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CLT Parking Garage Tally Analysis

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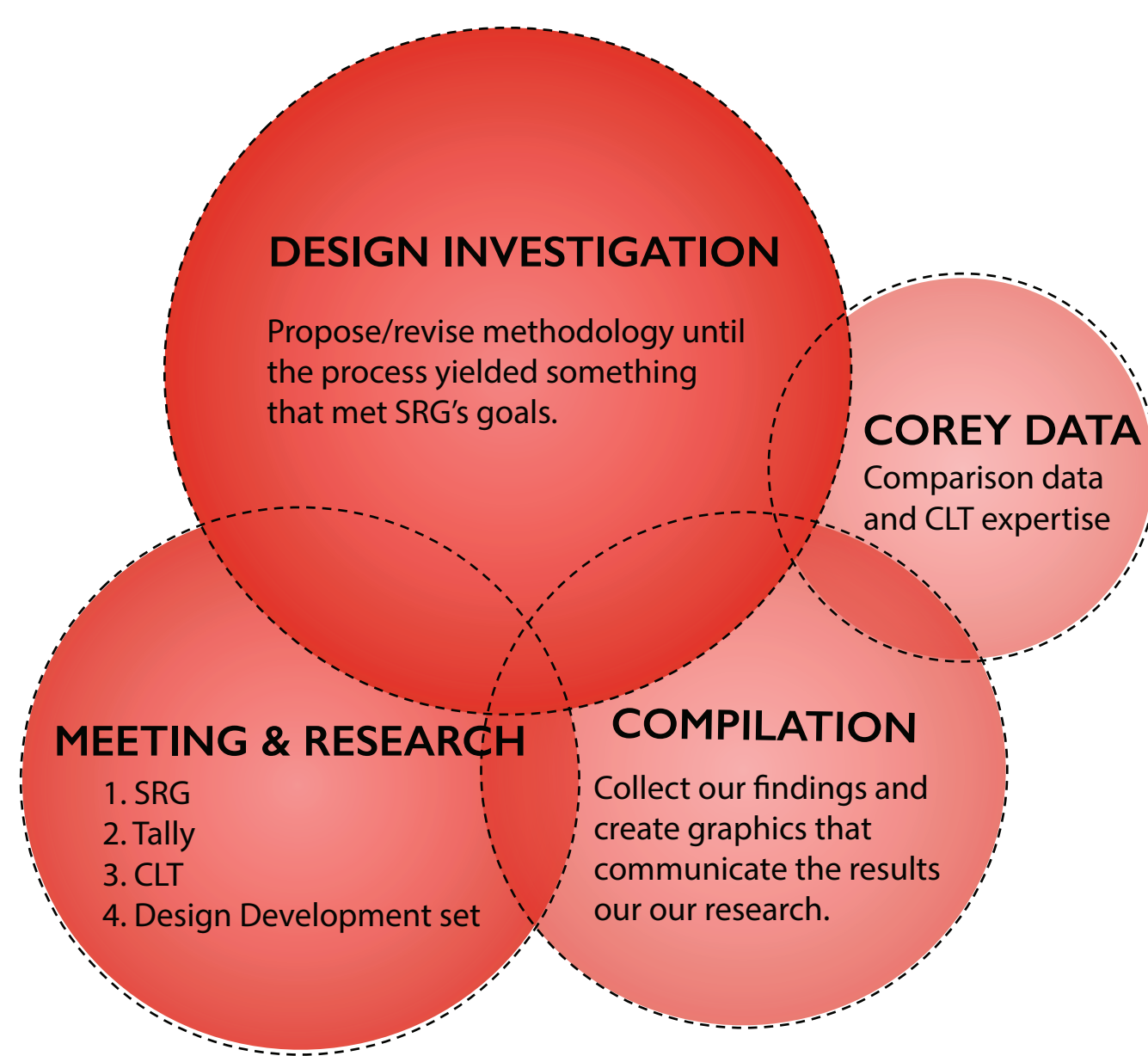
CLT Parking Garage Tally Analysis

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Introduction

The goal of this research project is divided into three components. First, utilize Tally to calculate the embodied energy and carbon of the CLT structural system of the Glenwood Parking Garage. Second, the embodied energy and carbon values will be compared against values found in a previous study for different structural systems in parking garages (pre-cast concrete, cellular steel, post-tensioned concrete). Finally, the subsequent dataset and process entailed in its generation will provide the basis for an evaluation of Tally as a tool for life cycle assessment as part of the design process. The assessment was completed using the established methodology for LCAs in conjunction with the the Autodesk Revit Plug-in Tally, developed by Kieran Timberlake Innovations and released in 2016. By doing so, this study analysis the role and accuracy of this new tool available to design teams, as well as the reduced environmental impact of an alternative structural system.

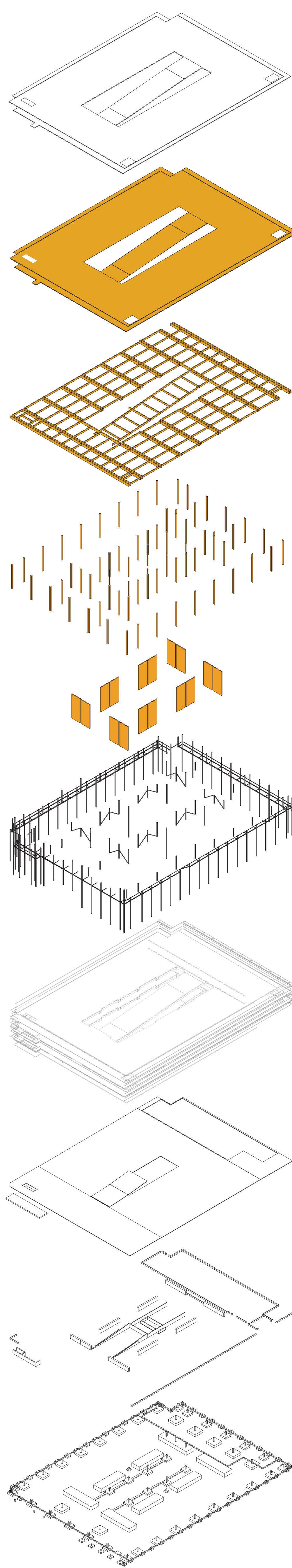
Methodology



Conclusion

After comparing the CLT structural system with the other parking garages, we concluded that it is comparable to the others in terms of its embodied energy, however its embodied carbon is significantly less.

Embodied Energy (MJ/ft ²)	Embodied Carbon (kgCO ₂ e/ft ²)
The total primary energy consumed during the processing of a material, including resource extraction, transportation, manufacturing and fabrication of construction.	Includes the carbon in the materials as well as the carbon emitted due to the processes used in making the material.



CONCRETE

CLT Panel

Glulam Beams

Glulam Columns

CLT Shear Wall

ENGINEERED WOOD

1,757,716.52 kg

STEEL

143,562.94 kg

FLOORS 1-3

Slabs

Walls

CONCRETE

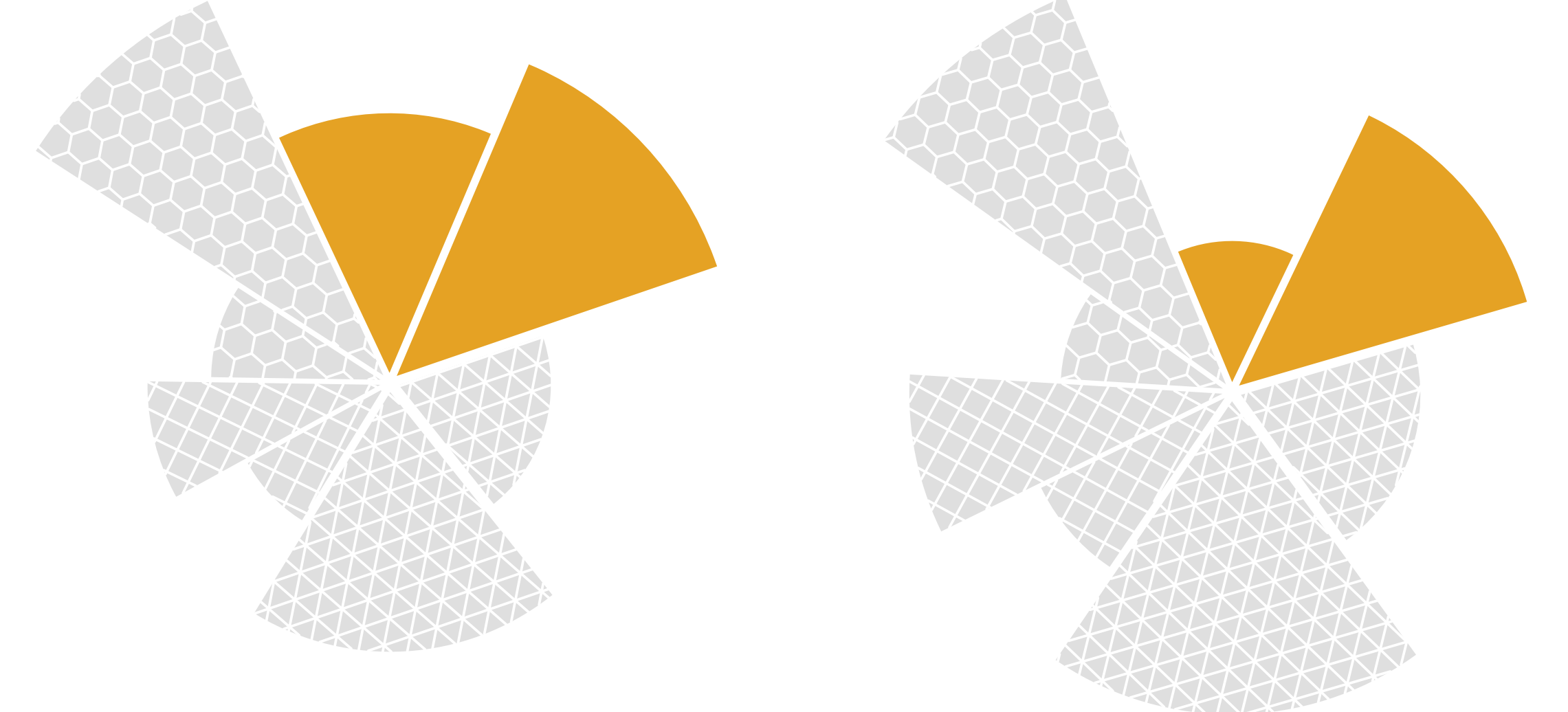
5,661,611.10 kg

Footings

Results

Embodied Energy Comparison (MJ/ft²)

Embodied Carbon Comparison (kgCO₂e/ft²)



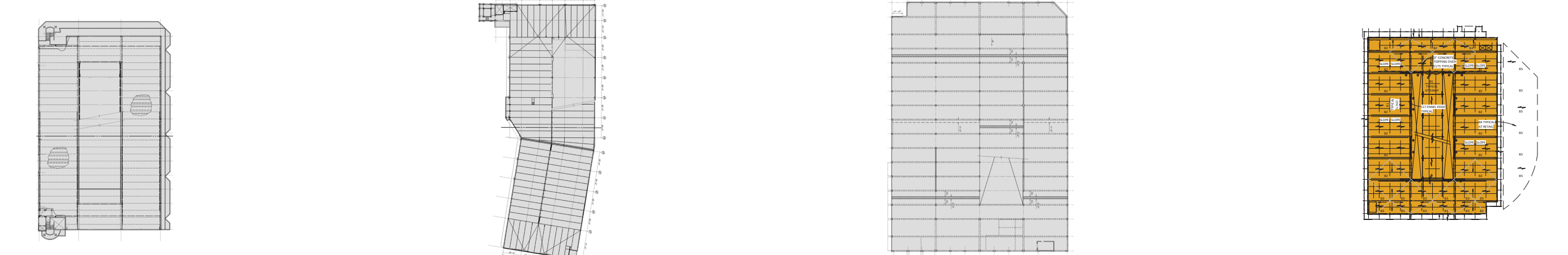
Pre-cast concrete

Cellular steel

Post-tensioned concrete

CLT

Plans at equivalent scale



Embodied Energy (Virgin v Best Practice)



Embodied Carbon (Virgin v Best Practice)

