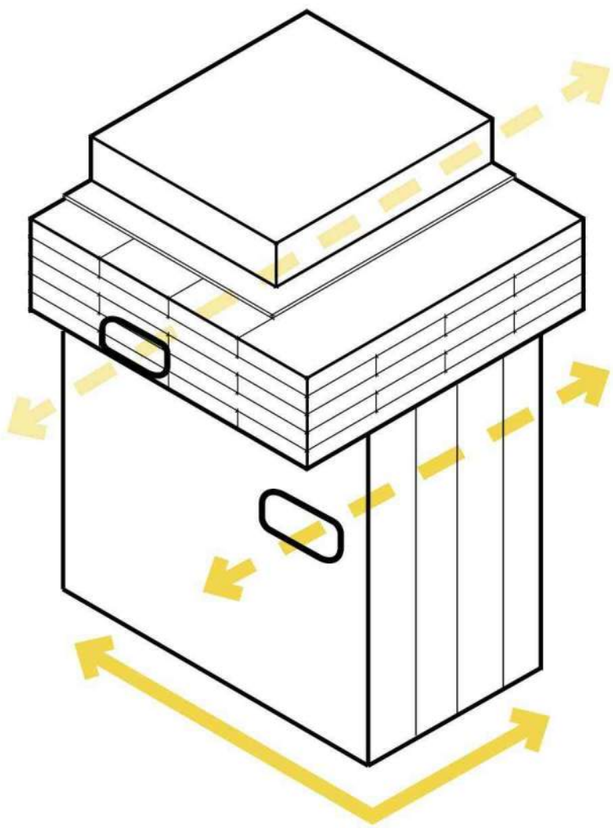
5/8” TYPE X GYPSUM BD.





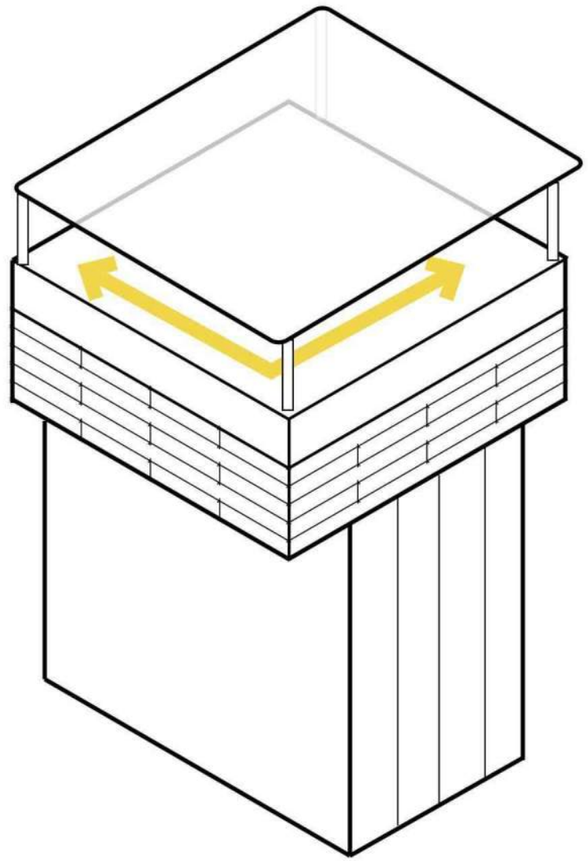
OPTION 01

IN-FLOOR SYSTEM



OPTION 02

BEAM/CEILING SYSTEM



OPTION 03

RAISED ACCESS FLOOR

COMPLETE

03

SCHEDULE

QUIETER

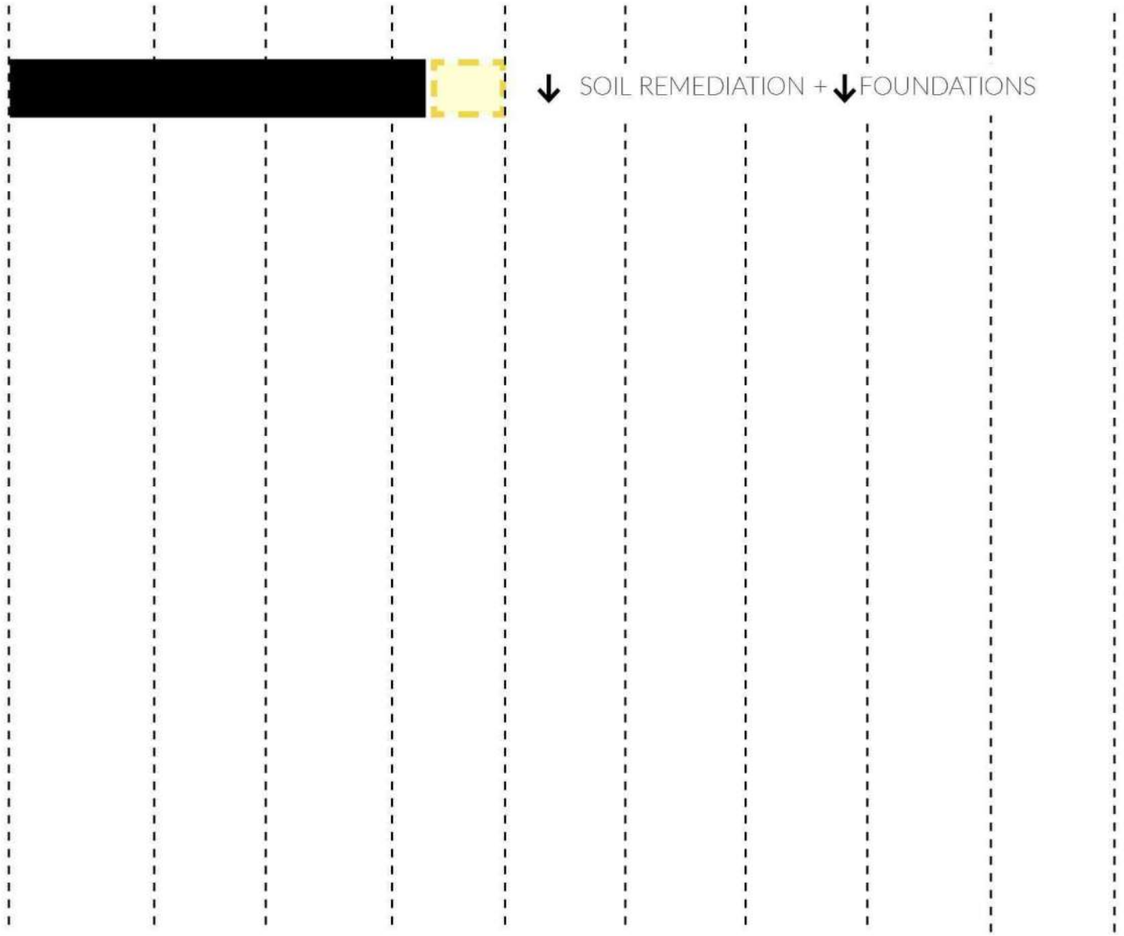
SITE SAFETY

ZERO LOT LINE BENEFITS

LESS WASTE

CLEAN SITE

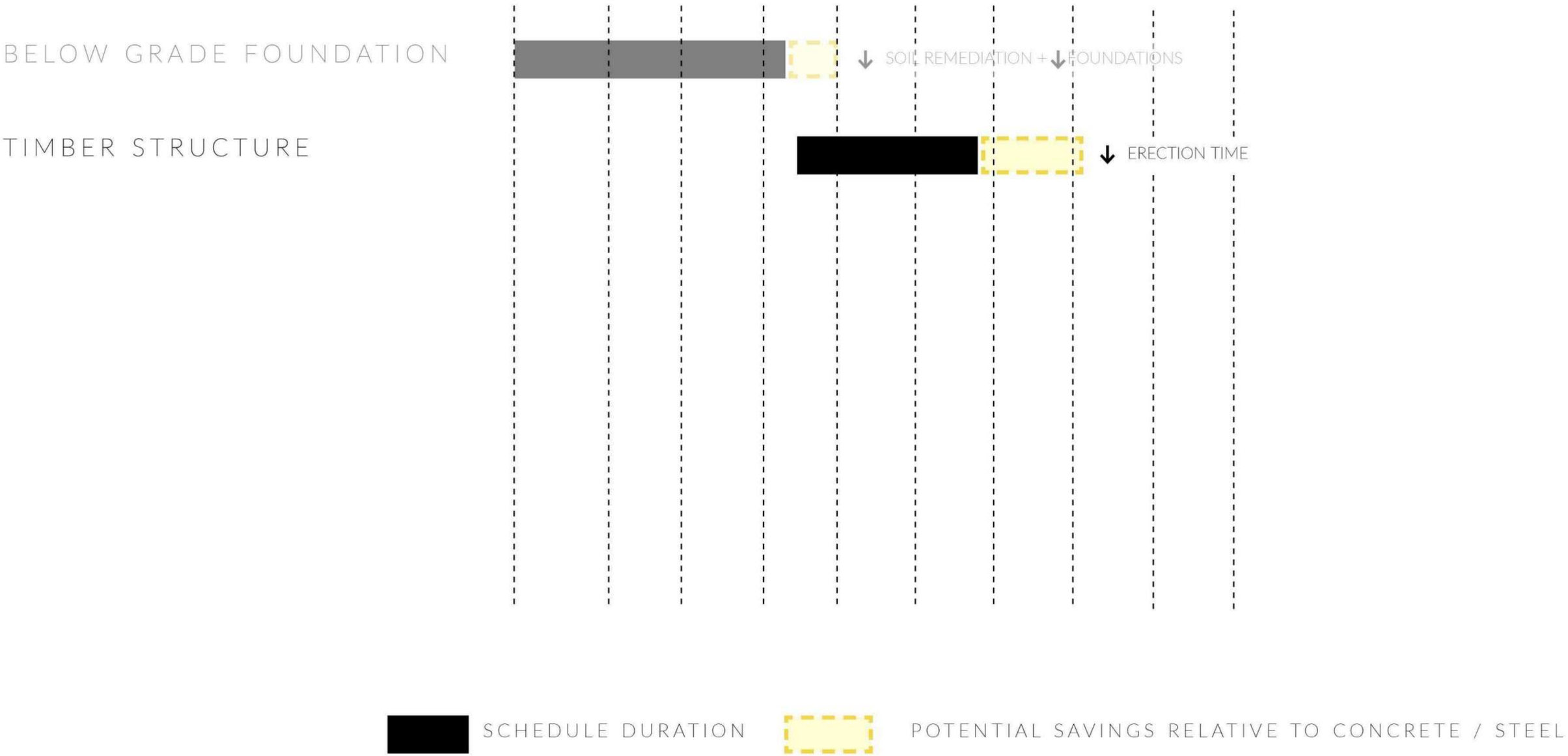
BELOW GRADE FOUNDATION



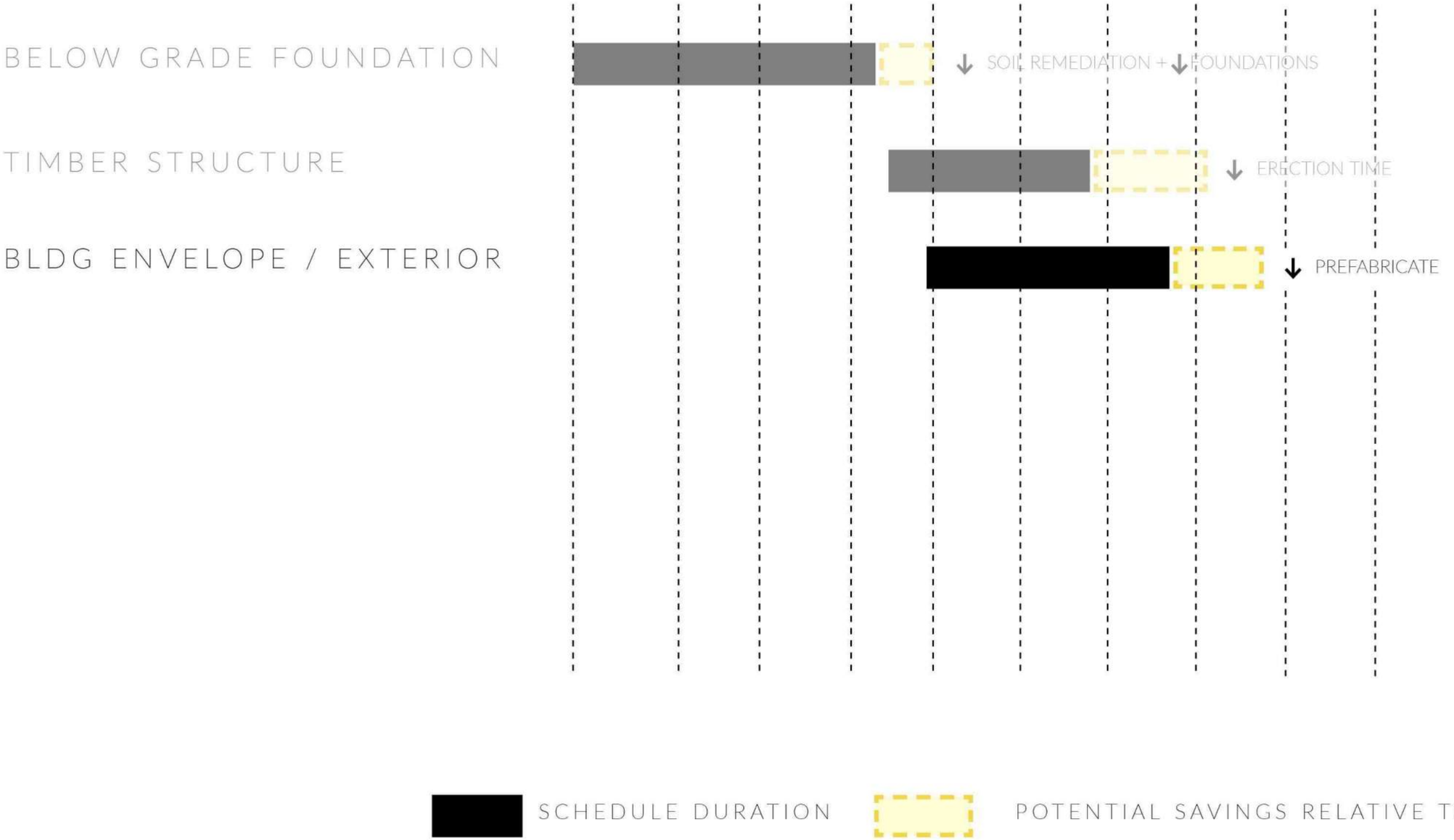
SCHEDULE DURATION

POTENTIAL SAVINGS RELATIVE TO CONCRETE / STEEL

CONSTRUCTION SCHEDULE



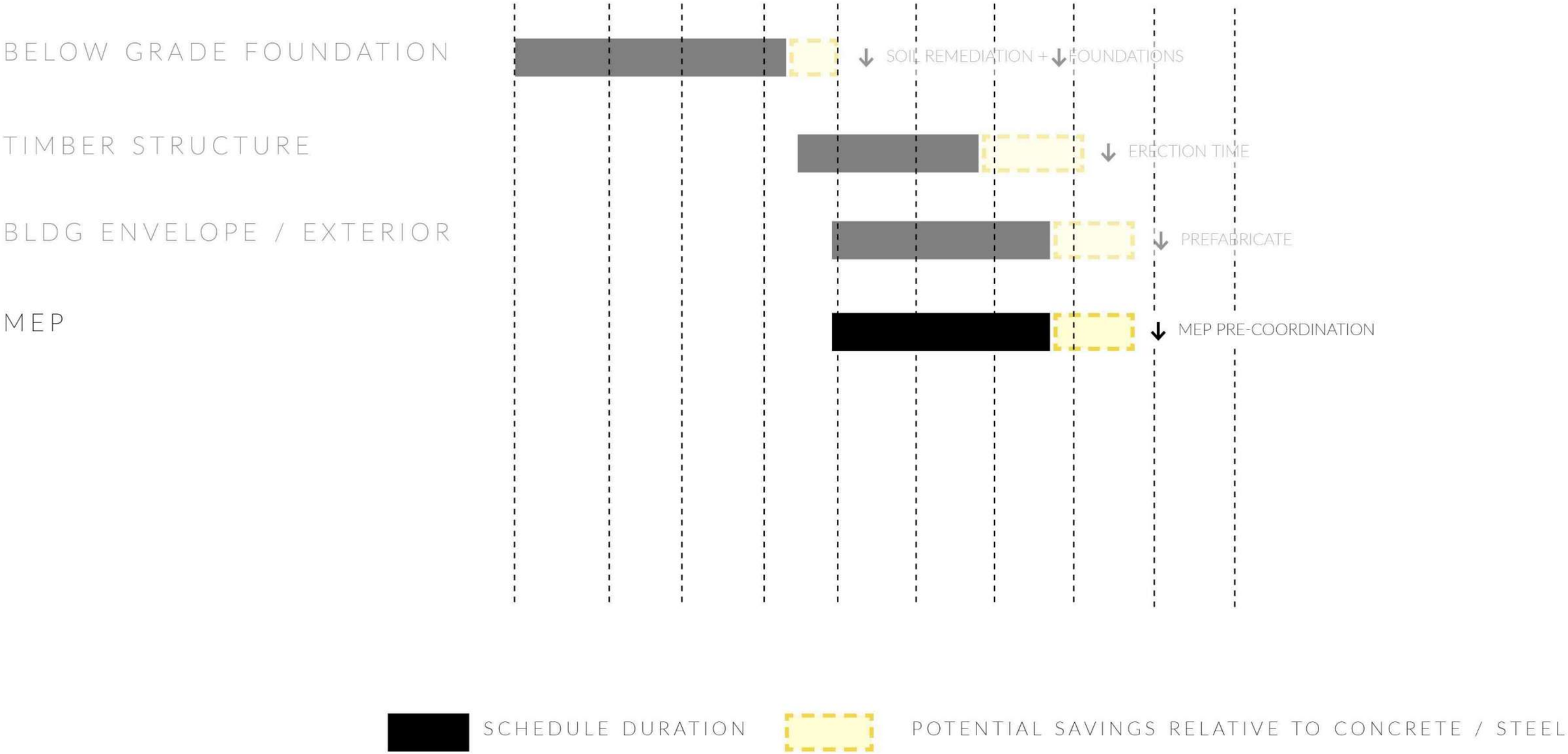
CONSTRUCTION SCHEDULE



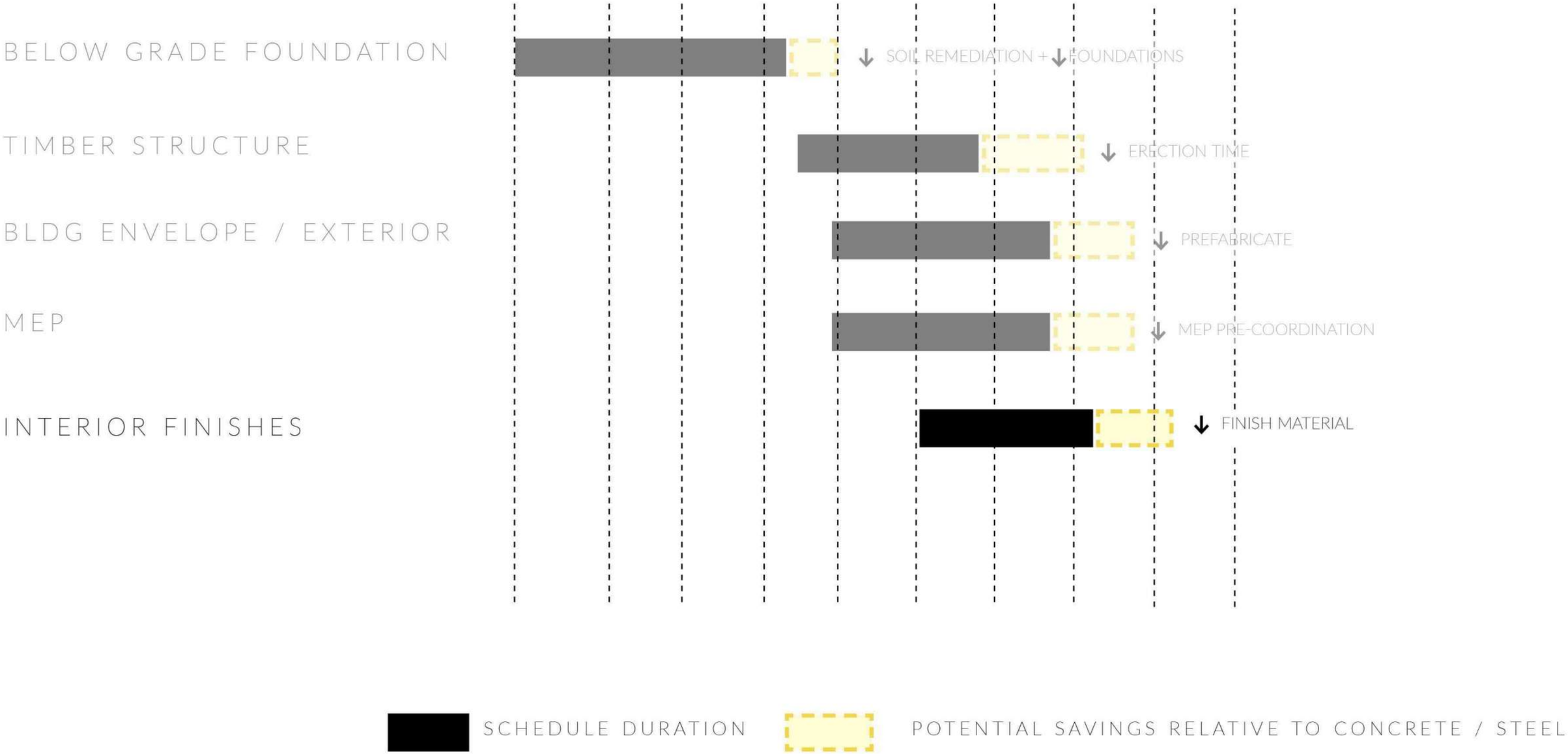
SCHEDULE DURATION

POTENTIAL SAVINGS RELATIVE TO CONCRETE / STEEL

CONSTRUCTION SCHEDULE



CONSTRUCTION SCHEDULE



CONSTRUCTION SCHEDULE

BROCK COMMONS | NATURALLYWOOD.COM | STRUCURLAM | ACTON OSTRY ARCHITECTS INC.

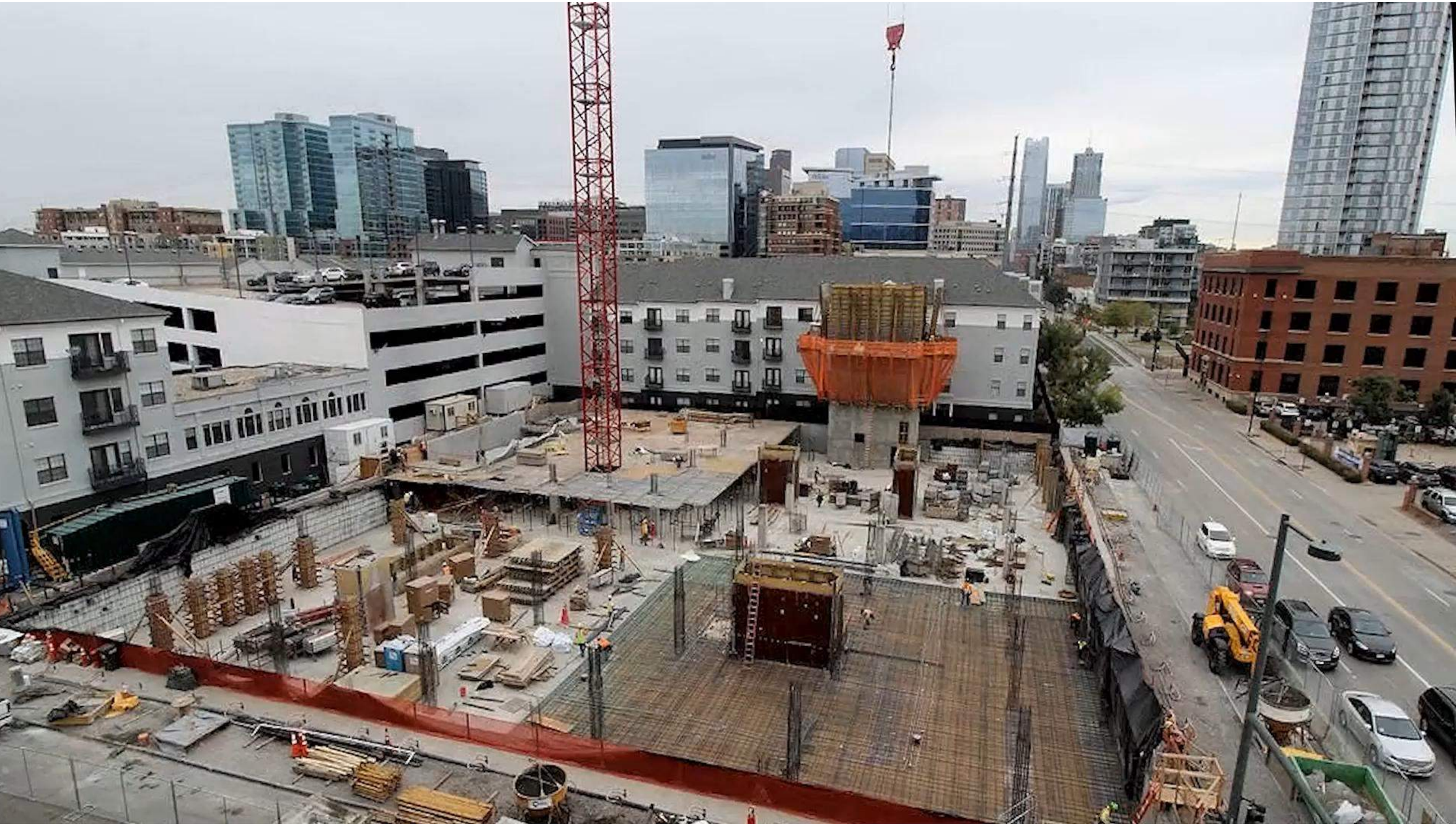
BROCK COMMONS | NATURALLYWOOD.COM | STRUCURLAM | ACTON OSTRY ARCHITECTS INC.

PLATTE15 | OZ ARCHITECTURE | KEN SCHROEPPEL PHOTOGRAPHY

CONSTRUCTION INSTALLATION

PLATTE15 | OZ ARCHITECTURE

MASS TIMBER - GRID OPTIMIZATION | PROVIDER #G516 | JUNE 2025



PLATTE15 | OZ ARCHITECTURE | JC BUCK PHOTOGRAPHY

MASS TIMBER - GRID OPTIMIZATION | PROVIDER #G516 | JUNE 2025

INTEGRATED DESIGN
DIGITAL MODEL COORDINATION

AESTHETIC / MATERIAL

PREFAB BENEFITS

COST / PRECONSTRUCTION

TOLERANCE / LIMITS

DUE-DILIGENCE

PROVIDER COMFORT

LOCAL JURISDICTION

THANK YOU!

THANK YOU!

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This concludes The American Institute of Architects Continuing Education Systems Course.