



EMBODIED CARBON ACTION PLAN 2024



*MIH 2023 Project of the Year
Waipahu High School*



STRUCTURAL
& FORENSIC
ENGINEERS



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& FORENSIC
ENGINEERS

ACTION SUMMARY

EDUCATION

Data Visualization
LCA Education
Lunch and Learns



REDUCTION

Sustainability
Review Program
CMU Specification
Submittal Review



REPORTING

(6) Building Project
Database Uploads
(3) Infrastructure
Project LCAs



ADVOCACY



SEAOH Sustainable
Design Committee
Client Presentations
Supplier Outreach
EPD Adoption



BIA 2022 - Grand Award
Brigham Young University - Hawaii Sciences Building

EMBODIED CARBON CHAMPION

Ryan Hobson is KAI Hawaii's Embodied Carbon Champion in 2024.

2023 YEAR IN REVIEW

- ✓ **EMBODIED CARBON INTEREST GROUP**
Continued and expanded our in-house KAI SE 2050 Committee
- ✓ **ONBOARDING**
Summarized committee objectives for 2024, with a brief introduction to SE 2050 and embodied carbon
- ✓ **FIRM WIDE PRESENTATIONS**
Presented lunch and learns in April and October on the activities of the

DATA VISUALIZATION

Provide a summary of data collected from SE 2050 projects, concrete database, systems and material comparisons, etc. through a clear and concise visual format.

LCA EDUCATION

Present and record an in-house training session on Life Cycle Assessment (LCA) using Tally; Share in-house spreadsheet for simple embodied carbon calculation with Hawaii-specific embodied carbon intensities.

LUNCH AND LEARN

Host (2) lunch and learn meetings during the year to share embodied carbon education and updates.



New employee onboarding materials



Iolani School - campus expansion

SUSTAINABILITY REVIEW PROGRAM

Develop guidelines for which projects would benefit from doing an in-house sustainability analysis.

CMU SPECIFICATIONS

Update specifications and general notes to aid consistent and efficient use of CMU assemblies.

SUBMITTAL REVIEW

Update submittal review checklist to include EPDs or GWP related items where applicable.

2023 YEAR IN REVIEW

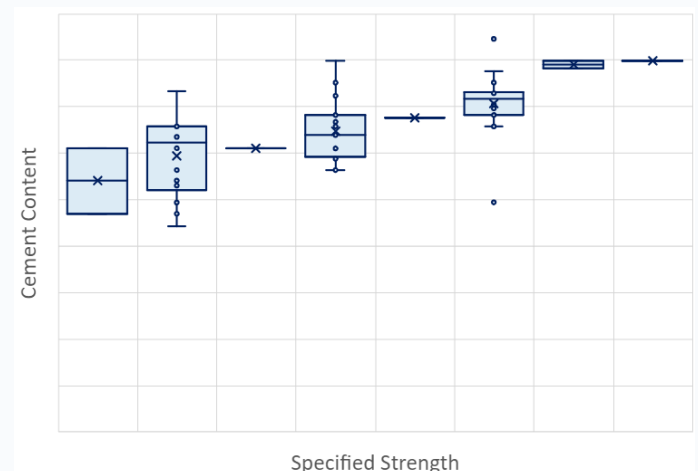
✓ CONCRETE DATABASE

Created a database of concrete mixes submitted by contractors on KAI-designed projects to inform the specification updates. We have reached over 100 mixes of various strengths and structural uses.

SPECIFICATIONS

Reviewed our standard specifications for concrete and updated them to include embodied carbon performance goals for both public sector and private sector standard specifications.

Partially complete; to be implemented in 2024



KAI Hawaii Concrete Database



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ADVOCACY



ESPACIO The Jewel of Waikiki
Hotel - adaptive reuse

2023 YEAR IN REVIEW

- ✓ **PUBLIC DECLARATION OF COMMITMENT**
Company website updated with an announcement of our SE 2050 participation :<https://kaihawaii.com/sustainability/>
- ✓ **ENGINEERING OUTREACH**
Presented at Structural Engineers Association of Hawaii (SEAOH) dinner meeting and wrote paper for SEAOH Convention
- ✓ **MATERIAL SUPPLIER ADVOCACY**
Shared SE 2050 participation with local ready mix suppliers and Cement and Concrete Products Industry of Hawaii

CLIENT PRESENTATIONS

Not complete; incorporated into 2024 goals

SEAOH SUSTAINABLE DESIGN COMMITTEE

Establish and lead this inaugural SEAOH committee.

ENGAGE SUPPLIERS IN SPEC UPDATES

Meet with local ready mix suppliers to discuss proposed concrete specification updates.

EPD ADOPTION

In our specifications for primary structural materials, require EPDs or a GWP calculation based on parameters we provide.

CLIENT PRESENTATIONS

Present on embodied carbon to (2) architecture firms and (1) state or county department or agency.



SEAOH/SEAOH Convention paper



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REPORTING



Daniel K. Inouye Int'l Airport Roadway Improvements

PROJECT UPLOADS TO THE SE 2050 DATABASE

Submit (6) building projects to the SE 2050 database, with LCA completed by (3) different KAI Hawaii staff.

INFRASTRUCTURE

Complete LCA of 3 infrastructure projects and report at least one case study internally.

Although not included in SE 2050 project reporting, infrastructure projects are a significant share of KAI Hawaii's work, and we are equally committed to collaborating with public agencies to pursue net zero embodied carbon on upcoming projects.

2023 YEAR IN REVIEW

✓ PROJECT UPLOADS

Submitted 3 projects to the SE 2050 Database

✓ IN-HOUSE REPORTING TOOL

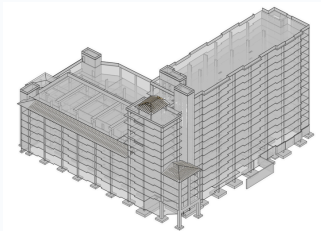
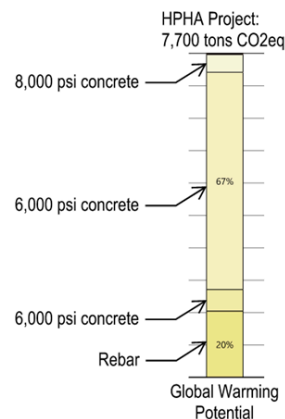
Created a tool for assessment of embodied carbon for building and infrastructure projects with Hawaii-specific embodied carbon intensities for structural materials

PROJECT COMPARISONS AND ANALYSIS

Submit two projects of a similar type so that embodied carbon data can be analyzed and compared.

Not complete; incorporated into 2024 goals

Life Cycle Assessment Using Tally



Example Project Life Cycle Assessment