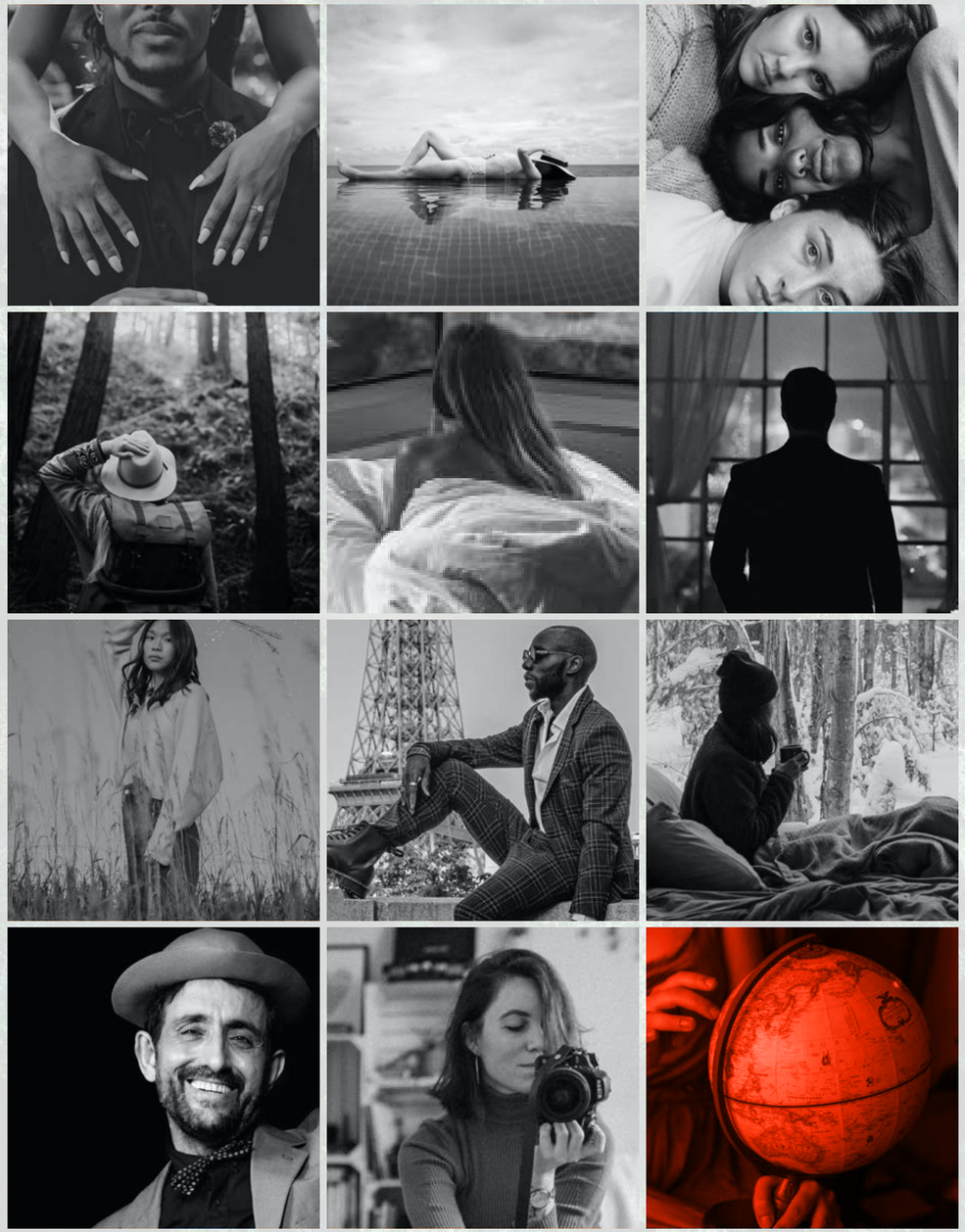
DLRGROUP

a future for MASS TIMBER

Mass Timber Innovation:
The Hospitality Prototype



HELPING TO SHELTER

WANDERERS · CONTRARIANS
MAKERS · ARTISTS
ADVENTURERS
PARTIERS · BUILDERS
FREE SPIRITS
NOMADS · ESCAPISTS
AND ALL YOU MEANING-SEEKING
TRAVELERS

SINCE 1966

WHY MASS TIMBER?

Timber construction is in the midst of a renaissance as manufacturing, design, and construction innovations inspire boundary-pushing concepts for the age-old material.

How does timber measure up? With the right design and detailing, it brings value to both owners and guests.

Join us on a journey through our mass timber hospitality prototype and research.

Cheers,

Ed Wilms, AIA
Principal
Global Hospitality Leader

HOSPITALITY

prototype

VALUE OF MASS TIMBER

The world has reached a crucial tipping point around carbon emissions. Could timber construction be the answer for the hospitality industry?

MASS TIMBER FOR THE MASSES

From a collaborative transdisciplinary initiative involving designers, researchers, and owners, a mass timber hotel prototype evolved. The prototype addresses perceived barriers by dispelling common, industry-specific objections. Three factors are most often cited as reasons timber won't work in hospitality: sound, structure, and safety. Experts tested these myths, debunking them one-by-one. Acousticians modeled multiple timber assemblies, discovering a unique combination of structural, wall, and connection details to meet hoteliers' demanding sound requirements. And fire modeling shows the assembly meets fire safety and performance code with no disadvantages.

The prototype also calculates a competitive cost model and – in response to a rise in conscious consumerism – quantifies environmental and health benefits. Most importantly, it's different than sky-high timber concepts that only work when a city bends their building code. This prototype could be built, today, in any North American city working under the commonly adopted 2021 building code. This is mass timber for the masses.

As a functional prototype, the module was feasibility tested across a variety of North American building and climate with real hotel proformas. A comparative cost model between the timber prototype and a similar concrete hotel shows a slim 3% timber premium. Having explored hundreds of options in research and predictive modeling, it's time to build.

Learn More

Quantifying the Benefits

Mass timber is a low-carbon, renewable, domestically sourced building material. The prototype's 73,000 cubic feet of wood products directly reduce the building's carbon footprint by 22% compared to a similar concrete structure; however, the benefit of timber extends beyond its first impact: trees absorb and store carbon.

Capturing this stored carbon inside a building where it won't be released back into the atmosphere translates to an 86% carbon footprint reduction over the prototype's life cycle. With the projected construction start of 500+ hotels anticipated in 2023, the ecological benefit magnifies even if timber is only used in a small percentage. Research also shows that staying at a timber hotel can boost relaxation and lower stress hormones, heart rate, and blood pressure—an added benefit for the leisure-seeking traveler.

High performance building and sustainable design features

1. ROOF SHAPED FOR RAIN COLLECTION
2. DEEP EAVES FOR PROTECTION AND SHADING
3. OPEN SPACES AND OPERABLE WINDOWS FOR NATURAL VENTILATION
4. OPERABLE GUESTROOM WINDOWS
5. MECHANICAL CIRCULATION PLENUM
6. PUBLIC SPACE MECHANICAL RUNS
7. GUESTROOM SUPPLY AIR
8. GUESTROOM EXHAUST AIR
9. GUESTROOM HEATING & COOLING LINES
10. FIRE SPRINKLERS
11. GUESTROOM MECHANICAL UNIT
12. RAINWATER CISTERNS
13. CONSOLIDATED PLUMBING DROPS ALONG BEAM IN CEILING / FAUX BEAM EXTENSIONS

Material Myth Busting

Sound, structure, and safety are the three main concerns with timber working in the hospitality space. The research team set out to test these myths, debunking them one by one.

Sound

We sized the prototype's rooms to be easily modified to accommodate various hotel brands and service levels to avoid limiting the design to boutique or luxury markets. However, we modeled the prototype after Marriott's industry-leading hospitality standards. Acousticians modeled timber assemblies to discover a unique combination of structural, wall, and connection details that meet the hospitality giant's particular sound requirements.

Structure

Structural engineers tested timber structural modules against cost and typical hotel room modules, finding the sweet spot where the space between structural members neatly houses a hotel room with minor modification. Advancements in wood and fire science meant clearing the perceived life safety barrier: fire modeling shows the prototype assembly meets performance code with no disadvantages.

Safety

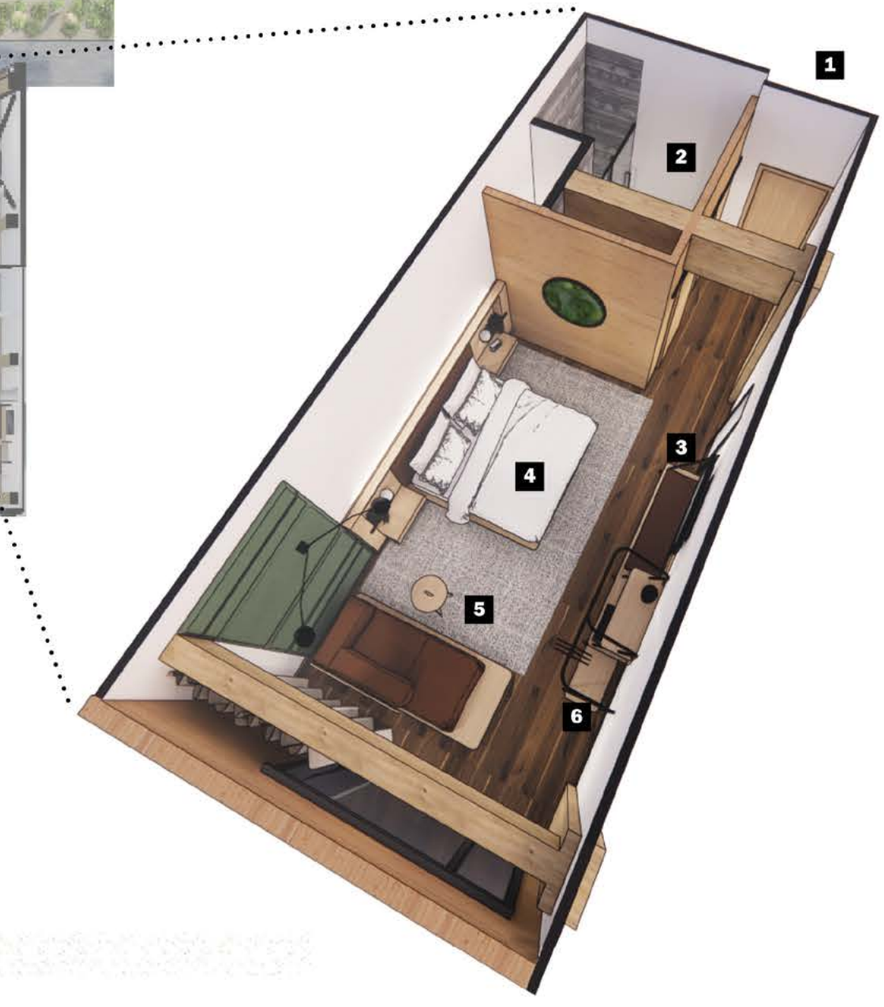
The catalyst for our project was the 2021 update to the International Building Code (IBC). Before this update, limitations for mass timber buildings were based on similar light wood framing – despite its structural potential. The previous restrictions interfered with designing multiple stories and the total area that would make sense financially to a developer – leading them to choose a cheaper building option. We can now leverage mass timber's strength to design hotels sized similarly to steel-frame, with the advantages of a comparative price point, modularity, and prefabrication. Advancements in wood and fire science also meant clearing the barrier presented by fire safety; materials innovation has improved the strength and resilience of engineered lumber. Because of these significant changes to the code, we feel that it has become a viable option for developers.

Changes in the IBC meant we could incorporate a stunning roof deck into our design, an amenity that many hotels use to attract guests and community members looking for a great spot to dine and relax. The sustainable ethos of the hotel is woven throughout the concept design by incorporating other natural or minimally processed materials, encouraging physical activity through an appealing interior stair and fitness space, and celebrating biophilia and nature through a rooftop garden and seasonal menu concept.

Guest wellbeing features backed by research

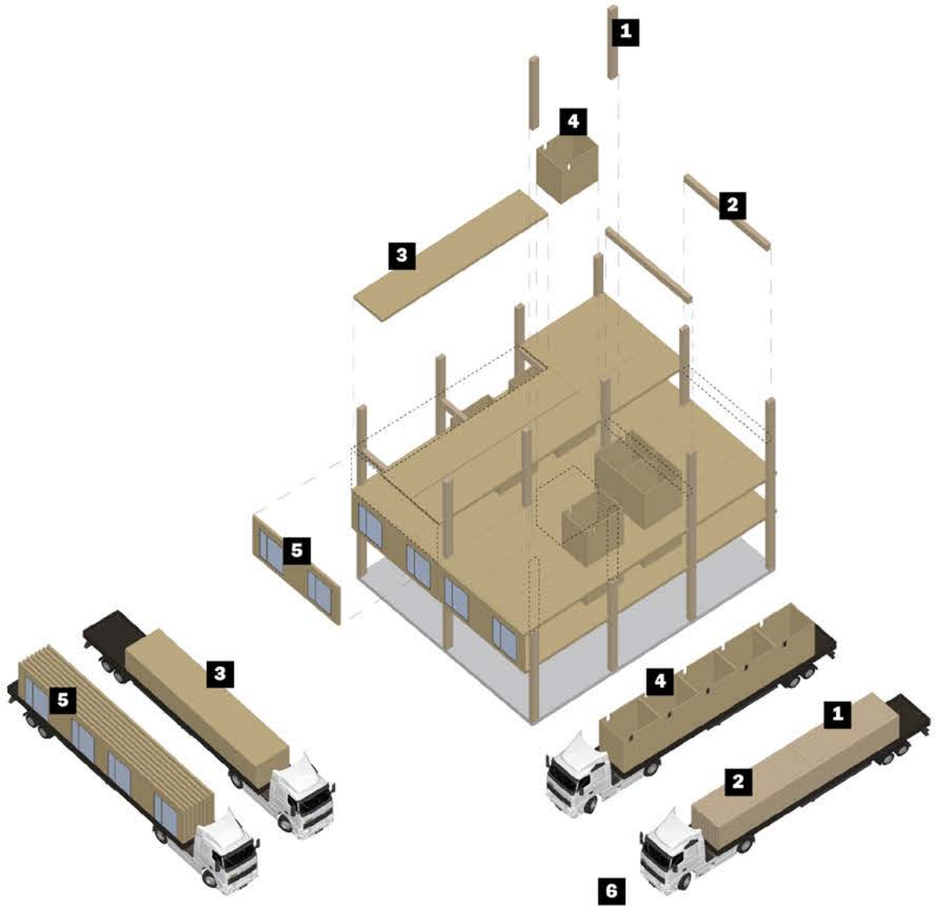
1. MOTORIZED DRAPERY for cutting out glare
2. ACOUSTIC PANELING for sleeping soundly
3. HORIZON LIGHT LINE for mental grounding
4. GREENERY for biophilia benefits
5. MOOD-SETTING TOUCHPAD for personalized experience
6. COLOR ADJUSTABLE LIGHTING for circadian rhythms
7. NATURAL FIBER RUG for air quality (no offgassing)
8. EXPOSED TIMBER for reduced stress hormones

Typical guest room floor plan: 34 rooms



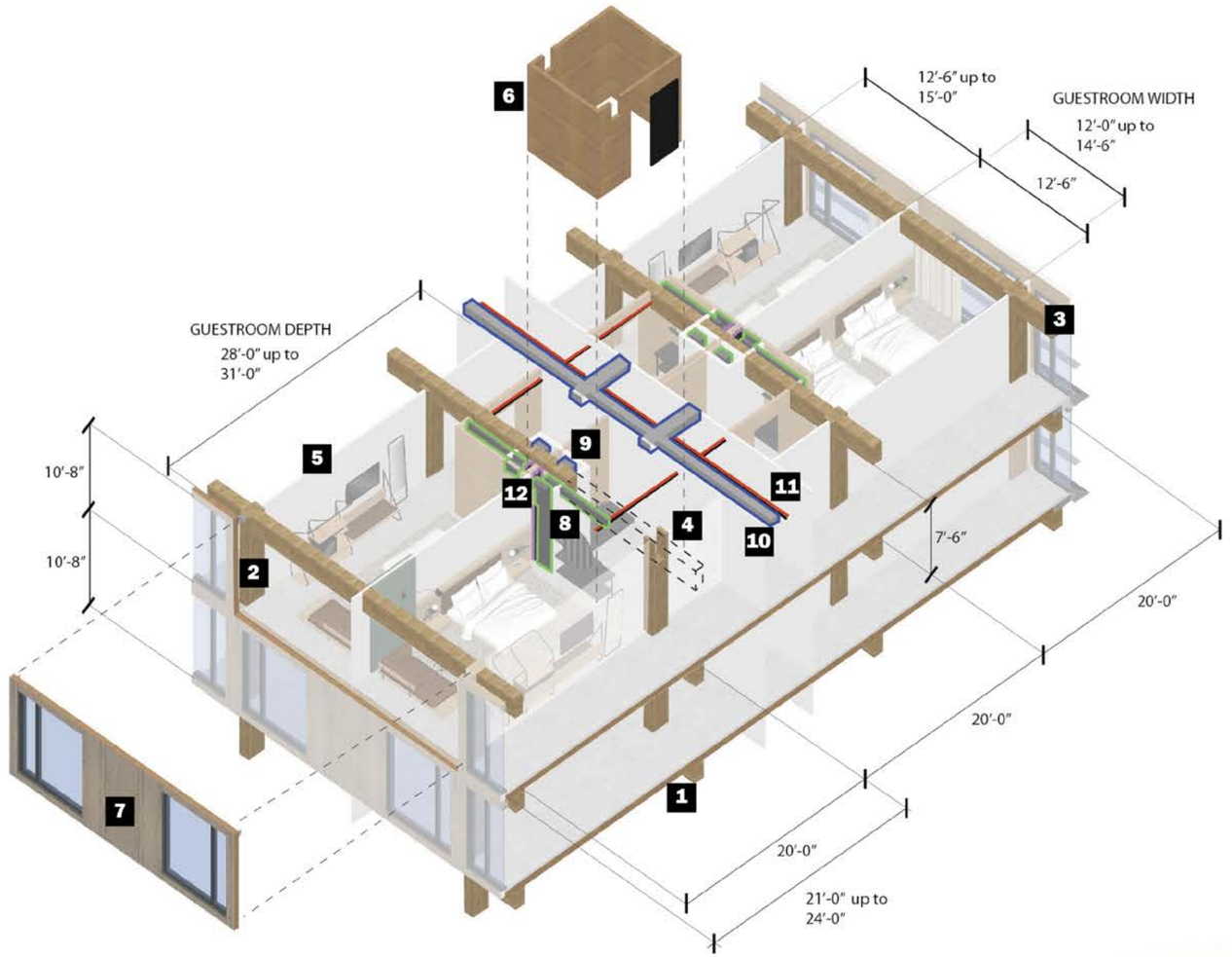
Typical king guest room

1 ENTRY
2 PREFABRICATED BATH MODULE
3 OPEN WARDROBE
4 REST
5 LOUNGE
6 LUGGAGE



Modular prefabrication, transport, and assembly efficiencies

1. GLULAMINATED TIMBER COLUMNS FORM VERTICAL STRUCTURE
2. GLULAMINATEDTIMBER BEAMS FORM HORIZONTAL STRUCTURE
3. CROSSLAMINATED OR DOWEL LAMINATED TIMBER PANELS FORM FLOOR
4. PREFABRICATED WOOD BATHROOM POD DROPS IN
5. PREFABRICATED FACADE PANEL ENCLOSES SPACE
6. ALL DIMENSIONED FOR TRANSPORTATION ON STANDARD FLATBED SEMI TRUCKS



Prototype guestroom module with mechanical integration

1. CLT OR DLT FLOOR PANEL
2. GLULAM COLUMNS
3. GLULAM BEAMS
4. 2-HR FIRE RATED STRUCTURAL CONNECTIONS
5. STANDARD GYPSUM ACOUSTIC PARTITIONS
6. PREFABRICATED BATHROOM POD
7. PREFABRICATED FACADE PANEL
8. VERTICALLY ORIENTED MECHANICAL UNIT - GUESTROOM SIDE OF BEAM (HEAT PUMP, FAN COIL, or OTHER)
9. FRESH AIR SUPPLY - HALLWAY SIDE OF BEAM - VERTICAL TO ROOF
10. EXHAUST - RUNS IN HALLWAY
11. SPRINKLERS - MAIN LINE IN HALLWAY - BRANCHES PENETRATE THROUGH BEAMS
12. HEATING AND COOLING LINES

Responisble Disruptor

In early 2023, DLR Group was named one of three Responsible Disruptors in the second annual *Metropolis* Responsible Disruptors program for our Mass Timber Innovation: The Hospitality Prototype.

The program honors projects representing positive change, or disruption, encouraging healthy innovation in architecture and design. Our prototype caught the judges' attention for its use of domestically grown, sustainable timber in a code-compliant hotel concept.

What's next? A guestroom prototype is in development at the University of Minnesota for acoustic testing. Beyond this project, it will be used for graduate student research from design to forestry management.


THINGS WE
believe

Inspired Design Stirs An Emotional Response

AND PEOPLE BUY WITH THEIR HEARTS, NOT THEIR HEADS.

Good Ideas Travel Well

FROM OUR STUDIOS TO ANYWHERE.

The brands we partner with strategically drop into new locations to serve their markets and adapt to guest preferences. From New York to Los Angeles – and everywhere in between – DLR Group responds with a no boundaries model.

Our 32 studios across the globe provide local roots and familiarity with climate, market conditions, and jurisdictional regulations. From these hubs, we've delivered hospitality experiences in 38 states and counting.

Partnerships Power Passion

TRUST. RELIABILITY. CREATIVITY.

Having delivered more than 10,000 keys and received over 185 design awards, we get the brief: balancing the needs of owners and operators while personifying the brand through design.

APRIM

AUTOGRAPH COLLECTION

canopy BY HILTON

CONCORD HOSPITALITY ENTERPRISES

DREAM HOTELS

HYATT

JW MARRIOTT

KIMPTON

MARRIOTT

moxy HOTELS

OTO DEVELOPMENT

SAGE HOSPITALITY

TAPESTRY COLLECTION BY HILTON

TRIBUTE PORTFOLIO

THOMPSON HOTELS

WHITE LODGING

Ed Wilms

AIA | Senior Principal | Global Hospitality Leader

Ed is a leading hospitality expert whose designs build brand loyalty. His leadership style is inclusive and inquisitive: Ed knows that the best ideas can be borne from unexpected places and people, they just need a platform where they can be heard and turned from vision into reality.

Brian Murch

AIA | Principal | Hospitality Design Leader

Brian is an architect and a master storyteller of the spirit of exploration. His sources of inspiration have no boundaries, from bustling urbanity to untamed nature, from people's personal experiences to pioneering technology.

Valentina Castellon

Principal | Hospitality Interior Design Leader

Lauded by Boutique Design as a rising star, Valentina is a recognized boundary pusher. She challenges clients and colleagues to go beyond routine, finding fresh design expressions that leave a lasting memory along the way.

Steve Cavanaugh

AIA, LEED AP | Principal | Design Leader

Steve guides DLR Group's partnership with Hines to deliver the innovative T3 mass timber asset class. Exploring how the built environment is shaped by materiality and climate, he has designed over two million square feet of mass timber projects across the United States and in Canada.

Joe Cicora

Principal | Business Development

Joe builds long lasting relationships with hospitality studio's client partners, matching their needs with our tailored services. He aligns the righ tteam with the overall vision, proving that the value of our design team starts with the first handshake and doesn't end with the grand opening.

Missy Goldstein

Associate | Business Development

Missy's formal education in fine art, material culture, and business guided her into a career where she connects people to the finer things in life. She has a gift for matching client preferences—spoken and unspoken—to artistic design expressions that evoke an emotional response.

Rebecca Buchmeier

AIA, LEED AP BD+C | Principal | Hospitality Leader

Rebecca has worked on multiple project types specializing in hospitality as both an Architect and an Interior Designer. Her expertise in both roles provides the insight and capacity to lead multidisciplinary teams and manage complex projects, resulting in effective project delivery.

Ed Wilms, AIA

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All architecture and interior design depicted is the work of DLR Group.

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HUMAN EXPERIENCE
THROUGH DESIGN
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