MANAGING ACOUSTICS IN MASS TIMBER HIGH-RISES:
INTRO CLEVELAND CASE STUDY

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PRESENTATION FOR:
WOODWORKS

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DISCLAIMER: THIS PRESENTATION WAS DEVELOPED BY A THIRD PARTY AND IS NOT FUNDED BY WOODWORKS OR THE SOFTWOOD LUMBER BOARD.
LOCATION: OHIO CITY, CLEVELAND, OH
SIZE: 515,000 SF GROSS
HEIGHT: 115’, 9 STORIES (TALLEST IN COUNTRY WHEN COMPLETED)
TYPE: MIXED-USE RETAIL & RESIDENTIAL
COMPLETION: 2022
SUSTAINABILITY: LEED GOLD CERTIFIED
TIMBER APPROVAL PROCESS
- 18-MONTH TOTAL TIMELINE, INITIATED DURING CONCEPT DESIGN
- ENGAGED CODE CONSULTANT AND ICC AD-HOC COMMITTEE DURING REVIEW PROCESS WITH THE CITY OF CLEVELAND
- LIFE SAFETY ENHANCEMENTS
  - NON-COMBUSTIBLE VERTICAL EGRESS COMPONENTS
  - ADDED ENCAPSULATION IN CORRIDORS
  - ALL TIMBER IS SIZED FOR 2HR RATING, REGARDLESS OF ENCAPSULATION
ACHIEVEMENTS

- TALLEST AND LARGEST MASS TIMBER BUILDING IN THE COUNTRY WHEN COMPLETED IN 2022
- TIMBER COST SIMILAR TO CONCRETE
- LEASING VELOCITY - FULLY OCCUPIED WITHIN 2 MONTHS, AND AT RENTS SUBSTANTIALLY HIGHER THAN ORIGINAL BUDGET
1. ACHIEVE THE LOOK AND FEEL OF HISTORIC LOFT BUILDINGS, BUT WITH NEW CONSTRUCTION: MAXIMIZE THE AMOUNT OF EXPOSED MASS TIMBER AT CEILINGS AND COLUMNS, AND MAXIMIZE NATURAL LIGHTING INTO EACH UNIT.
2. INCLUDE 3,000 SF FITNESS CENTER AT THE TOP FLOOR (ABOVE PENTHOUSE UNITS).
3. INCLUDE A 500-PERSON EVENT SPACE AT THE TOP FLOOR (ABOVE PENTHOUSE UNITS).

DESIGN GOALS
ACOUSTIC FOCUS AREAS

1. TYPICAL FLOOR-CEILING ASSEMBLY
2. DEMISING WALLS - HEAD AND BASE
3. FITNESS FLOOR
4. EVENT SPACE/ PENTHOUSE FLOOR-CEILING

SECTION DIAGRAM
1. TYPICAL FLOOR-FLOOR ASSEMBLY

GOAL - PROVIDE SOUND ISOLATION CONSISTENT WITH MARKET COMPS (CONCRETE), USING LIGHTER WEIGHT MASS TIMBER STRUCTURE.
1. OTHER COMMON FLOOR-FLOOR ASSEMBLIES
2. DEMISING WALLS

- **U.L. #**
- **STC:**

**TYPICAL INTERIOR RATED COMMON AREA WALLS AND AS INDICATED ON PLANS**

- **USE 5/8" COATED GLASS MAT WATER RESISTANT OR FIBER-REINFORCED WATER RESISTANT GYPSUM BACK BOARD AT ALL WET WALL LOCATIONS (KITCHENS & BATHROOMS).**
- **MOISTURE RESISTANT GYPSUM SUCH AS GREENBOARD MAY BE USED AT WALLS W/O TILE.**

- **PROVIDE FULL FIRE STOPPING AT ALL PENETRATIONS.**
- **PROVIDE FLOOR & CEILING RUNNERS - CHANNEL SHAPED, ATTACHED @ FLOOR & CEILING W/ STEEL FASTENERS @ 24" O.C.**

**D2.1 1-HR. FIRE RATED - NON-LOAD BEARING METAL STUD INTERIOR PARTITION WALL**

**U419 NGC-2386 SOUND TEST**

**LOCATION / NOTES**

- **FLOOR ASSEMBLY**
- **7 3/4"**
- **BOND BREAKER TAPE & CONTINUOUS ACOUSTIC SEALANT TO MATCH WALL FIRE RATING, EACH SIDE**
- **METAL ‘J’ CASING TRIM AT GYP. BOARD EDGE + 1/2" REVEAL, EACH SIDE**
- **6" FLOOR & CEILING RUNNERS - SEE NOTES**

**HORIZONTAL SECTION**

- **RESILIENT CHANNEL**
- **6" GALVANIZED STEEL STUDS @ 16" O.C. (16 GA. MIN) - SEE NOTES ON SIDE**
- **MINERAL WOOL BATT INSULATION COMpletely FILLING STUD CAVITY**

**VERTICAL SECTION AT HEAD**

- **(1) LAYER 5/8" ‘TYPE X’ GYP. BOARD, EACH SIDE**
- **BOND BREAKER TAPE & CONTINUOUS ACOUSTIC SEALANT TO MATCH WALL FIRE RATING, EACH SIDE**
- **6" FLOOR & CEILING RUNNERS - SEE NOTES**

**VERTICAL SECTION AT SILL**

- **BOND BREAKER TAPE & CONTINUOUS ACOUSTIC SEALANT TO MATCH WALL FIRE RATING, EACH SIDE**
- **FLOOR ASSEMBLY**
3. FITNESS FLOOR

GOAL - MINIMIZE SOUND TRANSMISSION FROM IMPACT NOISE (WEIGHTS) TO THE PREMIUM-RENT PENTHOUSE UNITS BELOW.
4. EVENT SPACE/ PENTHOUSE FLOOR-CEILING ASSEMBLY

GOAL - MINIMIZE SOUND TRANSMISSION FROM EVENT SPACE - CONVERSATION, LOUD MUSIC, DANCING (IMPACT NOISE), TO THE PREMIUM-RENT PENTHOUSE UNITS BELOW.
ACOUSTIC DETAILS - EXECUTION
1. TYPICAL FLOOR-FLOOR

CLT DECK PREPPED FOR ACOUSTIC MAT LAYOUT

ACOUSTIC MAT INSTALLATION IN PROGRESS

ACOUSTIC MAT INSTALLATION COMPLETE AND READY FOR TOPPING SLAB
2. DEMISING WALLS - CORRIDOR

TIMBER FRAMING IN PLACE

ADDED CORRIDOR DRYWALL INSTALLED PRIOR TO ACOUSTIC MAT AND TOPPING SLAB

CORRIDOR ROUGH FRAMING
LESSONS LEARNED:
1. DRYWALL ENCAPSULATION HELPS ACOUSTIC PERFORMANCE, BUT REQUIRES MORE COORDINATION DURING CONSTRUCTION.
2. SIMPLIFY/STANDARDIZE THE DETAILS WHEREVER POSSIBLE.
3. TO MANAGE FLANKING, DETAILS AT TOP, BOTTOM, AND INTERSECTIONS ARE AS IMPORTANT AS THE OVERALL WALL ASSEMBLY.
3. FITNESS FLOOR

RUBBER FLOOR TILES AT WEIGHT MACHINES

RUBBER FLOOR TILES AT WEIGHT MACHINES
4. EVENT SPACE/ PENTHOUSE FLOOR-CEILING ASSEMBLY

FLOATING SLAB INSTALLATION IN PROGRESS

FINISHED EVENT SPACE

FLOATING SLAB INSTALLATION IN PROGRESS

FINISHED EVENT SPACE
APPLICATION - INTRO BUCKHEAD
INTRO BUCKHEAD

LOCATION:
ATLANTA, GA

TYPE:
MULTIFAMILY RESIDENTIAL

SIZE:
519,000 SF GROSS

HEIGHT:
225', 22 STORIES

CONSTRUCTION:
GLULAM POST & BEAM WITH CLT PLANKS, CONCRETE PODIUM
STREAMLINING MASS TIMBER HIGH-RISE

SIMPLIFIED PROGRAM:
1. NO EVENT SPACE.
2. FITNESS ROOM IS ON THE PODIUM SLAB RATHER THAN ABOVE PENTHOUSES.

STRATEGIC UNIT PLANNING:
1. STACKED FLOORPLATE.
2. MORE EXPOSED TIMBER CEILINGS THAN INTRO CLEVELAND.
STREAMLINING MASS TIMBER HIGH-RISE

DEMISING WALLS:
1. WALLS ARE ADJACENT TO, NOT UNDER, BEAMS.
2. STAGGERED STUD ROWS INSTEAD OF SINGLE STUD + RESILIENT CHANNEL TO REDUCE FLANKING.
THANK YOU

THIS CONCLUDES THE AMERICAN INSTITUTE OF ARCHITECTS CONTINUING EDUCATION SYSTEMS COURSE.