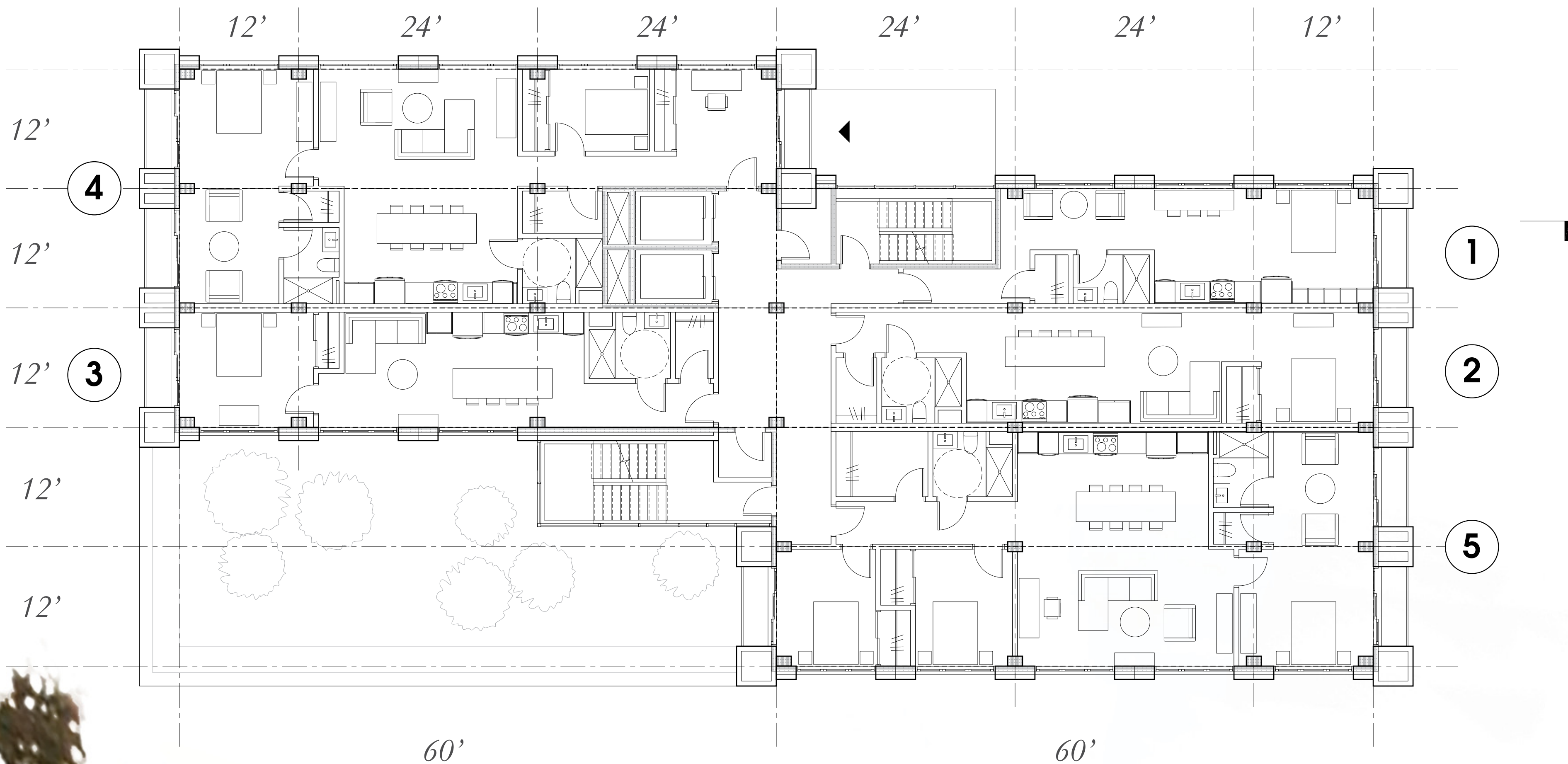


THE IMPETUS

Nelson, BC



 **TYPICAL RESIDENTIAL FLOOR PLAN (L2-L8)**
1/8" = 1'-0"

1 STUDIO 1
*(coupled with stair core
+ service room)*
460 sq.ft.

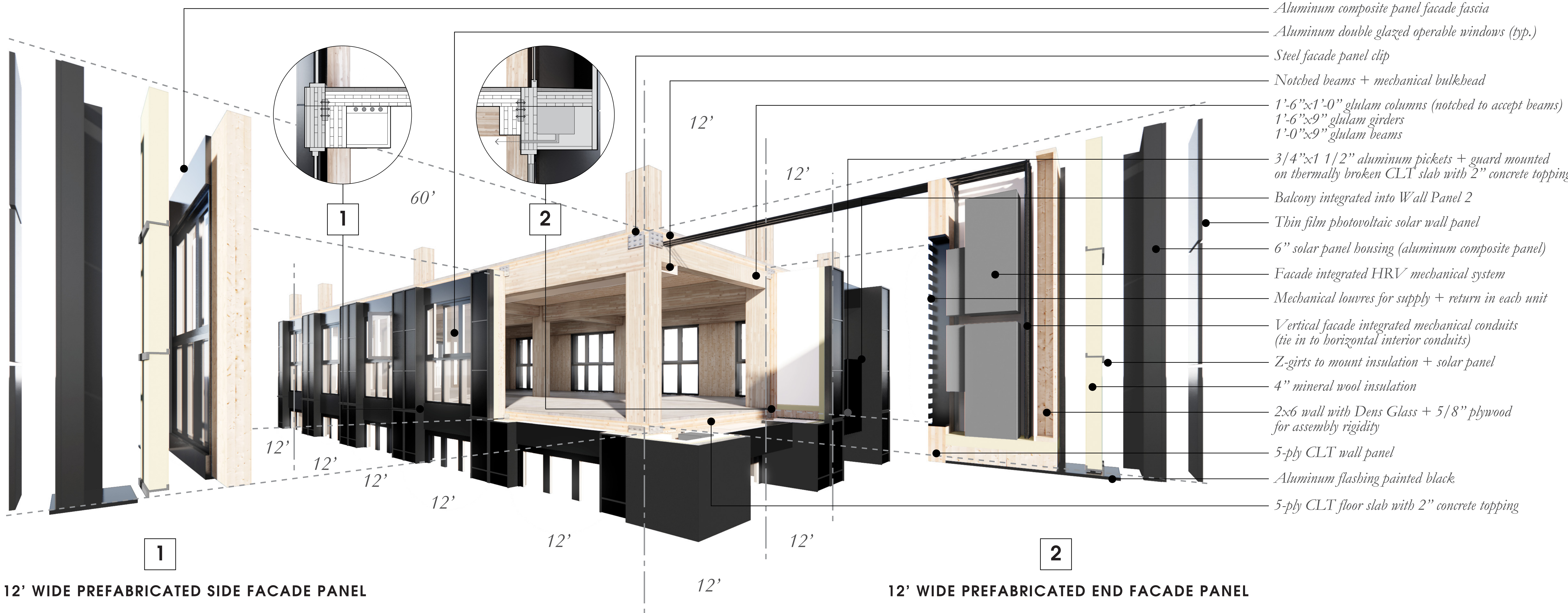
2 STUDIO 2
600 sq.ft.
fully accessible

3 1 BEDROOM
620 sq.ft.
fully accessible

4 2 BEDROOM
*(coupled with elevator
core + mechanical shafts)*
1,200 sq.ft.
fully accessible

5 3 BEDROOM
1,350 sq.ft.
fully accessible





MODULAR CONSTRUCTION
Wood prefabrication results in 75% waste reduction compared to steel (+ speed of assembly)

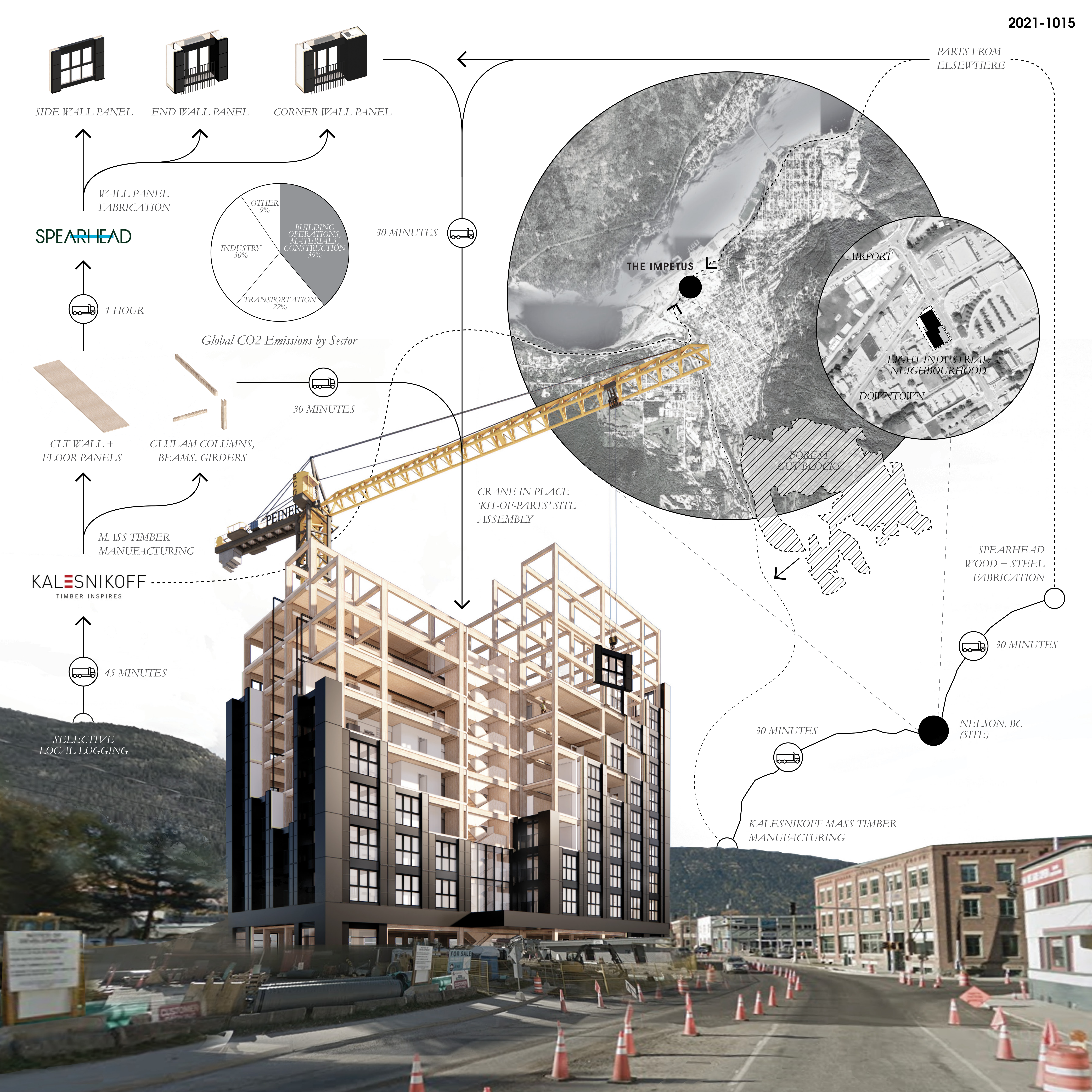
PREFABRICATED KIT-OF-PARTS
Columns, beams, girders, floor slabs, facade panels (+ typical units & standardized millwork)

AFFORDABLE HOUSING
Project conforms to BC Housing design guidelines and qualifies for provincial funding

LOCAL INVESTMENT
Nelson Cares Society is a non-profit committed to providing equitable housing for all



- 12 STOREY MASS TIMBER**
Maxed out BCBC allowable mass timber construction height = profitable venture
- BIOPHILIA**
L2 & L10 rooftop gardens + natural wood proven to increase health and well-being
- FACADE INTEGRATED HRV**
Decentralized displacement ventilation integrated into modular facade panels
- PHOTOVOLTAIC WALL PANELS**
Thin film solar panels integrated into facade system to supply localized energy for units
- ZERO WASTE CLT FLOOR GRID**
12'x60' typ. CLT manufacturing size used as building grid to eliminate off-cut material
- CLT EXTERIOR + SHEAR WALLS**
CLT used for its strength and fire resistant capabilities, ease of manufacturing, and warmth



Title of Project: The Impetus

Project Location: Nelson, BC, Canada

Design Intent: Mass timber kit-of-parts with an emphasis on sustainability & equitable multi-family housing.

Off-Site Plan: Selective local logging, mass timber manufacturing at Kalesnikoff, wood and steel fabrication (façade panel manufacturing) at Spearhead—all trucked to site within 1-hour distances.

On-Site Assembly Plan: Crane in place kit of parts assembly (beams, columns, wall panels) with simple connection details.

Text Description:

Nelson, located in the Selkirk Mountains on the West Arm of Kootenay Lake in the Southern Interior of British Columbia, is rapidly growing, and undergoing a major demographic shift with an increasing demand for housing. As a result, the City has set forth initiatives to promote innovative affordable housing solutions. There's opportunity to develop affordable mixed-housing communities with market and rental units that accommodate young professionals, seniors, low-income families, and supportive housing through the implementation of sustainable materials and methods. This strategy for scalable, modular housing can be jump-started and set in motion by the Impetus.

The Impetus is predicated on the idea that mass timber construction is beneficial to both the environment and the construction process. Building, operations, materials, and construction account for 39% of global CO2 emissions, with building materials independently accounting for 11% of global carbon emissions. Building in mass timber reduces embodied carbon emissions and uses the building for carbon sequestering, entering into net-zero and net-positive buildings. Wood prefabrication results in a 75% reduction of waste compared to steel, with timber's strength-to-weight ratio 20% more than steel and 4-5 times higher than reinforced concrete, allowing for larger truckloads, and reduced transportation costs. Through speed of assembly, prefabrication will decrease the amount of on-site construction and be less disruptive to the surrounding environment.

The floor plate and grid for this project is driven by the standardized 12' x 60' manufactured CLT panel module size for zero-waste, which drives the dimensions of the studios, 1-bedroom, 2-bedroom, and 3-bedroom units. The units are fully accessible and conform to BC Housing Design Guidelines, qualifying the project for provincial funding. The unit modules can be arrayed in a variety of orientations at a range of scales, producing diverse architecture. This project tops out at the max-allowable 12-storey mass timber construction height under BCBC regulations to maximize mass timber profitability.

There are nearby sustainably regulated forest cut blocks (no old growth trees) that will be utilized with mass timber manufacturer Kalesnikoff. The cut blocks are just south of Nelson and the logs will be trucked to Kalesnikoff, about 45 minutes west, where CLT walls + floor panels and glulam beams + columns will be manufactured and trucked 30 minutes to site (beams, columns, floors) or 1 hour east to Spearhead (wall panels) where the prefabricated façade walls will be manufactured and trucked to site 30 minutes away. The façade panels will include integrated decentralized displacement ventilation (façade integrated HRVs) with energy supply for each unit powered by façade integrated photovoltaic solar panels that tie into in-suite mechanical conduits. The wall space required for mechanical equipment will be used to create small balconies on the ends of each unit. Once the kit-of-parts are trucked to site they will be easily craned-in-place with simple timber notched connection details and façade mounted steel clips.

The Impetus empowers the notion that modular construction, sustainable design, and affordable housing can be weaved together to create simple yet elegant buildings through practical design solutions that have lasting positive impact on the community and the environment.