



Mid-rise and Complete Communities

Six Storey Building Code Change

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25 March 2015

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9. Product Development
10. Towards a New Normal

Introduction

Quadrangle Architects



Introduction

Quadrangle Architects



- 299 Queen Broadcast Centre | Toronto, ON

Introduction

Growing up in The Netherlands



Introduction

Performance, Aesthetics and Creature Comforts



Introduction

Performance, Aesthetics and Creature Comforts



Introduction

Performance, Aesthetics and Creature Comforts



Introduction

Performance, Aesthetics and Creature Comforts



The Future is Here!

The Future is Here!

23 September, 2014 Ontario moves to allow Six in Wood

ON ONO



WEDNESDAY, SEPTEMBER 24, 2014 TORONTO STAR

Ontario

Ontario allows taller wood-framed buildings

» BUSINESS

Maximum height increased by 50 per cent, could help construction, forest industries

ROB FERGUSON
QUEEN'S PARK BUREAU

Developers are promising more mid-sized condo projects after Ontario followed through on a promise to allow wood-framed buildings up to six storeys.

The move...



The move, which takes effect Tuesday, follows the lead of British Columbia in 2009 by increasing the maximum height from four storeys after lobbying by the building and struggling forest industries.

Municipal Affairs and Housing Minister Ted McMeekin announced the change Tuesday, saying safety concerns have been met with measures such as requiring stairwells of noncombustible materials such as concrete and steel.

Allowing taller wood-framed buildings "will give builders and the public even safer, more affordable housing."

The Past... and Today...

The Past...

Where Trees Grow People Build With Wood



The Past...

Where Trees Grow People Build With Wood



Today...

Building Complete Suburban Communities in BC



Today...

Business As Usual



Today...

Capitalizing on Renewable Resources

**GROW,
CUT,
REPEAT...**



Today...

Speed, Ease, Quality and Cost

One Cubic Meter



- Concrete 410 kg Co2
- Seasonal Restrictions
- Multiple Trades
- Mixture Ratios
- \$175-200 /sqft



- Steel 8,200 kg Co2
- Conventional Lead-time
- Skilled Trades
- Specialized Connections
- \$95-97 /sqft



- Wood -1,000 kg Co2
- Reduced Timeline
- Lighter Modules
- Pre-Fabrication
- \$82-85 / sqft

Today...

Wide Range of Experience; Steel, Wood and Concrete



1919 Minnesota Court, Mississauga



HOT Condos, Mississauga



100 Broadview, Toronto

Today...

Speed, Ease, Quality and Cost



- Savings in construction time is invaluable considering influx of people and limited length of the building season



- Shorter learning curves for construction crews allow structures to be erected more quickly and with higher precision



- Engineered and structural wood systems are viable and possibly more sound



- Using cost effective materials allow six storey structures to be economically feasible

Today...

Research, Innovation and Education



Today...

Sophisticated Design and Construction



Intensification Strategies

Intensification Strategies

Housing Starts in Ontario

In the last five years we have seen a reversal of the number of single family homes versus Apartment/Condo units.

Jan - July

2010		Single	Semi	Row	Apt/ Condo	Total
		13,678	1,406	5,106	9,699	29,889

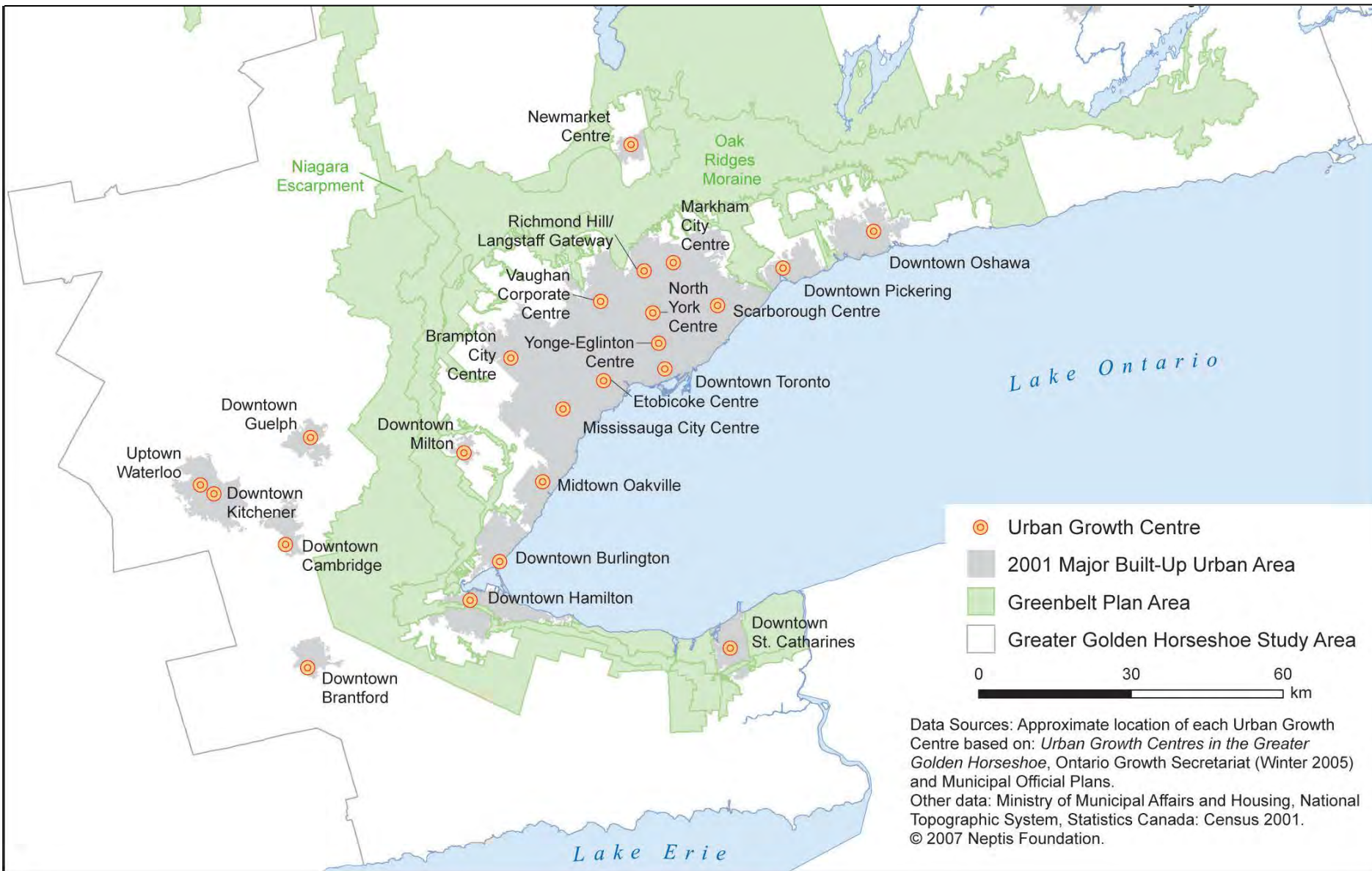
46% 5% 17% 32%

2014		Single	Semi	Row	Apt/ Condo	Total
		10,468	1,465	5,120	14,486	31,539

33% 5% 16% 46%

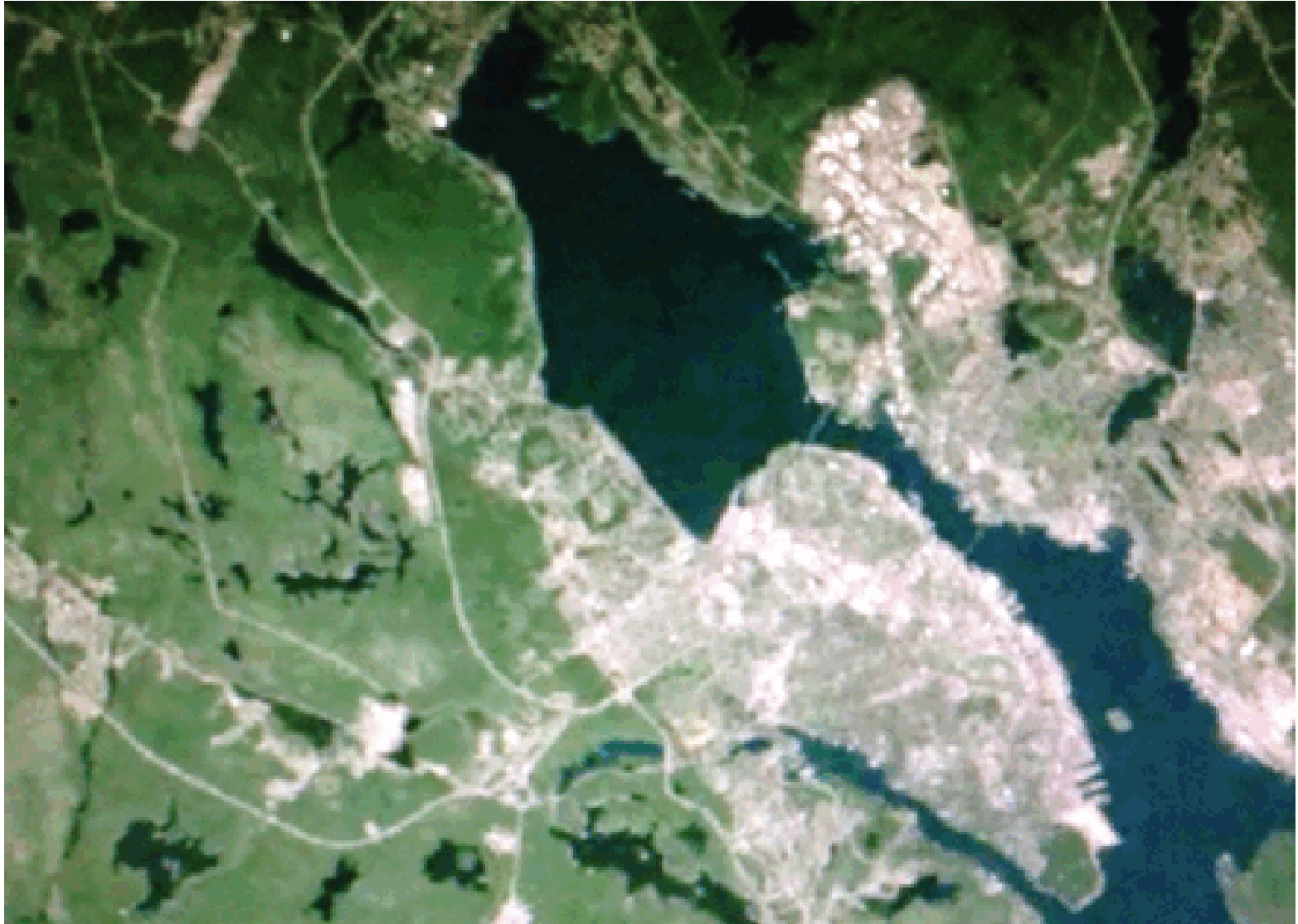
Intensification Strategies

Places to Grow Act (2005) – Growth Centres in the GTA



Intensification Strategies

Halifax's Urban Growth – from 1984 to 2012

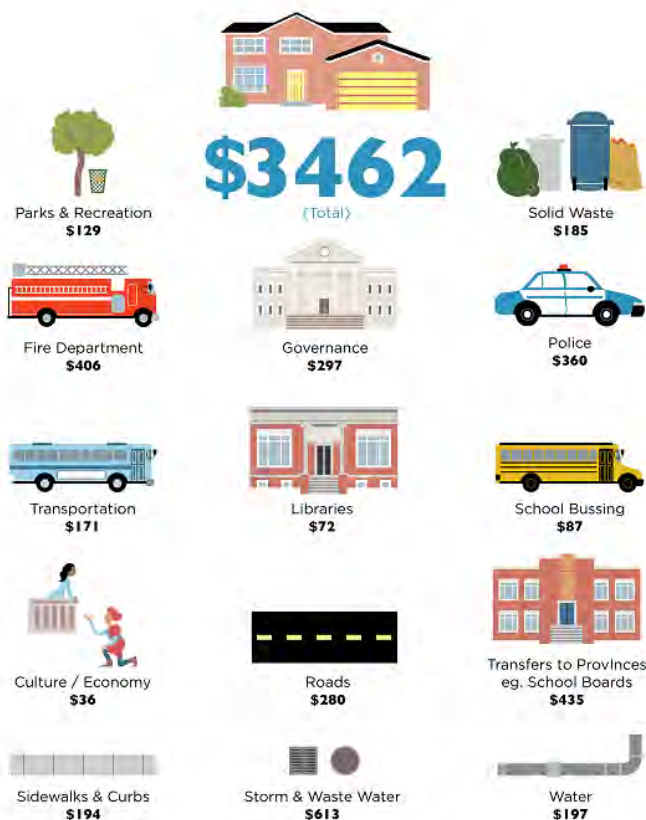


Intensification Strategies

The Cost of Development

Suburban

City's Annual Cost, per Household



Urban

City's Annual Cost, per Household



For more data and more reports, visit thecostofsprawl.com

Data based on Halifax Regional Municipality

Intensification Strategies

Curbing Sprawl



Intensification Strategies

Transition From Urban to Suburban



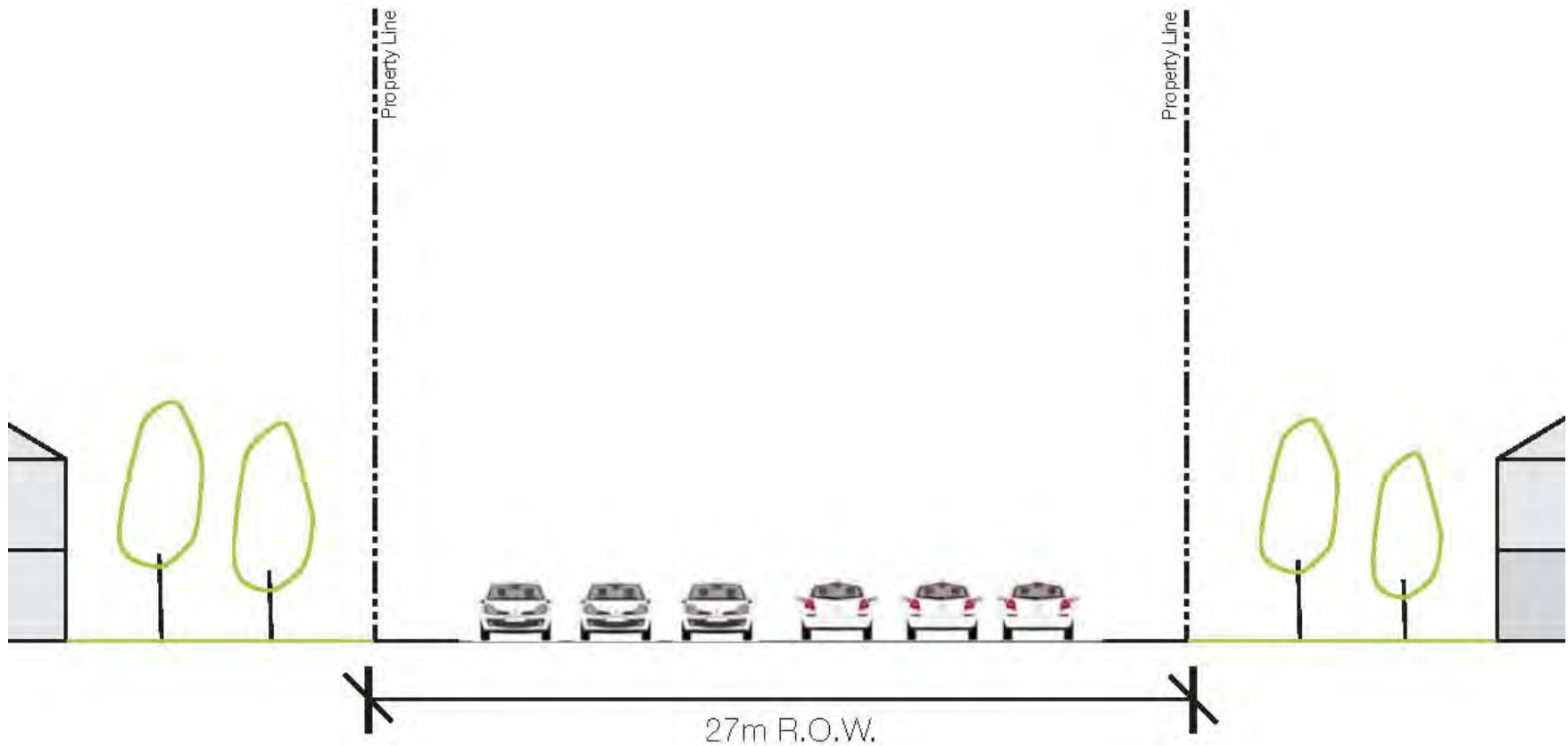
Intensification Strategies

Suburban Right-of-Way



Intensification Strategies

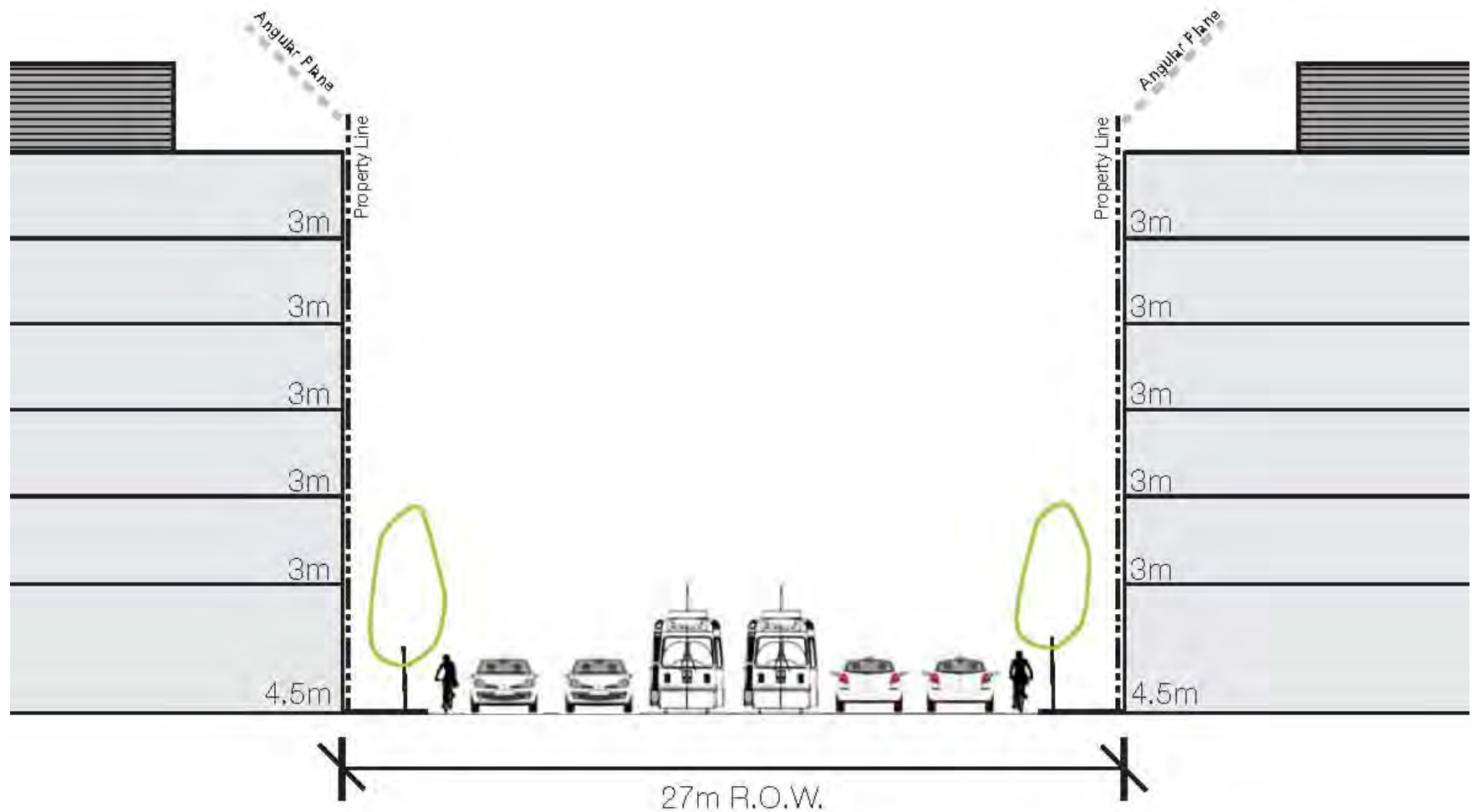
Suburban Right-of-Way



27m Suburban Street

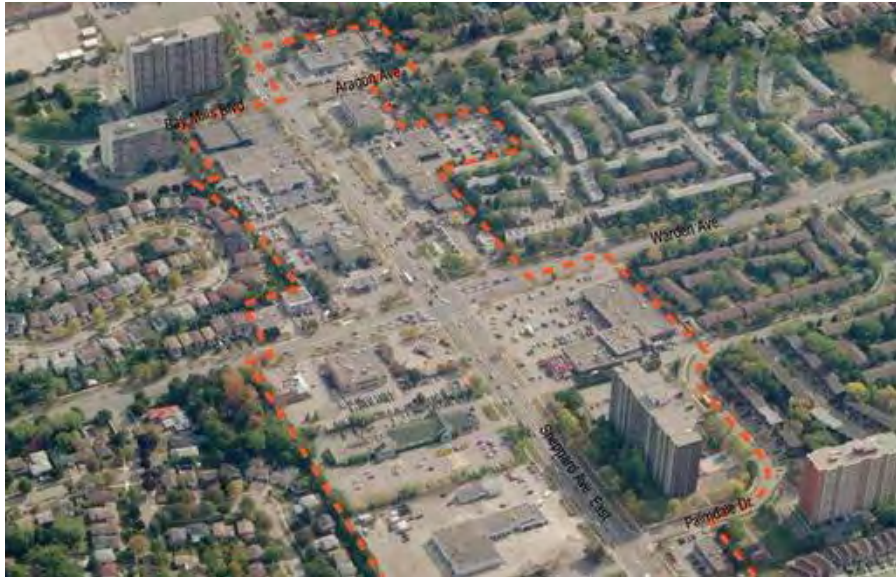
Intensification Strategies

Mid-rise Mixed-use Potential



Intensification Strategies

Mid-rise Mixed-use Potential



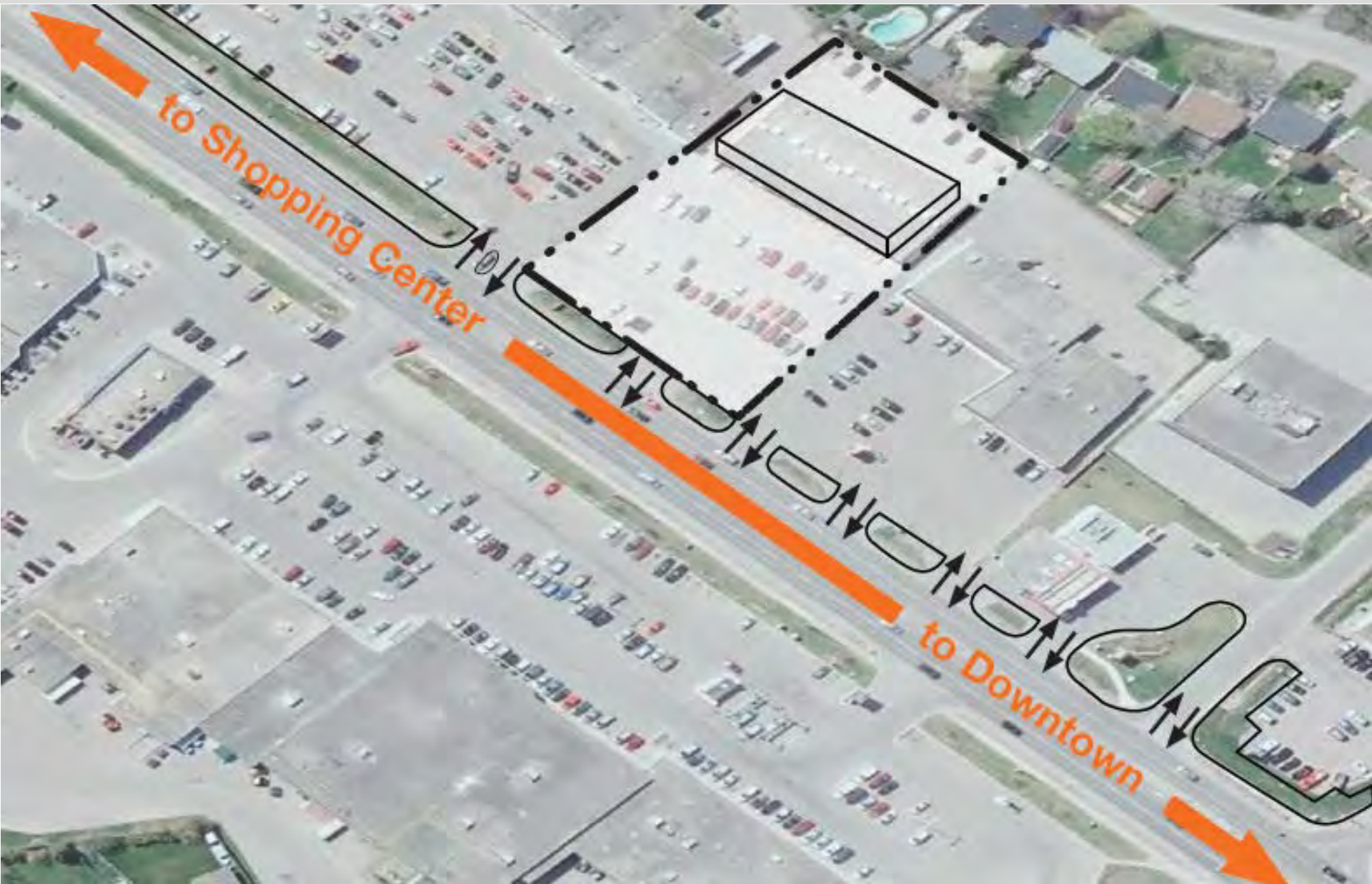
[3/24/15, 7:49 AM](#)

Absorbing 1/4 of our new growth, Avenues are well served by transit and expected to develop incrementally over time.

pic.twitter.com/GCQb9aw19z

Intensification Strategies

Mid-rise Mixed-use Potential



Intensification Strategies

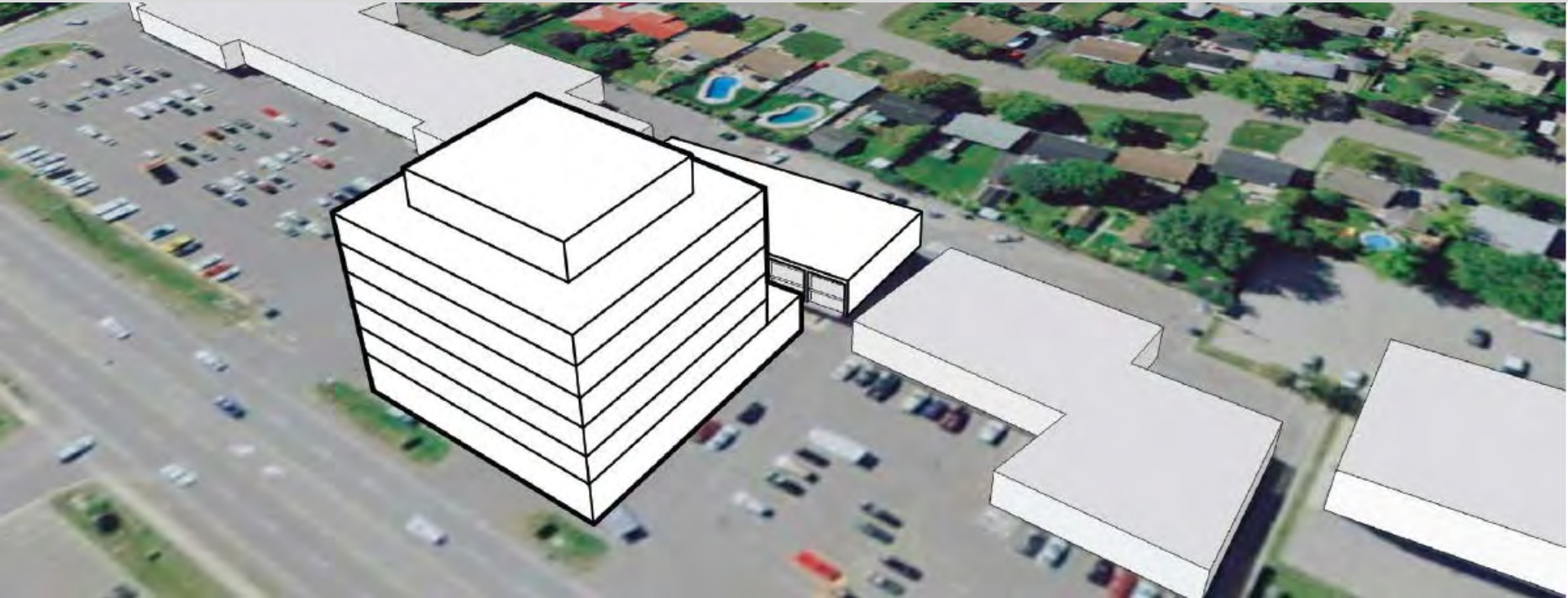
Mid-rise Mixed-use Potential



- Create appealing built form
- Provide landscaped public space

Intensification Strategies

Mid-rise Mixed-use Potential



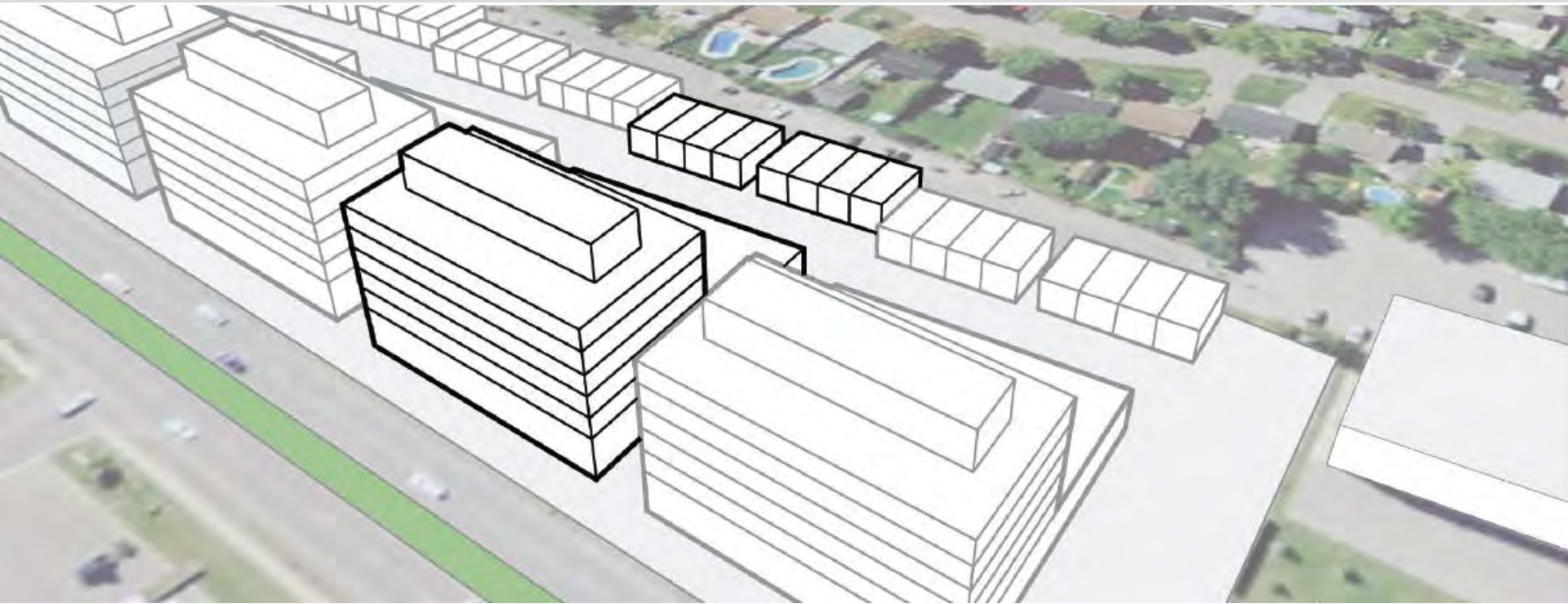
- Add multi storey commercial building

Challenge:

- Requires approvals for additional density

Intensification Strategies

Mid-rise Mixed-use Potential



- Mid-rise with retail along the street

Challenge:

- Requires re-zoning to allow mixed use

Intensification Strategies

Intensification Strategies in the Nineties



Intensification Strategies

Our “Near Urban” Locations



Intensification Strategies

Intensification Strategies Today



Six Storey Visualization of HOT Condominiums, Mississauga, Ontario

Master Planning

Master Planning

People First; Transit and Pedestrian Oriented Development

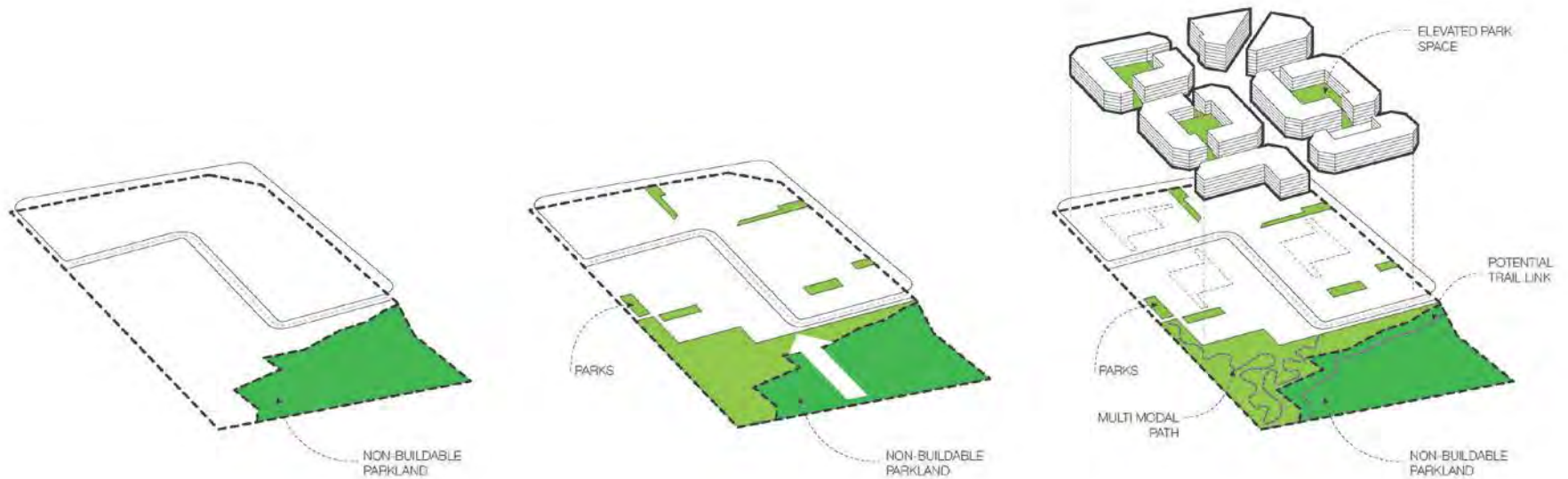


Master Planning

Inspired by Barcelona

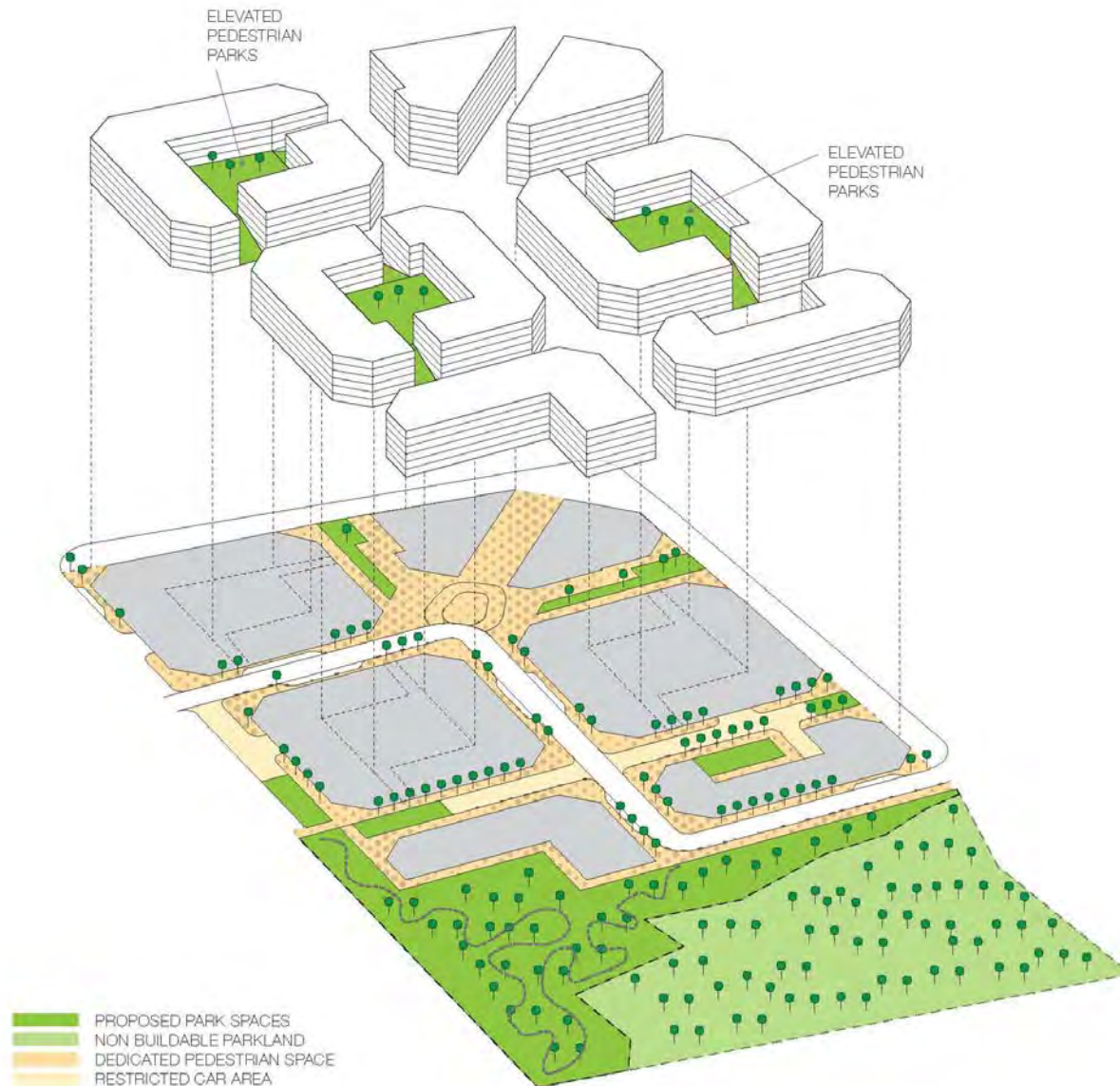


Accommodating Mid-rise Mixed Use Buildings



Master Planning

Accommodating Streets and Parks



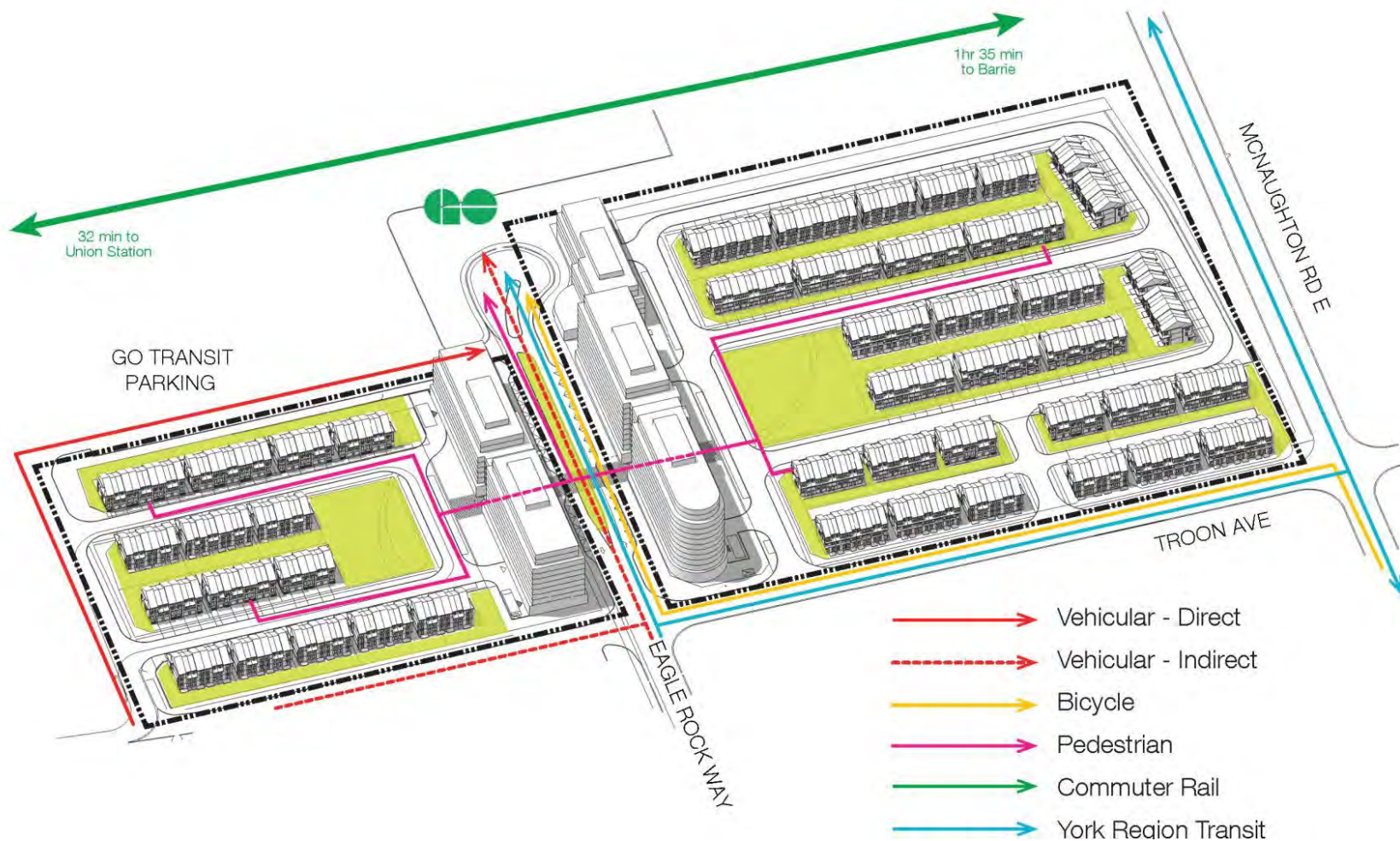
Master Planning

Mid-rise Mixed-use Potential



Master Planning

Maple Go Station, Vaughan



Master Planning

Places to Grow Community of the Year, 2012



2016 BUILT

- 1 - 1200 Residential Condominiums & Community Retail
- 2 - 180 Luxury Townhomes
- 3 - Public Park
- 4 - Viva Surface Transit Station
- 5 - Marriot Hotel (Full Service) & Condominium and Retail
- 6 - 2400 Seat Cineplex
- 7 - 100,000 sf Restaurant and Retail, 80,000 sf Office
- 8 - Office Building
- 9 - Carousel and Skating Rink
- 10 - Honeywell Office Building
- 11 - 200,000 sf Office Building
- 12 - Mixed Use Retail / Office Residential / Whole Foods

2016 - 2026

- 13 - Residential
- 14 - Office
- 15 - Parking Structure
- 16 - Retail
- 17 - Proposed Arena
- 18 - Public Park

FULL BUILDOUT

Residential	7000 units
Retail	2.2 million square feet
Office	3.4 million square feet

Master Planning

Places to Grow Community of the Year, 2012



Master Planning

Rouge Bijou, Aviva and Main Street in Downtown Markham



Master Planning

Pan/Parapan American Games Athletes' Village, Toronto



Master Planning

A Brand New Neighbourhood

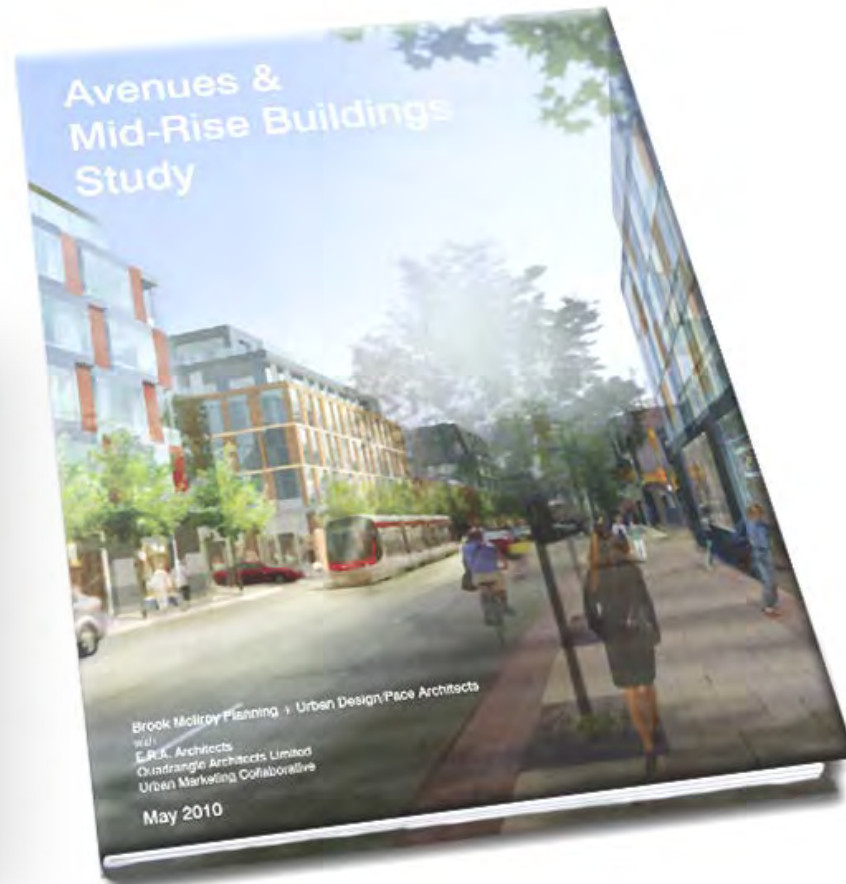
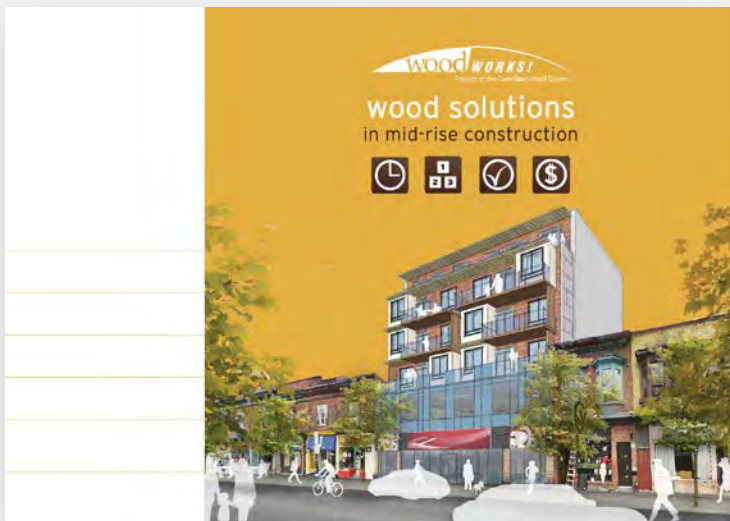


What is Mid-rise?

What is Mid-rise?

Providing Performance Criteria

- Avenues and Mid-rise Buildings Study
for the City of Toronto!
- Wood Solutions in Mid-rise Construction
for WoodWORKS!



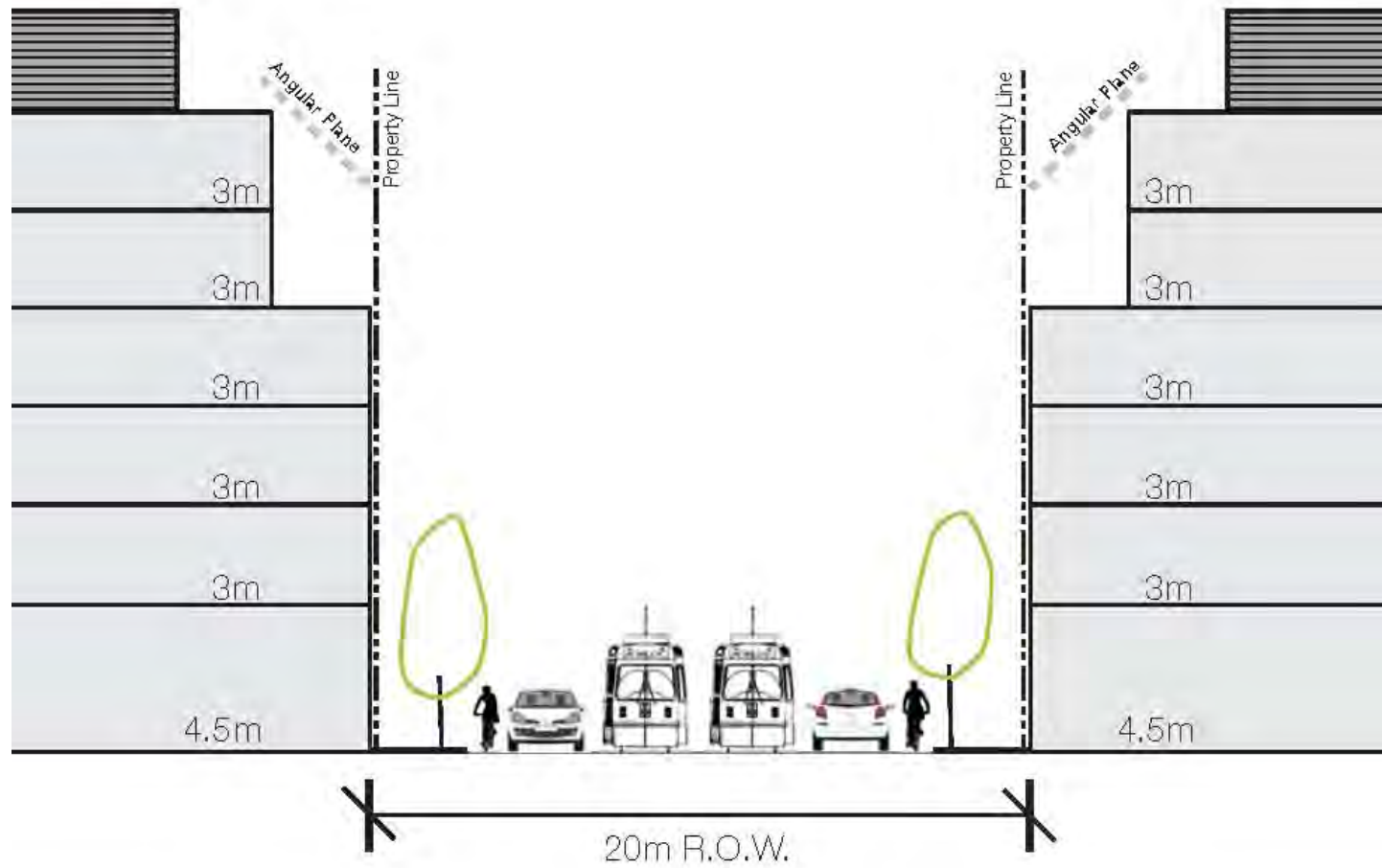
What is Mid-rise?

Urbanization Opportunity



What is Mid-rise?

Urban Main Street Right-of-Way



What is Mid-rise?

Main Street Revitalization



What is Mid-rise?

Main Street Revitalization



What is Mid-rise?

Main Street Revitalization



What is Mid-rise?

Classic Prototype



What is Mid-rise?

Urban Renewal



Corktown Phase III | Toronto, ON

What is Mid-Rise?

Suburban Intensification



Viva Condominiums | Markham, ON

What is Mid-Rise?

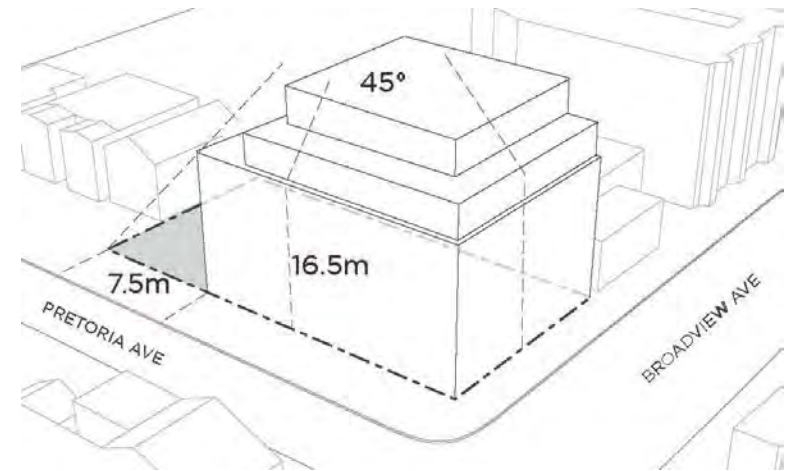
Small Town Insertion



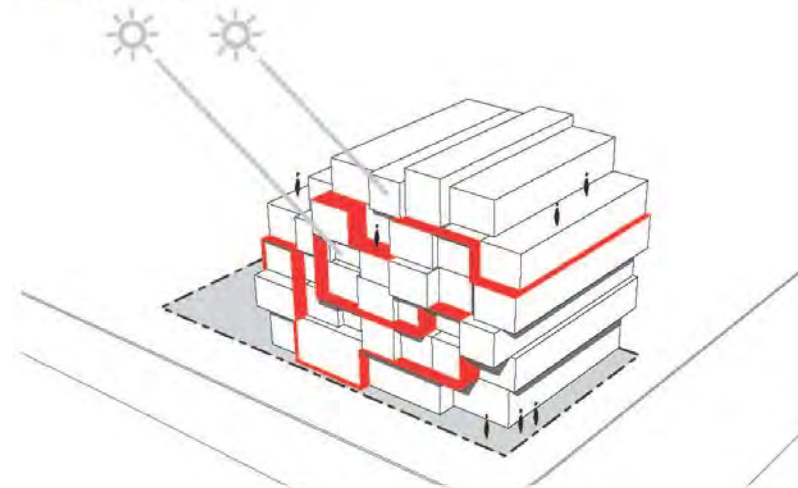
The 42 | Waterloo, ON

What is Mid-Rise?

838 Broadview Avenue, Toronto



OPPORTUNITY FOR LIGHT
TO REACH INTO UNITS



838 Broadview Avenue | Toronto, ON

What is Mid-Rise?

1990 Bloor Street West, Toronto



Tumbling
Geometries



SETBACKS AND CONTEXT



AS OF RIGHT MASSING

The High Park | Toronto, ON

What is Mid-Rise?

Animating the Façade at 2803 Dundas West, Toronto



Duke | Toronto, ON

What is Mid-rise?

799 College Street, Toronto



2013

Toronto Urban Design Awards

AWARD OF EXCELLENCE
PRIVATE BUILDINGS IN CONTEXT
— MID-RISE

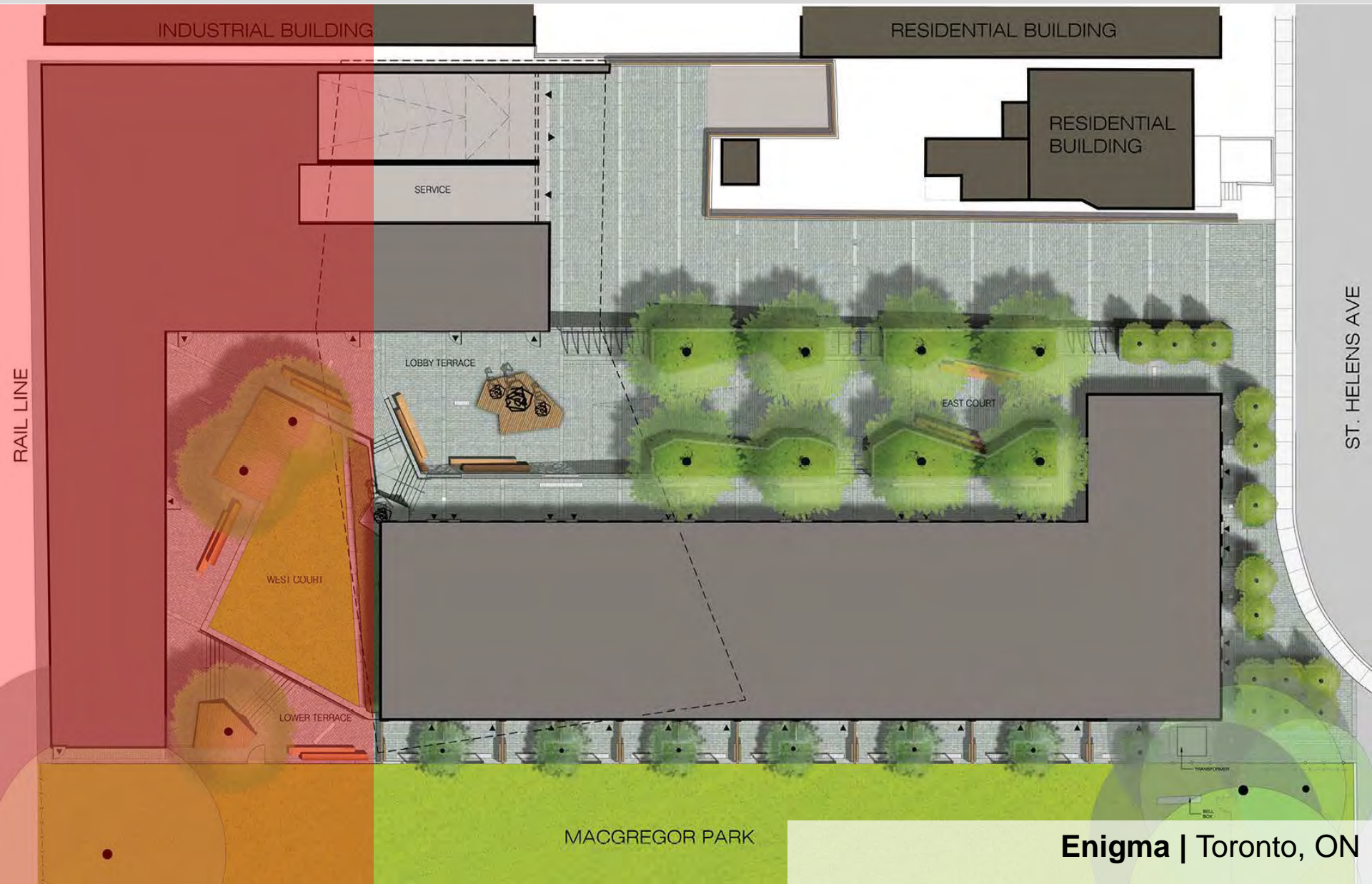
What is Mid-Rise?

Mixed use at 138 St Helens Avenue, Toronto



What is Mid-Rise?

Mixed use at 138 St Helens Avenue, Toronto



What is Mid-Rise?

Mixed use at 138 St Helens Avenue, Toronto



Enigma | Toronto, ON

What is Mid-Rise?

Mixed use at 138 St Helens Avenue, Toronto

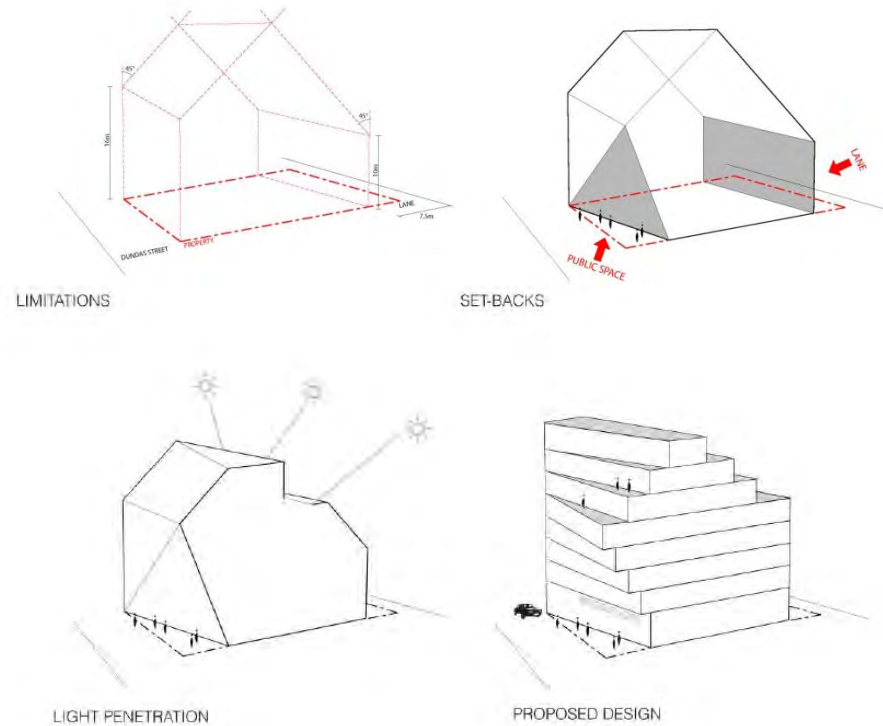


What is Mid-Rise?

1245 Dundas Street West, Toronto



Concept design RAW | partner in charge Richard Witt



Abacus Lofts | Toronto, ON

What is Mid-Rise?

1245 Dundas Street West, Toronto

PROPOSED BUILDING STATS

8 STOREYS

300sm retail

3196sm residential / 43 units

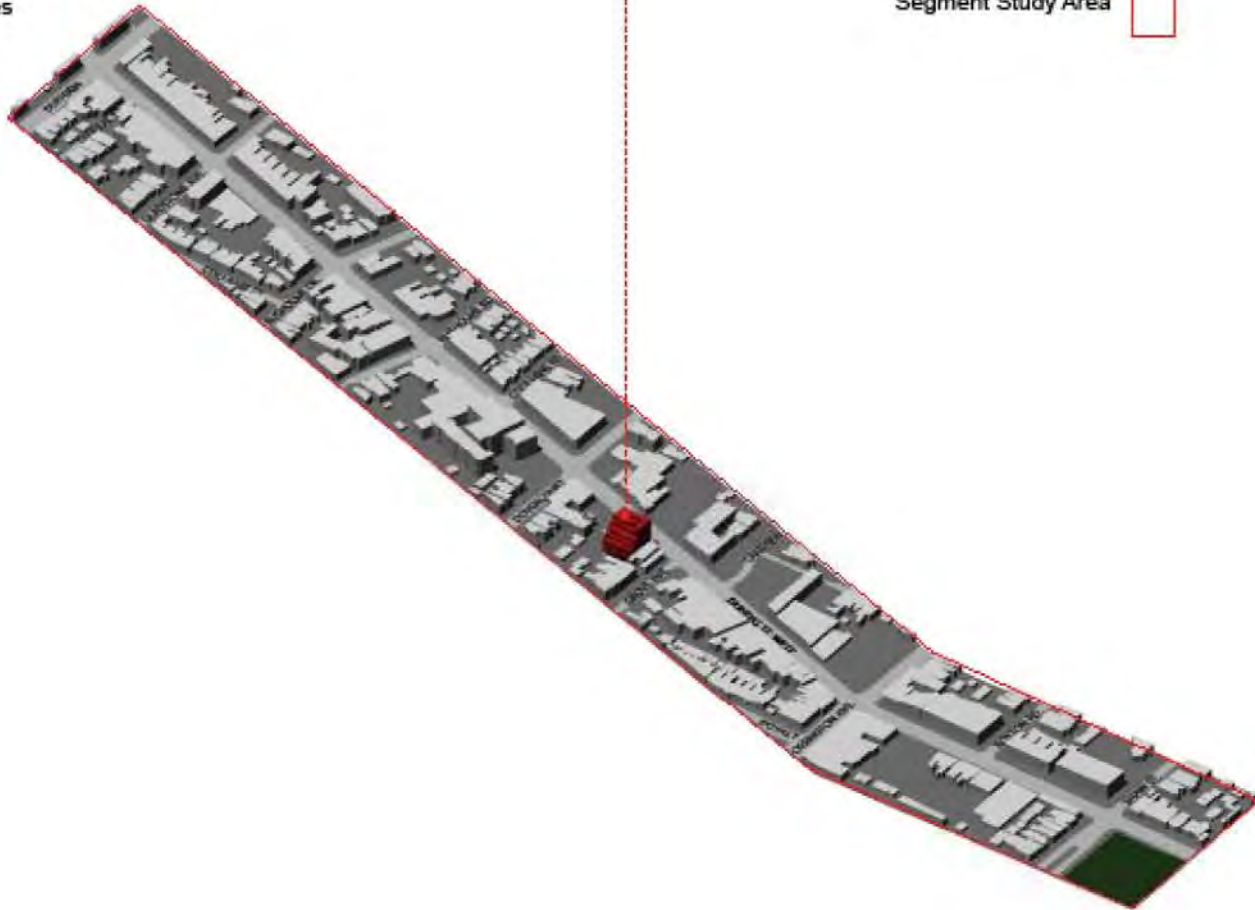
30 parking spaces

32 bikes

Proposed Building



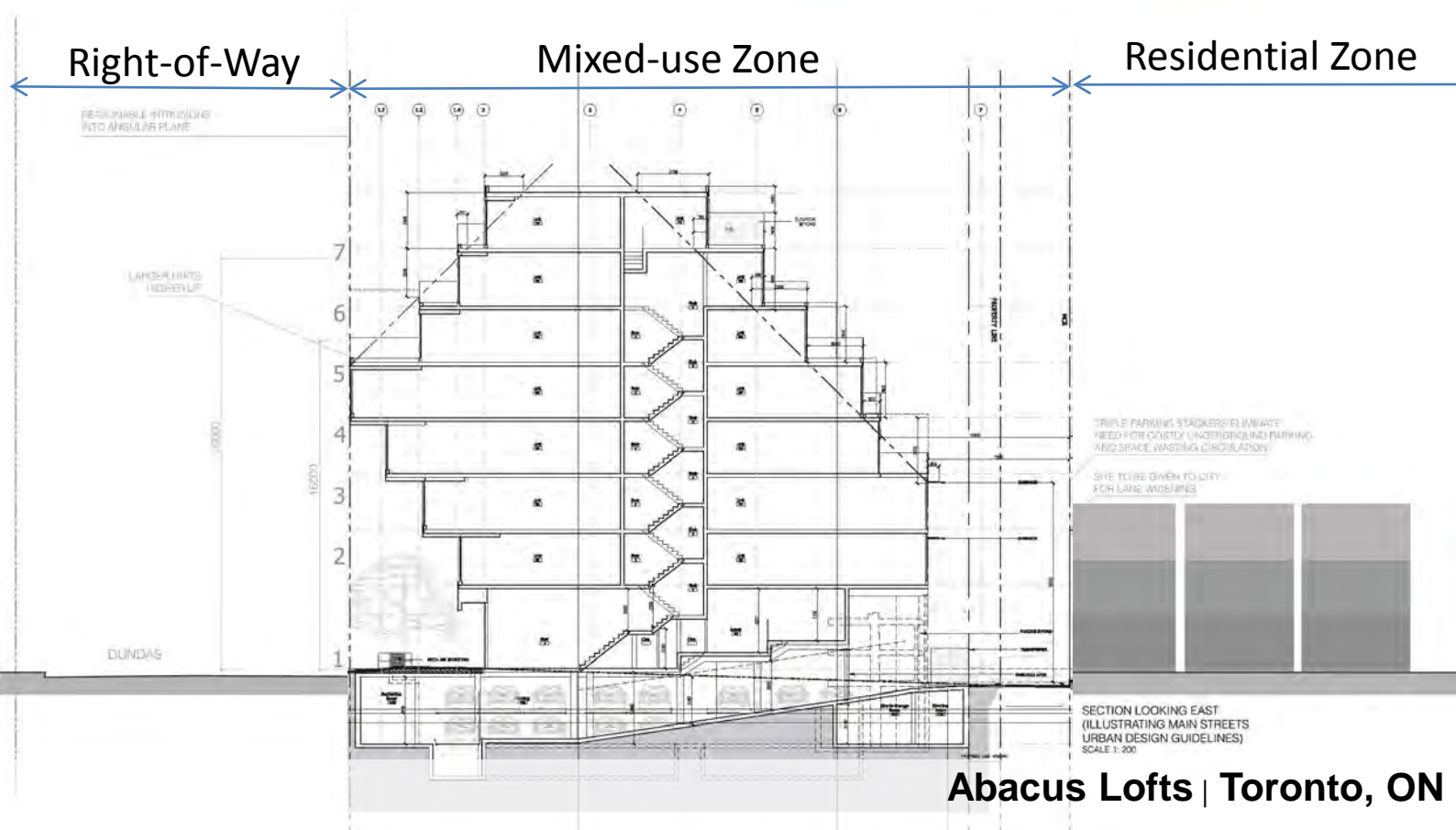
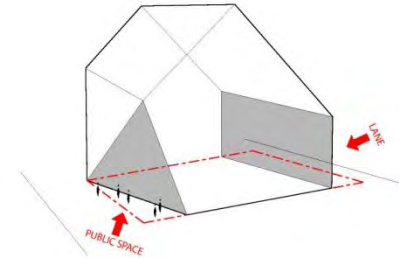
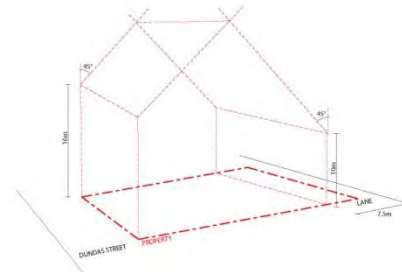
Segment Study Area



Abacus Lofts | Toronto, ON

What is Mid-Rise?

1245 Dundas Street West, Toronto



Abacus Lofts | Toronto, ON

What is Mid-Rise?

1245 Dundas Street West, Toronto



Abolishing the Myths

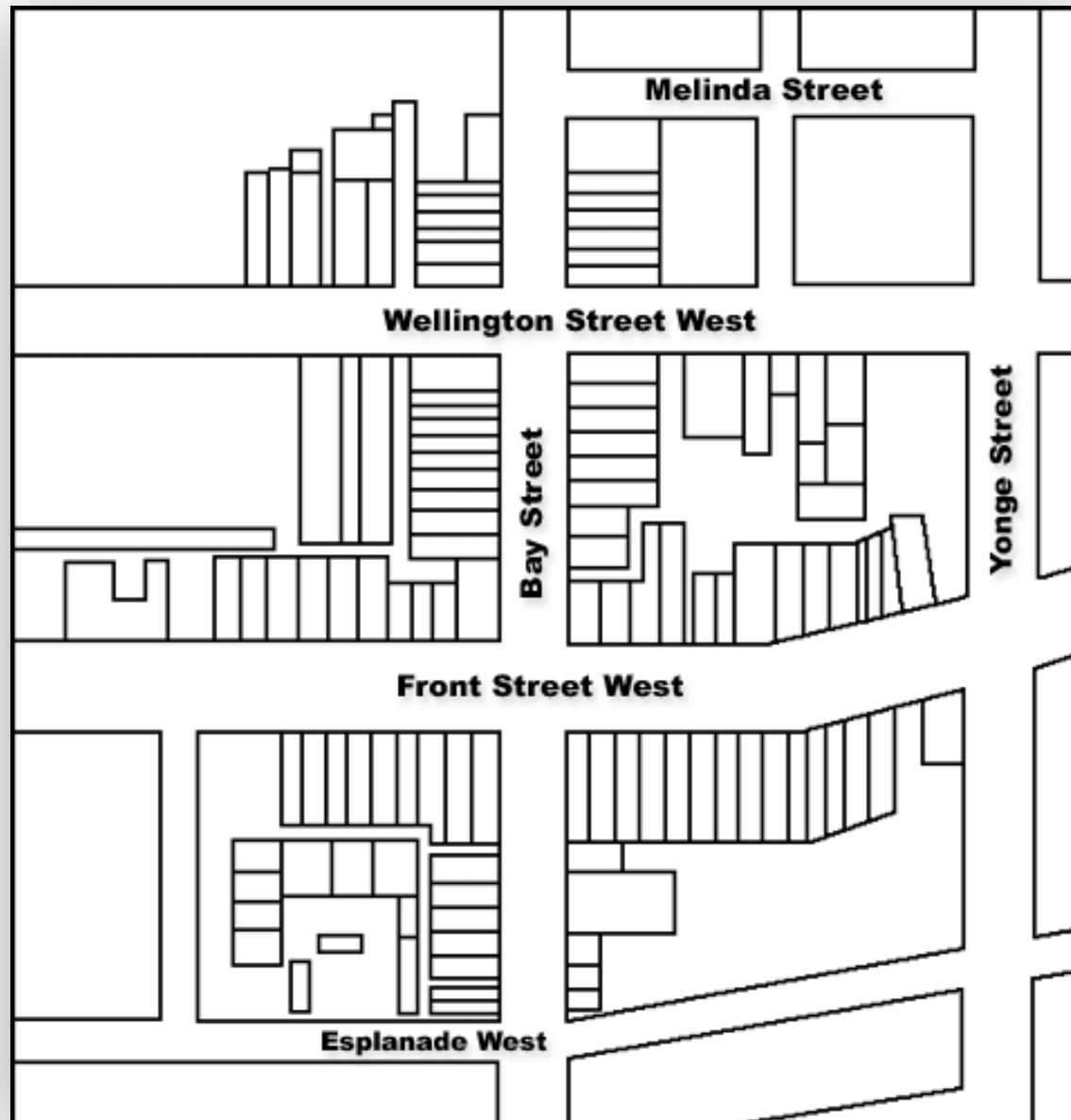
Abolishing the myths

Wood Burns



Abolishing the myths

Toronto's Great fire - 1904



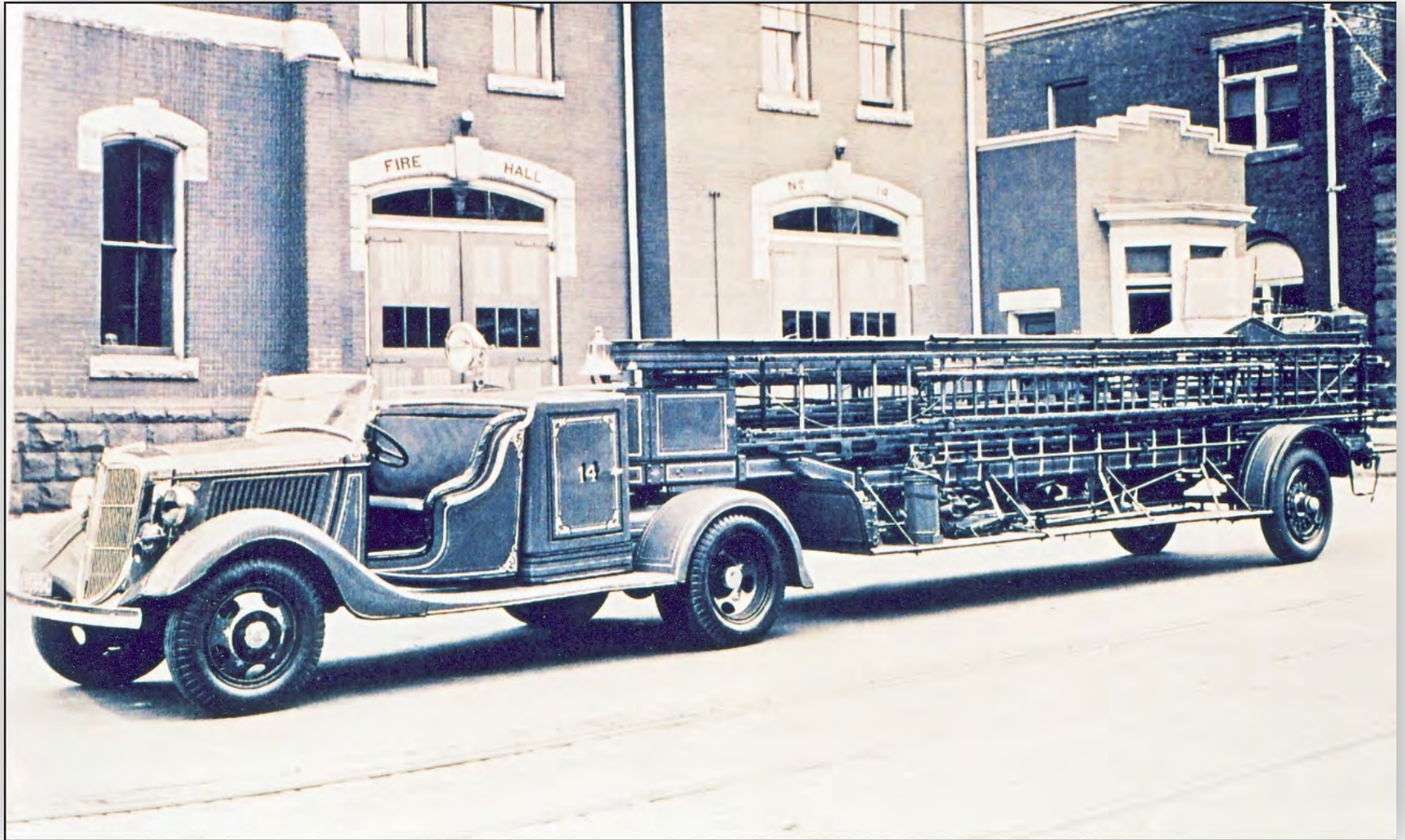
Abolishing the myths

Toronto's Great Fire - 1904



Abolishing the myths

Toronto's Aerial Ladder Truck – 1935 (OBC 1941)



Abolishing the myths

Fire Fighting Today – Non-combustible Buildings



Abolishing the myths

Code Change in British Columbia



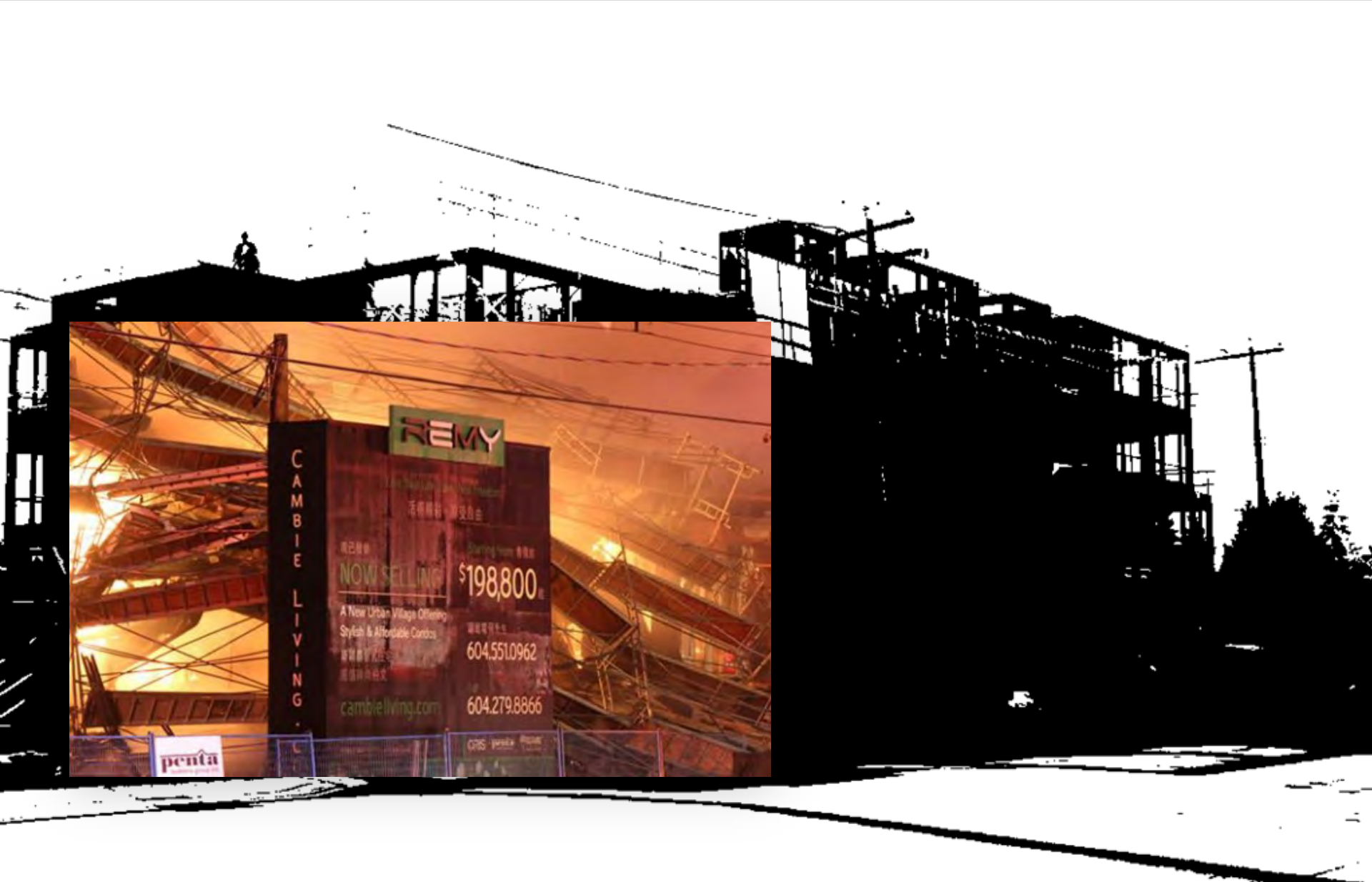
Abolishing the myths

Code Change in British Columbia



Abolishing the myths

Code Change in British Columbia



Abolishing the myths

Code Change in British Columbia



Building Code Change

Building Code Change

Urban Infill – Mixed Use Development



Building Code Change

Six Storey Code Change in Ontario – Mixed Use Development

Major Occupancy
C or D allowed:

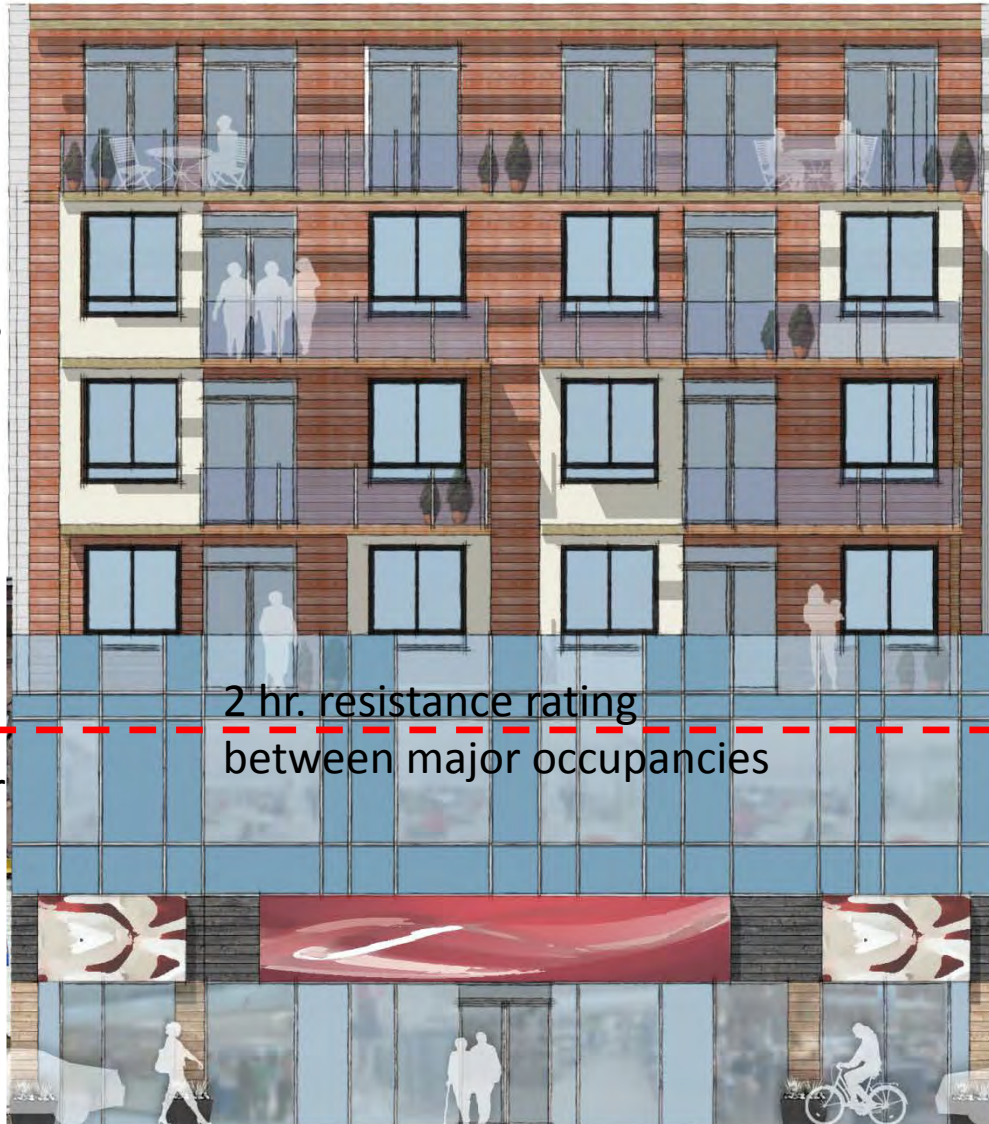
- Residential
- Business and
Personal Services

2 hr. resistance rating
between major occupancies

On 1st and 2nd Floor

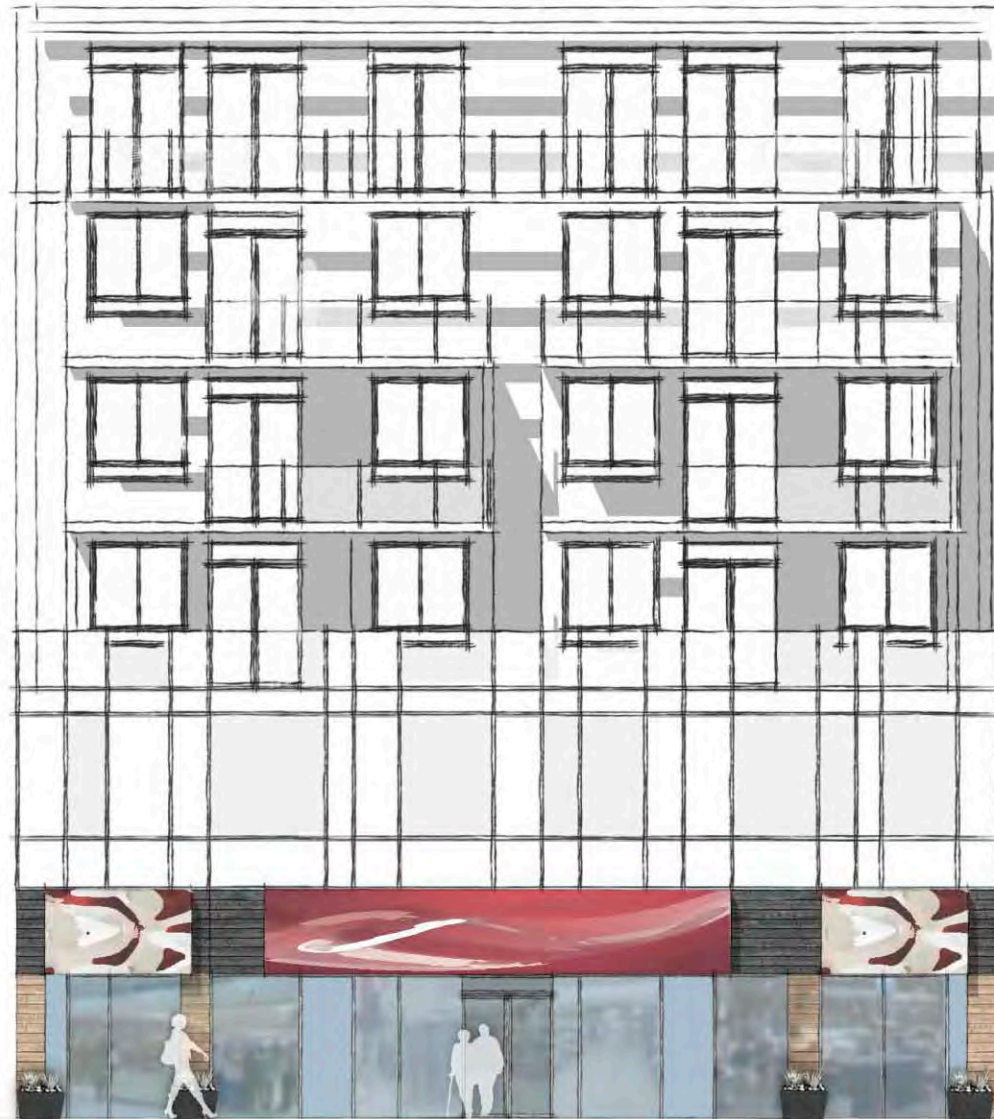
A division 2 or
E permitted:

- Assembly
- Mercantile



Building Code Change

Six Storey Code Change in Ontario – Mixed Use Development

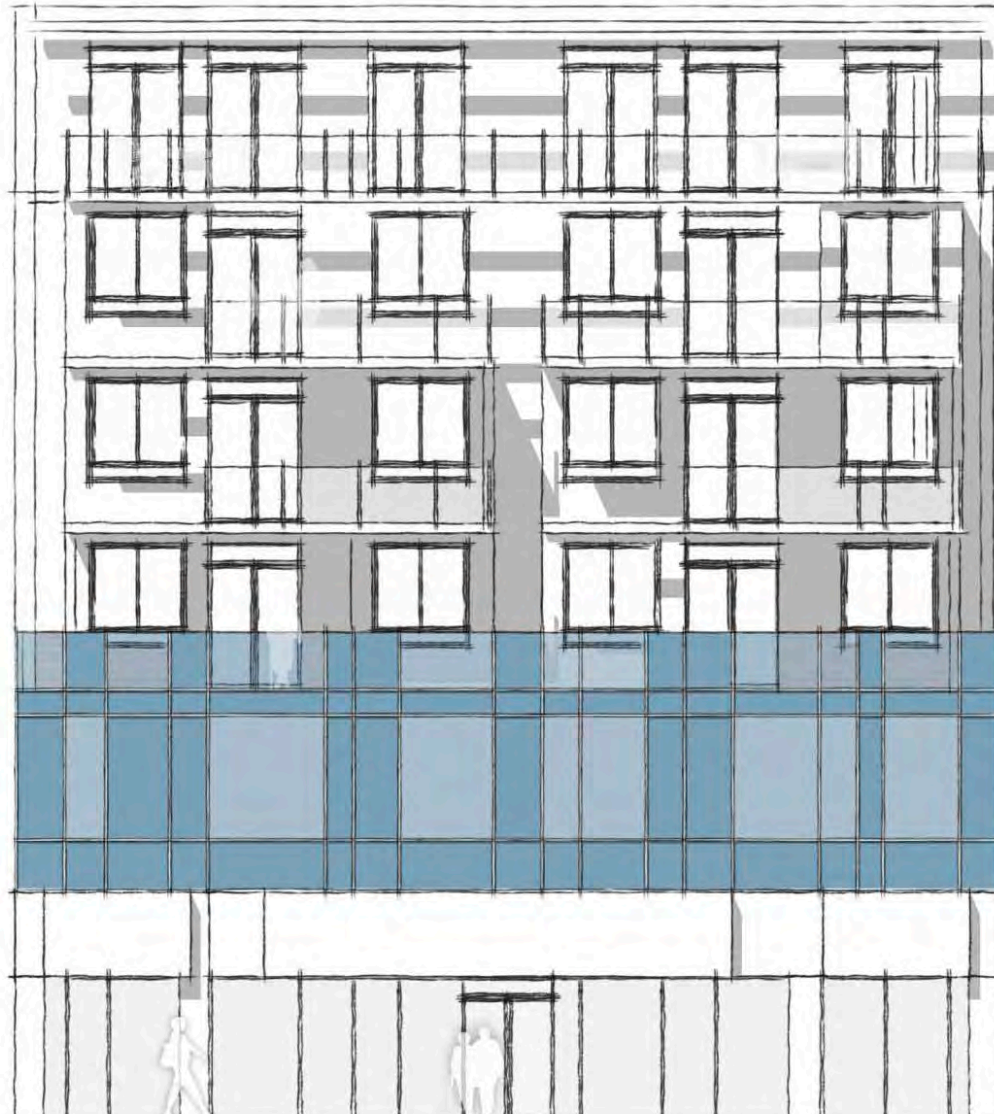


Retail

Building Code Change

Six Storey Code Change in Ontario – Mixed Use Development

Office



Building Code Change

Six Storey Code Change in Ontario – Mixed Use Development

Residential



Building Code Change

Six Storey Code Change in Ontario – Mixed Use Development

Residential

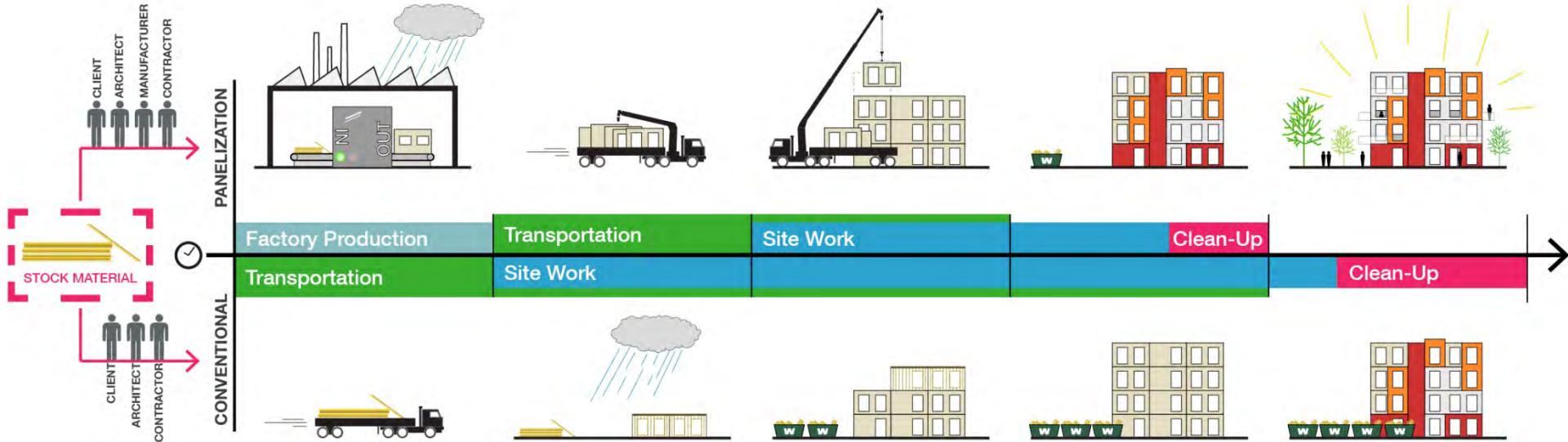
18 m
MAX.



Product Development

Product Development

Construction Methods



Product Development

Product Development



moses structural
engineers

Product Development

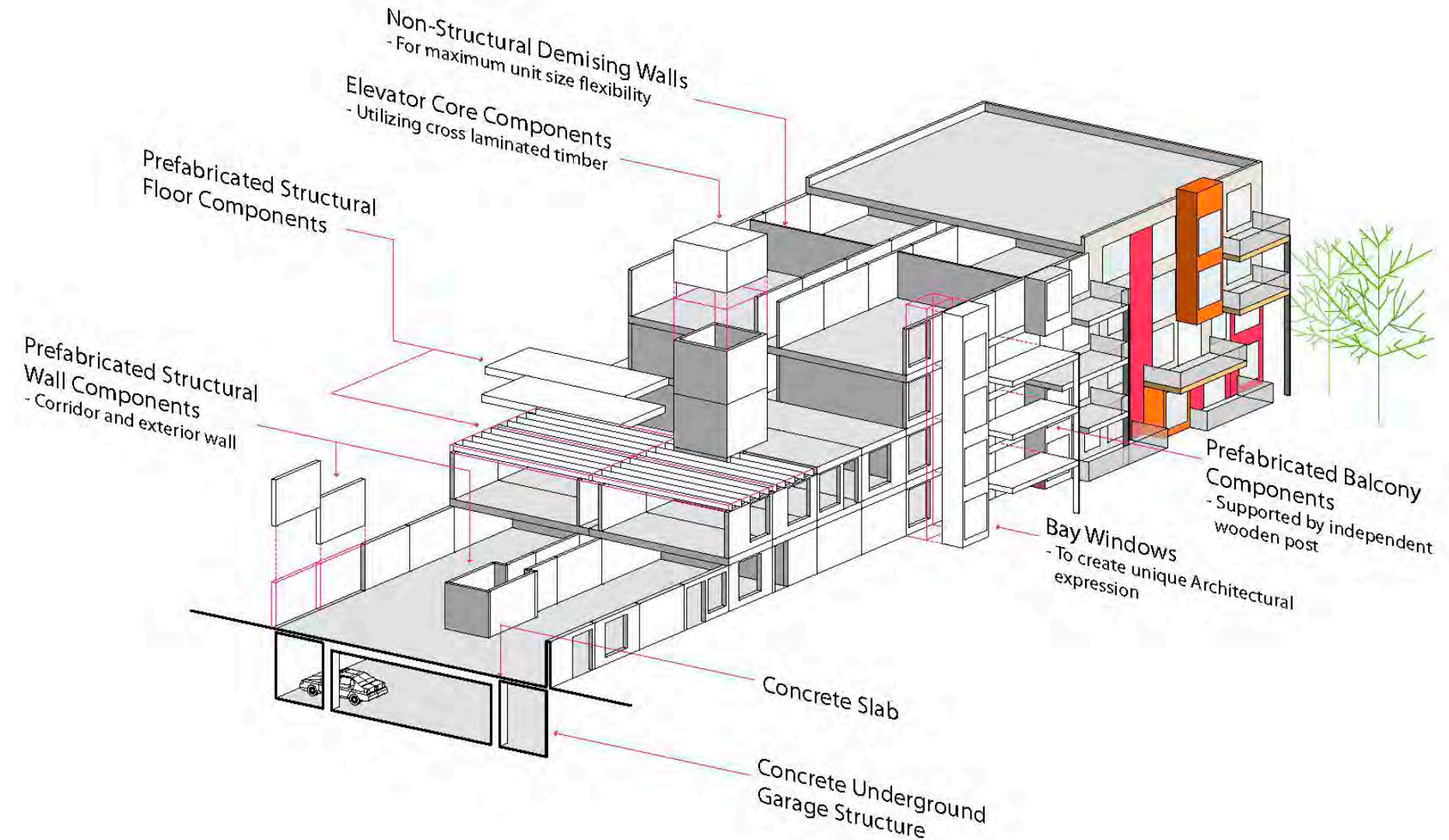
Product Development



**moses structural
engineers**

Product Development

Building Components



Product Development

Computer Controlled Automated Assembly



Product Development

Quick On-site Installation



Product Development

Panelization and Prefabrication



Product Development

Site Framing



Product Development

Structural Considerations



Straps



Hold-downs



Roof anchor connections

Product Development

Fire Considerations



Sprinklered protection at underside of balconies



Continuity of assembly FRR

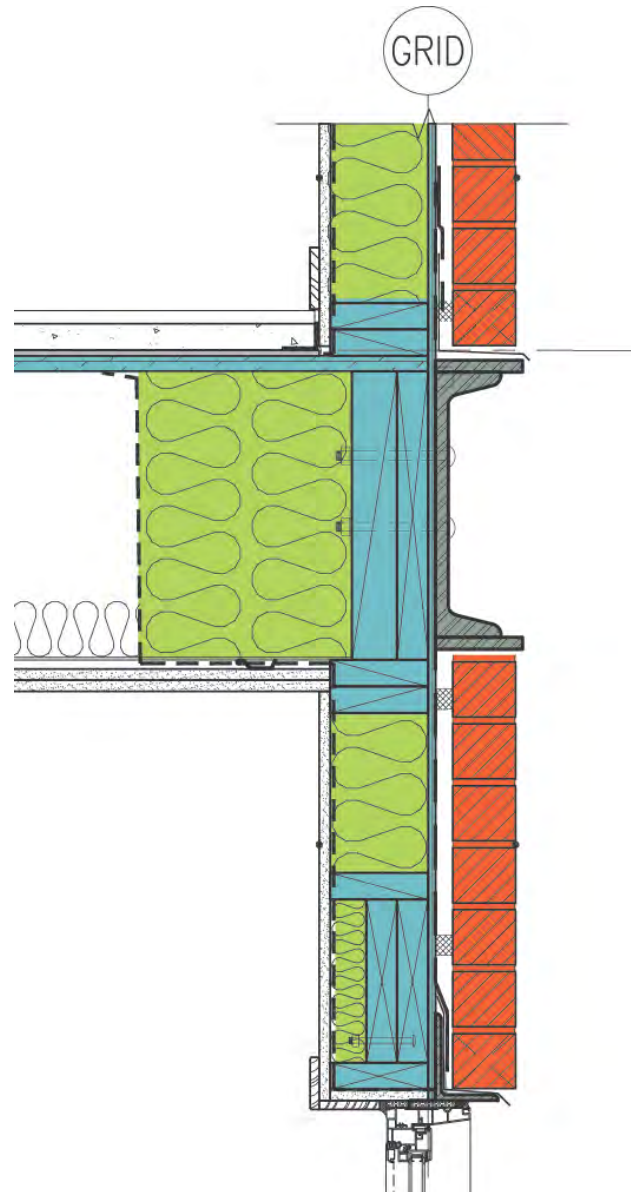
Product Development

Material Interface and Acoustics



Product Development

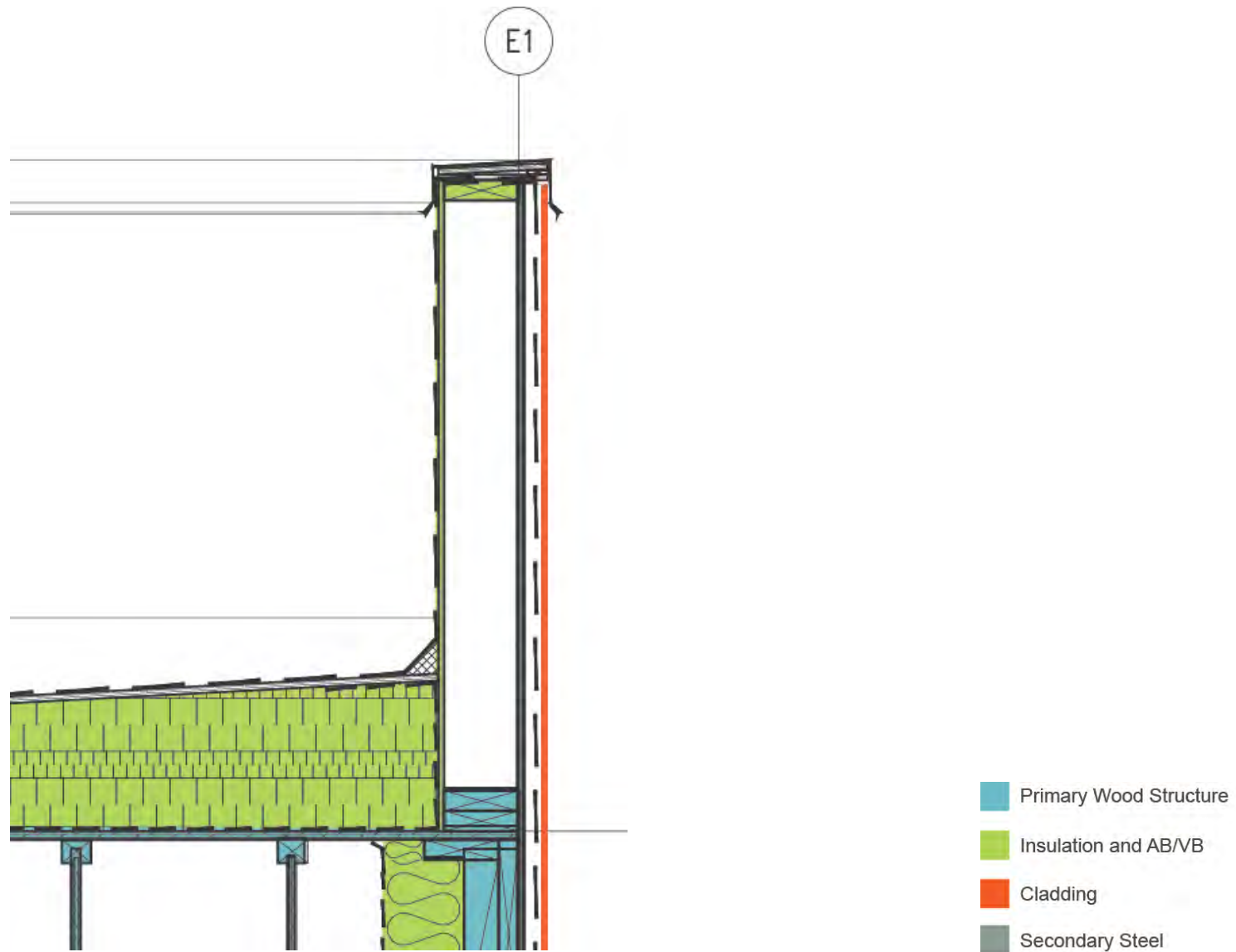
Shrinkage and Cladding



- Primary Wood Structure
- Insulation and AB/VB
- Cladding
- Secondary Steel

Product Development

Shrinkage and Cladding



Product Development

Shrinkage and Cladding



Product Development

Shrinkage and Cladding

	4 SPF	2 SPF	4 LVL	2 LVL
6 th to roof	51	41	37	34
5 th to 6 th	43	34	29	28
4 th to 5 th	34	28	24	23
3rd to 4th	26	21	18	17
2nd to 3rd	17	14	12	11
Ground to 2nd	9	7	6	6



moses structural
engineers

Product Development

4-Storey Corridor Walls Structural Analysis for 2x6 studs 2'-0"

	SPF Sill	Dfir Sill	LVL Sill
4 th to Roof	2x6	2x6	2x6
3 rd to 4 th	2-2x6	2x6	2x6
2 nd to 3 rd	2-2x6	2-2x6	2-2x6
Ground to 2 nd	3-2x6	3-2x6	2-2x6



moses structural
engineers

Product Development

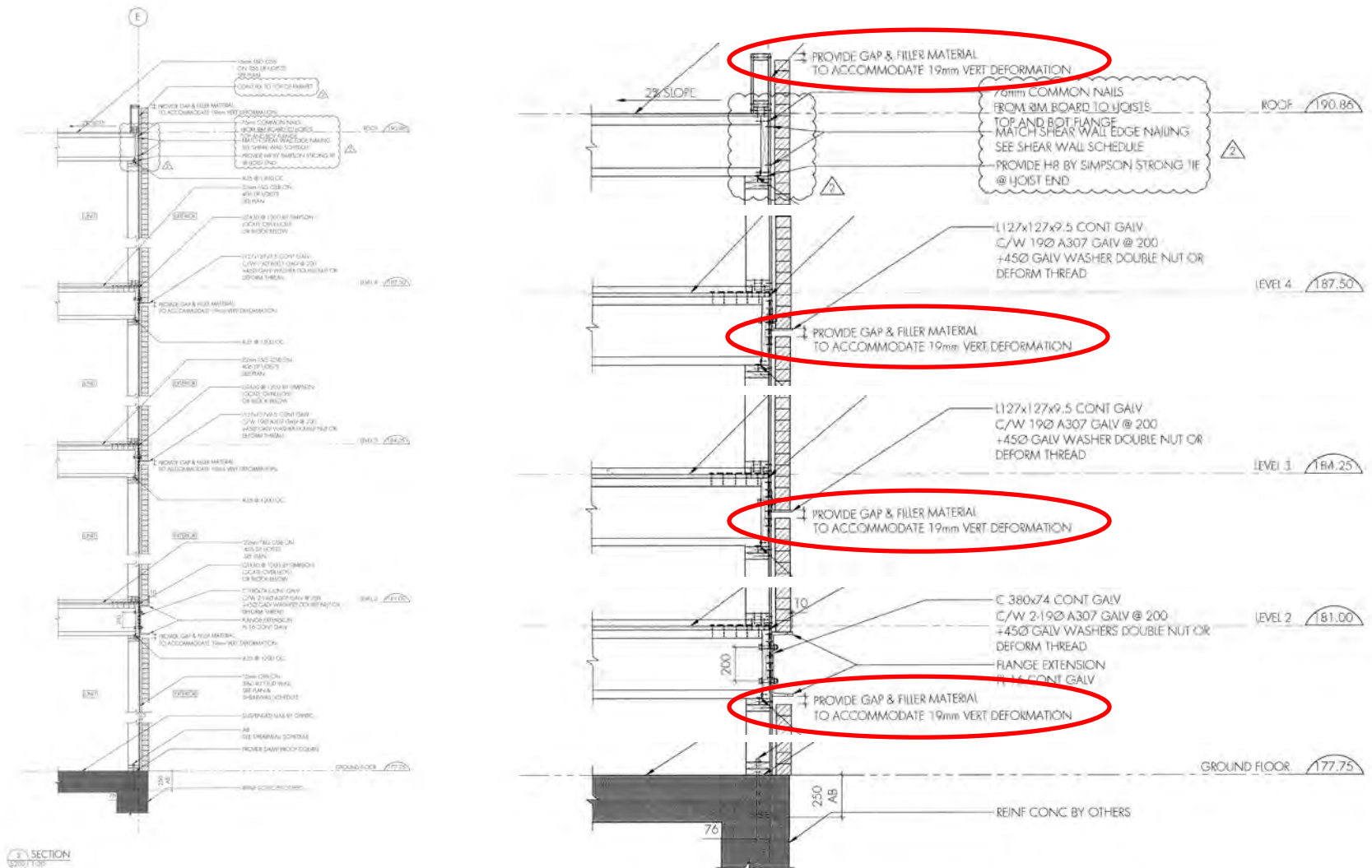
6-Storey Corridor Walls Structural Analysis for 2x6 studs 2'-0"

	SPF Sill	Dfir Sill	LVL Sill
6 th to roof	2x6	2x6	2x6
5 th to 6 th	2-2x6	2x6	2x6
4 th to 5 th	2-2x6	2-2x6	2-2x6
3 rd to 4 th	3-2x6	3-2x6	2-2x6
2 nd to 3 rd	4-2x6	3-2x6	3-2x6
Ground to 2 nd	5-2x6	4-2x6	4-2x6

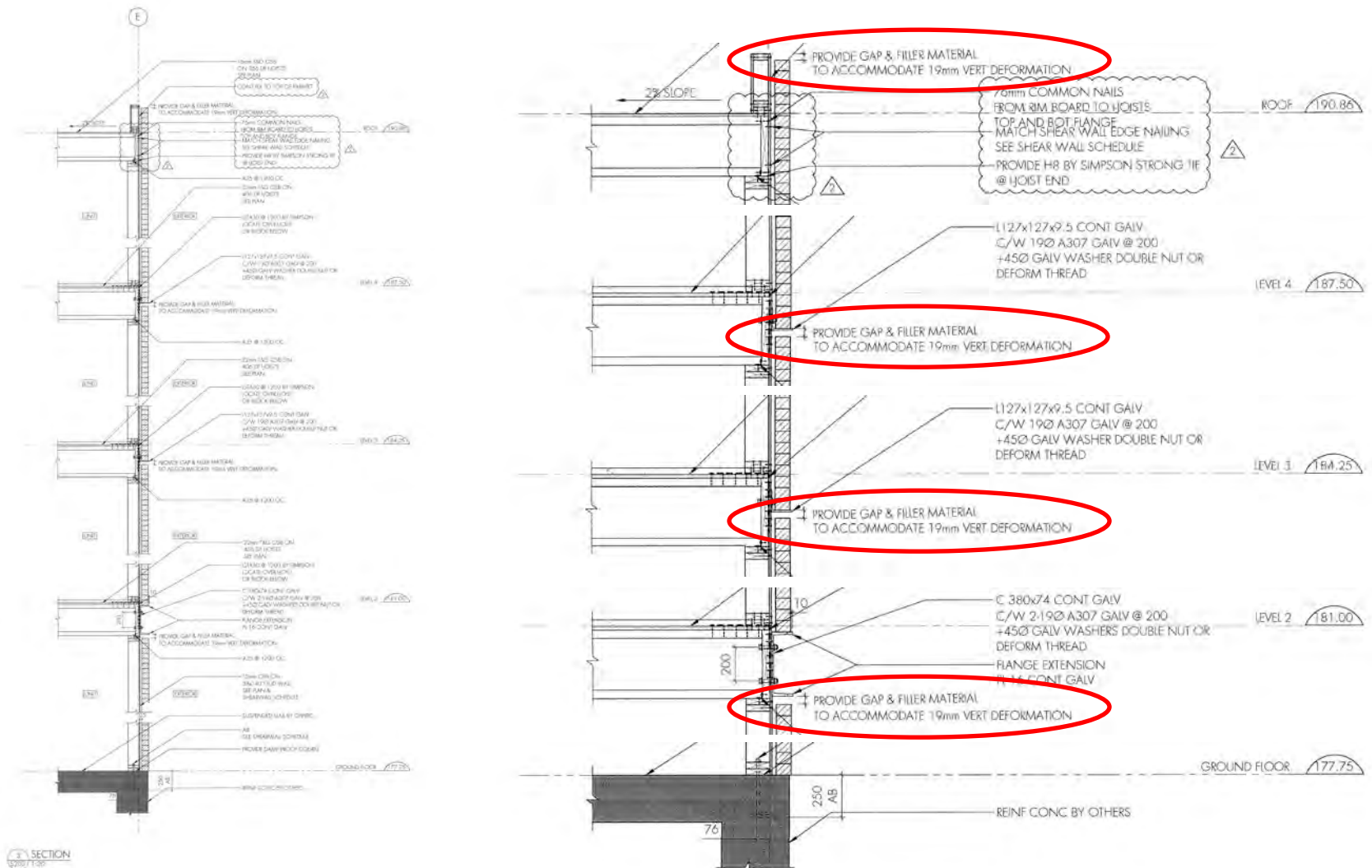


moses structural
engineers

Shrinkage and Cladding

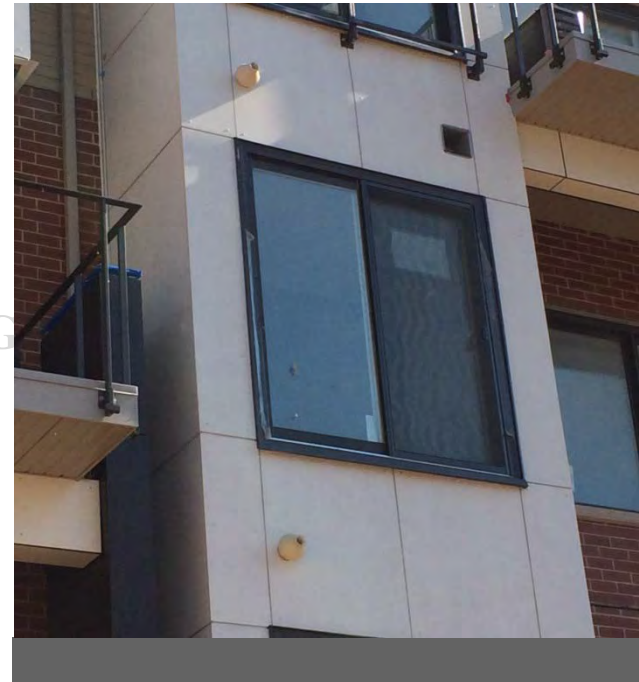


Shrinkage and Cladding



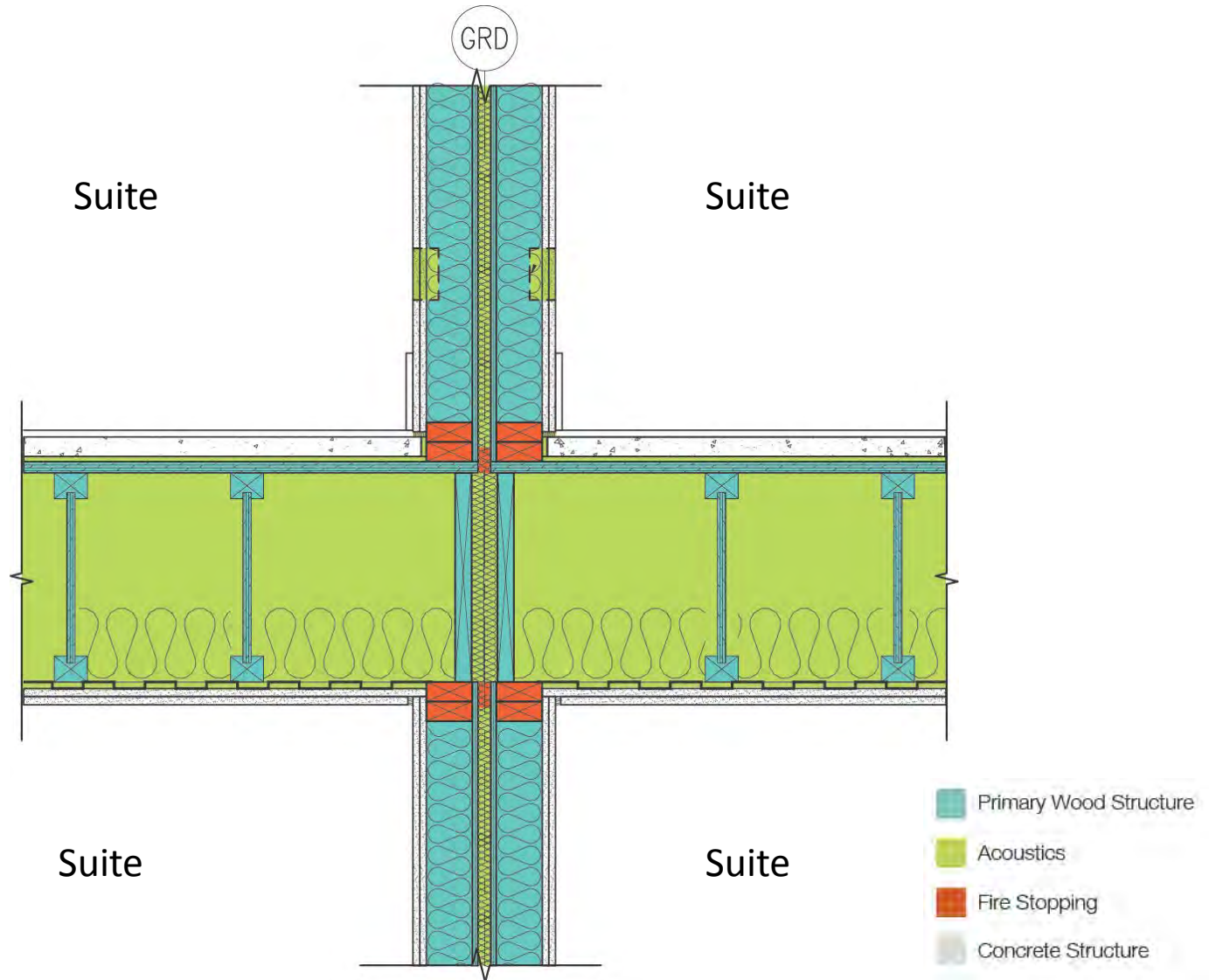
Product Development

Shrinkage and Cladding



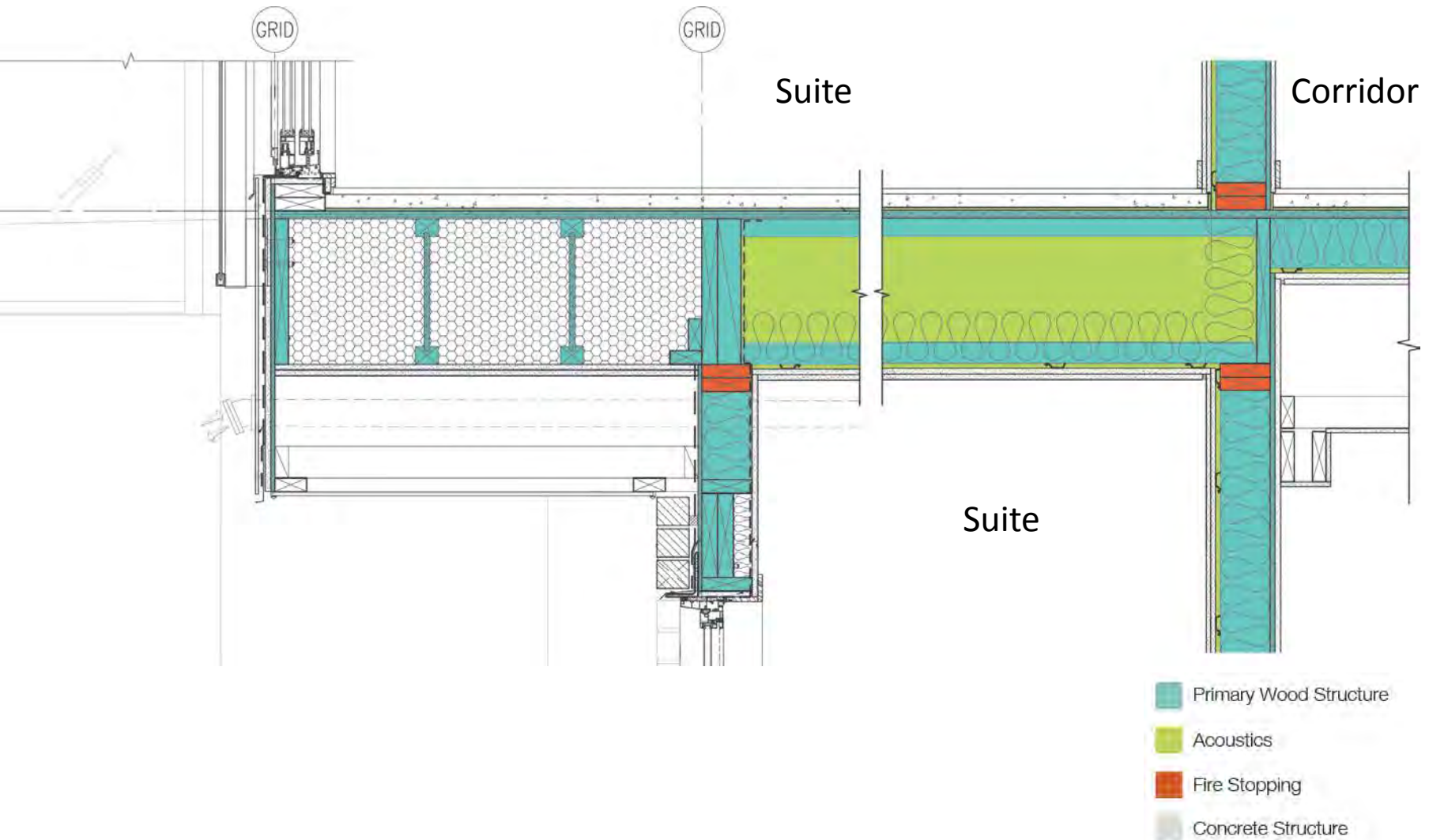
Product Development

Demising Wall / Floor



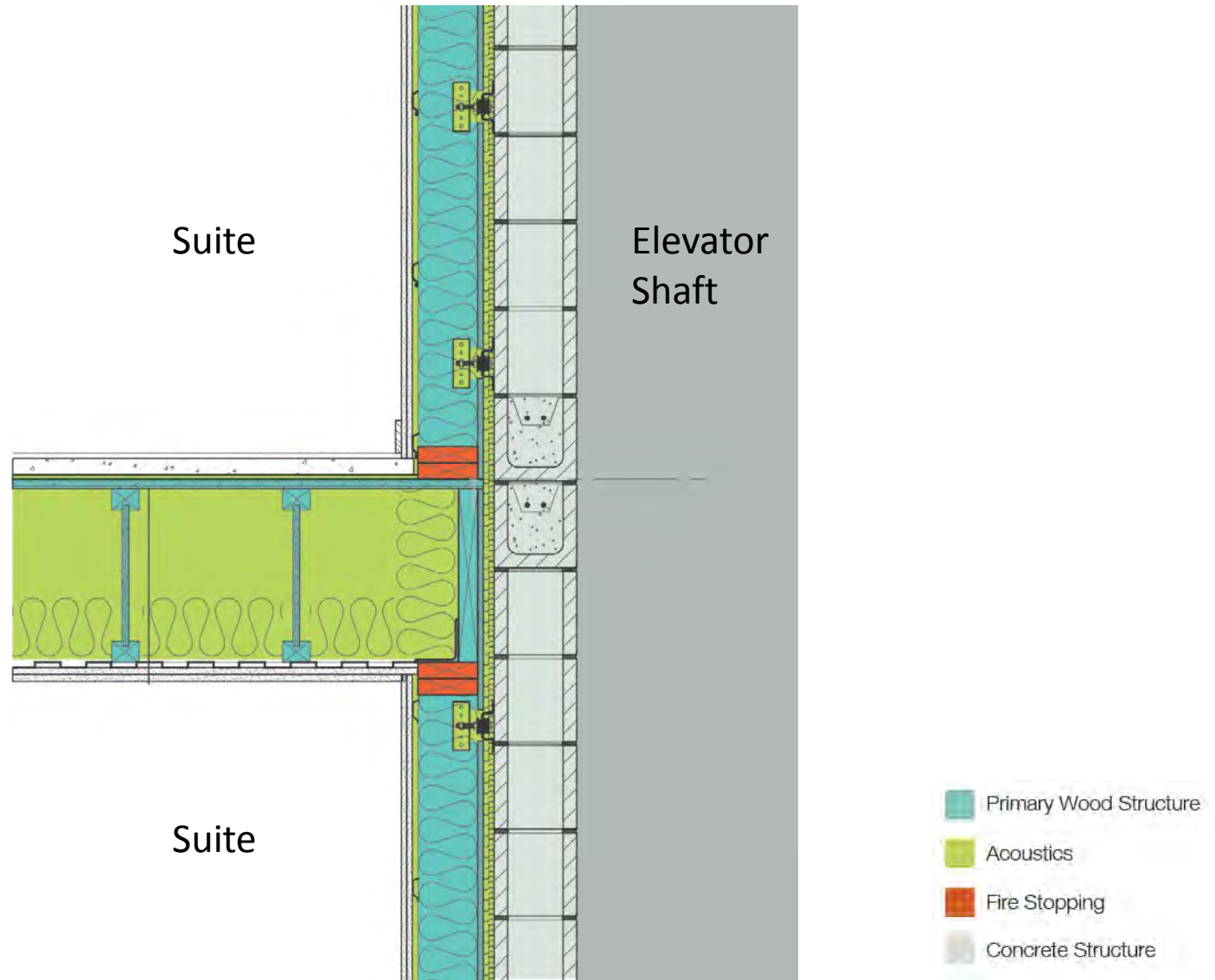
Product Development

Exterior and Corridor Wall + Bay Window



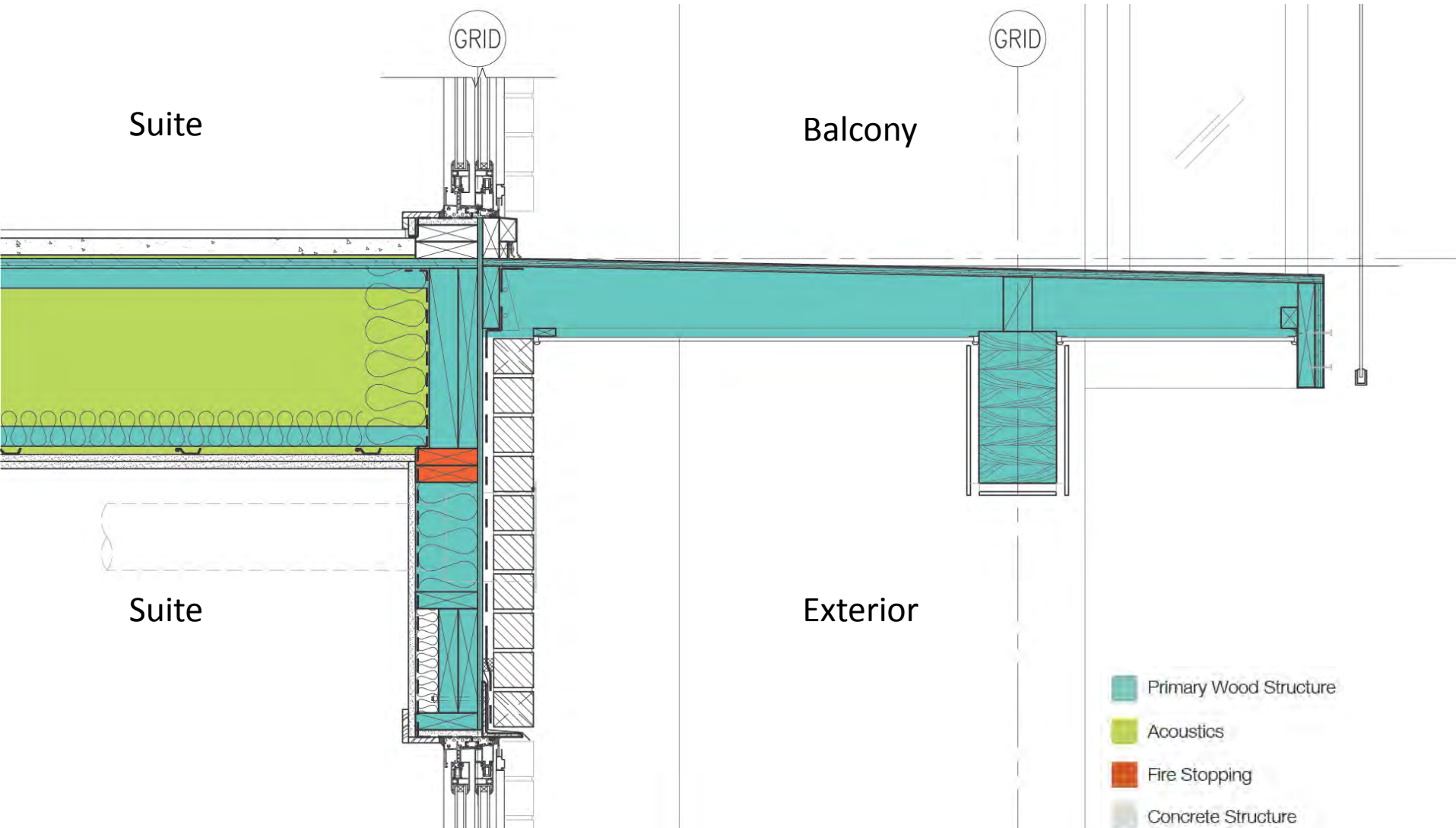
Product Development

Concrete Elevator Shaft Interface



Product Development

Balcony Intergration



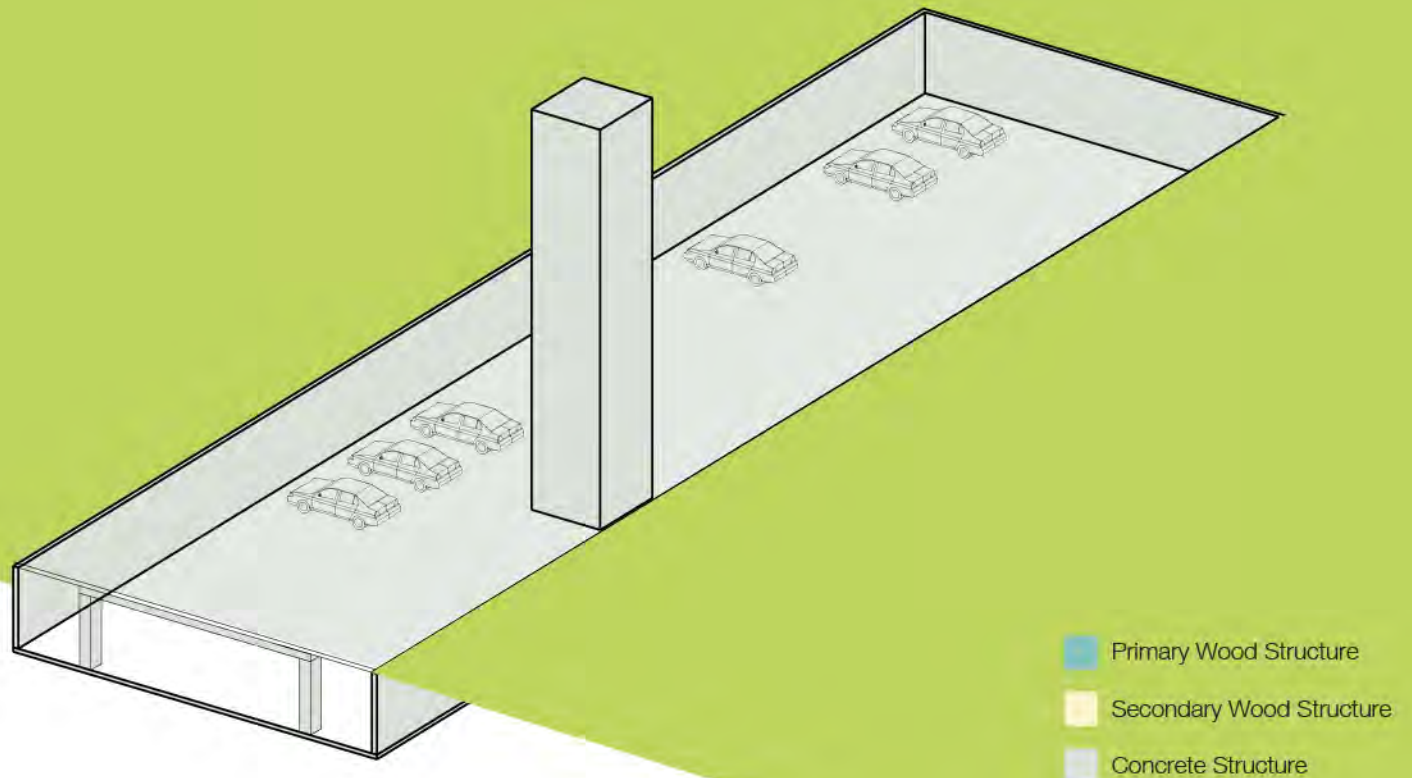
Product Development

Structural Considerations



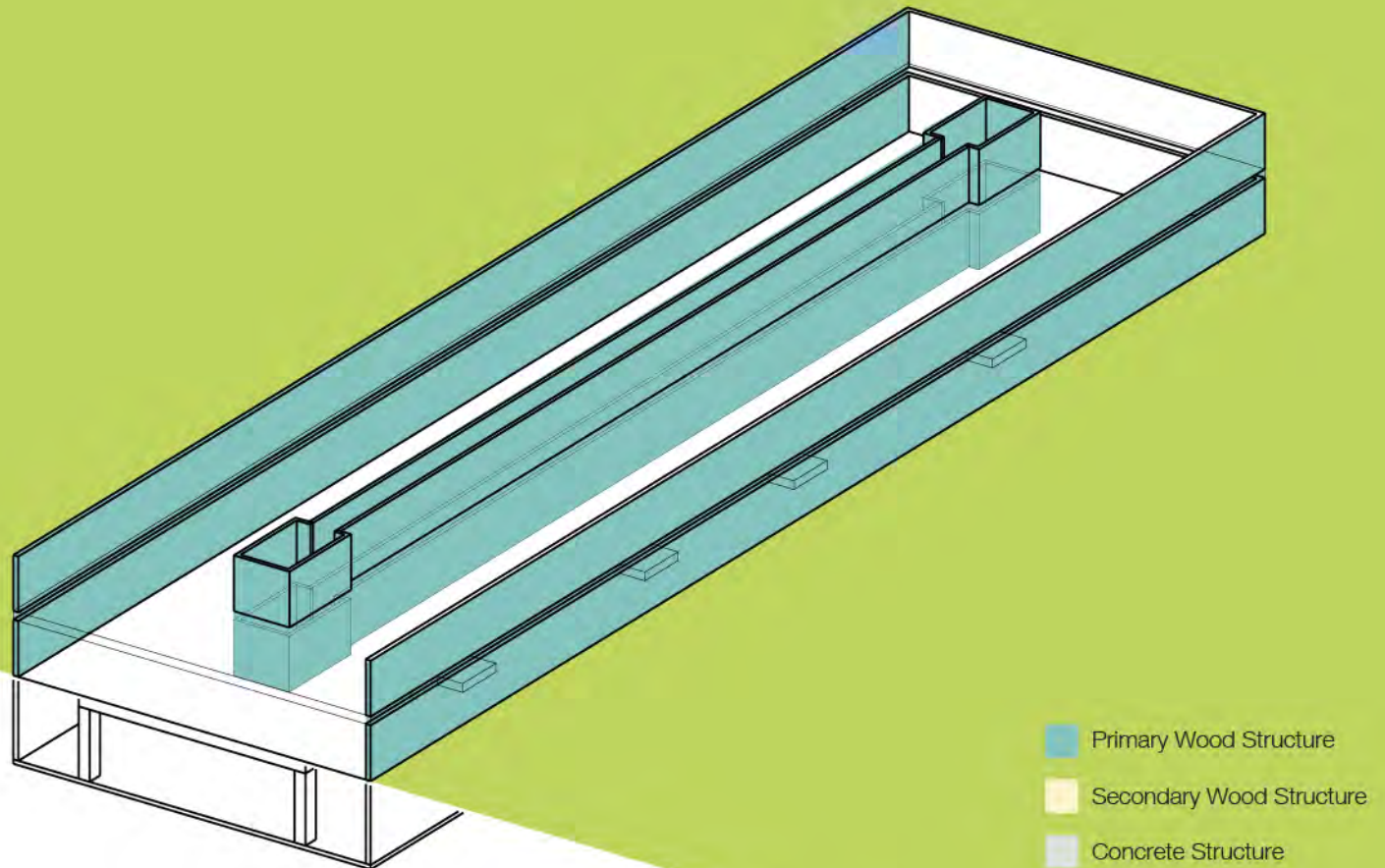
Product Development

Collaboration and Coordination



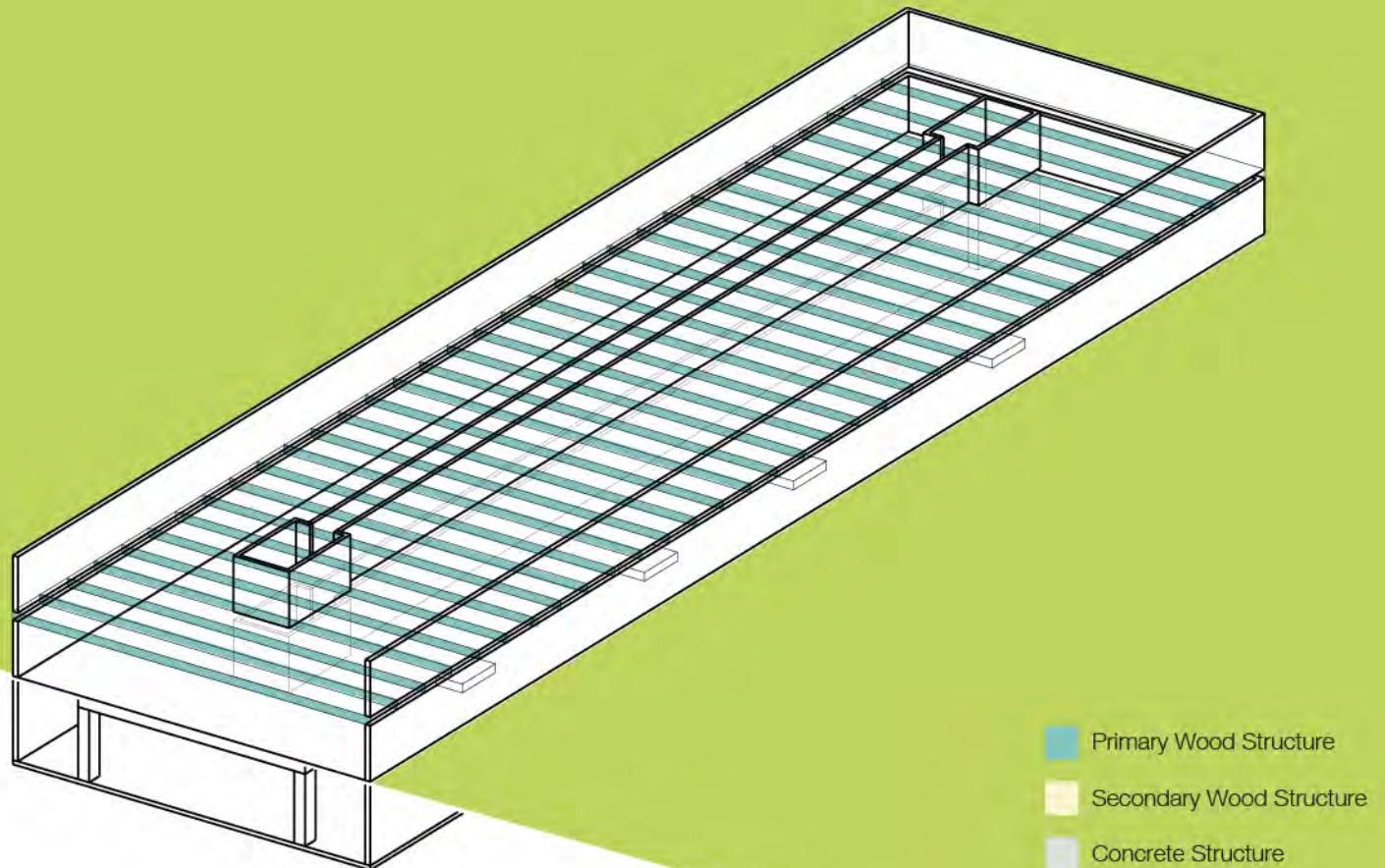
Product Development

Collaboration and Coordination



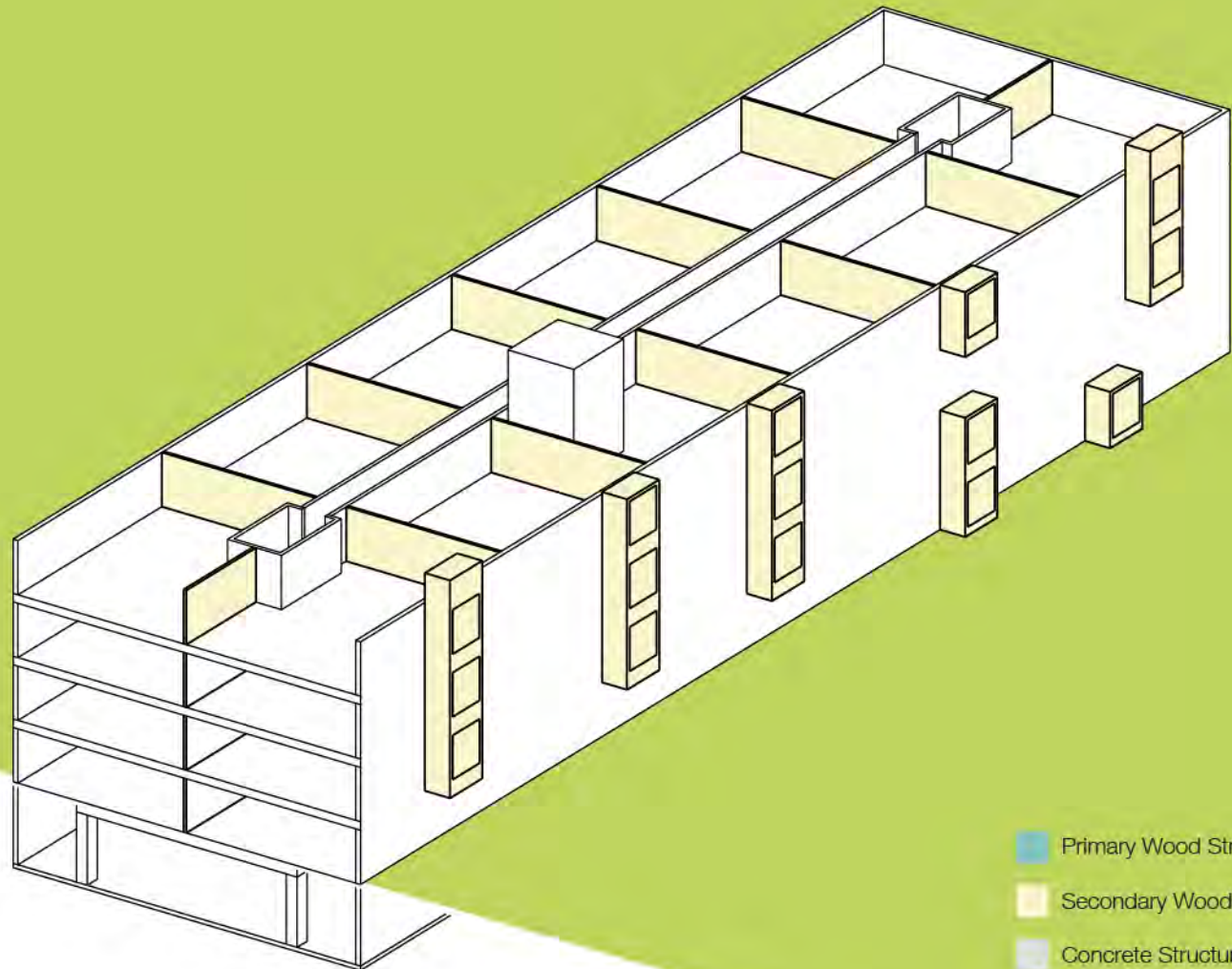
Product Development

Collaboration and Coordination



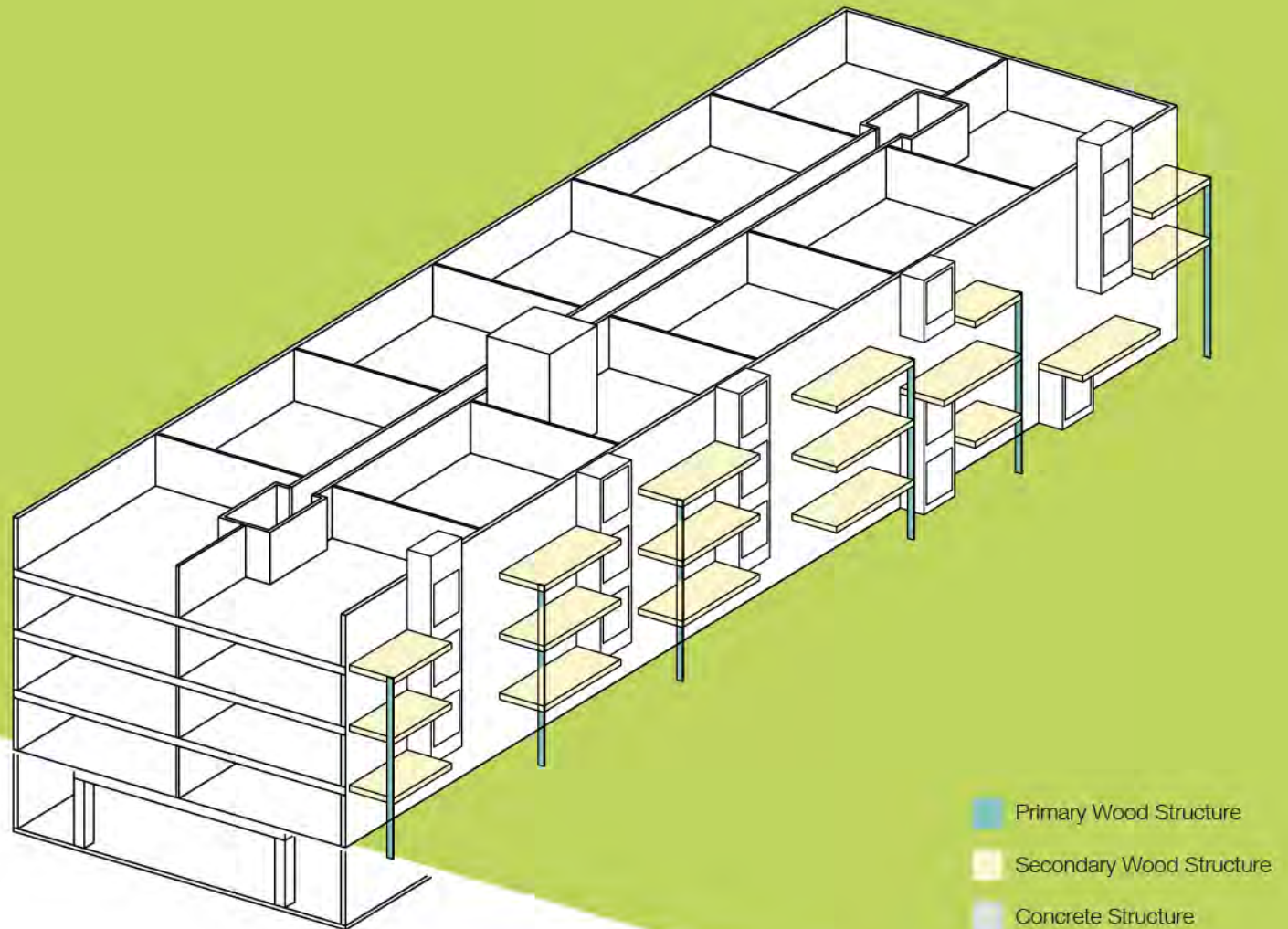
Product Development

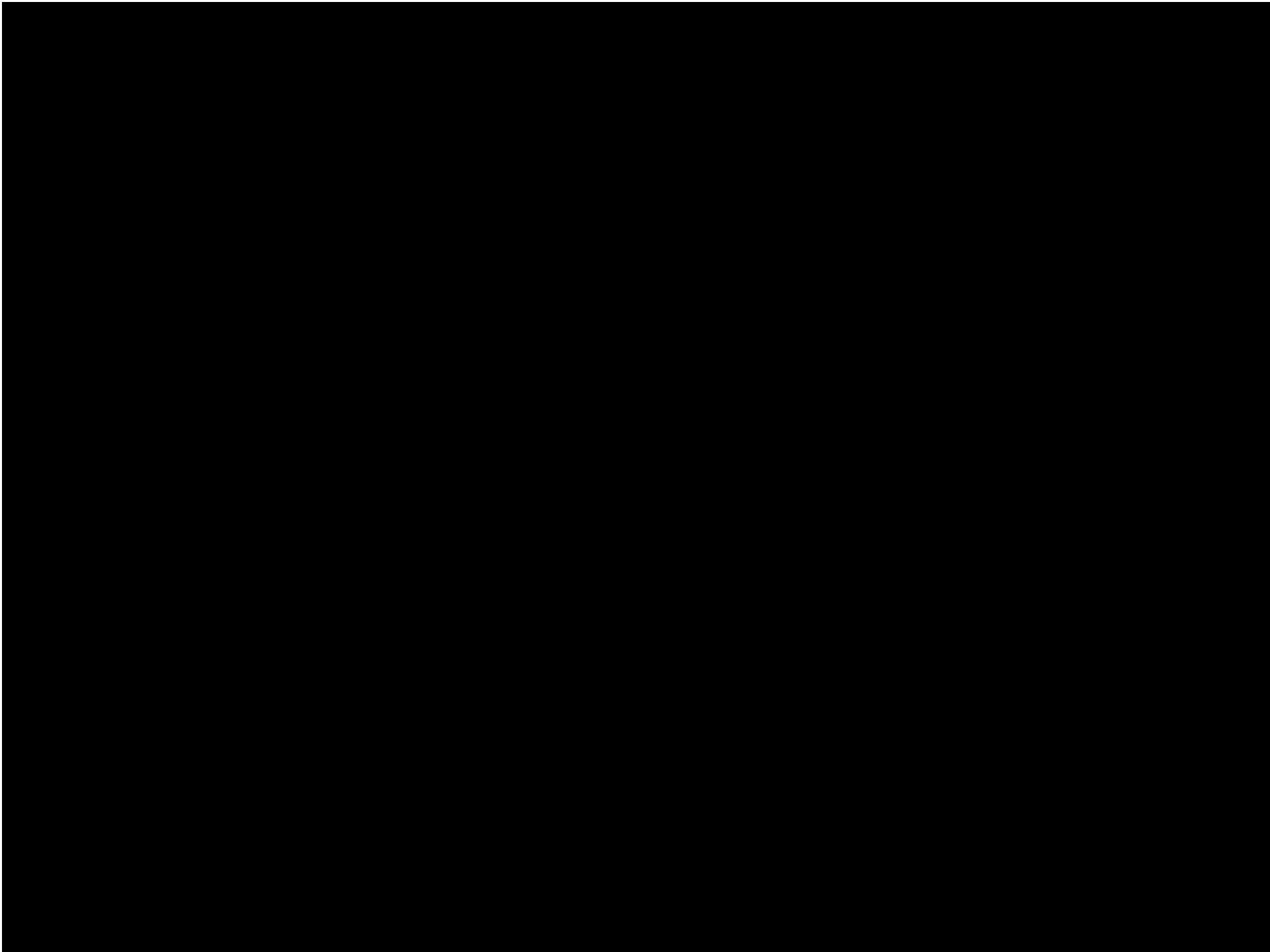
Collaboration and Coordination



Product Development

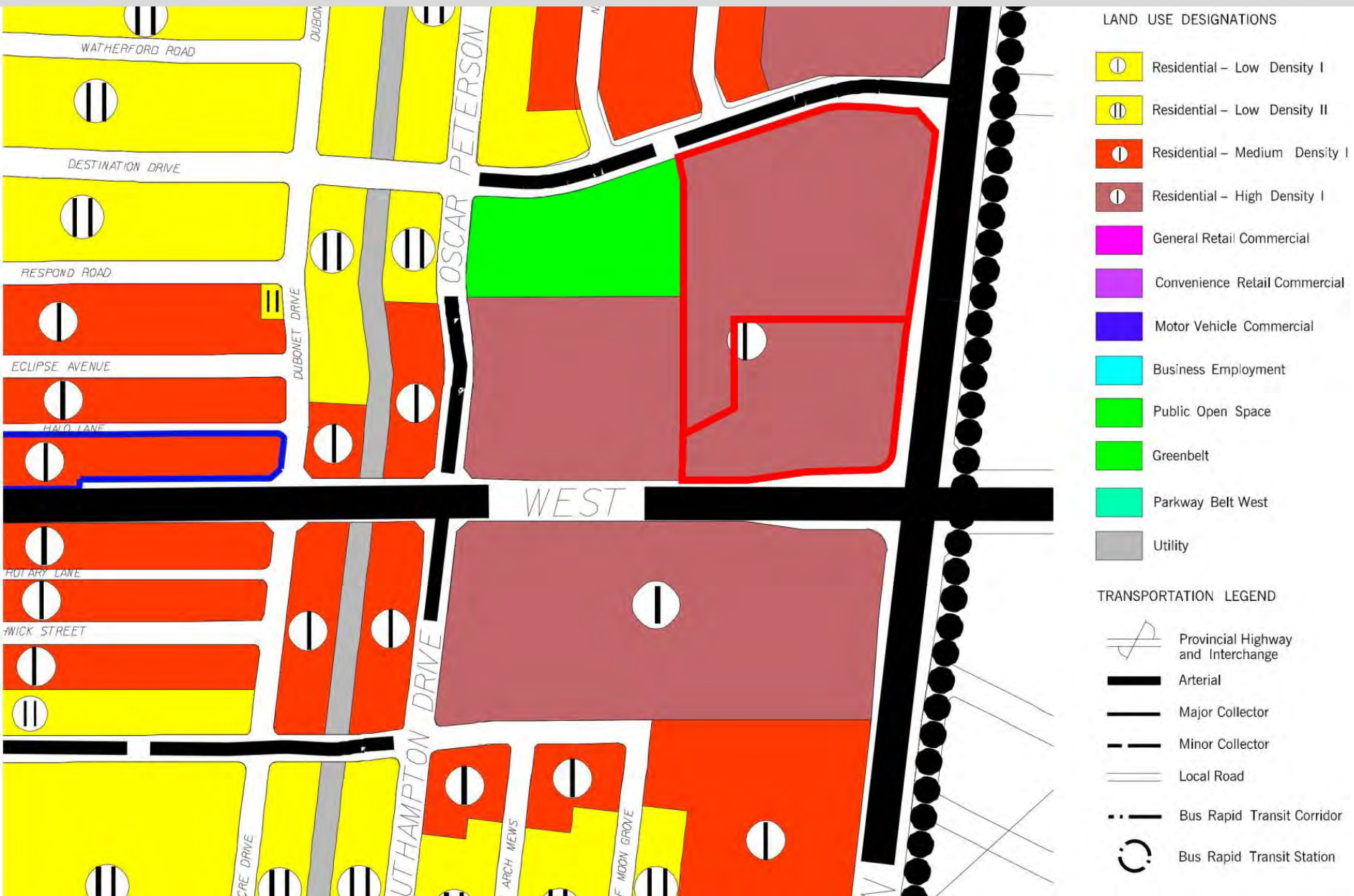
Collaboration and Coordination



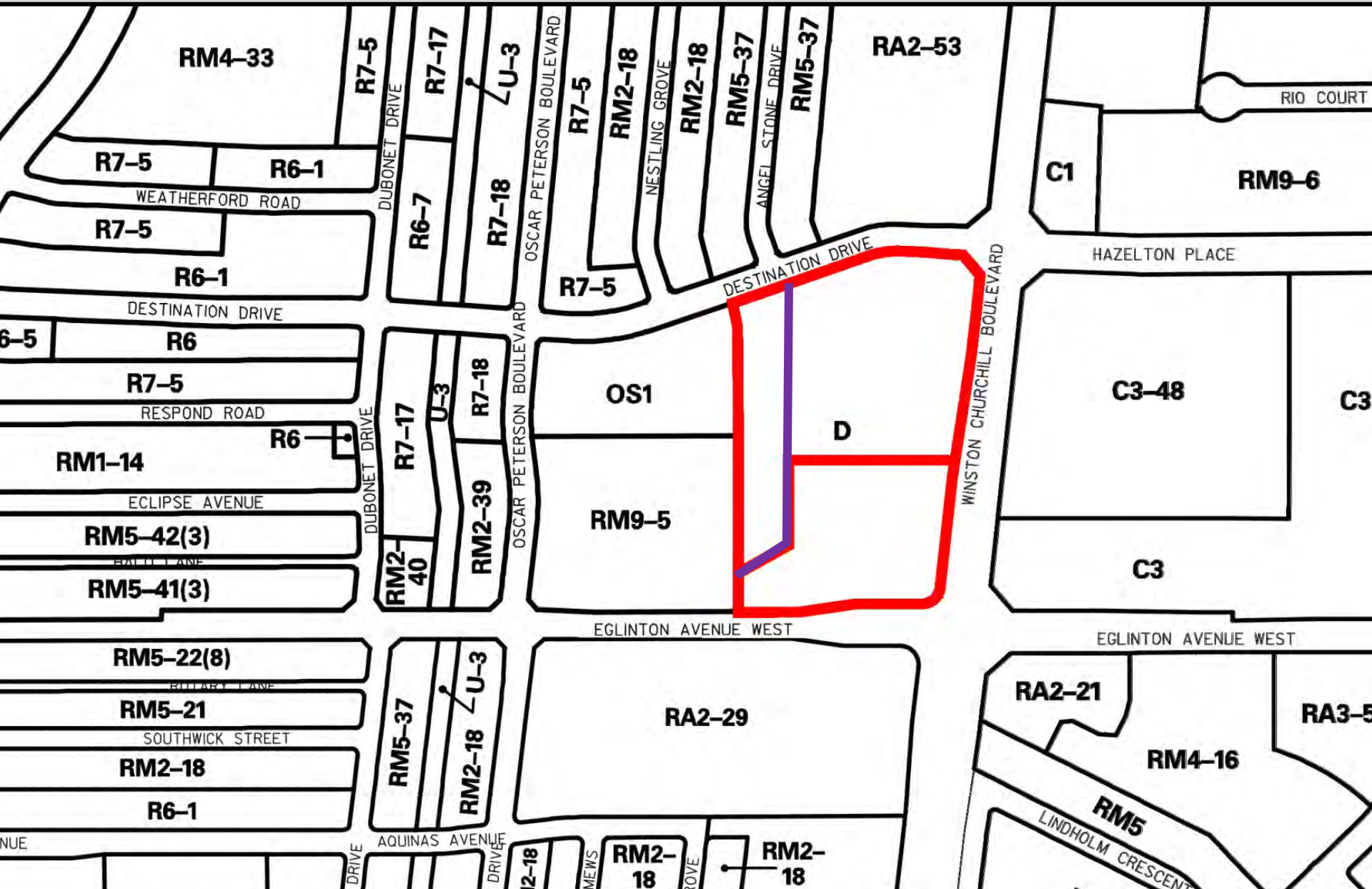


H(ome) O(wnership) T(oday) Condominiums

Winston Churchill and Eglinton West - Official Plan Land Use



Winston Churchill and Eglinton West – Zoning By-Laws



H(ome) O(wnership) T(oday) Condominiums

Winston Churchill and Eglington West – Context



H(ome) O(wnership) T(oday) Condominiums

Winston Churchill and Eglinton West – Site Planning



H(ome) O(wnership) T(oday) Condominiums

Winston Churchill and Eglinton West – Site Plan

LEGEND

- 1 Gateway Feature
- 2 Playground
- 3 Outdoor Amenity
- 4 Indoor Amenity
- 5 Entry
- 6 Entry Lobby
- 7 Loading
- 8 Ramp to Garage
- 9 Visitor Parking
- 10 Balcony Above



Towards a New Normal

Towards a New Normal

Back to the Future

1915 _ 2015



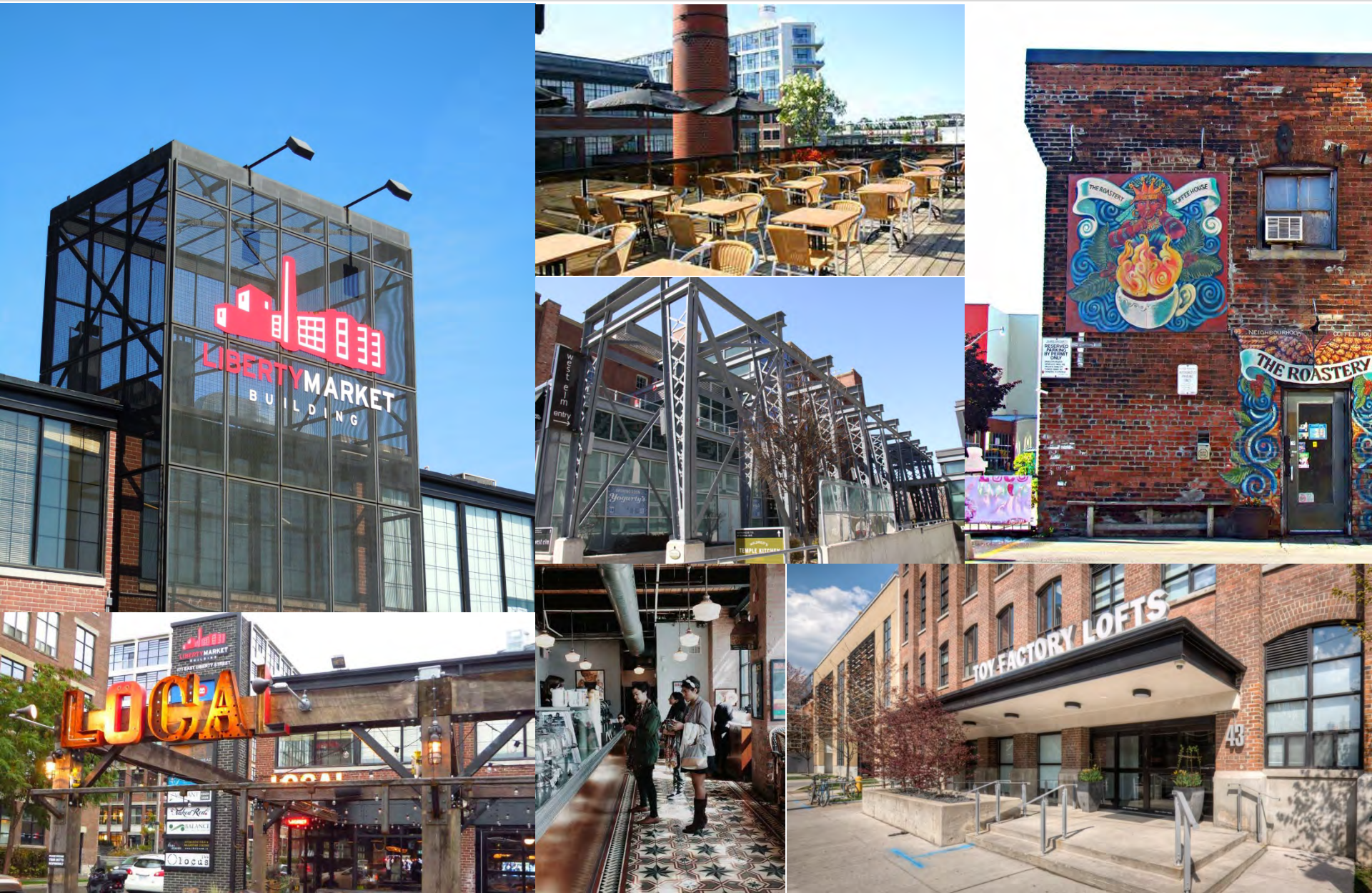
Towards a New Normal

Large Brick and Beam Buildings



Towards a New Normal

Adaptive Re-use and Places for People



Towards a New Normal

Re-inventing Existing Exterior Places



Towards a New Normal

Re-inventing Existing Interior Places



Towards a New Normal

High Performance Space



Towards a New Normal

High Performance, Warm, Inviting and Sustainable Space



Towards a New Normal

Proportion and Scale

Local
Neighbourhood
Building



67 Mowat Avenue

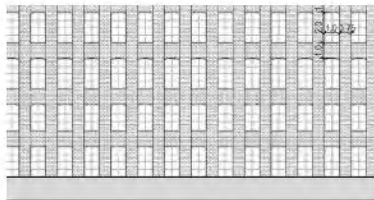


155 Liberty Street

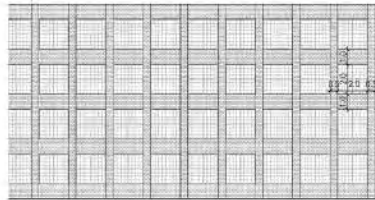


99 Atlantic Avenue

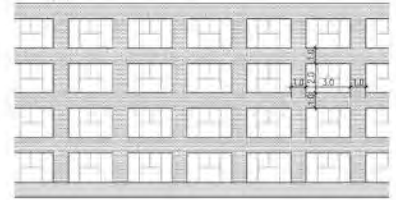
Rhythm



Building 1

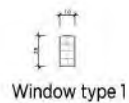


Building 2

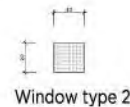


Building 3

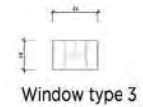
Module



Window type 1

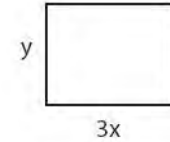
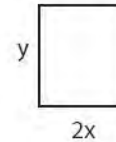
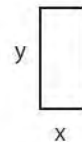


Window type 2



Window type 3

Proportion

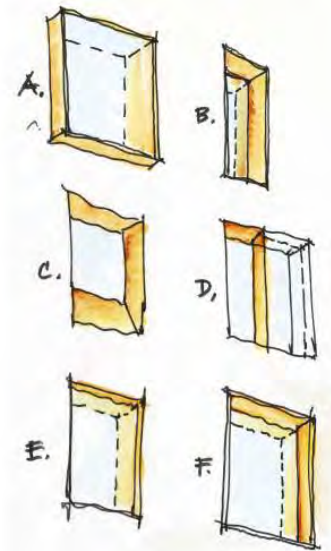
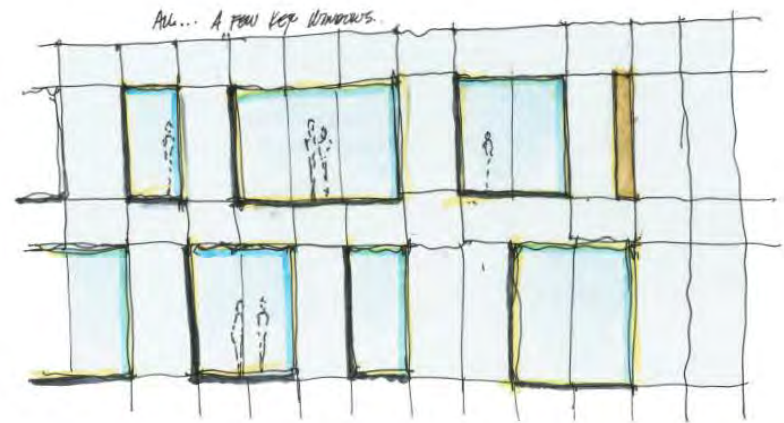
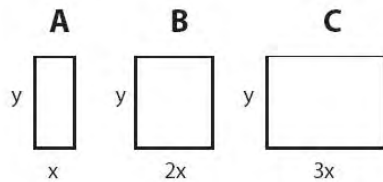


Towards a New Normal

Providing Transition and Integration

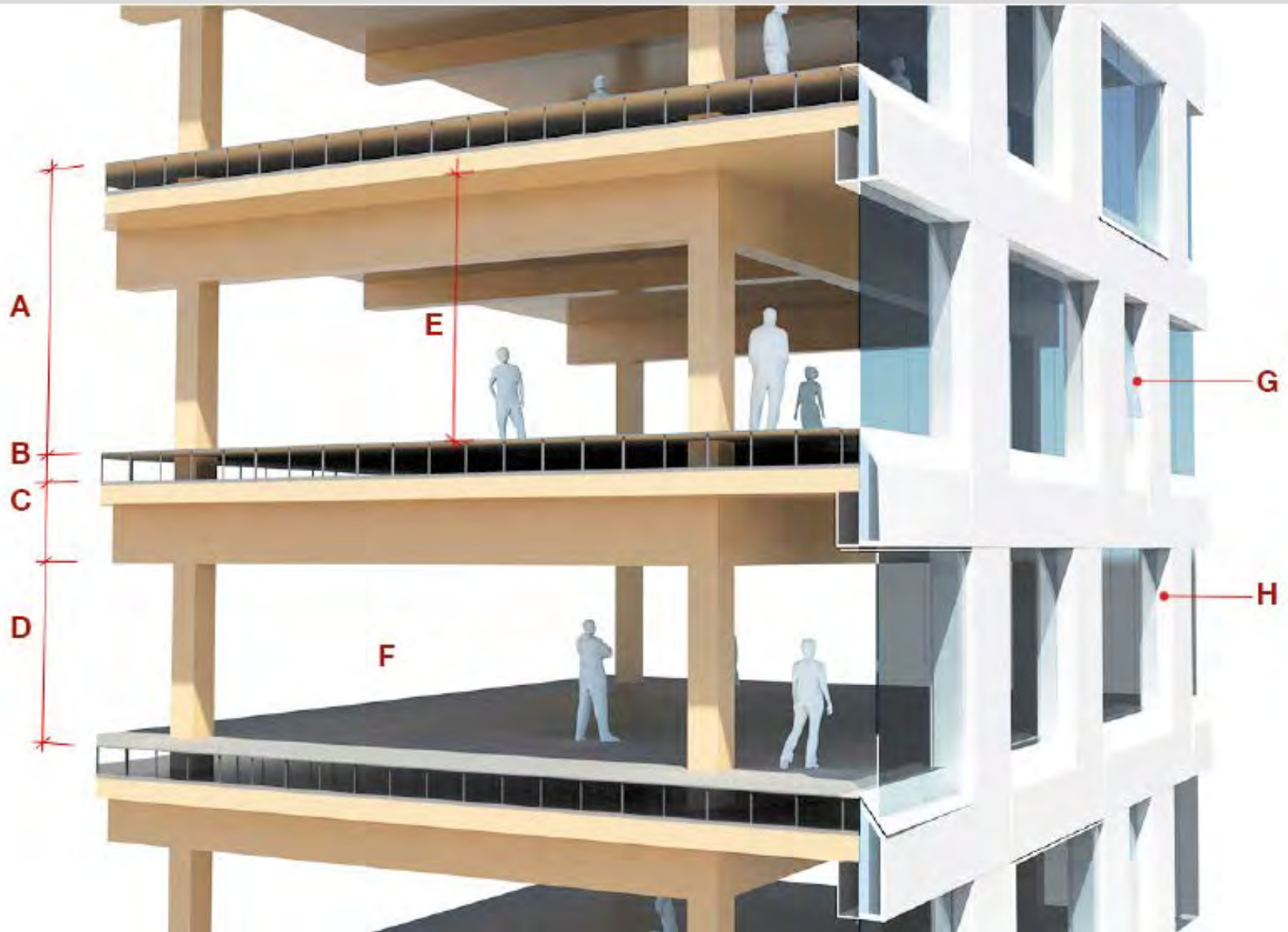


' identifies alternate (protruding) position of glass within frame



Towards a New Normal

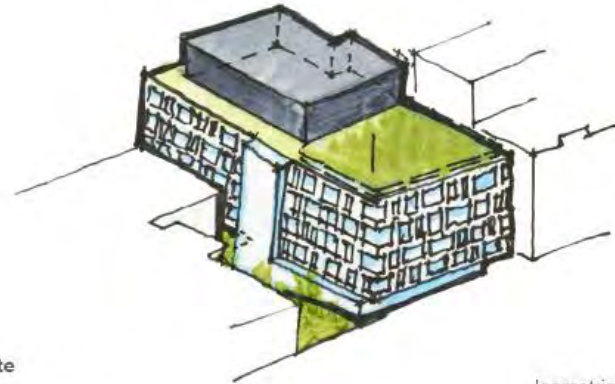
Performance, Aesthetics and Creature Comfort



Towards a New Normal

Accommodating Versatility

Facade A Selected Option For Further Development (North, East, West Facade)



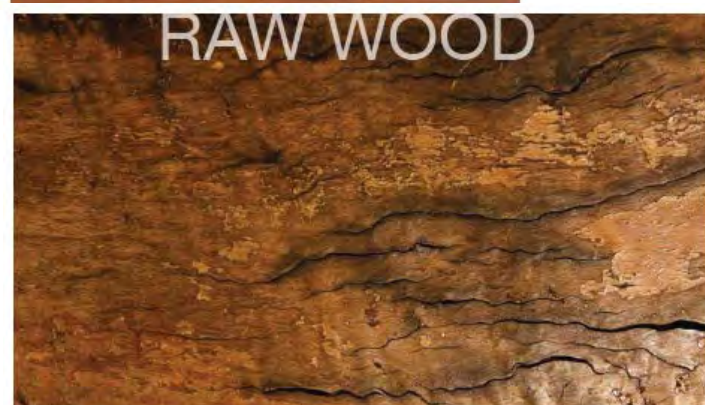
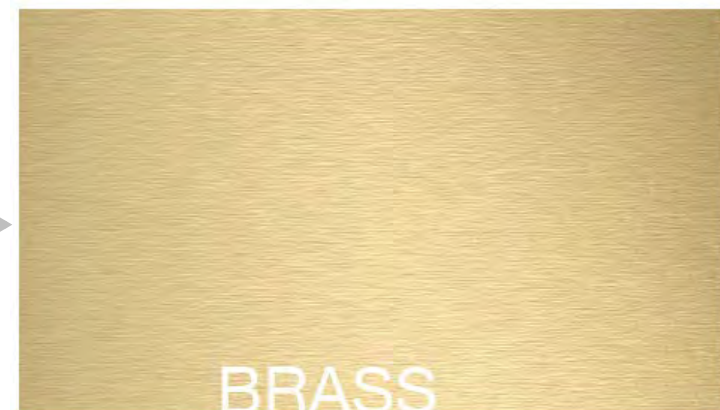
Material Palette

1. Vegetated Roof Garden
2. Roof Pavers
3. Black Metal Capped Curb
4. Clear Glass Balustrade
5. Stone
6. Brass (Bronze | Iron Black)
7. Vision Glass
8. Black Metal
9. Low Iron Clear Glass
10. Street Pavers



Towards a New Normal

Durable Choices for Interior and Exterior Finishes



Product Development

Doing More With Wood



Towards a New Normal

Collaboration and Developing Best Practices





Inspiration Realized



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