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145 ST. GEORGE CARBON ANALYSIS REPORT

FOR

TENBLOCK

145 ST. GEORGE ST.

TORONTO, ON

OUR PROJECT NUMBER:

21196.002.F.001

DATE:

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GLOSSARY OF TERMS

Carbon Emissions: The release of carbon into the atmosphere.

Existing Building: The building currently standing at 145 St. George

Proposed Construction: The building that will be constructed at 145 St. George

Annual Consumption: The amount of energy consumed by a building in a calendar year

Consumption Intensity: The amount of annual consumption normalized to a universal factor. For this report, the factor is number of units.

Carbon Intensity: The amount of annual carbon emissions normalized to a universal factor. For this report, the factor is number of units.

Cumulative Emissions: The addition of annual carbon emissions for a given number of years.

Carbon Positive: The point of time where the Cumulative Emissions of the Proposed Construction are lower than the Cumulative Emissions of the Existing Building.

Embodied Carbon: The carbon emissions associated with creating the building products, construction of a building, and disposal of building materials after demolition.

Life Cycle Assessment: A method to assess the overall environmental impact associated with all stages of the life cycle of a building.

kWh: Denotes kilowatt hours (ekWh denotes equivalent kWh hours. Used only when comparing natural gas use and electricity use directly).

kgCO_{2e}: Denotes kilograms of equivalent carbon dioxide emissions. Used to combine all different carbon emissions into one term.

Tonne CO_{2e}: Denotes metric tonnes of equivalent carbon dioxide emissions. Used to combine all different carbon emissions into one term.

m³: Denotes cubic meters. Used to describe natural gas consumption

EXECUTIVE SUMMARY

Authorization

This report was prepared at the request of Tenblock. A similar report was issued for the previous design iteration of the proposed development at 145 St. George – dated August 6, 2021. This report reflects changes to the proposed development's design. This includes the addition of 57 residential units – from 341 to 398 total units – and the elimination of all but one underground level. The following key differences were found between the previous version of this report:

- The embodied carbon emissions associated with the proposed development have decreased from 31,584 kgCO_{2e}/unit to 24,012 kgCO_{2e}/unit in the revised proposal. This represents a 24% improvement.
- The total annual carbon emissions per unit, which includes transportation emissions, have decreased from 1,355 kgCO_{2e}/unit under Tier 1 of the Toronto Green Standard version 3 in the original submission to 890 kgCO_{2e}/unit under Tier 2 in the revised proposal. This represents a 34% improvement.
- In turn, the carbon positive timeline has improved from 13 years after construction under Tier 1 of the Toronto Green Standard version 3 in the original submission to 8.6 years for Tier 2 in the revised proposal. This is an improvement of 4.4 years.

Purpose

This report presents the findings of a carbon analysis performed at 145 St. George Street in Toronto, Ontario. The analysis compares the building's carbon emissions with the proposed construction to determine the amount of time it will take for the proposed construction to become carbon positive. The analysis also compares the carbon emissions of the proposed construction to a similar-sized suburban development. The embodied carbon of the proposed construction and the estimated annual emissions were taken into consideration in this analysis.

Existing Asset Overview

145 St. George is a multi-unit residential building (MURB) located near the intersection of St. George Street and Prince Arthur Avenue. The building has twelve storeys above grade and one level of below grade parking and mechanical and electrical rooms. The building was originally constructed in 1959.

Building heating is provided by two hot water boilers and distributed to the units' fan coils. Residents have control of the heat at the fan coil units. Domestic hot water is provided by six hot water heaters and tanks. Three tanks are reserved for the lower section of the building and three are reserved for the upper portion.

The existing building has a total of 130 rental units. The facility follows a general multi-residential building schedule. The building equipment is well maintained by knowledgeable and conscientious building operators. The annual carbon emissions from the existing building has

been updated in this report from the previous version based on a corrected emissions factors from 3,716 kgCO_{2e}/unit to 3,633 kgCO_{2e}/unit.

Key Findings

The report identifies and compares the carbon emissions of the existing building and the proposed building at various tiers of the Toronto Green Standard (v3). The buildings were compared on a per-unit basis. The following key results were found:

- The existing building emits 3,633 kgCO_{2e}/unit annually and an additional 56 kgCO_{2e}/unit of transportation emissions.
- The embodied carbon emissions of the proposed development totaled 9,557 Ton CO_{2e} or 24,012 kgCO_{2e}/unit – including the emissions related to the demolition of the existing building.
- The annual emissions of the proposed building range based on which Toronto Green Standard Version 3 Tier is considered from 1,177 kgCO_{2e}/unit (Tier 1) to 294 kgCO_{2e}/unit (Tier 4) annually and an additional 7.0 kgCO_{2e}/unit of transportation emissions in all Tier levels – the same for all levels.
- Carbon positive timelines for Tiers 1-4 compared to the existing building – including transportation emissions are: 9.6 years, 8.6 years, 7.8 years, and 7.1 years.

1. BENCHMARKING

Utility Consumption

Tenblock provided monthly utility data as tabular data. For benchmarking purposes, the utility bills from January 2016-December 2020 were used. The annual consumption of electricity and natural gas was averaged to determine a typical year’s energy consumption. These represent the two major sources of carbon emissions in the building. Table 1 below summarizes the utility consumption and carbon emissions for the property.

Table 1: Utility Data for 145 St. George (January 2016 – December 2020)

Utility	Annual Consumption	Consumption Intensity	Carbon Emissions	Carbon Intensity
Electricity Consumption	203,154 kWh	1,563 kWh/unit	6,095 kgCO _{2e}	46.9 kgCO _{2e} /unit
Natural Gas	245,502 m ³	1,888 m ³ /unit	466,209 kgCO _{2e}	3,586 kgCO _{2e} /unit

Over the course of the year, the monthly carbon emissions vary. This is dependent on the natural gas consumption as it is the main driver of carbon emissions in the building. The figure below shows the annual emissions pattern for each analysed year. The emissions factors used to calculate carbon emissions for electricity was 30 gCO_{2e}/kWh and for natural gas was 1,899 gCO_{2e}/m³. This was corrected from 43 gCO_{2e}/kWh and 1,933 gCO_{2e}/m³ used in previous versions of this report. These have been updated based on Ontario’s published emissions factors.

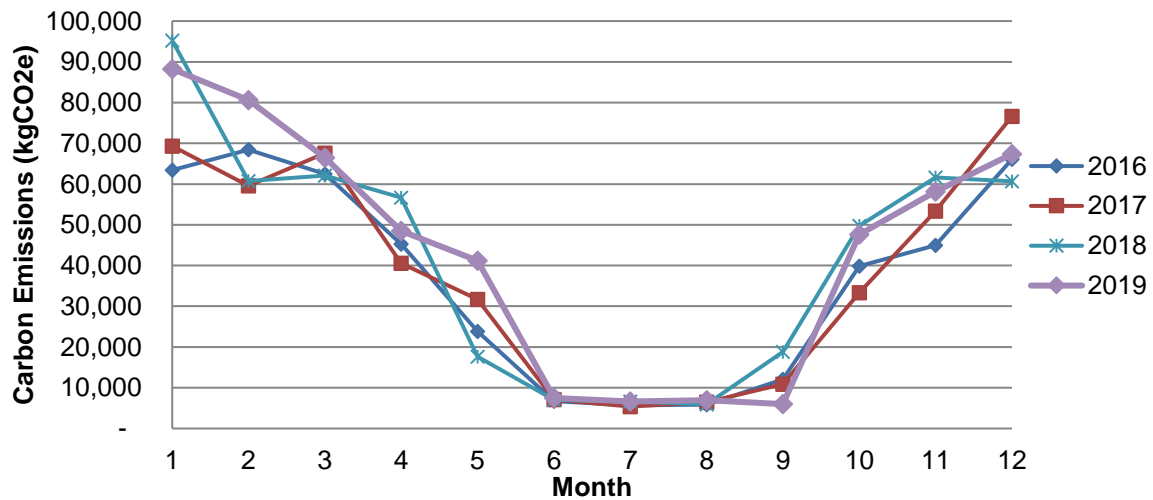


Figure 1: Total Monthly Emissions 145 St. George

Carbon Emissions Intensity

To directly compare the annual carbon emissions of the existing building with the proposed development, the total operating emissions of the existing building needed to be normalized based on the number of existing units. 145 St. George currently has 130 rental units – resulting in average annual emissions of 3,633 kgCO_{2e}/unit. The previously used emissions factor resulted in average emissions of 3,716 kgCO_{2e}/unit. This has been corrected.

2. PROPOSED BUILDING ANALYSIS

The proposed development will consist of a single residential tower with significant indoor and outdoor space. The total number of available units will increase from 130 in the existing building to 398. The proposed development will have 28 storeys above ground and one level of underground bicycle parking. The emissions of the proposed development will be compared to the emissions of the existing building and to a typical suburban development with a similar number of units.

Life Cycle Assessment Methodology

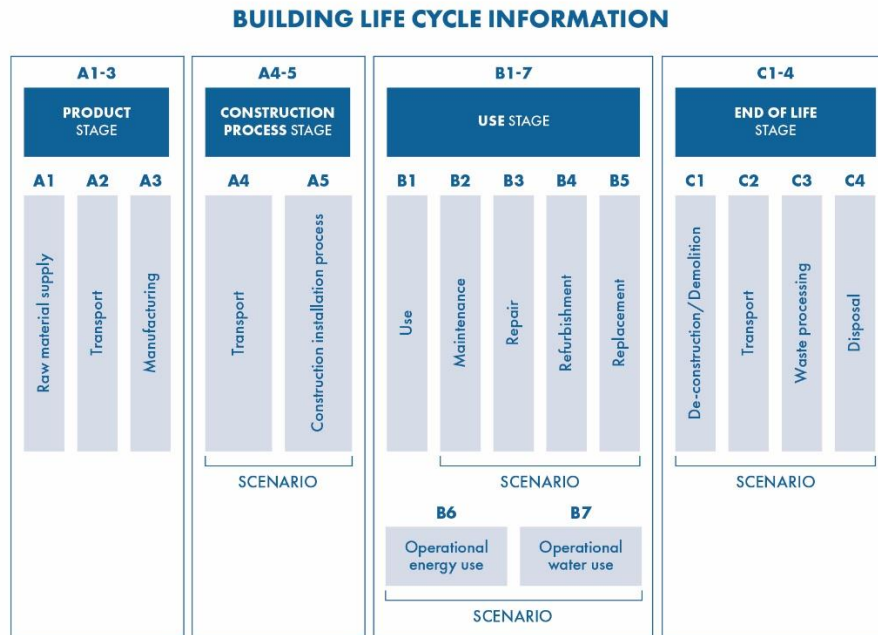
Life Cycle Assessment (“LCA”) is the method of measuring a project’s environmental impact through the whole life cycle of the building including the manufacturing, construction, and final use of the resources required for the delivery of the building function.

The analysis of the proposed building and the typical suburb development life cycle impact and was completed using One Click LCA. The program is in accordance with ISO 14044 and US EPA’s Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI).

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

- building envelope
- footings
- foundations
- structural wall assemblies
- structural floors and ceilings
- roof assemblies
- parking structures
- stair construction
- interior partitions (an optional addition)

The process of LCA follows multiple stages of production, construction, use, and life as shown in the image below:



Source: One Click LCA

Figure 2: Life Cycle Stages

Proposed Building Life Cycle Assessment

By quantifying the impact not associated with building operations, a project can aim to make reductions to an area that greatly affects the environment, and allow for a more sustainable building. LCA scopes can vary depending on the project needs and goals, but must always include the complete enclosure and structure. The Section numbers indicated in the table below refers to the process described in Figure 2.

Since the original analysis in 2021, the availability of information for life cycle assessment has seen growth with more data available through increased participation of manufacturers and more information on the Use (B1-B5) or End-Of-Life (C1-C4) stages. With the update required in 2023 due to design changes, some of the data required a revision due to datasets being expired or no longer representative. The update resulted in an overall decrease in embodied carbon, as expected due to the removal of parking levels, but some increases were noted, especially within the Use (B1-B5) or End-Of-Life (C1-C4) stages. It is worth noting that updates like this are essential in maintaining accurate and up-to-date assessments of a building's environmental impact through LCA. As an example of some of these changes, a dataset mineral wool insulation in the original report expired and the replacement product provided an increase in all life cycle stages. In addition, updated dataset for a metal frame stud wall saw the addition of data under the replacement stage (B4). The Transportation stage (A4) is dependent on the material type chosen and can increase or decrease depending on a variety of factors including the distance of travel required for a product (based on its manufacturing) and method of transport required.

Table 2: Embodied Carbon Emissions Breakdown of Proposed Building Once Constructed

Section	Result Category	Emissions (Ton CO _{2e})
C1-C4	End of Life – Existing Building (Demolition)	165.4
A1-A3	Construction Materials	7,980.8
A4	Transportation to Site	722.5
A5	Construction & Installation	325.4
B4-B5	Material Replacement & Refurbishment	123.1
C1-C4	End of Life of Proposed Building (Demolition)	165.4
Total		9,556.9

Table 2 above shows the emissions from various stages of the life cycle of the proposed development. The breakdown includes the emissions from demolishing the existing building, constructing the proposed building, and the demolition of the proposed building. The total emissions found by the LCA was 9,557 TonneCO_{2e}. This value was used to perform the carbon emissions analysis comparing the proposed building’s emissions to the existing building. Dividing the total emissions by the proposed number of units, the embodied carbon has a total of 24,012 kgCO_{2e}/unit. To determine the carbon positive timeline, this value was used as the first-year carbon emissions of the proposed development.

Proposed Building Carbon Emissions

The proposed development’s annual carbon emissions were calculated in four separate scenarios – representing Tiers 1-4 of the Toronto Green Standard Version 3. The carbon emission intensity of the proposed building was calculated based on the acceptable emissions for each tier and the number of units in the proposed building design. The results of the calculations are summarized in the table below. These represent the estimated annual emissions of the proposed development after the building is constructed and operational. The emissions in Table 3 represent the estimated annual operational emissions based on the tier levels of Toronto Green Standard. They are not based on a proposed mechanical design. Total emissions and emissions per unit have been updated based on updates to the building design.

Table 3: Proposed Development’s Annual Carbon Emissions Breakdown

	TGS v3 Tier 1	TGS v3 Tier 2	TGS v3 Tier 3	TGS v3 Tier 4
Carbon Intensity (kgCO_{2e}/m²)	20	15	10	5
Total Emissions (ton CO_{2e})	469	351	234	117
Emissions per unit (kgCO_{2e}/unit)	1,177	883	589	294

Typical Suburban Development

Another consideration to take into account is the alternative to constructing a new multi-unit residential building. In the second half of the 20th century, new housing developments have commonly been single-family homes in suburban regions outside of the city centre. The emissions of the proposed development can be better understood when compared to this alternative form of housing development.

For this analysis, the proposed new units were replaced with single-family homes located 43km from Toronto’s city centre. As there are 268 new units in the proposed building, it was assumed that 268 houses would be constructed. It was found that the total emissions to construct 268 single-family houses is about 10,084 Tonne CO_{2e}. This was calculated using the same calculation method outlined in the Life Cycle Assessment Methodology Section. The breakdown of emissions for constructing the suburban development is summarized in the table below. Each house was assumed to be 1,700ft² and have three bedrooms.

Table 4: Embodied Carbon Emissions of an Equivalent Suburban Development

Section	Result Category	Emissions (Tonne CO _{2e})
A1-A3	Construction Materials	6,362.2
A4	Transportation to Site	785.4
A5	Construction & Installation	445.8
B4-B5	Material Replacement & Refurbishment	1,603.9
C1-C4	End of Life of Equivalent Suburban Development (Demolition)	886.8
Total		10,084.0

Another important consideration is the carbon emissions of a typical suburban development compared to the proposed building. Two major factors contribute to annual carbon emissions: the house, and transportation. To determine the emissions from the house, emissions factors from a report by Natural Resources Canada titled *Achieving Real Net Zero Emission Homes: Embodied carbon scenario analysis of the upper tiers of performance in the 2020 Canadian National Building Code*. The report cites the average emissions of a two-storey home in Toronto to be 3.5 TonneCO_{2e} annually. This value was used for the house’s annual emissions.

The carbon emissions associated with transportation were also considered. People living in transit-oriented housing have different commuting patterns than those living in suburban communities. These differences are reflected in their transportation-related emissions. Therefore, this should be considered to develop a more complete picture of the carbon emissions. To complete the analysis, the number of commuters needed to be established.

The number of generated trips by mode for the proposed development were estimated by RJ Burnside accounting for the removal of personal vehicle parking in the proposed building. Table 5 below shows the number of trips by mode during peak AM and PM hours for the proposed development. These trip numbers were used to determine the average transportation emissions per unit for the proposed development. These trip numbers have been updated from previous versions of this report based on updates from RJ Burnside.

Table 5: Number of Trips by Mode (Proposed Development)

Mode	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Modeshare Split
Automobile	3	3	2%
Transit	49	58	38%
Cycling	63	75	50%
Walking	12	15	10%
Total	126	150	

To determine the existing building's trips by mode, the *Transportation Study* prepared by RJ Burnside, dated December 2022 was used and scaled to apply to the existing building's size. It is therefore an appropriate indicator of the modeshare of the existing building. The number of trips for each mode were adjusted to reflect the size of the existing building. Table 6 below shows the estimated trips by mode of the existing building. These trips were used to determine the average transportation emissions per unit for the existing building. They were also subtracted from the total number of trips for the suburban development, as in this scenario the existing building would remain and the suburban development would only represent the additional housing of the proposed building. Therefore, the total trips of the existing building and the suburban development equal the total trips in the proposed development. In previous versions of this report, this was not considered and all trips were allocated to the suburban development. This update better reflects what would happen in this scenario.

Table 6: Number of Trips by Mode (Existing Building)

Mode	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Modeshare Split
Automobile	11	13	26%
Transit	12	14	29%
Cycling	10	11	23%
Walking	9	11	22%
Total	41	49	

To determine the number of trips in each mode for the suburban development, average modeshare values for suburban developments near the City of Toronto were used. The results are summarized in Table 7. The weekday commute was assumed to be 35 kilometers from the city centre. The total number of trips was based on the total trips from Table 5 and distributed based on a weighted average of modeshare from the suburbs listed in Table 7. The number of trips for each mode in the suburban development is shown in Table 8. These trip numbers were used to calculate the average transportation emissions per house for the suburban development.

Table 7: Commuter Statistics for Suburbs of Toronto

Municipality of Residential Zone	Daily Trips per Household					
	Total	Auto	Transit	Walk	Cycle	Other
Pickering	5.7	4.7	0.5	0.1	0.0	0.4
Ajax	5.2	4.3	0.6	0.2	0.0	0.1
King City	5.0	4.5	0.3	0.3	0.0	0.0
Whitchurch-Stouffville	4.5	3.8	0.2	0.5	0.0	0.0
Bolton	5.5	5.0	0.1	0.1	0.0	0.3
Brampton	7.4	6.1	0.7	0.2	0.0	0.4
Milton	5.8	4.8	0.4	0.5	0.1	0.0
Average	7.0	6.0	0.5	0.4	0.0	0.2

Table 8: Number of Commuters by Mode - Suburban Development

Mode	Weekday AM Peak Hour Trips	Weekday PM Peak Hour Trips	Modeshare Split
Automobile	73	87	85%
Transit	6	7	7%
Cycling	4	5	5%
Walking	2	3	3%
Total	86	102	

To determine how the number of commuters translates into carbon emissions, emissions factors needed to be determined. The carbon emissions from driving were based on the emissions factor of the Honda Civic. The Honda Civic produces 0.165kgCO_{2e} per kilometer driven. The suburban transit riders were assumed to be using the GO train network, which currently uses diesel-powered trains. The emissions factor for these trains is 0.091kgCO_{2e} per passenger per kilometer. The electrified subway system and streetcars result in a per passenger emissions factor of just 0.005kgCO_{2e} per kilometer. Because of its central location within downtown, it was assumed that the residents of the proposed development are within 5 kilometers of work. The emissions factors for transportation are summarized in Table 9 and Table 10. The emissions in the Suburban Development scenario includes the transportation emissions for the assumed 268 new single detached homes.

Table 9: Emissions Factors for Each Transportation Mode

Transport Mode	kgCO _{2e} /passenger per kilometer	kgCO _{2e} /passenger per day	kgCO _{2e} /passenger per year
Single Car	0.165	11.55	4,203
Subway	0.005	0.05	18.1
GO Train	0.091	6.4	1,658

Table 10: Per-unit Emissions Factors for Transportation

	Existing Building	Proposed Building	Suburban Development
Single Car (kgCO _{2e} /unit)	54.5	4.5	769.5
Subway (kgCO _{2e} /unit)	1.9	2.4	
GO Train (kgCO _{2e} /unit)			20.2
Total Transportation Emissions (kgCO_{2e}/unit)	56.4	7.0	789.8

The emissions from the home and from transportation can be combined to get the total emissions for the proposed building and the suburban development. Total annual emissions – including transportation emissions – for a suburban home are 4,340 kgCO_{2e}/unit. The comparison of the emission differences is summarized in Table 11.

Table 11: Proposed Building's Emissions Compared to a Suburban Home

	Suburban Development	Proposed Building			
		TGS v3 Tier 1	TGS v3 Tier 2	TGS v3 Tier 3	TGS v3 Tier 4
Carbon Intensity (kgCO _{2e} /unit)	3,500	1,177	883	589	294
Transportation Emissions (kgCO _{2e} /unit)	790	7	7	7	7
Total Annual Emissions (kgCO_{2e}/unit)	4,340	1,184	890	596	301
Percent Savings of Annual Emissions		73.3%	79.9%	86.6%	93.2%
Embodied Carbon (kgCO _{2e} /unit)	37,627	24,012	24,012	24,012	24,012

The carbon intensity and transportation emissions have been updated compared to previous versions of this report. The three major reasons for the changes are updates to the conducted transportation study, updates to the proposed building design, and improvements to the calculation method used to calculate emissions. The updated calculation method includes keeping the existing building's total trips for the suburban scenario that was previously omitted in older versions of this study.

3. CARBON EMISSIONS ANALYSIS

The purpose of this analysis is to understand how the existing building’s carbon emissions compared to the proposed building’s emissions. Table 12 below shows how the existing building compares to the emissions of the proposed building. The proposed building is represented in four scenarios – each representing a different tier of Toronto Green Standard v3. The annual carbon emissions are higher in the existing building because the building’s equipment and operations are significantly less efficient than what would be constructed today. Newly constructed buildings require high-efficient equipment and operations in order to meet the requirements of Toronto Green Standard.

Table 12: Existing Building Emissions compared to Proposed Building

	Existing Building	Proposed Building			
		TGS v3 Tier 1	TGS v3 Tier 2	TGS v3 Tier 3	TGS v3 Tier 4
Carbon Intensity (kgCO_{2e}/unit)	3,633	1,177	883	589	294
Transportation Emissions (kgCO_{2e}/unit)	56	7	7	7	7
Total Annual Emissions (kgCO_{2e}/unit)	3,689	1,184	890	596	301
Percent Savings of Annual Emissions		68%	76%	84%	92%
Embodied Carbon (kgCO_{2e}/unit)	N/A	24,012	24,012	24,012	24,012

Quantifying the embodied carbon emissions of the existing building was also investigated. Since the existing building was constructed in 1959 (64 years ago), carbon emissions associated with the materials and construction of the existing building have already been emitted and are not impacted by the construction of the proposed building. Also, the ongoing embodied carbon associated with the lifecycle of the existing building was not considered because the building structure has surpassed the 60-year lifespan. This lifespan is commonly used in Life Cycle Assessments – including frameworks used by the City of Toronto and the Canada Green Building Council. Including this would further favour the proposed building. Therefore, including the embodied carbon in the Existing Building scenario is not applicable.

However, the emissions associated with the demolition of the existing building have been included in the embodied carbon calculations for the proposed building. The purpose of this analysis is to determine the time it will take for the proposed building to become carbon positive. The emissions associated with the construction of the existing building do not impact that timeline and are excluded from this analysis.

Figure 3 below show the accumulated carbon emissions over time. Included in Figure 3 are the carbon intensity and transportation emissions for the existing building and the proposed development, and the embodied carbon of the proposed development – all per unit. While the embodied carbon of the proposed building is significant, the improved energy performance of the proposed buildings mean that the proposed building will be carbon-positive between 7 and 9 years after construction.

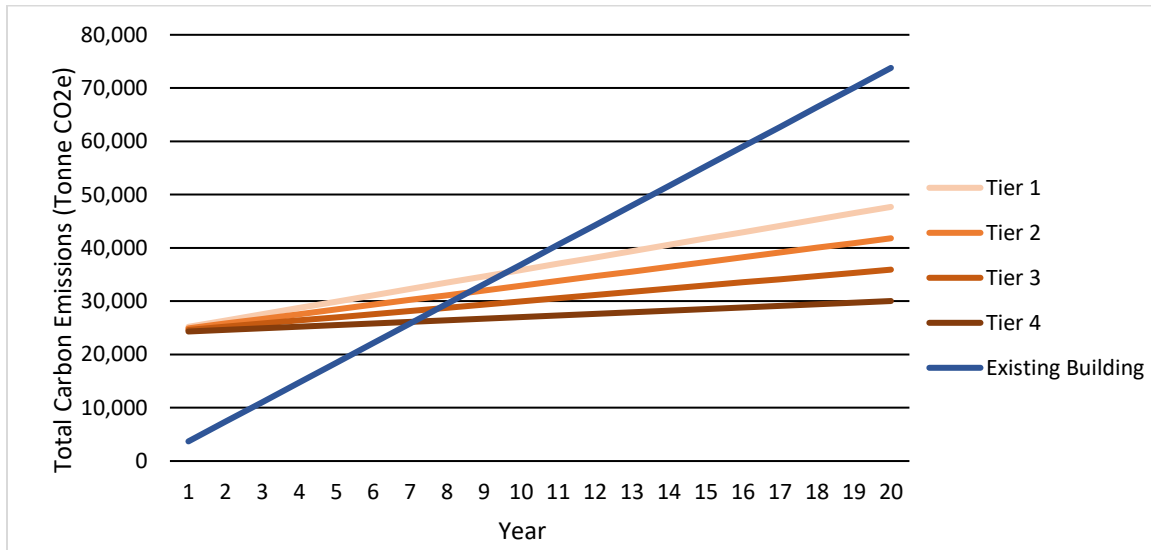


Figure 3: Cumulative Carbon Emissions per unit

Assumptions and Limitations

The LCA was done based on Progress drawings dated December 2022. Due to the stage of the development, default values or assumptions based on project experience were used in areas where information was limited or not available. These assumptions are noted in Appendix B of this report.

Site work, including but not limited to excavation, landscaping, and other site development are not part of the scope of the LCA for the proposed building and suburban dwelling scenarios. The investigation into the embodied carbon on interior finishes can be investigated as the project design develops.

The selection for each building material was selected to be industry wide environmental product declarations or data sets as available by One Click LCA whenever possible, including typical selections such as recycled content. Any product specific environmental product data used is noted within Appendix B.

For the initial LCA exercise, industry average data was used based on available documentation within One Click LCA, as such the associated emissions values may be expected to be conservative in most cases. The design development for the project efforts will be made to provide the most accurate data available.

In order to project the future performance of the existing building, a number of assumptions were made. The most significant of which is the assumption that the current operation of the existing building does not change in the near future. The per-unit carbon emissions were calculated based on the previous 5 years of utility data. In order to estimate the future emissions, it was assumed that the operations would not significantly change from the current performance.

The hot water boilers at 145 St. George are operating well. However, they are not high-efficiency condensing boilers. This analysis assumes there are no retrofits of the heating system that would increase the overall efficiency. It also assumes that the current equipment does not lose efficiency through wear and deterioration.

LIMITS OF LIABILITY ASSOCIATED WITH THIS REPORT

1. It is understood that hazardous materials may be present (e.g. asbestos, mould, PCB's, etc.) within the existing building. The identification of and abatement recommendations with respect to hazardous materials is outside the scope of services provided. Any costs associated with hazardous materials were not evaluated as part of this report.
2. The review of existing installations was general in nature and limited to casual, visual observation without removal of ceilings, chases, destructive testing or dismantling. The review was not exhaustive and was performed to acquire a general understanding of the condition of existing systems. Very limited existing drawings were made available for the review of existing systems.
3. This report has been prepared solely for the use of the Client. The material contained in this report reflects our best judgement in light of the information available at the time of preparation. There is no warranty expressed or implied. Professional judgement was exercised in gathering and assessing information. The results presented are the product of professional care and competence and cannot be construed as an absolute guarantee.
4. Where expected or anticipated equipment life is provided it is based on ASHRAE Median Service Life statistics. Actual life of equipment will vary depending on variables such as operation, service and maintenance frequency.
5. Capital cost estimates are made are equivalent to Class D order of magnitude estimates. Actual costs will vary depending on final design solution and contractor pricing.

APPENDIX A – UTILITY ANALYSIS

Electricity Analysis

At 145 St. George, a single electricity meter measures all electrical consumption on the site. Electricity data was sent for the last five years for analysis. In that time, the electricity consumption remained consistent from January 2016 to September 2019. Since then and throughout 2020, there has been a notable decrease in electricity consumption. In 2020, the electricity consumption was 28% lower than the previous four years. The expectation is that due to the COVID-19 lockdowns throughout 2020 the electricity consumption would have increased. The significant decrease in consumption will need to be explained through some other means.

The month-to-month energy consumption in the building remains consistent throughout the year. The building does not have any air conditioning systems, therefore there is no summer peak in electricity consumption as is typical of residential buildings.

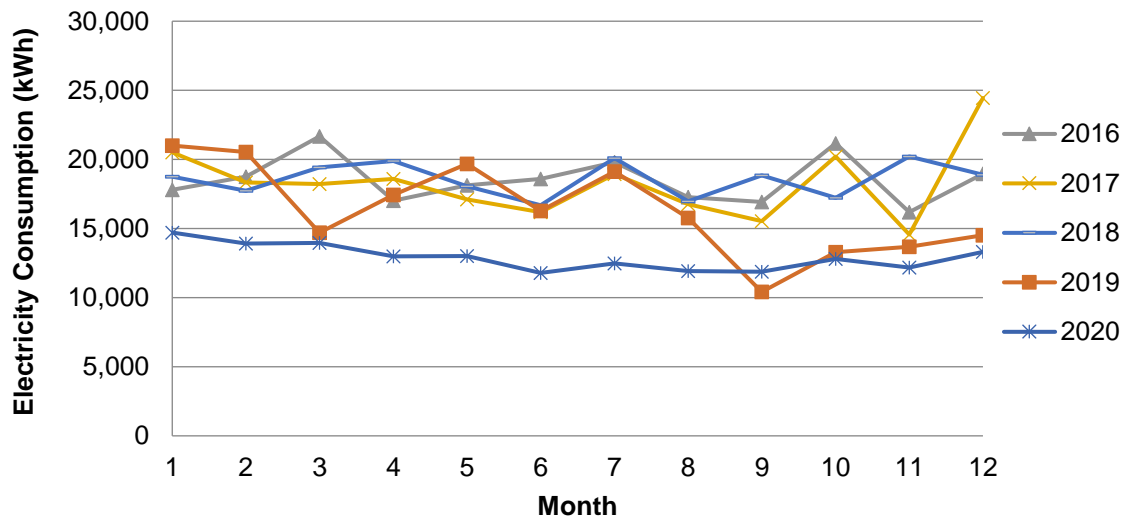


Figure 4: Electricity Consumption

Carbon emissions due to electricity consumption were estimated based on the current carbon emissions from electricity in Ontario. The factor that was used for the calculations was 43kgCO_{2e}/MWh. To that end, the carbon emissions of the existing building from electricity consumption was estimated. Figure 5 below shows the monthly carbon emissions. The average annual emissions from electricity is 8,736kgCO_{2e}.

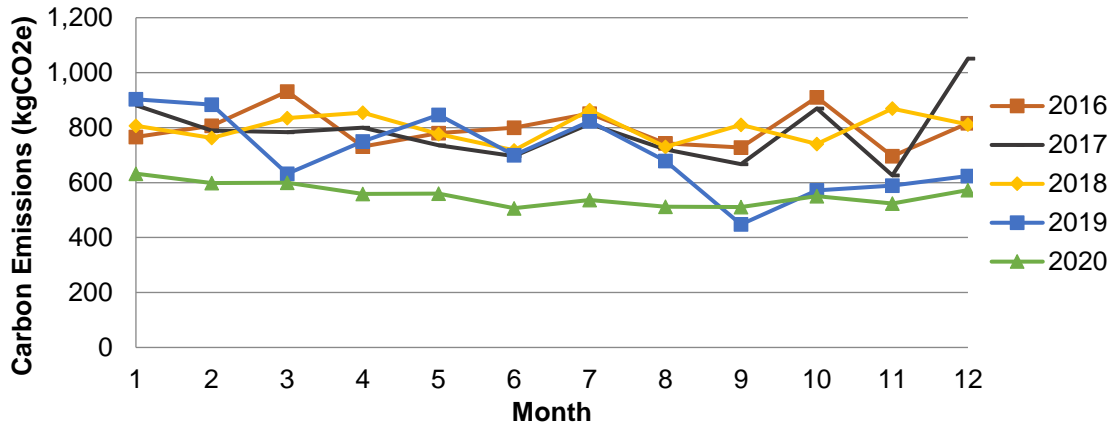


Figure 5: Total Electricity Carbon Gas Emissions

Natural Gas Analysis

Natural gas consumption at 145 St. George is measured by a single meter. The monthly consumption pattern follows a typical residential building with natural gas heating. The consumption is high during the winter months and low during summer months. Much like electricity consumption, the natural gas consumption has been consistent in the last few years.

A factor of 1,891kgCO_{2e}/m³ was used to calculate the carbon emissions from natural gas consumption. The average carbon emissions from natural gas is 474,343kgCO_{2e} annually.

Total emissions from the site are therefore 483,078kgCO_{2e} annually. 145 St. George currently has 130 unit. This means that the building currently emits 3,716kgCO_{2e}/unit per year. Natural gas contributes to 98% of the building's total carbon emissions.

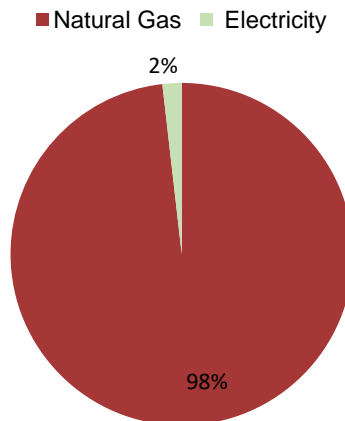


Figure 6: Carbon Emissions by Source

APPENDIX B – PROPOSED BUILDING LCA MODEL INPUTS SUMMARY

ENVELOPE AND GLAZING

System	Information
Walls	Window Wall (Kawneer), with vision glazing and opaque spandrels Curtain Wall (Kawneer), with vision glazing and opaque spandrels Pre-cast concrete wall with XPS Insulation
Glazing	Assumed an overall 40% window-to-wall ratio
Roof	Concrete structure with concrete topper, XPS insulation, and modified bitumen membrane
Comments	Additional green roof materials are not accounted for in analysis Curtain and window wall systems use specific products from Kawneer Deep caps are not accounted for in analysis Glazing fritting, coatings, and gas fill are not accounted for in analysis

STRUCTURE

System	Information
Interior Floor	Concrete slab with rebar
Slab on Grade	Concrete slab with rebar
Foundations	<i>See parking structure</i>
Columns and Beams	Concrete, as per One Click LCA Carbon Designer
Stairs / Elevator Cores	As per One Click LCA Carbon Designer
Comments	As structural details are not fully available, the One Click LCA Carbon Designer tool was utilized for the calculation of potential structural details including amount of rebar, volume of concrete required for columns and concrete core for stairs and elevator

MISCELLANEOUS

System	Information
Interior Partitions	Metal stud framing with drywall, as per One Click LCA Carbon Designer
Balcony Railing	Glass railings, does not account for framing Pre-cast concrete colonnade
Parking Structure	Concrete structure, strip footings, and limited insulation near grade connections and slabs. Created using the One Click LCA Carbon Designer

ENVIRONMENTAL PRODUCT DECLARATIONS

The selection for each building material was selected to be industry wide environmental product declarations or data sets as available by One Click LCA whenever possible, including typical selections such as recycled content. Any product specific environmental product data used is noted within this appendix.

For the initial LCA exercise, industry average data was used based on available documentation within One Click LCA, as such the associated emissions values may be expected to be conservative in most cases. The design development for the project efforts will be made to provide the most accurate data available.

APPENDIX C – PROPOSED BUILDING LCA MODEL INPUTS MATERIALS

See the following pages for bill of materials.

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Section	Resource	User input	Unit	Global warming (kg CO2e)	Question	Service life	Omniclass	Construction	Resource type	Datasource	Name	Transformation process	Years of replacement	uniClass	csiMasterformat
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	37,944.00	kg	23,863.34	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	457,436.00	kg	61,364.58	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate		P2	3
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	37,944.00	kg	764.09	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic	Concrete mixer truck, average, 100% fill rate		P4	5
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	457,436.00	kg	10,789.64	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic			P2	3
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	37,944.00	kg	1,231.27	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic			P4	5
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	457,436.00	kg	3,351.68	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic			P2	3
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	37,944.00	kg	-	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic			P4	5
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	457,436.00	kg	-	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic			P2	3
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	37,944.00	kg	294.07	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic	Steel waste		P4	5
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	457,436.00	kg	5,063.05	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic Reinforcement steel (rebar), generic	Concrete waste		P2	3
D	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	37,944.00	kg	(5,884.10)	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Ready-mix concrete, normal-strength, generic			P4	5
D	Reinforcement steel (rebar), generic, 90% recycled content, A615 Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	457,436.00	kg	(4,217.78)	Columns and load-bearing vertical structures	As building	Not defined	Concrete column - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
				106,721.71	Columns and load-bearing vertical structures										
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³) Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	437.20	m2	11,941.50	External walls and facade	As building	21-02 20 10. Exterior Walls		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic Mineral wool insulation batt, with kraft paper facing			P2	3
A1-A3	Anodized aluminum extrusions (Aluminum Extruders Council (AEC)) Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	437.20	m2	127.57	External walls and facade	As building	21-02 20 10. Exterior Walls		Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing Anodized aluminum extrusions			P3	7
A1-A3	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	3,633.00	m2	354,984.46	External walls and facade	As building	21-02 20 10. Exterior Walls		Aluminium	EPD Aluminium Extrusions	Mineral wool insulation batt, with kraft paper facing			P4	5
A1-A3	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	5,850.00	m2	1,706.95	External walls and facade	As building	21-02 20 10. Exterior Walls		Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Window wall curtain wall system			P3	7
A1-A3	Steel sheets, generic, 90% recycled content (typical), S235, S275 and S355 Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	5,850.00	m2	147,601.99	External walls and facade	As building	21-02 20 10. Exterior Walls		Aluminum frame windows	Window wall, Kawneer 2015	Steel sheets, generic			P8	8
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³) Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	5,850.00	m2	147,601.99	External walls and facade	As building	21-02 20 10. Exterior Walls		Structural steel and steel profiles	One Click LCA	Gypsum plaster board, regular, generic			P4	5
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³) Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	7,263.00	m2	21,367.66	External walls and facade	As building	21-02 20 10. Exterior Walls		Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic			P232	9
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³) Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	437.20	m2	740.27	External walls and facade	As building	21-02 20 10. Exterior Walls		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic Mineral wool insulation batt, with kraft paper facing	Trailer combination, 40 ton capacity, 100% fill rate		P2	3
A4	Anodized aluminum extrusions (Aluminum Extruders Council (AEC)) Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	437.20	m2	27.60	External walls and facade	As building	21-02 20 10. Exterior Walls		Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing Anodized aluminum extrusions	Trailer combination, 40 ton capacity, 100% fill rate		P3	7
A4	Anodized aluminum extrusions (Aluminum Extruders Council (AEC)) Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	3,633.00	m2	788.14	External walls and facade	As building	21-02 20 10. Exterior Walls		Aluminium	EPD Aluminium Extrusions	Aluminium extrusions	Trailer combination, 40 ton capacity, 100% fill rate		P4	5

A4	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	5,850.00	m2	369.25	External walls and facade	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing	Trailer combination, 40 ton capacity, 100% fill rate	P3	7
A4	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	5,850.00	m2	5,346.86	External walls and facade	As building	21-02 20 20. Exterior Windows	Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system	Trailer combination, 40 ton capacity, 100% fill rate	P8	8
A4	Steel sheets, generic, 90% recycled content (typical), S235, S275 and S355	5,850.00	m2	2,774.27	External walls and facade	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles	One Click LCA	Steel sheets, generic	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	7,263.00	m2	549.57	External walls and facade	As building	21-02 20 10. Exterior Walls	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic	Trailer combination, 40 ton capacity, 100% fill rate	P232	9
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	437.20	m2	472.32	External walls and facade	As building	21-02 20 10. Exterior Walls	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A5	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	437.20	m2	28.55	External walls and facade	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing		P3	7
A5	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,633.00	m2	26,741.71	External walls and facade	As building	21-02 20 10. Exterior Walls	Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions		P4	5
A5	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	5,850.00	m2	381.96	External walls and facade	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing		P3	7
A5	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	5,850.00	m2	-	External walls and facade	As building	21-02 20 20. Exterior Windows	Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system		P8	8
A5	Steel sheets, generic, 90% recycled content (typical), S235, S275 and S355	5,850.00	m2	5,053.44	External walls and facade	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles	One Click LCA	Steel sheets, generic		P4	5
A5	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	7,263.00	m2	3,241.64	External walls and facade	As building	21-02 20 10. Exterior Walls	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic		P232	9
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	437.20	m2	-	External walls and facade	As building	21-02 20 10. Exterior Walls	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
B3	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	437.20	m2	-	External walls and facade	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing		P3	7
B3	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,633.00	m2	-	External walls and facade	As building	21-02 20 10. Exterior Walls	Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions		P4	5
B3	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	5,850.00	m2	-	External walls and facade	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing		P3	7
B3	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	5,850.00	m2	-	External walls and facade	As building	21-02 20 20. Exterior Windows	Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system		P8	8
B3	Steel sheets, generic, 90% recycled content (typical), S235, S275 and S355	5,850.00	m2	-	External walls and facade	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles	One Click LCA	Steel sheets, generic		P4	5
B3	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m2 (2.20 lbs/ft2) (for 12.5 mm/0.49 in), 858 kg/m3 (53.6 lbs/ft3)	7,263.00	m2	-	External walls and facade	As building	21-02 20 10. Exterior Walls	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic		P232	9
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	437.20	m2	1,179.96	External walls and facade	As building	21-02 20 10. Exterior Walls	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3
C3-C4	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	437.20	m2	184.84	External walls and facade	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing	Construction waste to landfill	P3	7
C3-C4	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,633.00	m2	303.32	External walls and facade	As building	21-02 20 10. Exterior Walls	Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions	Aluminium waste	P4	5
C3-C4	Mineral wool insulation batt, with kraft paper facing, R11, EcoBatt Insulation with Ecose Technology, Kraft Facing (Knauf Insulation)	5,850.00	m2	2,473.25	External walls and facade	As building	21-02 20 10. Exterior Walls	Rock wool insulation	EcoBatt Insulation, Knauf Insulation 2013	Mineral wool insulation batt, with kraft paper facing	Construction waste to landfill	P3	7
C3-C4	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	5,850.00	m2	1,836.17	External walls and facade	As building	21-02 20 20. Exterior Windows	Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system	Aluminium waste	P8	8
C3-C4	Steel sheets, generic, 90% recycled content (typical), S235, S275 and S355	5,850.00	m2	1,067.70	External walls and facade	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles	One Click LCA	Steel sheets, generic	Steel waste	P4	5

C3-C4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm(0.49 in), 858 kg/m ³ (53.6 lbs/ft ³))	7,263.00	m2	3,681.03	External walls and facade	As building	21-02 20 10. Exterior Walls	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic	Construction waste to landfill	P232	9
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	437.20	m2	(992.23)	External walls and facade	As building	21-02 20 10. Exterior Walls	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
D	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,633.00	m2	(9,207.66)	External walls and facade	As building	21-02 20 10. Exterior Walls	Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions		P4	5
D	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	5,850.00	m2	(47,564.09)	External walls and facade	As building	21-02 20 20. Exterior Windows	Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system		P8	8
D	Steel sheets, generic, 90% recycled content (typical), S235, S275 and S355	5,850.00	m2	(21,048.22)	External walls and facade	As building	21-02 20 10. Exterior Walls	Structural steel and steel profiles	One Click LCA	Steel sheets, generic		P4	5
				3,072,398.99	External walls and facade								
A1-A3	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	186.00	m2	3,366.60	Foundation, sub-surface, basement and retaining walls	75	21-03 10 10. Interior Partitions	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation		P7	7
A1-A3	Ready-mix concrete, low-strength, generic, C12/15 (1700/2200 PSI), 0% recycled binders in cement (220 kg/m ³ / 13.73 lbs/ft ³)	1,761.00	m2	18,275.66	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for lightweight applications (domestic and auxiliary)	One Click LCA	Ready-mix concrete, low-strength, generic		P2	3
A1-A3	Foundation waterproofing sheet membrane, 0.08in	1,828.00	m2	9,961.27	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Bitumen and other roofing	Quartz 2015	Foundation waterproofing sheet membrane		P34	7
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	44,228.67	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	39,314.37	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A1-A3	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	1,828.00	m2	33,086.80	Foundation, sub-surface, basement and retaining walls	75	21-01 10 10. Standard Foundations	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation		P7	7
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	13,984.00	kg	8,794.67	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	72,689.00	kg	45,714.80	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Reinforcement for concrete (rebar)	Reinforcement steel (rebar), generic		P4	5
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	#####	kg	114,256.67	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Ready-mix concrete for external walls and floors	Ready-mix concrete, normal-strength, generic		P2	3
A4	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	186.00	m2	1.54	Foundation, sub-surface, basement and retaining walls	75	21-03 10 10. Interior Partitions	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation	Trailer combination, 40 ton capacity, 100% fill rate	P7	7
A4	Ready-mix concrete, low-strength, generic, C12/15 (1700/2200 PSI), 0% recycled binders in cement (220 kg/m ³ / 13.73 lbs/ft ³)	1,761.00	m2	4,569.08	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for lightweight applications (domestic and auxiliary)	One Click LCA	Ready-mix concrete, low-strength, generic	Concrete mixer truck, average, 100% fill rate	P2	3
A4	Foundation waterproofing sheet membrane, 0.08in	1,828.00	m2	128.10	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Bitumen and other roofing	Quartz 2015	Foundation waterproofing sheet membrane	Trailer combination, 40 ton capacity, 100% fill rate	P34	7
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	9,313.36	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate	P2	3
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	8,278.54	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate	P2	3
A4	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	1,828.00	m2	15.13	Foundation, sub-surface, basement and retaining walls	75	21-01 10 10. Standard Foundations	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation	Trailer combination, 40 ton capacity, 100% fill rate	P7	7
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	13,984.00	kg	281.60	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	72,689.00	kg	1,463.76	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Reinforcement for concrete (rebar)	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	#####	kg	26,345.40	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Ready-mix concrete for external walls and floors	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate	P2	3
A5	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	186.00	m2	146.80	Foundation, sub-surface, basement and retaining walls	75	21-03 10 10. Interior Partitions	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation		P7	7

A5	Ready-mix concrete, low-strength, generic, C12/15 (1700/2200 PSI), 0% recycled binders in cement (220 kg/m ³ / 13.73 lbs/ft ³)	1,761.00	m ²	1,110.92	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for lightweight applications (domestic and auxiliary)	One Click LCA	Ready-mix concrete, low-strength, generic	P2	3	
A5	Foundation waterproofing sheet membrane, 0.08in	1,828.00	m ²	1,065.77	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Bitumen and other roofing	Quartz 2015	Foundation waterproofing sheet membrane	P34	7	
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m ²	2,543.50	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m ²	2,260.89	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
A5	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	1,828.00	m ²	1,442.73	Foundation, sub-surface, basement and retaining walls	75	21-01 10 10. Standard Foundations	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation	P7	7	
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	13,984.00	kg	453.78	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	P4	5	
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	72,689.00	kg	2,358.74	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Reinforcement for concrete (rebar)	Reinforcement steel (rebar), generic	P4	5	
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	#####	kg	6,760.73	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Ready-mix concrete for external walls and floors	Ready-mix concrete, normal-strength, generic	P2	3	
B3	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand Ag Board, StyrofoamTM Brand CavlymateTM, StyrofoamTM Brand CiadmateTM, 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 UtilityFITM, StyrofoamTM Brand WallmateTM, StyrofoamTM Brand Z-mateTM, (DuPont de Nemours)	186.00	m ²	-	Foundation, sub-surface, basement and retaining walls	75	21-03 10 10. Interior Partitions	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation	P7	7	
B3	Ready-mix concrete, low-strength, generic, C12/15 (1700/2200 PSI), 0% recycled binders in cement (220 kg/m ³ / 13.73 lbs/ft ³)	1,761.00	m ²	-	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for lightweight applications (domestic and auxiliary)	One Click LCA	Ready-mix concrete, low-strength, generic	P2	3	
B3	Foundation waterproofing sheet membrane, 0.08in	1,828.00	m ²	-	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Bitumen and other roofing	Quartz 2015	Foundation waterproofing sheet membrane	P34	7	
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m ²	-	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m ²	-	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
B3	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	1,828.00	m ²	-	Foundation, sub-surface, basement and retaining walls	75	21-01 10 10. Standard Foundations	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation	P7	7	
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	13,984.00	kg	-	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	P4	5	
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	72,689.00	kg	-	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Reinforcement for concrete (rebar)	Reinforcement steel (rebar), generic	P4	5	
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	#####	kg	-	Foundation, sub-surface, basement and retaining walls	As building	Not defined	Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	Ready-mix concrete for external walls and floors	Ready-mix concrete, normal-strength, generic	P2	3	
C3-C4	XPS insulation, R=1m2K/W, 0.681 kg/m ² , StyrofoamTM Brand	186.00	m ²	300.89	Foundation, sub-surface, basement and retaining walls	75	21-03 10 10. Interior Partitions	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation	Plastic waste	P7	7

C3-C4	Ready-mix concrete, low-strength, generic, C12/15 (1700/2200 PSI), 0% recycled binders in cement (220 kg/m ³ / 13.73 lbs/ft ³)	1,761.00	m2	2,144.04	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations		Ready-mix concrete for lightweight applications (domestic and auxiliary)	One Click LCA	Ready-mix concrete, low-strength, generic	Concrete waste	P2	3	
C3-C4	Foundation waterproofing sheet membrane, 0.08in	1,828.00	m2	490.28	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Concrete Sandwich	Bitumen and other roofing	Quartz 2015	Foundation waterproofing sheet membrane	Construction waste to landfill	P34	7	
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	4,370.30	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Concrete Sandwich	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3	
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	3,884.72	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Concrete Sandwich	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3	
C3-C4	XPS insulation, R=1m2K/W, 0.681 kg/m ² , Styrofoam™ Brand Reinforcement steel (rebar), generic, 90% recycled content, A615	1,828.00	m2	2,957.15	Foundation, sub-surface, basement and retaining walls	75	21-01 10 10. Standard Foundations	Concrete Sandwich	XPS (extruded polystyrene) insulation	EPD North American Grey Reduced GWP Styrofoam Brand XPS Products	XPS insulation	Plastic waste	P7	7	
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	13,984.00	kg	108.38	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Concrete Sandwich	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste	P4	5	
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	72,689.00	kg	563.34	Foundation, sub-surface, basement and retaining walls	As building	Not defined		Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	One Click LCA	Reinforcement steel (rebar), generic	Steel waste	P4	5	
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	#####	kg	12,362.61	Foundation, sub-surface, basement and retaining walls	As building	Not defined		Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3	
D	Ready-mix concrete, low-strength, generic, C12/15 (1700/2200 PSI), 0% recycled binders in cement (220 kg/m ³ / 13.73 lbs/ft ³)	1,761.00	m2	(1,815.14)	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations		Ready-mix concrete for lightweight applications (domestic and auxiliary)	One Click LCA	Ready-mix concrete, low-strength, generic		P2	3	
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	(3,699.88)	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Concrete Sandwich	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3	
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,828.00	m2	(3,288.79)	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Concrete Sandwich	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3	
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	13,984.00	kg	(2,168.54)	Foundation, sub-surface, basement and retaining walls	As building	21-01 10 10. Standard Foundations	Concrete Sandwich	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5	
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	72,689.00	kg	(11,272.11)	Foundation, sub-surface, basement and retaining walls	As building	Not defined		Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	One Click LCA	Reinforcement steel (rebar), generic		P4	5	
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	#####	kg	(10,335.31)	Foundation, sub-surface, basement and retaining walls	As building	Not defined		Footing foundations for hard soils (sand, gravel, silt or clay) per GFA	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3	
				412,721.58	Foundation, sub-surface, basement and retaining walls										
A1-A3	Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m ³ , Light Charcoal (Permacon)	208.90	m3	105,912.30	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers		P2	3	
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,036.00	m2	28,296.89	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3	
A1-A3	EPS insulation, 1.02in	1,036.00	m2	1,623.27	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	EPS (expanded polystyrene) insulation	Quartz 2015	EPS insulation		P7	7	
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m2	100,114.01	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3	
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m2	22,883.20	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3	
A1-A3	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m ² (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,064.00	m2	7,235.20	Floor slabs, ceilings, roofing decks, beams and roof	20	21-02 10 10 10 01. Floor Structural Frame - Beam		Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Membrane	SBS polymer-modified bitumen membrane roofing, self-adhered		20.4	P34	7
A1-A3	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft ² , DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,064.00	m2	3,504.56	Floor slabs, ceilings, roofing decks, beams and roof	40	21-02 10 10 10 01. Floor Structural Frame - Beam		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing		40	P232	9

A1-A3	XPS insulation (extruded polystyrene), 1.02in	1,064.33	m2	64,392.16	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-03 10 10. Interior Partitions		XPS (extruded polystyrene) insulation	Quartz 2015	XPS insulation (extruded polystyrene)			P7	7
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,158.00	kg	5,759.55	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,409.00	kg	5,917.41	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	22,548.00	m2	1,328,567.97	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	240,932.00	kg	151,524.41	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	541,153.00	kg	340,336.22	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A1-A3	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3)	#####	kg	396,532.63	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
A4	Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m3, Light Charcoal (Permacon)	208.90	m3	3,336.34	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers	Trailer combination, 40 ton capacity, 100% fill rate		P2	3
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,036.00	m2	5,958.56	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3
A4	EPS insulation, 1.02in	1,036.00	m2	27.66	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	EPS (expanded polystyrene) insulation	Quartz 2015	EPS insulation	Trailer combination, 40 ton capacity, 100% fill rate		P7	7
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,064.00	m2	21,081.30	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,064.00	m2	4,818.58	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3
A4	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,064.00	m2	86.50	Floor slabs, ceilings, roofing decks, beams and roof	20	21-02 10 10 10 01. Floor Structural Frame - Beam		Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Membrane	Trailer combination, 40 ton capacity, 100% fill rate	20.4	P34	7	
A4	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,064.00	m2	73.22	Floor slabs, ceilings, roofing decks, beams and roof	40	21-02 10 10 10 01. Floor Structural Frame - Beam		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing	Trailer combination, 40 ton capacity, 100% fill rate	40	P232	9
A4	XPS insulation (extruded polystyrene), 1.02in	1,064.33	m2	49.72	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-03 10 10. Interior Partitions		XPS (extruded polystyrene) insulation	Quartz 2015	XPS insulation (extruded polystyrene)	Trailer combination, 40 ton capacity, 100% fill rate		P7	7
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,158.00	kg	184.42	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate		P4	5
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,409.00	kg	189.47	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate		P4	5
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	22,548.00	m2	306,342.32	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	240,932.00	kg	4,851.73	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate		P4	5
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	541,153.00	kg	10,897.39	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate		P4	5
A4	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3)	#####	kg	69,721.70	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3
A5	Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m3, Light Charcoal (Permacon)	208.90	m3	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers	Trailer combination, 40 ton capacity, 100% fill rate		P2	3

	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,036.00	m2	1,627.29	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,036.00	m2	70.95	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	EPS (expanded polystyrene) insulation	Quartz 2015	EPS insulation	P7	7	
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m2	5,757.34	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m2	1,315.96	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
A5	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m ² (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,064.00	m2	737.44	Floor slabs, ceilings, roofing decks, beams and roof	20	21-02 10 10 10 01. Floor Structural Frame - Beam		Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Membrane	SBS polymer-modified bitumen membrane roofing, self-adhered	20.4	P34	7
A5	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft ² , DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,064.00	m2	514.10	Floor slabs, ceilings, roofing decks, beams and roof	40	21-02 10 10 10 01. Floor Structural Frame - Beam		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing	40	P232	9
A5	XPS insulation (extruded polystyrene), 1.02in	1,064.33	m2	2,586.50	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-03 10 10. Interior Partitions		XPS (extruded polystyrene) insulation	Quartz 2015	XPS insulation (extruded polystyrene)	P7	7	
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,158.00	kg	297.17	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	P4	5	
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,409.00	kg	305.32	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	P4	5	
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	22,548.00	m2	78,613.22	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	240,932.00	kg	7,818.19	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	P4	5	
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	541,153.00	kg	17,560.29	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	P4	5	
A5	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	#####	kg	21,658.24	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
B3	Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m ³ , Light Charcoal (Permacon)	208.90	m3	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers	P2	3	
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,036.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
B3	EPS insulation, 1.02in	1,036.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	EPS (expanded polystyrene) insulation	Quartz 2015	EPS insulation	P7	7	
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	P2	3	
B3	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m ² (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,064.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	20	21-02 10 10 10 01. Floor Structural Frame - Beam		Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Membrane	SBS polymer-modified bitumen membrane roofing, self-adhered	20.4	P34	7
B3	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft ² , DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,064.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	40	21-02 10 10 10 01. Floor Structural Frame - Beam		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing	40	P232	9

B3	XPS insulation (extruded polystyrene), 1.02in	1,064.33	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-03 10 10. Interior Partitions		XPS (extruded polystyrene) insulation	Quartz 2015	XPS insulation (extruded polystyrene)			P7	7
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,158.00	kg	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,409.00	kg	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	22,548.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	240,932.00	kg	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	541,153.00	kg	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
B3	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m3 / 24.97 lbs/ft3)	#####	kg	-	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
B4-B5	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,064.00	m2	14,748.81	Floor slabs, ceilings, roofing decks, beams and roof	20	21-02 10 10 10 01. Floor Structural Frame - Beam		Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Membrane			20.4	P34	7
B4-B5	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,064.00	m2	4,112.79	Floor slabs, ceilings, roofing decks, beams and roof	40	21-02 10 10 10 01. Floor Structural Frame - Beam		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing		40	P232	9
C3-C4	Pavers, 139 sq. in, T min 2.36 in, 2300 kg/m3, Light Charcoal (Permacon)	208.90	m3	5,318.00	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers	Concrete waste		P2	3
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,036.00	m2	2,796.06	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste		P2	3
C3-C4	EPS insulation, 1.02in	1,036.00	m2	105.87	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade		EPS (expanded polystyrene) insulation	Quartz 2015	EPS insulation	Construction waste to landfill		P7	7
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,064.00	m2	9,892.42	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste		P2	3
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	1,064.00	m2	2,261.13	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste		P2	3
C3-C4	SBS polymer-modified bitumen membrane roofing, self-adhered, 6.69 kg/m2 (Certain Teed, Henry, IKO, Malarkey Roofing Products, Siplast, Soprema)	1,064.00	m2	-	Floor slabs, ceilings, roofing decks, beams and roof	20	21-02 10 10 10 01. Floor Structural Frame - Beam		Bitumen and other roofing	EPD SBS-modified Bitumen Roofing Membrane		Preparation of construction waste	20.4	P34	7
C3-C4	Gypsum board with glass mat sheathing, 1/2in, 2.03 lb/ft2, DensDeck® Roof Board (Georgia-Pacific Gypsum)	1,064.00	m2	490.40	Floor slabs, ceilings, roofing decks, beams and roof	40	21-02 10 10 10 01. Floor Structural Frame - Beam		Specialty gypsum board	EPD Georgia-Pacific Gypsum EPD for 1/2 DensDeck® Roof Board	Gypsum board with glass mat sheathing	Construction waste to landfill	40	P232	9
C3-C4	XPS insulation (extruded polystyrene), 1.02in	1,064.33	m2	190.31	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-03 10 10. Interior Partitions		XPS (extruded polystyrene) insulation	Quartz 2015	XPS insulation (extruded polystyrene)	Construction waste to landfill		P7	7
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,158.00	kg	70.97	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste		P4	5
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,409.00	kg	72.92	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste		P4	5
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m3 / 18.72 lbs/ft3)	22,548.00	m2	143,751.46	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste		P2	3
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	240,932.00	kg	1,867.22	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste		P4	5
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	541,153.00	kg	4,193.94	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste		P4	5

C3-C4	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	#####	kg	32,716.98	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3
D	Pavers, 139 sq. in. T min 2.36 in, 2300 kg/m ³ , Light Charcoal (Permacon)	208.90	m ³	(4,583.68)	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Other precast concrete products	EPD CASSARA SLABS AND BOULEVARD PAVERS	Pavers		P2	3
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,036.00	m ²	(2,367.13)	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m ²	(8,374.89)	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 0% recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	1,064.00	m ²	(1,914.26)	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,158.00	kg	(1,420.16)	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-01 40 10. Standard Slabs-on-Grade	Ground slab, reinforced concrete (4400/5400 psi), 4-inch thick, climate zone 6 (Group R), includes rigid insulation R15	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	9,409.00	kg	(1,459.08)	Floor slabs, ceilings, roofing decks, beams and roof	As building	21-02 10 10 10 01. Floor Structural Frame - Beam		Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	22,548.00	m ²	(120,178.21)	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	240,932.00	kg	(37,362.08)	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	541,153.00	kg	(83,918.30)	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	In-situ concrete slab assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
D	Ready-mix concrete, normal-strength, generic, C40/50 (5800/7300 PSI), 10% (typical) recycled binders in cement (400 kg/m ³ / 24.97 lbs/ft ³)	#####	kg	(27,254.91)	Floor slabs, ceilings, roofing decks, beams and roof	As building	Not defined	Concrete beam - for concrete buildings	Ready-mix concrete for structures (beams, columns, piling)	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
				3,351,670.01	Floor slabs, ceilings, roofing decks, beams and roof									
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	12,523.00	m ²	461,173.29	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A1-A3	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	37,568.00	m ²	110,524.59	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic		P232	9
A1-A3	Steel stud framing for drywall/gypsum plasterboard per sq meter of wall area (incl. air gaps per m ³), C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	76,639.00	kg	108,680.51	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	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 m ³)		P4	5
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	159,668.00	kg	100,416.71	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	12,523.00	m ²	106,337.73	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck average, 100% fill rate	P2	3

A4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	37,568.00	m2	2,842.68	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic	Trailer combination, 40 ton capacity, 100% fill rate	P232	9
A4	Steel stud framing for drywall/gypsum plasterboard per sq meter of wall area (incl. air gaps per m ³). C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	76,639.00	kg	1,543.31	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	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 m ³)	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	159,668.00	kg	3,215.29	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	12,523.00	m2	27,288.27	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A5	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	37,568.00	m2	16,767.45	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic		P232	9
A5	Steel stud framing for drywall/gypsum plasterboard per sq meter of wall area (incl. air gaps per m ³). C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	76,639.00	kg	3,688.02	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	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 m ³)		P4	5
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	159,668.00	kg	5,181.19	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	12,523.00	m2	-	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
B3	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	37,568.00	m2	-	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic		P232	9
B3	Steel stud framing for drywall/gypsum plasterboard per sq meter of wall area (incl. air gaps per m ³). C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	76,639.00	kg	-	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	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 m ³)		P4	5
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	159,668.00	kg	-	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	12,523.00	m2	49,899.09	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3

C3-C4	Gypsum plaster board, regular, generic, 6.5-25 mm (0.25-0.98 in), 10.1725 kg/m ² (2.20 lbs/ft ²) (for 12.5 mm/0.49 in), 858 kg/m ³ (53.6 lbs/ft ³)	37,568.00	m ²	19,040.18	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	Regular gypsum board	One Click LCA	Gypsum plaster board, regular, generic	Construction waste to landfill		P232	9
C3-C4	Steel stud framing for drywall/gypsum plasterboard per sq meter of wall area (incl. air gaps per m ³). C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	76,639.00	kg	593.95	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	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 m ³)	Steel waste		P4	5
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	159,668.00	kg	1,237.43	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste		P4	5
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	12,523.00	m ²	(41,716.33)	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
D	Steel stud framing for drywall/gypsum plasterboard per sq meter of wall area (incl. air gaps per m ³). C-profile: 4 x 2 inch, gauge 25, 10 ft. height x 16 inch (40 cm) spacing	76,639.00	kg	(54,467.64)	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Drywall metal frame wall system, 2x4, 16 inches spacing, cavity insulation (R 0.45); climate zones 2,3,4,5,6. Double sided 0.5 inch drywall (gypsum board) with 16 inch o.c. steel 2x4 C-profile stud spacing	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 m ³)			P4	5
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	159,668.00	kg	(24,760.22)	Internal walls and non-bearing structures	As building	21-03 10 10. Interior Partitions	Load bearing wall, seismic zones 1, 2, thickness 6 inch	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
				1,018,429.69	Internal walls and non-bearing structures										
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	119.00	m ³	29,215.38	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	342.00	m ³	83,963.52	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
A1-A3	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,818.45	m ²	121,563.03	Other structures and materials	As building	21-02 10 80. Stairs		Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions			P4	5
A1-A3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	5,049.00	m ²	247,913.33	Other structures and materials	As building	Not defined	Concrete balcony assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	11,850.00	kg	7,452.58	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	34,155.00	kg	21,480.40	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A1-A3	Reinforcement steel (rebar), generic, 90% recycled content, A615	121,182.00	kg	76,212.50	Other structures and materials	As building	Not defined	Concrete balcony assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	119.00	m ³	6,736.51	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	342.00	m ³	19,360.38	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3
A4	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,818.45	m ²	269.90	Other structures and materials	As building	21-02 10 80. Stairs		Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions	Trailer combination, 40 ton capacity, 100% fill rate		P4	5
A4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	5,049.00	m ²	57,164.06	Other structures and materials	As building	Not defined	Concrete balcony assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete mixer truck, average, 100% fill rate		P2	3

A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	11,850.00	kg	238.63	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	34,155.00	kg	687.79	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A4	Reinforcement steel (rebar), generic, 90% recycled content, A615	121,182.00	kg	2,440.29	Other structures and materials	As building	Not defined	Concrete balcony assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Trailer combination, 40 ton capacity, 100% fill rate	P4	5
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	119.00	m ³	1,728.71	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	342.00	m ³	4,968.24	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A5	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,818.45	m ²	9,157.59	Other structures and materials	As building	21-02 10 80. Stairs		Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions		P4	5
A5	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	5,049.00	m ²	14,669.38	Other structures and materials	As building	Not defined	Concrete balcony assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	11,850.00	kg	384.53	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	34,155.00	kg	1,108.32	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
A5	Reinforcement steel (rebar), generic, 90% recycled content, A615	121,182.00	kg	3,932.33	Other structures and materials	As building	Not defined	Concrete balcony assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	119.00	m ³	-	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	342.00	m ³	-	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
B3	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,818.45	m ²	-	Other structures and materials	As building	21-02 10 80. Stairs		Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions		P4	5
B3	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	5,049.00	m ²	-	Other structures and materials	As building	Not defined	Concrete balcony assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic		P2	3
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	11,850.00	kg	-	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	34,155.00	kg	-	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
B3	Reinforcement steel (rebar), generic, 90% recycled content, A615	121,182.00	kg	-	Other structures and materials	As building	Not defined	Concrete balcony assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic		P4	5
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	119.00	m ³	3,161.11	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	342.00	m ³	9,084.88	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3
C3-C4	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,818.45	m ²	103.87	Other structures and materials	As building	21-02 10 80. Stairs		Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions	Aluminium waste	P4	5
C3-C4	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	5,049.00	m ²	26,824.30	Other structures and materials	As building	Not defined	Concrete balcony assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic	Concrete waste	P2	3
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	11,850.00	kg	91.84	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste	P4	5
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	34,155.00	kg	264.70	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste	P4	5
C3-C4	Reinforcement steel (rebar), generic, 90% recycled content, A615	121,182.00	kg	939.16	Other structures and materials	As building	Not defined	Concrete balcony assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic	Steel waste	P4	5

D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	119.00	m3	(2,642.73)	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	342.00	m3	(7,595.08)	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
D	Anodized aluminum extrusions (Aluminum Extruders Council (AEC))	3,818.45	m2	(3,153.13)	Other structures and materials	As building	21-02 10 80. Stairs		Aluminium	EPD Aluminium Extrusions	Anodized aluminum extrusions			P4	5
D	Ready-mix concrete, normal-strength, generic, C30/37 (4400/5400 PSI), 10% (typical) recycled binders in cement (300 kg/m ³ / 18.72 lbs/ft ³)	5,049.00	m2	(22,425.48)	Other structures and materials	As building	Not defined	Concrete balcony assembly	Ready-mix concrete for external walls and floors	One Click LCA	Ready-mix concrete, normal-strength, generic			P2	3
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	11,850.00	kg	(1,837.62)	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	34,155.00	kg	(5,296.52)	Other structures and materials	As building	Not defined	Concrete assembly for stairs and elevator shafts per one metre height	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
D	Reinforcement steel (rebar), generic, 90% recycled content, A615	121,182.00	kg	(18,792.07)	Other structures and materials	As building	Not defined	Concrete balcony assembly	Reinforcement for concrete (rebar)	One Click LCA	Reinforcement steel (rebar), generic			P4	5
				751,117.24	Other structures and materials										
A1-A3	Fiberglass reinforced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy) Aluminium frame curtain wall system, 1.5m x 1.6m, 35.6 kg/m2, 1600 1, 1600 2, 1600 3, 1600 4, 1600 5, 1600 SS, 1600 UT 1, 1600 UT 2, 1620/1620 SSG, 1630 SS IR, 2250 IG, 2250 LR, 7500 and Clearwall Curtain Wall Systems (Kawneer)	15.00	m2	1,799.76	Windows and doors	40	21-02 20 50. Exterior Doors and Grilles		Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinforced polyester (FRP) door, per m2		40	P8	8
A1-A3	Window wall curtain wall system, 1.5m x 1.6m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	660.00	m2	226,874.02	Windows and doors	As building	21-02 20 20. Exterior Windows		Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL ALUMINUM CURTAIN WALL SYSTEMS	Aluminium frame curtain wall system			P314	8
A1-A3	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	3,910.00	m2	1,655,852.93	Windows and doors	As building	21-02 20 20. Exterior Windows		Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system			P8	8
A4	Fiberglass reinforced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy) Aluminium frame curtain wall system, 1.5m x 1.6m, 35.6 kg/m2, 1600 1, 1600 2, 1600 3, 1600 4, 1600 5, 1600 SS, 1600 UT 1, 1600 UT 2, 1620/1620 SSG, 1630 SS IR, 2250 IG, 2250 LR, 7500 and Clearwall Curtain Wall Systems (Kawneer)	15.00	m2	5.79	Windows and doors	40	21-02 20 50. Exterior Doors and Grilles		Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinforced polyester (FRP) door, per m2	Trailer combination, 40 ton capacity, 100% fill rate	40	P8	8
A4	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	660.00	m2	163.15	Windows and doors	As building	21-02 20 20. Exterior Windows		Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL ALUMINUM CURTAIN WALL SYSTEMS	Aluminium frame curtain wall system	Trailer combination, 40 ton capacity, 100% fill rate		P314	8
A4	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	3,910.00	m2	3,573.71	Windows and doors	As building	21-02 20 20. Exterior Windows		Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system	Trailer combination, 40 ton capacity, 100% fill rate		P8	8
A5	Fiberglass reinforced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy) Aluminium frame curtain wall system, 1.5m x 1.6m, 35.6 kg/m2, 1600 1, 1600 2, 1600 3, 1600 4, 1600 5, 1600 SS, 1600 UT 1, 1600 UT 2, 1620/1620 SSG, 1630 SS IR, 2250 IG, 2250 LR, 7500 and Clearwall Curtain Wall Systems (Kawneer)	15.00	m2	-	Windows and doors	40	21-02 20 50. Exterior Doors and Grilles		Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinforced polyester (FRP) door, per m2		40	P8	8
A5	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	660.00	m2	-	Windows and doors	As building	21-02 20 20. Exterior Windows		Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL ALUMINUM CURTAIN WALL SYSTEMS	Aluminium frame curtain wall system			P314	8
A5	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	3,910.00	m2	-	Windows and doors	As building	21-02 20 20. Exterior Windows		Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system			P8	8
B3	Fiberglass reinforced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy) Aluminium frame curtain wall system, 1.5m x 1.6m, 35.6 kg/m2, 1600 1, 1600 2, 1600 3, 1600 4, 1600 5, 1600 SS, 1600 UT 1, 1600 UT 2, 1620/1620 SSG, 1630 SS IR, 2250 IG, 2250 LR, 7500 and Clearwall Curtain Wall Systems (Kawneer)	15.00	m2	-	Windows and doors	40	21-02 20 50. Exterior Doors and Grilles		Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinforced polyester (FRP) door, per m2		40	P8	8
B3	Window wall curtain wall system, 1.5m x 1.6m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	660.00	m2	-	Windows and doors	As building	21-02 20 20. Exterior Windows		Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL ALUMINUM CURTAIN WALL SYSTEMS	Aluminium frame curtain wall system			P314	8
B3	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	3,910.00	m2	-	Windows and doors	As building	21-02 20 20. Exterior Windows		Aluminium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system			P8	8

B4-B5	Fiberglass reinforced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy)	15.00	m2	1,809.07	Windows and doors	40	21-02 20 50. Exterior Doors and Grilles	Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinforced polyester (FRP) door, per m2	40	P8	8
C3-C4	Fiberglass reinforced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy)	15.00	m2	-	Windows and doors	40	21-02 20 50. Exterior Doors and Grilles	Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinforced polyester (FRP) door, per m2	40	P8	8
C3-C4	Aluminium frame curtain wall system, 1.5m x 1.6m, 35.6 kg/m2, 1600 1, 1600 2, 1600 3, 1600 4, 1600 5, 1600 SS, 1600 UT 1, 1600 UT 2, 1620/1620 SSG, 1630 SS IR, 2250 IG, 2250 LR, 7500 and Clearwall Curtain Wall Systems (Kawneer)	660.00	m2	182.09	Windows and doors	As building	21-02 20 20. Exterior Windows	Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL ALUMINUM CURTAIN WALL SYSTEMS	Aluminium frame curtain wall system	Aluminium waste	P314	8
C3-C4	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	3,910.00	m2	1,227.25	Windows and doors	As building	21-02 20 20. Exterior Windows	Alumium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system	Aluminium waste	P8	8
D	Fiberglass reinforced polyester (FRP) door, per m2, 0.375-1.125 in / 9.5-28.6 mm glass pocket thickness (Fleming / Assa Abloy)	15.00	m2	-	Windows and doors	40	21-02 20 50. Exterior Doors and Grilles	Glass doors	EPD Fleming Fiberglass reinforced polyester door	Fiberglass reinforced polyester (FRP) door, per m2	40	P8	8
D	Aluminium frame curtain wall system, 1.5m x 1.6m, 35.6 kg/m2, 1600 1, 1600 2, 1600 3, 1600 4, 1600 5, 1600 SS, 1600 UT 1, 1600 UT 2, 1620/1620 SSG, 1630 SS IR, 2250 IG, 2250 LR, 7500 and Clearwall Curtain Wall Systems (Kawneer)	660.00	m2	3,463.00	Windows and doors	As building	21-02 20 20. Exterior Windows	Glass facades and glazing	EPD TRADITIONAL CURTAIN WALL ALUMINUM CURTAIN WALL SYSTEMS	Aluminium frame curtain wall system		P314	8
D	Window wall curtain wall system, 1.5m x 1.3m, 40.5 kg/piece, MetroView FG 501T, FG 623, TR-700 Window Walls and PG123 Framing (Kawneer)	3,910.00	m2	(31,790.70)	Windows and doors	As building	21-02 20 20. Exterior Windows	Alumium frame windows	Window wall, Kawneer 2015	Window wall curtain wall system		P8	8
				1,891,487.78	Windows and doors								