

SE 2050 Embodied Carbon Action Plan

2026



ballinger

Introduction

The challenges that are easiest to meet are rarely the challenges that need us the most.



Since our beginnings, Ballinger has worked to artfully integrate architectural aspiration with engineering acumen to achieve each project's mission. Ours is a design culture, where experience and analytical tools ensure that complex, resource-intensive projects are environmentally responsible in both design and operation. Our interdisciplinary teams collaborate toward solutions that require disciplinary synthesis: the deep integration of architecture, planning, interior design, and engineering is key to achieving excellence in the design of transformative environments.

Our clients operate at the forefront of research, practice, and teaching that contributes directly to communal health. With core missions of knowledge sharing, innovation, and wellbeing, our clients help lead in visioning and realizing a more sustainable future as they educate the future leaders of our society and economy.

As architects, engineers, interior designers, and planners, we have a professional and ethical responsibility to our clients and the communities we serve to steward our shared resources and the built environment. Given the scale and often energy-intensive project types we work within and the collective footprint of our work, Ballinger is positioned to significantly reduce the environmental impact of the built environment.

As a firm, we overwhelmingly view holistic sustainability measures – reducing our carbon footprint, promoting health and wellbeing, and implementing an equitable and inclusive design process – as an integral measure of design excellence. We are committed to advancing our sustainability performance as a firm and further establishing ourselves as sustainability leaders, more broadly leveraging our strengths as a collaborative, interdisciplinary practice.

Sustainability at Ballinger

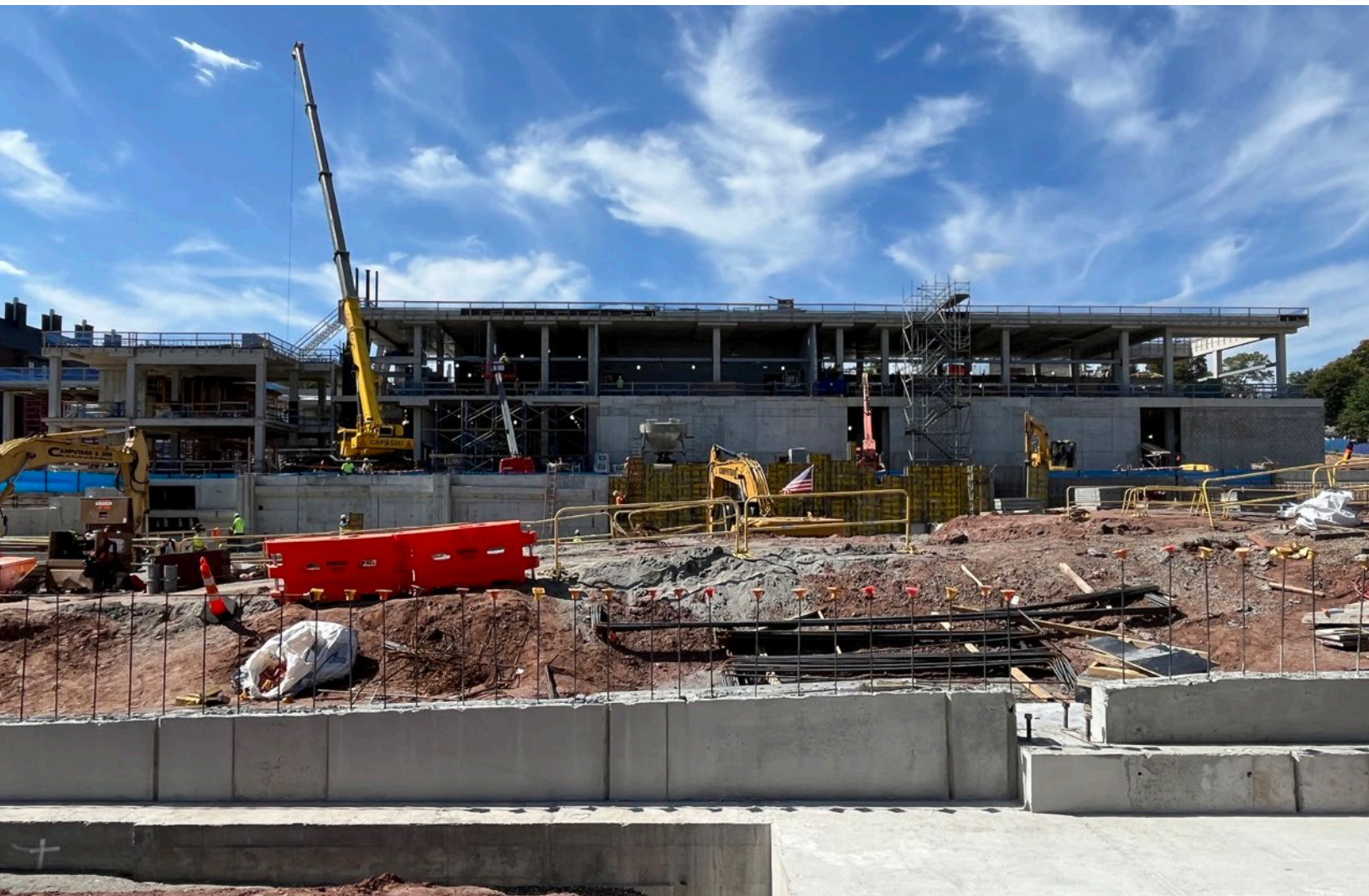
As architects, engineers, interior designers, and planners, we have a professional and ethical responsibility to our clients and the communities we serve to boldly direct our talent and expertise toward reversing the effects of the climate crisis in the built environment. The Sustainability Working Group meets regularly to advance this crucial mission. The Sustainability Working Group has also developed the Ballinger Sustainability Action Plan (SAP), which supports the advancement of sustainability performance in our work through the following:

- Firm-wide commitments across eleven design and operational measures

- 1 Equity
- 2 Site
- 3 Water
- 4 Operational Carbon
- 5 Embodied Carbon
- 6 Resiliency
- 7 Wellbeing
- 8 Post Occupancy Evaluation (POE)
- 9 Knowledge sharing
- 10 Community
- 11 Operations

- A consistent, intentional design process to support project teams in meeting these commitments
- Accountability measures to gauge our process
- Operations recommendations to reduce Ballinger's day-to-day impacts while enhancing health and wellbeing in our work environment

Central to Ballinger's commitment to resource stewardship is the recognition of the unparalleled role that creating, renovating, and operating buildings contributes to greenhouse gas (GHG) emissions. To this end, we have committed to the decarbonization of new and existing buildings – a commitment formalized in our active participation as signatories to the AIA 2030 Commitment, AIA Materials Pledge, Architects Declare, MEP 2040, and SE 2050 programs.



Embodied Carbon Action Plan

Education

One of the most impactful ways Ballinger can contribute to sustainable development is in education of our current and future professionals, clients, community members, and leaders to contribute to the requisitely multi-faceted creation of a truly sustainable future. Ballinger, as a multi-disciplinary firm, has the unique opportunity to learn from and educate one another in all aspects of the design process.

Checklist

REQUIRED

- Present Boston Society of Architects, “Embodied Carbon 101: Structure” during biweekly structural team meeting. Also, post link to “Embodied Carbon 101” series on company intranet site.
- Embodied Carbon Reduction Champion (ECRC): Ballinger’s ECRC is also the structural studio leader and a member of the firm’s sustainability group. The ECRC uses those roles to advocate for embodied carbon reduction in Ballinger’s work at firm- and project-wide levels, including changes to specifications, conducting LCAs, and encouraging designs with reduced concrete quantities. The ECRC and structural group has also been encouraging the use of mass timber during the conceptual design phase of projects, in the hope of branching into that field of structural design to reduce embodied carbon.

ELECTED

- Include “Embodied Carbon 101: Basic Literacy” and Embodied Carbon 101: Structure” webinars from Boston Society of Architecture as part of the new hire structural engineer on-boarding program.
- Educate the firm’s sustainability group on the lessons learned from the construction of concrete framed structures using alternative cementitious replacement materials. Understanding the construction impacts of these materials, both structurally and architecturally, will help improve our ability to expand their use in our typical projects.

Reduction Strategy

Ballinger aims to integrate embodied carbon reduction into our design process where possible. Current strategies include using performance-based concrete mix designs that require supplementary cementitious materials, listing maximum allowable embodied carbon values on the design drawings, and conducting LCAs to compare designs.

Checklist

ELECTED

- All new projects use revised concrete specifications and performance-based concrete mix designs that incorporate embodied carbon performance requirements. Ballinger also includes carbon capture and cement replacement alternatives where possible.
- Ballinger promotes and participates in LEED/Sustainability design charrettes.
- Ballinger’s sustainability group, consisting of architects and engineers across all disciplines in the A/E industry, meet once a month to discuss all facets of sustainability in the firm’s projects. Example topics include cement types and content in concrete, energy modeling procedures, LCA process and software, design process to promote sustainability goals, internal and external educational topics, etc.

Reporting

Ballinger has selected a steel-framed structure and a concrete-framed structure for the 2026 report as part of continuing effort to diversify our LCA data. The steel-framed structure is a three-story public health services facility that includes several large overhang conditions. The second project is a large seven-story concrete advanced research, lab, and classroom facility. The facility contains major vibration sensitive, below-grade research labs and significant areas of exposed and polished concrete surfaces.

Checklist

REQUIRED

- Submit two (2) projects to the SE 2050 database
- Include all structural material quantities in SE 2050 database submission.

Embodied Carbon Action Plan (Continued)

Advocacy

We are continually populating our firm intranet, B:hive, with sustainability resources across all disciplines. This firm-wide resource is a hub for all things sustainable, enabling us to share resources and report our project data. Ballinger also started a cross-disciplinary sustainability group that is open to all members of the firm and is working to promote sustainable design ideas in all facets of design. Additionally, we encourage everyone to participate in educational communities, such as the Carbon Leadership Forum, and more locally, the Delaware Valley Association of Structural Engineers (DVASE) and their Sustainability Committee. We want to educate ourselves and learn from other firms in our area.

Checklist

REQUIRED

- Describe the value of SE 2050 to clients: Ballinger has developed a Sustainability Action Plan that accompanies marketing materials and proposals. The Plan includes Ballinger's commitment to SE 2050, as well as AIA 2030 and MEP 2040, as part of a comprehensive approach to sustainability design and lowered embodied carbon.
- Share Ballinger's commitment to SE 2050 on our company website

ELECTED

- Ballinger is completing the construction document phase of large concrete-framed multi-phased research facility in 2025 that incorporates specific sustainability goals for concrete construction. The goals include utilizing concrete mix designs meeting GSA's Low Embodied Carbon Concrete Standards. Additionally, proprietary pozzolanic alternatives are being incorporated in concrete mixes to further lower the embodied carbon and to incorporate more recycled materials in the concrete structure.

Lessons Learned

- Engineers have used their LCA experience to improve the data that is modeled in the BIM process. The Ballinger Structural Revit User Group is working to include modeling data in the standard Revit model template that allows for a more streamlined LCA process using Tally.
- Past projects with extensive below grade concrete structures have resulted in high embodied carbon, due to the need for thick mat foundations and walls. Current projects with similar structural design requirements are being designed with increased cement replacement to help combat this issue.
- Early feedback from bidders on a large-scale concrete-framed structure have provided new insight on the use of a proprietary supplementary cementitious material. While obtaining the product at the required scale is not an issue, the use of the product is impacting the bidding process and causing the client to rethink their desire to require the product. Additionally, negative impacts of the product on early concrete compressive strength has resulted in several bidders proposing higher strength concrete than required by the contract documents, in order to achieve required early concrete strength for early re-shore activities. The project is still under bid and the full impact of these issues remains unknown; however, this situation has led us to choose this project for reporting in 2026 and 2027/2028. The goal is to learn how the LCA data changed from assumed quantities during design in 2026 to the as-built quantities in construction in 2027/2028.

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