

McEvoy & Dupont Apartments, San Jose, CA: Steel BRB Lateral System

Lisa Podesto

*Senior Business Development Manager,
Design-Build Americas, Lendlease*



**CTBUH 2022
Steel-Timber Conference**

McEvoy and Dupont Design Case Study

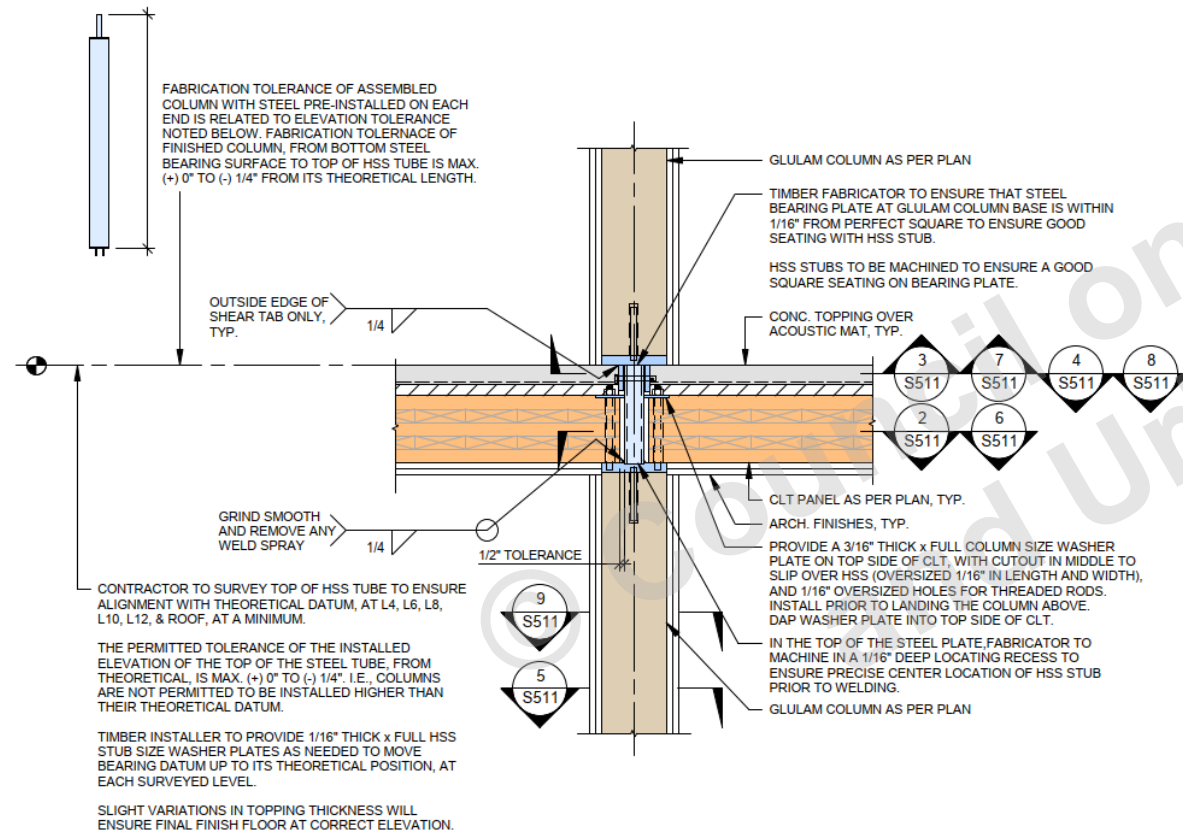


McEvoy & Dupont Overview

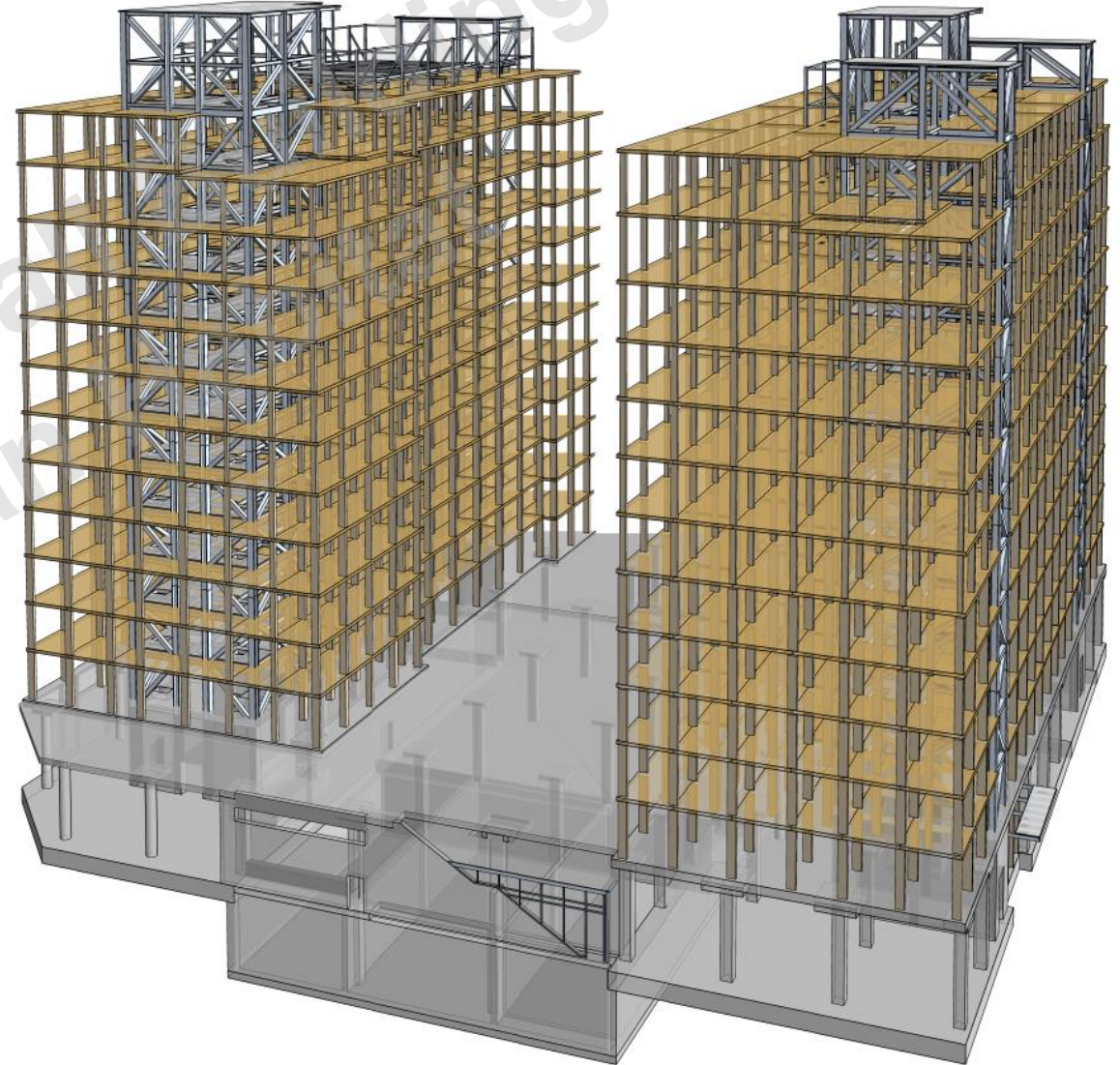
- San Jose, California, United States
- 365 Affordable Housing units
- 2 towers over a podium
- 12 stories of Type IVB over a 1 story Type IA
- Total Area ~300,000sf
- Parking: 92 car, 16 motorcycle, 457 bicycle
- ~17,500sf of amenity (incl. office, laundry and common areas, Urban Farm)
- LEED Platinum



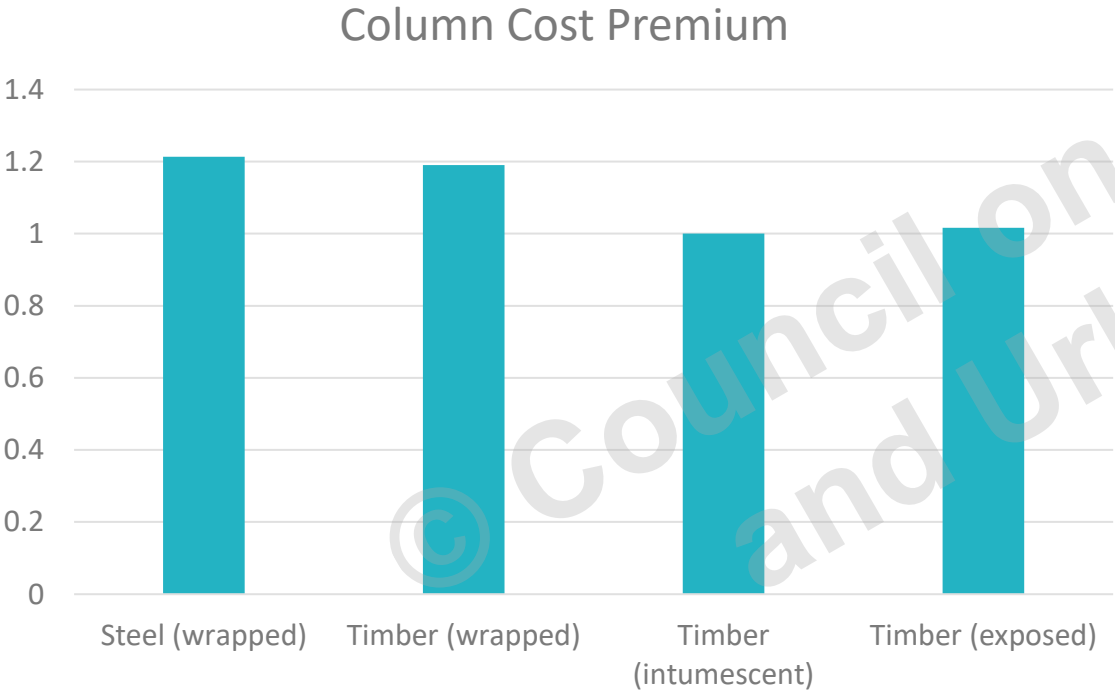
Structural Approach



1 TYPICAL TIMBER COLUMN TO CLT SLAB
SA204 1" = 1'-0"
(WC1 TO WC1, WC2 TO WC2)

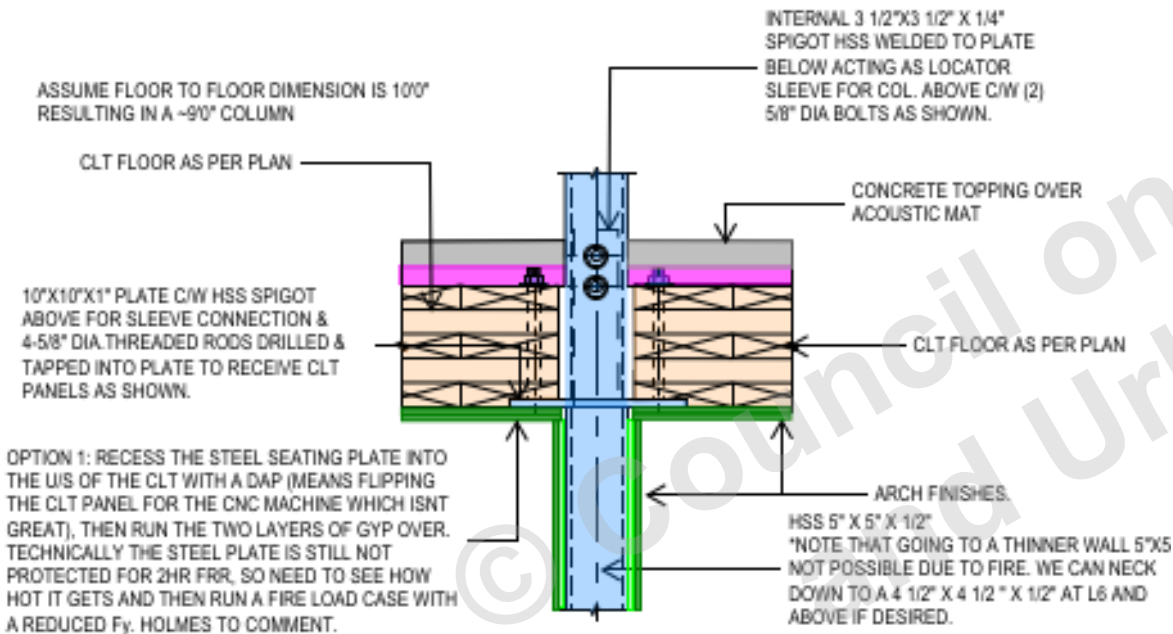


Timber vs. Steel Columns

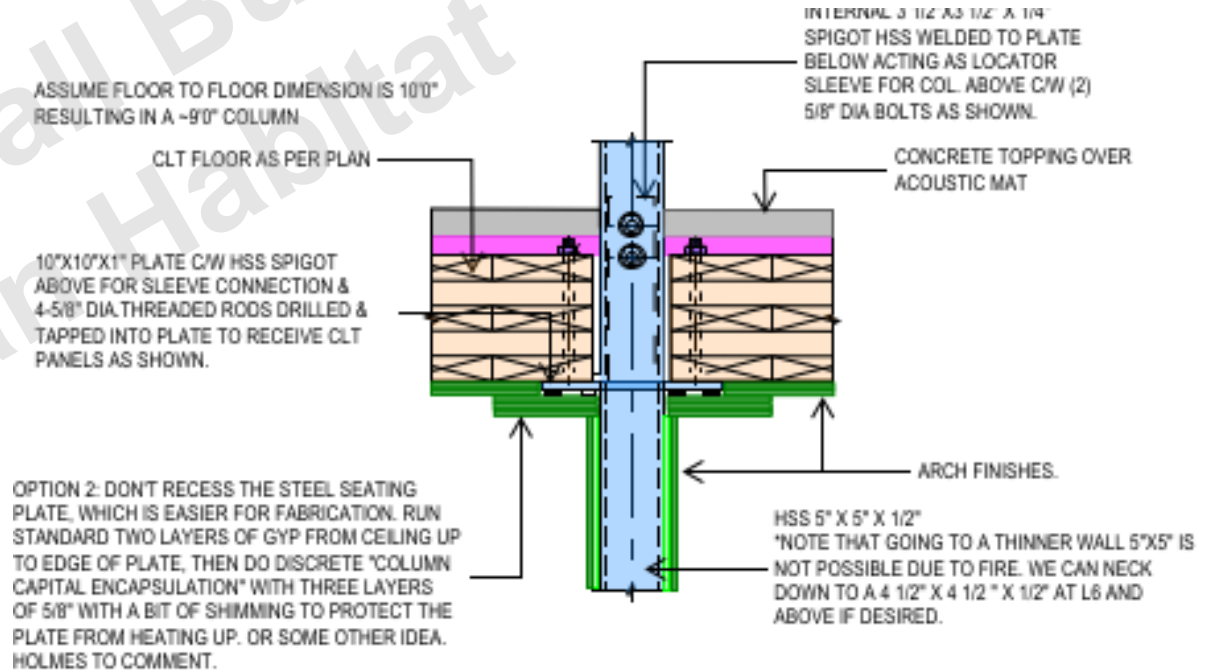


	Steel	Timber
Architectural Opportunities	Smaller columns, more usable floor space and hence better unit flexibility	Opportunity for timber exposure, aesthetics.
Construction	Slightly lighter in weight, need crane and separate trade installation.	Wouldn't require two trades to complete vertical structure erection
Detailing Complexities	Non flush column head detail for fire rating steel connection	Need added space for acoustic attenuation at demising walls
Other		Improved carbon footprint

Passive Fire Protection



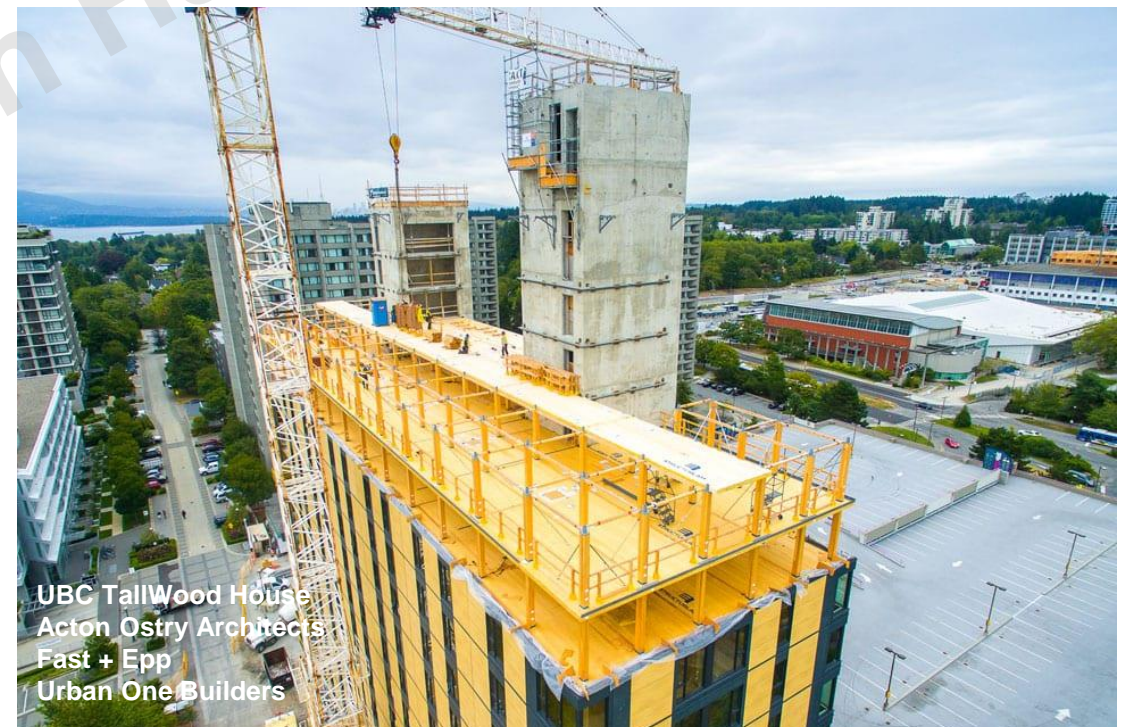
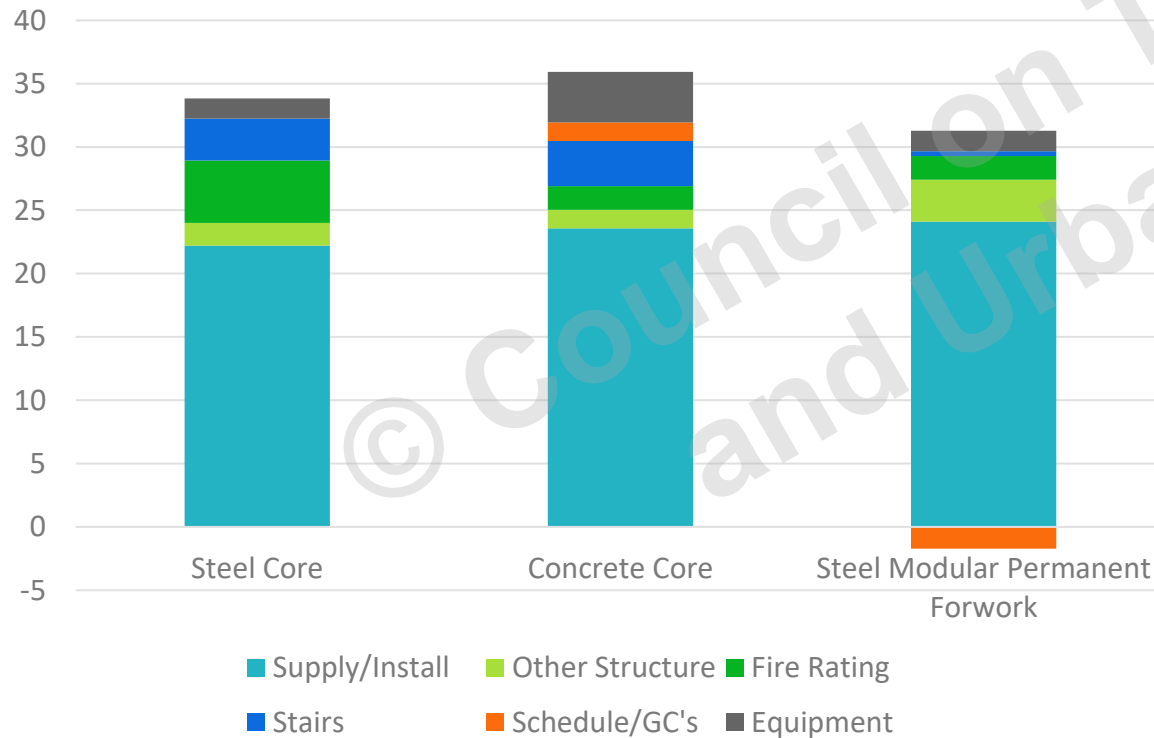
1 DETAIL: TYPICAL STEEL COLUMN TO CLT SLAB - ENCAPSULATION OPTION 1



2 DETAIL: TYPICAL STEEL COLUMN TO CLT SLAB - ENCAPSULATION OPTION 2

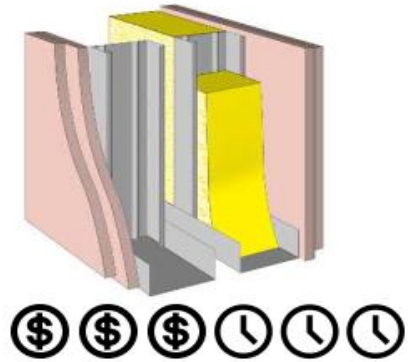
Steel vs. Concrete Lateral Core

Lateral Core Cost Comparison



Passive Fire Protection

Hidden BRB (in walls)



OR



STEEL PLATE TO SUPPORT SHAFT WALL ASSEMBLY, BELOW

TYPICAL WALL ASSEMBLY, SEE SHEET A007

STEEL COLUMN, SEE STRUC.

08 71 00 - 2-HR. SPRAY APPLIED FIRE PROTECTION

STEEL CROSS BRACING, SEE STRUC.

PROVIDE LT. GA. FRAMING AS NEC. FOR FRAMING AT COLUMN, AND BLOCKING

07 84 00 - CONT. FIRE STOPPING

STAIR LANDING EXTENDS TO STEEL C.L.

2-HR. SHAFT WALL ASSEMBLY, SEE SHEET A007

TWO (2) LAYERS OF GYP. BD. TO CONTINUE AT COLUMN LOCATION

2-HR. SHAFT WALL ASSEMBLY, SEE SHEET A007

2
A842

PLAN DETAIL AT STAIR COLUMN

1 1/2" = 1'-0"

Optimization and Distribution

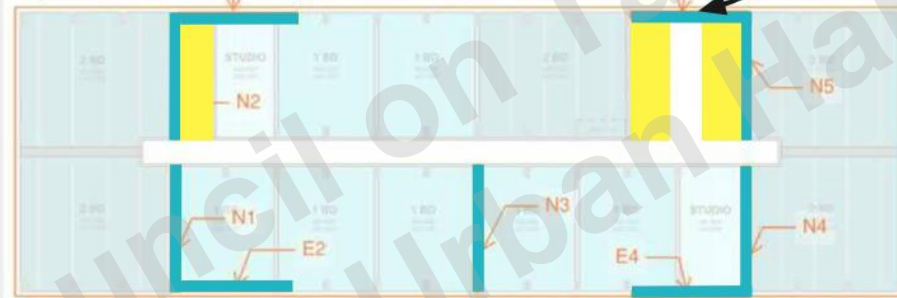
Optimising Material Usage Example

BRB Replacing Concrete Shear Walls/Cores Insitu



Steel Tonnage: 338 tons Braces per floor: 14

Optimised BRB Efficiency Location

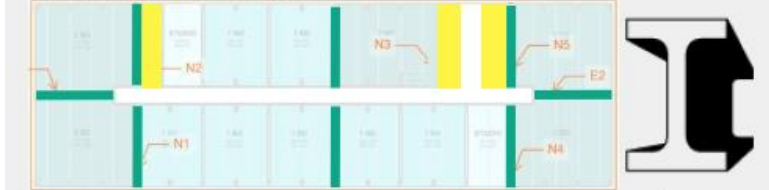


Steel Tonnage: 254 tons Braces per floor: 18

Element Sizing vs BRB Count Example

All three options have the same seismic performance.

Option A: 8 Locations



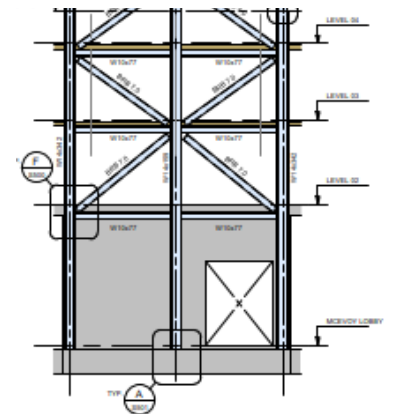
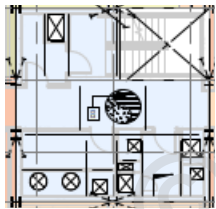
Option B: 14 Locations



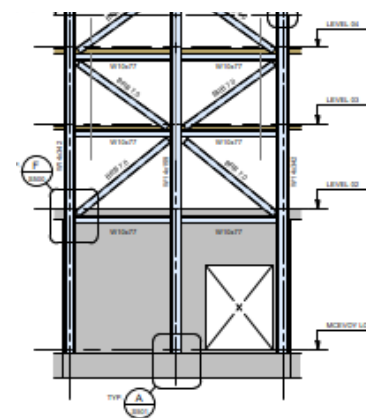
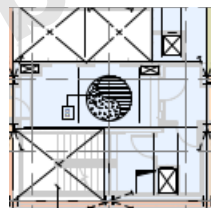
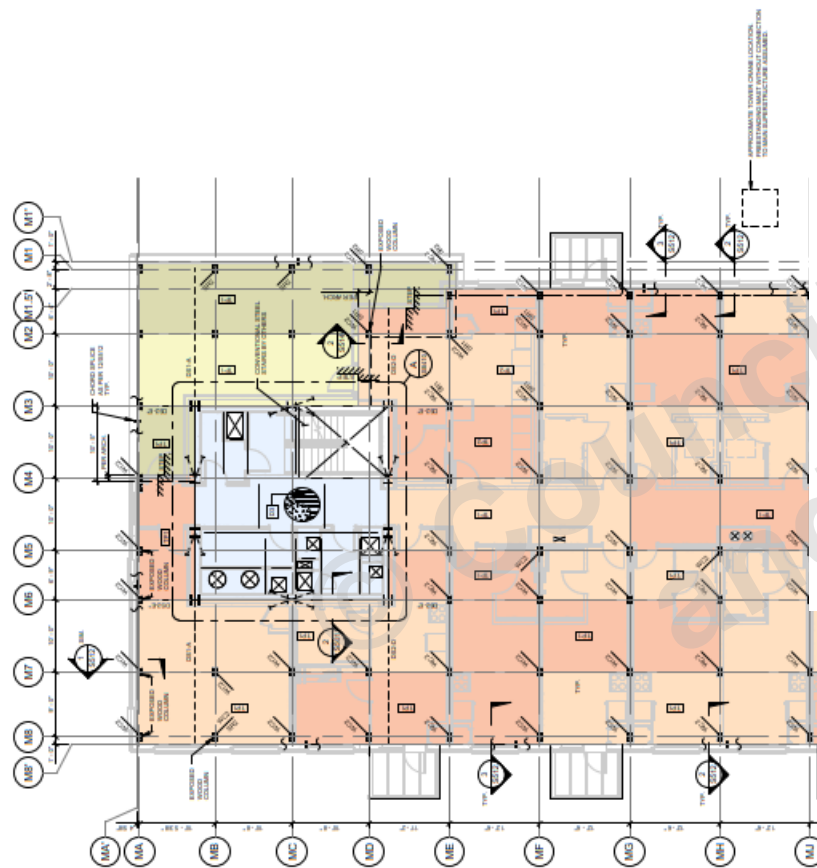
Option C: 19 Locations



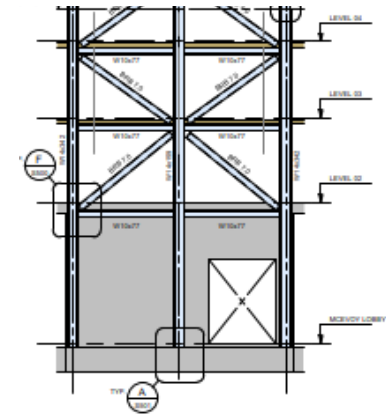
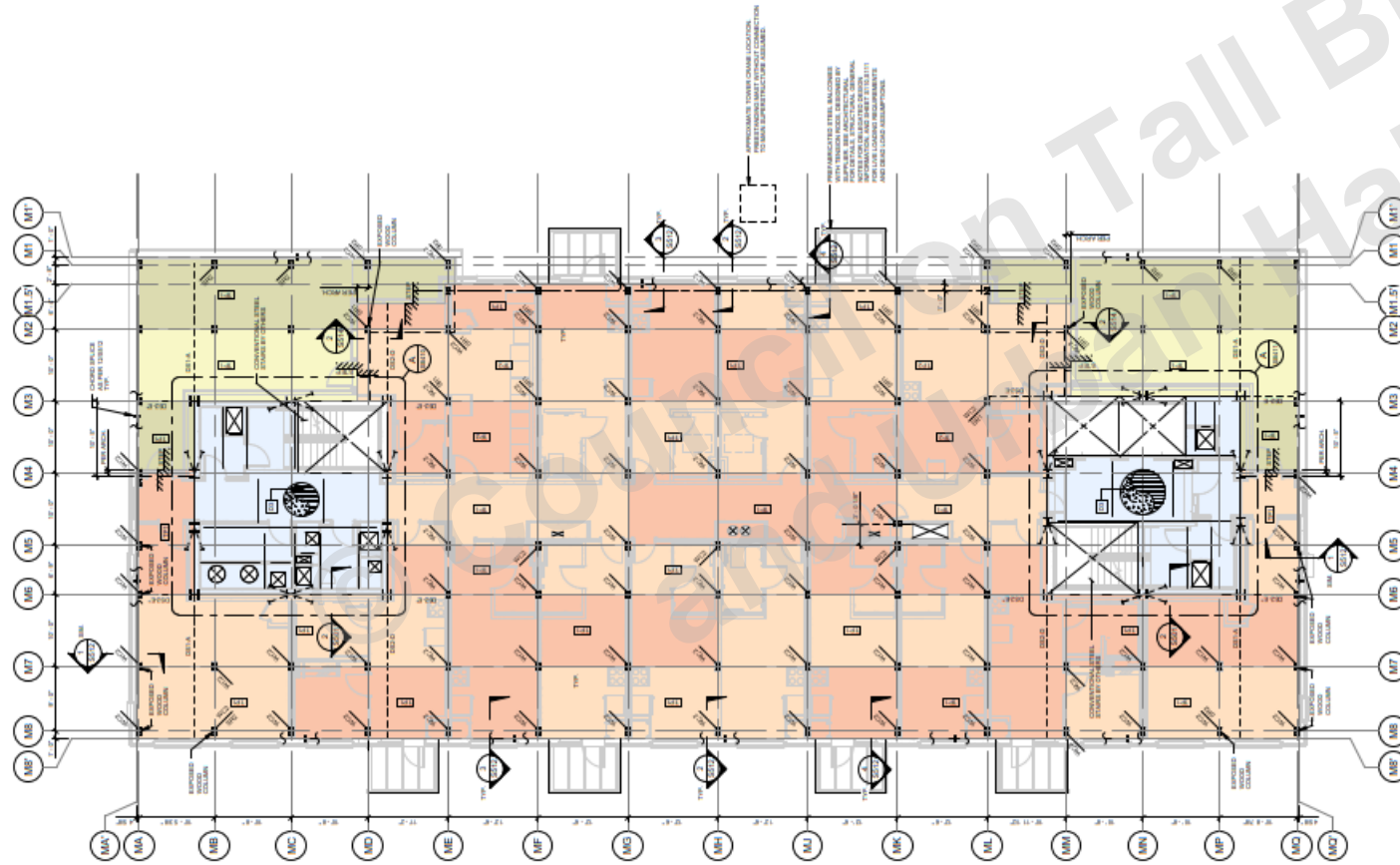
Sequencing



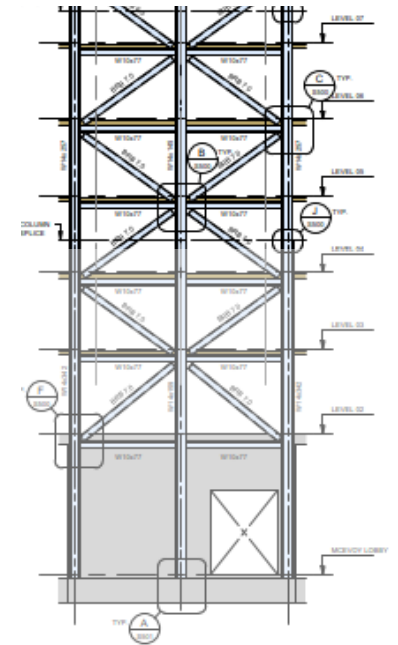
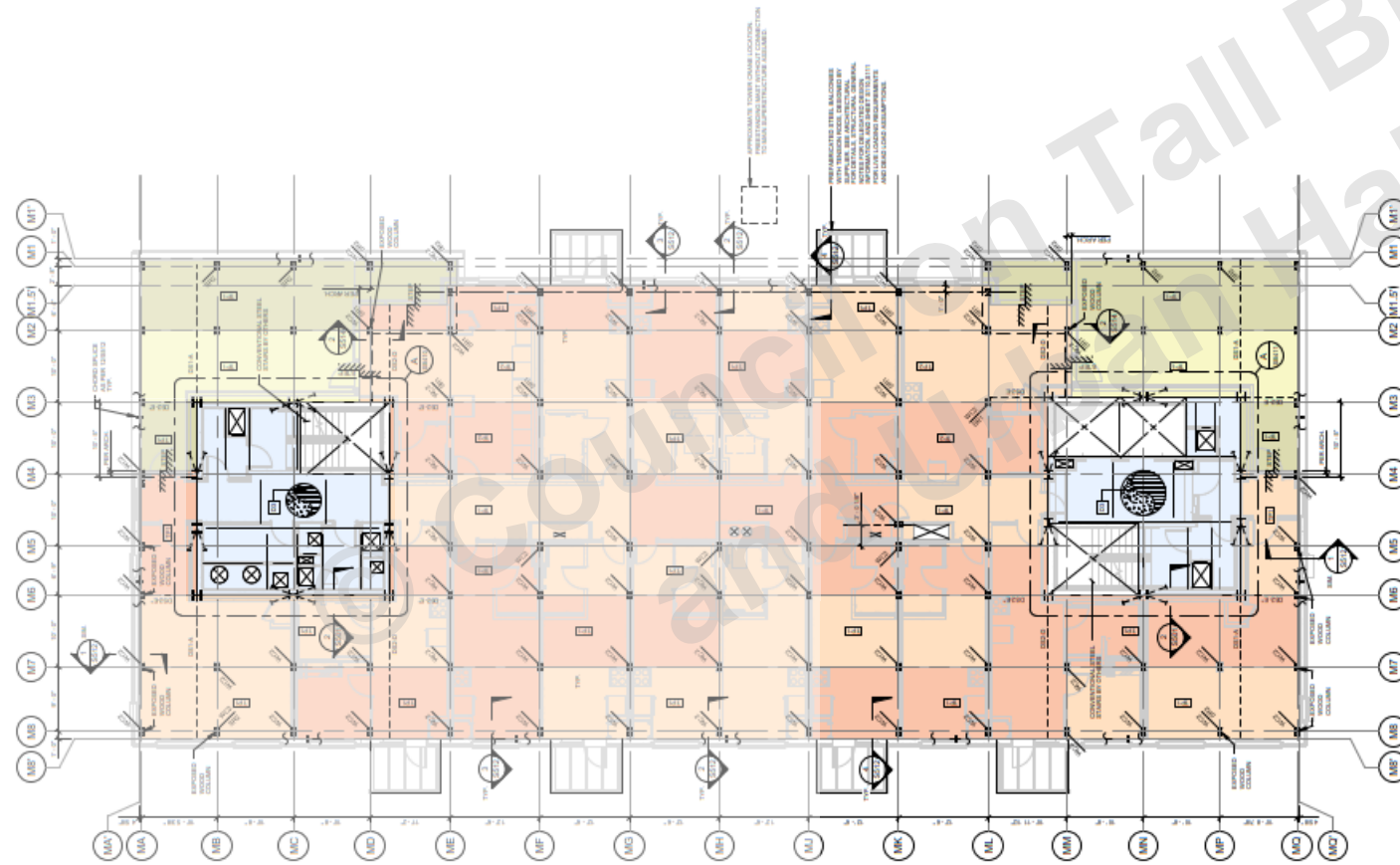
Sequencing



Sequencing

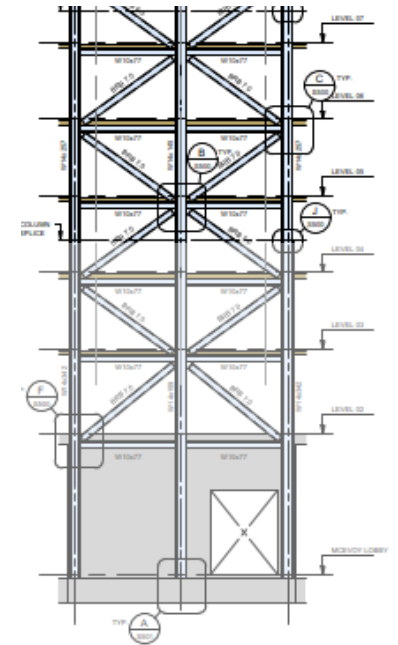
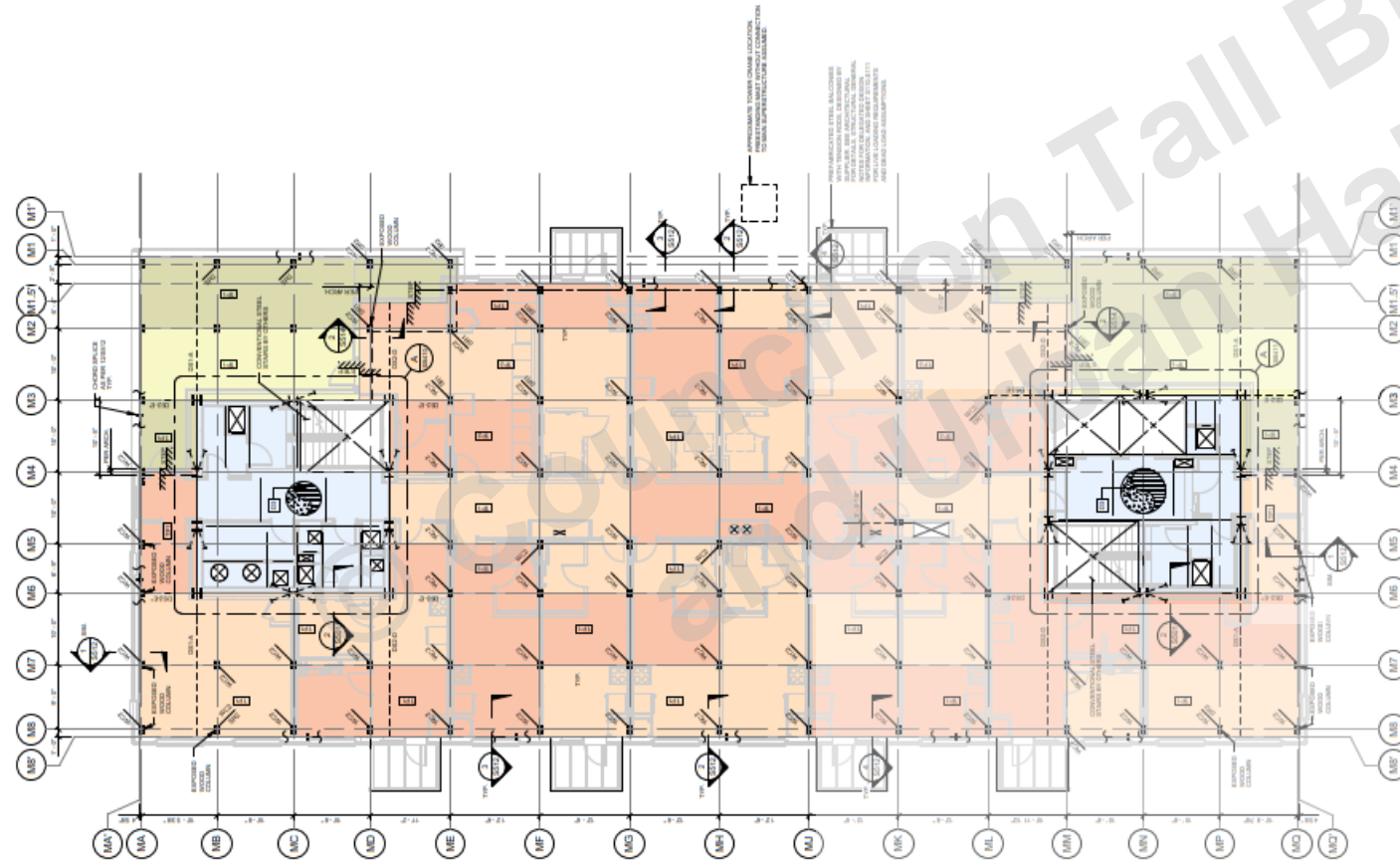


Sequencing



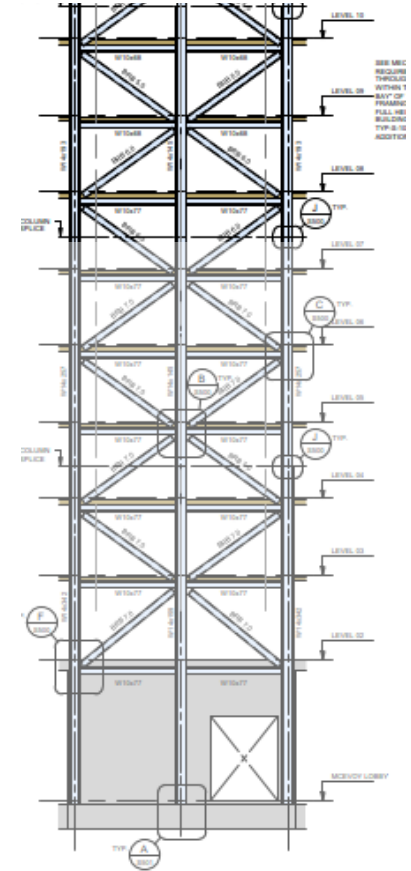
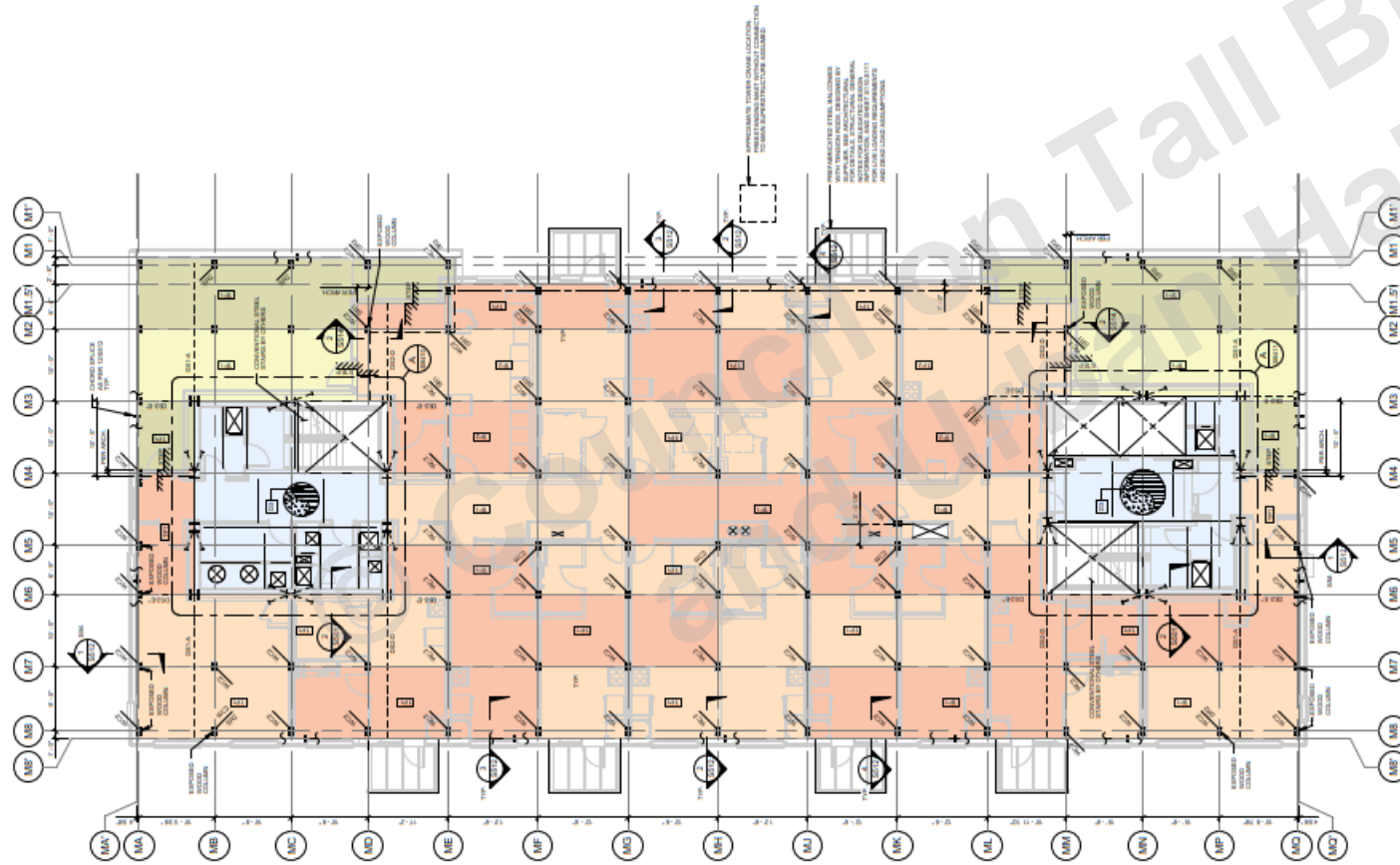
1. MISC
2. CORE
3. CORE
4. CORE
5. CORE
6. CORE
7. CORE
8. CORE
9. CORE
10. CORE
11. CORE
12. CORE
13. CORE
14. CORE
15. CORE
16. CORE
17. CORE
18. CORE
19. CORE
20. CORE
21. CORE

Sequencing

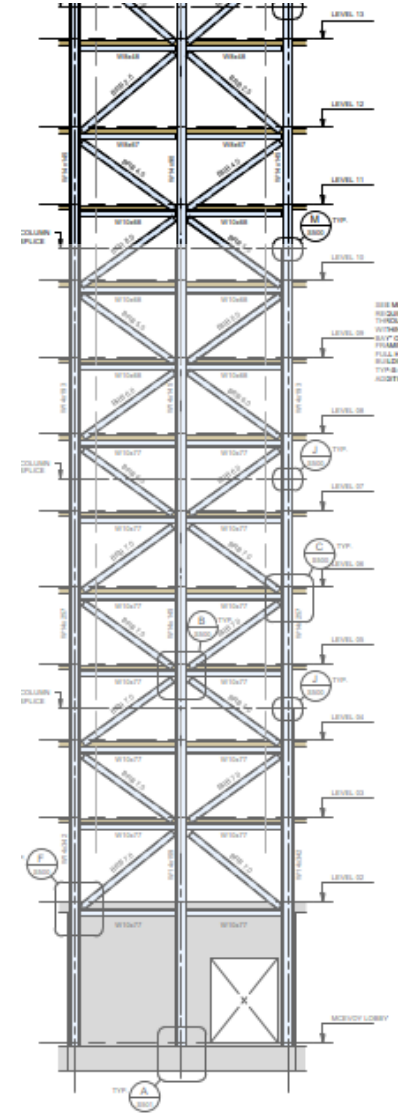
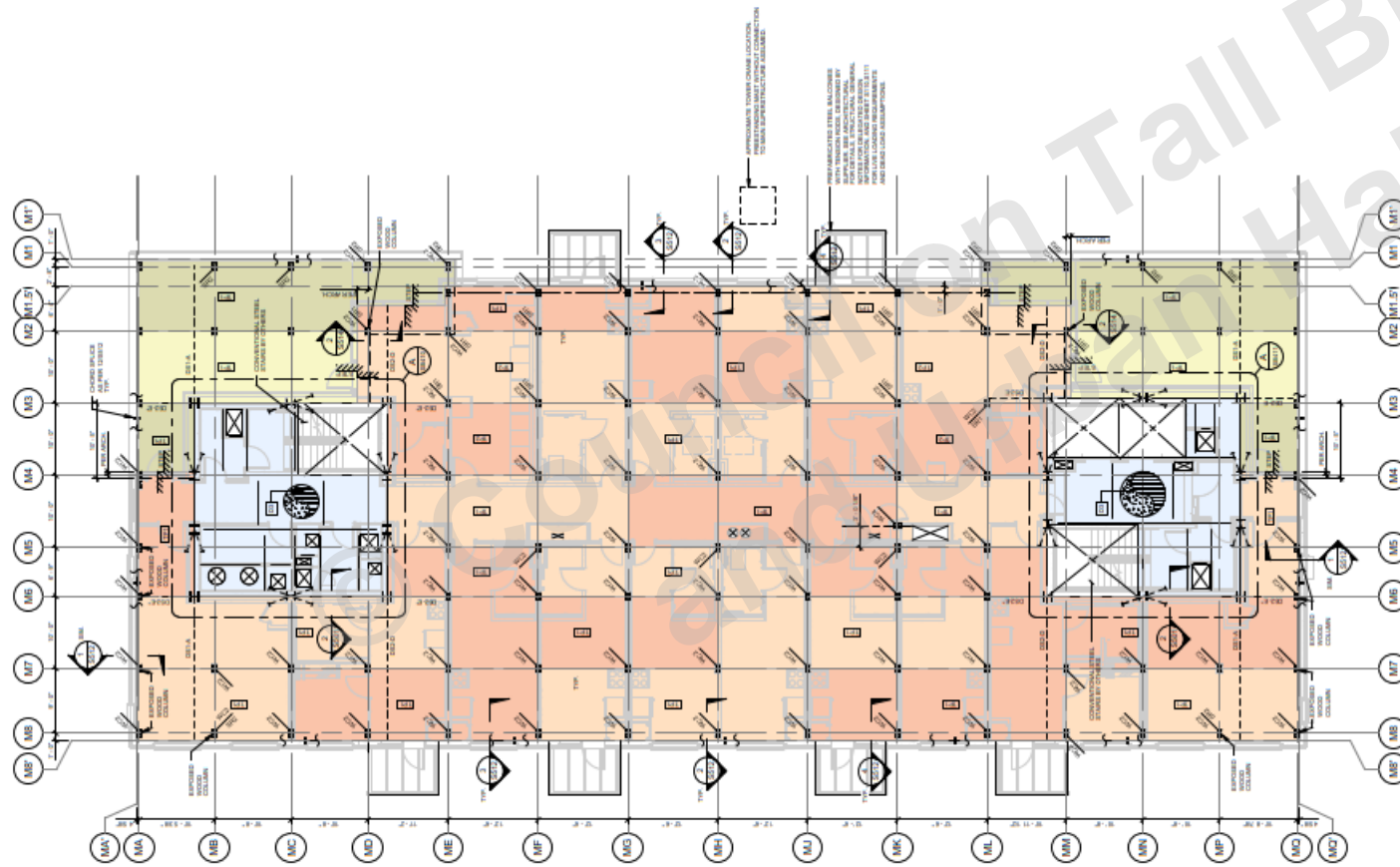


1. MISC
2. CLIMB
3. GROUND
4. FLOOR
5. ROOF
6. MECH
7. ELEV
8. ELEV
9. ELEV
10. ELEV
11. ELEV
12. ELEV
13. ELEV
14. ELEV
15. ELEV

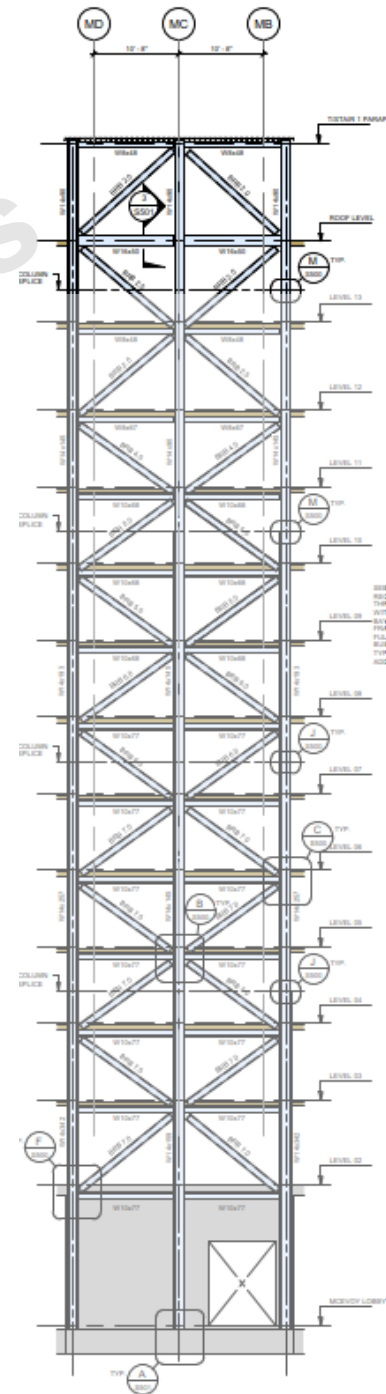
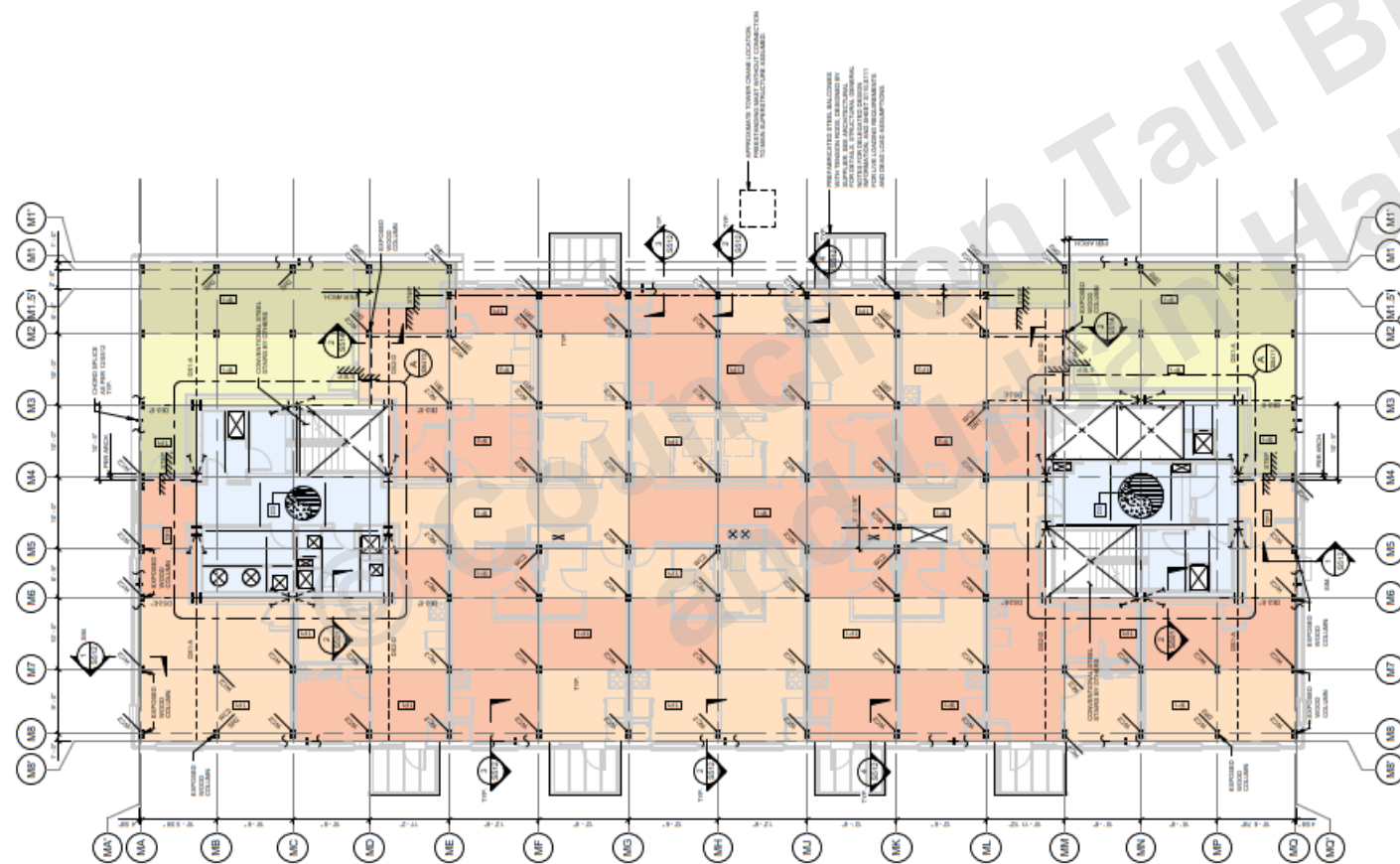
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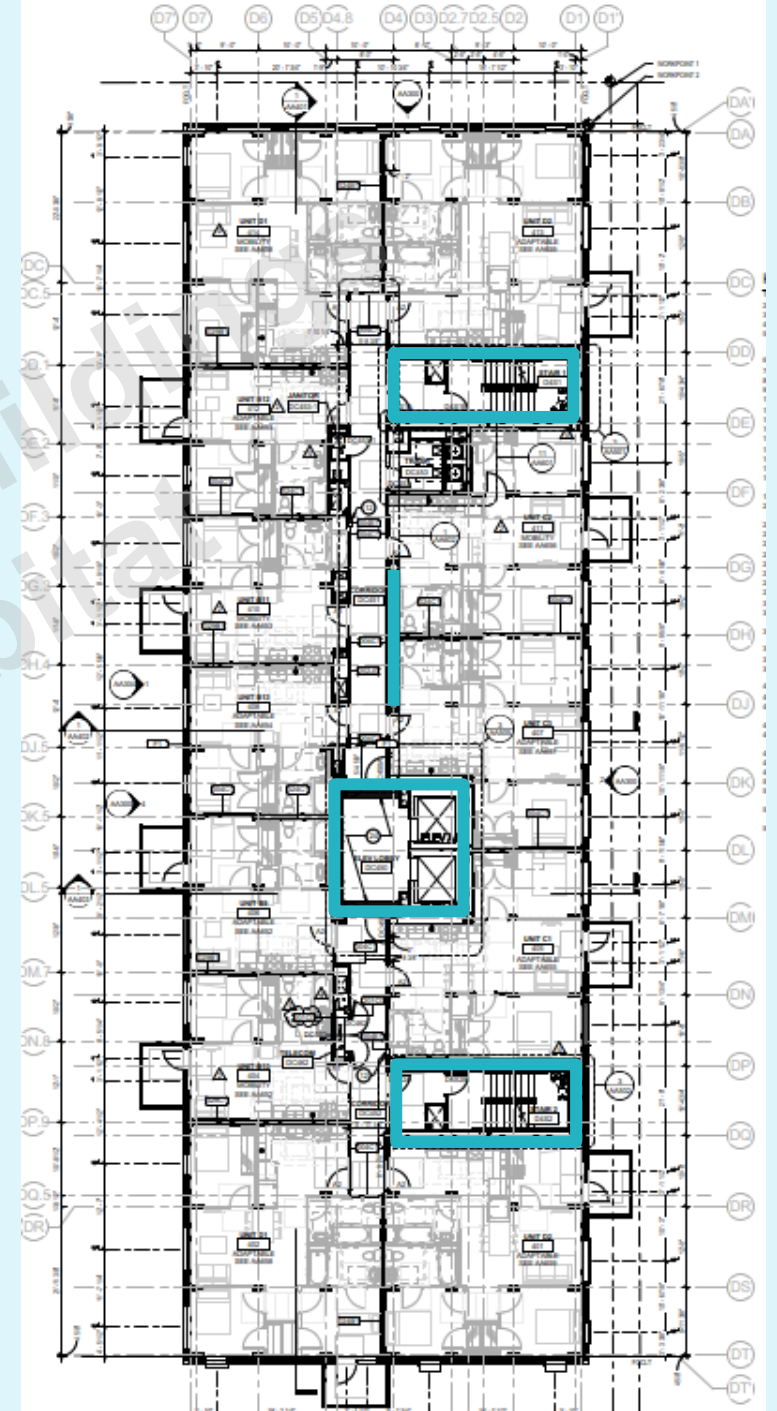
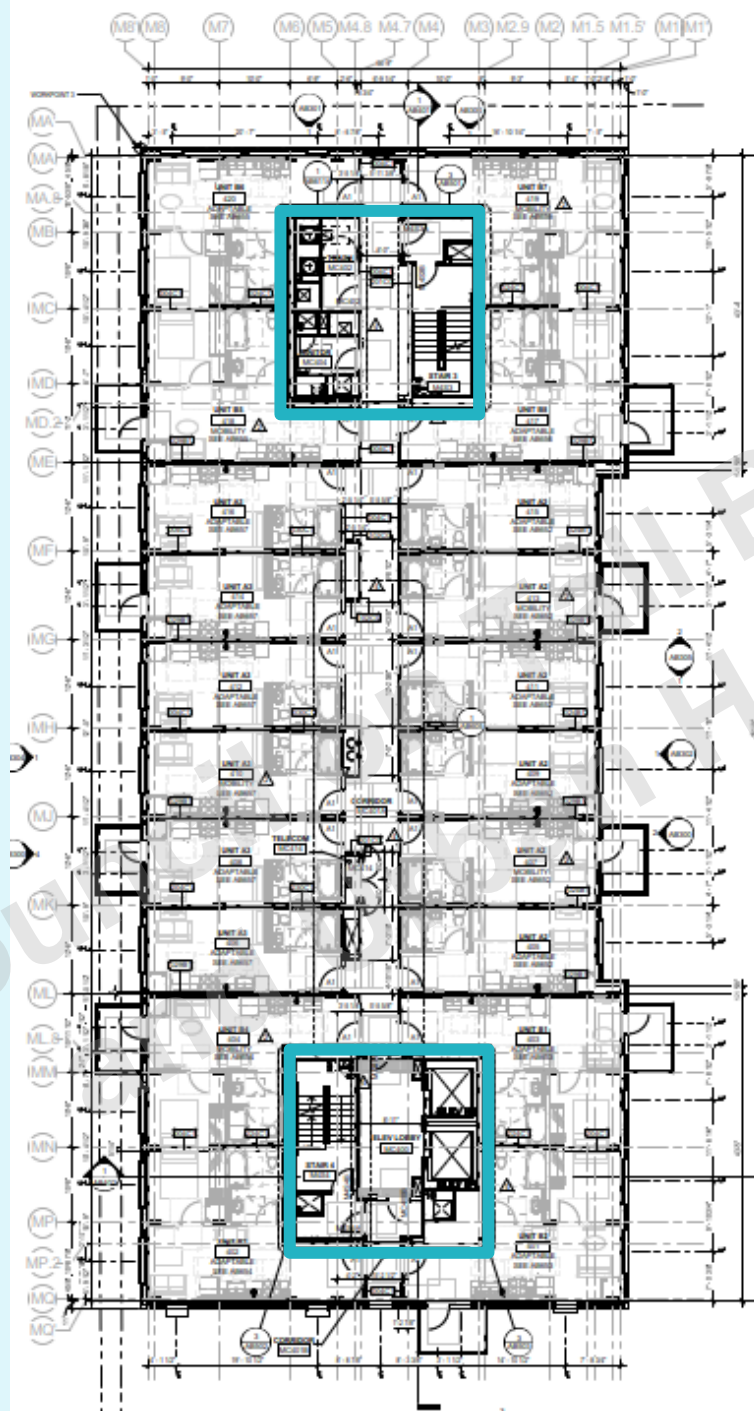


Sequencing



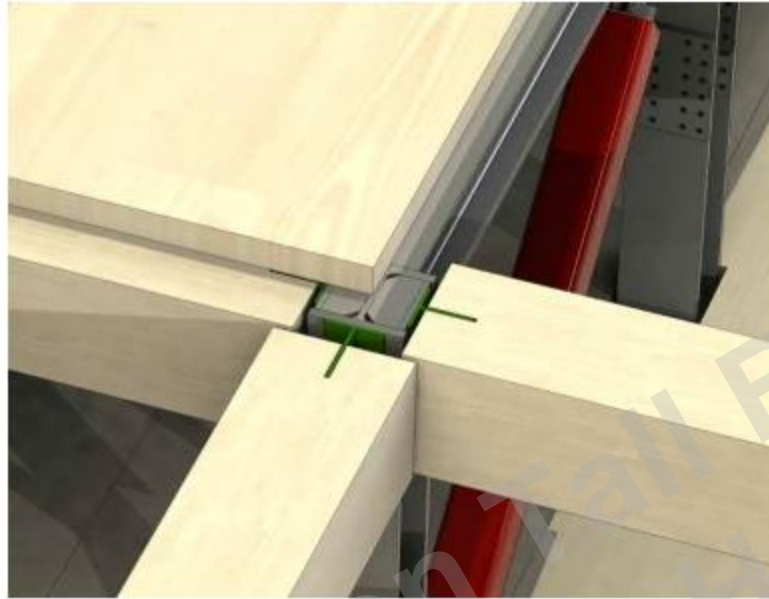
Procurement & Planning

- Subcontractor Interest
- Union Trade Coordination
- Crane Utilization
- Safety during erection



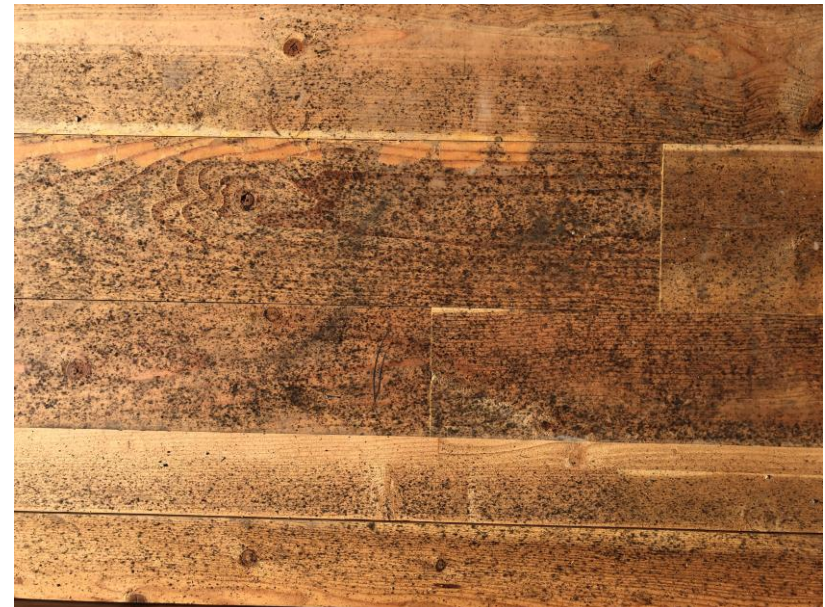
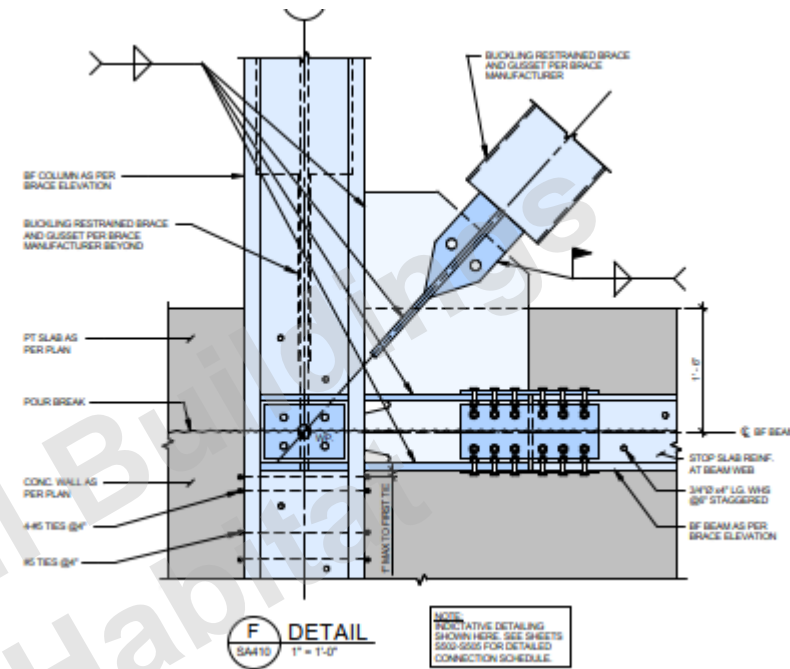
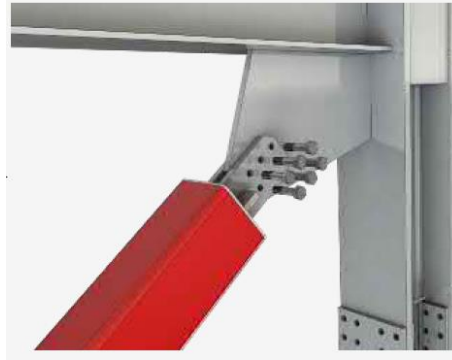
Tolerances and Interfaces

Source: Lendlease Podium



Welding & Gridding

- Eliminating Hot Works
- Iron Staining



Can we make the
whole more than the
sum of its parts?