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BIM-LCA Construction Project

Spanish Case Study Report: LCA of a Single-family house.

Summary

1 – Aims

UPCT and CTCON developed the case study "**Construction products life cycle analysis (LCA) using a Building Information Modelling (BIM) model of a single-family house**".

Its main goal is to develop a didactic methodology for teaching and learning concepts related to the circular economy and the LCA in construction, through the study of several alternatives in the construction of a single-family home.

2 – Description of the case study

The Spanish case study of this Project has focused on studying several solutions to build a single-family house and perform a life cycle analysis (LCA) of each alternative using the BIM models created. The objective of this LCA assessment is to compare the sustainability of each solution.

- **Solution 1: Single-family house with concrete structures and brick envelope.**

Figure 1. House with concrete structure.

- **Solution 2: Single family house with steel structure and brick envelope**

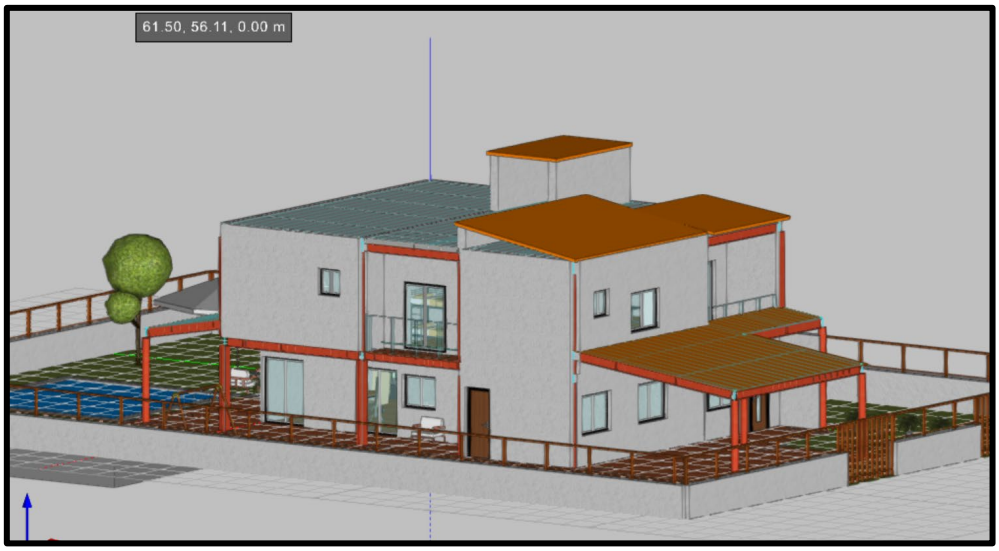

Figure 2. House with steel structure.

- **Solution 3: Singel family house with structure and envelope in timber.**

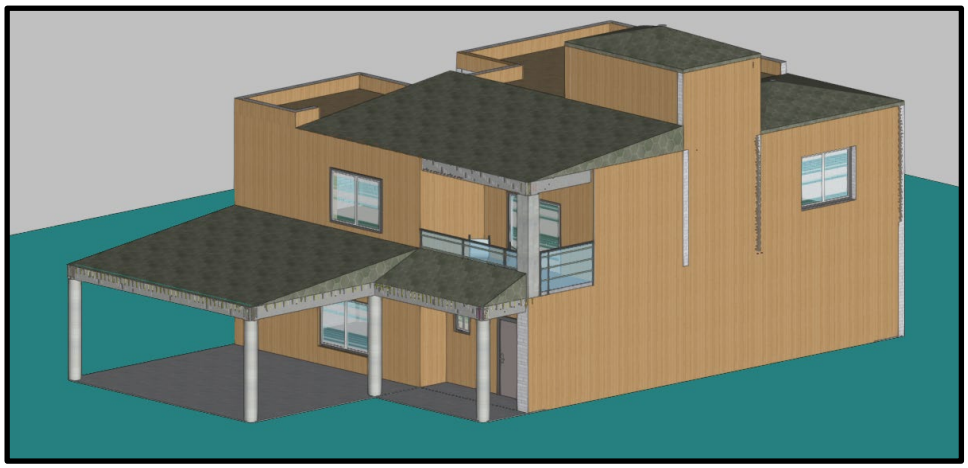

Figure 3. House with timber structure and timber envelope

2.1.- Starting data for the study:

2.1.1. Localization of the single-family house.

The single-family house is located in Cartagena municipality, in an area on the outskirts of this port city that belongs to the Province of Murcia in Spain. The construction zone of the project has been specifically defined as a normal accessibility zone, with minimum slopes.

Figure 4. Project Location.

The surface of the plot is estimated at an area close to 700 square meters, while the total built area is believed to be close to 360 m2.

2.1.2. Characteristics of the house

It is a detached house of two floors above ground, with two parking spaces on its main façade south of the location of the house, with large patio on the rear façade, common areas and a toilet on the lower floor, and three bedrooms and three bathrooms on the upper floor. With flat and sloping roof areas.

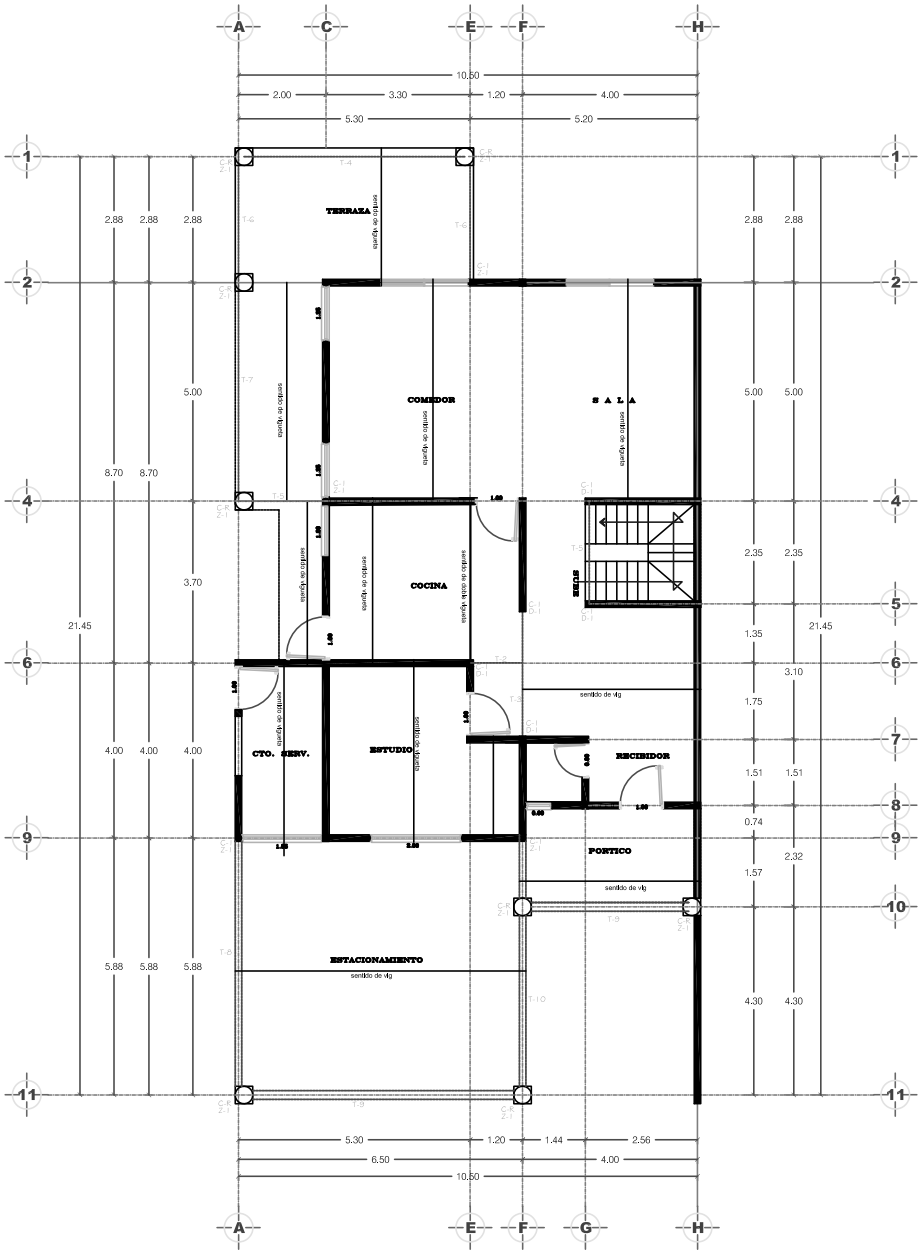

Figure 5. Plan of ground floor.

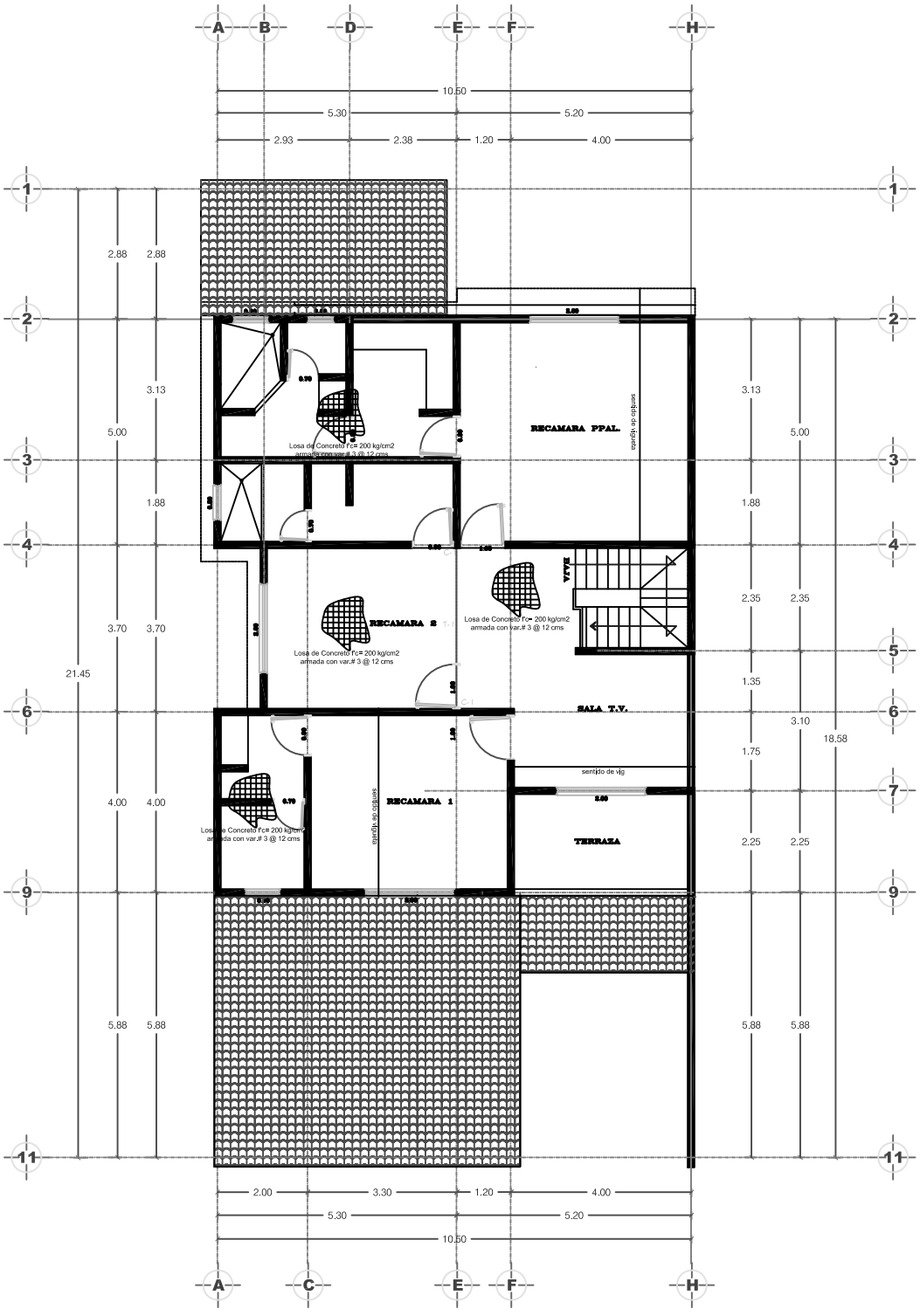

Figure 6. Plan of first floor.

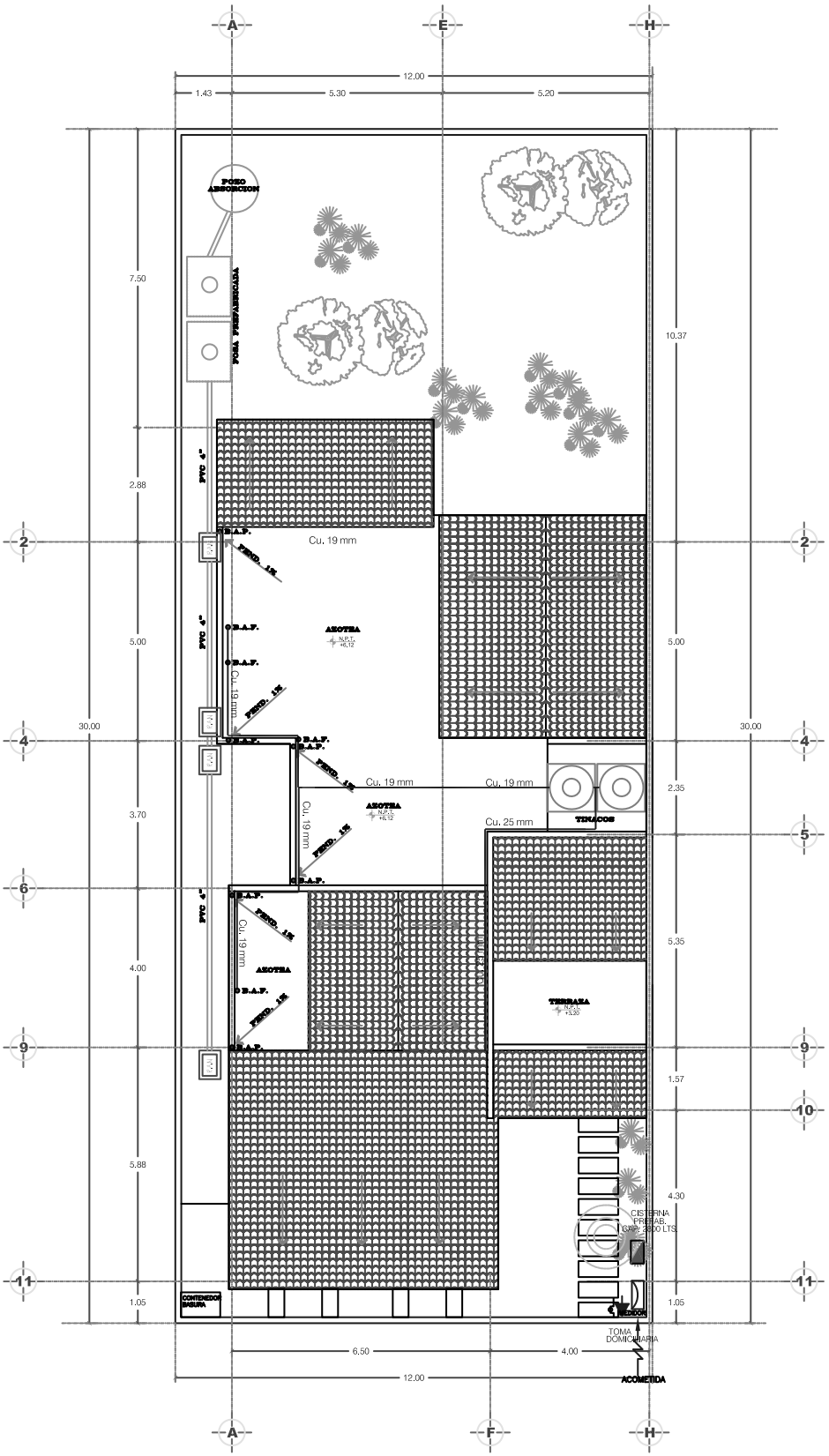

Figure 7. Overall plan

It is estimated that the construction area is 360 m^2, The terrain on which the house sits is a semi-hard clay soil.

Each of the mentioned solutions to be studied in this case of study of the BIM-LCA Construction Project, has been offered as a master's thesis or final degree project to Civil Engineering students of the UPCT.

The following section shows one of the offers made to students.

2.2.- Example of Master Thesis offered

Title in English: Timber structure design and life cycle analysis of a single-family house using BIM and LCA tools.

Objectives: The aim of this study is to carry out the design of the timber structure of a single-family house following Eurocode 5, and an analysis of the environmental impact produced by this construction throughout its life cycle following the EN ISO 15978:2012 standard. In order to carry out the analysis of the life cycle of the single-family house, a BIM model will be built as a preliminary step, from which the measurements of the materials used and other parameters will be obtained. In the second part of this master thesis, a parametric study will be carried out to analyse the improvement for the environment caused by the use of other materials in the structure and thermal envelope and the change in the transport distances of the materials.

Phases: In this master's thesis the student will have to develop the following phases:

Phase 1: Choice of the type of foundation according to the geotechnical properties of the ground.

Phase 2: Choice of the enclosure and partitions of the dwelling. Several alternatives.

Phase 3: Determination of gravity loads (own weight, dead loads, service loads...) and horizontal loads (wind and earthquakes) acting on the building for its design.

Phase 4: Design of the structural system of the house. Pre-dimensioning of beams, columns and floors under gravity loads and service load.

Phase 5: Analysis to obtain internal forces and deformations in the structure after carrying out the appropriate combinations of actions.

Phase 7: Verification of the ultimate and serviceability limit states of both the foundation and the rest of the structural elements.

Phase 8: BIM modelling of the house with Cype Architecture.

Phase 9: Obtaining measurements of housing materials with Open BIM Quantities

Phase 10: Construction budget and Life Cycle Analysis of the building in stages A1-A5 with the Archimedes Cype tool. These stages are as follows:

- Product:A1-A3
  Extraction of raw materials (A1)
  Transport to factory (A2)
  Manufacturing (A3)
- Construction process: A4 - A5
  Transport of the product (A4)

Product installation and construction process (A5)

Phase 11: Full life cycle analysis of the building with OneClick. Input: measurements and other parameters in Excel sheet. This analysis will be carried out according to the standard *UNE 15978:2012. Sustainability in construction. Assessment of the environmental performance of buildings. Calculation methods.*
In this analysis, in addition to steps A1-A5, the following steps will be considered:

- Stage of use, information modules related to the building structure.
  - B1: use or application of the installed product; - B2: maintenance;
  - B3: repair; - B4: replacement; - B5: rehabilitation.
- Stage of use, information modules related to the operation of the building.
  - B6: in-service energy use (e.g. operation of the heating system and other installed services linked to the building;
  - B7: in-service water use.
- End-of-life stage. The stage includes the supply and transport of all materials and products, and the associated energy and water use.
  - C1: deconstruction, demolition;
  - C3: treatment of waste for reuse, recovery and/or recycling;
  - C4: elimination.
- Benefits and burdens beyond system boundaries. The stage includes:
  - D: potential for reuse, recovery and/or recycling, expressed as net loads and benefits.

Phase 12: Comparison of the results of the analysis with the results of other case studies, other Master's Thesis, of single-family houses with concrete or steel structure and brick envelopes. The results of the life cycle analysis to be compared will be the corresponding indicators of environmental impact, use of resources and other indicators relating to waste generated, reusable materials.

Phase 13: Drafting of a tutorial guide for the use of BIM and LCA tools in this case study.

Requirements: Student of the Master's Degree in Civil Engineering.

Abstract: The assessment of the environmental impact of a building throughout its life cycle is a very useful tool to quantify the sustainability of building materials. This Master's Thesis aims to develop a life cycle analysis for a case study and compare the results with other cases already analysed. The design of a single-family house with timber structure with BIM tools will be the first step to carry out the life cycle analysis.

Bibliography:

UNE-EN ISO 14040: 2006.Environmental Management. Life Cycle Analysis. Principles and reference framework.
UNE-EN ISO 14044: 2006. Environmental Management. Life Cycle Assessment. Requirements and guidelines.
UNE-EN 15978:2012 Sustainability in construction. Assessment of the environmental performance of buildings. Calculation methods.
UNE-EN 1995-1-1. Eurocode 5: Design of timber structures Part 1-1: General rules and building regulations.
Spanish Technical Building Code.

Competences: Those included in the MUICCP Master's Thesis Teaching Guide. In addition: ability to use BIM and LCA tools to assess the sustainability of the materials used in the construction of a single-family house.

3 – State of the art use of BIM and LCA to assess the sustainability of a building.

The high environmental impact of residential buildings throughout their lifecycle has aroused growing and notable interest within the scientific community in recent decades, utilizing the methodology of Life Cycle Assessment (LCA).

Over time, various methodologies have been devised to assess environmental impact. The most internationally recognized methodology is Life Cycle Assessment (LCA), applied to construction sector products through the UNE-EN 15804 standard (2012) and to buildings through the UNE-EN 15978 standard (2012). Additionally, the LCA methodology also serves as a decision-making tool in the design and construction stages of the building, particularly in the selection of construction materials with a lower associated environmental impact.

From the review of the literature on LCA studies applied to the environmental assessment of buildings, it is concluded that the buildings most frequently analyzed are residential ones in the European continent, with the ultimate goal of evaluating newly constructed buildings. Within the scope, the lifecycle stages most frequently analyzed are product and construction, followed by end-of-life. The most commonly used functional unit is the total building area, considering its expected service life, which is generally assumed to be 50 years.

On the other hand, despite articles specifically addressing LCA in buildings, it should be noted that both inventory databases and software tools used are not typically specific to buildings. Most authors employ generic databases and software that could also be used for LCA of other types of products or systems. This indicates that there is still progress to be made in the development and use of building-specific software and databases that adapt to the specific conditions of each region.

The potential of Building Information Modeling (BIM) tools in facilitating decision-making processes during Life Cycle Assessment (LCA) applications within the context of building construction has been widely acknowledged and documented in a number of academic review articles [1], [2]. For instance, Soust-Verdaguer et al. [3] conducted a comprehensive review of studies that explored the synergies between BIM and LCA, with a specific focus on how BIM can streamline data input and optimize the output of LCA tools. This review also put forth practical strategies for integrating BIM software and LCA tools, such as the development of templates and software plug-ins. It is

important to note, however, that this review predates 2018, and many recent publications on this subject have not been considered.

In particular, since 2018, a substantial number of research papers have emerged that investigate the integration of BIM and LCA through case studies. Eleftheriadis et al. [4], for instance, conducted an in-depth review that delved into the relationship between BIM and LCA in terms of enhancing energy efficiency (including embodied and operational energy) and engineering performance aspects (such as cost and safety) of structural systems. This review underscored the imperative of incorporating BIM in the decision-making process related to building structures and presented critical insights in both engineering and sustainable energy domains, along with proposing a set of research guidelines. However, it primarily emphasized a qualitative perspective, without thoroughly addressing the methodological barriers and quantitative aspects associated with BIM-integrated LCA.

Similarly, Llatas et al. [5] conducted a systematic literature review (SLR) with the aim of identifying opportunities for integrating LCA into the BIM process during the building design phase. Their review paper introduced an approach to assist in the implementation of BIM-integrated LCA; however, it analyzed only 36 case studies published in two specific journals.

Dalla Mora et al. [6], on the other hand, conducted an extensive review of BIM-integrated LCA studies published between 2007 and 2019, demonstrating how BIM could enhance data management in LCA applications. They also examined the influence of various parameters in this context and highlighted the notable absence of readily available LCA databases integrated into BIM tools as a significant challenge. Nevertheless, a systematic analysis of how these factors affect the BIM-integrated LCA application remains limited.

Seyis [7] conducted a comprehensive review that identified the advantages and disadvantages associated with BIM-based LCAs. The findings of this review pointed to laborious data input processes as a primary challenge in BIM-integrated LCA. A similar study was conducted by Obrecht et al. [8] , which facilitated a comparative assessment of different types of BIM-integrated LCA methods, weighing their respective strengths and weaknesses.

Panteli et al. [9] focused their research on prior studies concerning the use of BIM for environmental assessments of buildings during the design phase. They emphasized the critical importance of data interoperability between BIM and LCA tools in this context.

In summary, while these previously published works have conducted reviews of the integration of BIM and LCA, there exists a compelling need for a more systematic and comprehensive review to provide a deeper understanding of these crucial aspects within the field of BIM-integrated LCA. In the work of Teng et al. [10] a systematic review of previous work on the integration of BIM and LCA is developed. The fig. 7 and table 1 show some results of this work.

Concerning the methodological aspects of software integration and data interchange, a pivotal undertaking revolves around the formulation of strategies for achieving seamless software integration and efficient data exchange between Building Information Modeling (BIM) software and Life Cycle Assessment (LCA) tools. Conventionally, LCA for buildings tends to be executed toward the latter stages of the design process, a juncture at which precise and comprehensive data become accessible. However, at this stage, influencing critical decisions may be impractical or too late in the development process. To ameliorate this challenge, various methodological approaches have been proposed with the aim of integrating BIM software and LCA tools more effectively.

Data exchange emerges as another significant hurdle when dealing with disparate data formats inherent to BIM software and specialized LCA tools. The paramount objectives in coupling BIM and LCA tools often encompass the exportation of Bill of Quantities (BoQ) and the establishment of building datasets, both of which represent intricate and time-intensive procedures. In this context, three distinct approaches have been identified by Teng et al. [10] to facilitate data transfer between BIM and LCA tools. These approaches encompass the integration of a process that amalgamates diverse data into a third-party application or tool (Type I), the importation of a BoQ report generated from the BIM model into a dedicated LCA tool (Type II), and the utilization of plug-ins that incorporate LCA data into BIM software (Type III) (as illustrated in Figure 7). A comparative analysis of these three categories of approaches is delineated in Table 1.

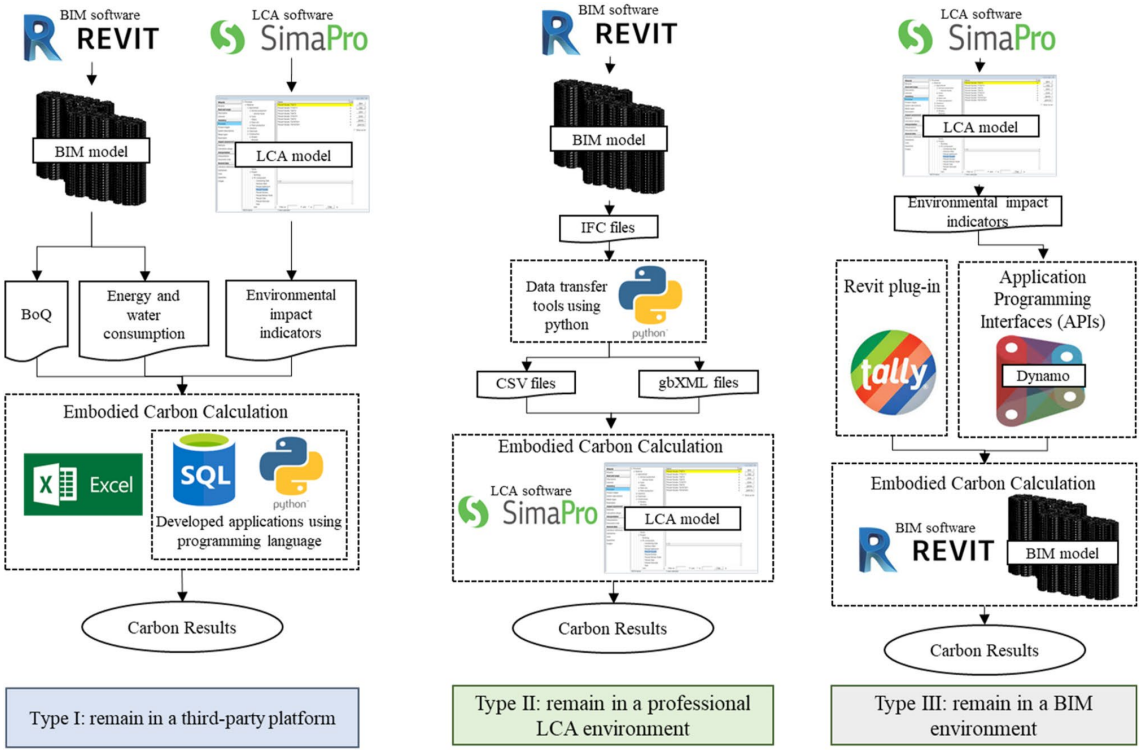

Figure 8. Three approaches for data exchange between BIM software and LCA tools. (Source: Tend et al. [10])

Table 1: Three types of data exchange approaches between BIM and LCA tools. (Source: Tend et al. [10])

Type	Data exchange approach	Calculation platform	Description	Advantage	Disadvantage
I	From BIM and LCA to a third party	Excel	Importing a BoQ report generated from the BIM model and corresponding emission factors provided by LCA tools into Excel	Simple and time-saving	Inefficient to handle a more complex calculation
		Self-developed application	Using programming language to achieve automatic data extraction and calculation between BIM and LCA tools	Automatic and clear calculation	Only numerical results can be obtained
II	From BIM to LCA	Professional LCA tools	Importing a BoQ report generated from the BIM model or BIM model into dedicated LCA tools	Professional, detailed and visualized analysis	Inconsistent data formats of material databases; Manually data mapping is needed
III	From LCA to BIM	BIM platform	Using a Revit plug-in to conduct LCA Importing LCA data into BIM objects or an in-built database through application programming interfaces (APIs)	Flexible data modification, integrated data storage, quick feedback, and intuitive visualization	Inaccuracy of the results Manual data mapping is needed

4 – Regulations and standards

LCA regulations and standards:

- UNE-EN ISO 14040: 2006.Environmental Management. Life Cycle Analysis. Principles and reference framework.
- UNE-EN ISO 14044: 2006. Environmental Management. Life Cycle Assessment. Requirements and guidelines.
- UNE-EN 15978:2012 Sustainability in construction. Assessment of the environmental performance of buildings. Calculation methods.

BIM regulations and standards:

- UNE-EN ISO 16739-1: Data exchange in the construction industry and in property management using IFC (Industry Foundation Classes).
- UNE-EN ISO 19650-1: Organization and digitization of information in building and civil engineering works that use BIM (Building Information Modelling).

5 – Case study methodology.

In the Spanish Case Study of this BIM-LCA project, Cype's Open BIM software package has been used (see next Figure):

- With them we design the structure of the house (using CypeCad) and its corresponding Open BIM model, that is, its BIM model in IFC format. We upload this BIM model of the housing structure to a server (BIMServerCenter).
- Then we use another software (**Cype Architecture**) to create the BIM model of the architectural part of the house.
- Next, we enrich the BIM model of the house by incorporating information about the housing envelope with **Open BIM Construction Systems**.
- And finally, we use the **Open BIM Quantities** and **Arquimedes** software to build the Bill of Quantities of the construction, from the measurements that the software makes in the elements of the BIM model. Arquimedes is able to print the LCA report that has been made by adding impacts of each of the budget items using the Cype LCA database.

This LCA only contains stages A1 to A5. Next Figure shows the workflow and data exchange in the Spanish Case Study using Cype software and BIMServerCenter. In this workflow each software exchanges information with the OpenBIM model of the house that is stored in a BIMServerCenter Project.

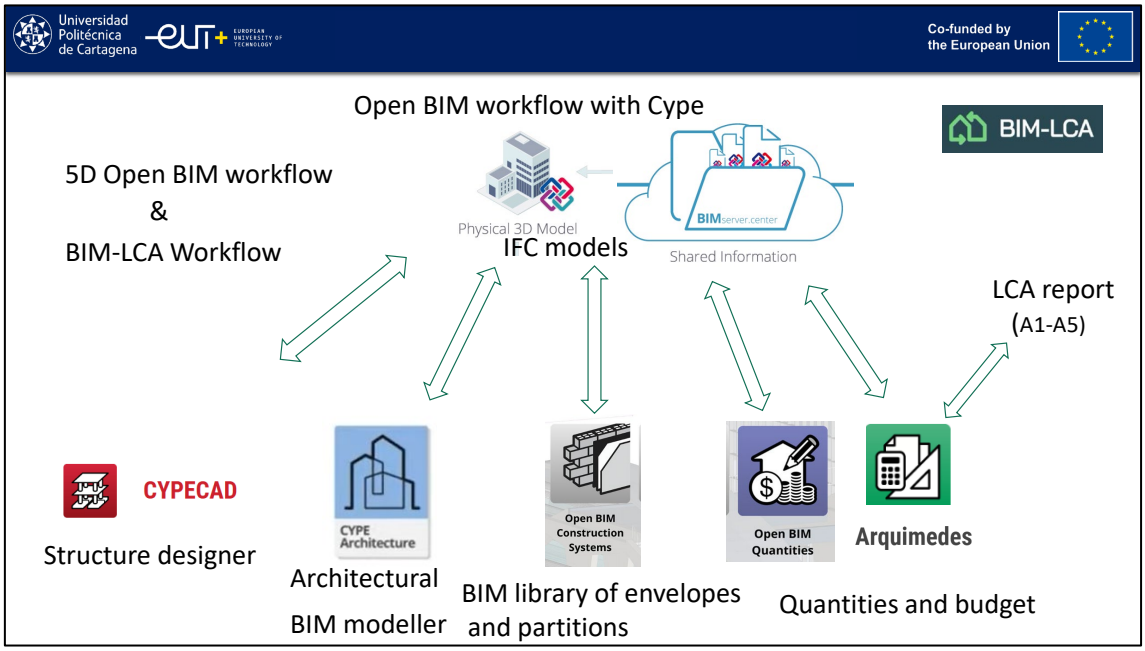

Figure 9. Workflow in the Spanish Case Study using OneClick LCA.

With the workflow followed to develop the Spanish case study, the integration between the BIM model and the LCA assessment is perfect since the same database that serves to build the Bill of Quantities serves to perform the Construction Life Cycle Analysis.

The Cype Architecture software is explained in a tutorial of this BIM-LCA Construction E+ Project.

Another way to use Archimedes to obtain the LCA of the construction is to use the excel sheet developed in this project.

As a result of this project (BIM-LCA Construction), a web application has been developed that, based on quantities of material used in the construction of a building (single-storey housing, multi-storey building or industrial warehouse), makes an LCA to show a series of environmental impacts of construction in phases A1-A3 (extraction and manufacture of construction products). This app is available on the BIM-LCA Construction Project website (https://bimlca.eu)

An LCA Excel App has also been developed with the aim of performing building LCAs and showing the cost and environmental impacts of building construction (A1-A5). This Excel app is also available on the Project's website, and includes the options to choose among various materials for the structure (concrete, steel or wood), and to choose various types of foundations, doors, windows, insulation materials, floors, partitions, facades and roofs.

The LCA Excel project app, has a user guide, in tutorial format, that is part of the results of the BIM-LCA Construction project in the work package 3. This user guide is also available on the Project website.

6 – Development of the case study.

6.1.- BIM models.

The BIM model of the three alternatives studied begins with the modelling and design of the structure of the single-family house in CypeCAD. Figs. 10 and 11 show the model of the structure in reinforced concrete and structural steel in CypeCAD.

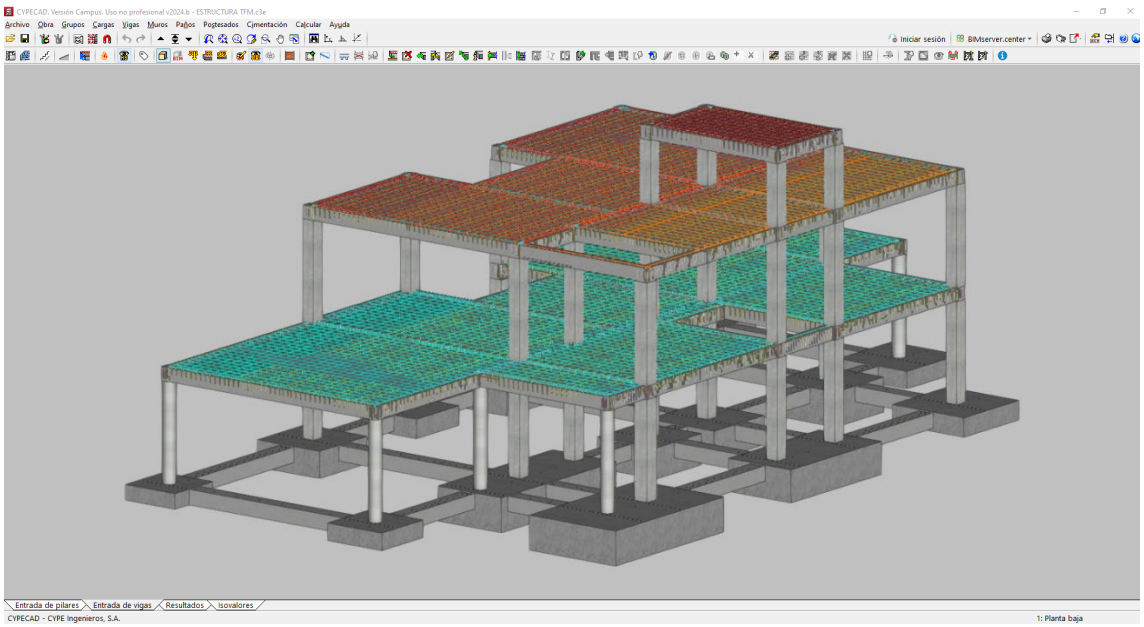

Figure 10. Reinforced concrete structure of the single-family house in CypeCAD

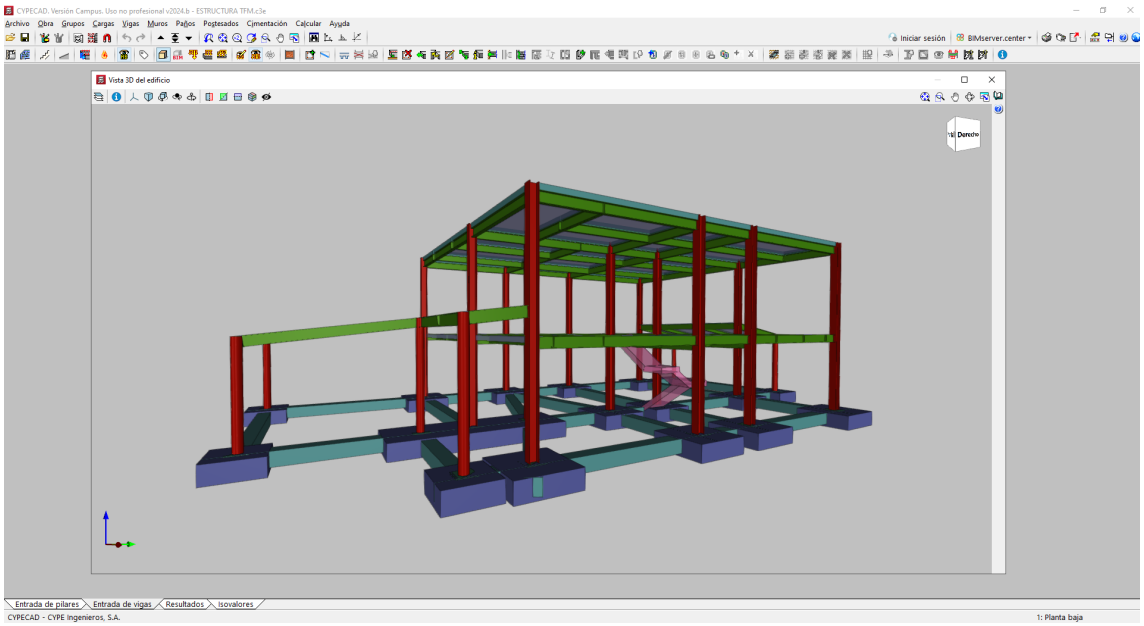

Figure 11. Steel structure in CypeCAD.

The next step in the construction of the BIM model has been to model the architectural elements of the house using Cype Architecture. Fig. 12 and 13 show this model in the aforementioned software.

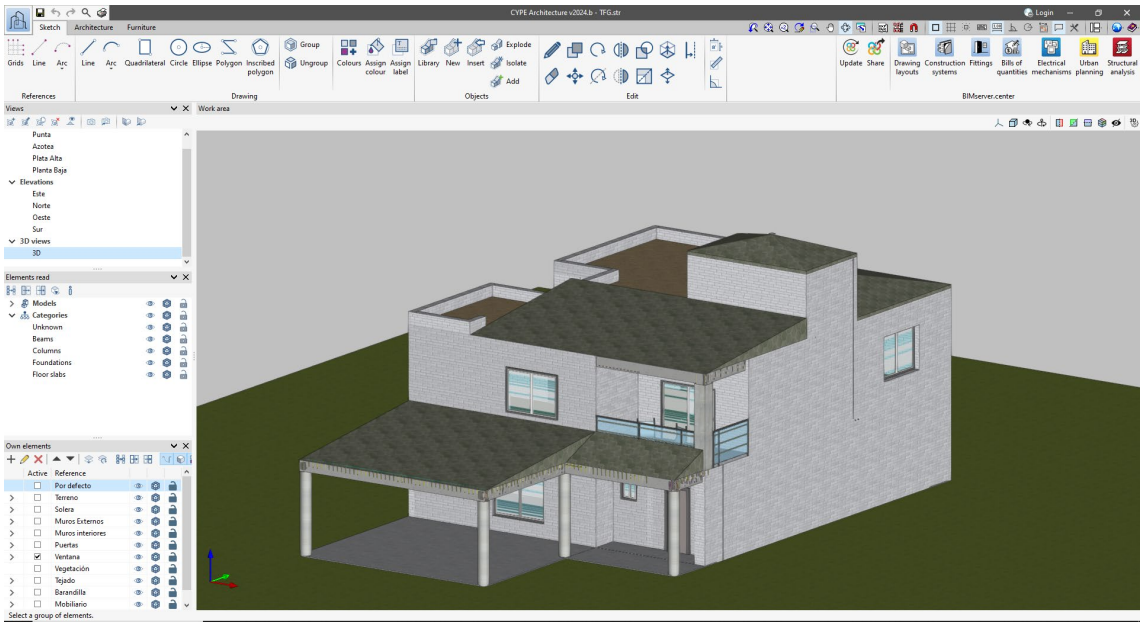

Figure 12. Architectural elements of the concrete structure house in Cype Architecture.

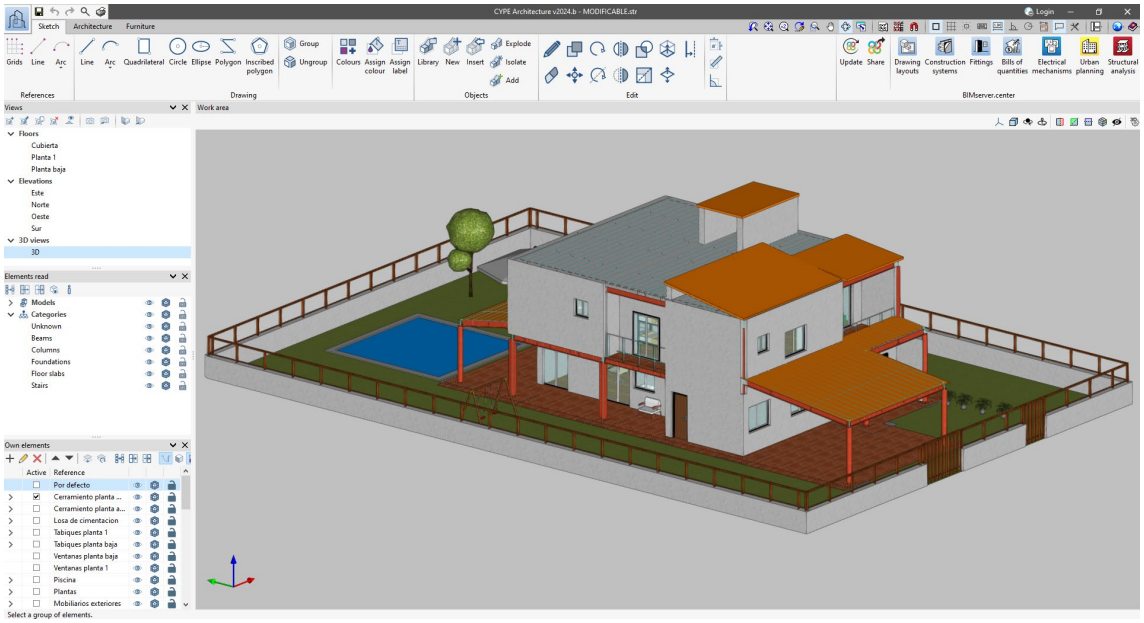

Figure 13. Architectural elements of the steel structure house in Cype Architecture

The amount of materials used in the design of the three alternatives studied has been calculated with OpenBIM Quaitities, as well as their construction budget.

Figs. 14 and 15 show the models in OpenBIM Quantities.

A cost data base has been built for each model using Arquimedes. These databases with prices and description of the work units of the single-family house have been imported into OpenBIM Quantities for the calculation of the Bill of Quantities.

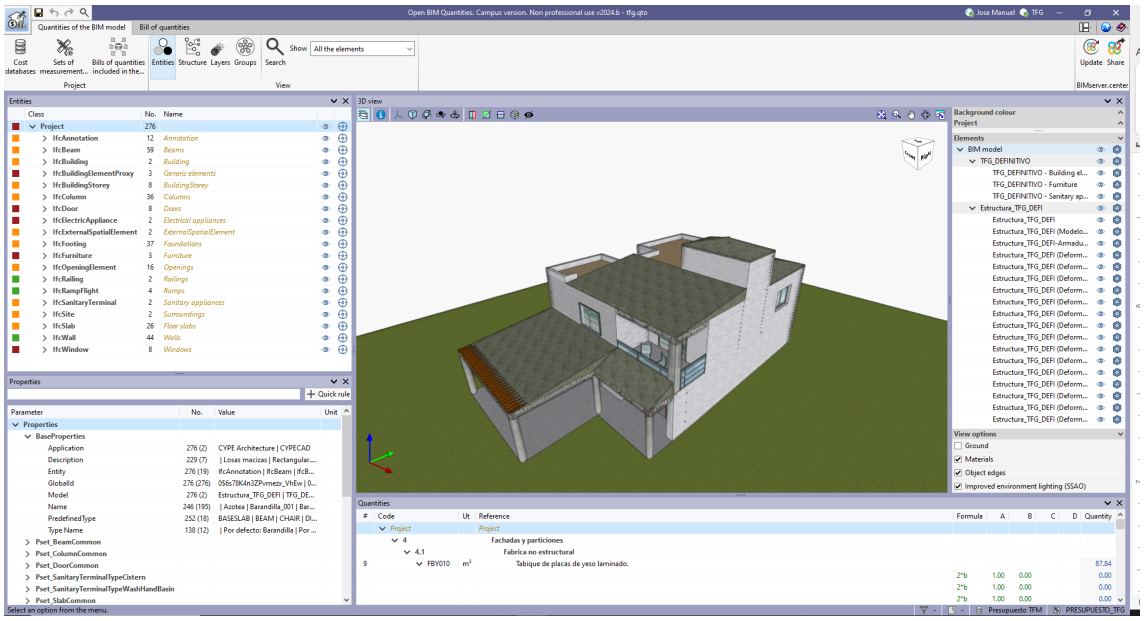

Figure 14. Architectural elements of the steel structure house in Cype Architecture

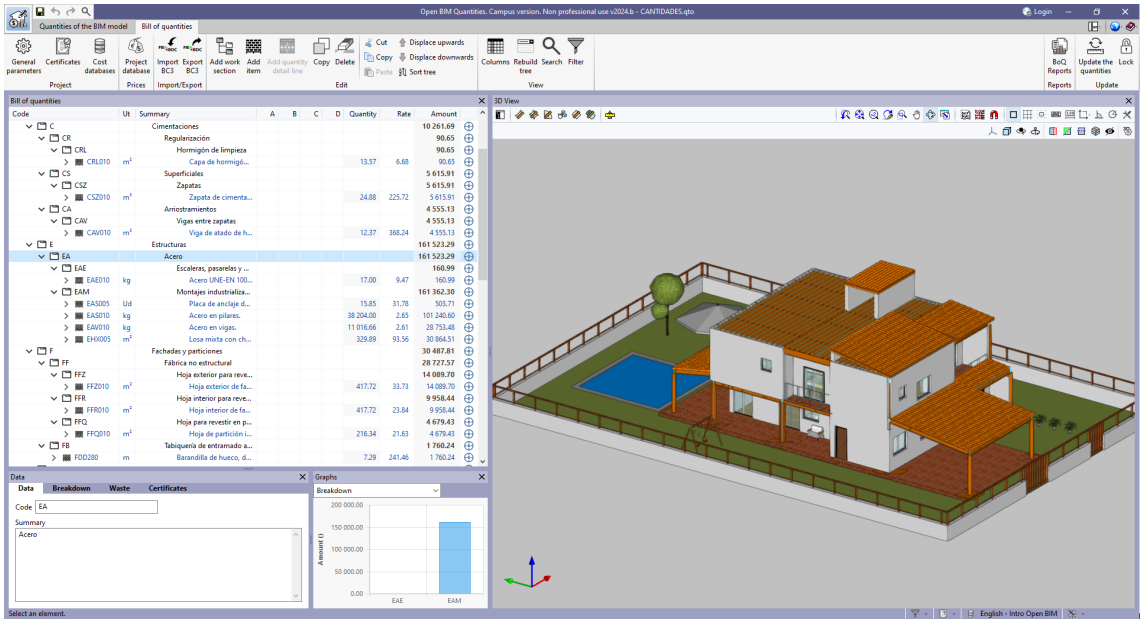

Figure 15. Architectural elements of the steel structure house in Cype Architecture

6.2.- LCA Analysis.

The SETAC (Society of Environmental Toxicology And Chemistry) defines Life Cycle Assessment as:

"An objective process for assessing the environmental burdens associated with a product, process or activity, identifying and quantifying the use of matter and energy, as well as emissions or discharges into the environment, to determine the impact of

that use of resources and those emissions or discharges, in order to evaluate and implement environmental improvement strategies. The study includes the complete cycle of the product, process or activity, taking into account the stages of: extraction and processing of raw materials, production, transport and distribution, use, reuse and maintenance, recycling and final disposal."

In accordance with the UNE-EN ISO 14040 standard, the development of a Life Cycle Assessment must include the following methodological stages:

- Stage 1: Definition of objectives and scope (Functional Unit)
- Stage 2: General Inventory Analysis
- Stage 3: Impact Assessment
- Stage 4: Interpretation of the results.

6.2.1. Objectives and scope of the LCA in the case study.

The main objective of the Life Cycle Analysis of this case study is to evaluate the environmental impacts of the construction of a single-family house considering several alternatives in the use of construction materials (concrete, bricks, structural steel and timber) during the following phases of its life cycle:

- Product: A1 - A3
    - Extraction of raw materials (A1)
    - Transport to factory (A2)
    - Manufacturing (A3)
- Construction process: A4 - A5
    - Transport of the product (A4)
    - Product Installation and Construction Process (A5)

So the scope of this LCA includes the construction of the single-family home but not the use of it.

6.2.2. General inventory Analysis.

The life cycle inventory analysis is the estimation of raw material and energy requirement, solid wastes, environmental emissions, water pollutants, and other emissions for the life of a process or product.

In the LCA of the single-family house developed in this project, this analysis can be consulted by unit of product, in the Environmental Product Declarations (EPD) of each material or product used in the construction of the house. Links to these

Environmental Product Declarations can be found in the "Materials" tab of the LCA Excel App developed in the project (https://bimlca.eu).

6.2.3. Impact Assessment.

The environmental impacts measured in this study are as follows:

Table 2: Environmental impacts considered

Enviromental Impacts	Units
Abiotic depletion potential for fossil resources (ADPF)	MJ
Abiotic depletion potential for non fossil resources (ADPE)	kg Sb-eq.
Acidification potential (AP)	kg SO2-eq.
Global warming potential (GWP)	kg CO2-eq.
Eutrophication potential (EP)	kg Phosphat-eq.
Photochemical Ozone Creation Potential (POCP)	kg Ethen-eq
Ozone Depletion Potential (ODP)	kq CFC 11-eq

Table 3: Use of resources considered

Energy consumption	Units
Total use of renewable primary energy resources (PERT)	MJ
Total use of non renewable primary energy resource (PENRT)	MJ

The list of impacts of each single-family house alternative studied is included in annexes 1, 2 and 3 of this document.

Below are the PERT, PENRT and GWP impacts of the three alternatives studied

6.2.3.1 Single-family house in concrete and bricks

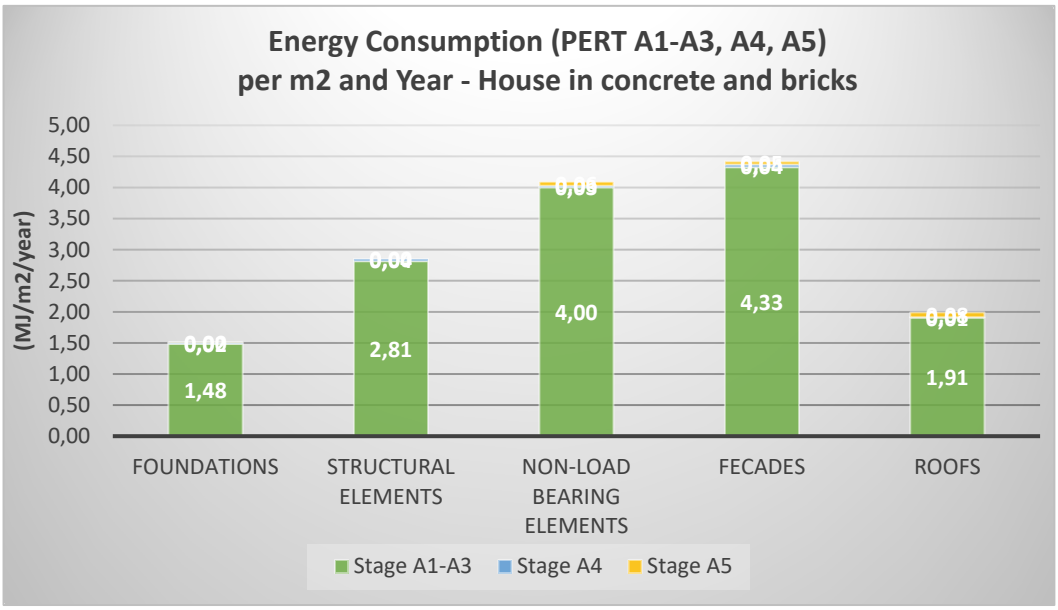

Figure 16. Total Renewable Primary Energy Consumption (PERT) per m2 and year of the house in concrete and bricks

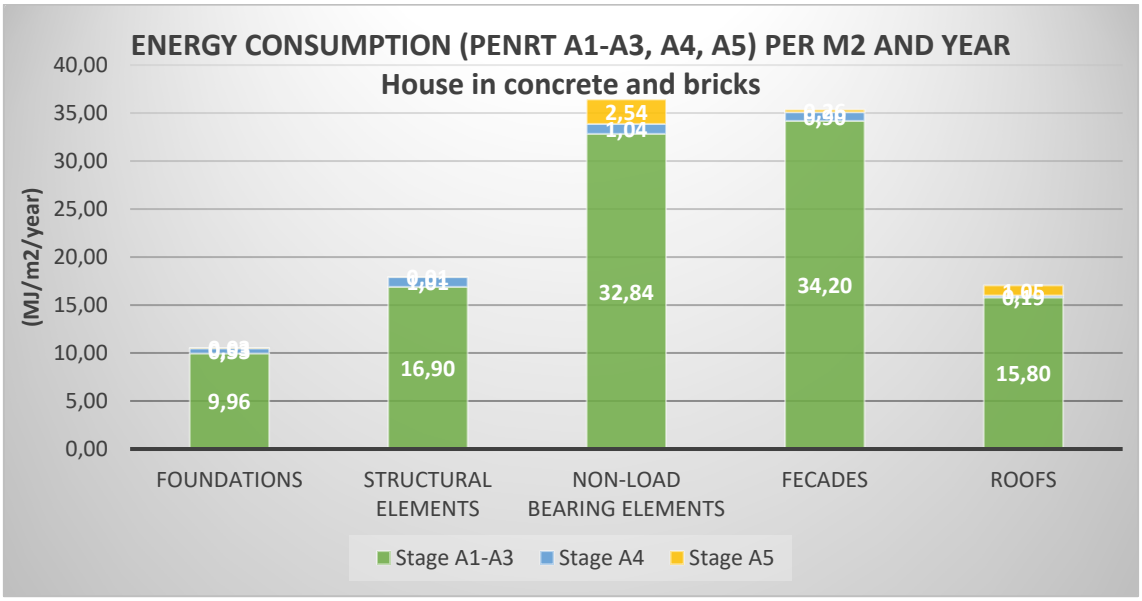

Figure 17. Total non-renewable Primary Energy Consumption (PENRT) per m2 and year of the house in concrete and bricks

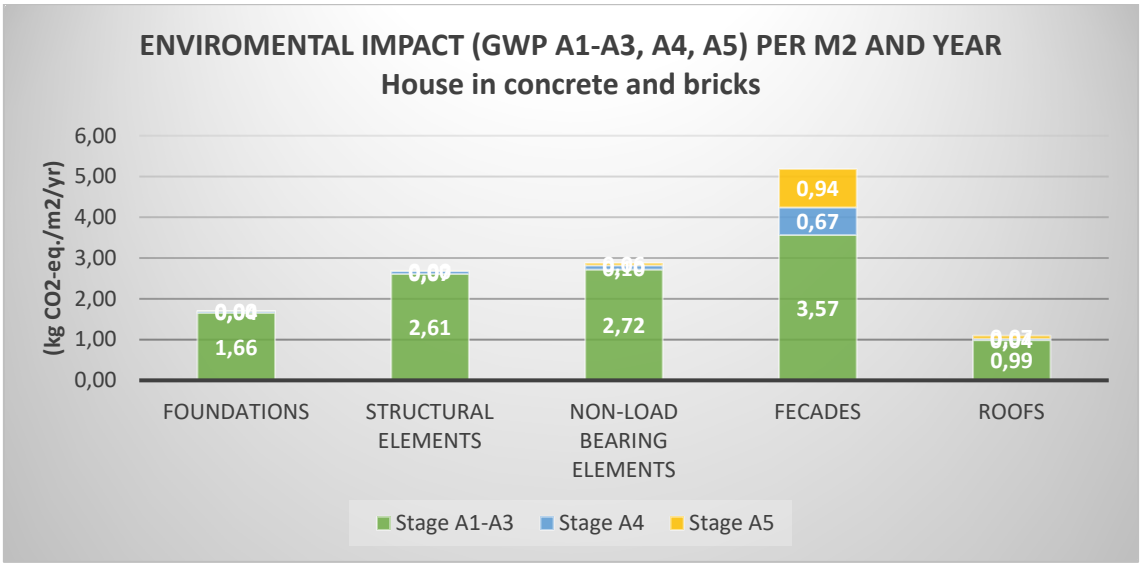

Figure 18. Global Warming Potential (GWP) per m2 and year of the house in concrete and bricks

6.2.3.2 Single-family house in steel and bricks

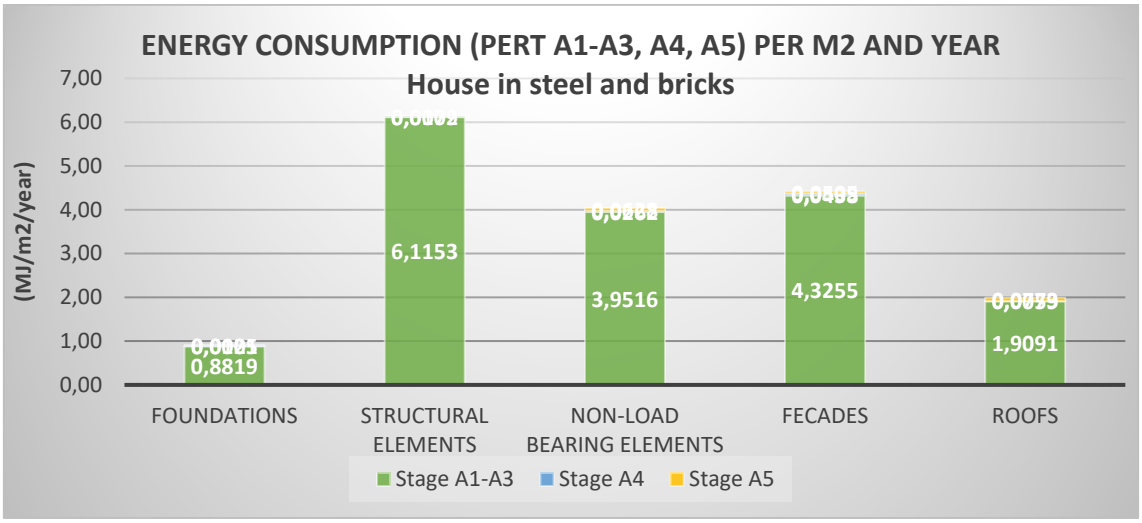

Figure 19. Total Renewable Primary Energy Consumption (PERT) per m2 and year of the house in steel and bricks

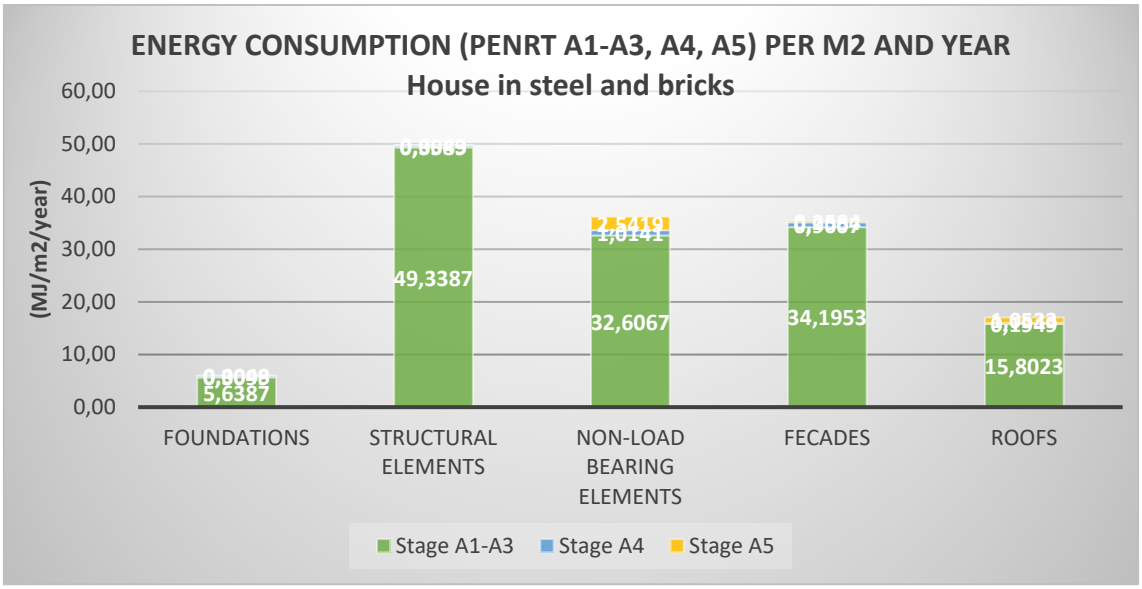

Figure 20. Total non-renewable Primary Energy Consumption (PENRT) per m2 and year of the house in steel and bricks

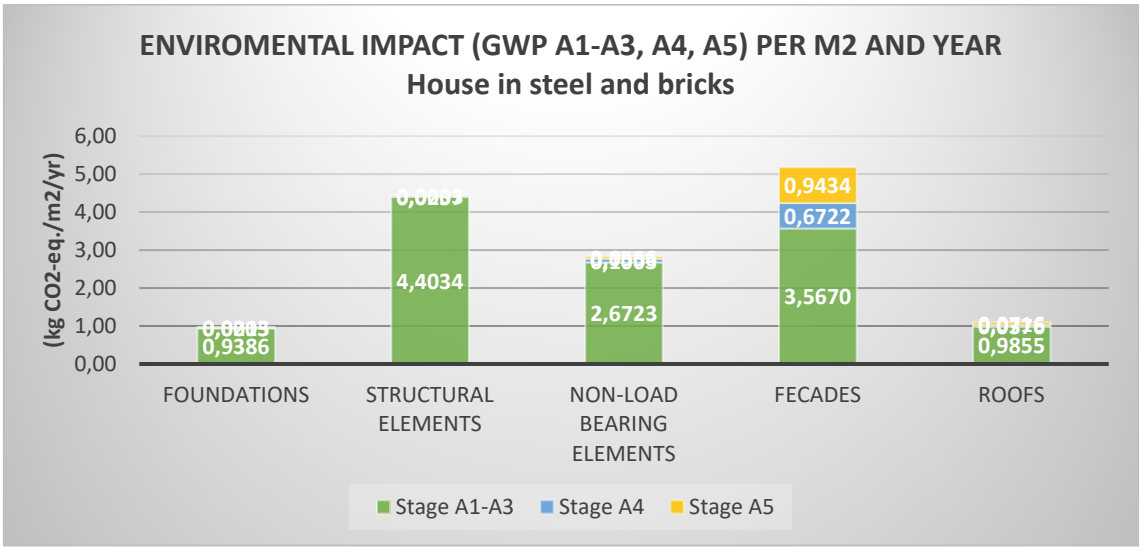

Figure 21. Global Warming Potential (GWP) per m2 and year of the house in steel and bricks

6.2.3.2 Single-family house in timber

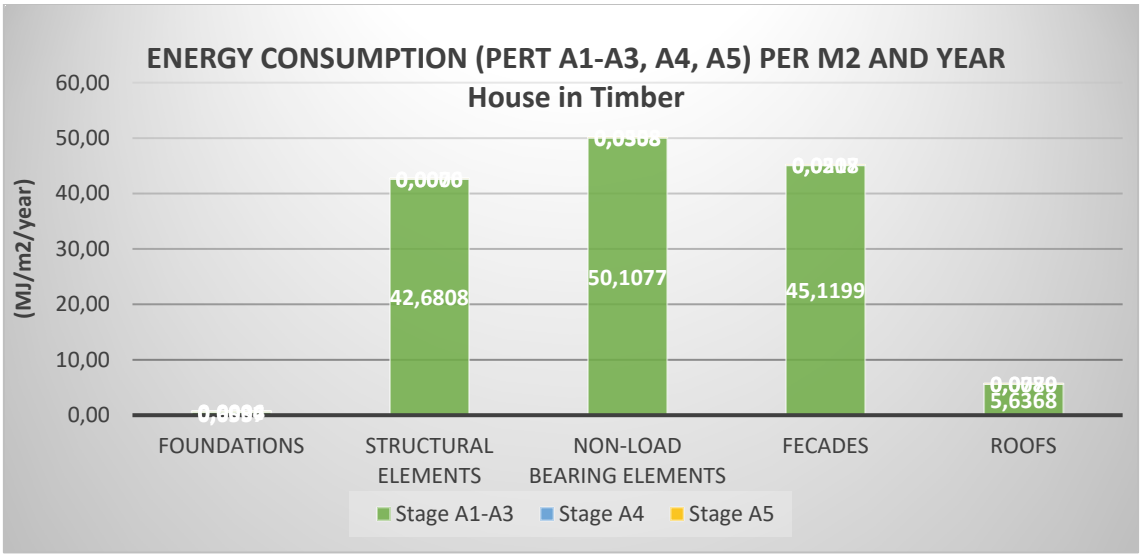

Figure 22. Total Renewable Primary Energy Consumption (PERT) per m2 and year of the house in timber.

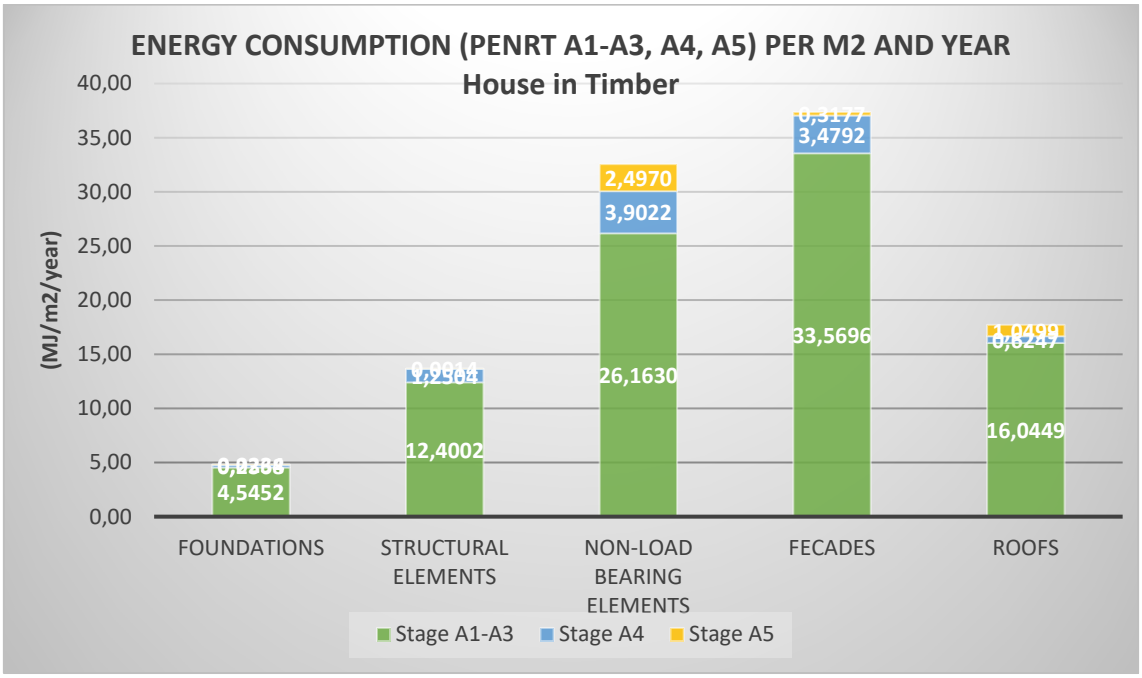

Figure 23. Total non-renewable Primary Primary Energy Consumption (PENRT) per m2 and year of the house in timber

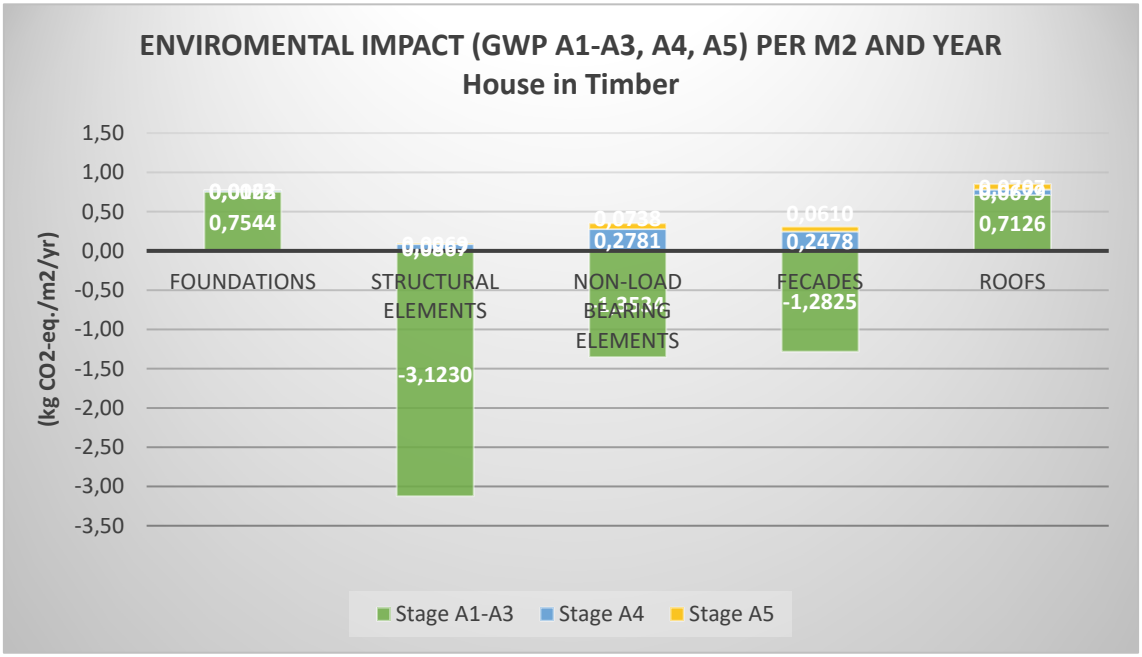

Figure 24. Global Warming Potential (GWP) per m2 and year of the house in timber

6.2.4. Interpretation of the results.

The interpretation of the results of the LCAs carried out is included in the next section of this document (Section 7), where a comparison is made among the results obtained in each alternative studied.

7 – Analysis of the different alternatives studied.

This section compares the results, in terms of costs, primary energies consumed and CO2 emissions or equivalent, of the three solutions studied for single-family housing (concrete and bricks; structural steel and bricks; and wood).

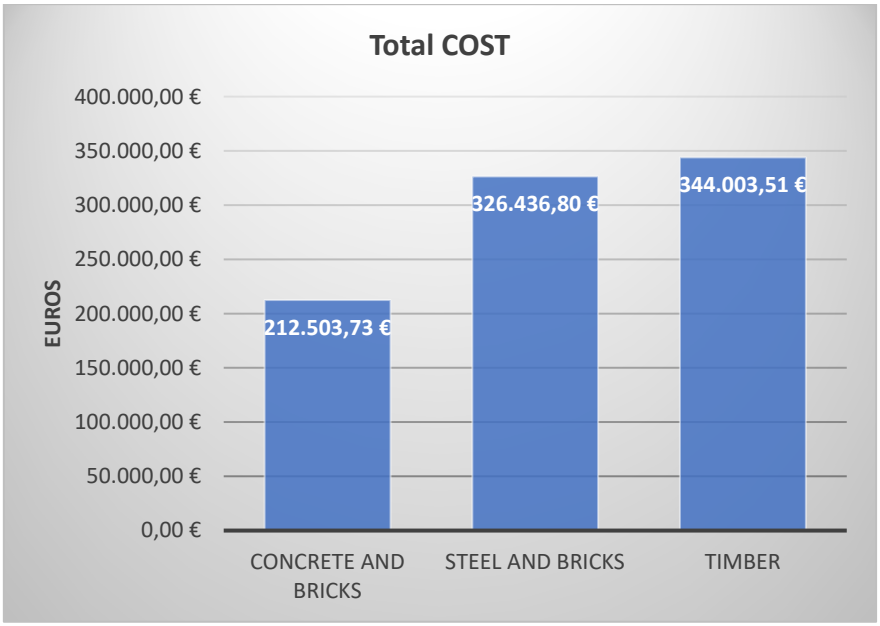

Figure 25. Total cost of the three studied alternatives

Fig. 25 shows the total construction cost of the three solutions. We can see that the most expensive solution is the house in timber. The second most expensive is the single-family house with a steel structure and brick walls. And the cheapest is the house with a reinforced concrete structure and brick walls.

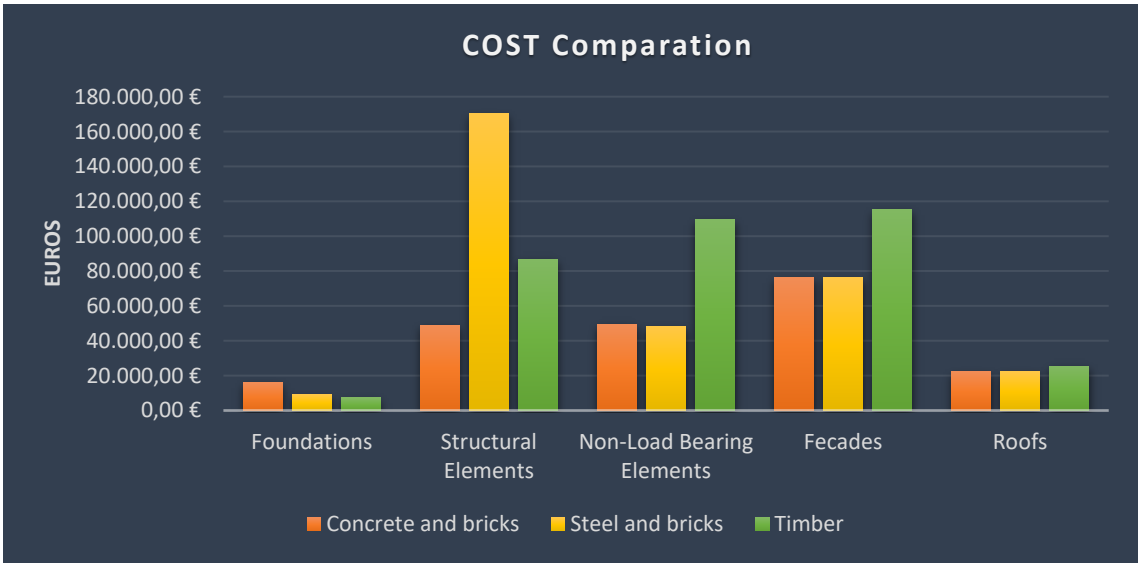

Figure 26. Cost comparation of parts of the building in the three studied alterlatives

Fig. 26 shows the cost of each chapter of the construction budget of the house: foundations, structural elements, non-load bearing elements, facades and roofs, for the three different solutions. In this figure 26 we can see that:

- The most expensive foundation is for the house with a reinforced concrete structure, as it weighs more and needs a larger foundation.
- The most expensive structure (beams, columns and slabs) corresponds to the steel structure, followed by the wooden structure. And finally, the cheapest structure for the house studied is the one with reinforced concrete.
- The most expensive interior walls and facades correspond to those built in wood.
- The cost of roofing is similar in all three solutions.

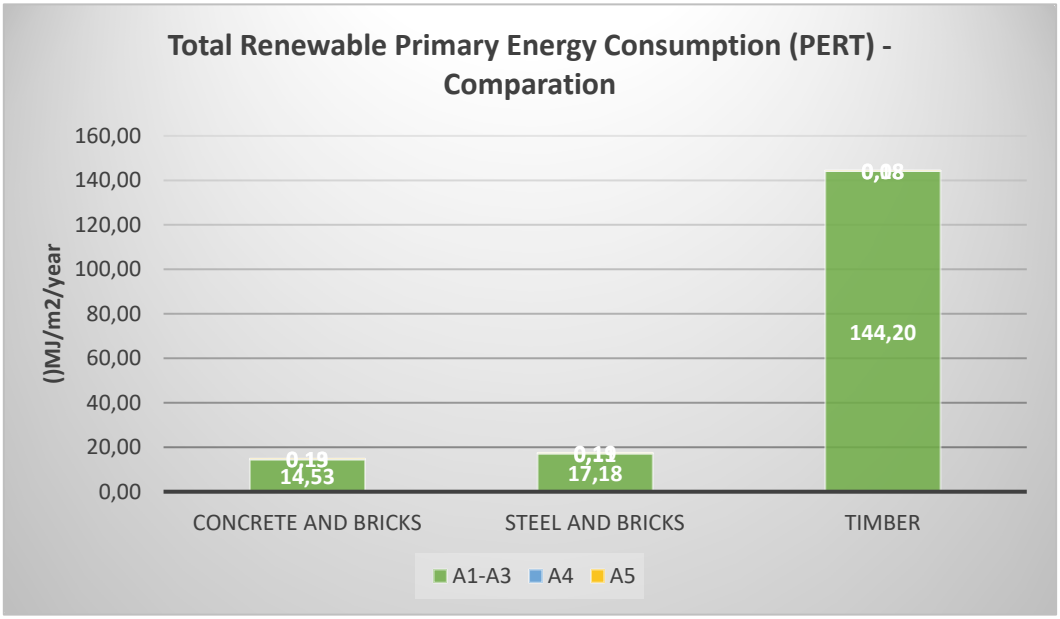

Figure 27. Total Renewable Primary Energy Consumption (PERT) - Comparation

Fig 27 and 28 shows the renewable and non-renewable primary energy consumed in the construction of the house for each solution studied (concrete, steel and wood) in MJ per square metre and year. The graph of Fig. 27 shows that the highest consumption of renewable energy occurs in the construction of the wooden house. The wooden house consumes a greater amount of energy because the process of manufacturing technical wood, such as cross-laminated timber (CLT) panels and glued laminated timber (Glulam) beams and pillars, consumes a large amount of energy per volume of material. The aim is to ensure that this energy comes from renewable sources to minimise the impact on the environment.

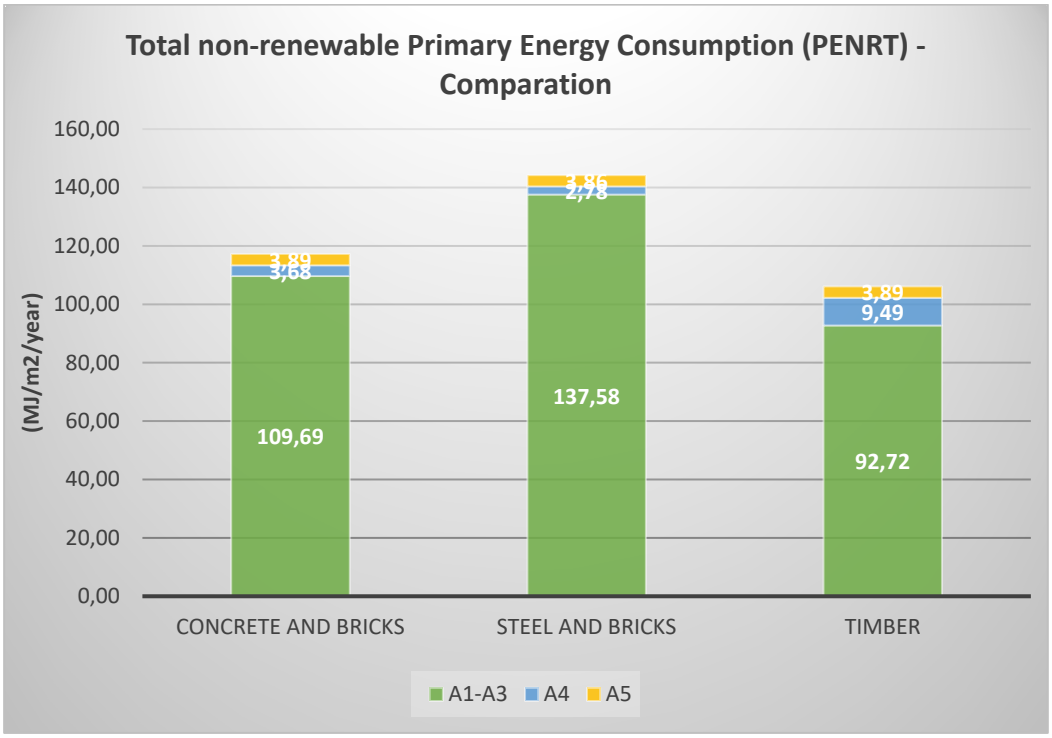

Figure 28. Total non-renewable Primary Energy Consumption (PERT) – Comparation.

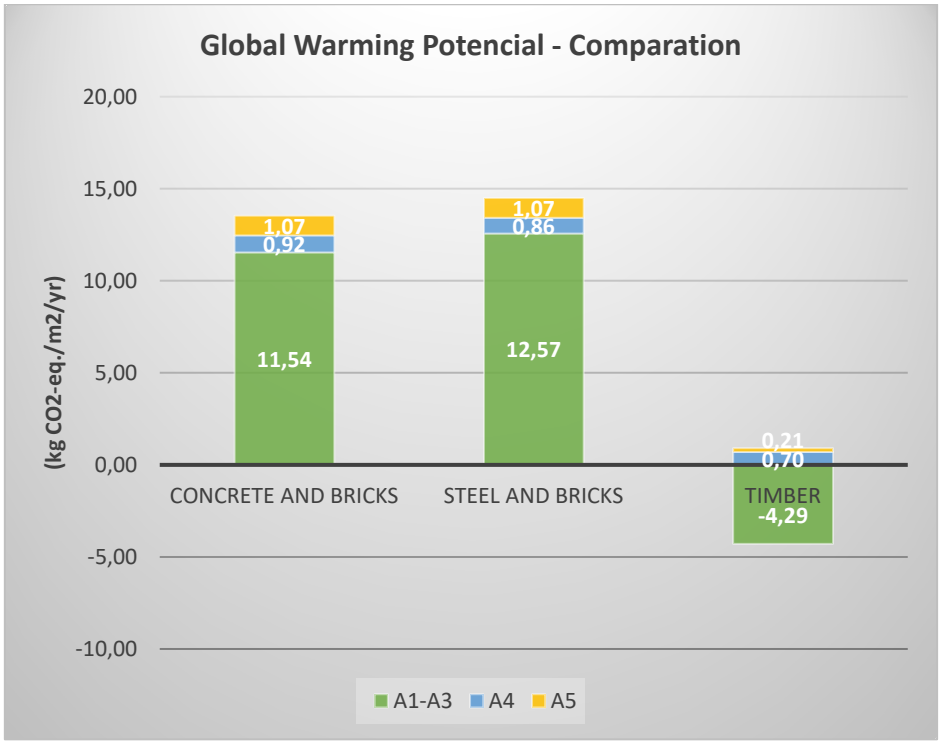

Figure 29. Global Warming Potencial Comparation

Fig. 29 shows the greenhouse gas emissions in Kg of CO2 eq. per square meter of construction and per year for the three alternatives studied. We can observe that the emissions produced in stages A1 to A5 of the house life cycle in the wood solution are negative. This means that the wood, while in the tree, absorbs more CO2 than it is

emitted by the extraction of raw materials, transport, manufacture and installation of the construction products in this wooden house solution. The CO2 emissions due to the steel-framed house are slightly higher than those produced in the construction of the reinforced concrete framed house.

8 – Conclusions and recommendations.

Conclusions:

The life cycle assessment is a useful tool for making decisions in design stages about the choice of more sustainable materials and solutions in building construction.

The BIM methodology allows you to build 3D models and obtain the quantities of materials to be used in the construction of buildings to subsequently perform an LCA, saving time in the analysis.

Of the three solutions studied for the construction of a single-family home, the one that uses timber in the structure and in the interior walls and façade is the slightly more expensive but environmentally more sustainable solution.

It has been proven that the single-family house solution in wood is the one that consumes the most primary energy. If the energy consumed during the manufacture of the technical wood elements is renewable energy, the environmental impact of this solution is considerably reduced.

Recommendations:

Optimisation in the design of buildings, either through parametric studies or through numerical optimisation, would make it possible to save material and therefore obtain more sustainable solutions, which produce lower environmental impacts.

The use of timber framing for the interior walls in the wooden house instead of CLT panels would save material and make the wood solution cheaper.

9 –References

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Annex 1. LCA with Excel app of a single-family house concrete and bricks

Erasmus+ Project 2022-1-NO01-KA220-HED-000087893

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BIM-LCA Construction Project

Inputs

1- Data of the building

Project Name:	**Single-family house in concrete and bricks**	
Building type	Residential	
Address	Street 1	
IndoorFloor area	257.52	m2
Analysed service life	50	year
City	Cartagena	
Country	Spain	

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable

2- Areas and volumes in elements of the building - User inputs

Footing volume (m3):	53.89
Volume of Foundation beams (m3):	9.53
Footing plant area (m2):	73.81
Foundation beam plant area (m2):	23.87
Volume of piles (m3):	0.00
Volumen of pile caps (m3):	0.00
Pile cap plant area (m2):	0.00
Foundation slab volume (m3):	0.00
Foundation slab plant area (m2):	0.00
Column volume (m3):	10.89
beam volume (m3):	19.68
Retaining wall volume (m3):	0.00
Area of slabs (including beams) (m2):	351.13
Partition area (m2):	221.66
Facade area (m2):	374.42
Exterior party wall (m2):	0.00
Stairs (m2):	10.80
Ramps (m2):	0.00
Steel volume in stiffening elements (m3):	0.00
Concrete volume in stiffening walls (m3):	0.00
Interior door surface (m2):	7.64
Main door surface (m2):	4.00
Exterior glazed door surface (m2):	4.00
Windows surface (m2):	21.54
Flat roof area (m2):	134.33
Inclinated roof area (horizontal projection) (m2):	86.22
roof inclination angle (deg):	20.00
parapets (m2):	26.40
Railing (m):	5.50

Note: IMPORTANT - If any of the previus element is missing in the project enter 0

Floor Areas (m2)	Indoor	outdoor	total
Ground floor:	116.52	80.37	196.89
Intermediate floors:	141		
roof type 1:		128.48	
roof tape 2:		5.85	

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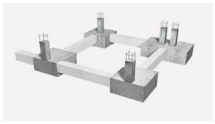
BIM-LCA Construction Project

Inputs

2- Choice the type of structural, construction systems & materials

a) Type of Foundation: 2 (enter 1, 2 or 3)


(1) Piles and pile caps


(2) Footings


(3) Foundation slab

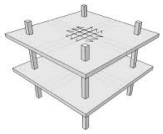
b) Material in Beams and Columns 1

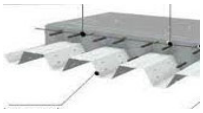

(1) Reinf. Concrete

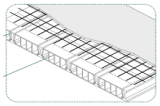

(2) Steel


(3) Timber

c) Type of structural slabs 1 (enter 1, 2, 3 or 4)


(1)-Mass concrete slabs


(2) Composite slab slabs


(3) Lightweight concrete slabs


(4) Timber slabs

c-1) If the perviuos answer was *(3) Lightweight concrete slabs* , pease chose:

Type of bocks: 1


(1) Concrete blocks


(2) Ceramic blocks

d) If it exists in the building, choose one of these stiffening systems:

Type of structure stiffening system: 0

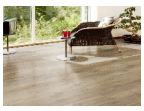
(0) Without stiffening system


(1) Concrete stiffening walls


(2) Steel stiffening elements

e) Type of flooring (non-structural) 1


(1) Ceramic flooring


(2) Wood floating floor


(3) Screed flooring

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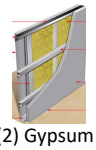
BIM-LCA Construction Project

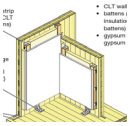
Inputs

f) Type of internal partitions 1

(1) Brick walls



(2) Gypsum cardboard walls



(3) Structural Timber wall

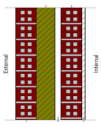
g) Type of stairs 1

(1) Concrete

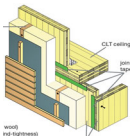
(2) Steel

(3) Timber

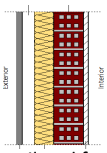
h) Type of facades 1



(1) Double bricks wall



(2) Timber



(3) Ventilated facade

h-1) If the perviuos answer was *(3) Ventilated facade* , pease chose:

Type of tiles for external cladding: 1

N-STON	PORCE	A-STON
(1) Natural semi-rijo limestone	(1) EXTRUDED PORCELAIN	(2) Artificial stone Aggregates+polyester resins

i) Type of windows 1

(1) PVC Double Glazed Window WIN_PVC

(2) Hardwood double glazed window WIN_WOOD

(3) Aluminium Window WIN_AL

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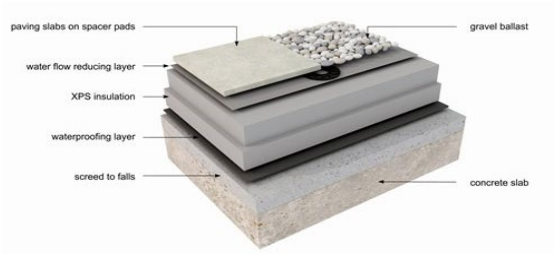
BIM-LCA Construction Project

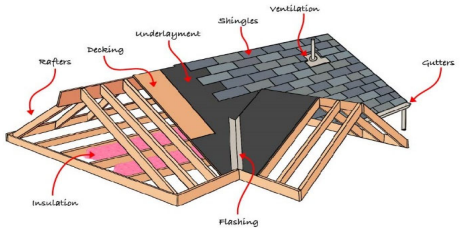
Inputs

j) Type of finishing coat in flat roof 1 (enter 1 or 2)



(1) Ceramic tiles (2) Gravel ballast

k) Type of inclinated roof 1



(1) with brick walls (2) With timber structure

l) Structure under inclinated roof

Eliminate the structure and insulation of inclinated roofs?: 2 (enter 1 or 2)

(1) Yes (2) No

m) Material in the insulation layers of the facades and roofs 1 (enter 1,2,...or 6)

1	MWOOL	Mineral wool insulation
2	POLYU1	Insulation board with a core of rigid polyurethane
3	POLYU2	Polyurethane thermal insulation spray foam
4	EPS	Expanded Polystyrene for insulation
5	CELL	Cellulose Fibre Insulation
6	CORK	Cork-based thermal insulation panels

BIM-LCA

BIM-LCA Construction Project

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Building Material Quantities

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable
30	Parameter loaded by default by app and editable by user
846.26	**kg** Quantity calculated by the program based on the user inputs and parameters of each material. Not user-editable
MWOOL	A type of material or construction element from which one material can be chosen from several alternatives. See note 3, 4 and 5.

Project name: Single-family house in concrete and bricks

							Auxiliary quantiites								
						nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	Quantities (Q)	Unit	Formula
1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0			0.00	vol (m3)			0.00	m3	Q=nr*Par1
			1.A.2	Rebar	REB	0			30	Kg Rebar/m3 Con			0.00	kg	Q=nr*Par1*Qcon
	1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0			0.00	vol (m3)			0.00	m3	Q=nr*Par1
			1.B.1.2	Rebar	REB	0			80	Kg Rebar/m3 Con			0.00	kg	Q=Par1*Qcon
			1.B.1.3	Blinding concrete	CON0	0	0.10		0.00	pile cap area (m2)			0.00	m3	Q=nr*e*Par1
		1.B.2-Footings	1.B.2.1	Concrete	CON1	1			53.89	footing vol (m3)			53.89	m3	Q=nr*Par1
			1.B.2.2	Rebar	REB	1			63.3	Kg Rebar/m3 Con			3411.24	kg	Q=Par1*Qcon
			1.B.2.3	Blinding concrete	CON0	1	0.10		73.81	Footing area (m2)			7.38	m3	Q=nr*e*Par1
		1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	1			9.53	beam vol (m3)			9.53	m3	Q=nr*Par1
			1.B.3.2	Rebar	REB	1			88.8	Kg Rebar/m3 Con			846.26	kg	Q=nr*Par1*Qcon
			1.B.3.3	Blinding concrete	CON0	1	0.10		23.87	Beam area (m2)			2.39	m3	Q=nr*e*Par1
		1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0			0.00	slab vol (m3)			0.00	m3	Q=nr*Par1
			1.B.4.2	Rebar	REB	0			75	Kg Rebar/m3 Con			0.00	kg	
			1.B.4.3	Blinding concrete	CON0	0	0.10		0.00	Slab area (m2)			0.00	m3	Q=e*Par1
	1.C - Retaining walls		1.C.1	Concrete	CON3	1			0.00	wall vol (m3)			0.00	m3	Q=nr*Par1
			1.C.2	Rebar	REB	1			90	Kg Rebar/m3 Con			0.00	kg	Q=Par1*Qcon
2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams (Timber, steel or concrete)	2.A.1.1	Gulam Timber	GLT	0			19.68	beam volume (m3)			0.00	m3	Q=nr*Par1
			2.A.1.2	Steel in timber connec. (galvanized)	ST-G	0			8	kg Steel/m3 timber			0.00	kg	Q=nr*Par1*Q CLT
			2.A.1.3	Structural steel	ST	0		7850	19.68	beam volume (m3)	1.1	due to connections	0.00	kg	Q=nr*Par1*d*Par2
			2.A.1.4	Concrete	CON3	1			19.68	beam volume (m3)			19.68	m3	Q=nr*Par1
			2.A.1.5	Rebar	REB	1			137.6	Kg Rebar/m3 Con			2707.97	kg	Q=Par1*Q Con
		2.A.2-Columns (Timber, steel or concrete	2.A.2.1	Gulam Timber	GLT	0			10.89	column vol (m3)			0.00	m3	Q=nr*Par1
			2.A.2.2	Steel in timber connect. (galvanized)	ST-G	0			8	kg Steel/m3 timber			0.00	kg	Q=nr*Par1*Q CLT
			2.A.2.3	Structural steel	ST	0		7850	10.89	column vol (m3)	1.1	due to connections	0.00	kg	Q=nr*Par1*d*Par2
			2.A.2.4	Concrete	CON3	1			10.89	column vol (m3)			10.89	m3	Q=nr*Par1
			2.A.2.5	Rebar	REB	1			202.3	Kg Rebar/m3 Con			2203.05	kg	
		2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	1	0.25		272.41	Slab area (m2)			68.10	m3	Q=nr*e*Par1
			2.A.3.2	Rebar	REB	1			90	Kg Rebar/m3 Con			6129.23	kg	
		2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	0	0.16		351.13	Slab area (m2)			0.00	m3	Q=nr*e*Par1
			2.A.4.2	Rebar	REB	0			25	Kg Rebar/m3 Con			0.00	kg	Q=Par1*Q Con
			2.A.4.3	Galvanized steel plates	ST-G	0	0.001	7850	351.13	Slab area (m2)	1.200	m2 plates/m2 slab	0.00	kg	Q=nr*e*Par1*Par2*d
		2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0	0.25		272.41	Slab area (m2)	0.820	m3 block/m2 slab	0.00	m3	Q=nr*e*Par1*Par2
			2.A.5.2	Ceramic blocks	CERB	0	0.25	320	272.41	Slab area (m2)	0.820	m3 block/m2 slab	0.00	kg	Q=nr*e*Par1*Par2*d
			2.A.5.3	Precast concrete beams	CONBEAM	0		2500	272.41	Slab area (m2)	0.038	m2 beam cross sec	0.00	kg	Q=nr*(Par1/0.8)*Par2*d
			2.A.5.4	Concrete (cast in place)	CON2	0	0.05		272.41	Slab area (m2)			0.00	m3	Q=nr*Par1*e
			2.A.5.5	Rebar	REB	0			25	Kg Rebar/m3 Con			0.00	kg	Q=Par1*Q Con
		2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	0	0.16		351.13	foor area (m2)			0.00	m3	Q=nr*Par1*e
			2.A.6.2	Steel in timber connect. (galvanized)	ST-G	0			4	kg Steel/m3 CLT			0.00	kg	Q=nr*Par1*Q CLT
	2.B-Concrete stiffening walls/steel in stiffening elements		2.B.1	Structural steel	ST	0		7850	0.00	steel volume (m3)	1.1	due to connections	0.00	kg	Q=nr*Par1*d*Par2
			2.B.2	Concrete	CON3	0			0.00	concrete vol (m3)			0.00	m3	Q=nr*Par1
			2.B.3	rebar	REB	0			140	Kg Rebar/m3 Con			0.00	kg	Q=Par1*Qcon
	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	1	0.15		196.89	Slab area (m2)			29.53	m3	Q=nr*Par1*e
			3.A.1.2	rebar	REB	1			30	Kg Rebar/m3 Con			886.01	kg	Q=Par1*Qcon
			3.A.1.3	Graded aggregate	AGG	1	0.25	1800	196.89	Slab area (m2)			88600.50	kg	Q=nr*Par1*e*d
		3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	1			257.52	Floor area (m2)			257.52	m2	Q=nr*Par1
			3.A.2.2	Tile bond coat (adhesive)	ADH	1			257.52	Floor area (m2)	6.00	kg/m2	1545.12	kg	Q=nr*Par1*Par2
			3.A.2.3	Mortar bed	MOR	1	0.03	1600	257.52	Floor area (m2)			12360.96	kg	Q=nr*e*Par1*d
			3.A.2.4	Cleavage membrane	POLY	1	0.005		257.52	Floor area (m2)			1.29	m3	Q=nr*e*Par1
		3.A.3-Flooring Type II: Wood floating floor or	3.A.3.1	Laminated wood flooring	WFL	0			257.52	Floor area (m2)			0.00	m2	Q=nr*Par1
			3.A.3.2	Chipboard flooring (plywood)	PLYW	0	0.03		257.52	Floor area (m2)			0.00	m3	Q=nr*Par1*e
			3.A.3.3	Insulation layer	MWOOL	0	0.04		257.52	Floor area (m2)			0.00	m3	Q=nr*Par1*e

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Project name: Single-family house in concrete and bricks

						Auxiliary quantiites									
						nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula
3 - Non-load bearing elements	3.B-Vertical elements		3.A.3.4	Timber battens	GLT	0			257.52	Floor area (m2)	0.045	m3 timb/m2 floor	0.00	**m3**	Q=nr*Par1*Par2
		3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0	0.05		257.52	Floor area (m2)			0.00	**m4**	Q=nr*Par1*e
			3.A.4.2	Sound insulation layer	POLY	0	0.005		257.52	Floor area (m2)			0.00	**m3**	Q=nr*e*Par1
		3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	1	0.110	805	221.66	Wall area (m2)			19627.99	**kg**	Q=nr*e*Par1*d
			3.B.1.2	Finishing coat (plastering mortars)	PLASM	1	0.02	1600	221.66	Wall area (m2)			7093.12	**kg**	Q=nr*e*Par1*d
		3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0			221.66	Wall area (m2)			0.00	**m2**	Q=nr*Par1
			3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0			221.66	Wall area (m2)	3.040	kg ST /m2 wall	0.00	**kg**	Q=nr*Par1*Par2
			3.B.2.3	Insulation layer	MWOOL	0	0.05		221.66	Wall area (m2)			0.00	**m3**	Q=nr*Par1
		3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	0	0.100		221.66	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.3.2	Steel in timber connect. (galvanized)	ST-G	0			4	kg Steel/m3 CLT			0.00	**kg**	Q=nr*Par1*Q CLT
			3.B.3.3	Insulation layer	MWOOL	0	0.050		221.66	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.3.4	Timber battens	GLT	0			221.66	Wall area (m2)	0.045	m3 timb/m2 wall	0.00	**m3**	Q=nr*Par1*Par2
			3.B.3.5	Gypsum plasterboard	GYP_P	0			221.66	Wall area (m2)	2	number or boards	0.00	**m2**	Q=nr*Par1*Par2
		3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	1	0.20		0.00	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.4.2	Insulation layer	MWOOL	1	0.05		0.00	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.4.3	Finishing coat (plastering mortars)	PLASM	1	0.04	1600	0.00	Wall area (m2)			0.00	**kg**	Q=nr*e*Par1*d
		3.B.5-Parapets	3.B.5.1	Brick wall	CERB	1	0.110	805	26.40	Wall area (m2)			2337.72	**kg**	Q=nr*e*Par1*d
			3.B.5.2	Finishing coat (plastering mortars)	PLASM	1	0.02	1600	26.40	Wall area (m2)			844.80	**kg**	Q=nr*e*Par1*d
		3.B.6-Railings	3.B.6	Railings	ST-SL	1			5.50	long (m)	9.50	kg ST/m railing	52.25	**kg**	Q=nr*Par1*Par2
		3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	1			7.64	door (m2)			7.64	**m2**	Q=nr*Par1
	3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	1			10.80	stairs area (m2)	1.27	m2 title/m2 stairs	13.72	**m2**	Q=nr*Par1*Par2
			3.C.1.2	Tile bond coat (adhesive)	ADH	1			6.00	kg/m2 title			82.30	**kg**	Q=nr*Par1*m2 title
			3.C.1.3	Mostar	MOR	1		1600	10.80	stairs area (m2)	0.0715	m3 mor/m2 stairs	1235.52	**kg**	Q=nr*Par1*Par2*d
			3.C.1.4	Concrete	CON3	1	0.20		10.80	stairs area (m2)			2.16	**m3**	Q=nr*Par1*e
			3.C.1.5	Rebar	REB	1			137.6	Kg Rebar/m3 Con			297.22	**kg**	Q=nr*Par1*Qcon
			3.C.1.6	Structural steel	ST	0			10.80	stairs area (m2)	21.33	kg ST/m2 Stairs	0.00	**kg**	Q=nr*Par1*Par2
			3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	0	0.160		10.80	stairs area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0			4.00	kg Steel/m3 CLT			0.00	**kg**	Q=nr*Par1*Q CLT
		3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	1			0.00	ramp area (m2)			0.00	**m2**	Q=nr*Par1
			3.C.2.2	Tile bond coat (adhesive)	ADH	1			0.00	ramp area (m2)	6.00	kg/m2 title	0.00	**kg**	Q=nr*Par1*Par2
			3.C.2.3	Mostar	MOR	1	0.03	1600	0.00	ramp area (m2)			0.00	**kg**	Q=nr*e*Par1*d
			3.C.2.4	Concrete	CON3	1	0.10		0.00	ramp area (m2)			0.00	**m3**	Q=nr*e*Par1
			3.C.2.5	Rebar	REB	1			30	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	1	0.03	1600	374.42	Wall area (m2)			17972.16	**kg**	Q=nr*e*Par1*d
			4.A.1.2	Brick walls	CERB	1	0.22	805	374.42	Wall area (m2)			66309.78	**kg**	Q=nr*e*Par1*d
			4.A.1.3	Insulation layer	MWOOL	1	0.07	152	374.42	Wall area (m2)			26.21	**m3**	Q=nr*Par1*e
			4.A.1.4	Interior finish	GYP_P	1			374.42	Wall area (m2)			374.42	**m2**	Q=nr*Par1
		4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	0			374.42	Wall area (m2)			0.00	**m2**	Q=nr*Par1
			4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	0	0.100		374.42	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.3.2	Steel in timber connect (galvanized)	ST-G	0			4	kg Steel/m3 CLT			0.00	**kg**	Q=nr*Par1*Q CLT
			4.A.2.3	Insulation layer	MWOOL	0	0.05		374.42	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			4.A.2.4	Timber battens	GLT	0			374.42	Wall area (m2)	0.045	m3 timb/m2 wall	0.00	**m3**	Q=nr*Par1*Par2
			4.A.2.5	External wooden cladding	WCLA	0			374.42	Wall area (m2)			0.00	**m2**	Q=nr*Par1
		4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0			374.42	Wall area (m2)			0.00	**m2**	Q=nr*Par1
			4.A.3.2	Brick wall	CERB	0	0.12	1000	374.42	Wall area (m2)			0.00	**kg**	Q=nr*e*Par1*d
			4.A.3.3	Insulation layer	MWOOL	0	0.05		374.42	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			4.A.3.4	Tiles for external cladding	N-STON	0	0.03	2750	374.42	Wall area (m2)			0.00	**kg**	Q=nr*Par1*e*d
	4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_PVC	1			21.54	Surface (m2)			21.54	**m2**	Q=nr*Par1
		4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	1			4.00	Surface (m2)			4.00	**m3**	Q=nr*Par2
			4.B.2.2	Exterior front doors	DOOR_W	1			4.00	Surface (m2)			4.00	**m3**	Q=nr*Par3
		5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	1		2300	134.33	roof area (m2)			134.33	**m2**	Q=nr*Par1

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Project name: Single-family house in concrete and bricks

						Auxiliary quantiites								
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula
5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.2	Gravel ballast	GRAV	0	0.15	1800	134.33	roof area (m2)			0.00	**kg**	Q=nr*Par1*e*d
		5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	1			134.33	roof area (m2)			134.33	**m2**	Q=nr*Par1
		5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	1	0.07		134.33	Wall area (m2)			9.40	**m3**	Q=nr*Par1*e
		5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	1	0.03	1600	134.33	Wall area (m2)			6447.84	**kg**	Q=nr*e*Par1*d
	5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	1			86.22	roof tiles area (m2)	40	kg/m2	3670.14	**kg**	Q=nr*Par1*Par2/cos(Par3)
		5.B.2-Mostar	5.B.2	Cement mostar	MOR	1	0.02	1600	86.22	roof tiles area (m2)			2936.11	**kg**	Q=nr*e*Par1*d/cos(Par3)
		5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	1			86.22	roof tiles area (m2)			91.75	**m2**	Q=nr*Par1/cos(Par3)
		5.B.4-Decking	5.B.4	Ceramic deck or	CERB	1	0.03	1030	86.22	roof tiles area (m2)			2835.18	**kg**	Q=nr*e*Par1*d/cos(Par3)
			5.B.5	wooden deck (plywood)	PLYW	0	0.03		86.22	roof tiles area (m2)			0.00	**m3**	Q=nr*Par1*e
		5.B.5-Structure	5.B.6	Brick walls or	CERB	1	0.045	483	86.22	roof tiles area (m2)	0.80	wall separation (m)	1979.19	**kg**	Q=nr*e*(Par1^0.5/Par2)*(tg(Par
			5.B.7	Gulam timber beams	GLT	0	0.05		86.22	roof tiles area (m2)	0.60	wall separation (m)	0.00	**m3**	Q=nr*e*0.05*(((Par1^0.5)/cos(P
		5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	1	0.05		86.22	roof tiles area (m2)			4.31	**m3**	Q=nr*Par1*e

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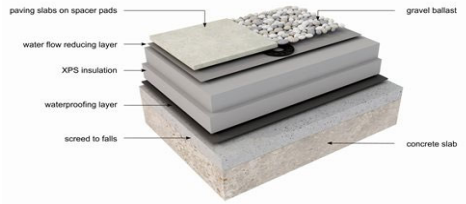
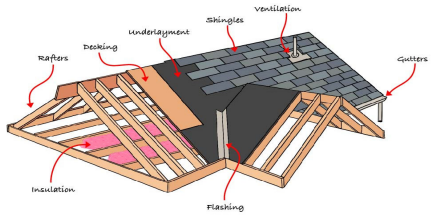
					Auxiliary quantiites										
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements	Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula

5.A - Flat roof



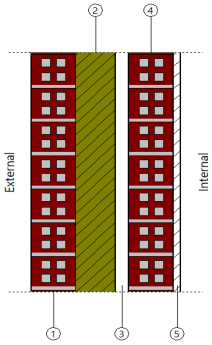
5.B - Tiled roof with timber structure



5.B - Tiled roof

Tiled roof with brick walls

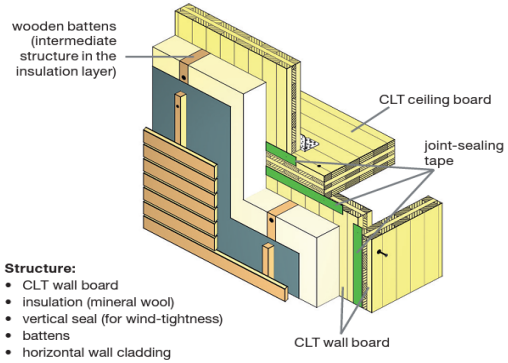
4.A.1 - Facade Type I: Facade with double brick wall



Layers
1 - M01 - 100 mm brick: 10.16 cm
2 - I04 - 89 mm batt insulation: 8.94 cm
3 - F04 - Wall air space resistance: 3.00 cm
4 - M01 - 100 mm brick: 10.16 cm
5 - G01 - 16 mm gyp board: 1.59 cm
Total thickness: 33.85 cm
Thermal description
Heat transfer coefficient (U): 0.39 W/(m²·K)
Thermal capacity: 51975.29 J/m²·K

4.A.2 - Facade Type II: with Timber walls

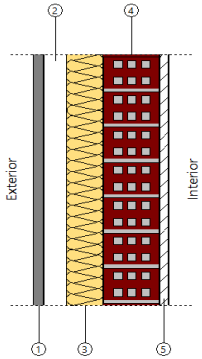
External wall
Insulation with mineral wool



Structure:

- CLT wall board
- insulation (mineral wool)
- vertical seal (for wind-tightness)
- battens
- horizontal wall cladding

4.A.3 - Facade Type III: Ventilated facade



Capas
1 - Caliza muy dura [2200 < d < 2590]: 2.00 cm
2 - Cámara de aire: 5.00 cm
3 - URSA TERRA Vento Plus P8792 80mm: 8.00 cm
4 - 1/2 pie LP métrico o catalán 40 mm< G < 60 mm: 12.00 cm
5 - Enlucido de yeso 1000 < d < 1300: 2.00 cm
Espesor total: 29.00 cm
Caracterización térmica
Transmitancia térmica (U): 0.33 W/(m²·K)
Capacidad térmica: 61992.71 J/m²·K

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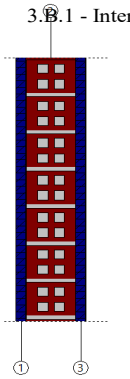
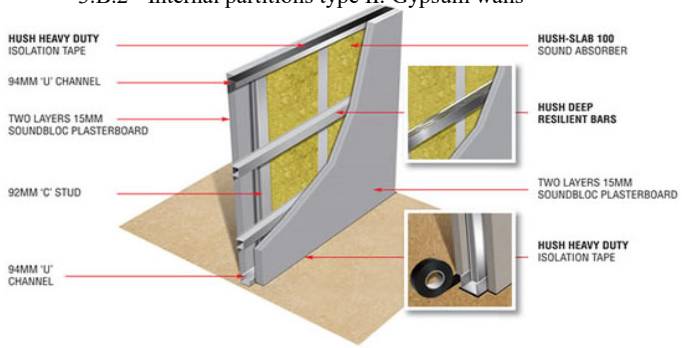
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements	Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula

3.B.1 - Internal partitions type I: brick walls



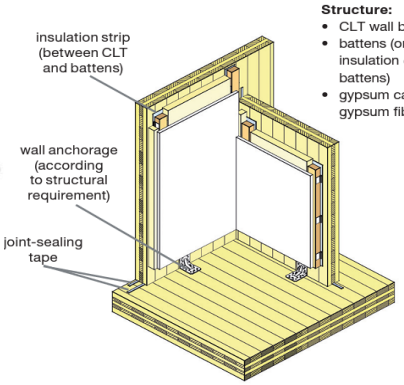
Layers
1 - Cement, sand: 2.00 cm
2 - M01 - 100 mm brick: 10.16 cm
3 - Cement, sand: 2.00 cm
Total thickness: 14.16 cm
Thermal description
Heat transfer coefficient (U): 2.42 W/(m²·K)
Thermal capacity: 70113.91 J/m²·K

3.B.2 - Internal partitions type II: Gypsum walls



3.B.3 - Internal partitions type III: Timber walls

Internal wall
Facing panel (spring clips)



Structure:
- CLT wall board
- battens (on spring clips), insulation (between battens)
- gypsum cardboard or gypsum fibreboard

3.A.2 - Flooring Type I: Ceramic flooring

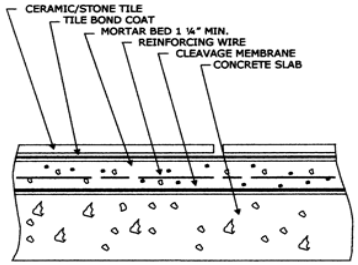
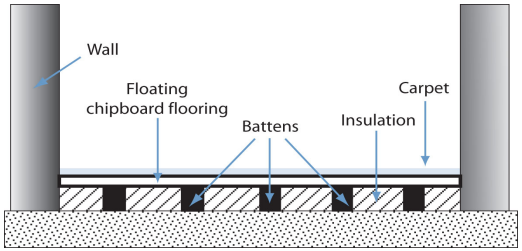
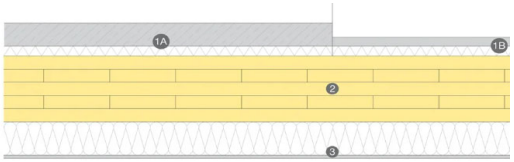


FIGURE F

3.A.3 - Flooring Type II: Wooden floating floor



3.A.4 - Flooring Type III Screed flooring



1A. Wet screed (50-70 mm) with impact sound insulation (20-30 mm).
1B. Dry screed (25 mm) with impact sound insulation (20-30 mm).
2. CLT floor 220 mm (140 mm or thicker).
3. Mineral wool and suspended ceiling (~70 mm) with single layer gypsum board ceiling.

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BIM-LCA Construction Project

Description of Materials and Impact Data

Project name: Single-family house in concrete and bricks

			1		2	3	4	5	6
nr.	Building part	Type of Material	Mat Code	Material Name	Description	Quant. Studied in EPD	Unit	Cost €
1	Under foundation	Blinding concrete	CON0	Concrete C16/20	C16/20 ECOPact Prime concrete produced in the plant of Greenwich of Aggregate Industries for use as ready-mixed concrete of normal building construction and civil engineering.	1	m3	87.54
2	Structure	Concrete	CON1	Ready mixed concrete (C30/37, C35/45 SCC) - C30/37 (Foundation)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	118.28
3	Structure	Concrete	CON2	Ready mixed concrete (C30/37, C35/45 SCC) - C35/45 SCC (Floor)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	244.28
4	Structure	Concrete	CON3	Ready mixed concrete (C30/37, C35/45 SCC) - C30/37 (Inner wall, Column and Beams)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	408
5	Structure	Rebar	REB	STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT	STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT are used to reinforce concrete in building constructions	1000	kg	1800
6	Structure	Structural steel	ST	Hot rolled steel profiles	The hot rolled steel profiles are made of steel bloom produced in electric arc furnace (EAF) process using 100% of iron scrap. The profiles constitute intermediate products commonly used for construction of power poles, roads, steel structures, supporting structures for buildings, load-bearing structures of buildings such industrial halls and warehouses as well as in railway, mining and shipbuilding industry. A specific product technical data is available at manufacturer website: www.wostsa.pl.	1000	kg	2690
7	Structure / Pattitions /roof stucture	Gulam Timber / Timber battens	GLT	Glued laminated timber	This EPD is based on a declared unit of 1 m³ of glued laminated timber (moisture of 10% at a raw density of 464 kg/m³). The results refer to a representative average of Rubner glued laminated timber including standard beams as well as sophisticated 3D-beam components. The LCA covers 100% of the Rubner group's production referring to its sites located at Rohrbach (Austria), Ober-Grafendorf (Austria), Brixen (Italy) and Calitri (Italy).	1	m3	1134
8	Composite steel-concrete slabs	Galvanized steel plates	ST-G	Galvanized Structural Steel	The declaration covers galvanized structural steel produced at the production site in Brande, Denmark. The declaration covers all life cycle modules from A1-A5, C1-C4 and D and is based on product-specific data provided by Give Steel A/S and background data from GaBi professional 2020 and Ecoinvent v3.6.	1000	kg	2500
9	Walls and Lightweight concrete slabs	Concrete o ceramic blocks	CONB	Concrete blocks	Autoclaved aerated concrete blocks with a dry density of 375 kg/m3 , also called Planstein PP 2/040	1	m3	261.76
10	Walls / Lightweight concrete slabs / Inclinated roof	Ceramic blocks / brick wall /ceramic deck	CERB	Red bricks or ceramic blocks	Bricks such as "RT Ultima 150" and "RT 550 Unika" are used to build walls, pillars and partitions.	1000	kg	420
11	Lightweight concrete slabs	Precast concrete beams	CONBEAM	Precast concrete elements of structures	Precast concrete structures: filigree slabs, shell/double walls, one/three layer walls, balconies, stairs, columns, beams and other precast concrete products	1	kg	0.3
12	Walls, slabs	Cross Laminated Timber (CLT) panels	CLT	Cross Laminated Timber - CLT	Cross Laminated Timber - CLT -Gross Density: 424.0 kg/m^3	1	m3	1355.7
13	Under the Ground slab	Graded aggregate	AGG	Aggregates	Aggregates from Uddevalla quarry - Glimmingen. Product variation: Sub base 0/150, Macadam 100/250, Macadam 150/300	1000	kg	50
14	Roof	Roof tiles	RTIL	Roof tiles (produced using natural gas) - Red tile	The product is produced using certified green electricity and natural gas. The declared unit is in tonnes - the mass required for roofing must be calculated using information from producer (dens=40 kg/m2)	1000	kg	3100
15	Flooting, roof	Ceramic tiles	CEFT	Ceramic Floor Tiles	Ceramic Floor Tiles 1 kg/m2	1	m2	32.21
16	Roof, fooring	Tile bond coat (adhesive)	ADH	Mineral adhesives H40® Gel, Bioflex®, H40® Sin Limites® & H40® Sem Limites	The International EPD System: Construction products / Aggregates The International EPD System: Construction products / Cement and building limes	1	kg	0.6
17	Roof, flooring	Mortar bed / Wet screed	MOR	Cement mortars	Cement mortars (1600 kg/m3)	1	kg	0.25
18	Flooring	Cleavage membrane / Sound insuolation layer	POLY	POLYETHYLENE FOAM BASED PRODUCTS	This product is a flexible material made mostly of polyethylene. It is soft and resilient and gives the impression of being a soundproofing and cushioning material. Foamed polyethylene packaging protects against scratches damage during transport moisture, including sea moisture. Foam also has insulating properties, which means that it protects against heat loss. Polyethylene foam products in the form of rolls, sheets and bags. Dens=935 kg/m3	0.001069519	m3	1.73
19	Flooring	Laminated wood flooring	WFL	Multi-layered engineered wood flooring	Multi-layered engineered wood floors are floor coverings in accordance with EN 13489 for private and commercial use in interior areas, which are either laid "floating" on screed or on other existing floors such as wood or tiles, in connection with suitable underlay materials, or are glued to the screed across the whole floor area.	1	m2	29.71
20	Flooring	Chipboard flooring (plywood)	PLYW	S-P-02010 SELEX® Plywood	m3 of plywood products produced in Chile and installed across different countries across the world	1	m3	1430.67
21	Flooring, partition, facades, roof	Insulation layer	MWOOL	Mineral wool insulation (high bulk density range)	Mineral wool is the generic term for insulating materials made of glass wool and stone wool. These are non-combustible insulating materials, which consist mainly of amorphous fibres obtained from a silicate melt. The mineral wool insulation materials described in this declaration are produced in the form of rolls, boards and mats in the high bulk density range (> 120 kg/m³). The ready-made products are supplied in thicknesses between 10 mm and 400 mm.	1	m3	96.5
22	Flooring, partition, facades, roof	Insulation layer	POLYU1	S-P-07206 Insulation board with a core of rigid polyurethane (PIR) for buildings	6 cm/m2: thermal resistance (m2k/w): 2.33 Thermal Resistance (m2K/W) grammage (kg/m^2): 2.46 grammage (kg/m^2)	0.06	m3	30.69
23	Flooring, partition, facades, roof	Insulation layer	POLYU2	Polyurethane thermal insulation spray foam	Polyurethane thermal insulation spray foam (blowing agent HFO; density 40 kg/m3)	0.13	m3	290.4
24	Flooring, partition, facades, roof	Insulation layer	EPS	EUROTHERM EPS INSULATION (white); 0,035-0,039 W/mK	Expanded polystyrene foam EPS, wall insulation, External Thermal Insulation Composite System (ETICS), pitched roof insulation and ceiling insulation. Gross density: 16.0 kg/m^3	1	m3	114.5

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BIM-LCA Construction Project

Description of Materials and Impact Data

Project name: Single-family house in concrete and bricks

			1	2	3	4	5	6
nr.	Building part	Type of Material	Mat Code	Material Name	Description	Quant. Studied in EPD	Unit	Cost €
25	Flooring, partition, facades, roof	Insulation layer	CELL	Cellulose Fibre Insulation - Thermal insulation for use in pitched roofs, walls and floor spaces in dwellings.	One m² of installed in-situ insulation, thickness 300mm with an R-value of 9.09 m²K/W, at a density of 37 kg/m³. Reference service life of 50 years	0.3	m3	203.13
26	Flooring, partition, facades, roof	Insulation layer	CORK	S-P-02315 Cork-based thermal insulation panels: Slim and Lisoflex	Cork-based thermal insulation panels: grammage (kg/m^2): 3.3 grammage (kg/m^2); layer thickness (m): 0.02 layer thickness (m); thermal resistance (m2k/w): 0.465 Thermal Resistance (m2K/W).	0.02	m3	53.84
27	Partition walls	Finishing coat (plastering mortars) / Esternal finishing /Interior finishing	PLASM	Mineral pre-made mortar: rendering and plastering mortar – normal/finishing render or plaster with special properties	Rendering and plastering mortars produced in the factory for use as a base coat or finishing render/plaster on walls, ceilings, piers, and separating walls of structures which comply with the applicable standards or on similar backgrounds. 1600 kg/m3	1	kg	1.5
28	Partition walls	Gypsum cardboard or fiberboard	GYP_F	Gypsum fibreboards 12,5 mm	conversion factor to 1kg: 16.66 - gross density: 1175.0 kg/m^3 layer thickness: 0.0125 m grammage: 16.66 kg/m^2	1	m2	36.9
29	Partition walls, facades	Gypsum plasterboard	GYP_P	STANDARD GYPSUM PLASTERBOARD STD 12,5 mm	grammage (kg/m^2): 8.6 grammage (kg/m^2) thermal conductivity (w/m.k): 0.21 Thermal Conductivity (W/m.K) thermal resistance (m2k/w): 0.06 Thermal Resistance (m2K/W) layer thickness (m): 0.0125 layer thickness (m)	1	m2	36.9
30	Partition walls	Galvanized steel (U, C) channel studs	ST-GC	Cold-rolled steel profiles for framing and partition systems	The raw material is hot dipped sheet rolled galvanised steel, grade DX51D+Z steel for forming. The steel profile sections are manufactured in accordance with EN 14195:2014 Metal framing components for gypsum board systems.	1000	kg	2820
31	Railings	Railings	ST-SL	Welded and Pickled Stainless Steel Products	Products from Øglænd System AS that are made from stainless steel, and then machined, welded and pickled. Stainless steel forms a protective chromium oxide layer when the alloy is exposed to air, hindering direct contact between the alloy and the corrosive environment.	1	kg	14.47
32	Interior doors	Interior doors	WDOOR	Wooden interior doors	This EPD describes an average of the doors produced by the member companies of the VHI. In addition to standard doors, the member companies of the VHI also produce so-called functional doors. These offer additional functions such as moisture, smoke, fire, sound, burglary and radiation protection. For these purposes, the doors are given a modified design.	2.6814	m2	394.28
33	Facades	External wooden cladding	WCLA	Wood Plastic Composite products: Cladding: WEO 35	FIBERDECK wood plastic composite combines the proven strength of high-density, recycled polyethylene plastic and realistic wood fibers with an outer shell of polymer that completely encapsulates the board in an impermeable layer of protection from weather, sun, water, scuffs and scrapes	50.75	m2	2869.79
34	Facades	Tiles for external cladding	N-STON	Slabs for façade claddings and for interior claddings and flooring in natural semi-rijo limestone:	Slabs for façade claddings and for interior claddings and flooring in natural semi-rijo limestone. Dens: 2750 kg/m3	1	kg	2.5
35	Facades	Tiles for external cladding	PORCE	EXTRUDED PORCELAIN VENTILATED FAÇADE GA16 & GA20	EXTRUDED PORCELAIN VENTILATED FAÇADE GA16 & GA20. 324 kg/m2	324	kg	560
36	Facades	Tiles for external cladding	A-STON	S-P-07728 STONEO Ventilated Facade Panels	The engineering stone facade panels are made of a high-quality material comprising a selected combination of aggregates, bound by stable polyester resins.The panels are used for facade cladding and are mounted as a component of ventilated facades (rainscreen claddings).	1	kg	2.25
37	Windows	Windows	WIN_PVC	Passiv PVC Double Glazed Window	The Passiv PVC windows cover a range of different sizes and shapes of windows. The LCA has been executed based on a Double-glazed 1230 mm x 1480 mm window, with a thermal performance of U window = 1.2 W/m2K, U glass = 1.2 W/m2K and a life expectancy of 50 years. After which the results have been scaled back to a functional unit of 1m2.	1	m2	146.96
38	Windows	Windows	WIN_WOOD	Hardwood double glazed window	The raw materials for the Hardwood windows comprise glass, argon, hardwood/softwood profiles, warm edge spacer and associated hardware (hinges, handles, recievers and gears).	1	m2	299.17
39	Windows	Windows	WIN_AL	Aluminium Windows	The aluminium windows are assembled with extruded aluminium profiles and comes in different frame widths of 45 mm - 50 mm and 70 mm - 75 mm. They consist of an aluminium profile frame and an aluminium profile sash with an insulating glass unit (IGU). The aluminium profiles are powder coated and thermally broken with a reinforced polyamide strip.	1	m2	127.72
40	Facades	Exterior glazed doors	DOOR_GL	Exterior facade folding doors with thermally modified beech and double glazing, painted	Folding door in the facade of buildings, for renovation and in new buildings	1	m2	150.14
41	Facades	Exterior front doors	DOOR_W	Wooden full doors	Exterior doors manufactured by Porta KMI Poland Sp. z o. o. Sp. k. are dedicated for communication in domestic as well as commercial premises. Among company's products, wooden and steel doorsare distinguish. Depending on the customer's needs, doors possess various functionalities and can be produced from a wide range of materials.	2.307	m2	632.54
42	Roof	Gravel ballast	GRAV	S-P-05225 Aggregates from Nyrand gravel pit-Svebølle	S-P-05225 Aggregates from Nyrand gravel pit-Svebølle	1000	kg	123.75
43	Roof	Waterproofing layer	WP	PTM reinforced bitumen membrane for roof waterproofing	System of PTM reinforced bitumen membrane for roof waterproofing: ·PTM BituFlex (top layer) & PTM DuraFlex Kombi (bottom layer) .	1	m2	4.2

BIM-LCA

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Enviromental Impacts	
Abiotic depletion potential for fossil resources (ADPF)	Eutrophication potential (EP)
Abiotic depletion potential for non fossil resources (ADPE)	Photochemical Ozone Creation Potential (POCP)
Acidification potential (AP)	Ozone Depletion Potential (ODP)
Global warming potential (GWP)	

BIM-LCA Construction Project

LCA - Enviromental Impact results

Energy consumption	Table Caption and Summary	
	IMPACTS A1-A3	PRODUCTION
Total use of renewable primary energy resources (PERT)	IMPACTS A4	TRANSPORT
Total use of non renewable primary energy resource (PENRT)	IMPACTS A5	INSTALLATION

Project name: Single-family house in concrete and bricks

UNIT IMPACTS * QUANTITIES

Module	Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	Quantities (Q)	Unit	Cost (Euros)	Energy Consumption (A1-A3) PERT (MJ)	Energy Consumption (A1-A3) PENRT (MJ)	Energy Consumption (A4) PERT (MJ)	Energy Consumption (A4) PENRT (MJ)	Energy Consumption (A5) PERT (MJ)	Energy Consumption (A5) PENRT (MJ)
A1-A3	1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0
				1.A.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0
				1.B.1.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
				1.B.1.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0
			1.B.2-Footings	1.B.2.1	Concrete	CON1	53.89	m3	6374.11	10239.1	75446	184.3038	3179.51	0	6.52069
				1.B.2.2	Rebar	REB	3411.24	kg	6140.23	5403.399408	24543.85022	40.934844	2237.771472	0	0.10233711
				1.B.2.3	Blinding concrete	CON0	7.38	m3	646.13	233.90389	6630.3523	6.7078528	211.98232	5.1194616	309.19009
			1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	9.53	m3	1127.21	1810.7	13342	32.5926	562.27	0	1.15313
				1.B.3.2	Rebar	REB	846.26	kg	1523.28	1340.482176	6088.86948	10.155168	555.149184	0	0.02538792
				1.B.3.3	Blinding concrete	CON0	2.39	m3	208.96	75.64403	2144.2421	2.1693056	68.55464	1.6556232	99.99143
			1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0
				1.B.4.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
				1.B.4.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0
		1.C - Retaining walls		1.C.1	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				1.C.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		1-Total Fundations							**16019.91**	19103.2295	128195.3141	276.8636	6815.2376	6.7751	416.9831
	2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams	2.A.1.1	Gulam Timber	GLT	0.00	m3	0.00	0	0	0	0	0	0
				2.A.1.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0
				2.A.1.3	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				2.A.1.4	Concrete	CON3	19.68	m3	8029.44	3739.2	27552	67.3056	1161.12	0	31.8816
				2.A.1.5	Rebar	REB	2707.97	kg	4874.34	4289.421312	19483.82976	32.495616	1776.427008	0	0.08123904
			2.A.2-Columns	2.A.2.1	Gulam Timber	GLT	0.00	m3	0.00	0	0	0	0	0	0
				2.A.2.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0
				2.A.2.3	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				2.A.2.4	Concrete	CON3	10.89	m3	4443.12	2069.1	15246	37.2438	642.51	0	17.6418
				2.A.2.5	Rebar	REB	2203.05	kg	3965.48	3489.626448	15850.92317	26.436564	1445.198832	0	0.06609141
			2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	68.10	m3	16636.08	12939.475	95343.5	232.91055	4018.0475	0	15.3230625
				2.A.3.2	Rebar	REB	6129.23	kg	11032.61	9708.6924	44099.77388	73.5507	4020.7716	0	0.18387675
			2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	0.00	m3	0.00	0	0	0	0	0	0
				2.A.4.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
				2.A.4.3	Galvanized steel plates	ST-G	0.00	kg	0.00	0	0	0	0	0	0
			2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0.00	m3	0.00	0	0	0	0	0	0
				2.A.5.2	Ceramic blocks	CERB	0.00	kg	0.00	0	0	0	0	0	0
				2.A.5.3	Precast concrete beams	CONBEAM	0.00	kg	0.00	0	0	0	0	0	0
				2.A.5.4	Concrete (cast in place)	CON2	0.00	m3	0.00	0	0	0	0	0	0
				2.A.5.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
			2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0
				2.A.6.2	Steel in timber connect (galvanized)	ST-G		kg	0.00	0	0	0	0	0	0
				2.A.6.3	Steel in connections (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0
		2.B-Load-bearing walls		2.B.1	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				2.B.2	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				2.B.3	rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		2- Total structural elements							**48981.07**	36235.5152	217576.0268	469.9428	13064.0749	0.0000	65.1777
	3 - Non-load bearing elements	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	29.53	m3	3493.22	5611.365	41346.9	101.00457	1742.4765	0	3.5735535
				3.A.1.2	rebar	REB	886.01	kg	1594.81	1403.43192	6374.805975	10.63206	581.21928	0	0.02658015
				3.A.1.3	Graded aggregate	AGG	88600.50	kg	4430.03	1151.8065	2569.4145	0	1333.083123	0	29144.33707
			3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	257.52	m2	8294.72	10506.816	48413.76	3.270504	2366.6088	517.6152	2678.208
				3.A.2.2	Tile bond coat (adhesive)	ADH	1545.12	kg	927.07	3012.984	11356.632	0	2085.912	0	0.8343648
				3.A.2.3	Mortar bed	MOR	12360.96	kg	3090.24	4697.1648	64771.4304	0	0	0	0
				3.A.2.4	Cleavage membrane	POLY	1.29	m3	2082.76	4340.803474	107268.0246	21.3091362	1480.80438	0.068983814	0.934231056
			3.A.3-Flooring Type II: Wood floating floor or	3.A.3.1	Laminated wood flooring	WFL	0.00	m2	0.00	0	0	0	0	0	0
				3.A.3.2	Chipboard flooring (plywood)	PLYW	0.00	m3	0.00	0	0	0	0	0	0
				3.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
				3.A.3.4	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0
			3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0.00	m4	0.00	0	0	0	0	0	0
				3.A.4.2	Sound insulation layer	POLY	0.00	m3	0.00	0	0	0	0	0	0
		3.B-Vertical elements	3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	19627.99	kg	8243.76	6045.421844	81063.61109	40.23738565	802.7849137	18.74473332	196.27993
				3.B.1.2	Finishing coat (plastering mortars)	PLASM	7093.12	kg	10639.68	5546.81984	24896.8512	139.734464	2078.28416	16.8106944	87.245376
			3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0.00	m2	0.00	0	0	0	0	0	0
				3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0.00	kg	0.00	0	0	0	0	0	0
				3.B.2.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
			3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0
				3.B.3.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0
				3.B.3.3	Insulation layer	MWOOL	0.00		0.00	0	0	0	0	0	0
				3.B.3.4	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0
				3.B.3.5	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0
			3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	0.00	m3	0.00	0	0	0	0	0	0
				3.B.4.2	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
				3.B.4.3	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00	0	0	0	0	0	0
			3.B.5-Parapets	3.B.5.1	Brick wall	CERB	2337.72	kg	981.84	720.01776	9654.7836	4.792326	95.612748	2.2325226	23.3772
				3.B.5.2	Finishing coat (plastering mortars)	PLASM	844.80	kg	1267.20	660.6336	2965.248	16.64256	247.5264	2.002176	10.39104
			3.B.6-Railings	3.B.6	Railings	ST-SL	52.25	kg	756.06	514.14	3370.125	0.000788975	6.53125	98.7525	397.518
			3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	7.64	m2	1123.41	5230.761587	3971.893936	0	0	124.854479	44.22048184
		3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	13.72	m2	441.79	559.6128	2578.608	0.1741932	126.05004	27.56916	142.6464
				3.C.1.2	Tile bond coat (adhesive)	ADH	82.30	kg	49.38	160.4772	604.8756	0	111.0996	0	0.04443984
				3.C.1.3	Mostar	MOR	1235.52	kg	308.88	469.4976	6474.1248	0	0	0	0
				3.C.1.4	Concrete	CON3	2.16	m3	881.28	410.4	3024	7.3872	127.44	0	3.4992
				3.C.1.5	Rebar	REB	297.22	kg	534.99	470.790144	2138.46912	3.566592	194.973696	0	0.00891648
				3.C.1.6	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0
				3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0
			3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	0.00	m2	0.00	0	0	0	0	0	0
				3.C.2.2	Tile bond coat (adhesive)	ADH	0.00	kg	0.00	0	0	0	0	0	0
				3.C.2.3	Mostar	MOR	0.00	kg	0.00	0	0	0	0	0	0
				3.C.2.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				3.C.2.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		3-Total non-load bearing elements							**49141.11**	51512.9441	422843.5578	348.7518	13380.4069	808.6504	32733.1448
	4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	17972.16	kg	26958.24	14054.22912	63082.2816	354.051552	5265.84288	42.5940192	221.057568
				4.A.1.2	Brick walls	CERB	66309.78	kg	27850.11	20423.41286	273859.3997	135.9350531	2712.070084	63.32584181	663.09782
				4.A.1.3	Insulation layer	MWOOL	26.21	m3	2529.21	11503.30566	55013.5306	66.4932478	1154.52407	250.168723	1230.793424
				4.A.1.4	Interior finish	GYP_P	374.42	m2	13816.10	1411.5634	16549.364	6.36514	2429.9858	212.67056	1127.0042
			4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0
				4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0
				4.A.2.3	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0
				4.A.2.4	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
				4.A.2.5	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0
				4.A.2.6	External wooden cladding	WCLA	0.00	m2	0.00	0	0	0	0	0	0
			4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0
				4.A.3.2	Brick wall	CERB	0.00	kg	0.00	0	0	0	0	0	0
				4.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
				4.A.3.4	Tiles for external cladding	N-STON	0.00	kg	0.00	0	0	0	0	0	0
		4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_PVC	21.54	m2	3165.52	1011.64764	25950.4227	0.1703814	12.29934	2.059224	44.8032
			4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	4.00	m3	600.56	5600	4080	1.228	22.08	4.04	13.56
				4.B.2.2	Exterior front doors	DOOR_W	4.00	m4	1096.73	1691.205202	1763.502384	0	0	75.9774599	26.90940616
		4- Total facades							**76016.46**	55695.3639	440298.5009	564.2434	11596.8022	650.8358	3327.2256
	5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	134.33	m2	4326.77	5480.664	25254.04	1.705991	1234.4927	270.0033	1397.032
				5.A.1.2	Gravel ballast	GRAV	0.00	kg	0.00	0	0	0	0	0	0
			5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	134.33	m2	564.19	2417.94	37746.73	12.801649	185.3754	347.9147	6797.098
			5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	9.40	m3	907.40	4127.02059	19737.1069	23.8556647	414.206555	89.7525895	441.569576
			5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	6447.84	kg	1611.96	2450.1792	33786.6816	0	0	0	0
		5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	3670.14	kg	11377.42	3963.747206	16845.92562	7.523779419	161.8530109	3.780240391	32.92112263
			5.B.2-Mostar	5.B.2	Cement mostar	MOR	2936.11	kg	734.03	1115.721436	15385.21138	0	0	0	0
			5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	91.75	m2	385.36	1651.561336	25782.70752	8.744099739	126.6197024	237.6413255	4642.722422
			5.B.4-Decking	5.B.4	Ceramic deck or	CERB	2835.18	kg	1190.78	873.2355303	11709.29461	5.812119601	115.958874	2.70759718	28.35180293
				5.B.5	wooden deck (plywood)	PLYW	0.00	m3	0.00	0	0	0	0	0	0
			5.B.5-Structure	5.B.6	Brick walls or	CERB	1979.19	kg	831.26	609.5906241	8174.056097	4.057340193	80.94888483	1.890126773	19.79190338
				5.B.7	Gulam timber beams	GLT	0.00	m3	0.00	0	0	0	0	0	0
			5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	4.31	m3	416.01	1892.0979	9048.789	10.937007	189.89955	41.148495	202.44456
		5-Total Roofs							**22345.18**	24581.7578	203470.5427	75.4377	2509.3547	994.8384	13561.9314
	Total building (A1-A5)								**212503.73**	162547.053	1208913.3997	1659.8016	44856.5216	1466.2614	36542.5311

Ref.	Env impacts A1-A3 GWP (kg CO2-eq)	ADPF (MJ)	ADPE (kg Sb-eq)	AP (kg SO2-eq.)	EP (kg Phosphat-eq.)	POCP (kg Ethen-eq)	ODP (kq CFC 11-eq)
1.A.1	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0
1.B.2.1	15196.98	73290.4	0.00371841	23.49604	7.5446	0.856851	0.000180532
1.B.2.2	1797.721899	22258.32143	0.003477074	6.822474	2.906373924	0.641312556	0.000183879
1.B.2.3	938.8632	6608.2093	2.42835E-05	1.9131552	0.08303625	1.6725346	2.24382E-05
1.B.3.1	2687.46	12960.8	0.00065757	4.15508	1.3342	0.151527	3.19255E-05
1.B.3.2	445.981128	5521.8726	0.000862597	1.692528	0.721016928	0.159097632	4.5617E-05
1.B.3.3	303.6264	2137.0811	7.85323E-06	0.6187104	0.02685375	0.5408942	7.25648E-06
1.B.4.1	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0
1-Total Fundations	21370.6326	122776.6844	0.0087	38.6980	12.6161	4.0222	0.0005
2.A.1.1	0	0	0	0	0	0	0
2.A.1.2	0	0	0	0	0	0	0
2.A.1.3	0	0	0	0	0	0	0
2.A.1.4	5549.76	26764.8	0.00135792	8.58048	2.7552	0.312912	0.000065928
2.A.1.5	1427.099136	17669.4912	0.002760232	5.415936	2.307188736	0.509097984	0.00014597
2.A.2.1	0	0	0	0	0	0	0
2.A.2.2	0	0	0	0	0	0	0
2.A.2.3	0	0	0	0	0	0	0
2.A.2.4	3070.98	14810.4	0.00075141	4.74804	1.5246	0.173151	3.64815E-05
2.A.2.5	1161.005769	14374.88168	0.002245566	4.406094	1.876996044	0.414172836	0.000118753
2.A.3.1	19204.905	92619.4	0.004699073	29.69269	9.53435	1.08282975	0.000228143
2.A.3.2	3230.101575	39993.19313	0.006247519	12.25845	5.2220997	1.1522943	0.00033039
2.A.4.1	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0
2.A.6.1	0	0	0	0	0	0	0
2.A.6.2	0	0	0	0	0	0	0
2.A.6.3	0	0	0	0	0	0	0
2.B.1	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0
2- Total structural elements	33643.8515	206232.1660	0.0181	65.1017	23.2204	3.6445	0.0009
3.A.1.1	8328.447	40165.56	0.002037812	12.876606	4.13469	0.46958265	9.89372E-05
3.A.1.2	466.924635	5781.182625	0.000903105	1.77201	0.75487626	0.16656894	4.77592E-05
3.A.1.3	203.78115	2569.4145	0.000177201	0.886005	1.77201	0.1063206	4.07562E-06
3.A.2.1	3038.736	41975.76	0.0888444	7.571088	0.9064704	0.5382168	0.000507314
3.A.2.2	794.19168	10383.2064	0.000893079	2.394936	0.74320272	0.129172032	4.92893E-05
3.A.2.3	7107.552	64647.8208	0.102843187	26.3288448	1.2979008	19.2830976	0.000537702
3.A.2.4	3339.635244	107219.8684	0.016987114	0.014614907	1.291189185	15.20533278	0.005680727
3.A.3.1	0	0	0	0	0	0	0
3.A.3.2	0	0	0	0	0	0	0
3.A.3.3	0	0	0	0	0	0	0
3.A.3.4	0	0	0	0	0	0	0
3.A.4.1	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0
3.B.1.1	6163.189802	73212.41389	0.005240674	19.58873701	4.043366558	1.018692837	9.93176E-06
3.B.1.2	2652.82688	22910.7776	0.006107176	6.5256704	0.671718464	0.544042304	1.76619E-05
3.B.2.1	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0
3.B.3.1	0	0	0	0	0	0	0
3.B.3.2	0	0	0	0	0	0	0
3.B.3.3	0	0	0	0	0	0	0
3.B.3.4	0	0	0	0	0	0	0
3.B.3.5	0	0	0	0	0	0	0
3.B.4.1	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0
3.B.5.1	734.04408	8719.6956	0.000624171	2.33304456	0.48157032	0.121327668	1.18289E-06
3.B.5.2	315.9552	2728.704	0.000727373	0.777216	0.08000256	0.06479616	2.10355E-06
3.B.6	246.62	3317.875	0.03223825	3.213375	0.1614525	1.51525	1.34283E-05
3.B.7	-53.99343626	3562.854479	0.007604669	0.515345267	0.107630715	0.101675766	2.8068E-10
3.C.1.1	161.8488	2235.708	0.00473202	0.4032504	0.04828032	0.02866644	2.70205E-05
3.C.1.2	42.300144	553.02912	4.75671E-05	0.1275588	0.039584376	0.006879946	2.62524E-06
3.C.1.3	710.424	6461.7696	0.010279526	2.6316576	0.1297296	1.9274112	5.37451E-05
3.C.1.4	609.12	2937.6	0.00014904	0.94176	0.3024	0.034344	0.000007236
3.C.1.5	156.632832	1939.3344	0.000302952	0.594432	0.253228032	0.055876608	1.60211E-05
3.C.1.6	0	0	0	0	0	0	0
3.C.1.7	0	0	0	0	0	0	0
3.C.1.8	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0
3-Total non-load bearing elements	35018.2360	401322.5744	0.2807	89.4962	17.2193	41.3173	0.0071
4.A.1.1	6721.58784	58050.0768	0.01547403	16.5343872	1.701963552	1.378464672	4.47507E-05
4.A.1.2	20821.27155	247335.4869	0.017704712	66.17716244	13.65981509	3.441477686	3.35527E-05
4.A.1.3	4544.70996	51920.8214	0.001003034	26.602541	3.64572754	1.571515624	1.45672E-08
4.A.1.4	812.4914	14377.728	0.000225775	1.666169	0.01160702	2.3176598	4.79258E-05
4.A.2.1	0	0	0	0	0	0	0
4.A.2.2	0	0	0	0	0	0	0
4.A.2.3	0	0	0	0	0	0	0
4.A.2.4	0	0	0	0	0	0	0
4.A.2.5	0	0	0	0	0	0	0
4.A.2.6	0	0	0	0	0	0	0
4.A.3.1	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0
4.B.1	12847.533	22832.63694	10.082874	4.70431446	0.5696253	0.348767064	2.11904E-05
4.B.2.1	172	0	0	1.372	0.00564	0.888	0.00000528
4.B.2.2	9.085392284	1620.286086	0.002990377	0.483953186	0.095722583	0.269293455	4.03988E-06
4- Total facades	45928.6791	396137.0361	10.1203	117.5405	19.6901	10.2152	0.0002
5.A.1.1	1585.094	21895.79	0.04634385	3.949302	0.4728416	0.2807497	0.00026463
5.A.1.2	0	0	0	0	0	0	0
5.A.2	467.4684	0	0	0.9282203	0.02511971	0.9429966	5.56126E-06
5.A.3	1630.49754	18627.5411	0.000359857	9.5441465	1.30797121	0.563809876	5.22624E-09
5.A.4	3707.508	33722.2032	0.053646029	13.7338992	0.6770232	10.0586304	0.000280481
5.B.1	1031.308301	16515.61336	0.001471725	14.0933234	1.181783889	0.741367533	7.74399E-06
5.B.2	1688.262699	15355.85029	0.024428427	6.253912258	0.308291449	4.580330105	0.000127721
5.B.3	319.3018582	0	0	0.634016046	0.017157887	0.644108921	3.79859E-06
5.B.4	890.246612	10575.22249	0.000756993	2.829509932	0.58404714	0.147145857	1.4346E-06
5.B.5	0	0	0	0	0	0	0
5.B.6	621.4657662	7382.379961	0.000528444	1.975231957	0.40771321	0.102719979	1.00147E-06
5.B.7	0	0	0	0	0	0	0
5.B.8	747.5274	8540.091	0.000164982	4.375665	0.5996601	0.25848756	2.39605E-09
5-Total Roofs	12688.6806	132614.6914	0.1277	58.3172	5.5816	18.3203	0.0007
Total building (A1-A5)	135961.3993	1126468.4609	10.4278	310.8364	72.7459	59.1991	0.0086

Ref.	Env impacts A4 GWP (kg CO2-eq.)	ADPF (MJ)	ADPE (kg Sb-eq)	AP (kg SO2-eq.)	EP (kg Phosphat-eq.)	POCP (kg Ethen-eq)	ODP (kq CFC 11-eq)	Env impacts A5 GWP (kg CO2-eq.)	ADPF (MJ)	ADPE (kg Sb-eq)	AP (kg SO2-eq.)	EP (kg Phosphat-eq.)	POCP (kg Ethen-eq)	ODP (kq CFC 11-eq)
1.A.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2.1	233.8826	3168.732	1.65981E-05	0.544289	0.1309527	-0.1816093	3.85852E-14	0.97002	13.25694	3.50824E-05	0.004171086	0.01708313	0.00080835	6.25124E-08
1.B.2.2	139.860717	2166.135495	0.000243562	0.81869688	0.143271954	0.030701133	2.68123E-05	0.000286203	0.003411237	1.05748E-08	1.25875E-06	5.15097E-06	2.43221E-07	1.88641E-11
1.B.2.3	15.027716	211.98232	9.77983E-07	0.037355241	0.000111232	0.018489405	3.54878E-06	29.088521	308.82104	1.11675E-06	0.16474392	0.001959656	0.18297499	3.30743E-06
1.B.3.1	41.3602	560.364	2.93524E-06	0.096253	0.0231579	-0.0321161	6.82348E-15	0.17154	2.34438	6.20403E-06	0.000737622	0.00302101	0.00014295	1.10548E-08
1.B.3.2	34.696824	537.37764	6.04232E-05	0.20310336	0.035543088	0.007616376	6.65164E-06	7.10015E-05	0.000846264	2.62342E-09	3.12271E-07	1.27786E-06	6.03386E-08	4.67984E-12
1.B.3.3	4.859932	68.55464	3.16278E-07	0.012080607	3.59721E-05	0.005979435	1.14767E-06	9.407167	99.87208	3.61153E-07	0.05327784	0.000633749	0.05917373	1.06961E-06
1.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Total Fundations	469.6880	6713.1461	0.0003	1.7118	0.3331	-0.1509	0.0000	39.6376	424.2987	0.0000	0.2229	0.0227	0.2431	0.0000
2.A.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.4	85.4112	1157.184	6.06144E-06	0.198768	0.478224	-0.663216	1.40909E-14	4.6248	64.72752	0.000171019	0.1968	0.7872	0.003936	3.0504E-07
2.A.1.5	111.026688	1719.55968	0.000193349	0.64991232	0.113734656	0.024371712	2.12846E-05	0.000227199	0.002707968	8.3947E-09	9.9924E-07	4.08903E-06	1.93078E-07	1.49751E-11
2.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.4	47.2626	640.332	3.35412E-06	0.109989	0.264627	-0.366993	7.79724E-15	2.55915	35.81721	9.46341E-05	0.1089	0.4356	0.002178	1.68795E-07
2.A.2.5	90.324927	1398.934845	0.000157298	0.52873128	0.092527974	0.019827423	1.73159E-05	0.000184836	0.002203047	6.82945E-09	8.12924E-07	3.3266E-06	1.57077E-07	1.21828E-11
2.A.3.1	295.56485	4004.427	2.09756E-05	0.68783525	1.65489075	-2.29505425	4.87614E-14	2.2473825	31.05474	8.2404E-05	0.009738658	0.039908065	0.001886439	1.4642E-07
2.A.3.2	251.298225	3892.057875	0.000437627	1.471014	0.25742745	0.055163025	4.81757E-05	0.000514242	0.006129225	1.90006E-08	2.26168E-06	9.25513E-06	4.37014E-07	3.38946E-11
2.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2- Total structural elements	880.8885	12812.4954	0.0008	3.6462	2.8614	-3.2259	0.0001	9.4323	131.6105	0.0003	0.3154	1.2627	0.0080	0.0000
3.A.1.1	128.17539	1736.5698	9.09632E-06	0.29828835	0.071766405	-0.099527895	2.1146E-14	0.531603	7.265241	1.92263E-05	0.002285893	0.00936212	0.000443003	3.42589E-08
3.A.1.2	36.326205	562.613175	6.32608E-05	0.2126412	0.03721221	0.007974045	6.964E-06	7.43358E-05	0.000886005	2.74662E-09	3.26936E-07	1.33787E-06	6.31722E-08	4.89961E-12
3.A.1.3	116.5096575	10851.34624	0.059185134	6.910839	1.417608	0.354402	0.0886005	0.26402949	37.389411	9.77264E-06	0.001159781	0.004752176	0.000224425	1.74543E-08
3.A.2.1	156.05712	2224.9728	6.69552E-06	0.2600952	0.03064488	0.012953256	2.88422E-05	285.8472	2070.4608	0.002678208	0.669552	0.09760008	0.04661112	2.13742E-05
3.A.2.2	38.318976	4244.135616	0.142769088	2.472192	0.540173952	0.142769088	0.050185498	0.004604458	0.064276992	1.70581E-07	2.0272E-05	8.28184E-05	3.91224E-06	3.0408E-10
3.A.2.3	406.1440627	4467.250944	0.024351091	2.825344627	0.554982382	1.51357483	0.504574387	0.036835661	0.504574387	1.36218E-06	0.161953298	0.000660941	3.13227E-05	2.4314E-09
3.A.2.4	100.4057604	1480.80438	0.000355152	0.405716322	0.006729835	0.40932804	2.3115E-05	0.042377491	0.930619338	2.68471E-07	0.00061038	0.000104379	0.000208276	1.20391E-09
3.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.1.1	57.90257935	800.8221144	4.65183E-06	0.243387113	0.060454218	-0.088914808	1.94317E-11	46.12578355	191.5692117	3.98448E-06	0.078315692	0.012954475	-0.002610523	1.55061E-11
3.B.1.2	154.630016	2071.19104	1.60305E-05	0.117745792	0.026528269	-0.001666883	3.24865E-12	295.783104	78.733632	5.17798E-06	0.038728435	0.008582675	0.002588989	4.05017E-12
3.B.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.5.1	6.896274	95.378976	5.5404E-07	0.028987728	0.007200178	-0.010589872	2.31434E-12	5.493642	22.8161472	4.74557E-07	0.009327503	0.001542895	-0.000310917	1.8468E-12
3.B.5.2	18.41664	246.6816	1.90925E-06	0.01402368	0.003159552	-0.000198528	3.86918E-13	35.22816	9.37728	6.16704E-07	0.004612608	0.001022208	0.000308352	4.82381E-13
3.B.6	18.9145	2080.22925	0.01133825	1.30625	0.26125	0.05225	0.02460975	0.99275	13.8985	3.66795E-05	0.004362875	0.01781725	0.000841225	6.53125E-08
3.B.7	1.626926233	179.0445141	0.000977295	0.113970314	0.022794063	0.005698516	0.002116999	30.31610353	9.163213247	1.06049E-06	0.00994391	0.002254903	0.000581818	1.14113E-14
3.C.1.1	8.311896	118.50624	3.56616E-07	0.01385316	0.001632204	0.000689915	1.53619E-06	15.22476	110.27664	0.000142646	0.0356616	0.005198364	0.002482596	1.13843E-06
3.C.1.2	2.0409408	226.0506528	0.00760415	0.1316736	0.028770682	0.00760415	0.002672974	0.000245242	0.003423514	9.08548E-09	1.07972E-06	4.41107E-06	2.08373E-07	1.61959E-11
3.C.1.3	40.59548064	446.516928	0.002433974	0.282402806	0.055472377	0.151286953	0.050433926	0.00368185	0.050433926	1.36154E-07	0.016187783	6.60633E-05	3.13081E-06	2.43027E-10
3.C.1.4	9.3744	127.008	6.6528E-07	0.021816	0.052488	-0.072792	1.54656E-15	0.5076	7.10424	1.87704E-05	0.0216	0.0864	0.000432	3.348E-08
3.C.1.5	12.185856	188.73216	2.12212E-05	0.07133184	0.012483072	0.002674944	2.33612E-06	2.49364E-05	0.000297216	9.2137E-10	1.09673E-07	4.48796E-07	2.11915E-08	1.6436E-12
3.C.1.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Total non-load bearing elements	1312.8327	32147.8544	0.2491	15.7306	3.1914	2.3875	0.7233	716.4026	2559.6088	0.0029	1.0543	0.2484	0.0518	0.0000
4.A.1.1	391.793088	5247.87072	4.06171E-05	0.298337856	0.067215878	-0.004223458	8.23125E-12	749.439072	199.490976	1.31197E-05	0.098127994	0.021746314	0.006559838	1.02621E-11
4.A.1.2	195.6138569	2705.439106	1.57154E-05	0.822241297	0.204234129	-0.300383312	6.56467E-11	155.8279877	647.1834723	1.34609E-05	0.26457603	0.043764456	-0.008819201	5.23847E-11
4.A.1.3	84.918456	1142.72984	6.98218E-06	0.125595445	0.027362614	-0.028175105	2.10855E-14	580.276116	1155.048258	2.11588E-05	0.581586586	0.082926542	0.034832293	2.91449E-10
4.A.1.4	183.09138	2415.009	6.29026E-06	0.5092112	0.000143403	0.7900262	3.93141E-06	90.23522	999.7014	9.32306E-06	0.2321404	0.001067097	0.33585474	2.4824E-06
4.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.B.1	7797.48	12.0624	0.00557886	0.0031233	0.000497574	0.000141949	1.3484E-07	10489.98	43.7262	5.66502E-08	0.0057081	0.00060312	0.000374796	3.85566E-07
4.B.2.1	1.668	0	0	0.00532	0.00000492	0.0048	2.116E-16	62.8	0	0	0.02532	0.000001568	0.02876	7.24E-15
4.B.2.2	0.990030342	108.9536194	0.000594712	0.06935414	0.013870828	0.003467707	0.001288253	18.44820113	5.576072822	6.4534E-07	0.006051149	0.001372172	0.000354053	6.94408E-15
4- Total facades	8655.5548	11632.0647	0.0062	1.8332	0.3133	0.4657	0.0013	12147.0066	3050.7264	0.0001	1.2135	0.1515	0.3979	0.0000
5.A.1.1	81.40398	1160.6112	3.49258E-06	0.1356733	0.01598527	0.006756799	1.5045E-05	149.1063	1080.0132	0.001397032	0.349258	0.05091107	0.02431373	1.11494E-05
5.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.A.2	13.97032	0	0	0.01571661	5.02394E-05	0.01356733	1.3836E-12	255.227	0	0	0.5453798	0.007750841	0.5077674	2.12241E-05
5.A.3	30.466044	409.97516	2.50499E-06	0.045059655	0.009816836	-0.010108333	7.56479E-15	208.184634	414.394617	7.59112E-06	0.208654789	0.029751408	0.01249672	1.04562E-10
5.A.4	211.8566789	2330.249376	0.012702245	1.473782789	0.28949512	0.789525112	0.263200829	0.019214563	0.263200829	7.10552E-07	0.0844796	0.000344766	1.63388E-05	1.26829E-09
5.B.1	11.89124162	160.3849564	1.01296E-06	0.008661522	0.001724964	-0.000111572	8.51472E-13	27.74623044	31.67327628	2.33054E-07	0.011817839	0.001981874	-0.000340222	2.00389E-12
5.B.2	96.47173477	1061.109808	0.005784135	0.671106444	0.131825424	0.35952068	0.119851971	0.008749605	0.119851971	3.23559E-07	0.038468901	0.000156994	7.4401E-06	5.77533E-10
5.B.3	9.542354384	0	0	0.010735149	3.43158E-05	0.009267094	9.4506E-13	174.3314743	0	0	0.372518835	0.005294172	0.346827881	1.4497E-05
5.B.4	8.363781865	115.675356	6.71938E-07	0.035156236	0.008732355	-0.012843367	2.80683E-12	6.662673689	27.67135966	5.75542E-07	0.011312369	0.001871219	-0.000377079	2.23979E-12
5.B.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.6	5.838611498	80.7509658	4.69068E-07	0.02454196	0.006095906	-0.008965732	1.9594E-12	4.651097295	19.3168977	4.01776E-07	0.007896969	0.001306266	-0.000263232	1.56356E-12
5.B.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.8	13.96764	187.9596	1.14845E-06	0.020658312	0.004500684	-0.004634325	3.4682E-15	95.44554	189.98577	3.48027E-06	0.09566109	0.013640004	0.005729319	4.79383E-11
5-Total Roofs	483.7724	5506.7164	0.0185	2.4411	0.4683	1.1420	0.3831	921.3829	1763.4382	0.0014	1.7254	0.1130	0.8962	0.0000
Total building (A1-A5)	11318.9640	63305.5606	0.2565	22.9218	6.6992	-0.5237	0.7247	12912.4790	6166.2444	0.0034	2.8062	1.6853	0.7009	0.0000

BIM-LCA

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BIM-LCA Construction Project

LCA - Enviromental Impact results

Project name: Single-family house in concrete and bricks

Module	Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	Quantities (Q)	Unit	Cost (Euros)
A1-A3	1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0.00	m3	0.00
				1.A.2	Rebar	REB	0.00	kg	0.00
		1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0.00	m3	0.00
				1.B.1.2	Rebar	REB	0.00	kg	0.00
				1.B.1.3	Blinding concrete	CON0	0.00	m3	0.00
			1.B.2-Footings	1.B.2.1	Concrete	CON1	53.89	m3	6374.11
				1.B.2.2	Rebar	REB	3411.24	kg	6140.23
				1.B.2.3	Blinding concrete	CON0	7.38	m3	646.13
			1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	9.53	m3	1127.21
				1.B.3.2	Rebar	REB	846.26	kg	1523.28
				1.B.3.3	Blinding concrete	CON0	2.39	m3	208.96
			1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0.00	m3	0.00
				1.B.4.2	Rebar	REB	0.00	kg	0.00
				1.B.4.3	Blinding concrete	CON0	0.00	m3	0.00
		1.C - Retaining walls		1.C.1	Concrete	CON3	0.00	m3	0.00
				1.C.2	Rebar	REB	0.00	kg	0.00
		1-Total Fundations							**16019.91**
	2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams	2.A.1.1	Gulam Timber	GLT	0.00	m3	0.00
				2.A.1.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00
				2.A.1.3	Structural steel	ST	0.00	kg	0.00
				2.A.1.4	Concrete	CON3	19.68	m3	8029.44
				2.A.1.5	Rebar	REB	2707.97	kg	4874.34
			2.A.2-Columns	2.A.2.1	Gulam Timber	GLT	0.00	m3	0.00
				2.A.2.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00
				2.A.2.3	Structural steel	ST	0.00	kg	0.00
				2.A.2.4	Concrete	CON3	10.89	m3	4443.12
				2.A.2.5	Rebar	REB	2203.05	kg	3965.48
			2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	68.10	m3	16636.08
				2.A.3.2	Rebar	REB	6129.23	kg	11032.61
			2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	0.00	m3	0.00
				2.A.4.2	Rebar	REB	0.00	kg	0.00
				2.A.4.3	Galvanized steel plates	ST-G	0.00	kg	0.00
			2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0.00	m3	0.00
				2.A.5.2	Ceramic blocks	CERB	0.00	kg	0.00
				2.A.5.3	Precast concrete beams	CONBEAM	0.00	kg	0.00
				2.A.5.4	Concrete (cast in place)	CON2	0.00	m3	0.00
				2.A.5.5	Rebar	REB	0.00	kg	0.00
			2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00
				2.A.6.2	Steel in timber connect (galvanized)	ST-G		kg	0.00
				2.A.6.3	Steel in connections (galvanized)	ST-G	0.00	kg	0.00
		2.B-Load-bearing walls		2.B.1	Structural steel	ST	0.00	kg	0.00
				2.B.2	Concrete	CON3	0.00	m3	0.00
				2.B.3	rebar	REB	0.00	kg	0.00
		2- Total structural elements							**48981.07**
	3 - Non-load bearing elements	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	29.53	m3	3493.22
				3.A.1.2	rebar	REB	886.01	kg	1594.81
				3.A.1.3	Graded aggregate	AGG	88600.50	kg	4430.03
			3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	257.52	m2	8294.72
				3.A.2.2	Tile bond coat (adhesive)	ADH	1545.12	kg	927.07
				3.A.2.3	Mortar bed	MOR	12360.96	kg	3090.24
				3.A.2.4	Cleavage membrane	POLY	1.29	m3	2082.76
			3.A.3-Flooring Type II: Wood floating floor or	3.A.3.1	Laminated wood flooring	WFL	0.00	m2	0.00
				3.A.3.2	Chipboard flooring (plywood)	PLYW	0.00	m3	0.00
				3.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00
				3.A.3.4	Timber battens	GLT	0.00	m3	0.00
			3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0.00	m4	0.00
				3.A.4.2	Sound insulation layer	POLY	0.00	m3	0.00
		3.B-Vertical elements	3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	19627.99	kg	8243.76
				3.B.1.2	Finishing coat (plastering mortars)	PLASM	7093.12	kg	10639.68
			3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0.00	m2	0.00
				3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0.00	kg	0.00
				3.B.2.3	Insulation layer	MWOOL	0.00	m3	0.00
			3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00
				3.B.3.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00
				3.B.3.3	Insulation layer	MWOOL	0.00		0.00
				3.B.3.4	Timber battens	GLT	0.00	m3	0.00
				3.B.3.5	Gypsum plasterboard	GYP_P	0.00	m2	0.00
			3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	0.00	m3	0.00
				3.B.4.2	Insulation layer	MWOOL	0.00	m3	0.00
				3.B.4.3	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00
			3.B.5-Parapets	3.B.5.1	Brick wall	CERB	2337.72	kg	981.84
				3.B.5.2	Finishing coat (plastering mortars)	PLASM	844.80	kg	1267.20
			3.B.6-Railings	3.B.6	Railings	ST-SL	52.25	kg	756.06
			3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	7.64	m2	1123.41
		3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	13.72	m2	441.79
				3.C.1.2	Tile bond coat (adhesive)	ADH	82.30	kg	49.38
				3.C.1.3	Mostar	MOR	1235.52	kg	308.88
				3.C.1.4	Concrete	CON3	2.16	m3	881.28
				3.C.1.5	Rebar	REB	297.22	kg	534.99
				3.C.1.6	Structural steel	ST	0.00	kg	0.00
				3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00
				3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0.00	kg	0.00
			3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	0.00	m2	0.00
				3.C.2.2	Tile bond coat (adhesive)	ADH	0.00	kg	0.00
				3.C.2.3	Mostar	MOR	0.00	kg	0.00
				3.C.2.4	Concrete	CON3	0.00	m3	0.00
				3.C.2.5	Rebar	REB	0.00	kg	0.00
		3-Total non-load bearing elements							**49141.11**
	4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	17972.16	kg	26958.24
				4.A.1.2	Brick walls	CERB	66309.78	kg	27850.11
				4.A.1.3	Insulation layer	MWOOL	26.21	m3	2529.21
				4.A.1.4	Interior finish	GYP_P	374.42	m2	13816.10
			4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00
				4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00
				4.A.2.3	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00
				4.A.2.4	Insulation layer	MWOOL	0.00	m3	0.00
				4.A.2.5	Timber battens	GLT	0.00	m3	0.00
				4.A.2.6	External wooden cladding	WCLA	0.00	m2	0.00
			4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00
				4.A.3.2	Brick wall	CERB	0.00	kg	0.00
				4.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00
				4.A.3.4	Tiles for external cladding	N-STON	0.00	kg	0.00
		4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_PVC	21.54	m2	3165.52
			4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	4.00	m3	600.56
				4.B.2.2	Exterior front doors	DOOR_W	4.00	m4	1096.73
		4- Total facades							**76016.46**
	5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	134.33	m2	4326.77
				5.A.1.2	Gravel ballast	GRAV	0.00	kg	0.00
			5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	134.33	m2	564.19
			5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	9.40	m3	907.40
			5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	6447.84	kg	1611.96
		5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	3670.14	kg	11377.42
			5.B.2-Mostar	5.B.2	Cement mostar	MOR	2936.11	kg	734.03
			5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	91.75	m2	385.36
			5.B.4-Decking	5.B.4	Ceramic deck or	CERB	2835.18	kg	1190.78
				5.B.5	wooden deck (plywood)	PLYW	0.00	m3	0.00
			5.B.5-Structure	5.B.6	Brick walls or	CERB	1979.19	kg	831.26
				5.B.7	Gulam timber beams	GLT	0.00	m3	0.00
			5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	4.31	m3	416.01
		5-Total Roofs							**22345.18**
	Total building (A1-A5)								**212503.73**

IMPACTS PER UNIT AREA AND YEAR

Ref.	Energy Consumption (A1-A3) (/m2/yr) PERT (MJ/m2/yr)	Energy Consumption (A1-A3) PERT (MJ/m2/yr)	Energy Consumption (A4) (/m2/yr) PERT (MJ/m2/yr)	Energy Consumption (A4) PERT (MJ/m2/yr)	Energy Consumption (A5) (/m2/yr) PERT (MJ/m2/yr)	Energy Consumption (A5) PERT (MJ/m2/yr)	Env imp A1-A3 (/m2/yr) GWP (kg CO2-eq./m2/yr)	ADPF (MJ/m2/yr)	ADPE (kg Sb-eq./m2/yr)	AP (kg SO2-eq./m2/yr)	EP (kg Phosphat-eq./m2/yr)	POCP (kg Ethen-eq./m2/yr)	ODP (kg CFC 11-eq./m2/yr)
1.A.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2.1	0.795208139	5.859428394	0.014313747	0.246933054	0	0.000506422	1.180256291	5.692016154	2.88786E-07	0.001824793	0.000585943	6.65464E-05	1.40208E-08
1.B.2.2	0.419648913	1.906170411	0.003179158	0.173793994	0	7.9479E-06	0.139618041	1.728667399	2.70043E-07	0.00052986	0.00022572	4.98068E-05	1.42808E-08
1.B.2.3	0.018165881	0.514938824	0.000520958	0.016463368	0.000397597	0.024012899	0.07291575	0.513219113	1.88595E-09	0.000148583	6.44892E-06	0.000129896	1.74264E-09
1.B.3.1	0.140625971	1.036191364	0.002531267	0.043668065	0	8.95565E-05	0.208718546	1.006585896	5.10694E-08	0.0003227	0.000103619	1.17682E-05	2.47946E-09
1.B.3.2	0.104107034	0.472885172	0.00078869	0.043115034	0	1.97172E-06	0.034636621	0.42885	6.69926E-08	0.000131448	5.5997E-05	1.23561E-05	3.54279E-09
1.B.3.3	0.005874808	0.166530141	0.000168477	0.005324219	0.000128582	0.007765721	0.023580801	0.16597399	6.09912E-10	4.80514E-05	2.08557E-06	4.20079E-05	5.63566E-10
1.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Total Fundations	1.4836	9.9561	0.0215	0.5293	0.0005	0.0324	1.6597	9.5353	0.0000	0.0030	0.0010	0.0003	0.0000
2.A.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.4	0.290400746	2.139794967	0.005227213	0.090177074	0	0.002476048	0.431015843	2.078657968	1.05461E-07	0.000666393	0.000213979	2.4302E-05	5.12022E-09
2.A.1.5	0.333133062	1.513189637	0.002523735	0.137964198	0	6.30934E-06	0.110834043	1.372281081	2.1437E-07	0.000420623	0.000179185	3.95385E-05	1.13366E-08
2.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.4	0.160694315	1.184063374	0.002892498	0.049899814	0	0.00137013	0.238504194	1.150232992	5.83574E-08	0.000368751	0.000118406	1.34476E-05	2.83329E-09
2.A.2.5	0.271017897	1.231044048	0.002053166	0.112239735	0	5.13291E-06	0.090168202	1.116408953	1.74399E-07	0.000342194	0.000145775	3.21663E-05	9.22282E-09
2.A.3.1	1.004929714	7.404745263	0.018088735	0.312057122	0	0.001190048	1.49152726	7.193181112	3.64948E-07	0.002306049	0.000740475	8.40967E-05	1.77185E-08
2.A.3.2	0.754014632	3.424959139	0.005712232	0.312268686	0	1.42806E-05	0.250862191	3.106026182	4.85207E-07	0.000952039	0.000405568	8.94916E-05	2.56593E-08
2.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2- Total structural elements	2.8142	16.8978	0.0365	1.0146	0.0000	0.0051	2.6129	16.0168	0.0000	0.0051	0.0018	0.0003	0.0000
3.A.1.1	0.435800326	3.211160298	0.007844406	0.13532747	0	0.000277536	0.646819432	3.119412861	1.58264E-07	0.001000047	0.000321116	3.64696E-05	7.68385E-09
3.A.1.2	0.108995955	0.495092107	0.000825727	0.045139739	0	2.06432E-06	0.036263175	0.44898902	7.01386E-08	0.000137621	5.86266E-05	1.29364E-05	3.70917E-09
3.A.1.3	0.089453751	0.199550676	0	0.103532395	0	2.263462028	0.015826433	0.199550676	1.37621E-08	6.88106E-05	0.000137621	8.25727E-06	3.16529E-10
3.A.2.1	0.816	3.76	0.000254	0.1838	0.0402	0.208	0.236	3.26	0.0000069	0.000588	0.0000704	0.0000418	3.94E-08
3.A.2.2	0.234	0.882	0	0.162	0	0.0000648	0.06168	0.8064	6.936E-08	0.000186	0.00005772	0.000010032	3.828E-09
3.A.2.3	0.3648	5.0304	0	0	0	0	0.552	5.0208	7.9872E-06	0.0020448	0.0001008	0.0014976	4.176E-08
3.A.2.4	0.3371236	8.33085	0.00165495	0.115005	5.35755E-06	0.000072556	0.259369	8.32711	1.31929E-06	1.13505E-06	0.000100279	0.001180905	4.41187E-07
3.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.1.1	0.469510861	6.295713816	0.003124991	0.062347384	0.001455789	0.015243859	0.478657176	5.685959451	4.07011E-07	0.001521337	0.000314023	7.91156E-05	7.71339E-10
3.B.1.2	0.430787499	1.933585834	0.010852319	0.161407592	0.001305584	0.006775814	0.206028804	1.779339671	4.74307E-07	0.000506809	5.21683E-05	4.22524E-05	1.37169E-09
3.B.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.5	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.5.1	0.055919366	0.749827866	0.000372191	0.007425656	0.000173386	0.001815564	0.057008705	0.677205312	4.84756E-08	0.000181193	3.74006E-05	9.42278E-06	9.18675E-11
3.B.5.2	0.051307363	0.230292637	0.001292526	0.019223858	0.000155497	0.000807008	0.024538304	0.211921715	5.64906E-08	6.03616E-05	6.21331E-06	5.03232E-06	1.6337E-10
3.B.6	0.039930103	0.261736952	6.12749E-08	0.000507242	0.007669501	0.030872787	0.019153464	0.257679015	2.50375E-06	0.000249563	1.2539E-05	0.00011768	1.04289E-09
3.B.7	0.406241192	0.308472657	0	0	0.009696682	0.003434334	-0.004193339	0.27670507	5.90608E-07	4.00237E-05	8.35902E-06	7.89653E-06	2.17987E-14
3.C.1.1	0.043461696	0.200264678	1.35285E-05	0.009789534	0.002141128	0.011078472	0.012569804	0.173633737	3.67507E-07	3.1318E-05	3.74964E-06	2.22635E-06	2.09852E-09
3.C.1.2	0.012463281	0.04697698	0	0.008628425	0	3.45137E-06	0.003285193	0.042950382	3.69424E-09	9.90671E-06	3.07428E-06	5.34323E-07	2.03886E-10
3.C.1.3	0.036463001	0.502805592	0	0	0	0	0.055174278	0.501846039	7.98348E-07	0.000204385	1.00753E-05	0.00014969	4.17405E-09
3.C.1.4	0.031873253	0.234855545	0.000573719	0.009897484	0	0.000271761	0.047306617	0.228145387	1.1575E-08	7.31407E-05	2.34856E-05	2.66729E-06	5.61976E-10
3.C.1.5	0.036563385	0.166081789	0.000276995	0.015142412	0	6.92488E-07	0.012164712	0.150616216	2.35284E-08	4.61659E-05	1.96667E-05	4.33959E-06	1.24426E-09
3.C.1.6	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.7	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.8	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Total non-load bearing elements	4.0007	32.8397	0.0271	1.0392	0.0628	2.5422	2.7197	31.1683	0.0000	0.0070	0.0013	0.0032	0.0000
4.A.1.1	1.091505834	4.899214166	0.027497014	0.408965741	0.003308016	0.017168186	0.522024529	4.508393663	1.20177E-06	0.001284125	0.000132181	0.000107057	3.47551E-09
4.A.1.2	1.586161297	21.26898102	0.010557242	0.210629861	0.00491813	0.051498743	1.617060543	19.20903129	1.37502E-06	0.005139575	0.001060874	0.000267278	2.60584E-09
4.A.1.3	0.893391244	4.272563731	0.005164123	0.089664808	0.019429071	0.095588181	0.352959767	4.032371963	7.78995E-08	0.002066056	0.000283141	0.00012205	1.13134E-12
4.A.1.4	0.109627477	1.285287667	0.000494341	0.188722103	0.016516819	0.087527509	0.063101227	1.116630009	1.75346E-08	0.000129401	9.01446E-07	0.000179998	3.7221E-09
4.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.6	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0
4.B.1	0.078568472	2.015410275	1.32325E-05	0.000955214	0.000159927	0.00347959	0.997789143	1.773270965	0.000783075	0.000365355	4.42393E-05	2.70866E-05	1.64573E-09
4.B.2.1	0.434917676	0.316868593	9.53712E-05	0.001714818	0.000313762	0.001053122	0.013358186	0	0	0.000106555	4.38024E-07	6.89655E-05	4.10065E-10
4.B.2.2	0.131345542	0.136960421	0	0	0.005900704	0.002089889	0.000705607	0.125837689	2.32244E-07	3.75857E-05	7.43419E-06	2.09144E-05	3.13753E-10
4- Total facades	4.3255	34.1953	0.0438	0.9007	0.0505	0.2584	3.5670	30.7655	0.0008	0.0091	0.0015	0.0008	0.0000
5.A.1.1	0.425649581	1.961326499	0.000132494	0.095875482	0.020969501	0.108498913	0.123104536	1.700511805	3.59924E-06	0.000306718	3.67227E-05	2.18041E-05	2.05522E-08
5.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
5.A.2	0.18778658	2.931557161	0.000994226	0.014396971	0.027020402	0.527888941	0.036305405	0	0	7.20892E-05	1.95089E-06	7.32368E-05	4.31909E-10
5.A.3	0.320520394	1.53286012	0.001852723	0.032168884	0.006970534	0.034294002	0.12663075	1.446686945	2.79479E-08	0.000741235	0.000101582	4.37877E-05	4.0589E-13
5.A.4	0.190290401	2.624004473	0	0	0	0	0.287939422	2.618996831	4.16636E-06	0.001066628	5.25802E-05	0.000781192	2.17832E-08
5.B.1	0.307839951	1.308319791	0.000584326	0.012570131	0.000293588	0.002556782	0.080095395	1.282666461	1.143E-07	0.001094542	9.17819E-05	5.75775E-05	6.01428E-10
5.B.2	0.086651245	1.194875068	0	0	0	0	0.131117016	1.192594772	1.89721E-06	0.000485703	2.39431E-05	0.000355726	9.91929E-09
5.B.3	0.128266646	2.002384865	0.000679101	0.009833776	0.018456145	0.360571794	0.024798218	0	0	4.92401E-05	1.33255E-06	5.0024E-05	2.95013E-10
5.B.4	0.067818851	0.909389143	0.000451392	0.009005815	0.000210282	0.002201911	0.069139998	0.821312713	5.8791E-08	0.000219751	4.53594E-05	1.14279E-05	1.11417E-10
5.B.5	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.6	0.047343167	0.634828836	0.000315109	0.006286804	0.000146795	0.001537116	0.048265437	0.573344203	4.1041E-08	0.000153404	3.16646E-05	7.97763E-06	7.77781E-11
5.B.7	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.8	0.146947647	0.702763979	0.00084941	0.014748334	0.003195751	0.015722628	0.058055871	0.663256524	1.28131E-08	0.000339831	4.65719E-05	2.00751E-05	1.86087E-13
5-Total Roofs	1.9091	15.8023	0.0059	0.1949	0.0773	1.0533	0.9855	10.2994	0.0000	0.0045	0.0004	0.0014	0.0000
Total building (A1-A5)	12.6240	93.8889	0.1289	3.4837	0.1139	2.8380	10.5593	87.4859	0.0008	0.0241	0.0056	0.0046	0.0000

Ref.	Env imp A4 (/m2/yr) GWP (kg CO2-eq./m2/yr)	ADPF (MJ/m2/yr)	ADPE (kg Sb-eq./m2/yr)	AP (kg SO2-eq./m2/yr)	EP (kg Phosphat-eq./m2/yr)	POCP (kg Ethen-eq./m2/yr)	ODP (kg CFC 11-eq./m2/yr)	Env imp A5 (/m2/yr) GWP (kg CO2-eq./m2/yr)	ADPF (MJ/m2/yr)	ADPE (kg Sb-eq./m2/yr)	AP (kg SO2-eq./m2/yr)	EP (kg Phosphat-eq./m2/yr)	POCP (kg Ethen-eq./m2/yr)	ODP (kg CFC 11-eq./m2/yr)
1.A.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2.1	0.018164228	0.24609599	1.2891E-09	4.2272E-05	1.017E-05	-1.4104E-05	2.99668E-18	7.53355E-05	0.00102959	2.7246E-09	3.2394E-07	1.3267E-06	6.278E-08	4.85495E-12
1.B.2.2	0.010862125	0.16823047	1.8916E-08	6.3583E-05	1.1127E-05	2.3844E-06	2.08235E-09	2.22276E-08	2.6493E-07	8.2128E-13	9.7759E-11	4.0004E-10	1.8889E-11	1.46506E-15
1.B.2.3	0.001167111	0.01646337	7.5954E-11	2.9012E-06	8.6387E-09	1.436E-06	2.75612E-10	0.002259127	0.02398424	8.6731E-11	1.2795E-05	1.5219E-07	1.4211E-05	2.56868E-10
1.B.3.1	0.003212193	0.04352004	2.2796E-10	7.4754E-06	1.7985E-06	-2.4943E-06	5.29938E-19	1.33225E-05	0.00018207	4.8183E-10	5.7287E-08	2.3462E-07	1.1102E-08	8.58559E-13
1.B.3.2	0.00269469	0.04173483	4.6927E-09	1.5774E-05	2.7604E-06	5.9152E-07	5.16592E-10	5.51426E-09	6.5724E-08	2.0374E-13	2.4252E-11	9.9243E-11	4.6861E-12	3.63454E-16
1.B.3.3	0.000377441	0.00532422	2.4563E-11	9.3823E-07	2.7937E-09	4.6439E-07	8.91325E-11	0.000730597	0.00775645	2.8049E-11	4.1378E-06	4.9219E-08	4.5957E-06	8.30704E-11
1.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Total Fundations	0.0365	0.5214	0.0000	0.0001	0.0000	0.0000	0.0000	0.0031	0.0330	0.0000	0.0000	0.0000	0.0000	0.0000
2.A.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.4	0.006633364	0.08987139	4.7075E-10	1.5437E-05	3.7141E-05	-5.1508E-05	1.09435E-18	0.00035918	0.00502699	1.3282E-08	1.5284E-05	6.1137E-05	3.0568E-07	2.36906E-11
2.A.1.5	0.008622762	0.13354766	1.5016E-08	5.0475E-05	8.8331E-06	1.8928E-06	1.65305E-09	1.76451E-08	2.1031E-07	6.5196E-13	7.7605E-11	3.1757E-10	1.4995E-11	1.16302E-15
2.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.4	0.003670596	0.04973066	2.6049E-10	8.5422E-06	2.0552E-05	-2.8502E-05	6.05564E-19	0.000198753	0.0027817	7.3497E-09	8.4576E-06	3.383E-05	1.6915E-07	1.31093E-11
2.A.2.5	0.007014983	0.1086467	1.2216E-08	4.1063E-05	7.1861E-06	1.5399E-06	1.34482E-09	1.43551E-08	1.711E-07	5.304E-13	6.3135E-11	2.5836E-10	1.2199E-11	9.46167E-16
2.A.3.1	0.02295471	0.3109993	1.629E-09	5.342E-05	0.00012853	-0.00017824	3.787E-18	0.00017454	0.00241183	6.3998E-09	7.5634E-07	3.0994E-06	1.4651E-07	1.13716E-11
2.A.3.2	0.019516793	0.30227228	3.3988E-08	0.00011424	1.9993E-05	4.2842E-06	3.74151E-09	3.9938E-08	4.7602E-07	1.4757E-12	1.7565E-10	7.1879E-10	3.394E-11	2.63239E-15
2.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2- Total structural elements	0.0684	0.9951	0.0000	0.0003	0.0002	-0.0003	0.0000	0.0007	0.0102	0.0000	0.0000	0.0001	0.0000	0.0000
3.A.1.1	0.009954597	0.13486873	7.0646E-10	2.3166E-05	5.5737E-06	-7.7297E-06	1.64228E-18	4.12863E-05	0.00056425	1.4932E-09	1.7753E-07	7.271E-07	3.4405E-08	2.66068E-12
3.A.1.2	0.002821234	0.04369472	4.9131E-09	1.6515E-05	2.89E-06	6.193E-07	5.40851E-10	5.77321E-09	6.8811E-08	2.1331E-13	2.5391E-11	1.039E-10	4.9062E-12	3.80522E-16
3.A.1.3	0.009048591	0.84275755	4.5965E-06	0.00053672	0.0001101	2.7524E-05	6.88106E-06	2.05056E-05	0.00290381	7.5898E-10	9.0073E-08	3.6907E-07	1.743E-08	1.35557E-12
3.A.2.1	0.01212	0.1728	5.2E-10	0.0000202	0.00000238	1.006E-06	2.24E-09	0.0222	0.1608	2.08E-07	0.000052	0.00000758	0.00000362	1.66E-09
3.A.2.2	0.002976	0.329616	1.1088E-05	0.000192	4.1952E-05	1.1088E-05	3.8976E-06	3.576E-07	4.992E-06	1.3248E-11	1.5744E-09	6.432E-09	3.0384E-10	2.3616E-14
3.A.2.3	0.03154272	0.346944	1.8912E-06	0.00021943	4.3102E-05	0.00011755	3.91872E-05	2.8608E-06	3.9187E-05	1.0579E-10	1.2578E-05	5.1331E-08	2.4326E-09	1.88832E-13
3.A.2.4	0.0077979	0.115005	2.7583E-08	3.151E-05	5.2267E-07	0.00003179	1.7952E-09	3.2912E-06	7.2276E-05	2.0851E-11	4.7405E-08	8.1065E-09	1.6176E-08	9.35E-14
3.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.1.1	0.004496938	0.06219495	3.6128E-10	1.8902E-05	4.6951E-06	-6.9055E-06	1.50914E-15	0.003582307	0.01487801	3.0945E-10	6.0823E-06	1.0061E-06	-2.0274E-07	1.20426E-15
3.B.1.2	0.012009166	0.16085671	1.245E-09	9.1446E-06	2.0603E-06	-1.2946E-07	2.52303E-16	0.022971661	0.00611476	4.0214E-10	3.0078E-06	6.6656E-07	2.0107E-07	3.14552E-16
3.B.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.5.1	0.000535591	0.0074075	4.3029E-11	2.2513E-06	5.5919E-07	-8.2245E-07	1.79741E-16	0.000426658	0.00177199	3.6856E-11	7.2441E-07	1.1983E-07	-2.4147E-08	1.4343E-16
3.B.5.2	0.001430308	0.01915825	1.4828E-10	1.0891E-06	2.4538E-07	-1.5418E-08	3.00496E-17	0.002735955	0.00072828	4.7896E-11	3.5823E-07	7.9389E-08	2.3948E-08	3.74636E-17
3.B.6	0.001468973	0.16155866	8.8057E-07	0.00010145	2.029E-05	4.0579E-06	1.91129E-06	7.71008E-05	0.00107941	2.8487E-09	3.3884E-07	1.3838E-06	6.5333E-08	5.07242E-12
3.B.7	0.000126353	0.01390529	7.5901E-08	8.8514E-06	1.7703E-06	4.4257E-07	1.64414E-07	0.002354466	0.00071165	8.2362E-11	7.7228E-07	1.7512E-07	4.5186E-08	8.86244E-19
3.C.1.1	0.000645534	0.00920365	2.7696E-11	1.0759E-06	1.2676E-07	5.3581E-08	1.19307E-10	0.001182414	0.00856451	1.1078E-08	2.7696E-06	4.0373E-07	1.9281E-07	8.84147E-11
3.C.1.2	0.000158507	0.01755597	5.9057E-07	1.0226E-05	2.2344E-06	5.9057E-07	2.07594E-07	1.90464E-08	2.6588E-07	7.0561E-13	8.3856E-11	3.4258E-10	1.6183E-11	1.25783E-15
3.C.1.3	0.003152802	0.03467823	1.8903E-07	2.1932E-05	4.3082E-06	1.175E-05	3.91689E-06	2.85947E-07	3.9169E-06	1.0574E-11	1.2572E-06	5.1307E-09	2.4315E-10	1.88744E-14
3.C.1.4	0.000728052	0.00986393	5.1668E-11	1.6943E-06	4.0764E-06	-5.6533E-06	1.20112E-19	3.94222E-05	0.00055174	1.4578E-09	1.6775E-06	6.7102E-06	3.3551E-08	2.60019E-12
3.C.1.5	0.000946401	0.01465767	1.6481E-09	5.5399E-06	9.6948E-07	2.0775E-07	1.81432E-10	1.93666E-09	2.3083E-08	7.1557E-14	8.5176E-12	3.4855E-11	1.6458E-12	1.27649E-16
3.C.1.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Total non-load bearing elements	0.1020	2.4967	0.0000	0.0012	0.0002	0.0002	0.0001	0.0556	0.1988	0.0000	0.0001	0.0000	0.0000	0.0000
4.A.1.1	0.030428168	0.40756995	3.1545E-09	2.317E-05	5.2202E-06	-3.2801E-07	6.39271E-16	0.058204339	0.01549324	1.0189E-09	7.621E-06	1.6889E-06	5.0946E-07	7.96995E-16
4.A.1.2	0.015192129	0.21011487	1.2205E-09	6.3858E-05	1.5862E-05	-2.3329E-05	5.09838E-15	0.012102205	0.05026277	1.0454E-09	2.0548E-05	3.3989E-06	-6.8493E-07	4.0684E-15
4.A.1.3	0.006595096	0.08874882	5.4226E-10	9.7542E-06	2.1251E-06	-2.1882E-06	1.63758E-18	0.045066489	0.08970552	1.6433E-09	4.5168E-05	6.4404E-06	2.7052E-06	2.2635E-14
4.A.1.4	0.014219585	0.18755895	4.8853E-10	3.9547E-05	1.1137E-08	6.1356E-05	3.05329E-10	0.007008016	0.07764068	7.2406E-10	1.8029E-05	8.2875E-08	2.6084E-05	1.92793E-10
4.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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4.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.B.1	0.605582479	0.00093681	4.3328E-07	2.4257E-07	3.8644E-08	1.1024E-08	1.04722E-11	0.814692451	0.00339595	4.3997E-12	4.4331E-07	4.6841E-08	2.9108E-08	2.99445E-11
4.B.2.1	0.000129543	0	0	4.1317E-07	3.8211E-10	3.7279E-07	1.64337E-20	0.004877291	0	0	1.9664E-06	1.2178E-10	2.2336E-06	5.62286E-19
4.B.2.2	7.68896E-05	0.00846176	4.6188E-08	5.3863E-06	1.0773E-06	2.6932E-07	1.00051E-07	0.001432759	0.00043306	5.012E-11	4.6996E-07	1.0657E-07	2.7497E-08	5.39304E-19
4- Total facades	0.6722	0.9034	0.0000	0.0001	0.0000	0.0000	0.0000	0.9434	0.2369	0.0000	0.0001	0.0000	0.0000	0.0000
5.A.1.1	0.006322148	0.09013756	2.7125E-10	1.0537E-05	1.2415E-06	5.2476E-07	1.16845E-09	0.011580172	0.08387801	1.085E-07	2.7125E-05	3.954E-06	1.8883E-06	8.65905E-10
5.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.A.2	0.001084989	0	0	1.2206E-06	3.9018E-09	1.0537E-06	1.07456E-16	0.019821917	0	0	4.2356E-05	6.0196E-07	3.9435E-05	1.64835E-09
5.A.3	0.002366111	0.03184026	1.9455E-10	3.4995E-06	7.6241E-07	-7.8505E-07	5.87511E-19	0.016168425	0.03218349	5.8956E-10	1.6205E-05	2.3106E-06	9.7054E-07	8.12073E-15
5.A.4	0.01645361	0.18097619	9.8651E-07	0.00011446	2.2483E-05	6.1318E-05	2.04412E-05	1.49228E-06	2.0441E-05	5.5184E-11	6.561E-06	2.6776E-08	1.2689E-09	9.85003E-14
5.B.1	0.00092352	0.01245612	7.867E-11	6.7269E-07	1.3397E-07	-8.6651E-09	6.61286E-17	0.00215488	0.00245987	1.81E-11	9.1782E-07	1.5392E-07	-2.6423E-08	1.5563E-16
5.B.2	0.007492368	0.08240989	4.4922E-07	5.2121E-05	1.0238E-05	2.7922E-05	9.30817E-06	6.79528E-07	9.3082E-06	2.5129E-11	2.9876E-06	1.2193E-08	5.7783E-10	4.48534E-14
5.B.3	0.000741096	0	0	8.3373E-07	2.6651E-09	7.1972E-07	7.3397E-17	0.013539257	0	0	2.8931E-05	4.1117E-07	2.6936E-05	1.1259E-09
5.B.4	0.000649564	0.0089838	5.2185E-11	2.7304E-06	6.7819E-07	-9.9747E-07	2.17989E-16	0.000517449	0.00214906	4.4699E-11	8.7856E-07	1.4533E-07	-2.9285E-08	1.73951E-16
5.B.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.6	0.000453449	0.00627143	3.643E-11	1.906E-06	4.7343E-07	-6.9631E-07	1.52174E-16	0.000361222	0.00150023	3.1203E-11	6.1331E-07	1.0145E-07	-2.0444E-08	1.21432E-16
5.B.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.8	0.001084781	0.01459767	8.9193E-11	1.6044E-06	3.4954E-07	-3.5992E-07	2.69354E-19	0.00741267	0.01475503	2.7029E-10	7.4294E-06	1.0593E-06	4.4496E-07	3.72308E-15
5-Total Roofs	0.0376	0.4277	0.0000	0.0002	0.0000	0.0001	0.0000	0.0716	0.1370	0.0000	0.0001	0.0000	0.0001	0.0000
Total building (A1-A5)	0.8791	4.9166	0.0000	0.0018	0.0005	0.0000	0.0001	1.0028	0.4789	0.0000	0.0002	0.0001	0.0001	0.0000

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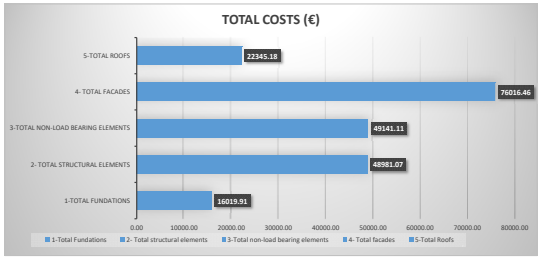
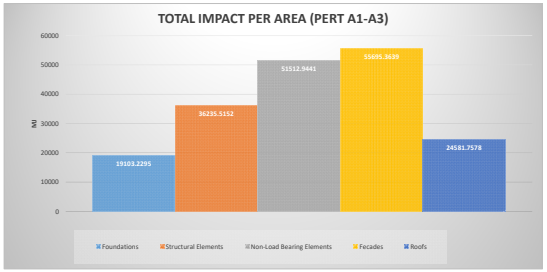
BIM-LCA Construction Project

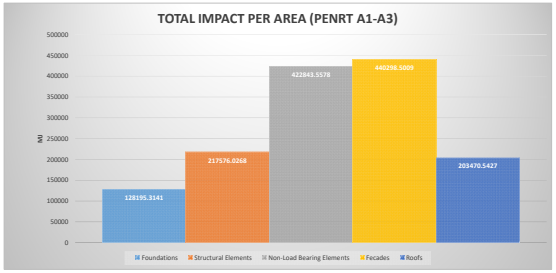
Graphical Results

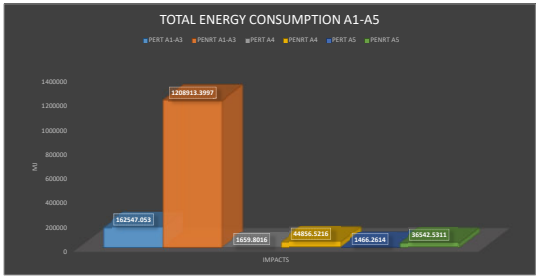
Project name: Single-family house in concrete and bricks

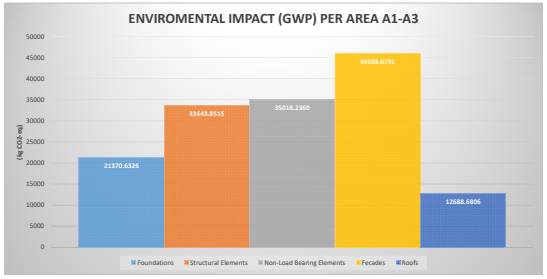
Enviromental Impacts	
Abiotic depletion potential for fossil resources (ADPF)	Eutrophication potential (EP)
Abiotic depletion potential for non fossil resources (ADPE)	Photochemical Ozone Creation Potential (POCP)
Acidification potential (AP)	Ozone Depletion Potential (ODP)
Global warming potential (GWP)	

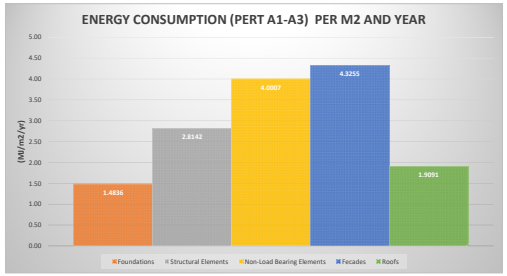


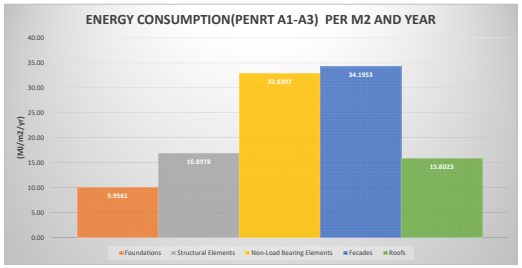


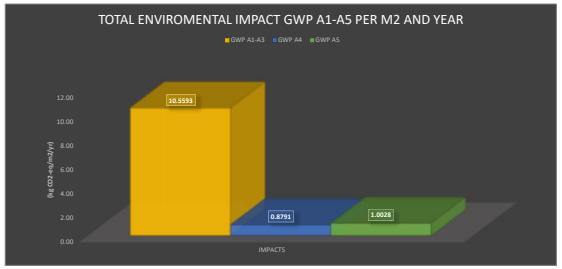












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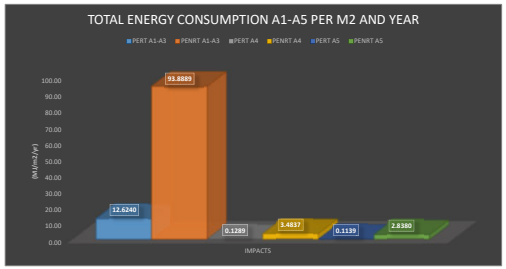

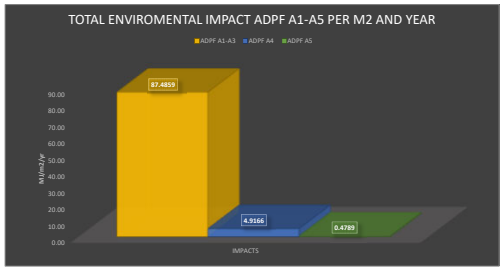

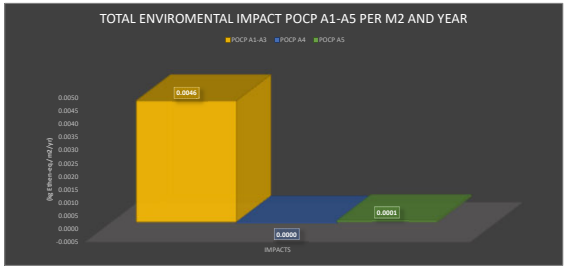

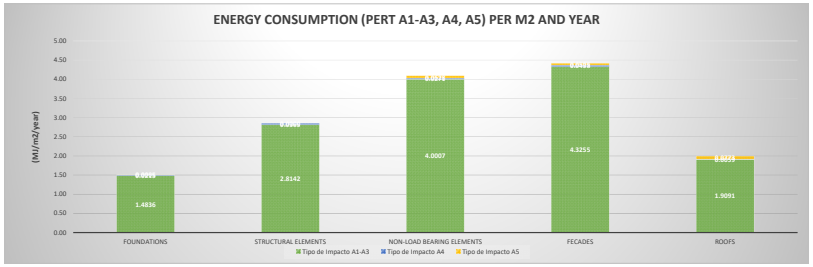

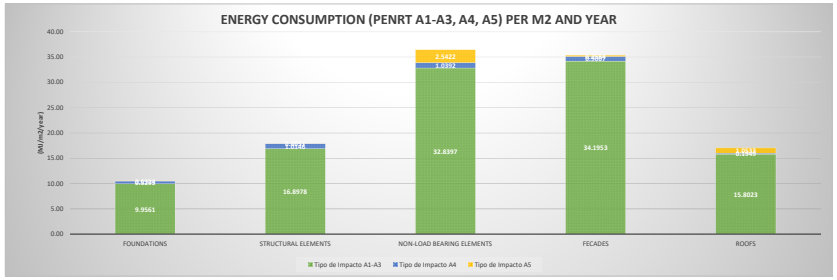

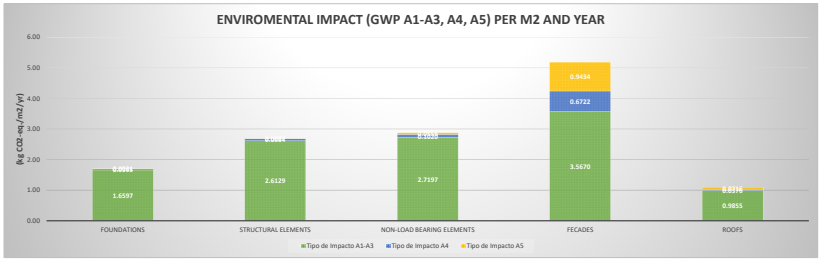

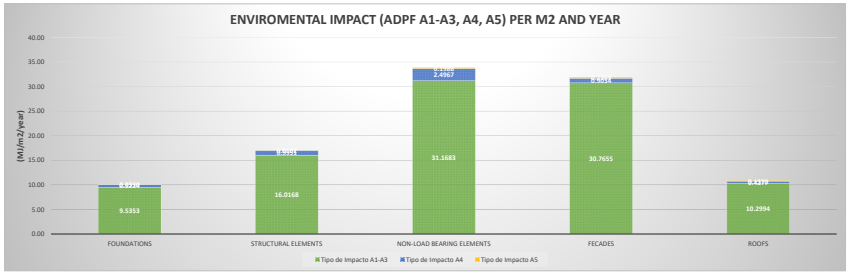

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BIM-LCA Construction Project

Graphical Results

Project name: Single-family house in concrete and bricks

Enviromental Impacts	
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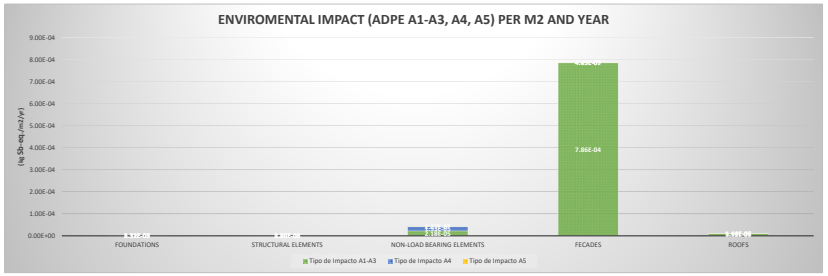
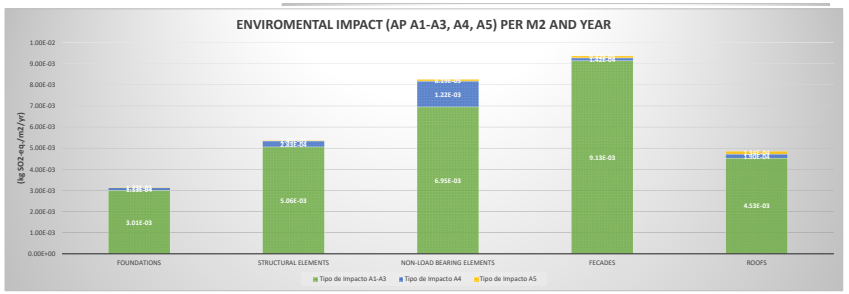
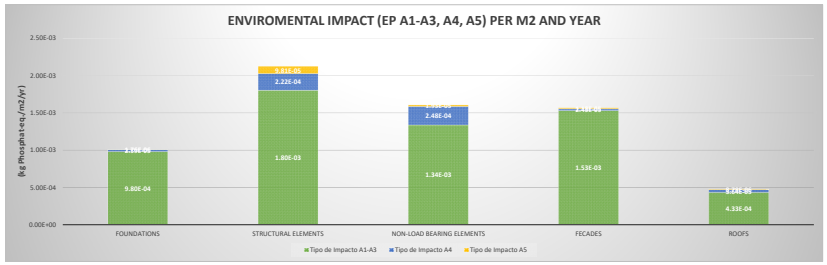
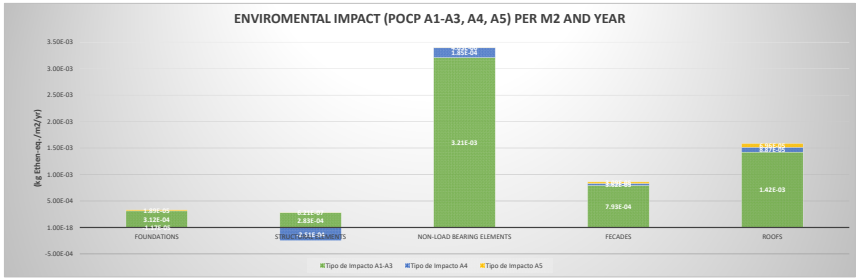
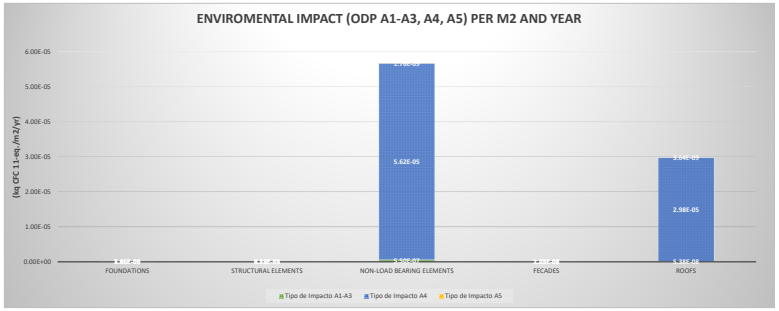
Global warming potential (GWP)	











Annex 2. LCA with Excel app of a single-family house in steel and bricks

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BIM-LCA Construction Project

Inputs

1- Data of the building

Project Name:	**Single-family house with steel structure and bricks**	
Building type	Residential	
Address	Street 1	
IndoorFloor area	257.52	m2
Analysed service life	50	year
City	Cartagena	
Country	Spain	

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable

2- Areas and volumes in elements of the building - User inputs

Footing volume (m3):	24.88
Volume of Foundation beams (m3):	12.37
Footing plant area (m2):	9.05
Foundation beam plant area (m2):	4.52
Volume of piles (m3):	0.00
Volumen of pile caps (m3):	0.00
Pile cap plant area (m2):	0.00
Foundation slab volume (m3):	0.00
Foundation slab plant area (m2):	0.00
Column volume (m3):	4.87
beam volume (m3):	1.41
Retaining wall volume (m3):	0.00
Area of slabs (including beams) (m2):	351.13
Partition area (m2):	221.66
Facade area (m2):	374.42
Exterior party wall (m2):	0.00
Stairs (m2):	10.80
Ramps (m2):	0.00
Steel volume in stiffening elements (m3):	0.00
Concrete volume in stiffening walls (m3):	0.00
Interior door surface (m2):	7.64
Main door surface (m2):	4.00
Exterior glazed door surface (m2):	4.00
Windows surface (m2):	21.54
Flat roof area (m2):	134.33
Inclinated roof area (horizontal projection) (m2):	86.22
roof inclination angle (deg):	20.00
parapets (m2):	26.40
Railing (m):	5.50

Note: IMPORTANT - If any of the previus element is missing in the project enter 0

Floor Areas (m2)	Indoor	outdoor	total
Ground floor:	116.52	80.37	196.89
Intermediate floors:	141		
roof type 1:		128.48	
roof tape 2:		5.85	

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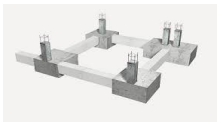
BIM-LCA Construction Project

Inputs

2- Choice the type of structural, construction systems & materials

a) Type of Foundation: 2 (enter 1, 2 or 3)


(1) Piles and pile caps


(2) Footings


(3) Foundation slab

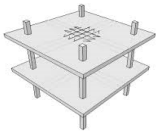
b) Material in Beams and Columns 2


(1) Reinf. Concrete

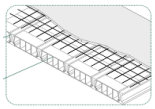

(2) Steel


(3) Timber

c) Type of structural slabs 2 (enter 1, 2, 3 or 4)


(1)-Mass concrete slabs


(2) Composite slab slabs


(3) Lightweight concrete slabs


(4) Timber slabs

c-1) If the perviuos answer was *(3) Lightweight concrete slabs* , pease chose:

Type of bocks: 1


(1) Concrete blocks


(2) Ceramic blocks

d) If it exists in the building, choose one of these stiffening systems:

Type of structure stiffening system: 0


(0) Without stiffening system


(1) Concrete stiffening walls

(2) Steel stiffening elements

e) Type of flooring (non-structural) 1


(1) Ceramic flooring


(2) Wood floating floor


(3) Screed flooring

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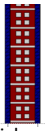
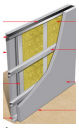
BIM-LCA Construction Project

Inputs

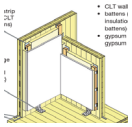
f) Type of internal partitions 1



(1) Brick walls



(2) Gypsum cardboard walls



(3) Structural Timber wall

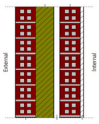
g) Type of stairs 2

(1) Concrete

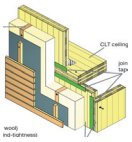
(2) Steel

(3) Timber

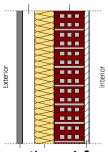
h) Type of facades 1



(1) Double bricks wall



(2) Timber



(3) Ventilated facade

h-1) If the perviuos answer was *(3) Ventilated facade* , pease chose:

Type of tiles for external cladding: 1

N-STON	PORCE	A-STON
(1) Natural semi-rijo limestone	(1) EXTRUDED PORCELAIN	(2) Artificial stone Aggregates+polyester resins

i) Type of windows 1

(1) PVC Double Glazed Window WIN_PVC

(2) Hardwood double glazed window WIN_WOOD

(3) Aluminium Window WIN_AL

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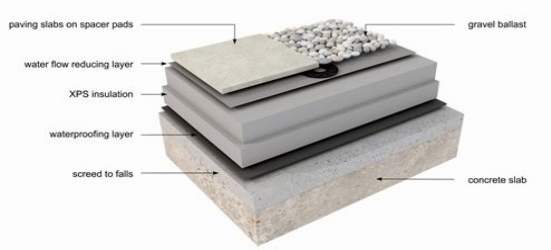
BIM-LCA Construction Project

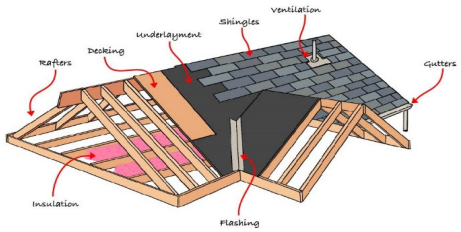
Inputs

j) Type of finishing coat in flat roof 1 (enter 1 or 2)



(1) Ceramic tiles (2) Gravel ballast

k) Type of inclinated roof 1



(1) with brick walls (2) With timber structure

l) Structure under inclinated roof

Eliminate the structure and insulation of inclinated roofs?: 2 (enter 1 or 2)

(1) Yes (2) No

m) Material in the insulation layers of the facades and roofs 1 (enter 1,2,...or 6)

1	MWOOL	Mineral wool insulation
2	POLYU1	Insulation board with a core of rigid polyurethane
3	POLYU2	Polyurethane thermal insulation spray foam
4	EPS	Expanded Polystyrene for insulation
5	CELL	Cellulose Fibre Insulation
6	CORK	Cork-based thermal insulation panels

BIM-LCA

BIM-LCA Construction Project

Co-funded by the European Union

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Building Material Quantities

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable
30	Parameter loaded by default by app and editable by user
1098.46	**kg** Quantity calculated by the program based on the user inputs and parameters of each material. Not user-editable
MWOOL	A type of material or construction element from which one material can be chosen from several alternatives. See note 3, 4 and 5.

Project name: Single-family house with steel structure and bricks

						Auxiliary quantiites								
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula
1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0			0.00	vol (m3)			0.00	**m3**	Q=nr*Par1
			1.A.2	Rebar	REB	0			30	Kg Rebar/m3 Con			0.00	**kg**	Q=nr*Par1*Qcon
	1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0			0.00	vol (m3)			0.00	**m3**	Q=nr*Par1
			1.B.1.2	Rebar	REB	0			80	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
			1.B.1.3	Blinding concrete	CON0	0	0.10		0.00	pile cap area (m2)			0.00	**m3**	Q=nr*e*Par1
		1.B.2-Footings	1.B.2.1	Concrete	CON1	1			24.88	footing vol (m3)			24.88	**m3**	Q=nr*Par1
			1.B.2.2	Rebar	REB	1			63.3	Kg Rebar/m3 Con			1574.90	**kg**	Q=Par1*Qcon
			1.B.2.3	Blinding concrete	CON0	1	0.10		9.05	Footing area (m2)			0.91	**m3**	Q=nr*e*Par1
		1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	1			12.37	beam vol (m3)			12.37	**m3**	Q=nr*Par1
			1.B.3.2	Rebar	REB	1			88.8	Kg Rebar/m3 Con			1098.46	**kg**	Q=nr*Par1*Qcon
			1.B.3.3	Blinding concrete	CON0	1	0.10		4.52	Beam area (m2)			0.45	**m3**	Q=nr*e*Par1
		1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0			0.00	slab vol (m3)			0.00	**m3**	Q=nr*Par1
			1.B.4.2	Rebar	REB	0			75	Kg Rebar/m3 Con			0.00	**kg**	
			1.B.4.3	Blinding concrete	CON0	0	0.10		0.00	Slab area (m2)			0.00	**m3**	Q=e*Par1
	1.C - Retaining walls		1.C.1	Concrete	CON3	1			0.00	wall vol (m3)			0.00	**m3**	Q=nr*Par1
			1.C.2	Rebar	REB	1			90	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams (Timber, steel or concrete)	2.A.1.1	Gulam Timber	GLT	0			1.41	beam volume (m3)			0.00	**m3**	Q=nr*Par1
			2.A.1.2	Steel in timber connec. (galvanized)	ST-G	0			8	kg Steel/m3 timber			0.00	**kg**	Q=nr*Par1*Q CLT
			2.A.1.3	Structural steel	ST	1		7850	1.41	beam volume (m3)	1.1	due to connections	12175.35	**kg**	Q=nr*Par1*d*Par2
			2.A.1.4	Concrete	CON3	0			1.41	beam volume (m3)			0.00	**m3**	Q=nr*Par1
			2.A.1.5	Rebar	REB	0			137.6	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Q Con
		2.A.2-Columns (Timber, steel or concrete	2.A.2.1	Gulam Timber	GLT	0			4.87	column vol (m3)			0.00	**m3**	Q=nr*Par1
			2.A.2.2	Steel in timber connect. (galvanized)	ST-G	0			8	kg Steel/m3 timber			0.00	**kg**	Q=nr*Par1*Q CLT
			2.A.2.3	Structural steel	ST	1		7850	4.87	column vol (m3)	1.1	due to connections	42052.45	**kg**	Q=nr*Par1*d*Par2
			2.A.2.4	Concrete	CON3	0			4.87	column vol (m3)			0	**m3**	Q=nr*Par1
			2.A.2.5	Rebar	REB	0			202.3	Kg Rebar/m3 Con			0.00	**kg**	
		2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	0	0.25		345.49	Slab area (m2)			0.00	**m3**	Q=nr*e*Par1
			2.A.3.2	Rebar	REB	0			90	Kg Rebar/m3 Con			0.00	**kg**	
		2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	1	0.16		351.13	Slab area (m2)			56.18	**m3**	Q=nr*e*Par1
			2.A.4.2	Rebar	REB	1			25	Kg Rebar/m3 Con			1404.52	**kg**	Q=Par1*Q Con
			2.A.4.3	Galvanized steel plates	ST-G	1	0.001	7850	351.13	Slab area (m2)	1.200	m2 plates/m2 slab	3307.64	**kg**	Q=nr*e*Par1*Par2*d
		2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0	0.25		345.49	Slab area (m2)	0.820	m3 block/m2 slab	0.00	**m3**	Q=nr*e*Par1*Par2
			2.A.5.2	Ceramic blocks	CERB	0	0.25	320	345.49	Slab area (m2)	0.820	m3 block/m2 slab	0.00	**kg**	Q=nr*e*Par1*Par2*d
			2.A.5.3	Precast concrete beams	CONBEAM	0		2500	345.49	Slab area (m2)	0.038	m2 beam cross sec	0.00	**kg**	Q=nr*(Par1/0.8)*Par2*d
			2.A.5.4	Concrete (cast in place)	CON2	0	0.05		345.49	Slab area (m2)			0.00	**m3**	Q=nr*Par1*e
			2.A.5.5	Rebar	REB	0			25	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Q Con
		2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	0	0.16		351.13	foor area (m2)			0.00	**m3**	Q=nr*Par1*e
			2.A.6.2	Steel in timber connect. (galvanized)	ST-G	0			4	kg Steel/m3 CLT			0.00	**kg**	Q=nr*Par1*Q CLT
	2.B-Concrete stiffening walls/steel in stiffening elements		2.B.1	Structural steel	ST	0		7850	0.00	steel volume (m3)	1.1	due to connections	0.00	**kg**	Q=nr*Par1*d*Par2
			2.B.2	Concrete	CON3	0			0.00	concrete vol (m3)			0.00	**m3**	Q=nr*Par1
			2.B.3	rebar	REB	0			140	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	1	0.15		196.89	Slab area (m2)			29.53	**m3**	Q=nr*Par1*e
			3.A.1.2	rebar	REB	1			30	Kg Rebar/m3 Con			886.01	**kg**	Q=Par1*Qcon
			3.A.1.3	Graded aggregate	AGG	1	0.25	1800	196.89	Slab area (m2)			88600.50	**kg**	Q=nr*Par1*e*d
		3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	1			257.52	Floor area (m2)			257.52	**m2**	Q=nr*Par1
			3.A.2.2	Tile bond coat (adhesive)	ADH	1			257.52	Floor area (m2)	6.00	kg/m2	1545.12	**kg**	Q=nr*Par1*Par2
			3.A.2.3	Mortar bed	MOR	1	0.03	1600	257.52	Floor area (m2)			12360.96	**kg**	Q=nr*e*Par1*d
			3.A.2.4	Cleavage membrane	POLY	1	0.005		257.52	Floor area (m2)			1.29	**m3**	Q=nr*e*Par1
		3.A.3-Flooring Type II: Wood floating	3.A.3.1	Laminated wood flooring	WFL	0			257.52	Floor area (m2)			0.00	**m2**	Q=nr*Par1
			3.A.3.2	Chipboard flooring (plywood)	PLYW	0	0.03		257.52	Floor area (m2)			0.00	**m3**	Q=nr*Par1*e

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Project name: Single-family house with steel structure and bricks

							Auxiliary quantiites								
						nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula
3 - Non-load bearing elements	3.B-Vertical elements	floor or	3.A.3.3	Insulation layer	MWOOL	0	0.04		257.52	Floor area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.A.3.4	Timber battens	GLT	0			257.52	Floor area (m2)	0.045	m3 timb/m2 floor	0.00	**m3**	Q=nr*Par1*Par2
		3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0	0.05		257.52	Floor area (m2)			0.00	**m4**	Q=nr*Par1*e
			3.A.4.2	Sound insulation layer	POLY	0	0.005		257.52	Floor area (m2)			0.00	**m3**	Q=nr*e*Par1
		3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	1	0.110	805	221.66	Wall area (m2)			19627.99	**kg**	Q=nr*e*Par1*d
			3.B.1.2	Finishing coat (plastering mortars)	PLASM	1	0.02	1600	221.66	Wall area (m2)			7093.12	**kg**	Q=nr*e*Par1*d
		3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0			221.66	Wall area (m2)			0.00	**m2**	Q=nr*Par1
			3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0			221.66	Wall area (m2)	3.040	kg ST /m2 wall	0.00	**kg**	Q=nr*Par1*Par2
			3.B.2.3	Insulation layer	MWOOL	0	0.05		221.66	Wall area (m2)			0.00	**m3**	Q=nr*Par1
		3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	0	0.100		221.66	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.3.2	Steel in timber connect. (galvanized)	ST-G	0			4	kg Steel/m3 CLT			0.00	**kg**	Q=nr*Par1*Q CLT
			3.B.3.3	Insulation layer	MWOOL	0	0.050		221.66	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.3.4	Timber battens	GLT	0			221.66	Wall area (m2)	0.045	m3 timb/m2 wall	0.00	**m3**	Q=nr*Par1*Par2
			3.B.3.5	Gypsum plasterboard	GYP_P	0			221.66	Wall area (m2)	2	number or boards	0.00	**m2**	Q=nr*Par1*Par2
		3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	1	0.20		0.00	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.4.2	Insulation layer	MWOOL	1	0.05		0.00	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.4.3	Finishing coat (plastering mortars)	PLASM	1	0.04	1600	0.00	Wall area (m2)			0.00	**kg**	Q=nr*e*Par1*d
		3.B.5-Parapets	3.B.5.1	Brick wall	CERB	1	0.110	805	26.40	Wall area (m2)			2337.72	**kg**	Q=nr*e*Par1*d
			3.B.5.2	Finishing coat (plastering mortars)	PLASM	1	0.02	1600	26.40	Wall area (m2)			844.80	**kg**	Q=nr*e*Par1*d
		3.B.6-Railings	3.B.6	Railings	ST-SL	1			5.50	long (m)	9.50	kg ST/m railing	52.25	**kg**	Q=nr*Par1*Par2
		3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	1			7.64	door (m2)			7.64	**m2**	Q=nr*Par1
	3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	1			10.80	stairs area (m2)	1.27	m2 title/m2 stairs	13.72	**m2**	Q=nr*Par1*Par2
			3.C.1.2	Tile bond coat (adhesive)	ADH	1			6.00	kg/m2 title			82.30	**kg**	Q=nr*Par1*m2 title
			3.C.1.3	Mostar	MOR	1		1600	10.80	stairs area (m2)	0.0715	m3 mor/m2 stairs	1235.52	**kg**	Q=nr*Par1*Par2*d
			3.C.1.4	Concrete	CON3	0	0.20		10.80	stairs area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.C.1.5	Rebar	REB	0			137.6	Kg Rebar/m3 Con			0.00	**kg**	Q=nr*Par1*Qcon
			3.C.1.6	Structural steel	ST	1			10.80	stairs area (m2)	21.33	kg ST/m2 Stairs	230.36	**kg**	Q=nr*Par1*Par2
			3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	0	0.160		10.80	stairs area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0			4.00	kg Steel/m3 CLT			0.00	**kg**	Q=nr*Par1*Q CLT
		3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	1			0.00	ramp area (m2)			0.00	**m2**	Q=nr*Par1
			3.C.2.2	Tile bond coat (adhesive)	ADH	1			0.00	ramp area (m2)	6.00	kg/m2 title	0.00	**kg**	Q=nr*Par1*Par2
			3.C.2.3	Mostar	MOR	1	0.03	1600	0.00	ramp area (m2)			0.00	**kg**	Q=nr*e*Par1*d
			3.C.2.4	Concrete	CON3	1	0.10		0.00	ramp area (m2)			0.00	**m3**	Q=nr*e*Par1
			3.C.2.5	Rebar	REB	1			30	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	1	0.03	1600	374.42	Wall area (m2)			17972.16	**kg**	Q=nr*e*Par1*d
			4.A.1.2	Brick walls	CERB	1	0.22	805	374.42	Wall area (m2)			66309.78	**kg**	Q=nr*e*Par1*d
			4.A.1.3	Insulation layer	MWOOL	1	0.07	152	374.42	Wall area (m2)			26.21	**m3**	Q=nr*Par1*e
			4.A.1.4	Interior finish	GYP_P	1			374.42	Wall area (m2)			374.42	**m2**	Q=nr*Par1
		4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	0			374.42	Wall area (m2)			0.00	**m2**	Q=nr*Par1
			4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	0	0.100		374.42	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			3.B.3.2	Steel in timber connect (galvanized)	ST-G	0			4	kg Steel/m3 CLT			0.00	**kg**	Q=nr*Par1*Q CLT
			4.A.2.3	Insulation layer	MWOOL	0	0.05		374.42	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			4.A.2.4	Timber battens	GLT	0			374.42	Wall area (m2)	0.045	m3 timb/m2 wall	0.00	**m3**	Q=nr*Par1*Par2
			4.A.2.5	External wooden cladding	WCLA	0			374.42	Wall area (m2)			0.00	**m2**	Q=nr*Par1
		4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0			374.42	Wall area (m2)			0.00	**m2**	Q=nr*Par1
			4.A.3.2	Brick wall	CERB	0	0.12	1000	374.42	Wall area (m2)			0.00	**kg**	Q=nr*e*Par1*d
			4.A.3.3	Insulation layer	MWOOL	0	0.05		374.42	Wall area (m2)			0.00	**m3**	Q=nr*Par1*e
			4.A.3.4	Tiles for external cladding	N-STON	0	0.03	2750	374.42	Wall area (m2)			0.00	**kg**	Q=nr*Par1*e*d
	4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_PVC	1			21.54	Surface (m2)			21.54	**m2**	Q=nr*Par1
		4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	1			4.00	Surface (m2)			4.00	**m3**	Q=nr*Par2
			4.B.2.2	Exterior front doors	DOOR_W	1			4.00	Surface (m2)			4.00	**m3**	Q=nr*Par3

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Building Material Quantities

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable
30	Parameter loaded by default by app and editable by user
1098.46	**kg** Quantity calculated by the program based on the user inputs and parameters of each material. Not user-editable
MWOOL	A type of material or construction element from which one material can be chosen from several alternatives. See note 3, 4 and 5.

Project name: Single-family house with steel structure and bricks

						Auxiliary quantiites								
						nr.	thickness	density	Parameter 1		Parameter 2		Material	
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula
5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	1		2300	134.33	roof area (m2)			134.33	**m2**	Q=nr*Par1
			5.A.1.2	Gravel ballast	GRAV	0	0.15	1800	134.33	roof area (m2)			0.00	**kg**	Q=nr*Par1*e*d
		5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	1			134.33	roof area (m2)			134.33	**m2**	Q=nr*Par1
		5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	1	0.07		134.33	Wall area (m2)			9.40	**m3**	Q=nr*Par1*e
		5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	1	0.03	1600	134.33	Wall area (m2)			6447.84	**kg**	Q=nr*e*Par1*d
	5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	1			86.22	roof tiles area (m2)	40	kg/m2	3670.14	**kg**	Q=nr*Par1*Par2/cos(Par3)
		5.B.2-Mostar	5.B.2	Cement mostar	MOR	1	0.02	1600	86.22	roof tiles area (m2)			2936.11	**kg**	Q=nr*e*Par1*d/cos(Par3)
		5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	1			86.22	roof tiles area (m2)			91.75	**m2**	Q=nr*Par1/cos(Par3)
		5.B.4-Decking	5.B.4	Ceramic deck or	CERB	1	0.03	1030	86.22	roof tiles area (m2)			2835.18	**kg**	Q=nr*e*Par1*d/cos(Par3)
			5.B.5	wooden deck (plywood)	PLYW	0	0.03		86.22	roof tiles area (m2)			0.00	**m3**	Q=nr*Par1*e
		5.B.5-Structure	5.B.6	Brick walls or	CERB	1	0.045	483	86.22	roof tiles area (m2)	0.80	wall separation (m)	1979.19	**kg**	Q=nr*e*(Par1^0.5/Par2)*(tg(Par
			5.B.7	Gulam timber beams	GLT	0	0.05		86.22	roof tiles area (m2)	0.60	wall separation (m)	0.00	**m3**	Q=nr*e*0.05*(((Par1^0.5)/cos(P
		5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	1	0.05		86.22	roof tiles area (m2)			4.31	**m3**	Q=nr*Par1*e

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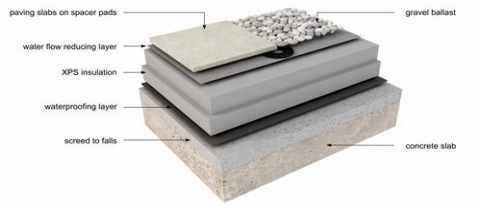
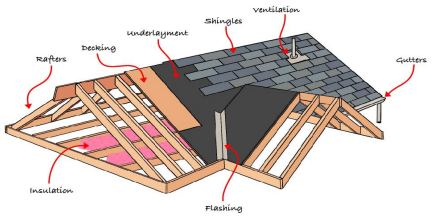
					Auxiliary quantiites									
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements	Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula

5.A - Flat roof



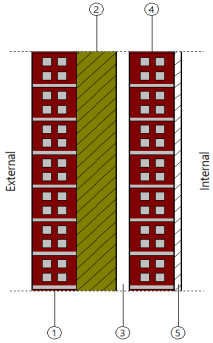
5.B - Tiled roof with timber structure



5.B - Tiled roof

Tiled roof with brick walls

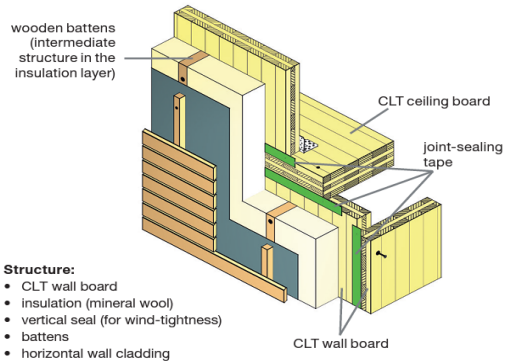
4.A.1 - Facade Type I: Facade with double brick wall



Layers
1 - M01 - 100 mm brick: 10.16 cm
2 - I04 - 89 mm batt insulation: 8.94 cm
3 - F04 - Wall air space resistance: 3.00 cm
4 - M01 - 100 mm brick: 10.16 cm
5 - G01 - 16 mm gyp board: 1.59 cm
Total thickness: 33.85 cm
Thermal description
Heat transfer coefficient (U): 0.39 W/(m²·K)
Thermal capacity: 51975.29 J/m²·K

4.A.2 - Facade Type II: with Timber walls

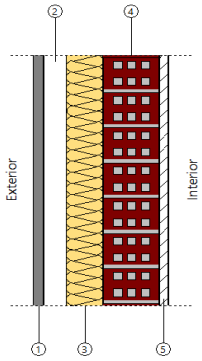
External wall
Insulation with mineral wool



Structure:

- CLT wall board
- insulation (mineral wool)
- vertical seal (for wind-tightness)
- battens
- horizontal wall cladding

4.A.3 - Facade Type III: Ventilated facade



Capas
1 - Caliza muy dura [2200 < d < 2590]: 2.00 cm
2 - Cámara de aire: 5.00 cm
3 - URSA TERRA Vento Plus P8792 80mm: 8.00 cm
4 - 1/2 pie LP métrico o catalán 40 mm< G < 60 mm: 12.00 cm
5 - Enlucido de yeso 1000 < d < 1300: 2.00 cm
Espesor total: 29.00 cm
Caracterización térmica
Transmitancia térmica (U): 0.33 W/(m²·K)
Capacidad térmica: 61992.71 J/m²·K

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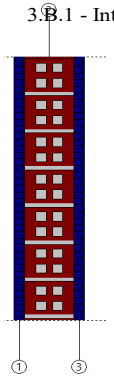
Project name: Single-family house with steel structure and bricks

					Auxiliary quantiites									
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements	Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula

3.B.1 - Internal partitions type I: brick walls

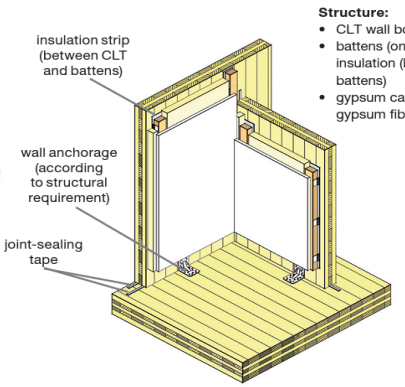


Layers
1 - Cement, sand: 2.00 cm
2 - M01 - 100 mm brick: 10.16 cm
3 - Cement, sand: 2.00 cm
Total thickness: 14.16 cm
Thermal description
Heat transfer coefficient (U): 2.42 W/(m²·K)
Thermal capacity: 70113.91 J/m²·K

3.B.2 - Internal partitions type II: Gypsum walls

3.B.3 - Internal partitions type III: Timber walls

Internal wall
Facing panel (spring clips)



Structure:
- CLT wall board
- battens (on spring clips), insulation (between battens)
- gypsum cardboard or gypsum fibreboard

3.A.2 - Flooring Type I: Ceramic flooring

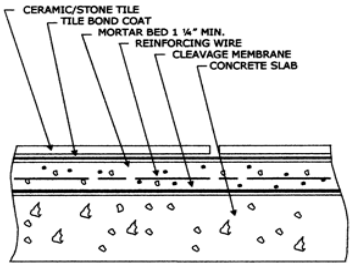
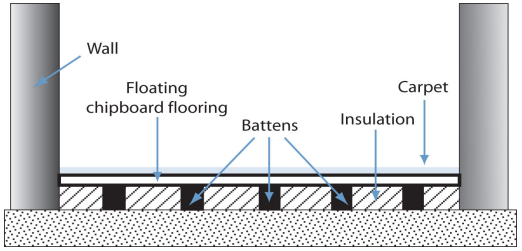
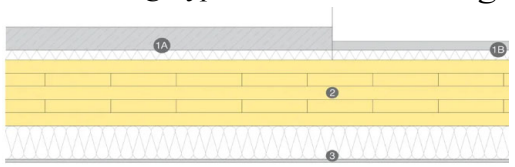


FIGURE F

3.A.3 - Flooring Type II: Wooden floating floor



3.A.4 - Flooring Type III: Screed flooring



1A. Wet screed (50-70 mm) with impact sound insulation (20-30 mm).
1B. Dry screed (25 mm) with impact sound insulation (20-30 mm).
2. CLT floor 220 mm (140 mm or thicker).
3. Mineral wool and suspended ceiling (~70 mm) with single layer gypsum board ceiling.

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BIM-LCA Construction Project

Description of Materials and Impact Data

Project name: Single-family house with steel structure and bricks

			1	2	3	4	5	6
nr.	Building part	Type of Material	Mat Code	Material Name	Description	Quant. Studied in EPD	Unit	Cost €
1	Under foundation	Blinding concrete	CON0	Concrete C16/20	C16/20 ECOPact Prime concrete produced in the plant of Greenwich of Aggregate Industries for use as ready-mixed concrete of normal building construction and civil engineering.	1	m3	87.54
2	Structure	Concrete	CON1	Ready mixed concrete (C30/37, C35/45 SCC) - C30/37 (Foundation)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	118.28
3	Structure	Concrete	CON2	Ready mixed concrete (C30/37, C35/45 SCC) - C35/45 SCC (Floor)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	244.28
4	Structure	Concrete	CON3	Ready mixed concrete (C30/37, C35/45 SCC) - C30/37 (Inner wall, Column and Beams)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	408
5	Structure	Rebar	REB	STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT	STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT are used to reinforce concrete in building constructions	1000	kg	1800
6	Structure	Structural steel	ST	Hot rolled steel profiles	The hot rolled steel profiles are made of steel bloom produced in electric arc furnace (EAF) process using 100% of iron scrap. The profiles constitute intermediate products commonly used for construction of power poles, roads, steel structures, supporting structures for buildings, load-bearing structures of buildings such industrial halls and warehouses as well as in railway, mining and shipbuilding industry. A specific product technical data is available at manufacturer website: www.wostsa.pl.	1000	kg	2690
7	Structure / Pattitions /roof stucture	Gulam Timber / Timber battens	GLT	Glued laminated timber	This EPD is based on a declared unit of 1 m³ of glued laminated timber (moisture of 10% at a raw density of 464 kg/m³). The results refer to a representative average of Rubner glued laminated timber including standard beams as well as sophisticated 3D-beam components. The LCA covers 100% of the Rubner group's production referring to its sites located at Rohrbach (Austria), Ober-Grafendorf (Austria), Brixen (Italy) and Calitri (Italy).	1	m3	1134
8	Composite steel-concrete slabs	Galvanized steel plates	ST-G	Galvanized Structural Steel	The declaration covers galvanized structural steel produced at the production site in Brande, Denmark. The declaration covers all life cycle modules from A1-A5, C1-C4 and D and is based on product-specific data provided by Give Steel A/S and background data from GaBi professional 2020 and Ecoinvent v3.6.	1000	kg	2500
9	Walls and Lightweight concrete slabs	Concrete o ceramic blocks	CONB	Concrete blocks	Autoclaved aerated concrete blocks with a dry density of 375 kg/m3 , also called Planstein PP 2/040	1	m3	261.76
10	Walls / Lightweight concrete slabs / Inclinated roof	Ceramic blocks / brick wall /ceramic deck	CERB	Red bricks or ceramic blocks	Bricks such as "RT Ultima 150" and "RT 550 Unika" are used to build walls, pillars and partitions.	1000	kg	420
11	Lightweight concrete slabs	Precast concrete beams	CONBEAM	Precast concrete elements of structures	Precast concrete structures: filigree slabs, shell/double walls, one/three layer walls, balconies, stairs, columns, beams and other precast concrete products	1	kg	0.3
12	Walls, slabs	Cross Laminated Timber (CLT) panels	CLT	Cross Laminated Timber - CLT	Cross Laminated Timber - CLT -Gross Density: 424.0 kg/m^3	1	m3	1355.7
13	Under the Ground slab	Graded aggregate	AGG	Aggregates	Aggregates from Uddevalla quarry - Glimmingen. Product variation: Sub base 0/150, Macadam 100/250, Macadam 150/300	1000	kg	50
14	Roof	Roof tiles	RTIL	Roof tiles (produced using natural gas) - Red tile	The product is produced using certified green electricity and natural gas. The declared unit is in tonnes - the mass required for roofing must be calculated using information from producer (dens=40 kg/m2)	1000	kg	3100
15	Flooting, roof	Ceramic tiles	CEFT	Ceramic Floor Tiles	Ceramic Floor Tiles 1 kg/m2	1	m2	32.21
16	Roof, fooring	Tile bond coat (adhesive)	ADH	Mineral adhesives H40® Gel, Bioflex®, H40® Sin Limites® & H40® Sem Limites	The International EPD System: Construction products / Aggregates The International EPD System: Construction products / Cement and building limes	1	kg	0.6
17	Roof, flooring	Mortar bed / Wet screed	MOR	Cement mortars	Cement mortars (1600 kg/m3)	1	kg	0.25
18	Flooring	Cleavage membrane / Sound insuolation layer	POLY	POLYETHYLENE FOAM BASED PRODUCTS	This product is a flexible material made mostly of polyethylene. It is soft and resilient and gives the impression of being a soundproofing and cushioning material. Foamed polyethylene packaging protects against scratches damage during transport moisture, including sea moisture. Foam also has insulating properties, which means that it protects against heat loss. Polyethylene foam products in the form of rolls, sheets and bags. Dens=935 kg/m3	0.001069519	m3	1.73
19	Flooring	Laminated wood flooring	WFL	Multi-layered engineered wood flooring	Multi-layered engineered wood floors are floor coverings in accordance with EN 13489 for private and commercial use in interior areas, which are either laid "floating" on screed or on other existing floors such as wood or tiles, in connection with suitable underlay materials, or are glued to the screed across the whole floor area.	1	m2	29.71
20	Flooring	Chipboard flooring (plywood)	PLYW	S-P-02010 SELEX® Plywood	m3 of plywood products produced in Chile and installed across different countries across the world	1	m3	1430.67
21	Flooring, partition, facades, roof	Insulation layer	MWOOL	Mineral wool insulation (high bulk density range)	Mineral wool is the generic term for insulating materials made of glass wool and stone wool. These are non-combustible insulating materials, which consist mainly of amorphous fibres obtained from a silicate melt. The mineral wool insulation materials described in this declaration are produced in the form of rolls, boards and mats in the high bulk density range (> 120 kg/m³). The ready-made products are supplied in thicknesses between 10 mm and 400 mm.	1	m3	96.5
22	Flooring, partition, facades, roof	Insulation layer	POLYU1	S-P-07206 Insulation board with a core of rigid polyurethane (PIR) for buildings	6 cm/m2: thermal resistance (m2k/w): 2.33 Thermal Resistance (m2K/W) grammage (kg/m^2): 2.46 grammage (kg/m^2)	0.06	m3	30.69
23	Flooring, partition, facades, roof	Insulation layer	POLYU2	Polyurethane thermal insulation spray foam	Polyurethane thermal insulation spray foam (blowing agent HFO; density 40 kg/m3)	0.13	m3	290.4

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BIM-LCA Construction Project

Description of Materials and Impact Data

Project name: Single-family house with steel structure and bricks

			1	2	3	4	5	6
nr.	Building part	Type of Material	Mat Code	Material Name	Description	Quant. Studied in EPD	Unit	Cost €
24	Flooring, partition, facades, roof	Insulation layer	EPS	EUROTHERM EPS INSULATION (white); 0,035-0,039 W/mK	Expanded polystyrene foam EPS, wall insulation, External Thermal Insulation Composite System (ETICS), pitched roof insulation and ceiling insulation. Gross density: 16.0 kg/m^3	1	m3	114.5
25	Flooring, partition, facades, roof	Insulation layer	CELL	Cellulose Fibre Insulation - Thermal insulation for use in pitched roofs, walls and floor spaces in dwellings.	One m² of installed in-situ insulation, thickness 300mm with an R-value of 9.09 m²K/W, at a density of 37 kg/m³. Reference service life of 50 years	0.3	m3	203.13
26	Flooring, partition, facades, roof	Insulation layer	CORK	S-P-02315 Cork-based thermal insulation panels: Slim and Lisoflex	Cork-based thermal insulation panels: grammage (kg/m^2): 3.3 grammage (kg/m^2); layer thickness (m): 0.02 layer thickness (m); thermal resistance (m2k/w): 0.465 Thermal Resistance (m2K/W).	0.02	m3	53.84
27	Partition walls	Finishing coat (plastering mortars) / Esternal finishing /Interior finishing	PLASM	Mineral pre-made mortar: rendering and plastering mortar – normal/finishing render or plaster with special properties	Rendering and plastering mortars produced in the factory for use as a base coat or finishing render/plaster on walls, ceilings, piers, and separating walls of structures which comply with the applicable standards or on similar backgrounds. 1600 kg/m3	1	kg	1.5
28	Partition walls	Gypsum cardboard or fiberboard	GYP_F	Gypsum fibreboards 12,5 mm	conversion factor to 1kg: 16.66 - gross density: 1175.0 kg/m^3 layer thickness: 0.0125 m grammage: 16.66 kg/m^2	1	m2	36.9
29	Partition walls, facades	Gypsum plasterboard	GYP_P	STANDARD GYPSUM PLASTERBOARD STD 12,5 mm	grammage (kg/m^2): 8.6 grammage (kg/m^2) thermal conductivity (w/m.k): 0.21 Thermal Conductivity (W/m.K) thermal resistance (m2k/w): 0.06 Thermal Resistance (m2K/W) layer thickness (m): 0.0125 layer thickness (m)	1	m2	36.9
30	Partition walls	Galvanized steel (U, C) channel studs	ST-GC	Cold-rolled steel profiles for framing and partition systems	The raw material is hot dipped sheet rolled galvanised steel, grade DX51D+Z steel for forming. The steel profile sections are manufactured in accordance with EN 14195:2014 Metal framing components for gypsum board systems.	1000	kg	2820
31	Railings	Railings	ST-SL	Welded and Pickled Stainless Steel Products	Products from Øglænd System AS that are made from stainless steel, and then machined, welded and pickled. Stainless steel forms a protective chromium oxide layer when the alloy is exposed to air, hindering direct contact between the alloy and the corrosive environment.	1	kg	14.47
32	Interior doors	Interior doors	WDOOR	Wooden interior doors	This EPD describes an average of the doors produced by the member companies of the VHI. In addition to standard doors, the member companies of the VHI also produce so-called functional doors. These offer additional functions such as moisture, smoke, fire, sound, burglary and radiation protection. For these purposes, the doors are given a modified design.	2.6814	m2	394.28
33	Facades	External wooden cladding	WCLA	Wood Plastic Composite products: Cladding: WEO 35	FIBERDECK wood plastic composite combines the proven strength of high-density, recycled polyethylene plastic and realistic wood fibers with an outer shell of polymer that completely encapsulates the board in an impermeable layer of protection from weather, sun, water, scuffs and scrapes	50.75	m2	2869.79
34	Facades	Tiles for external cladding	N-STON	Slabs for façade claddings and for interior claddings and flooring in natural semi-rijo limestone:	Slabs for façade claddings and for interior claddings and flooring in natural semi-rijo limestone. Dens: 2750 kg/m3	1	kg	2.5
35	Facades	Tiles for external cladding	PORCE	EXTRUDED PORCELAIN VENTILATED FAÇADE GA16 & GA20	EXTRUDED PORCELAIN VENTILATED FAÇADE GA16 & GA20. 324 kg/m2	324	kg	560
36	Facades	Tiles for external cladding	A-STON	S-P-07728 STONEO Ventilated Facade Panels	The engineering stone facade panels are made of a high-quality material comprising a selected combination of aggregates, bound by stable polyester resins.The panels are used for facade cladding and are mounted as a component of ventilated facades (rainscreen claddings).	1	kg	2.25
37	Windows	Windows	WIN_PVC	Passiv PVC Double Glazed Window	The Passiv PVC windows cover a range of different sizes and shapes of windows. The LCA has been executed based on a Double-glazed 1230 mm x 1480 mm window, with a thermal performance of U window = 1.2 W/m2K, U glass = 1.2 W/m2K and a life expectancy of 50 years. After which the results have been scaled back to a functional unit of 1m2.	1	m2	146.96
38	Windows	Windows	WIN_WOOD	Hardwood double glazed window	The raw materials for the Hardwood windows comprise glass, argon, hardwood/softwood profiles, warm edge spacer and associated hardware (hinges, handles, recievers and gears).	1	m2	299.17
39	Windows	Windows	WIN_AL	Aluminium Windows	The aluminium windows are assembled with extruded aluminium profiles and comes in different frame widths of 45 mm - 50 mm and 70 mm - 75 mm. They consist of an aluminium profile frame and an aluminium profile sash with an insulating glass unit (IGU). The aluminium profiles are powder coated and thermally broken with a reinforced polyamide strip.	1	m2	127.72
40	Facades	Exterior glazed doors	DOOR_GL	Exterior facade folding doors with thermally modified beech and double glazing, painted	Folding door in the facade of buildings, for renovation and in new buildings	1	m2	150.14
41	Facades	Exterior front doors	DOOR_W	Wooden full doors	Exterior doors manufactured by Porta KMI Poland Sp. z o. o. Sp. k. are dedicated for communication in domestic as well as commercial premises. Among company's products, wooden and steel doorsare distinguish. Depending on the customer's needs, doors possess various functionalities and can be produced from a wide range of materials.	2.307	m2	632.54
42	Roof	Gravel ballast	GRAV	S-P-05225 Aggregates from Nyrand gravel pit-Svebølle	S-P-05225 Aggregates from Nyrand gravel pit-Svebølle	1000	kg	123.75
43	Roof	Waterproofing layer	WP	PTM reinforced bitumen membrane for roof waterproofing	System of PTM reinforced bitumen membrane for roof waterproofing: ·PTM BituFlex (top layer) & PTM DuraFlex Kombi (bottom layer) .	1	m2	4.2

BIM-LCA

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Enviromental Impacts	
Abiotic depletion potential for fossil resources (ADPF)	Eutrophication potential (EP)
Abiotic depletion potential for non fossil resources (ADPE)	Photochemical Ozone Creation Potential (POCP)
Acidification potential (AP)	Ozone Depletion Potential (ODP)
Global warming potential (GWP)	

BIM-LCA Construction Project

LCA - Enviromental Impact results

Energy consumption	Table Caption and Summary	
	IMPACTS A1-A3	PRODUCTION
Total use of renewable primary energy resources (PERT)	IMPACTS A4	TRANSPORT
Total use of non renewable primary energy resource (PENRT)	IMPACTS A5	INSTALLATION

Project name: Single-family house with steel structure and bricks

UNIT IMPACTS * QUANTITIES

Module	Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	Quantities (Q)	Unit	Cost	Energy Consumption (A1-A3)		Energy Consumption (A4)		Energy Consumption (A5)		Env impacts A1-A3							Env impacts A4							Env impacts A5						
										PERT	PENRT	PERT	PENRT	PERT	PENRT	GWP	ADPF	ADPE	AP	EP	POCP	ODP	GWP	ADPF	ADPE	AP	EP	POCP	ODP	GWP	ADPF	ADPE	AP	EP	POCP	ODP
									(Euros)	(MJ)	(MJ)	(MJ)	(MJ)	(MJ)	(MJ)	(kg CO2-eq)	(MJ)	(kg Sb-eq)	(kg SO2-eq.)	(kg Phosphat-eq.)	(kg Ethen-eq)	(kq CFC 11-eq)	(kg CO2-eq.)	(MJ)	(kg Sb-eq)	(kg SO2-eq.)	(kg Phosphat-eq.)	(kg Ethen-eq)	(kq CFC 11-eq)	(kg CO2-eq.)	(MJ)	(kg Sb-eq)	(kg SO2-eq.)	(kg Phosphat-eq.)	(kg Ethen-eq)	(kq CFC 11-eq)
A1-A3	1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1.A.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1.B.1.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1.B.1.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.B.2-Footings	1.B.2.1	Concrete	CON1	24.88	m3	2942.81	4727.2	34832	85.0896	1467.92	0	3.01048	7016.16	33836.8	0.00171672	10.84768	3.4832	0.395592	0.000083348	107.9792	1462.944	7.66304E-06	0.251288	0.0604584	-0.0838456	1.78141E-14	0.44784	6.12048	1.61969E-05	0.001925712	0.00788696	0.0003732	2.88608E-08
				1.B.2.2	Rebar	REB	1574.90	kg	2834.83	2494.647936	11331.43428	18.898848	1033.137024	0	0.04724712	829.974408	10276.2486	0.0016053	3.149808	1.341818208	0.296081952	8.48936E-05	64.571064	1000.06404	0.000112448	0.37797696	0.066145968	0.014174136	1.23787E-05	0.000132134	0.001574904	4.8822E-09	5.8114E-07	2.37811E-06	1.12291E-07	8.70922E-12
				1.B.2.3	Blinding concrete	CON0	0.91	m3	79.22	28.67945	812.9615	0.822464	25.9916	0.627708	37.91045	115.116	810.2465	2.97745E-06	0.234576	0.01018125	0.205073	2.7512E-06	1.84258	25.9916	1.19913E-07	0.004580205	1.36384E-05	0.002267025	4.35124E-07	3.566605	37.8652	1.36927E-07	0.0201996	0.000240278	0.02243495	4.05531E-07
			1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	12.37	m3	1463.12	2350.3	17318	42.3054	729.83	0	1.49677	3488.34	16823.2	0.00085353	5.39332	1.7318	0.196683	4.14395E-05	53.6858	727.356	3.80996E-06	0.124937	0.0300591	-0.0416869	8.85692E-15	0.22266	3.04302	8.05287E-06	0.000957438	0.00392129	0.00018555	1.43492E-08
				1.B.3.2	Rebar	REB	1098.46	kg	1977.22	1739.954304	7903.39092	13.181472	720.587136	0	0.03295368	578.886312	7167.4254	0.001119656	2.196912	0.935884512	0.206509728	5.92112E-05	45.036696	697.51956	7.84298E-05	0.26362944	0.046135152	0.009886104	8.63386E-06	9.21605E-05	0.001098456	3.40521E-09	4.0533E-07	1.65867E-06	7.83199E-08	6.07446E-12
				1.B.3.3	Blinding concrete	CON0	0.45	m3	39.57	14.32388	406.0316	0.4107776	12.98144	0.3135072	18.93428	57.4944	404.6756	1.48708E-06	0.1171584	0.005085	0.1024232	1.37408E-06	0.920272	12.98144	5.989E-08	0.002287572	6.81164E-06	0.00113226	2.17322E-07	1.781332	18.91168	6.83876E-08	0.01008864	0.000120006	0.01120508	2.02541E-07
			1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1.B.4.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1.B.4.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1.C - Retaining walls		1.C.1	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				1.C.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1-Total Fundations							**9336.77**	11355.1056	72603.8183	160.7086	3990.4472	0.9412	61.4322	12085.9711	69318.5961	0.0053	21.9395	7.5080	1.4024	0.0003	274.0356	3926.8566	0.0002	1.0247	0.2028	-0.0981	0.0000	6.0187	65.9431	0.0000	0.0332	0.0122	0.0342	0.0000
	2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams	2.A.1.1	Gulam Timber	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.1.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.1.3	Structural steel	ST	12175.35	kg	32751.69	13193.56235	114315.5787	0	4.10309295	0	0.3652605	8234.310959	112611.0297	0.020662299	36.32138237	5.318229406	20.30945783	0.001284414	0.30438375	33.44568645	0.00018263	0.243507	0.004261373	0.001125002	0.000395699	0.005771116	0.08522745	2.13069E-07	2.53247E-05	0.000103856	4.90667E-06	3.81088E-10
				2.A.1.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.1.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.2-Columns	2.A.2.1	Gulam Timber	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.2.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.2.3	Structural steel	ST	42052.45	kg	113121.09	45569.25434	394834.6583	0	14.17167565	0	1.2615735	28440.49246	388947.3153	0.071365531	125.4504483	18.36863632	70.1468508	0.004436239	1.05131125	115.5180802	0.000630787	0.841049	0.014718358	0.003885646	0.001366705	0.019932861	0.29436715	7.35918E-07	8.74691E-05	0.000358707	1.69471E-05	1.31624E-09
				2.A.2.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.2.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.3.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	56.18	m3	13723.85	10674.352	78653.12	192.138336	3314.6672	0	12.64068	15842.9856	76405.888	0.003876475	24.4948288	7.865312	0.89327472	0.000188206	243.824672	3303.43104	1.73037E-05	0.56742608	1.36519344	-1.89329296	4.02255E-14	1.8539664	25.6184448	6.79788E-05	0.008033854	0.032921949	0.001556208	1.20789E-07
				2.A.4.2	Rebar	REB	1404.52	kg	2528.14	2224.75968	10105.5214	16.85424	921.36512	0	0.0421356	740.18204	9164.493	0.001431627	2.80904	1.19665104	0.26404976	7.57092E-05	57.58532	891.8702	0.000100283	0.3370848	0.05898984	0.01264068	1.10395E-05	0.000117839	0.00140452	4.35401E-09	5.18268E-07	2.12083E-06	1.00142E-07	7.767E-12
				2.A.4.3	Galvanized steel plates	ST-G	3307.64	kg	8269.11	7078.359444	37376.38398	21.23507833	367.1485506	2.40134998	41.67632196	3439.950384	37045.61952	0.000972448	9.889857354	0.00549069	8.467570176	2.8545E-11	27.75113819	367.1485506	2.22604E-06	0.099229338	0.045314731	0.088314111	5.0607E-15	2.176430147	41.67632196	2.51712E-07	0.011279068	0.00502762	0.014189795	5.72223E-16
			2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.5.2	Ceramic blocks	CERB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.5.3	Precast concrete beams	CONBEAM	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.5.4	Concrete (cast in place)	CON2	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.5.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.6.2	Steel in timber connect (galvanized)	ST-G		kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.A.6.3	Steel in connections (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2.B-Load-bearing walls		2.B.1	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.B.2	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				2.B.3	rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2- Total structural elements							**170393.88**	78740.2878	635285.2624	230.2277	4621.4556	2.4013	55.9860	56697.9214	624174.3455	0.0983	198.9656	32.7543	100.0812	0.0060	330.5168	4711.4136	0.0009	2.0883	1.4885	-1.7873	0.0018	4.0562	67.6758	0.0001	0.0194	0.0384	0.0158	0.0000
	3 - Non-load bearing elements	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	29.53	m3	3493.22	5611.365	41346.9	101.00457	1742.4765	0	3.5735535	8328.447	40165.56	0.002037812	12.876606	4.13469	0.46958265	9.89372E-05	128.17539	1736.5698	9.09632E-06	0.29828835	0.071766405	-0.099527895	2.1146E-14	0.531603	7.265241	1.92263E-05	0.002285893	0.00936212	0.000443003	3.42589E-08
				3.A.1.2	rebar	REB	886.01	kg	1594.81	1403.43192	6374.805975	10.63206	581.21928	0	0.02658015	466.924635	5781.182625	0.000903105	1.77201	0.75487626	0.16656894	4.77592E-05	36.326205	562.613175	6.32608E-05	0.2126412	0.03721221	0.007974045	6.964E-06	7.43358E-05	0.000886005	2.74662E-09	3.26936E-07	1.33787E-06	6.31722E-08	4.89961E-12
				3.A.1.3	Graded aggregate	AGG	88600.50	kg	4430.03	1151.8065	2569.4145	0	1333.083123	0	29144.33707	203.78115	2569.4145	0.000177201	0.886005	1.77201	0.1063206	4.07562E-06	116.5096575	10851.34624	0.059185134	6.910839	1.417608	0.354402	0.0886005	0.26402949	37.389411	9.77264E-06	0.001159781	0.004752176	0.000224425	1.74543E-08
			3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	257.52	m2	8294.72	10506.816	48413.76	3.270504	2366.6088	517.6152	2678.208	3038.736	41975.76	0.0888444	7.571088	0.9064704	0.5382168	0.000507314	156.05712	2224.9728	6.69552E-06	0.2600952	0.03064488	0.012953256	2.88422E-05	285.8472	2070.4608	0.002678208	0.669552	0.09760008	0.04661112	2.13742E-05
				3.A.2.2	Tile bond coat (adhesive)	ADH	1545.12	kg	927.07	3012.984	11356.632	0	2085.912	0	0.8343648	794.19168	10383.2064	0.000893079	2.394936	0.74320272	0.129172032	4.92893E-05	38.318976	4244.135616	0.142769088	2.472192	0.540173952	0.142769088	0.050185498	0.004604458	0.064276992	1.70581E-07	2.0272E-05	8.28184E-05	3.91224E-06	3.0408E-10
				3.A.2.3	Mortar bed	MOR	12360.96	kg	3090.24	4697.1648	64771.4304	0	0	0	0	7107.552	64647.8208	0.102843187	26.3288448	1.2979008	19.2830976	0.000537702	406.1440627	4467.250944	0.024351091	2.825344627	0.554982382	1.51357483	0.504574387	0.036835661	0.504574387	1.36218E-06	0.161953298	0.000660941	3.13227E-05	2.4314E-09
				3.A.2.4	Cleavage membrane	POLY	1.29	m3	2082.76	4340.803474	107268.0246	21.3091362	1480.80438	0.068983814	0.934231056	3339.635244	107219.8684	0.016987114	0.014614907	1.291189185	15.20533278	0.005680727	100.4057604	1480.80438	0.000355152	0.405716322	0.006729835	0.40932804	2.3115E-05	0.042377491	0.930619338	2.68471E-07	0.00061038	0.000104379	0.000208276	1.20391E-09
			3.A.3-Flooring Type II: Wood floating floor or	3.A.3.1	Laminated wood flooring	WFL	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.A.3.2	Chipboard flooring (plywood)	PLYW	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.A.3.4	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0.00	m4	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.A.4.2	Sound insulation layer	POLY	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3.B-Vertical elements	3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	19627.99	kg	8243.76	6045.421844	81063.61109	40.23738565	802.7849137	18.74473332	196.27993	6163.189802	73212.41389	0.005240674	19.58873701	4.043366558	1.018692837	9.93176E-06	57.90257935	800.8221144	4.65183E-06	0.243387113	0.060454218	-0.088914808	1.94317E-11	46.12578355	191.5692117	3.98448E-06	0.078315692	0.012954475	-0.002610523	1.55061E-11
				3.B.1.2	Finishing coat (plastering mortars)	PLASM	7093.12	kg	10639.68	5546.81984	24896.8512	139.734464	2078.28416	16.8106944	87.245376	2652.82688	22910.7776	0.006107176	6.5256704	0.671718464	0.544042304	1.76619E-05	154.630016	2071.19104	1.60305E-05	0.117745792	0.026528269	-0.001666883	3.24865E-12	295.783104	78.733632	5.17798E-06	0.038728435	0.008582675	0.002588989	4.05017E-12
			3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.2.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.3.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.3.3	Insulation layer	MWOOL	0.00		0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.3.4	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.3.5	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.4.2	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.B.4.3	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.5-Parapets	3.B.5.1	Brick wall	CERB	2337.72	kg	981.84	720.01776	9654.7836	4.792326	95.612748	2.2325226	23.3772	734.04408	8719.6956	0.000624171	2.33304456	0.48157032	0.121327668	1.18289E-06	6.896274	95.378976	5.5404E-07	0.028987728	0.007200178	-0.010589872	2.31434E-12	5.493642	22.8161472	4.74557E-07	0.009327503	0.001542895	-0.000310917	1.8468E-12
				3.B.5.2	Finishing coat (plastering mortars)	PLASM	844.80	kg	1267.20	660.6336	2965.248	16.64256	247.5264	2.002176	10.39104	315.9552	2728.704	0.000727373	0.777216	0.08000256	0.06479616	2.10355E-06	18.41664	246.6816	1.90925E-06	0.01402368	0.003159552	-0.000198528	3.86918E-13	35.22816	9.37728	6.16704E-07	0.004612608	0.001022208	0.000308352	4.82381E-13
			3.B.6-Railings	3.B.6	Railings	ST-SL	52.25	kg	756.06	514.14	3370.125	0.000788975	6.53125	98.7525	397.518	246.62	3317.875	0.03223825	3.213375	0.1614525	1.51525	1.34283E-05	18.9145	2080.22925	0.01133825	1.30625	0.26125	0.05225	0.02460975	0.99275	13.8985	3.66795E-05	0.004362875	0.01781725	0.000841225	6.53125E-08
			3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	7.64	m2	1123.41	5230.761587	3971.893936	0	0	124.854479	44.22048184	-53.99343626	3562.854479	0.007604669	0.515345267	0.107630715	0.101675766	2.8068E-10	1.626926233	179.0445141	0.000977295	0.113970314	0.022794063	0.005698516	0.002116999	30.31610353	9.163213247	1.06049E-06	0.00994391	0.002254903	0.000581818	1.14113E-14
		3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	13.72	m2	441.79	559.6128	2578.608	0.1741932	126.05004	27.56916	142.6464	161.8488	2235.708	0.00473202	0.4032504	0.04828032	0.02866644	2.70205E-05	8.311896	118.50624	3.56616E-07	0.01385316	0.001632204	0.000689915	1.53619E-06	15.22476	110.27664	0.000142646	0.0356616	0.005198364	0.002482596	1.13843E-06
				3.C.1.2	Tile bond coat (adhesive)	ADH	82.30	kg	49.38	160.4772	604.8756	0	111.0996	0	0.04443984	42.300144	553.02912	4.75671E-05	0.1275588	0.039584376	0.006879946	2.62524E-06	2.0409408	226.0506528	0.00760415	0.1316736	0.028770682	0.00760415	0.002672974	0.000245242	0.003423514	9.08548E-09	1.07972E-06	4.41107E-06	2.08373E-07	1.61959E-11
				3.C.1.3	Mostar	MOR	1235.52	kg	308.88	469.4976	6474.1248	0	0	0	0	710.424	6461.7696	0.010279526	2.6316576	0.1297296	1.9274112	5.37451E-05	40.59548064	446.516928	0.002433974	0.282402806	0.055472377	0.151286953	0.050433926	0.00368185	0.050433926	1.36154E-07	0.016187783	6.60633E-05	3.13081E-06	2.43027E-10
				3.C.1.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.C.1.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.C.1.6	Structural steel	ST	230.36	kg	619.68	249.629111	2162.910632	0	0.077632668	0	0.00691092	155.7974768	2130.659672	0.000390942	0.687219581	0.100623686	0.384265581	2.43018E-05	0.0057591	0.632809908	3.45546E-06	0.00460728	8.06274E-05	2.12856E-05	7.48683E-06	0.000109193	0.001612548	4.03137E-09	4.79157E-07	1.965E-06	9.28367E-08	7.21039E-12
				3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.C.2.2	Tile bond coat (adhesive)	ADH	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.C.2.3	Mostar	MOR	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.C.2.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				3.C.2.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3-Total non-load bearing elements							**48344.52**	50881.3830	419843.9993	337.7980	13058.0708	808.6504	32729.6436	34408.2807	398576.2996	0.2807	88.6472	16.7643	41.6113	0.0071	1291.2782	31832.7471	0.2491	15.6420	3.1265	2.4577	0.7233	715.8951	2552.5059	0.0029	1.0327	0.1620	0.0514	0.0000
	4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	17972.16	kg	26958.24	14054.22912	63082.2816	354.051552	5265.84288	42.5940192	221.057568	6721.58784	58050.0768	0.01547403	16.5343872	1.701963552	1.378464672	4.47507E-05	391.793088	5247.87072	4.06171E-05	0.298337856	0.067215878	-0.004223458	8.23125E-12	749.439072	199.490976	1.31197E-05	0.098127994	0.021746314	0.006559838	1.02621E-11
				4.A.1.2	Brick walls	CERB	66309.78	kg	27850.11	20423.41286	273859.3997	135.9350531	2712.070084	63.32584181	663.09782	20821.27155	247335.4869	0.017704712	66.17716244	13.65981509	3.441477686	3.35527E-05	195.6138569	2705.439106	1.57154E-05	0.822241297	0.204234129	-0.300383312	6.56467E-11	155.8279877	647.1834723	1.34609E-05	0.26457603	0.043764456	-0.008819201	5.23847E-11
				4.A.1.3	Insulation layer	MWOOL	26.21	m3	2529.21	11503.30566	55013.5306	66.4932478	1154.52407	250.168723	1230.793424	4544.70996	51920.8214	0.001003034	26.602541	3.64572754	1.571515624	1.45672E-08	84.918456	1142.72984	6.98218E-06	0.125595445	0.027362614	-0.028175105	2.10855E-14	580.276116	1155.048258	2.11588E-05	0.581586586	0.082926542	0.034832293	2.91449E-10
				4.A.1.4	Interior finish	GYP_P	374.42	m2	13816.10	1411.5634	16549.364	6.36514	2429.9858	212.67056	1127.0042	812.4914	14377.728	0.000225775	1.666169	0.01160702	2.3176598	4.79258E-05	183.09138	2415.009	6.29026E-06	0.5092112	0.000143403	0.7900262	3.93141E-06	90.23522	999.7014	9.32306E-06	0.2321404	0.001067097	0.33585474	2.4824E-06
			4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.2.3	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.2.4	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.2.5	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.2.6	External wooden cladding	WCLA	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.3.2	Brick wall	CERB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				4.A.3.4	Tiles for external cladding	N-STON	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_PVC	21.54	m2	3165.52	1011.64764	25950.4227	0.1703814	12.29934	2.059224	44.8032	12847.533	22832.63694	10.082874	4.70431446	0.5696253	0.348767064	2.11904E-05	7797.48	12.0624	0.00557886	0.0031233	0.000497574	0.000141949	1.3484E-07	10489.98	43.7262	5.66502E-08	0.0057081	0.00060312	0.000374796	3.85566E-07
			4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	4.00	m3	600.56	5600	4080	1.228	22.08	4.04	13.56	172	0	0	1.372	0.00564	0.888	0.00000528	1.668	0	0	0.00532	0.00000492	0.0048	2.116E-16	62.8	0	0	0.02532	0.000001568	0.02876	7.24E-15
				4.B.2.2	Exterior front doors	DOOR_W	4.00	m4	1096.73	1691.205202	1763.502384	0	0	75.9774599	26.90940616	9.085392284	1620.286086	0.002990377	0.483953186	0.095722583	0.269293455	4.03988E-06	0.990030342	108.9536194	0.000594712	0.06935414	0.013870828	0.003467707	0.001288253	18.44820113	5.576072822	6.4534E-07	0.006051149	0.001372172	0.000354053	6.94408E-15
		4- Total facades							**76016.46**	55695.3639	440298.5009	564.2434	11596.8022	650.8358	3327.2256	45928.6791	396137.0361	10.1203	117.5405	19.6901	10.2152	0.0002	8655.5548	11632.0647	0.0062	1.8332	0.3133	0.4657	0.0013	12147.0066	3050.7264	0.0001	1.2135	0.1515	0.3979	0.0000
	5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	134.33	m2	4326.77	5480.664	25254.04	1.705991	1234.4927	270.0033	1397.032	1585.094	21895.79	0.04634385	3.949302	0.4728416	0.2807497	0.00026463	81.40398	1160.6112	3.49258E-06	0.1356733	0.01598527	0.006756799	1.5045E-05	149.1063	1080.0132	0.001397032	0.349258	0.05091107	0.02431373	1.11494E-05
				5.A.1.2	Gravel ballast	GRAV	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	134.33	m2	564.19	2417.94	37746.73	12.801649	185.3754	347.9147	6797.098	467.4684	0	0	0.9282203	0.02511971	0.9429966	5.56126E-06	13.97032	0	0	0.01571661	5.02394E-05	0.01356733	1.3836E-12	255.227	0	0	0.5453798	0.007750841	0.5077674	2.12241E-05
			5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	9.40	m3	907.40	4127.02059	19737.1069	23.8556647	414.206555	89.7525895	441.569576	1630.49754	18627.5411	0.000359857	9.5441465	1.30797121	0.563809876	5.22624E-09	30.466044	409.97516	2.50499E-06	0.045059655	0.009816836	-0.010108333	7.56479E-15	208.184634	414.394617	7.59112E-06	0.208654789	0.029751408	0.01249672	1.04562E-10
			5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	6447.84	kg	1611.96	2450.1792	33786.6816	0	0	0	0	3707.508	33722.2032	0.053646029	13.7338992	0.6770232	10.0586304	0.000280481	211.8566789	2330.249376	0.012702245	1.473782789	0.28949512	0.789525112	0.263200829	0.019214563	0.263200829	7.10552E-07	0.0844796	0.000344766	1.63388E-05	1.26829E-09
		5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	3670.14	kg	11377.42	3963.747206	16845.92562	7.523779419	161.8530109	3.780240391	32.92112263	1031.308301	16515.61336	0.001471725	14.0933234	1.181783889	0.741367533	7.74399E-06	11.89124162	160.3849564	1.01296E-06	0.008661522	0.001724964	-0.000111572	8.51472E-13	27.74623044	31.67327628	2.33054E-07	0.011817839	0.001981874	-0.000340222	2.00389E-12
			5.B.2-Mostar	5.B.2	Cement mostar	MOR	2936.11	kg	734.03	1115.721436	15385.21138	0	0	0	0	1688.262699	15355.85029	0.024428427	6.253912258	0.308291449	4.580330105	0.000127721	96.47173477	1061.109808	0.005784135	0.671106444	0.131825424	0.35952068	0.119851971	0.008749605	0.119851971	3.23559E-07	0.038468901	0.000156994	7.4401E-06	5.77533E-10
			5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	91.75	m2	385.36	1651.561336	25782.70752	8.744099739	126.6197024	237.6413255	4642.722422	319.3018582	0	0	0.634016046	0.017157887	0.644108921	3.79859E-06	9.542354384	0	0	0.010735149	3.43158E-05	0.009267094	9.4506E-13	174.3314743	0	0	0.372518835	0.005294172	0.346827881	1.4497E-05
			5.B.4-Decking	5.B.4	Ceramic deck or	CERB	2835.18	kg	1190.78	873.2355303	11709.29461	5.812119601	115.958874	2.70759718	28.35180293	890.246612	10575.22249	0.000756993	2.829509932	0.58404714	0.147145857	1.4346E-06	8.363781865	115.675356	6.71938E-07	0.035156236	0.008732355	-0.012843367	2.80683E-12	6.662673689	27.67135966	5.75542E-07	0.011312369	0.001871219	-0.000377079	2.23979E-12
				5.B.5	wooden deck (plywood)	PLYW	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			5.B.5-Structure	5.B.6	Brick walls or	CERB	1979.19	kg	831.26	609.5906241	8174.056097	4.057340193	80.94888483	1.890126773	19.79190338	621.4657662	7382.379961	0.000528444	1.975231957	0.40771321	0.102719979	1.00147E-06	5.838611498	80.7509658	4.69068E-07	0.02454196	0.006095906	-0.008965732	1.9594E-12	4.651097295	19.3168977	4.01776E-07	0.007896969	0.001306266	-0.000263232	1.56356E-12
				5.B.7	Gulam timber beams	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	4.31	m3	416.01	1892.0979	9048.789	10.937007	189.89955	41.148495	202.44456	747.5274	8540.091	0.000164982	4.375665	0.5996601	0.25848756	2.39605E-09	13.96764	187.9596	1.14845E-06	0.020658312	0.004500684	-0.004634325	3.4682E-15	95.44554	189.98577	3.48027E-06	0.09566109	0.013640004	0.005729319	4.79383E-11
		5-Total Roofs							**22345.18**	24581.7578	203470.5427	75.4377	2509.3547	994.8384	13561.9314	12688.6806	132614.6914	0.1277	58.3172	5.5816	18.3203	0.0007	483.7724	5506.7164	0.0185	2.4411	0.4683	1.1420	0.3831	921.3829	1763.4382	0.0014	1.7254	0.1130	0.8962	0.0000
	Total building (A1-A5)								**326436.80**	196672.140	1568031.5809	1292.9776	33266.7758	1462.8288	36174.2873	149120.8524	1488206.2773	10.5046	427.0927	76.7167	153.3100	0.0135	10551.3854	52103.0820	0.2565	20.5882	5.1311	1.0379	0.7263	12872.9765	5736.8511	0.0031	2.2988	0.3641	0.4993	0.0000

BIM-LCA

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BIM-LCA Construction Project

LCA - Enviromental Impact results

Project name: Single-family house with steel structure and bricks

IMPACTS PER UNIT AREA AND YEAR

Module	Building part	Building element types / building elements	Ref.	Type of Material	Mat Code	Quantities (Q)	Unit	Cost (Euros)	Energy Consumption (A1-A3) (/m2/yr)		Energy Consumption (A4) (/m2/yr)		Energy Consumption (A5) (/m2/yr)		Env imp A1-A3 (/m2/yr)							Env imp A4 (/m2/yr)							Env imp A5 (/m2/yr)						
									PERT	PERT	PERT	PERT	PERT	PERT	GWP	ADPF	ADPE	AP	EP	POCP	ODP	GWP	ADPF	ADPE	AP	EP	POCP	ODP	GWP	ADPF	ADPE	AP	EP	POCP	ODP
									(MJ/m2/yr)	(MJ/m2/yr)	(MJ/m2/yr)	(MJ/m2/yr)	(MJ/m2/yr)	(MJ/m2/yr)	(kg CO2-eq./m2/yr)	(MJ/m2/yr)	(kg Sb-eq./m2/yr)	(kg SO2-eq./m2/yr)	(kg Phosphat-eq./m2/yr)	(kg Ethen-eq./m2/yr)	g CFC 11-eq./m2/	(kg CO2-eq./m2/yr)	(MJ/m2/yr)	g Sb-eq./m2/y	SO2-eq./m2/	hosphat-eq./m	Ethen-eq./m2	CFC 11-eq./m2/	(kg CO2-eq./m2/yr)	(MJ/m2/yr)	g Sb-eq./m2/y	SO2-eq./m2/	hosphat-eq./m	Ethen-eq./m2	CFC 11-eq./m2/
A1-A3	1- Foundations	1.A - Piles	1.A.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.A.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1.B-Basement / 1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.B.1.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.B.1.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1.B.2-Footings	1.B.2.1	Concrete	CON1	24.88	m3	2942.81	0.36713265	2.705187947	0.006608388	0.114004349	0	0.000233806	0.544902144	2.627896862	1.33327E-07	0.000842473	0.000270519	3.07232E-05	6.47313E-09	0.008386083	0.11361789	5.9514E-10	1.9516E-05	4.6954E-06	-6.5118E-06	1.38351E-18	3.4781E-05	0.00047534	1.2579E-09	1.4956E-07	6.1253E-07	2.8984E-08	2.24144E-12
			1.B.2.2	Rebar	REB	1574.90	kg	2834.83	0.193744015	0.880043048	0.001467758	0.08023742	0	3.66939E-06	0.064459025	0.798093243	1.24674E-07	0.000244626	0.000104211	2.29949E-05	6.59317E-09	0.005014839	0.07766884	8.7332E-09	2.9355E-05	5.1372E-06	1.1008E-06	9.61381E-10	1.02621E-08	1.2231E-07	3.7917E-13	4.5134E-11	1.8469E-10	8.7209E-12	6.76392E-16
			1.B.2.3	Blinding concrete	CON0	0.91	m3	79.22	0.002227357	0.063137737	6.38757E-05	0.002018608	4.87502E-05	0.002944272	0.008940354	0.062926879	2.3124E-10	1.82181E-05	7.90715E-07	1.59268E-05	2.13669E-10	0.000143102	0.00201861	9.3129E-12	3.5572E-07	1.0592E-09	1.7607E-07	3.37934E-11	0.000276996	0.00294076	1.0634E-11	1.5688E-06	1.8661E-08	1.7424E-06	3.14951E-11
		1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	12.37	m3	1463.12	0.182533395	1.344982914	0.003285601	0.056681423	0	0.000116245	0.270917987	1.306554831	6.62884E-08	0.000418866	0.000134498	1.52752E-05	3.21835E-09	0.004169447	0.05648928	2.959E-10	9.7031E-06	2.3345E-06	-3.2376E-06	6.87863E-19	1.72926E-05	0.00023633	6.2542E-10	7.4358E-08	3.0454E-07	1.4411E-08	1.11441E-12
			1.B.3.2	Rebar	REB	1098.46	kg	1977.22	0.135131586	0.613807931	0.001023724	0.055963586	0	2.55931E-06	0.044958552	0.55665	8.69568E-08	0.000170621	7.26844E-05	1.60383E-05	4.59857E-09	0.003497724	0.05417207	6.0912E-09	2.0474E-05	3.583E-06	7.6779E-07	6.70539E-10	7.15754E-09	8.531E-08	2.6446E-13	3.148E-11	1.2882E-10	6.0826E-12	4.71766E-16
			1.B.3.3	Blinding concrete	CON0	0.45	m3	39.57	0.001112448	0.031533986	3.19026E-05	0.001008189	2.43482E-05	0.001470509	0.004465238	0.031428674	1.15492E-10	9.09897E-06	3.94921E-07	7.95458E-06	1.06716E-10	7.14719E-05	0.00100819	4.6513E-12	1.7766E-07	5.2902E-10	8.7936E-08	1.6878E-11	0.000138345	0.00146875	5.3112E-12	7.8352E-07	9.3201E-09	8.7023E-07	1.57301E-11
		1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.B.4.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.B.4.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1.C - Retaining walls	1.C.1	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			1.C.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		1-Total Fundations						**9336.77**	0.8819	5.6387	0.0125	0.3099	0.0001	0.0048	0.9386	5.3836	0.0000	0.0017	0.0006	0.0001	0.0000	0.0213	0.3050	0.0000	0.0001	0.0000	0.0000	0.0000	0.0005	0.0051	0.0000	0.0000	0.0000	0.0000	0.0000
	2 - Load bearing structural frame	2.A-Frames / 2.A.1-Beams	2.A.1.1	Gulam Timber	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.1.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.1.3	Structural steel	ST	12175.35	kg	32751.69	1.024663121	8.87819033	0	0.000318662	0	2.83675E-05	0.639508462	8.745808456	1.60471E-06	0.002820859	0.000413034	0.001577311	9.97526E-08	2.36396E-05	0.00259752	1.4184E-08	1.8912E-05	3.3095E-07	8.7372E-08	3.07315E-08	4.48207E-07	6.6191E-06	1.6548E-11	1.9668E-09	8.0658E-09	3.8107E-10	2.95968E-14
			2.A.1.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.1.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2.A.2-Columns	2.A.2.1	Gulam Timber	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.2.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.2.3	Structural steel	ST	42052.45	kg	113121.09	3.53908468	30.66438788	0	0.001100627	0	9.79787E-05	2.208798731	30.20715403	5.54252E-06	0.009742967	0.001426579	0.005447876	3.44536E-07	8.16489E-05	0.00897158	4.8989E-08	6.5319E-05	1.1431E-06	3.0177E-07	1.06144E-07	1.54806E-06	2.2862E-05	5.7154E-11	6.7932E-09	2.7859E-08	1.3162E-09	1.02224E-13
			2.A.2.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.2.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.3.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	56.18	m3	13723.85	0.829011494	6.108505747	0.014922207	0.257429885	0	0.000981724	1.230427586	5.933977011	3.01062E-07	0.001902363	0.000610851	6.93752E-05	1.46168E-08	0.018936368	0.25655724	1.3439E-09	4.4069E-05	0.00010603	-0.00014704	3.12406E-18	0.000143986	0.00198963	5.2795E-09	6.2394E-07	2.5568E-06	1.2086E-07	9.38092E-12
			2.A.4.2	Rebar	REB	1404.52	kg	2528.14	0.172783448	0.784833908	0.001308966	0.071556782	0	3.27241E-06	0.057485402	0.71175	1.11186E-07	0.000218161	9.29366E-05	2.05071E-05	5.87987E-09	0.004472299	0.06926609	7.7883E-09	2.6179E-05	4.5814E-06	9.8172E-07	8.57372E-10	9.15185E-09	1.0908E-07	3.3815E-13	4.0251E-11	1.6471E-10	7.7774E-12	6.03215E-16
			2.A.4.3	Galvanized steel plates	ST-G	3307.64	kg	8269.11	0.549732793	2.902794655	0.001649198	0.028514178	0.000186498	0.003236744	0.267159862	2.877106207	7.5524E-08	0.000768085	4.26428E-07	0.000657624	2.21691E-15	0.002155261	0.02851418	1.7288E-10	7.7065E-06	3.5193E-06	6.8588E-06	3.93033E-19	0.00016903	0.00323674	1.9549E-11	8.7598E-07	3.9046E-07	1.102E-06	4.4441E-20
		2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.5.2	Ceramic blocks	CERB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.5.3	Precast concrete beams	CONBEAM	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.5.4	Concrete (cast in place)	CON2	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.5.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.6.2	Steel in timber connect (galvanized)	ST-G		kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.A.6.3	Steel in connections (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2.B-Load-bearing walls	2.B.1	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.B.2	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			2.B.3	rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2- Total structural elements						**170393.88**	6.1153	49.3387	0.0179	0.3589	0.0002	0.0043	4.4034	48.4758	0.0000	0.0155	0.0025	0.0078	0.0000	0.0257	0.3659	0.0000	0.0002	0.0001	-0.0001	0.0000	0.0003	0.0053	0.0000	0.0000	0.0000	0.0000	0.0000
	3 - Non-load bearing elements	3.A-Horizontal elements / 3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	29.53	m3	3493.22	0.435800326	3.211160298	0.007844406	0.13532747	0	0.000277536	0.646819432	3.119412861	1.58264E-07	0.001000047	0.000321116	3.64696E-05	7.68385E-09	0.009954597	0.13486873	7.0646E-10	2.3166E-05	5.5737E-06	-7.7297E-06	1.64228E-18	4.12863E-05	0.00056425	1.4932E-09	1.7753E-07	7.271E-07	3.4405E-08	2.66068E-12
			3.A.1.2	rebar	REB	886.01	kg	1594.81	0.108995955	0.495092107	0.000825727	0.045139739	0	2.06432E-06	0.036263175	0.44898902	7.01386E-08	0.000137621	5.86266E-05	1.29364E-05	3.70917E-09	0.002821234	0.04369472	4.9131E-09	1.6515E-05	2.89E-06	6.193E-07	5.40851E-10	5.77321E-09	6.8811E-08	2.1331E-13	2.5391E-11	1.039E-10	4.9062E-12	3.80522E-16
			3.A.1.3	Graded aggregate	AGG	88600.50	kg	4430.03	0.089453751	0.199550676	0	0.103532395	0	2.263462028	0.015826433	0.199550676	1.37621E-08	6.88106E-05	0.000137621	8.25727E-06	3.16529E-10	0.009048591	0.84275755	4.5965E-06	0.00053672	0.0001101	2.7524E-05	6.88106E-06	2.05056E-05	0.00290381	7.5898E-10	9.0073E-08	3.6907E-07	1.743E-08	1.35557E-12
		3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	257.52	m2	8294.72	0.816	3.76	0.000254	0.1838	0.0402	0.208	0.236	3.26	0.0000069	0.000588	0.0000704	0.0000418	3.94E-08	0.01212	0.1728	5.2E-10	0.0000202	0.00000238	1.006E-06	2.24E-09	0.0222	0.1608	2.08E-07	0.000052	0.00000758	0.00000362	1.66E-09
			3.A.2.2	Tile bond coat (adhesive)	ADH	1545.12	kg	927.07	0.234	0.882	0	0.162	0	0.0000648	0.06168	0.8064	6.936E-08	0.000186	0.00005772	0.000010032	3.828E-09	0.002976	0.329616	1.1088E-05	0.000192	4.1952E-05	1.1088E-05	3.8976E-06	3.576E-07	4.992E-06	1.3248E-11	1.5744E-09	6.432E-09	3.0384E-10	2.3616E-14
			3.A.2.3	Mortar bed	MOR	12360.96	kg	3090.24	0.3648	5.0304	0	0	0	0	0.552	5.0208	7.9872E-06	0.0020448	0.0001008	0.0014976	4.176E-08	0.03154272	0.346944	1.8912E-06	0.00021943	4.3102E-05	0.00011755	3.91872E-05	2.8608E-06	3.9187E-05	1.0579E-10	1.2578E-05	5.1331E-08	2.4326E-09	1.88832E-13
			3.A.2.4	Cleavage membrane	POLY	1.29	m3	2082.76	0.3371236	8.33085	0.00165495	0.115005	5.35755E-06	0.000072556	0.259369	8.32711	1.31929E-06	1.13505E-06	0.000100279	0.001180905	4.41187E-07	0.0077979	0.115005	2.7583E-08	3.151E-05	5.2267E-07	0.00003179	1.7952E-09	3.2912E-06	7.2276E-05	2.0851E-11	4.7405E-08	8.1065E-09	1.6176E-08	9.35E-14
		3.A.3-Flooring Type II: Wood floating floor or	3.A.3.1	Laminated wood flooring	WFL	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.A.3.2	Chipboard flooring (plywood)	PLYW	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.A.3.4	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0.00	m4	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.A.4.2	Sound insulation layer	POLY	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3.B-Vertical elements / 3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	19627.99	kg	8243.76	0.469510861	6.295713816	0.003124991	0.062347384	0.001455789	0.015243859	0.478657176	5.685959451	4.07011E-07	0.001521337	0.000314023	7.91156E-05	7.71339E-10	0.004496938	0.06219495	3.6128E-10	1.8902E-05	4.6951E-06	-6.9055E-06	1.50914E-15	0.003582307	0.01487801	3.0945E-10	6.0823E-06	1.0061E-06	-2.0274E-07	1.20426E-15
			3.B.1.2	Finishing coat (plastering mortars)	PLASM	7093.12	kg	10639.68	0.430787499	1.933585834	0.010852319	0.161407592	0.001305584	0.006775814	0.206028804	1.779339671	4.74307E-07	0.000506809	5.21683E-05	4.22524E-05	1.37169E-09	0.012009166	0.16085671	1.245E-09	9.1446E-06	2.0603E-06	-1.2946E-07	2.52303E-16	0.022971661	0.00611476	4.0214E-10	3.0078E-06	6.6656E-07	2.0107E-07	3.14552E-16
		3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.2.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.3.2	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.3.3	Insulation layer	MWOOL	0.00		0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.3.4	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.3.5	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.4.2	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.B.4.3	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3.B.5-Parapets	3.B.5.1	Brick wall	CERB	2337.72	kg	981.84	0.055919366	0.749827866	0.000372191	0.007425656	0.000173386	0.001815564	0.057008705	0.677205312	4.84756E-08	0.000181193	3.74006E-05	9.42278E-06	9.18675E-11	0.000535591	0.0074075	4.3029E-11	2.2513E-06	5.5919E-07	-8.2245E-07	1.79741E-16	0.000426658	0.00177199	3.6856E-11	7.2441E-07	1.1983E-07	-2.4147E-08	1.4343E-16
			3.B.5.2	Finishing coat (plastering mortars)	PLASM	844.80	kg	1267.20	0.051307363	0.230292637	0.001292526	0.019223858	0.000155497	0.000807008	0.024538304	0.211921715	5.64906E-08	6.03616E-05	6.21331E-06	5.03232E-06	1.6337E-10	0.001430308	0.01915825	1.4828E-10	1.0891E-06	2.4538E-07	-1.5418E-08	3.00496E-17	0.002735955	0.00072828	4.7896E-11	3.5823E-07	7.9389E-08	2.3948E-08	3.74636E-17
		3.B.6-Railings	3.B.6	Railings	ST-SL	52.25	kg	756.06	0.039930103	0.261736952	6.12749E-08	0.000507242	0.007669501	0.030872787	0.019153464	0.257679015	2.50375E-06	0.000249563	1.2539E-05	0.00011768	1.04289E-09	0.001468973	0.16155866	8.8057E-07	0.00010145	2.029E-05	4.0579E-06	1.91129E-06	7.71008E-05	0.00107941	2.8487E-09	3.3884E-07	1.3838E-06	6.5333E-08	5.07242E-12
		3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	7.64	m2	1123.41	0.406241192	0.308472657	0	0	0.009696682	0.003434334	-0.004193339	0.27670507	5.90608E-07	4.00237E-05	8.35902E-06	7.89653E-06	2.17987E-14	0.000126353	0.01390529	7.5901E-08	8.8514E-06	1.7703E-06	4.4257E-07	1.64414E-07	0.002354466	0.00071165	8.2362E-11	7.7228E-07	1.7512E-07	4.5186E-08	8.86244E-19
		3.C-Inclined elements / 3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	13.72	m2	441.79	0.043461696	0.200264678	1.35285E-05	0.009789534	0.002141128	0.011078472	0.012569804	0.173633737	3.67507E-07	3.1318E-05	3.74964E-06	2.22635E-06	2.09852E-09	0.000645534	0.00920365	2.7696E-11	1.0759E-06	1.2676E-07	5.3581E-08	1.19307E-10	0.001182414	0.00856451	1.1078E-08	2.7696E-06	4.0373E-07	1.9281E-07	8.84147E-11
			3.C.1.2	Tile bond coat (adhesive)	ADH	82.30	kg	49.38	0.012463281	0.04697698	0	0.008628425	0	3.45137E-06	0.003285193	0.042950382	3.69424E-09	9.90671E-06	3.07428E-06	5.34323E-07	2.03886E-10	0.000158507	0.01755597	5.9057E-07	1.0226E-05	2.2344E-06	5.9057E-07	2.07594E-07	1.90464E-08	2.6588E-07	7.0561E-13	8.3856E-11	3.4258E-10	1.6183E-11	1.25783E-15
			3.C.1.3	Mostar	MOR	1235.52	kg	308.88	0.036463001	0.502805592	0	0	0	0	0.055174278	0.501846039	7.98348E-07	0.000204385	1.00753E-05	0.00014969	4.17405E-09	0.003152802	0.03467823	1.8903E-07	2.1932E-05	4.3082E-06	1.175E-05	3.91689E-06	2.85947E-07	3.9169E-06	1.0574E-11	1.2572E-06	5.1307E-09	2.4315E-10	1.88744E-14
			3.C.1.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.1.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.1.6	Structural steel	ST	230.36	kg	619.68	0.019387163	0.167980012	0	6.02925E-06	0	5.36729E-07	0.012099835	0.165475277	3.0362E-08	5.33721E-05	7.81482E-06	2.98436E-05	1.88737E-09	4.47274E-07	4.9146E-05	2.6836E-10	3.5782E-07	6.2618E-09	1.6531E-09	5.81456E-10	8.48032E-09	1.2524E-07	3.1309E-13	3.7213E-11	1.5261E-10	7.2101E-12	5.59987E-16
			3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.2.2	Tile bond coat (adhesive)	ADH	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.2.3	Mostar	MOR	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.2.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			3.C.2.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		3-Total non-load bearing elements						**48344.52**	3.9516	32.6067	0.0262	1.0141	0.0628	2.5419	2.6723	30.9550	0.0000	0.0069	0.0013	0.0032	0.0000	0.1003	2.4723	0.0000	0.0012	0.0002	0.0002	0.0001	0.0556	0.1982	0.0000	0.0001	0.0000	0.0000	0.0000
	4 - Facades	4.A-External wall systems / 4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	17972.16	kg	26958.24	1.091505834	4.899214166	0.027497014	0.408965741	0.003308016	0.017168186	0.522024529	4.508393663	1.20177E-06	0.001284125	0.000132181	0.000107057	3.47551E-09	0.030428168	0.40756995	3.1545E-09	2.317E-05	5.2202E-06	-3.2801E-07	6.39271E-16	0.058204339	0.01549324	1.0189E-09	7.621E-06	1.6889E-06	5.0946E-07	7.96995E-16
			4.A.1.2	Brick walls	CERB	66309.78	kg	27850.11	1.586161297	21.26898102	0.010557242	0.210629861	0.00491813	0.051498743	1.617060543	19.20903129	1.37502E-06	0.005139575	0.001060874	0.000267278	2.60584E-09	0.015192129	0.21011487	1.2205E-09	6.3858E-05	1.5862E-05	-2.3329E-05	5.09838E-15	0.012102205	0.05026277	1.0454E-09	2.0548E-05	3.3989E-06	-6.8493E-07	4.0684E-15
			4.A.1.3	Insulation layer	MWOOL	26.21	m3	2529.21	0.893391244	4.272563731	0.005164123	0.089664808	0.019429071	0.095588181	0.352959767	4.032371963	7.78995E-08	0.002066056	0.000283141	0.00012205	1.13134E-12	0.006595096	0.08874882	5.4226E-10	9.7542E-06	2.1251E-06	-2.1882E-06	1.63758E-18	0.045066489	0.08970552	1.6433E-09	4.5168E-05	6.4404E-06	2.7052E-06	2.2635E-14
			4.A.1.4	Interior finish	GYP_P	374.42	m2	13816.10	0.109627477	1.285287667	0.000494341	0.188722103	0.016516819	0.087527509	0.063101227	1.116630009	1.75346E-08	0.000129401	9.01446E-07	0.000179998	3.7221E-09	0.014219585	0.18755895	4.8853E-10	3.9547E-05	1.1137E-08	6.1356E-05	3.05329E-10	0.007008016	0.07764068	7.2406E-10	1.8029E-05	8.2875E-08	2.6084E-05	1.92793E-10
		4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.2.3	Steel in timber connect (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.2.4	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.2.5	Timber battens	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.2.6	External wooden cladding	WCLA	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.3.2	Brick wall	CERB	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			4.A.3.4	Tiles for external cladding	N-STON	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		4.B-Facade openings / 4.B.1-Windows	4.B.1	Windows	WIN_PVC	21.54	m2	3165.52	0.078568472	2.015410275	1.32325E-05	0.000955214	0.000159927	0.00347959	0.997789143	1.773270965	0.000783075	0.000365355	4.42393E-05	2.70866E-05	1.64573E-09	0.605582479	0.00093681	4.3328E-07	2.4257E-07	3.8644E-08	1.1024E-08	1.04722E-11	0.814692451	0.00339595	4.3997E-12	4.4331E-07	4.6841E-08	2.9108E-08	2.99445E-11
		4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	4.00	m3	600.56	0.434917676	0.316868593	9.53712E-05	0.001714818	0.000313762	0.001053122	0.013358186	0	0	0.000106555	4.38024E-07	6.89655E-05	4.10065E-10	0.000129543	0	0	4.1317E-07	3.8211E-10	3.7279E-07	1.64337E-20	0.004877291	0	0	1.9664E-06	1.2178E-10	2.2336E-06	5.62286E-19
			4.B.2.2	Exterior front doors	DOOR_W	4.00	m4	1096.73	0.131345542	0.136960421	0	0	0.005900704	0.002089889	0.000705607	0.125837689	2.32244E-07	3.75857E-05	7.43419E-06	2.09144E-05	3.13753E-10	7.68896E-05	0.00846176	4.6188E-08	5.3863E-06	1.0773E-06	2.6932E-07	1.00051E-07	0.001432759	0.00043306	5.012E-11	4.6996E-07	1.0657E-07	2.7497E-08	5.39304E-19
		4- Total facades						**76016.46**	4.3255	34.1953	0.0438	0.9007	0.0505	0.2584	3.5670	30.7655	0.0008	0.0091	0.0015	0.0008	0.0000	0.6722	0.9034	0.0000	0.0001	0.0000	0.0000	0.0000	0.9434	0.2369	0.0000	0.0001	0.0000	0.0000	0.0000
	5 - Roof	5.A-Roof Type I: Flat roof or / 5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	134.33	m2	4326.77	0.425649581	1.961326499	0.000132494	0.095875482	0.020969501	0.108498913	0.123104536	1.700511805	3.59924E-06	0.000306718	3.67227E-05	2.18041E-05	2.05522E-08	0.006322148	0.09013756	2.7125E-10	1.0537E-05	1.2415E-06	5.2476E-07	1.16845E-09	0.011580172	0.08387801	1.085E-07	2.7125E-05	3.954E-06	1.8883E-06	8.65905E-10
			5.A.1.2	Gravel ballast	GRAV	0.00	kg	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	134.33	m2	564.19	0.18778658	2.931557161	0.000994226	0.014396971	0.027020402	0.527888941	0.036305405	0	0	7.20892E-05	1.95089E-06	7.32368E-05	4.31909E-10	0.001084989	0	0	1.2206E-06	3.9018E-09	1.0537E-06	1.07456E-16	0.019821917	0	0	4.2356E-05	6.0196E-07	3.9435E-05	1.64835E-09
		5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	9.40	m3	907.40	0.320520394	1.53286012	0.001852723	0.032168884	0.006970534	0.034294002	0.12663075	1.446686945	2.79479E-08	0.000741235	0.000101582	4.37877E-05	4.0589E-13	0.002366111	0.03184026	1.9455E-10	3.4995E-06	7.6241E-07	-7.8505E-07	5.87511E-19	0.016168425	0.03218349	5.8956E-10	1.6205E-05	2.3106E-06	9.7054E-07	8.12073E-15
		5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	6447.84	kg	1611.96	0.190290401	2.624004473	0	0	0	0	0.287939422	2.618996831	4.16636E-06	0.001066628	5.25802E-05	0.000781192	2.17832E-08	0.01645361	0.18097619	9.8651E-07	0.00011446	2.2483E-05	6.1318E-05	2.04412E-05	1.49228E-06	2.0441E-05	5.5184E-11	6.561E-06	2.6776E-08	1.2689E-09	9.85003E-14
		5.B-Roof type II: Inclinated tiled roof / 5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	3670.14	kg	11377.42	0.307839951	1.308319791	0.000584326	0.012570131	0.000293588	0.002556782	0.080095395	1.282666461	1.143E-07	0.001094542	9.17819E-05	5.75775E-05	6.01428E-10	0.00092352	0.01245612	7.867E-11	6.7269E-07	1.3397E-07	-8.6651E-09	6.61286E-17	0.00215488	0.00245987	1.81E-11	9.1782E-07	1.5392E-07	-2.6423E-08	1.5563E-16
		5.B.2-Mostar	5.B.2	Cement mostar	MOR	2936.11	kg	734.03	0.086651245	1.194875068	0	0	0	0	0.131117016	1.192594772	1.89721E-06	0.000485703	2.39431E-05	0.000355726	9.91929E-09	0.007492368	0.08240989	4.4922E-07	5.2121E-05	1.0238E-05	2.7922E-05	9.30817E-06	6.79528E-07	9.3082E-06	2.5129E-11	2.9876E-06	1.2193E-08	5.7783E-10	4.48534E-14
		5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	91.75	m2	385.36	0.128266646	2.002384865	0.000679101	0.009833776	0.018456145	0.360571794	0.024798218	0	0	4.92401E-05	1.33255E-06	5.0024E-05	2.95013E-10	0.000741096	0	0	8.3373E-07	2.6651E-09	7.1972E-07	7.3397E-17	0.013539257	0	0	2.8931E-05	4.1117E-07	2.6936E-05	1.1259E-09
		5.B.4-Decking	5.B.4	Ceramic deck or	CERB	2835.18	kg	1190.78	0.067818851	0.909389143	0.000451392	0.009005815	0.000210282	0.002201911	0.069139998	0.821312713	5.8791E-08	0.000219751	4.53594E-05	1.14279E-05	1.11417E-10	0.000649564	0.0089838	5.2185E-11	2.7304E-06	6.7819E-07	-9.9747E-07	2.17989E-16	0.000517449	0.00214906	4.4699E-11	8.7856E-07	1.4533E-07	-2.9285E-08	1.73951E-16
			5.B.5	wooden deck (plywood)	PLYW	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5.B.5-Structure	5.B.6	Brick walls or	CERB	1979.19	kg	831.26	0.047343167	0.634828836	0.000315109	0.006286804	0.000146795	0.001537116	0.048265437	0.573344203	4.1041E-08	0.000153404	3.16646E-05	7.97763E-06	7.77781E-11	0.000453449	0.00627143	3.643E-11	1.906E-06	4.7343E-07	-6.9631E-07	1.52174E-16	0.000361222	0.00150023	3.1203E-11	6.1331E-07	1.0145E-07	-2.0444E-08	1.21432E-16
			5.B.7	Gulam timber beams	GLT	0.00	m3	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	4.31	m3	416.01	0.146947647	0.702763979	0.00084941	0.014748334	0.003195751	0.015722628	0.058055871	0.663256524	1.28131E-08	0.000339831	4.65719E-05	2.00751E-05	1.86087E-13	0.001084781	0.01459767	8.9193E-11	1.6044E-06	3.4954E-07	-3.5992E-07	2.69354E-19	0.00741267	0.01475503	2.7029E-10	7.4294E-06	1.0593E-06	4.4496E-07	3.72308E-15
		5-Total Roofs						**22345.18**	1.9091	15.8023	0.0059	0.1949	0.0773	1.0533	0.9855	10.2994	0.0000	0.0045	0.0004	0.0014	0.0000	0.0376	0.4277	0.0000	0.0002	0.0000	0.0001	0.0000	0.0716	0.1370	0.0000	0.0001	0.0000	0.0001	0.0000
	Total building (A1-A5)							**326436.80**	15.2743	121.7794	0.1004	2.5836	0.1136	2.8094	11.5813	115.5799	0.0008	0.0332	0.0060	0.0119	0.0000	0.8195	4.0465	0.0000	0.0016	0.0004	0.0001	0.0001	0.9998	0.4455	0.0000	0.0002	0.0000	0.0000	0.0000

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BIM-LCA Construction Project

Graphical Results

Project name: Single-family house with steel structure and bricks

Enviromental Impacts	
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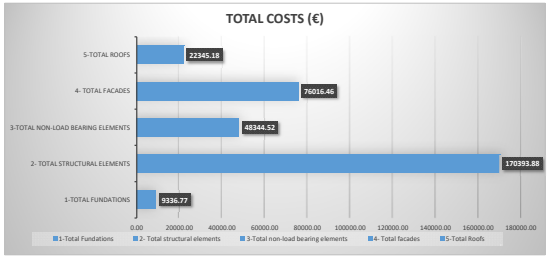
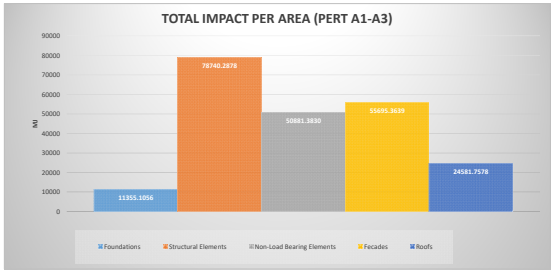
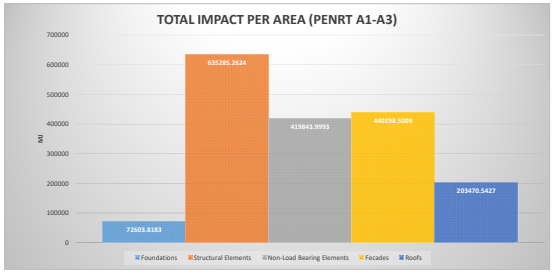
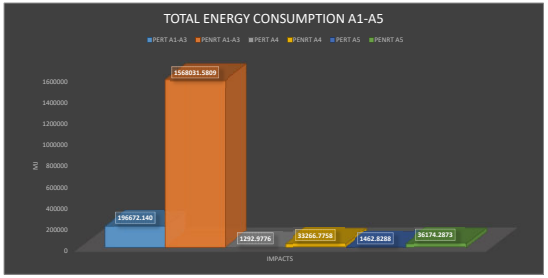
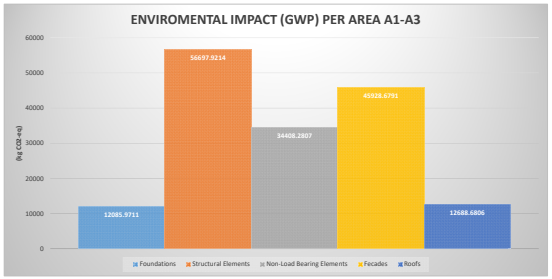
Abiotic depletion potential for non fossil resources (ADPE)	Photochemical Ozone Creation Potential (POCP)
Acidification potential (AP)	Ozone Depletion Potential (ODP)
Global warming potential (GWP)	

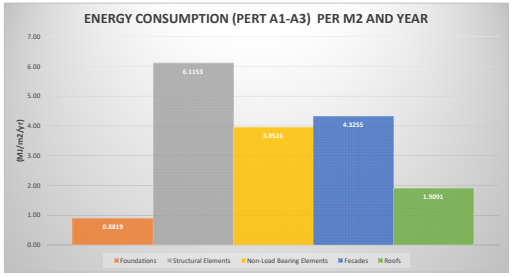


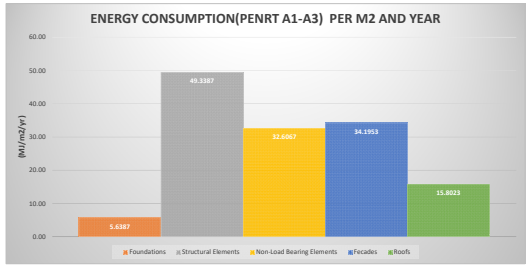


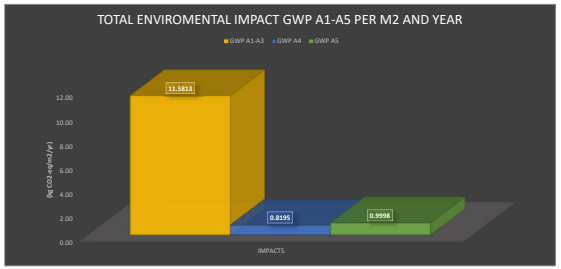












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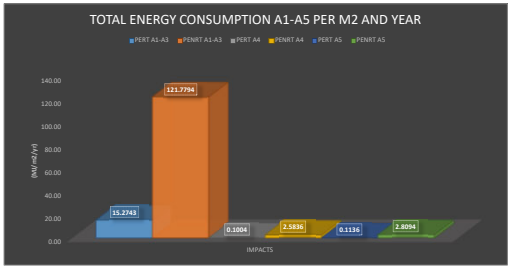

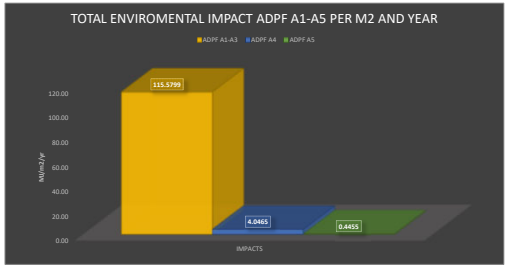

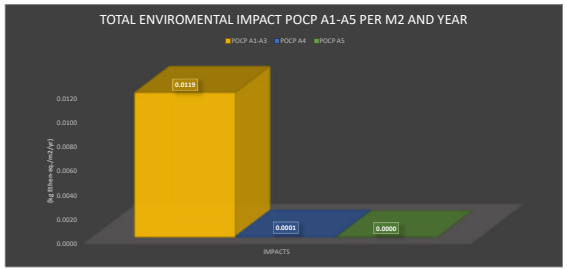

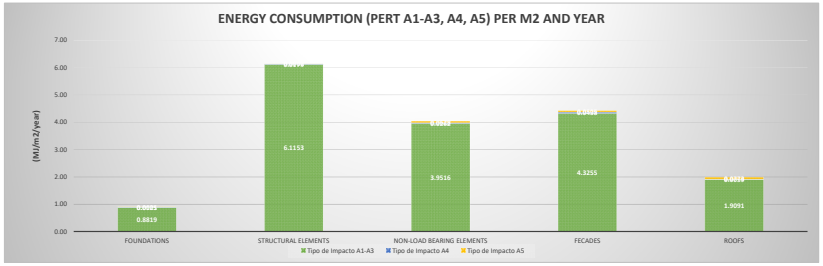

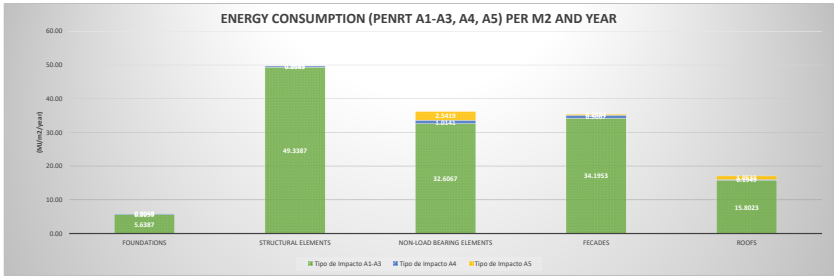

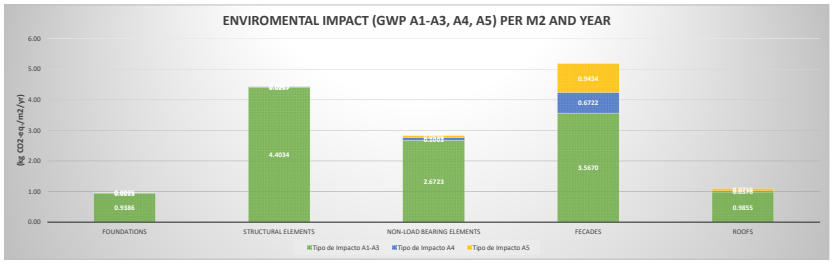

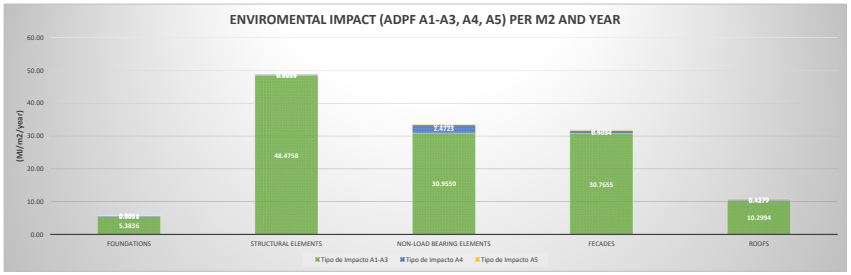

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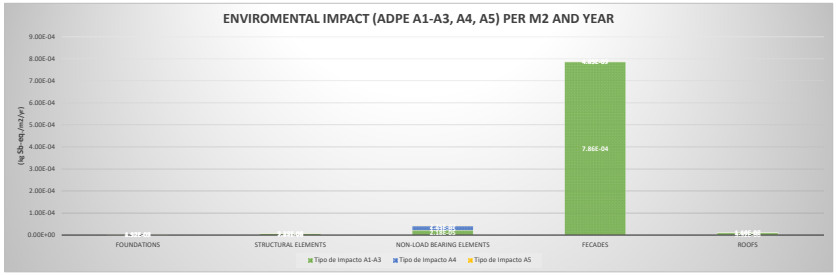
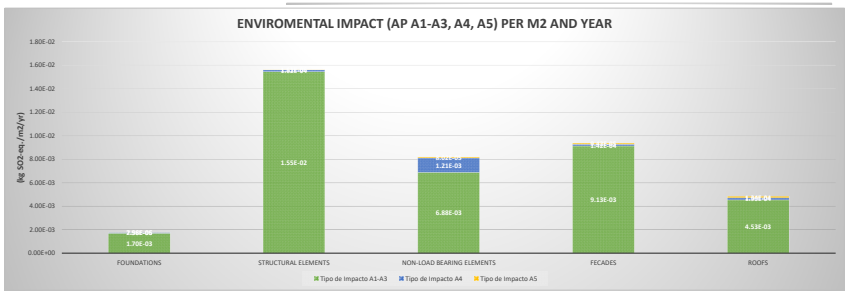
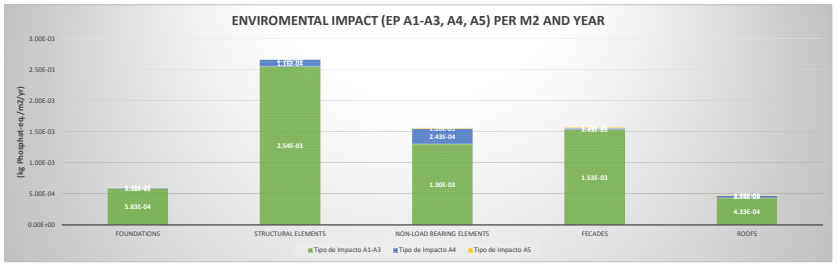
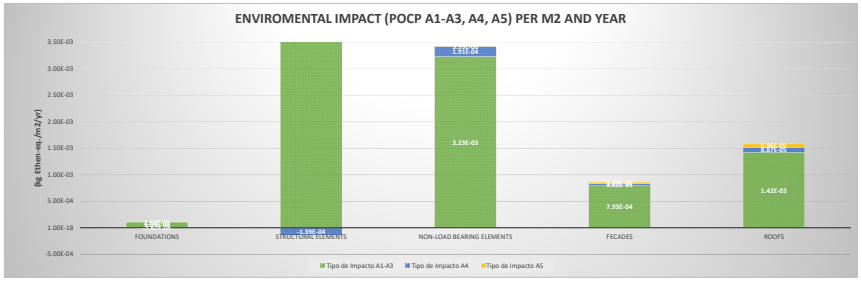
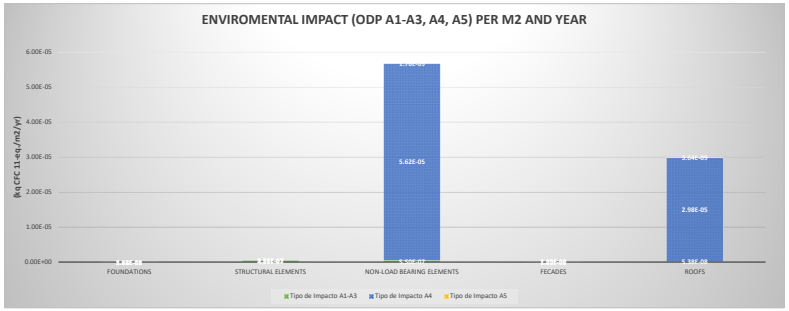
Enviromental Impacts	
Abiotic depletion potential for fossil resources (ADPF)	Eutrophication potential (EP)
Abiotic depletion potential for non fossil resources (ADPE)	Photochemical Ozone Creation Potential (POCP)
Acidification potential (AP)	Ozone Depletion Potential (ODP)
Global warming potential (GWP)	











Annex 3. LCA with Excel app of a single-family house in timber

Co-funded by the European Union

Erasmus+ Project 2022-1-NO01-KA220-HED-000087893

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BIM-LCA Construction Project

Inputs

1- Data of the building

Project Name:	Single-family house in timber (structure, facades and partitions)	
Building type	Residential	
Address	Street 1	
IndoorFloor area	257.52	m2
Analysed service life	50	year
City	Cartagena	
Country	Spain	

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable

2- Areas and volumes in elements of the building - User inputs

Footing volume (m3):	24.83
Volume of Foundation beams (m3):	2.98
Footing plant area (m2):	59.43
Foundation beam plant area (m2):	11.56
Volume of piles (m3):	0.00
Volumen of pile caps (m3):	0.00
Pile cap plant area (m2):	0.00
Foundation slab volume (m3):	0.00
Foundation slab plant area (m2):	0.00
Column volume (m3):	5.76
beam volume (m3):	2.80
Retaining wall volume (m3):	0.00
Area of slabs (including beams) (m2):	351.13
Partition area (m2):	221.66
Facade area (m2):	374.42
Exterior party wall (m2):	0.00
Stairs (m2):	10.80
Ramps (m2):	0.00
Steel volume in stiffening elements (m3):	0.00
Concrete volume in stiffening walls (m3):	0.00
Interior door surface (m2):	7.64
Main door surface (m2):	4.00
Exterior glazed door surface (m2):	4.00
Windows surface (m2):	21.54
Flat roof area (m2):	134.33
Inclinated roof area (horizontal projection) (m2):	86.22
roof inclination angle (deg):	20.00
parapets (m2):	26.40
Railing (m):	5.50

Note: IMPORTANT - If any of the previus element is missing in the project enter 0

Floor Areas (m2)	Indoor	outdoor	total
Ground floor:	116.52	80.37	196.89
Intermediate floors:	141		
roof type 1:		128.48	
roof tape 2:		5.85	

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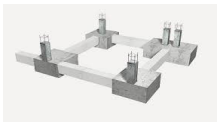
BIM-LCA Construction Project

Inputs

2- Choice the type of structural, construction systems & materials

a) Type of Foundation: 2 (enter 1, 2 or 3)

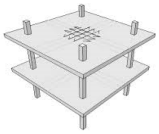

(1) Piles and pile caps (2) Footings (3) Foundation slab

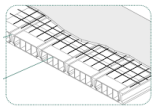
b) Material in Beams and Columns 3



(1) Reinf. Concrete (2) Steel (3) Timber

c) Type of structural slabs 4 (enter 1, 2, 3 or 4)






(1)-Mass concrete slabs (2) Composite slab slabs (3) Lightweight concrete slabs (4) Timber slabs

c-1) If the perviuos answer was *(3) Lightweight concrete slabs* , pease chose:

Type of bocks: 1


(1) Concrete blocks (2) Ceramic blocks

d) If it exists in the building, choose one of these stiffening systems:

Type of structure stiffening system: 0


(0) Without stiffening system (1) Concrete stiffening walls (2) Steel stiffening elements

e) Type of flooring (non-structural) 2



(1) Ceramic flooring (2) Wood floating floor (3) Screed flooring

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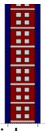
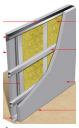
BIM-LCA Construction Project

Inputs

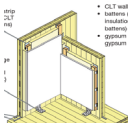
f) Type of internal partitions 3



(1) Brick walls



(2) Gypsum cardboard walls



(3) Structural Timber wall

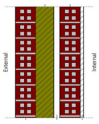
g) Type of stairs 3

(1) Concrete

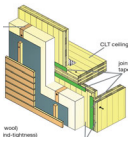
(2) Steel

(3) Timber

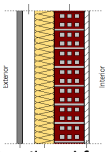
h) Type of facades 2



(1) Double bricks wall



(2) Timber



(3) Ventilated facade

h-1) If the perviuos answer was *(3) Ventilated facade* , pease chose:

Type of tiles for external cladding: 1

N-STON	PORCE	A-STON
(1) Natural semi-rijo limestone	(1) EXTRUDED PORCELAIN	(2) Artificial stone Aggregates+polyester resins

i) Type of windows 2

(1) PVC Double Glazed Window WIN_PVC

(2) Hardwood double glazed window WIN_WOOD

(3) Aluminium Window WIN_AL

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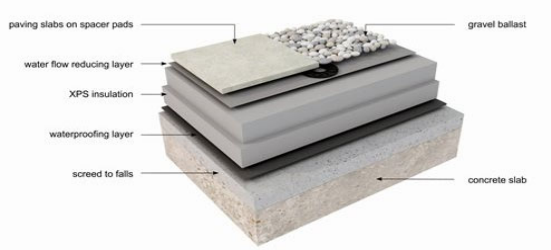
BIM-LCA Construction Project

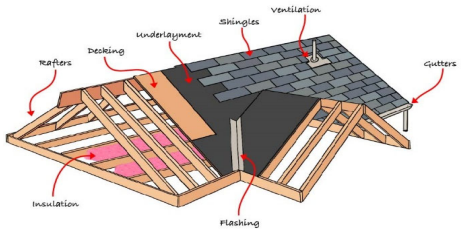
Inputs

j) Type of finishing coat in flat roof 1 (enter 1 or 2)



(1) Ceramic tiles (2) Gravel ballast

k) Type of inclinated roof 2



(1) with brick walls (2) With timber structure

l) Structure under inclinated roof

Eliminate the structure and insulation of inclinated roofs?: 2 (enter 1 or 2)

(1) Yes (2) No

m) Material in the insulation layers of the facades and roofs 1 (enter 1,2,...or 6)

1	MWOOL	Mineral wool insulation
2	POLYU1	Insulation board with a core of rigid polyurethane
3	POLYU2	Polyurethane thermal insulation spray foam
4	EPS	Expanded Polystyrene for insulation
5	CELL	Cellulose Fibre Insulation
6	CORK	Cork-based thermal insulation panels

BIM-LCA

BIM-LCA Construction Project

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Building Material Quantities

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable
30	Parameter loaded by default by app and editable by user
264.62	**kg** Quantity calculated by the program based on the user inputs and parameters of each material. Not user-editable
MWOOL	A type of material or construction element from which one material can be chosen from several alternatives. See note 3, 4 and 5.

Project name: Single-family house in timber (structure, facades and partitions)

						Auxiliary quantiites								
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula
1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0			0.00	vol (m3)			0.00	**m3**	Q=nr*Par1
			1.A.2	Rebar	REB	0			30	Kg Rebar/m3 Con			0.00	**kg**	Q=nr*Par1*Qcon
	1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0			0.00	vol (m3)			0.00	**m3**	Q=nr*Par1
			1.B.1.2	Rebar	REB	0			80	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
			1.B.1.3	Blinding concrete	CON0	0	0.10		0.00	pile cap area (m2)			0.00	**m3**	Q=nr*e*Par1
		1.B.2-Footings	1.B.2.1	Concrete	CON1	1			24.83	footing vol (m3)			24.83	**m3**	Q=nr*Par1
			1.B.2.2	Rebar	REB	1			63.3	Kg Rebar/m3 Con			1571.74	**kg**	Q=Par1*Qcon
			1.B.2.3	Blinding concrete	CON0	1	0.10		59.43	Footing area (m2)			5.94	**m3**	Q=nr*e*Par1
		1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	1			2.98	beam vol (m3)			2.98	**m3**	Q=nr*Par1
			1.B.3.2	Rebar	REB	1			88.8	Kg Rebar/m3 Con			264.62	**kg**	Q=nr*Par1*Qcon
			1.B.3.3	Blinding concrete	CON0	1	0.10		11.56	Beam area (m2)			1.16	**m3**	Q=nr*e*Par1
		1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0			0.00	slab vol (m3)			0.00	**m3**	Q=nr*Par1
			1.B.4.2	Rebar	REB	0			75	Kg Rebar/m3 Con			0.00	**kg**	
			1.B.4.3	Blinding concrete	CON0	0	0.10		0.00	Slab area (m2)			0.00	**m3**	Q=e*Par1
	1.C - Retaining walls		1.C.1	Concrete	CON3	1			0.00	wall vol (m3)			0.00	**m3**	Q=nr*Par1
			1.C.2	Rebar	REB	1			90	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams (Timber, steel or concrete)	2.A.1.1	Gulam Timber	GLT	1			2.80	beam volume (m3)			2.80	**m3**	Q=nr*Par1
			2.A.1.2	Steel in timber connec. (galvanized)	ST-G	1			8	kg Steel/m3 timber			22.40	**kg**	Q=nr*Par1*Q CLT
			2.A.1.3	Structural steel	ST	0		7850	2.80	beam volume (m3)	1.1	due to connections	0.00	**kg**	Q=nr*Par1*d*Par2
			2.A.1.4	Concrete	CON3	0			2.80	beam volume (m3)			0.00	**m3**	Q=nr*Par1
			2.A.1.5	Rebar	REB	0			137.6	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Q Con
		2.A.2-Columns (Timber, steel or concrete	2.A.2.1	Gulam Timber	GLT	1			5.76	column vol (m3)			5.76	**m3**	Q=nr*Par1
			2.A.2.2	Steel in timber connect. (galvanized)	ST-G	1			8	kg Steel/m3 timber			46.08	**kg**	Q=nr*Par1*Q CLT
			2.A.2.3	Structural steel	ST	0		7850	5.76	column vol (m3)	1.1	due to connections	0.00	**kg**	Q=nr*Par1*d*Par2
			2.A.2.4	Concrete	CON3	0			5.76	column vol (m3)			0.00	**m3**	Q=nr*Par1
			2.A.2.5	Rebar	REB	0			202.3	Kg Rebar/m3 Con			0.00	**kg**	
		2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	0	0.25		339.93	Slab area (m2)			0.00	**m3**	Q=nr*e*Par1
			2.A.3.2	Rebar	REB	0			90	Kg Rebar/m3 Con			0.00	**kg**	
		2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	0	0.16		351.13	Slab area (m2)			0.00	**m3**	Q=nr*e*Par1
			2.A.4.2	Rebar	REB	0			25	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Q Con
			2.A.4.3	Galvanized steel plates	ST-G	0	0.001	7850	351.13	Slab area (m2)	1.200	m2 plates/m2 slab	0.00	**kg**	Q=nr*e*Par1*Par2*d
		2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0	0.25		339.93	Slab area (m2)	0.820	m3 block/m2 slab	0.00	**m3**	Q=nr*e*Par1*Par2
			2.A.5.2	Ceramic blocks	CERB	0	0.25	320	339.93	Slab area (m2)	0.820	m3 block/m2 slab	0.00	**kg**	Q=nr*e*Par1*Par2*d
			2.A.5.3	Precast concrete beams	CONBEAM	0		2500	339.93	Slab area (m2)	0.038	m2 beam cross sec	0.00	**kg**	Q=nr*(Par1/0.8)*Par2*d
			2.A.5.4	Concrete (cast in place)	CON2	0	0.05		339.93	Slab area (m2)			0.00	**m3**	Q=nr*Par1*e
			2.A.5.5	Rebar	REB	0			25	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Q Con
		2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	1	0.16		351.13	foor area (m2)			56.18	**m3**	Q=nr*Par1*e
			2.A.6.2	Steel in timber connect. (galvanized)	ST-G	1			4	kg Steel/m3 CLT			224.72	**kg**	Q=nr*Par1*Q CLT
	2.B-Concrete stiffening walls/steel in stiffening elements		2.B.1	Structural steel	ST	0		7850	0.00	steel volume (m3)	1.1	due to connections	0.00	**kg**	Q=nr*Par1*d*Par2
			2.B.2	Concrete	CON3	0			0.00	concrete vol (m3)			0.00	**m3**	Q=nr*Par1
			2.B.3	rebar	REB	0			140	Kg Rebar/m3 Con			0.00	**kg**	Q=Par1*Qcon
	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	1	0.15		196.89	Slab area (m2)			29.53	**m3**	Q=nr*Par1*e
			3.A.1.2	rebar	REB	1			30	Kg Rebar/m3 Con			886.01	**kg**	Q=Par1*Qcon
			3.A.1.3	Graded aggregate	AGG	1	0.25	1800	196.89	Slab area (m2)			88600.50	**kg**	Q=nr*Par1*e*d
		3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	0			257.52	Floor area (m2)			0	**m2**	Q=nr*Par1
			3.A.2.2	Tile bond coat (adhesive)	ADH	0			257.52	Floor area (m2)	6.00	kg/m2	1545.12	**kg**	Q=nr*Par1*Par2
			3.A.2.3	Mortar bed	MOR	0	0.03	1600	257.52	Floor area (m2)			0.00	**kg**	Q=nr*e*Par1*d
			3.A.2.4	Cleavage membrane	POLY	0	0.005		257.52	Floor area (m2)			0.00	**m3**	Q=nr*e*Par1
		3.A.3-Flooring Type II: Wood floating	3.A.3.1	Laminated wood flooring	WFL	1			257.52	Floor area (m2)			257.52	**m2**	Q=nr*Par1
			3.A.3.2	Chipboard flooring (plywood)	PLYW	1	0.03		257.52	Floor area (m2)			7.73	**m3**	Q=nr*Par1*e

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Project name: Single-family house in timber (structure, facades and partitions)

						Auxiliary quantiites						Material		
						nr.	thickness	density	Parameter 1		Parameter 2				
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	Quantities (Q)	Unit	Formula
3 - Non-load bearing elements	3.B-Vertical elements	floor or	3.A.3.3	Insulation layer	MWOOL	1	0.04		257.52	Floor area (m2)			10.30	m3	Q=nr*Par1*e
			3.A.3.4	Timber battens	GLT	1			257.52	Floor area (m2)	0.045	m3 timb/m2 floor	11.59	m3	Q=nr*Par1*Par2
		3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0	0.05		257.52	Floor area (m2)			0.00	m4	Q=nr*Par1*e
			3.A.4.2	Sound insulation layer	POLY	0	0.005		257.52	Floor area (m2)			0.00	m3	Q=nr*e*Par1
		3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	0	0.110	805	221.66	Wall area (m2)			0.00	kg	Q=nr*e*Par1*d
			3.B.1.2	Finishing coat (plastering mortars)	PLASM	0	0.02	1600	221.66	Wall area (m2)			0.00	kg	Q=nr*e*Par1*d
		3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0			221.66	Wall area (m2)			0.00	m2	Q=nr*Par1
			3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0			221.66	Wall area (m2)	3.040	kg ST /m2 wall	0.00	kg	Q=nr*Par1*Par2
			3.B.2.3	Insulation layer	MWOOL	0	0.05		221.66	Wall area (m2)			0.00	m3	Q=nr*Par1
		3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	1	0.100		221.66	Wall area (m2)			22.17	m3	Q=nr*Par1*e
			3.B.3.2	Steel in timber connect. (galvanized)	ST-G	1			4	kg Steel/m3 CLT			88.66	kg	Q=nr*Par1*Q CLT
			3.B.3.3	Insulation layer	MWOOL	1	0.050		221.66	Wall area (m2)			11.08	m3	Q=nr*Par1*e
			3.B.3.4	Timber battens	GLT	1			221.66	Wall area (m2)	0.045	m3 timb/m2 wall	9.97	m3	Q=nr*Par1*Par2
			3.B.3.5	Gypsum plasterboard	GYP_P	1			221.66	Wall area (m2)	2	number or boards	443.32	m2	Q=nr*Par1*Par2
		3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	1	0.20		0.00	Wall area (m2)			0.00	m3	Q=nr*Par1*e
			3.B.4.2	Insulation layer	MWOOL	1	0.05		0.00	Wall area (m2)			0.00	m3	Q=nr*Par1*e
			3.B.4.3	Finishing coat (plastering mortars)	PLASM	1	0.04	1600	0.00	Wall area (m2)			0.00	kg	Q=nr*e*Par1*d
		3.B.5-Parapets	3.B.5.1	Brick wall	CERB	1	0.110	805	26.40	Wall area (m2)			2337.72	kg	Q=nr*e*Par1*d
			3.B.5.2	Finishing coat (plastering mortars)	PLASM	1	0.02	1600	26.40	Wall area (m2)			844.80	kg	Q=nr*e*Par1*d
		3.B.6-Railings	3.B.6	Railings	ST-SL	1			5.50	long (m)	9.50	kg ST/m railing	52.25	kg	Q=nr*Par1*Par2
		3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	1			7.64	door (m2)			7.64	m2	Q=nr*Par1
	3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	1			10.80	stairs area (m2)	1.27	m2 title/m2 stairs	13.72	m2	Q=nr*Par1*Par2
			3.C.1.2	Tile bond coat (adhesive)	ADH	1			6.00	kg/m2 title			82.30	kg	Q=nr*Par1*m2 title
			3.C.1.3	Mostar	MOR	1		1600	10.80	stairs area (m2)	0.0715	m3 mor/m2 stairs	1235.52	kg	Q=nr*Par1*Par2*d
			3.C.1.4	Concrete	CON3	0	0.20		10.80	stairs area (m2)			0.00	m3	Q=nr*Par1*e
			3.C.1.5	Rebar	REB	0			137.6	Kg Rebar/m3 Con			0.00	kg	Q=nr*Par1*Qcon
			3.C.1.6	Structural steel	ST	0			10.80	stairs area (m2)	21.33	kg ST/m2 Stairs	0.00	kg	Q=nr*Par1*Par2
			3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	1	0.160		10.80	stairs area (m2)			1.73	m3	Q=nr*Par1*e
			3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0			4.00	kg Steel/m3 CLT			0.00	kg	Q=nr*Par1*Q CLT
		3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	1			0.00	ramp area (m2)			0.00	m2	Q=nr*Par1
			3.C.2.2	Tile bond coat (adhesive)	ADH	1			0.00	ramp area (m2)	6.00	kg/m2 title	0.00	kg	Q=nr*Par1*Par2
			3.C.2.3	Mostar	MOR	1	0.03	1600	0.00	ramp area (m2)			0.00	kg	Q=nr*e*Par1*d
			3.C.2.4	Concrete	CON3	1	0.10		0.00	ramp area (m2)			0.00	m3	Q=nr*e*Par1
			3.C.2.5	Rebar	REB	1			30	Kg Rebar/m3 Con			0.00	kg	Q=Par1*Qcon
4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	0	0.03	1600	374.42	Wall area (m2)			0.00	kg	Q=nr*e*Par1*d
			4.A.1.2	Brick walls	CERB	0	0.22	805	374.42	Wall area (m2)			0.00	kg	Q=nr*e*Par1*d
			4.A.1.3	Insulation layer	MWOOL	0	0.07	152	374.42	Wall area (m2)			0.00	m3	Q=nr*Par1*e
			4.A.1.4	Interior finish	GYP_P	0			374.42	Wall area (m2)			0.00	m2	Q=nr*Par1
		4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	1			374.42	Wall area (m2)			374.42	m2	Q=nr*Par1
			4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	1	0.100		374.42	Wall area (m2)			37.44	m3	Q=nr*Par1*e
			3.B.3.2	Steel in timber connect (galvanized)	ST-G	1			4	kg Steel/m3 CLT			149.77	kg	Q=nr*Par1*Q CLT
			4.A.2.3	Insulation layer	MWOOL	1	0.05		374.42	Wall area (m2)			18.72	m3	Q=nr*Par1*e
			4.A.2.4	Timber battens	GLT	1			374.42	Wall area (m2)	0.045	m3 timb/m2 wall	16.85	m3	Q=nr*Par1*Par2
			4.A.2.5	External wooden cladding	WCLA	1			374.42	Wall area (m2)			374.42	m2	Q=nr*Par1
		4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0			374.42	Wall area (m2)			0.00	m2	Q=nr*Par1
			4.A.3.2	Brick wall	CERB	0	0.12	1000	374.42	Wall area (m2)			0.00	kg	Q=nr*e*Par1*d
			4.A.3.3	Insulation layer	MWOOL	0	0.05		374.42	Wall area (m2)			0.00	m3	Q=nr*Par1*e
			4.A.3.4	Tiles for external cladding	N-STON	0	0.03	2750	374.42	Wall area (m2)			0.00	kg	Q=nr*Par1*e*d
	4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_WOOD	1			21.54	Surface (m2)			21.54	m2	Q=nr*Par1
		4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	1			4.00	Surface (m2)			4.00	m3	Q=nr*Par2
			4.B.2.2	Exterior front doors	DOOR_W	1			4.00	Surface (m2)			4.00	m3	Q=nr*Par3

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Building Material Quantities

Excel Legend

10.80	User input (or parameter readed from IFC file)
23.87	Parameter calculated by app and not editable
30	Parameter loaded by default by app and editable by user
264.62	**kg** Quantity calculated by the program based on the user inputs and parameters of each material. Not user-editable
MWOOL	A type of material or construction element from which one material can be chosen from several alternatives. See note 3, 4 and 5.

Project name: Single-family house in timber (structure, facades and partitions)

							Auxiliary quantiites							
						nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula
5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	1		2300	134.33	roof area (m2)			134.33	**m2**	Q=nr*Par1
			5.A.1.2	Gravel ballast	GRAV	0	0.15	1800	134.33	roof area (m2)			0.00	**kg**	Q=nr*Par1*e*d
		5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	1			134.33	roof area (m2)			134.33	**m2**	Q=nr*Par1
		5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	1	0.07		134.33	Wall area (m2)			9.40	**m3**	Q=nr*Par1*e
		5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	1	0.03	1600	134.33	Wall area (m2)			6447.84	**kg**	Q=nr*e*Par1*d
	5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	1			86.22	roof tiles area (m2)	40	kg/m2	3670.14	**kg**	Q=nr*Par1*Par2/cos(Par3)
		5.B.2-Mostar	5.B.2	Cement mostar	MOR	1	0.02	1600	86.22	roof tiles area (m2)			2936.11	**kg**	Q=nr*e*Par1*d/cos(Par3)
		5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	1			86.22	roof tiles area (m2)			91.75	**m2**	Q=nr*Par1/cos(Par3)
		5.B.4-Decking	5.B.4	Ceramic deck or	CERB	0	0.03	1030	86.22	roof tiles area (m2)			0.00	**kg**	Q=nr*e*Par1*d/cos(Par3)
			5.B.5	wooden deck (plywood)	PLYW	1	0.03		86.22	roof tiles area (m2)			2.59	**m3**	Q=nr*Par1*e
		5.B.5-Structure	5.B.6	Brick walls or	CERB	0	0.045	483	86.22	roof tiles area (m2)	0.80	wall separation (m)	0.00	**kg**	Q=nr*e*(Par1^0.5/Par2)*(tg(Par
			5.B.7	Gulam timber beams	GLT	1	0.05		86.22	roof tiles area (m2)	0.60	wall separation (m)	1.25	**m3**	Q=nr*e*0.05*(((Par1^0.5)/cos(P
		5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	1	0.05		86.22	roof tiles area (m2)			4.31	**m3**	Q=nr*Par1*e

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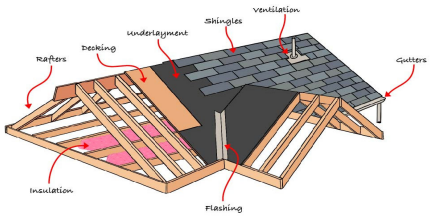
Project name: Single-family house in timber (structure, facades and partitions)

					Auxiliary quantiites									
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements	Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula

5.A - Flat roof

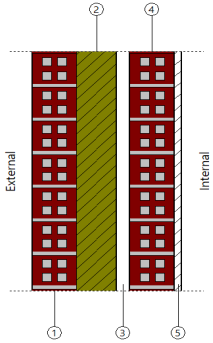
5.B - Tiled roof with timber structure



5.B - Tiled roof

Tiled roof with brick walls

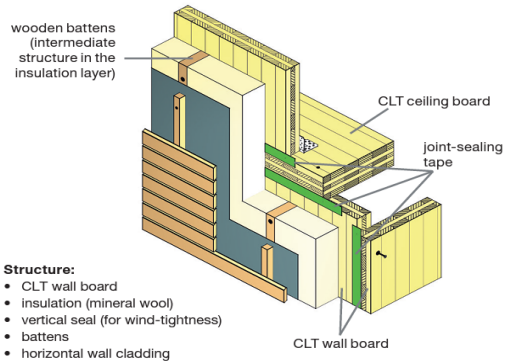
4.A.1 - Facade Type I: Facade with double brick wall



Layers
1 - M01 - 100 mm brick: 10.16 cm
2 - I04 - 89 mm batt insulation: 8.94 cm
3 - F04 - Wall air space resistance: 3.00 cm
4 - M01 - 100 mm brick: 10.16 cm
5 - G01 - 16 mm gyp board: 1.59 cm
Total thickness: 33.85 cm
Thermal description
Heat transfer coefficient (U): 0.39 W/(m²·K)
Thermal capacity: 51975.29 J/m²·K

4.A.2 - Facade Type II: with Timber walls

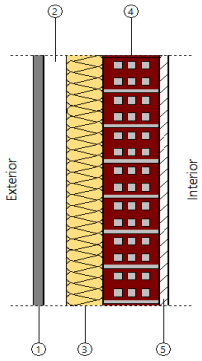
External wall
Insulation with mineral wool



Structure:

- CLT wall board
- insulation (mineral wool)
- vertical seal (for wind-tightness)
- battens
- horizontal wall cladding

4.A.3 - Facade Type III: Ventilated facade



Capas
1 - Caliza muy dura [2200 < d < 2590]: 2.00 cm
2 - Cámara de aire: 5.00 cm
3 - URSA TERRA Vento Plus P8792 80mm: 8.00 cm
4 - 1/2 pie LP métrico o catalán 40 mm< G < 60 mm: 12.00 cm
5 - Enlucido de yeso 1000 < d < 1300: 2.00 cm
Espesor total: 29.00 cm
Caracterización térmica
Transmitancia térmica (U): 0.33 W/(m²·K)
Capacidad térmica: 61992.71 J/m²·K

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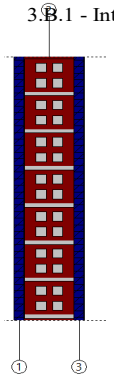
Project name: Single-family house in timber (structure, facades and partitions)

					Auxiliary quantiites									
					nr.	thickness	density	Parameter 1		Parameter 2		Material		
Building part	Building element types / building elements	Ref.	Type of Material	Mat Code	1/0	e (m)	d (kg/m3)	Par. Value	Par. name (unit)	Par. Value	Par. name (unit)	**Quantities (Q)**	**Unit**	Formula

3.B.1 - Internal partitions type I: brick walls

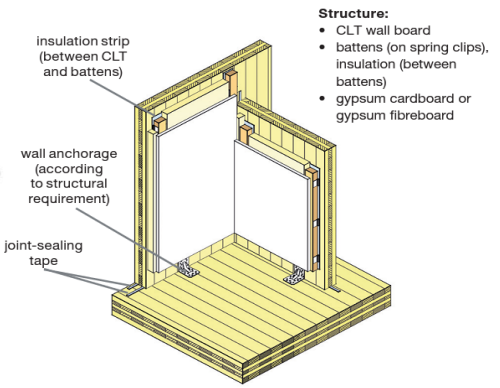


Layers
1 - Cement, sand: 2.00 cm
2 - M01 - 100 mm brick: 10.16 cm
3 - Cement, sand: 2.00 cm
Total thickness: 14.16 cm
Thermal description
Heat transfer coefficient (U): 2.42 W/(m²·K)
Thermal capacity: 70113.91 J/m²·K

3.B.2 - Internal partitions type II: Gypsum walls

3.B.3 - Internal partitions type III: Timber walls

Internal wall
Facing panel (spring clips)



Structure:
- CLT wall board
- battens (on spring clips), insulation (between battens)
- gypsum cardboard or gypsum fibreboard

3.A.2 - Flooring Type I: Ceramic flooring

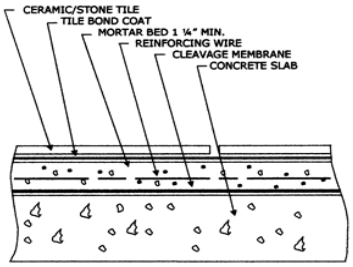
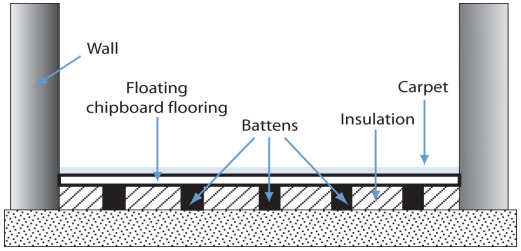
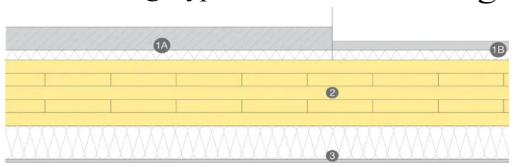


FIGURE F

3.A.3 - Flooring Type II: Wooden floating floor



3.A.4 - Flooring Type III: Screed flooring



1A. Wet screed (50-70 mm) with impact sound insulation (20-30 mm).
1B. Dry screed (25 mm) with impact sound insulation (20-30 mm).
2. CLT floor 220 mm (140 mm or thicker).
3. Mineral wool and suspended ceiling (~70 mm) with single layer gypsum board ceiling.

Co-funded by the European Union

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BIM-LCA Construction Project

Description of Materials and Impact Data

Project name: Single-family house in timber (structure, facades and partitions)

			1	2	3	4	5	6
nr.	Building part	Type of Material	Mat Code	Material Name	Description	Quant. Studied in EPD	Unit	Cost €
1	Under foundation	Blinding concrete	CON0	Concrete C16/20	C16/20 ECOPact Prime concrete produced in the plant of Greenwich of Aggregate Industries for use as ready-mixed concrete of normal building construction and civil engineering.	1	m3	87.54
2	Structure	Concrete	CON1	Ready mixed concrete (C30/37, C35/45 SCC) - C30/37 (Foundation)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	118.28
3	Structure	Concrete	CON2	Ready mixed concrete (C30/37, C35/45 SCC) - C35/45 SCC (Floor)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	244.28
4	Structure	Concrete	CON3	Ready mixed concrete (C30/37, C35/45 SCC) - C30/37 (Inner wall, Column and Beams)	1m3 factory concrete for use in exposure classes XC2, XC3, XC4, XF1 and XA1. This corresponds to concrete exposed to moderate environmental impact as defined in DS/EN 206 DK NA. The SPD has been prepared on the basis of weighted average data from several manufacturers (average product, Industry level). The producers who provide data for the EPD cover approx. 80% of the total Danish production of factory concrete.	1	m3	408
5	Structure	Rebar	REB	STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT	STEEL DEFORMED BARS FOR CONCRETE REINFORCEMENT are used to reinforce concrete in building constructions	1000	kg	1800
6	Structure	Structural steel	ST	Hot rolled steel profiles	The hot rolled steel profiles are made of steel bloom produced in electric arc furnace (EAF) process using 100% of iron scrap. The profiles constitute intermediate products commonly used for construction of power poles, roads, steel structures, supporting structures for buildings, load-bearing structures of buildings such industrial halls and warehouses as well as in railway, mining and shipbuilding industry. A specific product technical data is available at manufacturer website: www.wostsa.pl.	1000	kg	2690
7	Structure / Pattitions /roof stucture	Gulam Timber / Timber battens	GLT	Glued laminated timber	This EPD is based on a declared unit of 1 m³ of glued laminated timber (moisture of 10% at a raw density of 464 kg/m³). The results refer to a representative average of Rubner glued laminated timber including standard beams as well as sophisticated 3D-beam components. The LCA covers 100% of the Rubner group's production referring to its sites located at Rohrbach (Austria), Ober-Grafendorf (Austria), Brixen (Italy) and Calitri (Italy).	1	m3	1134
8	Composite steel-concrete slabs	Galvanized steel plates	ST-G	Galvanized Structural Steel	The declaration covers galvanized structural steel produced at the production site in Brande, Denmark. The declaration covers all life cycle modules from A1-A5, C1-C4 and D and is based on product-specific data provided by Give Steel A/S and background data from GaBi professional 2020 and Ecoinvent v3.6.	1000	kg	2500
9	Walls and Lightweight concrete slabs	Concrete o ceramic blocks	CONB	Concrete blocks	Autoclaved aerated concrete blocks with a dry density of 375 kg/m3 , also called Planstein PP 2/040	1	m3	261.76
10	Walls / Lightweight concrete slabs / Inclinated roof	Ceramic blocks / brick wall /ceramic deck	CERB	Red bricks or ceramic blocks	Bricks such as "RT Ultima 150" and "RT 550 Unika" are used to build walls, pillars and partitions.	1000	kg	420
11	Lightweight concrete slabs	Precast concrete beams	CONBEAM	Precast concrete elements of structures	Precast concrete structures: filigree slabs, shell/double walls, one/three layer walls, balconies, stairs, columns, beams and other precast concrete products	1	kg	0.3
12	Walls, slabs	Cross Laminated Timber (CLT) panels	CLT	Cross Laminated Timber - CLT	Cross Laminated Timber - CLT -Gross Density: 424.0 kg/m^3	1	m3	1355.7
13	Under the Ground slab	Graded aggregate	AGG	Aggregates	Aggregates from Uddevalla quarry - Glimmingen. Product variation: Sub base 0/150, Macadam 100/250, Macadam 150/300	1000	kg	50
14	Roof	Roof tiles	RTIL	Roof tiles (produced using natural gas) - Red tile	The product is produced using certified green electricity and natural gas. The declared unit is in tonnes - the mass required for roofing must be calculated using information from producer (dens=40 kg/m2)	1000	kg	3100
15	Flooting, roof	Ceramic tiles	CEFT	Ceramic Floor Tiles	Ceramic Floor Tiles 1 kg/m2	1	m2	32.21
16	Roof, fooring	Tile bond coat (adhesive)	ADH	Mineral adhesives H40® Gel, Bioflex®, H40® Sin Limites® & H40® Sem Limites	The International EPD System: Construction products / Aggregates The International EPD System: Construction products / Cement and building limes	1	kg	0.6
17	Roof, flooring	Mortar bed / Wet screed	MOR	Cement mortars	Cement mortars (1600 kg/m3)	1	kg	0.25
18	Flooring	Cleavage membrane / Sound insuolation layer	POLY	POLYETHYLENE FOAM BASED PRODUCTS	This product is a flexible material made mostly of polyethylene. It is soft and resilient and gives the impression of being a soundproofing and cushioning material. Foamed polyethylene packaging protects against scratches damage during transport moisture, including sea moisture. Foam also has insulating properties, which means that it protects against heat loss. Polyethylene foam products in the form of rolls, sheets and bags. Dens=935 kg/m3	0.001069519	m3	1.73
19	Flooring	Laminated wood flooring	WFL	Multi-layered engineered wood flooring	Multi-layered engineered wood floors are floor coverings in accordance with EN 13489 for private and commercial use in interior areas, which are either laid "floating" on screed or on other existing floors such as wood or tiles, in connection with suitable underlay materials, or are glued to the screed across the whole floor area.	1	m2	29.71
20	Flooring	Chipboard flooring (plywood)	PLYW	S-P-02010 SELEX® Plywood	m3 of plywood products produced in Chile and installed across different countries across the world	1	m3	1430.67
21	Flooring, partition, facades, roof	Insulation layer	MWOOL	Mineral wool insulation (high bulk density range)	Mineral wool is the generic term for insulating materials made of glass wool and stone wool. These are non-combustible insulating materials, which consist mainly of amorphous fibres obtained from a silicate melt. The mineral wool insulation materials described in this declaration are produced in the form of rolls, boards and mats in the high bulk density range (> 120 kg/m³). The ready-made products are supplied in thicknesses between 10 mm and 400 mm.	1	m3	96.5
22	Flooring, partition, facades, roof	Insulation layer	POLYU1	S-P-07206 Insulation board with a core of rigid polyurethane (PIR) for buildings	6 cm/m2: thermal resistance (m2k/w): 2.33 Thermal Resistance (m2K/W) grammage (kg/m^2): 2.46 grammage (kg/m^2)	0.06	m3	30.69
23	Flooring, partition, facades, roof	Insulation layer	POLYU2	Polyurethane thermal insulation spray foam	Polyurethane thermal insulation spray foam (blowing agent HFO; density 40 kg/m3)	0.13	m3	290.4

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BIM-LCA Construction Project

Description of Materials and Impact Data

Project name: Single-family house in timber (structure, facades and partitions)

			1	2	3	4	5	6
nr.	Building part	Type of Material	Mat Code	Material Name	Description	Quant. Studied in EPD	Unit	Cost €
24	Flooring, partition, facades, roof	Insulation layer	EPS	EUROTHERM EPS INSULATION (white); 0,035-0,039 W/mK	Expanded polystyrene foam EPS, wall insulation, External Thermal Insulation Composite System (ETICS), pitched roof insulation and ceiling insulation. Gross density: 16.0 kg/m^3	1	m3	114.5
25	Flooring, partition, facades, roof	Insulation layer	CELL	Cellulose Fibre Insulation - Thermal insulation for use in pitched roofs, walls and floor spaces in dwellings.	One m² of installed in-situ insulation, thickness 300mm with an R-value of 9.09 m²K/W, at a density of 37 kg/m³. Reference service life of 50 years	0.3	m3	203.13
26	Flooring, partition, facades, roof	Insulation layer	CORK	S-P-02315 Cork-based thermal insulation panels: Slim and Lisoflex	Cork-based thermal insulation panels: grammage (kg/m^2): 3.3 grammage (kg/m^2); layer thickness (m): 0.02 layer thickness (m); thermal resistance (m2k/w): 0.465 Thermal Resistance (m2K/W).	0.02	m3	53.84
27	Partition walls	Finishing coat (plastering mortars) / Esternal finishing /Interior finishing	PLASM	Mineral pre-made mortar: rendering and plastering mortar – normal/finishing render or plaster with special properties	Rendering and plastering mortars produced in the factory for use as a base coat or finishing render/plaster on walls, ceilings, piers, and separating walls of structures which comply with the applicable standards or on similar backgrounds. 1600 kg/m3	1	kg	1.5
28	Partition walls	Gypsum cardboard or fiberboard	GYP_F	Gypsum fibreboards 12,5 mm	conversion factor to 1kg: 16.66 - gross density: 1175.0 kg/m^3 layer thickness: 0.0125 m grammage: 16.66 kg/m^2	1	m2	36.9
29	Partition walls, facades	Gypsum plasterboard	GYP_P	STANDARD GYPSUM PLASTERBOARD STD 12,5 mm	grammage (kg/m^2): 8.6 grammage (kg/m^2) thermal conductivity (w/m.k): 0.21 Thermal Conductivity (W/m.K) thermal resistance (m2k/w): 0.06 Thermal Resistance (m2K/W) layer thickness (m): 0.0125 layer thickness (m)	1	m2	36.9
30	Partition walls	Galvanized steel (U, C) channel studs	ST-GC	Cold-rolled steel profiles for framing and partition systems	The raw material is hot dipped sheet rolled galvanised steel, grade DX51D+Z steel for forming. The steel profile sections are manufactured in accordance with EN 14195:2014 Metal framing components for gypsum board systems.	1000	kg	2820
31	Railings	Railings	ST-SL	Welded and Pickled Stainless Steel Products	Products from Øglænd System AS that are made from stainless steel, and then machined, welded and pickled. Stainless steel forms a protective chromium oxide layer when the alloy is exposed to air, hindering direct contact between the alloy and the corrosive environment.	1	kg	14.47
32	Interior doors	Interior doors	WDOOR	Wooden interior doors	This EPD describes an average of the doors produced by the member companies of the VHI. In addition to standard doors, the member companies of the VHI also produce so-called functional doors. These offer additional functions such as moisture, smoke, fire, sound, burglary and radiation protection. For these purposes, the doors are given a modified design.	2.6814	m2	394.28
33	Facades	External wooden cladding	WCLA	Wood Plastic Composite products: Cladding: WEO 35	FIBERDECK wood plastic composite combines the proven strength of high-density, recycled polyethylene plastic and realistic wood fibers with an outer shell of polymer that completely encapsulates the board in an impermeable layer of protection from weather, sun, water, scuffs and scrapes	50.75	m2	2869.79
34	Facades	Tiles for external cladding	N-STON	Slabs for façade claddings and for interior claddings and flooring in natural semi-rijo limestone:	Slabs for façade claddings and for interior claddings and flooring in natural semi-rijo limestone. Dens: 2750 kg/m3	1	kg	2.5
35	Facades	Tiles for external cladding	PORCE	EXTRUDED PORCELAIN VENTILATED FAÇADE GA16 & GA20	EXTRUDED PORCELAIN VENTILATED FAÇADE GA16 & GA20. 324 kg/m2	324	kg	560
36	Facades	Tiles for external cladding	A-STON	S-P-07728 STONEO Ventilated Facade Panels	The engineering stone facade panels are made of a high-quality material comprising a selected combination of aggregates, bound by stable polyester resins.The panels are used for facade cladding and are mounted as a component of ventilated facades (rainscreen claddings).	1	kg	2.25
37	Windows	Windows	WIN_PVC	Passiv PVC Double Glazed Window	The Passiv PVC windows cover a range of different sizes and shapes of windows. The LCA has been executed based on a Double-glazed 1230 mm x 1480 mm window, with a thermal performance of U window = 1.2 W/m2K, U glass = 1.2 W/m2K and a life expectancy of 50 years. After which the results have been scaled back to a functional unit of 1m2.	1	m2	146.96
38	Windows	Windows	WIN_WOOD	Hardwood double glazed window	The raw materials for the Hardwood windows comprise glass, argon, hardwood/softwood profiles, warm edge spacer and associated hardware (hinges, handles, recievers and gears).	1	m2	299.17
39	Windows	Windows	WIN_AL	Aluminium Windows	The aluminium windows are assembled with extruded aluminium profiles and comes in different frame widths of 45 mm - 50 mm and 70 mm - 75 mm. They consist of an aluminium profile frame and an aluminium profile sash with an insulating glass unit (IGU). The aluminium profiles are powder coated and thermally broken with a reinforced polyamide strip.	1	m2	127.72
40	Facades	Exterior glazed doors	DOOR_GL	Exterior facade folding doors with thermally modified beech and double glazing, painted	Folding door in the facade of buildings, for renovation and in new buildings	1	m2	150.14
41	Facades	Exterior front doors	DOOR_W	Wooden full doors	Exterior doors manufactured by Porta KMI Poland Sp. z o. o. Sp. k. are dedicated for communication in domestic as well as commercial premises. Among company's products, wooden and steel doorsare distinguish. Depending on the customer's needs, doors possess various functionalities and can be produced from a wide range of materials.	2.307	m2	632.54
42	Roof	Gravel ballast	GRAV	S-P-05225 Aggregates from Nyrand gravel pit-Svebølle	S-P-05225 Aggregates from Nyrand gravel pit-Svebølle	1000	kg	123.75
43	Roof	Waterproofing layer	WP	PTM reinforced bitumen membrane for roof waterproofing	System of PTM reinforced bitumen membrane for roof waterproofing: ·PTM BituFlex (top layer) & PTM DuraFlex Kombi (bottom layer) .	1	m2	4.2

BIM-LCA

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Enviromental Impacts	
Abiotic depletion potential for fossil resources (ADPF)	Eutrophication potential (EP)
Abiotic depletion potential for non fossil resources (ADPE)	Photochemical Ozone Creation Potential (POCP)
Acidification potential (AP)	Ozone Depletion Potential (ODP)
Global warming potential (GWP)	

BIM-LCA Construction Project

LCA - Enviromental Impact results

Energy consumption	Table Caption and Summary	
	IMPACTS A1-A3	PRODUCTION
Total use of renewable primary energy resources (PERT)	IMPACTS A4	TRANSPORT
Total use of non renewable primary energy resource (PENRT)	IMPACTS A5	INSTALLATION

Project name: Single-family house in timber (structure, facades and partitions)

UNIT IMPACTS * QUANTITIES

Module	Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	Quantities (Q)	Unit	Cost (Euros)	Energy Consumption (A1-A3) PERT (MJ)	Energy Consumption (A1-A3) PENRT (MJ)	Energy Consumption (A4) PERT (MJ)	Energy Consumption (A4) PENRT (MJ)	Energy Consumption (A5) PERT (MJ)	Energy Consumption (A5) PENRT (MJ)
A1-A3	1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0
				1.A.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0
				1.B.1.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
				1.B.1.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0
			1.B.2-Footings	1.B.2.1	Concrete	CON1	24.83	m3	2936.89	4717.7	34762	84.9186	1464.97	0	3.00443
				1.B.2.2	Rebar	REB	1571.74	kg	2829.13	2489.634576	11308.66211	18.860868	1031.060784	0	0.04715217
				1.B.2.3	Blinding concrete	CON0	5.94	m3	520.25	188.33367	5338.5969	5.4009984	170.68296	4.1220648	248.95227
			1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	2.98	m3	352.47	566.2	4172	10.1916	175.82	0	0.36058
				1.B.3.2	Rebar	REB	264.62	kg	476.32	419.164416	1903.96968	3.175488	173.593344	0	0.00793872
				1.B.3.3	Blinding concrete	CON0	1.16	m3	101.20	36.63364	1038.4348	1.0505728	33.20032	0.8018016	48.42484
			1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0.00	m3	0.00	0	0	0	0	0	0
				1.B.4.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
				1.B.4.3	Blinding concrete	CON0	0.00	m3	0.00	0	0	0	0	0	0
		1.C - Retaining walls		1.C.1	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				1.C.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		1-Total Fundations							**7216.27**	8417.6663	58523.6635	123.5981	3049.3274	4.9239	300.7972
	2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams	2.A.1.1	Gulam Timber	GLT	2.80	m3	3175.20	31696	4208.4	0	3133.06	0	0.0252
				2.A.1.2	Steel in timber connect (galvanized)	ST-G	22.40	kg	56.00	47.936	253.12	0.143808	2.4864	0.0162624	0.28224
				2.A.1.3	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				2.A.1.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				2.A.1.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
			2.A.2-Columns	2.A.2.1	Gulam Timber	GLT	5.76	m3	6531.84	65203.2	8657.28	0	6445.152	0	0.05184
				2.A.2.2	Steel in timber connect (galvanized)	ST-G	46.08	kg	115.20	98.6112	520.704	0.2958336	5.11488	0.03345408	0.580608
				2.A.2.3	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				2.A.2.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				2.A.2.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
			2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	0.00	m3	0.00	0	0	0	0	0	0
				2.A.3.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
			2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	0.00	m3	0.00	0	0	0	0	0	0
				2.A.4.2	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
				2.A.4.3	Galvanized steel plates	ST-G	0.00	kg	0.00	0	0	0	0	0	0
			2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0.00	m3	0.00	0	0	0	0	0	0
				2.A.5.2	Ceramic blocks	CERB	0.00	kg	0.00	0	0	0	0	0	0
				2.A.5.3	Precast concrete beams	CONBEAM	0.00	kg	0.00	0	0	0	0	0	0
				2.A.5.4	Concrete (cast in place)	CON2	0.00	m3	0.00	0	0	0	0	0	0
				2.A.5.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
			2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	56.18	m3	76164.31	452030.7168	143485.7632	95.3388176	6488.8824	0.24017292	13.7362056
				2.A.6.2	Steel in timber connect (galvanized)	ST-G		kg	0.00	0	0	0	0	0	0
				2.A.6.3	Steel in connections (galvanized)	ST-G	224.72	kg	561.81	480.907648	2539.37216	1.442722944	24.9442752	0.163149043	2.83151232
		2.B-Load-bearing walls		2.B.1	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				2.B.2	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				2.B.3	rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		2- Total structural elements							**86604.36**	549557.3716	159664.6394	97.2212	16099.6400	0.4530	17.5076
	3 - Non-load bearing elements	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	29.53	m3	3493.22	5611.365	41346.9	101.00457	1742.4765	0	3.5735535
				3.A.1.2	rebar	REB	886.01	kg	1594.81	1403.43192	6374.805975	10.63206	581.21928	0	0.02658015
				3.A.1.3	Graded aggregate	AGG	88600.50	kg	4430.03	1151.8065	2569.4145	0	1333.083123	0	29144.33707
			3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	0.00	m2	0.00	0	0	0	0	0	0
				3.A.2.2	Tile bond coat (adhesive)	ADH	1545.12	kg	927.07	3012.984	11356.632	0	2085.912	0	0.8343648
				3.A.2.3	Mortar bed	MOR	0.00	kg	0.00	0	0	0	0	0	0
				3.A.2.4	Cleavage membrane	POLY	0.00	m3	0.00	0	0	0	0	0	0
			3.A.3-Flooring Type II: Wood floating floor or	3.A.3.1	Laminated wood flooring	WFL	257.52	m2	7650.92	72491.88	23573.3808	14.3902176	250.978992	3.2988312	24.026616
				3.A.3.2	Chipboard flooring (plywood)	PLYW	7.73	m3	11052.78	105608.952	63118.152	145.936584	12948.1056	3.1636332	14.7404448
				3.A.3.3	Insulation layer	MWOOL	10.30	m3	994.03	4521.02112	21621.3792	26.1331296	453.75024	98.321136	483.725568
				3.A.3.4	Timber battens	GLT	11.59	m3	13141.25	131180.688	17417.3652	0	12966.84018	0	0.1042956
			3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0.00	m4	0.00	0	0	0	0	0	0
				3.A.4.2	Sound insulation layer	POLY	0.00	m3	0.00	0	0	0	0	0	0
		3.B-Vertical elements	3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	0.00	kg	0.00	0	0	0	0	0	0
				3.B.1.2	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00	0	0	0	0	0	0
			3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0.00	m2	0.00	0	0	0	0	0	0
				3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0.00	kg	0.00	0	0	0	0	0	0
				3.B.2.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
			3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	22.17	m3	30050.45	178347.636	56611.964	37.615702	2560.173	0.09475965	5.419587
				3.B.3.2	Steel in timber connect (galvanized)	ST-G	88.66	kg	221.66	189.74096	1001.9032	0.56922288	9.841704	0.064370064	1.1171664
				3.B.3.3	Insulation layer	MWOOL	11.08		1069.51	4864.3287	23263.217	28.117571	488.20615	105.787235	520.45768
				3.B.3.4	Timber battens	GLT	9.97	m3	11311.31	112913.604	14991.9741	0	11161.19057	0	0.0897723
				3.B.3.5	Gypsum plasterboard	GYP_P	443.32	m2	16358.51	1671.3164	19594.744	7.53644	2877.1468	251.80576	1334.3932
			3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	0.00	m3	0.00	0	0	0	0	0	0
				3.B.4.2	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
				3.B.4.3	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00	0	0	0	0	0	0
			3.B.5-Parapets	3.B.5.1	Brick wall	CERB	2337.72	kg	981.84	720.01776	9654.7836	4.792326	95.612748	2.2325226	23.3772
				3.B.5.2	Finishing coat (plastering mortars)	PLASM	844.80	kg	1267.20	660.6336	2965.248	16.64256	247.5264	2.002176	10.39104
			3.B.6-Railings	3.B.6	Railings	ST-SL	52.25	kg	756.06	514.14	3370.125	0.000788975	6.53125	98.7525	397.518
			3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	7.64	m2	1123.41	5230.761587	3971.893936	0	0	124.854479	44.22048184
		3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	13.72	m2	441.79	559.6128	2578.608	0.1741932	126.05004	27.56916	142.6464
				3.C.1.2	Tile bond coat (adhesive)	ADH	82.30	kg	49.38	160.4772	604.8756	0	111.0996	0	0.04443984
				3.C.1.3	Mostar	MOR	1235.52	kg	308.88	469.4976	6474.1248	0	0	0	0
				3.C.1.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				3.C.1.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
				3.C.1.6	Structural steel	ST	0.00	kg	0.00	0	0	0	0	0	0
				3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	1.73	m3	2342.65	13903.488	4413.312	2.932416	199.584	0.0073872	0.422496
				3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0.00	kg	0.00	0	0	0	0	0	0
			3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	0.00	m2	0.00	0	0	0	0	0	0
				3.C.2.2	Tile bond coat (adhesive)	ADH	0.00	kg	0.00	0	0	0	0	0	0
				3.C.2.3	Mostar	MOR	0.00	kg	0.00	0	0	0	0	0	0
				3.C.2.4	Concrete	CON3	0.00	m3	0.00	0	0	0	0	0	0
				3.C.2.5	Rebar	REB	0.00	kg	0.00	0	0	0	0	0	0
		3-Total non-load bearing elements							**109566.74**	645187.3831	336874.8029	396.4778	50245.3282	717.9539	32151.4660
	4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	0.00	kg	0.00	0	0	0	0	0	0
				4.A.1.2	Brick walls	CERB	0.00	kg	0.00	0	0	0	0	0	0
				4.A.1.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
				4.A.1.4	Interior finish	GYP_P	0.00	m2	0.00	0	0	0	0	0	0
			4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	374.42	m2	13816.10	1411.5634	16549.364	6.36514	2429.9858	212.67056	1127.0042
				4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	37.44	m3	50760.12	301258.332	95626.868	63.539074	4324.551	0.16006455	9.154569
				4.A.2.3	Steel in timber connect (galvanized)	ST-G	149.77	kg	374.42	320.50352	1692.3784	0.96151056	16.624248	0.108731568	1.8870768
				4.A.2.4	Insulation layer	MWOOL	18.72	m3	1806.58	8216.6469	39295.379	47.495177	824.66005	178.691945	879.13816
				4.A.2.5	Timber battens	GLT	16.85	m3	19106.65	190729.548	25323.8967	0	18853.07666	0	0.1516401
				4.A.2.6	External wooden cladding	WCLA	374.42	m2	21172.55	35560.67783	223545.3399	154.1946404	17706.56158	176.3278424	1873.944433
			4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00	0	0	0	0	0	0
				4.A.3.2	Brick wall	CERB	0.00	kg	0.00	0	0	0	0	0	0
				4.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00	0	0	0	0	0	0
				4.A.3.4	Tiles for external cladding	N-STON	0.00	kg	0.00	0	0	0	0	0	0
		4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_WOOD	21.54	m2	6444.12	36175.15914	24366.048	6.84972	620.352	5.44962	158.9652
			4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	4.00	m3	600.56	5600	4080	1.228	22.08	4.04	13.56
				4.B.2.2	Exterior front doors	DOOR_W	4.00	m4	1096.73	1691.205202	1763.502384	0	0	75.9774599	26.90940616
		4- Total facades							**115177.83**	580963.6360	432242.7764	280.6333	44797.8913	653.4262	4090.7147
	5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	134.33	m2	4326.77	5480.664	25254.04	1.705991	1234.4927	270.0033	1397.032
				5.A.1.2	Gravel ballast	GRAV	0.00	kg	0.00	0	0	0	0	0	0
			5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	134.33	m2	564.19	2417.94	37746.73	12.801649	185.3754	347.9147	6797.098
			5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	9.40	m3	907.40	4127.02059	19737.1069	23.8556647	414.206555	89.7525895	441.569576
			5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	6447.84	kg	1611.96	2450.1792	33786.6816	0	0	0	0
		5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	3670.14	kg	11377.42	3963.747206	16845.92562	7.523779419	161.8530109	3.780240391	32.92112263
			5.B.2-Mostar	5.B.2	Cement mostar	MOR	2936.11	kg	734.03	1115.721436	15385.21138	0	0	0	0
			5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	91.75	m2	385.36	1651.561336	25782.70752	8.744099739	126.6197024	237.6413255	4642.722422
			5.B.4-Decking	5.B.4	Ceramic deck or	CERB	0.00	kg	0.00	0	0	0	0	0	0
				5.B.5	wooden deck (plywood)	PLYW	2.59	m3	3700.57	35358.822	21132.522	48.860874	4335.1416	1.0592127	4.9352328
			5.B.5-Structure	5.B.6	Brick walls or	CERB	0.00	kg	0.00	0	0	0	0	0	0
				5.B.7	Gulam timber beams	GLT	1.25	m3	1414.60	14121.07819	1874.90994	0	1395.828661	0	0.011227006
			5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	4.31	m3	416.01	1892.0979	9048.789	10.937007	189.89955	41.148495	202.44456
		5-Total Roofs							**25438.31**	72578.8319	206594.6240	114.4291	8043.4172	991.2999	13518.7341
	Total building (A1-A5)								**344003.51**	1784126.057	987305.8821	897.9304	114192.1869	1376.7571	36560.4855

Ref.	Env impacts A1-A3 GWP (kg CO2-eq)	ADPF (MJ)	ADPE (kg Sb-eq)	AP (kg SO2-eq.)	EP (kg Phosphat-eq.)	POCP (kg Ethen-eq)	ODP (kq CFC 11-eq)
1.A.1	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0
1.B.2.1	7002.06	33768.8	0.00171327	10.82588	3.4762	0.394797	8.31805E-05
1.B.2.2	828.306453	10255.59698	0.001602074	3.143478	1.339121628	0.295486932	8.4723E-05
1.B.2.3	755.9496	5320.7679	1.95525E-05	1.5404256	0.06685875	1.3466838	1.80667E-05
1.B.3.1	840.36	4052.8	0.00020562	1.29928	0.4172	0.047382	0.000009983
1.B.3.2	139.456848	1726.6716	0.000269731	0.529248	0.225459648	0.049749312	1.42643E-05
1.B.3.3	147.0432	1034.9668	3.80324E-06	0.2996352	0.013005	0.2619496	3.51424E-06
1.B.4.1	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0
1-Total Fundations	9713.1761	56159.6033	0.0038	17.6379	5.5378	2.3960	0.0002
2.A.1.1	-1809.64	3766	0.0002842	2.35088	0.47628	0.28756	0.00007182
2.A.1.2	23.296	250.88	6.5856E-06	0.066976	0.000037184	0.057344	1.93312E-13
2.A.1.3	0	0	0	0	0	0	0
2.A.1.4	0	0	0	0	0	0	0
2.A.1.5	0	0	0	0	0	0	0
2.A.2.1	-3722.688	7747.2	0.00058464	4.836096	0.979776	0.591552	0.000147744
2.A.2.2	47.9232	516.096	1.35475E-05	0.1377792	7.64928E-05	0.1179648	3.9767E-13
2.A.2.3	0	0	0	0	0	0	0
2.A.2.4	0	0	0	0	0	0	0
2.A.2.5	0	0	0	0	0	0	0
2.A.3.1	0	0	0	0	0	0	0
2.A.3.2	0	0	0	0	0	0	0
2.A.4.1	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0
2.A.6.1	-34983.78416	57192.0544	0.008382175	23.48919248	5.293354976	5.898984	0.000527819
2.A.6.2	0	0	0	0	0	0	0
2.A.6.3	233.712128	2516.89984	6.60686E-05	0.671922368	0.000373041	0.575291392	1.93936E-12
2.B.1	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0
2- Total structural elements	-40211.1808	71989.1302	0.0093	31.5528	6.7499	7.5287	0.0007
3.A.1.1	8328.447	40165.56	0.002037812	12.876606	4.13469	0.46958265	9.89372E-05
3.A.1.2	466.924635	5781.182625	0.000903105	1.77201	0.75487626	0.16656894	4.77592E-05
3.A.1.3	203.78115	2569.4145	0.000177201	0.886005	1.77201	0.1063206	4.07562E-06
3.A.2.1	0	0	0	0	0	0	0
3.A.2.2	794.19168	10383.2064	0.000893079	2.394936	0.74320272	0.129172032	4.92893E-05
3.A.2.3	0	0	0	0	0	0	0
3.A.2.4	0	0	0	0	0	0	0
3.A.3.1	-1751.90856	23537.328	0.00431861	7.2723648	0.042413544	10.6664784	2.82499E-05
3.A.3.2	-3571.54488	58814.9928	0.005180015	32.0535144	889.98912	16.3473696	0.000179466
3.A.3.3	1786.15872	20405.8848	0.000394212	10.455312	1.43284128	0.617635968	5.72518E-09
3.A.3.4	-7489.58292	15586.398	0.001176223	9.72962064	1.97118684	1.19012868	0.000297242
3.A.4.1	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0
3.B.1.1	0	0	0	0	0	0	0
3.B.1.2	0	0	0	0	0	0	0
3.B.2.1	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0
3.B.3.1	-13802.7682	22564.988	0.003307167	9.2676046	2.08848052	2.32743	0.00020825
3.B.3.2	92.21056	993.0368	2.60672E-05	0.26510536	0.000147182	0.22697984	7.6517E-13
3.B.3.3	1921.7922	21955.423	0.000424146	11.249245	1.5416453	0.66453668	6.15993E-09
3.B.3.4	-6446.64861	13415.9715	0.001012432	8.37475812	1.69669647	1.02440169	0.000255851
3.B.3.5	962.0044	17023.488	0.000267322	1.972774	0.01374292	2.7441508	5.6745E-05
3.B.4.1	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0
3.B.5.1	734.04408	8719.6956	0.000624171	2.33304456	0.48157032	0.121327668	1.18289E-06
3.B.5.2	315.9552	2728.704	0.000727373	0.777216	0.08000256	0.06479616	2.10355E-06
3.B.6	246.62	3317.875	0.03223825	3.213375	0.1614525	1.51525	1.34283E-05
3.B.7	-53.99343626	3562.854479	0.007604669	0.515345267	0.107630715	0.101675766	2.8068E-10
3.C.1.1	161.8488	2235.708	0.00473202	0.4032504	0.04828032	0.02866644	2.70205E-05
3.C.1.2	42.300144	553.02912	4.75671E-05	0.1275588	0.039584376	0.006879946	2.62524E-06
3.C.1.3	710.424	6461.7696	0.010279526	2.6316576	0.1297296	1.9274112	5.37451E-05
3.C.1.4	0	0	0	0	0	0	0
3.C.1.5	0	0	0	0	0	0	0
3.C.1.6	0	0	0	0	0	0	0
3.C.1.7	-1076.0256	1759.104	0.000257818	0.7224768	0.16281216	0.18144	1.62346E-05
3.C.1.8	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0
3-Total non-load bearing elements	-17425.7696	282535.6142	0.0766	119.2938	907.3921	40.6282	0.0013
4.A.1.1	0	0	0	0	0	0	0
4.A.1.2	0	0	0	0	0	0	0
4.A.1.3	0	0	0	0	0	0	0
4.A.1.4	0	0	0	0	0	0	0
4.A.2.1	812.4914	14377.728	0.000225775	1.666169	0.01160702	2.3176598	4.79258E-05
4.A.2.2	-23315.1334	38115.956	0.005586346	15.6545002	3.52778524	3.93141	0.000351768
4.A.2.3	155.75872	1677.4016	4.40318E-05	0.44780632	0.000248615	0.38340608	1.2925E-12
4.A.2.4	3246.2214	37086.301	0.000716453	19.001815	2.6040911	1.12251116	1.04051E-08
4.A.2.5	-10889.44407	22661.7705	0.001710163	14.14633644	2.86599789	1.73038203	0.000432174
4.A.2.6	11583.04236	209527.6453	0.055628114	58.0627665	14.82924532	5.95383133	0.000826306
4.A.3.1	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0
4.B.1	1712.2146	24312.198	7.3460016	7.267596	0.8807706	0.8499684	3.67257E-05
4.B.2.1	172	0	0	1.372	0.00564	0.888	0.00000528
4.B.2.2	9.085392284	1620.286086	0.002990377	0.483953186	0.095722583	0.269293455	4.03988E-06
4- Total facades	-16513.7636	349379.2865	7.4129	118.1029	24.8211	17.4465	0.0017
5.A.1.1	1585.094	21895.79	0.04634385	3.949302	0.4728416	0.2807497	0.00026463
5.A.1.2	0	0	0	0	0	0	0
5.A.2	467.4684	0	0	0.9282203	0.02511971	0.9429966	5.56126E-06
5.A.3	1630.49754	18627.5411	0.000359857	9.5441465	1.30797121	0.563809876	5.22624E-09
5.A.4	3707.508	33722.2032	0.053646029	13.7338992	0.6770232	10.0586304	0.000280481
5.B.1	1031.308301	16515.61336	0.001471725	14.0933234	1.181783889	0.741367533	7.74399E-06
5.B.2	1688.262699	15355.85029	0.024428427	6.253912258	0.308291449	4.580330105	0.000127721
5.B.3	319.3018582	0	0	0.634016046	0.017157887	0.644108921	3.79859E-06
5.B.4	0	0	0	0	0	0	0
5.B.5	-1195.78518	19691.7858	0.001734315	10.7318034	297.97632	5.4732456	6.00867E-05
5.B.6	0	0	0	0	0	0	0
5.B.7	-806.2237488	1677.813619	0.000126616	1.047354881	0.212190406	0.128112609	3.1997E-05
5.B.8	747.5274	8540.091	0.000164982	4.375665	0.5996601	0.25848756	2.39605E-09
5-Total Roofs	9174.9593	136026.6884	0.1283	65.2916	302.7784	23.6718	0.0008
Total building (A1-A5)	-64437.5380	760063.6342	7.5027	286.5875	944.5010	67.9994	0.0040

Ref.	Env impacts A4 GWP (kg CO2-eq.)	ADPF (MJ)	ADPE (kg Sb-eq)	AP (kg SO2-eq.)	EP (kg Phosphat-eq.)	POCP (kg Ethen-eq)	ODP (kq CFC 11-eq)
1.A.1	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0
1.B.2.1	107.7622	1460.004	7.64764E-06	0.250783	0.0603369	-0.0836771	1.77783E-14
1.B.2.2	64.441299	998.054265	0.000112222	0.37721736	0.066013038	0.014145651	1.23539E-05
1.B.2.3	12.099948	170.68296	7.87448E-07	0.030077523	8.9561E-05	0.014887215	2.85739E-06
1.B.3.1	12.9332	175.224	9.1784E-07	0.030098	0.0072414	-0.0100426	2.13368E-15
1.B.3.2	10.849584	168.03624	1.88942E-05	0.06350976	0.011114208	0.002381616	2.07994E-06
1.B.3.3	2.353616	33.20032	1.5317E-07	0.005850516	1.74209E-05	0.00289578	5.55805E-07
1.B.4.1	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0
1-Total Fundations	210.4398	3005.2018	0.0001	0.7575	0.1448	-0.0594	0.0000
2.A.1.1	231.8456	25503.0804	0.14	16.2288	3.2452	0.8568	0.3024
2.A.1.2	0.187936	2.4864	1.50752E-08	0.000672	0.00030688	0.00059808	3.4272E-17
2.A.1.3	0	0	0	0	0	0	0
2.A.1.4	0	0	0	0	0	0	0
2.A.1.5	0	0	0	0	0	0	0
2.A.2.1	476.93952	52463.47968	0.288	33.38496	6.67584	1.76256	0.62208
2.A.2.2	0.3866112	5.11488	3.10118E-08	0.0013824	0.000631296	0.001230336	7.05024E-17
2.A.2.3	0	0	0	0	0	0	0
2.A.2.4	0	0	0	0	0	0	0
2.A.2.5	0	0	0	0	0	0	0
2.A.3.1	0	0	0	0	0	0	0
2.A.3.2	0	0	0	0	0	0	0
2.A.4.1	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0
2.A.6.1	405.5691952	6140.56144	0.000957321	2.10678	0.462367984	0.075338453	1.74554E-05
2.A.6.2	0	0	0	0	0	0	0
2.A.6.3	1.885427648	24.9442752	1.51239E-07	0.006741696	0.003078708	0.006000109	3.43826E-16
2.B.1	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0
2- Total structural elements	1116.8143	84139.6671	0.4290	51.7293	10.3874	2.7025	0.9245
3.A.1.1	128.17539	1736.5698	9.09632E-06	0.29828835	0.071766405	-0.099527895	2.1146E-14
3.A.1.2	36.326205	562.613175	6.32608E-05	0.2126412	0.03721221	0.007974045	6.964E-06
3.A.1.3	116.5096575	10851.34624	0.059185134	6.910839	1.417608	0.354402	0.0886005
3.A.2.1	0	0	0	0	0	0	0
3.A.2.2	38.318976	4244.135616	0.142769088	2.472192	0.540173952	0.142769088	0.050185498
3.A.2.3	0	0	0	0	0	0	0
3.A.2.4	0	0	0	0	0	0	0
3.A.3.1	18.9096936	250.05192	1.66409E-06	0.021853147	5.57788E-05	0.019223868	3.70571E-15
3.A.3.2	901.57752	12198.7224	0.003347502	15.9997176	1.54589256	10.7617608	0.000180702
3.A.3.3	33.374592	449.11488	2.74413E-06	0.049361434	0.010754035	-0.01107336	8.28699E-15
3.A.3.4	959.5426968	105549.9632	0.57942	67.1663664	13.4309556	3.5460504	1.2515472
3.A.4.1	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0
3.B.1.1	0	0	0	0	0	0	0
3.B.1.2	0	0	0	0	0	0	0
3.B.2.1	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0
3.B.3.1	160.016354	2422.7438	0.000377709	0.831225	0.18242618	0.029724606	6.88698E-06
3.B.3.2	0.74389096	9.841704	5.96709E-08	0.00265992	0.001214697	0.002367329	1.35656E-16
3.B.3.3	35.90892	483.2188	2.95251E-06	0.053109736	0.011570652	-0.011914225	8.91627E-15
3.B.3.4	825.9251094	90851.99145	0.498735	57.8133612	11.5606773	3.0522582	1.0772676
3.B.3.5	216.78348	2859.414	7.44778E-06	0.6029152	0.000169792	0.9354052	4.65486E-06
3.B.4.1	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0
3.B.5.1	6.896274	95.378976	5.5404E-07	0.028987728	0.007200178	-0.010589872	2.31434E-12
3.B.5.2	18.41664	246.6816	1.90925E-06	0.01402368	0.003159552	-0.000198528	3.86918E-13
3.B.6	18.9145	2080.22925	0.01133825	1.30625	0.26125	0.05225	0.02460975
3.B.7	1.626926233	179.0445141	0.000977295	0.113970314	0.022794063	0.005698516	0.002116999
3.C.1.1	8.311896	118.50624	3.56616E-07	0.01385316	0.001632204	0.000689915	1.53619E-06
3.C.1.2	2.0409408	226.0506528	0.00760415	0.1316736	0.028770682	0.00760415	0.002672974
3.C.1.3	40.59548064	446.516928	0.002433974	0.282402806	0.055472377	0.151286953	0.050433926
3.C.1.4	0	0	0	0	0	0	0
3.C.1.5	0	0	0	0	0	0	0
3.C.1.6	0	0	0	0	0	0	0
3.C.1.7	12.474432	188.8704	2.94451E-05	0.0648	0.01422144	0.002317248	5.3689E-07
3.C.1.8	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0
3-Total non-load bearing elements	3581.3896	236051.0055	1.3063	154.3905	29.2050	18.9385	2.5476
4.A.1.1	0	0	0	0	0	0	0
4.A.1.2	0	0	0	0	0	0	0
4.A.1.3	0	0	0	0	0	0	0
4.A.1.4	0	0	0	0	0	0	0
4.A.2.1	183.09138	2415.009	6.29026E-06	0.5092112	0.000143403	0.7900262	3.93141E-06
4.A.2.2	270.293798	4092.4106	0.000638012	1.404075	0.30814766	0.050209722	1.16332E-05
4.A.2.3	1.25655352	16.624248	1.00794E-07	0.00449304	0.002051822	0.003998806	2.29145E-16
4.A.2.4	60.65604	816.2356	4.98727E-06	0.089711032	0.019544724	-0.020125075	1.5061E-14
4.A.2.5	1395.122618	153463.8755	0.842445	97.6562244	19.5278751	5.1557634	1.8196812
4.A.2.6	1239.45931	16673.67882	0.003032249	28.62560788	0.061972966	1.268970246	0.000254532
4.A.3.1	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0
4.B.1	38.5566	581.58	0.000154011	0.0921912	0.01462566	0.01826592	6.91434E-06
4.B.2.1	1.668	0	0	0.00532	0.00000492	0.0048	2.116E-16
4.B.2.2	0.990030342	108.9536194	0.000594712	0.06935414	0.013870828	0.003467707	0.001288253
4- Total facades	3191.0943	178168.3674	0.8469	128.4562	19.9482	7.2754	1.8212
5.A.1.1	81.40398	1160.6112	3.49258E-06	0.1356733	0.01598527	0.006756799	1.5045E-05
5.A.1.2	0	0	0	0	0	0	0
5.A.2	13.97032	0	0	0.01571661	5.02394E-05	0.01356733	1.3836E-12
5.A.3	30.466044	409.97516	2.50499E-06	0.045059655	0.009816836	-0.010108333	7.56479E-15
5.A.4	211.8566789	2330.249376	0.012702245	1.473782789	0.28949512	0.789525112	0.263200829
5.B.1	11.89124162	160.3849564	1.01296E-06	0.008661522	0.001724964	-0.000111572	8.51472E-13
5.B.2	96.47173477	1061.109808	0.005784135	0.671106444	0.131825424	0.35952068	0.119851971
5.B.3	9.542354384	0	0	0.010735149	3.43158E-05	0.009267094	9.4506E-13
5.B.4	0	0	0	0	0	0	0
5.B.5	301.85622	4084.2414	0.001120774	5.3568486	0.51757866	3.6031338	6.05006E-05
5.B.6	0	0	0	0	0	0	0
5.B.7	103.2909467	11362.03283	0.062372254	7.230191626	1.445788836	0.381718191	0.134724068
5.B.8	13.96764	187.9596	1.14845E-06	0.020658312	0.004500684	-0.004634325	3.4682E-15
5-Total Roofs	874.7172	20756.5643	0.0820	14.9684	2.4168	5.1486	0.5179
Total building (A1-A5)	8099.7380	501364.2418	2.5823	335.3336	59.6855	28.8570	5.2934

Ref.	Env impacts A5 GWP (kg CO2-eq.)	ADPF (MJ)	ADPE (kg Sb-eq)	AP (kg SO2-eq.)	EP (kg Phosphat-eq.)	POCP (kg Ethen-eq)	ODP (kq CFC 11-eq)
1.A.1	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0
1.B.2.1	0.44694	6.10818	1.61643E-05	0.001921842	0.00787111	0.00037245	2.88028E-08
1.B.2.2	0.000131869	0.001571739	4.87239E-09	5.79972E-07	2.37333E-06	1.12065E-07	8.69172E-12
1.B.2.3	23.421363	248.65512	8.99176E-07	0.13264776	0.001577867	0.14732697	2.66306E-06
1.B.3.1	0.05364	0.73308	1.93998E-06	0.000230652	0.00094466	0.0000447	3.4568E-09
1.B.3.2	2.2202E-05	0.000264624	8.20334E-10	9.76463E-08	3.99582E-07	1.88677E-08	1.46337E-12
1.B.3.3	4.555796	48.36704	1.74903E-07	0.02580192	0.000306918	0.02865724	5.18004E-07
1.B.4.1	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0
1-Total Fundations	28.4779	303.8653	0.0000	0.1606	0.0107	0.1764	0.0000
2.A.1.1	0.0028	0.0504	1.2964E-07	0.000015428	0.000063	0.000002968	2.3128E-10
2.A.1.2	0.0147392	0.28224	1.70464E-09	0.000076384	0.000034048	0.000096096	3.8752E-18
2.A.1.3	0	0	0	0	0	0	0
2.A.1.4	0	0	0	0	0	0	0
2.A.1.5	0	0	0	0	0	0	0
2.A.2.1	0.00576	0.10368	2.66688E-07	3.17376E-05	0.0001296	6.1056E-06	4.75776E-10
2.A.2.2	0.03032064	0.580608	3.50669E-09	0.000157133	7.00416E-05	0.000197683	7.97184E-18
2.A.2.3	0	0	0	0	0	0	0
2.A.2.4	0	0	0	0	0	0	0
2.A.2.5	0	0	0	0	0	0	0
2.A.3.1	0	0	0	0	0	0	0
2.A.3.2	0	0	0	0	0	0	0
2.A.4.1	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0
2.A.6.1	88.6533024	12.99461904	9.32601E-07	0.008713642	0.00286185	0.00014607	8.85971E-08
2.A.6.2	0	0	0	0	0	0	0
2.A.6.3	0.147867866	2.83151232	1.71014E-08	0.000766306	0.000341579	0.000964063	3.88771E-17
2.B.1	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0
2- Total structural elements	88.8548	16.8431	0.0000	0.0098	0.0035	0.0014	0.0000
3.A.1.1	0.531603	7.265241	1.92263E-05	0.002285893	0.00936212	0.000443003	3.42589E-08
3.A.1.2	7.43358E-05	0.000886005	2.74662E-09	3.26936E-07	1.33787E-06	6.31722E-08	4.89961E-12
3.A.1.3	0.26402949	37.389411	9.77264E-06	0.001159781	0.004752176	0.000224425	1.74543E-08
3.A.2.1	0	0	0	0	0	0	0
3.A.2.2	0.004604458	0.064276992	1.70581E-07	2.0272E-05	8.28184E-05	3.91224E-06	3.0408E-10
3.A.2.3	0	0	0	0	0	0	0
3.A.2.4	0	0	0	0	0	0	0
3.A.3.1	241.450752	23.9828376	1.95303E-07	0.011704284	3.40956E-06	0.008003722	8.56512E-15
3.A.3.2	2.21879232	13.8365496	3.27102E-06	0.008444081	0.003831125	0.005862185	6.81784E-08
3.A.3.3	228.059712	453.956256	8.31584E-06	0.228574752	0.032591731	0.013689763	1.14545E-10
3.A.3.4	0.0115884	0.2085912	5.36543E-07	6.38521E-05	0.000260739	1.22837E-05	9.57202E-10
3.A.4.1	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0
3.B.1.1	0	0	0	0	0	0	0
3.B.1.2	0	0	0	0	0	0	0
3.B.2.1	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0
3.B.3.1	34.977948	5.1269958	3.67956E-07	0.003437947	0.001129136	5.76316E-05	3.49558E-08
3.B.3.2	0.058340912	1.1171664	6.74733E-09	0.000302344	0.000134769	0.000380369	1.53389E-17
3.B.3.3	245.37762	488.42781	8.94731E-06	0.24593177	0.035066612	0.014729307	1.23243E-10
3.B.3.4	0.0099747	0.1795446	4.61829E-07	5.49606E-05	0.000224431	1.05732E-05	8.2391E-10
3.B.3.5	106.84012	1183.6644	1.10387E-05	0.2748584	0.001263462	0.39765804	2.93921E-06
3.B.4.1	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0
3.B.5.1	5.493642	22.8161472	4.74557E-07	0.009327503	0.001542895	-0.000310917	1.8468E-12
3.B.5.2	35.22816	9.37728	6.16704E-07	0.004612608	0.001022208	0.000308352	4.82381E-13
3.B.6	0.99275	13.8985	3.66795E-05	0.004362875	0.01781725	0.000841225	6.53125E-08
3.B.7	30.31610353	9.163213247	1.06049E-06	0.00994391	0.002254903	0.000581818	1.14113E-14
3.C.1.1	15.22476	110.27664	0.000142646	0.0356616	0.005198364	0.002482596	1.13843E-06
3.C.1.2	0.000245242	0.003423514	9.08548E-09	1.07972E-06	4.41107E-06	2.08373E-07	1.61959E-11
3.C.1.3	0.00368185	0.050433926	1.36154E-07	0.016187783	6.60633E-05	3.13081E-06	2.43027E-10
3.C.1.4	0	0	0	0	0	0	0
3.C.1.5	0	0	0	0	0	0	0
3.C.1.6	0	0	0	0	0	0	0
3.C.1.7	2.726784	0.3996864	2.86848E-08	0.000268013	8.80243E-05	4.4928E-06	2.72506E-09
3.C.1.8	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0
3-Total non-load bearing elements	949.7913	2381.2053	0.0002	0.8572	0.1167	0.4450	0.0000
4.A.1.1	0	0	0	0	0	0	0
4.A.1.2	0	0	0	0	0	0	0
4.A.1.3	0	0	0	0	0	0	0
4.A.1.4	0	0	0	0	0	0	0
4.A.2.1	90.23522	999.7014	9.32306E-06	0.2321404	0.001067097	0.33585474	2.4824E-06
4.A.2.2	59.083476	8.6603346	6.21537E-07	0.005807254	0.001907295	9.73492E-05	5.9046E-08
4.A.2.3	0.098547344	1.8870768	1.13973E-08	0.000510709	0.000227647	0.000642505	2.59099E-17
4.A.2.4	414.48294	825.03447	1.51135E-05	0.41541899	0.059233244	0.024880209	2.08178E-10
4.A.2.5	0.0168489	0.3032802	7.80104E-07	9.28374E-05	0.0003791	1.78598E-05	1.39172E-09
4.A.2.6	136.4880788	1741.145222	0.000585054	0.449304	0.056734774	0.027592725	1.93297E-05
4.A.3.1	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0
4.B.1	3.4464	151.6416	1.92568E-05	0.02039838	0.00260634	0.00286482	1.44964E-06
4.B.2.1	62.8	0	0	0.02532	0.000001568	0.02876	7.24E-15
4.B.2.2	18.44820113	5.576072822	6.4534E-07	0.006051149	0.001372172	0.000354053	6.94408E-15
4- Total facades	785.0997	3733.9495	0.0006	1.1550	0.1235	0.4211	0.0000
5.A.1.1	149.1063	1080.0132	0.001397032	0.349258	0.05091107	0.02431373	1.11494E-05
5.A.1.2	0	0	0	0	0	0	0
5.A.2	255.227	0	0	0.5453798	0.007750841	0.5077674	2.12241E-05
5.A.3	208.184634	414.394617	7.59112E-06	0.208654789	0.029751408	0.01249672	1.04562E-10
5.A.4	0.019214563	0.263200829	7.10552E-07	0.0844796	0.000344766	1.63388E-05	1.26829E-09
5.B.1	27.74623044	31.67327628	2.33054E-07	0.011817839	0.001981874	-0.000340222	2.00389E-12
5.B.2	0.008749605	0.119851971	3.23559E-07	0.038468901	0.000156994	7.4401E-06	5.77533E-10
5.B.3	174.3314743	0	0	0.372518835	0.005294172	0.346827881	1.4497E-05
5.B.4	0	0	0	0	0	0	0
5.B.5	0.74287152	4.6326006	1.09517E-06	0.002827154	0.001282695	0.001962712	2.28267E-08
5.B.6	0	0	0	0	0	0	0
5.B.7	0.001247445	0.022454011	5.77567E-08	6.87342E-06	2.80675E-05	1.32229E-06	1.03039E-10
5.B.8	95.44554	189.98577	3.48027E-06	0.09566109	0.013640004	0.005729319	4.79383E-11
5-Total Roofs	910.8133	1721.1050	0.0014	1.7091	0.1111	0.8988	0.0000
Total building (A1-A5)	1852.2237	6435.8631	0.0009	2.1826	0.2544	1.0439	0.0000

BIM-LCA

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BIM-LCA Construction Project

LCA - Enviromental Impact results

Project name: **Single-family house in timber (structure, facades and partitions)**

Module	Building part	Building element types / building elements		Ref.	Type of Material	Mat Code	Quantities (Q)	Unit	Cost (Euros)
A1-A3	1- Foundations	1.A - Piles		1.A.1	Concrete	CON1	0.00	m3	0.00
				1.A.2	Rebar	REB	0.00	kg	0.00
		1.B-Basement	1.B.1-Pile Caps	1.B.1.1	Concrete	CON1	0.00	m3	0.00
				1.B.1.2	Rebar	REB	0.00	kg	0.00
				1.B.1.3	Blinding concrete	CON0	0.00	m3	0.00
			1.B.2-Footings	1.B.2.1	Concrete	CON1	24.83	m3	2936.89
				1.B.2.2	Rebar	REB	1571.74	kg	2829.13
				1.B.2.3	Blinding concrete	CON0	5.94	m3	520.25
			1.B.3-Foundation beams	1.B.3.1	Concrete	CON1	2.98	m3	352.47
				1.B.3.2	Rebar	REB	264.62	kg	476.32
				1.B.3.3	Blinding concrete	CON0	1.16	m3	101.20
			1.B.4-Foundation slab	1.B.4.1	Concrete	CON1	0.00	m3	0.00
				1.B.4.2	Rebar	REB	0.00	kg	0.00
				1.B.4.3	Blinding concrete	CON0	0.00	m3	0.00
		1.C - Retaining walls		1.C.1	Concrete	CON3	0.00	m3	0.00
				1.C.2	Rebar	REB	0.00	kg	0.00
		1-Total Fundations							**7216.27**
	2 - Load bearing structural frame	2.A-Frames	2.A.1-Beams	2.A.1.1	Gulam Timber	GLT	2.80	m3	3175.20
				2.A.1.2	Steel in timber connect (galvanized)	ST-G	22.40	kg	56.00
				2.A.1.3	Structural steel	ST	0.00	kg	0.00
				2.A.1.4	Concrete	CON3	0.00	m3	0.00
				2.A.1.5	Rebar	REB	0.00	kg	0.00
			2.A.2-Columns	2.A.2.1	Gulam Timber	GLT	5.76	m3	6531.84
				2.A.2.2	Steel in timber connect (galvanized)	ST-G	46.08	kg	115.20
				2.A.2.3	Structural steel	ST	0.00	kg	0.00
				2.A.2.4	Concrete	CON3	0.00	m3	0.00
				2.A.2.5	Rebar	REB	0.00	kg	0.00
			2.A.3-Mass concrete slabs or	2.A.3.1	Concrete	CON2	0.00	m3	0.00
				2.A.3.2	Rebar	REB	0.00	kg	0.00
			2.A.4-Composite slabs or	2.A.4.1	Concrete	CON2	0.00	m3	0.00
				2.A.4.2	Rebar	REB	0.00	kg	0.00
				2.A.4.3	Galvanized steel plates	ST-G	0.00	kg	0.00
			2.A.5-Lightweight concrete slabs or	2.A.5.1	Concrete blocks or	CONB	0.00	m3	0.00
				2.A.5.2	Ceramic blocks	CERB	0.00	kg	0.00
				2.A.5.3	Precast concrete beams	CONBEAM	0.00	kg	0.00
				2.A.5.4	Concrete (cast in place)	CON2	0.00	m3	0.00
				2.A.5.5	Rebar	REB	0.00	kg	0.00
			2.A.6-Mass timber structural floors	2.A.6.1	Cross Laminated Timber (CLT) panels	CLT	56.18	m3	76164.31
				2.A.6.2	Steel in timber connect (galvanized)	ST-G		kg	0.00
				2.A.6.3	Steel in connections (galvanized)	ST-G	224.72	kg	561.81
		2.B-Load-bearing walls		2.B.1	Structural steel	ST	0.00	kg	0.00
				2.B.2	Concrete	CON3	0.00	m3	0.00
				2.B.3	rebar	REB	0.00	kg	0.00
		2- Total structural elements							**86604.36**
	3 - Non-load bearing elements	3.A-Horizontal elements	3.A.1-Ground floor slab (non-structural)	3.A.1.1	Concrete	CON1	29.53	m3	3493.22
				3.A.1.2	rebar	REB	886.01	kg	1594.81
				3.A.1.3	Graded aggregate	AGG	88600.50	kg	4430.03
			3.A.2-Flooring Type I: Ceramic flooring or	3.A.2.1	Ceramic tiles	CEFT	0.00	m2	0.00
				3.A.2.2	Tile bond coat (adhesive)	ADH	1545.12	kg	927.07
				3.A.2.3	Mortar bed	MOR	0.00	kg	0.00
				3.A.2.4	Cleavage membrane	POLY	0.00	m3	0.00
			3.A.3-Flooring Type II: Wood floating floor or	3.A.3.1	Laminated wood flooring	WFL	257.52	m2	7650.92
				3.A.3.2	Chipboard flooring (plywood)	PLYW	7.73	m3	11052.78
				3.A.3.3	Insulation layer	MWOOL	10.30	m3	994.03
				3.A.3.4	Timber battens	GLT	11.59	m3	13141.25
			3.A.4-Flooring Type III: Screed flooring	3.A.4.1	Wet screed (cement mostar)	MOR	0.00	m4	0.00
				3.A.4.2	Sound insulation layer	POLY	0.00	m3	0.00
		3.B-Vertical elements	3.B.1-Internal partition Type I: Brick walls	3.B.1.1	Brick wall	CERB	0.00	kg	0.00
				3.B.1.2	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00
			3.B.2-Internal partition Type II: Gypsum cardboard walls	3.B.2.1	Gypsum cardboard or fiberboard	GYP_F	0.00	m2	0.00
				3.B.2.2	Galvanized steel (U, C) channel studs	ST-GC	0.00	kg	0.00
				3.B.2.3	Insulation layer	MWOOL	0.00	m3	0.00
			3.B.3-Internal partition Type III: Structural Timber wall	3.B.3.1	Cross Laminated Timber (CLT) panels	CLT	22.17	m3	30050.45
				3.B.3.2	Steel in timber connect (galvanized)	ST-G	88.66	kg	221.66
				3.B.3.3	Insulation layer	MWOOL	11.08		1069.51
				3.B.3.4	Timber battens	GLT	9.97	m3	11311.31
				3.B.3.5	Gypsum plasterboard	GYP_P	443.32	m2	16358.51
			3.B.4-External party walls	3.B.4.1	Concrete blocks	CONB	0.00	m3	0.00
				3.B.4.2	Insulation layer	MWOOL	0.00	m3	0.00
				3.B.4.3	Finishing coat (plastering mortars)	PLASM	0.00	kg	0.00
			3.B.5-Parapets	3.B.5.1	Brick wall	CERB	2337.72	kg	981.84
				3.B.5.2	Finishing coat (plastering mortars)	PLASM	844.80	kg	1267.20
			3.B.6-Railings	3.B.6	Railings	ST-SL	52.25	kg	756.06
			3.B.7-Interior doors	3.B.7	Interior doors	WDOOR	7.64	m2	1123.41
		3.C-Inclined elements	3.C.1-Stairs	3.C.1.1	Ceramic tiles	CEFT	13.72	m2	441.79
				3.C.1.2	Tile bond coat (adhesive)	ADH	82.30	kg	49.38
				3.C.1.3	Mostar	MOR	1235.52	kg	308.88
				3.C.1.4	Concrete	CON3	0.00	m3	0.00
				3.C.1.5	Rebar	REB	0.00	kg	0.00
				3.C.1.6	Structural steel	ST	0.00	kg	0.00
				3.C.1.7	Cross Laminated Timber (CLT) panels	CLT	1.73	m3	2342.65
				3.C.1.8	Steel in timber connect. (galvanized)	ST-G	0.00	kg	0.00
			3.C.2-Ramps	3.C.2.1	Ceramic tiles	CEFT	0.00	m2	0.00
				3.C.2.2	Tile bond coat (adhesive)	ADH	0.00	kg	0.00
				3.C.2.3	Mostar	MOR	0.00	kg	0.00
				3.C.2.4	Concrete	CON3	0.00	m3	0.00
				3.C.2.5	Rebar	REB	0.00	kg	0.00
		3-Total non-load bearing elements							**109566.74**
	4 - Facades	4.A-External wall systems	4.A.1-Facade type I: with bricks or,	4.A.1.1	External finish	PLASM	0.00	kg	0.00
				4.A.1.2	Brick walls	CERB	0.00	kg	0.00
				4.A.1.3	Insulation layer	MWOOL	0.00	m3	0.00
				4.A.1.4	Interior finish	GYP_P	0.00	m2	0.00
			4.A.2-Facade type II: Timber panels or,	4.A.2.1	Gypsum plasterboard	GYP_P	374.42	m2	13816.10
				4.A.2.2	Cross Laminated Timber (CLT) panels	CLT	37.44	m3	50760.12
				4.A.2.3	Steel in timber connect (galvanized)	ST-G	149.77	kg	374.42
				4.A.2.4	Insulation layer	MWOOL	18.72	m3	1806.58
				4.A.2.5	Timber battens	GLT	16.85	m3	19106.65
				4.A.2.6	External wooden cladding	WCLA	374.42	m2	21172.55
			4.A.3-Facade type III: Ventilated facade	4.A.3.1	Gypsum plasterboard	GYP_P	0.00	m2	0.00
				4.A.3.2	Brick wall	CERB	0.00	kg	0.00
				4.A.3.3	Insulation layer	MWOOL	0.00	m3	0.00
				4.A.3.4	Tiles for external cladding	N-STON	0.00	kg	0.00
		4.B-Facade openings	4.B.1-Windows	4.B.1	Windows	WIN_WOOD	21.54	m2	6444.12
			4.B.2-Exterior doors	4.B.2.1	Exterior glazed doors	DOOR_GL	4.00	m3	600.56
				4.B.2.2	Exterior front doors	DOOR_W	4.00	m4	1096.73
		4- Total facades							**115177.83**
	5 - Roof	5.A-Roof Type I: Flat roof or	5.A.1-Finishing coat	5.A.1.1	Ceramic tiles or	CEFT	134.33	m2	4326.77
				5.A.1.2	Gravel ballast	GRAV	0.00	kg	0.00
			5.A.2-Waterproofing layer	5.A.2	Waterproofing layer	WP	134.33	m2	564.19
			5.A.3-Insulation layer	5.A.3	Insulation layer	MWOOL	9.40	m3	907.40
			5.A.4-Screed to falls	5.A.4	Cement mostar	MOR	6447.84	kg	1611.96
		5.B-Roof type II: Inclinated tiled roof	5.B.1-Roof tiles	5.B.1	Roof tiles	RTIL	3670.14	kg	11377.42
			5.B.2-Mostar	5.B.2	Cement mostar	MOR	2936.11	kg	734.03
			5.B.3-Waterproofing layer	5.B.3	Waterproofing layer	WP	91.75	m2	385.36
			5.B.4-Decking	5.B.4	Ceramic deck or	CERB	0.00	kg	0.00
				5.B.5	wooden deck (plywood)	PLYW	2.59	m3	3700.57
			5.B.5-Structure	5.B.6	Brick walls or	CERB	0.00	kg	0.00
				5.B.7	Gulam timber beams	GLT	1.25	m3	1414.60
			5.B.6-Insulation layer	5.B.8	Insulation layer	MWOOL	4.31	m3	416.01
		5-Total Roofs							**25438.31**
	Total building (A1-A5)								**344003.51**

IMPACTS PER UNIT AREA AND YEAR

Ref.	Energy Consumption (A1-A3) (/m2/yr) PERT (MJ/m2/yr)	Energy Consumption (A1-A3) PERT (MJ/m2/yr)	Energy Consumption (A4) (/m2/yr) PERT (MJ/m2/yr)	Energy Consumption (A4) PERT (MJ/m2/yr)	Energy Consumption (A5) (/m2/yr) PERT (MJ/m2/yr)	Energy Consumption (A5) PERT (MJ/m2/yr)	Env imp A1-A3 (/m2/yr) GWP (kg CO2-eq./m2/yr)	ADPF (MJ/m2/yr)	ADPE (kg Sb-eq./m2/yr)	AP (kg SO2-eq./m2/yr)	EP (kg Phosphat-eq./m2/yr)	POCP (kg Ethen-eq./m2/yr)	ODP (kg CFC 11-eq./m2/yr)
1.A.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2.1	0.366394843	2.699751476	0.006595107	0.113775241	0	0.000233336	0.543807083	2.622615719	1.33059E-07	0.00084078	0.000269975	3.06615E-05	6.46012E-09
1.B.2.2	0.193354658	0.878274472	0.001464808	0.080076171	0	3.66202E-06	0.064329485	0.796489358	1.24423E-07	0.000244135	0.000104001	2.29487E-05	6.57992E-09
1.B.2.3	0.014626722	0.4146161	0.000419462	0.013255899	0.000320136	0.019334597	0.058709972	0.413231431	1.51852E-09	0.000119635	5.19251E-06	0.000104589	1.40313E-09
1.B.3.1	0.043973284	0.324013669	0.000791519	0.013654862	0	2.8004E-05	0.06526561	0.314756135	1.59692E-08	0.000100907	3.24014E-05	3.67987E-06	7.75318E-10
1.B.3.2	0.032553931	0.147869655	0.000246621	0.013481931	0	6.16552E-07	0.010830759	0.1341	2.09484E-08	4.11034E-05	1.75101E-05	3.86372E-06	1.10782E-09
1.B.3.3	0.00284511	0.080648866	8.15916E-05	0.002578465	6.2271E-05	0.003760861	0.011419944	0.080379528	2.95374E-10	2.32708E-05	1.01002E-06	2.0344E-05	2.72929E-10
1.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Total Fundations	0.6537	4.5452	0.0096	0.2368	0.0004	0.0234	0.7544	4.3616	0.0000	0.0014	0.0004	0.0002	0.0000
2.A.1.1	2.461634048	0.326840634	0	0.243325567	0	1.95713E-06	-0.140543647	0.292482137	2.20721E-08	0.000182578	3.69897E-05	2.2333E-05	5.57782E-09
2.A.1.2	0.003722895	0.019658279	1.11687E-05	0.000193103	1.263E-06	2.19199E-05	0.001809258	0.019484312	5.11463E-10	5.20162E-06	2.88785E-09	4.45356E-06	1.50134E-17
2.A.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.4	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.5	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.1	5.063932898	0.672357875	0	0.500555452	0	4.0261E-06	-0.28911836	0.60167754	4.54054E-08	0.00037559	7.60932E-05	4.59422E-05	1.14744E-08
2.A.2.2	0.007658527	0.040439888	2.29756E-05	0.000397241	2.59817E-06	4.50923E-05	0.003721901	0.040082013	1.05215E-09	1.07005E-05	5.94073E-09	9.1616E-06	3.08846E-17
2.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.1	35.10645517	11.14365977	0.007404382	0.503951724	1.86528E-05	0.001066807	-2.716976092	4.441756322	6.50992E-07	0.001824262	0.000411102	0.000458138	4.09924E-08
2.A.6.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.3	0.037349149	0.197217471	0.000112047	0.001937269	1.26708E-05	0.000219906	0.018150989	0.195472184	5.13114E-09	5.21841E-05	2.89718E-08	4.46794E-05	1.50618E-16
2.B.1	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0	0	0	0	0	0	0
2- Total structural elements	42.6808	12.4002	0.0076	1.2504	0.0000	0.0014	-3.1230	5.5910	0.0000	0.0025	0.0005	0.0006	0.0000
3.A.1.1	0.435800326	3.211160298	0.007844406	0.13532747	0	0.000277536	0.646819432	3.119412861	1.58264E-07	0.001000047	0.000321116	3.64696E-05	7.68385E-09
3.A.1.2	0.108995955	0.495092107	0.000825727	0.045139739	0	2.06432E-06	0.036263175	0.44898902	7.01386E-08	0.000137621	5.86266E-05	1.29364E-05	3.70917E-09
3.A.1.3	0.089453751	0.199550676	0	0.103532395	0	2.263462028	0.015826433	0.199550676	1.37621E-08	6.88106E-05	0.000137621	8.25727E-06	3.16529E-10
3.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.2.2	0.234	0.882	0	0.162	0	0.0000648	0.06168	0.8064	6.936E-08	0.000186	0.00005772	0.000010032	3.828E-09
3.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.1	5.63	1.8308	0.0011176	0.019492	0.0002562	0.001866	-0.13606	1.828	3.354E-07	0.0005648	0.000003294	0.0008284	2.194E-09
3.A.3.2	8.202	4.902	0.011334	1.0056	0.0002457	0.0011448	-0.27738	4.5678	4.023E-07	0.0024894	0.06912	0.0012696	1.3938E-08
3.A.3.3	0.35112	1.6792	0.0020296	0.03524	0.007636	0.037568	0.13872	1.5848	3.0616E-08	0.000812	0.00011128	0.000047968	4.4464E-13
3.A.3.4	10.188	1.3527	0	1.007055	0	0.0000081	-0.58167	1.2105	9.135E-08	0.00075564	0.00015309	0.00009243	2.3085E-08
3.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.1	13.85116775	4.396704256	0.002921381	0.198832945	7.3594E-06	0.000420906	-1.071976406	1.752484312	2.56847E-07	0.000719758	0.000162199	0.000180757	1.61735E-08
3.B.3.2	0.014736017	0.077811681	4.42081E-05	0.000764345	4.99923E-06	8.67635E-05	0.007161429	0.077123082	2.02448E-09	2.05891E-05	1.14307E-08	1.76281E-05	5.94261E-17
3.B.3.3	0.377782596	1.806711479	0.002183719	0.037915979	0.008215846	0.040420758	0.149253821	1.705143135	3.29409E-08	0.00087366	0.00011973	5.16105E-05	4.78404E-13
3.B.3.4	8.769307549	1.164334739	0	0.866821262	0	6.97206E-06	-0.500671685	1.041936277	7.86294E-08	0.000650416	0.000131772	7.9559E-05	1.98704E-08
3.B.3.5	0.129800901	1.521803666	0.000585309	0.223450357	0.01955621	0.103634141	0.074712985	1.322109972	2.07613E-08	0.000153213	1.06733E-06	0.000213121	4.40703E-09
3.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.5.1	0.055919366	0.749827866	0.000372191	0.007425656	0.000173386	0.001815564	0.057008705	0.677205312	4.84756E-08	0.000181193	3.74006E-05	9.42278E-06	9.18675E-11
3.B.5.2	0.051307363	0.230292637	0.001292526	0.019223858	0.000155497	0.000807008	0.024538304	0.211921715	5.64906E-08	6.03616E-05	6.21331E-06	5.03232E-06	1.6337E-10
3.B.6	0.039930103	0.261736952	6.12749E-08	0.000507242	0.007669501	0.030872787	0.019153464	0.257679015	2.50375E-06	0.000249563	1.2539E-05	0.00011768	1.04289E-09
3.B.7	0.406241192	0.308472657	0	0	0.009696682	0.003434334	-0.004193339	0.27670507	5.90608E-07	4.00237E-05	8.35902E-06	7.89653E-06	2.17987E-14
3.C.1.1	0.043461696	0.200264678	1.35285E-05	0.009789534	0.002141128	0.011078472	0.012569804	0.173633737	3.67507E-07	3.1318E-05	3.74964E-06	2.22635E-06	2.09852E-09
3.C.1.2	0.012463281	0.04697698	0	0.008628425	0	3.45137E-06	0.003285193	0.042950382	3.69424E-09	9.90671E-06	3.07428E-06	5.34323E-07	2.03886E-10
3.C.1.3	0.036463001	0.502805592	0	0	0	0	0.055174278	0.501846039	7.98348E-07	0.000204385	1.00753E-05	0.00014969	4.17405E-09
3.C.1.4	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.5	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.6	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.7	1.079798695	0.342754893	0.000227743	0.015500466	5.73719E-07	3.28127E-05	-0.083568313	0.136618826	2.00231E-08	5.61103E-05	1.26446E-05	1.40913E-05	1.26084E-09
3.C.1.8	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Total non-load bearing elements	50.1077	26.1630	0.0308	3.9022	0.0558	2.4970	-1.3534	21.9428	0.0000	0.0093	0.0705	0.0032	0.0000
4.A.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.1.4	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.1	0.109627477	1.285287667	0.000494341	0.188722103	0.016516819	0.087527509	0.063101227	1.116630009	1.75346E-08	0.000129401	9.01446E-07	0.000179998	3.7221E-09
4.A.2.2	23.39688816	7.426752718	0.00493469	0.33586137	1.24312E-05	0.000710979	-1.810743507	2.960232681	4.33857E-07	0.001215789	0.000273981	0.000305329	2.73196E-08
4.A.2.3	0.024891544	0.131436657	7.46746E-05	0.001291103	8.44451E-06	0.000146558	0.012096825	0.130273501	3.41968E-09	3.47784E-05	1.93084E-08	2.97768E-05	1.0038E-16
4.A.2.4	0.638136603	3.051831236	0.003688659	0.064046292	0.013877908	0.068277272	0.252114119	2.880265688	5.56425E-08	0.001475755	0.000202244	8.71786E-05	8.08103E-13
4.A.2.5	14.81279497	1.966751841	0	1.464202909	0	1.1777E-05	-0.845716377	1.760000815	1.32818E-07	0.001098659	0.000222584	0.000134388	3.35643E-08
4.A.2.6	2.761779888	17.36139639	0.011975353	1.37516011	0.013694303	0.145537778	0.899583905	16.27272797	4.32029E-06	0.004509379	0.001151697	0.000462398	6.41741E-08
4.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0
4.B.1	2.809502884	1.892361603	0.000531976	0.048178938	0.000423239	0.012345853	0.132977213	1.888179404	0.000570519	0.00056443	6.84041E-05	6.60118E-05	2.85226E-09
4.B.2.1	0.434917676	0.316868593	9.53712E-05	0.001714818	0.000313762	0.001053122	0.013358186	0	0	0.000106555	4.38024E-07	6.89655E-05	4.10065E-10
4.B.2.2	0.131345542	0.136960421	0	0	0.005900704	0.002089889	0.000705607	0.125837689	2.32244E-07	3.75857E-05	7.43419E-06	2.09144E-05	3.13753E-10
4- Total facades	45.1199	33.5696	0.0218	3.4792	0.0507	0.3177	-1.2825	27.1341	0.0006	0.0092	0.0019	0.0014	0.0000
5.A.1.1	0.425649581	1.961326499	0.000132494	0.095875482	0.020969501	0.108498913	0.123104536	1.700511805	3.59924E-06	0.000306718	3.67227E-05	2.18041E-05	2.05522E-08
5.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0
5.A.2	0.18778658	2.931557161	0.000994226	0.014396971	0.027020402	0.527888941	0.036305405	0	0	7.20892E-05	1.95089E-06	7.32368E-05	4.31909E-10
5.A.3	0.320520394	1.53286012	0.001852723	0.032168884	0.006970534	0.034294002	0.12663075	1.446686945	2.79479E-08	0.000741235	0.000101582	4.37877E-05	4.0589E-13
5.A.4	0.190290401	2.624004473	0	0	0	0	0.287939422	2.618996831	4.16636E-06	0.001066628	5.25802E-05	0.000781192	2.17832E-08
5.B.1	0.307839951	1.308319791	0.000584326	0.012570131	0.000293588	0.002556782	0.080095395	1.282666461	1.143E-07	0.001094542	9.17819E-05	5.75775E-05	6.01428E-10
5.B.2	0.086651245	1.194875068	0	0	0	0	0.131117016	1.192594772	1.89721E-06	0.000485703	2.39431E-05	0.000355726	9.91929E-09
5.B.3	0.128266646	2.002384865	0.000679101	0.009833776	0.018456145	0.360571794	0.024798218	0	0	4.92401E-05	1.33255E-06	5.0024E-05	2.95013E-10
5.B.4	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.5	2.746102982	1.641233458	0.003794725	0.336683877	8.22626E-05	0.000383289	-0.092869306	1.529340308	1.34694E-07	0.000833473	0.023141994	0.000425073	4.66657E-09
5.B.6	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.7	1.096697592	0.145612763	0	0.108405457	0	8.71933E-07	-0.062614457	0.1303055	9.83346E-09	8.13416E-05	1.64795E-05	9.94972E-06	2.48501E-09
5.B.8	0.146947647	0.702763979	0.00084941	0.014748334	0.003195751	0.015722628	0.058055871	0.663256524	1.28131E-08	0.000339831	4.65719E-05	2.00751E-05	1.86087E-13
5-Total Roofs	5.6368	16.0449	0.0089	0.6247	0.0770	1.0499	0.7126	10.5644	0.0000	0.0051	0.0235	0.0018	0.0000
Total building (A1-A5)	138.5621	76.6780	0.0697	8.8686	0.1069	2.8394	-5.0045	59.0295	0.0006	0.0223	0.0734	0.0053	0.0000

Ref.	Env imp A4 (/m2/yr) GWP (kg CO2-eq./m2/yr)	ADPF (MJ/m2/yr)	ADPE (kg Sb-eq./m2/yr)	AP (kg SO2-eq./m2/yr)	EP (kg Phosphat-eq./m2/yr)	POCP (kg Ethen-eq./m2/yr)	ODP (kg CFC 11-eq./m2/yr)	Env imp A5 (/m2/yr) GWP (kg CO2-eq./m2/yr)	ADPF (MJ/m2/yr)	ADPE (kg Sb-eq./m2/yr)	AP (kg SO2-eq./m2/yr)	EP (kg Phosphat-eq./m2/yr)	POCP (kg Ethen-eq./m2/yr)	ODP (kg CFC 11-eq./m2/yr)
1.A.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.A.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.2.1	0.00836923	0.11338956	5.9395E-10	1.9477E-05	4.686E-06	-6.4987E-06	1.38073E-18	3.47111E-05	0.00047438	1.2554E-09	1.4926E-07	6.113E-07	2.8926E-08	2.23694E-12
1.B.2.2	0.005004761	0.07751276	8.7156E-09	2.9296E-05	5.1268E-06	1.0986E-06	9.59449E-10	1.02414E-08	1.2207E-07	3.7841E-13	4.5043E-11	1.8432E-10	8.7034E-12	6.75032E-16
1.B.2.3	0.000939729	0.0132559	6.1156E-11	2.3359E-06	6.9557E-09	1.1562E-06	2.21916E-10	0.001818994	0.01931152	6.9833E-11	1.0302E-05	1.2254E-07	1.1442E-05	2.06823E-10
1.B.3.1	0.001004442	0.01360857	7.1283E-11	2.3375E-06	5.624E-07	-7.7995E-07	1.6571E-19	4.16589E-06	5.6934E-05	1.5067E-10	1.7913E-08	7.3366E-08	3.4716E-09	2.68468E-13
1.B.3.2	0.000842621	0.01305034	1.4674E-09	4.9324E-06	8.6317E-07	1.8497E-07	1.61537E-10	1.72429E-09	2.0552E-08	6.371E-14	7.5836E-12	3.1033E-11	1.4653E-12	1.13651E-16
1.B.3.3	0.000182791	0.00257847	1.1896E-11	4.5437E-07	1.353E-09	2.249E-07	4.3166E-11	0.000353821	0.00375637	1.3584E-11	2.0039E-06	2.3836E-08	2.2256E-06	4.02302E-11
1.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.C.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1-Total Fundations	0.0163	0.2334	0.0000	0.0001	0.0000	0.0000	0.0000	0.0022	0.0236	0.0000	0.0000	0.0000	0.0000	0.0000
2.A.1.1	0.018006027	1.98066794	1.0873E-05	0.00126039	0.00025203	6.6542E-05	2.34856E-05	2.17459E-07	3.9143E-06	1.0068E-11	1.1982E-09	4.8928E-09	2.3051E-10	1.79621E-14
2.A.1.2	1.45958E-05	0.0001931	1.1708E-12	5.219E-08	2.3833E-08	4.6449E-08	2.6617E-21	1.1447E-06	2.192E-05	1.3239E-13	5.9323E-09	2.6443E-09	7.4632E-09	3.00963E-22
2.A.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.1	0.037040969	4.07451691	2.2367E-05	0.00259281	0.00051847	0.00013689	4.83131E-05	4.47344E-07	8.0522E-06	2.0712E-11	2.4649E-09	1.0065E-08	4.7418E-10	3.69506E-14
2.A.2.2	3.00257E-05	0.00039724	2.4085E-12	1.0736E-07	4.9029E-08	9.5553E-08	5.47549E-21	2.35482E-06	4.5092E-05	2.7234E-13	1.2204E-08	5.4397E-09	1.5353E-08	6.19124E-22
2.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.5.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.1	0.031498074	0.47689977	7.4349E-08	0.00016362	3.5909E-05	5.8511E-06	1.35565E-09	0.006885159	0.00100921	7.2429E-11	6.7674E-07	2.2226E-07	1.1344E-08	6.8808E-12
2.A.6.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.A.6.3	0.00014643	0.00193727	1.1746E-11	5.2359E-07	2.391E-07	4.6599E-07	2.67029E-20	1.1484E-05	0.00021991	1.3282E-12	5.9514E-08	2.6528E-08	7.4873E-08	3.01935E-21
2.B.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.B.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2- Total structural elements	0.0867	6.5346	0.0000	0.0040	0.0008	0.0002	0.0001	0.0069	0.0013	0.0000	0.0000	0.0000	0.0000	0.0000
3.A.1.1	0.009954597	0.13486873	7.0646E-10	2.3166E-05	5.5737E-06	-7.7297E-06	1.64228E-18	4.12863E-05	0.00056425	1.4932E-09	1.7753E-07	7.271E-07	3.4405E-08	2.66068E-12
3.A.1.2	0.002821234	0.04369472	4.9131E-09	1.6515E-05	2.89E-06	6.193E-07	5.40851E-10	5.77321E-09	6.8811E-08	2.1331E-13	2.5391E-11	1.039E-10	4.9062E-12	3.80522E-16
3.A.1.3	0.009048591	0.84275755	4.5965E-06	0.00053672	0.0001101	2.7524E-05	6.88106E-06	2.05056E-05	0.00290381	7.5898E-10	9.0073E-08	3.6907E-07	1.743E-08	1.35557E-12
3.A.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.2.2	0.002976	0.329616	1.1088E-05	0.000192	4.1952E-05	1.1088E-05	3.8976E-06	3.576E-07	4.992E-06	1.3248E-11	1.5744E-09	6.432E-09	3.0384E-10	2.3616E-14
3.A.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.3.1	0.0014686	0.01942	1.2924E-10	1.6972E-06	4.332E-09	1.493E-06	2.878E-19	0.018752	0.0018626	1.5168E-11	9.09E-07	2.648E-10	6.216E-07	6.652E-19
3.A.3.2	0.07002	0.9474	2.5998E-07	0.0012426	0.00012006	0.0008358	1.4034E-08	0.00017232	0.0010746	2.5404E-10	6.558E-07	2.9754E-07	4.5528E-07	5.295E-12
3.A.3.3	0.002592	0.03488	2.1312E-10	3.8336E-06	8.352E-07	-0.00000086	6.436E-19	0.017712	0.035256	6.4584E-10	1.7752E-05	2.5312E-06	1.0632E-06	8.896E-15
3.A.3.4	0.0745218	8.1974187	0.000045	0.0052164	0.0010431	0.0002754	0.0000972	0.0000009	0.0000162	4.167E-11	4.959E-09	2.025E-08	9.54E-10	7.434E-14
3.A.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.A.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.3.1	0.012427489	0.18815966	2.9334E-08	6.4556E-05	1.4168E-05	2.3085E-06	5.34869E-10	0.002716523	0.00039818	2.8577E-11	2.67E-07	8.7693E-08	4.4759E-09	2.7148E-12
3.B.3.2	5.77735E-05	0.00076434	4.6343E-12	2.0658E-07	9.4338E-08	1.8386E-07	1.05356E-20	4.53098E-06	8.6763E-05	5.2402E-13	2.3481E-08	1.0467E-08	2.9541E-08	1.19128E-21
3.B.3.3	0.002788826	0.03752864	2.293E-10	4.1247E-06	8.9862E-07	-9.253E-07	6.92472E-19	0.019056976	0.03793319	6.9488E-10	1.91E-05	2.7234E-06	1.1439E-06	9.57153E-15
3.B.3.4	0.064144541	7.05591732	3.8734E-05	0.00449001	0.00089785	0.00023705	8.36648E-05	7.74674E-07	1.3944E-05	3.5867E-11	4.2685E-09	1.743E-08	8.2115E-10	6.39881E-14
3.B.3.5	0.016836244	0.22207316	5.7842E-10	4.6825E-05	1.3187E-08	7.2647E-05	3.61514E-10	0.008297617	0.09192796	8.5731E-10	2.1347E-05	9.8125E-08	3.0884E-05	2.28271E-10
3.B.4.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.4.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.B.5.1	0.000535591	0.0074075	4.3029E-11	2.2513E-06	5.5919E-07	-8.2245E-07	1.79741E-16	0.000426658	0.00177199	3.6856E-11	7.2441E-07	1.1983E-07	-2.4147E-08	1.4343E-16
3.B.5.2	0.001430308	0.01915825	1.4828E-10	1.0891E-06	2.4538E-07	-1.5418E-08	3.00496E-17	0.002735955	0.00072828	4.7896E-11	3.5823E-07	7.9389E-08	2.3948E-08	3.74636E-17
3.B.6	0.001468973	0.16155866	8.8057E-07	0.00010145	2.029E-05	4.0579E-06	1.91129E-06	7.71008E-05	0.00107941	2.8487E-09	3.3884E-07	1.3838E-06	6.5333E-08	5.07242E-12
3.B.7	0.000126353	0.01390529	7.5901E-08	8.8514E-06	1.7703E-06	4.4257E-07	1.64414E-07	0.002354466	0.00071165	8.2362E-11	7.7228E-07	1.7512E-07	4.5186E-08	8.86244E-19
3.C.1.1	0.000645534	0.00920365	2.7696E-11	1.0759E-06	1.2676E-07	5.3581E-08	1.19307E-10	0.001182414	0.00856451	1.1078E-08	2.7696E-06	4.0373E-07	1.9281E-07	8.84147E-11
3.C.1.2	0.000158507	0.01755597	5.9057E-07	1.0226E-05	2.2344E-06	5.9057E-07	2.07594E-07	1.90464E-08	2.6588E-07	7.0561E-13	8.3856E-11	3.4258E-10	1.6183E-11	1.25783E-15
3.C.1.3	0.003152802	0.03467823	1.8903E-07	2.1932E-05	4.3082E-06	1.175E-05	3.91689E-06	2.85947E-07	3.9169E-06	1.0574E-11	1.2572E-06	5.1307E-09	2.4315E-10	1.88744E-14
3.C.1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.1.7	0.000968813	0.01466841	2.2868E-09	5.0326E-06	1.1045E-06	1.7997E-07	4.16969E-11	0.000211773	3.1041E-05	2.2278E-12	2.0815E-08	6.8363E-09	3.4893E-10	2.11638E-13
3.C.1.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.C.2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-Total non-load bearing elements	0.2781	18.3326	0.0001	0.0120	0.0023	0.0015	0.0002	0.0738	0.1849	0.0000	0.0001	0.0000	0.0000	0.0000
4.A.1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.1.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.1.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.2.1	0.014219585	0.18755895	4.8853E-10	3.9547E-05	1.1137E-08	6.1356E-05	3.05329E-10	0.007008016	0.07764068	7.2406E-10	1.8029E-05	8.2875E-08	2.6084E-05	1.92793E-10
4.A.2.2	0.020992063	0.31783245	4.955E-08	0.00010905	2.3932E-05	3.8995E-06	9.03482E-10	0.004588651	0.0006726	4.8271E-11	4.5101E-07	1.4813E-07	7.5605E-09	4.58574E-12
4.A.2.3	9.75888E-05	0.0012911	7.828E-12	3.4895E-07	1.5935E-07	3.1056E-07	1.77963E-20	7.65357E-06	0.00014656	8.8516E-13	3.9664E-08	1.768E-08	4.9899E-08	2.01226E-21
4.A.2.4	0.004710783	0.06339202	3.8733E-10	6.9673E-06	1.5179E-06	-1.563E-06	1.1697E-18	0.032190349	0.06407537	1.1738E-09	3.2263E-05	4.6003E-06	1.9323E-06	1.61679E-14
4.A.2.5	0.108350623	11.9185986	6.5428E-05	0.00758436	0.00151661	0.00040042	0.000141323	1.30855E-06	2.3554E-05	6.0586E-11	7.2101E-09	2.9442E-08	1.3871E-09	1.08086E-13
4.A.2.6	0.096261208	1.29494244	2.355E-07	0.00222318	4.8131E-06	9.8553E-05	1.97679E-08	0.010600193	0.13522408	4.5438E-08	3.4895E-05	4.4062E-06	2.143E-06	1.50122E-09
4.A.3.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.A.3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.B.1	0.002994455	0.04516775	1.1961E-08	7.1599E-06	1.1359E-06	1.4186E-06	5.36994E-10	0.000267661	0.01177707	1.4956E-09	1.5842E-06	2.0242E-07	2.2249E-07	1.12585E-10
4.B.2.1	0.000129543	0	0	4.1317E-07	3.8211E-10	3.7279E-07	1.64337E-20	0.004877291	0	0	1.9664E-06	1.2178E-10	2.2336E-06	5.62286E-19
4.B.2.2	7.68896E-05	0.00846176	4.6188E-08	5.3863E-06	1.0773E-06	2.6932E-07	1.00051E-07	0.001432759	0.00043306	5.012E-11	4.6996E-07	1.0657E-07	2.7497E-08	5.39304E-19
4- Total facades	0.2478	13.8372	0.0001	0.0100	0.0015	0.0006	0.0001	0.0610	0.2900	0.0000	0.0001	0.0000	0.0000	0.0000
5.A.1.1	0.006322148	0.09013756	2.7125E-10	1.0537E-05	1.2415E-06	5.2476E-07	1.16845E-09	0.011580172	0.08387801	1.085E-07	2.7125E-05	3.954E-06	1.8883E-06	8.65905E-10
5.A.1.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.A.2	0.001084989	0	0	1.2206E-06	3.9018E-09	1.0537E-06	1.07456E-16	0.019821917	0	0	4.2356E-05	6.0196E-07	3.9435E-05	1.64835E-09
5.A.3	0.002366111	0.03184026	1.9455E-10	3.4995E-06	7.6241E-07	-7.8505E-07	5.87511E-19	0.016168425	0.03218349	5.8956E-10	1.6205E-05	2.3106E-06	9.7054E-07	8.12073E-15
5.A.4	0.01645361	0.18097619	9.8651E-07	0.00011446	2.2483E-05	6.1318E-05	2.04412E-05	1.49228E-06	2.0441E-05	5.5184E-11	6.561E-06	2.6776E-08	1.2689E-09	9.85003E-14
5.B.1	0.00092352	0.01245612	7.867E-11	6.7269E-07	1.3397E-07	-8.6651E-09	6.61286E-17	0.00215488	0.00245987	1.81E-11	9.1782E-07	1.5392E-07	-2.6423E-08	1.5563E-16
5.B.2	0.007492368	0.08240989	4.4922E-07	5.2121E-05	1.0238E-05	2.7922E-05	9.30817E-06	6.79528E-07	9.3082E-06	2.5129E-11	2.9876E-06	1.2193E-08	5.7783E-10	4.48534E-14
5.B.3	0.000741096	0	0	8.3373E-07	2.6651E-09	7.1972E-07	7.3397E-17	0.013539257	0	0	2.8931E-05	4.1117E-07	2.6936E-05	1.1259E-09
5.B.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.5	0.023443322	0.317198	8.7044E-08	0.00041603	4.0197E-05	0.00027983	4.69871E-09	5.76943E-05	0.00035979	8.5055E-11	2.1957E-07	9.9619E-08	1.5243E-07	1.77281E-12
5.B.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.B.7	0.008021975	0.88241945	4.8441E-06	0.00056152	0.00011229	2.9646E-05	1.04632E-05	9.68814E-08	1.7439E-06	4.4856E-12	5.3382E-10	2.1798E-09	1.0269E-10	8.0024E-15
5.B.8	0.001084781	0.01459767	8.9193E-11	1.6044E-06	3.4954E-07	-3.5992E-07	2.69354E-19	0.00741267	0.01475503	2.7029E-10	7.4294E-06	1.0593E-06	4.4496E-07	3.72308E-15
5-Total Roofs	0.0679	1.6120	0.0000	0.0012	0.0002	0.0004	0.0000	0.0707	0.1337	0.0000	0.0001	0.0000	0.0001	0.0000
Total building (A1-A5)	0.6291	38.9379	0.0002	0.0260	0.0046	0.0022	0.0004	0.1439	0.4998	0.0000	0.0002	0.0000	0.0001	0.0000

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Enviromental Impacts	
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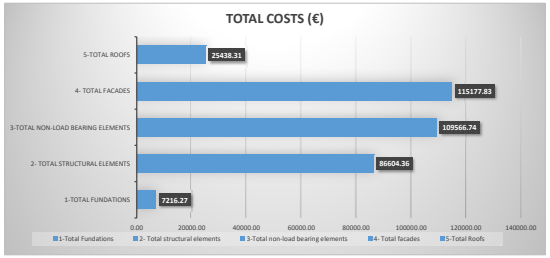
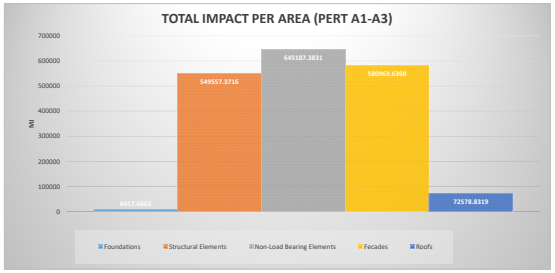
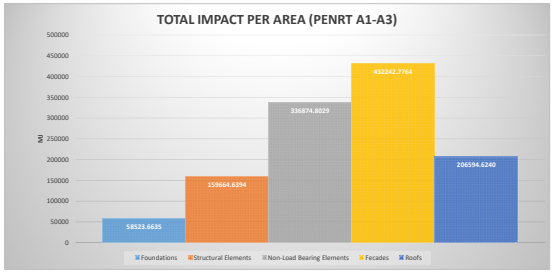
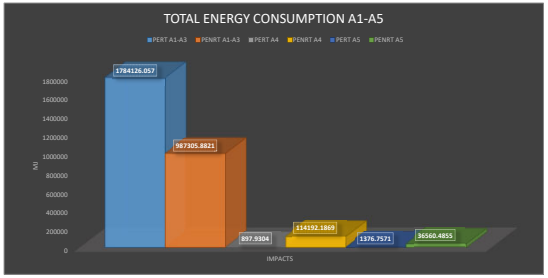
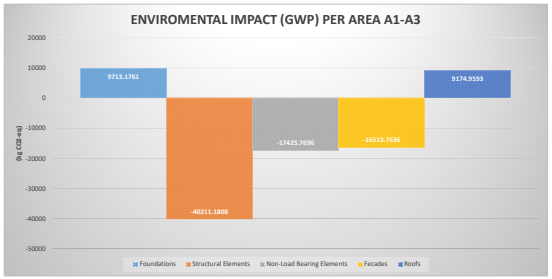
Abiotic depletion potential for non fossil resources (ADPE)	Photochemical Ozone Creation Potential (POCP)
Acidification potential (AP)	Ozone Depletion Potential (ODP)
Global warming potential (GWP)	

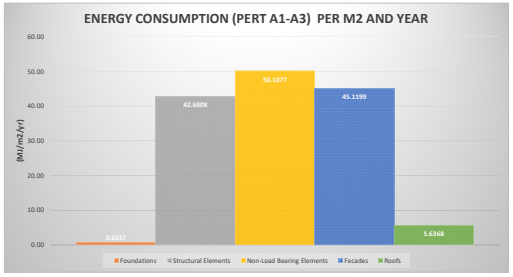


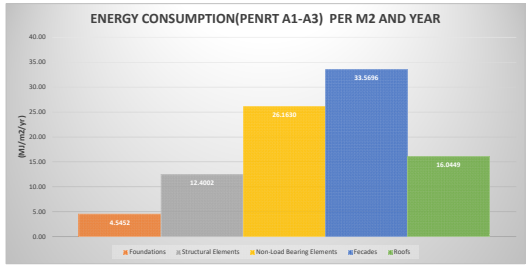


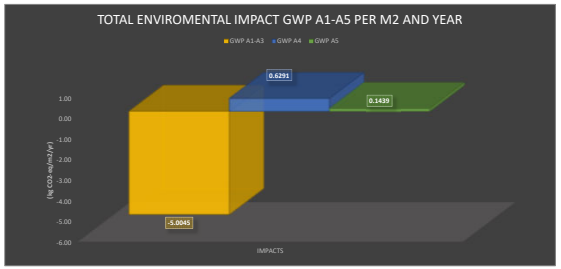












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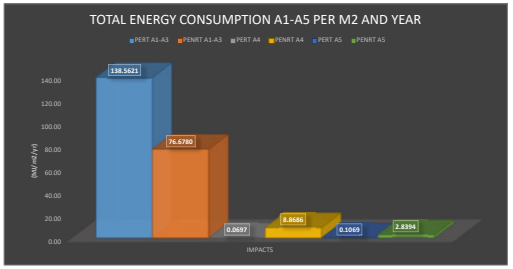

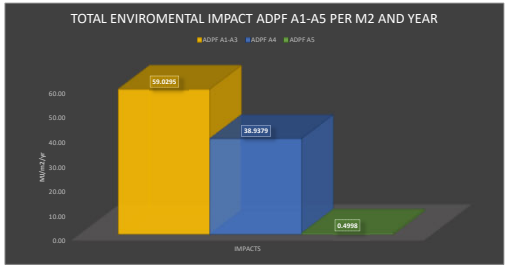

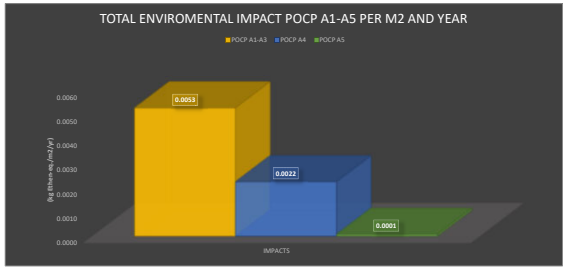

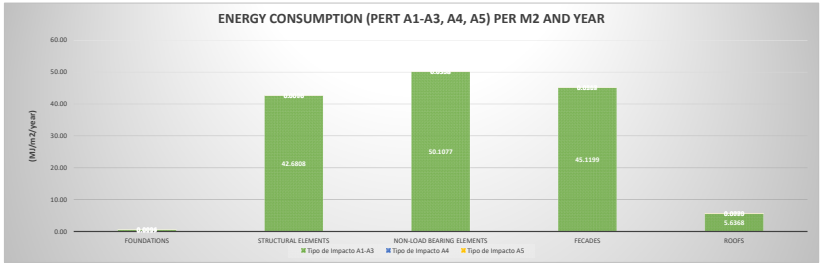

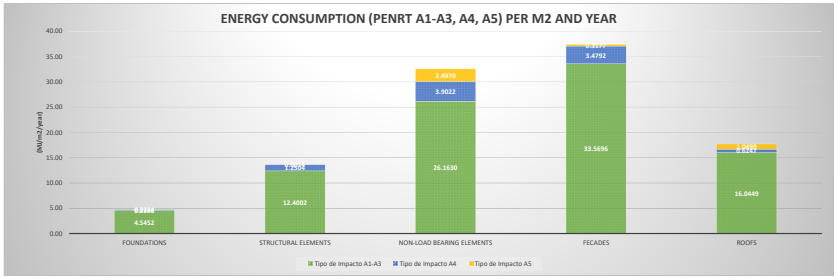

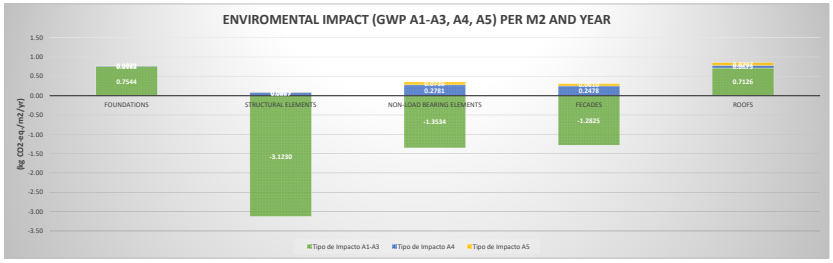

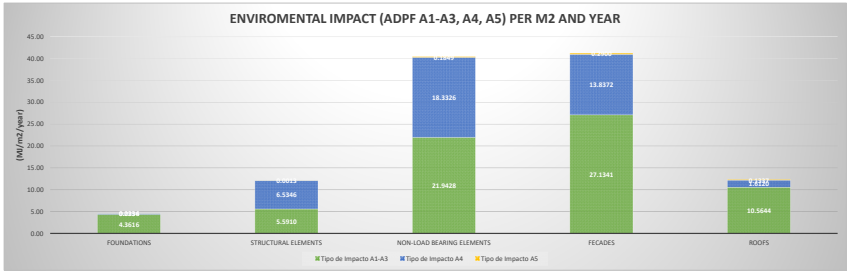

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