Timber Offices: Two Case Studies of Form, Function, and Sustainability

(AIA #19DS34 1.0 HSW; ICC #21375 0.1 ICC)

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RMW architecture & interiors

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DPR Construction

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

Course Description

This presentation will showcase two modern wood office buildings in California—which are helping to lead a nationwide renaissance in creative wood design. First, the project architect for Ice Block 1, one of the first contemporary timber-framed midrise structures in Northern California, will share its story from the decision to use wood, through fire and seismic performance, to construction lessons learned and more. Second, the general contractor for the DPR office expansion in Sacramento will discuss unique aspects of a mass timber install over an existing structure. This project includes a 6,000-square-foot, glulam post-and-beam addition with CLT shear walls and roof framing over a structure built in the 1940s.

Learning Objectives

1. Review the design decisions that led to the use of wood on two recently completed office projects in California.

2. Discuss code-compliance design strategies for aspects such as fire and life safety and seismic lateral resistance.

3. Highlight how the use of timber allows for more sustainable construction and operation.

4. Explore the construction phase of a mass timber project, reviewing lessons learned, building official and inspector interaction, site safety and cost impacts.

ICE Block 1: Sacramento’s First Mid-Rise Timber Office

BACKGROUND

R Street Historically was the Industrial Corridor for Sacramento

Served by rail

Business and industry flourished

Since the early 2000's the street has been a Special Planning district with many renovated historic warehouses

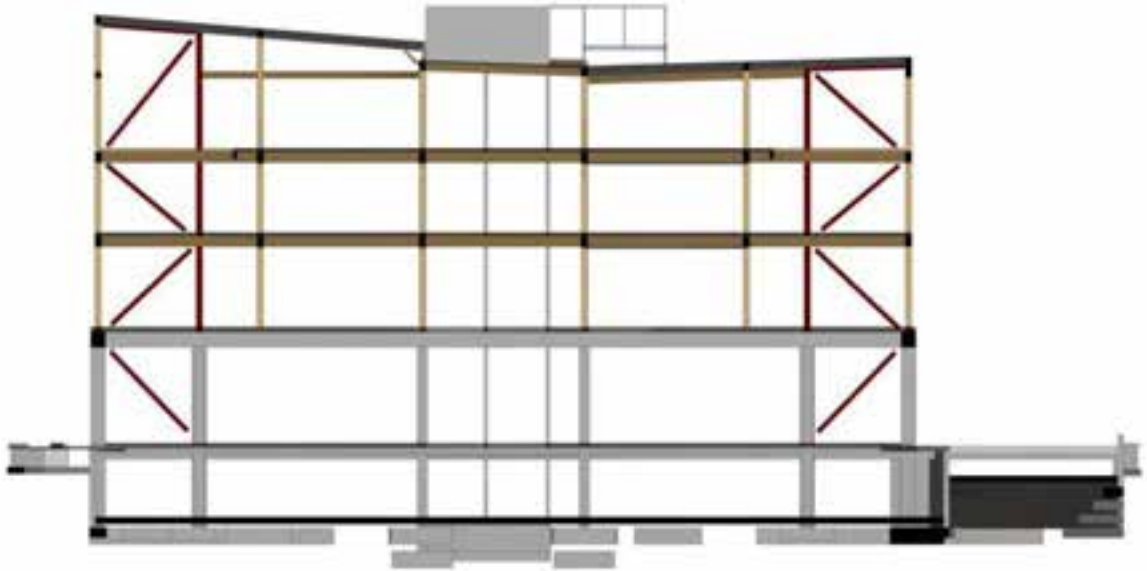
BACKGROUND

Project Began as a Renovation

The Crystal Ice factory served Sacramento from 1910 as the Principal supplier of block ice up until the 1970s as cold storage and then sat vacant until 2015

PROJECT SPECIFICS

4 Story building above 1 level of underground parking.



2 Level of poured in place concrete under 3 levels of timber framed wood.

PROJECT SPECIFICS

2 – 4 Story building wings shifted on site to allow for varied outdoor terrace depth connected by a bridge.

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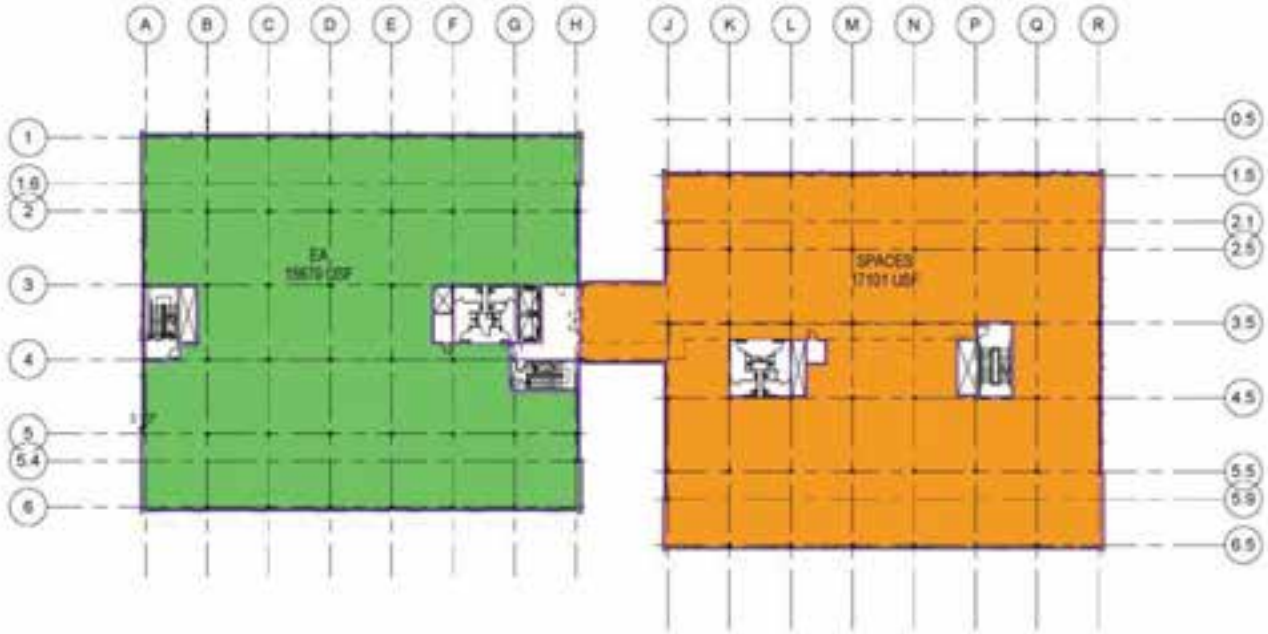
2 – 4 Story building wings shifted on site to allow for varied outdoor terrace depth connected by a bridge.



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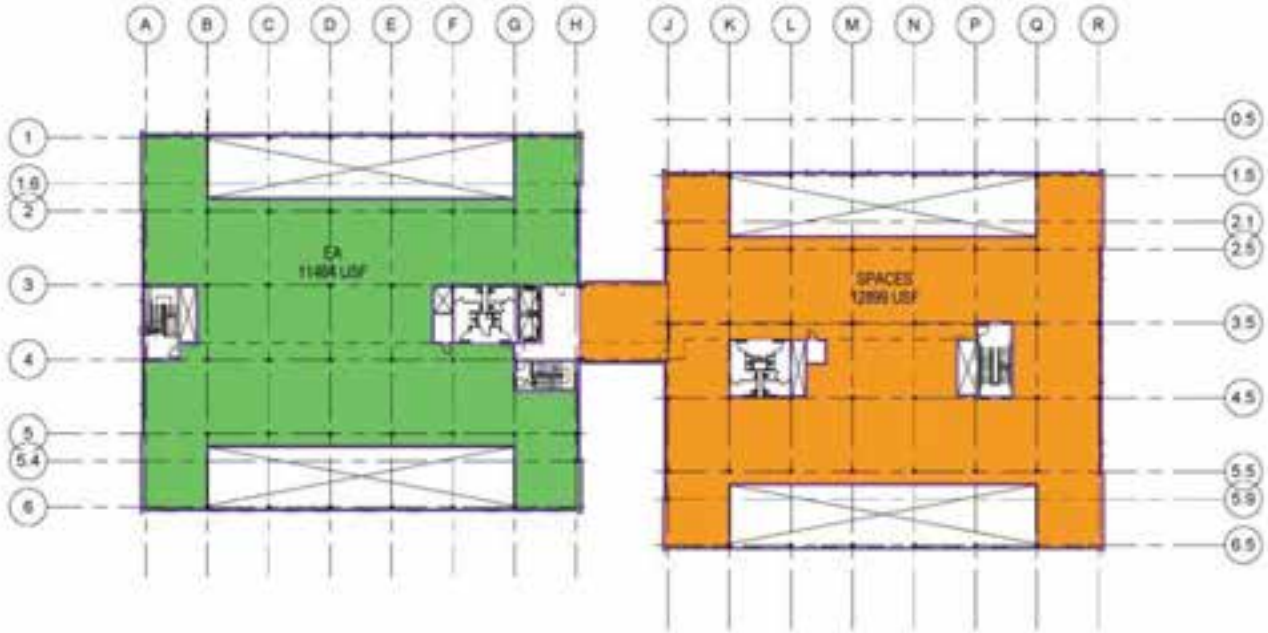


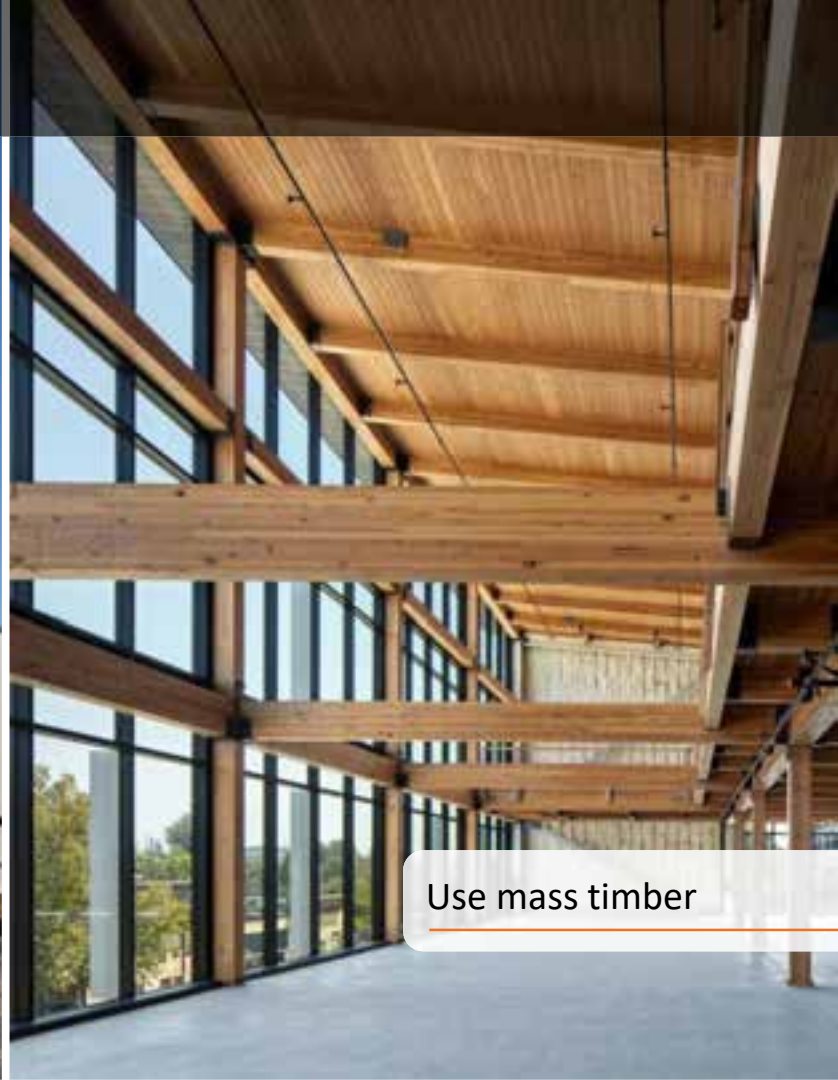
2 – 4 Story building wings shifted on site to allow for varied outdoor terrace depth connected by a bridge.

PROJECT SPECIFICS

Raised ground floor pedestrian plaza to recreate loading dock aesthetic of traditional R Street.

DESIGN OBJECTIVES

Create authentic, historically referential architecture worthy of replacing the Crystal Ice renovation project.

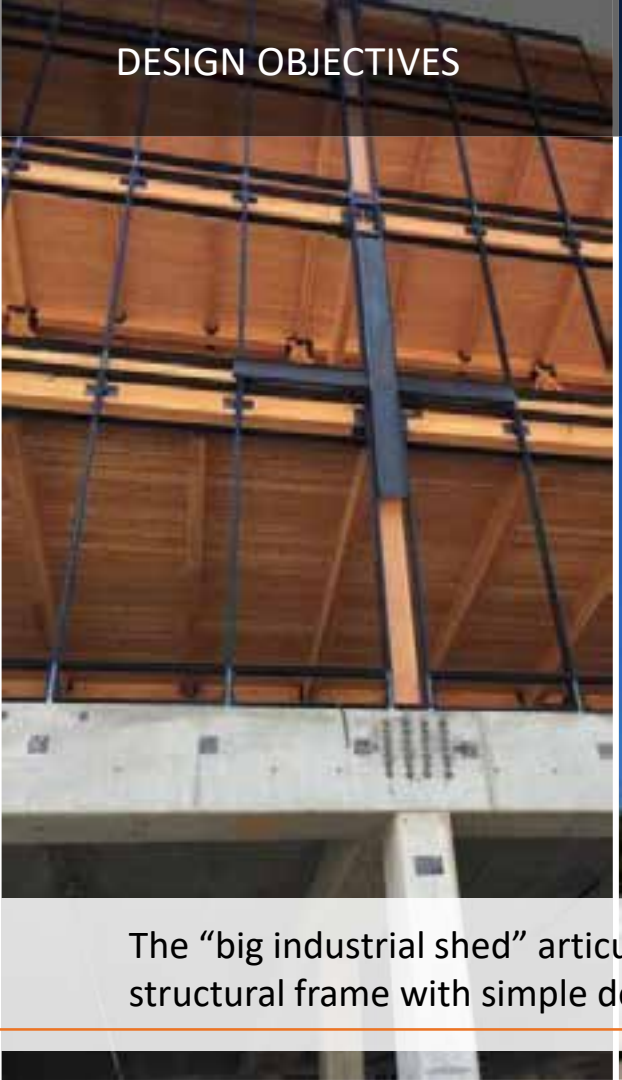


Use mass timber

Natural Materials Palette

Timber, Raw Steel, Galvanized Industrial Panels, Clear Glass

DESIGN OBJECTIVES



The “big industrial shed” articulated structural frame with simple details.

Research Precedents

Market Analysis for Office/Retail Creative Space

MASS TIMBER GOALS

Maintain a historic frame look to be balanced - no deep girders shallow purlins, exposed connections

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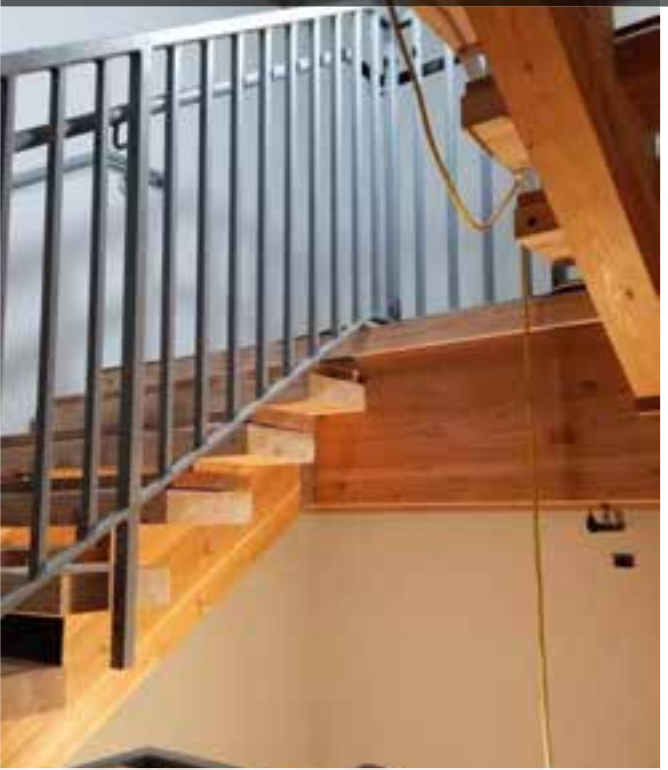
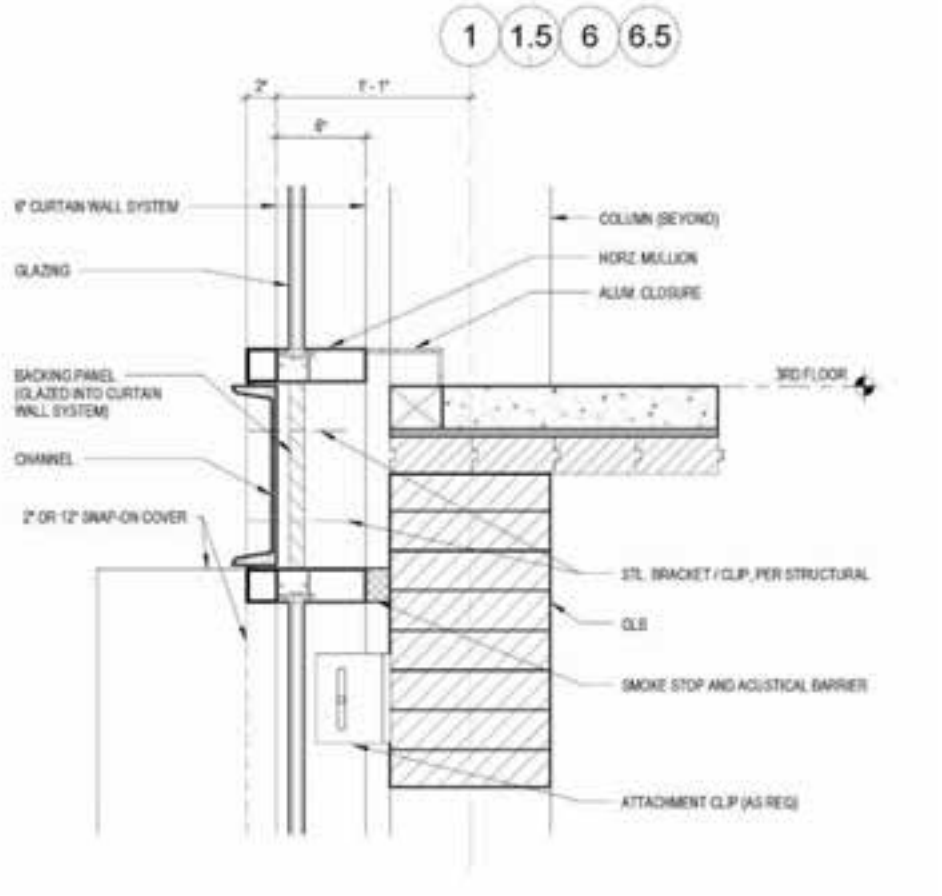
MASS TIMBER GOALS



Develop an aesthetic to express the wood, both inside and out

MASS TIMBER GOALS

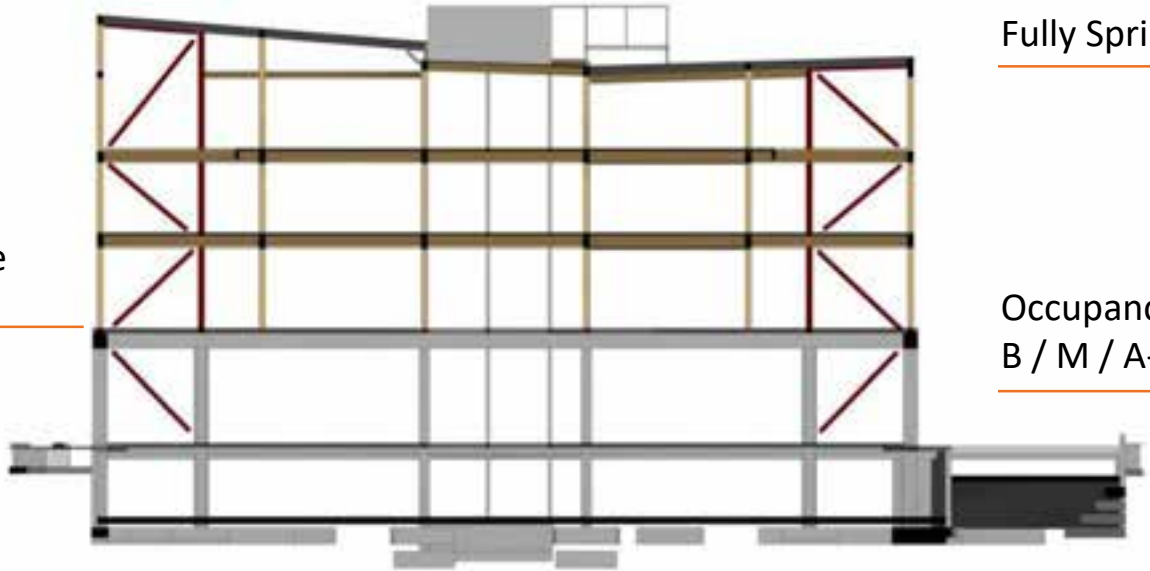
Validate the acoustics of exposed wood surfaces



CODE COMPLIANCE

4 Stories Plus Basement

Construction Type
Above: III-B
Below: I-A



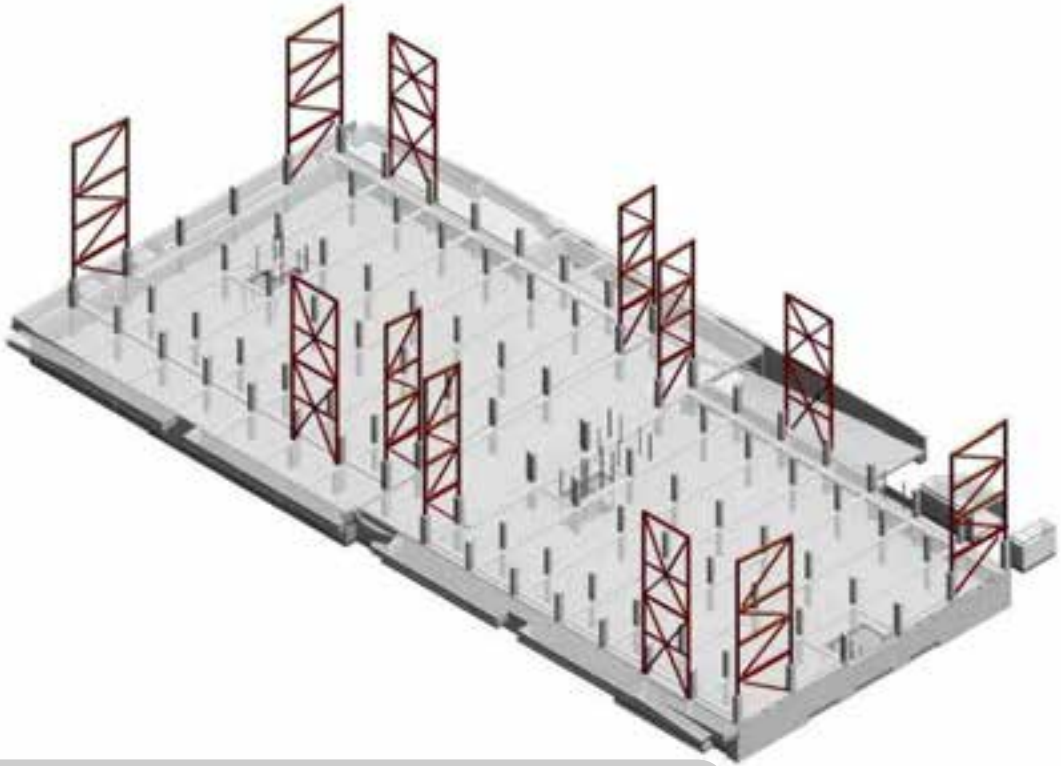
Fully Sprinklered

Occupancy Groups
B / M / A-2 / S-2

CODE COMPLIANCE

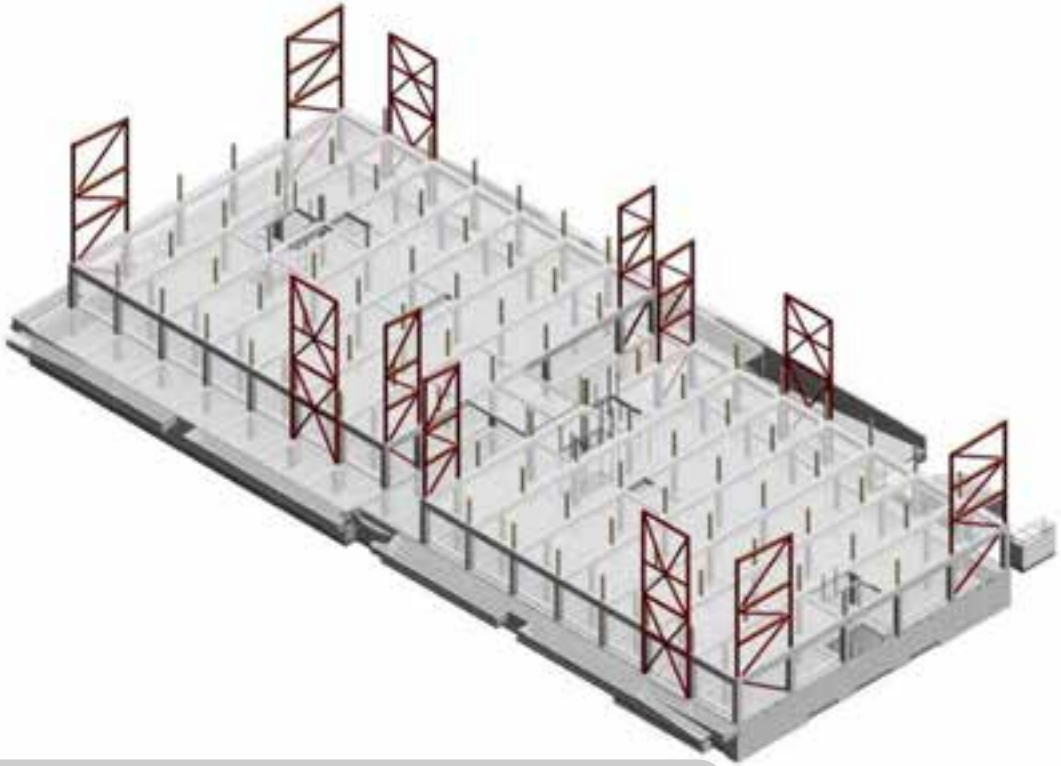
Total area – 131,900 GSF above grade
Area per floor – 35,760 GSF

SEISMIC LATERAL RESISTANCE SYSTEM:



Buckling Restrained Braced Frame (6 per wing)
converts to shear walls at grade through parking garage

SEISMIC LATERAL RESISTANCE SYSTEM:



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SEISMIC LATERAL RESISTANCE SYSTEM:

Buckling Restrained Braced Frame (6 per wing)
converts to shear walls at grade through parking garage

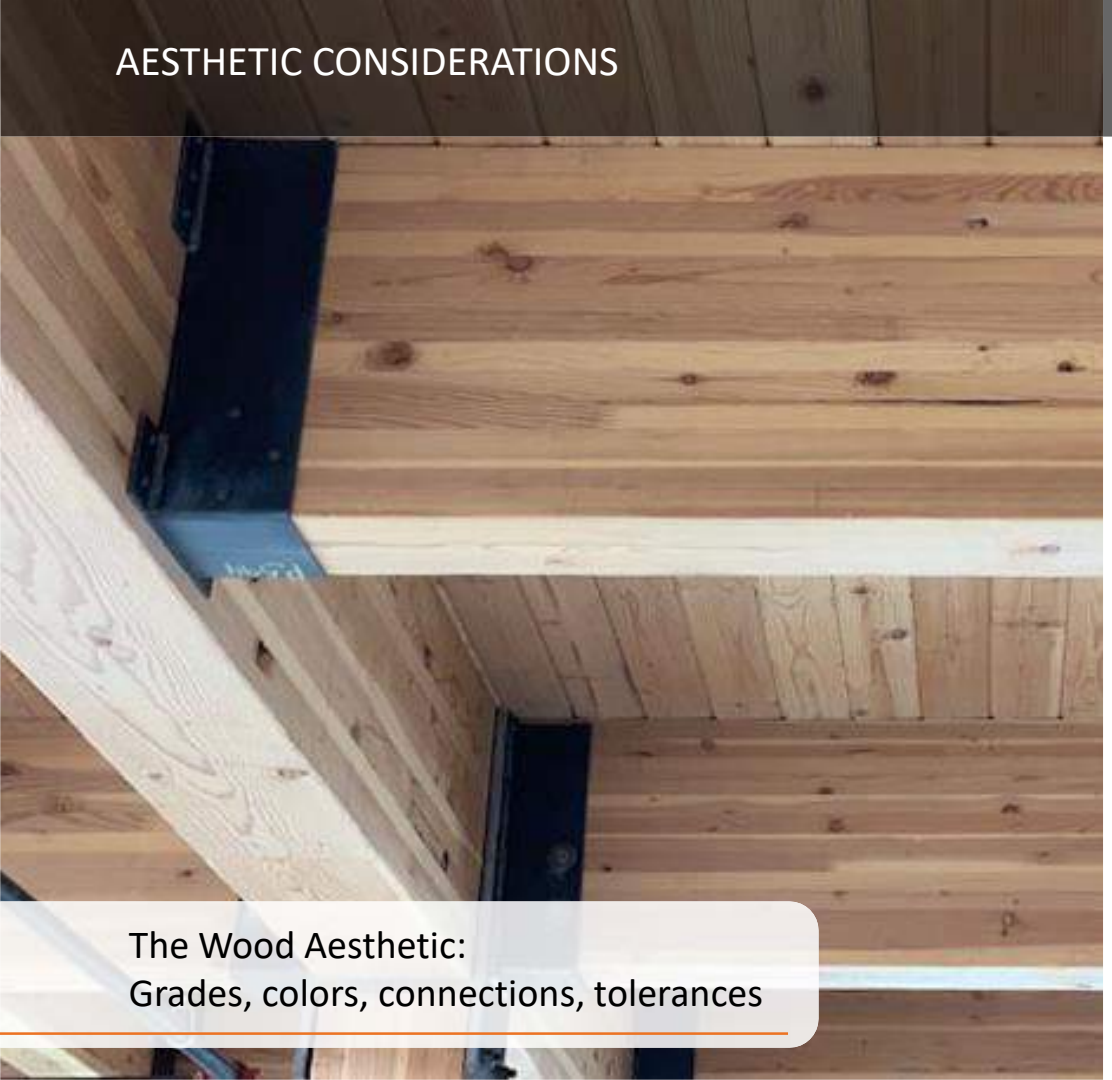
SEISMIC LATERAL RESISTANCE SYSTEM

Either in the plane of the frame line or outboard of the window wall with large steel drag plates through the curtain wall.

OSB diaphragm on all floors

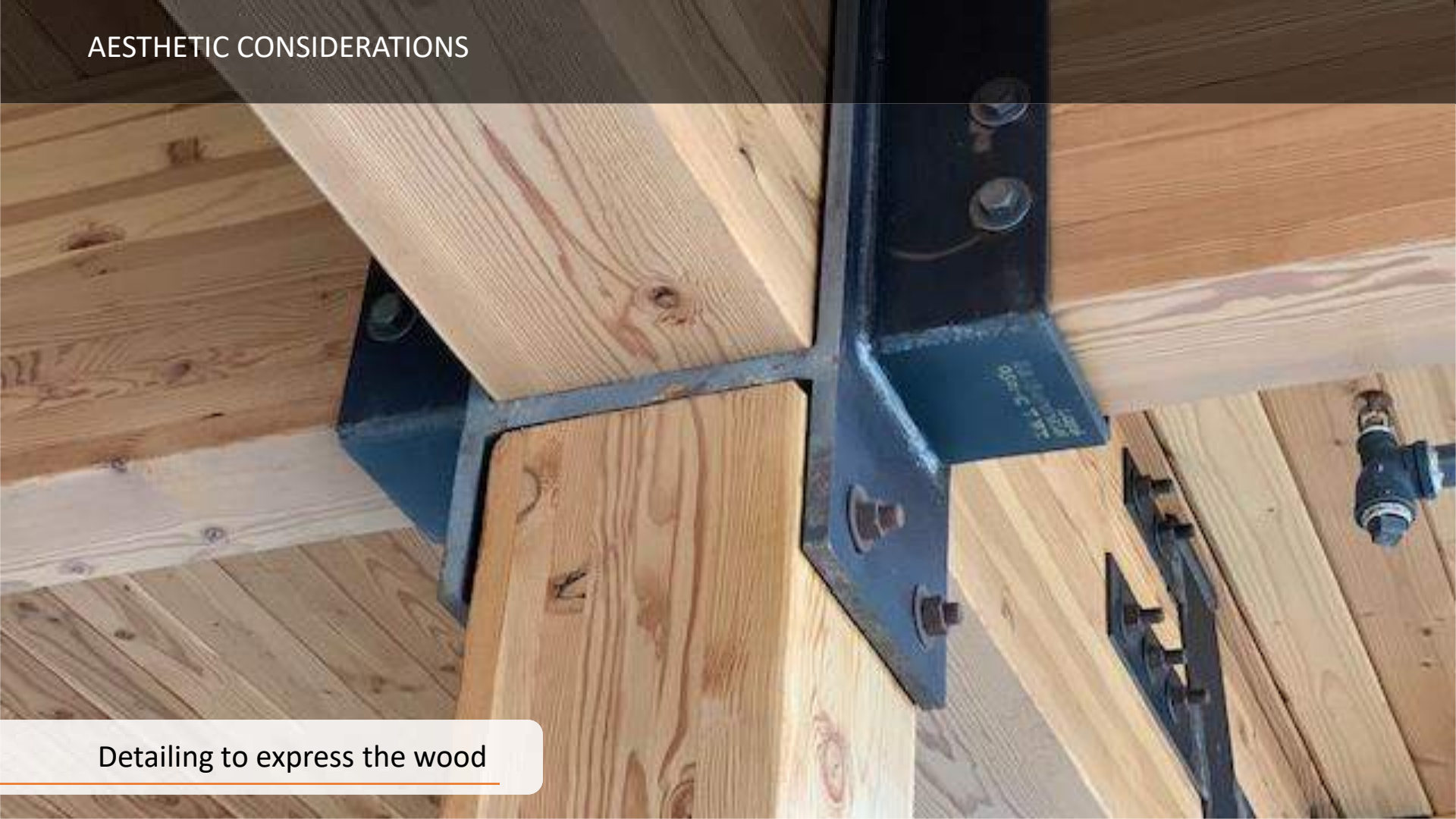
Transfer girder at second floor

AESTHETIC CONSIDERATIONS



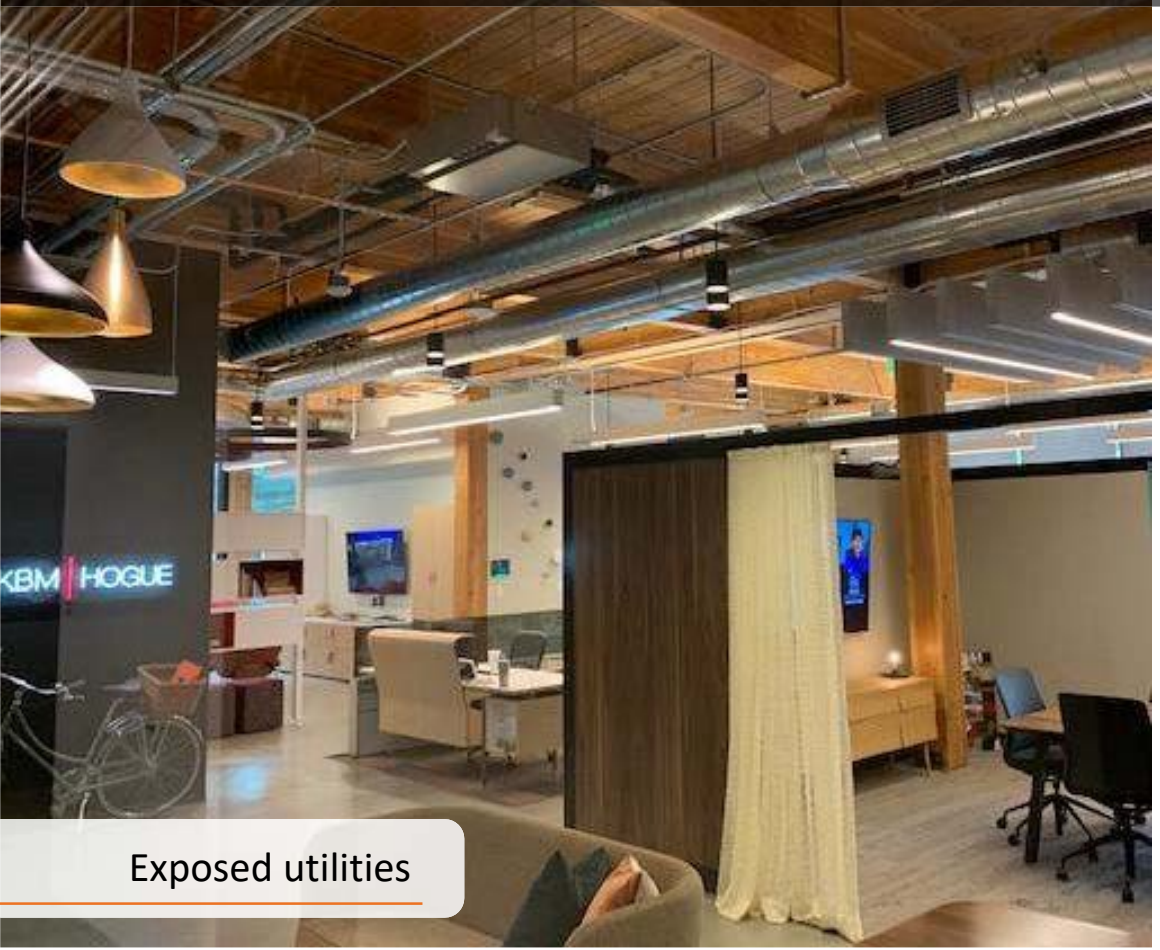
The Wood Aesthetic:
Grades, colors, connections, tolerances

AESTHETIC CONSIDERATIONS



Detailing to express the wood

AESTHETIC CONSIDERATIONS



Exposed utilities

AESTHETIC CONSIDERATIONS

Managing the tenant work letter

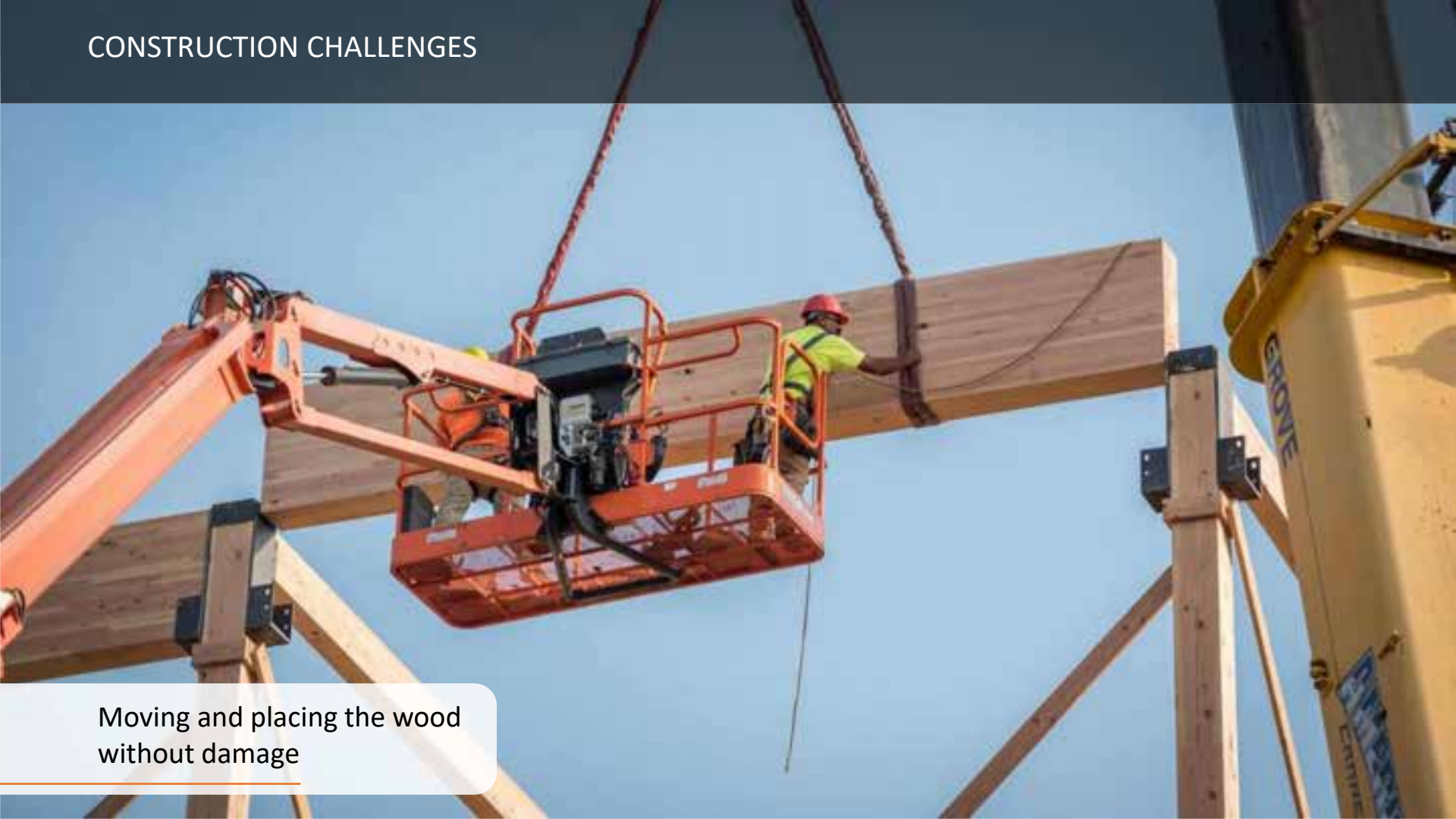
CONSTRUCTION CHALLENGES

Keeping the wood dry/protected

CONSTRUCTION CHALLENGES

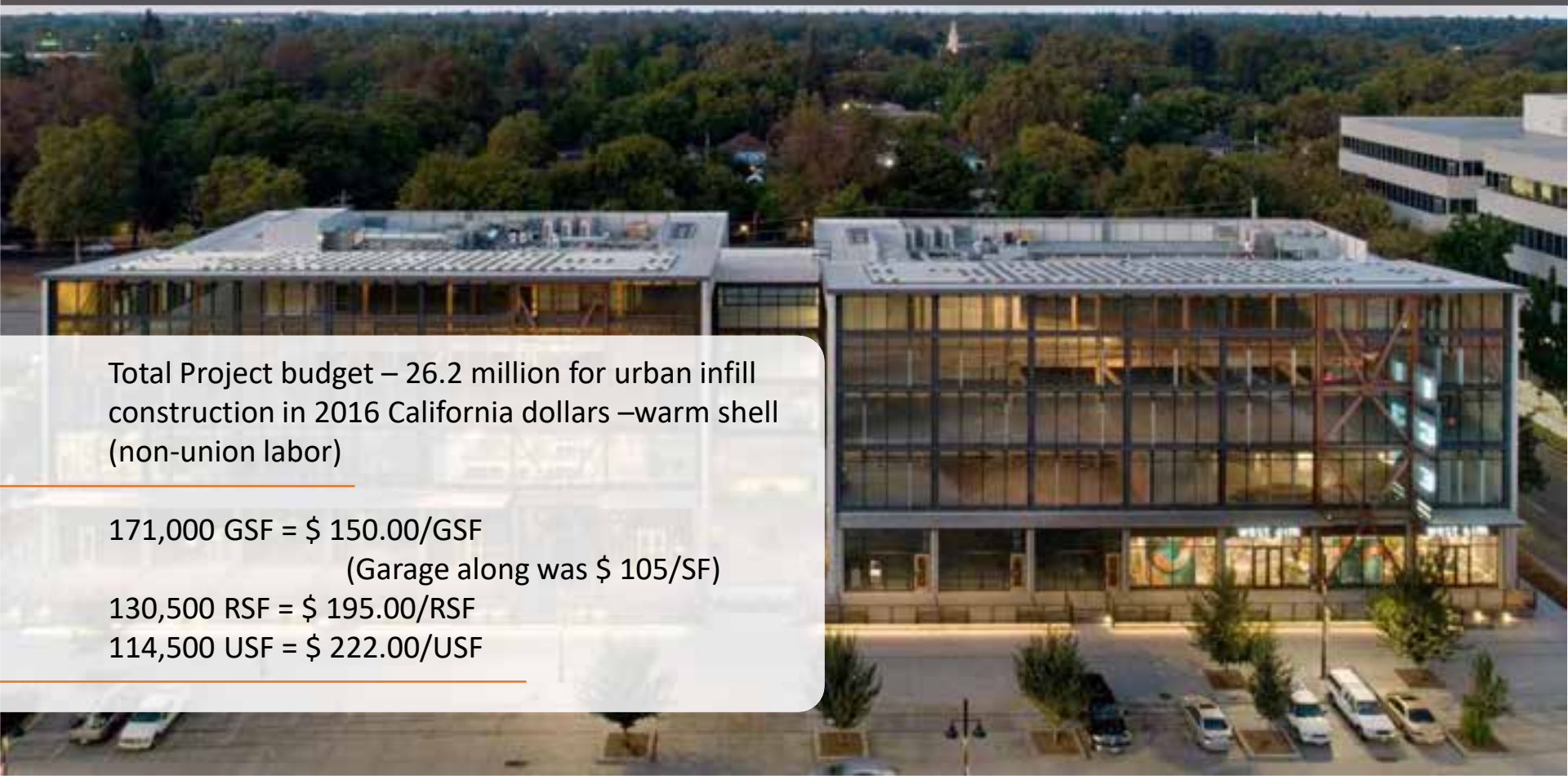
Designing and specifying concrete slabs over wood decks

CONSTRUCTION CHALLENGES



Moving and placing the wood without damage

BUDGET



Total Project budget – 26.2 million for urban infill construction in 2016 California dollars –warm shell (non-union labor)

171,000 GSF = $ 150.00/GSF
(Garage along was $ 105/SF)
130,500 RSF = $ 195.00/RSF
114,500 USF = $ 222.00/USF

BUDGET

Comparison with 2020 Type III-A warm shell
Mass timber – $220.00
(no podium / no parking)

LESSONS LEARNED

Keep the wood dry

LESSONS LEARNED

Heavy timber is a carpenter’s trade not a cabinetmaker’s

LESSONS LEARNED

Select your Construction team wisely –
experience and enthusiasm for new paradigms

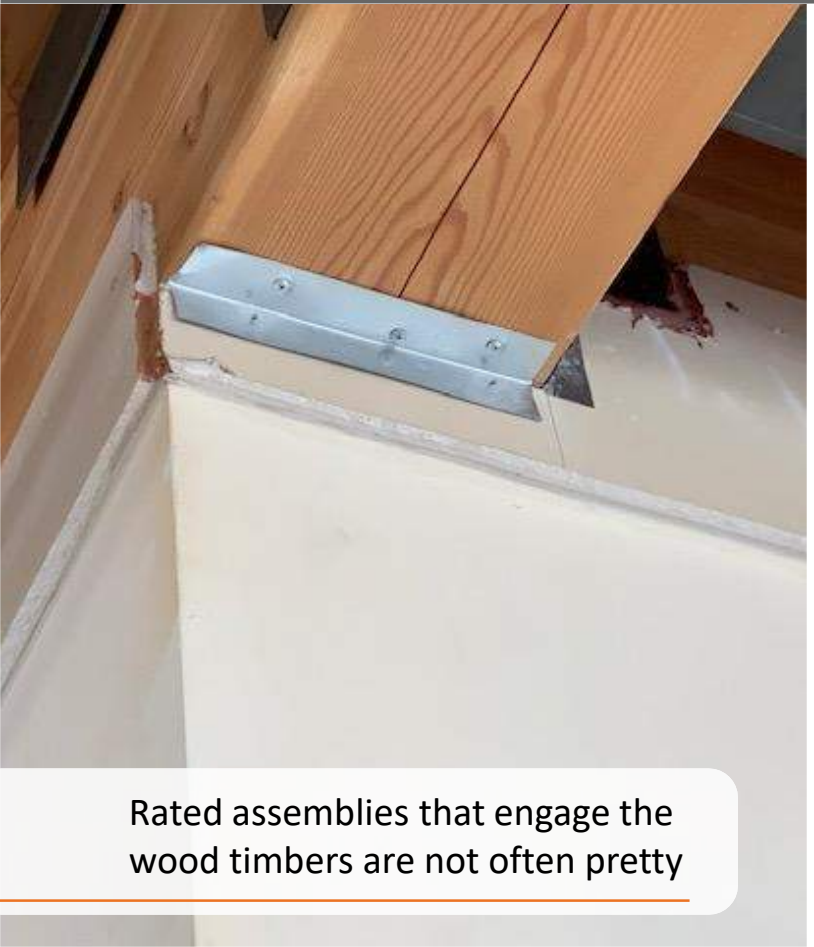
LESSONS LEARNED

Be vigilant for anchor/connection strategies that assume concealed construction

LESSONS LEARNED

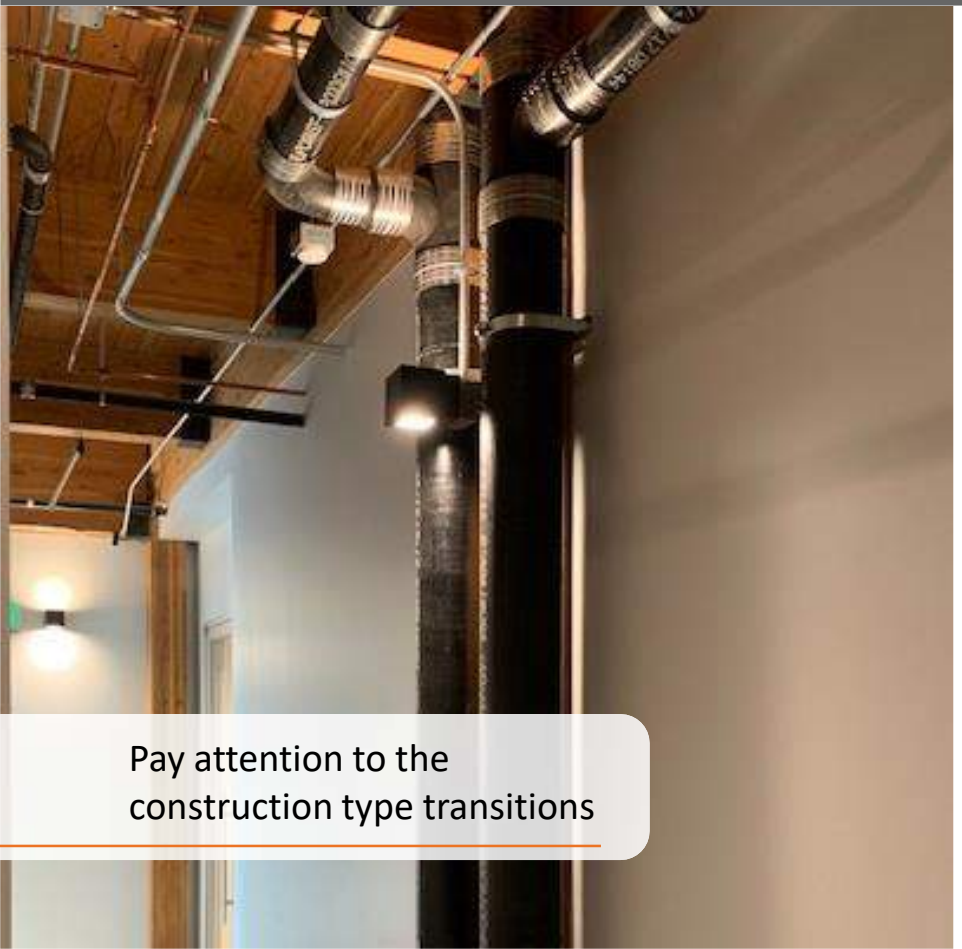
The way we detailed this building was not conducive to fast construction

LESSONS LEARNED



Rated assemblies that engage the wood timbers are not often pretty

LESSONS LEARNED

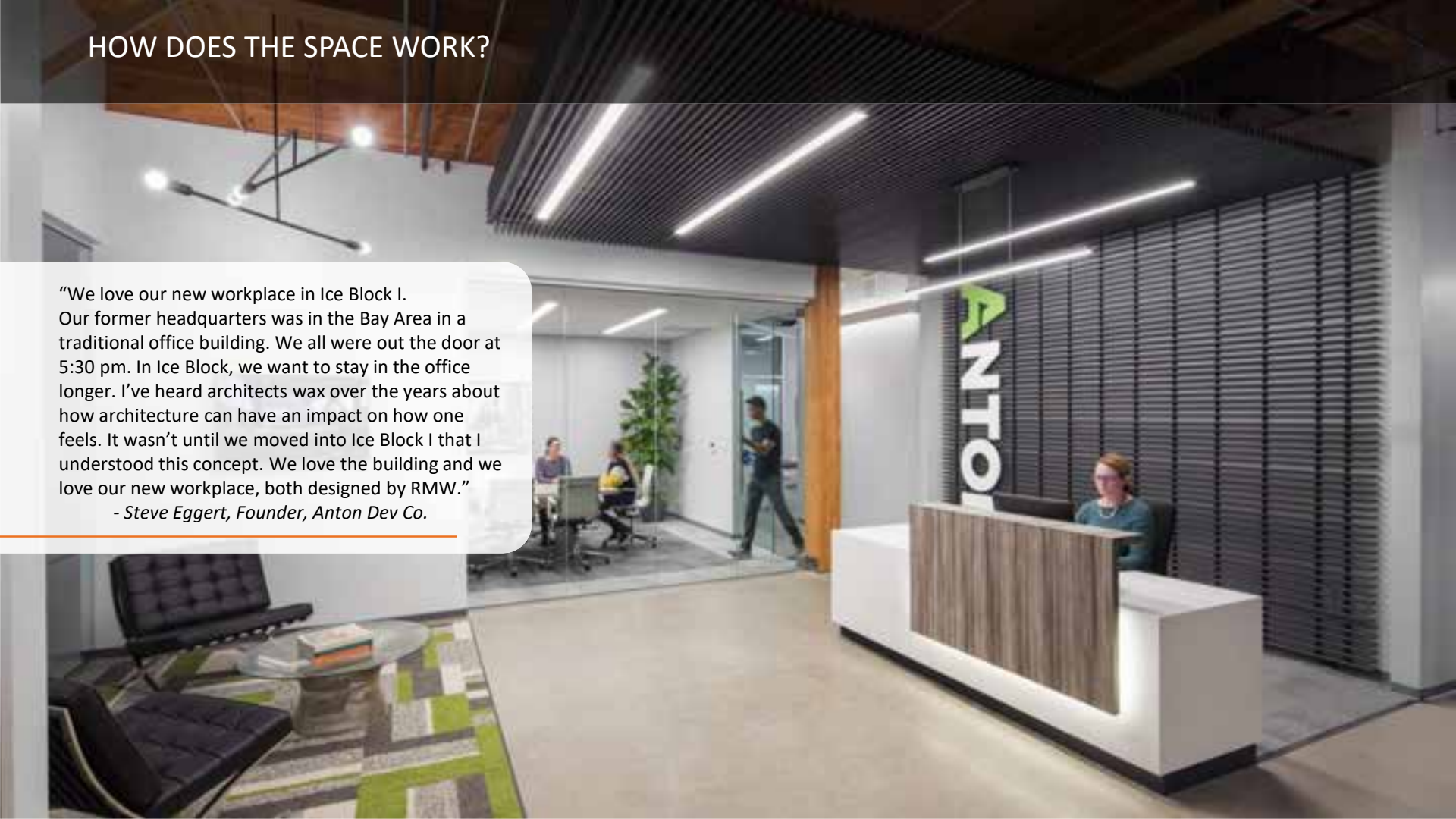


Pay attention to the construction type transitions

LESSONS LEARNED

Clients will be in uncharted visual territory – MOCK STUFF UP

HOW DOES THE SPACE WORK?



"We love our new workplace in Ice Block I. Our former headquarters was in the Bay Area in a traditional office building. We all were out the door at 5:30 pm. In Ice Block, we want to stay in the office longer. I've heard architects wax over the years about how architecture can have an impact on how one feels. It wasn't until we moved into Ice Block I that I understood this concept. We love the building and we love our new workplace, both designed by RMW."

- Steve Eggert, Founder, Anton Dev Co.

HOW DOES THE SPACE WORK?

Anton

HOW DOES THE SPACE WORK?

"We renovated all of our showrooms (SF, San Jose and Sacramento) at the same time. Our SF and San Jose showrooms are located in traditional high-rise buildings. Our Sacramento showroom is our favorite because the architecture of Ice Block I gave us the framework to create the most interesting space."

- Mark Dailey, President, KBM-Hogue Furniture

HOW DOES THE SPACE WORK?

KBM Hogue

HOW DOES THE SPACE WORK? /LEASING VELOCITY

Sky Lounge

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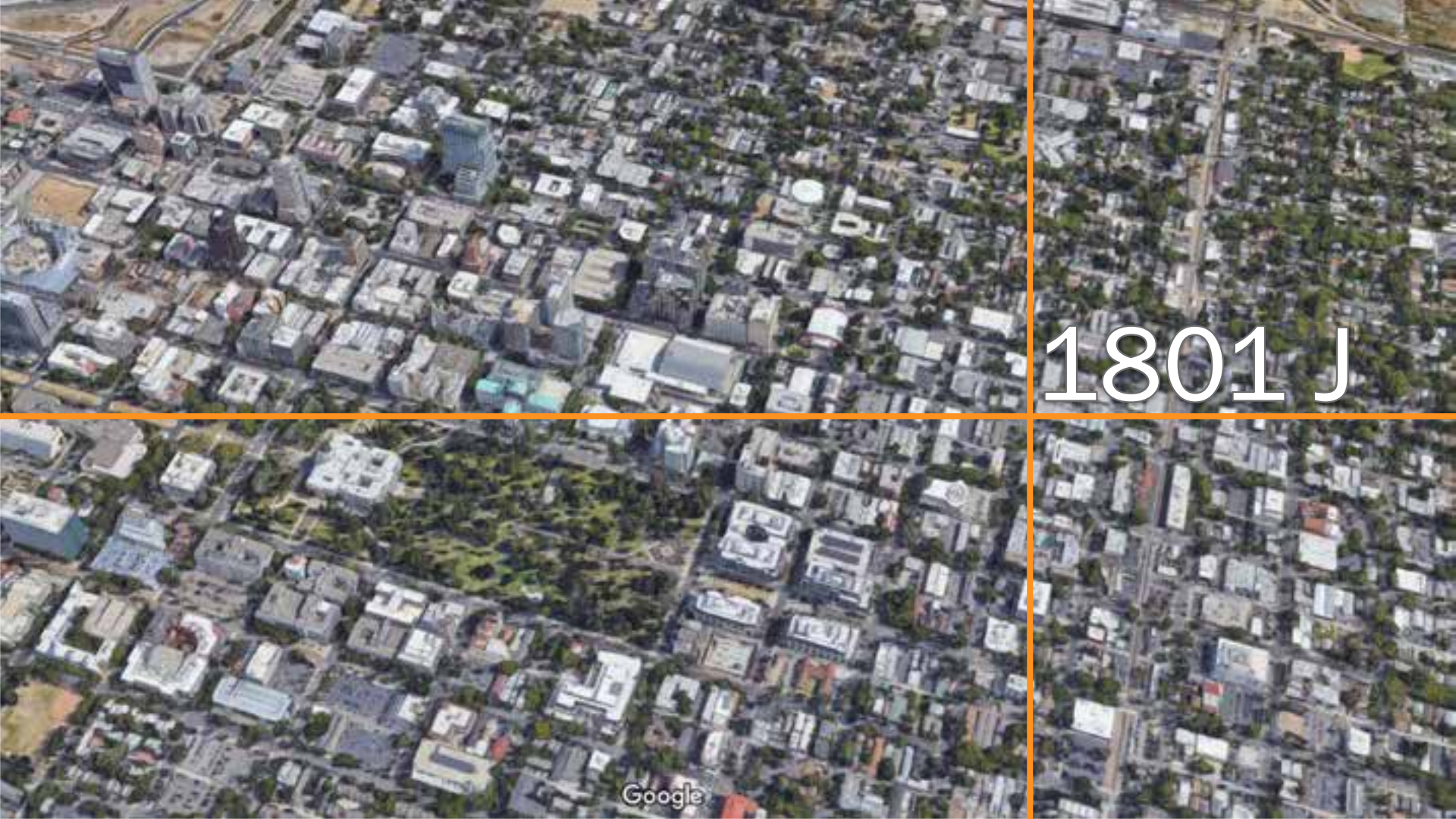

1801 J
Google

Project Goals

Goals, Certifications & Themes

DPR Sacramento

DPR's Point of View embodies two fundamental beliefs; Respect for the Individual and the belief that We Can Change the World. Our new office in Sacramento, which seeks to achieve LEED Platinum, Zero Net Energy and WELL Building Certifications, will create an environment that lives up to DPR's lofty goals.

Rather than building new, DPR chose to renovate the 26,872-sq.-ft. space, which as originally built in 1940. This decision emphasizes DPR's commitment to sustainability and to moving the industry forward, showcasing how older structure can be transformed into sustainable, highly desirable office space.

To be considered a success, the project must live up to the goals set from the beginning:

1. Taking Care of People & Place by providing a welcoming atmosphere for DPR and its customers, partners and surrounding communities built within an environmentally & socially conscious means.

2. Creating a Transformative Workplace that will challenge staff to think differently about work and provide flexibility for future growth.

3. Executing design & construction in a Fiscally Responsible manner that will analyze life cycle costs and be on par with comparable market rate developments.

4. Pursuing solutions that are Innovative & Simple to showcase what can be possible with commercially available products while maintaining DPR's passion to stand out from the crowd.

Targeted Certifications

LEED BD+C
Yes: 47 ???: 21 No: 44

LEED ID+C
Yes: 75 ???: 17 No: 17

WELL v2
Yes: 58 ???: 106 No: 10

ILFI ZNE
Production: 267,699kWh/yr (108%)

ILFI Petal Certification
Place | Energy | Beauty

Yes: 104.59 ???: 31.64 No: 7.33

DPR EUI: 27 | Tenant EUI: 30

Sustainable Features

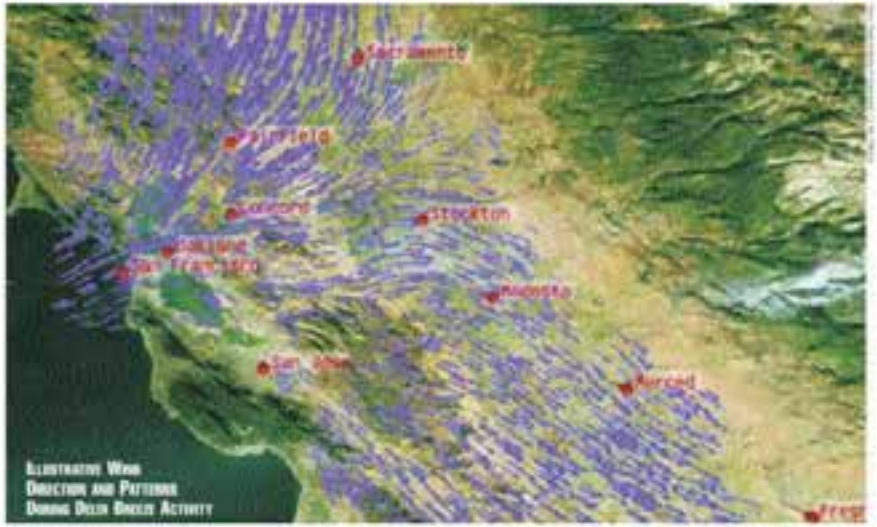
1. **Existing Trees** – Trees preserved, used for shading interior
2. **Solar Tubes** – Tubular skylights were installed on the new and old roofs to maximize filtered daylight reducing reliance on artificial lighting.
3. **Operable Windows with High-Performance Glazing** - all glazing in existing building replaced to high performance
4. **Exterior Sun-Shading**
5. **Vegetated Roof and shaded roof terrace** – A new rooftop terrace creates a parklike space for work or respite.
6. **Retractable Wall/ Door**
7. **Mass Timber Construction Addition** - This low-carbon, low-toxin material creates a sleek, serene environment and improves indoor air quality. First use of CLT shear walls in CA.
8. **Adaptive Reuse of Existing Building** - A 1940s era building, once a vehicle testing facility, has been converted in a model of efficiency and community resilience.
9. **Seed Wall**
10. **Thermal Labyrinth** - Ventilation system conditions the building by drawing outdoor air through a concrete maze located in the existing basement. Through heat exchange with the ground, outdoor air is pre-cooled and pre-heated in the summer and winter seasons, respectively.

11. **Red/Green Light Indictor Operable Windows**-indicator lights are controlled by the BMS and will leverage public data from the air quality sensors installed at California's Air Quality Board building which is located within 1 mile of the project.
12. **New Communicating Stair** - to encourage active design/ connection to community
13. **Lucid Dashboard** - DPR can view, compare and share energy and water use data in real-time. Staff can assess energy consumption rates and adjust practices, as required, encouraging employees to actively participate in maintaining the building's functionality.
14. **Photovoltaics** –new photovoltaic panels were integrated in a-typical locations –above the rooftop terrace, existing/ new roof and carport, offsetting all operational energy on a annual basis resulting in a net-positive energy facility.
15. **Rightsized & Flexible Workspace** - DPR's agile workspace reflects its family-like culture, rightsized to flexibly accommodate employees that spend more time at job sites than in the office and to encourage collaboration.
16. **Biophilia** - From exposed woodgrain panels, to sculptural "grow columns," a seed wall, abundant plantings, and oversized sliding windows, the design creates a soothing environment that brings users closer to nature.
17. **Certifications** - The project is targeting LEED Platinum (interior) and Gold (Core+Shell) certification, WELL v2, REVEAL, fitwel, Energy Star, and ILFI's Zero-Net Energy certification.

CONNECTION TO SACRAMENTO COMMUNITY

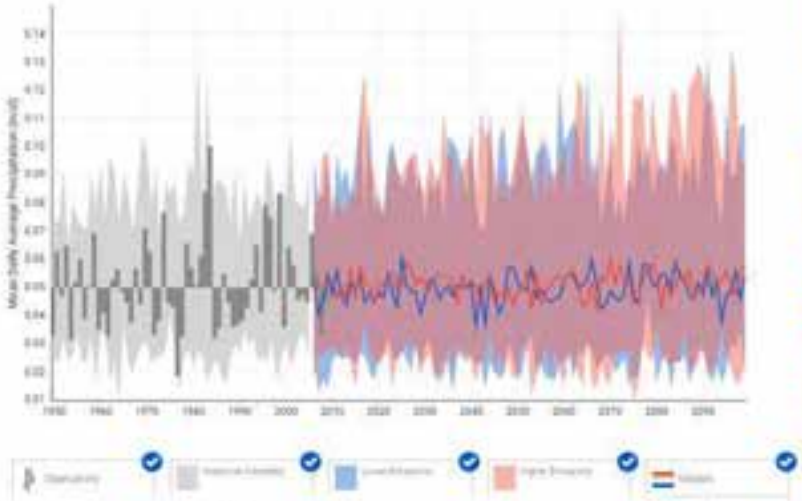
CITY OF TREES

THE DELTA BREEZE



- Weather phenomenon unique to the Sacramento region that brings relief to the hot weather
- Similar to the temperature regulation that occurs on the coast, the geographically huge river delta region cools the baking valley air as the predominant northeaster winds blow past

WATER



CROSS LAMINATED TIMBER - INTERIOR







+XP
Experience

Mass Timber Projects In Design and Constructed in the US (December 2018)

Stage	Mass Timber	# of Projects
Construction Started / Built	CLT	16
	Heavy Timber Decking	3
	Post & Beam	7
	Total	26
In Design	CLT	24
	NLT	1
	Heavy Timber Decking	1
	Post & Beam	14
	Total	40
Grand Total		66

		Construction Started / Built			In Design				
State	City	CLT	Heavy Timber Decking	Post & Beam	CLT	Heavy Timber Decking	NLT	Post & Beam	Grand Total
CA	Anguin							1	1
	Bethel Island				1				1
	Brentwood	1							1
	Claremont			1					1
	Davis							1	1
	Dublin				1				1
	East Palo Alto	1							1
	Fountain Valley				1				1
	Frazier Park	1							1
	Hayward				1				1
	Long Beach			1					1
	Los Angeles	1			2			1	4
	Madera				1				1
	Menlo Park			1					1
	Merced				1				1
	Morgan Hill	1							1
	Mountain View	2							2
	National City						1		1
	Newport Beach	1							1
	Oakland	1		1	3				5
	Porterville				1				1
	Quincy	1							1
	Richmond							2	2
	Sacramento		1		1			1	3
	Salinas			1					1
	San Diego	2							2
	San Francisco				6			6	12
	San Jose	1				1		1	3
	Santa Clara		1						1
	Santa Monica				1				1
	Santa Rosa	1							1
	South San Francisco	2							2
	Sunnyvale				1				1
	Tahoe							1	1
	Truckee				2				2
	Universal City			1					1
	Walnut Creek		1						1
	West Sacramento			1					1
	Yerba Buena Island				1				1
	Total	16	3	7	24	1	1	14	66

Considering mass timber for a project? Ask us anything.

For free project support, contact:
help@woodworks.org
woodworks.org/project-assistance

Mass Timber

Overview

Cross Laminated Timber (CLT)

Structural timber made up of pressed dried timber boards stacked at right angles and glued together with non-toxic adhesive

Glue Laminated Timber

Structural timber made up of layers of dimensioned lumber bonded together in a parallel orientation.

2nd

DPR Installation of CLT

9625 Towne Center Dr.

San Diego, CA

- Developer: Alexandria
- Occupant: Tekeda
- CLT Roof Deck
- 1st DPR CLT Installation
- DPR SPW crew had to re-plumbing new steel structure due to higher tolerances from CLT structure

9625 Towne Center

Lessons Learned

- Jurisdictional approval – CLT thickness, splice joints
- Detailing is the longest process
- Identify factory vs. field penetrations (MEP coordination)
- Tolerances of structural connections
- Acceptance of control samples (species, glues, finishes)
- Installation – staging, trucking, cabling of columns
- Temp waterproofing to avoid staining & mold
- SAFETY: Pre-installed perimeter guardrails

1801 J St.

Sacramento, CA

- 6,000sf 2nd floor expansion to existing building
- Type V-B Construction
- Glulam beams & columns
- CLT windwalls, shearwalls and roof deck
- Digitally pre-fabricated off-site in Penticton, BC Canada

1st

CLT Installation in Sacramento, CA

1st

CLT Shearwall Installation in California

#1

Largest Mass Timber Vertical Expansion to an Existing Building in the US

Floorplans & Elevations


STORAGE 90 SF
UP
TENANT ENTRY/EXIT
FITNESS/ GAME ROOM 465 (300 SF)
ADA 80 SF
ADA 80 SF
LOCKERS/ BIKE PARKING 250 SF
DPR PARKING ENTRY/EXIT
LEASABLE APPROX. 11,350 SF
DISPLAY WALL
CORRIDOR 1,075 SF
TENANT ENTRY/EXIT
DPR STREET ENTRY/EXIT
OFFICE LEASABLE SPACE
FOOD SERVICE LEASABLE SPACE
RETAIL/FITNESS LEASABLE SPACE
SHARED AMENITY
DPR CIRCULATION
DPR EXTERIOR AMENITY
DPR OPEN COLLABORATION
DPR COLLABORATION
DPR FOCUS WORK
TOILET ROOM
DPR BACK OF HOUSE
EGRESS EXIT
NORTH


EXTENT OF DEMO
PLANTER
HUDDLE 80 SF
HUDDLE 100 SF
HUDDLE 100 SF
EGRESS EXIT
FOCUS WORK 3000 SF 30 WORKSTATIONS
PRODUCTION MAIL SUPPLY 200 SF
IT 80 SF
FEMALE TOILET
MALE TOILET
BREAK AREA
COFFEE AREA
OPEN COLLABORATION LIVING ROOM
RECEPTION
WELLNESS 100 SF
LOCKERS/ EMPLOYEE DISPLAY AREA
LIBRARY 100 SF
LARGE CONF ROOM 450 SF
TRAINING ROOM 1100 SF
KITCHEN
WINE BAR/ PRE-FUNCTION
MEDIUM CONF ROOM 300 SF
CONF ROOM 150 SF
EXT. AMENITY 600 SF
OFFICE LEASABLE SPACE
FOOD SERVICE LEASABLE SPACE
RETAIL/FITNESS LEASABLE SPACE
SHARED AMENITY
DRR CIRCULATION
DRR EXTERIOR AMENITY
DRR OPEN COLLABORATION
DRR COLLABORATION
DRR FOCUS WORK
TOILET ROOM
DRR BACK OF HOUSE
EGRESS EXIT
NORTH

Before & After

Before & After

Before & After

Code Approvals

City of
SACRAMENTO
Community Development

March 14, 2019

Scott Hooker
President
Buehler Engineering, Inc.
600 Q Street Suite 200
Sacramento, CA 95811

Subject: 1801 J Street – California Mass Timber Competition

Dear Mr. Hooker,

We are writing a letter of support for Buehler's role in obtaining a building permit for a project using CLT construction at 1801 J Street.

Buehler and DPR met with the City on March 9, 2018 to present their CLT concept, gauge the City's openness to approving a project using CLT, and to determine the City's requirements to achieve approval. The City asked Buehler to prepare two Alternate Materials, Design and Methods of Construction requests per the California Building Code to address the use of CLT as elements of the primary Lateral Force Resisting System (LFRS): 1) utilization of CLT as the structural diaphragm for the East Building roof, and 2) utilization of CLT shearwalls at the second level of the new East Building.

The preliminary AMMR's were received March 28, 2018 and approved on August 31, 2018. Buehler was proactive and transparent throughout the AMMR approval process. They addressed the City's questions and concerns with research and calculations supporting the design. The project was submitted for plan review on May 18, 2018 and the permit was issued on September 10, 2018.

1801 J Street is Sacramento's *only* approved project using CLT for the both the diaphragm and lateral system. Utilizing CLT to retrofit and renovate the existing building satisfied the City's desire to conserve Sacramento's history while strengthening and modernizing the existing, unassuming office space.

Sincerely,

Anna Tekautz, S.E.
Supervising Engineer

Allison Konwinski, S.E.
Senior Engineer


SACRAMENTO
Community Development

Request for
Alternate Materials, Design and Methods of Construction

APPROVED

ISSUED BY


COM-1809305 & COM-1809314

SACRAMENTO
Community Development

Request for
Alternate Materials, Design and Methods of Construction

APPROVED

ISSUED BY

Sustainability


2,432
Cubic Feet of Wood Products Used
12
Seconds for US & Canadian Forest to Grow This Wood
55
Metric Tons of CO_2 Stored in the Wood
115
Metric Tons of CO_2 Avoided in Greenhouse Gas Emissions
14
Homes Per Year
33
Cars Off the Road Per Year

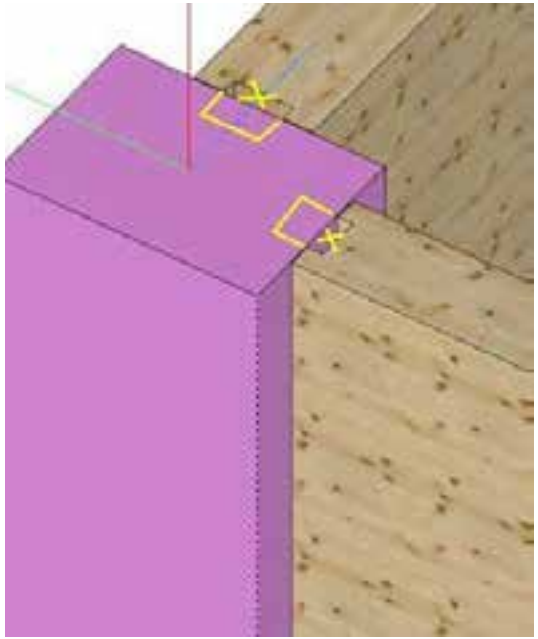
Mass Timber Logistics

New DPR Sacramento Office

Clash Coordination

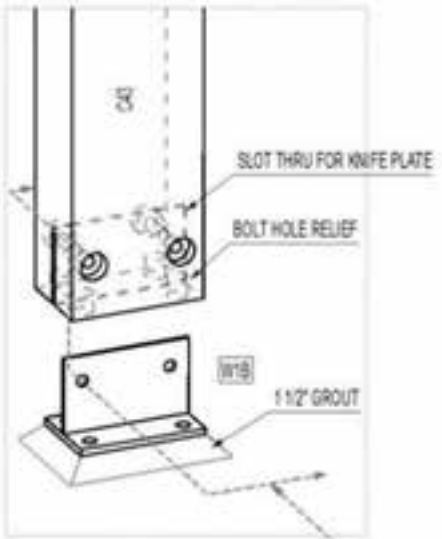
New DPR Sacramento Office

BIM Detailing for Asthetics

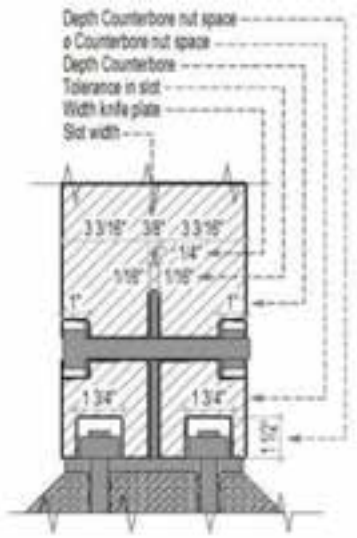


New DPR Sacramento Office

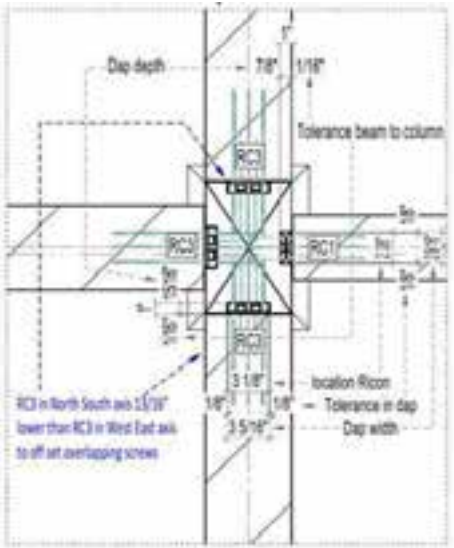
Detailing For Prefabrication



DETAIL D7 / -

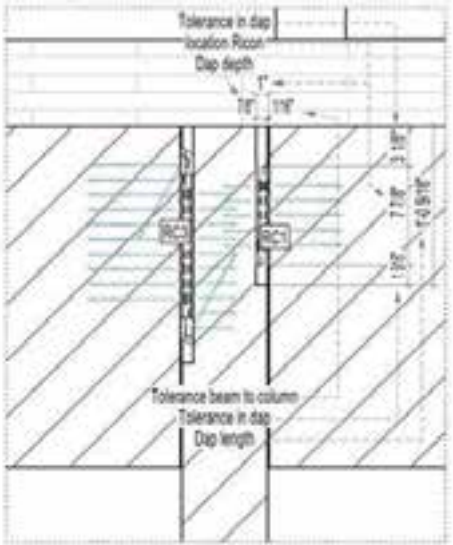


Section 07 / -



D123 SH. 6 Detail 123

planview dap in top column RC1 & RC3 typ.

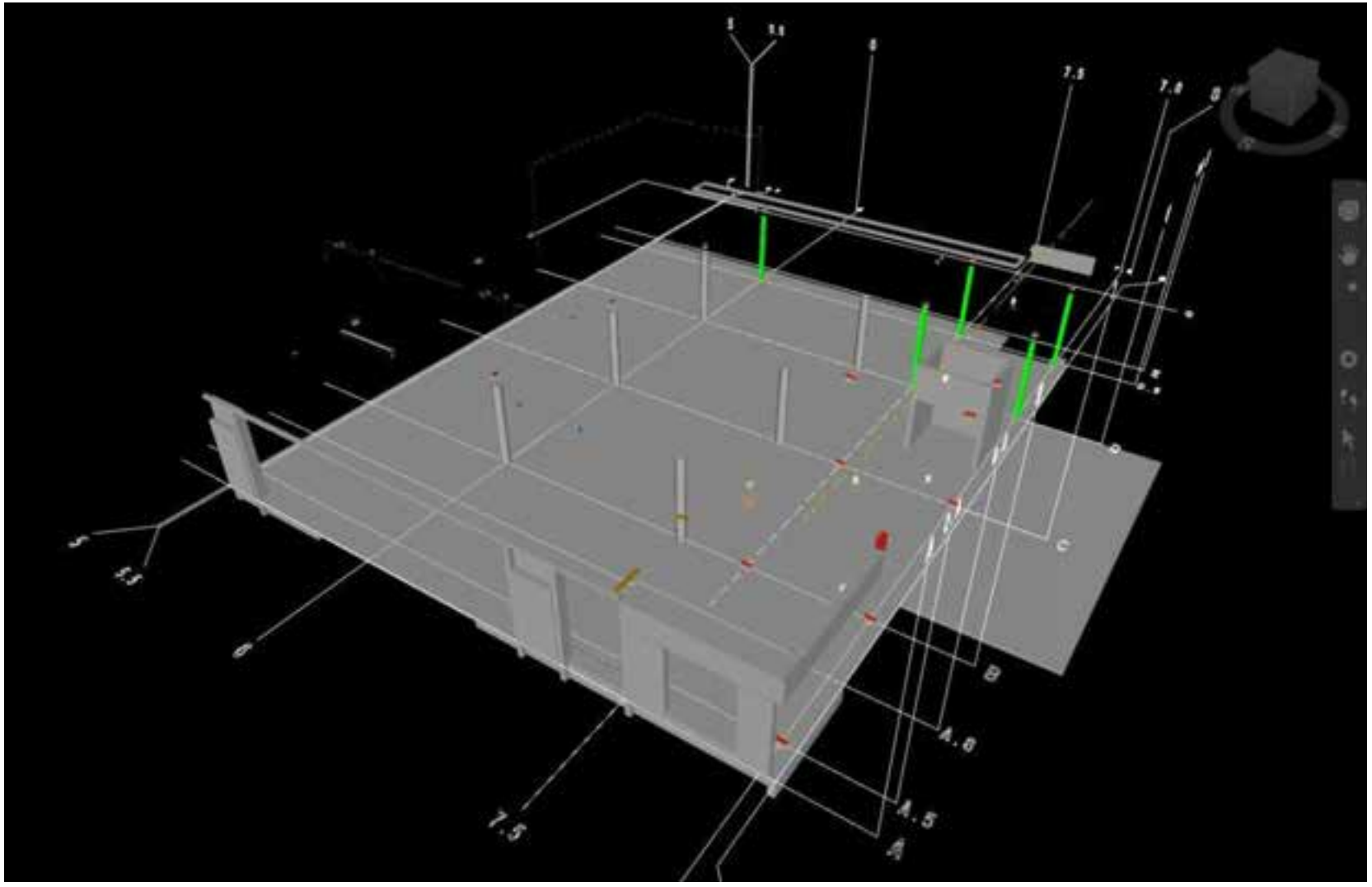


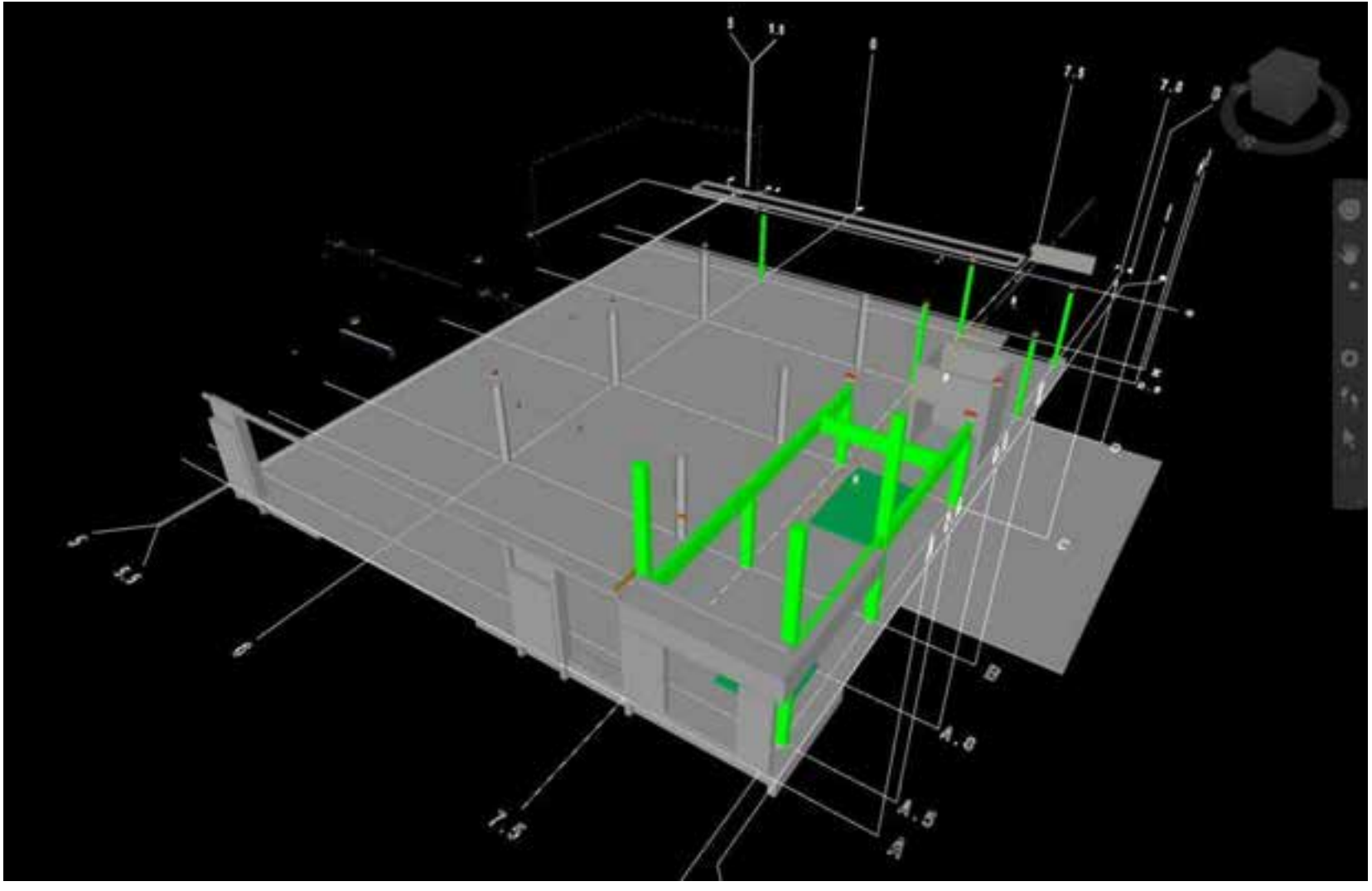
D124 SH. 12 Detail 124

dap in top column RC1 typ.

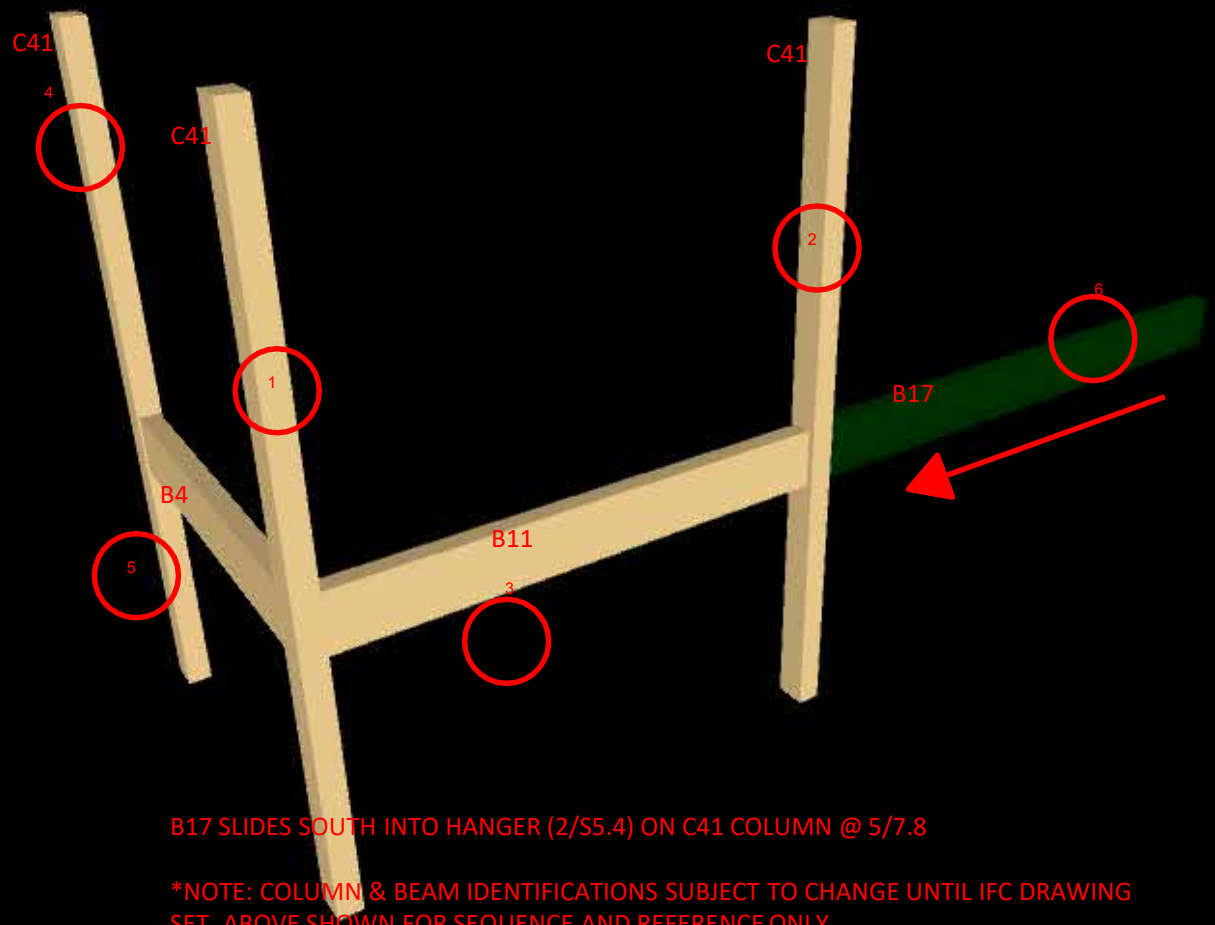
New DPR Sacramento Office

Mass Timber Logistics


5
5.5
6
7.5
A.5
A
A.6
B
C
7.5
7.6
8

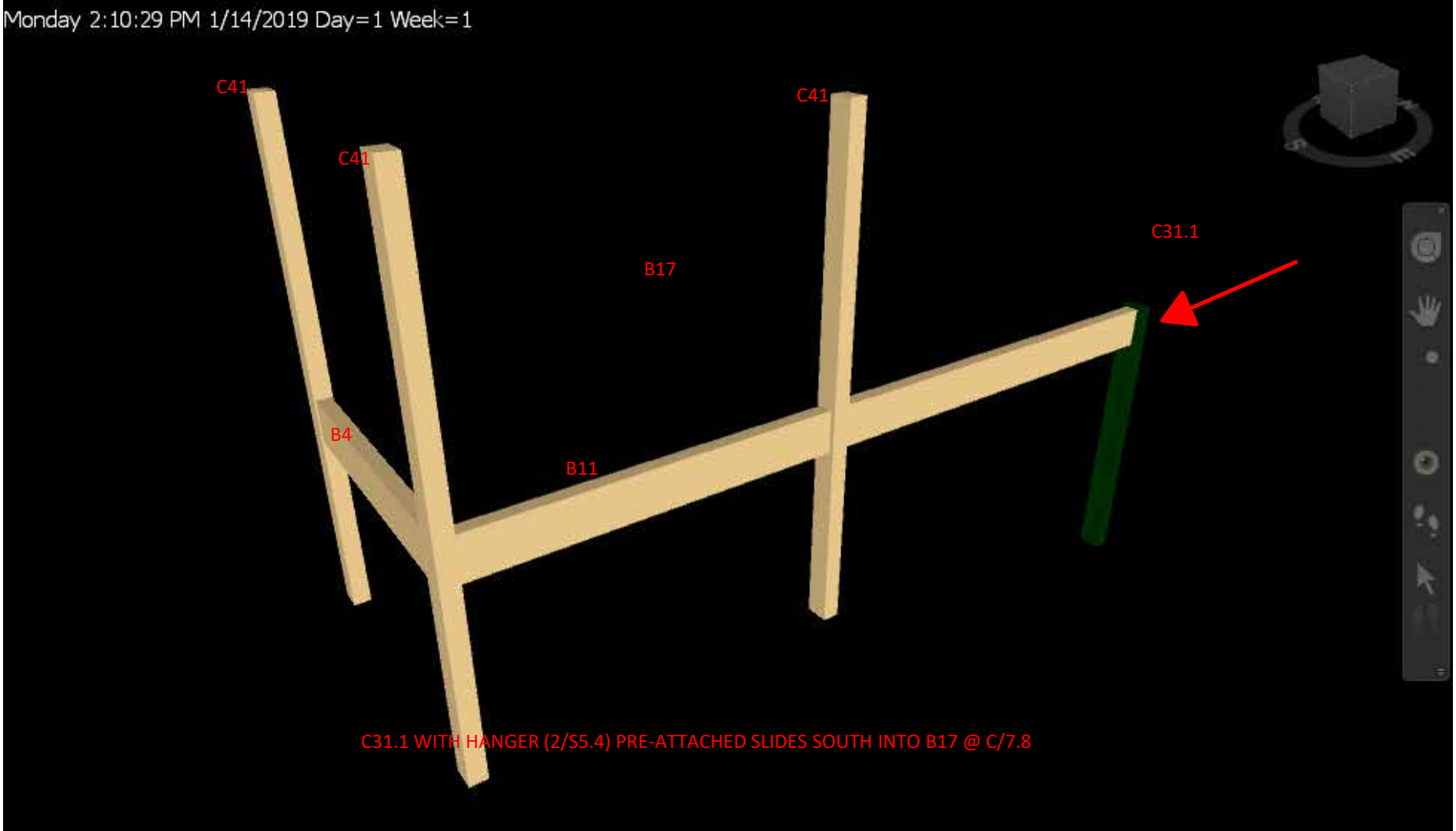

7.5
7.5
B
A.5
A

Monday 12:17:24 PM 1/14/2019 Day=1 Week=1

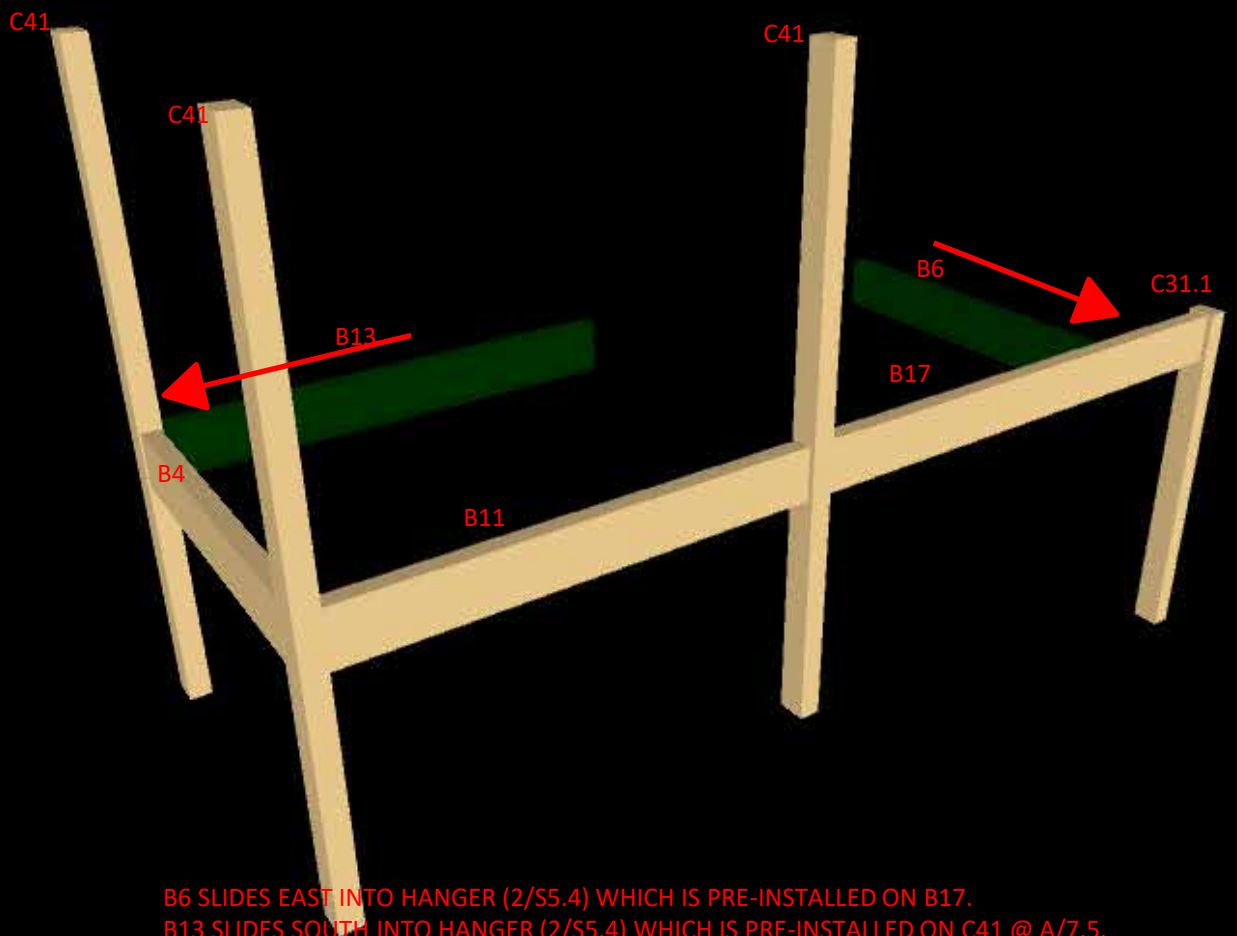


B17 SLIDES SOUTH INTO HANGER (2/S5.4) ON C41 COLUMN @ 5/7.8

*NOTE: COLUMN & BEAM IDENTIFICATIONS SUBJECT TO CHANGE UNTIL IFC DRAWING SET. ABOVE SHOWN FOR SEQUENCE AND REFERENCE ONLY.

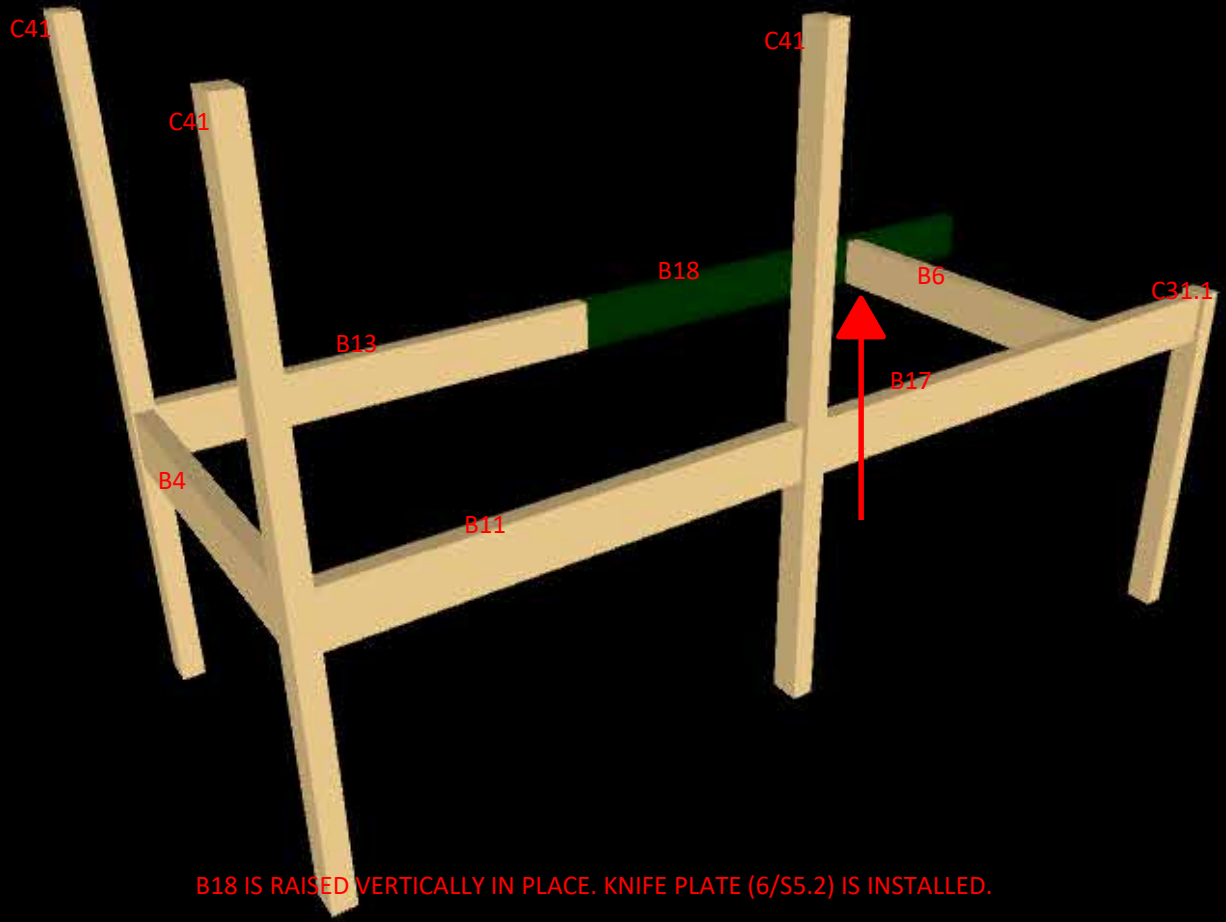

Monday 2:10:29 PM 1/14/2019 Day=1 Week=1
C41
C41
C41
C31.1
B17
B4
B11
C31.1 WITH HANGER (2/S5.4) PRE-ATTACHED SLIDES SOUTH INTO B17 @ C/7.8

Tuesday 7:21:50 AM 1/15/2019 Day=2 Week=1

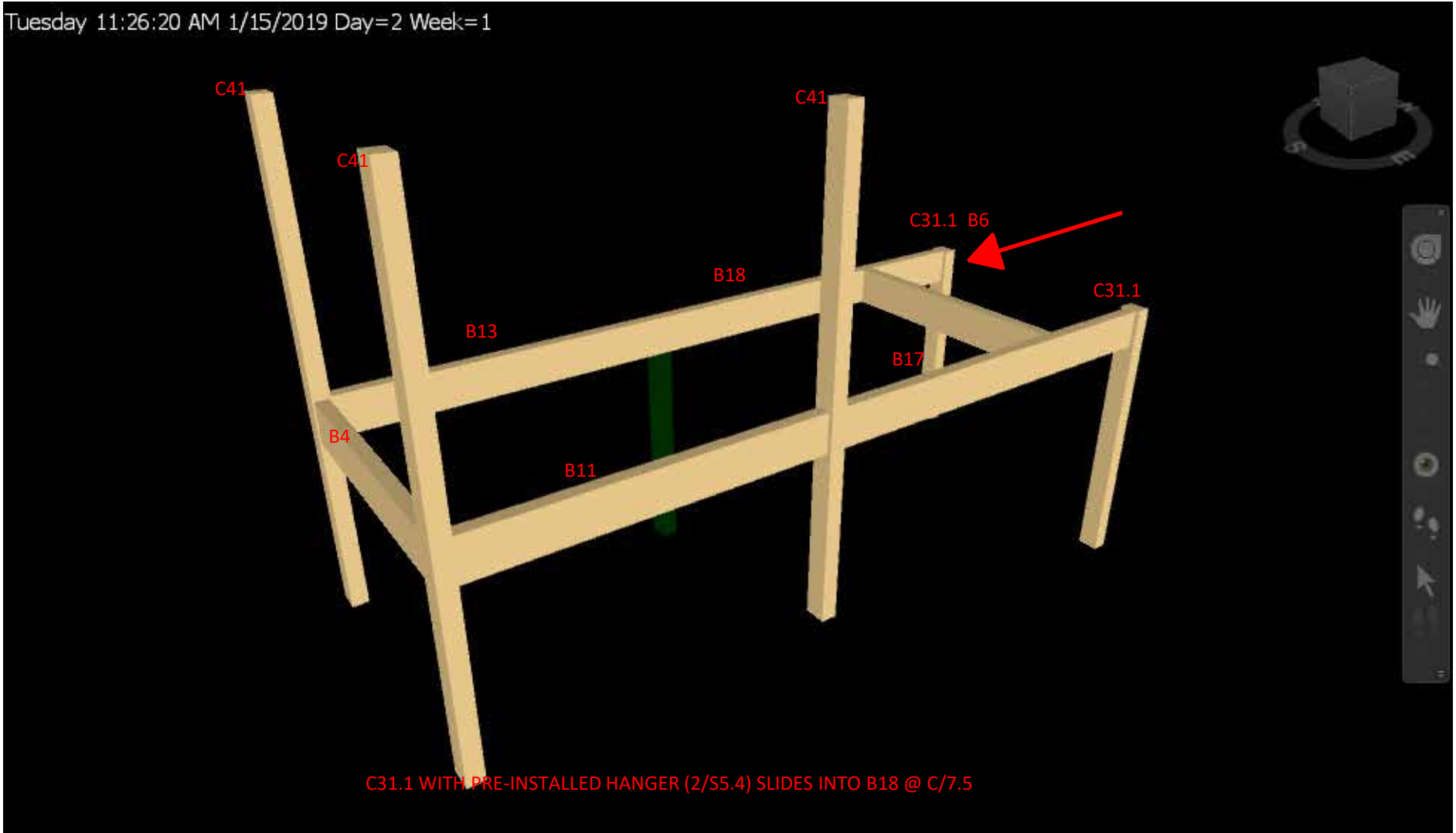


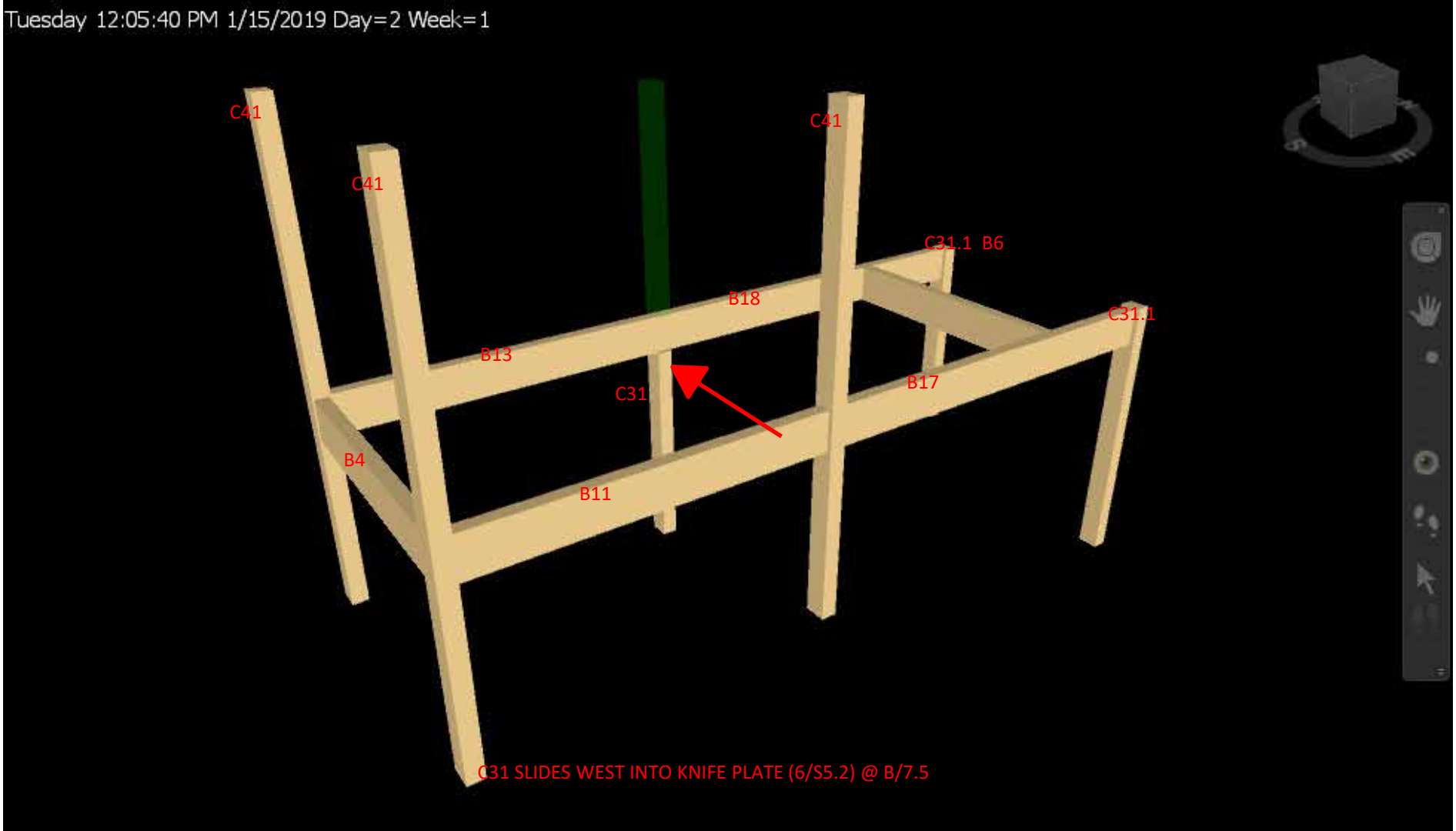
B6 SLIDES EAST INTO HANGER (2/S5.4) WHICH IS PRE-INSTALLED ON B17.
B13 SLIDES SOUTH INTO HANGER (2/S5.4) WHICH IS PRE-INSTALLED ON C41 @ A/7.5.

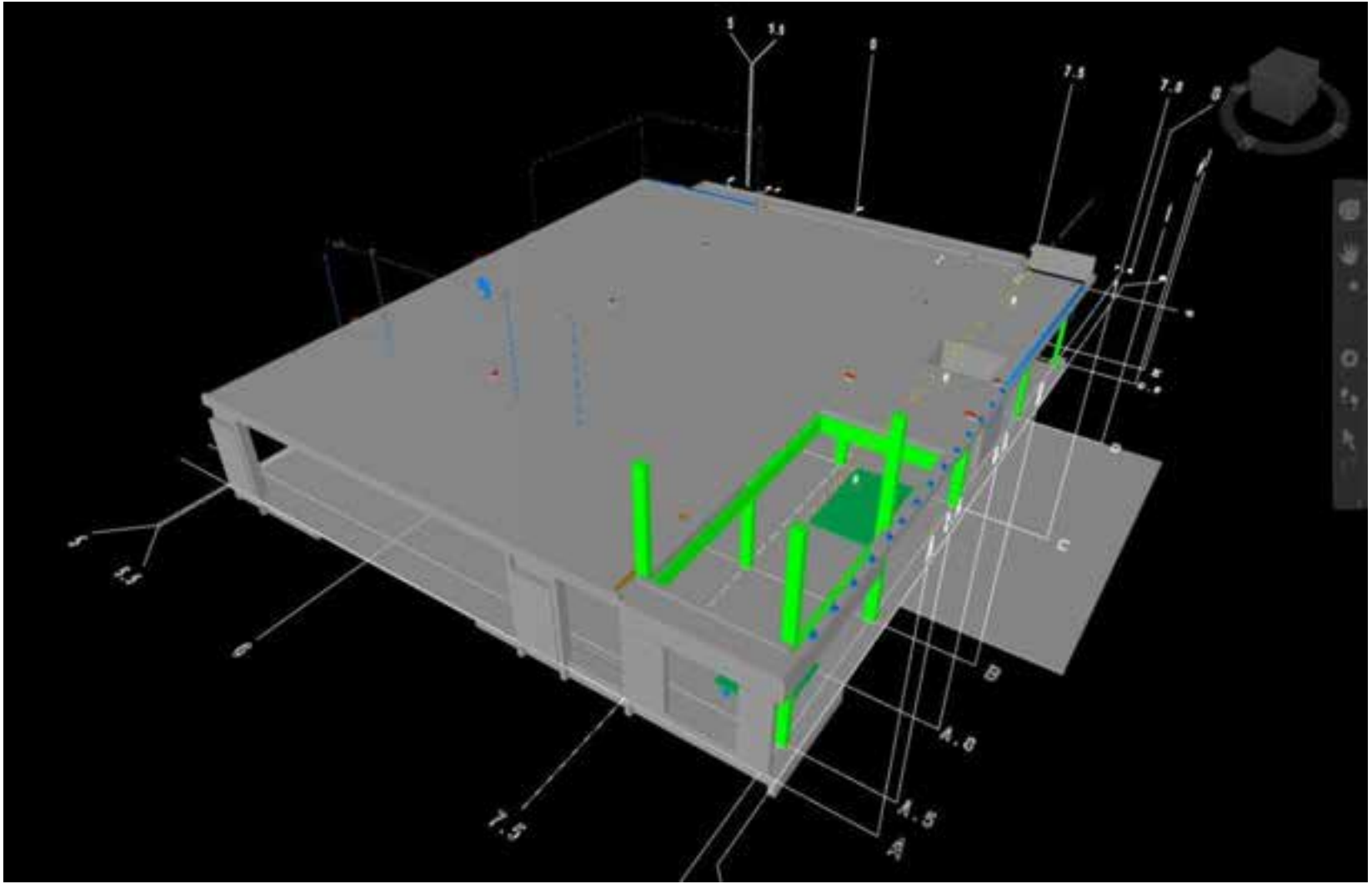
Tuesday 9:00:05 AM 1/15/2019 Day=2 Week=1

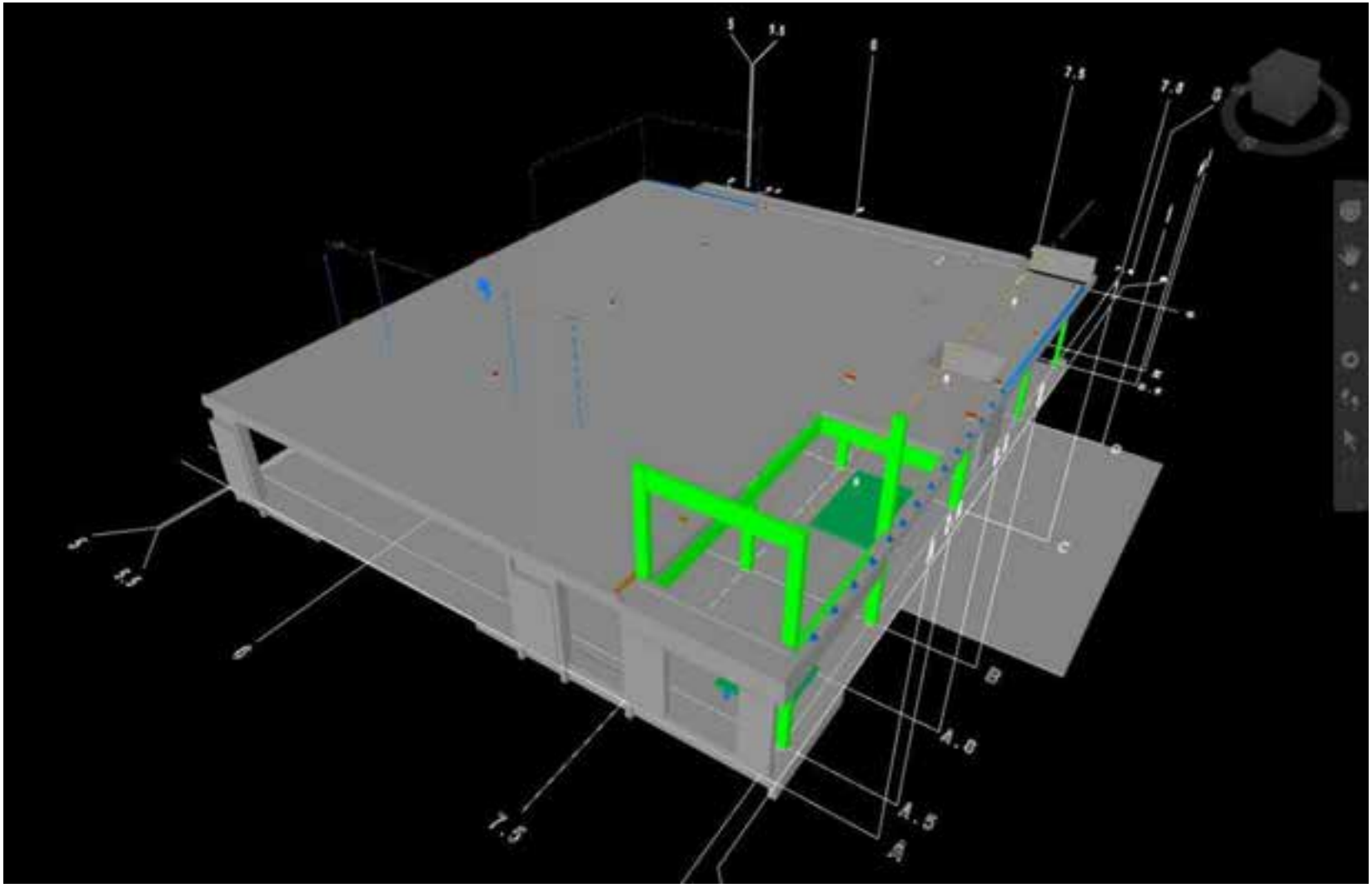


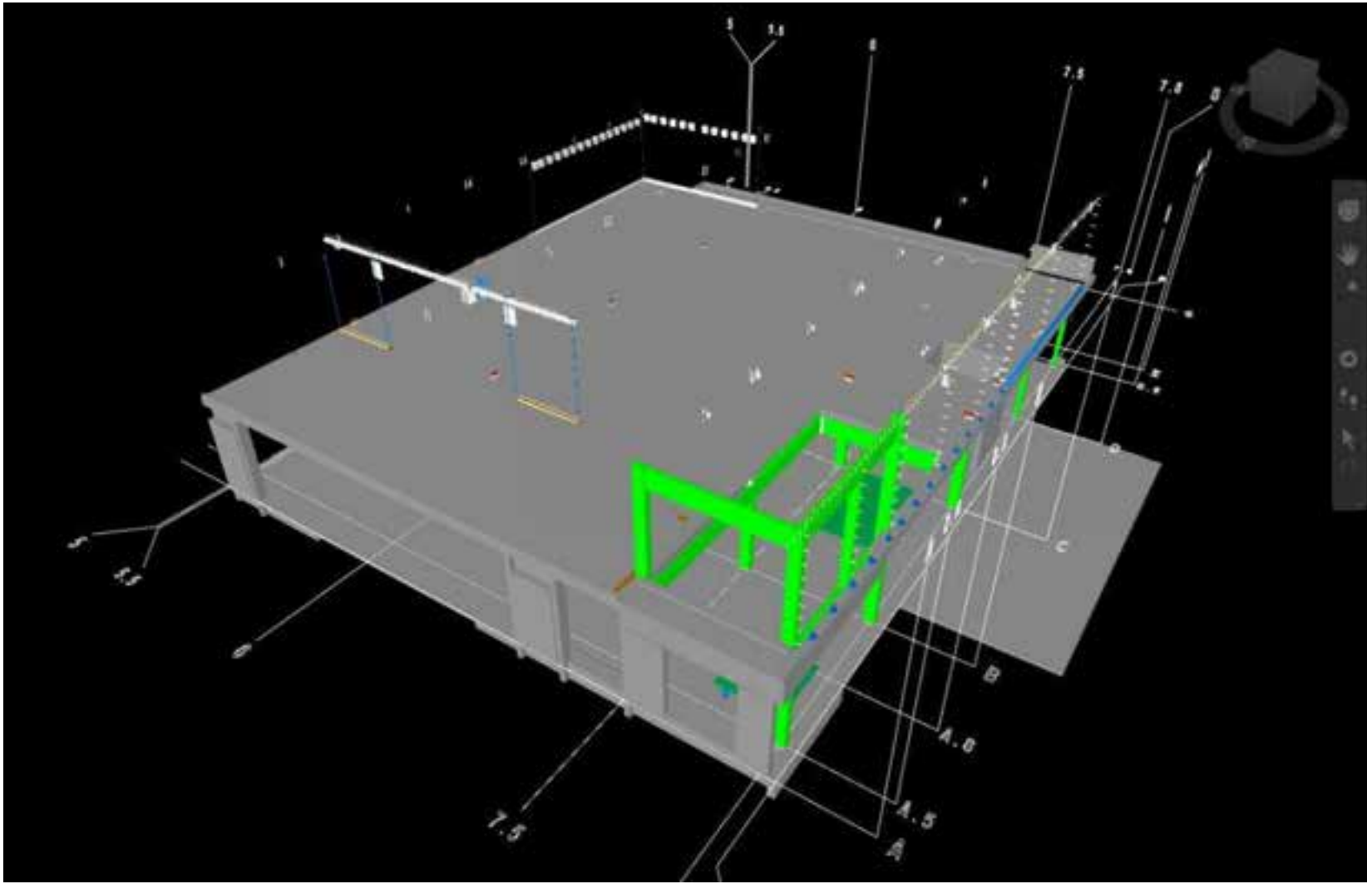
B18 IS RAISED VERTICALLY IN PLACE. KNIFE PLATE (6/S5.2) IS INSTALLED.

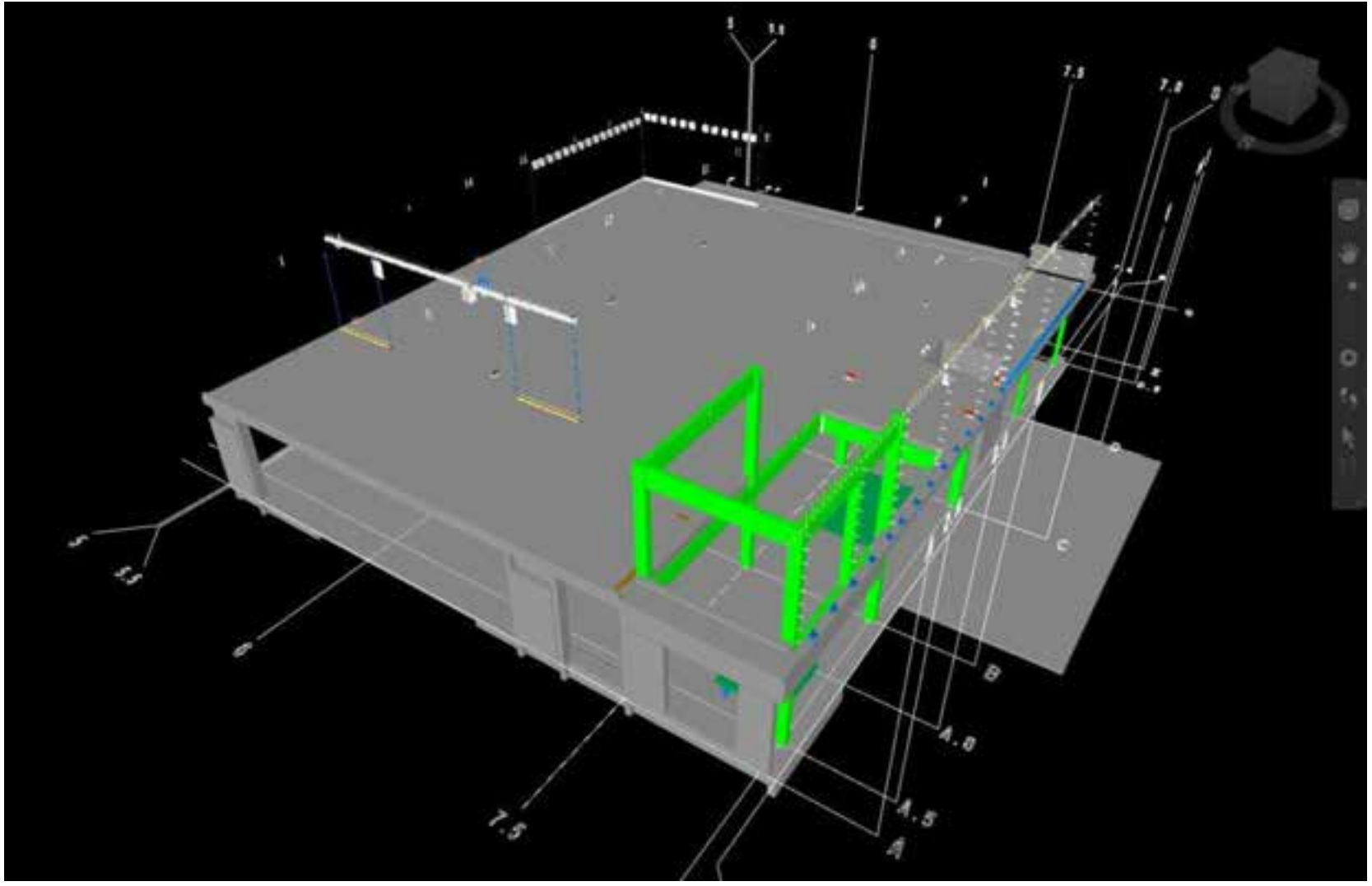

Tuesday 11:26:20 AM 1/15/2019 Day=2 Week=1
C41
C41
C41
C31.1 B6
B18
C31.1
B13
B17
B4
B11
C31.1 WITH PRE-INSTALLED HANGER (2/S5.4) SLIDES INTO B18 @ C/7.5


Tuesday 12:05:40 PM 1/15/2019 Day=2 Week=1
C41
C41
C41
C31.1 B6
B18
C31.1
B13
C31
B17
B4
B11
C31 SLIDES WEST INTO KNIFE PLATE (6/S5.2) @ B/7.5


7.5
A.6
A.5
A
B
C


7.5
7.0
B
A.6
A.5
A
7.5


7.5
7.5
A.6
A.5
A
B
C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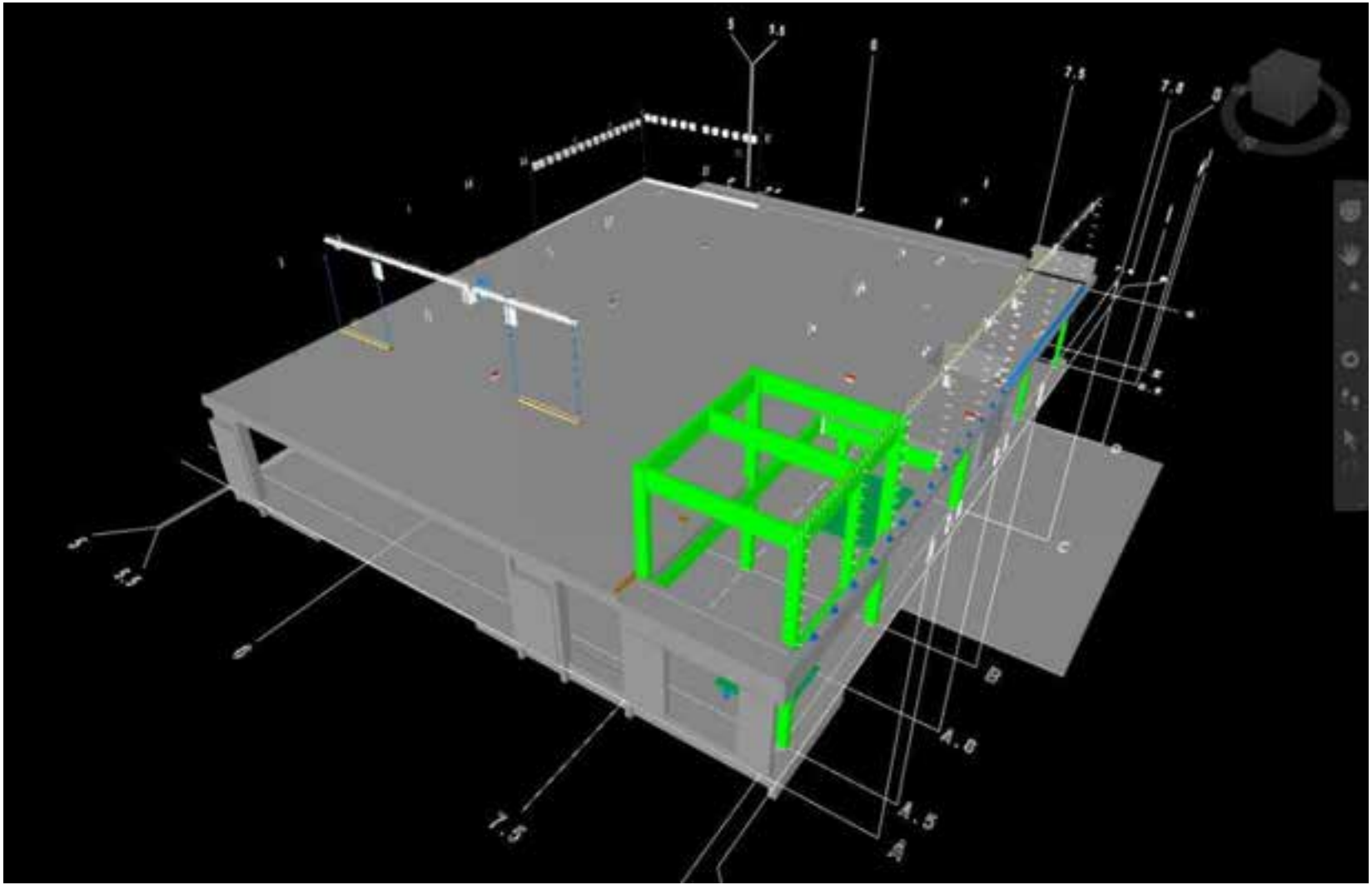
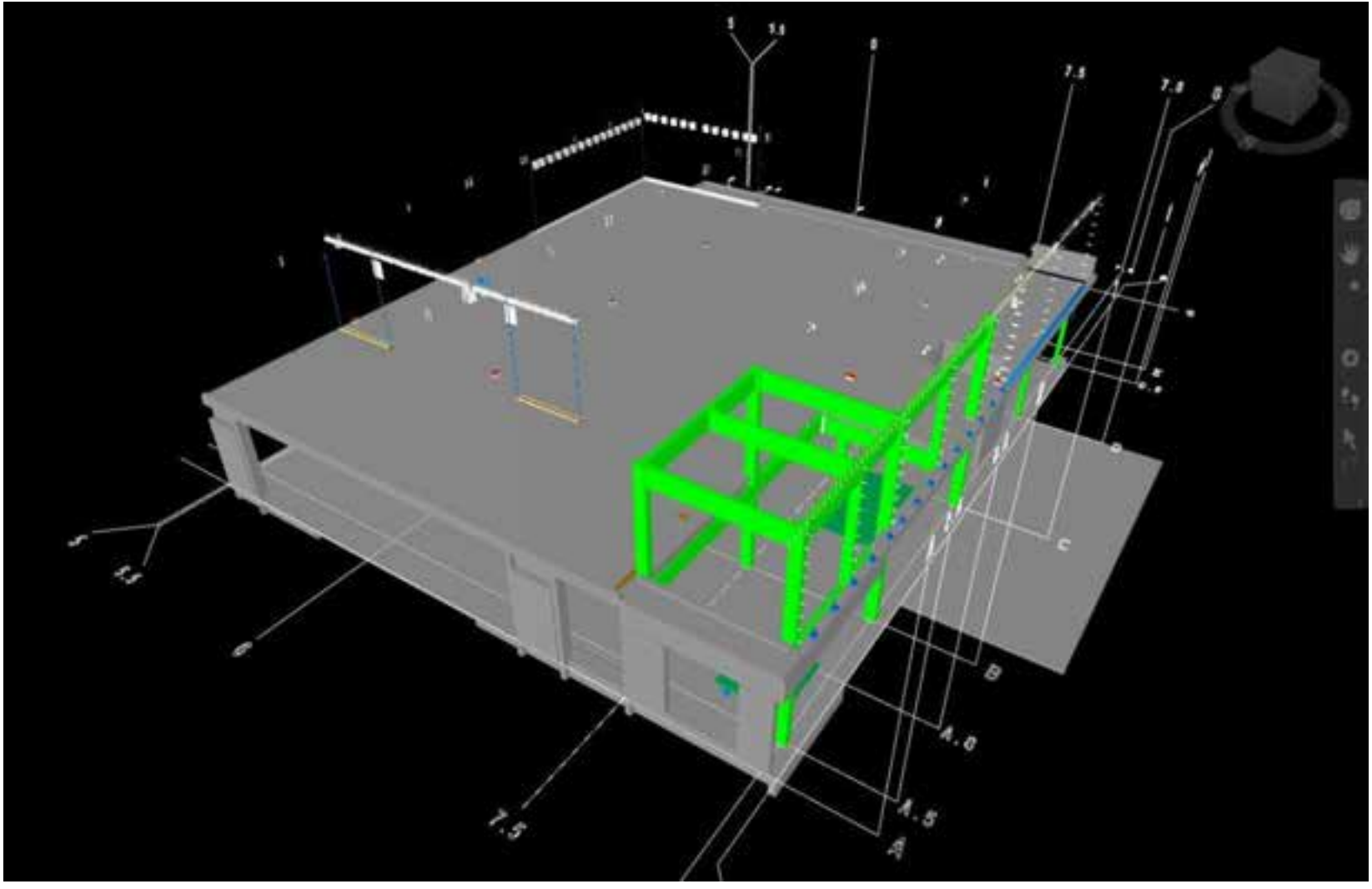
7.5
B
A.5
A
7.5


7.5
7.8
B
C
A.6
A.5
A
7.5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7.5
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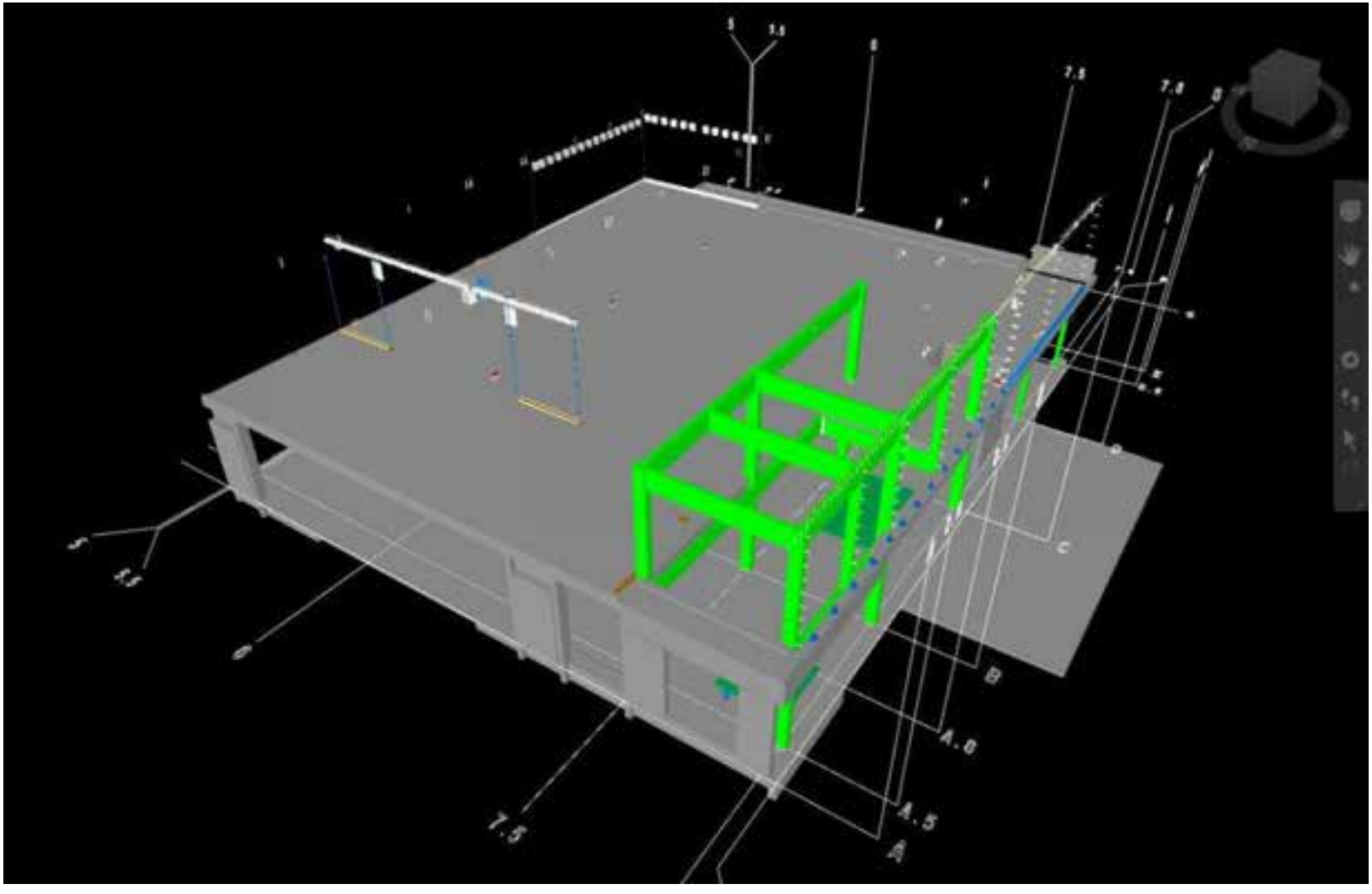
A.6
A.5
A
7.5
C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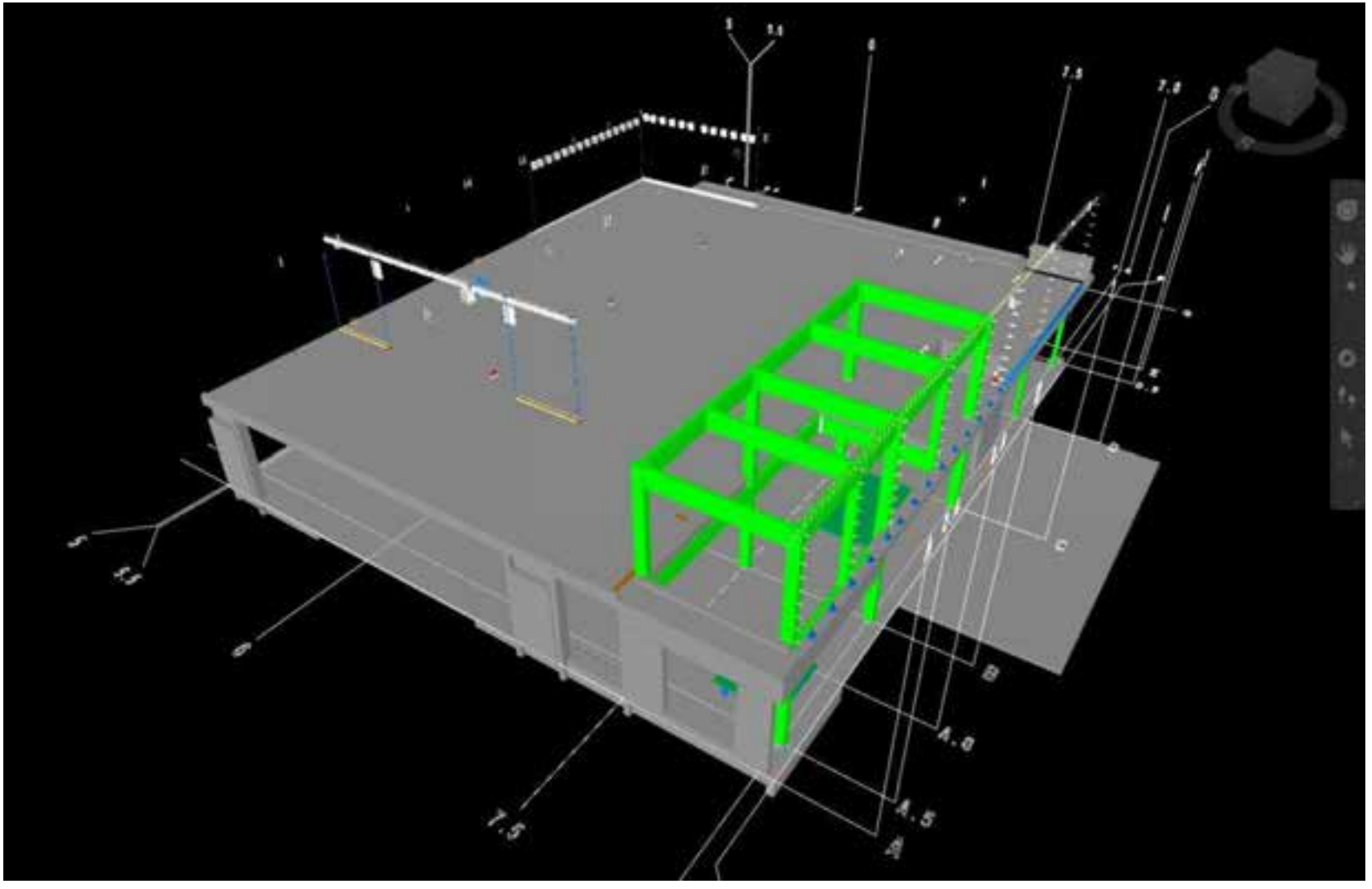
7.5
B
A.6
A.5
A
7.5


7.5
7.5
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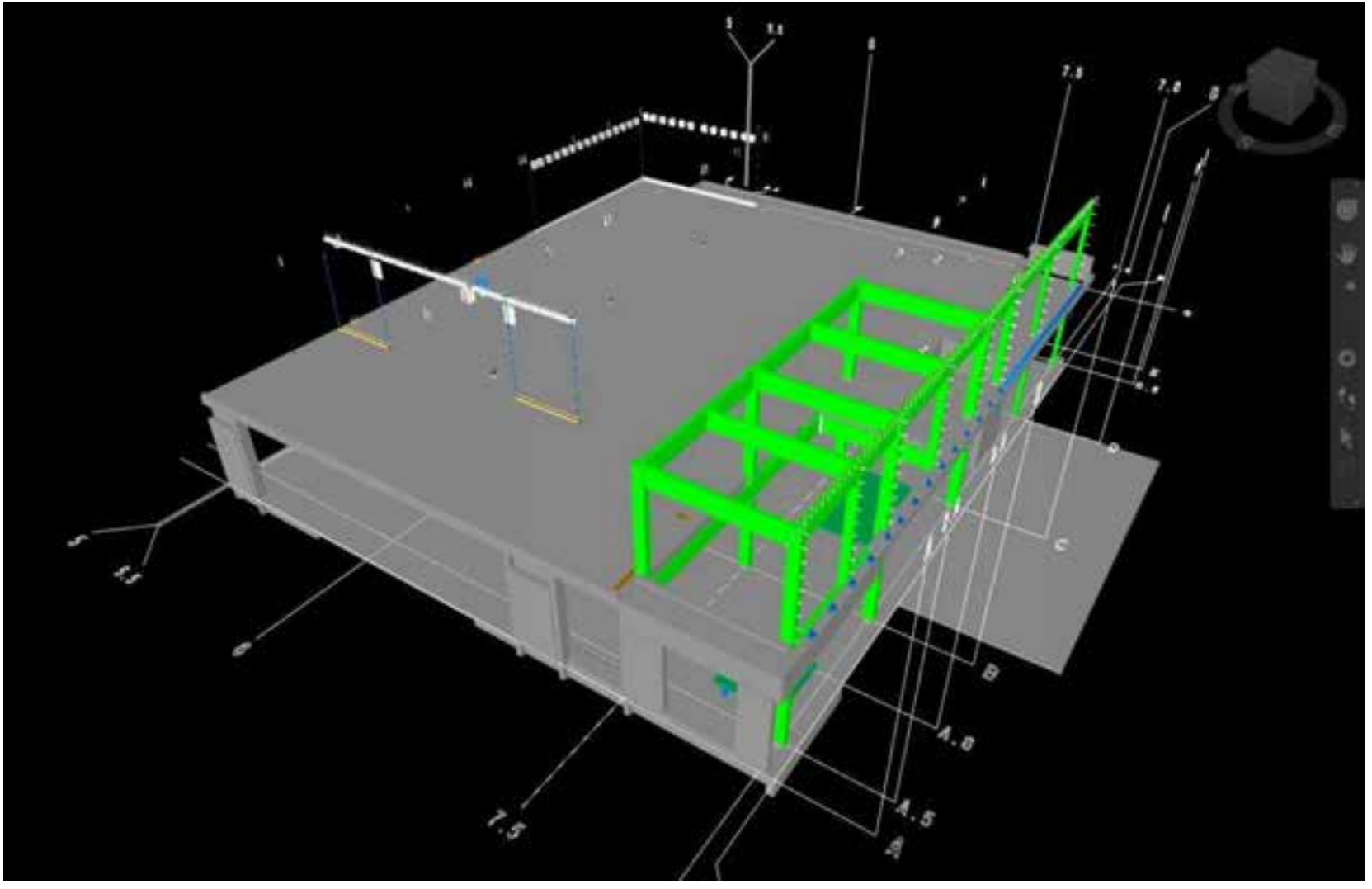
A.6
A.5
A
7.5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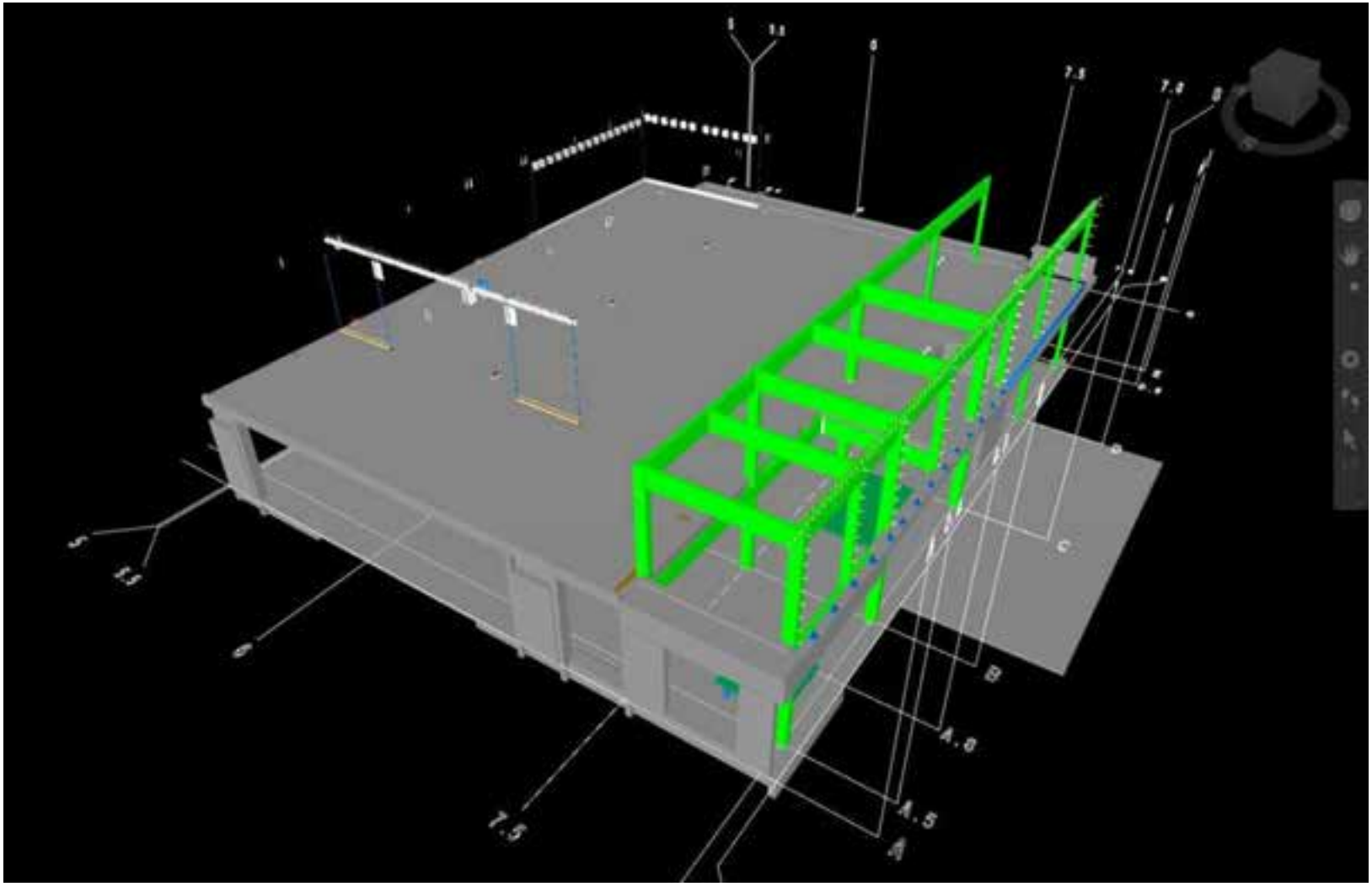
7.5
B
A.6
A.5
A
7.5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7.5
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A.5
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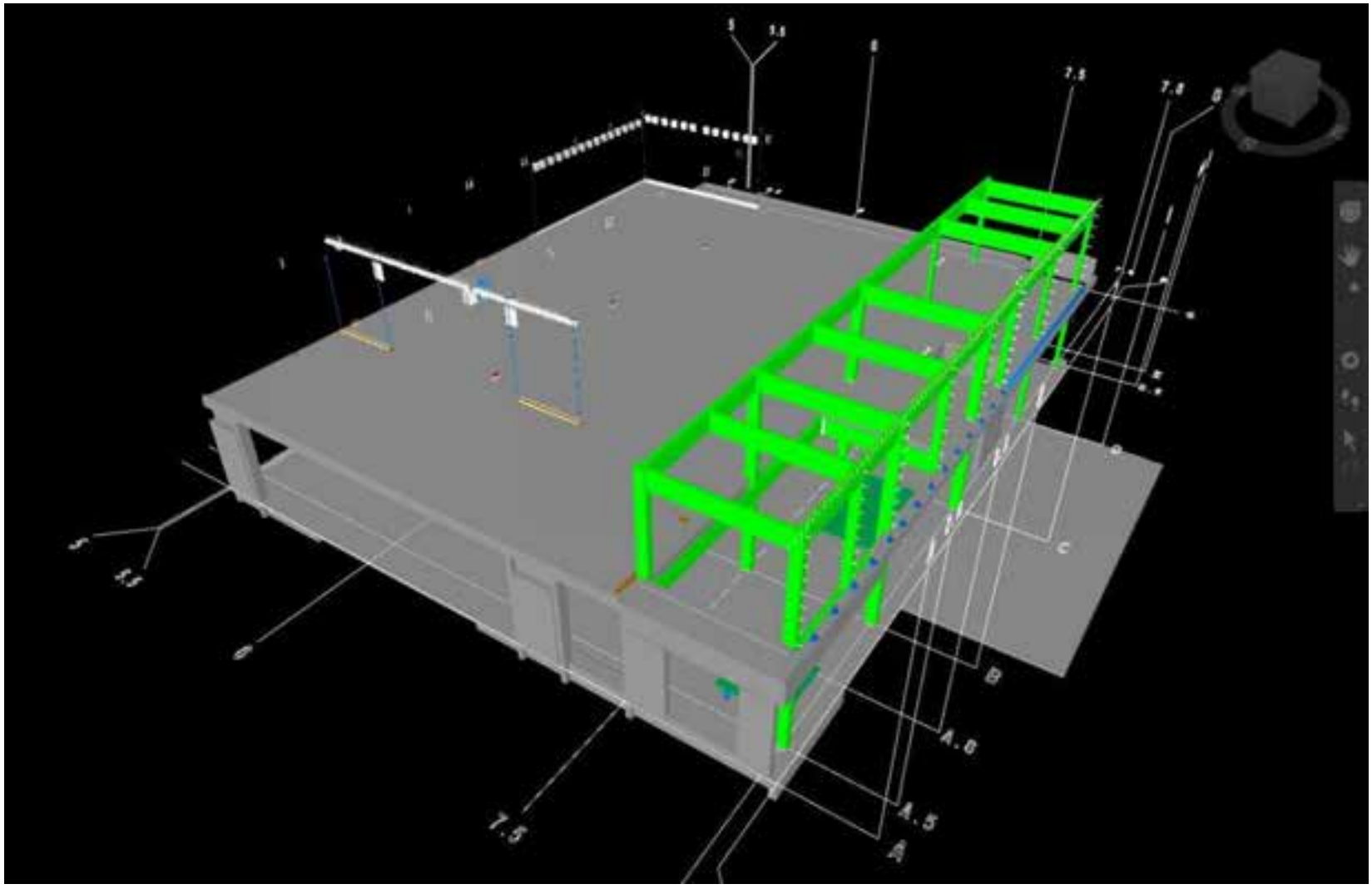
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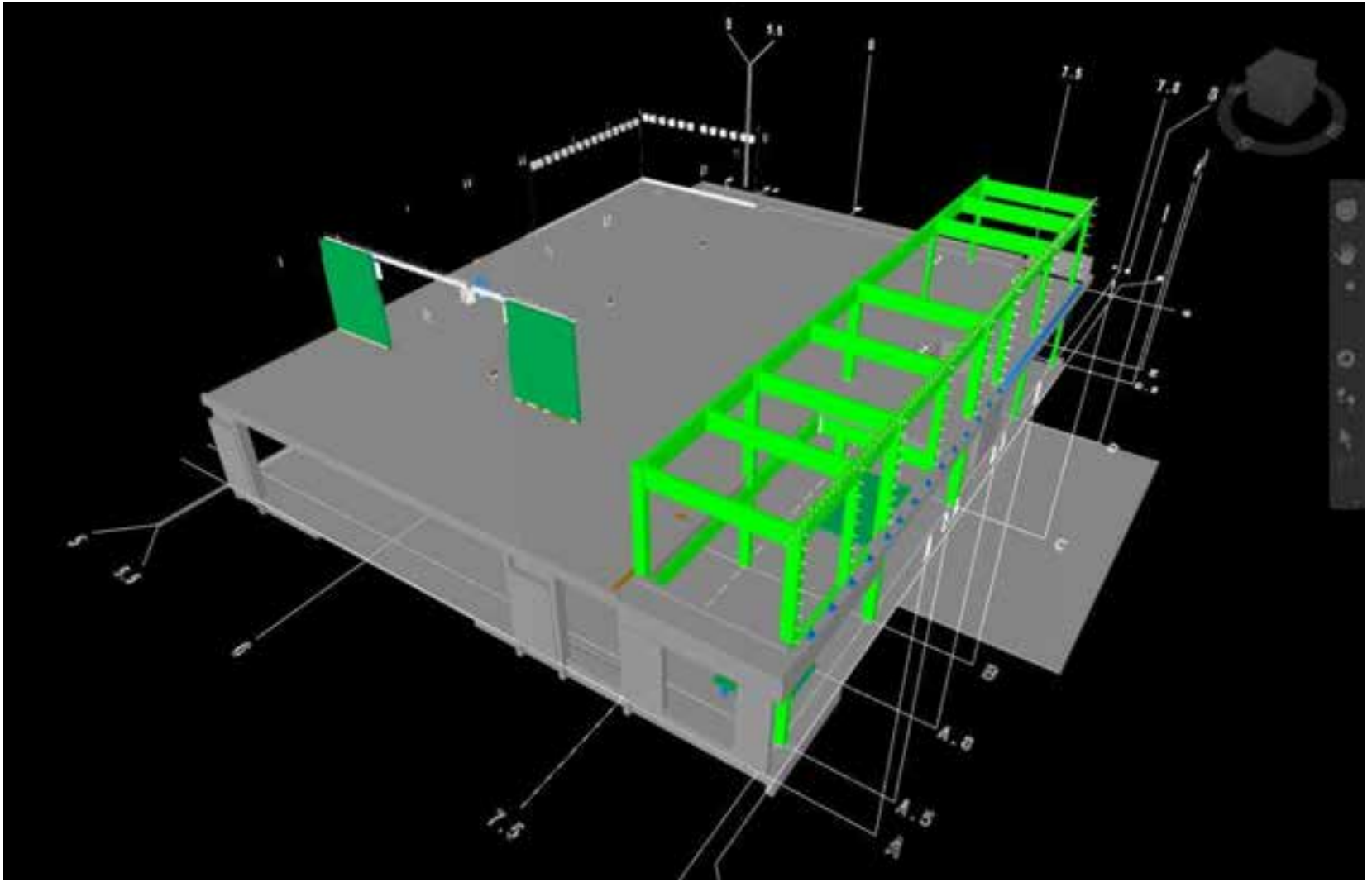
7.5
A.6
A.5
A
B
C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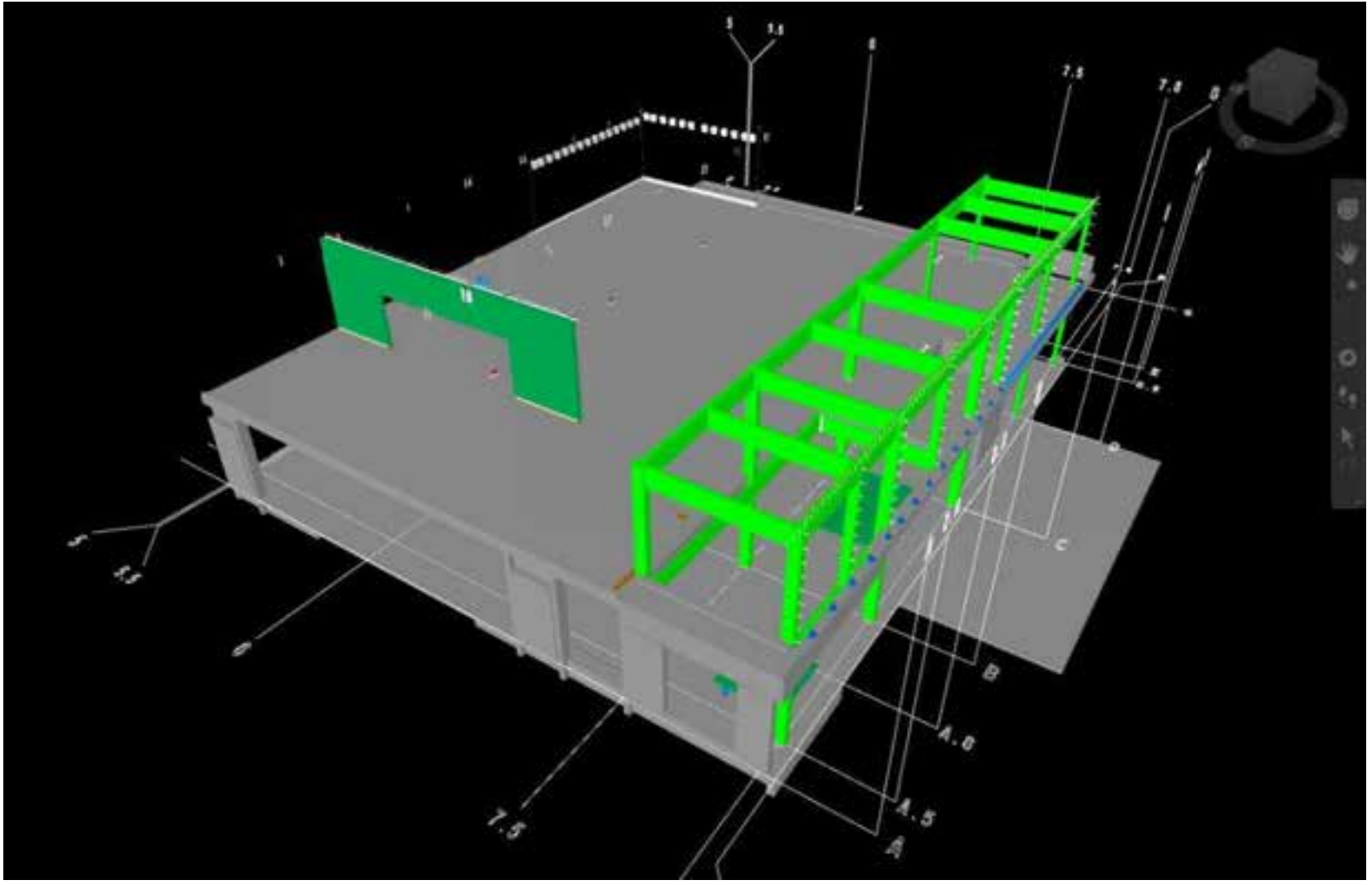
7.5
B
C
B
A.5
A
7.5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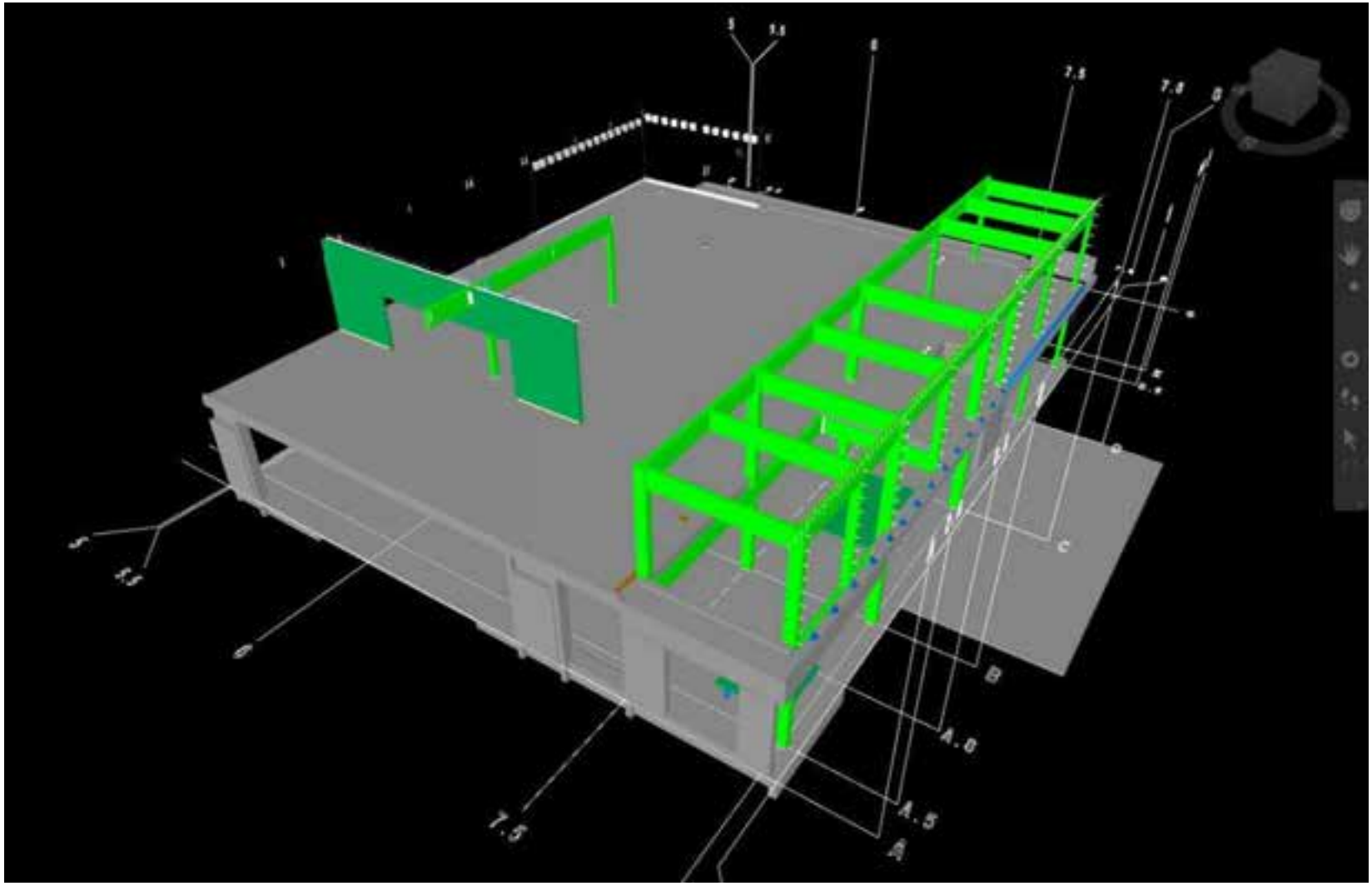
7.5
A.6
A.5
A
B
C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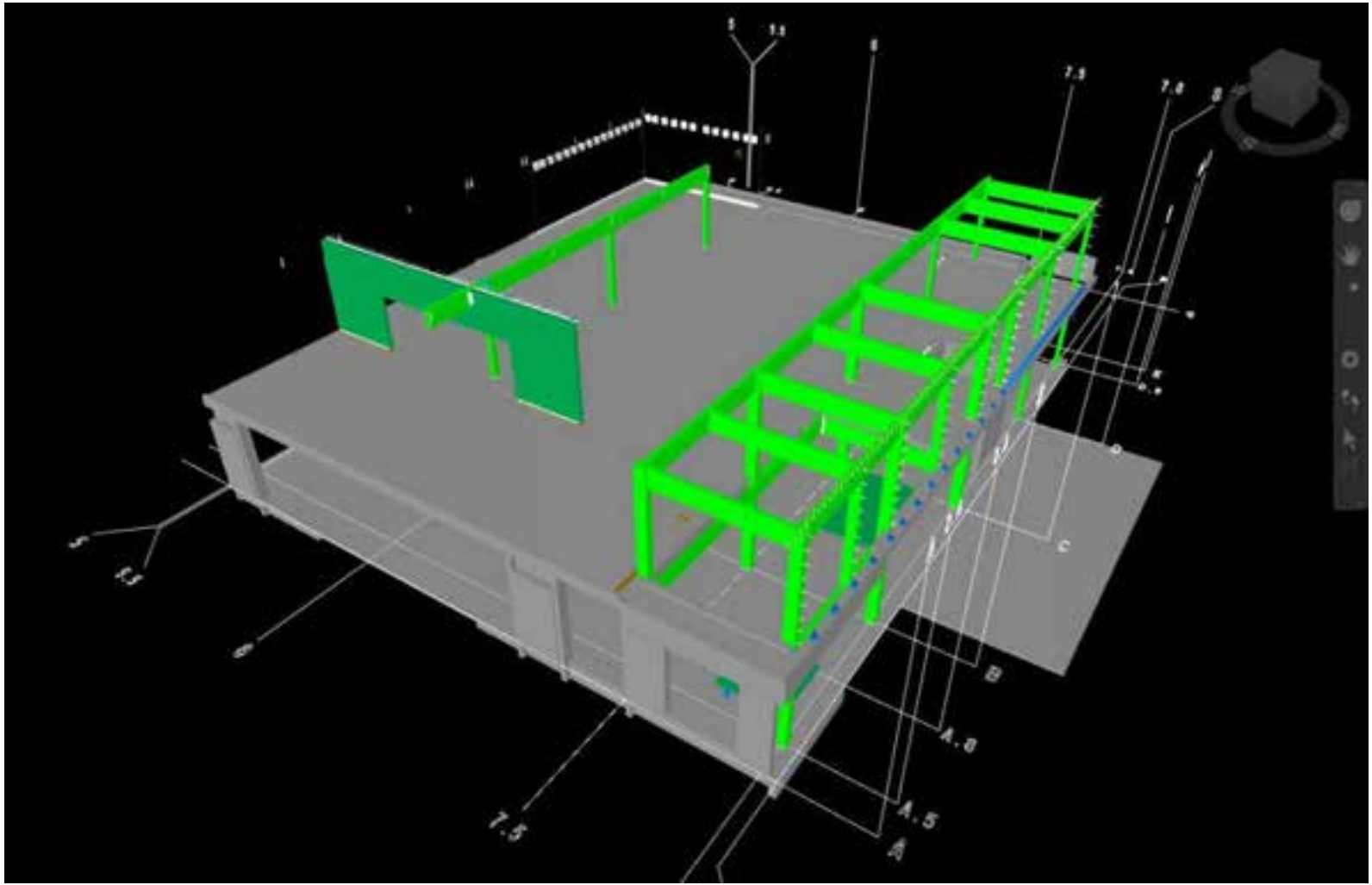
7.5
B
C
B
A.6
A.5
A
7.5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A.5
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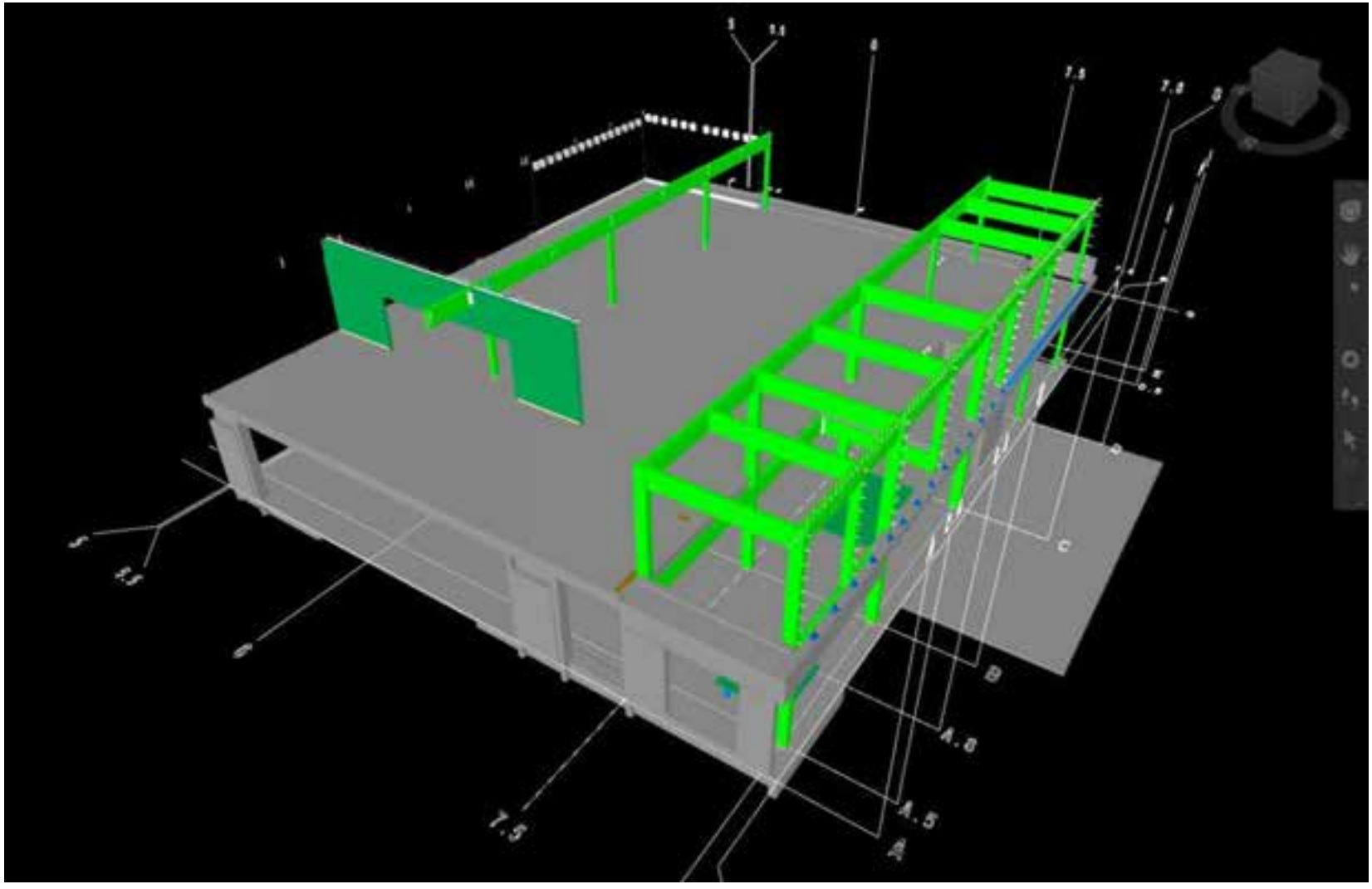
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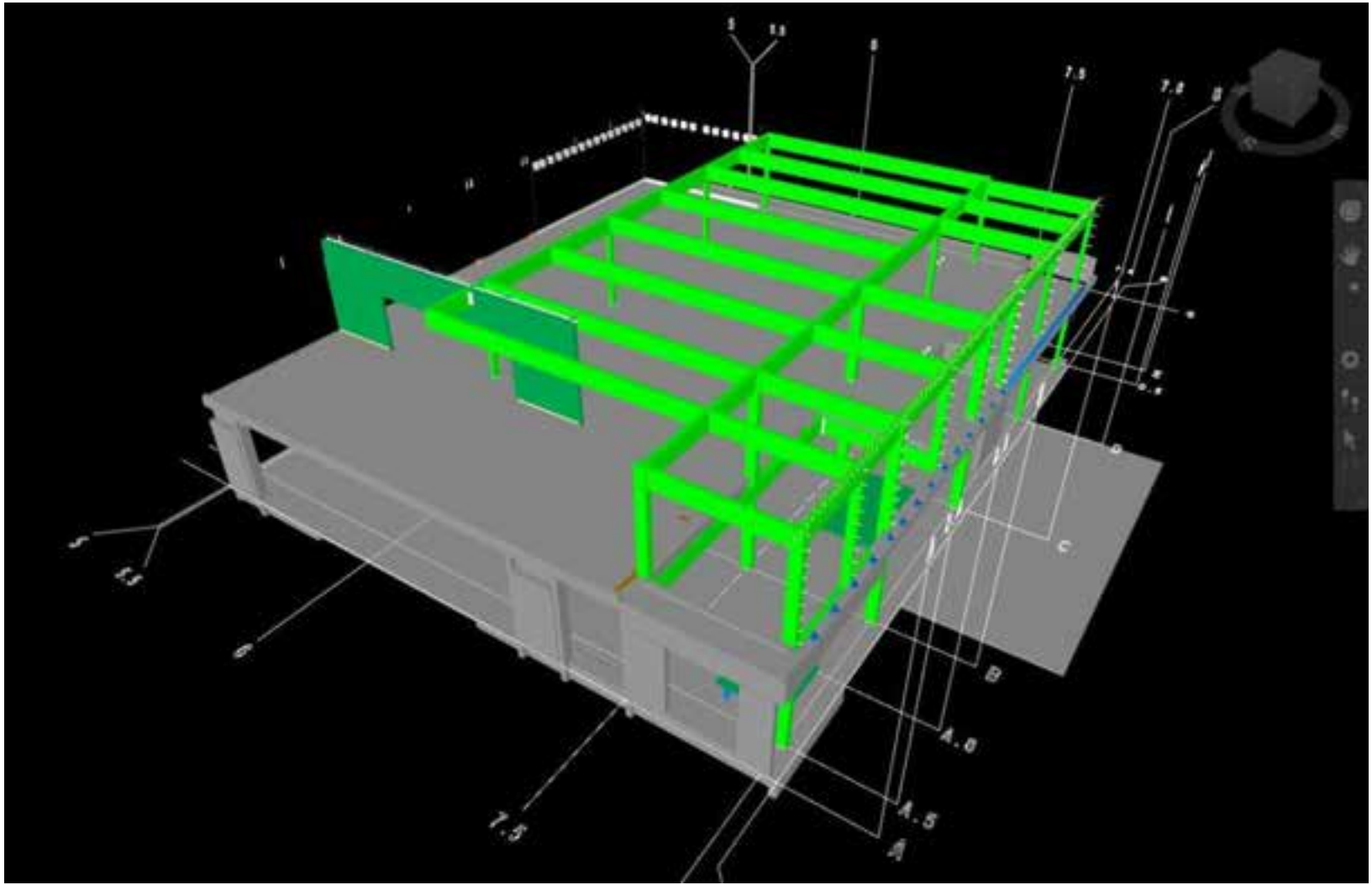
6
7.5
7.6
8
5
5.5
6
7.5
A
A.5
A.6
B
C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C
A.6
A.5
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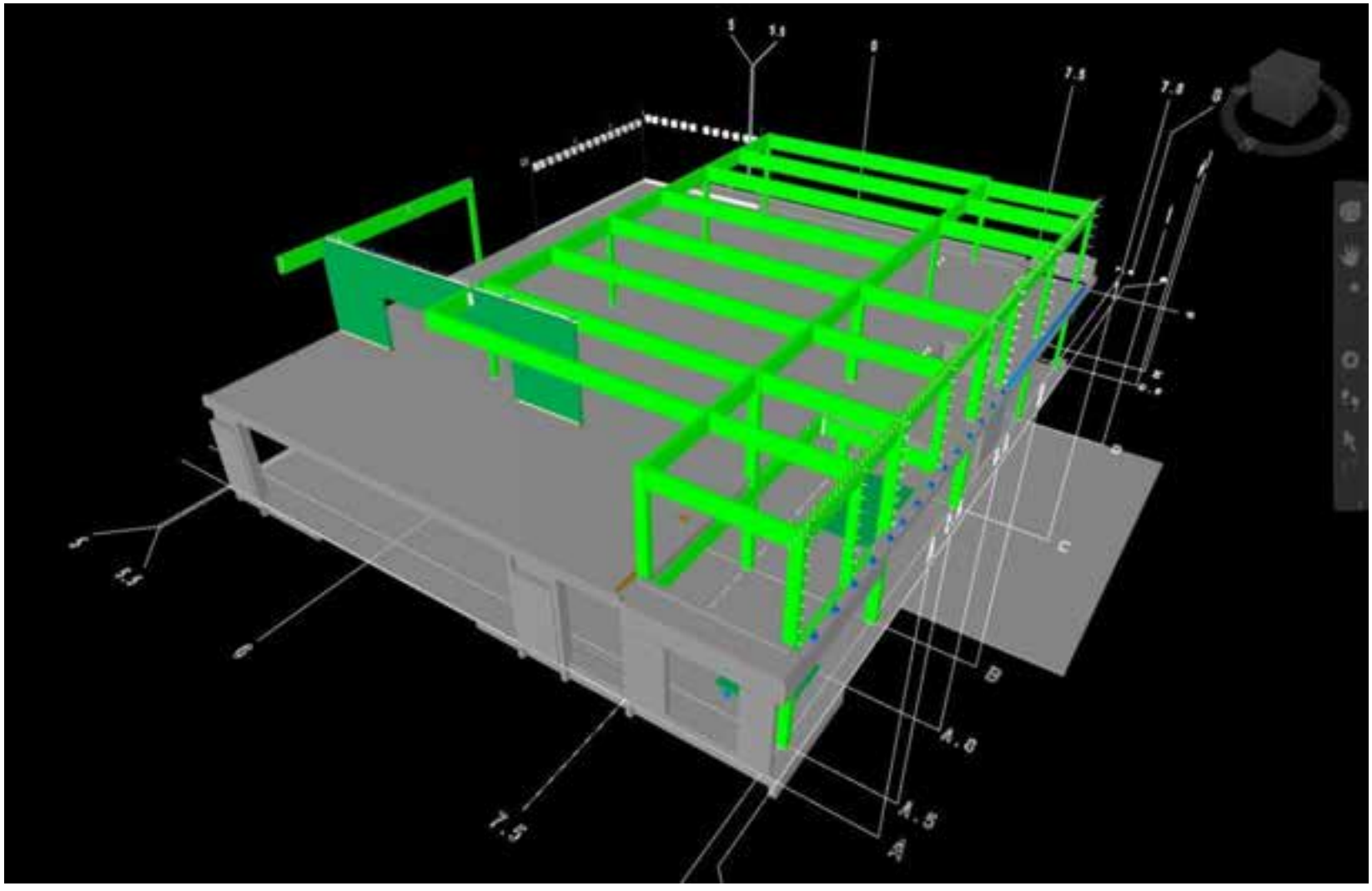
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7.8
8
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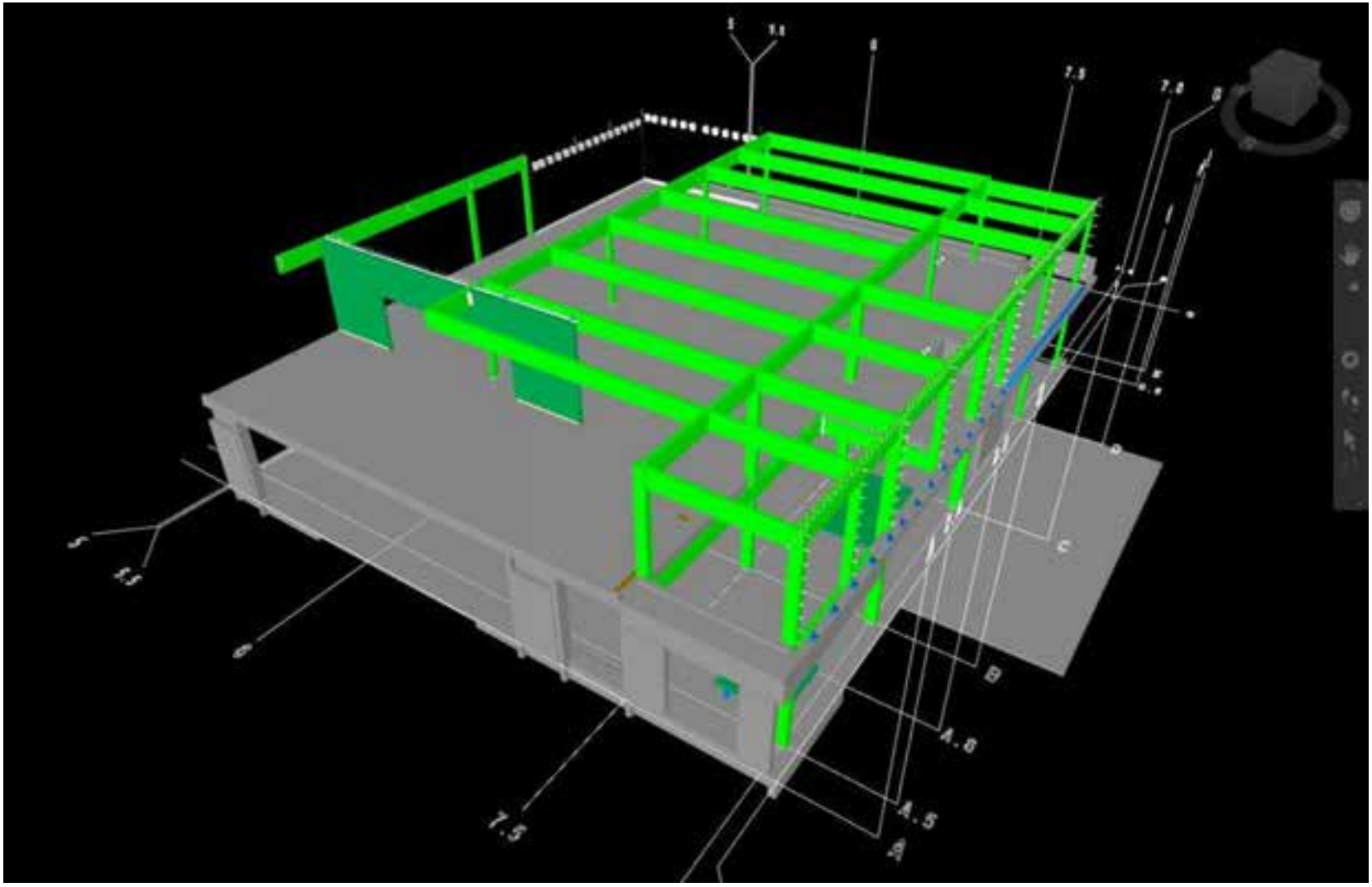
A.6
A.5
A
7.5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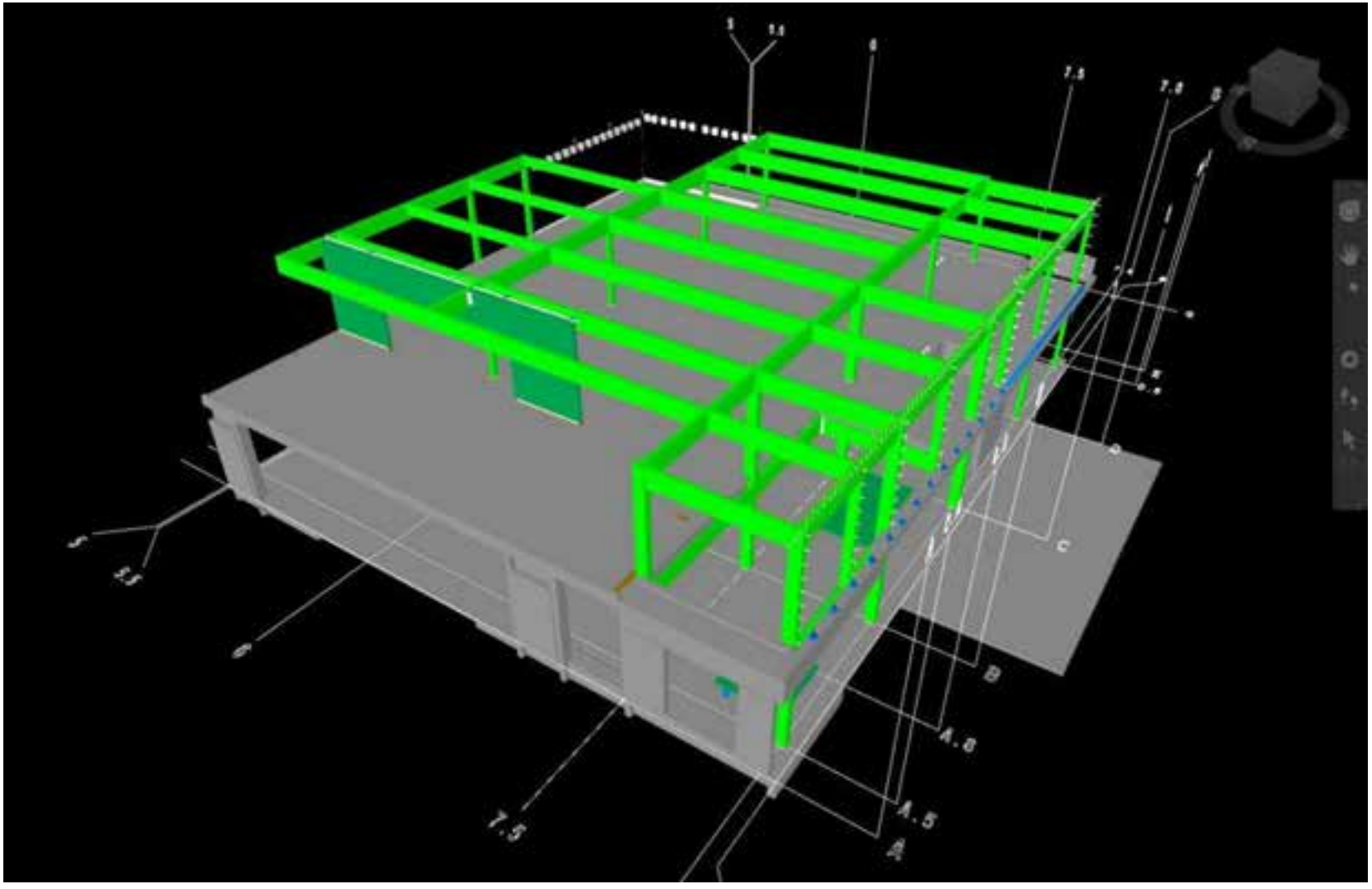
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1.1
6
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7.8
B
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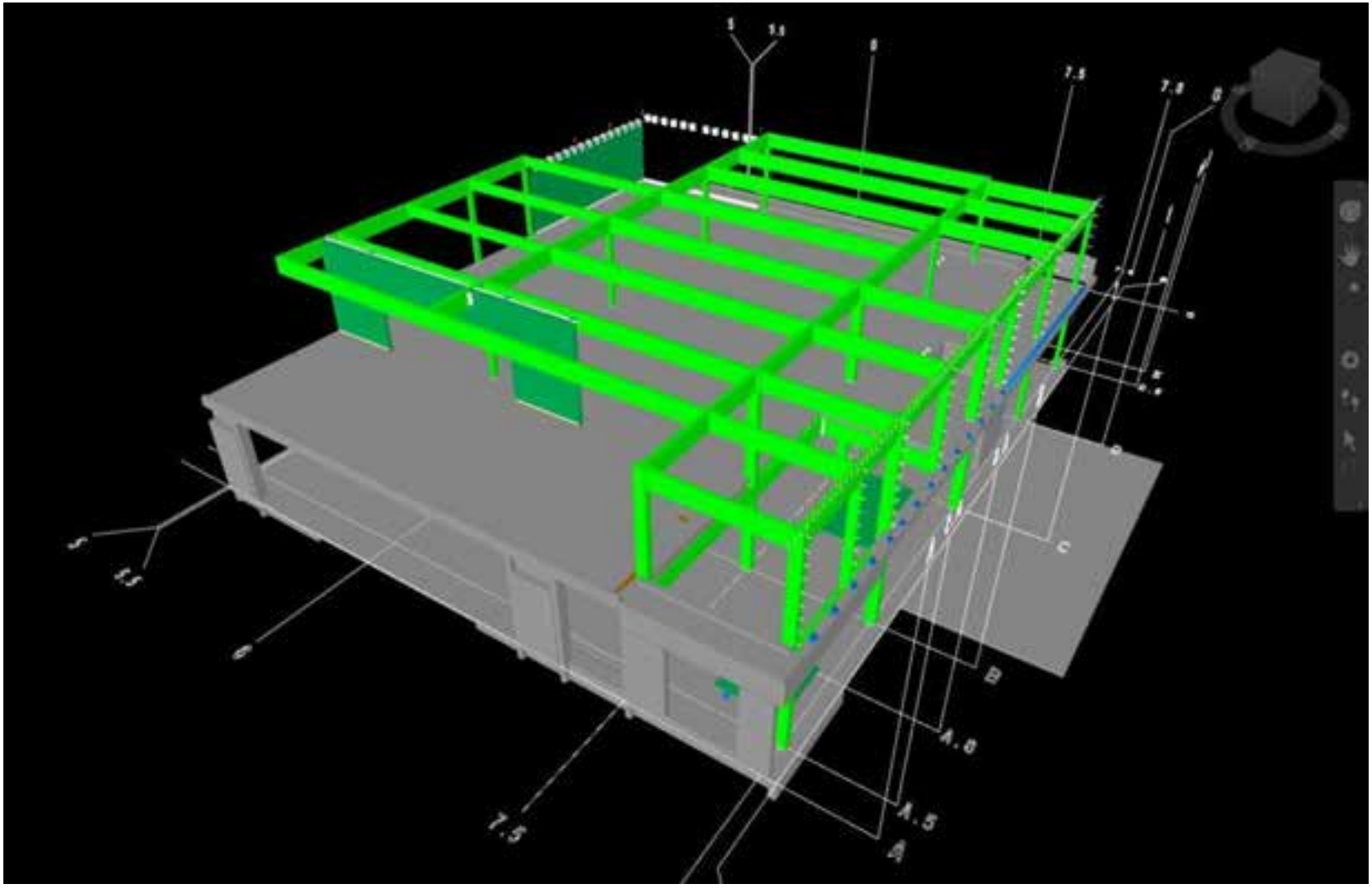
A.6
A.5
A
7.5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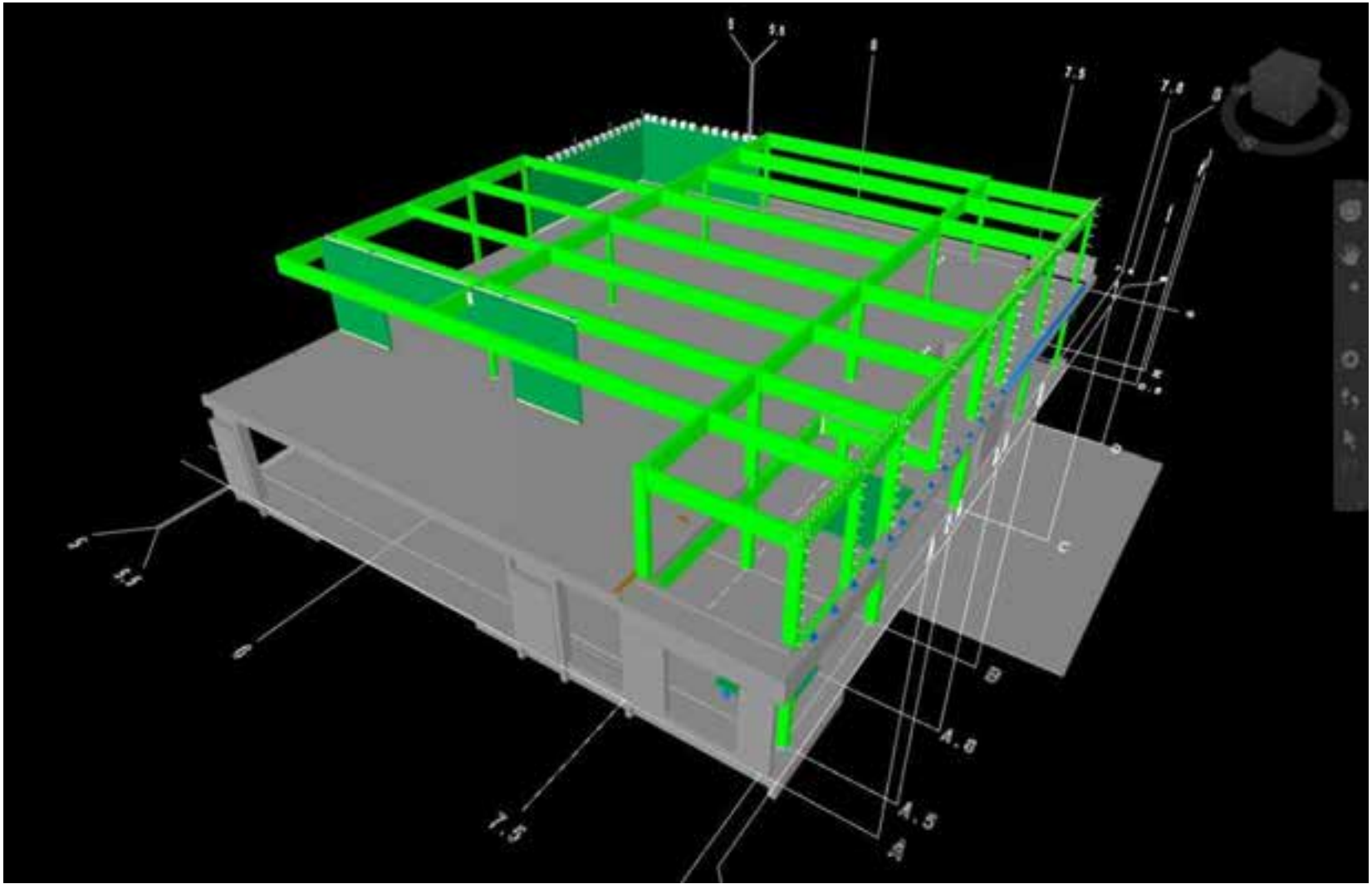
7.5
B
C
B
A.5
A
7.5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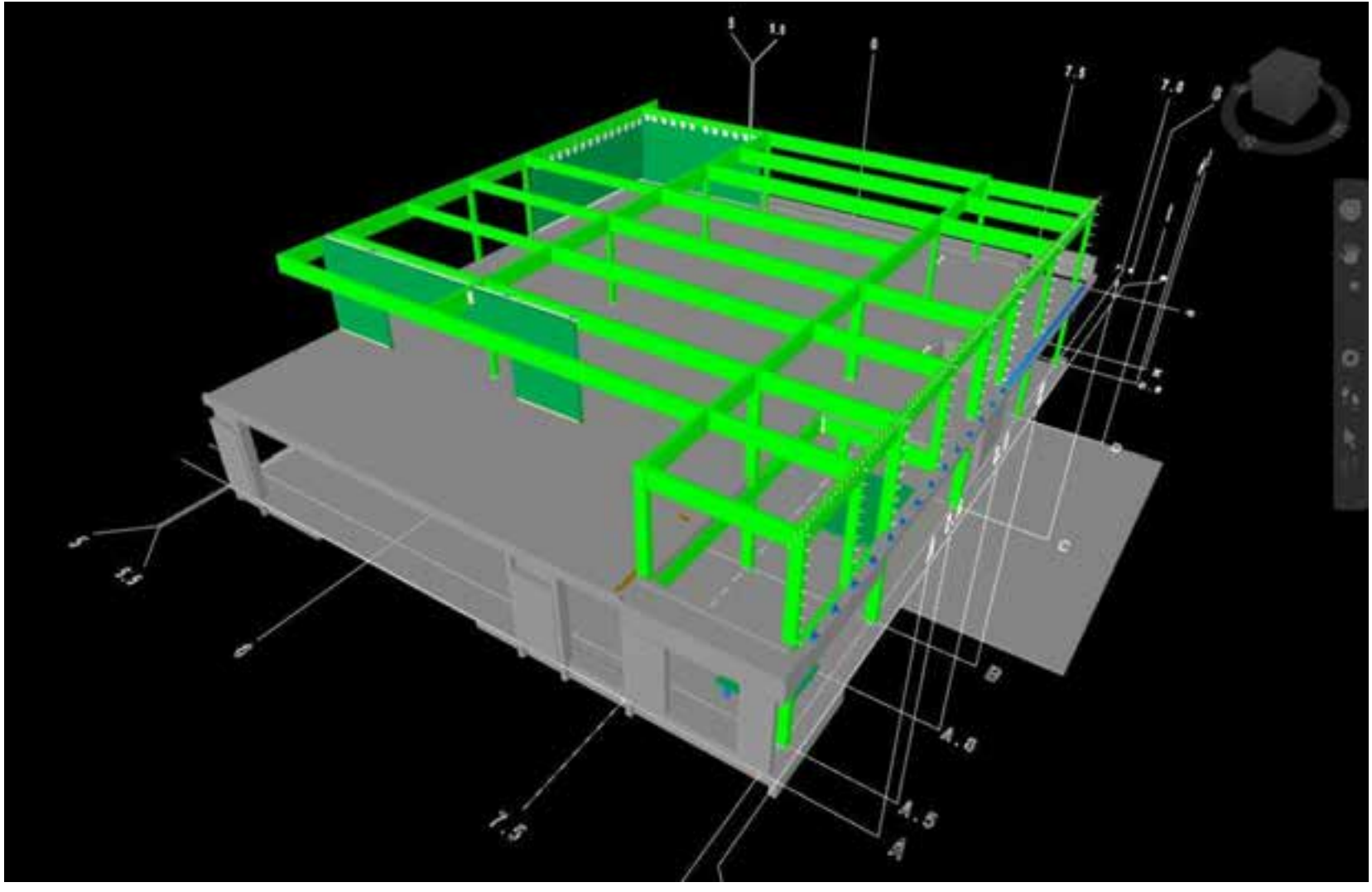
7.5
A.5
A
B
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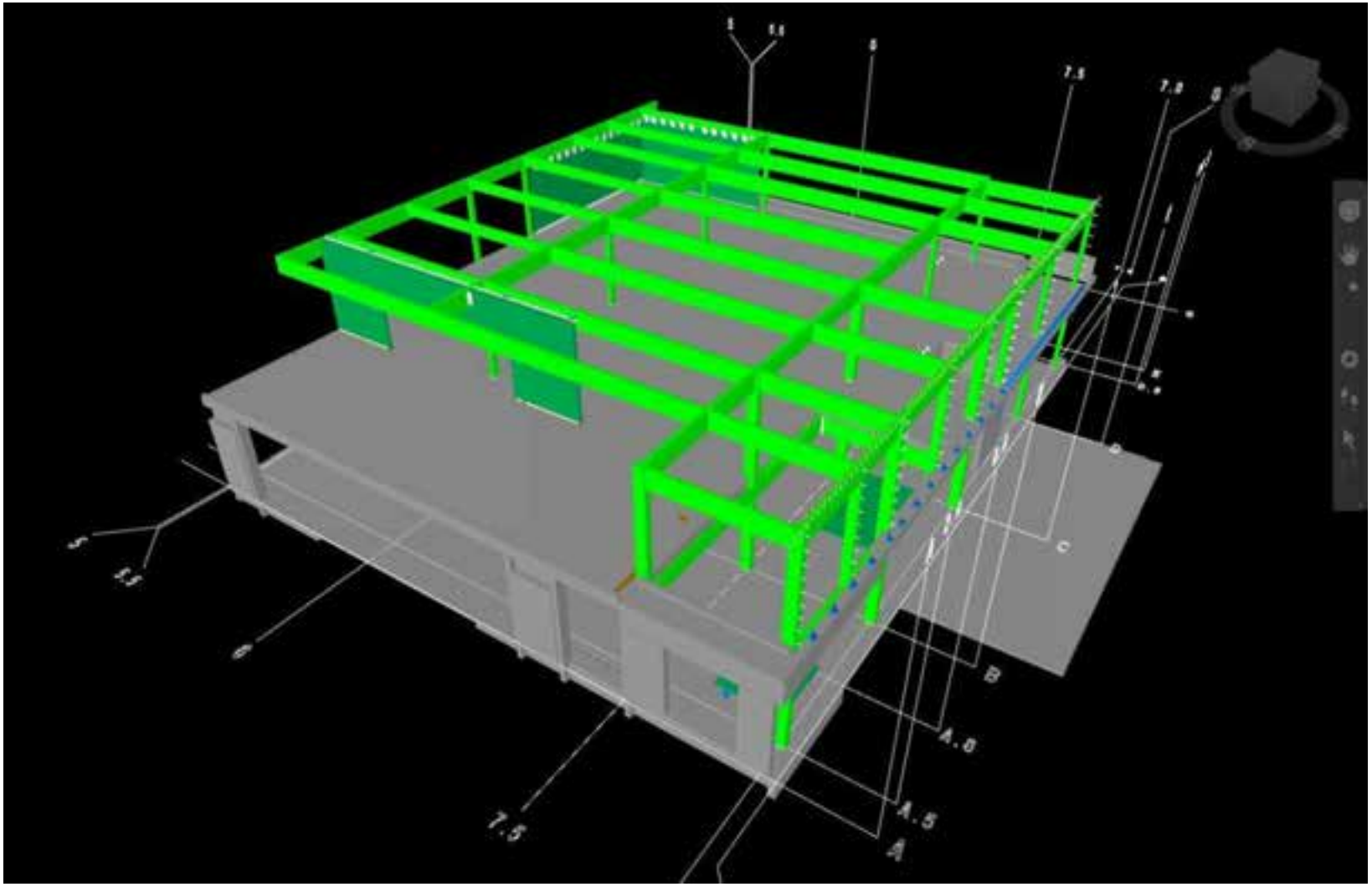
7.5
7.5
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C
B
A.5
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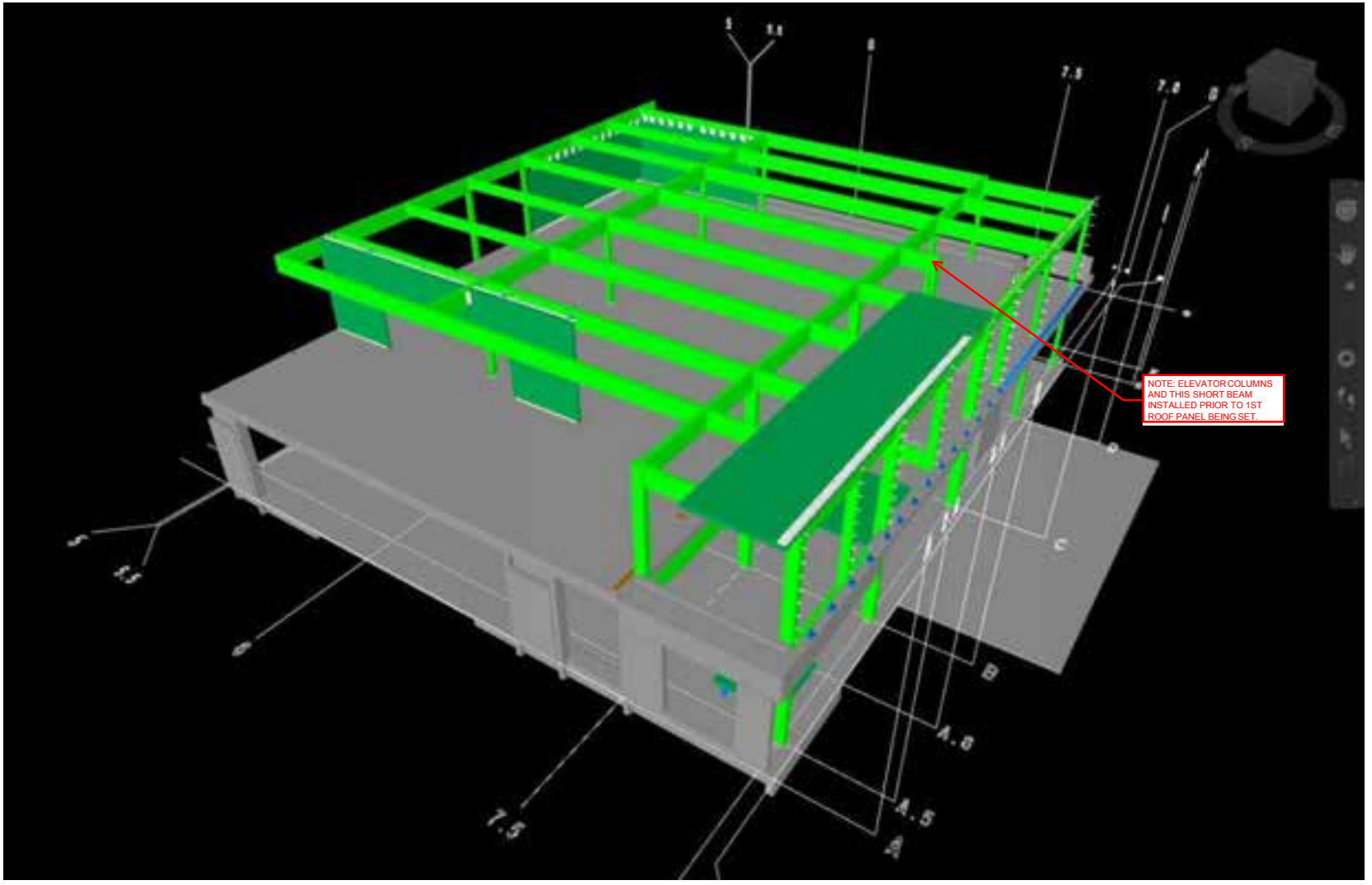
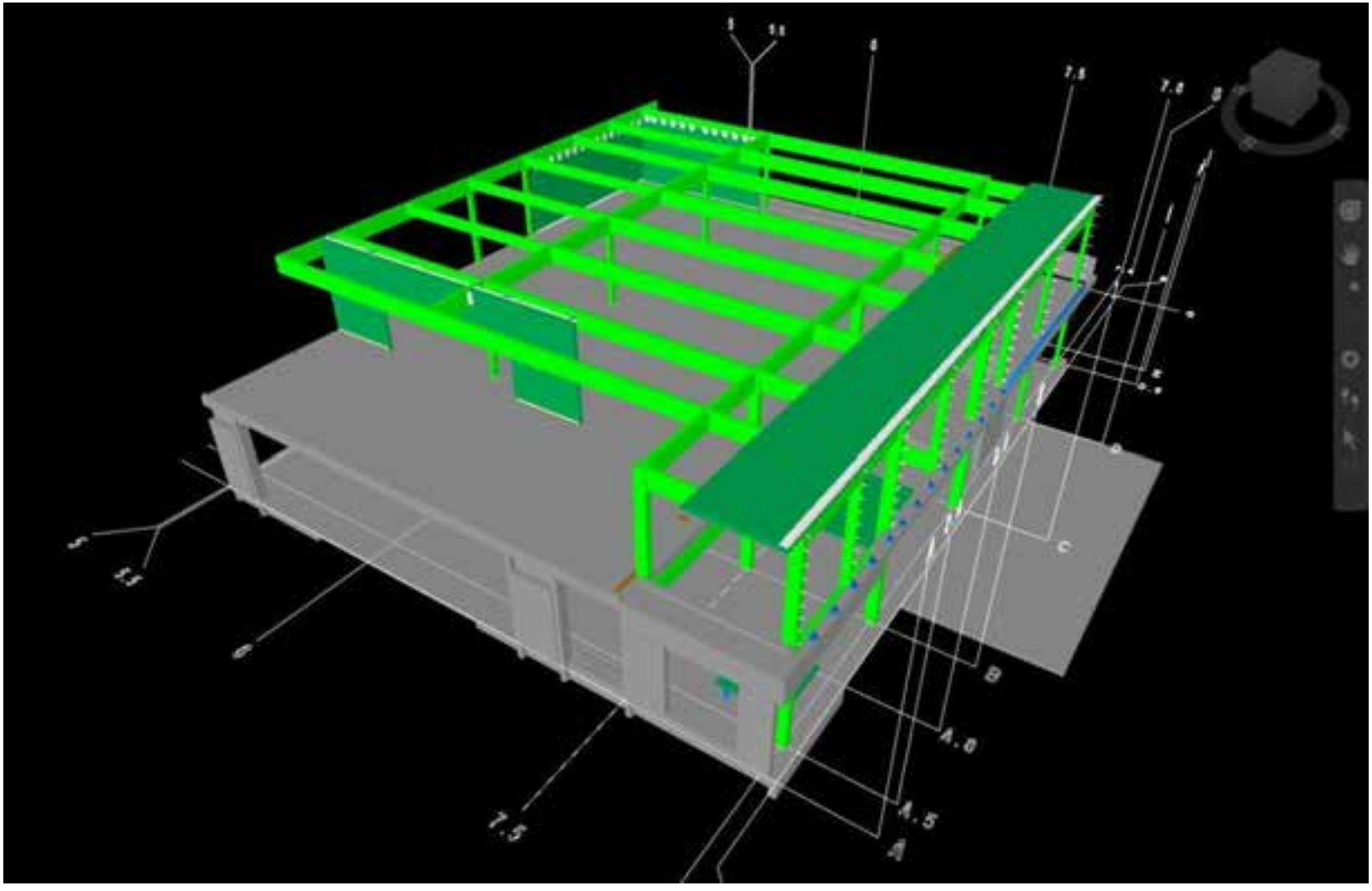
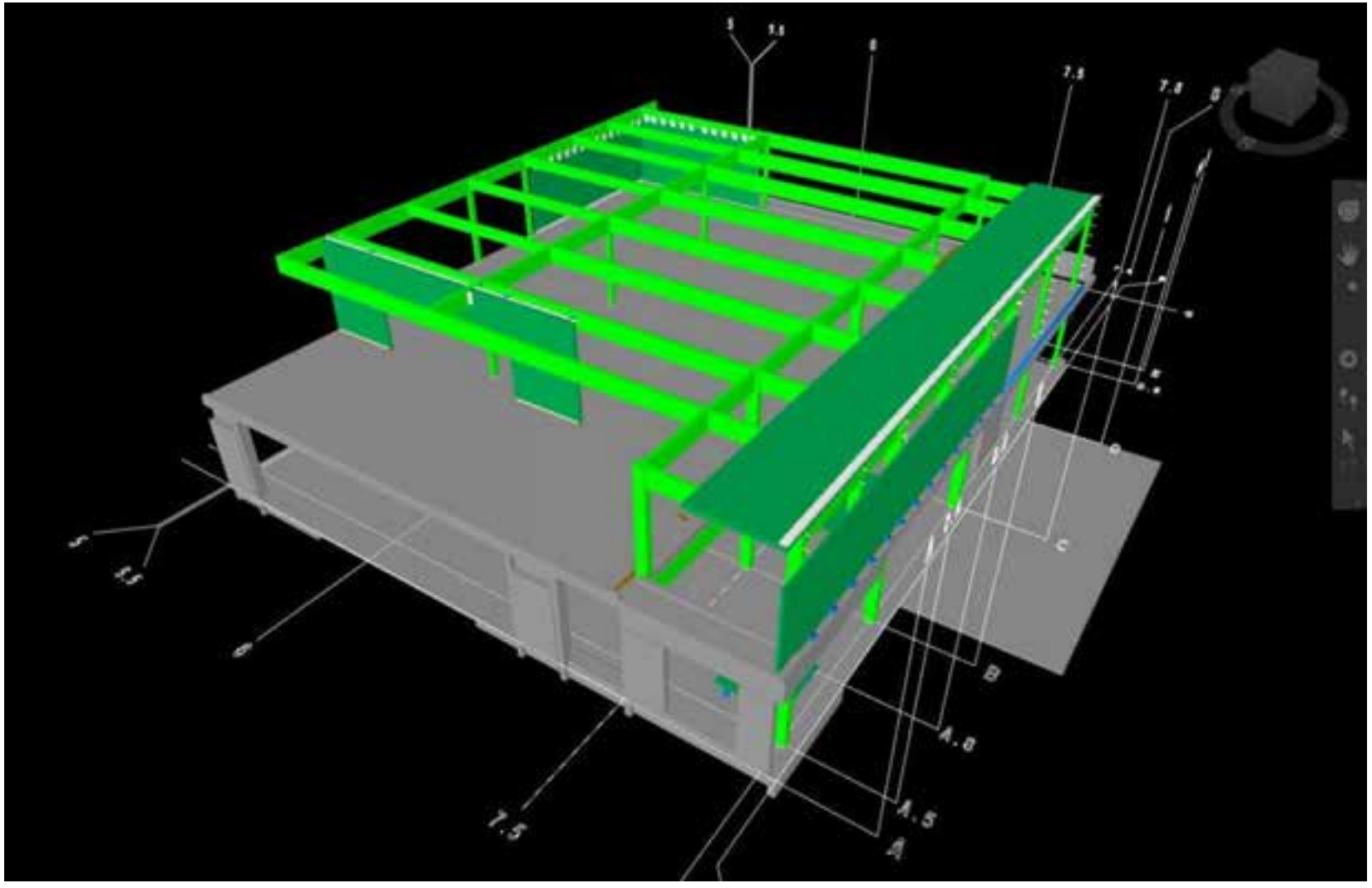
7.5


NOTE: ELEVATOR COLUMNS AND THIS SHORT BEAM INSTALLED PRIOR TO 1ST ROOF PANEL BEING SET.


11
7.5
7.5
B
C
B
A.6
A.5
A
7.5


7.5
7.5
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C
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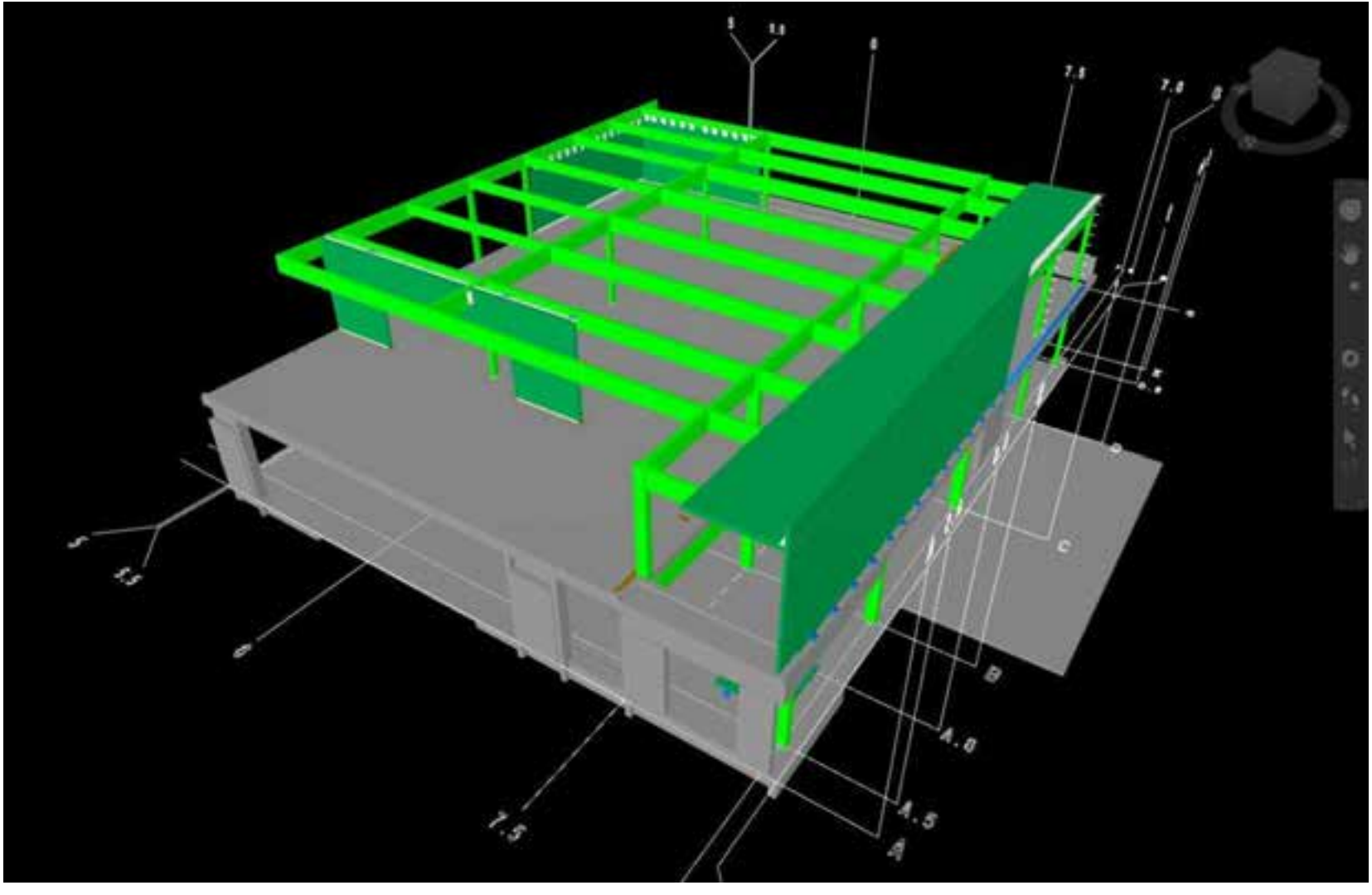
7.5


7.5
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B
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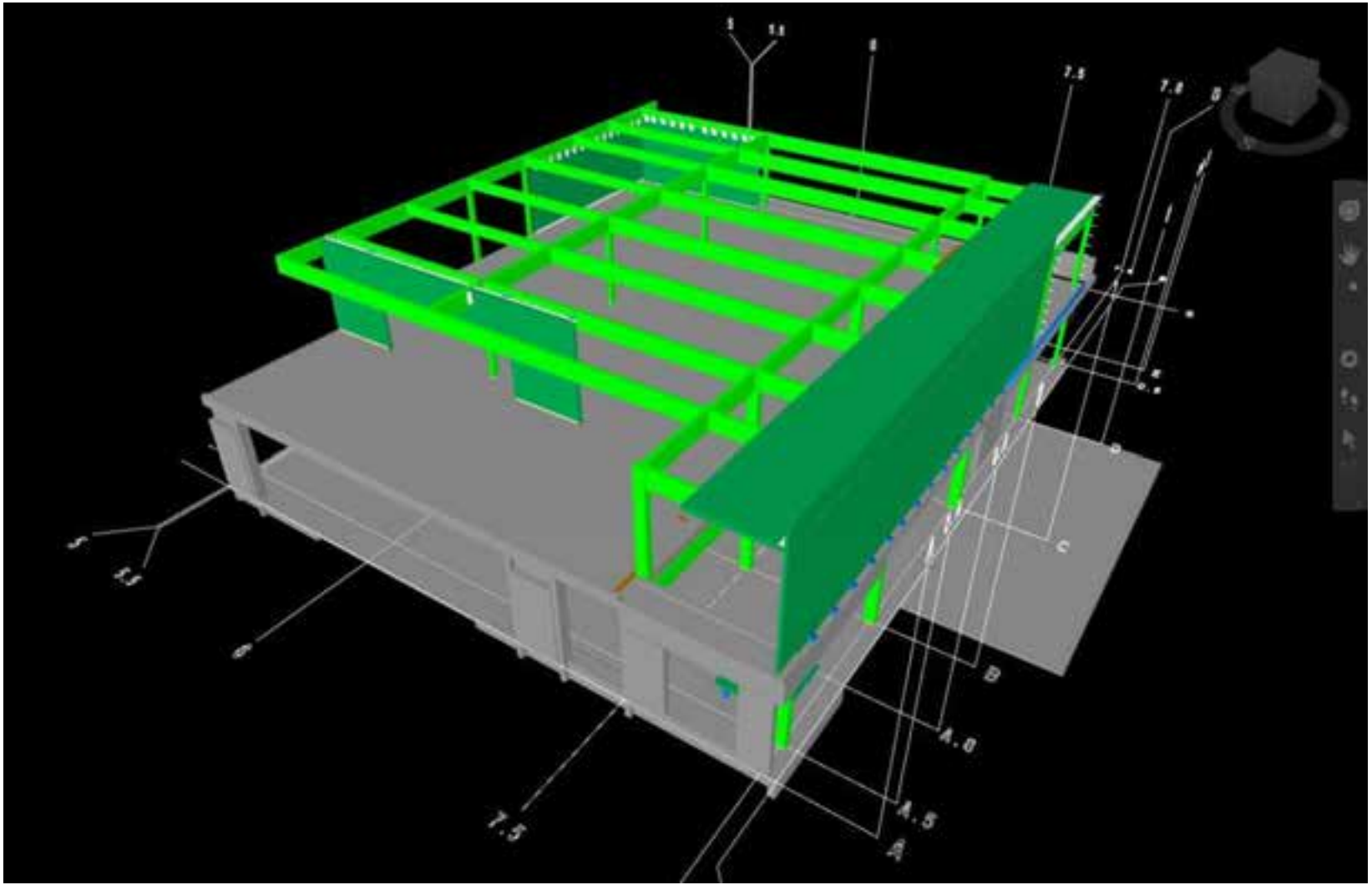
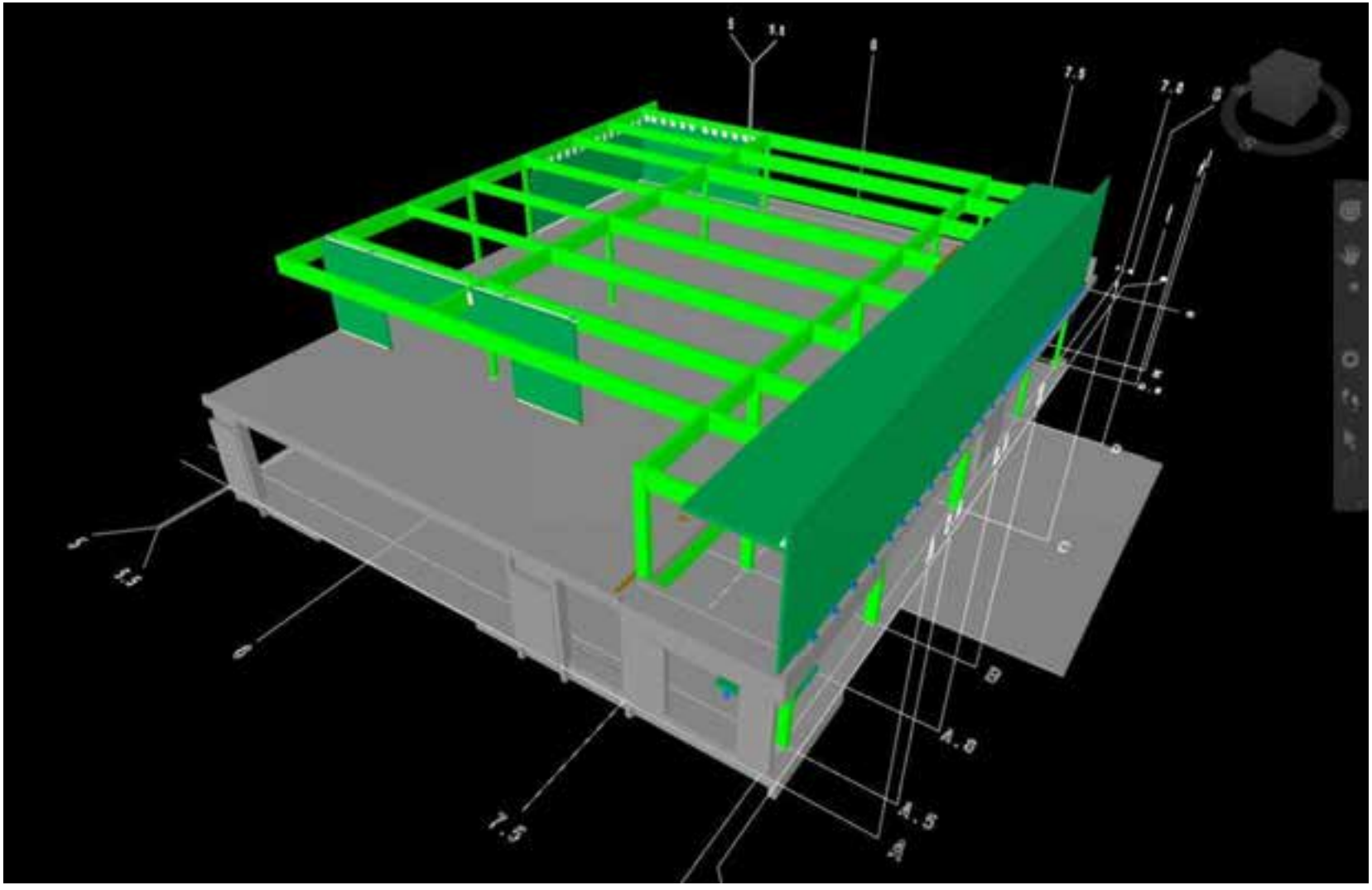
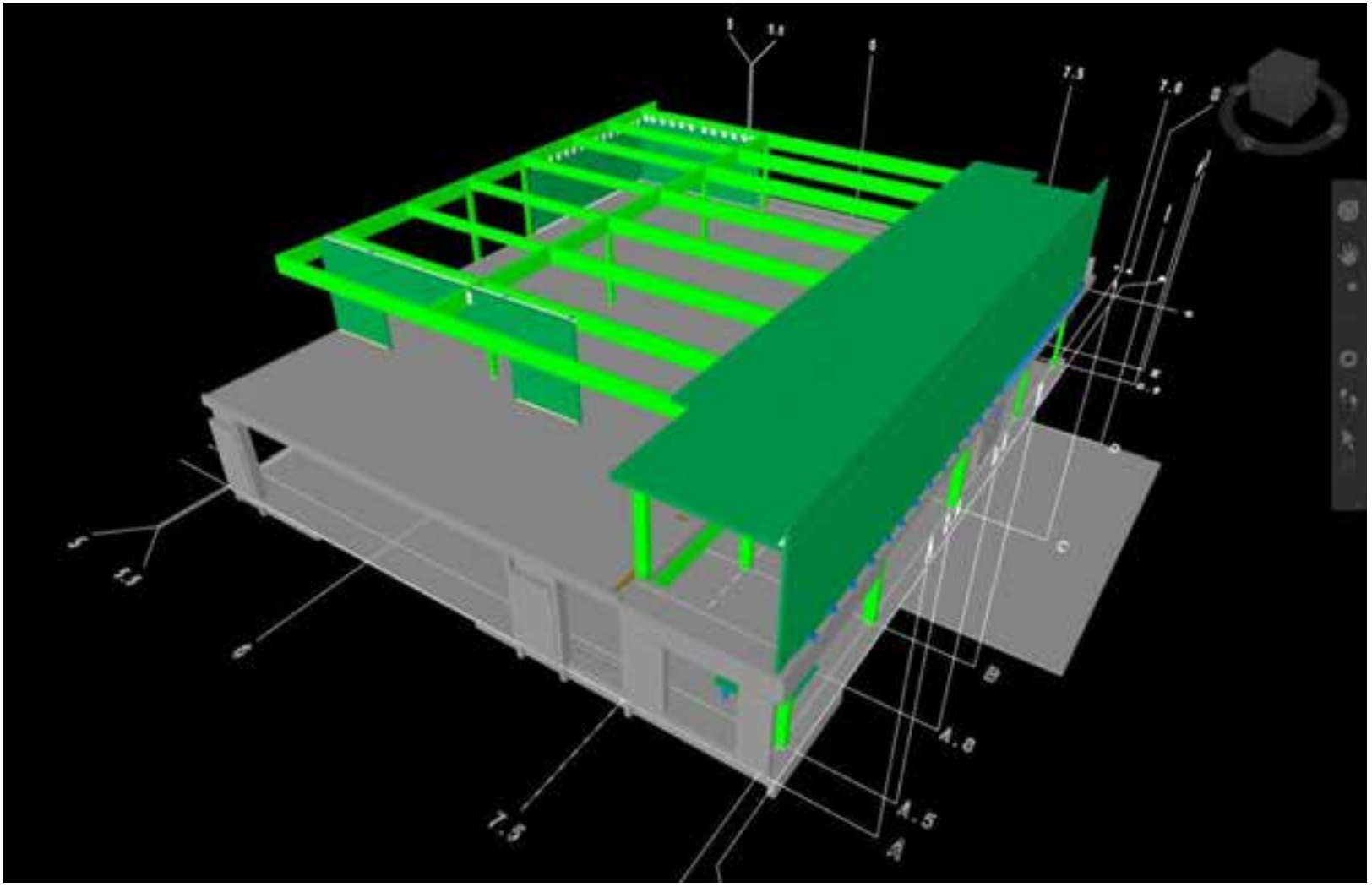

7.5
7.5
B
C
B
A.5
A
7.5


7.5
7.5
B
B
A.5
A
7.5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A.5
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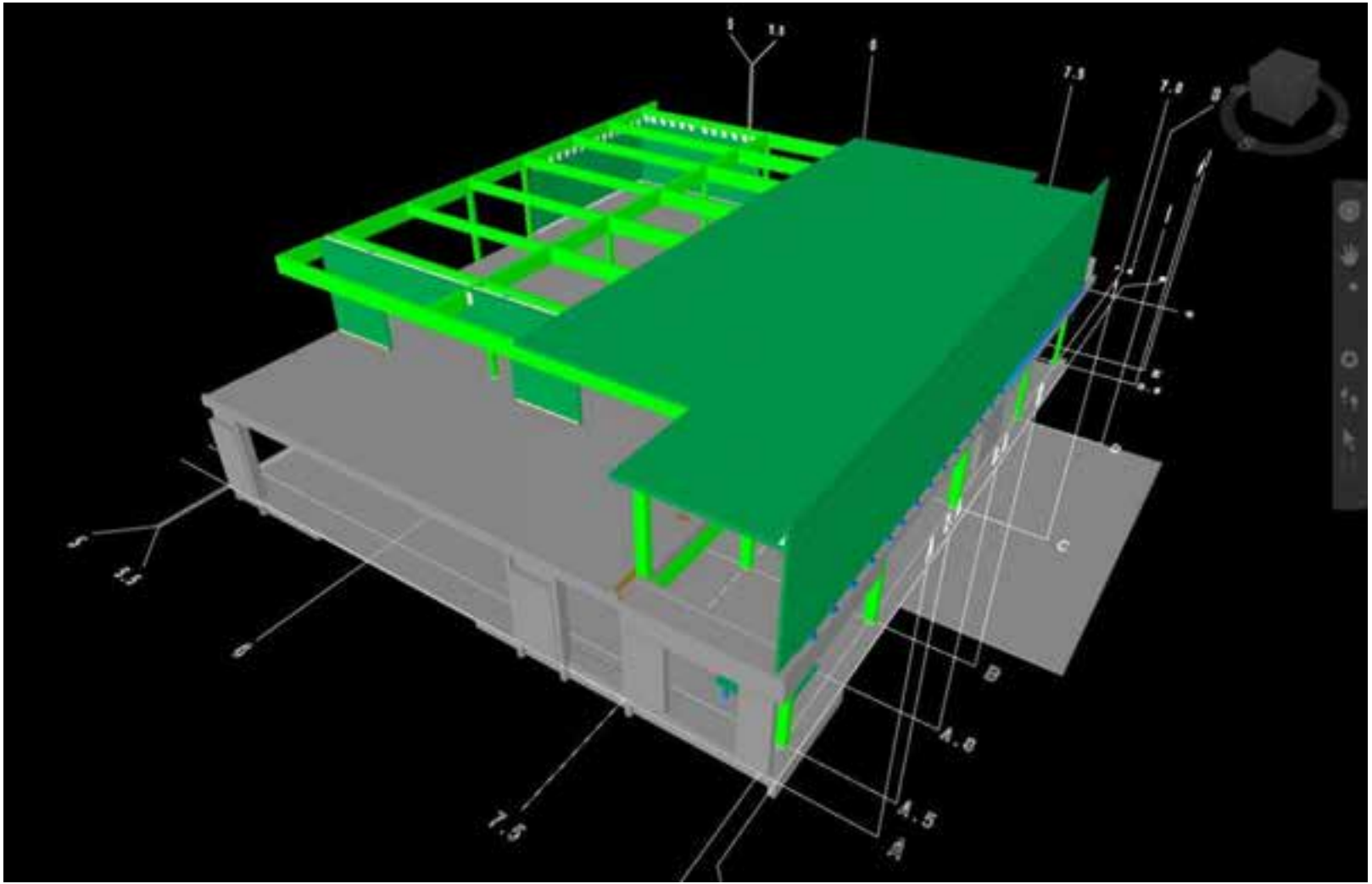
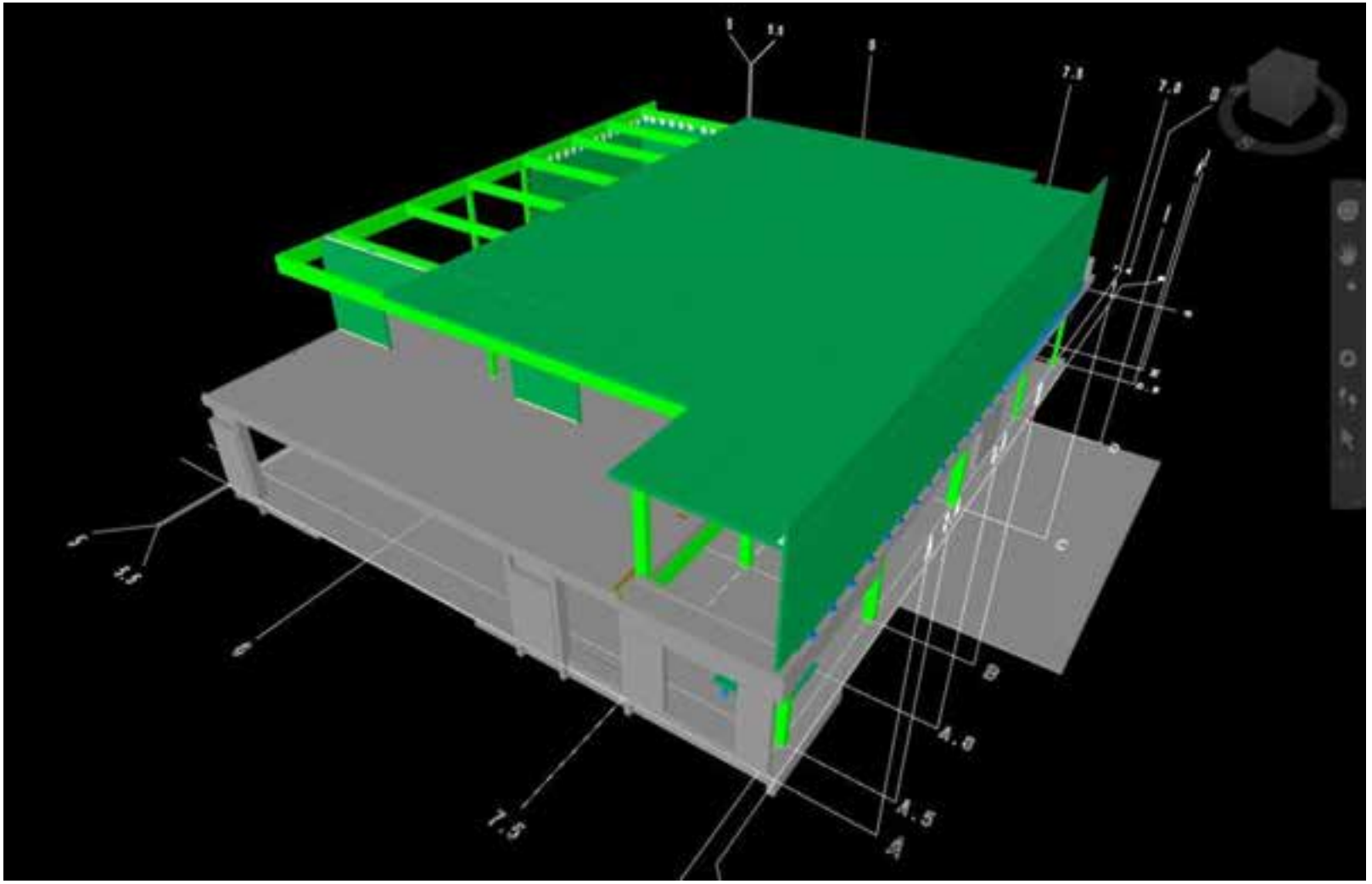
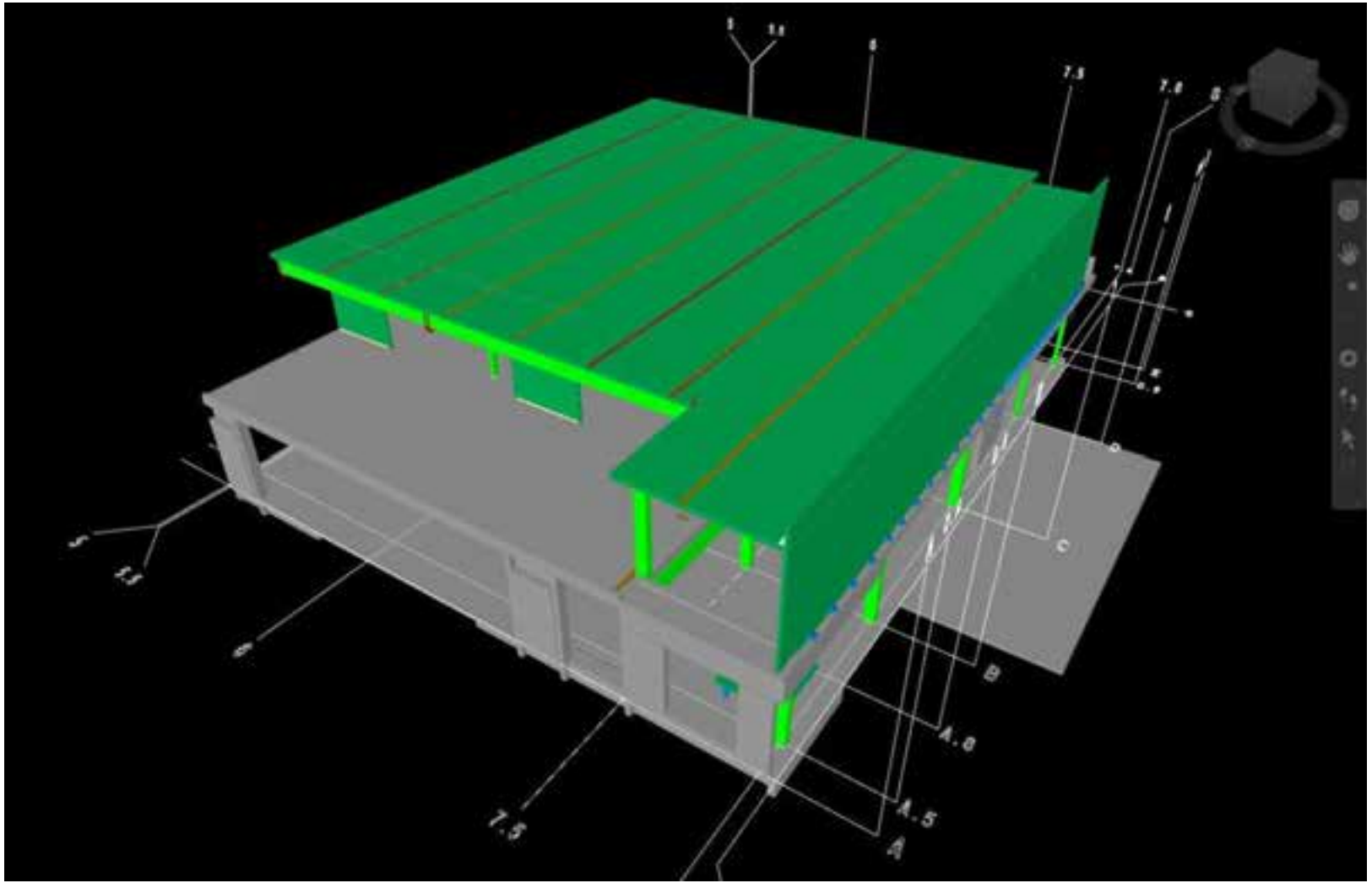
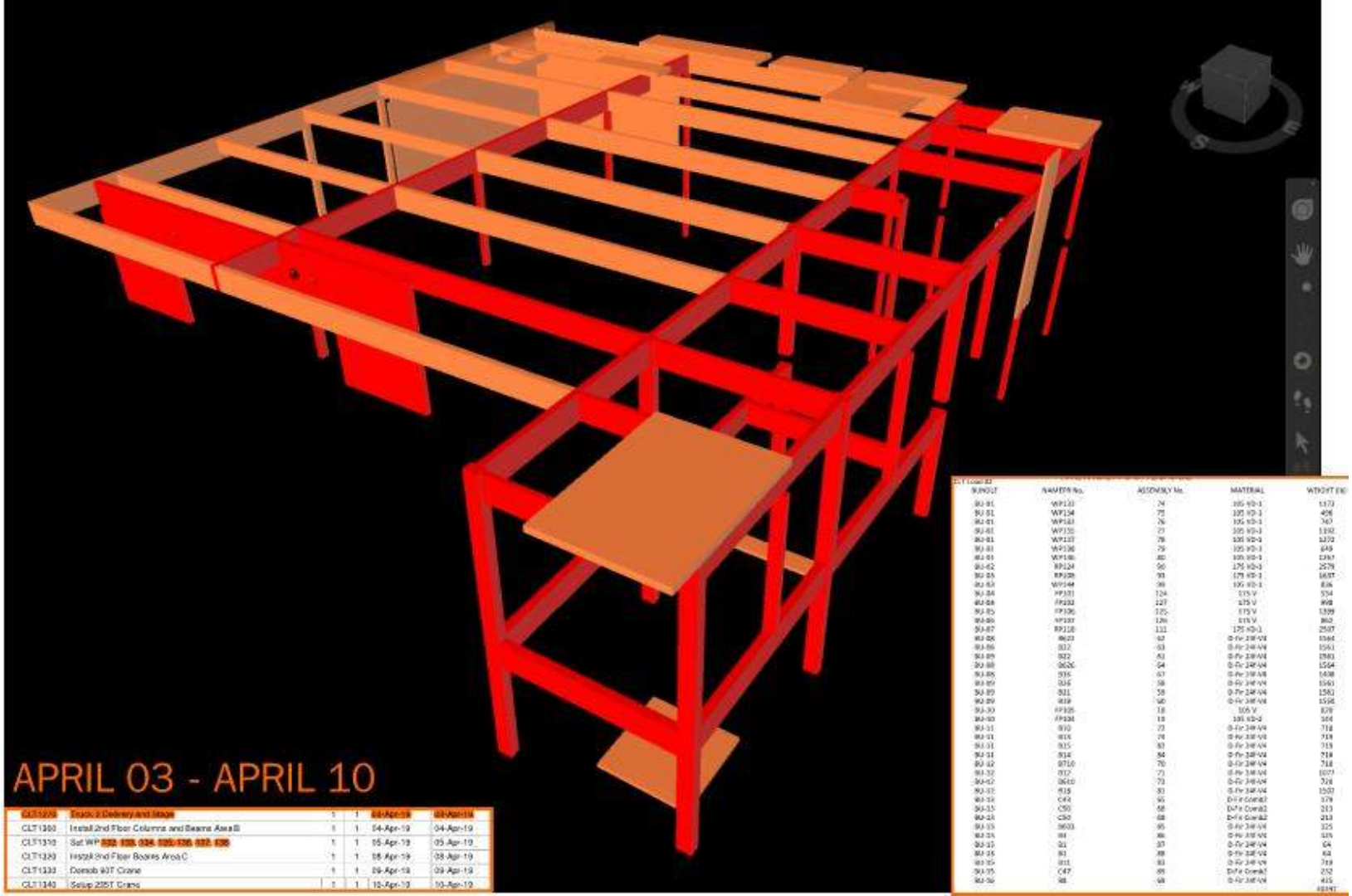
7.5


11
7.5
7.0
B
C
B
A.6
A.5
A
7.5


7.5
A.5
A
B

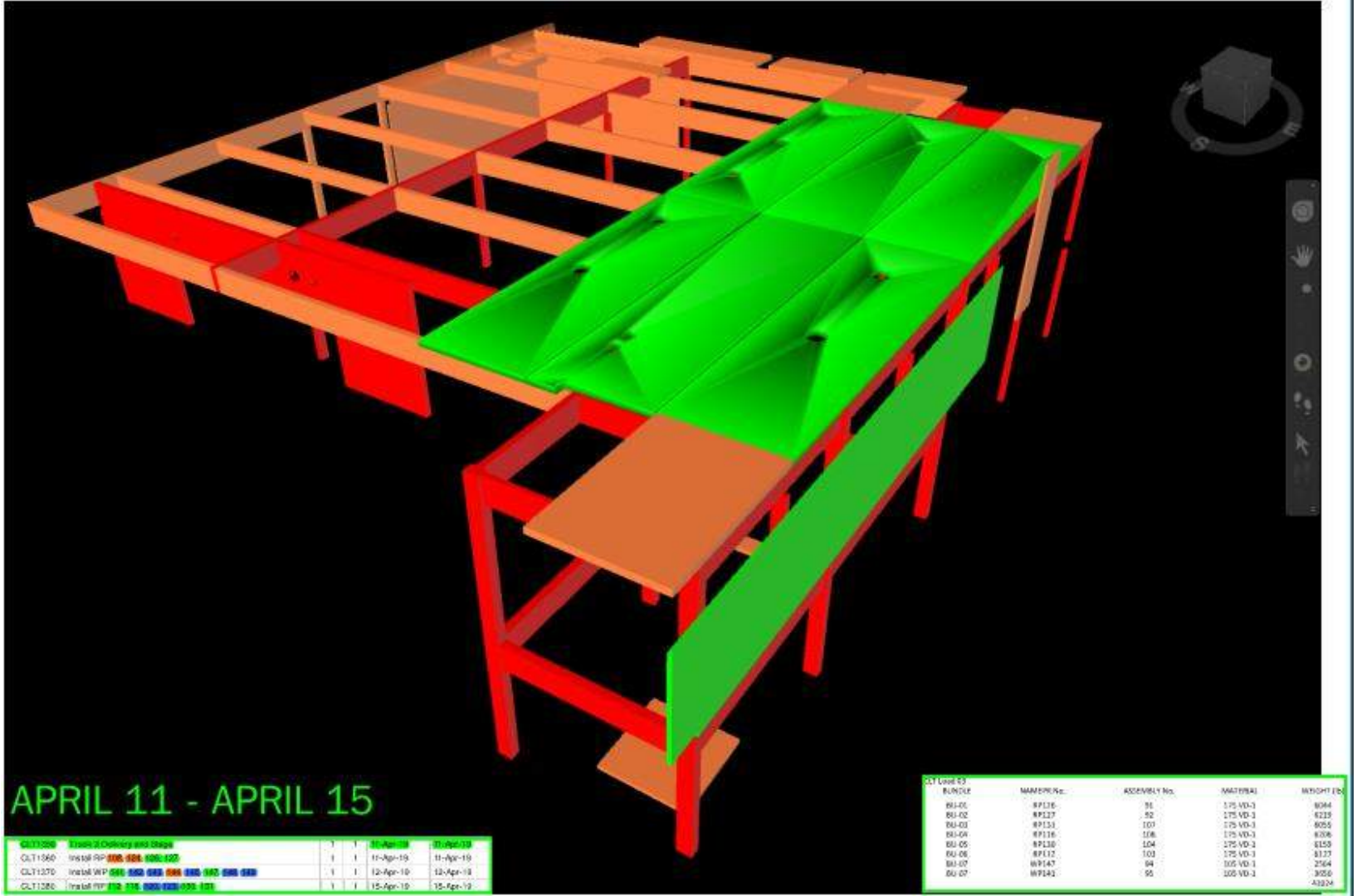

7.5
7.5
A.6
A.5
A
B
C

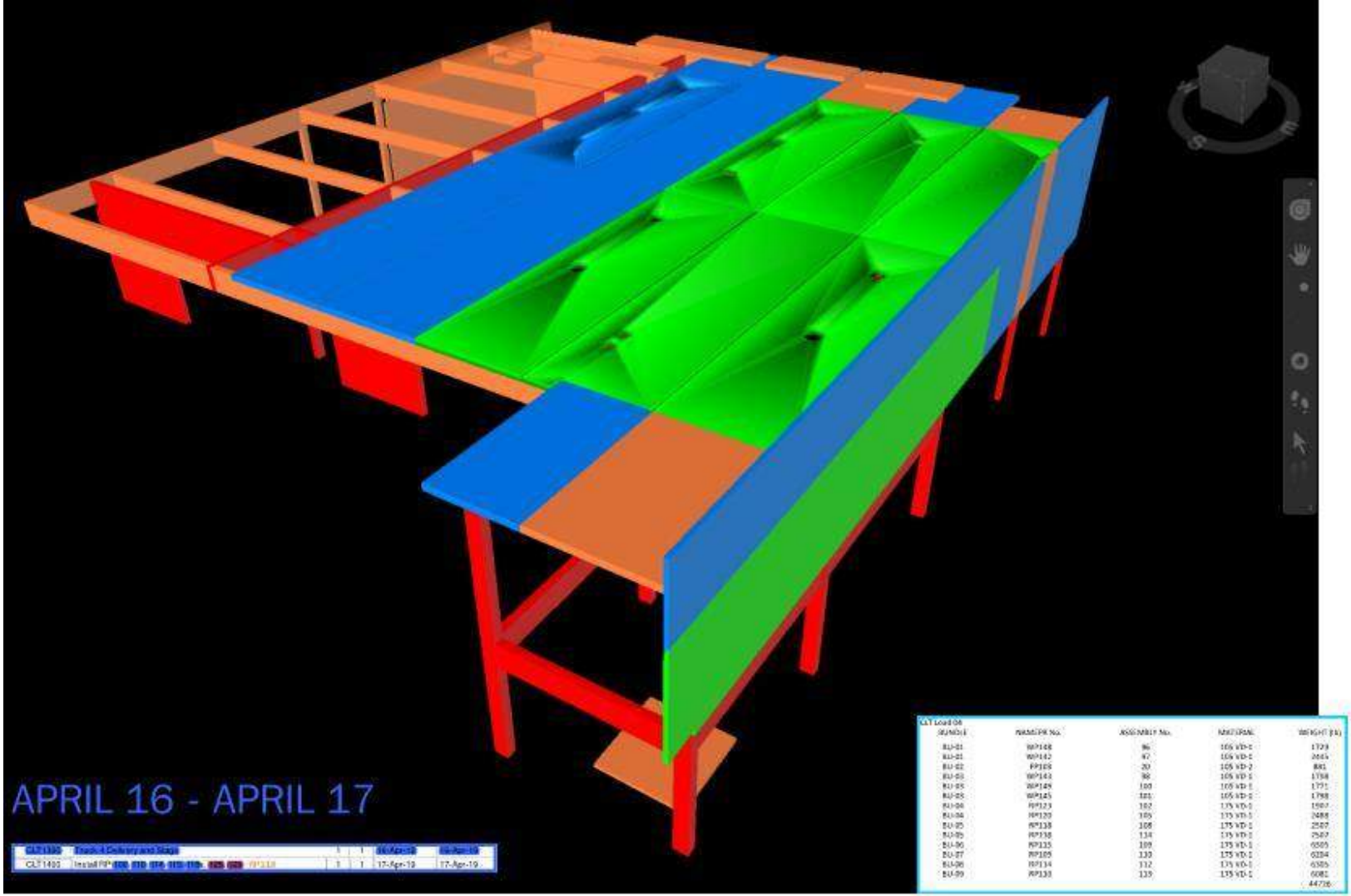
CLT1250	Setup WT Crane	1	1	26-Mar-19*	26-Mar-19
[redacted]	[redacted]	1	1	[redacted]	[redacted]
CLT1260	Erect 1st Floor Columns and Beams	2	2	28-Mar-19	29-Mar-19
CLT1240	Erect 2nd Floor Columns and Beams Area A	1	1	01-Apr-19	01-Apr-19
CLT1290	Set WP [redacted]	1	1	02-Apr-19	02-Apr-19

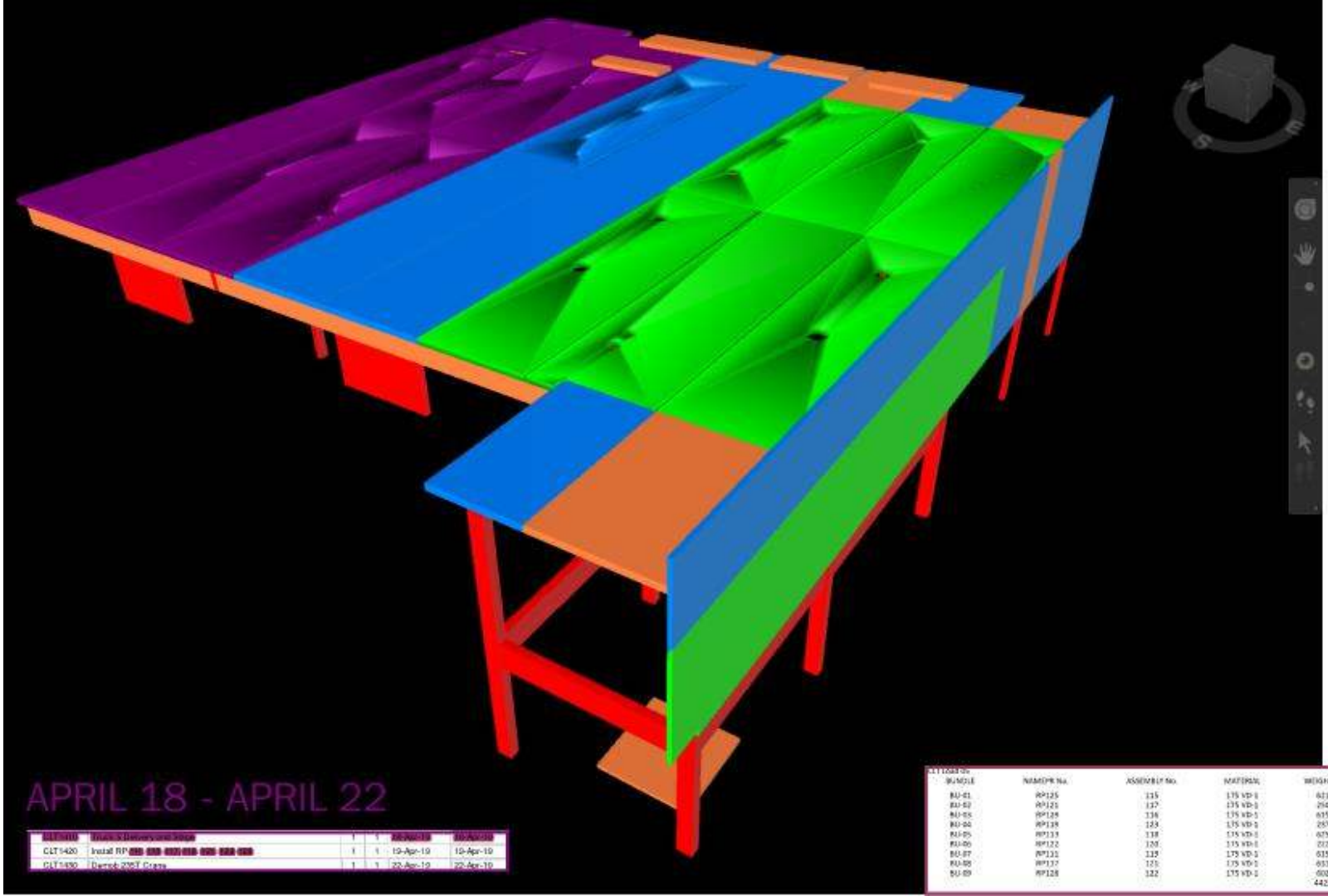


CLT1299	Truck 3 Delivery and Stage	1	1	03-Apr-19	03-Apr-19
CLT1300	Install 2nd Floor Columns and Beams Area B	1	1	04-Apr-19	04-Apr-19
CLT1310	Set WP 132 133 134 135 136 137 138	1	1	05-Apr-19	05-Apr-19
CLT1320	Install 2nd Floor Beams Area C	1	1	08-Apr-19	08-Apr-19
CLT1330	Demob 90T Crane	1	1	09-Apr-19	09-Apr-19
CLT1340	Setup 225T Crane	1	1	10-Apr-19	10-Apr-19

SUBSET	NAMEPP No.	ASSEMBLY No.	MATERIAL	WEIGHT EA
SU-01	WP133	74	105 YD-1	1173
SU-01	WP134	75	105 YD-1	406
SU-01	WP161	76	105 YD-1	747
SU-01	WP132	77	105 YD-1	1192
SU-01	WP137	78	105 YD-1	1272
SU-01	WP138	79	105 YD-1	649
SU-01	WP136	80	105 YD-1	1267
SU-02	RP124	90	175 YD-1	2578
SU-05	RP109	93	175 YD-1	1637
SU-03	WP144	99	105 YD-1	836
SU-04	FP101	124	175 V	554
SU-04	FP102	127	175 V	958
SU-05	FP106	125	175 V	1399
SU-06	FP107	126	175 V	862
SU-07	RP118	131	175 YD-1	2597
SU-08	B623	47	D-Fir 24F-V4	1564
SU-08	B12	53	D-Fir 24F-V4	1561
SU-09	B22	51	D-Fir 24F-V4	1561
SU-08	B626	54	D-Fir 24F-V4	1564
SU-08	B35	57	D-Fir 24F-V4	1438
SU-09	B26	58	D-Fir 24F-V4	1561
SU-09	B21	59	D-Fir 24F-V4	1561
SU-09	B19	60	D-Fir 24F-V4	1556
SU-10	FP105	18	105 V	879
SU-10	FP104	19	105 YD-1	564
SU-11	B10	73	D-Fir 24F-V4	718
SU-11	B15	74	D-Fir 24F-V4	718
SU-11	B25	83	D-Fir 24F-V4	719
SU-11	B14	84	D-Fir 24F-V4	718
SU-12	B710	70	D-Fir 24F-V4	718
SU-12	B12	71	D-Fir 24F-V4	1077
SU-12	B610	72	D-Fir 24F-V4	726
SU-13	B16	81	D-Fir 24F-V4	1503
SU-14	C44	91	D-Fir Comb2	179
SU-15	C50	68	D-Fir Comb2	213
SU-15	C50	68	D-Fir Comb2	213
SU-15	B603	85	D-Fir 24F-V4	325
SU-15	B1	86	D-Fir 24F-V4	325
SU-17	B1	87	D-Fir 24F-V4	64
SU-15	B1	88	D-Fir 24F-V4	64
SU-15	B11	83	D-Fir 24F-V4	719
SU-15	C47	89	D-Fir Comb2	252
SU-16	B8	69	D-Fir 24F-V4	415


APRIL 11 - APRIL 15


APRIL 16 - APRIL 17


APRIL 18 - APRIL 22

New DPR Sacramento Office

Mass Timber Logistics

Final Product

Let’s discuss form, function, and sustainability

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

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