



SE 250

Embodied Carbon Action Plan 2024



Saiful Bouquet has consistently pursued sustainability through Efficient, Resilient, and Innovative structural solutions.

As a firm, we believe that structural engineers have the power and responsibility to make a substantial difference in the worldwide effort to reduce the global warming potential of the built environment. This goal can only be achieved by changing the way the industry is currently approaching building design and by bringing innovation, creativity, and commitment to sustainable practices in the forefront of our design.

Saiful Bouquet formally committed to the SE 2050 Challenge in 2021, reflecting our dedication to reducing the carbon footprint and environmental impact of our projects, and we continue to be fully invested in this endeavor.

Our sustainability approach is grounded in proactive collaboration, assisting in early-stage decision making and studying the supply-chain logistics at project locations. Our aim is to develop and execute project-specific low-carbon material strategies, in addition to optimized structural design to meet and exceed the embodied carbon reduction targets for any project while avoiding a cost premium typically associated with low-carbon strategies.

Fueled by challenges, we embrace innovation and creativity as guiding principles in our pursuit of sustainable infrastructure. Additionally, we actively engage in industry-wide discussions on sustainability and advocate for embodied carbon reduction. We firmly believe in our capacity and responsibility to push the boundaries of traditional engineering toward a safer and more sustainable future.

Saiful Islam
Chairman & CEO





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01. | Sustainability Leaders

Education stands as a cornerstone of the SE 2050 mission.

Saiful Bouquet's culture revolves around continuous education and has always been a key factor of our continued success. Through our comprehensive education and training strategy, we empower all staff members to influence carbon reduction effectively on their projects.

Our Embodied Carbon Action Plans (ECAP) are driven by the Sustainability Committee, a group of passionate engineers deeply ingrained in Saiful Bouquet's culture of continuous education. This committee not only propels our engagement in SE 2050 but also advocates sustainable design across our Los Angeles and San Diego offices. By nurturing innovation and knowledge dissemination, they ensure every employee remains at the forefront of embodied carbon understanding and industry advancements.

Sustainability Committee

The Sustainability Committee within Saiful Bouquet pro-actively brainstorms and leads the Firm's engineering practices to achieve more sustainable solutions, while educating the office about State-of-the-Art practices.



Anibal Mendez
BIM Project Manager



**Farzad
Kouroshezhad**
Senior Engineer



Tao Li
Senior Project BIM
Designer Drafting

Rishabh Singhvi
SE2050 Embodied Carbon Champion

Project Manager
& Director of Sustainability



**Soumaya
El Mounni**
Project Engineer



Wesley Su
Engineer



Siddhant Jain
Project Engineer





02. | Education Plan

Since the signing of the SE2050 commitment, the firm has continuously engaged in a company-wide effort led by the Sustainability Committee in spreading awareness amongst all engineers and developing resources that enable a standardized approach towards sustainability. The internal education focuses on 4 key areas:

Conducting Internal Embodied Carbon Sessions

aiming at educating firm management and employees on the latest developments in sustainability and policy changes. Led by our Sustainability Director, these internal sessions aim to provide engineers with a comprehensive understanding of importance of embodied carbon in the built environment and share successful strategies implemented by Saiful Bouquet to address this challenge. The internal sessions also aim to educate management and engineers about 2022 CalGreen and BuyCleanAct applicability and compliance requirements.

Enrolling Employees In External Webinars focused on embodied carbon, hosted by organizations like CLF, AIA, and SEAOSC Sustainability Committee. Recognizing that learning about embodied carbon reduction is an ongoing process, Saiful Bouquet mandates engineers to attend at least one seminar per semester on this topic. Additionally, the sustainability committee provides quarterly updates on state-of-the-art practices for embodied carbon reduction in the construction industry.



Organizing Training Sessions for a select group of employees to enhance their proficiency with LCA tools such as Tally. These sessions aim to empower employees with the knowledge and skills necessary to accurately assess and address embodied carbon in our projects.

Participating in Seminars and working sessions – Since 2023, participating in seminars and networking events has given our team valuable opportunities to connect with like-minded professionals who are passionate about sustainability. These interactions foster connections and collaborations that enhance our collective knowledge. Our Sustainability Committee actively reports back to the firm, ensuring that the latest insights and innovations in sustainable practices are shared and integrated into our projects. Looking ahead, Saiful Bouquet aims to co-chair a hub such as the Carbon Leadership Forum (CLF) Regional Hub to further engage with the sustainable design and engineering ecosystem.



Internal meeting at the Saiful Bouquet headquarters in Los Angeles



03. | Knowledge Sharing

Saiful Bouquet Structural Engineers is committed to advancing sustainable design through education and collaboration.

Client Engagement

We actively engage with architects, developers, and contractors through “Lunch & Learn” sessions. These sessions showcase how efficient structural designs can significantly reduce embodied carbon without sacrificing cost-effectiveness. We share detailed case studies and best practices, emphasizing the impact of early-stage structural decisions.

Industry Partnerships

We foster ongoing dialogue with local material suppliers and fabricators. This collaboration ensures we’re up-to-date on the latest low-carbon materials and production processes. We work together to identify cost drivers in specifications and find mutually beneficial solutions.

Education and Outreach

We believe in empowering the next generation of engineers. We regularly participate in informational sessions at colleges, highlighting the importance of sustainability and structural efficiency for a more sustainable future.



RESNICK SUSTAINABILITY

Caltech Resnick Sustainability Institute



■ 04. | Reduction Strategy

Saiful Bouquet Structural Engineers is committed to a holistic approach to reducing embodied carbon footprint of structural framing through a multi-pronged approach.

Early-Stage Design Optimization

We conduct comprehensive early-design studies comparing multiple structural framing options. These studies assess embodied carbon impact alongside cost considerations, providing clients with clear, data-driven insights to inform decision-making.

Performance-Based Specifications

Our specifications prioritize performance, allowing material suppliers flexibility to innovate and reduce embodied carbon. We require Environmental Product Declarations (EPDs) for all materials and, for projects with specific sustainability targets, provide procedures for material pre-approval, monitoring, and reporting.

Industry Collaboration

We actively engage with the National Ready Mixed Concrete Association (NRMCA) and major concrete suppliers to develop regional decarbonization strategies. This includes exploring alternative cementitious materials, use of high-performance aggregates, and other solutions that reduce reliance on traditional Portland cement.

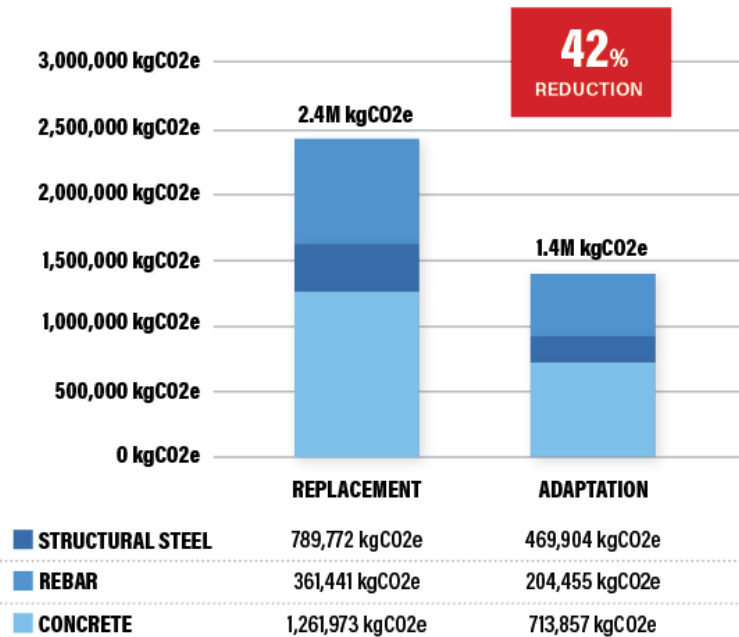


Adaptive Reuse Expertise

We specialize in structural solutions that maximize adaptive reuse of existing buildings. Our projects, such as the LA Times Press and LAX Terminal 3, demonstrate how we enable repurposing and extend the life of structures, reducing the need for new construction.

LAX Terminal 3

Total GWP: Replacement Vs Adaptation - by Material Category

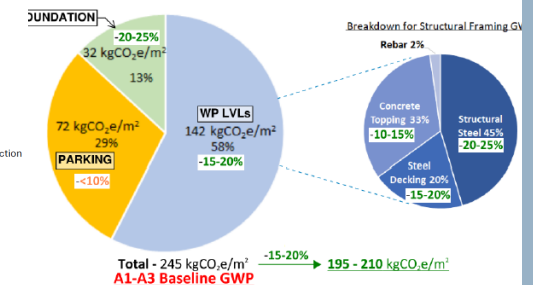


MULTIPLE STRUCTURAL SCHEMES STUDIES AT EARLY STAGES

Scheme Description	Above Podium (WPK1, WPK2, WPK3)	Relative Carbon Impact	Relative Cost Index	Flexibility for Future Modification	Typ. Floor-to-Floor Ht. for 10' Ceiling (Assuming 1.5m Slab)		
1 STEEL SCHEME	Steel Moment Frames in Long Dir. & Backed Reinforced Brace Frames (BRF) in the Short Dir.	1.8 - 2.8	55	High	15'-0"		
2 CONCRETE SCHEME - Alternate 1	Concrete Flat Slab w/ 8" Drop Panel	2.6 - 3.3	55 - 55+	Low - Moderate	16'-0"		May need to explore performance based design as Alternate Means of Compliance due to the impact of the New Code on Shear Wall Buildings (above 3-4 stories)
3 CONCRETE SCHEME - Alternate 2	Concrete Wide-Flange (21" Deep X 54" Wide) Beams with one-way slab	2.6 - 2.3	55	Moderate	15'-0"		
4 HYBRID - STEEL / TIMBER (CLT)	Steel Moment Frames in Long Dir. & Backed Reinforced Brace Frames (BRF) in the Short Dir. - CLT w/ 3" Concrete Topping Slab	1.3 - 1.5	55+	Moderate - High	15'-0"		
5 HYBRID - PRECAST CONCRETE / TIMBER (CLT)	Series: Cast-in-Place Shear Walls, Gravity Resist Columns and Precast + Solum Slab - CLT w/ 3" Concrete Topping Slab	1.80	55	Moderate	15'-0"		

STEEL SCHEME - OPPORTUNITIES

- **Structural Steel and Steel Decking** (reduce GWP by 15-25%)
 - Using steel with 90% or more recycled content (Nucor)
- **Foundation** (reduce by 20-25%)
 - Require Type 1L cement in all concrete mixes
 - Allow SCMs in the concrete mix
 - Specify 56-day strength instead of 28-day
 - Allow CarbonCure and similar processes
- **Parking** (reduce by <10%)
 - Majority of GWP for Parking comes from elevated concrete slabs
 - Limited acceptability of SCMs and local aggregates limit the reduction



Comprehensive early-design studies comparing structural framing options.



05. | Reporting Plan

To effectively gauge our performance standards, establishing a baseline for comparison is essential. By systematically tracking and collecting quantitative data, Saiful Bouquet can accurately evaluate our performance and ensure we meet design standards. The calculation of Embodied Carbon for structural materials will be based on the **volume take-off** of the structural materials based on the Structural Revit Models. The strength and material type of the structural elements is appropriately modeled in the Revit model which will be used to determine material specific volume take-offs.

Saiful Bouquet has been **actively collaborating with local manufacturers** and industry representatives to collect EPDs for various concrete mixes and mill-specific Rebar and Structural Steel EPDs. Structural specifications also request for EPDs on all structural materials so that our database of relevant EPDs grow consistently.

We have successfully used **Tally for Revit for conducting LCS analysis** on a number of projects. In addition, Saiful Bouquet has supported dedicated sustainability consultants with their choice of tool – **OneClick, EC3**, etc.



As structural engineers, our scope of reporting mainly focuses on the **cradle-to-gate** (A1-A3) portion of the full life cycle of the construction material. We believe that this is the scope that we have the most control and impact on when making early design decisions.

The material quantities are primarily based on the **Revit modeling**. For determining material quantities for reinforcement, structural elements are assigned with their corresponding rebar densities such that the total rebar quantity per element is calculated. Similarly, structural steel elements are assigned with a multiplier to account for miscellaneous steel required for connections and other details that will not be captured in the structural Revit model.



The One Beverly Hills development is designed to sets the standard for future green development.

Saiful Bouquet Structural Engineers

Los Angeles

725 S. Figueroa St. 37th Floor
Los Angeles, CA 90017
(213) 315-2277

San Diego

2020 Camino Del Rio North, Ste. 305
San Diego, CA 92108
(619) 630-9199

www.saifulbouquet.com

