UTILIZING MASS TIMBER

A Case Study on the Rapid Housing Initiative

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Managing Principal
Jan. 16, 2024
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Disclaimer: This presentation was developed by a third party and is not funded by WoodWorks or the Softwood Lumber Board.
AGENDA

01
Our Pursuit of Mass Timber

02
Rapid Housing Response

03
1470 Blockline Rd. Case Study

04
Next Steps for Mass Timber Housing
OUR PURSUIT OF MASS TIMBER

‘Almost’ Mass Timber Project No. 1
THE WALTER
description
5-STOREY MID-RISE, INFILL RESIDENTIAL APARTMENT W/ 38 DWELLING UNITS
completed
2017
construction type
HAMBRO
why not mass timber
COST & SUPPLY UNCERTAINTY

‘Almost’ Mass Timber Project No. 2
GLOVE BOX
description
ADAPTIVE RE-USE/ADDITION, CLASS A OFFICE AS PART OF A DOWNTOWN INTENSIFICATION
completed
2022
construction type
CAST IN PLACE
why not mass timber
COMPLEXITY & BUILDING CODE

‘Almost’ Mass Timber Project No. 3
WOODin
description
OFFICE PROTOTYPE W/ RESEARCH FUNDING THROUGH NRCAN - GREEN CONSTRUCTION THROUGH WOOD.
completed
--
construction type
MASS TIMBER
why not mass timber
GLOBAL PANDEMIC
'Almost' Mass Timber Project No. 1

THE WALTER

CROSS LAMINATED TIMBER (CLT)

SYSTEM DESCRIPTION:
Cross-laminated timber (CLT) is a wood panel consisting of layers of dimension lumber glued to form structural panels with exceptional strength, dimensional stability, and rigidity. CLT is well suited to floors, walls and roofs used in mid-rise construction. The wall and floor panels may be left exposed in the interior which provides additional aesthetic attributes.

BUDGET: See attached.

SCHEDULE IMPACT:
- Panels are prefabricated with pre-cut openings;
- Components are lifted into place by crane and assembled by carpenters using hand tools;
- Building Permit resubmission is required with an Alternate Solution to expose ceilings.

SUSTAINABILITY:
- Naturally occurring and renewable;
- Sourced from sustainably managed forests;
- Can contribute to reduced carbon footprint;
- Can contribute to occupant sense of well-being;
- Improved thermal resistance;
- Outperforms steel and concrete in terms of embodied energy, air and water pollution.

MARKETABILITY:
- Ability to market the project for its sustainable features and distinctive wood interiors.

BRANDING POTENTIAL:
- Unique amongst competition;
- Distinction associated with being the first project of its kind in the region.

HAMBRO

SYSTEM DESCRIPTION:
The Hambro composite floor system combines open web steel joists with steel deck and a transversely reinforced concrete compression slab. The system accommodates spans of up to 43 ft. and large web openings enable passage of various mechanical systems such as HVAC, electrical and plumbing components.

BUDGET: See attached.

SCHEDULE IMPACT:
- System components are site placed/ assembled;
- Forming/placement of cast-in place concrete loadbearing walls is time-consuming;
- Installation of floor framing is relatively quick;
- Building Permit resubmission is required.

SUSTAINABILITY:
- No tangible environmental benefits.

MARKETABILITY:
- Cost savings related to structure could be invested in higher level interior fixtures and finishes.

BRANDING POTENTIAL:
- No special attributes.
Almost Mass Timber Project No. 1

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BUDGET: See attached.

SCHEDULE IMPACT:
- System components are site placed/ assembled;
- Framing/placement of cast-in place concrete loadbearing walls is time-consuming;
- Installation of floor framing is relatively quick;
- Building Permit resubmission is required.

SUSTAINABILITY:
- No tangible environmental benefits.

MARKETABILITY:
- Cost savings related to structure could be invested in higher level interior fixtures and finishes.

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**OUR PURSUIT OF MASS TIMBER**

*Almost* Mass Timber Project No. 1

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OUR PURSUIT OF MASS TIMBER

‘Almost’ Mass Timber Project No. 2

GLOVE BOX
OUR PURSUIT OF MASS TIMBER

‘Almost’ Mass Timber Project No. 2
GLOVE BOX
OUR PURSUIT OF MASS TIMBER

'Almost' Mass Timber Project No. 3

WOODin
OUR PURSUIT OF MASS TIMBER

'Almost' Mass Timber Project No. 3

WOODin
THE RAPID HOUSING INITIATIVE (RHI)
The RHI is delivered by the Canada Mortgage and Housing Corporation (CMHC), under the National Housing Strategy (NHS).

The first round was announced in October 2020. Round 2 was announced in June 2021, and Round 3 is currently underway

In Round 1, $1 billion in available funding went towards projects that helped those in severe housing need, specifically:

- People at risk of, or experiencing homelessness
- People living in temporary shelters because of the COVID-19 pandemic

QUICK FACTS – ROUND 1:

- **Modular construction was required** and defined as “housing units that are partially or fully built in off-site (e.g., a factory, warehouse, or similar facility) by a qualified manufacturer and delivered to the site in whole or in parts.

- Cities Stream funding provided money directly to municipalities who could then pass along the funding directly to NFP organizations. Project Stream required the NFP’s to apply directly to CMHC. YWKW received their Cities Stream funding from the Region of Waterloo.

- At least 25 per cent of this new funding will go toward **women-focused housing** projects.

- The units will be **built within 12 months** of when funding is provided to program applicants.

- **The RHI takes a human rights-based approach to housing**, serving people experiencing or at risk of homelessness and other vulnerable people under the NHS, including women and children fleeing domestic violence, seniors, young adults, indigenous peoples, people with disabilities, people experiencing mental health and addiction issues, veterans, LGBTQ2 individuals, racialized and black Canadians, and recent immigrants or refugees.
Mass Timber Project No. 1

**YWKW TRANSITIONAL HOUSING**

EDGE assembled a team that was selected by the YWKW as the successful proponent to deliver 41 compact yet accessible 1-bedroom transitional housing units. Some specific features of the design included:

- Modular construction through mass timber CLT and Glulam pre-fabrication
- Completion of design, approvals AND construction within 1 year of contract award.
- Maximized the material efficiency and minimized the installation time
- Exposure of mass timber surfaces inside the building to impart a sense of warmth and well-being.

.Completed

2022

**construction type**

MASS TIMBER
1470 BLOCKLINE ROAD CASE STUDY
1470 BLOCKLINE ROAD CASE STUDY

CONSTRUCTION ADVISER
WALTERFEDDY

CLIENT
YW-KW

GENERAL CONTRACTOR
MELLOUL-BLAMEY

ARCHITECT
EDGE ARCHITECTS
*mcCallumSather

TRADES AND CONSULTANTS
MTE (CIVIL & STRUCTURAL), DEI (MECH & ELEC), DEAN LANE, STECHO ELECTRIC, MHBC, VORTEX FIRE, HGC, RDH

CMHC RHI CITIES STREAM

CITY OF KITCHENER

MASS TIMBER TRADE PARTNER
ELEMENT 5
In collab w/ CONTRACT FRAMING

REGION OF WATERLOO

ARCHITECT LED DESIGN-BUILD STRUCTURE
CONTRACTUAL CONNECTIONS
1470 BLOCKLINE ROAD CASE STUDY

**THE DESIGN BUILD PROCESS**

1. **PROPOSAL RESPONSE + PLANNING AND APPROVALS** [± 5 MONTHS]
   Architectural plans are adapted to the chosen site and submitted for any municipal approvals and permits. Element 5 develops shop drawings and begins manufacturing the structural components in their factory.

2. **SITE WORK BEGINS** [± 2 MONTHS]
   Once plans are approved, any site work and grading can commence. Meanwhile production continues on the structural components off-site at the element 5 factory. Any underground electrical and mechanical work is completed.

3. **FOUNDATION** [± 1 MONTHS]
   Slab on grade foundation is poured.

4. **SUPER STRUCTURE** [± 1 MONTH]
   Modular wall and floor panels arrive on site. They are then craned into place to create the superstructure.

5. **ROOF AND WALL PANELS** [± 1 MONTH]
   Modular roof and exterior wall panels arrive on site. They are then craned into place.

6. **COMPLETION** [± 4 MONTHS]
   Once the envelope is complete, interior finishing can be finished. Final site work and landscaping is completed at this time.
1 4 7 0  B L O C K L I N E  R O A D  C A S E  S T U D Y

1. CLT FLOOR + ROOF PANELS
   - Continuous span across multiple bearing walls for increased stiffness and reduced panel depth.

2. CLT WALL PANELS

3. GLULAM COLUMN

OPTIMIZED STRUCTURAL LAYOUT
Narrow building width (14m vs. 18m typical) responds to tapered property boundaries and also creates small unit sizes that meet client requirements.
1470 BLOCKLINE ROAD CASE STUDY

ADAPTABLE BUILDING & UNIT LAYOUT
Effective depth of a CLT panel. After accounting for the depth of char and the effects of heat exposure on the affected lamination, in this hypothetical example the panel’s effective depth is reduced from 5 to 3 plies. (CLT Handbook)
1470 BLOCKLINE ROAD CASE STUDY

ACOUSTICAL DESIGN
MOISTURE CONTROL STRATEGY

Photo 2.2c Moisture Content reading in CLT before membrane applied
1470 BLOCKLINE ROAD CASE STUDY
1470 BLOCKLINE ROAD CASE STUDY
NEXT STEPS FOR MASS TIMBER HOUSING

THE HOUSING CONTINUUM

HOMELESSNESS  
EMERGENCY SHELTER  
TRANSITIONAL HOUSING  
SUPPORTIVE HOUSING  
COMMUNITY HOUSING  
AFFORDABLE HOUSING  
MARKET HOUSING
NEXT STEPS FOR MASS TIMBER HOUSING

THE HOUSING CONTINUUM

HOMELESSNESS  EMERGENCY SHELTER  TRANSITIONAL HOUSING  SUPPORTIVE HOUSING  COMMUNITY HOUSING  AFFORDABLE HOUSING  MARKET HOUSING
NEXT STEPS FOR MASS TIMBER HOUSING

PASSAGE HOUSE
EAST GWILLIMBURY, ONTARIO

York Region & R-Hauz (18) 1-Bedroom Units
NEXT STEPS FOR MASS TIMBER HOUSING

1470 & 1480 BLOCKLINE RD (YWKW)  
KITCHENER, ONTARIO

Phase 1 (41) 1- Bedroom Units (for women)

Phase 2 (10) 2- Bedroom Units (for women & children)
NEXT STEPS FOR MASS TIMBER HOUSING

1480 BLOCKLINE RD PHASE 2
KITCHENER, ONTARIO
NEXT STEPS FOR MASS TIMBER HOUSING

1480 BLOCKLINE RD PHASE 2
KITCHENER, ONTARIO
NEXT STEPS FOR MASS TIMBER HOUSING

PASSIVE HOUSE SUPPORTIVE HOUSING PROJECT
HAMILTON, ON
HYBRID CLT, 6 Storey Affordable Housing Project
KITCHENER, ON
NEXT STEPS FOR MASS TIMBER HOUSING

QUUTAQ SOCIETY HOUSING
IQALUIT, NUNAVUT
NEXT STEPS FOR MASS TIMBER HOUSING

PINNGUAQ MAKER SPACE & APARTMENTS
IQALUIT, NUNAVUT
NEXT STEPS FOR MASS TIMBER HOUSING

The Missing Middle

Detached House  Duplex  Triplex, Fourplex, etc.  Townhouse  Low-Rise Apartment Building  Mid- & High-Rise Apartment Buildings
NEXT STEPS FOR MASS TIMBER HOUSING
QUESTIONS?

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This concludes The American Institute of Architects Continuing Education Systems Course.