

Exploring Mass Timber's Role in Hybrid Multi-Family Housing: A Case Study from the Bay Area

Project One – Oakland, CA

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

Introduction to

PROJECT ONE

Prototype Project - MVP

Type IIIA – 4 Stories over SOG

15,000 Square Feet

9 Apartments - Market Rate

Ground Floor – Retail and Garage

Cost - Undisclosed

Owner/ Developer – Venture Capital backed Start-up

General Contractor – Gurnet Point





PROJECT ONE

Site Logistics

Postage Stamp Size Lot – 3,750 SF Building Footprint

North Elevation – Main city road; Heavy bike commuter route

South Elevation – Zero lot line, adjacent property

East Elevation – Caltrans Highway

West Elevation – Powerlines

No Dumpster

No Onsite Storage

No Access

PROJECT ONE

APPROACH

- P1 originally designed as traditional light frame construction, utilizing TJI's and Light frame walls, and miscellaneous steel throughout which was not penciling within competitive bay area market
- Gurnet Point was introduced to Owner and proposed a design/Assist collaboration with DCI Engineers
- Utilize a full project model at LOD 410
- Result was a 34% financial savings and 20% duration reduction



PROJECT ONE

GARAGE

- Valued engineered out all structural steel above slab
- Only used glulam beams and columns for garage clear spans
- Engineered / sized beams and columns with char rating to leave exposed at completion
- Eliminated the need for steel subcontractor
- Only framer working within building for structure duration



PROJECT ONE

MASS PLYWOOD PANEL (MPP)

- Mass Plywood Panels (MPP) manufactured by Freres Lumber
- First Multi-story to be built with MPP
- MPP varied in thickness from 5" (floors) to 4" (Roof)
 - 2hr Fire Separation in Mass Timber
 - Solid exterior Rim for Type IIIA
- MPP blanks currently come in 12'-0" x 48'-0"
- Very good performance with Longitudinal span
- Each floor was comprised of 19 individual unique panels
- Installed within 1/16" tolerance
- CNC precision cut MEP Risers
- Simplified what was a very complex floor framing plan
- 2 hours to complete an entire floor plate
- Our largest panel was 8' x 45' @ approx. 5,700 #
- Clean looking product before, during, and after install
- No cut offs or waste





PROJECT ONE

WALL ASSEMBLIES

- Prefabricated Walls used for all vertical elements due to site constraints
- Leveraged fully coordinated project Model to produce prefabricated wall panels
- Prefabricated wall panels, increase quality and decrease waste
- Reduced onsite labor due to tight sight restrictions
- Predictability for sequence of deliveries and timing; only one truck at a time



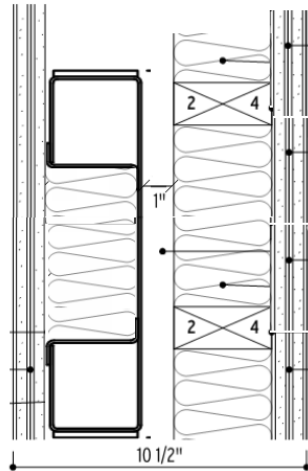


PROJECT ONE

WALL ASSEMBLIES

- Lateral Forces - Cold-Formed Steel Moment Frames by Mitek
- First project to utilize the new CFS Moment Frames
- Condensed shear loads into about 30% of the surface area as traditional ply
- Only possible to reduce shear SF so significantly due to collaboration with MPP
- No vertical plywood sheathing within building
- Mass timber allows deck to act as transfer slab and not stack shear elements
- 10-day city revision/ differed submittal approval

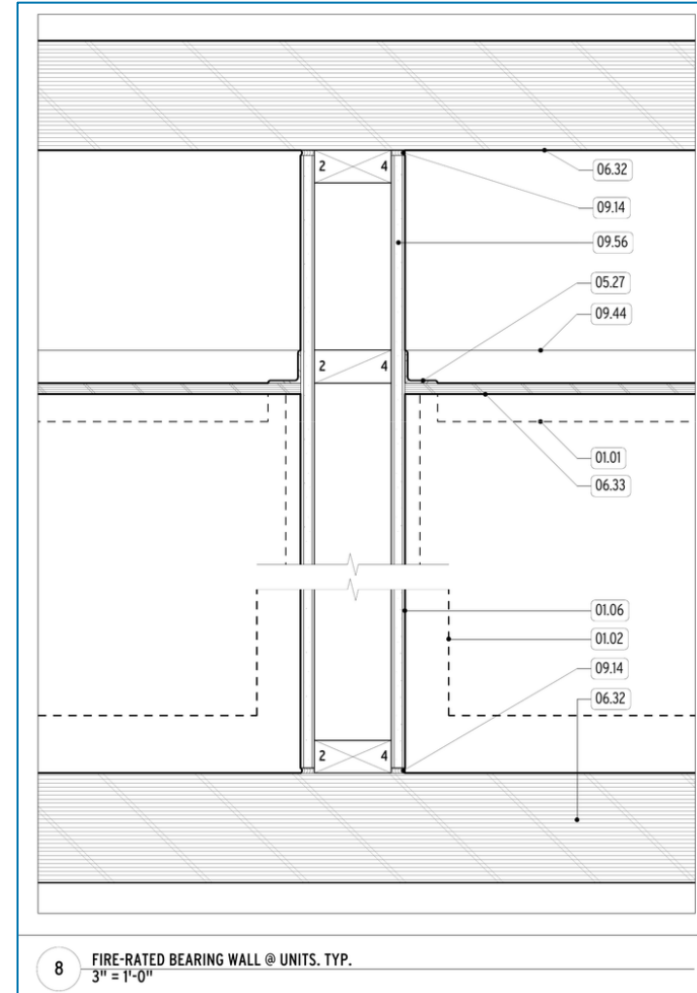
Wall Assemblies



Min. STC 60

2X4 DBL. STUD DEMISING WALL

One Side - 2X Layers 5/8" Type-X G.W.B. over 2x4 wood studs @ 12"/16" O.C., (w/3-1/2" Batt Insulation) Separated by 1" air gap. With a 2x4 plate with MiTek CFS Moment Frame as in lieu of wood studs. (w/3-1/2" Batt Insulation in all open cavities). Infill portion of portal frame opening to be wood stud per structural schedule.

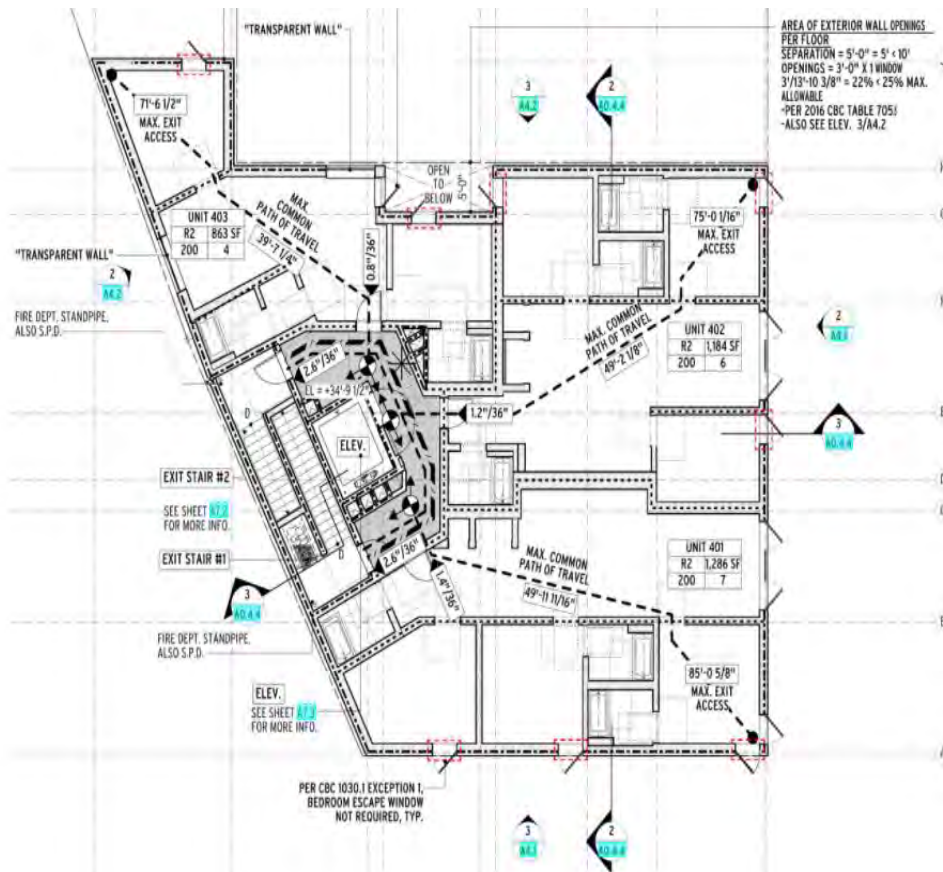




PROJECT ONE

Stair Assemblies

- Unique Stairway Egress due to building shape and size
- 'Helix Stairs'
- Same footprint as traditional Stair, but creates two distinct rated egress paths





PROJECT ONE

THE RESULT

- All completed within current building code
- 23 Working Days from SOG to Roof Complete
- No Pickup or 2nd Side Shear
- Fully coordinated structure and MEP handoffs
- Exterior façade started prior to completion of wood structure
- Minimal site inspections
- Roof on within 5 days of structure being complete
- Elevator 100% completed 1 month after wood structure completed

> QUESTIONS?

This concludes The American Institute
of Architects Continuing Education
Systems Course

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