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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

Prepared by

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Reviewed by

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Footprint

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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:
  - Above Grade: 50 (excluding mechanical penthouse level)
  - 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 $kgCO_2e$ and $kgCO_2/m^2$.

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 ($kgCO_2e$). 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.

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.

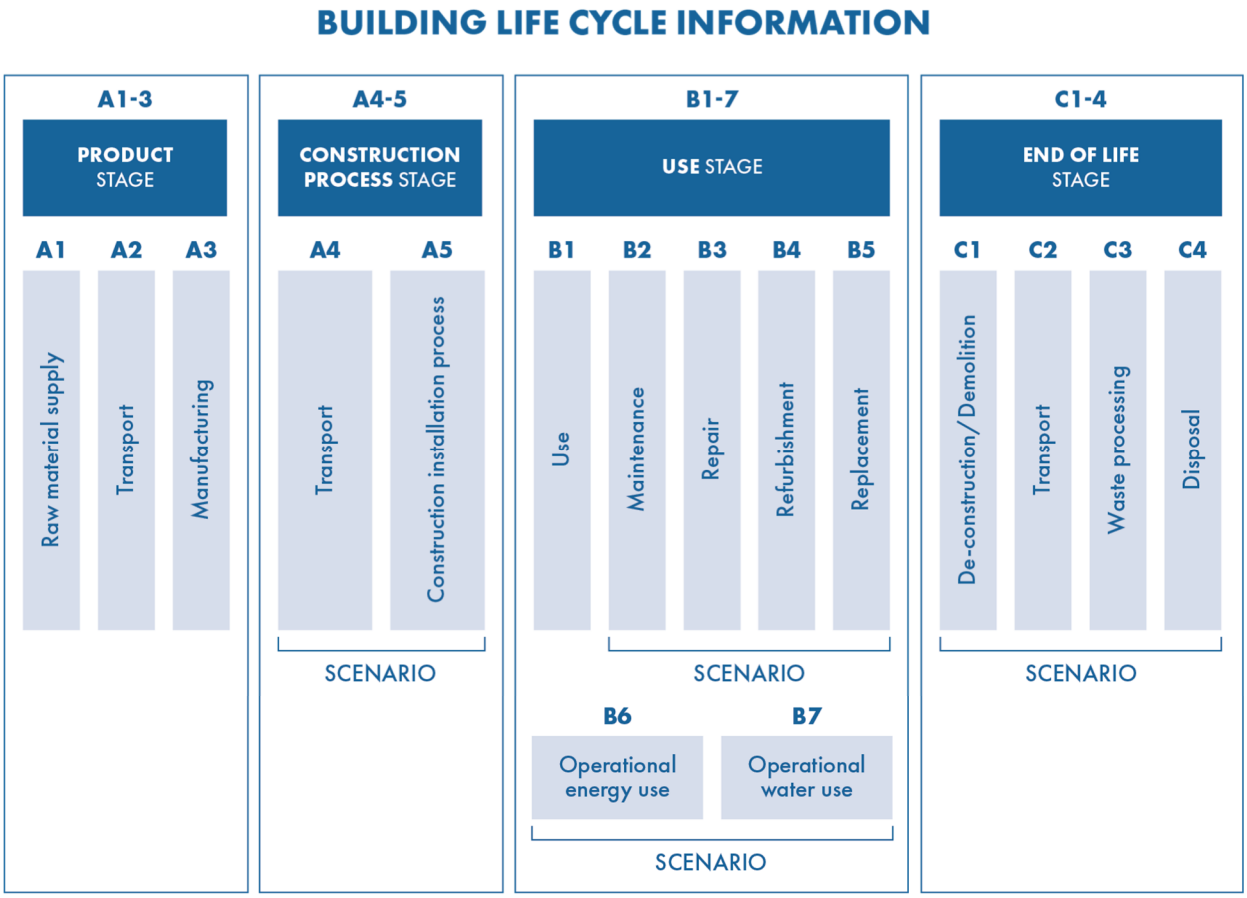

Figure 1: Building Life Cycle Information and life cycle stages

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.

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.
Columns and Beams	Assumed column-beam concrete frame, estimated as per One Click LCA 3D Carbon Designer. Concrete columns and beams at 30MPa, with reinforcement (assumed 325kg/m³ as per One Click LCA)
Other Assemblies	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)
	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 CO_2e)
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 $kgCO_2e/m^2$

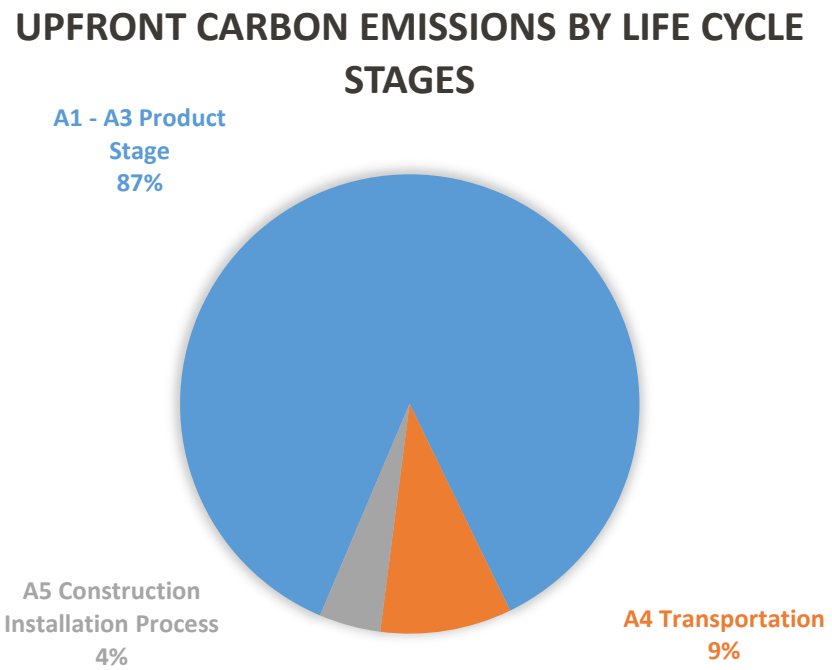

Figure 2: Upfront Carbon Emissions by Life Cycle Stages

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.

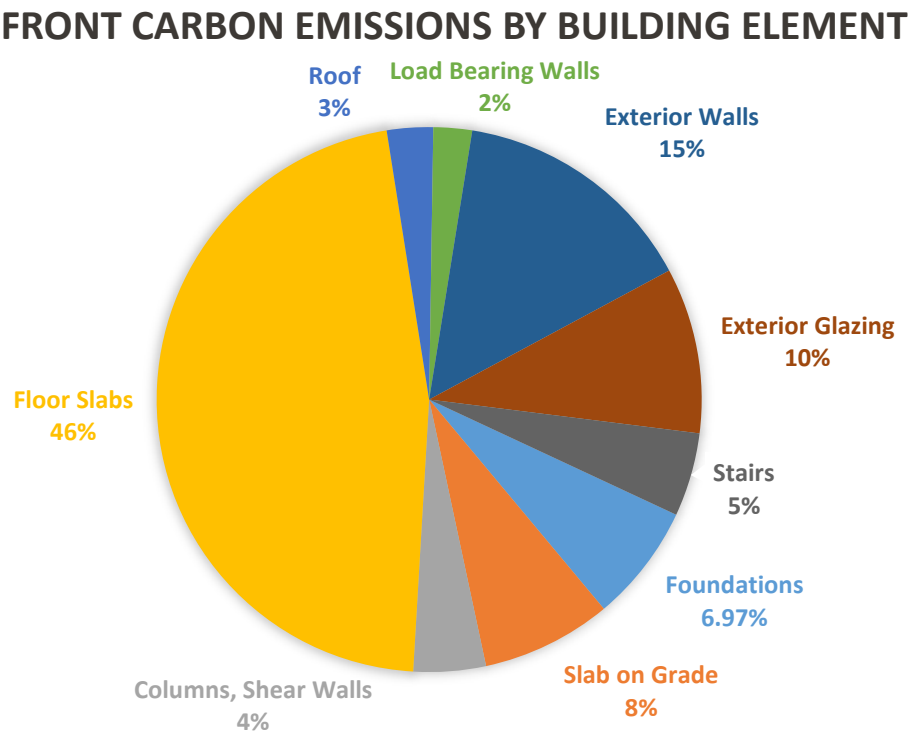

Figure 3: Upfront Carbon Emissionsby Building Elements

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 CO_2e)	
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_2e/m^2	278.90 kgCO_2e/m^2
Variance	**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 CO_2e)	
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_2e/m^2	307.56 kgCO_2e/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 CO_2e)	
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_2e/m^2	307.48 kgCO_2e/m^2
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 unit

Section	Resource	User input	Unit	Global warming kg CO2e	Thickness 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 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 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)	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	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		Loadbearing Wall - Rebar - Average amount of reinforcement in walls 70-100 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)	-	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	XPS insulation boards, closed-cell (incl. A5 installation and B1 use phase impacts), L = 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 , 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)
A1-A3	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 (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	Rock wool insulation board for curtain wall systems
A1-A3	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	EPDM Non-Reinforced Single Ply Waterproofing Roof Membrane (Fully Adhered)
A1-A3	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	-	m2	-	15.88	Spandrel - Interior Drywall	40	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Specialty gypsum board	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	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	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Aluminium	Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum, sheet
A1-A3	Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in (CISCA)	128.00	ton	755,423.91	3	Spandrel - Back Pan and other metals	As building	21-02 20 10. Exterior Walls		Aluminium	Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum, sheet
A1-A3	Anodized aluminum curtainwall extrusion	174.00	ton	569,698.95		Spandrel - Curtainwall Frame	As building	21-02 20 10. Exterior Walls		Aluminium	Quartz 2015	Anodized aluminum curtainwall extrusion
A1-A3	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	882.30	m2	2,631.50	15.88	Exterior Walls - ACM - Interior Drywall	40	21-02 20 10. Exterior Walls		Specialty gypsum board	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	Gypsum plaster board, fire resistant
A1-A3	Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American Wood Council, Canadian Wood Council)	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	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 (9.36-12.49 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
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)	Steel stud framing for drywall/gypsum 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 Drywall	40	21-02 20 10. Exterior Walls		Specialty gypsum board	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	Gypsum plaster board, fire resistant
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)	Steel stud framing for drywall/gypsum 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	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 (9.36-12.49 lbs/ft3)), Lambda=0.039 W/(m.K)	3,529.20	m2	43,902.53	50	Exterior Walls - Precast - 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	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 Concrete Association 2015	Precast concrete, architectural wall panel
A1-A3	Fiberglass batt insulation, 9.65in	3,529.20	m2	9,168.86	152	Exterior Walls - Precast - Batt	60	21-02 20 10. Exterior Walls		Glass wool insulation	Quartz 2015	Fiberglass batt insulation
A1-A3	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	10,294.00	m2	30,702.29	15.88	Spandrel - Interior Drywall	40	21-02 20 10. Exterior Walls		Specialty gypsum board	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	Gypsum plaster board, fire resistant
A1-A3	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air 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	41,566.05	63.5	Spandrel - 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)	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (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 mm	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
A1-A3	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	108.20	m2	23,994.19	152	FDN Wall - Below grade insulation @ P1 (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	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
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 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
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	68,034.00	kg	52,318.15		FDN Wall - Rebar - 88 kg/m3	As building	21-01 10 10. Standard Foundations		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	199,571.00	kg	153,470.10		Footing - Rebar - 150kg/m3	As building	21-01 10 10. Standard Foundations		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	590.20	m2	64,579.66	75	Soffit - 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)
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	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	Gypsum plaster board, fire resistant

A1-A3	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	814.40	m2	89,111.62	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)
A1-A3	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	814.40	m2	5,537.92		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
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 40 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,057.22	m2	431,147.53	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
A1-A3	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	8,676.80		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
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air 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	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A1-A3	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, Soprema, Inc. (USA))	1,276.00	m2	71,206.51	150	Roof - Level 50 + Mech		75 21-02 10 20 90. Roof Construction Supplementary Components		PIR (polyisocyanurate foam) insulation	EPD Polyiso High-Density Roof Cover Boards	Polyisocyanurate (PIR) insulation boards, high-density
A1-A3	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,276.00	m2	4,202.84	12.7	Roof - Level 50 + Mech	As building	21-02 10 20 20. Roof Decks, Slabs, and Sheathing		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing
A1-A3	Aggregate (crushed gravel), generic, dry bulk density, 1600 kg/m3	1,276.00	m2	717.84	200	Roof - Level 50 + Mech Ballast	As building	21-02 10 20 90. Roof Construction Supplementary Components		Sand, soil and gravel	One Click LCA	Aggregate (crushed gravel), generic, dry bulk density
A1-A3	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	12,396.40		Roof - Amenity and Priv. Terrace	As building	21-02 10 20. Roof Construction		Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Mambrane	SBS polymer-modified bitumen membrane roofing, self-adhered
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air 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	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A1-A3	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, 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 Polyiso High-Density Roof Cover Boards	Polyisocyanurate (PIR) insulation boards, high-density
A1-A3	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,823.00	m2	6,004.52	12.7	Roof - Amenity and Priv. Terrace	As building	21-02 10 20. Roof Construction		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing
A1-A3	Pavers, 139 sq. in. T min 2.36 in, 2300 kg/m3, Light grey (Permacon)	1,823.00	m2	61,191.55	59.94	Roof - Amenity and Priv. Terrace	As building	21-02 10 20. Roof Construction		Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers
A1-A3	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	1,956.00	m2	214,025.44	75	SOG - Rigid insulation - extruded polystyrene (XPS)	As building	21-01 40 20. Structural Slabs-on-Grade		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, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,956.00	m2	82,791.72	150	SOG - Concrete	As building	21-01 40 20. Structural Slabs-on-Grade		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	35,208.00	kg	27,074.95		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)
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	45,936.00	kg	35,324.78		Roof - Level 50 + Mech	As building	21-02 10 20 10. Roof Strucural Frame		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	55,961.04	m2	4,133,562.22	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
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)
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	21-01 40 20. Structural Slabs-on-Grade		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
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	21-02 10 10 20. Floor Decks, Slabs, and Toppings		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	432.00	m3	114,212.16	203.2	Stairs - Concrete 1	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
A1-A3	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,224.00	m3	323,601.12	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
A1-A3	Ready-mix concrete, Ontario industry average, 30 MPa concrete without air entrainment GU (Concrete Ontario)	1,903.00	m2	141,116.97	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
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	43,200.00	kg	33,220.80		Stairs - Rebar 1	As building	21-02 10 80. Stairs		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	57,080.16	kg	43,894.64		Balconies - Rebar	As building	21-02 10 10 30. Balcony Floor Construction		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	124,560.00	kg	95,786.64		Stairs - Rebar 2	As building	21-02 10 80. Stairs		Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A1-A3	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	2,023.72		Door - area per One Click LCA estimate		40 21-02 20 50. Exterior Doors and Grilles		Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinfroced polyester (FRP) door, per m2
A1-A3	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 CURTAIN WALL, 1600 UT SYSTEM™ 2, 1620/1620 SSG, 1620UT, 1630 SS, 2250 IG, 2250 LR, 7500 WALL™, CLEARWALL (Kawneer)	195.80	m2	21,621.25		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
A1-A3	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	1,352,571.79		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
A4	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	230.00	m3	13,020.14	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
A4	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	840.00	m3	47,551.81	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	Ready-mix concrete, Ontario industry average
A4	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	6,337.00	m2	53,809.96	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
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	14,950.00	kg	301.05		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)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	80,797.00	kg	1,627.04		Loadbearing Wall - Rebar - Average amount of reinforcement in walls 70-100 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)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	273,000.00	kg	5,497.50		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)
A4	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	-	m2	765.07	15.88	Spandrel - Interior Drywall		40 21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Specialty gypsum board	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	Gypsum plaster board, fire resistant
A4	Anodized aluminum curtainwall extrusion	-	ton	3,503.90		Spandrel - Curtainwall Frame	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Aluminium	Quartz 2015	Anodized aluminum curtainwall extrusion
A4	Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in (CISCA)	-	ton	2,577.58	3	Spandrel - Back Pan and other metals	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Aluminium	Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum, sheet
A4	Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in (CISCA)	128.00	ton	2,577.58	3	Spandrel - Back Pan and other metals	As building	21-02 20 10. Exterior Walls		Aluminium	Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum, sheet
A4	Anodized aluminum curtainwall extrusion	174.00	ton	3,503.90		Spandrel - Curtainwall Frame	As building	21-02 20 10. Exterior Walls		Aluminium	Quartz 2015	Anodized aluminum curtainwall extrusion
A4	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	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	Gypsum plaster board, fire resistant
A4	Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American Wood Council, Canadian Wood Council)	882.30	m2	101.04	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)

A4	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 (9.36-12.49 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
A4	Roll formed aluminum cladding, 4.91 kg/m2 (Metal Construction Association)	882.30	m2	87.24		Exterior Walls - ACM - Cladding	As building	21-02 20 10. Exterior Walls		Aluminium	EPD ROLL FORMED CLADDING	Roll formed aluminum cladding
A4	Fiberglass batt insulation, 9.65in	882.30	m2	7.86	89	Exterior Walls - ACM - Batt		60	21-02 20 10. Exterior Walls	Glass wool insulation	Quartz 2015	Fiberglass batt insulation
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	LCA based on NREL data for steel product, primary structural, beams and columns, at plant (U.S. Life Cycle Inventory Database 2012)	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3)
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 Drywall		40	21-02 20 10. Exterior Walls	Specialty gypsum board	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	Gypsum plaster board, fire resistant
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)	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3)
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)
A4	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 (9.36-12.49 lbs/ft3)), Lambda=0.039 W/(m.K)	3,529.20	m2	245.06	50	Exterior Walls - Precast - Mineral Wool Insulation 50 mm		75	21-02 20 10. Exterior Walls	Rock wool insulation	One Click LCA	Rock wool insulation panels, unfaced, generic
A4	Precast concrete, architectural wall panel	3,529.20	m2	7,351.94	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
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	Quartz 2015	Fiberglass batt insulation
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	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	Gypsum plaster board, fire resistant
A4	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air 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	635.36	63.5	Spandrel - 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)	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3)
A4	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	400.29	100	Spandrel - Mineral Wool Insulation 100 mm	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
A4	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	108.20	m2	5.38	152	FDN Wall - Below grade insulation @ P1 (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)
A4	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,300.00	m3	73,592.08	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
A4	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	2,668.00	m2	45,310.08	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	Ready-mix concrete, Ontario industry average
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	68,034.00	kg	1,370.03		FDN Wall - Rebar - 88 kg/m3	As building		21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	199,571.00	kg	4,018.83		Footing - Rebar - 150kg/m3	As building		21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	590.20	m2	14.48	75	Soffit - 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)
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	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	Gypsum plaster board, fire resistant
A4	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	814.40	m2	19.98	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)
A4	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	814.40	m2	66.21		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
A4	Ready-mix concrete, Ontario industry average, Baseline 40 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	1,057.22	m2	74,810.60	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
A4	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	103.73		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
A4	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air 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	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A4	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, Soprema, Inc. (USA))	1,276.00	m2	215.75	150	Roof - Level 50 + Mech		75	21-02 10 20 90. Roof Construction Supplementary Components	PIR (polyisocyanurate foam) insulation	EPD Polyiso High-Density Roof Cover Boards	Polyisocyanurate (PIR) insulation boards, high-density
A4	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,276.00	m2	87.81	12.7	Roof - Level 50 + Mech	As building		21-02 10 20 20. Roof Decks, Slabs, and Sheathing	Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing
A4	Aggregate (crushed gravel), generic, dry bulk density, 1600 kg/m3	1,276.00	m2	812.12	200	Roof - Level 50 + Mech Ballast	As building		21-02 10 20 90. Roof Construction Supplementary Components	Sand, soil and gravel	One Click LCA	Aggregate (crushed gravel), generic, dry bulk density
A4	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	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	SBS polymer-modified bitumen membrane roofing, self-adhered
A4	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 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	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry average
A4	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, Soprema, Inc. (USA))	1,823.00	m2	308.23	150	Roof - Amenity and Priv. Terrace		75	21-02 10 20. Roof Construction	PIR (polyisocyanurate foam) insulation	EPD Polyiso High-Density Roof Cover Boards	Polyisocyanurate (PIR) insulation boards, high-density
A4	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,823.00	m2	125.45	12.7	Roof - Amenity and Priv. Terrace	As building		21-02 10 20. Roof Construction	Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing
A4	Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m3, Light grey (Permacon)	1,823.00	m2	1,745.16	59.94	Roof - Amenity and Priv. Terrace	As building		21-02 10 20. Roof Construction	Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers

A4	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	1,956.00	m2	47.98	75	SOG - Rigid insulation - extruded polystyrene (XPS)	As building	21-01 40 20. Structural Slabs-on-Grade	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation, (incl. A5 installation and B1 use phase impacts)
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,956.00	m2	16,609.17	150	SOG - Concrete	As building	21-01 40 20. Structural Slabs-on-Grade	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, 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 Frame	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	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
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 Frame	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	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)	1,678,831.20	kg	33,807.23		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)
A4	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air 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	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry 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	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED 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	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	21-02 10 10 30. Balcony Floor Construction	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	124,560.00	kg	2,508.31		Stairs - Rebar 2	As building	21-02 10 80. Stairs	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A4	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	6.56		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
A4	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 CURTAIN WALL, 1600 UT SYSTEM™ 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
A4	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		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
A5	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	230.00	m3	3,346.15	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
A5	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	840.00	m3	12,220.71	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	Ready-mix concrete, Ontario industry average
A5	Ready-mix concrete, Ontario industry average, Baseline 30 MPa concrete without air 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	EPD Concrete Ontario Member Industry-Wide EPD for READY-MIXED CONCRETE	Ready-mix concrete, Ontario industry 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)	As building	21-03 10 10. Interior Partitions	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	273,000.00	kg	11,181.98		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)
A5	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)	-	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
A5	XPS insulation boards, closed-cell (incl. A5 installation and B1 use phase impacts), L = 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 , 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)
A5	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 (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	Rock wool insulation board for curtain wall systems
A5	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	EPDM Non-Reinforced Single Ply Waterproofing Roof Membrane (Fully Adhered)
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	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	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
A5	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	As building	21-02 20 20. Exterior Windows	Spandrel Panel (Metal)	Aluminium	Aluminium specialty products, An industry-average environmental profile, CISCA 2014	Aluminum, sheet
A5	Aluminum, sheet, 1.4-13 kg/m2, 0.02-0.188x2-12x144in, 0.02-0.188x12-48x24-120in (CISCA)	128.00	ton	57,380.83	3	Spandrel - Back Pan and other metals	As building	21-02 20 10. Exterior Walls		Aluminium	Aluminium specialty products, An industry-average environmental profile, 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	Anodized aluminum curtainwall extrusion
A5	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	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	Gypsum plaster board, fire resistant
A5	Oriented strand board (OSB), 9.5 mm, 620 kg/m3, 7% moisture content (American Wood Council, Canadian Wood Council)	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	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 (9.36-12.49 lbs/ft3)), Lambda=0.039 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 LCA	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
A5	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	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)	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3)
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 Drywall		40 21-02 20 10. Exterior Walls		Specialty gypsum board	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	Gypsum plaster board, fire resistant
A5	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	798.16	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)	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (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)
A5	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 (9.36-12.49 lbs/ft3)), Lambda=0.039 W/(m.K)	3,529.20	m2	1,771.88	50	Exterior Walls - Precast - Mineral Wool Insulation 50 mm		75 21-02 20 10. Exterior Walls		Rock wool insulation	One Click LCA	Rock wool insulation panels, unfaced, generic
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		60 21-02 20 10. Exterior Walls		Glass wool insulation	Quartz 2015	Fiberglass batt insulation
A5	Gypsum plaster board, fire resistant, 10.7 kg/m2, 15.875 mm (Gypsum Association)	10,294.00	m2	4,322.42	15.88	Spandrel - Interior Drywall		40 21-02 20 10. Exterior Walls		Specialty gypsum board	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	Gypsum plaster board, fire resistant
A5	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air 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	LCA based on NREL data for steel product, primary structural, beams and columns, at plant (U.S. Life Cycle Inventory Database 2012)	Steel stud framing for drywall/gypsum plasterboard per sq. meter of wall area (incl. air gaps per m3)

A5	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	3,739.86	100	Spandrel - Mineral Wool Insulation 100 mm	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
A5	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	108.20	m2	996.71	152	FDN Wall - Below grade insulation @ P1 (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)
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	Ready-mix concrete, Ontario industry average
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	68,034.00	kg	2,786.65		FDN Wall - Rebar - 88 kg/m3	As building	21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	199,571.00	kg	8,174.36		Footing - Rebar - 150kg/m3	As building	21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	590.20	m2	2,682.62	75	Soffit - 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	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	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	Gypsum plaster board, fire resistant
A5	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, 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 Membrane	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 Membrane	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
A5	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, Soprema, Inc. (USA))	1,276.00	m2	4,329.92	150	Roof - Level 50 + Mech	75	21-02 10 20 90. Roof Construction Supplementary Components	PIR (polyisocyanurate foam) insulation	EPD Polyiso High-Density Roof Cover Boards	Polyisocyanurate (PIR) insulation boards, high-density
A5	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,276.00	m2	580.98	12.7	Roof - Level 50 + Mech	As building	21-02 10 20 20. Roof Decks, Slabs, and Sheathing	Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing
A5	Aggregate (crushed gravel), generic, dry bulk density, 1600 kg/m3	1,276.00	m2	-	200	Roof - Level 50 + Mech Ballast	As building	21-02 10 20 90. Roof Construction Supplementary Components	Sand, soil and gravel	One Click LCA	Aggregate (crushed gravel), generic, dry bulk density
A5	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	As building	21-02 10 20. Roof Construction	Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Membrane	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)	1,823.00	m2	5,757.64	200	Roof - Amenity and Priv. Terrace	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
A5	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, Soprema, Inc. (USA))	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	Polyisocyanurate (PIR) insulation boards, high-density
A5	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,823.00	m2	830.03	12.7	Roof - Amenity and Priv. Terrace	As building	21-02 10 20. Roof Construction	Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing
A5	Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m3, Light grey (Permacon)	1,823.00	m2	-	59.94	Roof - Amenity and Priv. Terrace	As building	21-02 10 20. Roof Construction	Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers
A5	XPS insulation, (incl. A5 installation and B1 use phase impacts), R=1m2K/W, 0.681 kg/m2, StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavitymateTM, StyrofoamTM Brand CladmateTM, StyrofoamTM Brand DeckmateTM, StyrofoamTM Brand DuramateTM, StyrofoamTM Brand FreezermateTM, StyrofoamTM Brand Highload, StyrofoamTM Brand Panel Core, StyrofoamTM Brand PanelmateTM, StyrofoamTM Brand PerimateTM, StyrofoamTM Brand PlazamateTM, StyrofoamTM Brand Recovermate, StyrofoamTM Brand Residential Sheathing, StyrofoamTM Brand Residing Board, 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, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM. (DuPont de Nemours)	1,956.00	m2	8,890.55	75	SOG - Rigid insulation - extruded polystyrene (XPS)	As building	21-01 40 20. Structural Slabs-on-Grade	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, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,956.00	m2	4,477.42	150	SOG - Concrete	As building	21-01 40 20. Structural Slabs-on-Grade	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	35,208.00	kg	1,442.11		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)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	45,936.00	kg	1,881.52		Roof - Level 50 + Mech	As building	21-02 10 20 10. Roof Strucural Frame	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Ready-mix concrete, Ontario industry average, Baseline 35 MPa concrete without air entrainment GU 15 SL (Concrete Ontario)	55,961.04	m2	220,929.44	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
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	65,617.00	kg	2,687.65		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)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	253,732.80	kg	10,392.80		Transfer Slab - 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)
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	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, Baseline 30 MPa concrete without air entrainment GU 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	Ready-mix concrete, Ontario industry 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	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	57,080.16	kg	2,337.98		Balconies - Rebar	As building	21-02 10 10 30. Balcony Floor Construction	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	Reinforcement steel (rebar)
A5	Reinforcement steel (rebar), 7850 kg/m3 (Gerdau, Whitby plant)	124,560.00	kg	5,101.93		Stairs - Rebar 2	As building	21-02 10 80. Stairs	Reinforcement for concrete (rebar)	EPD Gerdau Rebar, Whitby Steel Mill	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	40	21-02 20 50. Exterior Doors and Grilles	Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinfroced polyester (FRP) door, per m2

A5	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 CURTAIN WALL, 1600 UT SYSTEM™ 2, 1620/1620 SSG, 1620UT, 1630 SS, 2250 IG, 2250 LR, 7500 WALL™, CLEARWALL (Kawneer)	195.80	m2	-	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
A5	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	-	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