

Perkins&Will

Low Carbon Labs

Low Carbon Labs - Executive Summary

Why Laboratory Embodied Carbon ?

EMBODIED CARBON - TECHNICAL BUILDINGS

LCA tools have experienced a renaissance, enabling an increasing focus on the embodied carbon impacts of structural materials in light commercial, multifamily, and residential applications. But little is known about the embodied carbon intensity of other building types and systems.

Improved design resources will enable us to make better choices at earlier design phases, leading to more beautiful design, better occupant outcomes, and less impact to our fragile climate.

WHY LABS ?

Labs are designed to support discovery and innovation. Their designs can serve as models for innovation in buildings of all types.

Lab building embodied carbon is significant, due to the intensive structure, finishes, and mechanical systems of these buildings. For example: lab building structural systems are heavier per square foot than office or residential structures, due to their vibration performance. And lab building finishes and built-in casework are significantly more robust than office equivalents.

But hard data is lacking on the embodied carbon intensity of labs and technical buildings that would allow us to quantify these differences.

LABS RE-IMAGINED

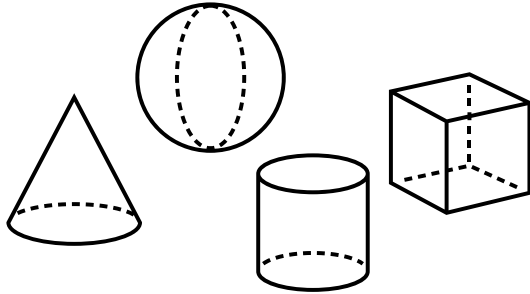
A standard kit of parts for lab planning and lab materials choices has emerged over the past 50+ years. Lab designers have become familiar with a predictable set of choices applying to many projects.

Recent projects show experimentation with a variety of design choices uncommon in laboratory buildings, such as CLT / Timber structural systems, low-carbon concrete, wood cladding, timber curtain wall, and demountable partitions. But no resource brings these experiments into a common framework for evaluating their carbon benefits.

Our goal is to daylight these strategies, quantify their benefits, and advocate for broader adoption. Our hope is this transforms how - and what - we design.

Low Carbon Labs - Executive Summary

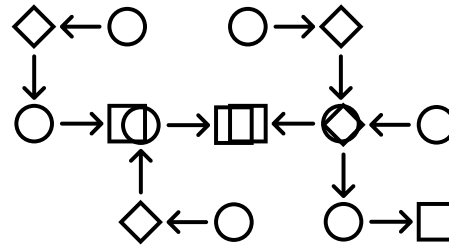
Caveats



“all models are wrong but some models are useful”

It has been said that "all models are wrong but some models are useful." In other words, any model is at best a useful fiction ... Nevertheless, enormous progress has been made by entertaining such fictions and using them as approximations. - George Box, Statistical Control: By Monitoring and Feedback Adjustment, 1997

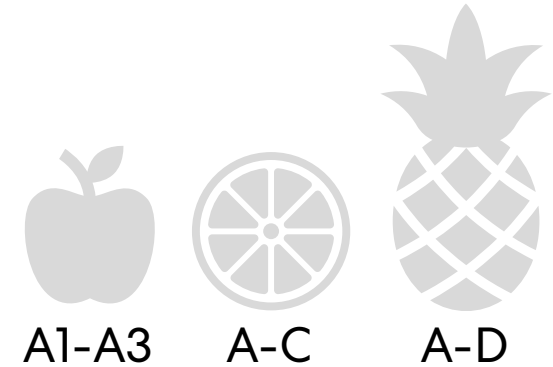
Low Carbon Labs is a simplified model of building systems. It does not include all the systems and products required to make a lab building. But it does demonstrate a method for evaluating individual design choices to improve future projects. We hope that the methods and examples help building owners and designers to contextualize the carbon impact of design choices alongside other conventional project drivers, such as scope, schedule, and cost.



Complexity

A key lesson of the study is the surprising difficulty of conducting embodied carbon analysis. There are numerous obstacles, including:

- Lack of EPD data for many products
- Wide variation in EPD scope and format
- Difficulty obtaining quantity takeoffs from design software
- Complexity of conversions between design software units and EPD reporting units
- Complexity of summarizing data across many product categories and creating holistic dashboards
- EC analysis software tools are still developing



Apples, Oranges, and Pineapples

This study intentionally mixes EPD data from a variety of sources with different Product Category Rules (PCRs), modules (aka. product life cycle stages), and EPD types (ex. product specific vs. industry average).

This is out of necessity. Quality EPD data is sorely lacking for many individual products and, in some cases, for whole product categories.

To maintain “fairness” in comparisons between individual system selections, we have held the calculations within each system to consistent rules (for example, using consistent A1-A3 scope and product specific EPDs).

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Caveats

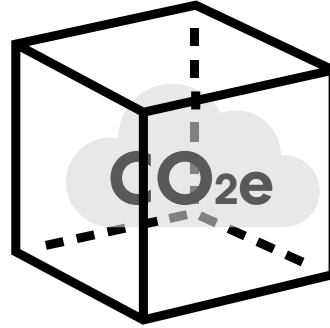


Directionality vs. Magnitude

This analysis represents a set of design choices, not a complete embodied carbon assessment of a laboratory building.

The complexity and difficulty of assessing just the products and systems included within this study belie the extraordinary difficulty of summarizing the complete Embodied Carbon picture of any building, let alone one as complex as a laboratory.

This leaves us unable to compare the total impact of various systems or design choices relative to the total Embodied Carbon impact of a whole building. For example, we are unable to say “Structure represents X% of a lab building’s Embodied Carbon”, because we don’t know what a lab building’s total embodied carbon is. Nobody does.



So what can we say about Embodied Carbon ?

This study shows that many design choices have significant Embodied Carbon impact that can be easily compared to a building’s Operational Carbon profile from an energy model or utility meters.

While the absolute magnitude of carbon reduction is debatable, the results clearly show that Embodied Carbon reduction options exist that are equivalent to years (or even decades) of Operational Carbon pollution.

As we have effective design choices to reduce Operational Carbon due to building energy use and building energy fuel source choices, we also have effective design choices to reduce Embodied Carbon due to building construction materials, systems, and methods.



Choose your own adventure

Is “Reimagined” right for my project?

We recognize that not all options will be possible for every laboratory project. Program differences, code / jurisdictional issues, and scope / schedule / budget drivers may place one or several system choices out of reach for a particular project.

So, we have deliberately structured “Low Carbon Labs” as a “choose your own adventure” of system-by-system choices. This has two advantages:

1. Teams can pick and choose individual options as the opportunity arises to make small, medium, or large improvements on a particular project.
2. Teams can adapt the method to evaluate additional systems, options, or choices specific to their particular interests.

Low Carbon Labs - Executive Summary

Scope and Results

SCOPE AND SYSTEMS

This study uses a 22' wide x 88' long x 1 story (15' high) "module". The 22' width reflects 2x 11' wide lab aisles. The 88' depth is composed of a 33' structural bay for computing / office work, a 33' bay for wet bench ("open lab") work, and a 22' bay for laboratory support / instrument work. This module provides a cross section of typical laboratory building space types.

The study evaluates (3) choices for each of (14) different building systems: superstructure for office and lab; building envelope (wall backup, insulation, cladding, and glazing); interior partitions; doors; floor finishes for office and labs; ceilings for office and labs; lab equipment (fumehoods); chairs; systems furniture; lab casework cabinets and countertop.

For some systems (ex. flooring), we were able to find many EPDs; thus, the challenge was picking realistic system options from many choices. For other systems (ex. lab countertops), very few EPDs were available, leading to limited system options.

SCENARIOS

The 3 scenarios (Baseline, Improved, Reimagined) are summaries of individual choices within each system type, aggregated. They don't necessarily represent a specific design case. Rather, they capture the potential for savings along a continuum of design choices. Still, the scenarios are useful to explain the potential of the individual choices when combined at the scale of a building.

The **Baseline** scenario provides a point of reference, with many system choices that can be found in conventional laboratory buildings.

Improved represents realistically achievable improvements that may be found in progressive projects.

Reimagined represents the better choices that we discovered for each system within the scope of the research study.

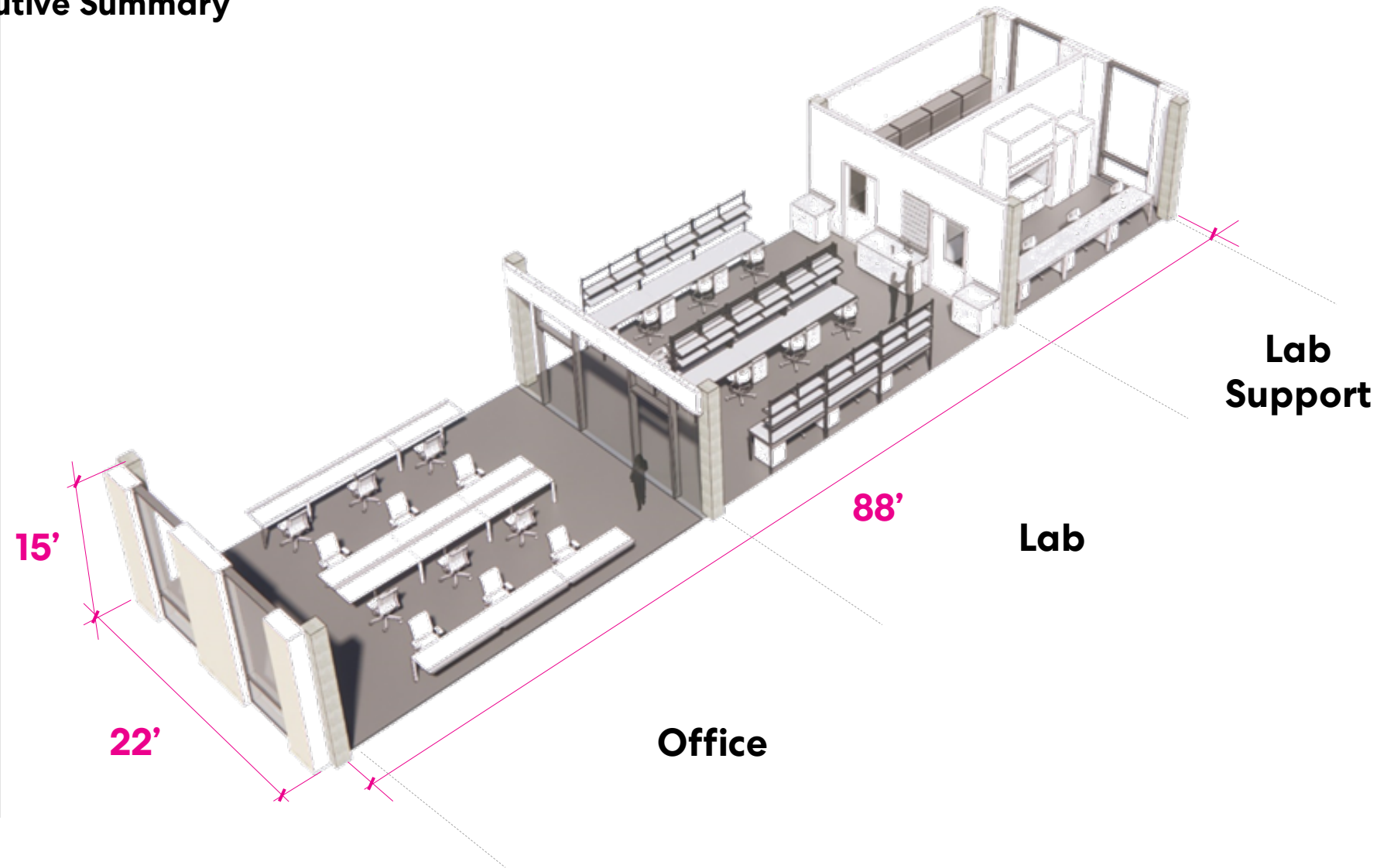
RESULTS

Baseline: The sum of the studied systems within the 22x88 module equates to ~175,000 kg CO₂e/sf.

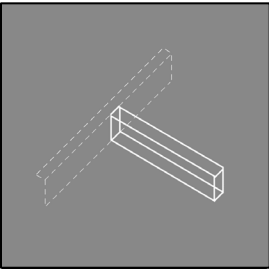
Improved: The sum of the studied systems within the 22x88 module equates to ~130,000 kg CO₂e/sf, or a reduction of 26% from the baseline. The savings is equivalent to 2-7 years of operational carbon.

Reimagined: The sum of the studied systems within the 22x88 module equates to ~50,000 kg CO₂e/sf, or a reduction of 73% from the baseline. The savings is equivalent to 7-20 years of operational carbon.

Scope

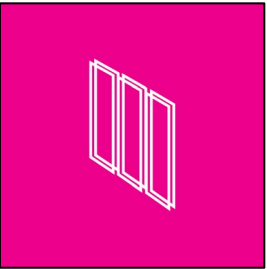


Systems



STRUCTURE

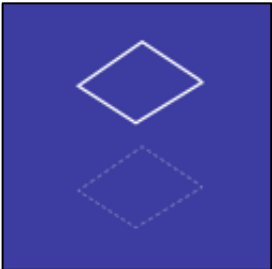
Special thanks
to LeMessurier



**ENVELOPE
OPAQUE**



PARTITIONS



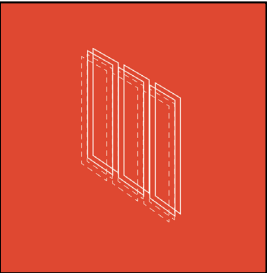
CEILINGS



**OFFICE
SYSTEMS**



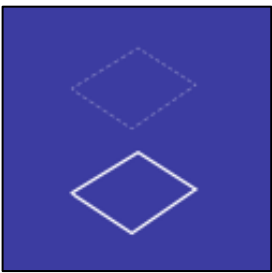
**LAB
BENCHTOP**



**ENVELOPE
GLAZING (%)**



DOORS



FLOORS

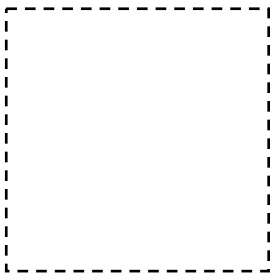


**LAB
CASEWORK**



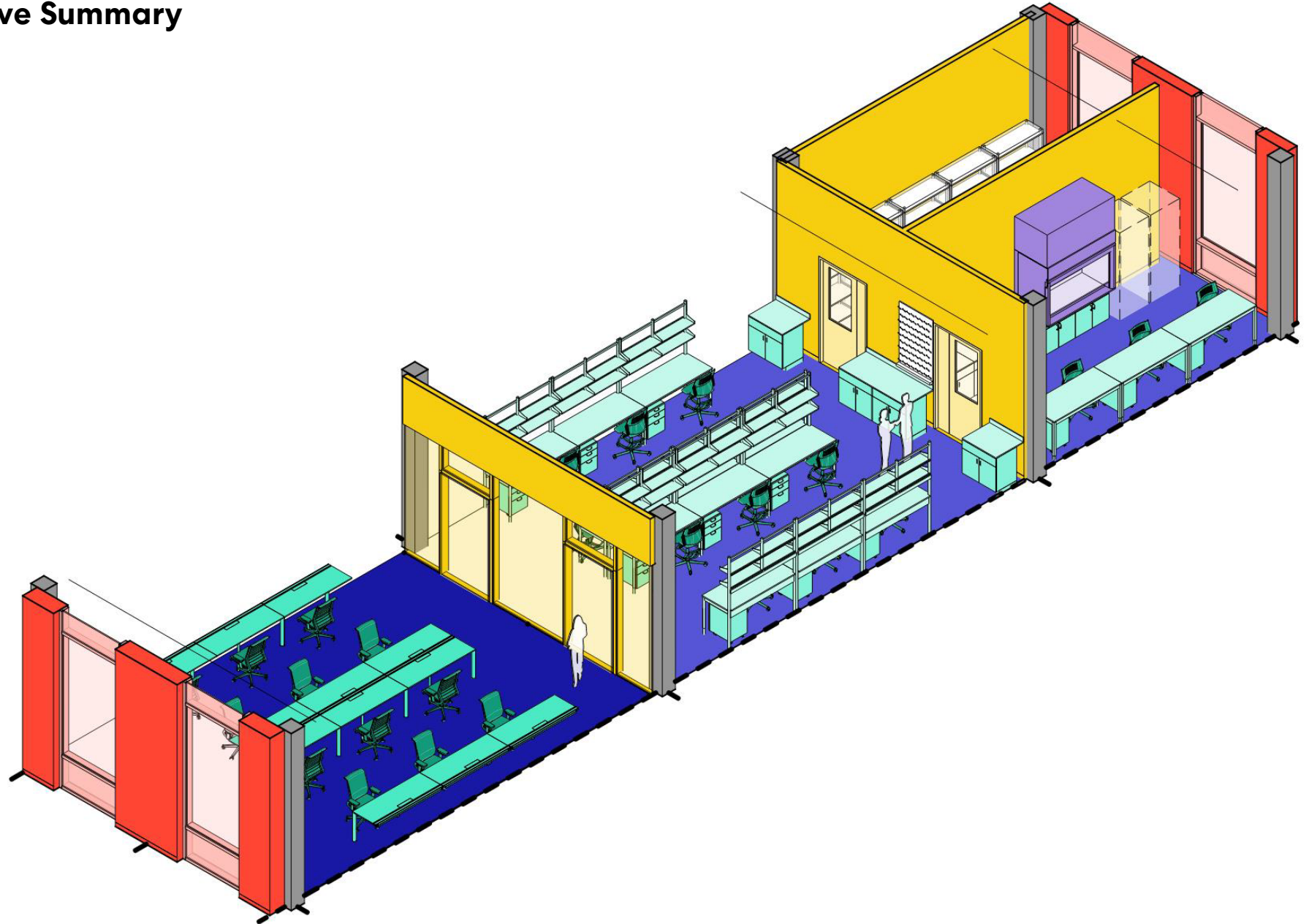
**LAB
FUMEHOODS**

Special thanks
to BR+A



MEP SYSTEMS

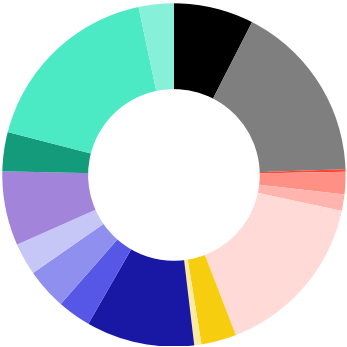
Systems



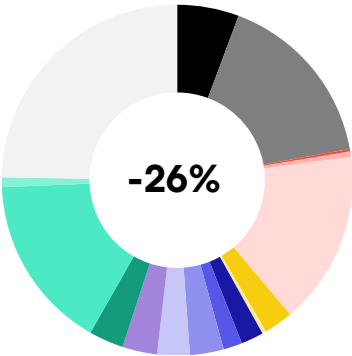
Scenarios



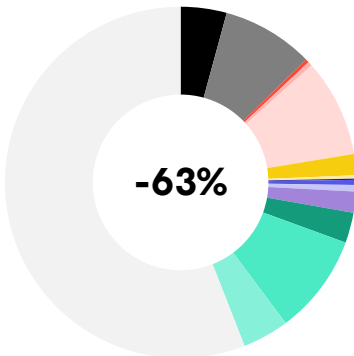
BASELINE



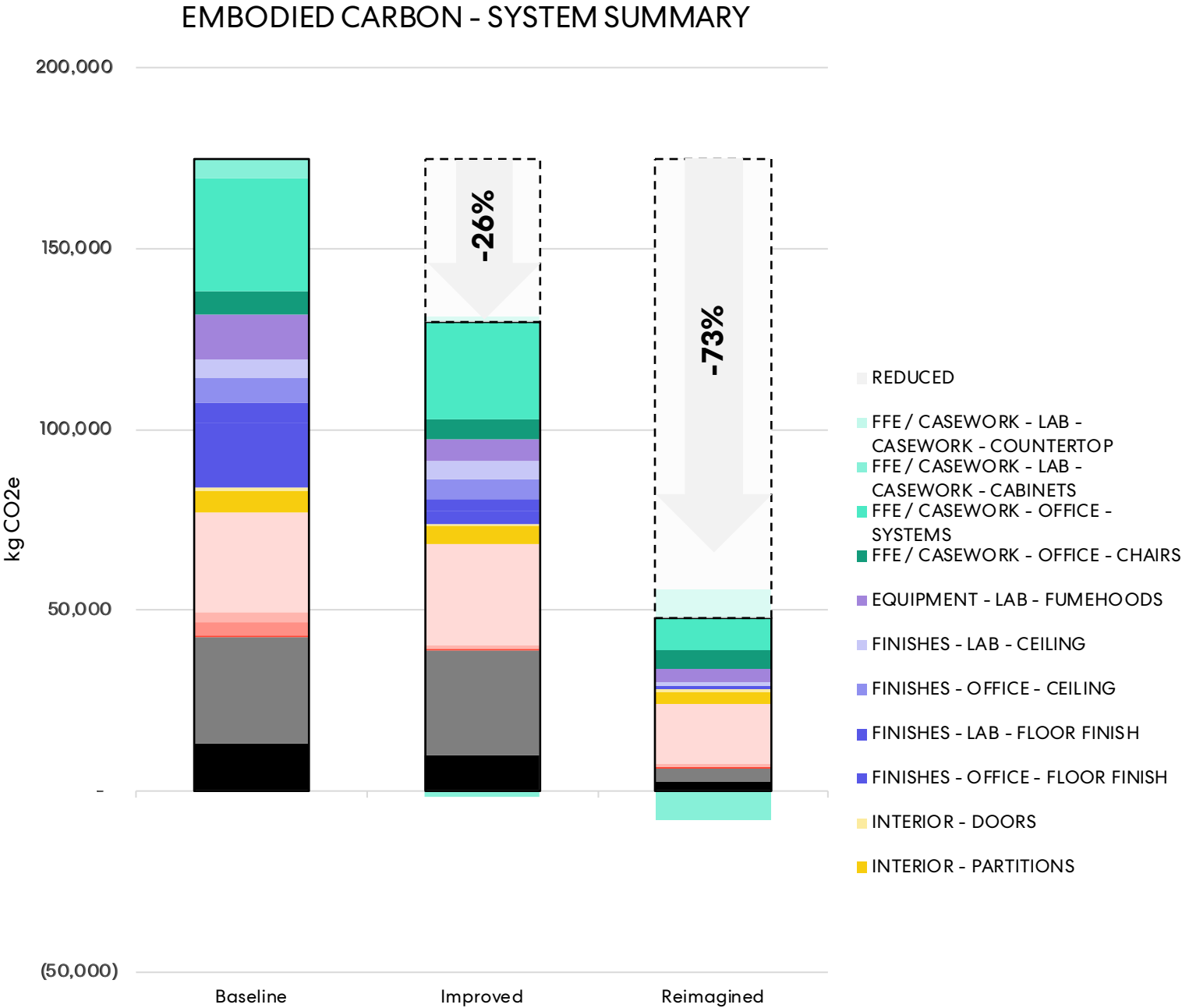
IMPROVED



REIMAGINED



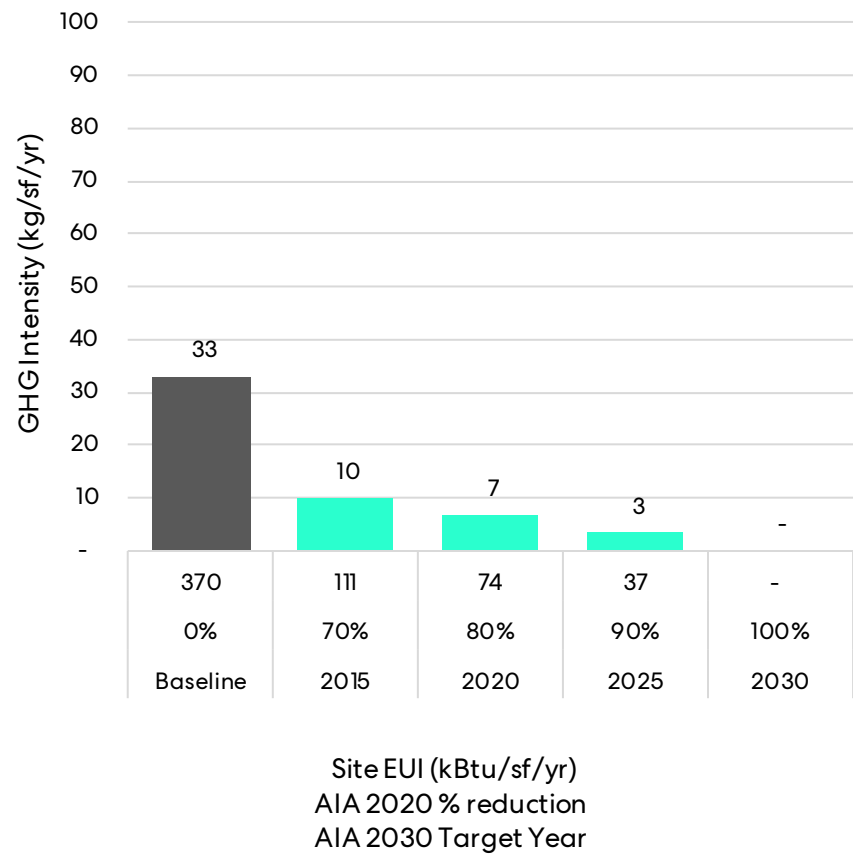
Results



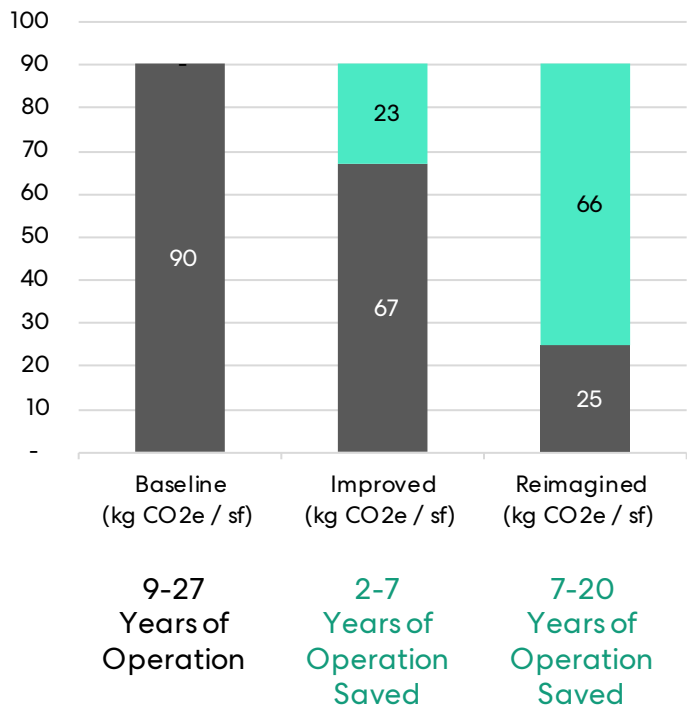
Context

Note: the “module” represents “net” program area of lab space. A real building would contain “gross” areas such as corridors, stairways, mechanical spaces, and storage. These may equate to 35-50% of the total building area included in the operational carbon assessments. So, the comparison of embodied carbon reduction to operational carbon may be diluted by a similar factor in practice.

Operational Carbon Intensity Labs



Embodied Carbon Intensity All Design Choices



Low Carbon Labs

**Why do
we care?**

**How We
Thought
We'd Do It**

**How We
Did It**

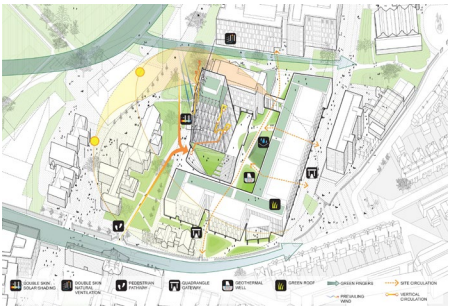
**Looking
Ahead**

Why do we care? (Why We Need the Data)

Low Carbon Labs

Who's Asking?

FOCAS
Technical University Dublin
Ireland, 2020



Competition Brief - Stage I



Competition Regulations

<p>Strategic Objectives</p> <p>It is the GDA's ambition to develop an enduring, adaptable and environmentally responsible building, which is of its place and reflective of the progressive ethos of TU Dublin, its staff, students and its research programmes.</p> <p>The following objectives support that ambition:</p> <p>Research</p> <p>To develop a research Institute that underpins TU Dublin's research strategy and facilitates growth in research numbers at TU Dublin. FOCAS must be an open, collaborative and enriching learning environment that will support the development of interdisciplinary work.</p> <p>Environmental Responsibility</p> <p>To make a beautiful, useful and environmentally responsible building. The project design solutions must support reduced carbon impacts in terms of the building operation, its life cycle and also embodied carbon.</p> <p>Sustainability & Climate Action</p> <p>Site wide Sustainability Strategy</p> <p>The GDA is committed to meeting the requirements of the Programme for Government and the Climate Action & Low Carbon Development Act</p> <p>Collective Ambition</p> <p>Developing a culture of awareness of environmental responsibility around the design, delivery and occupancy of FOCAS is an important consideration.</p> <p>The architect as Team Lead must be able to engender and support a culture that encourages integration and innovation of sustainable and low carbon solutions.</p>	<p>Embodied Carbon</p> <p>This project targets an outcome of a minimum of 40% reduction in upfront embodied carbon compared to a baseline. The baseline is the current RIBA referenced M4i benchmark of 1,000kg CO2e/m2. This is considered to be a minimum target, the Design Team must work to maximise reductions and review all emerging guidance and benchmarks particularly during preliminary design (CWMF Work Stage (i)).</p> <p>A range of solutions and opportunities must be considered in the reduction of embodied carbon. It is anticipated that integration of structure, facade, service strategies and fire engineering will be critical in the success of a low embodied carbon solution.</p> <p>The potential for off-site, modular construction and low carbon materials such as mass timber/ mass timber hybrid both to affect whole life carbon and minimise time-on-site must be interrogated as fundamental design principles.</p> <p>Life Cycle Assessment & Life Cycle Costs</p> <p>Both of these targets for embodied and operational carbon sit under the concept of 'Whole Life Net Carbon' and circular design as structured in BS EN 15978. The carrying out of Life Cycle Assessments and integrating this into the design process to support and check these targets will form part of the Design Team scope.</p>	<p>Developing a Preliminary Design</p> <p>FOCAS is an innovative and distinctive Institute and it is expected that this way of thinking and working be reflected in an approach to pedagogy.</p> <p>The Design Team will develop strategies for carbon reduction and environmental responsibility, defining further targets and metrics appropriate to the project. This will be done in collaboration with the GDA and TU Dublin. It will be critical to the ongoing success of the project in meeting all targets that are set that strategies are developed with a full understanding of value and measured against agreed benchmarks. Upfront and life cycle costs must be understood, measured and demonstrated.</p>
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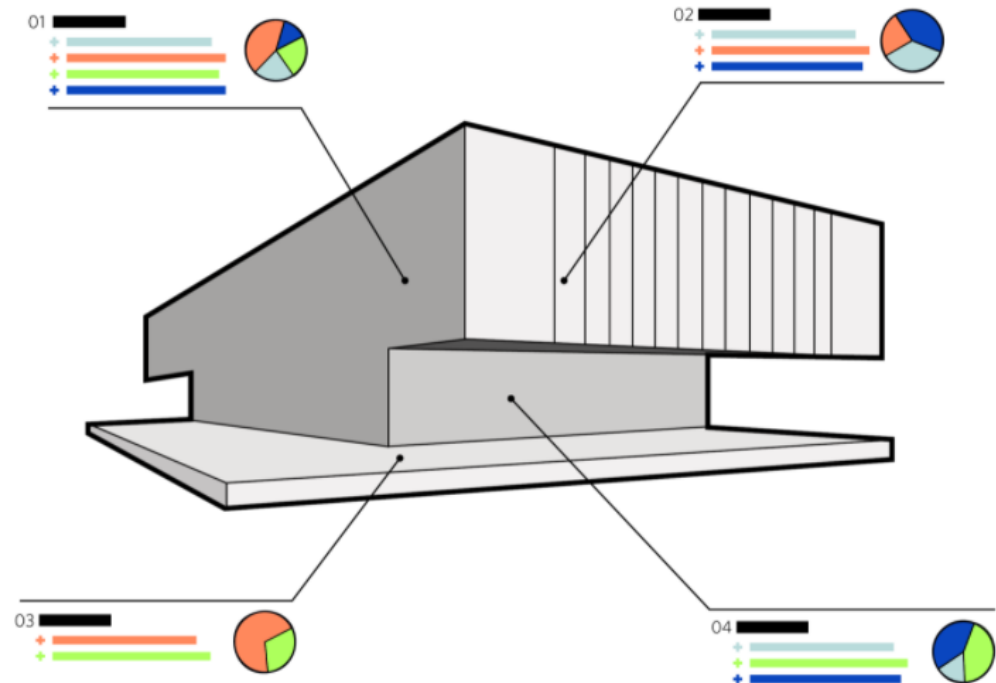
<p>Competition Brief</p> <p>This Competition relates to TU Dublin's FOCAS Research Institute (FOCAS), originally the Facility for Optical Characterisation and Spectroscopy. TU Dublin is Ireland's first Technological University, its City Campus at Grangegorman is being developed by the GDA.</p> <p>FOCAS is an existing TU Dublin research institute which will be relocated to the Grangegorman City Campus. The Competition Brief and supporting information for FOCAS are available from the GDA website. Entrants will be provided with a full access following successful registration to participate in the Competition.</p> <p>The aspirations and guiding principles of the project are underpinned by project objectives. These are set out in the Competition Brief and include:</p> <p>Research</p> <p>To develop a research Institute that underpins TU Dublin's Research strategy and facilitates growth in research numbers at TU Dublin. FOCAS must be an open, collaborative and enriching learning environment that will support the development of interdisciplinary work.</p> <p>Environmental Responsibility</p> <p>To make a beautiful, useful and environmentally responsible building. The project design solutions must support reduced carbon impacts in terms of the building operation, its life cycle and also embodied carbon.</p>	<p>Design Approach - Response Requirements</p> <p>Stage II is an opportunity for Entrants to develop their Stage I submission. Entrants must further demonstrate their understanding of the needs and requirements set out in the Project Brief.</p> <p>Entrants are particularly asked to illustrate an approach to the following:</p> <p>Atmosphere – The making of an open, collaborative and enriching learning environment that will support the development of interdisciplinary research;</p> <p>Adaptability – Spatial adaptability considering evolution of use and research activities as well as enduring 'loose fit' design solutions; and</p> <p>Construction – Investigate the potential of mass-timber and composite technology, low-carbon materials and off site fabricating with reduced on-site assembly. Solutions should address opportunities of modularity and sequencing of the construction works to minimise time-on-site and maximise the potential for disassembly and re-use.</p> <p>Submissions will be evaluated based on their response to the above with reference to an understanding of the Brief and project requirements.</p>	<p>Design Statement - Response Requirements</p> <p>In the Design Statement, Entrants must address three topics. The response to this section must be aligned to the Entrants' Design Approach.</p> <p>a. Design</p> <p>Entrants must describe their design strategy to realise the project brief - in particular Whole Life Carbon objectives.</p> <p>This strategy should be succinct in describing proposed methods for working with and leading design solutions with the Design Team - in particular addressing the collaboration across competencies beyond the Team Lead's expertise.</p> <p>The strategy must specifically reflect the requirement to work with the GDA and TU Dublin in developing a Definitive Project Brief as part of Work Stage (i).</p>
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How We Thought We'd Do It

Tally, a tool originally developed by Kieran Timberlake, “allows Revit users to imbue their BIM with the complete information about the building materials and architectural products their structures will ultimately contain. Tally quantifies a building or material's embodied environmental impacts to land, air, and water systems...Tally gives its users the power to conduct whole building LCAs during design and to use LCA data to run comparative analyses of various design options that show their differing environmental impacts.”

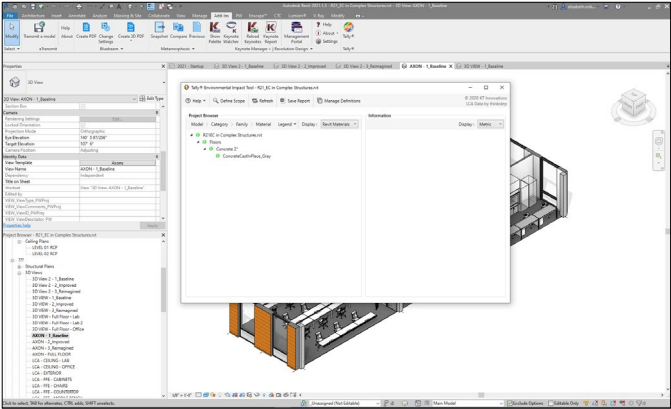
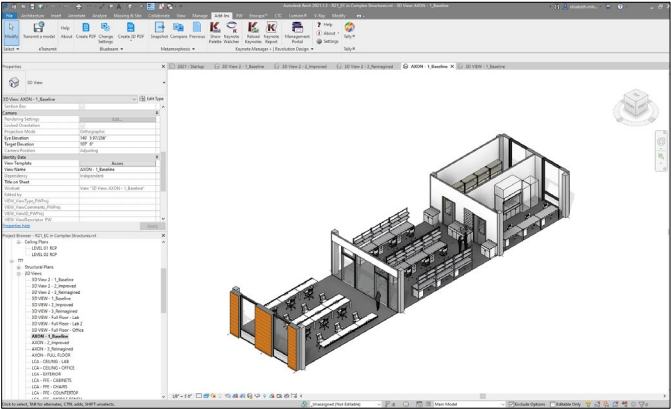
WEBINARS

To learn more about LCA and Tally watch the recorded webinars below. Topics range from LCA for designers to interpreting data and achieving the LEED v4 Whole Building Life-Cycle Impact Reduction credit.



Re-framing Steel: How to Optimize Your Steel Structure to Reduce Embodied Impacts

Low Carbon Labs



Model in Revit

Model lab module in Revit, utilizing design options to include Baseline, Improved and Reimagined scenarios

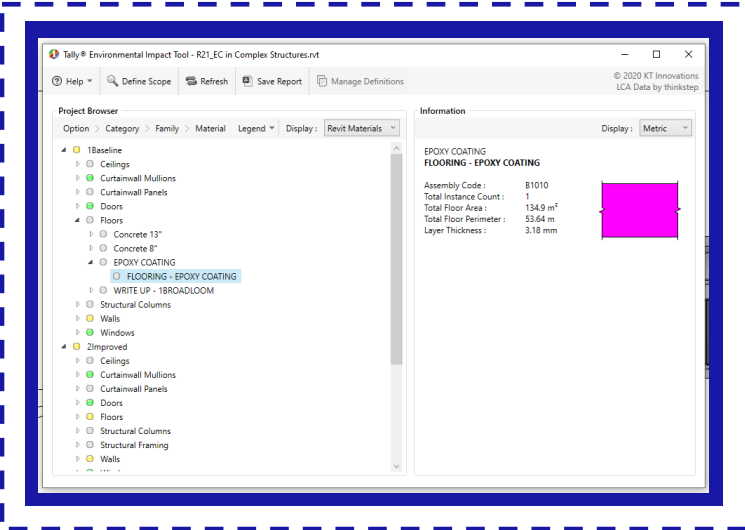
Use Tally to Assign Materials

Utilizing Tally Revit Plug-in, assign materials aligned with materials specified in Laboratory projects

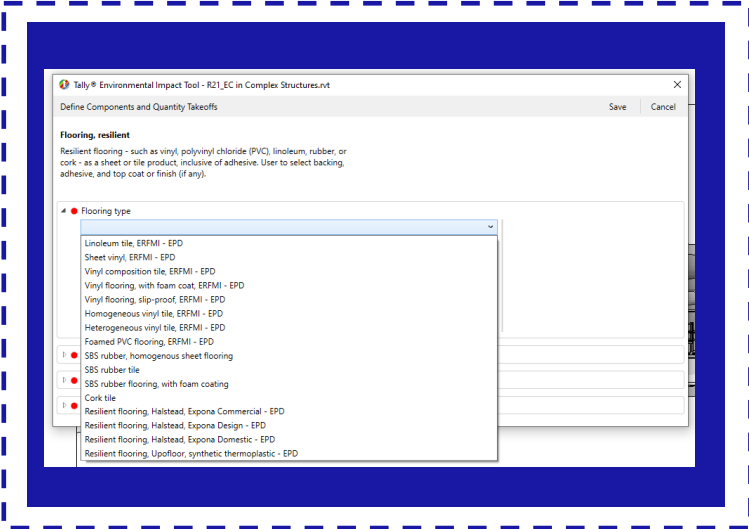
Report produced by Tally for Material Assessment

Tally

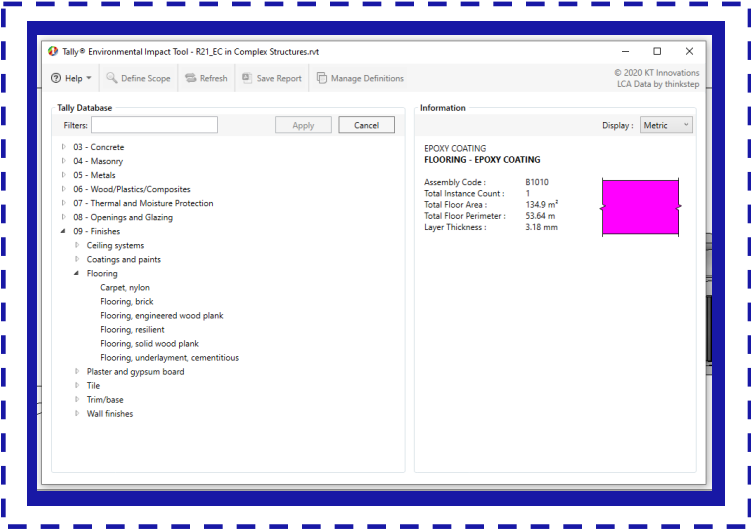
Low Carbon Labs



Material Categories currently available in Tally cover some, but not all categories relevant to an embodied carbon in laboratories analysis.



For available categories, material options currently available in Tally do not yet include the laboratory finishes typically specified.



Tally

Low Carbon Labs

Tally

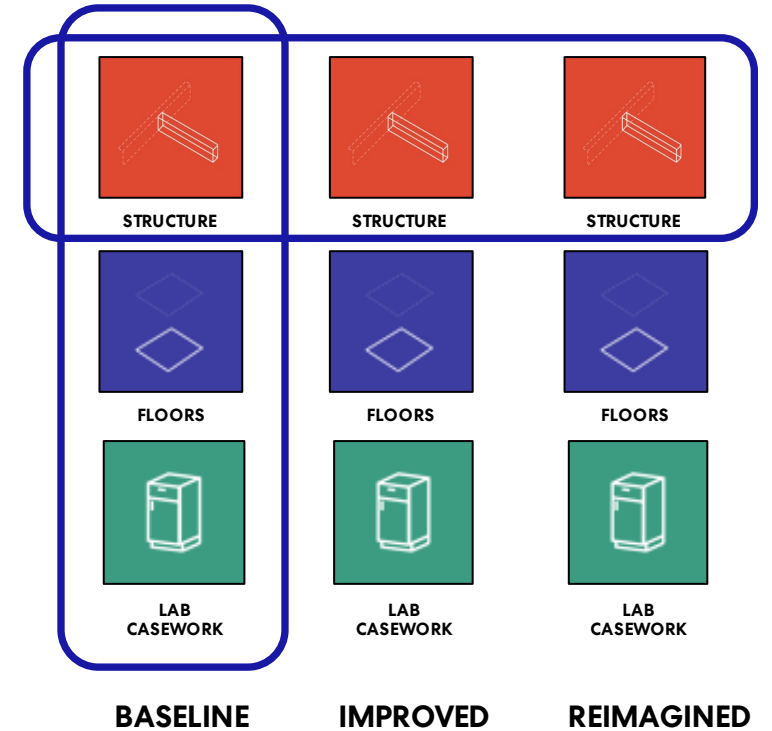


Whole systems not available in

Tally –lab casework, equipment, office/writeup furniture systems.

When the system is available, the products we specify aren't available – flooring is available to analyze, but not the flooring we are looking to analyze.

✓ TALLY



Tally assessment is geared towards whole-building LCA –

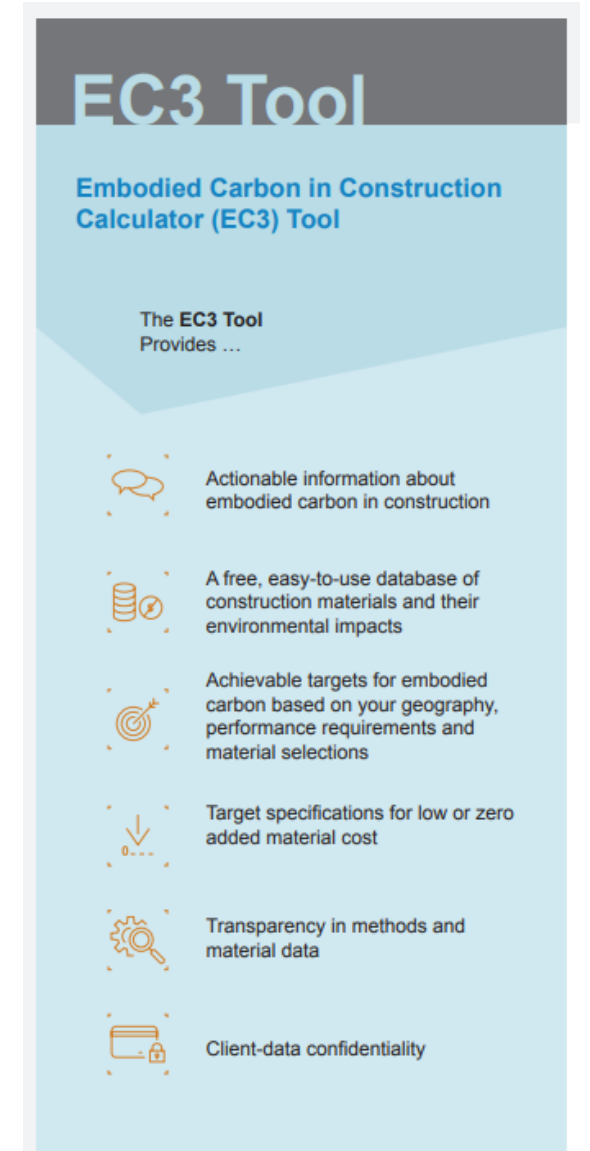
could not review system by system, to understand individual impact of specific material choice.

EC3

“The Embodied Carbon in Construction Calculator (EC3) tool, is a ...tool that allows benchmarking, assessment and reductions in embodied carbon, ...The EC3 tool ...utilizes building material quantities from construction estimates and/or BIM models and a robust database of digital, third-party verified Environmental Product Declarations (EPDs).

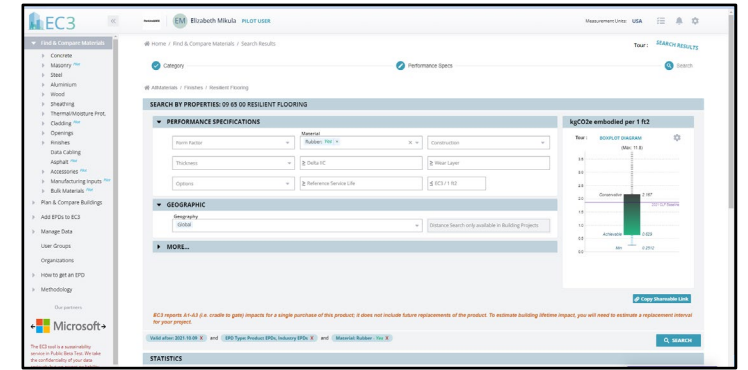
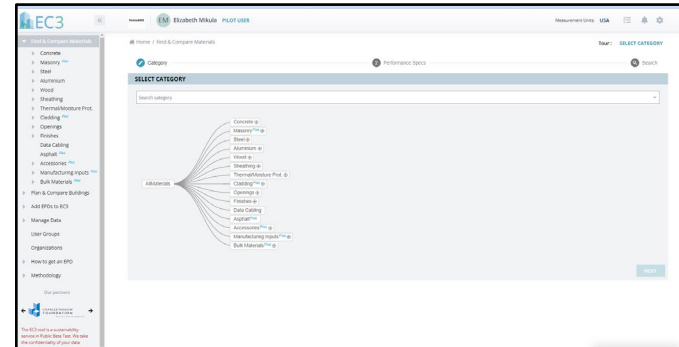
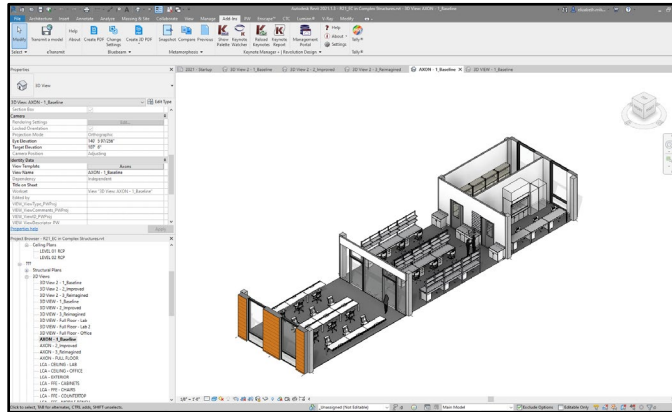
The tool and its subsequent effect on the industry is driving demand for low-carbon solutions and incentivizing construction materials manufacturers and suppliers to invest in disclosure, transparency and material innovations that reduce the carbon emissions of their products.”

- <https://carbonleadershipforum.org/what-we-do/initiatives/ec3/>



https://buildingtransparency-live-87c7ea3ad4714-809eeaa.divio-media.com/filer_public/61/f3/61f3b402-7627-402b-82ee-3619eb91525e/ec3_product_brief_pdf.pdf

Low Carbon Labs

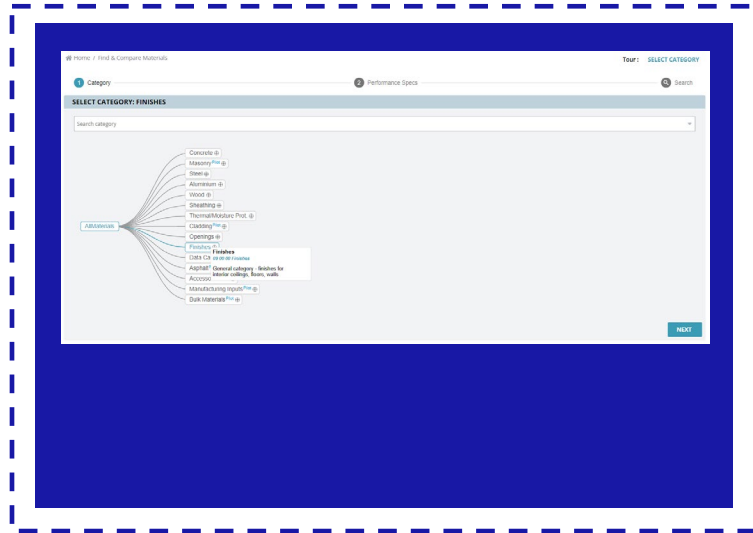


Model in Revit

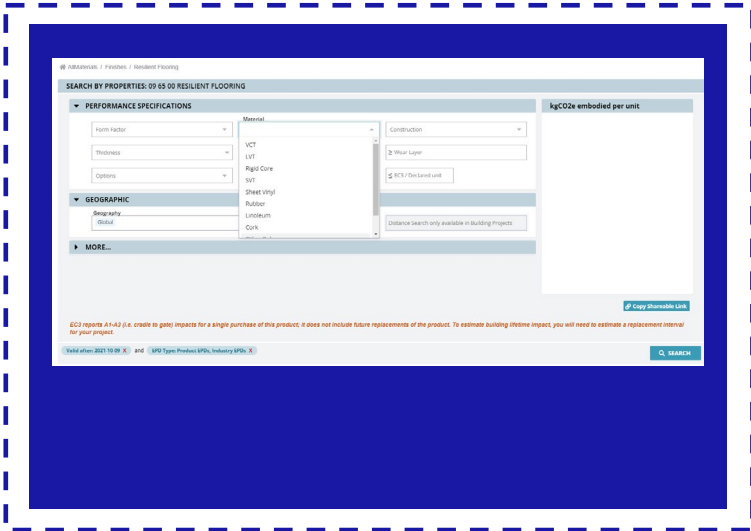
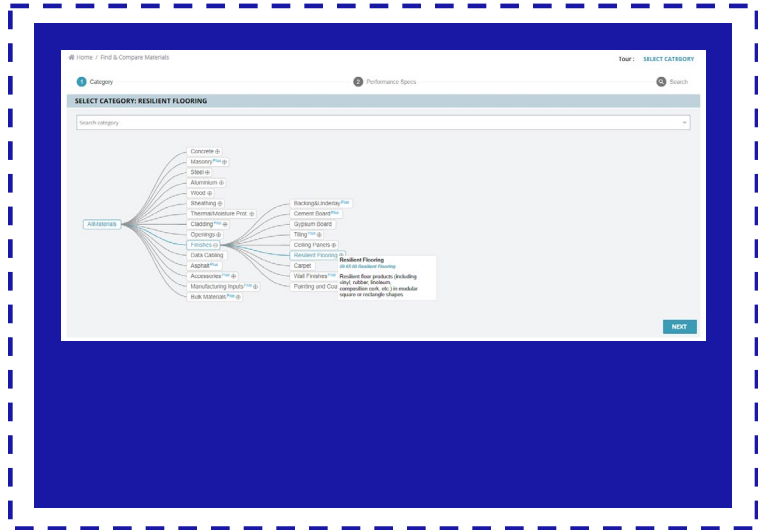
Import to EC3 from BIM360

Assign Materials and Compare Options in EC3

Low Carbon Labs

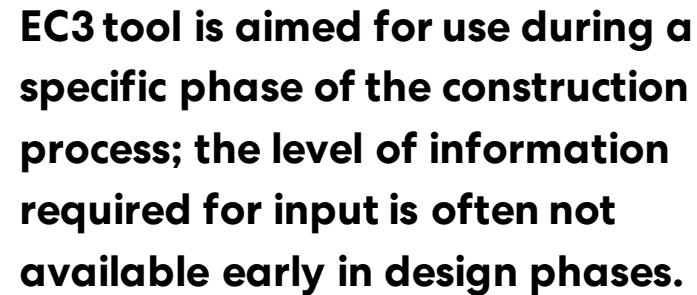
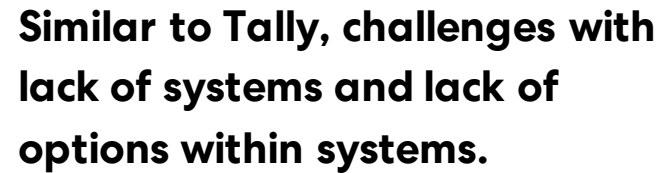


Material Categories currently available in EC3 cover some, but not all categories relevant to an embodied carbon in laboratories analysis. (even with Pilot program access)



For available categories, material options currently available in EC3 do not yet include the laboratory finishes typically specified.

EC3



Perkins&Will

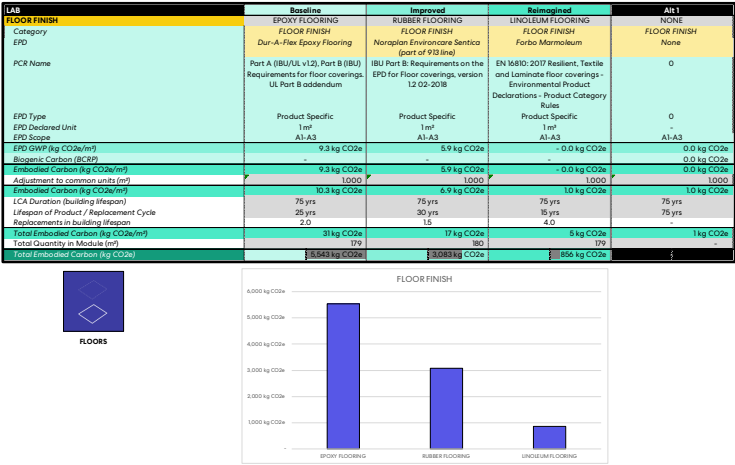
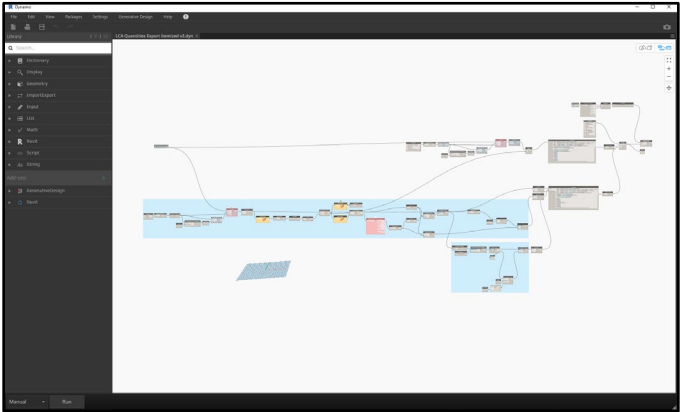
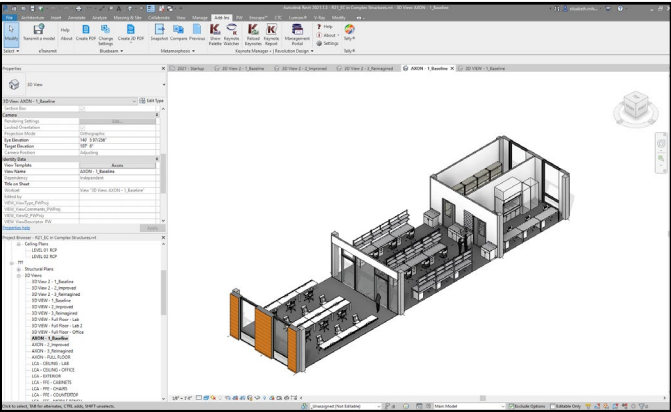
How We Did It

Innovation Incubator 2021 | J. Werner + E. Mikula

Low Carbon Labs

Method

Low Carbon Labs



Model in Revit

Use Dynamo to Extract Information

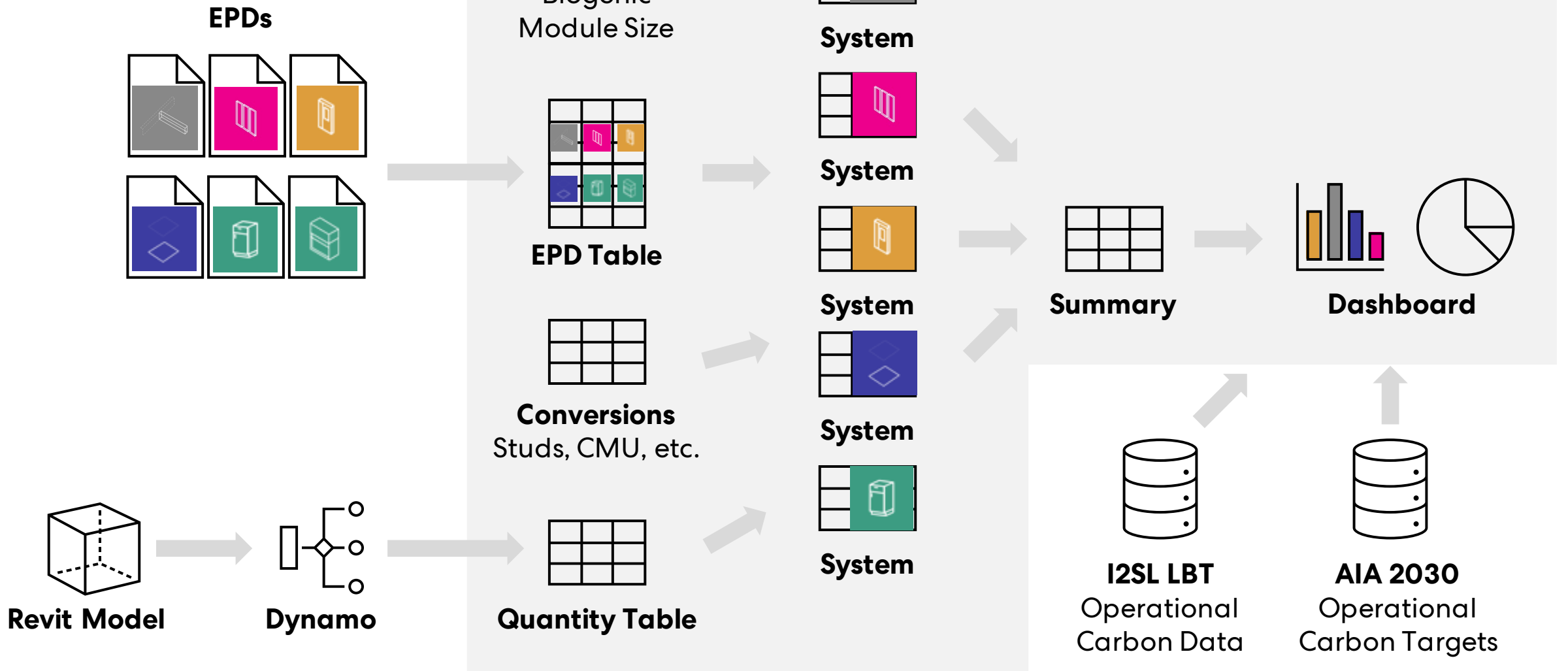
Utilize Dynamo script to extract material quantity data

Pivot Data collected from Revit with Data collected from EPDs

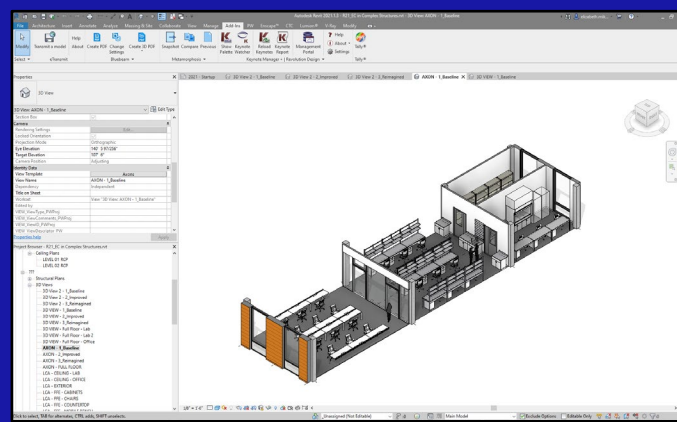
Utilize database created with specific laboratory materials to manually analyze with material quantity data pulled from Revit model

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Data flow



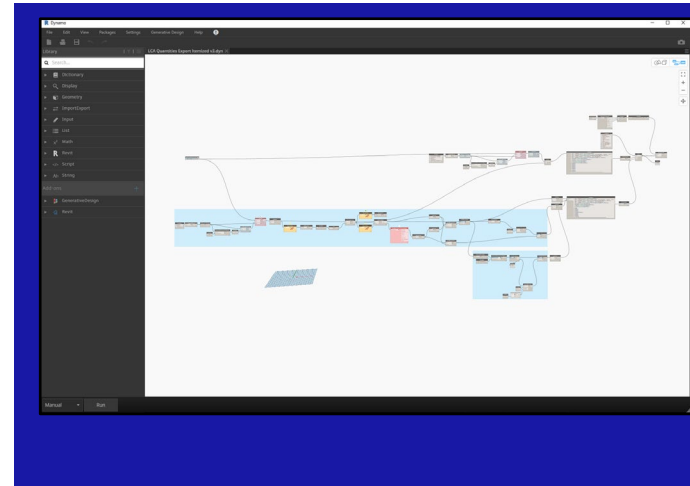
Low Carbon Labs



Use module modeled in Revit,
to pull relevant material
quantity data via Dynamo
script.

Low Carbon Lanes										
Line	Company	Product Name	Family	Type	Item Comments	LCs	LC Category	LC Subcategory	LC Sequence	LCs
1	Interline	Interlock	New Construction	12653 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
2	Interline	Interlock	New Construction	12654 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
3	Interline	Interlock	New Construction	12655 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
4	Interline	Interlock	New Construction	12656 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
5	Interline	Interlock	New Construction	12657 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
6	Interline	Interlock	New Construction	12658 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
7	Interline	Interlock	New Construction	12659 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
8	Interline	Interlock	New Construction	12660 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
9	Interline	Interlock	New Construction	12661 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
10	Interline	Interlock	New Construction	12662 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
11	Interline	Interlock	New Construction	12663 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
12	Interline	Interlock	New Construction	12664 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
13	Interline	Interlock	New Construction	12665 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
14	Interline	Interlock	New Construction	12666 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
15	Interline	Interlock	New Construction	12667 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
16	Interline	Interlock	New Construction	12668 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
17	Interline	Interlock	New Construction	12669 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
18	Interline	Interlock	New Construction	12670 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
19	Interline	Interlock	New Construction	12671 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
20	Interline	Interlock	New Construction	12672 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
21	Interline	Interlock	New Construction	12673 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
22	Interline	Interlock	New Construction	12674 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
23	Interline	Interlock	New Construction	12675 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
24	Interline	Interlock	New Construction	12676 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
25	Interline	Interlock	New Construction	12677 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
26	Interline	Interlock	New Construction	12678 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
27	Interline	Interlock	New Construction	12679 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR
28	Interline	Interlock	New Construction	12680 - CAMBER - BASE CABINET - WOOD 36x36x8	WOOD metal		1	CABINETRY	CABINETS	LAR
29	Interline	Interlock	New Construction	12681 - CAMBER - BASE CABINET - WOOD 36x36x8	FH Mobile Cabinetry Cabinet D - 36x36x8 metal		1	CABINETRY	CABINETS	LAR
30	Interline	Interlock	New Construction	12682 - FH MOBILE - COMBO CABINET D - 30x36x8	FH Mobile Cabinetry Cabinet D - 30x36x8 metal		1	CABINETRY	CABINETS	LAR

Once pulled from Revit via
Dynamo, information is
available in Excel for analysis.

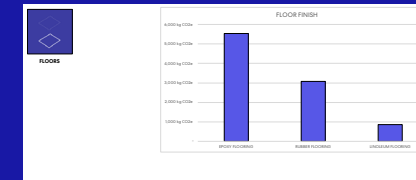


Low Carbon Labs

[illegible]

Given the specificity of laboratory material selection, a separate EPD resource was created to reference, listing products typically specified.

LCaB	Baseline	Improved	Reimagined	Alt 1
FLOOR FINISH	EPOXY FLOORING	RUBBER FLOORING	LINOLEUM FLOORING	NONE
Category	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH
PCR Name	<p>Dur-A-Flow Epoxy Flooring</p> <p>Alt A (B/U/LA v12), Part B (B/U Requirements for Floor coverings, version 12.02.2018)</p> <p>Alt Part B addendum</p>	<p>Noragren Environmental Service (part of ISO 14001)</p> <p>Alt Part B Requirements on the EPD for Floor coverings, version 12.02.2018</p>	<p>Alt 1880: 2018 Rubble, Textile and Laminate Floor coverings</p> <p>Environmental Product Declarations - Product Category</p>	<p>None</p>
EPD Type	Product Specific	Product Specific	Product Specific	Alt 1
EPD Declared Unit	1 m²	1 m²	1 m²	Alt 1
EPD Scope	Alt-A3	Alt-A3	Alt-A3	Alt-A3
EPD Global CO2e (kg CO2e/m²)	- 9.3 kg CO2e	- 5.9 kg CO2e	- 0.0 kg CO2e	- 0.0 kg CO2e
Biogenic Carbon (BCPR)	0.00 kg CO2e	0.00 kg CO2e	0.00 kg CO2e	0.00 kg CO2e
Embodied Carbon (kg CO2e/m²)	- 9.3 kg CO2e	- 5.9 kg CO2e	- 0.0 kg CO2e	- 0.0 kg CO2e
Embodied Carbon (kg CO2e/m²)	- 10.3 kg CO2e	- 6.9 kg CO2e	- 1.0 kg CO2e	- 1.0 kg CO2e
Embodied Carbon (kg CO2e/m²)	75 g/m²	75 g/m²	75 g/m²	75 g/m²
Integration of Product / Replacement Cycle	75 yrs	30 yrs	75 yrs	75 yrs
Total Embodied Carbon (kg CO2e/m²)	- 31 kg CO2e	- 17 kg CO2e	- 8 kg CO2e	- 13 kg CO2e
Total embodied (Carbon kg CO2e)	1554 kg CO2e	1088 kg CO2e	856 kg CO2e	1



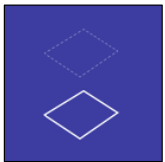
EMBOIDED CARBON - SYSTEM SUMMARY						
System	Material	Replaced	Replaced	Carbon Footprint Addition	Notes	
BUILDING STRUCTURE	- SUPERSTRUCTURE					
	- SUPERSTRUCTURE - OFFICE (STRENGTH)	CONCRETE (20,000 kg CO ₂ e)	STEEL (20,000 kg CO ₂ e)	STEEL (20,000 kg CO ₂ e)	CONCRETE (20,000 kg CO ₂ e)	
	- SUPERSTRUCTURE - LABORATORY (FCA)	CONCRETE (20,000 kg CO ₂ e)	STEEL (20,000 kg CO ₂ e)	STEEL (20,000 kg CO ₂ e)	CONCRETE (20,000 kg CO ₂ e)	
ARCHITECTURE AND INTERIORS	- BUILDING ENVELOPE					
	- WALL BACKUP	CMU - DRYWALL DESIGN (100 kg CO ₂ e)	METAL STUDS - DRYWALL DESIGN (100 kg CO ₂ e)	WOOD REMAINS - DRYWALL DESIGN (100 kg CO ₂ e)	Notes	
	07:00:00 INSULATION	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)		
08:00:00 GLAZING	- CLADDING	TERMOCLAD CLADDING (100 kg CO ₂ e)	METAL PANEL CLADDING (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)		
	- GLAZING	ALUMINUM THERMOCLAD (100 kg CO ₂ e)	ALUMINUM THERMOCLAD (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)		
	- INTERIOR	CMU - DRYWALL DESIGN (100 kg CO ₂ e)	METAL STUDS - DRYWALL DESIGN (100 kg CO ₂ e)	WOOD REMAINS - DRYWALL DESIGN (100 kg CO ₂ e)		
09:00:00 DOORS	- PARTITIONS	CMU - DRYWALL DESIGN (100 kg CO ₂ e)	METAL STUDS - DRYWALL DESIGN (100 kg CO ₂ e)	WOOD REMAINS - DRYWALL DESIGN (100 kg CO ₂ e)		
	- DOORS	GLASS DOOR (100 kg CO ₂ e)	STEEL DOOR (100 kg CO ₂ e)	WOOD DOOR (100 kg CO ₂ e)		
	- FINISHES	CARPET BRICKWORK (100 kg CO ₂ e)	CARPET TILE (100 kg CO ₂ e)	CARPET TILE (100 kg CO ₂ e)		
09:00:00 LAB - FLOOR FINISH	- CARPET BRICKWORK	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)		
	- CARPET BRICKWORK	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)		
	- CARPET BRICKWORK	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)	SPF INSULATION (100 kg CO ₂ e)		
09:00:00 TYPIC - CEILING	- TYPIC - CEILING	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)		
	- TYPIC - CEILING	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)		
	- TYPIC - CEILING	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)	ACQUACEDRAL CEILING SYSTEM (100 kg CO ₂ e)		

Collecting EPDs, and cataloging their data, enabled manual creation of Baseline, Improved and Reimagined Scenarios,

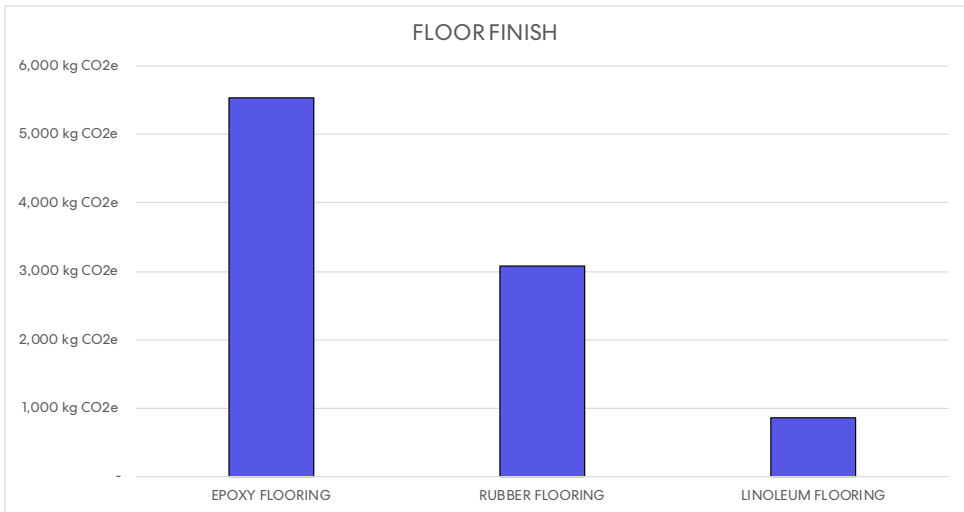
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LAB	Baseline	Improved	Reimagined	Alt 1
FLOOR FINISH	EPOXY FLOORING	RUBBER FLOORING	LINOLEUM FLOORING	NONE
Category	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH
EPD	Dur-A-Flex Epoxy Flooring	Noraplan Environcare Senticra (part of 913 line)	Forbo Marmoleum	None
PCR Name	Part A (IBU/UL v1.2), Part B (IBU) Requirements for floor coverings. UL Part B addendum	IBU Part B: Requirements on the EPD for Floor coverings, version 1.2 02-2018	EN 16810: 2017 Resilient, Textile and Laminate floor coverings - Environmental Product Declarations - Product Category Rules	0
EPD Type	Product Specific	Product Specific	Product Specific	0
EPD Declared Unit	1 m ²	1 m ²	1 m ³	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO ₂ e/m ²)	9.3 kg CO ₂ e	5.9 kg CO ₂ e	- 0.0 kg CO ₂ e	0.0 kg CO ₂ e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO ₂ e
Embodied Carbon (kg CO ₂ e/m ²)	9.3 kg CO ₂ e	5.9 kg CO ₂ e	- 0.0 kg CO ₂ e	0.0 kg CO ₂ e
Adjustment to common units (m ²)	1,000	1,000	1,000	1,000
Embodied Carbon (kg CO ₂ e/m ²)	10.3 kg CO ₂ e	6.9 kg CO ₂ e	1.0 kg CO ₂ e	1.0 kg CO ₂ e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	25 yrs	30 yrs	15 yrs	75 yrs
Replacements in building lifespan	2.0	1.5	4.0	-
Total Embodied Carbon (kg CO ₂ e/m ²)	31 kg CO ₂ e	17 kg CO ₂ e	5 kg CO ₂ e	1 kg CO ₂ e
Total Quantity in Module (m ²)	179	180	179	-
Total Embodied Carbon (kg CO ₂ e)	5,543 kg CO ₂ e	3,083 kg CO ₂ e	856 kg CO ₂ e	-



FLOORS



Low Carbon Labs

Materials Analyzed

EMBODIED CARBON - SYSTEM SUMMARY					
LAST UPDATED:		10/15/2021	Baseline	Improved	Reimagined
BUILDING STRUCTURE					
-	Foundations				
Multiple	FOUNDATIONS	CONCRETE	CONCRETE WITH CARBON CURE	??	
-	SUPERSTRUCTURE				
-	SUPERSTRUCTURE - OFFICE (STRENGTH)	CONCRETE (22X33)	STEEL (22X33)	TIMBER (22X22)	
Y	SUPERSTRUCTURE - OFFICE (STRENGTH)	13,068 kg CO2e	9,946 kg CO2e	2,541 kg CO2e	
-	SUPERSTRUCTURE - LABORATORY (VCA)	CONCRETE (22X33)	STEEL (22X33)	TIMBER (22X22)	
Y	SUPERSTRUCTURE - LABORATORY (VCA)	29,403 kg CO2e	28,919 kg CO2e	3,630 kg CO2e	
ARCHITECTURE AND INTERIORS					
-	BUILDING ENVELOPE				
-	WALL BACKUP	CMU + DRYWALL FINISH	METAL STUDS + DRYWALL FINISH	WOOD FRAMING + DRYWALL FINISH	
Y	BUILDING ENVELOPE - WALL BACKUP	417 kg CO2e	399 kg CO2e	572 kg CO2e	
07 00 00	INSULATION	XPS INSULATION	SPF INSULATION	MINERAL WOOL INSULATION	
Y	BUILDING ENVELOPE - INSULATION	3,708 kg CO2e	97 kg CO2e	140 kg CO2e	
-	CLADDING	TERRACOTTA CLADDING	METAL PANEL CLADDING	FIBER CEMENT CLADDING	
Y	BUILDING ENVELOPE - CLADDING	2,712 kg CO2e	822 kg CO2e	629 kg CO2e	
08 00 00	GLAZING	ALUMINUM STOREFRONT	ALUMINUM STOREFRONT	ALUMINUM STOREFRONT	
Y	BUILDING ENVELOPE - GLAZING	27,718 kg CO2e	28,334 kg CO2e	16,528 kg CO2e	
-	INTERIOR				
-	PARTITIONS	CMU + DRYWALL FINISH	METAL STUDS + DRYWALL FINISH	WOOD FRAMING + DRYWALL FINISH	
Y	INTERIOR - PARTITIONS	5,790 kg CO2e	4,738 kg CO2e	3,570 kg CO2e	
08 00 00	DOORS	GLASS DOOR	STEEL DOOR	WOOD DOOR	
Y	INTERIOR - DOORS	1,195 kg CO2e	650 kg CO2e	555 kg CO2e	
09 00 00	FINISHES				
09 00 00	OFFICE - FLOOR FINISH	CARPET BROADLOOM	CARPET TILE	CARPET TILE	
Y	FINISHES - OFFICE - FLOOR FINISH	17,905 kg CO2e	3,673 kg CO2e	210 kg CO2e	
09 00 00	LAB - FLOOR FINISH	EPOXY FLOORING	RUBBER FLOORING	LINOLEUM FLOORING	
Y	FINISHES - LAB - FLOOR FINISH	5,543 kg CO2e	3,083 kg CO2e	856 kg CO2e	
09 00 00	OFFICE - CEILING	DRYWALL CEILING SYSTEM	ACOUSTICAL CEILING SYSTEM	ACOUSTIC FINISH	
Y	FINISHES - OFFICE - CEILING	6,799 kg CO2e	5,513 kg CO2e	61 kg CO2e	
09 00 00	LAB - CEILING	ACOUSTICAL CEILING CLEANROOM	ACOUSTICAL CEILING SYSTEM	ACOUSTICAL CEILING	
Y	FINISHES - LAB - CEILING	5,321 kg CO2e	5,321 kg CO2e	1,044 kg CO2e	
11 00 00	EQUIPMENT				
11 53 13	LAB - FUMEHOODS	Conventional 100 fpm	High Performance 60 fpm	Filter Fumehoods	
Y	EQUIPMENT - LAB - FUMEHOODS	12,271 kg CO2e	5,684 kg CO2e	3,560 kg CO2e	
12 00 00	FFE / CASEWORK				
12 00 00	OFFICE - CHAIRS	TASK CHAIR	TASK CHAIR	TASK CHAIR	
Y	FFE / CASEWORK - OFFICE - CHAIRS	6,468 kg CO2e	5,652 kg CO2e	5,118 kg CO2e	
12 00 00	OFFICE - SYSTEMS	SPINE BASED WORKSTATION	PANEL BASED WORKSTATION	BENCHING	
Y	FFE / CASEWORK - OFFICE - SYSTEMS	31,041 kg CO2e	28,596 kg CO2e	16,919 kg CO2e	
12 35 53	LAB - CASEWORK - CABINETS	STEEL SHEET	BAMBOO	PLYWOOD	
Y	FFE / CASEWORK - LAB - CASEWORK - CABINETS	5,811 kg CO2e	(1,565 kg CO2e)	(7,846 kg CO2e)	
12 35 53	LAB - CASEWORK - COUNTERTOP	EPOXY COUNTER	STAINLESS STEEL SHEET	PHENOLIC PANEL	
Y	FFE / CASEWORK - LAB - CASEWORK - COUNTER	-	33 kg CO2e	23 kg CO2e	
CARBON IMPACT OF CHOICES		175,169 kg CO2e	129,893 kg CO2e	48,109 kg CO2e	
MODULE SIZE		1,936 sf	1,936 sf	1,936 sf	
CARBON INTENSITY OF CHOICES		90.5 kg CO2e/sf	67.1 kg CO2e/sf	24.8 kg CO2e/sf	
% REDUCTION		0%	-26%	-73%	

Low Carbon Labs

Materials Analyzed

EMBODIED CARBON - SYSTEM SUMMARY					
LAST UPDATED:		10/15/2021	Baseline	Improved	Reimagined
ARCHITECTURE AND INTERIORS					
-	BUILDING ENVELOPE		.	.	.
-	WALL BACKUP		CMU + DRYWALL FINISH	METAL STUDS + DRYWALL FINISH	WOOD FRAMING + DRYWALL FINIS
Y	BUILDING ENVELOPE - WALL BACKUP		417 kg CO2e	399 kg CO2e	572 kg CO2e
07 00 00	INSULATION		XPS INSULATION	SPF INSULATION	MINERAL WOOL INSULATION
Y	BUILDING ENVELOPE - INSULATION		3,708 kg CO2e	97 kg CO2e	140 kg CO2e
-	CLADDING		TERRACOTTA CLADDING	METAL PANEL CLADDING	FIBER CEMENT CLADDING
Y	BUILDING ENVELOPE - CLADDING		2,712 kg CO2e	822 kg CO2e	629 kg CO2e
08 00 00	GLAZING		ALUMINUM STOREFRONT	ALUMINUM STOREFRONT	ALUMINUM STOREFRONT
Y	BUILDING ENVELOPE - GLAZING		27,718 kg CO2e	28,334 kg CO2e	16,528 kg CO2e
-	INTERIOR		.	.	.
-	PARTITIONS		CMU + DRYWALL FINISH	METAL STUDS + DRYWALL FINISH	WOOD FRAMING + DRYWALL FINIS
Y	INTERIOR - PARTITIONS		5,790 kg CO2e	4,738 kg CO2e	3,570 kg CO2e
08 00 00	DOORS		GLASS DOOR	STEEL DOOR	WOOD DOOR
Y	INTERIOR - DOORS		1,195 kg CO2e	650 kg CO2e	555 kg CO2e
09 00 00	FINISHES		.	.	.
09 00 00	OFFICE - FLOOR FINISH		CARPET BROADLOOM	CARPET TILE	CARPET TILE
Y	FINISHES - OFFICE - FLOOR FINISH		17,905 kg CO2e	3,673 kg CO2e	210 kg CO2e
09 00 00	LAB - FLOOR FINISH		EPOXY FLOORING	RUBBER FLOORING	LINOLEUM FLOORING
Y	FINISHES - LAB - FLOOR FINISH		5,543 kg CO2e	3,083 kg CO2e	856 kg CO2e

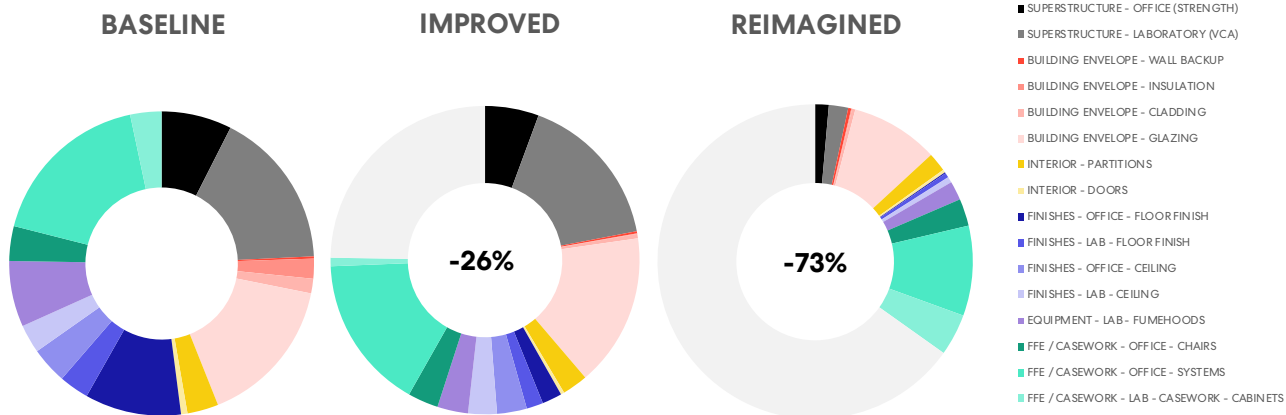
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Materials Analyzed

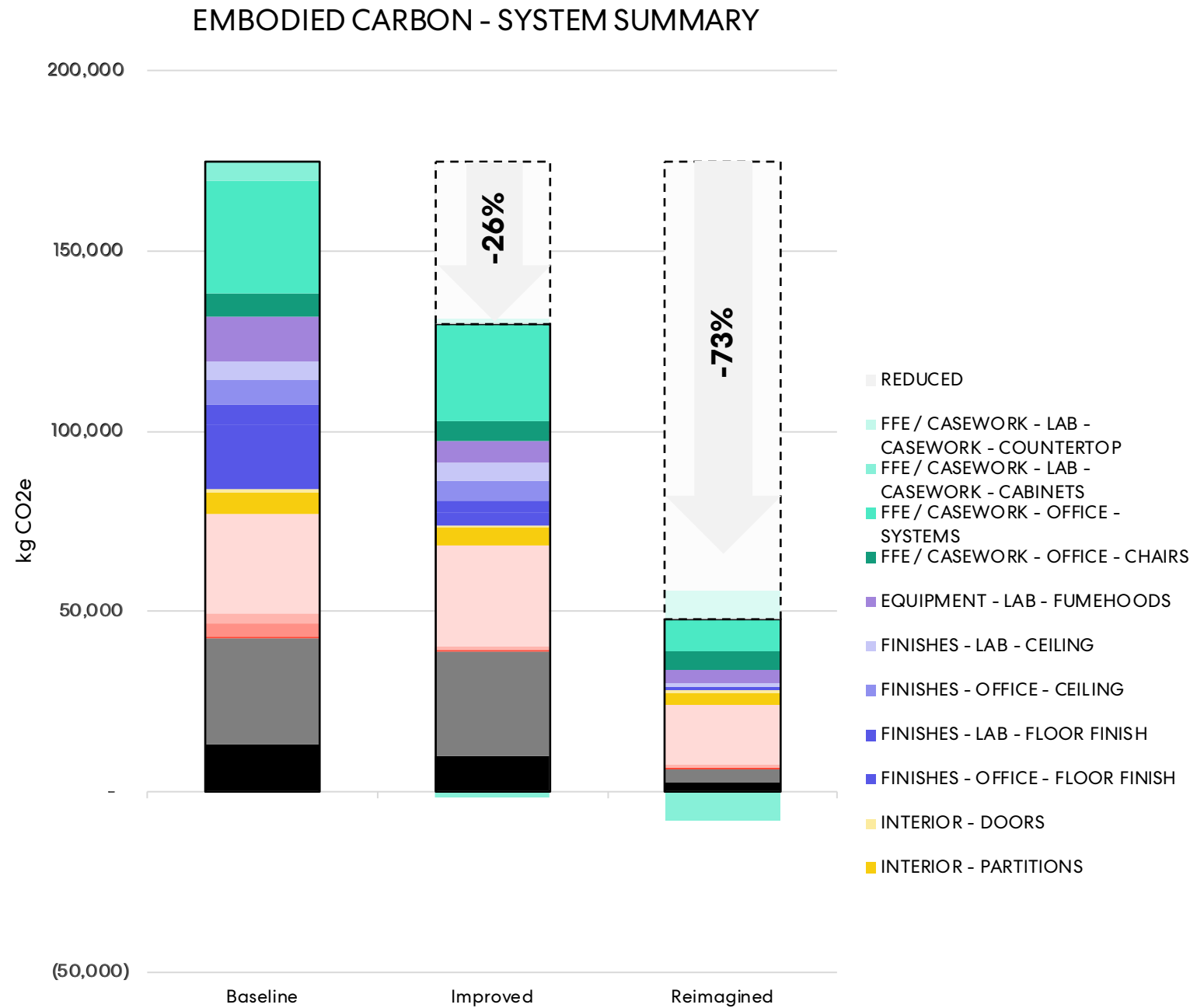
EMBODIED CARBON - SYSTEM SUMMARY				
LAST UPDATED:	10/15/2021	Baseline	Improved	Reimagined
09 00 00	OFFICE - CEILING	DRYWALL CEILING SYSTEM	ACOUSTICAL CEILING SYSTEM	ACOUSTIC FINISH
Y	FINISHES - OFFICE - CEILING	6,799 kg CO2e	5,513 kg CO2e	61 kg CO2e
09 00 00	LAB - CEILING	ACOUSTICAL CEILING CLEANROOM	ACOUSTICAL CEILING SYSTEM	ACOUSTICAL CEILING
Y	FINISHES - LAB - CEILING	5,321 kg CO2e	5,321 kg CO2e	1,044 kg CO2e
11 00 00	EQUIPMENT	.	.	.
11 53 13	LAB - FUMEHOODS	Conventional 100 fpm	High Performance 60 fpm	Filter Fumehoods
Y	EQUIPMENT - LAB - FUMEHOODS	12,271 kg CO2e	5,684 kg CO2e	3,560 kg CO2e
12 00 00	FFE / CASEWORK	.	.	.
12 00 00	OFFICE - CHAIRS	TASK CHAIR	TASK CHAIR	TASK CHAIR
Y	FFE / CASEWORK - OFFICE - CHAIRS	6,468 kg CO2e	5,652 kg CO2e	5,118 kg CO2e
12 00 00	OFFICE - SYSTEMS	SPINE BASED WORKSTATION	PANEL BASED WORKSTATION	BENCHING
Y	FFE / CASEWORK - OFFICE - SYSTEMS	31,041 kg CO2e	28,596 kg CO2e	16,919 kg CO2e
12 35 53	LAB - CASEWORK - CABINETS	STEEL SHEET	BAMBOO	PLYWOOD
Y	FFE / CASEWORK - LAB - CASEWORK - CABINETS	5,811 kg CO2e	(1,565 kg CO2e)	(7,846 kg CO2e)
12 35 53	LAB - CASEWORK - COUNTERTOP	EPOXY COUNTER	STAINLESS STEEL SHEET	PHENOLIC PANEL
Y	FFE / CASEWORK - LAB - CASEWORK - COUNTERTOP	-	33 kg CO2e	23 kg CO2e
CARBON IMPACT OF CHOICES		175,169 kg CO2e	129,893 kg CO2e	48,109 kg CO2e
MODULE SIZE		1,936 sf	1,936 sf	1,936 sf
CARBON INTENSITY OF CHOICES		90.5 kg CO2e/sf	67.1 kg CO2e/sf	24.8 kg CO2e/sf
% REDUCTION		0%	-26%	-73%

Data Summary

LOW CARBON LABS EMBODIED CARBON - SYSTEM SUMMARY				10/15/2021
CATEGORY	Baseline	Improved	Reimagined	
SUPERSTRUCTURE - OFFICE (STRENGTH)	13,068	9,946	2,541	
SUPERSTRUCTURE - LABORATORY (VCA)	29,403	28,919	3,630	
BUILDING ENVELOPE - WALL BACKUP	417	399	572	
BUILDING ENVELOPE - INSULATION	3,708	97	140	
BUILDING ENVELOPE - CLADDING	2,712	822	629	
BUILDING ENVELOPE - GLAZING	27,718	28,334	16,528	
INTERIOR - PARTITIONS	5,790	4,738	3,570	
INTERIOR - DOORS	1,195	650	555	
FINISHES - OFFICE - FLOOR FINISH	17,905	3,673	210	
FINISHES - LAB - FLOOR FINISH	5,543	3,083	856	
FINISHES - OFFICE - CEILING	6,799	5,513	61	
FINISHES - LAB - CEILING	5,321	5,321	1,044	
EQUIPMENT - LAB - FUMEHOODS	12,271	5,684	3,560	
FFE / CASEWORK - OFFICE - CHAIRS	6,468	5,652	5,118	
FFE / CASEWORK - OFFICE - SYSTEMS	31,041	28,596	16,919	
FFE / CASEWORK - LAB - CASEWORK - CABINETS	5,811	(1,565)	(7,846)	
FFE / CASEWORK - LAB - CASEWORK - COUNTERTOP	-	33	23	
REDUCED	-	43,711	119,214	
CARBON IMPACT OF CHOICES	175,169	129,893	48,109	
REDUCED	-	45,276	127,060	



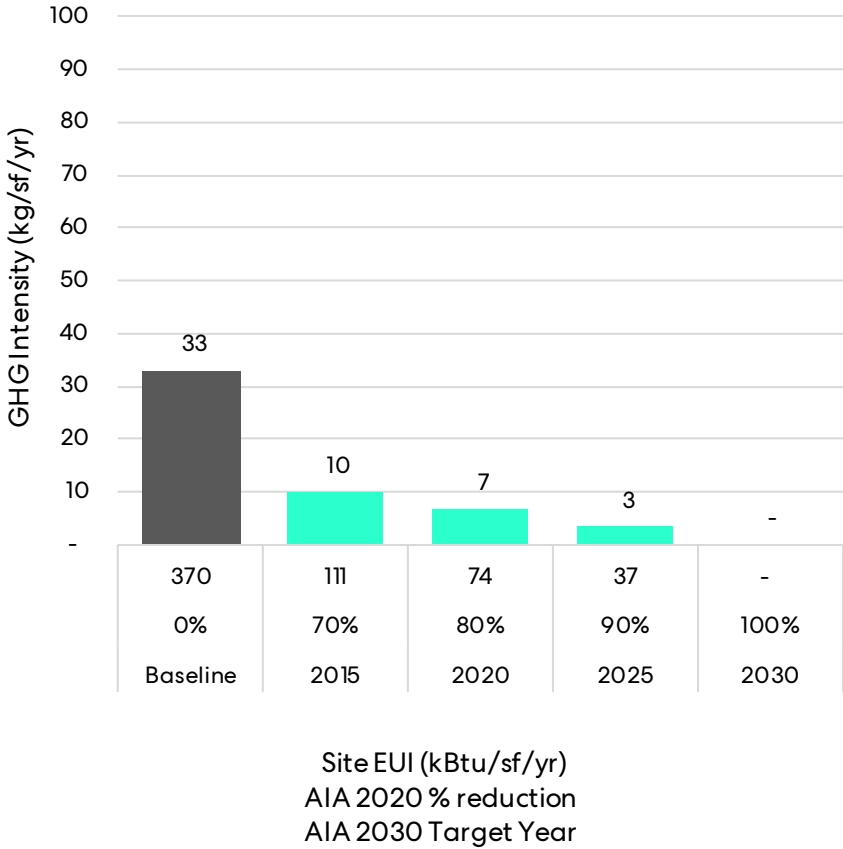
Data Summary



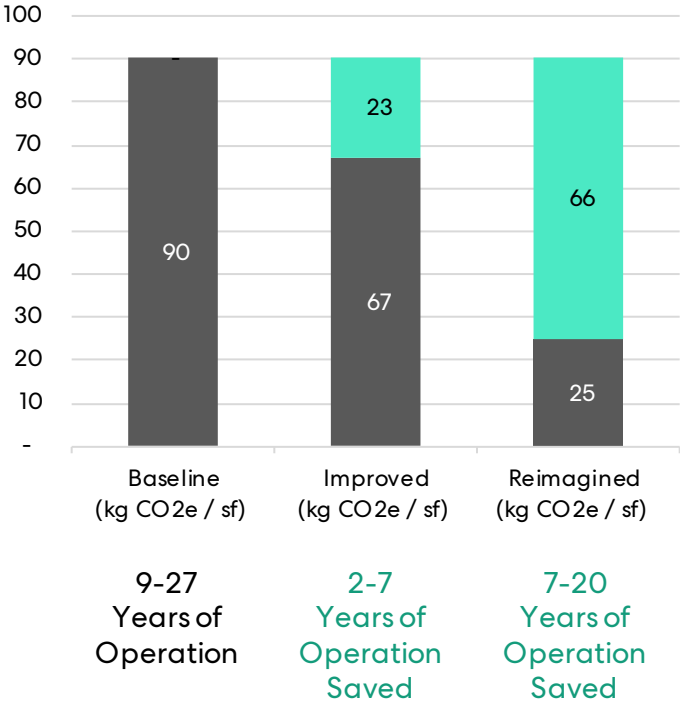
Data Summary

Note: the “module” represents “net” program area of lab space. A real building would contain “gross” areas such as corridors, stairways, mechanical spaces, and storage. These may equate to 35-50% of the total building area included in the operational carbon assessments. So, the comparison of embodied carbon reduction to operational carbon may be diluted by a similar factor in practice.

Operational Carbon Intensity Labs



Embodied Carbon Intensity All Design Choices



Low Carbon Labs

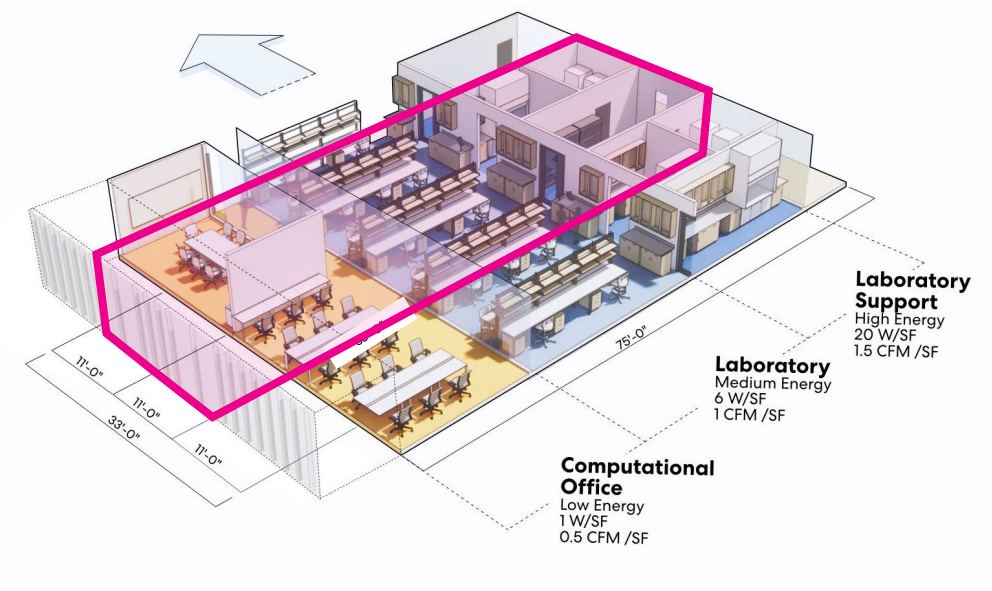
Scope and Strategy

Low Carbon Labs

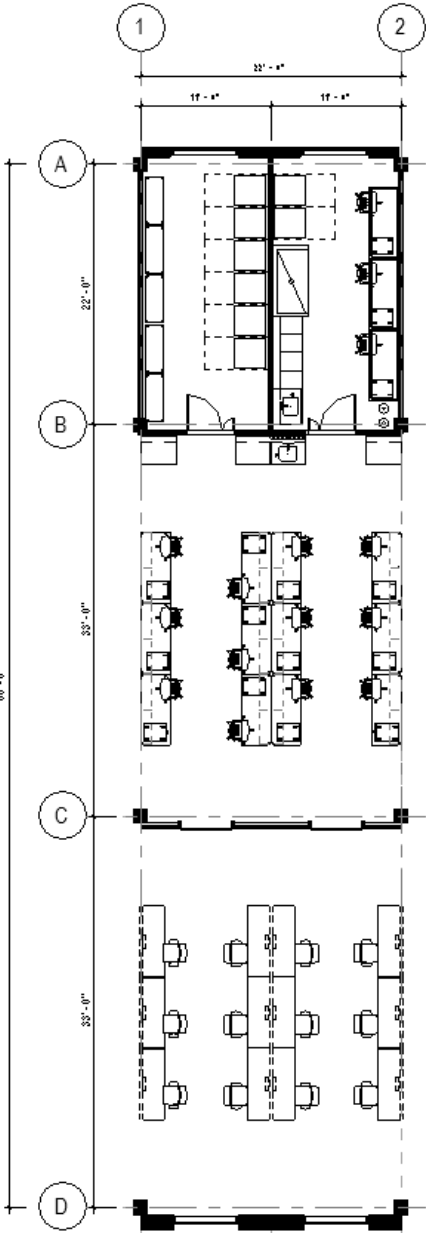
Module for Analysis

Laboratory design planning follows a “best practice” planning standard - a module based on 11’-0”. For the purposes of this study, a 22’-0” wide module was selected. Extending in the opposite direction, modules of 22’-0” (Laboratory Support), 33’-0” (Laboratory) and 33’-0” (Office/Write Up)

Programmatically the module for analysis chosen includes lab , lab support, and office/write up.

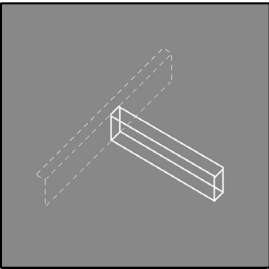


Example Laboratory Building Section



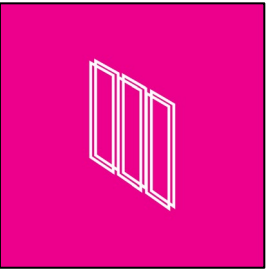
Project Analysis Module

Systems



STRUCTURE

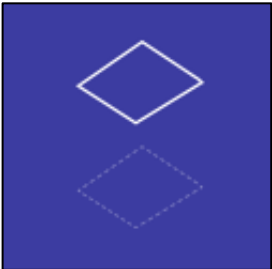
Special thanks
to LeMessurier



**ENVELOPE
OPAQUE**



PARTITIONS



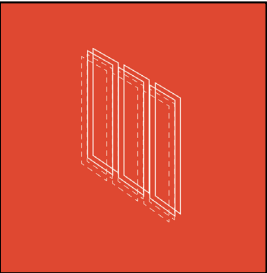
CEILINGS



**OFFICE
SYSTEMS**



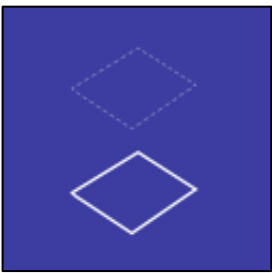
**LAB
BENCHTOP**



**ENVELOPE
GLAZING (%)**



DOORS



FLOORS

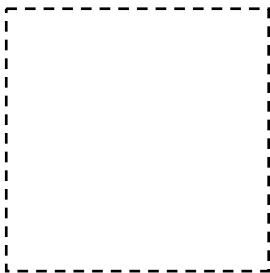


**LAB
CASEWORK**



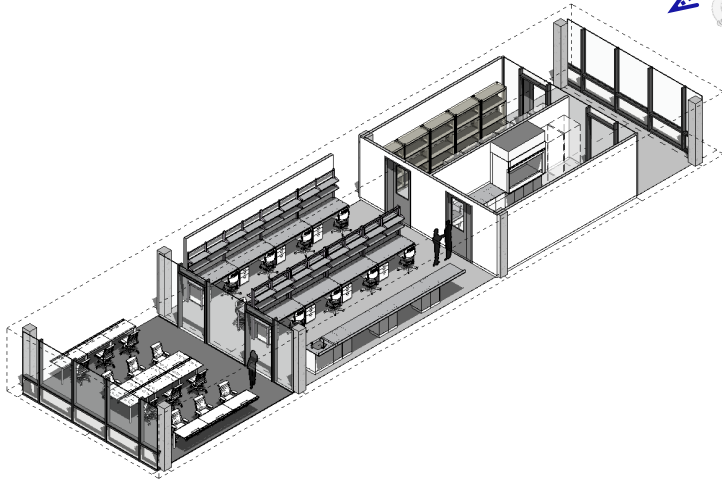
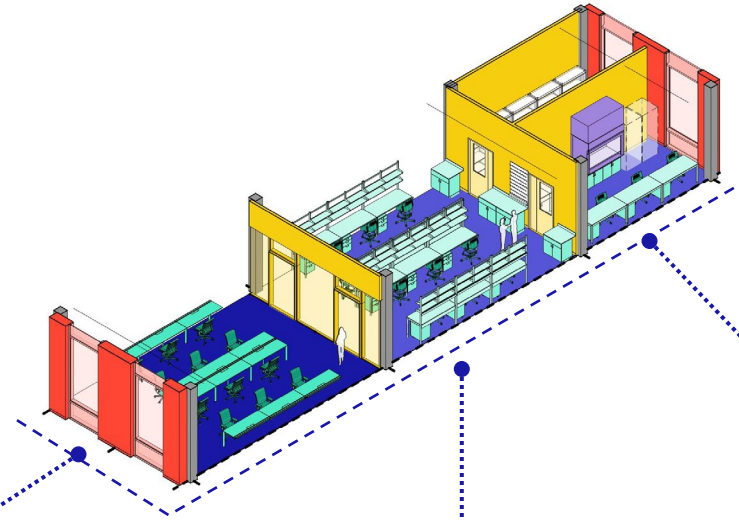
**LAB
FUMEHOODS**

Special thanks
to BR+A

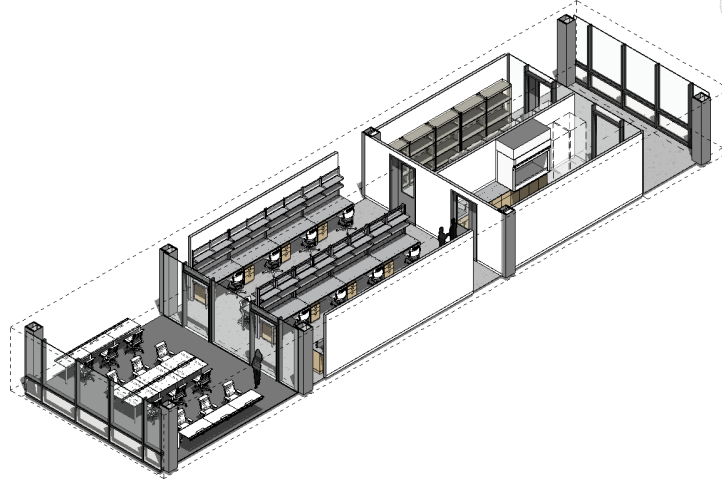


MEP SYSTEMS

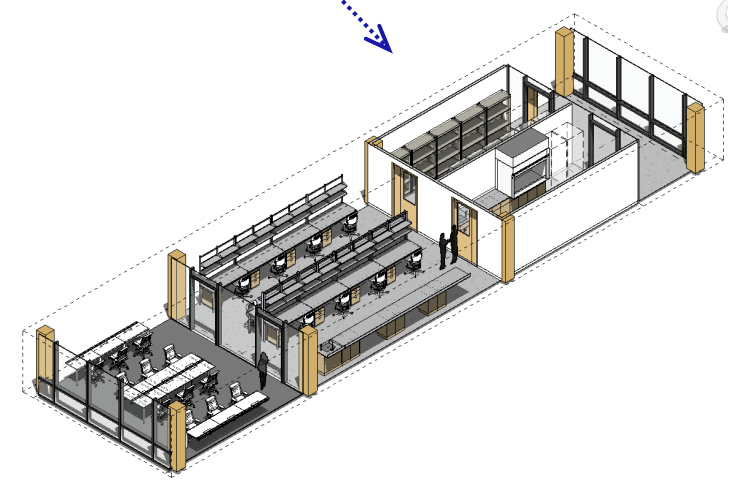
Scope : Systems Visualized



Baseline

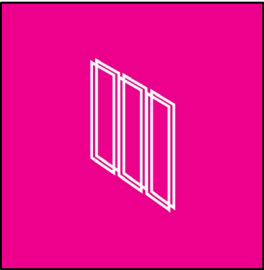


Improved

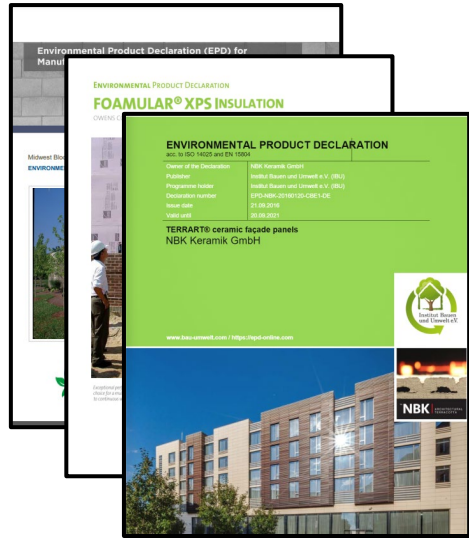


Reimagined

Low Carbon Labs

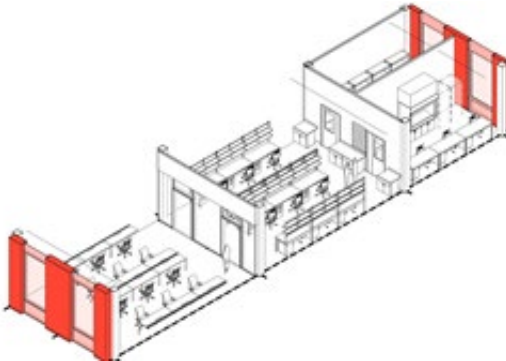


ENVELOPE OPAQUE



CMU + Drywall + XPS Insulation +
Terracotta Cladding

Baseline



Metal Studs + Drywall + SPF
Insulation + Metal Panel Cladding

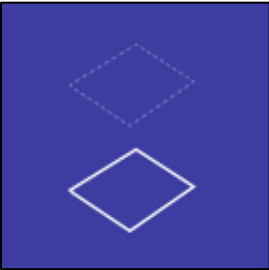
Improved



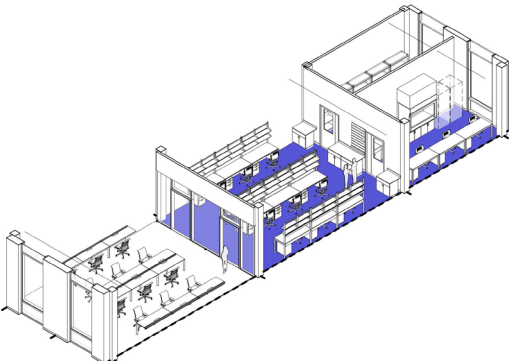
Wood Framing + Drywall + Mineral Wool
Insulation + Fiber Cement Cladding

Reimagined

Low Carbon Labs



FLOORS
(LAB)



Environmental Product Declaration
DUR-A-FLEX
Epoxy Flooring Systems



As one of the leading manufacturers of epoxy floor and seal solutions, Dur-A-Flex designs products with people and the environment in mind. All Dur-A-Flex floor and seal systems are VOC-compliant, phthalate-free and meet LEED® requirements for low-emitting materials. We strive to give our customers the confidence that they are not only choosing the right floor for the job, but also the right floor for the environment. With our Environmental Product Declarations (EPDs) and Health Product Declarations (HPDs), our customers have tools to efficiently evaluate the environmental and human health impacts of our high-performance products.





Dur-A-Flex Epoxy Flooring

Epoxy
Baseline

ENVIRONMENTAL PRODUCT DECLARATION
noraplan® standard 913
RUBBER SHEET AND TILE FLOOR COVERINGS



For over 60 years, nora® rubber floor coverings have met the unique demands of flexible workspaces. Extremely durable, hygienic, sound absorbent, and anti-slip resistant, nora flooring solutions address the daily challenges of commercial applications and allow comfortable, quiet and safe environments.

nora is a manufacturing facility ISO 9001 and ISO 14001 certified. This declaration includes every phase of the product life cycle from the production through to installation, usage and maintenance, right up to the end of the product's life cycle in the building.

The superior performance attributes combined with an extended life cycle, fully comply with ISO 14001 and ISO 9001 certified low emissions and environmental friendly requirements make nora the perfect solution for healthcare, education and the sciences.





Noraplan Environcare Sentica

Rubber
Improved

ENVIRONMENTAL PRODUCT DECLARATION
MARMOLEUM 2.0 AND 2.5 MM
FORBO FLOORING SYSTEMS
RESILIENT LINOLEUM FLOOR COVERING



Marmoleum linoleum is globally used in over 100 countries and is manufactured by Forbo for more than 100 years. Marmoleum is produced using the combination of natural ingredients, renewable and high-performance.

Forbo has the best flooring manufacturer to publish a complete Life Cycle Assessment (LCA) report verified by UL. In 2016, we added more to our public Environmental Product Declaration (EPD) in all products including full LCA reports. The EPD is using an improved flooring Product Declaration (PD) to provide additional information to show the impact on human health and the environment.

By offering the complete story from how the materials are sourced to how they are installed, we will ensure the environmental and social benefits of Marmoleum are clear and visible to all our customers and stakeholders alike.

For more information visit: www.forbo.com





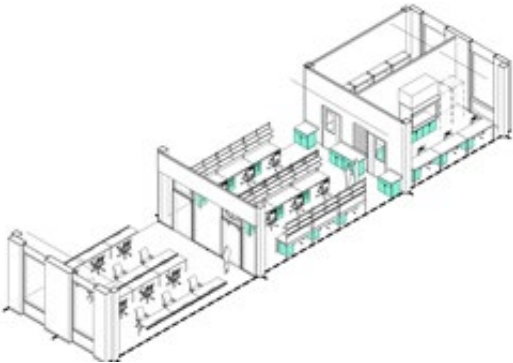
Forbo Marmoleum

Linoleum
Reimagined

Low Carbon Labs



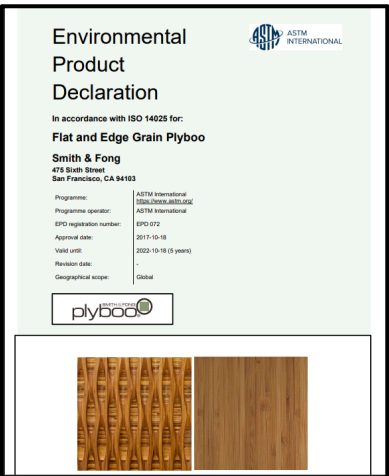
LAB CASEWORK
(RAW MATERIALS)



Steel Sheet
Baseline



Cold Formed Steel Framing



Bamboo
Improved



Flat and Edge Grain Plyboo



Plywood
Reimagined

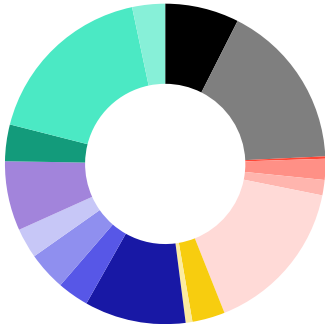


North American
Softwood Plywood

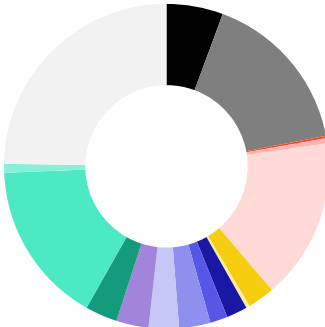
Scenarios



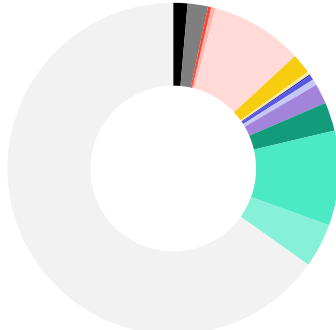
BASELINE



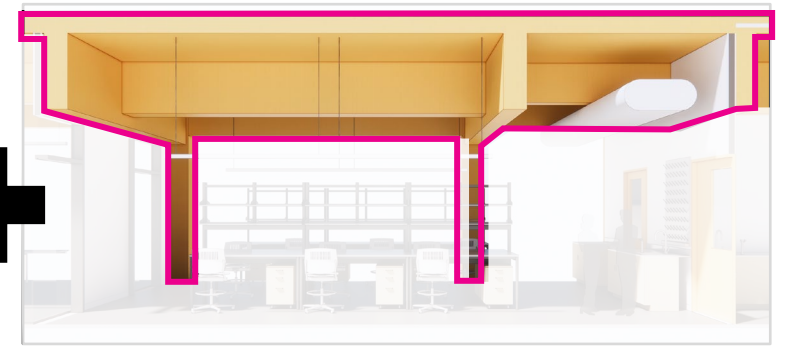
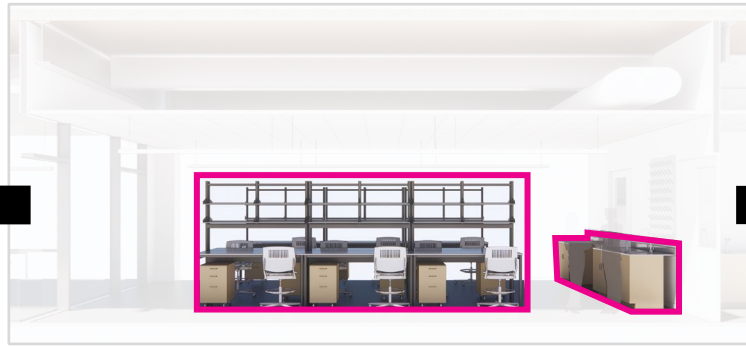
IMPROVED



REIMAGINED



Scenarios : Choose your own Adventure



BASELINE

Floor
Ceiling

IMPROVED

Lab casework
Fumehoods

REIMAGINED

Structure

Looking Ahead

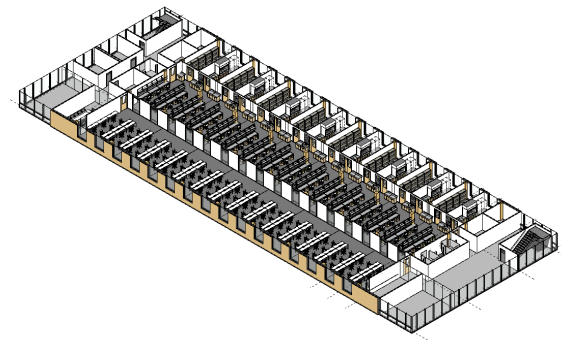
Future Research



More Systems

MEP ?

Other systems ?



Expanded Physical Scope

From Module to Floor

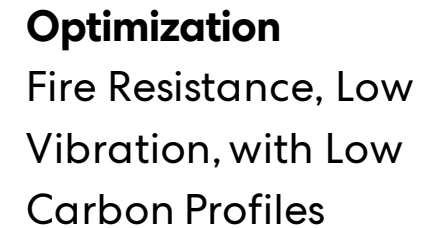
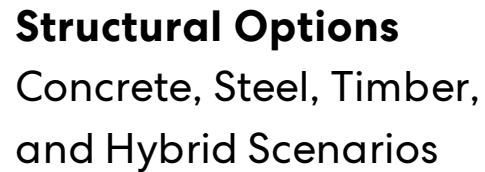
From Floor to Building



More Products

Additional glazing systems

Additional lab casework types



48

Parallel Research : Code - Jensen Hughes

Mass Timber

General Prescriptive Requirements – 2018 & 2019 CBC

- Mass timber (e.g. CLT, Glulam, etc.) permitted in Type III, Type IV (light) and Type V buildings.
- Max. # of stories (with separation) = 6 (commercial), 5 (residential).
- Max. area per floor = 100,000 sf (commercial), 85,000 sf (residential).
- Minimum dimensions for floors, roofs, columns, e.g.:
 - Columns: Min. 8" for floor joists, 8" x 8" for roof.
 - Beams & Glulam: Min. 6" x 10"
- Interior and Exterior wall allowances.
- No non-combustible separation in excavations and connecting utilities.
- Demonstrating Fire Resistance Rating (FRR):
 - Tested assemblies (listed systems).
 - Calculate FRR to required mass timber.
- Details, Details, Details (i.e. connections, joints, penetrations).
- Fire risk during construction.

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Mass Timber in the Code But 100 Series Challenges

Connections: Fire, Seismic, and other challenges.

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Mass Timber

Common Prescriptive Mass Timber Applications

- Podium Design:
 - Max. # of stories (with separation) = 6 (commercial), 5 (residential).
 - Max. area per floor = 100,000 sf (commercial), 85,000 sf (residential).
 - Max. height (Type IV) = 45'.
- Exterior walls (2 hr FRR):
 - HT = exterior walls (CBC Section 2102.2.2 2-hour or less).
 - CLT = exterior walls (CBC Section 602.4.2 and 2102.1.4.2 2-hour or less).
 - CLT = exterior walls (CBC Section 602.4.2 and 2102.1.4.2 2-hour or less).
 - CLT = exterior walls (CBC Section 602.4.2 and 2102.1.4.2 2-hour or less).
- Interior walls (1 hr FRR):
 - HT = interior walls (CBC Section 703.2.1.1).
 - CLT = interior walls (CBC Section 703.2.1.1).
- Interior floors (1 hr FRR):
 - HT = interior floors (CBC Section 703.2.1.1).
 - CLT = interior floors (CBC Section 703.2.1.1).

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Mass Timber in the Code But 100 Series Challenges

Connections: Fire, Seismic, and other challenges.

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NFPA 45 considerations for heavy timber labs

- 5.1.5.1 Floors, floor openings, floor penetrations, and floor firestop systems shall be sealed or curbed to prevent liquid leakage to lower floors.
- 5.1.5.2 The sealing material shall be compatible with the chemicals being stored or used in the laboratory, or a program shall be in place to inspect and repair, if necessary, after exposure to leakage.

IBC (2018) Considerations for heavy timber labs

[F] 428.3.3 Floor assembly fire resistance. The floor assembly supporting laboratory suites and the construction supporting the floor of laboratory suites shall have a fire-resistance rating of not less than 2 hours.

Exception: The floor assembly of the laboratory suites and the construction supporting the floor of the laboratory suites are allowed to be 1-hour fire-resistance rated in buildings of Types IIA, IIIA and VA construction, provided that the building is three or fewer stories.

[F] 428.3.8 Liquid-tight floor. Portions of laboratory suites where hazardous materials are present shall be provided with a liquid-tight floor.

Mass Timber – Now and Near Future

Key Highlights

Prescriptive (CBC 2018 & 2019)

Performance Based (Use 2022 IBC and Oregon Pre-approval as Basis for AMM)

Design Component	IV-BT	IV-C	IV-A	IV-A
No. Stories	6	6	12	18
Max. height	85'	90'	240'	310'
Max. Floor Area	100,000 sf	110,000 sf	210,000 sf	320,000 sf
Fire Resistance Rating (FRR)	1 hr	2 hour	2 hour	3 hour
Evacuation	No (Exposed timber permitted)	No (Exposed timber permitted)	Yes (Ceilings (20% of floor area)* "Solid" joints of floor area)* "Exposed joints" 1" separation	Yes (No Exposed Timber)
Interior Surfaces	Type III or better ratings	Type III or better ratings	Type III or better ratings	Type III or better ratings
Exterior walls of lab, shops	100% HT or equivalent or non-combustible materials	40 min, non-combust.	40 min, non-combust.	40 min, non-combust.
Exterior timber in entry/entrance	No	No	No	No
Technical Risk	Low	Medium-High	Medium-High	High
Approach Risk	Low	Unknown (Medium-High)	Unknown (Medium-High)	Unknown (High)

Code Pathways Currently Available:

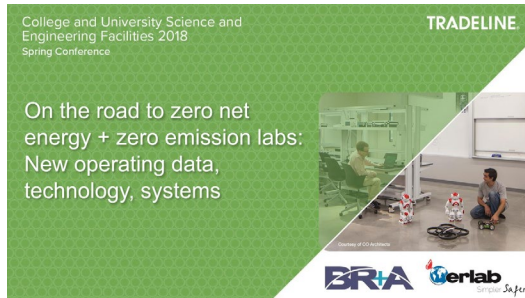
Prescriptive & Performance Based

Code Development Process

Speculate – Which way are we headed?

Both negative and positive trends

Parallel Research : MEP – BR+A



**Quantifying Fumehood
Embodied Carbon**

**MEP Systems Embodied
Carbon**

**Embodied vs Operational
Carbon - Savings in
Context**

Perkins&Will

Graphics

Innovation Incubator 2021 | J. Werner + E. Mikula

Typical Adaptable Lab Frameworks



Laminated



Reverse Laminated



Clustered



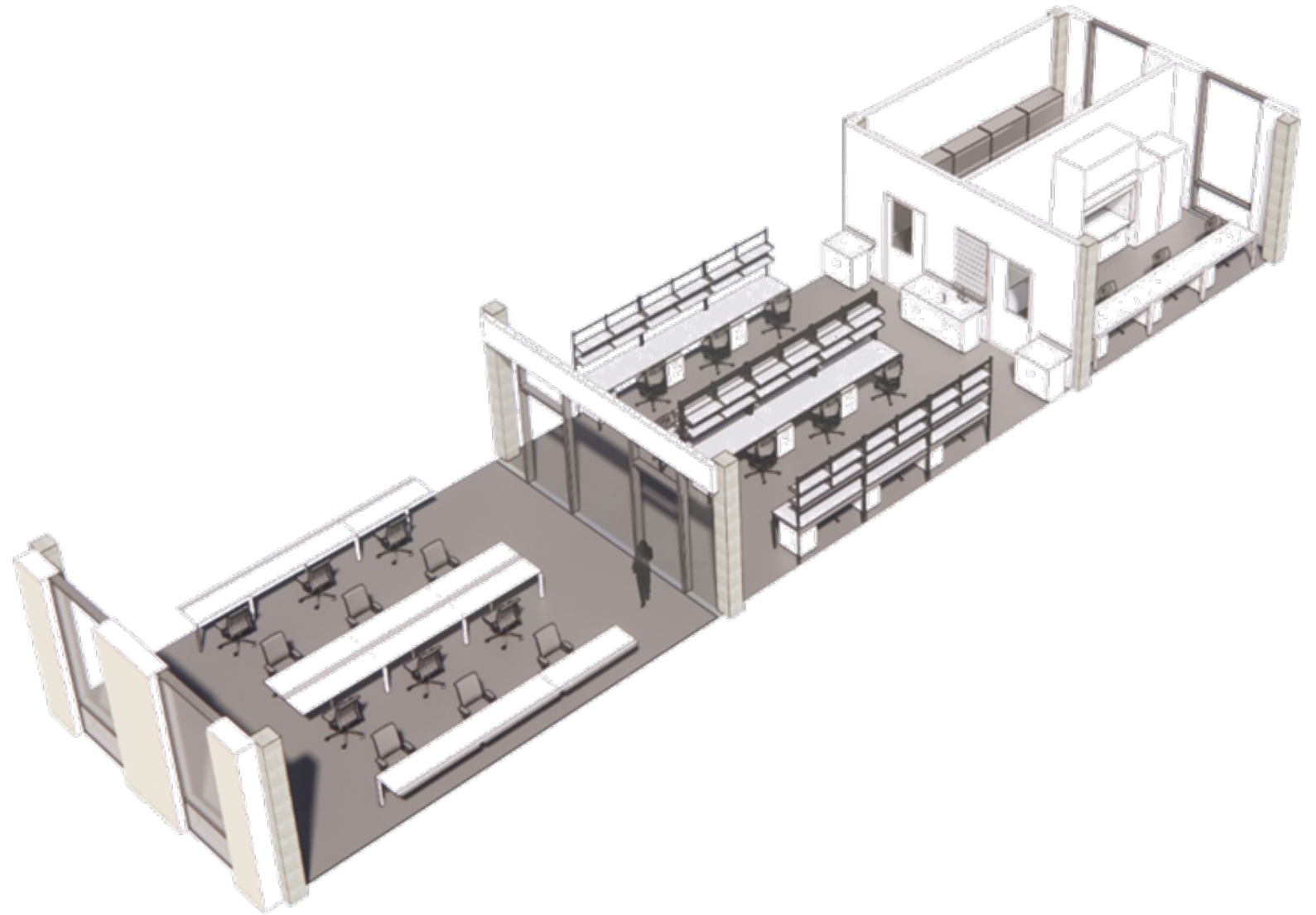
**Laminated
Wet Lab + Support**



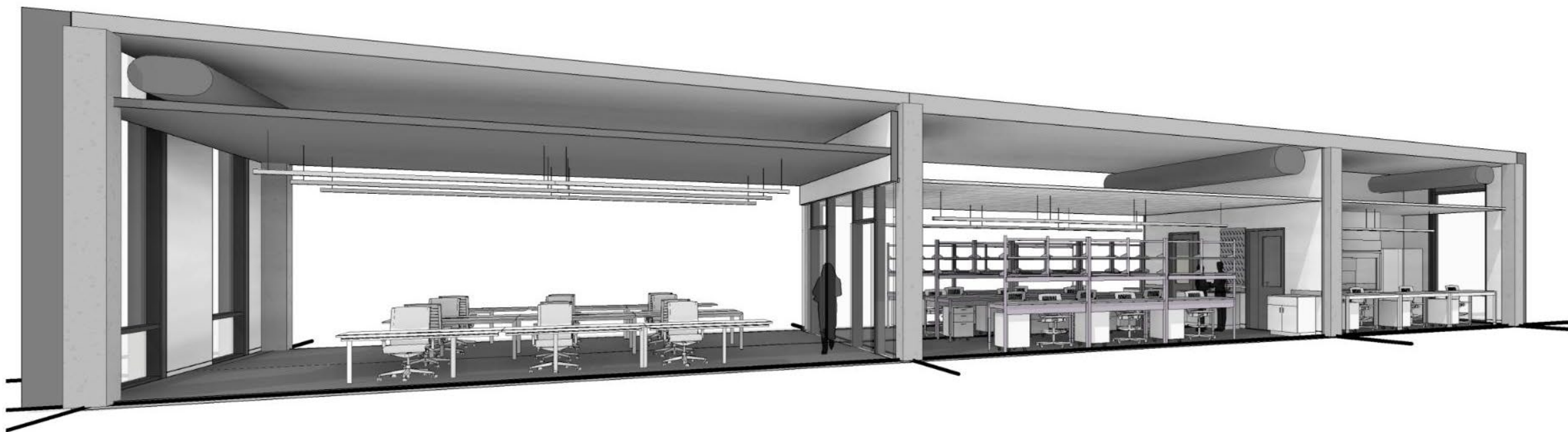
**Laminated
Chemistry**



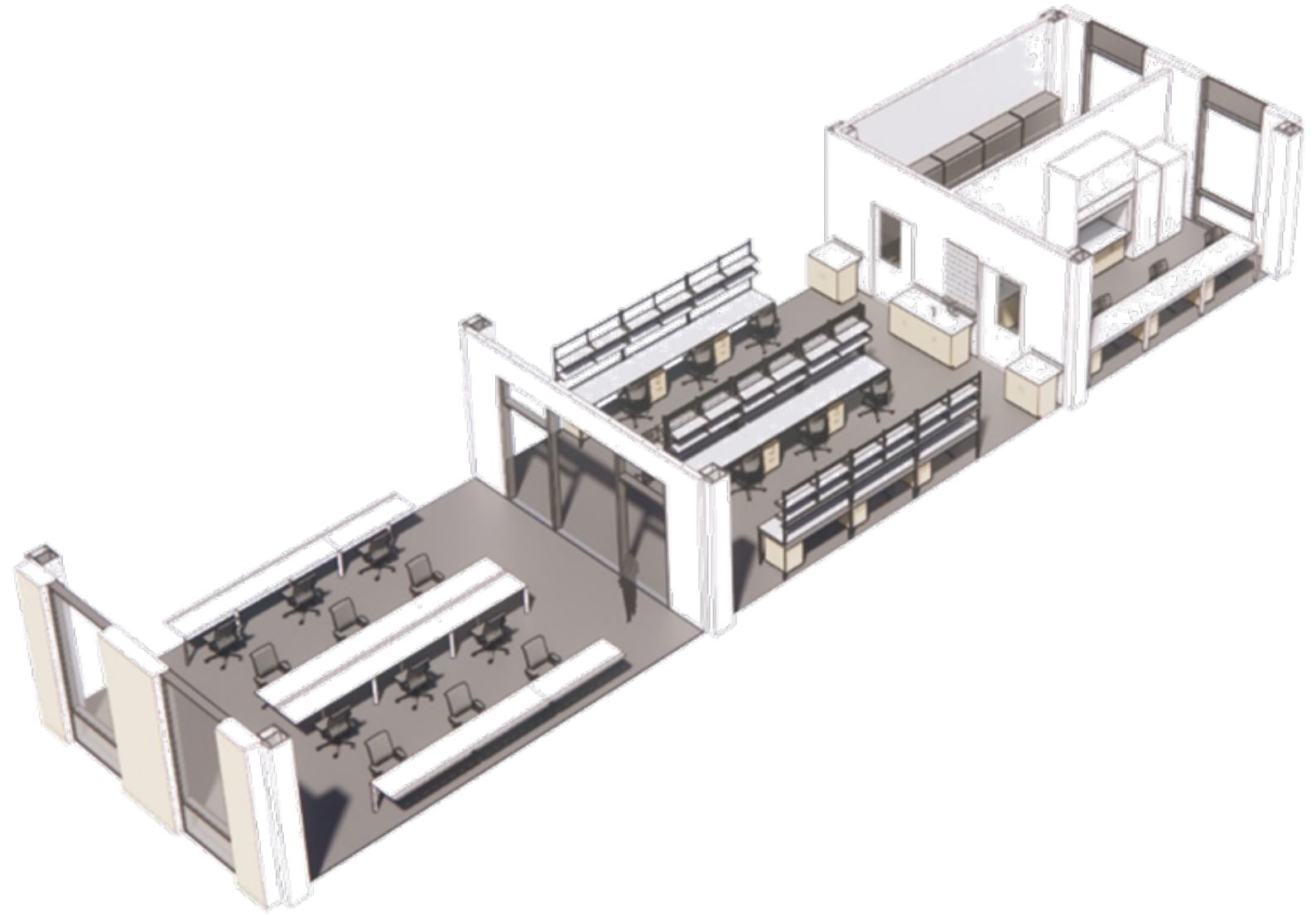
**Laminated
Lab + Collaboration**



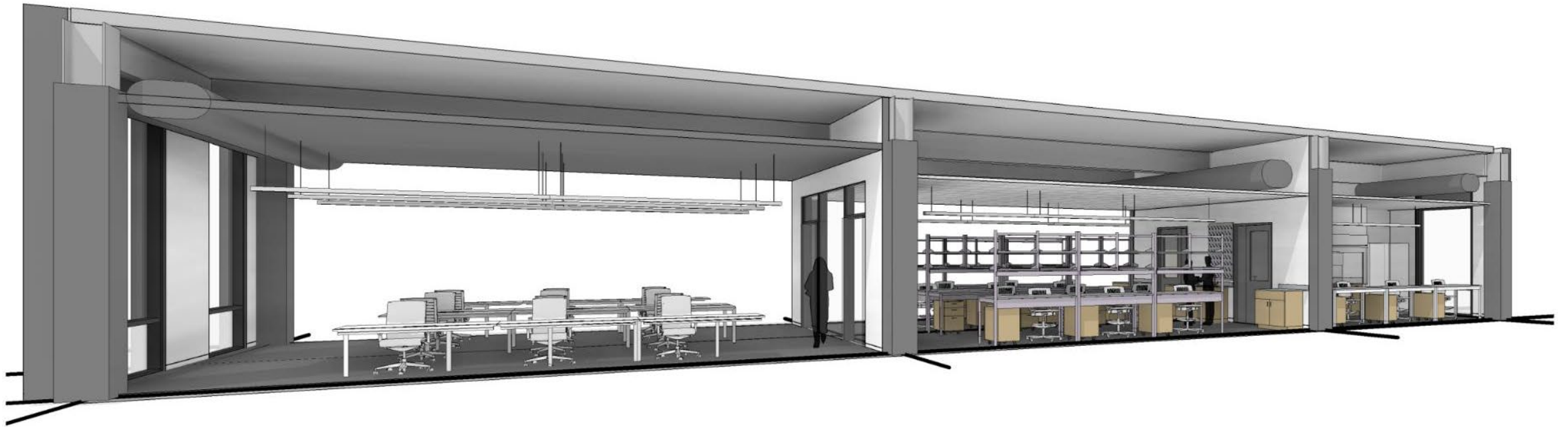
Baseline



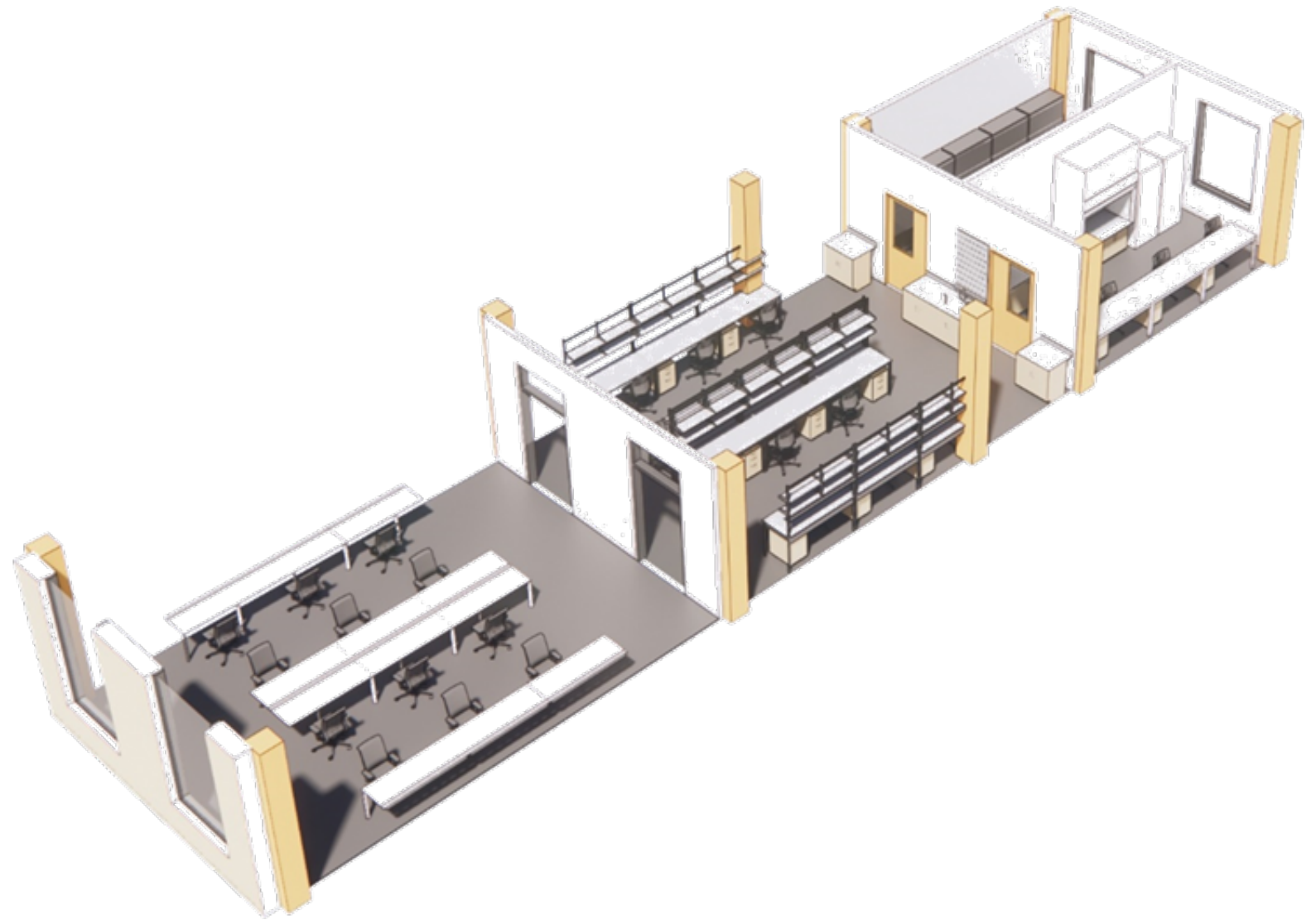
Baseline



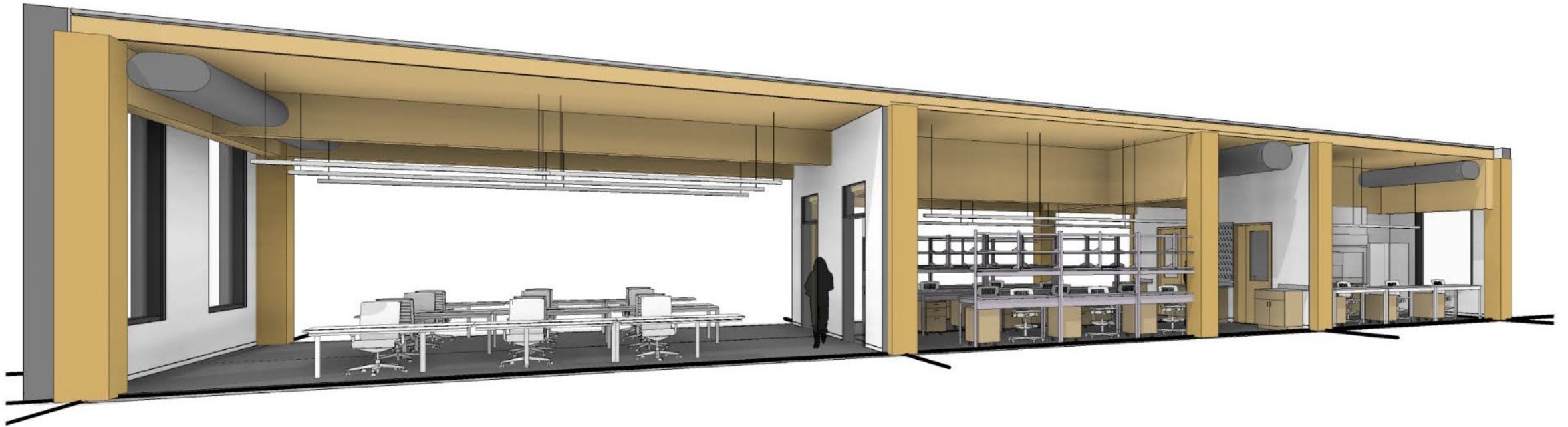
Improved



Improved



Re-Imagined



Re-Imagined



Re-Imagined Laboratory



Re-Imagined Laboratory



Re-Imagined Office / Write Up

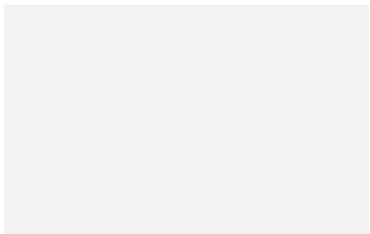
Perkins&Will
Thank you!



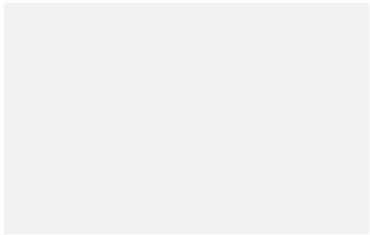
Innovation Incubator 2021 J. Werner & E. Mikula

Citations for product images

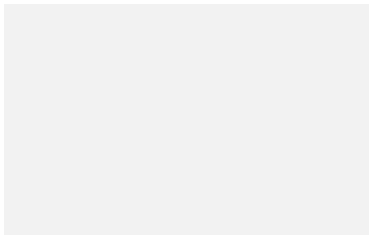
Structure



Structure

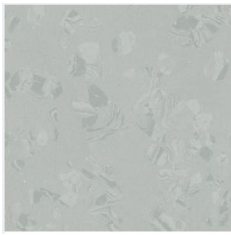
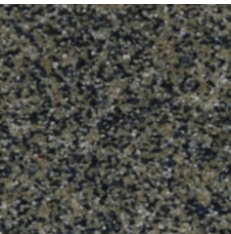


Structure



Structure

Flooring



6524
Frost Bite

Moon
stone

Baseline – Epoxy
<https://www.dur-a-flex.com/products/accelera-hq/>

Improved – Rubber
<https://www.nora.com/united-states/en/products/noraplan-sentica>

Reimagined – Linoleum
<https://forbo.blob.core.windows.net/forbodocuments/1136333/2020%20Colorex%20Brochure.pdf>

Other



Baseline – Steel Sheet
https://www.scs-certified.com/products/cert_pdfs/SCS-EPD-07103_SFIA_052821.pdf

Improved – Plyboo
https://www.plyboo.com/wp-content/uploads/files-migrated/downloads/Smith_Fong_Plyboo_EPD.pdf

Reimagined – Plywood
https://www.awc.org/pdf/greenbuilding/epd/AWC_EPD_NorthAmericanSoftwoodPlywood_20200605.pdf

Low-Carbon Labs

Exploring low embodied carbon design choices for complex building typologies

Volume II : Data Overview

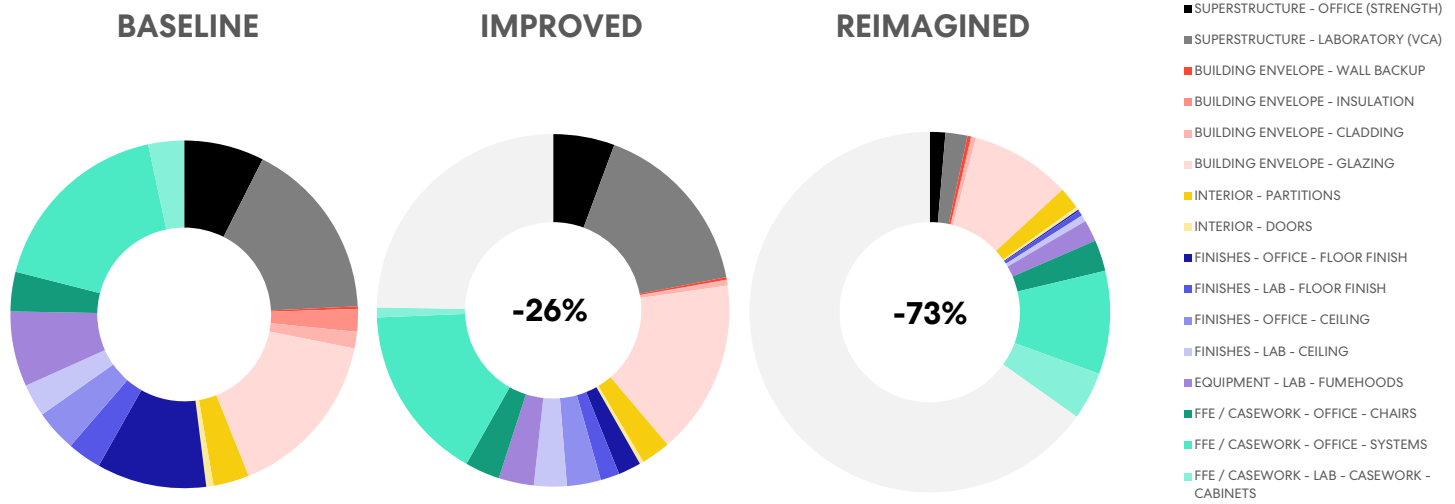


2030

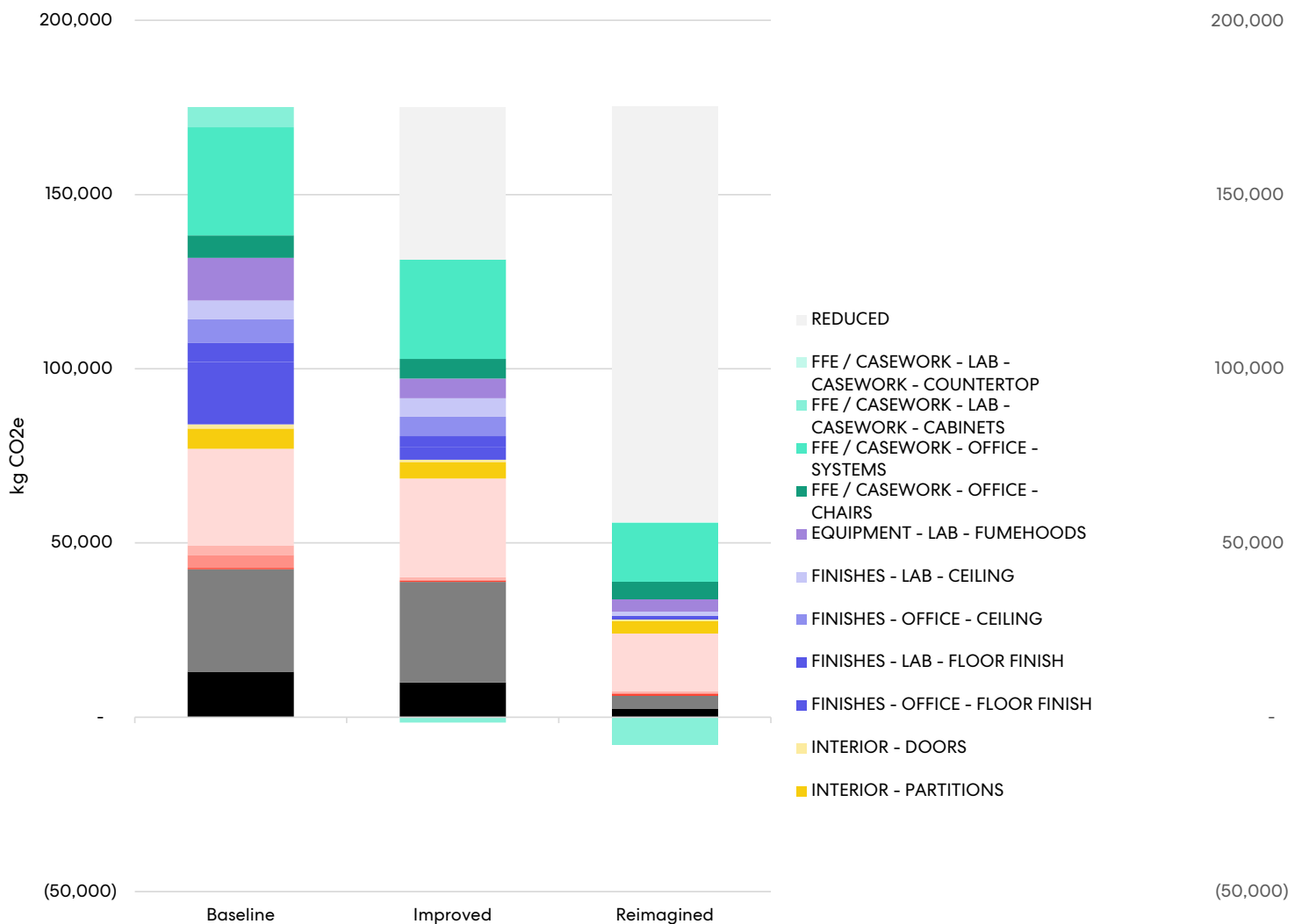
2020

SUMMARY

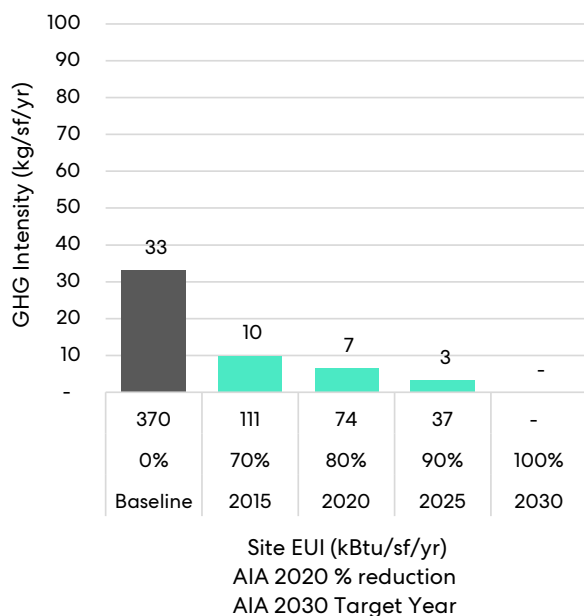
EMBODIED CARBON - SYSTEM SUMMARY				
LAST UPDATED: 10/15/2021		Baseline	Improved	Reimagined
BUILDING STRUCTURE				
-	Foundations	.	.	.
Multiple	FOUNDATIONS	CONCRETE	CONCRETE WITH CARBON CURE	??
	FOUNDATIONS	-	-	-
-	SUPERSTRUCTURE	.	.	.
-	SUPERSTRUCTURE - OFFICE (STRENGTH)	CONCRETE (22X33)	STEEL (22X33)	TIMBER (22X22)
Y	SUPERSTRUCTURE - OFFICE (STRENGTH)	13,068 kg CO2e	9,946 kg CO2e	2,541 kg CO2e
-	SUPERSTRUCTURE - LABORATORY (VCA)	CONCRETE (22X33)	STEEL (22X33)	TIMBER (22X22)
Y	SUPERSTRUCTURE - LABORATORY (VCA)	29,403 kg CO2e	28,919 kg CO2e	3,630 kg CO2e
ARCHITECTURE AND INTERIORS				
-	BUILDING ENVELOPE	.	.	.
-	WALL BACKUP	CMU + DRYWALL FINISH	METAL STUDS + DRYWALL FINISH	WOOD FRAMING + DRYWALL FINISH
Y	BUILDING ENVELOPE - WALL BACKUP	417 kg CO2e	399 kg CO2e	572 kg CO2e
07 00 00	INSULATION	XPS INSULATION	SPF INSULATION	MINERAL WOOL INSULATION
Y	BUILDING ENVELOPE - INSULATION	3,708 kg CO2e	97 kg CO2e	140 kg CO2e
-	CLADDING	TERRACOTTA CLADDING	METAL PANEL CLADDING	FIBER CEMENT CLADDING
Y	BUILDING ENVELOPE - CLADDING	2,712 kg CO2e	822 kg CO2e	629 kg CO2e
08 00 00	GLAZING	ALUMINUM STOREFRONT	ALUMINUM STOREFRONT	ALUMINUM STOREFRONT
Y	BUILDING ENVELOPE - GLAZING	27,718 kg CO2e	28,334 kg CO2e	16,528 kg CO2e
-	INTERIOR	.	.	.
-	PARTITIONS	CMU + DRYWALL FINISH	METAL STUDS + DRYWALL FINISH	WOOD FRAMING + DRYWALL FINISH
Y	INTERIOR - PARTITIONS	5,790 kg CO2e	4,738 kg CO2e	3,570 kg CO2e
08 00 00	DOORS	GLASS DOOR	STEEL DOOR	WOOD DOOR
Y	INTERIOR - DOORS	1,195 kg CO2e	650 kg CO2e	555 kg CO2e
09 00 00	FINISHES	.	.	.
09 00 00	OFFICE - FLOOR FINISH	CARPET BROADLOOM	CARPET TILE	CARPET TILE
Y	FINISHES - OFFICE - FLOOR FINISH	17,905 kg CO2e	3,673 kg CO2e	210 kg CO2e
09 00 00	LAB - FLOOR FINISH	EPOXY FLOORING	RUBBER FLOORING	LINOLEUM FLOORING
Y	FINISHES - LAB - FLOOR FINISH	5,543 kg CO2e	3,083 kg CO2e	856 kg CO2e
09 00 00	OFFICE - CEILING	DRYWALL CEILING SYSTEM	ACOUSTICAL CEILING SYSTEM	ACOUSTIC FINISH
Y	FINISHES - OFFICE - CEILING	6,799 kg CO2e	5,513 kg CO2e	61 kg CO2e
09 00 00	LAB - CEILING	ACOUSTICAL CEILING CLEANROOM	ACOUSTICAL CEILING SYSTEM	ACOUSTICAL CEILING
Y	FINISHES - LAB - CEILING	5,321 kg CO2e	5,321 kg CO2e	1,044 kg CO2e
11 00 00	EQUIPMENT	.	.	.
11 53 13	LAB - FUMEHOODS	Conventional 100 fpm	High Performance 60 fpm	Filter Fumehoods
Y	EQUIPMENT - LAB - FUMEHOODS	12,271 kg CO2e	5,684 kg CO2e	3,560 kg CO2e
12 00 00	FFE / CASEWORK	.	.	.
12 00 00	OFFICE - CHAIRS	TASK CHAIR	TASK CHAIR	TASK CHAIR
Y	FFE / CASEWORK - OFFICE - CHAIRS	6,468 kg CO2e	5,652 kg CO2e	5,118 kg CO2e
12 00 00	OFFICE - SYSTEMS	SPINE BASED WORKSTATION	PANEL BASED WORKSTATION	BENCHING
Y	FFE / CASEWORK - OFFICE - SYSTEMS	31,041 kg CO2e	28,596 kg CO2e	16,919 kg CO2e
12 35 53	LAB - CASEWORK - CABINETS	STEEL SHEET	BAMBOO	PLYWOOD
Y	FFE / CASEWORK - LAB - CASEWORK - CABINETS	5,811 kg CO2e	(1,565 kg CO2e)	(7,846 kg CO2e)
12 35 53	LAB - CASEWORK - COUNTERTOP	EPOXY COUNTER	STAINLESS STEEL SHEET	PHENOLIC PANEL
Y	FFE / CASEWORK - LAB - CASEWORK - COUNTERTOP	-	33 kg CO2e	23 kg CO2e
CARBON IMPACT OF CHOICES		175,169 kg CO2e	129,893 kg CO2e	48,109 kg CO2e
MODULE SIZE		1,936 sf	1,936 sf	1,936 sf
CARBON INTENSITY OF CHOICES		90.5 kg CO2e/sf	67.1 kg CO2e/sf	24.8 kg CO2e/sf
% REDUCTION		0%	-26%	-73%



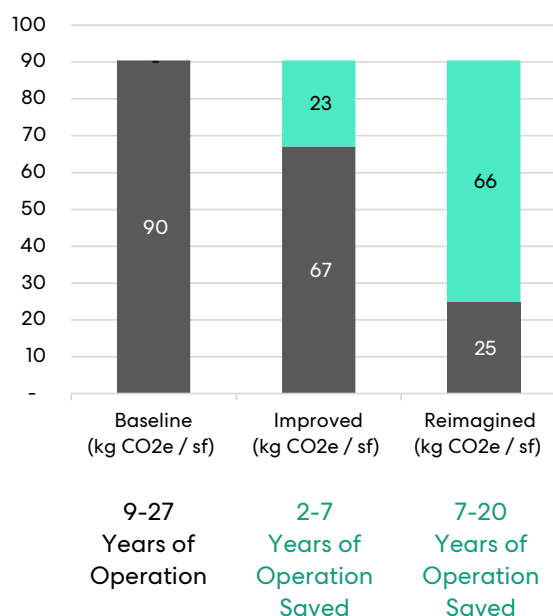
EMBODIED CARBON - SYSTEM SUMMARY



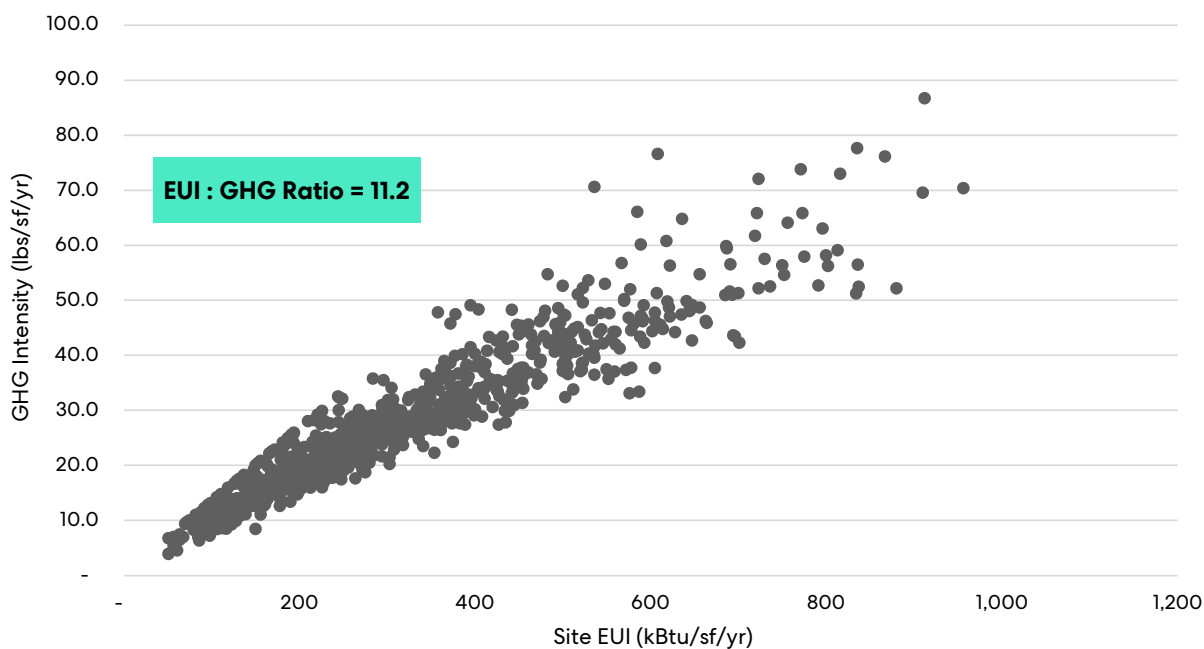
Operational Carbon Intensity Labs



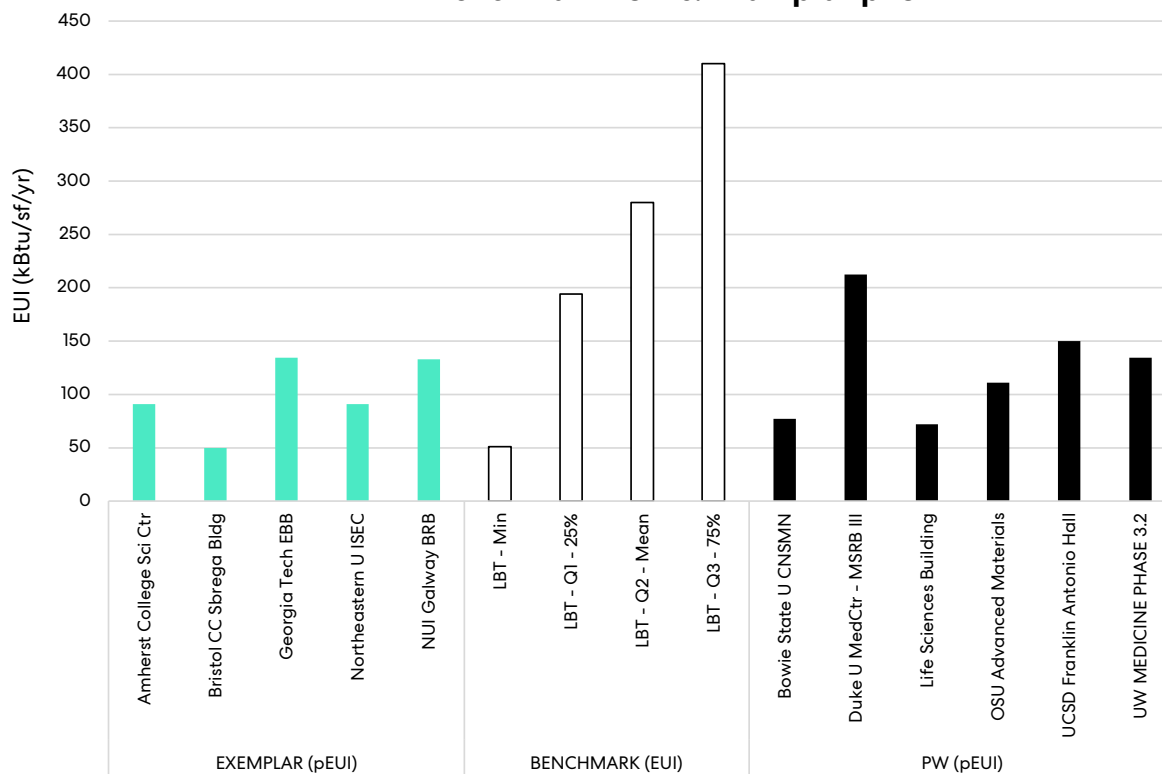
Embodied Carbon Intensity All Design Choices



I2SL LAB BENCHMARKING TOOL



Laboratory Building EUI Benchmark EUI vs. Exemplar pEUI



ASSUMPTIONS

Low Carbon Labs

Basic Assumptions

Last Updated: 9/29/2021

LCA Settings

Building Service Life 75 Years
Include Biogenic Carbon ? Yes Yes / No

Quantity Takeoff Settings

Revit Model Units ft² for LCA units conversion

Reference Module

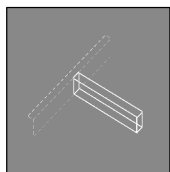
Grid X dimension 22 Feet
Grid Y dimension 88 Feet

Module Size 1,936 Square Feet
179.9 Square Meters

Floors 1

DETAIL

SUPERSTRUCTURE	Baseline	Improved	Reimagined	Alt 1
OFFICE (STRENGTH)	CONCRETE (22X33)	STEEL (22X33)	TIMBER (22X22)	
LeMessurier Scenario	Strength	Strength	Strength	Strength
LeMessurier Bay Studies	Concrete (22x33)	Steel (22x33)	Timber (22x22)	
Code	St C	St S	St T22	#N/A
LeMessurier LCA Scope	[A-D] Bio	[A-D] Bio	[A-D] Bio	[A-D] Bio
Embodied Carbon of Module (kg CO2e/sf)	18	13.7	3.5	#N/A
Total Quantity in Module (square feet)	726	726	726	726
Total Embodied Carbon (kg CO2e)	13,068	9,946	2,541	#N/A
LABORATORY (VCA)	CONCRETE (22X33)	STEEL (22X33)	TIMBER (22X22)	
LeMessurier Scenario	Laboratory (VC-A)	Laboratory (VC-A)	Laboratory (VC-A)	Strength
LeMessurier Bay Studies	Concrete (22x33)	Steel (22x33)	Timber (22x22)	
Code	2 C	2 S	2 T22	#N/A
LeMessurier LCA Scope	[A-D] Bio	[A-D] Bio	[A-D] Bio	[A-D] Bio
Embodied Carbon of Module (kg CO2e/sf)	24.3	23.9	3	#N/A
Total Quantity in Module (square feet)	1,210	1,210	1,210	1,210
Total Embodied Carbon (kg CO2e)	29,403	28,919	3,630	#N/A
Total Embodied Carbon (kg CO2e)	42,471 kg CO2e	38,865 kg CO2e	6,171 kg CO2e	#N/A

**Preliminary Results**

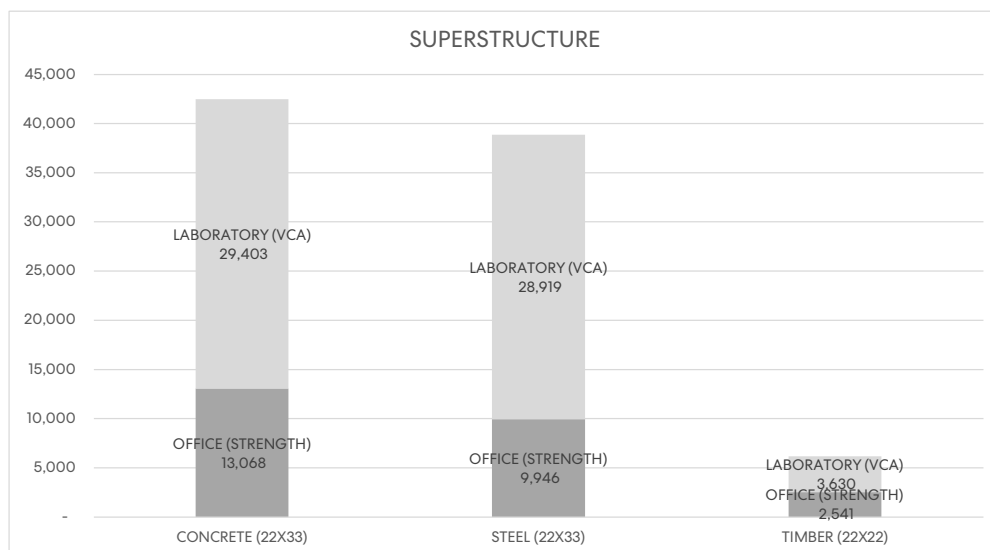
Superstructure embodied carbon results are preliminary. The results as reported here are part of an ongoing research collaboration between the LeMessurier and the authors of this Innovation Incubator project.

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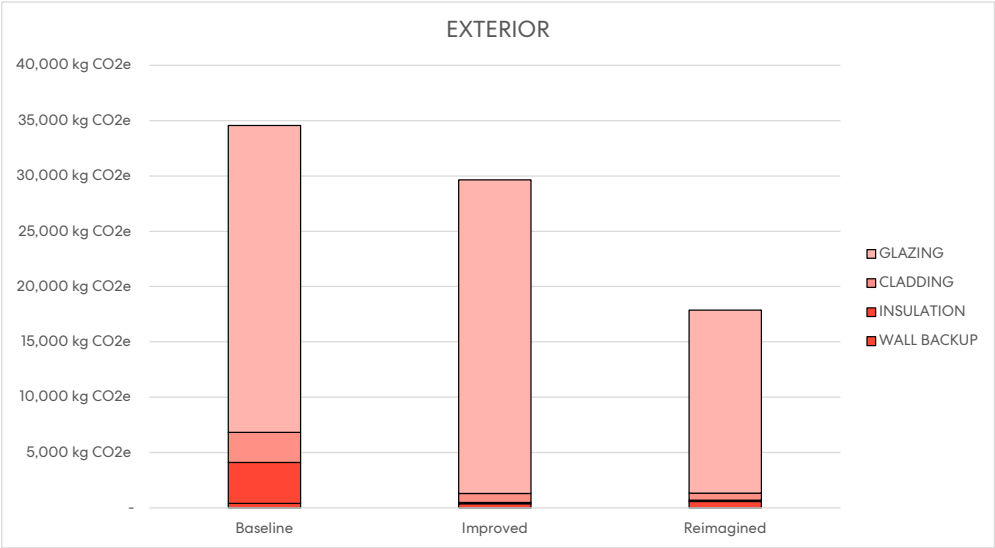
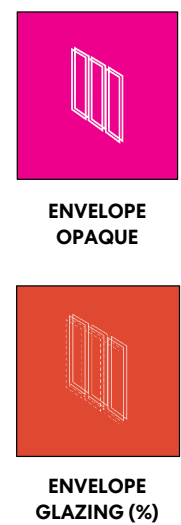


EXTERIOR	Baseline	Improved	Reimagined	Alt 1
WALL BACKUP	CMU + DRYWALL FINISH	METAL STUDS + DRYWALL	WOOD FRAMING + DRYWALL	NONE + NONE
WALL FRAMING	CMU	METAL STUDS	WOOD FRAMING	NONE
Category	PARTITIONS	PARTITIONS	PARTITIONS	PARTITIONS
EPD	CMU	Cold Formed Steel Framing Systems	Stora Enso LVL (Laminated Veneer Lumber)	None
PCR Name	Manufactured Concrete and Concrete Masonry Products (UN CPC 3755)	UL Part B: Designated Steel Construction Product EPD Requirements, v2.0 (August 26, 2020)	Standards EN 15804 and EN 16485 provide the core product category rules for the assessment. Standard EN 15942 provides the communication format for EPD. Biogenic carbon content of wood is calculated in line with EN 16449 standard.	0
EPD Declared Unit	1 cu yd	1 metric tonne	1 m³	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO2e)	294.0 kg CO2e	1,710.0 kg CO2e	155.3 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	- 804.0 kg CO2e	0.0 kg CO2e
Embodied Carbon (kg CO2e)	294.0 kg CO2e	1,710.0 kg CO2e	- 648.7 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	0.001204	0.000014	0.000204	1.000000
Total Embodied Carbon (kg CO2e/m²)	0.35 kg CO2e	0.02 kg CO2e	- 0.13 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	75 yrs	30 yrs	75 yrs	75 yrs
Replacements in building lifespan	-	1.5	-	-
Total Embodied Carbon (kg CO2e/m²)	0.35 kg CO2e	0.06 kg CO2e	- 0.13 kg CO2e	0.00 kg CO2e
INTERIOR FINISH	DRYWALL FINISH	DRYWALL FINISH	DRYWALL FINISH	NONE
Category	PARTITIONS	PARTITIONS	PARTITIONS	PARTITIONS
EPD	5/8" Gypsum Board	5/8" Gypsum Board	5/8" Gypsum Board	None
PCR Name	or Environmental Product Declaration	or Environmental Product Declaration	or Environmental Product Declaration	0
EPD Declared Unit	92.9 m²	92.9 m²	92.9 m²	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO2e)	503.9 kg CO2e	503.9 kg CO2e	503.9 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Embodied Carbon (kg CO2e)	503.9 kg CO2e	503.9 kg CO2e	503.9 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	0.010764	0.010764	0.010764	1.000000
Total Embodied Carbon (kg CO2e/m²)	5.4 kg CO2e	5.4 kg CO2e	5.4 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO2e/m²)	13.56 kg CO2e	13.56 kg CO2e	13.56 kg CO2e	0.00 kg CO2e
WALL FRAMING + INTERIOR FINISH	14 kg CO2e	14 kg CO2e	13 kg CO2e	0 kg CO2e
Total Quantity in Module (m²)	30 SM	29 SM	43 SM	-
Total Embodied Carbon (kg CO2e)	417 kg CO2e	399 kg CO2e	572 kg CO2e	-
INSULATION	XPS INSULATION	SPF INSULATION	MINERAL WOOL INSULATION	NONE
Category	INSULATION	INSULATION	INSULATION	INSULATION
EPD	FOAMULAR Extruded Polystyrene (XPS) Insulation	Spray Polyurethane Foam Insulation (HFC)	Rockwool Cavityrock	None
PCR Name	Envelope Thermal Insulation EPD (Environment, 2018)	Part B: Building and Requirements on the Back		0
EPD Declared Unit	1 m²	1 m²	1 m²	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO2e)	21.9 kg CO2e	3.3 kg CO2e	1.3 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Embodied Carbon (kg CO2e)	21.9 kg CO2e	3.3 kg CO2e	1.3 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	1.000000	1.000000	1.000000	1.000000
Total Embodied Carbon (kg CO2e/m²)	21.9 kg CO2e	3.3 kg CO2e	1.3 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	60 yrs	75 yrs	30 yrs	75 yrs
Replacements in building lifespan	0.3	-	1.5	-
Total Embodied Carbon (kg CO2e/m²)	27 kg CO2e	3 kg CO2e	3 kg CO2e	0 kg CO2e
Adjustment from EPD units (R5.68 to R20)	3.52	3.52	3.52	3.52
Total Embodied Carbon (kg CO2e/m²)	124 kg CO2e	15 kg CO2e	15 kg CO2e	0 kg CO2e
Total Quantity in Module (m²)	30 SM	29 SM	43 SM	-
Total Embodied Carbon (kg CO2e)	3,708 kg CO2e	97 kg CO2e	140 kg CO2e	-
CLADDING SUBFRAMING	NONE	ALUMINUM FRAMING	ALUMINUM FRAMING	NONE
Category	CLADDING	CLADDING	CLADDING	CLADDING
EPD	None	ALUMINUM SPECIALTY PRODUCTS	ALUMINUM SPECIALTY PRODUCTS	None
		AN INDUSTRY-AVERAGE ENVIRONMENTAL PROFILE	AN INDUSTRY-AVERAGE ENVIRONMENTAL PROFILE	

PCR Name	0	Institute Construction and Environment e.V. (IBU), 2014. PCR Guidance-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Metal Ceilings, Version 1.6, 2014. UL Environment Addendum-Product Category Rules for preparing an environmental product declaration (EPD) for PCR: IBU Product Category Rules, Part B: Requirements on the EPD for Metal Ceilings, October 2013, Version 1.2014	Institute Construction and Environment e.V. (IBU), 2014. PCR Guidance-Texts for Building-Related Products and Services. Part B: Requirements on the EPD for Metal Ceilings, Version 1.6, 2014. UL Environment Addendum-Product Category Rules for preparing an environmental product declaration (EPD) for PCR: IBU Product Category Rules, Part B: Requirements on the EPD for Metal Ceilings, October 2013, Version 1.2014	0
EPD Declared Unit	-	1 kg	1 kg	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO2e)	0.0 kg CO2e	9.5 kg CO2e	9.5 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	0.0 kg CO2e	-	-	0.0 kg CO2e
Embodied Carbon (kg CO2e)	0.0 kg CO2e	9.5 kg CO2e	9.5 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	1.000000	0.009171	0.009171	1.000000
Total Embodied Carbon (kg CO2e/m²)	0.0 kg CO2e	0.1 kg CO2e	0.1 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	75 yrs	75 yrs	75 yrs	75 yrs
Replacements in building lifespan	-	-	-	-
Total Embodied Carbon (kg CO2e/m²)	0 kg CO2e	0 kg CO2e	0 kg CO2e	0 kg CO2e

CLADDING	TERRACOTTA CLADDING	METAL PANEL CLADDING	FIBER CEMENT CLADDING	NONE
Category	CLADDING	CLADDING	CLADDING	CLADDING
EPD	Terrart	Metal Composite Panel System	EQUITONE (Linea / Lunara) fibre cement sheets	None
PCR Name	PCR part B: Requirements relating to the EPD for ceramic panellings, 1.6, 07.2014, Institut Bauen und Umwelt e.V., 2014	UL Part B: Insulated Metal Panels, Metal Composite Panels, and Metal Cladding: Roof and Wall Panels, v2.0 October 23 2018	Fibre cement / Fibre concrete, 07.2014 (PCR checked and approved by the SVR)	0
EPD Declared Unit	1 m²	100 m²	1 m²	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO2e)	90.5 kg CO2e	2,800.0 kg CO2e	9.8 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Embodied Carbon (kg CO2e)	90.5 kg CO2e	2,800.0 kg CO2e	9.8 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	1.000000	0.010000	1.000000	1.000000
Total Embodied Carbon (kg CO2e/1M2)	90.5 kg CO2e	28.0 kg CO2e	9.8 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	75 yrs	75 yrs	50 yrs	75 yrs
Replacements in building lifespan	-	-	0.5	-
Total Embodied Carbon (kg CO2e/1M2)	91 kg CO2e	28 kg CO2e	15 kg CO2e	0 kg CO2e
CLADDING SUBFRAMING + CLADDING	91 kg CO2e	28 kg CO2e	15 kg CO2e	0 kg CO2e
Total Quantity in Module (m²)	30 SM	29 SM	43 SM	-
Total Embodied Carbon (kg CO2e)	2,712 kg CO2e	822 kg CO2e	629 kg CO2e	-

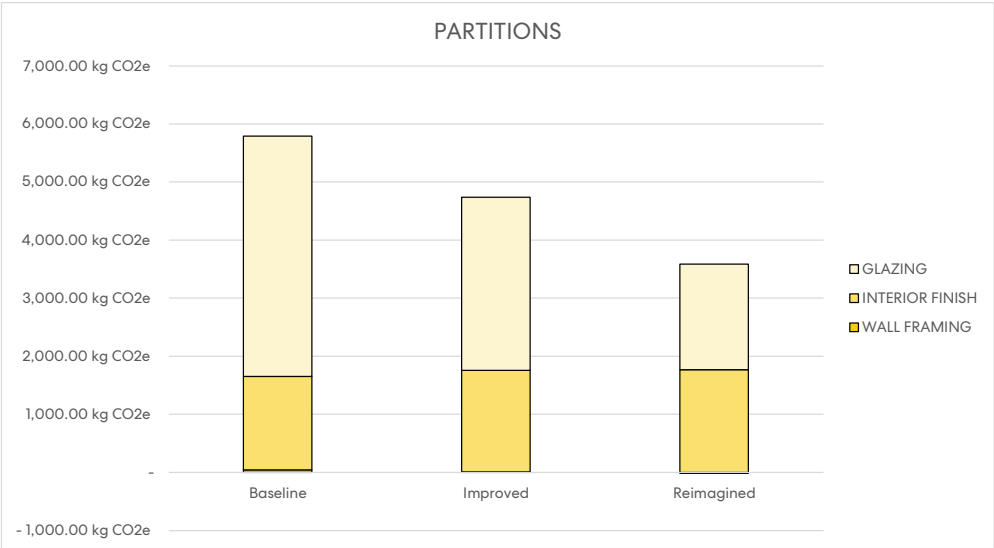
GLAZING	ALUMINUM STOREFRONT	ALUMINUM STOREFRONT	ALUMINUM STOREFRONT	NONE
Category	GLAZING	GLAZING	GLAZING	GLAZING
EPD	Traditional Curtain Wall	Traditional Curtain Wall	Traditional Curtain Wall	None
PCR Name	Gate Window Product Category	Gate Window Product Category	Gate Window Product Category	0
EPD Declared Unit	1 m²	1 m²	1 m²	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO2e)	353.6 kg CO2e	353.6 kg CO2e	353.6 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Embodied Carbon (kg CO2e)	353.6 kg CO2e	353.6 kg CO2e	353.6 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	1.000000	1.000000	1.000000	1.000000
Total Embodied Carbon (kg CO2e/1M2)	353.6 kg CO2e	353.6 kg CO2e	353.6 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO2e/1M2)	884 kg CO2e	884 kg CO2e	884 kg CO2e	0 kg CO2e
Total Quantity in Module (m²)	31 SM	32 SM	19 SM	-
Total Embodied Carbon (kg CO2e)	27,718 kg CO2e	28,334 kg CO2e	16,528 kg CO2e	-



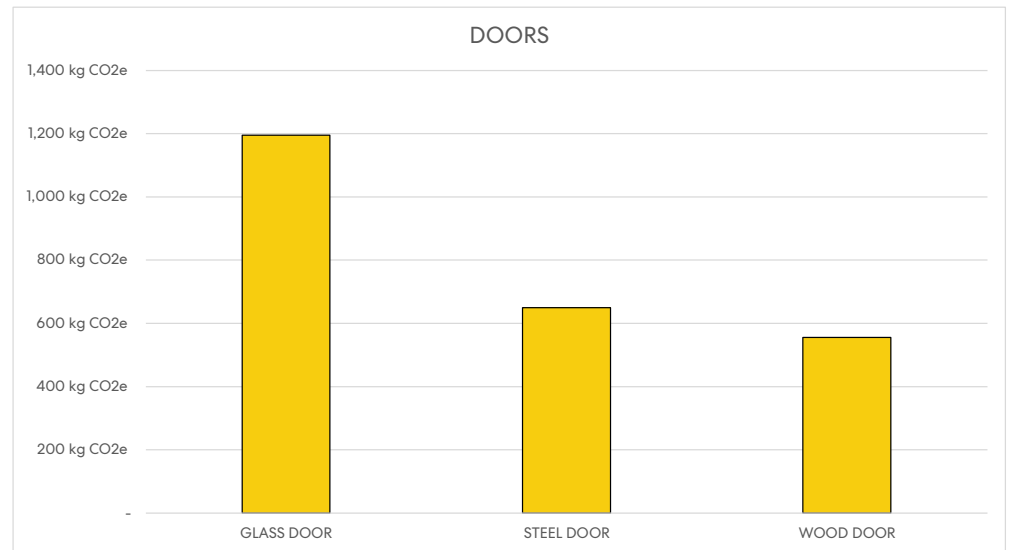
INTERIOR	Baseline	Improved	Reimagined	Alt 1
PARTITIONS	CMU + DRYWALL FINISH	METAL STUDS + DRYWALL	WOOD FRAMING + DRYWALL	NONE + NONE
WALL FRAMING				
Category	CMU	METAL STUDS	WOOD FRAMING	NONE
EPD	PARTITIONS	PARTITIONS	PARTITIONS	PARTITIONS
PCR Name	CMU	Cold Formed Steel Framing Systems	Stora Enso LVL (Laminated Veneer Lumber)	None
EPD Declared Unit	Manufactured Concrete and Concrete Masonry Products (UN CPC 3755)	UL Part B: Designated Steel Construction Product EPD Requirements, v2.0 (August 26, 2020)	Standards EN 15804 and EN 16485 provide the core product category rules for the assessment. Standard EN 15942 provides the communication format for EPD. Biogenic carbon content of wood is calculated in line with EN 16449 standard.	0
EPD Scope	1 cu yd A1-A3	1 metric tonne A1-A3	1 m³ A1-A3	- A1-A3
EPD GWP (kg CO2e)	294.0 kg CO2e	1,710.0 kg CO2e	155.3 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	- 804.0 kg CO2e	0.0 kg CO2e
Embodied Carbon (kg CO2e)	294.0 kg CO2e	1,710.0 kg CO2e	- 648.7 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	0.001204	0.000014	0.000204	1.000000
Total Embodied Carbon (kg CO2e/m²)	0.354 kg CO2e	0.0 kg CO2e	- 0.1 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	75 yrs	30 yrs	75 yrs	75 yrs
Replacements in building lifespan	-	1.5	-	-
Total Embodied Carbon (kg CO2e)	0.354 kg CO2e	0 kg CO2e	- 0 kg CO2e	2E-50
Total Quantity in Module (m²)	119 SM	129 SM	130 SM	-
Total Embodied Carbon (kg CO2e)	42.01 kg CO2e	7.55 kg CO2e	17.29 kg CO2e	-
INTERIOR FINISH				
Category	DRYWALL FINISH	DRYWALL FINISH	DRYWALL FINISH	NONE
EPD	PARTITIONS	PARTITIONS	PARTITIONS	PARTITIONS
EPD Declared Unit	5/8" Gypsum Board	5/8" Gypsum Board	5/8" Gypsum Board	None
EPD Scope	92.9 m² A1-A3	92.9 m² A1-A3	92.9 m² A1-A3	- A1-A3
EPD GWP (kg CO2e)	503.9 kg CO2e	503.9 kg CO2e	503.9 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Embodied Carbon (kg CO2e)	503.9 kg CO2e	503.9 kg CO2e	503.9 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	0.011	0.011	0.011	1.000
Total Embodied Carbon (kg CO2e/m²)	5.4 kg CO2e	5.4 kg CO2e	5.4 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO2e/m²)	14 kg CO2e	14 kg CO2e	14 kg CO2e	0 kg CO2e
Total Quantity in Module (m²)	119 SM	129 SM	130 SM	-
Total Embodied Carbon (kg CO2e)	1,610 kg CO2e	1,752 kg CO2e	1,768 kg CO2e	-
GLAZING				
Category	INTERIOR GLAZING	INTERIOR GLAZING	INTERIOR GLAZING	NONE
EPD	GLAZING	GLAZING	GLAZING	GLAZING
PCR Name	DIRTT Solid Glass Interior Wall (Savannah)	DIRTT Solid Glass Interior Wall (Savannah)	DIRTT Solid Glass Interior Wall (Savannah)	None
EPD Type	Earthsure Product Category Rule 30162403:2014 for Interior Wall Systems	Earthsure Product Category Rule 30162403:2014 for Interior Wall Systems	Earthsure Product Category Rule 30162403:2014 for Interior Wall Systems	0
EPD Declared Unit	Product Specific	Product Specific	Product Specific	0
EPD Scope	1 m² A1-A3	1 m² A1-A3	1 m² A1-A3	- A1-A3
EPD GWP (kg CO2e)	81.0 kg CO2e	81.0 kg CO2e	81.0 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Embodied Carbon (kg CO2e)	81.0 kg CO2e	81.0 kg CO2e	81.0 kg CO2e	0.0 kg CO2e
Adjustment to common units (m²)	1.000	1.000	1.000	1.000
Total Embodied Carbon (kg CO2e/m²)	81.0 kg CO2e	81.0 kg CO2e	81.0 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO2e/m²)	203 kg CO2e	203 kg CO2e	203 kg CO2e	0 kg CO2e
Total Quantity in Module (m²)	20 SM	15 SM	9 SM	-
Total Embodied Carbon (kg CO2e)	4,139 kg CO2e	2,979 kg CO2e	1,819 kg CO2e	-
Total Embodied Carbon (kg CO2e)	5,790 kg CO2e	4,738 kg CO2e	3,570 kg CO2e	-



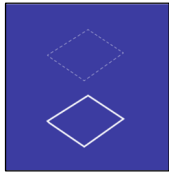
PARTITIONS



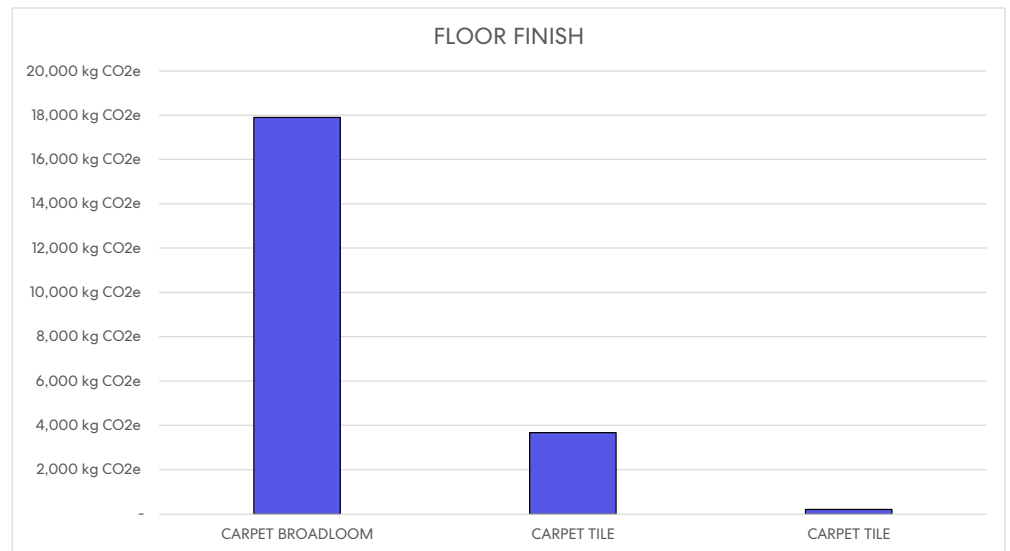
INTERIOR	Baseline	Improved	Reimagined	Alt 1
DOORS	GLASS DOOR	STEEL DOOR	WOOD DOOR	NONE
Category	DOORS	DOORS	DOORS	DOORS
EPD	Optima Aluminum Framed Doors	Assa Abloy Regent and Omega Doors	Eggers Industries - Architectural Wood Door Leaf	None
PCR Name	The CEN standard EN 15804 serves as the core PCR	Commercial Steel Doors and/or Frames 9005	PCR for preparing an EPD for interior architectural wood door leaves ASTM, 2015	0
EPD Type	Product Specific	Product Specific	Product Specific	0
EPD Declared Unit	1 Door	1 Door	1 Door	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
Total Embodied Carbon (kg CO2e/unit)	239.0 kg CO2e	130.0 kg CO2e	111.0 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Total Embodied Carbon (kg CO2e/unit)	239.0 kg CO2e	130.0 kg CO2e	111.0 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO2e/unit)	598 kg CO2e	325 kg CO2e	278 kg CO2e	0 kg CO2e
Total Quantity in Module (units)	2	2	2	-
Total Embodied Carbon (kg CO2e)	1,195 kg CO2e	650 kg CO2e	555 kg CO2e	-

**DOORS**

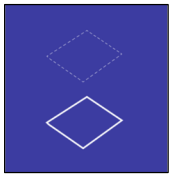
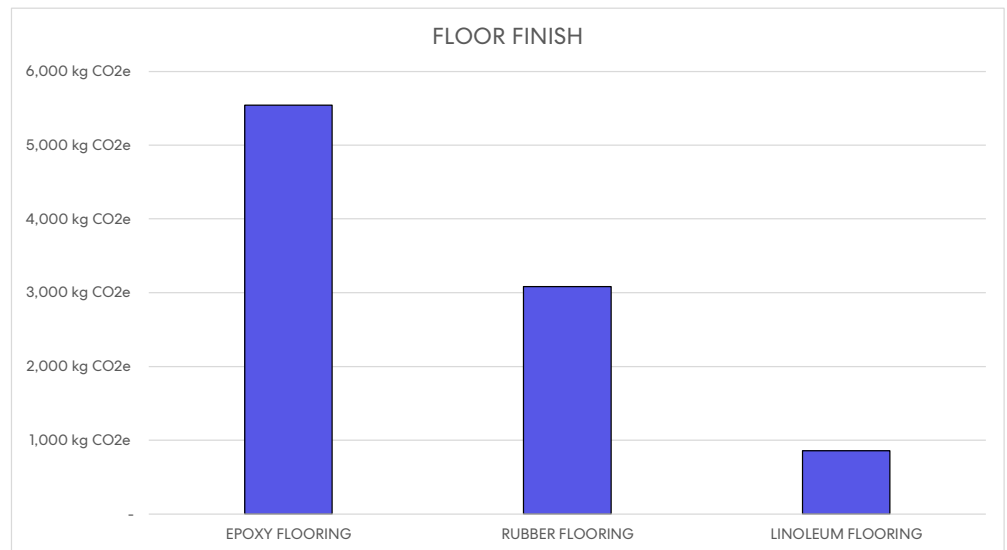
OFFICE	Baseline	Improved	Reimagined	Alt 1
FLOOR FINISH	CARPET BROADLOOM	CARPET TILE	CARPET TILE	NONE
Category	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH
EPD	Mohawk Tufted Nylon Carpet on Weldlok Onguard Backing	Mohawk Ecoflex Matrix Modular Carpet Tiles	INTERFACE CQUEST BIOX	None
PCR Name	UL Product Category Rule (PCR) Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements v.2.0 September 2018 Product Specific	UL Product Category Rule (PCR) Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements v.2.0 September 2018 Product Specific	Part A: Life Cycle Assessment Calculation Rules and Report Requirements, Version 3.2, 2018 Part B: Flooring EPD Requirements, Version 2.0, 2018 Product Specific	0
EPD Type				0
EPD Declared Unit	1 m ²	1 m ²	1 m ²	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO ₂ e/m ²)	52.9 kg CO ₂ e	10.0 kg CO ₂ e	- 0.4 kg CO ₂ e	0.0 kg CO ₂ e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO ₂ e
Embodied Carbon (kg CO ₂ e/m ²)	52.9 kg CO ₂ e	10.0 kg CO ₂ e	- 0.4 kg CO ₂ e	0.0 kg CO ₂ e
Adjustment to common units (m ²)	1.000	1.000	1.000	1.000
Embodied Carbon (kg CO ₂ e/m ²)	53.9 kg CO ₂ e	11.0 kg CO ₂ e	0.6 kg CO ₂ e	1.0 kg CO ₂ e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	15 yrs	15 yrs	15 yrs	75 yrs
Replacements in building lifespan	4.0	4.0	4.0	-
Total Embodied Carbon (kg CO ₂ e/m ²)	270 kg CO ₂ e	55 kg CO ₂ e	3 kg CO ₂ e	1 kg CO ₂ e
Total Quantity in Module (m ²)	66	67	66	-
Total Embodied Carbon (kg CO ₂ e)	7,905 kg CO ₂ e	3,673 kg CO ₂ e	210 kg CO ₂ e	-



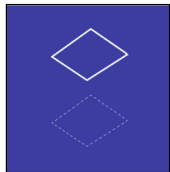
FLOORS



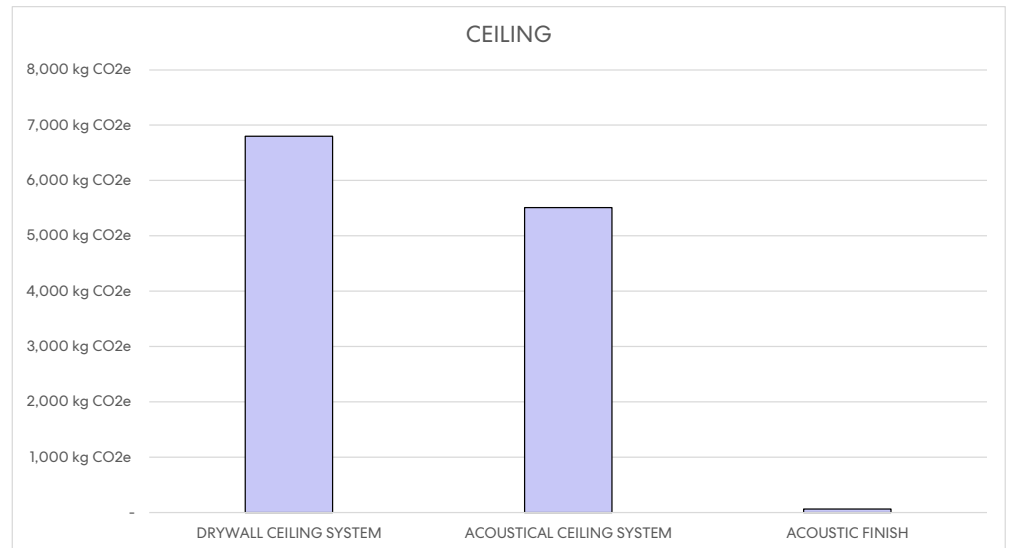
LAB	Baseline	Improved	Reimagined	Alt 1
FLOOR FINISH	EPOXY FLOORING	RUBBER FLOORING	LINOLEUM FLOORING	NONE
Category	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH	FLOOR FINISH
EPD	Dur-A-Flex Epoxy Flooring	Noraplan Environcare Sentica (part of 913 line)	Forbo Marmoleum	None
PCR Name	Part A (IBU/UL v1.2), Part B (IBU) Requirements for floor coverings. UL Part B addendum	IBU Part B: Requirements on the EPD for Floor coverings, version 1.2 02-2018	EN 16810: 2017 Resilient, Textile and Laminate floor coverings - Environmental Product Declarations - Product Category Rules	0
EPD Type	Product Specific	Product Specific	Product Specific	0
EPD Declared Unit	1 m ²	1 m ²	1 m ³	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
EPD GWP (kg CO ₂ e/m ²)	9.3 kg CO ₂ e	5.9 kg CO ₂ e	- 0.0 kg CO ₂ e	0.0 kg CO ₂ e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO ₂ e
Embodied Carbon (kg CO ₂ e/m ²)	9.3 kg CO ₂ e	5.9 kg CO ₂ e	- 0.0 kg CO ₂ e	0.0 kg CO ₂ e
Adjustment to common units (m ²)	1.000	1.000	1.000	1.000
Embodied Carbon (kg CO ₂ e/m ²)	10.3 kg CO ₂ e	6.9 kg CO ₂ e	1.0 kg CO ₂ e	1.0 kg CO ₂ e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	25 yrs	30 yrs	15 yrs	75 yrs
Replacements in building lifespan	2.0	1.5	4.0	-
Total Embodied Carbon (kg CO ₂ e/m ²)	31 kg CO ₂ e	17 kg CO ₂ e	5 kg CO ₂ e	1 kg CO ₂ e
Total Quantity in Module (m ²)	179	180	179	-
Total Embodied Carbon (kg CO ₂ e)	5,543 kg CO ₂ e	3,083 kg CO ₂ e	856 kg CO ₂ e	-

**FLOORS**

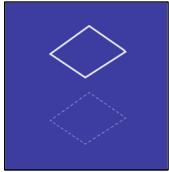
OFFICE	Baseline	Improved	Reimagined	Alt 1
CEILING	DRYWALL CEILING SYSTEM	ACOUSTICAL CEILING SYSTEM	ACOUSTIC FINISH	NONE
Category	CEILING	CEILING	CEILING	CEILING
EPD	USG Ensemble	Armstrong Ultima Ceiling	International Cellulose K-13	None
PCR Name	NSF International PCR for Gypsum Panel Products, v1.1 April 23 2020	PCR Guidance for Building Related Products and Services, From the range of Environmental Product Declarations of UL Environment: "Part B: Non-Metal Ceiling Panel EPD Requirements", October 2015v1.	Product Category Rules (PCR) Guidance for Building-Related Products and Services Part B: Building Envelope Thermal Insulation EPD Requirements	0
EPD Type	Product Specific	Product Specific	Product Specific	0
EPD Declared Unit	1,000 sf	1 m ²	1 m ²	-
EPD Scope	A1-A3	A1-D	A1-A3	A1-D
Total Embodied Carbon (kg CO ₂ e)	1,420.0 kg CO ₂ e	12.4 kg CO ₂ e	1.4 kg CO ₂ e	-
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO ₂ e
Total Embodied Carbon (kg CO ₂ e)	1,420.0 kg CO ₂ e	12.4 kg CO ₂ e	1.4 kg CO ₂ e	0.0 kg CO ₂ e
Adjustment to common units (m ²)	0.0107639	1.000	1.000	1.000
Total Embodied Carbon (kg CO ₂ e/m ²)	15.3 kg CO ₂ e	12.4 kg CO ₂ e	1.4 kg CO ₂ e	0.0 kg CO ₂ e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	75 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	-	-
Total Embodied Carbon (kg CO ₂ e/m ²)	38 kg CO ₂ e	31 kg CO ₂ e	1 kg CO ₂ e	0 kg CO ₂ e
Total Quantity in Module (m ²)	178	178	45	-
Total Embodied Carbon (kg CO ₂ e)	6,799 kg CO ₂ e	5,513 kg CO ₂ e	61 kg CO ₂ e	-



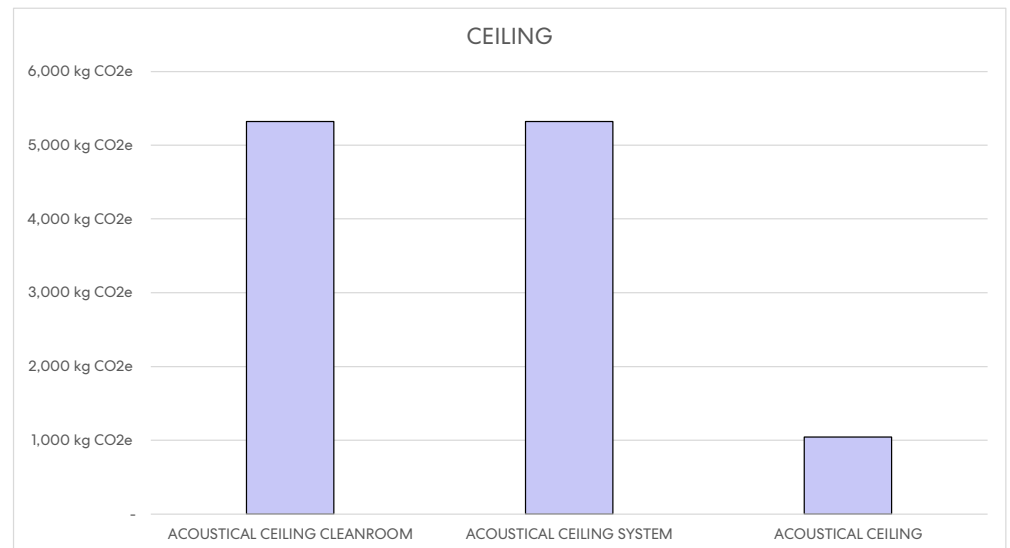
CEILINGS



LAB	Baseline	Improved	Reimagined	Alt 1
CEILING	ACOUSTICAL CEILING CLEANROOM	ACOUSTICAL CEILING SYSTEM	ACOUSTICAL CEILING	NONE
Category	CEILING	CEILING	CEILING	CEILING
EPD	Armstrong Clean Room FL Ceiling Panels	Armstrong Calla Ceiling Panels	Armstrong Optima Ceiling Panels	None
PCR Name	PCR Guidance for Building Related Products and Services, From the range of Environmental Product Declarations of UL Environment: "Part B: Non-Metal Ceiling Panel EPD Requirements". October 2015v1. Product Specific	PCR Guidance for Building Related Products and Services, From the range of Environmental Product Declarations of UL Environment: "Part B: Non-Metal Ceiling Panel EPD Requirements". October 2015v1. Product Specific	PCR Guidance for Building Related Products and Services, From the range of Environmental Product Declarations of UL Environment: "Part B: Non-Metal Ceiling Panel EPD Requirements". October 2015v1. Product Specific	0
EPD Type	1 m ²	1 m ²	1 m ²	0
EPD Declared Unit	A1-D	A1-D	A1-D	-
EPD Scope	A1-D	A1-D	A1-D	A1-D
Total Embodied Carbon (kg CO ₂ e/m ²)	11.0 kg CO ₂ e	11.0 kg CO ₂ e	8.4 kg CO ₂ e	-
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO ₂ e
Total Embodied Carbon (kg CO ₂ e/m ²)	10.9607	11.0 kg CO ₂ e	8.4 kg CO ₂ e	0.0 kg CO ₂ e
Adjustment to common units (m ²)	1.00000	1.000	1.000	1.000
Total Embodied Carbon (kg CO ₂ e/m ²)	12.0 kg CO ₂ e	12.0 kg CO ₂ e	9.4 kg CO ₂ e	1.0 kg CO ₂ e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO ₂ e/m ²)	30 kg CO ₂ e	30 kg CO ₂ e	23 kg CO ₂ e	1 kg CO ₂ e
Total Quantity in Module (m ²)	178	178	45	-
Total Embodied Carbon (kg CO ₂ e)	5,321 kg CO ₂ e	5,321 kg CO ₂ e	1,044 kg CO ₂ e	-



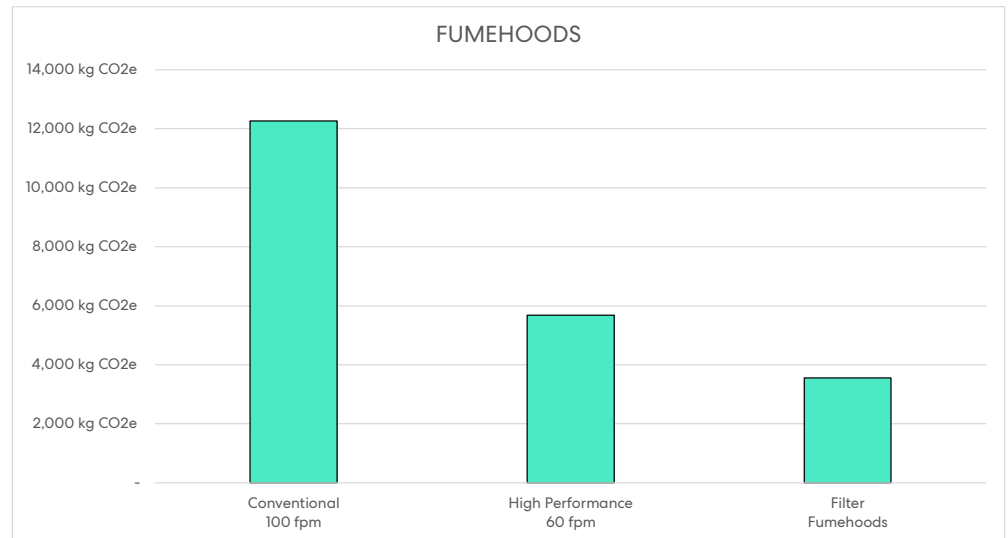
CEILINGS



LAB	Baseline	Improved	Reimagined	Alt 1
FUMEHOODS	Conventional 100 fpm	High Performance 60 fpm	Filter Fumehoods	
6' Hood Cabinet	166	166	166	
Supply + Exhaust AHUs - Alum	3,695	1,642	-	
Supply + Exhaust AHUs - Steel	298	132	-	
S.S. Exhaust Ductwork	203	90	-	
Supply Ductwork	547	243	-	
Embodied Carbon (kg CO2e/cabinet)	4,909 kg CO2e	2,274 kg CO2e	166 kg CO2e	
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	
Replacements in building lifespan	1.5	1.5	1.5	-
Cabinet Embodied Carbon (kg CO2e/cabinet)	12,271 kg CO2e	5,684 kg CO2e	414 kg CO2e	-
Filters	-	-	210	
Embodied Carbon (kg CO2e/FILTER)	-	-	210 kg CO2e	
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	
Lifespan of Product / Replacement Cycle	-	-	5 yrs	
Replacements in building lifespan	-	-	14.0	-
Filter Embodied Carbon (kg CO2e/FILTER)	-	-	3,146 kg CO2e	-
Total Embodied Carbon (kg CO2e/hood)	12,271 kg CO2e	5,684 kg CO2e	3,560 kg CO2e	
Total Quantity in Module	1	1	1	
Total Embodied Carbon (kg CO2e)	12,271 kg CO2e	5,684 kg CO2e	3,560 kg CO2e	



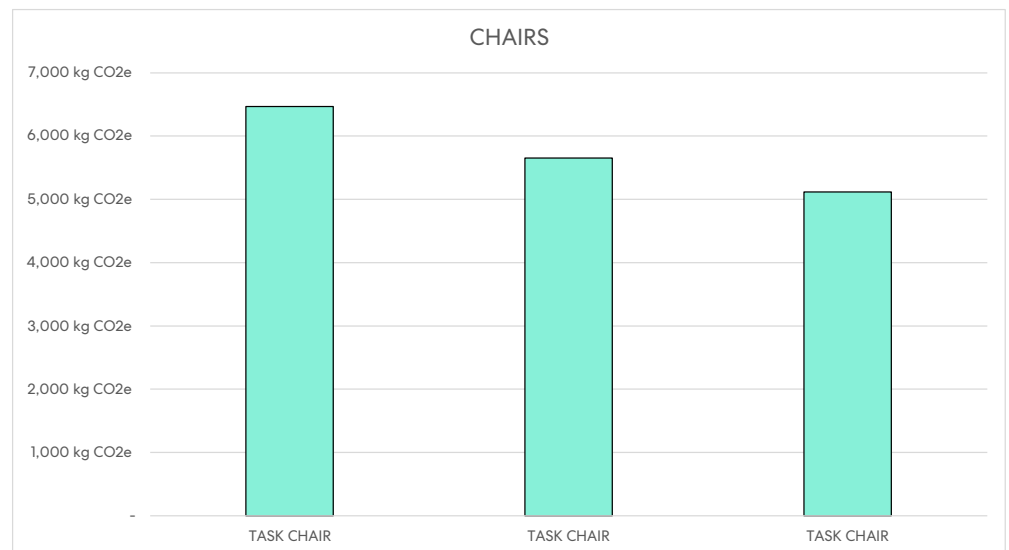
Analysis By:
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Boston, MA 02135
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OFFICE	Baseline	Improved	Reimagined	Alt 1
CHAIRS	TASK CHAIR	TASK CHAIR	TASK CHAIR	NONE
Category	CHAIRS	CHAIRS	CHAIRS	CHAIRS
EPD	<i>Knoll Olo Light Task Chair</i>	<i>Steelcase Think Chair</i>	<i>New Aeron Chair</i>	<i>None</i>
PCR Name	PCR 2012:01 Construction Products And Construction Services, Version 2.3, UN CPC 314 Product Specific	[Not specified]	Reference PCR: Product Category Rule for Environmental Product Declaration BIFMA PCR for Product Specific	0
EPD Type	1 Chair	Product Specific	1 Chair	0
EPD Declared Unit	1 Chair	1 Chair	1 Chair	-
EPD Scope	A1-A3	A1-A3	A1-A3	A1-A3
Total Embodied Carbon (kg CO2e/unit)	107.8 kg CO2e	94.2 kg CO2e	85.3 kg CO2e	0.0 kg CO2e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO2e
Total Embodied Carbon (kg CO2e/unit)	107.8 kg CO2e	94.2 kg CO2e	85.3 kg CO2e	0.0 kg CO2e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	15 yrs	15 yrs	15 yrs	75 yrs
Replacements in building lifespan	4.0	4.0	4.0	-
Total Embodied Carbon (kg CO2e/unit)	539 kg CO2e	471 kg CO2e	427 kg CO2e	0 kg CO2e
Total Quantity in Module (unit)	12	12	12	-
Total Embodied Carbon (kg CO2e)	6,468 kg CO2e	5,652 kg CO2e	5,118 kg CO2e	-



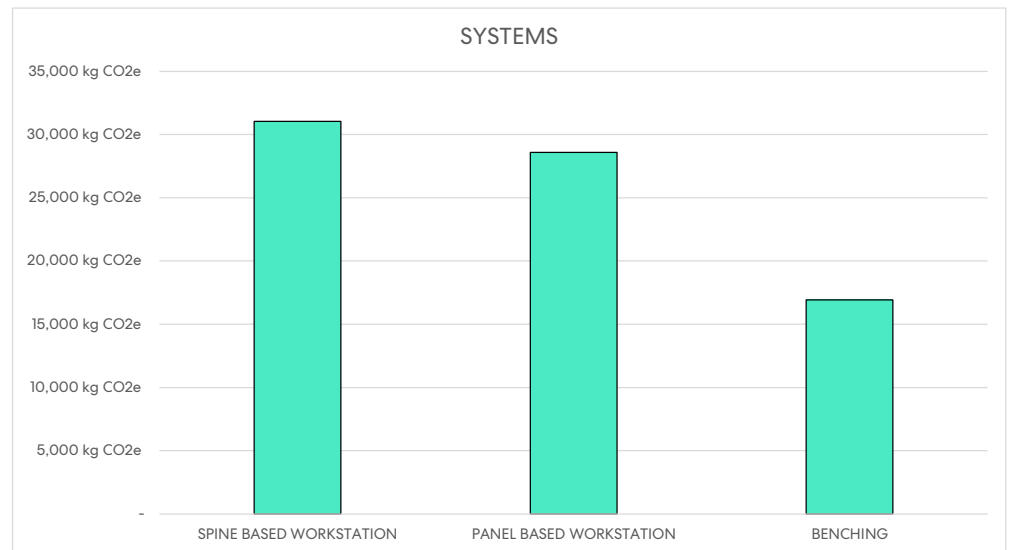
**OFFICE
SYSTEMS**



OFFICE	Baseline	Improved	Reimagined	Alt 1
SYSTEMS	SPINE BASED WORKSTATION	PANEL BASED WORKSTATION	BENCHING	NONE
Category	SYSTEMS	SYSTEMS	SYSTEMS	SYSTEMS
EPD	Knoll Currents	Knoll Dividends Horizon	Knoll Antenna Workspaces	None
PCR Name	NSF International-BIFMA PCR for Office Furniture Workspace	NSF International-BIFMA PCR for Office Furniture Workspace	NSF International-BIFMA PCR for Office Furniture Workspace	0
EPD Type	Products: UNCPC 3814	Products: UNCPC 3814	Products: UNCPC 3814	0
EPD Declared Unit	Product Specific	Product Specific	Product Specific	-
EPD Scope	1 m ²	1 m ²	1 m ²	A1-A3
	A1-A3	A1-A3	A1-A3	
Total Embodied Carbon (kg CO ₂ e/unit)	495.0 kg CO ₂ e	456.0 kg CO ₂ e	269.8 kg CO ₂ e	0.0 kg CO ₂ e
Biogenic Carbon (BCRP)	-	-	-	0.0 kg CO ₂ e
Total Embodied Carbon (kg CO ₂ e/unit)	495.0 kg CO ₂ e	456.0 kg CO ₂ e	269.8 kg CO ₂ e	0.0 kg CO ₂ e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	15 yrs	15 yrs	15 yrs	75 yrs
Replacements in building lifespan	4.0	4.0	4.0	-
Total Embodied Carbon (kg CO ₂ e/unit)	2,475 kg CO ₂ e	2,280 kg CO ₂ e	1,349 kg CO ₂ e	0 kg CO ₂ e
Total Quantity in Module (unit)	9	9	9	-
Total Surface Area of Workstations (m ²)	13	13	13	-
Total Embodied Carbon (kg CO ₂ e)	31,041 kg CO ₂ e	28,596 kg CO ₂ e	16,919 kg CO ₂ e	-



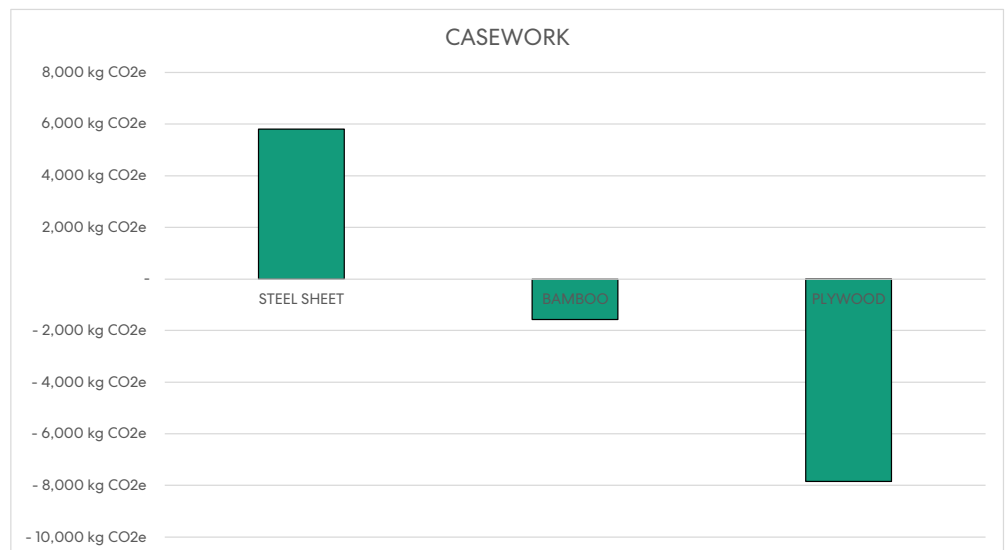
**OFFICE
SYSTEMS**



LAB	Baseline	Improved	Reimagined	Alt 1
CASEWORK	STEEL SHEET	BAMBOO	PLYWOOD	NONE
CABINETS	CABINETS	CABINETS	CABINETS	CABINETS
EPD	Cold Formed Steel Framing	Flat and Edge Grain Plyboo	North American Softwood Plywood	None
PCR Name	ISO 14044 and Product Category Rules (PCR) for Construction Products and Services.	ISO 14044 and Product Category Rules (PCR) for Construction Products and Services.	UL Environment: Product Category Rules for Building-Related Products and Services. Part A: Calculation Rules for the Life Cycle Assessment and requirements on the Project Report, v3.2 Part B: Structural and Architectural Wood Products EPD Requirements . v1.0 Industry Wide	0
EPD Type	Product Specific	Product Specific	Product Specific	0
EPD Declared Unit	1 metric tonne	1 kg	1 m³	-
EPD Scope	A1-A3 / kg	A1-A3 / kg	A1-A3 / kg	A1-A3 / kg
EPD GWP (kg CO2e/kg of product)	2.4 kg CO2e	3.6 kg CO2e	0.5 kg CO2e	-
Biogenic Carbon (BCRP/kg of product)	-	- 4.3 kg CO2e	- 4.4 kg CO2e	-
Embodied Carbon (kg CO2e/kg of product)	2.4 kg CO2e	- 0.7 kg CO2e	- 3.9 kg CO2e	-
Weight of Cabinet in lbs	75	73	65	130
Weight of Cabinet in kg	34.02	33.11	29.48	58.97
Embodied Carbon (kg CO2e/cabinet)	83 kg CO2e	- 23 kg CO2e	- 116 kg CO2e	-
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO2e/cabinet)	208 kg CO2e	- 58 kg CO2e	- 291 kg CO2e	-
Total Quantity in Module (project units)	28	27	27	-
Total Embodied Carbon (kg CO2e)	5,811 kg CO2e	1,565 kg CO2e	7,846 kg CO2e	-



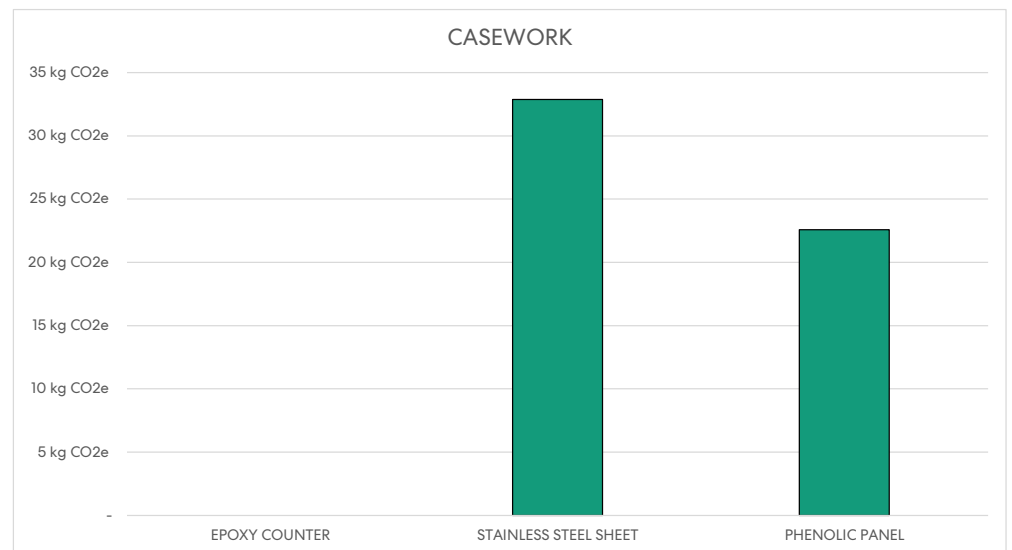
**LAB
CASEWORK**



LAB	Baseline	Improved	Reimagined	Alt 1
CASEWORK	EPOXY COUNTER	STAINLESS STEEL SHEET	PHENOLIC PANEL	NONE
COUNTERTOP	COUNTERTOP	COUNTERTOP	COUNTERTOP	COUNTERTOP
EPD	Durcon Greenstone	Cold Rolled Stainless Steel Outokumpu Oyj	Fundermax Max Panels	None
PCR Name	[No EPD Available]	Structural steels, 07.2014 (PCR checked and approved by the SVR)	Laminates, 10.2018 (PCR checked and approved by the SVR)	0
EPD Type	Product Specific	Product Specific	Product Specific	0
EPD Declared Unit	NA	1 metric tonne	1 m ²	-
EPD Scope	A1-A3 / kg	A1-A3 / kg	A1-A3 / kg	A1-A3
EPD GWP (kg CO ₂ e/kg of product)	-	3 kg CO ₂ e	2 kg CO ₂ e	0 kg CO ₂ e
Biogenic Carbon (BCRP/kg of product)	-	-	-	-
Embodied Carbon (kg CO ₂ e/kg of product)	-	3 kg CO ₂ e	2 kg CO ₂ e	0 kg CO ₂ e
Weight in Lbs/ft ²	11.0	4.0	5.3	-
Weight in kg/m ²	0.46	0.17	0.22	1.00
Embodied Carbon (kg CO ₂ e/m ²)	-	0.57 kg CO ₂ e	0.39 kg CO ₂ e	0.00 kg CO ₂ e
LCA Duration (building lifespan)	75 yrs	75 yrs	75 yrs	75 yrs
Lifespan of Product / Replacement Cycle	30 yrs	30 yrs	30 yrs	75 yrs
Replacements in building lifespan	1.5	1.5	1.5	-
Total Embodied Carbon (kg CO ₂ e/m ²)	-	1.43 kg CO ₂ e	0.98 kg CO ₂ e	0.00 kg CO ₂ e
Total Quantity in Module (m ²)	23.81	23.02	23.02	23.02
Total Embodied Carbon (kg CO ₂ e)		33 kg CO ₂ e	23 kg CO ₂ e	0 kg CO ₂ e

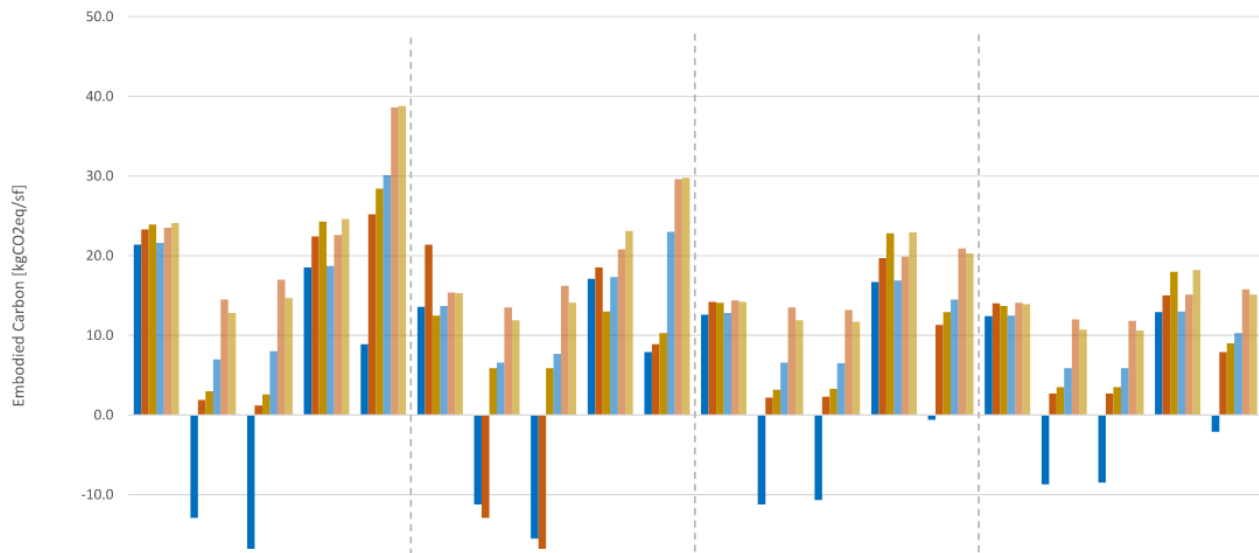


**LAB
BENCHTOP**



APPENDIX

Embodied carbon with and without biogenic carbon of steel, concrete, timber, and hybrid horizontal framing systems for varying vibration criteria of a 22'x33' [long beam/short girder]



LCA Category	2 S	2 T22	2 T	2 C	2 H	4 S	4 T22	4 T	4 C	4 H	8 S	8 T22	8 T	8 C	8 H	St S	St T22	St T	St C	St H
[A1-A3] Bio	21.40	-12.90	-16.80	18.50	8.90	13.60	-11.20	-15.50	17.10	7.90	12.60	-11.20	-10.70	16.70	-0.60	12.40	-8.70	-8.50	12.90	-2.10
[A-C] Bio	23.30	1.90	1.20	22.40	25.20	21.40	-12.90	-16.80	18.50	8.90	14.20	2.20	2.30	19.70	11.30	14.00	2.70	2.70	15.00	7.90
[A-D] Bio	23.90	3.00	2.60	24.30	28.40	12.50	5.90	5.90	13.00	10.30	14.10	3.20	3.30	22.80	12.90	13.70	3.50	3.50	18.00	9.00
[A1-A3] NoBio	21.60	7.00	8.00	18.70	30.10	13.70	6.60	7.70	17.30	23.00	12.80	6.60	6.50	16.90	14.50	12.50	5.90	5.90	13.00	10.30
[A-C] NoBio	23.50	14.50	17.00	22.60	38.60	15.40	13.50	16.20	20.80	29.60	14.40	13.50	13.20	19.90	20.90	14.10	12.00	11.80	15.10	15.80
[A-D] NoBio	24.10	12.80	14.70	24.60	38.80	15.30	11.90	14.10	23.10	29.80	14.20	11.90	11.70	22.90	20.30	13.90	10.70	10.60	18.20	15.10

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Preliminary Results

Superstructure embodied carbon results are preliminary. The results as reported here are part of an ongoing research collaboration between the LeMessurier and the authors of this Innovation Incubator project.

Low Carbon Labs

CMU CONVERSION CALCULATION

Omni Calculator

<https://www.omnicalculator.com/construction/concrete-block-fill>

Volume of concrete in CMU at specified size	0.011518	cu yd
CMU Size	16	" wide x 8" tall x 8" thicknes
CMU units wide	0.7500	per 1 LF horizontal
CMU units tall	1.5000	per 1 LF vertical
Equivalent # CMU units	1.1250	per 1 ft ² of wall
Equivalent # CMU units	0.1045	per 1 m ² of wall
Approx CMU cu yd per unit m ² of wall area	0.00120381	cu yd / m ²

Low Carbon Labs

METAL STUD CONVERSION CALCULATION

EPD Link

https://www.clarkdietrich.com/sites/default/files/imce/pdf/SupportTools/EPD_HPDP/101.1_Clark_western%20Dietrich_EPDP_Cold-Formed%20Steel%20Framing%20Systems.pdf

EPD Units

1 metric ton (mT)

ClarkDietrich iProstud

<https://www.itools.clarkdietrich.com/iprostud.php>

Interior Metal Stud Framing

Example Product

https://www.itools.clarkdietrich.com/submittalpro/dyn_pdf/%7B%22pdf_type%22%3A%22individual_product%22%2C%22project_product_code%22%3A%22product%7Cprostud~product_code%7C362PDS125-15-50ksi~coating%7CG40EQ%22%7D/CD_362PDS125-15-50ksi.pdf

Unit Weight 0.348 lbs / 1 LF

Conversion Factor (Pound to Metric Ton) 0.000454

Interior Metal Stud Mass / LF 0.000158 mT / 1 LF

Exterior Metal Stud Framing

Example Product

https://www.itools.clarkdietrich.com/submittalpro/dyn_pdf/%7B%22pdf_type%22%3A%22individual_product%22%2C%22project_product_code%22%3A%22product%7Cstructural_stud~product_code%7C550S162-33~coating%7CCP60~punched%7Ctrue%22%7D/CD_550S162-33.pdf

Unit Weight 1.11 lbs / 1 LF

Conversion Factor (Pound to Metric Ton) 0.000454

Exterior Metal Stud Mass / LF 0.000503 mT / 1 LF

Approx stud length per unit SF of wall area

Wall Height 14' - 6" High

Stud Spacing 0' - 16" O.C.

Vertical Studs Length / SF 0.75

Horizontal Studs Length / SF 0.14

Subtotal 0.89

Allowance for opening framing 0.04

5%

Stud Framing / SF of wall area 0.93 LF / SF

Conversion Factor (SF to m²) 0.09290

Stud Framing / m² of wall area 0.08662 LF / m²

Approx stud mT per unit m² of wall area

Interior Walls 1.37E-05 mT / m²

Exterior Walls 4.36E-05 mT / m²

Low Carbon Labs

LVL STUD CONVERSION CALCULATION

EPD Link	https://portal.envirodec.com/api/api/v1/EPDLibrary/Files/e5b39f2f-7029-49f0-b427-4f3108dd95c6/Data			
EPD Units	1 m³			
Approx stud volume per unit SF of wall area				
Wall Height	14'	-	6"	High
Stud Spacing	0'	-	16"	O.C.
Vertical Studs Length / SF	0.75	LF	/	SF
Horizontal Studs Length / SF	0.14	LF	/	SF
Subtotal	0.89	LF	/	SF
Allowance for opening framing	0.04			5%
Stud Framing Linear Feet / ft² of wall area	0.93	LF	/	SF
Stud Framing Linear Feet / m² of wall area	0.08662	LF	/	m²
Exterior Stud Cross Section				
Stud Thickness	2.0"			
Stud Depth	6.0"			
Stud Cross Section	0.083	ft²		
Volume ft³ / m² of wall area	0.00721801	ft³	/	m²
erior stud framing volume m³ / m² of wall area	0.0002044	m³	/	m²

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ALUMINUM ZEE GIRT CONVERSION CALCULATION

NOTES

Depth of Zee	Dim A	4.5	"	Wall Cavity Depth
Face of Zee	Dim B	1.0	"	Attachment Surfaces
Gauge	(16 Ga.)	0.0630	"	Thickness
Cross Section	Area	0.4095	sq.in. /	LF
Conversion Factor (sq.in. to m ²)		0.00065		
	Cross Section	0.00026	m ² /	LF
Wall Height		14	' -	6" High
Zee Spacing		-	' -	16" O.C.
Vertical Zee Length / SF		0.75	LF /	sf
Conversion Factor (SF to m ²)		0.09290		
	Framing / m ² of wall area	8.07293	LF /	m ²
Weight / Mass		4.3	kg /	m ²
		0.00917	kg /	m ²

https://www.certainteed.com/resources/101.1_CISCA_EPD_Aluminum_Specialty_Products_20141217.pdf

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FUMEHOOD CALCULATIONS

Fumehood (100 fpm face velocity)							
Component	Count	Unit	Material	lbs	kg	kgCO2e/ kg	kgCO2e
Hood Cabinet (6')	1	6' Hood	Carbon-Steel	500	226.80	0.73	166
Supply + Exhaust AHUs - Alum	900	cfm	Aluminum	900	408.23	9.05	3,695
Supply + Exhaust AHUs - Steel	900	cfm	Carbon-Steel	900	408.23	0.73	298
S.S. Exhaust Ductwork			Stainless Stee	225	102.06	2	203
Supply Ductwork			Carbon-Steel	1653	749.82	1	547
Hood + Ductwork							3,909

Fumehood (60 fpm high performance)							
Component	Count	Unit	Material	lbs	kg	kgCO2e/ kg	kgCO2e
Hood Cabinet (6')	1	6' Hood	Carbon-Steel	500	226.80	0.73	166
Supply + Exhaust AHUs - Alum	400	cfm	Aluminum	400	181.44	9.05	1,642
Supply + Exhaust AHUs - Steel	400	cfm	Carbon-Steel	400	181.44	0.73	132
S.S. Exhaust Ductwork			Stainless Stee	100	45.36	1.99	90
Supply Ductwork			Carbon-Steel	735	333.25	1	243
Hood + Ductwork							2,274

Filter Hood (carbon adsorption filter technology)							
Component	Count	Unit	Material	lbs	kg	kgCO2e/ kg	kgCO2e
Hood Cabinet (6')	1	6' Hood	Carbon-Steel	500	226.80	0.73	166
Hood + Ductwork							166

Filter Embodied Carbon per 5 year life				units	US Tons CO2	kg Co2	Notes	
Coconut Harvesting	zero	(product of coconut food industry)			0.000	-		
Removing Husk	zero	(waste product of coconut food industry)			0.000	-		
Transportation - local		Pounds of carbon (via truck), 160km		52.92	0.0004	0	105g/metricTon/km	https://timeforchange.org/co2-emissions-shipping-goods
Activation Process		4 tons CO2/Ton Activated Carbon		52.92	0.106	96		
Transportation - ship		Asia to America (cargo ship), 22,500km		52.92	0.012	11	20g/metricTon/km	https://sea-distances.org/
Transportation - Semi		From NY Port to Erlab (Semi truck), 400km		52.92	0.001	1	105g/metricTon/km	https://timeforchange.org/co2-emissions-shipping-goods
Filter Manufacturing		1-1/5HP motor for conveyor/filler, 5 mins/filter		n/a	0.373	338	1.5Hp motor for 5 mins/filter	
Transportation - local		to job site, Semi truck, 1,600km		104	0.009	8	105g/metricTon/km	
Transportation - local		from job site to incinerator, 400km		104	0.002	2	105g/metricTon/km	
Incineration		83kW (300kJ) produced per filter		n/a	-0.272	(247)	Ash, Water, Nitrogen, CO2	https://www.epa.gov/energy/greenhouse-gas-equivalencies-calcu
						Filters	210	
						Hood + Ductwork + Filters	375	

LCA Data (OneClickLCA)	Global Warming Potential		
	kgCO2e/ kg	kgCO2e/ lb	kgCO2e/m3
Galvanized steel	2.52	5.54	19683
Stainless steel	1.99	4.39	34504
Aluminum	9.05	19.92	31639
Structural steel	2.34	5.14	18352
Carbon-Steel	0.73	1.61	5708
Cast iron		1.5	
Copper		7.3	
**GWP values are collected from oneclicklca.com			
***GWP values (galvaized steel, stainless steel, aliminium,structural steel) are averaged based on 3 ratings; high recyled medium, and low recyled percentages.			
**Transportation is not added			
*Transportation method (Transportation distance approximate 370 mile)			
*Trailer combination, 40 ton capacity, 100% fill rate: 0.0559 kg CO2e / tonmile			

US Tons to Kg	907.185
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Analysis By:
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RESOURCES

Type	Name	Link
EPD Database	The International EPD System / Envirodec	https://www.envirodec.com/library
EPD Database	UL Spot	https://spot.ul.com/
EPD Database	The EPD Registry	https://www.theepdregistry.com/
EPD Database	SCS Global Services	https://www.scsglobalservices.com/certified-green-products-guide?program=192
Product DB	Sustainable Minds	https://www.transparencycatalog.com/
Reference	Principles for the Accounting of Biogenic Carbon in Product Carbon Footprint (PCF) Standards	https://www.bio.org/sites/default/files/legacy/bioorg/docs/Position_Carbon_Footprint_PCF.pdf
EPD Database	HPN Ecoguide	https://ecoguide.housingpartnership.net/ecoguide/certification/epd-certificate/
Reference	NIST - BEES	https://ws680.nist.gov/Bees2
EPD Database	ASTM PCR and EPD DB	https://www.astm.org/CERTIFICATION/EpdAndPCRs.html
EPD Database	NSF.org	http://info.nsf.org/Certified/Sustain/epd_search.asp
Calculation reference	Concrete Block Fill Calculator	https://www.omnicalculator.com/construction/concrete-block-fill#:~:text=The%20core%20volume%20of%20a,3%20or%200.006424%20m3.&text=From%20our%20calculations%20above%2C%20we,use%20to%20construct%20our%20wall.

Low Carbon Labs								
COMMUNICATIONS								
Product / Research Area	Company	Latest Communication	Type	Info Provided	Discussion	Contact	Contact Email	Contact 2
							Contact 2 Email	
Laboratory Structural Systems	LeMessurier	10/7/2021	Calls, Joint research.			Michael C. Gryniuk, P.E. Associate LeMessurier 1380 Soldiers Field Road Boston, MA 02135 T: 617-868-1200 x413	mrgryniuk@lemessurier.com	
Building / Fire Code Issues in Lab Buildings	Jensen Hughes		Calls, Joint research.			JEREMY LEBOWITZ, PE Practice Leader – Industrial Jensen Hughes +1 508-273-6482	jlebowitz@jensenhughes.com	
Laboratory Mechanical Systems	BR+A		Calls, Joint research.			JACOB KNOWLES Associate Principal Director of Sustainable Design BR+A CONSULTING ENGINEERS 617.925.8376 617.460.4694	jknowles@brplusa.com	TURAN KARAKUS Sustainable Design 617.925.8308 direct BR+A CONSULTING ENGINEERS
Epoxy Flooring, Paints	Sherwin Williams	8/13/2021	Call Email	Guidance on product options for high performance flooring. EPDs for flooring products.	Laboratory Flooring options. Epoxy or high performance coatings. EPD data available from SW.	Mike Starnier Business Development Manager The Sherwin-Williams Co. High Performance Flooring 484-624-2960	michael.starnier@sherwin.com	Mark T. Weiner CSI-HDA Specification Consultant The Sherwin Williams Company Office 401-245-8176 Mobile 617-438-1408
Laboratory Products and Materials	My Green Lab	8/19/2021	Call			James Connelly Chief Executive Officer Work: +1206-309-8961 Base: Spokane, Washington, USA Web: mygreenlab.org	James@mygreenlab.org	
Epoxy Flooring	Righter Group, Inc.	8/4/2021	Call	Tnemc does not have EPDs		Michael Woessner Coatings Consultant Righter Group, Inc. Cell: 978-497-0152	mwoessner@rightergroup.com	
Laboratory Casework	Mott	8/2/2021	Calls, Emails	Lab casework information. Weights of cabinets and countertop materials. Suggested EPDs for lab product raw materials.	Mott does not have EPDs. Mott President is the chair of SEFA board.	Chip Diefendorf Director of Business Development Mott Manufacturing Ltd. 1452 Hardy Road, Branford ON Canada N3T 5L8 C: 315.278.7477 QUALITY BY DESIGN www.mott.ca	chipd@mott.ca	
Concrete Block	Jandris Block	8/20/2021	Emails	Product data and EPDs.		Heidi Jandris 646-812-0860	heid@jandris.com	
Laboratory Casework	Kewaunee	8/23/2021	Email	No EPD or information available		Virginia Kowalick	virginiakowalick@kewaunee.com	
Laboratory Casework	Kewaunee	8/23/2021	Email	No EPD or information available		Rodney LaBelle	rodneylabelle@kewaunee.com	
Countertops	Fundermax	7/1/2021	Calls, Emails	EPD, Product information, suggestions for alternative products		Dawn Jacobs	Dawn.Jacobs@fundermax.biz	
Countertops	Durcon	7/29/2021	Calls, Emails	No EPD or information available.	Durcon was curious about the process for creating EPDs. They expressed concern about the cost of EPDs and about intellectual property protection.	Beto Garcia Architectural Specs Manager 204 Allison Drive, Taylor, TX 76784 512.595.8004 (office) 727.235.2073 (cell)	hgarcia@durcon.com	
Flooring	Interface	6/24/2021	Calls, Emails	Lab flooring options. Advice about seeking EPDS for products. Connections and advice for other MFRs.		Mikhail Davis Director, Technical Sustainability - Americas mikhail.davis@interface.com mobile +1 415-652-3099	mikhail.davis@interface.com	

Low Carbon Labs				Product Data				Product Category Rule				Type of EPD		Declared Unit		Life																		GWP Values (kg/CO2e)																	
Spec Section	LCA Category	LCA Subcategory	Display Name	Product Name	Product Description	Environmental Product Declaration (EPD)	Product Literature	Reference Link	0	PCR Name	Type of EPD	Ca lcu lation	Declared Unit Description	Unit Type	Declared Unit	Adjustment Factor to m²	Mass (kg)	2	Service Life (yrs)	1	A1-A3	A4	A5	B1	B2	B3	B4	C1	C2	C3	C4	D	A1-D	Biogenic Carbon	3	A1-A3 / kg	Biogenic Carbon / kg of product	Notes													
12 59 00	FURNITURE	SYSTEMS	PANEL BASED WORKSTATION	Knoll Dividends Horizon	Knoll	https://info.nsf.org/Certified/Sustainability/Products/1564-66330807/Knoll-B-EPD-Currents-Knoll.pdf	https://www.knoll.com/product/dividends-horizon%2Fsection-design			NSF International-BIFMA PCR for Office Furniture Workspace Products: UNCPC 3814	Product Specific		The functional unit is one square meter (1m2) of workspace for a period of 10 years. L shaped workstation with panel walls and pedestal storage.	Area	1 m²	1			15		4.54E+02																-	-													
12 59 00	FURNITURE	SYSTEMS	SPINE BASED WORKSTATION	Knoll Currents	Knoll	https://www.knoll.com/document/1564-66330807/Knoll-B-EPD-Currents-Knoll.pdf				NSF International-BIFMA PCR for Office Furniture Workspace Products: UNCPC 3814	Product Specific		The functional unit is one square meter (1m2) of workspace for a period of 10 years. L shaped workstation with panel walls and pedestal storage.	Area	1 m²	1			15		4.95E+02															-	-														
12 59 00	FURNITURE	SYSTEMS	BENCHING	Knoll Antenna Workspaces	Knoll	https://www.knoll.com/document/1564-66330807/Knoll-B-EPD-AntennaWorkspaces-final.pdf				NSF International-BIFMA PCR for Office Furniture Workspace Products: UNCPC 3814	Product Specific		The functional unit is one square meter (1m2) of workspace for a period of 10 years. Four linked desks with pedestal storage for each desk	Area	1 m²	1			15		2.70E+02															-	-														
12 59 00	FURNITURE	SYSTEMS	DESK	Steelcase B-Free Desk	Steelcase	https://www.steelcase.com/files/default/files/EPD_B-Free.pdf					Product Specific		The model chosen for analysis is the most representative line reference # N330107001 from the B-Free desk range. Standard features on this model include: 1600 x 800 mm top size 740 mm height facility manager sliding top function mobile brackets	Count	1 Desk			15		1.00E+02														-	-																
13 35 53	CASEWORK	COUNTERTOP	EPOXY COUNTER WOOD CLADDING	Durcon Greenstone	Epoxy Countertop	https://www.durcon.com/app/uploads/2020/10/Environmental-Product-Declaration-NE-27627673-wooden-decking-planned-timber-3-67626673-EN-16804.pdf	https://www.durcon.com/greenstone-woodtop-Bat-301-3-01-6			[No EPD Available]	Product Specific		EPD Not available		NA				30		NA														0.00E+00	-	-														
8 46 23	EXTERIOR	CLADDING		Acceya Wood - decking, cladding and planned timber for joinery applications		https://www.acceya.com/app/uploads/2020/10/Environmental-Product-Declaration-NE-27627673-wooden-decking-planned-timber-3-67626673-EN-16804.pdf				The CEN Norm EN 16804 serves as the core PCR	Product Specific		The declared unit is 1 m3 of Acceya planned timber	Volume	1 m³	1			60		-4.33E+02															-	-														

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Revit Quantity Data for all options and systems

LCA	1
Phase Created	New Construction
Type Comments	

Design Option	LCA Category	LCA Subcategory	LCA Spacetype	Type	#	VOLUME (m3)	AREA (m2)
Baseline	CASEWORK	COUNTERTOP	LAB		5	0	8
Baseline	CASEWORK	MOBILE BENCH	LAB		15	1	71
Baseline	CASEWORK	CABINETS	LAB		28	4	60
Baseline	DOORS		LAB		2	0	7
Baseline	EQUIPMENT	FUMEHOOD	LAB		1	2	16
Baseline	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Terracotta - Air	6	12	29
Baseline	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Terracotta - Concrete Masonry Units	6	12	29
Baseline	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Terracotta - Exterior Cladding Terracotta	6	12	29
Baseline	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Terracotta - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall	6	12	29
Baseline	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Terracotta - PW_ThermalProtection_RigidInsulation_Gray_Matte_Generic	6	12	29
Baseline	FURNITURE	CHAIRS	LAB		15	0	22
Baseline	FURNITURE	CHAIRS	OFFICE		12	0	24
Baseline	FURNITURE	SYSTEMS	OFFICE		9	0	26
Baseline	INTERIOR	FLOOR FINISH	LAB		1	0	112
Baseline	INTERIOR	FLOOR FINISH	OFFICE		1	2	66
Baseline	INTERIOR	PARTITIONS	LAB		15	44	356
Baseline	INTERIOR	CEILING	LAB		4	13	223
Baseline	INTERIOR	CEILING	OFFICE		2	14	133
Baseline	SUPERSTRUCTURE	COLUMN	LAB		6	3	
Baseline	SUPERSTRUCTURE	COLUMN	OFFICE		2	1	
Baseline	SUPERSTRUCTURE	SLAB	LAB		1	37	111
Baseline	SUPERSTRUCTURE	SLAB	OFFICE		1	14	69
Improved	CASEWORK	COUNTERTOP	LAB		4	0	7
Improved	CASEWORK	MOBILE BENCH	LAB		15	1	71
Improved	CASEWORK	CABINETS	LAB		27	3	56
Improved	DOORS		LAB		2	0	7
Improved	EQUIPMENT	FUMEHOOD	LAB		1	2	16
Improved	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Swisspearl - Air	6	11	29
Improved	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Swisspearl - Exterior Cladding Swisspearl	6	11	29
Improved	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Swisspearl - PW_Metal_Stud_Gray_Matte_Generic	6	11	29
Improved	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Swisspearl - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall	6	11	29
Improved	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Swisspearl - PW_ThermalProtection_RigidInsulation_Gray_Matte_Generic	6	11	29
Improved	FURNITURE	CHAIRS	LAB		15	0	22
Improved	FURNITURE	CHAIRS	OFFICE		12	0	24
Improved	FURNITURE	SYSTEMS	OFFICE		9	0	26
Improved	INTERIOR	FLOOR FINISH	LAB		1	0	113
Improved	INTERIOR	FLOOR FINISH	OFFICE		1	2	67
Improved	INTERIOR	PARTITIONS	LAB		15	48	388
Improved	INTERIOR	CEILING	LAB		4	13	223
Improved	INTERIOR	CEILING	OFFICE		2	14	133
Improved	SUPERSTRUCTURE	BEAM	LAB		6	1	
Improved	SUPERSTRUCTURE	BEAM	OFFICE		4	0	
Improved	SUPERSTRUCTURE	COLUMN	LAB		6	0	
Improved	SUPERSTRUCTURE	COLUMN	OFFICE		2	0	
Improved	SUPERSTRUCTURE	SLAB	OFFICE		1	30	180
Reimagined	CASEWORK	COUNTERTOP	LAB		4	0	7
Reimagined	CASEWORK	MOBILE BENCH	LAB		15	1	71
Reimagined	CASEWORK	CABINETS	LAB		27	3	56
Reimagined	DOORS		LAB		2	0	7
Reimagined	EQUIPMENT	FUMEHOOD	LAB		1	2	16
Reimagined	EQUIPMENT	OWNER EQUIPMENT	LAB		15	16	65
Reimagined	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Wood - Air	2	15	43
Reimagined	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Wood - Exterior Cladding Wood	2	15	43
Reimagined	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Wood - Laminated Veneer Lumber	2	15	43
Reimagined	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Wood - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall	2	15	43
Reimagined	EXTERIOR	OPAQUE	EXTERIOR	Exterior - Wood - PW_ThermalProtection_RigidInsulation_Gray_Matte_Generic	2	15	43
Reimagined	FURNITURE	CHAIRS	LAB		15	0	22
Reimagined	FURNITURE	CHAIRS	OFFICE		12	0	24
Reimagined	FURNITURE	SYSTEMS	OFFICE		9	0	26
Reimagined	INTERIOR	FLOOR FINISH	OFFICE		1	2	66
Reimagined	INTERIOR	PARTITIONS	LAB		15	48	391
Reimagined	SUPERSTRUCTURE	COLUMN	LAB		6	5	
Reimagined	SUPERSTRUCTURE	COLUMN	EXTERIOR	18" x 18"	4	4	

Low Carbon Labs												
Revit Quantity Data for all options and systems												
Design Option Category		Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D metal		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,WSB36 metal			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D metal		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D metal		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D metal		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Baseline	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D metal		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Baseline	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D metal		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Baseline	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D metal		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,WSB36 metal			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 metal		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Baseline	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,WSB36 metal			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Baseline	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0194678	0.851610833	0.7896755
Baseline	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0194678	0.851610833	0.7896755
Baseline	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0778712	3.342572521	3.158702
Baseline	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.038474096	1.662247812	1.560630948
Baseline	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0194678	0.851610833	0.7896755
Baseline	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Baseline	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Baseline	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Baseline	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK					

Design Option	Category	Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Baseline	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN' LAB		1.3167312	3.932248507	
Baseline	Specialty Equipment	New Construction	SE - Support - Vessels	Cylinder Generic 10x50		0	EQUIPMENT	OWNER EQUIPMEN' LAB		0.062472825	0.571017499	
Baseline	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN' LAB		1.3167312	3.932248507	
Baseline	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN' LAB		1.3167312	3.932248507	
Baseline	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN' LAB		1.3167312	3.932248507	
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta - Air		1	EXTERIOR		EXTERIOR	6.083619903	15.328995	
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta -		1	EXTERIOR		EXTERIOR	6.083619903	15.328995	
				PW_ThermalProtection_RigidInsulation_Gray_Matte								
				_Generic								
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta -		1	EXTERIOR		EXTERIOR	5.807091726	14.6322225	
				PW_ThermalProtection_RigidInsulation_Gray_Matte								
				_Generic								
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta - Concrete Masonry Units		1	EXTERIOR		EXTERIOR	5.807091726	14.6322225	
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta -		1	EXTERIOR		EXTERIOR	5.807091726	14.6322225	
				PW_Plaster_GypsumBoard_Gray_Matte_GenericWa								
				ll								
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta - Air		1	EXTERIOR		EXTERIOR	5.807091726	14.6322225	
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta -		1	EXTERIOR		EXTERIOR	6.083619903	15.328995	
				PW_Plaster_GypsumBoard_Gray_Matte_GenericWa								
				ll								
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta - Concrete Masonry Units		1	EXTERIOR		EXTERIOR	6.083619903	15.328995	
Baseline	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSâ„¢ (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		8.01288375	
Baseline	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSâ„¢ (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		8.01288375	
Baseline	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSâ„¢ (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		7.6644975	
Baseline	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSâ„¢ (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		7.6644975	
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta - Exterior Cladding Terracotta		1	EXTERIOR	OPAQUE	EXTERIOR	6.083619903	15.328995	
Baseline	Walls	New Construction	Basic Wall	Exterior - Terracotta - Exterior Cladding Terracotta		1	EXTERIOR	OPAQUE	EXTERIOR	5.807091726	14.6322225	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Baseline	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	

Design Option Category		Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Baseline	Ceilings	New Construction	Compound Ceiling	LAB CEILING - 1_ACT - PW_Ceiling_AcousticTile_White_LightGraySpeckles_24x24-Generic_APC2 (New)		1	INTERIOR		LAB	3.8254227	66.9366115	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	2.718341887	21.9537869	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR		LAB	3.774662284	30.48500655	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	0.991235483	8.005141833	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	3.774662284	30.48500655	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR		LAB	2.718341887	21.9537869	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR		LAB	0.991235483	8.005141833	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR		LAB	3.62280246	29.25859824	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR		LAB	3.590284785	28.99597791	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	3.590284785	28.99597791	
Baseline	Ceilings	New Construction	Compound Ceiling	WRITE UP - 1_GWB - PW_Plaster_GypsumBoard_Gray_Matte_GenericFor Ceilings		1	INTERIOR		OFFICE	7.171788808	66.43629014	
Baseline	Ceilings	New Construction	Compound Ceiling			1	INTERIOR	CEILING	LAB	3.8254227	66.9366115	
Baseline	Ceilings	New Construction	Compound Ceiling			1	INTERIOR	CEILING	LAB	2.547020362	44.56733956	
Baseline	Ceilings	New Construction	Compound Ceiling			1	INTERIOR	CEILING	OFFICE	7.171788808	66.43629014	
Baseline	Doors	New Construction	081113_Single HG with Leaf	Type F 96" x 84"		1	INTERIOR	DOORS	LAB	0.133150565	3.628196827	
Baseline	Doors	New Construction	081113_Single HG with Leaf	Type F 96" x 84"		1	INTERIOR	DOORS	LAB	0.133150565	3.628196827	
Baseline	Floors	New Construction	Floor	EPOXY COATING - FLOORING - EPOXY COATING		1	INTERIOR	FLOOR FINISH	LAB	0.356909667	112.41263	
Baseline	Floors	New Construction	Floor	WRITE UP - 1_BROADLOOM - WRITEUP - 1_BROADLOOM		1	INTERIOR	FLOOR FINISH	OFFICE	2.109349649	66.43629014	
Baseline	Walls	New Construction	Curtain Wall	GENERIC (Butt Glazed) 6"		1	INTERIOR	GLAZING	LAB		20.43866	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR	PARTITIONS	LAB	0.991235483	8.005141833	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR	PARTITIONS	LAB	3.62280246	29.25859824	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR	PARTITIONS	LAB	2.718341887	21.9537869	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR	PARTITIONS	LAB	3.590284785	28.99597791	
Baseline	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa II		1	INTERIOR	PARTITIONS	LAB	3.774662284	30.48500655	
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	LAB	0.536380496		
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	LAB	0.536380496		
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	LAB	0.536380496		
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	LAB	0.54862571		
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	LAB	0.536380496		
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	LAB	0.54862571		
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	OFFICE	0.552439793		
Baseline	Structural Columns	New Construction	Concrete-Rectangular-Column	16 x 16		1	SUPERSTRUCTURE	COLUMN	OFFICE	0.552439793		
Baseline	Floors	New Construction	Floor	Concrete 13" - Concrete_CastInPlace_Gray		1	SUPERSTRUCTURE	SLAB	LAB	36.72492316	111.2203748	
Baseline	Floors	New Construction	Floor	Concrete 8" - Concrete_CastInPlace_Gray		1	SUPERSTRUCTURE	SLAB	OFFICE	13.94759716	68.63983317	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - Plywood	Sheathing	1		EXTERIOR			17.37555253	14.6322225
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - Plywood	Sheathing	1		EXTERIOR			17.37555253	14.6322225
Improved	Floors	New Construction	Floor	LW Concrete on Metal Deck - 6 1/2" - Concrete	Cast-in-Place gray	1		SUPERSTRUCTURE	SLAB		97.42427933	179.860208
Improved	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,WSB36 wood				CASEWORK	CABINETS		0.108588701	4.125514166	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	

Design Option Category		Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Improved	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,	WSB36 wood		1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Improved	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,	WSB36 wood		1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Improved	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,	WSB36 wood		1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Improved	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B,	WSB36 wood		1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Improved	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Improved	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Improved	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Improved	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Improved	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)			CASEWORK	COUNTERTOP		0.0194678	0.851610833	0.7896755
Improved	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.038474096	1.662247812	1.560630948
Improved	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0194678	0.851610833	0.7896755
Improved	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0194678	0.851610833	0.7896755
Improved	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0778712	3.342572521	3.158702
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Improved	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Improved	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
115313 - FUME HOOD - VERTICAL SLIDING SASH (STAND ALONE)						1	EQUIPMENT	FUMEHOOD	LAB	1.822942956	15.76786965	
Improved	Specialty Equipment	New Construction	115313 - FUME HOOD - VERTICAL SLIDING SASH (STAND	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Improved	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Improved	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Improved	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Improved	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Improved	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
M2055 - Shelving Storage Wire CRS w Adjustable Shelv						0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
Improved	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	Shelves		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
M2055 - Shelving Storage Wire CRS w Adjustable Shelv						0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
Improved	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	Shelves		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
Improved	Specialty Equipment	New Construction	SE - Support - Vessels	Cylinder Generic 10x50		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	0.062472825	0.571017499	
Improved	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Improved	Specialty Equipment	New Construction	SE - Support - Vessels	Cylinder Generic 10x50		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	0.062472825	0.571017499	
M2055 - Shelving Storage Wire CRS w Adjustable Shelv						0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
Improved	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	Shelves		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
Improved	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
M2055 - Shelving Storage Wire CRS w Adjustable Shelv						0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
Improved	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	Shelves		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	

Design Option	Category	Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - Air		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - PW_Metal_Stud_Gray_Matte_Generic		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - PW_ThermalProtection_RigidInsulation_Gray_Matte_Generic		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - Air		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - PW_ThermalProtection_RigidInsulation_Gray_Matte_Generic		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - PW_Metal_Stud_Gray_Matte_Generic		1	EXTERIOR		EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSät (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		8.01288375	
Improved	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSät (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		8.01288375	
Improved	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSät (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		8.01288375	
Improved	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSät (Screw Spline) 2-1/2" x 7-1/2"		1	EXTERIOR	GLAZING	EXTERIOR		8.01288375	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - Exterior Cladding Swisspearl		1	EXTERIOR	OPAQUE	EXTERIOR	5.296061976	14.6322225	
Improved	Walls	New Construction	Basic Wall	Exterior - Swisspearl - Exterior Cladding Swisspearl		1	EXTERIOR	OPAQUE	EXTERIOR	5.296061976	14.6322225	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Improved	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms		1	FURNITURE	CHAIRS	LAB	0.013428797	1	

Design Option Category		Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Improved	Ceilings	New Construction	Compound Ceiling	LAB CEILING - 1_ACT - PW_Ceiling_AcousticTile_White_LightGraySpeckles_24x24-Generic_APC2 (New)		1	INTERIOR		LAB	2.547020362	44.56733956	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	3.774662284	30.48500655	
Improved	Ceilings	New Construction	Compound Ceiling	LAB CEILING - 1_ACT - PW_Ceiling_AcousticTile_White_LightGraySpeckles_24x24-Generic_APC2 (New)		1	INTERIOR		LAB	3.8254227	66.9366115	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	3.774662284	30.48500655	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	1.83767818	14.84125425	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR		LAB	3.774662284	30.48500655	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR		LAB	1.83767818	14.84125425	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	2.866001844	23.14627741	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR		LAB	2.866001844	23.14627741	
Improved	Ceilings	New Construction	Compound Ceiling	WRITE UP - 1_GWB - PW_Plaster_GypsumBoard_Gray_Matte_GenericFor Ceilings		1	INTERIOR		OFFICE	7.171788808	66.43629014	
Improved	Ceilings	New Construction	Compound Ceiling			1	INTERIOR	CEILING	LAB	2.547020362	44.56733956	
Improved	Ceilings	New Construction	Compound Ceiling			1	INTERIOR	CEILING	LAB	3.8254227	66.9366115	
Improved	Ceilings	New Construction	Compound Ceiling			1	INTERIOR	CEILING	OFFICE	7.171788808	66.43629014	
Improved	Doors	New Construction	081113_Single HG with Leaf	Type F 96" x 84"		1	INTERIOR	DOORS	LAB	0.133150565	3.628196827	
Improved	Doors	New Construction	081113_Single HG with Leaf	Type F 96" x 84"		1	INTERIOR	DOORS	LAB	0.133150565	3.628196827	
Improved	Floors	New Construction	Floor	EPOXY COATING - FLOORING - EPOXY COATING		1	INTERIOR	FLOOR FINISH	LAB	0.357991211	112.7532743	
Improved	Floors	New Construction	Floor	WRITE UP - 1_BROADLOOM - WRITEUP - 1_BROADLOOM		1	INTERIOR	FLOOR FINISH	OFFICE	2.120165094	66.77693447	
Improved	Walls	New Construction	Curtain Wall	GENERIC (Butt Glazed) 6"		1	INTERIOR	GLAZING	LAB		14.70964167	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR	PARTITIONS	LAB	2.866001844	23.14627741	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR	PARTITIONS	LAB	3.740781541	30.21137818	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR	PARTITIONS	LAB	1.83767818	14.84125425	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR	PARTITIONS	LAB	3.774662284	30.48500655	
Improved	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll		1	INTERIOR	PARTITIONS	LAB	3.774662284	30.48500655	
Improved	Floors	New Construction	Floor	LW Concrete on Metal Deck - 6 1/2" - PW_Metal_AluminumDeck_DarkBronze_Anodized_ GrayShading_MRK		1	SUPERSTRUCTURE		OFFICE	29.69488427	179.860208	
Improved	Structural Framing	New Construction	W-Wide Flange	W24X84		1	SUPERSTRUCTURE	BEAM	LAB	0.10194353		
Improved	Structural Framing	New Construction	W-Wide Flange	W24X84		1	SUPERSTRUCTURE	BEAM	LAB	0.262914603		
Improved	Structural Framing	New Construction	W-Wide Flange	W24X84		1	SUPERSTRUCTURE	BEAM	LAB	0.25527225		
Improved	Structural Framing	New Construction	W-Wide Flange	W24X84		1	SUPERSTRUCTURE	BEAM	LAB	0.10194353		
Improved	Structural Framing	New Construction	W-Wide Flange	W24X84		1	SUPERSTRUCTURE	BEAM	LAB	0.10194353		
Improved	Structural Framing	New Construction	W-Wide Flange	W24X84		1	SUPERSTRUCTURE	BEAM	LAB	0.262914603		
Improved	Structural Framing	New Construction	W-Wide Flange	W16X31		1	SUPERSTRUCTURE	BEAM	OFFICE	0.057274591		
Improved	Structural Framing	New Construction	W-Wide Flange	W16X31		1	SUPERSTRUCTURE	BEAM	OFFICE	0.057274591		
Improved	Structural Framing	New Construction	W-Wide Flange	W18X40		1	SUPERSTRUCTURE	BEAM	OFFICE	0.05030804		
Improved	Structural Framing	New Construction	W-Wide Flange	W16X31		1	SUPERSTRUCTURE	BEAM	OFFICE	0.057274591		
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	LAB	0.074277887		
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	LAB	0.074277887		
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	LAB	0.074277887		
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	LAB	0.074277887		
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	LAB	0.074277887		

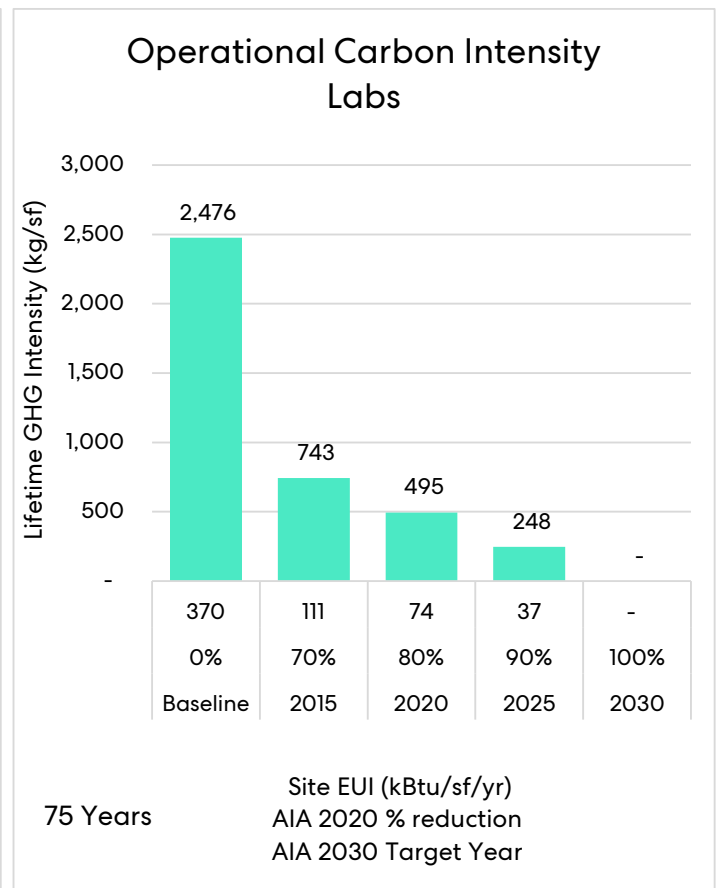
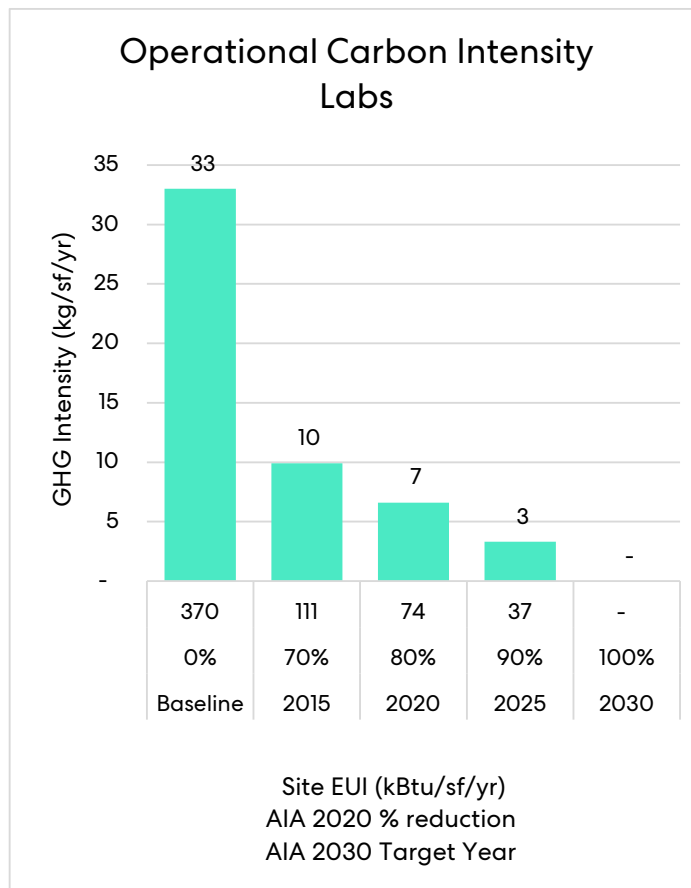
Design Option	Category	Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	LAB	0.074277887		
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	OFFICE	0.074277887		
Improved	Structural Columns	New Construction	W-Wide Flange-Column	W14X90		1	SUPERSTRUCTURE	COLUMN	OFFICE	0.074277887		
Reimagined	Floors	New Construction	Floor	CLT 7 PLY 9-5/8" - Softwood	Lumber			SUPERSTRUCTURE	SLAB		144.2628752	179.860208
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - Plywood	Sheathing		1	EXTERIOR			26.89062012	22.64510625
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - Plywood	Sheathing		1	EXTERIOR			23.71885364	19.974145
Reimagined	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B/WSB36 wood				CASEWORK	CABINETS		0.108588701	4.125514166	
Reimagined	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B/WSB36 wood			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B/WSB36 wood			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B/WSB36 wood			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B/WSB36 wood			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - CASEWORK - BASE CABINET - WOOD - SINK B/WSB36 wood			1	CASEWORK	CABINETS	LAB	0.108588701	4.125514166	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Reimagined	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Reimagined	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Reimagined	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553 - FH MOBILE - COMBO CABINET D - 18X28.5	FH Mobile Combo Cabinet D- 18x28.5 wood		1	CASEWORK	CABINETS	LAB	0.168799694	1.293698096	
Reimagined	Casework	New Construction	123553_Casework-BaseCabinet-Wood-CombinationCa	WIC1836 - 18"W x 36"H x 22"D		1	CASEWORK	CABINETS	LAB	0.061181196	2.485341643	
Reimagined	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP		0.0194678	0.851610833	0.7896755
Reimagined	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0194678	0.851610833	0.7896755
Reimagined	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0194678	0.851610833	0.7896755
Reimagined	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.0778712	3.342572521	3.158702
Reimagined	Casework	New Construction	123553 - COUNTERTOP - STRAIGHT	30" Deep x 36" High (Backsplash)		1	CASEWORK	COUNTERTOP	LAB	0.038474096	1.662247812	1.560630948
Reimagined	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Reimagined	Casework	New Construction	123554_Lab Casework-Mobile Table	6'-0"		1	CASEWORK	MOBILE BENCH	LAB	0.058776205	2.798219005	
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
Reimagined	Casework	New Construction	123553 - FH DISTINCTION - 6 FT	FH Distinction - 6 ft STAINLESS		1	CASEWORK	MOBILE BENCH	LAB	0.094244767	5.247662002	1.393545
115313 - FUME HOOD - VERTICAL SLIDING SASH												
Reimagined	Specialty Equipment	New Construction	115313 - FUME HOOD - VERTICAL SLIDING SASH (STAND	(STAND ALONE)		1	EQUIPMENT	FUMEHOOD	LAB	1.822942956	15.76786965	
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Reimagined	Specialty Equipment	New Construction	SE - Support - Vessels	Cylinder Generic 10x50		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	0.062472825	0.571017499	
Reimagined	Specialty Equipment	New Construction	SE - Support - Vessels	Cylinder Generic 10x50		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	0.062472825	0.571017499	
M2055 - Shelving Storage Wire CRS w Adjustable Shelv												
Reimagined	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	Shelves		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
M2055 - Shelving Storage Wire CRS w Adjustable Shelv												
Reimagined	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	Shelves		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
M2055 - Shelving Storage Wire CRS w Adjustable Shelv												
Reimagined	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	Shelves		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.112926445	6.562888053	
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR		0	EQUIPMENT	OWNER EQUIPMEN`	LAB	1.3167312	3.932248507	

Design Option Category	Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR	0	EQUIPMENT	OWNER EQUIPMEN` LAB		1.3167312	3.932248507	
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR	0	EQUIPMENT	OWNER EQUIPMEN` LAB		1.3167312	3.932248507	
Reimagined	Specialty Equipment	New Construction	M2055 - Shelving Storage Wire CRS w Adjustable Shelv	M2055 - Shelving Storage Wire CRS w Adjustable Shelves	0	EQUIPMENT	OWNER EQUIPMEN` LAB		1.112926445	6.562888053	
				M2055 - Shelving Storage Wire CRS w Adjustable Shelves	0	EQUIPMENT	OWNER EQUIPMEN` LAB		1.112926445	6.562888053	
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR	0	EQUIPMENT	OWNER EQUIPMEN` LAB		1.3167312	3.932248507	
Reimagined	Specialty Equipment	New Construction	Lab Equipment Matrix	01-REFRIGERATOR	0	EQUIPMENT	OWNER EQUIPMEN` LAB		1.3167312	3.932248507	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - Laminated Veneer Lumber	1	EXTERIOR		EXTERIOR	7.229497807	19.974145	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll	1	EXTERIOR		EXTERIOR	7.229497807	19.974145	
					1	EXTERIOR		EXTERIOR	7.229497807	19.974145	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - Air	1	EXTERIOR		EXTERIOR	7.229497807	19.974145	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - PW_ThermalProtection_RigidInsulation_Gray_Matte _Generic	1	EXTERIOR		EXTERIOR	7.229497807	19.974145	
					1	EXTERIOR		EXTERIOR	8.196251057	22.64510625	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - PW_Plaster_GypsumBoard_Gray_Matte_GenericWa ll	1	EXTERIOR		EXTERIOR	8.196251057	22.64510625	
					1	EXTERIOR		EXTERIOR	8.196251057	22.64510625	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - PW_ThermalProtection_RigidInsulation_Gray_Matte _Generic	1	EXTERIOR		EXTERIOR	8.196251057	22.64510625	
					1	EXTERIOR		EXTERIOR	5.3419225		
Reimagined	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSâ„† (Screw Spline) 2-1/2" x 7-1/2"	1	EXTERIOR	GLAZING	EXTERIOR		5.3419225	
Reimagined	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSâ„† (Screw Spline) 2-1/2" x 7-1/2"	1	EXTERIOR	GLAZING	EXTERIOR		4.006441875	
Reimagined	Walls	New Construction	Curtain Wall	Kawneer - 1600 SSâ„† (Screw Spline) 2-1/2" x 7-1/2"	1	EXTERIOR	GLAZING	EXTERIOR		4.006441875	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - Exterior Cladding Wood	1	EXTERIOR	OPAQUE	EXTERIOR	7.229497807	19.974145	
Reimagined	Walls	New Construction	Basic Wall	Exterior - Wood - Exterior Cladding Wood	1	EXTERIOR	OPAQUE	EXTERIOR	8.196251057	22.64510625	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction	Coalesse_Kart_StoolOnCasters	Non-Upholstered wo/Arms	1	FURNITURE	CHAIRS	LAB	0.013428797	1.458204617	
Reimagined	Furniture	New Construction									

Design Option Category		Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Reimagined	Ceilings	New Construction	Compound Ceiling	LAB CEILING - 1_ACT - PW_Ceiling_AcousticTile_White_LightGraySpeckles_24x24-Generic_APC2 (New)			INTERIOR			2.547020362	44.56733956	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	2.417858154	19.52704931	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	2.726252242	22.01767032	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR		LAB	3.598347112	29.06108864	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR		LAB	2.417858154	19.52704931	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR		LAB	3.774662284	30.48500655	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	3.774662284	30.48500655	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	3.598347112	29.06108864	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Metal_Stud_Gray_Matte_Generic		1	INTERIOR		LAB	3.630937808	29.32429869	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR		LAB	3.630937808	29.32429869	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR		LAB	2.726252242	22.01767032	
Reimagined	Ceilings	New Construction	Compound Ceiling				INTERIOR	CEILING		2.547020362	44.56733956	
Reimagined	Doors	New Construction	081113_Single HG with Leaf	Type F 96" x 84"		1	INTERIOR	DOORS	LAB	0.133150565	3.628196827	
Reimagined	Doors	New Construction	081113_Single HG with Leaf	Type F 96" x 84"		1	INTERIOR	DOORS	LAB	0.133150565	3.628196827	
Reimagined	Floors	New Construction	Floor	EPOXY COATING - FLOORING - EPOXY COATING			INTERIOR	FLOOR FINISH		0.356909667	112.41263	
Reimagined	Floors	New Construction	Floor	WRITE UP - 2_CARPET TILE - WRITEUP_2-CARPET TILE		1	INTERIOR	FLOOR FINISH	OFFICE	2.109349649	66.43629014	
Reimagined	Walls	New Construction	Curtain Wall	GENERIC (Butt Glazed) 6"		1	INTERIOR	GLAZING	LAB		4.490311667	
Reimagined	Walls	New Construction	Curtain Wall	GENERIC (Butt Glazed) 6"		1	INTERIOR	GLAZING	LAB		4.490311667	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR	PARTITIONS	LAB	2.726252242	22.01767032	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR	PARTITIONS	LAB	3.630937808	29.32429869	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR	PARTITIONS	LAB	3.774662284	30.48500655	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR	PARTITIONS	LAB	3.598347112	29.06108864	
Reimagined	Walls	New Construction	Basic Wall	Interior Wall - Tally - PW_Plaster_GypsumBoard_Gray_Matte_GenericWall		1	INTERIOR	PARTITIONS	LAB	2.417858154	19.52704931	
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		3.065096956		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		4.439456244		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		3.065096956		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	11.5" x 27.5"			SUPERSTRUCTURE	BEAM		1.362971322		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		2.744364746		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		2.744364746		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		2.744364746		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		2.919969259		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		2.89529755		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		4.439456244		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	4'-4" x 1'-1 5/8"			SUPERSTRUCTURE	BEAM		4.439456244		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	11.5" x 27.5"			SUPERSTRUCTURE	BEAM		1.987126678		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	11.5" x 27.5"			SUPERSTRUCTURE	BEAM		1.987126678		
Reimagined	Structural Framing	New Construction	Glulam-Western Species	11.5" x 27.5"			SUPERSTRUCTURE	BEAM		1.987126678		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	EXTERIOR	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	EXTERIOR	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	EXTERIOR	0.8893245		

Design Option Category		Phase Created	Family	Type	Type Comments	LCA	LCA Category	LCA Subcategory	LCA Spacetype	LCA_VOLUME_M3	LCA_AREA_M2	LCA_AREA_COUNTER_M2
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	EXTERIOR	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	LAB	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	LAB	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	LAB	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	LAB	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	LAB	0.8893245		
Reimagined	Structural Columns	New Construction	Parallel Strand Lumber	18" x 18"		1	SUPERSTRUCTURE	COLUMN	LAB	0.8893245		
Reimagined	Floors	New Construction	Floor	Concrete 2" - Concrete_CastInPlace_Gray			SUPERSTRUCTURE	SLAB		9.136887467	179.860208	

AIA 2030 Target Year	AIA 2020 % reduction	Site EUI (kBtu/sf/yr)	Lifetime EUI (kBtu/sf)	GHG Intensity (kg/sf/yr)	Lifetime GHG Intensity (kg/sf)
Baseline	0%	370	27,750	33	2,476
2015	70%	111	8,325	10	743
2020	80%	74	5,550	7	495
2025	90%	37	2,775	3	248
2030	100%	-	-	-	-

AIA 2030 Design Data ExchangeDDx Support Page: <https://transform.aia.org/confluence/pages/viewpage.action?pageId=81756799>US National Avg EUI Laboratories **370** kBtu/sf/yr**Energy Star Portfolio Manager**Emissions Factors <https://portfoliomanager.energystar.gov/pdf/reference/Emissions.pdf?dee6-4951>Indirect GHG Factors - US Electricity **0.1182** kg CO₂e / kBtu**I2SL Lab Benchmarking tool (LBT)**Analysis <https://lbt.i2sl.org/buildings/charts>Avg GHG/EUI **0.1935** kg CO₂e / kBtu**I2SL LAB BENCHMARKING TOOL**

