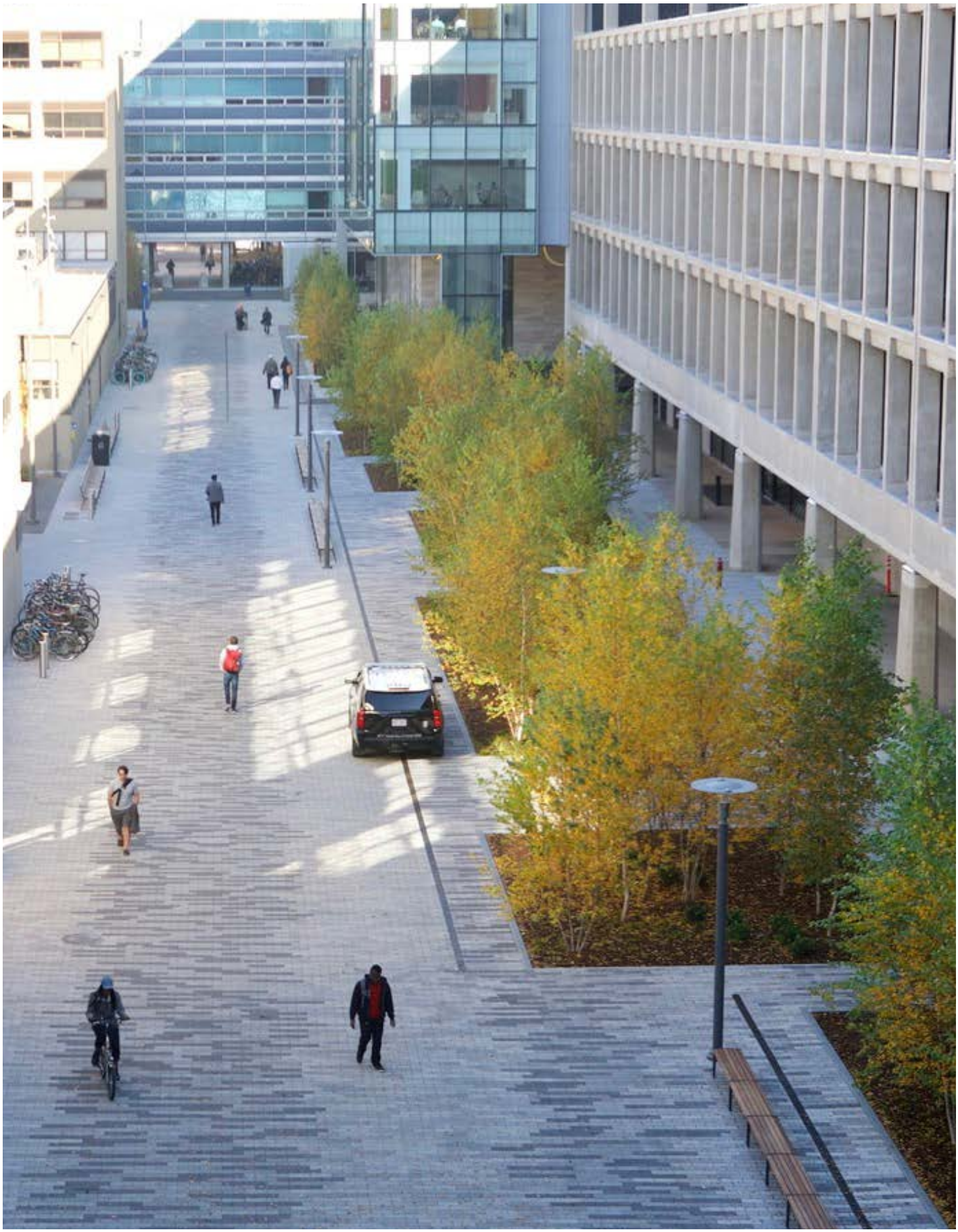
ANNUAL REPORT

2024 Carbon Assessment

REED–HILDERBRAND

2024 Carbon Assessment

REED+HILDERBRAND



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MIT North Corridor
Cambridge, MA

Executive Summary

In October 2024 Reed Hilderbrand pledged to work with the American Society of Landscape Architects (ASLA) towards the goals outlined in the ASLA's Climate Action Plan's Vision for 2040:

— Acheive zero embodied and operational emissions and increase carbon sequestration
— Provide significant economic benefits in the form of measurable ecosystem services and co-benefits, sequestration, and green jobs
— Address climate injustices, empower communities, and increase equitable distribution of climate investments
— Restore ecosystems and increase and protect biodiversity

Prompted to develop an approach, Reed Hilderbrand (RH) formed a climate action task force. The initial charge of the task force was to benchmark the firm's current carbon footprint and create a roadmap for reductions.

The task force followed the Common Reporting Format (CRF) for reporting of greenhouse gas emissions inventories outlined by the U.S. Environmental Protection Agency, consistent with the United Nations Framework Convention on Climate Change (UNFCCC). Data used to estimate the greenhouse gas emissions of our offices in Cambridge, Massachusetts and New Haven, Connecticut were collected from the United States Department of Energy (USDOE) Energy Usage Intensity (EUI) index. The calculation of embodied and anticipated operational emissions from Reed Hilderbrand's built projects completed in 2024 relied upon calculations made using Climate Positive Design's Pathfinder Tool version 3.1.

The effort to set a baseline for the practice yielded important insights into the opportunities and challenges that the practice and profession will face in meeting the ambitious goals of the ASLA Climate Action Plan. RH's climate action task force has identified three key areas for more attention in the coming year:

— Collaboration with peer firms on reporting standards
— Practicewide educational initiatives
— Prioritization of locally sourced and low carbon materials
— Evaluation of details and review of specifications

The Bruce Museum,
Greenwich, Connecticut

Approach

To meet the ASLA's Climate Action Plan goals to acheive zero embodied and operational emissions by 2040, firms will need to hit an interim target of **50 - 65% carbon emissions by 2030**, in keeping with the Paris Agreement's target to keep warming under 1.5 degrees celsius.

Reed Hilderbrand established a task force in October 2024 including members John Kett, Claire Fellman, Stephanie Hsia, Stephanie Pierce and Ted Marchant. Conducting the GHG assessment in-house with RH staff rather than with the assistance of a consultant presented a learning opportunity and developed expertise within the practice.

The team reviewed various evaluation and accounting tools with the goal of identifying an easily replicable methodology that could be integrated into the firm's typical project design and delivery process. The team selected Pathfinder and developed a spreadsheet-based system to complement the online tool in order to track inputs and outputs, and to document assumptions when Pathfinder's options differed from the details in the Construction Documentation sets.

The team explored benchmarking projects by typology and conducting a rough assessment using a sample of the largest projects. A simplified approach based on hardscape-to-planting area ratios was also considered. However, due to significant variability in project scale, typology, and design complexity across the firm's portfolio, the task force concluded that a project-specific, comprehensive assessment would provide more accurate and actionable insights. Moreover, the project-specific assessment presented a key learning opportunity at this early stage in the firm's understanding of the carbon impacts of our work.

Project assessments were based on bid documents that reached substantial completion in 2024 and excluded any prior phases of work previously completed on the respective sites. Where earthwork, pavements, and foundations were detailed in civil and structural drawing sets, the associated carbon impacts of these elements were incorporated into the total site work carbon footprint estimates.

Longwood Gardens,
Kennet Square, PA

INFORMATION GATHERING

1. Formation of RH task force
2. Review of peer presentations/ literature
3. Formation of working group with round table firms.

ESTABLISHING BASELINE 2024

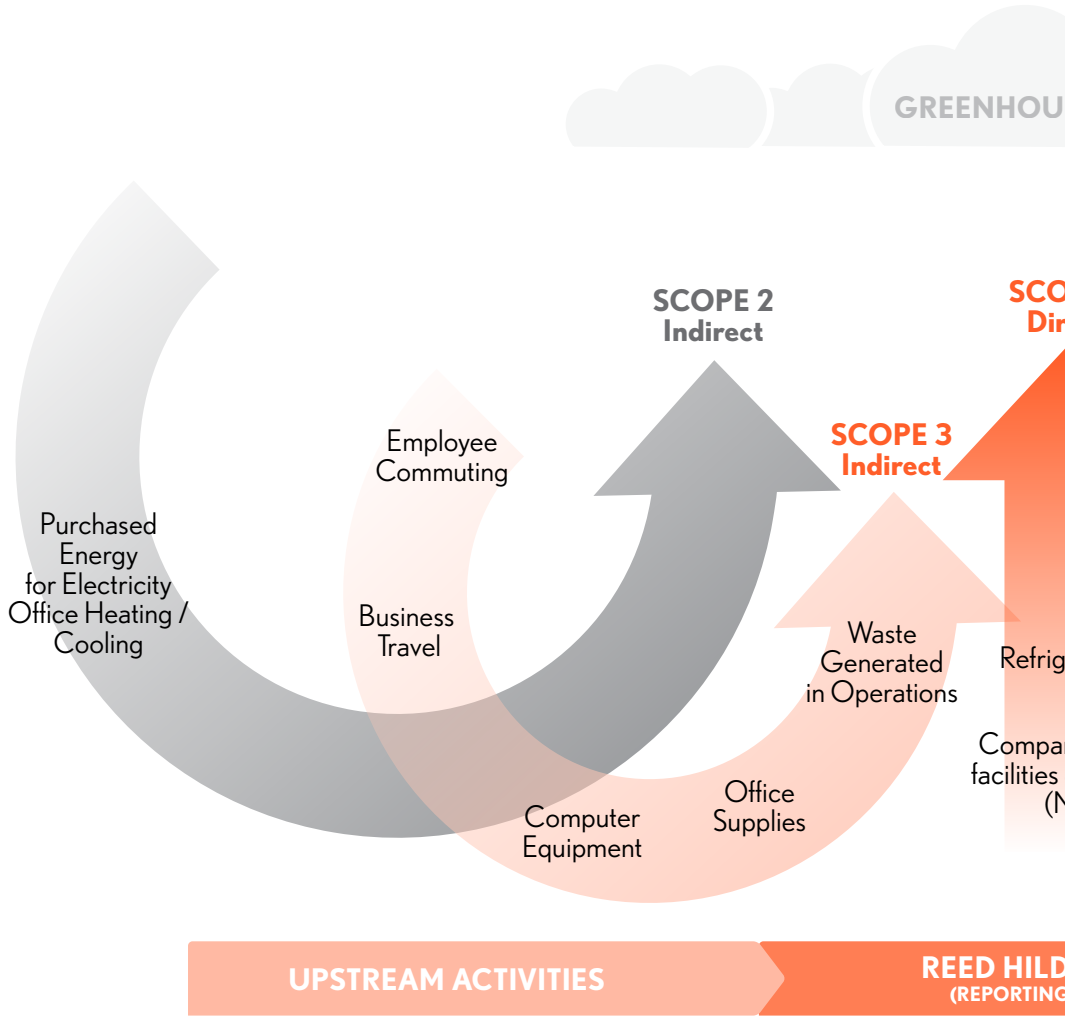
1. Work with RH Operations team to establish 2024 baseline for Scope 1,2 &3 GHG Emiassions.
2. Conduct employee survey

ASSESSMENT OF SCOPE 3 IMPACTS

1. Use Pathfinder to run a carbon life cycle analysis on projects RH built in 2024
2. Identify trends & areas of greatest potential emissions reduction.
3. Assess what's working well, where are we achieving greatest sequestration?
4. Identify patterns across project typology

CREATING A ROAD MAP TO REDUCTIONS

1. Analysis of RH standard details & re-tooling of specifications to meet lower emissions targets.
2. Develop literacy in carbon accounting and integrate into project work flows.
3. Develop stronger relationships with local suppliers in each project region.



GHG PROTOCOL

SCOPE 1: DIRECT EMISSIONS

Direct emissions are not applicable to Reed Hilderbrand since the company does not own its facilities and vehicles.

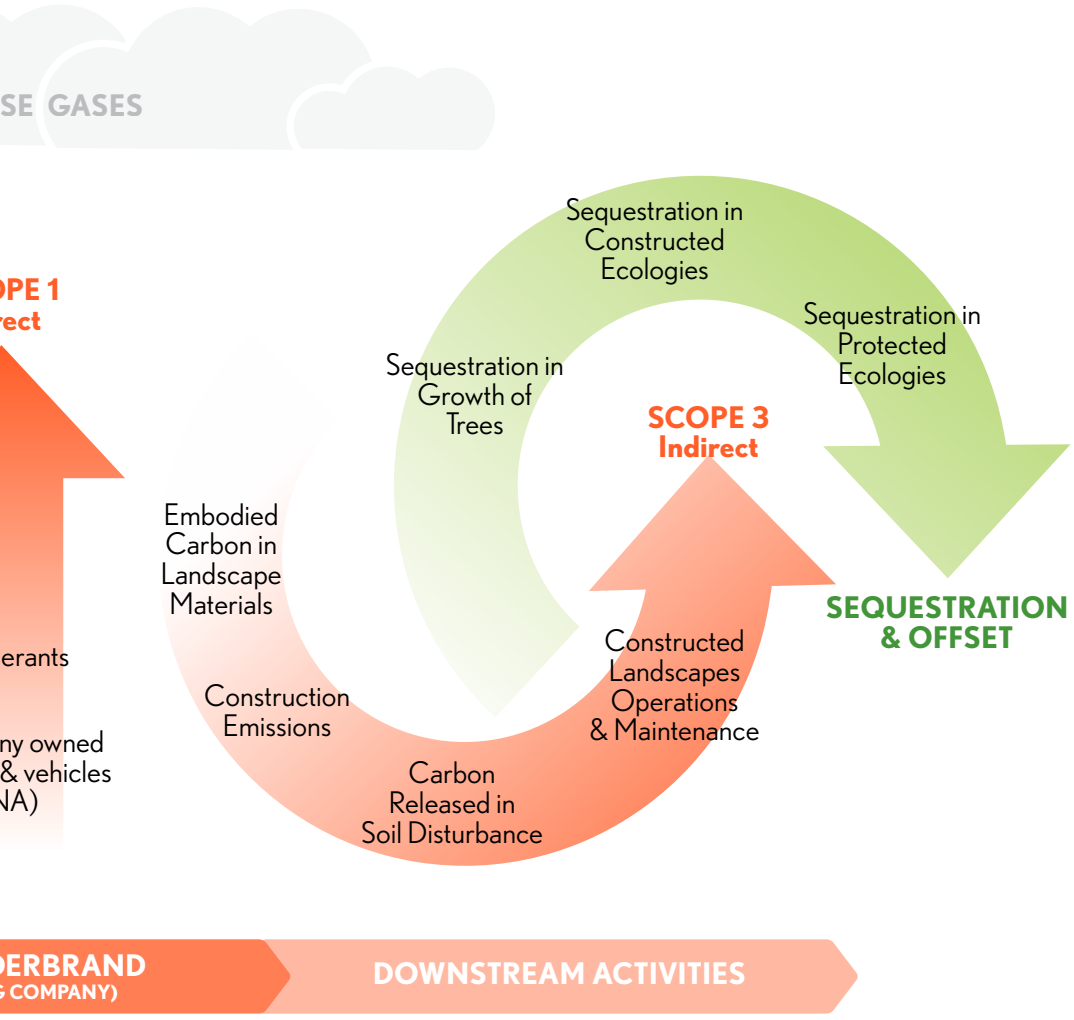
SCOPE 2: INDIRECT EMISSIONS

Working with the administrative and finance team, RH collected data on the indirect GHG emissions resulting from the generation of electricity, heating and cooling that RH purchased and consumed in 2024 in both Cambridge and New Haven offices.

SCOPE 3: INDIRECT DOWNSTREAM EMISSIONS

RH conducted an employee survey to capture commuting habits and worked with both DirectTravel and the finance team to estimate the business travel footprint, as well as contributions from equipment, office supplies and office waste.

RH conducted a full carbon assessment on all of our built projects from 2024. This process was beneficial for design staff to develop familiarity with the Path-finder Tool and the key contributing factors to both embodied and operational emissions within RH projects.



INVESTMENT

Staff across the office were engaged in the reporting effort including: the climate action task force, administrative and finance staff, a part time intern, and two designers who consulted with project managers for each project's life cycle assessment. Depending on the project scale and complexity the time to conduct each Project LCA ranged between 8 - 16 hours. Approximate effort on the 2024 assessment was:

PRINCIPAL	8 hours
ASSOCIATE PRINCIPAL	30 hours
SENIOR ASSOCIATE	30 hours
DESIGNER	80 hours
DESIGNER	40 hours
INTERN	50 hours
ADMINISTRATIVE STAFF	8 hours
TOTAL:	**~250 hours**

Findings

The largest contributors to Reed Hilderbrand's carbon footprint in 2024 were projects (93%) and business travel (5%). These results align with typical design practice profiles, where embodied carbon from materials, construction processes, and operational carbon associated with landscape maintenance over their lifespans constitute the primary impact sources.

SCOPE 3 PROJECT EMISSIONS

Reed Hilderbrand's total carbon footprint for 2024 was 8416 tons. For reference, this translates to 8442 acres of mature temperate forest sequestering carbon for 1 year, or 47 railcars worth of coal burned*. The team conducting the project assessments identified a number of factors that played a role in project carbon footprints:

- Pavements, site walls and foundations high in concrete & steel
- Distance materials travel before arriving on site
- Amount of regrading/earth moving
- Amount of aggregate subbase imported
- Anticipated mowing and irrigation practices
- Carbon footprint of existing regional water supply
- Existing conditions of the site prior to development
- Scale of disturbance/ability to protect existing high value ecologies

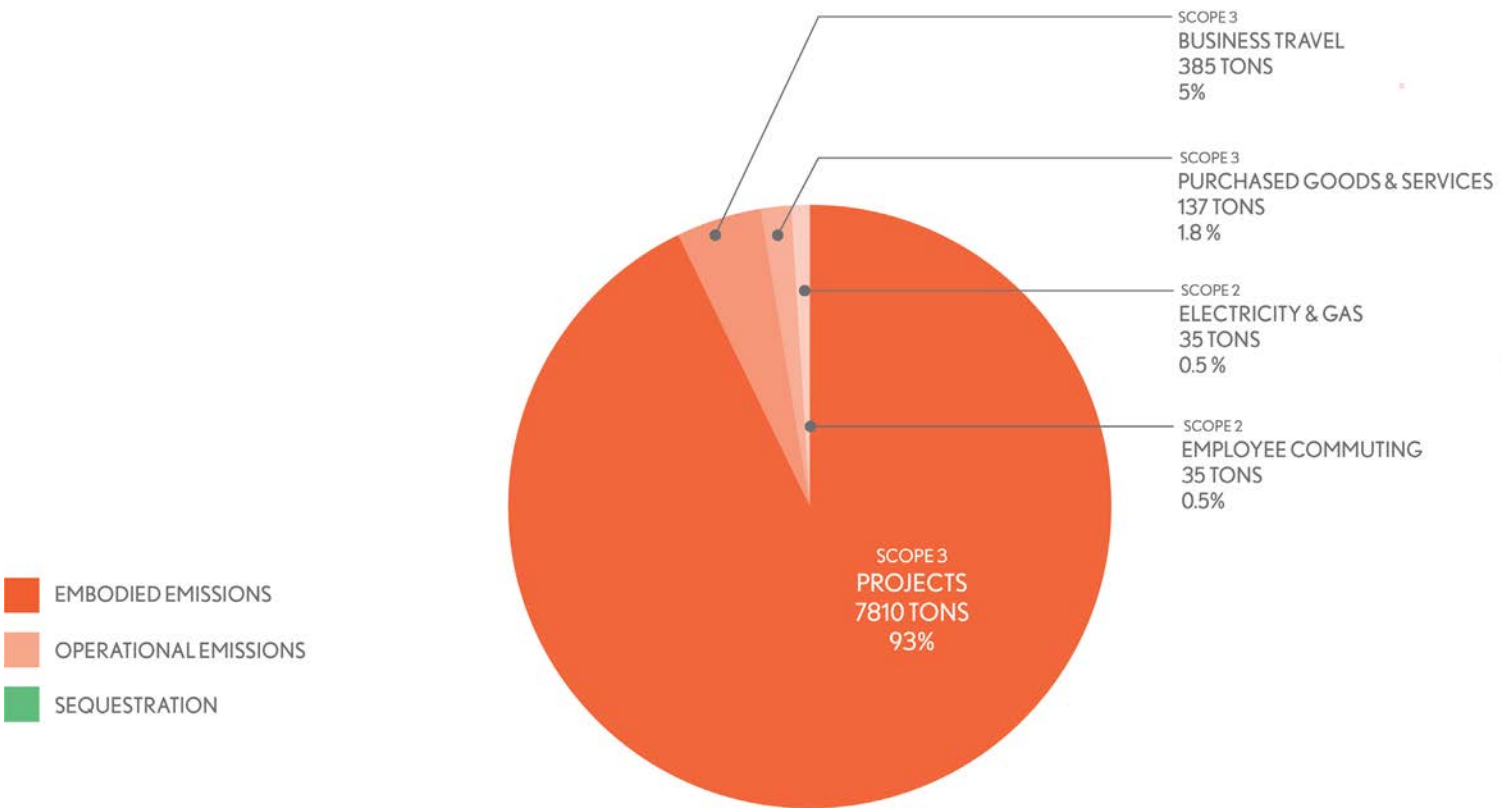
QUESTIONS & CONSIDERATIONS

It should be noted that the 2024 assessment represents RH's initial application of the Pathfinder Tool for Life Cycle Assessment (LCA). Although efforts were made to maintain consistency across projects, several questions arose during the process that will require further review and training to acheive consistent reporting. Moving forward, collaboration among firms and with the ASLA will be critical to establishing clear reporting standards for landscape architecture.

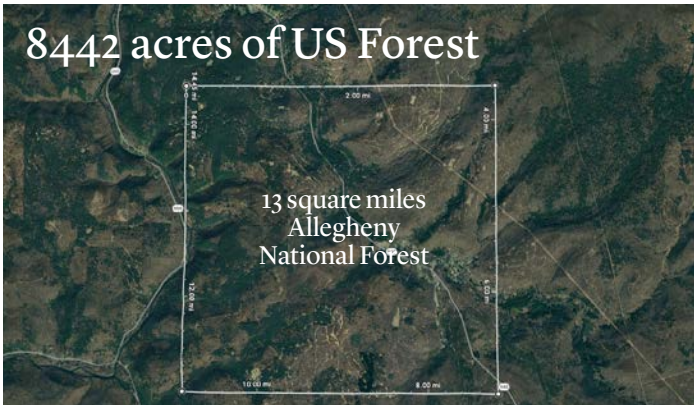
Volunteers installing planting at the 'Palmer Plant-Out', Palmer Museum of Art, State College, Pennsylvania

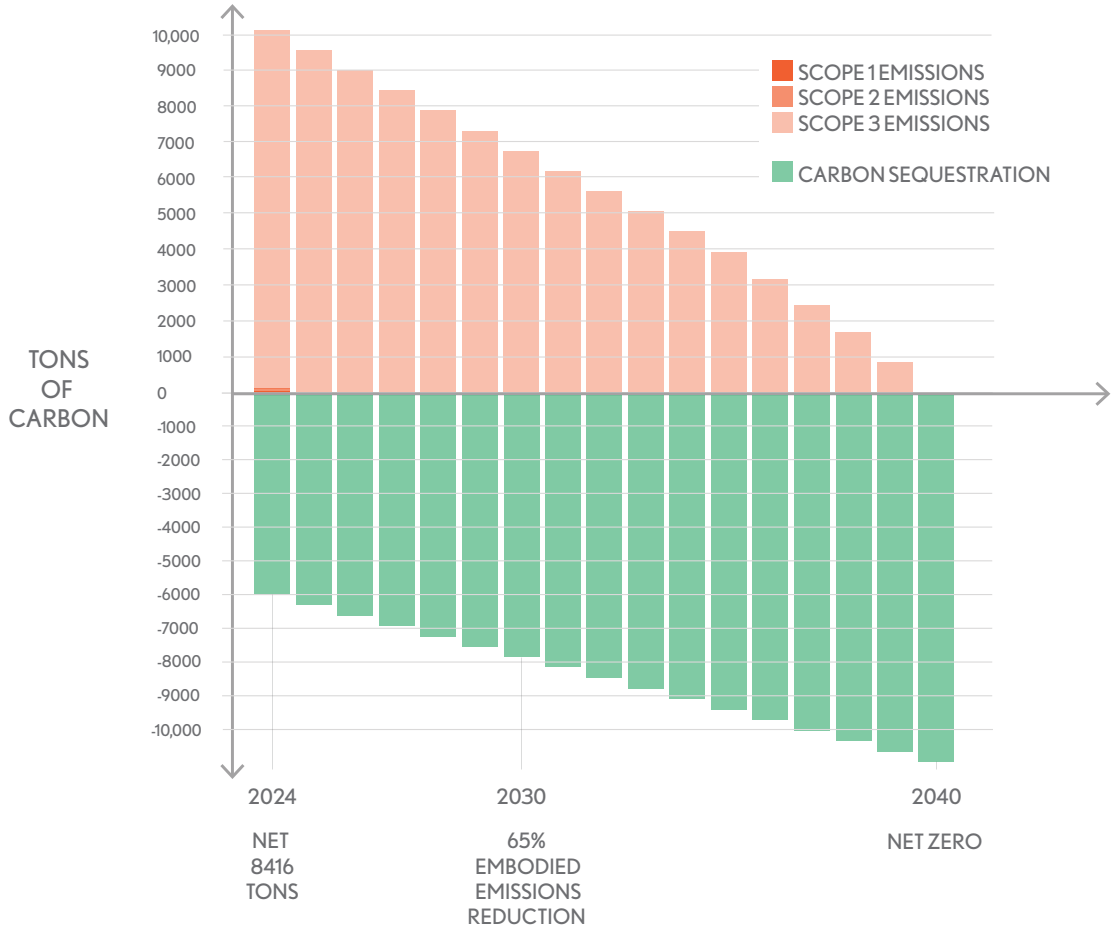
* https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

SCOPE 1, 2 & 3 GHG ASSESSMENT

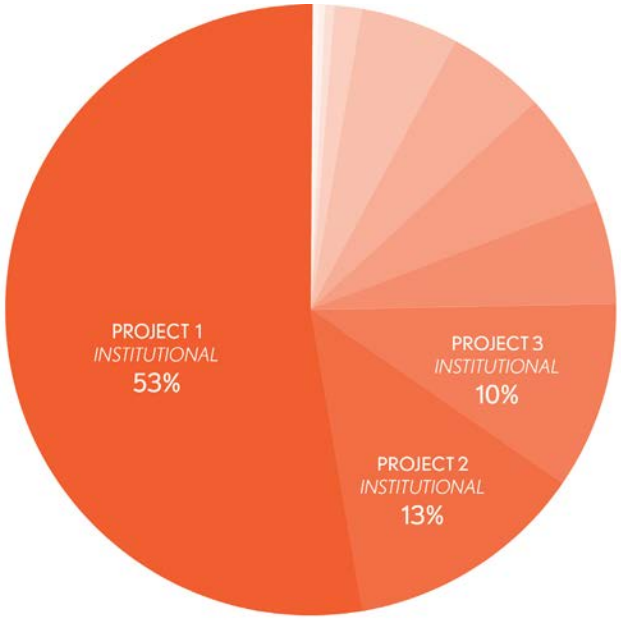


TOTAL SCOPE 1, 2 & 3: **8416 TONS**

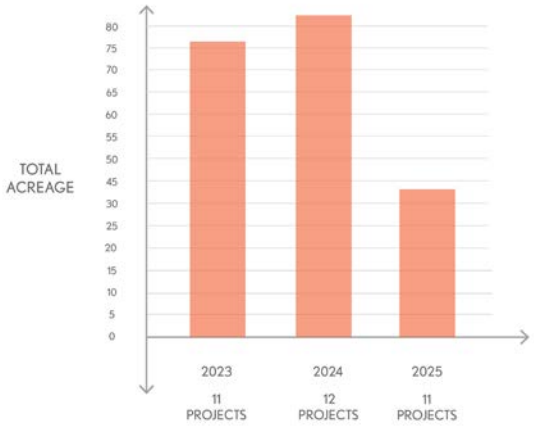




PATHWAY TO NET ZERO BY 2040

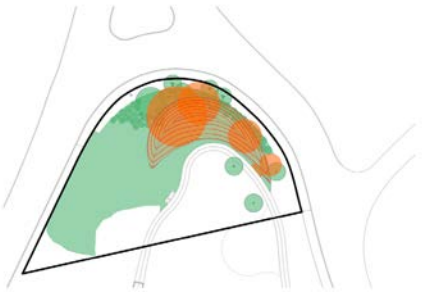


2024 PROJECTS
ESTIMATED EMBODIED CARBON: **7810 TONS**



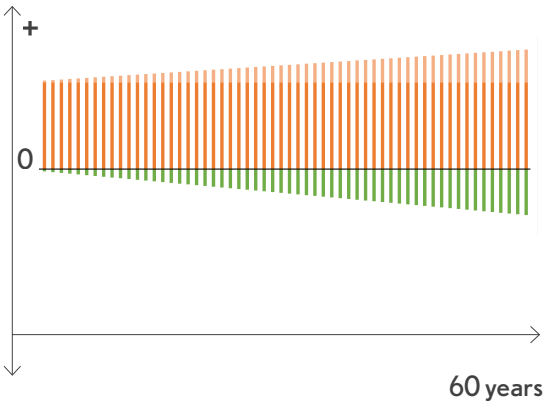
ACREAGE BUILT / YEAR
3 YEAR TREND

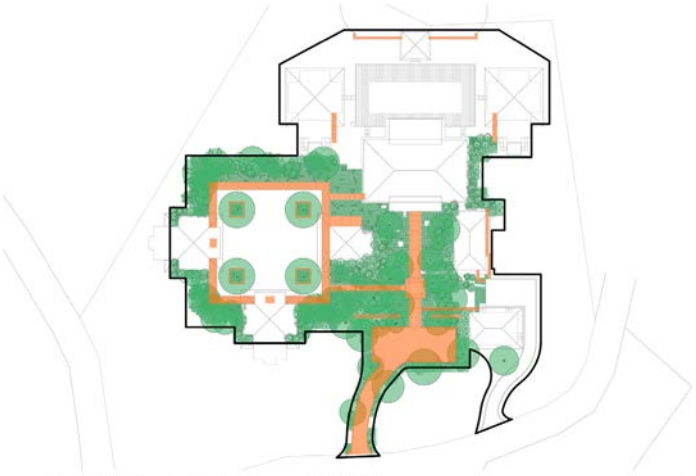
SCOPE 3: DOWNSTREAM
LANDSCAPES CONSTRUCTED IN 2024
TOTAL ACREAGE: 76



INSTITUTIONAL

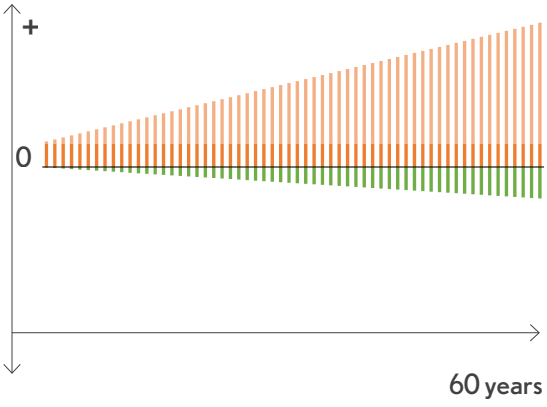
SIZE: 0.1 ACRE
EMBODIED EMISSIONS: 25 TONS
BIOGENIC (SEQ + EMISSIONS): 14 TONS
OPERATIONAL EMISSIONS: 10 TONS
YEARS TO POSITIVE: ∞

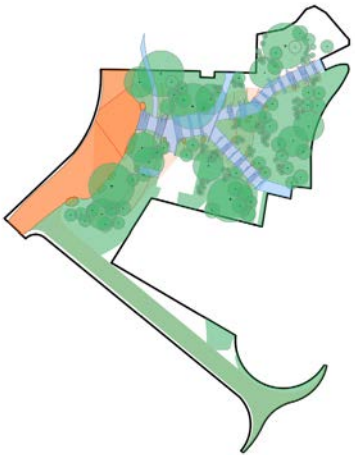


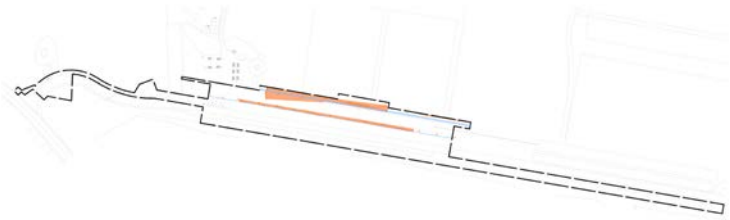


HOSPITALITY

SIZE: 0.6 ACRE
EMBODIED EMISSIONS: 23 TONS
BIOGENIC (SEQ + EMISSIONS): 31 TONS
OPERATIONAL EMISSIONS: 119 TONS
YEARS TO POSITIVE: 83





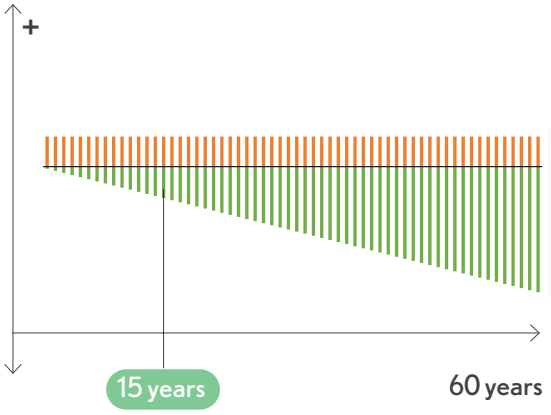


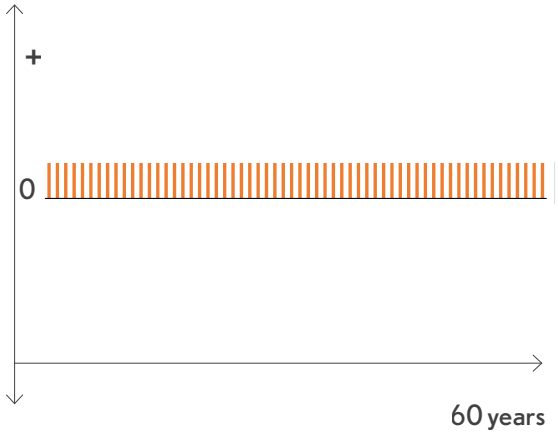
INSTITUTIONAL

SIZE: 0.5 ACRE
EMBODIED EMISSIONS: 37 TONS
BIOGENIC (SEQ + EMISSIONS): 155 TONS
OPERATIONAL EMISSIONS: 0.03 TONS
YEARS TO POSITIVE: 15

HOSPITALITY

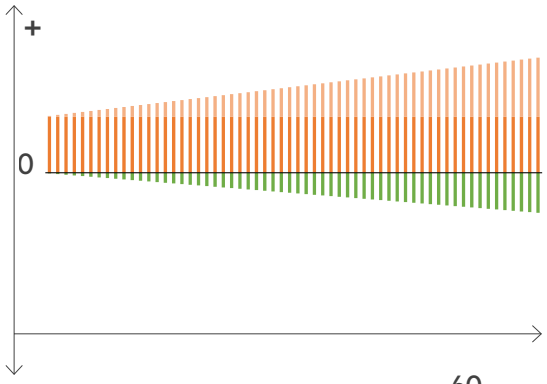
SIZE: 2 ACRES
EMBODIED EMISSIONS: 108 TONS
BIOGENIC (SEQ + EMISSIONS): 0 TONS
OPERATIONAL EMISSIONS: 0 TONS
YEARS TO POSITIVE: ∞



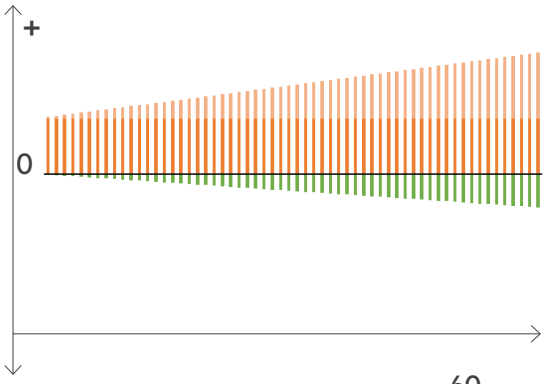


SCOPE 3: DOWNSTREAM
LANDSCAPES CONSTRUCTED IN 2024
TOTAL ACREAGE: 76

RESIDENTIAL
SIZE: 2 ACRES
EMBODIED EMISSIONS: 387 TONS
BIOGENIC (SEQ + EMISSIONS): 277 TONS
OPERATIONAL EMISSIONS: 410 TONS
YEARS TO POSITIVE: 94

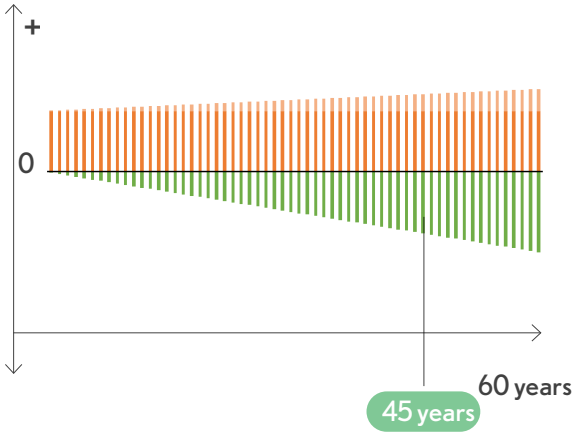


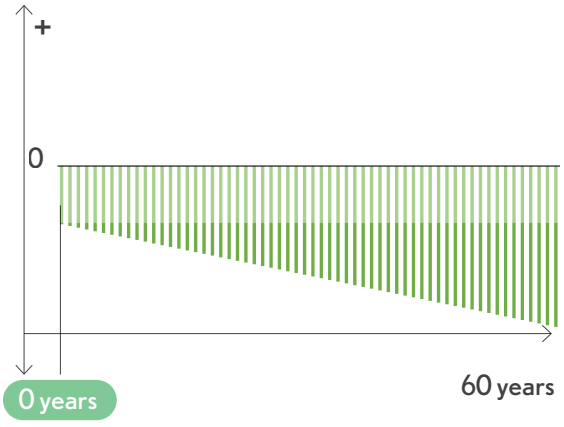
RESIDENTIAL
SIZE: 4.5 ACRES
EMBODIED EMISSIONS: 403 TONS
BIOGENIC (SEQ + EMISSIONS): 222 TONS
OPERATIONAL EMISSIONS: 473 TONS
YEARS TO POSITIVE: ∞



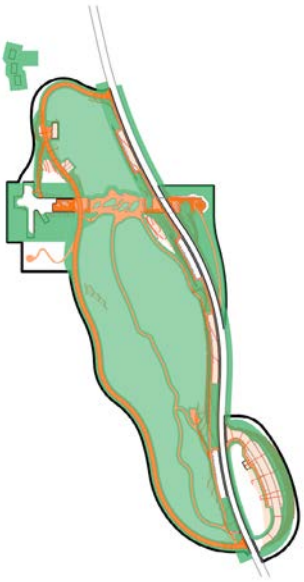
INSTITUTIONAL
SIZE: 5.4 ACRES
EMBODIED EMISSIONS: 939 TONS
BIOGENIC (SEQ + EMISSIONS): 302 TONS
OPERATIONAL EMISSIONS: 337 TONS
YEARS TO POSITIVE: 45

INSTITUTIONAL
SIZE: 6 ACRES
EMBODIED EMISSIONS: 6 TONS
BIOGENIC (SEQ + EMISSIONS): 13 TONS
OPERATIONAL EMISSIONS: 0 TONS
YEARS TO POSITIVE: 0



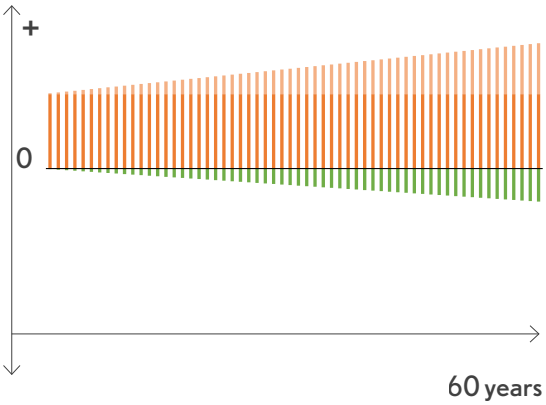


SCOPE 3: DOWNSTREAM
LANDSCAPES CONSTRUCTED IN 2024
TOTAL ACREAGE: 76



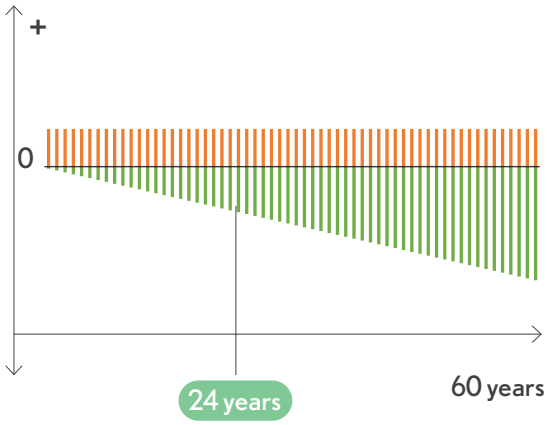
INSTITUTIONAL

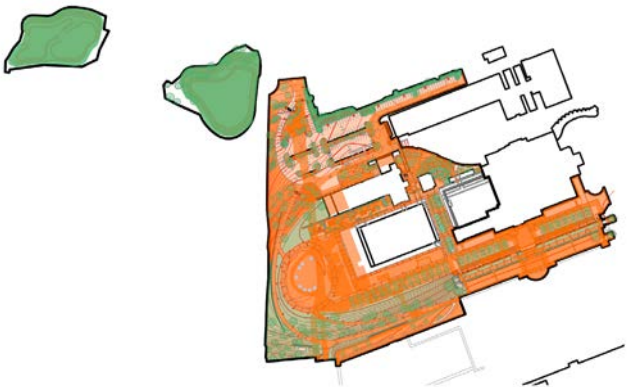
SIZE: 6 ACRES
EMBODIED EMISSIONS: 736 TONS
BIOGENIC (SEQ + EMISSIONS): 327TONS
OPERATIONAL EMISSIONS: 505 TONS
YEARS TO POSITIVE: ∞



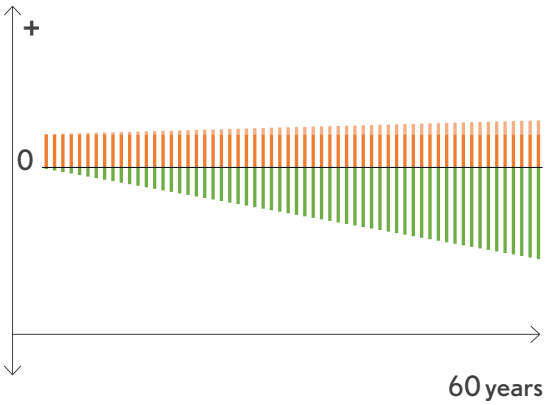
PUBLIC PARK

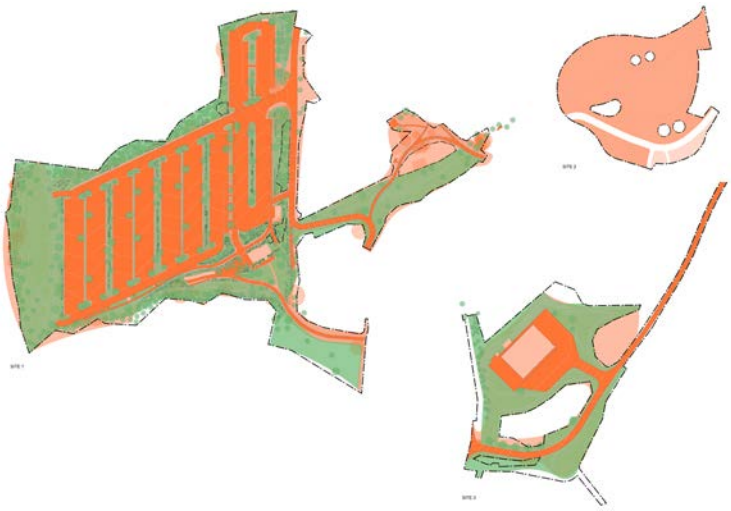
SIZE: 8 ACRES
EMBODIED EMISSIONS: 383 TONS
BIOGENIC (SEQ + EMISSIONS): 1159 TONS
OPERATIONAL EMISSIONS: 0
YEARS TO POSITIVE: 24



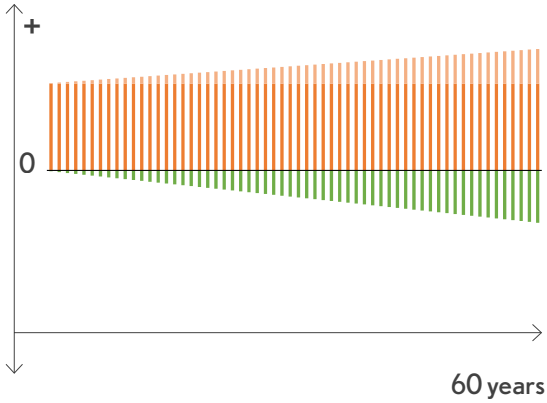


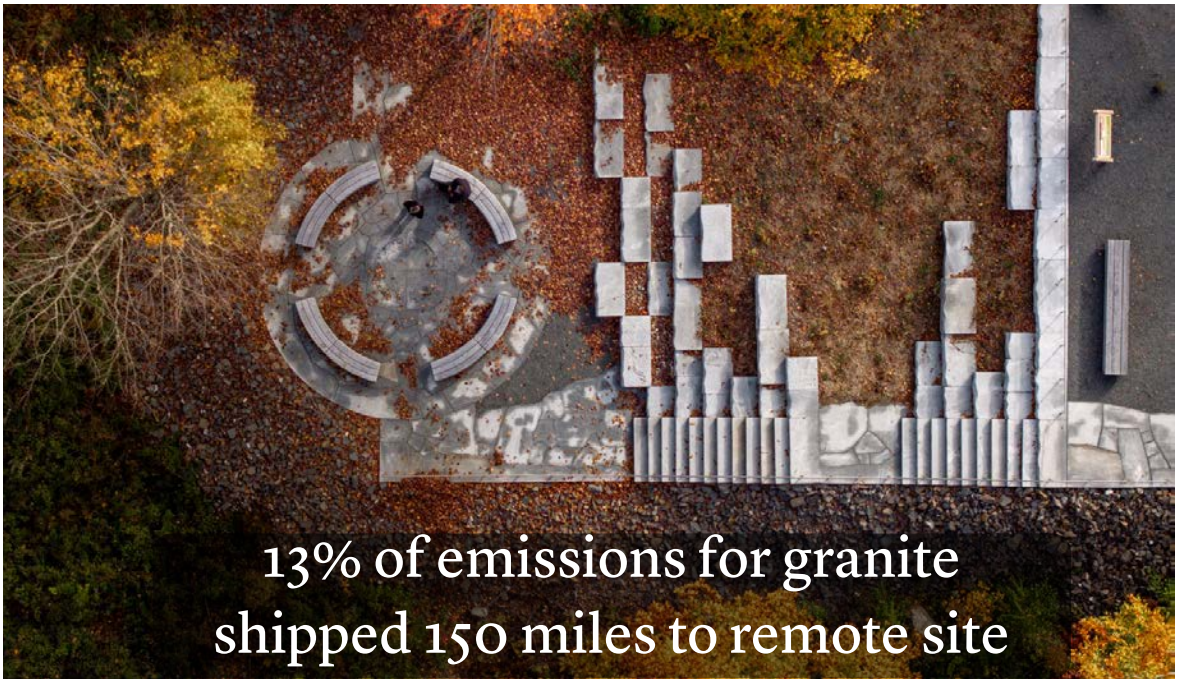
INSTITUTIONAL
SIZE: 16 ACRES
EMBODIED EMISSIONS: 4451 TONS
BIOGENIC (SEQ + EMISSIONS): 1250 TONS
OPERATIONAL EMISSIONS: 190 TONS
YEARS TO POSITIVE: 136



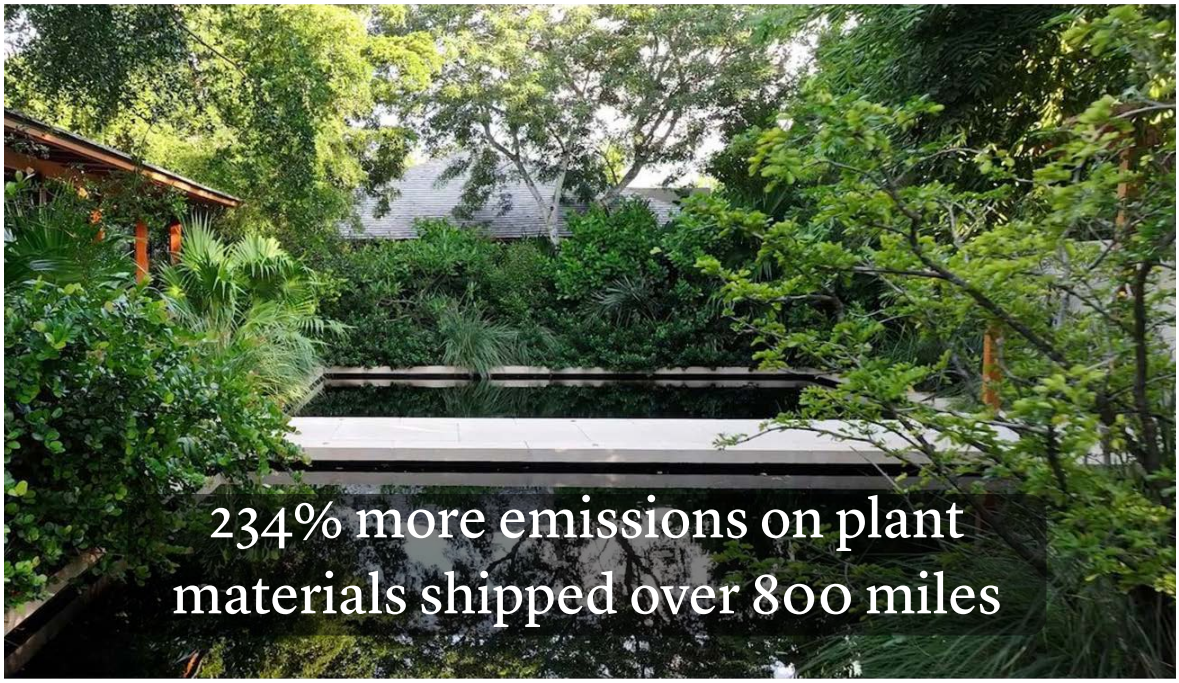


INSTITUTIONAL
SIZE: 25 ACRES
EMBODIED EMISSIONS: 3901 TONS
BIOGENIC (SEQ + EMISSIONS): 2353 TONS
OPERATIONAL EMISSIONS: 1558 TONS
YEARS TO POSITIVE: 82

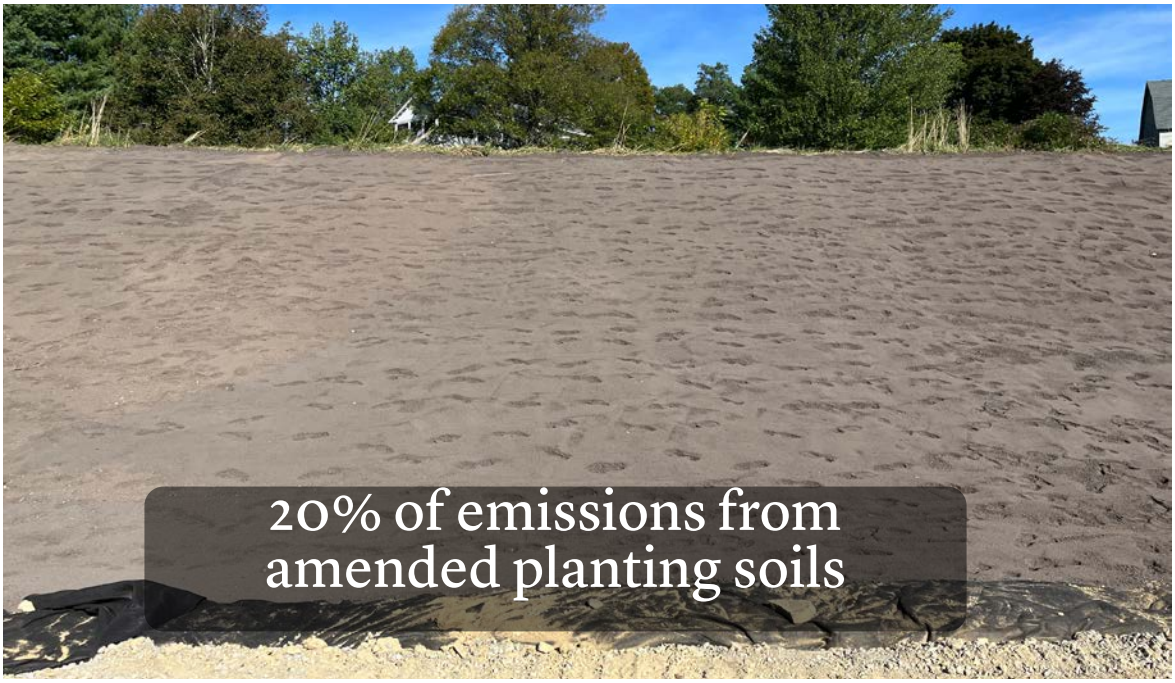




— Where materials come from matters a lot
— Preservation of high value ecosystems is essential



— Green is not always green (when it comes from far away)
— Irrigation systems have a significant impact over time



— Scale, weight and effort matters a lot in earthwork & soils
— Restored wetlands sequester carbon, but ‘restoration’ needs better definition

— Lawns offer little sequestration and high operational carbon
— Permeable pavement benefits should be balanced with impacts from extra aggregate

Next Steps

> Ecosystems are so similar to human societies – they're built on relationships. The stronger those are, the more resilient the system.
>
> *Suzanne Simard, Finding the Mother Tree*

Given that the vast majority of the firm's emissions arise from our projects, RH's key priorities will center on what we design, how we approach site conditions, the materials we select, and how we balance decarbonization with other sustainability goals. Achieving the ambitious target of net zero will require an examination of the 'business as usual' approach, as well a critical evaluation of the baseline conditions in the sites where we work.

COLLABORATION WITH PEER FIRMS

RH's initial efforts to conduct a GHG assessment have surfaced a number of important questions—questions we believe are best addressed through collaboration with peer firms to develop a standardized methodology for reporting tailored to the practice of landscape architecture. Establishing such a standard will be critical in building credibility with our clients and within the architecture and engineering (A&E) professions.

We also see value in sharing tools, data, and knowledge across firms to streamline the assessment process. While reporting is a vital first step—providing an initial diagnostic of emissions—it represents only one part of the broader challenge. The greater opportunity lies in integrating these assessment tools into the early stages of design, enabling us to make informed, low-carbon decisions from the outset.

Additionally, the work to undertake carbon accounting is intensive. To maximize the benefit of the work, carbon accounting with the aim of reducing emissions must be valued as a project deliverable, and having industry standards is essential.

PRACTICEWIDE EDUCATION

A priority in the coming year will be to embed Pathfinder into the skill set across the office by encouraging each project team to conduct their own carbon assessment for completed projects, supported by the Climate Action Task Force.

Storm King Art Center, Hudson Valley, New York

In addition to assessment of built projects, Project teams have begun piloting the use of Pathfinder in an iterative way during schematic design. Design teams will also test the use of parametric tools in Rhino and Grasshopper to better integrate immediate feedback during early stage conceptualization. By improving carbon literacy within design teams, we aim to foster more informed design decisions and stronger advocacy for low-carbon strategies early in the design process—with clients, consultants, and material suppliers alike.

RESEARCH INITIATIVES

A number of RH's existing research initiatives are focused on the broader goals of the ASLA Climate Action Plan and have synergy with decarbonization goals:

— Irrigation: watering without plastics
— Urban Trees & Soils: post occupancy research on tree health & soils
— Equity in Action: improved communication with laborers
— Low Carbon Pavement: re-tooling of typical approaches
— Parking in a Changing Climate: optimizing comfort & sequestration goals

In addition to RH research initiatives, we are also working to support academic research in landscape-focused carbon accounting, project typology-based benchmarking, and decarbonization strategies. We aim to accelerate the development and adoption of highly-applicable and credible low-carbon design strategies to establish new industry standards.

LOCALLY SOURCED MATERIALS

Building our expertise in site based material reclamation and reuse as well as strengthening relationships with local suppliers will be of utmost importance in the effort to draw down carbon footprint. Carbon focused lunch and learns as well as a tagging system for the materials library are a first step. The task force seeks to balance the adoption of innovative materials with the benefits that can be acheived simply by improving efficiencies with traditional craft and materials.

EVALUATION OF DETAILS

In the assessment process, we have noticed that use of the Pathfinder tool has generated increased sensitivity and awareness of the materials within our typical details, leading to more curiosity and innovation in detail design. Building on the lessons learned, we will be modifying our standard details with a preliminary focus on paving.

Credits

PHOTOGRAPHY CREDITS

Images appear courtesy of the following photographers:

James Florio
James Ewing/JBSA
Sahar Coston-Hardy/ESTO
Hao Liang
Miles + Miles
Peter Zwolinski/BFA

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