



# Embodied Carbon Action Plan

JOHN A. MARTIN  
ASSOCIATES  
STRUCTURAL ENGINEERS



STRUCTURAL  
ENGINEERING  
INSTITUTE





*Cal Poly Pomona Student Services Building, LEED Platinum*

# Table of Contents

<b>01</b> Executive Summary	3
<b>02</b> Education Plan	4
<b>03</b> Knowledge Sharing Plan	5
<b>04</b> Reduction Strategy	6
<b>05</b> Reporting Plan	7
<b>06</b> Lessons Learned	8



## [ Mission Statement ]

*JAMA is committed to championing and engineering designs that aim to reduce embodied carbon to net zero by 2050.*



*Cooper Union Academic Building / 41 Cooper Square, LEED Platinum*

# 01/ Executive Summary

The built environment is responsible for approximately 40% of global carbon emissions. For buildings, the greenhouse gases emitted from extraction of raw materials, transportation, manufacturing, construction, maintenance, renovation, and end-of-life deconstruction, commonly known as embodied carbon, is responsible for 13% of that total.<sup>1</sup>

With the world's building floor area projected to double by 2060,<sup>2</sup> structural engineers have a unique and vital role in helping to minimize greenhouse gases emitted as part of the construction process. We are proud to be a member of SE 2050 and to bring our expertise to innovate designs that will reduce the negative impact of the built environment.

1. "Why The Built Environment." Architecture 2030, [architecture2030.org/why-the-building-sector/#:~:text=The%20built%20environment%20generates%2040,for%20an%20additional%2013%25%20annually.](https://architecture2030.org/why-the-building-sector/#:~:text=The%20built%20environment%20generates%2040,for%20an%20additional%2013%25%20annually.)

2. Ibid.



# 02/ Education Plan

JAMA's success in meeting the SE 2050 carbon goals will be achieved by an office-wide initiative of implementing carbon reduction practices. Therefore a high priority is placed on internal education which includes:

- Delivering an annual in-house presentation on embodied carbon and current sustainability-related industry trends and code requirements.
- Educating new employees on our current sustainability measures and goals as part of the new employee on-boarding process.
- Providing employees access to the SE 2050 library and a collection of other sustainability resources on our internal online library.
- Supporting an in-office "Green Initiative Team" that is committed to reducing our carbon footprint in our building designs, developing and using Life Cycle Assessment (LCA) tools to more accurately calculate carbon emissions of buildings, and making our internal office operations more sustainable.
- Sending office representatives to external conferences, educational webinars, and workshops to continue learning and promoting sustainable practices in structural engineering.



*San Diego State University Aztec Center Student Union, LEED Platinum*



# 03/ Reporting

JAMA is committed to reporting a minimum of four Life Cycle Assessments (LCAs) for both of our California offices. As part of our internal workflow, we are committed to developing and advancing our methods for calculating embodied carbon. As we continue to use Tally to perform LCA's, we will refine and grow our database of Environmental Product Declarations (EPDs) to increase the accuracy of our LCA analysis.



*LAPD Old Rampart Police Station & Essential Facility Renovation, LEED Platinum*



# 04/ Reduction Strategy

Reducing carbon emissions is a continuous process as new material alternatives and construction methodologies are invented. JAMA is committed to exploring and employing these strategies which currently include but are not limited to:

- Using performance based concrete specifications and the use of Type 1L cement.
- Exploring the use of calcined clay in concrete mixes.
- Championing the use of mass timber.
- Optimizing design with advanced analysis to decrease tonnage of structural material.
- Advocating the use of American-made steel using recycled content and electric arc furnaces.



*City of Santa Monica, City Hall East, Living Building Challenge Certified, Net Zero Water & Energy*



# 05/ Advocacy

As one of the largest private structural engineering firms in the Western United States, JAMA takes its potential to influence owners, designers, and institutions seriously. As part of our commitment to SE 2050, we have not only announced our participation on our website ([www.johnmartin.com](http://www.johnmartin.com)) but have also developed a plan of action to:

- Educate clients on our commitment to SE 2050 as well as encourage their participation in sustainable building design.
- Facilitate presentations from external companies on sustainable materials and practices for our employees and collaborators. This also extends to educational workshops and presentations from internal experts on the use of LCA tools and sustainable design practices.



*San Diego International Airport Airside Expansion, LEED Platinum  
(First airport project to ever achieve this goal)*



# 06/ Lessons Learned

One of the main lessons we learned in 2023 is that structural engineers are only one cog in the machine reducing embodied carbon in a building life cycle. There must be stringent code requirements and advocacy toward clients and architects to prioritize sustainable building design. Also, more research is needed in the development of carbon zero materials. There are ways to decrease CO2 emitted from each structural material - steel, concrete, timber, and masonry, but no material is completely carbon zero which is needed to fulfill SE 2050's commitment.

JAMA is committed to do our part in the industry to advocate for sustainable practices and research and development.



Caltech Linde+Robinson Laboratory for Global Environmental Science, LEED Platinum  
*Nation's first LEED Platinum Laboratory in a Historic Building*



JOHN A. MARTIN  
ASSOCIATES & T  
STRUCTURAL ENGINEERS