footprint

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1365-1375 Yonge Street - Materials Emissions Assessment

For

Yonge & Rosehill Inc.

Project Location

1365-1375 Yonge Street, Toronto, Ontario

Footprint Project Number

23142-001

Date

2023-05-25

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Executive Summary

The following report presents the findings of the materials assessment performed for Yonge & Rosehill Inc. concerning the proposed residential development located at 1365-1375 Yonge Street, Toronto, Ontario.

The purpose of this report is to provide preliminary embodied carbon results for the proposed building design to evaluate embodied emissions, and explore the opportunities toward reducing emissions during design.

This report is in support of Zoning Bylaw Amendment application.

PROPOSED DEVELOPEMT

The proposed development is comprised of:

Total GFA: 45,919 sqm

Total floors:

o Above Grade: 50 (excluding mechanical penthouse level)

o Below Grade: 5

ENERGY STRATEGY REQUIREMENTS

As required by the City of Toronto, developments are required to submit an Energy Strategy that includes a material emissions assessment. This assessment must be completed in accordance with the Canada Green Building Council (CaGBC) Zero Carbon Building Standard v2 methodology using a cradle-to-gate to report the upfront carbon lifecycle stage (A1-5) as total emissions in kgCO₂e and kgCO₂/m².

LIFE CYCLE ASSESSMENT

Whole building life cycle assessment (wbLCA) is the method of measuring the environmental impact of a project through multiple stages of the materials used life including the manufacturing, transport, construction, and final use of the resources required for a building's life cycle. Life cycle assessment scopes can vary depending on the project needs and goals and will be clearly defined within the modelling methodology.

The metric commonly associate with life cycle assessment is global warming potential, also referred to as embodied carbon, and is presented as kilograms of carbon dioxide equivalent (kgCO₂e). This metric includes a variety of other greenhouse gasses, including method and nitrous oxide, standardized as a carbon dioxide equivalent.

A significant source of a building's carbon emissions is from the production of materials and the resources required for installation. These emissions, referred to as embodied carbon, are released before the building is operational and cannot be reduced. Careful consideration of building design and use of low-carbon materials at early design stages enable project teams to minimize the building's upfront carbon.

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Modelling Methodology

OVERVIEW

The analysis of the building's life cycle impact and subsequent report was completed using One Click LCA. The program is in accordance with EN 15978, EN 15804, ISO 14040, ISO 14044, ISO 21929 and US EPA's Tool for the Reduction and Assessment of Chemical and other environmental Impacts (TRACI). The LCA datasets are compliant with EN 15804 or ISO 14040/14044.

The project model assumes a building lifetime of 60 years and includes the following assemblies and elements:

- building envelope
- footings
- foundations
- complete structural wall assemblies
- structural floors and ceilings
- roof assemblies
- stair construction

The following items are excluded from the building model as per the Net Zero Emissions Strategy:

- excavation and other site development
- interior finishes and partitions
- building services (electrical, mechanical, fire detection, alarm systems, elevators, etc.)
- fixtures and fitting
- surface parking lots
- associate building site improvements

SYSTEM BOUNDARIES

The International Standard ISO 21930 and European Standard EN 15804 set out a common life-cycle model for building and construction works. The life-cycle model includes modular definitions for the life-cycle stages, allowing each stage to be compared in isolation with other projects.

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A1-3 **B1-7** C1-4 **A4-5 PRODUCT** CONSTRUCTION **END OF LIFE USE** STAGE **STAGE PROCESS STAGE** STAGE Δ1 Α2 **A3** Δ4 **A5 B1 B2 B3 B4 B5** C1 C2 C3 C4 Construction installation process De-construction/Demolition Raw material supply Waste processing Manufacturing Refurbishment Replacement Maintenance Transport Transport Transport Repair Disposal Use **SCENARIO SCENARIO SCENARIO B6 B7** Operational Operational energy use water use **SCENARIO**

BUILDING LIFE CYCLE INFORMATION

Figure 1: Building Life Cycle Information and life cycle stages

As illustrated in Figure 1, the product stage information (A1 - A3) is always represented as a combined value for building level assessments, as are end of life stages (C1 - C4) in most cases. Depending on the purpose of the LCA, other stages may be omitted or be replaced with a scenario in absence of detailed information.

The life cycle stages evaluated in the analysis to meet the requirements of the Net Zero Emissions Strategy can be found under Data Sources.

ABOUT THE ASSESSOR

This assessment has been reviewed by Christina Michayluk at Footprint. The assessor has received training in performing Life Cycle Assessments for buildings for Athena Impact Estimator and OneClick LCA. Training was delivered by Athena Sustainable Materials Institute through the CaGBC, and Bionova Ltd, who is a training partner for BRE Academy, various Green Building Councils and organizations, and delivers GBCI approved continued education trainings.

Life Cycle Assessment Inputs

SOURCE OF INPUTS

To populate the information required for a life cycle assessment, data has been extracted from architectural and structural information as detailed in Table 1: Data Sources for Life Cycle Assessment. Refer to Appendix A for detailed information on the current building design.

DATA SOURCES

The analysis has been performed relying on the following data sources for building information:

Table 1: Data Sources for Life Cycle Assessment

Data Type	Data Source
Material quantities (A1 - A3)	Drawings and design information as delivered by the client and the designers acting on the client's behalf. Additional assumptions may be required due to the project stage and will be clearly defined within this report. These assumptions will be clearly defined within Table 2: Proposed Baseline Details and Assumptions.
Material transport distances (A4)	Regionally applicable transportation scenarios from One Click LCA. Those represent regionally typical transportation distances and methods for product types, which are relevant when no decisions on suppliers are made.
Construction and installation (A5)	Impacts are based on default values from One Click LCA.

BASELINE / PROPOSED DESIGN

The proposed design has been modelled with the following as noted in Table 2: Proposed Baseline Details and Assumptions. In the event information was not available, assumptions have been made based on similar project types and past project experience and are listed below.

ENVIRONMENTAL PRODUCT DECLARATIONS

The selection for each building material or product was selected to best represent common materials and products. Wherever required, product specific declarations were selected or are represented through an industry wide environmental product declarations or data sets as available by One Click LCA. For concrete, the industry wide environmental product declarations from the Ontario Ready Mixed Concrete Association have been selected.

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Table 2: Proposed Baseline Details and Assumptions

Assembly	Details and Assumptions
Exterior Façade	Exterior Walls Precast concrete panel, 50 mm mineral wool, OSB, 2x4 steel stud with batt fill, 15 mm gypsum board ACM cladding, 50 mm mineral wool, OSB, 2x6 steel stud with batt fill, 15 mm gypsum board Kawneer Window Wall system, at ~40% Window-to-Wall Ratio. Spandrel panel including insulation (100 mm mineral wool) with metal frame, 41mm steel studs and interior gypsum board
Foundation	Foundation Wall 300 mm cast-in-place concrete wall, 30MPa with reinforcement (assumed 88kg/m³ as per One Click LCA), 152 mm XPS insulation to 600mm below grade Footings Strip footings estimated as per One Click LCA 3D Carbon Designer based on GFA, 30 MPa with reinforcement (assumed 150kg/m³ as per One Click LCA) Slab on Grade 150 mm cast-in-place concrete (30MPa) with reinforcement (assumed weight 100 kg/m² as per One Click LCA), 100 mm EPS
Floors	Typical Floors 200 mm cast-in-place concrete (35MPa) with reinforcement (assumed 120 kg/m³ as per One Click LCA) for all floors Transfer Slab 2000 mm cast-in-place concrete (40MPa) with reinforcement (assumed 120 kg/m³ as per One Click LCA) for transfer slab on Level 1
Roof	Inverted Roof Concrete pavers (for amenity and terrace spaces) or Stone Ballast, 150 mm polyiso insulation, waterproofing membrane, 250 mm cast-in-place concrete at 35 MPa with reinforcement Note: Vegetated roofs cannot be accurately captured within analysis due to lack of available life-cycle data on components such as filter fabric, etc. Assumed column-beam concrete frame, estimated as per One Click LCA 3D
Columns and Beams	Carbon Designer. Concrete columns and beams at 30MPa, with reinforcement (assumed 325kg/m³ as per One Click LCA) Interior Load Bearing Walls As per One Click LCA Carbon Designer, assumed at 15% at 30 MPa cast-in-place concrete, with reinforcement (85kg/m³)
Other Assemblies	Shear Walls As per One Click LCA Carbon Designer, 30 MPa cast-in-place concrete with reinforcement (65kg/m³) Balcony 250 mm 30 MPa cast-in-place concrete with reinforcement (65kg/m³)
Soils	Assumed hard soil containing silt or sand. Assumed that soil stabilization or a secant piling wall are not required.

Baseline Analysis

The life cycle assessment results for the proposed design as a baseline are summarized in the following table by total upfront emissions and intensity as a total per square meter of gross floor area (including functional parkade area).

Table 3: Results Summary - Proposed Building

Life Cycle Stage	Global Warming Potential (kg CO₂e)
A1-A3 Product Stage	12,717,405
A4 Transportation	1,362,037
A5 Construction Installation Process	639,056
Total Up Front Emissions	14,718,498
Total Embodied Emissions Intensity	306.69 kgCO ₂ e/m²

UPFRONT CARBON EMISSIONS BY LIFE CYCLE STAGES

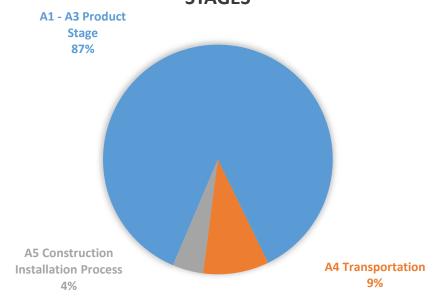


Figure 2: Upfront Carbon Emissions by Life Cycle Stages

RESULTS BREAKDOWN BY BUILDING ELEMENTS

The breakdown of the global warming potential over assembly categories are shown in Figure 3: Upfront Carbon Emissionsby Building Elements. The information shows that the floor slabs and exterior walls are the highest contributors to the overall upfront emissions of the project, contributing 48% and 15% respectively.

UPFRONT CARBON EMISSIONS BY BUILDING ELEMENT

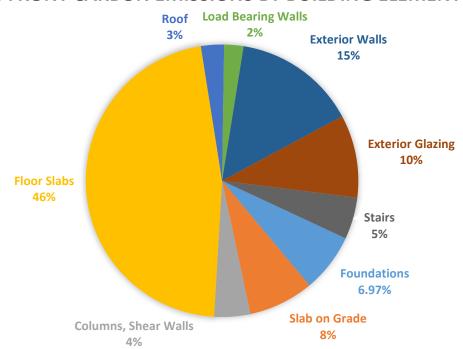


Figure 3: Upfront Carbon Emissionsby Building Elements

Upfront Carbon Reduction Measures

Upfront carbon reducing measures for evaluation were determined through a variety of design change options without reducing the project's residential gross floor area. Advanced design measures, such as alternative concrete mixes, were not evaluated within this preliminary analysis. The following measures were evaluated for the reduction of upfront carbon emissions:

- reduce floor slab thickness
- reduction of window-to-wall ratio (WWR)

REDUCED SLAB

- Reducing the slabs from the assumed 250 mm to 200 mm provided an approximate 9.11% reduction.

	Global Warming Potential (kg CO₂e)						
Life Cycle Stage	Baseline	Reduced Slab					
A1-A3 Product Stage	12,717,405	11,621,779					
A4 Transportation	1,362,037	1,184,818					
A5 Construction Installation Process	639,056	578,295					
Total Upfront Carbon Emissions	14,718,498	13,384,892					
Total Upfront Emissions Intensity	306.69 kgCO ₂ e/m²	278.90 kgCO ₂ e/m²					
Variance	e 9.06% reduction						

WINDOW-TO-WALL RATIO

WWR 35%

Reducing the total vision glazing from an approximate 40% to 35% and increasing the spandrel panels provides an increase in emissions of approximately 0.23%.

	Global Warming Potential (kg CO₂e)						
Life Cycle Stage	Baseline	wwr 35%					
A1-A3 Product Stage	12,717,405	12,752,172					
A4 Transportation	1,362,037	1,356,329					
A5 Construction Installation Process	639,056	651,638					
Total Upfront Carbon Emissions	14,718,498	14,760,139					
Total Upfront Emissions Intensity	306.69 kgCO ₂ e/m ²	307.56 kgCO ₂ e/m ²					
Variance	0.28% increase						

WWR 30%

Reducing the total vision glazing from an approximate 40% to 30% and increasing the spandrel panels provides an increase in emissions of approximately 0.21%.

	Global Warming Potential (kg CO₂e)						
Life Cycle Stage	Baseline	WWR 30%					
A1-A3 Product Stage	12,717,405	12,735,530					
A4 Transportation	1,362,037	1,356,757					
A5 Construction Installation Process	639,056	663,961					
Total Upfront Carbon Emissions	14,718,498	14,756,248					
Total Upfront Emissions Intensity	306.69 kgCO ₂ e/m ²	307.48 kgCO ₂ e/m²					
Variance	0.26% increase						

Limitations

Lifecycle assessment is a way of evaluating building design efficiency measures at different stages of a project (including early design) and for reporting at later design stages. Lifecycle assessment modelling makes assumptions for building design where design decisions are still in progress and may be ahead of decisions that can substantially impact carbon emissions intensity.

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Appendix – Bill of Materials

See the following pages for a bill of materials from One Click LCA for the baseline proposed design.

Project name 23142-001 1365-1375 Yonge Street

Indicator name Life Cycle Carbon - North America (Metric unil

			Global warming kg Thicknes	s						
Section	Resource	User input Unit	CO2e mm	Comment	Service life	Omniclass	Construction	Resource type	Datasource	Name
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	230.00 m3	60,807.40 203.2	Shear Wall - Concrete	As building	21-02 10 10 10 02. Floor Structural Frame - Column		Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	840.00 m3	222.079.20 203.2	Columns - Concrete	As building	21-02 10 10 10 02. Floor Structural Frame - Column		Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	average
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	6,337.00 m2	251,306.41 150	Loadbearing Wall - Concrete	As building	21-03 10 10. Interior Partitions		Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	14,950.00 kg	11,496.55	Shear Wall - Rebar at 65 kg/m3 Loadbearing Wall - Rebar - Average	As building	21-02 10 10 10 02. Floor Structural Frame - Column		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	80,797.00 kg	62,132.89	amount of reinforcement in walls 70-101 kg/m3 (4.36-6.24 lb/ft3)	As building	21-03 10 10. Interior Partitions		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	273.000.00 kg	209.937.00	Columns - Rebar - Average amount of reinforcement in columns 325 kg/m3	As building	21-02 10 10 10 02. Floor Structural Frame - Column		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Solid sheet steel for studs, industry average US and CN, 1ft 5/8in-14in x1ft 1/4in x 3ft 1/2in x0.0188in-0.1242in (SRI) XPS insulation boards, closed-cell (incl. A5 installation and B1 use phase impacts), L =	- m2	- 3.05	Spandrel - Studs	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Structural steel and steel profiles	EPD Industry-wide Cold-Formed Steel Studs and Track manufactured in U.S. and Canada.	Solid sheet steel for studs, industry average US and CN
A1-A3	0.0289 W/(m.K), R = 1 m2KW, 28.9 mm, 1.102 kg/m2, 38.13 kg/m3, SOPRA-XPS 20, SOPRA-XPS 26 W, SOPRA-XPS 30, SOPRA-XPS 35, SOPRA-XPS 35 DC, SOPRA-XPS 40, SOPRA-XPS 60, SOPRA-XPS 100 (SOPREMA)	- m2	- 25	Spandrel - Semi-Rigid 25mm		75 21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	XPS (extruded polystyrene) insulation	EPD EXTRUDED POLYSTYRENE THERMAL INSULATION BOARD	XPS insulation boards, closed-cell (incl. A5 installation and B1 use phase impacts)
	Rock wool insulation board for curtain wall systems, L=0.033 W/mK, R=4.2 (Rsi=0.74 m2K/W), 1 in (25.4 mm), 0.3 lb/ft2 (1.42 kg/m2), 3.5 lb/ft3 (56 kg/m3), CURTAINROCK							` ' ' '		Rock wool insulation board for curtain
A1-A3	(Rockwool North America)	- m2	- 100	Spandrel - Mineral Wool 100 mm	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Rock wool insulation	EPD Rockwool stone wool Thermal Insulation	wall systems EPDM Non-Reinforced Single Ply
A1-A3	EPDM Non-Reinforced Single Pty Waterproofing Roof Membrane (Fully Adhered), 60 mils: 2.07 kg/m2 (Single Pty Roofing Industry)	- m2	- 1.52	Spandrel - Membrane		35 21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Plastic membranes	EPD EPDM Non-Reinforced Single Ply Roofing Membrane (Fully Adhered) SPRI EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2	Waterproofing Roof Membrane (Fully Adhered)
A1-A3	Gyosum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gyosum Association)	- m2	- 15.88	Spandrel - Interior Drywall		40 21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Specialty gypsum board	in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US. and Canadian Markets	A Gypsum plaster board, fire resistant
A1-A3	Anodized aluminum curtainwall extrusion	- ton	-	Spandrel - Curtainwall Frame	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Aluminium	Quartz 2015	Anodized aluminum curtainwall extrusion
A1-A3	Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in (CISCA)	- ton	. 3	Spandrel - Back Pan and other metals	-		Snandrel Panel (Metal)	Aluminium	Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum sheet
A1-A3	(CISCA) Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in (CISCA)	- ton 128.00 ton	755,423.91 3	Spandrel - Back Pan and other metals Spandrel - Back Pan and other metals			Spandrei Panei (Metal)	Aluminium	CISCA 2014 Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum, sheet Aluminum, sheet
A1-A3	Anodized aluminum curtainwall extrusion	174.00 ton	569,698.95	Spandrel - Curtainwall Frame		21-02 20 10. Exterior Walls		Aluminium	Quartz 2015	Anodized aluminum curtainwall extrusion
									EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2 in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US.	4
A1-A3	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association) Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American	882.30 m2	2,631.50 15.88	Exterior Walls - ACM - Interior Drywall		40 21-02 20 10. Exterior Walls		Specialty gypsum board	and Canadian Markets	Gypsum plaster board, fire resistant
A1-A3	Wood Council, Canadian Wood Council) Rock wool insulation panels, unfaced, generic, L = 0.039 W/mK, R = 2.56 m2K/W (15	882.30 m2	2,033.27 9.5	Exterior Walls - ACM - OSB	As building	21-02 20 10. Exterior Walls		Oriented strand board (OSB)	EPD North American Oriented Strand Board	Oriented strand board (OSB)
A1-A3	ft2*Fh/BTU), 200 kg/m3 (12.49 lbs/ft3) (applicable for densities: 150-200 kg/m3 (9.36- 12.49 lbs/ft3)), Lambda=0.039 W/(m.K)	882.30 m2	10.975.63 50	Exterior Walls - ACM - Mineral Wool Insulation 50 mm		75 21-02 20 10. Exterior Walls		Rock wool insulation	One Click LCA	Rock wool insulation panels, unfaced, generic
A1-A3	Roll formed aluminum cladding, 4.91 kg/m2 (Metal Construction Association)	882.30 m2	16,410.78	Exterior Walls - ACM - Cladding	As building	21-02 20 10. Exterior Walls		Aluminium	EPD ROLL FORMED CLADDING	Roll formed aluminum cladding
A1-A3	Fiberglass batt insulation, 9.65in	882.30 m2	1,342.15 89	Exterior Walls - ACM - Batt		60 21-02 20 10. Exterior Walls		Glass wool insulation	Quartz 2015	Fiberglass batt insulation Steel stud framing for drywall/gypsum
A1-A3	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3), C-profile: 6 x 3 inch, gauge 20, 10 ft. height x 16 inch (40 cm) spacing	882.30 m2	14,483.00 152.4	Exterior Walls - ACM - Studs	As building	21-02 20 10. Exterior Walls		Structural steel and steel profiles	LCA based on NREL data for steel product, primary structural, beams and columns, at plant (U.S. Life Cycle Inventory Database 2012) EPD An Industry Average Cradie-to-Gate Life Cycle Assessment of 1/2 in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US.	plasterboard per sq. meter of wall area (incl. air gaps per m3)
A1-A3	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	3,529.20 m2	10,525.99 15.88	Exterior Walls - Precast - Interior Drywa	a .	40 21-02 20 10. Exterior Walls		Specialty gypsum board	and Canadian Markets	Gypsum plaster board, fire resistant Steel stud framing for drywall/gypsum
A1-A3	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3), C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	3,529.20 m2	22,875.23 101.6	Exterior Walls - Precast - Studs	As building	21-02 20 10. Exterior Walls		Structural steel and steel profiles	LCA based on NREL data for steel product, primary structural, beams and columns, at plant (U.S. Life Cycle Inventory Database 2012)	plasterboard per sq. meter of wall area (incl. air gaps per m3)
A1-A3	Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American Wood Council, Canadian Wood Council)	3,529.20 m2	8,133.08 9.5	Exterior Walls - Precast - OSB	As building	21-02 20 10. Exterior Walls		Oriented strand board (OSB)	EPD North American Oriented Strand Board	Oriented strand board (OSB)
A1-A3	Mock wool insulation panels, unfaced, generic, L = 0.039 W/mK, R = 2.56 m2K/W (15 ft2*Fh3TU), 200 kg/m3 (12.49 lbs/ft3) (applicable for densities: 150-200 kg/m3 (9.36- 12.49 bs/ft3). Lambda=0.039 W/m.K)	3.529.20 m2	43 902 53 50	Exterior Walls - Precast - Mineral Wool		75 21-02 20 10. Exterior Walls		Rock wool insulation	One Click I CA	Rock wool insulation panels, unfaced, generic
A1-A3	Precast concrete, architectural wall panel	3.529.20 m2	305.212.24 125	Exterior Walls - Precast - Cladding	As building	21-02 20 10. Exterior Walls		Concrete wall elements	Architectural and Insulated Wall Panel Industry Wide, National Precast	Precast concrete, architectural wall panel
A1-A3	Frecast concrete, architectural wall panel Fiberglass batt insulation, 9.65in	3,529.20 m2 3,529.20 m2	9,168.86 152	Exterior Walls - Precast - Cladding Exterior Walls - Precast - Batt	As building	21-02 20 10. Exterior Walls 60 21-02 20 10. Exterior Walls		Concrete wall elements Glass wool insulation	Concrete Association 2015 Quartz 2015	Fiberglass batt insulation
									EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2 in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US.	
A1-A3	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association) Steel stud framing for drywall(gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3), C-profite; 2-1/2 x 1-1/5 inch, gauge 25, 10. 1h. height x 16 inch (40 cm)	10,294.00 m2	30,702.29 15.88	Spandrel - Interior Drywall		40 21-02 20 10. Exterior Walls		Specialty gypsum board	and Canadian Markets LGA based on NREL data for steel product, primary structural, beams	Gypsum plaster board, fire resistant Steel stud framing for drywati/gypsum plasterboard per sq. meter of wall area
A1-A3	gaps per m3), C-profile: 2-1/2 x 1 -1/5 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing Rock wool insulation board for curtain wall systems, L=0.034 W/mK, R=5.68 (Rsi=1	10,294.00 m2	41,566.05 63.5	Spandrel - Studs	As building	21-02 20 10. Exterior Walls		Structural steel and steel profiles		(incl. air gaps per m3)
A1-A3	Rock wool insulation board for curtain wall systems, L=0.034 W/mk, R=5.68 (RSi=1 m2K/W), 1.34 in (34 mm), 0.39 lb/ft2 (1.9 kg/m2), 3.5 lb/ft3 (56 kg/m3), CURTAINROCK (Rockwool North America)	10 294 00 m2	45 777 27 100	Spandrel - Mineral Wool Insulation 100	As huilding	21-02 20 10. Exterior Walls		Rock wool insulation	FPD Rockwool stone wool Thermal Insulation	Rock wool insulation board for curtain wall systems
	XPS insulation, (Inc.). As installation and B1 use phase impacts), R=1m2KWI, 0.881 kg/mc, SyprobamTM Brand Ag Board, SyprobamTM Brand Carelymstel TM, SyprobamTM Brand Rama Carelymstel TM, SyprobamTM Brand Brand Rama Rama Carelymstel TM, SyprobamTM Brand Brand Reduces TM, SyprobamTM Brand Prezeromate TM, SyprobamTM Brand SyprobamTM B	1	30,772.27 100		, and the second			The state of the s		
A1-A3	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	108.20 m2	23,994.19 152	FDN Wall - Below grade insulation @ F (assumption)	As building	21-01 10 10. Standard Foundations		XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation, (incl. A5 installation and B1 use phase impacts)
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,300.00 m3	343,694.00 203.2	Footing - Concrete		21-01 10 10. Standard Foundations		Ready-mix concrete for external walls and floors	CONCRETE	Ready-mix concrete, Ontario industry average
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	2,668.00 m2	236,486.18 300	FDN Wall - Parkade Ext. Walls Concret	e As building	21-01 10 10. Standard Foundations		Ready-mix concrete for external walls and floors	CONCRETE	Ready-mix concrete, Ontario industry average
A1-A3 A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	68,034.00 kg 199,571.00 kg	52,318.15 153,470.10	FDN Wall - Rebar - 88 kg/m3 Footing - Rebar - 150kg/m3	As building	21-01 10 10. Standard Foundations 21-01 10 10. Standard Foundations		Reinforcement for concrete (rebar) Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar) Reinforcement steel (rebar)
A1-A3	XPS insulation, (incl. A5 installation and B1 use phase impacts), R+1m2XVV, 0.881 kg/mc, SlyndownTM Braned Agoust, SlyndownTM Braned Cashingthin, SlyndownTM Braned Research (Scholarith Braned Cashingthin, SlyndownTM Braned Research SlyndownTM Braned Research SlyndownTM Braned Research Braned Research Braned Research SlyndownTM Braned SlyndownTM		64.57 <u>9</u> .66 75	Soffit - Rigid insulation - extruded colvestrene (XPS)	As building	21-02 10 10. Floor Construction		XPS (extituded polyetyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation, (incl. A5 installation and B1 use phase impacts)
					As building				EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2 in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US.	4
A1-A3	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	590.20 m2	1,760.30 15.88	Soffit - Gypsum board		40 21-02 10 10. Floor Construction		Specialty gypsum board	and Canadian Markets	Gypsum plaster board, fire resistant

Ar's insulation, (inc. a histalation and a 1 use praise impacts), rel inta/viv, u.o.o.i kg/mz, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavlymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand Praied Transparent StyrofoamTM Brand Praied Transp PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Record StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, StyrofoamTM Brand RoofmateTM, StyrofoamTM Brand Scoreboard, StyrofoamTM Brand SM, StyrofoamTM Brand Square Edge, StyrofoamTM Brand StyrospanTM, StyrofoamTN Brand Tongue and Groove, StyrofoamTM Brand Ultra, StyrofoamTM Brand UtilityFitTM. Parkade - Rigid insulation - extruded EPD North American Grev Reduced GWP Styrofoam Brand XPS XPS insulation, (incl. A5 installation and brand i ongue and octove. Styriosam in brand uira, syriosam in brand zuist, syriosam in brand uira, syriosam in brand uira, syriosam in brand uira, syriosam in brand uira, sila, syriosam brand zmister IM. (DuPont de Nemours SBS polymer-modified blumen membrane rooffing, self-adhered, 6.69 kg/m² (Certain Teed, Henry, IKO, Malarkey Rooffing Products, Siplast, Soprema)
Ready-mix concrete, oritario industry average, Baseline 40 MPa concrete without air A1-A3 814.40 m2 89,111.62 75 polystyrene (XPS) As building 21-02 10 10. Floor Construction XPS (extruded polystyrene) insulatio B1 use phase impacts) SBS polymer-modified bitumen 21-02 10 20 90. Roof Constru A1-A3 814.40 m2 5,537.92 EPD SBS-modified Bitumen Roofing Mambran membrane roofing, self-adhered Ready-mix concrete, Ontario industry Supplementary Components 21-01 40 20. Structural Slabs-on-EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE Ready-mix concrete for structures (beams, columns, A1-A3 entrainment GU 15 SL (Concrete Ontario) 1.057.22 m2 431.147.53 1250 Transfer Slab - Concrete As building average SBS polymer-modified bitumen entrainment GU 15 St. (Concrete Ontario)
SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain
Teed, Henry, IKC). Malarkey Roofing Products, Siplast, Soprema)
Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air 21-02 10 20 90. Roof Construction A1-A3 1.276.00 m2 8.676.80 Roof - Level 50 + Mech As building EPD SBS-modified Bitumen Roofing Mambrane membrane roofing, self-adhered Ready-mix concrete, Ontario industry oncrete Ontario Member Industry-Wide EPD for READY-MIXED A1-A3 entrainment GU 15 SL (Concrete Ontario) 1.276.00 m2 75.401.39 200 Roof - Level 50 + Mech As building 21-02 10 20 10. Roof Strucural Frame Ready-mix concrete for external walls and floors CONCRETE entrainment GU 152 (Concrete Ontaino)
Polyisocyanurate (PIR) insulation boards, high-density, 2.69kg/m2 (5.93lb/m2), 28.8mm
(1.13in), 1m2K/M (5.678ltZ*Fh/Btu), 92.76 kg/m3 (Atlas Roofing Corporation, Carlisle
Construction Materials, Firestone Building Products, GAF, IKO, Johns Manville, 21-02 10 20 90. Roof Construction Polyisocyanurate (PIR) insulation boards, 71,206.51 150 Roof - Level 50 + Mech high-density A1-A3 Soprema, Inc. (USA)) 1,276.00 m2 75 Supplementary Components 21-02 10 20 20. Roof Decks, Slabs PIR (polyisocyanurate foam) insulation EPD Polyiso High-Density Roof Cover Boards Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board 4,202.84 12.7 1,276.00 m2 Roof - Level 50 + Mech EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board A1-A3 (Georgia-Pacific Gypsum) As building Specialty gypsum board Gypsum board with glass mat sheathing and Sheathing 21-02 10 20 90. Roof Construction Aggregate (crushed gravel), generic, dry bulk density SBS polymer-modified bitumen A1-A3 1,276.00 m2 717.84 200 Roof - Level 50 + Mech Ballast Aggregate (crushed gravel), generic, dry bulk density, 1600 kg/m3 As building Supplementary Components Sand, soil and gravel One Click LCA EPD SBS-modified Bitumen Roofing Mambrane
EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED
CONCRETE SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Feed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema) Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air 1.823.00 m2 Roof - Amenity and Priv. Terrace 21-02 10 20. Roof Construction A1-A3 As building Bitumen and other roofing membrane roofing, self-adhered Ready-mix concrete, Ontario industry Ready-mix A1-A3 entrainment GU 15 SL (Concrete Ontario) 1.823.00 m2 107.724.72 200 Roof - Amenity and Priv. Terrace As building 21-02 10 20 10, Roof Strucural Frame Ready-mix concrete for external walls and floors Polyisocyanurate (PIR) insulation boards, high-density, 2.69kg/m2 (5.93lb/m2), 28.8mm (1.13in), 1m2K/W (5.678ft2*Fh/Btu), 92.76 kg/m3 (Atlas Roofing Corporation, Carlisle Construction Materials, Firestone Building Products, GAF, IKO, Johns Manville, Polyisocyanurate (PIR) insulation boards A1-A3 Soprema. Inc. (USA)) 1.823.00 m2 101.731.56 150 Roof - Amenity and Priv. Terrace 75 21-02 10 20. Roof Construction PIR (polyisocyanurate foam) insulation EPD Polviso High-Density Roof Cover Boards Soprems, Inc. (USA))
Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)
Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m3, Light grey (Permacon) A1-A3 1.823.00 m2 6,004.52 12.7 Roof - Amenity and Priv. Terrace 61,191.55 59.94 Roof - Amenity and Priv. Terrace As building 21-02 10 20. Roof Construction As building 21-02 10 20. Roof Construction Specialty gypsum board Other precast concrete products EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board EPD CASSARA SLABS AND BOULEVARD PAVERS Gypsum board with glass mat sheathing XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 AvS insulation, (mir. A) insulation and a Live prose impact, N° InterVIT, Using Marketing March SyrdosamTM Brand Cavitymated, SyrdosamTM Brand Cavitymated, SyrdosamTM Brand Cavitymated March SyrdosamTM Brand DeckmateTM, SyrdosamTM Brand PackmateTM, SyrdosamTM, Sy Syrocian's Microsoft between the Control of the Con 21-01 40 20. Structural Slabs-on-XPS insulation, (incl. A5 installation and SOG - Rigid insulation - extruded EPD North American Grev Reduced GWP Styrofoam Brand XPS A1-A3 1,956.00 m2 214,025.44 75 As building XPS (extruded polystyrene) insulation B1 use phase impacts) 21-01 40 20. Structural Slabs-on Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3) Ready-mix concrete, normal-strength A1-A3 1,956.00 m2 82,791.72 150 SOG - Concrete As building Ready-mix concrete for external walls and floors One Click LCA 21-01 40 20. Structural Slabs-on-A1-A3 Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 35.208.00 kg 27.074.95 SOG - Rebar - 120kg/m3 Reinforcement for concrete (rebar) EPD Gerdau Rebar, Whitby Steel Mill Roof - Level 50 + Mech 21-02 10 20 10. Roof Strucural Frame EPD Gerdau Rebar, Whitby Steel Mill Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 45.936.00 kg 35.324.78 Reinforcement for concrete (rebar A1-A3 As building Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario) EPD Gerdau Rebar, Whilby Steel Mill

EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED Ready-mix concrete, Ontario industry 21-02 10 10 20. Floor Decks, Slabs, A1-A3 55.961.04 m2 4.133.562.22 250 Floor - Concrete Ready-mix concrete for external walls and floors A1-A3 Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 65.617.00 kg 50.459.47 Roof - Amenity and Priv. Terrace As building 21-02 10 20 10. Roof Strucural Frame Reinforcement for concrete (rebar) EPD Gerdau Rebar, Whitby Steel Mill Reinforcement steel (rebar) 21-01 40 20. Structural Slabs-on-A1-A3 Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 253.732.80 kg 195.120.52 Transfer Slab - Rebar - 120kg/m3 As building Reinforcement for concrete (rebar) EPD Gerdau Rebar, Whitby Steel Mill Reinforcement steel (rebar) 21-02 10 10 20. Floor Decks, Slabs A1-A3 Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 1,678,831.20 kg 1,291,021.19 Floor - Rebar - 120kg/m3 As building and Toppings Reinforcement for concrete (rebar) EPD Gerdau Rebar, Whitby Steel Mill Reinforcement steel (rebar) ete, Ontario industry average, Baseline 30 MPa concrete without air rete Ontario Member Industry-Wide EPD for READY-MIXED Ready-mix concrete. Ontario industry A1-A3 entrainment GU 15 SL (Concrete Ontario) 432.00 m3 114,212.16 203.2 As building 21-02 10 80. Stairs Ready-mix concrete for external walls and floors Stairs - Concrete 1 CONCRETE te. Ontario industry average. Baseline 30 MPa concrete without air ete Ontario Member Industry-Wide EPD for READY-MIXED Ready-mix concrete. Ontario industry Ready-mix concrete, Ontario industry average, 30 MPa concrete without air entrainment 1,224.00 m3 323,601.12 203.2 CONCRETE A1-A3 Stairs - Concrete 2 As building 21-02 10 80. Stairs 21-02 10 10 30. Balcony Floor Ready-mix concrete for external walls and floors E average ete Ontario Member Industry-Wide EPD for READY-MIXED Ready-mix concrete, Ontario industry A1-A3 1,903.00 m2 141,116.97 250 average Reinforcement steel (rebar) GU (Concrete Ontario) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Balconies - Concrete As building Ready-mix concrete for external walls and floors Reinforcement for concrete (rebar) CONCRETE EPD Gerdau Rebar, Whitby Steel Mill 43,200.00 kg As building 21-02 10 80. Stairs 21-02 10 10 30. Balcony Floor A1-A3 Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 57,080.16 kg EPD Gerdau Rebar, Whitby Steel Mill Balconies - Rebar As building Cons Reinforcement for concrete (rebar) Reinforcement for concrete (rebar) Reinforcement steel (rebar) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)
Fiberglass reinfroced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass
pocket thickness (Fleming / Assa Abloy). 124.560.00 kg 21-02 10 80. Stairs Reinforcement steel (rebar) Fiberglass reinfroced polyester (FRP) 21-02 10 60. Stairs 21-02 20 50. Exterior Doors and A1-A3 17.00 m2 EPD Fleming Fiberglass reinforced polyester door 2.023.72 Door - area per One Click LCA estim door, per m2 Aluminium frame curtain wall system, 34.9 kg/m2, 1600 WALL SYSTEM™ 1, 1600 WALL SYSTEM™ 2, 1600 WALL SYSTEM™ 3, 1600WALL SYSTEM™ 4, 1600 WALL SYSTEM™ 5, 1600 SS, 1600 UT SYSTEM™ 1, UDITAIN WALL, 1600 UT SYSTEM™ 2, 1620/1620 SSG, 1620UT, 1630 SS, 2250 IR, 7500 WALL™, CLEARWALL Curtain Wall (est. 2% of total glazing) @ As building 21-02 20 20. Exterior Windows 195.80 m2 EPD TRADITIONAL CURTAIN WALL A1-A3 21.621.25 Glass facades and glazing Aluminium frame curtain wall system (Kawneer)
Aluminium frame window wall system, 39.6 kg/m2, METROVIEW™ FG 501T,
METROVIEW™ FG 601T PG, FG 623, PG 123™ (Kawneer) A1-A3 9.594.00 m2 Window Wall (est. 98% of total glazing) As building 21-02 20 20. Exterior Windows Aluminium frame window wall system 1.352.571.79 Glass facades and glazing EPD WINDOW WALL Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED 21-02 10 10 10 02. Floor Structural Ready-mix concrete, Ontario industry ntrainment GU 15 SL (Concrete Ontario) 230.00 m3 13.020.14 203.2 Shear Wall - Concrete As building Ready-mix concrete for external walls and floors CONCRETE average

EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED Ready-mix concrete, Ontario industry CONCRETE rete, Ontario industry average, Baseline 30 MPa concrete without air 21-02 10 10 10 02. Floor Structural ntrainment GU 15 SL (Concrete Ontario) 840.00 m3 47.551.81 203.2 Columns - Concrete As huilding From Ready-mix concrete for external walls and floors CONCRETE Ontario industry average, Baseline 30 MPa concrete without ai rete Ontario Member Industry-Wide EPD for READY-MIXED Ready-mix concrete, Ontario industry Ready-mix concrete, Ontario industry aver entrainment GU 15 SL (Concrete Ontario) 6,337.00 m2 53,809.96 150 21-03 10 10. Interior Partitions Ready-mix concrete for external walls and floors Loadbearing Wall - Concrete As building CONCRETE 21-02 10 10 10 02. Floor Structura Shear Wall - Rebar at 65 kg/m3 Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 14,950.00 kg 301.05 As building Frame - Column Reinforcement for concrete (rebar) EPD Gerdau Rebar, Whitby Steel Mill Reinforcement steel (rebar) Loadbearing Wall - Rebar - Average amount of reinforcement in walls 70-100 Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 80.797.00 kg 1.627.04 ka/m3 (4.36-6.24 lb/ft3) As building 21-03 10 10. Interior Partition Reinforcement for concrete (rebar) EPD Gerdau Rebar, Whitby Steel Mill Reinforcement steel (rebar kg/ms (4.36-6.24 ibints) AS building 27-03 10 U. interior Partitions Columns - Rebar - Average amount of 21-02 10 10 10 02. Floor Structural reinforcement in columns 325 kg/ms As building Frame - Column EPD Gerdau Rebar, Whitby Steel Mill Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) 273,000.00 kg 5 497 50 Reinforcement for concrete (rebar) Reinforcement steel (rebar) EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2 in Lightweight and 5/8 in Type X Conventional Gypsum Board for the USA and Canadian Markets Gyosum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gyosum Association 765.07 15.88 40 21-02 20 20. Exterior Windows Spandrel Panel (Metal Specialty gypsum board Gypsum plaster board, fire resistan Spandrel - Curtainwall Frame As building 21-02 20 20. Exterior Windows Spandrel Panel (Metal) - ton 3.503.90 Quartz 2015 Anodized aluminum curtainwall extrusion Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120ir Aluminium specialty products, An industry-average environmental profile, CISCA 2014

Aluminium specialty products, An industry-average environmental profile, CISCA 2014 (CISCA) 2.577.58 3 Spandrel - Back Pan and other metals As building 21-02 20 20. Exterior Windows Spandrel Panel (Metal Aluminum, sheet v) um, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in 2,577.58 3 128.00 ton Spandrel - Back Pan and other metals As building 21-02 20 10. Exterior Walls Aluminum sheet Anodized aluminum curtainwall extrusion 174.00 ton 3,503.90 Spandrel - Curtainwall Frame 21-02 20 10. Exterior Walls As building nodized aluminum curtainwall extrusion EPD An Industry Average Cradle-to-Gate Life Cycle Asse in Lightweight and 5/8 in Type X Conventional Gypsum Board for the USA and Canadian Markets Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association) 882.30 m2 65.57 15.88 Exterior Walls - ACM - Interior Drywall 40 21-02 20 10. Exterior Walls Specialty gypsum board Gypsum plaster board, fire resistant

As building 21-02 20 10. Exterior Walls

Oriented strand board (OSB)

EPD North American Oriented Strand Board

Oriented strand board (OSB)

XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681

Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American

882.30 m2

101.04 9.5

Exterior Walls - ACM - OSB

Wood Council Canadian Wood Council)

Manufacture		Rock wool insulation panels, unfaced, generic, L = 0.039 W/mK, R = 2.56 m2K/W (15								
Manus Manu	A4	ft2*Fh/BTU), 200 kg/m3 (12.49 lbs/ft3) (applicable for densities: 150-200 kg/m3 (9.36- 12.49 lbs/ft3)), Lambda=0.039 W/(m.K)	882.30 m2	61.27 50	Exterior Walls - ACM - Mineral Wool Insulation 50 mm		75 21-02 20 10. Exterior Walls	Rock wool insulation	One Click LCA	Rock wool insulation panels, unfaced, generic
Part	A4	Roll formed aluminum cladding, 4.91 kg/m2 (Metal Construction Association)	882.30 m2	87.24		As building	21-02 20 10. Exterior Walls	Aluminium Class word invulation		
	A4		002.30 m2	7.00 09	Extenor Walls - ACM - Datt		00 21-02 20 10. Exterior walls	Glass wool insulation		Steel stud framing for drywall/gypsum
Part	A4	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3), C-profile: 6 x 3 inch, gauge 20, 10 ft. height x 16 inch (40 cm) spacing	882.30 m2	221.38 152.4	Exterior Walls - ACM - Studs	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles	and columns, at plant (U.S. Life Cycle Inventory Database 2012)	plasterboard per sq. meter of wall area (incl. air gaps per m3)
Market M	A4	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	3,529.20 m2	262.30 15.88	Exterior Walls - Precast - Interior Drywal	a	40 21-02 20 10. Exterior Walls	Specialty gypsum board	in Lightweight and 5/8 in Type X Conventional Gypsum Board for the USA	Gypsum plaster board, fire resistant
Mathematical Continue of Con	A4	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3), C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	3,529.20 m2	349.66 101.6	Exterior Walls - Precast - Studs	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles	LCA based on NREL data for steel product, primary structural, beams and columns, at plant (U.S. Life Cycle Inventory Database 2012)	plasterboard per sq. meter of wall area
Marke Mark	A4	Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American Wood Council, Canadian Wood Council)	3,529.20 m2	404.16 9.5	Exterior Walls - Precast - OSB	As building	21-02 20 10. Exterior Walls	Oriented strand board (OSB)	EPD North American Oriented Strand Board	Oriented strand board (OSB)
Marche M	A4	ft2*Fh/BTU), 200 kg/m3 (12.49 lbs/ft3) (applicable for densities: 150-200 kg/m3 (9.36-	3.529.20 m2	245.06 50			75.21-02.20.10. Exterior Walls.	Rock wool insulation	One Click I CA	
Company Comp	A4			7,351.94 125	Exterior Walls - Precast - Cladding			Concrete wall elements	Concrete Association 2015	-
Section Property	A4	Fiberglass batt insulation, 9.65in	3,529.20 m2	53.70 152	Exterior Walls - Precast - Batt		60 21-02 20 10. Exterior Walls	Glass wool insulation	EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2	, and the second
Part	A4	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	10.294.00 m2	765.07 15.88	Spandrel - Interior Drywall		40 21-02 20 10. Exterior Walls	Specialty gypsum board	in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US/ and Canadian Markets	Gypsum plaster board, fire resistant
Manual Control Manu		Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air						737		Steel stud framing for drywall/gypsum
March Marc	A4	spacing	10,294.00 m2	635.36 63.5	Spandrel - Studs	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles		
Property Control Con		m2K/W), 1.34 in (34 mm), 0.39 lb/ft2 (1.9 kg/m2), 3.5 lb/ft3 (56 kg/m3), CURTAINROCK			Spandrel - Mineral Wool Insulation 100					
Part	A4	(Rockwool North America)	10,294.00 m2	400.29 100	mm	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EPD Rockwool stone wool Thermal Insulation	wall systems
A		kg/m2. Synotaam1M Band Ag Board, Syrotaam1M Band Carlymate1M. Syrotaam1M Band Band Cadmite1M. Syrotaam1M Band Band Cadmite1M. Syrotaam1M Band Band Cadmite1M. Syrotaam1M Band Perezemate1M. Syrotaam1M Band Perezemate1M. Syrotaam1M Band Pereinate1M. Syrotaam1M Band Sozeeboard. Syrotaam1M Band Soze			ETNI Mell. Belavu arada jan dalina (A.D.	24			EPD North American Comp. Bud and CNIS Southern Stand VIS	VIS laudalan (fael AS indolosian and
Mathematical Cases	A4	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	108.20 m2	5.38 152	(assumption)	As building	21-01 10 10. Standard Foundations	XPS (extruded polystyrene) insulation	Products	B1 use phase impacts)
Mathematical Math	A4	entrainment GU 15 SL (Concrete Ontario) Ready-mix concrete. Ontario industry average. Baseline 35 MPa concrete without air						Ready-mix concrete for external walls and floors	CONCRETE	average
Mathematical and policy of policy	A4	entrainment GU 15 SL (Concrete Ontario)			FDN Wall - Parkade Ext. Walls Concrete	e As building	21-01 10 10. Standard Foundations		CONCRETE	average
1 1 1 1 1 1 1 1 1 1	A4 A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	199 571 00 kg		Footing - Rebar - 88 kg/m3 Footing - Rebar - 150kg/m3	As building As building	21-01 10 10. Standard Foundations 21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whithy Steel Mill FPD Gerdau Rebar, Whithy Steel Mill	Reinforcement steel (rebar)
Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Association) Fig. 1 August plant from fire resident, 10 Taylor, 15.97 mm (Gyptum Associatio		Duranted MI, Syroboam M, Brand Freezemate IM, Syroboam M, Brand Highood, Syroboam M, Borde Jone Lico, Syroboam M, Brand Pereinstell M, Syroboam M, Brand Pereinstell M, Syroboam M, Brand Recovernate, Syroboam M, Brand Recovernate M, Syroboam M, Brand Recovernate, Syroboam M, Brand Recovernate, Syroboam M, Brand Recovernate M, Syroboam M, Brand Recovernate, Syroboam M, Brand Recovernate M, Syroboam M, Brand Recovernate M, Brand Recovernate M, Syroboam M, Syrobo								XPS insulation, (incl. A5 installation and
A Gymun plate boord, for existing 17 Spring. Springer Market (27 Spring. 17 Spring. 17 Spring. Springer Market (27 Spring. 17 Spring. 17 Spring. Market (27 Spring. 17 Spring. 17 Spring. Market (27 Spring. Marke	A4	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	590.20 m2	14.48 75	polystyrene (XPS)	As building	21-02 10 10. Floor Construction	XPS (extruded polystyrene) insulation	EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2	
PSF Installation (Port of All statistics and ST is an plane reporting Port of Control Port of Port of Statistics Port of Port of Statistics Port of Statistics Port of Statistics Port of Port of Statistics Port of Port	A4	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	590.20 m2	43.86 15.88	Soffit - Gypsum board		40 21-02 10 10. Floor Construction	Specialty gypsum board	in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US/ and Canadian Markets	Gypsum plaster board, fire resistant
Syropher-modified blumen membranes motified specified period and production specified period and production specified period and production specified period		kg/m2. SyrodaemTM Brand Ag Board, SyrodaemTM Brand CarlymateTM, SyrodaemTM Brand Carlemant SyrodaemTM Brand Carlemant M2. SyrodaemTM Brand Brand Carlemant M2. SyrodaemTM Brand PreszemateTM, SyrodaemTM Brand FreszemateTM, SyrodaemTM Brand FreszemateTM, SyrodaemTM Brand FreszemateTM, SyrodaemTM Brand Practical M2. SyrodaemTM Brand Practical M2. SyrodaemTM Brand Practical M2. SyrodaemTM Brand Practical M2. SyrodaemTM Brand Residential StateM1. SyrodaemTM Brand Residential StateM1. SyrodaemTM Brand Residential StateM1. SyrodaemTM Brand Residential StateM1. SyrodaemTM Brand Scoreboard, SyrodaemTM Brand State StateM2. SyrodaemTM Brand StateM2. Sy			Parkada , Divid insulation , admir-				EDD North American Gase Starkpart (MIT Standards Standar	VPS insufation (find 4E installation
Ad Teel, Henry, (KO, Malatery Rocking Plockts, Spislat, Sogrems) 814.40 m2 66.21 Parkade - Membrane Confug, September 20 Supplementary Components - Restrict Confusion Statistics - Restrict C	A4	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	814.40 m2	19.98 75		As building	21-02 10 10. Floor Construction	XPS (extruded polystyrene) insulation		B1 use phase impacts)
## A settimment GUI 158. (Concrete Online) ## A settimment GUI 15	A4	Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema) Ready-mix concrete Ontario industry average, Baseline 40 MPa concrete without air					Supplementary Components 21-01 40 20. Structural Slabs-on-		EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	membrane roofing, self-adhered
Ad Teel, Henry, Kin, Oklaskrey, Roding Products, Siplast, Sogrems) 1,726 0 m2	A4	entrainment GU 15 SL (Concrete Ontario)	1,057.22 m2	74,810.60 1250	Transfer Slab - Concrete	As building		piling)	CONCRETE	serage SBS polymer-modified hitumen
Ad entamemed Gil 158. (Concrete Ontains) 1.78 f. of 1.7	A4	Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,276.00 m2	103.73	Roof - Level 50 + Mech	As building		Bitumen and other roofing		membrane roofing, self-adhered
(1.13h), 'mG/W/Y (5.78tF71bBU), 12.72 k g/m3 (Julia Materials, Prictor Building Pounds, CAF (KR), Ahm Marvile, Ad Soprema, Inc. (15A). Ad Soprem	A4	entrainment GU 15 SL (Concrete Ontario)	1,276.00 m2	14,446.69 200	Roof - Level 50 + Mech	As building	21-02 10 20 10. Roof Strucural Frame	Ready-mix concrete for external walls and floors		
Ad Soperma, Inc. (USA) Gypsam based with glass arest sheadeshing, 1/2n, 2.03 bill 2, Densibe-def Roof Board Ad Gypsam based with glass arest sheadeshing, 1/2n, 2.03 bill 2, Densibe-def Roof Board Ad Agengate (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (cever)is Particle (Sypsam) A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), generic, dy buik density, 1/2n, 2.03 bill 2, Densibe-def Roof Board A general (crushed gravel), gen		(1.13in), 1m2K/W (5.678ft2*Fh/Btu), 92.76 kg/m3 (Atlas Roofing Corporation, Carlisle Construction Materials, Firestone Building Products, GAF, IKO, Johns Manville,								
A4 (Georgia-Pacific Giypsum) A5 (Figure (Graphum) A	A4	Soprema Inc. (USA))	1,276.00 m2	215.75 150	Roof - Level 50 + Mech		75 Supplementary Components 21-02 10 20 20. Roof Decks, Slabs,	PIR (polyisocyanurate foam) insulation	· · · · · · · · · · · · · · · · · · ·	high-density
A4 Aggregate (crushed gravel), genefic, by but demaly, 1600 kgm3 1,278.00 m2 127.20 m2 state 4 a building Supplementality Components Sand, solid and gravel One Click LCA but demaly Supplementality Components Sand, solid and gravel One Click LCA but demaly Supplementality Components Sand, solid and gravel One Click LCA but demaly Supplementality Components Sand, solid and gravel One Click LCA but demaly Supplementality Components Sand, solid and gravel One Click LCA but demaly Supplementality Components Sand, solid and gravel One Click LCA but demaly Supplementality Components Sand, solid and gravel one Click Supplementality Components Sand, solid and gravel one Click Supplementality Components (PR) supplementality Components	A4		1,276.00 m2	87.81 12.7	Roof - Level 50 + Mech	As building	and Sheathing	Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	
A4 Teed, Henry, IKO, Makarkey, Rodfulling Photokack, Siylast, Sogremaly 1,823.0 m2 148.20 m2 148	A4	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain	1,276.00 m2	812.12 200	Roof - Level 50 + Mech Ballast	As building		Sand, soil and gravel	One Click LCA	bulk density
A4 entainment GU 15 St. (Concrete Ontains) 1,823.00 m2 20,839.75 200 Roof - Amenity and Priv. Terrace As building 21-02 10 20 10. Roof Strucural Frame Ready-mix concrete for external walls and floors (CNCRETE average (1.13m), Im/SVV (5 STRET-PhBBIL) 82 72 8 kg/m3 (5 8 8 bmC), 28 8 kg/m3 (5 8 8 8 8 bmC), 28 8 kg/m3 (5 8 8 8 8 bmC), 28 8 kg/m3 (5 8 8 8 8 bmC), 28 8 kg/m3 (5 8 8 8 8 bmC), 28 8 kg/m3 (5 8 8 8 8 bmC), 28 8 kg/m3 (5 8 8 8 8 kg/m3 (5 8 8 8 8 8 kg/m3 (5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	A4	Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,823.00 m2	148.20	Roof - Amenity and Priv. Terrace	As building	21-02 10 20. Roof Construction	Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Mambrane EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	membrane roofing, self-adhered
(1.13a), 'moXVV (5.678C7FNB3I), 82 7.8 kg/m3 (Alsas Rooting Corporation, Carrière Construction Materias, Frozone Building Pouds, CAF, EXO, Ahm Marrille, A4 Septema, Inc. (19Ah)	A4	entrainment GLI 15 SL (Concrete Ontario)	1,823.00 m2	20,639.75 200	Roof - Amenity and Priv. Terrace	As building	21-02 10 20 10. Roof Strucural Frame	Ready-mix concrete for external walls and floors	CONCRETE	
Gypsum board with glass mat alt-easthing, 1/2in, 2.03 bit/12, DensiDeck® Roof Board 4. (Geograp-Pacific Gyossum - Specially vivosum board EPD Georgia-Pacific Gyossum EPD for 1/2 DensiDeck® Roof Board Gyossum board with dates mat alt-easthing. 1.823.00 m2 125.45 12.7 Roof - Amenity and Priv. Terrace As building 2.1-02 10 20. Roof Construction Sociality vivosum board EPD Georgia-Pacific Gyossum EPD for 1/2 DensiDeck® Roof Board Gyossum board with dates mat alt-easthing.		(1.13in), 1m2K/W (5.678ft2*Fh/Btu), 92.76 kg/m3 (Atlas Roofing Corporation, Carlisle								Polyisocyanurate (PIR) insulation boards,
	A4	Soprema, Inc. (USA))	1,823.00 m2	308.23 150	Roof - Amenity and Priv. Terrace		75 21-02 10 20. Roof Construction	PIR (polyisocyanurate toam) insulation	EPD Polyiso High-Density Roof Cover Boards	nign-density
	A4 A4	Soprema, Inc. (USA)) Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Redit Gypsum)			•	As building	21-02 10 20. Roof Construction		EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	-

XPS insulation, (incl. A5 installation and B1 use phase impacts), R=fm2KW, 0.881 kg/mc, SyrobamTM Brand A Board, SyrobamTM Brand Cashymate TM. SyrobamTM Brand Barad Cashymate TM. SyrobamTM Brand Brand Cashymate TM. SyrobamTM Brand Ferezemate TM. SyrobamTM Brand Flexibam SyrobamTM Brand Torque and Grows. SyrobamTM Brand Torque and Grows. SyrobamTM Brand Torque Brand SyrobamTM Brand Flexibam Syrobam S

	StyrofoamTM Brand RoofmateTM, StyrofoamTM Brand Scoreboard, StyrofoamTM Brand SM, StyrofoamTM Brand Square Edge, StyrofoamTM Brand StyrospanTM, StyrofoamTM									
	Brand Tongue and Groove, StyrofoamTM Brand Ultra, StyrofoamTM Brand UtilityFitTM.			SOG - Rigid insulation - extruded		21-01 40 20. Structural Slabs-on-			EPD North American Grey Reduced GWP Styrofoam Brand XPS	XPS insulation, (incl. A5 installation and
A4	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours) Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled	1,956.00 m2	47.98 75	polystyrene (XPS)	As building	Grade 21-01 40 20. Structural Slabs-on-		XPS (extruded polystyrene) insulation	Products	B1 use phase impacts) Ready-mix concrete, normal-strength,
A4	binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,956.00 m2	16,609.17 150	SOG - Concrete	As building	Grade 21-01 40 20. Structural Slabs-on-		Ready-mix concrete for external walls and floors	One Click LCA	generic generic generic generic
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	35,208.00 kg	709.00	SOG - Rebar - 120kg/m3	As building	21-01 40 20. Structural Slabs-on- Grade		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	45,936.00 kg	925.03	Roof - Level 50 + Mech	As building	21-02 10 20 10. Roof Strucural Fran	ne	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
44	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	55.961.04 m2	791.978.72 250	Floor - Concrete	As building	21-02 10 10 20. Floor Decks, Slabs, and Toppings		Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
704								·		
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	65,617.00 kg	1,321.35	Roof - Amenity and Priv. Terrace	As building	21-02 10 20 10. Roof Strucural Fran 21-01 40 20. Structural Slabs-on-	ee .	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	253,732.80 kg	5,109.51	Transfer Slab - Rebar - 120kg/m3	As building	Grade 21-02 10 10 20. Floor Decks, Slabs,		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air	1,678,831.20 kg	33,807.23	Floor - Rebar - 120kg/m3	As building	and Toppings		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	Reinforcement steel (rebar) Ready-mix concrete. Ontario industry
A4	entrainment GU 15 SL (Concrete Ontario)	432.00 m3	24,455.21 203.2	Stairs - Concrete 1	As building	21-02 10 80. Stairs		Ready-mix concrete for external walls and floors	CONCRETE	average
A4	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,224.00 m3	69,289.77 203.2	Stairs - Concrete 2	As building	21-02 10 80. Stairs		Ready-mix concrete for external walls and floors	CONCRETE	Ready-mix concrete, Ontario industry average
A4	Ready-mix concrete, Ontario industry average, 30 MPa concrete without air entrainment GU (Concrete Ontario)	1,903.00 m2	26,931.87 250	Balconies - Concrete	As building	21-02 10 10 30. Balcony Floor Construction		Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	43,200.00 kg	869.93	Stairs - Rebar 1	As building	21-02 10 80. Stairs 21-02 10 10 30. Balcony Floor		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	57,080.16 kg	1,149.44	Balconies - Rebar	As building	Construction		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Fiberglass reinfroced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass	124,560.00 kg	2,508.31	Stairs - Rebar 2	As building	21-02 10 80. Stairs 21-02 20 50. Exterior Doors and		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar) Fiberglass reinfroced polyester (FRP)
A4	pocket thickness (Fleming / Assa Abloy) Aluminium frame curtain wall system, 34.9 kg/m2, 1600 WALL SYSTEM™ 1, 1600	17.00 m2	6.56	Door - area per One Click LCA estimate		40 Grilles		Glass doors	EPD Fleming Fiberglass reinforced polyester door	door, per m2
	WALL SYSTEM™ 2, 1600 WALL SYSTEM™ 3, 1600WALL SYSTEM™ 4, 1600 WALL SYSTEM™ 5, 1600 SS, 1600 UT SYSTEM™ 1 CURTAIN WALL, 1600 UT SYSTEM™									
A4	2, 1620/1620 SSG, 1620UT, 1630 SS, 2250 IG, 2250 LR, 7500 WALL™, CLEARWALL (Kawneer)	195.80 m2	47.45	Curtain Wall (est. 2% of total glazing) @ Podium	As building	21-02 20 20. Exterior Windows		Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL	Aluminium frame curtain wall system
	Aluminium frame window wall system, 39.6 kg/m2, METROVIEW™ FG 501T, METROVIEW™ FG 601T PG, FG 623. PG 123™ (Kawneer)	9.594.00 m2	2 638 15	Management (and ORM) of Antal standards	-	21-02 20 20 Exterior Windows		Glass facades and glazing	EPD WINDOW WALL	Aluminium frame window wall system
A4	Ready-mix concrete. Ontario industry average. Baseline 30 MPa concrete without air	-,		Window Wall (est. 98% of total glazing)		21-02 10 10 10 02. Floor Structural			EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	
A5	entrainment GU 15 SL (Concrete Ontario) Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air	230.00 m3	3,346.15 203.2	Shear Wall - Concrete	As building	Frame - Column 21-02 10 10 10 02. Floor Structural		Ready-mix concrete for external walls and floors	CONCRETE EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	average Ready-mix concrete, Ontario industry
A5	entrainment GU 15 SL (Concrete Ontario) Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air	840.00 m3	12,220.71 203.2	Columns - Concrete	As building	Frame - Column		Ready-mix concrete for external walls and floors	CONCRETE EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	average
A5	entrainment GU 15 SL (Concrete Ontario)	6,337.00 m2	13,829.04 150	Loadbearing Wall - Concrete	As building	21-03 10 10. Interior Partitions		Ready-mix concrete for external walls and floors	CONCRETE	average
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	14,950.00 kg	612.35	Shear Wall - Rebar at 65 kg/m3	As building	21-02 10 10 10 02. Floor Structural Frame - Column		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	80.797.00 kg	3.309.42	Loadbearing Wall - Rebar - Average amount of reinforcement in walls 70-100 kg/m3 (4.36-6.24 lb/ft3)	An huilding	21-03 10 10. Interior Partitions		Reinforcement for concrete (rebar)	EPD Gerdau Rebar. Whitby Steel Mill	Reinforcement steel (rebar)
				Columns - Rebar - Average amount of	-	21-02 10 10 10 02. Floor Structural		,	· · · · · · · · · · · · · · · · · · ·	,
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Solid sheet steel for studs, industry average US and CN, 1ft 5/8in-14in x1ft 1/4in x 3ft	273,000.00 kg	11,181.98	reinforcement in columns 325 kg/m3	As building	Frame - Column		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill EPD Industry-wide Cold-Formed Steel Studs and Track manufactured in	Reinforcement steel (rebar) Solid sheet steel for studs, industry
A5	1/2in x0.0188in-0.1242in (SRI) XPS insulation boards, closed-cell (incl. A5 installation and B1 use phase impacts), L =	- m2	- 3.05	Spandrel - Studs	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Structural steel and steel profiles	U.S. and Canada.	average US and CN
	0.0289 W/(m.K), R = 1 m2K/W, 28.9 mm, 1.102 kg/m2, 38.13 kg/m3, SOPRA-XPS 20 , SOPRA-XPS 25 CW . SOPRA-XPS 30 . SOPRA-XPS 35 . SOPRA-XPS 35 DC .									XPS insulation boards, closed-cell (incl. A5 installation and B1 use phase
A5	SOPRA-XPS 40 , SOPRA-XPS 60 , SOPRA-XPS 100 (SOPREMA) Rock wool insulation board for curtain wall systems, L=0.033 W/mK, R=4.2 (Rsi=0.74	- m2	- 25	Spandrel - Semi-Rigid 25mm		75 21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	XPS (extruded polystyrene) insulation	EPD EXTRUDED POLYSTYRENE THERMAL INSULATION BOARD	impacts)
	m2K/W), 1 in (25.4 mm), 0.3 lb/ft2 (1.42 kg/m2), 3.5 lb/ft3 (56 kg/m3), CURTAINROCK									Rock wool insulation board for curtain
A5	(Rockwool North America)	- m2	- 100	Spandrel - Mineral Wool 100 mm	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Rock wool insulation	EPD Rockwool stone wool Thermal Insulation	wall systems EPDM Non-Reinforced Single Ply
45	EPDM Non-Reinforced Single Ply Waterproofing Roof Membrane (Fully Adhered), 60 mils: 2.07 kg/m2 (Single Ply Roofing Industry)	- m2	- 1.52	Spandrel - Membrane		35 21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Plastic membranes	EPD EPDM Non-Reinforced Single Ply Roofing Membrane (Fully Adhered) SPRI	Waterproofing Roof Membrane (Fully Adhered)
7.0	nus. 2.07 kg/m2 (ongc 11) rooming massivy)	- 1112	1.02	opanaci - monarate		OS E POE ES ES. EXILITO VIII COMS	Opanico i ano (motal)		EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2 in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US/	
A5	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	- m2	484.64 15.88	Spandrel - Interior Drywall		40 21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Specialty gypsum board	and Canadian Markets	Gypsum plaster board, fire resistant
A5	Anodized aluminum curtainwall extrusion	- ton	984.23	Spandrel - Curtainwall Frame	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Aluminium	Quartz 2015	Anodized aluminum curtainwall extrusion
	Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in (CISCA)	- ton	724.03 3	Spandrel - Back Pan and other metals	A - b - 7 - 7	04 00 00 00 5-4-4	Spandrel Panel (Metal)	Aluminium	Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum, sheet
AU.	Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in						Spandiel Parlet (Metal)		Aluminium specialty products, An industry-average environmental profile,	,
A5	(CISCA)	128.00 ton	57,380.83 3	Spandrel - Back Pan and other metals	As building	21-02 20 10. Exterior Walls		Aluminium	CISCA 2014	Aluminum, sheet
A5	Anodized aluminum curtainwall extrusion	174.00 ton	43,711.66	Spandrel - Curtainwall Frame	As building	21-02 20 10. Exterior Walls		Aluminium	Quartz 2015 EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2	Anodized aluminum curtainwall extrusion
45	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	882.30 m2	370.48 15.88	Exterior Walls - ACM - Interior Drywall		40 21-02 20 10. Exterior Walls		Specialty gypsum board	in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US/ and Canadian Markets	Gypsum plaster board, fire resistant
AS	Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American									
A5	Wood Council, Canadian Wood Council) Rock wool insulation panels, unfaced, generic, L = 0.039 W/mK, R = 2.56 m2K/W (15	882.30 m2	381.31 9.5	Exterior Walls - ACM - OSB	As building	21-02 20 10. Exterior Walls		Oriented strand board (OSB)	EPD North American Oriented Strand Board	Oriented strand board (OSB)
A5	ft2"Fh/BTU), 200 kg/m3 (12.49 lbs/ft3) (applicable for densities: 150-200 kg/m3 (9.36- 12.49 lbs/ft3)) Lambdami 039 W/(m K)	882.30 m2	442.97 50	Exterior Walls - ACM - Mineral Wool Insulation 50 mm		75 21-02 20 10 Exterior Walls		Rock wool insulation	One Click I CA	Rock wool insulation panels, unfaced, generic
A5	Roll formed aluminum cladding, 4.91 kg/m2 (Metal Construction Association)	882.30 m2	827.56	Exterior Walls - ACM - Cladding	As building	21-02 20 10. Exterior Walls		Aluminium	EPD ROLL FORMED CLADDING	Roll formed aluminum cladding
A5	Fiberglass batt insulation, 9.65in	882.30 m2	108.90 89	Exterior Walls - ACM - Batt		60 21-02 20 10. Exterior Walls		Glass wool insulation	Quartz 2015	Fiberglass batt insulation Steel stud framing for drywall/gypsum
AE	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3), C-profile: 6 x 3 inch, gauge 20, 10 ft. height x 16 inch (40 cm) spacing	882.30 m2	505.34 152.4	Exterior Walls - ACM - Studs	An huilding	21-02 20 10. Exterior Walls		Structural steel and steel profiles	LCA based on NREL data for steel product, primary structural, beams and columns, at plant (U.S. Life Cycle Inventory Database 2012)	plasterboard per sq. meter of wall area (incl. air gaps per m3)
A.S	gaps per mo), c-prome. 6 x 3 mon, gauge 20, 10 nr. neight x 10 mon (40 cm) spacing	002.30 III2	303.34 132.4	Extensi Walls - ACM - Studs	As building	21-02 20 TO. EXTERIOR WAILS		Suddular steer and steer profiles	EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2	
A5	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	3,529.20 m2	1,481.90 15.88	Exterior Walls - Precast - Interior Drywal		40 21-02 20 10. Exterior Walls		Specialty gypsum board	in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US/ and Canadian Markets	Gypsum plaster board, fire resistant
	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air								LCA based on NREL data for steel product, primary structural, beams	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area
A5	gaps per m3), C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	3,529.20 m2	798.16 101.6	Exterior Walls - Precast - Studs	As building	21-02 20 10. Exterior Walls		Structural steel and steel profiles		(incl. air gaps per m3)
A5	Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American Wood Council, Canadian Wood Council)	3,529.20 m2	1,525.24 9.5	Exterior Walls - Precast - OSB	As building	21-02 20 10. Exterior Walls		Oriented strand board (OSB)	EPD North American Oriented Strand Board	Oriented strand board (OSB)
	Rock wool insulation panels, unfaced, generic, L = 0.039 W/mK, R = 2.56 m2K/W (15 ft2*Fh/BTU), 200 kg/m3 (12.49 lbs/ft3) (applicable for densities: 150-200 kg/m3 (9.36-			Exterior Walls - Precast - Mineral Wool						Rock wool insulation panels, unfaced.
A5	12.49 lbs/lt3)), Lambda=0.039 W/(m.K)	3,529.20 m2	1,771.88 50	Insulation 50 mm		75 21-02 20 10. Exterior Walls		Rock wool insulation	One Click LCA	generic pariots, arraced,
A5	Precast concrete, architectural wall panel	3,529.20 m2	15,852.20 125	Exterior Walls - Precast - Cladding	As building	21-02 20 10. Exterior Walls		Concrete wall elements	Architectural and Insulated Wall Panel Industry Wide, National Precast Concrete Association 2015	Precast concrete, architectural wall panel
A5	Fiberglass batt insulation, 9.65in	3,529.20 m2	743.93 152	Exterior Walls - Precast - Batt	, i	60 21-02 20 10. Exterior Walls		Glass wool insulation	Quartz 2015 EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2	Fiberglass batt insulation
									in Lightweight and 5/8 in Type X Conventional Gypsum Board for the USA	<u> </u>
A5	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association) Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air	10,294.00 m2	4,322.42 15.88	Spandrel - Interior Drywall		40 21-02 20 10. Exterior Walls		Specialty gypsum board		Gypsum plaster board, fire resistant Steel stud framing for drywall/gypsum
A5	gaps per m3), C-profile: 2-1/2 x 1 -1/5 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	10,294.00 m2	1,450.32 63.5	Spandrel - Studs	As building	21-02 20 10. Exterior Walls		Structural steel and steel profiles		plasterboard per sq. meter of wall area (incl. air gaps per m3)
		, 204.00 1112	.,		building	LO 10. LAIGIOI TIGIS		see and see prones	, pun (0.0. Enc dyac internally builded 2012)	/ == 0=/co her mo)

	Rock wool insulation board for curtain wall systems, L=0.034 W/mK, R=5.68 (Rsi=1								
45	m2K/W), 1.34 in (34 mm), 0.39 lb/ft2 (1.9 kg/m2), 3.5 lb/ft3 (56 kg/m3), CURTAINROCK (Rockwool North America)	10.294.00 m2	3.739.86 100	Spandrel - Mineral Wool Insulation 100	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EPD Rockwool stone wool Thermal Insulation	Rock wool insulation board for curtain wall systems
	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=fmCKW, 0.881 kg/mc, SyrofoamTM Brand Ag Board, SyrofoamTM Brand Cadmight, SyrofoamTM Brand Brand Ray SyrofoamTM Brand Brand Ray SyrofoamTM Brand Ray	10,254.00 mg	5,153.50				Took Took Took Took Took Took Took Took		,
A5	SM, StyrofoamTM Brand Square Edge, StyrofoamTM Brand StyrospanTM, StyrofoamTM Brand Tongue and Groove, StyrofoamTM Brand Ultra, StyrofoamTM Brand UltilityFiTM, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	108.20 m2	996.71 152	FDN Wall - Below grade insulation @ P (assumption)	1 As building	21-01 10 10. Standard Foundations	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation, (incl. A5 installation and B1 use phase impacts)
A5	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,300.00 m3	18,913.00 203.2	Footing - Concrete	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A5	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	2,668.00 m2	12,639.65 300	FDN Wall - Parkade Ext. Walls Concrete	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	average
A5 A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	68,034.00 kg 199,571.00 kg	2,786.65 8,174.36	FDN Wall - Rebar - 88 kg/m3 Footing - Rebar - 150kg/m3	As building As building	21-01 10 10. Standard Foundations 21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar) Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar) Reinforcement steel (rebar)
	JPS insulation, (rick J. & Insulation and S1 use phase Impacts), No FindXVM, 0.081 lights, StyrotosmTM Brand Ag Board, SyrotosmTM Brand CavitymashTM, SyrotosmTM Durandel TM, SyrotosmTM Brand FeezeemateTM, SyrotosmTM Erand Feljinad, SyrotosmTM Brand FeezeemateTM, SyrotosmTM Brand FeezeemateTM, Brand SyrotosmTM, Brand Syrotosm			Soffit - Rigid insulation - extruded				EPD North American Grey Reduced GWP Styrdoam Brand XPS	XPS insulation, (incl. A5 installation and
A5	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	590.20 m2	2,682.62 75	polystyrene (XPS)	As building	21-02 10 10. Floor Construction	XPS (extruded polystyrene) insulation	Products EPD An Industry Average Cradle-to-Gate Life Cycle Assessment of 1/2	B1 use phase impacts)
A5	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	590.20 m2	247.82 15.88	Soffit - Gypsum board		40 21-02 10 10. Floor Construction	Specialty gypsum board	in Lightweight and 5/8 in Type X Conventional Gypsum Board for the US and Canadian Markets	A Gypsum plaster board, fire resistant
	XPS insulation, (incl. A5 installation and 81 use phase impacts), R=1m2KW, 0.881 kg/m2, SyndoamTM Brand Ag Board, SyndoamTM Brand Carleymais TM, SyndoamTM Brand Calleymais TM, SyndoamTM Brand SyndoamTM Brand Paced Carley SyndoamTM Brand Paced Carley SyndoamTM Brand Paced Carleymais TM, SyndoamTM Brand								
A5	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	814.40 m2	3,701.67 75	Parkade - Rigid insulation - extruded polystyrene (XPS)	As building	21-02 10 10. Floor Construction	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation, (incl. A5 installation and B1 use phase impacts)
A5	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	814.40 m2	567.54	Parkade - Membrane	As building	21-02 10 20 90. Roof Construction Supplementary Components	Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Mambrane	SBS polymer-modified bitumen membrane roofing, self-adhered
A5	Ready-mix concrete, Ontario industry average, Baseline 40 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,057.22 m2	22,061.75 1250	Transfer Slab - Concrete	As building	21-01 40 20. Structural Slabs-on- Grade	Ready-mix concrete for structures (beams, columns, piling)	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A5	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,276.00 m2	889.21	Roof - Level 50 + Mech	As building	21-02 10 20 90. Roof Construction Supplementary Components	Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Mambrane	SBS polymer-modified bitumen membrane roofing, self-adhered
A5	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,276.00 m2	4,030.03 200	Roof - Level 50 + Mech	As building	21-02 10 20 10. Roof Strucural Frame	Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
	Polylisocyanurate (PIR) insulation boards, high-density, 2.68kg/m2 (5.93lb/m2), 28.8mm (1.13in), 1m2K/W (5.678fl2°Fh/Blu), 92.78 kg/m3 (Atlas Roofing Corporation, Carlisle Construction Materials, Firestone Building Products, GAF, IKO, Johns Manville,					21-02 10 20 90. Roof Construction			Polyisocyanurate (PIR) insulation boards,
A5	Soprema, Inc. (USA)) Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board	1,276.00 m2	4,329.92 150	Roof - Level 50 + Mech		75 Supplementary Components 21-02 10 20 20. Roof Decks, Slabs,	PIR (polyisocyanurate foam) insulation	EPD Polyiso High-Density Roof Cover Boards	high-density
A5	(Georgia-Pacific Gypsum)	1,276.00 m2 1,276.00 m2	580.98 12.7	Roof - Level 50 + Mech Roof - Level 50 + Mech Ballast	As building As building	and Sheathing 21-02 10 20 90. Roof Construction	Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board One Click LCA	Gypsum board with glass mat sheathing Aggregate (crushed gravel), generic, dry bulk density
A5	Aggregate (crushed gravel), generic, dry bulk densily, 1600 kg/m3 SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,823.00 m2	1.270.40	Roof - Amenity and Priv. Terrace	-	Supplementary Components 21-02 10 20. Roof Construction	Sand, soil and gravel	EPD SBS-modified Bitumen Roofing Mambrane	SBS polymer-modified bitumen
Ab	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air						Bitumen and other roofing	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	
A5	entrainment GU 15 SL (Concrete Ontario) Polyiscoyanurate (PIR) insulation boards, high-density, 2.69kg/m2 (5.93lb/m2), 28.8mm (1.13in), 1m2KW (5.678f82°Fh/Bbl., 92.76 kg/m3 (Alflas Roofing Corporation, Carlisile Construction Materials, Firestone Building Products, GAF, IKO, Johns Manville,	1,823.00 m2	5,757.64 200	Roof - Amenity and Priv. Terrace		21-02 10 20 10. Roof Strucural Frame	Ready-mix concrete for external walls and floors	CONCRETE	average Polyisocyanurate (PIR) insulation boards,
A5	Soprema, Inc. (USA)) Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board	1,823.00 m2	6,186.09 150	Roof - Amenity and Priv. Terrace		75 21-02 10 20. Roof Construction	PIR (polyisocyanurate foam) insulation	EPD Polyiso High-Density Roof Cover Boards	high-density
A5 A5	(Georgia-Pacific Gypsum) Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m3, Light grey (Permacon)	1,823.00 m2 1,823.00 m2	830.03 12.7 - 59.94	Roof - Amenity and Priv. Terrace Roof - Amenity and Priv. Terrace	As building As building	21-02 10 20. Roof Construction 21-02 10 20. Roof Construction	Specialty gypsum board Other precast concrete products	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board EPD CASSARA SLABS AND BOULEVARD PAVERS	Gypsum board with glass mat sheathing Pavers
	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=fn2K/W, 0.681 kg/m2, SyrofoamTM Brand Ag Board, SyrofoamTM Brand Cadmight, SyrofoamTM Brand Freezemate TM, SyrofoamTM Brand Freight, SyrofoamTM Brand Freezemate TM, SyrofoamTM Brand SyrofoamTM Brand SyrofoamTM Brand Freezemate TM, SyrofoamTM Brand SyrofoamTM B			SOG - Rigid insulation - extruded		21-01-40 20, Shuchural Slabe-on-		EPD North American Grey Reduced GWP Styrdoam Brand XPS	XPS insulation, (incl. A5 installation and
A5	StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours) Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled	1,956.00 m2	8,890.55 75	polystyrene (XPS)	As building	Grade 21-01 40 20. Structural Slabs-on-	XPS (extruded polystyrene) insulation	Products	B1 use phase impacts) Ready-mix concrete, normal-strength,
A5	binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,956.00 m2	4,477.42 150	SOG - Concrete	As building	Grade 21-01 40 20. Structural Slabs-on-	Ready-mix concrete for external walls and floors	One Click LCA	generic
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	35,208.00 kg	1,442.11	SOG - Rebar - 120kg/m3	As building	Grade	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air	45,936.00 kg	1,881.52	Roof - Level 50 + Mech	As building	21-02 10 20 10. Roof Strucural Frame 21-02 10 10 20. Floor Decks, Slabs,	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED	Reinforcement steel (rebar) Ready-mix concrete, Ontario industry
A5	entrainment GU 15 SL (Concrete Ontario) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	55,961.04 m2 65.617.00 ka	220,929.44 250	Floor - Concrete Roof - Amenity and Priv. Terrace	As building As building	and Toppings 21-02 10 20 10 Roof Structural Frame	Ready-mix concrete for external walls and floors Reinforcement for concrete (rebar)	CONCRETE EPD Gerdau Rebar, Whitby Steel Mill	average Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	65,617.00 kg 253,732.80 kg	2,687.65	Transfer Slab - Rebar - 120kg/m3	As building As building	21-02 10 20 10. Roof Strucural Frame 21-01 40 20. Structural Slabs-on- Grade	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	1.678.831.20 kg	68,764.32	Floor - Rebar - 120kg/m3	As building	21-02 10 10 20. Floor Decks, Slabs, and Toppings	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	432.00 m3	6,284.94 203.2	Stairs - Concrete 1		21-02 10 80. Stairs	Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A5	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GLI 15 SL (Concrete Ontario)	1,224.00 m3	17,807.32 203.2	Stairs - Concrete 2	As building	21-02 10 80. Stairs	Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A5	Ready-mix concrete, Ontario industry average, 30 MPa concrete without air entrainment GU (Concrete Ontario)	1,903.00 m2	7,534.96 250	Balconies - Concrete	As building	21-02 10 10 30. Balcony Floor Construction	Ready-mix concrete for external walls and floors	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	average
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	43,200.00 kg	1,769.46	Stairs - Rebar 1	As building	21-02 10 80. Stairs 21-02 10 10 30. Balcony Floor	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5 A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant) Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	57,080.16 kg 124,560.00 kg	2,337.98 5,101.93	Balconies - Rebar Stairs - Rebar 2	As building As building	Construction 21-02 10 80. Stairs	Reinforcement for concrete (rebar) Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar) Reinforcement steel (rebar)
A5	Fiberglass reinfroced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy)	17.00 m2		Door - area per One Click LCA estimate		21-02 20 50. Exterior Doors and 40 Grilles	Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinfroced polyester (FRP) door, per m2

Aluminium frame curtain wall system, 34.9 kg/m2, 1600 WALL SYSTEM™ 1, 1600 WALL SYSTEM™ 2, 1600 WALL SYSTEM™ 3, 1600 WALL SYSTEM™ 4, 1600 WALL SYSTEM™ 1, 1600 WALL SYSTEM™ 1, 1600 WALL SYSTEM™ 2, 1620/1620 SSG, 1620UT, 1630 SS, 2250 IG, 2250 IG, 7500 WALL™, CLEARWALL 2, 1620/1620 SSG, 1620UT, 1630 SS, 2250 IG, 2250 IG, 7500 WALL™, CLEARWALL

A5	(Kawneer)	195.80 m2	Podium As building	21-02 20 20. Exterior Windows	Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL	Aluminium frame curtain wall system
	Aluminium frame window wall system, 39.6 kg/m2, METROVIEW™ FG 501T,						
A5	METROVIEW™ FG 601T PG, FG 623, PG 123™ (Kawneer)	9,594.00 m2	Window Wall (est. 98% of total glazing) As building	21-02 20 20. Exterior Windows	Glass facades and glazing	EPD WINDOW WALL	Aluminium frame window wall system