



## Harvard SEC Sustainability Tour Key Talking Points

1. Behnisch Architekten, a renowned global architecture firm known for designing sustainable, innovative buildings is the SEC architect. The SEC is **544,000 square feet** and includes **70,000 square feet of public green space**.
2. Harvard has a holistic sustainable development vision and set of priorities grounded in research and science and our goal is to partner with faculty, students, staff, alumni and external partners to use Harvard's campus as a testbed to pilot and prove solutions to climate and sustainable development. In our built environment, we are working to enhance health, address climate change, and improve equity at scale.
3. The SEC was a testbed and has been referred to as one of the **healthiest, most energy-efficient, and climate resilient lab buildings**.
  - Achieved **LEED platinum (Resiliency, Stormwater retention, energy reduction and indoor air quality)**. **1<sup>st</sup> research building and largest building globally** to achieve rigorous, innovative **Living Building Challenge Certification in Materials, Equity, Beauty**.
4. This project and the new district energy system it is connected to were built in alignment with our climate goals to be **fossil fuel-neutral by 2026 and fossil fuel-free by 2050**.
5. The SEC's design and construction have especially **played an important role in sending clear market signals to transform the marketplace for healthier building materials for all** by creating transparency with ingredient labels, specifying chemicals of concern to remove (like PFAS, chemical flame retardants, antimicrobials) to optimize materials for health especially upstream where chemicals of concern are created, and products are manufactured.

### Climate: key features

High-performance envelope; highly efficient climate, natural ventilation, laboratory airflow reduction & heat recovery systems; low energy hydronic, radiant terminal systems; new intelligent program zoning.

**District Energy Facility** that powers the SEC uses low-temperature, hot-water, highly efficient cogeneration heating and cooling system designed to be resilient and flexible to transition to FFF. The DEF uses a 1.3-million-gallon tank to produce and store chilled water during off-peak hours when electricity is cheaper and less-polluting. The tank acts like a **battery**, conserving energy so it can be used during peak hours, lowering the burden on the power grid.

1. **Innovative lab ventilation management plan** allows the building to set the airflow to different spaces, the most significant driver of carbon emissions in lab buildings, based on safe usage and activities, significantly reducing overall air changes throughout the building.
2. **Natural ventilation** is enabled in all regularly-occupied spaces throughout the building via operable vents at the façade. Fresh air brought in through the windows is cascaded into public spaces and returned via the two atria to the laboratory air



handling equipment, where it is further filtered and re-used in laboratory environments.

3. Highly efficient Konvekta runaround **heat recovery** (>80% efficient vs. 40% for traditional systems) capture waste heat from the laboratory exhaust air stream and repurpose for other building functions.
4. Hydronic, radiant heating/cooling systems are used throughout the facility to promote **low-energy, quiet and zero-draft** heating and cooling. Active chilled beams are used in the laboratories, radiant ceiling panels in all offices and meeting spaces, and active radiant concrete slabs in the public zones.
5. **The upper floors are sheathed in a sophisticated screen enclosure that is the world's first hydroformed tensile façade system.** This façade is engineered to reduce energy use and maximize natural light—energy efficient, uplifting and conducive to well-being and productivity.
  - a. 14 different profiles, 12,000 panels, 1.5mm-thick stainless steel by hydroforming, a process that uses pressurized water to shape metal sheets against a single mold. Shield the interior from solar heat gain; winter sun in. Significantly reduces cooling/heating loads on DEF
6. Thermal enclosure behind the screen is **triple-glazed** and punctuated with operable windows to facilitate **natural ventilation** of the building's interior.

### **Health: Materials, Spaces, & Equity**

1. Interior building products including furniture, flooring, shades, composite wood, paints, and coatings were produced **without targeted chemical classes of concern** such as PFAS, chemical flame retardants, PVC, antimicrobials, and more.
2. In 2016 we created, **Harvard Healthier Building Academy**—a collaboration between the Harvard Office for Sustainability and faculty from SEAS, Harvard T.H. Chan School of Public Health, and Harvard Medical School, which lays out goals and priorities for building and operating a healthier building and to catalyze a healthier, more equitable supply chain. **The Academy seeks to translate the latest research into action to pilot, prove, and scale healthier materials at Harvard and work with other large organizations to transform the marketplace for all—affordable housing, public schools, consumers. We have collaborated with Google, KP, non-profit science groups**
3. **Professor Elsie Sunderland**, SEAS and Chan, HHBA adviser, studies exposure pathways and environmental lifetimes for chemicals. Her lab tested products, carpet and fabric, for toxic fluorinated stain and water repellants before use in the building.
4. At the end of construction, the SEC project team **reviewed approximately 6,000 unique products.** Over, **1,700 products were used** that were certified through third-party labels and Red List Free Disclosures that disclose the levels of harmful ingredients. (Declare Labels, HPDs, EPDs, Forest Stewardship Certification, etc.)
5. **Circadian lighting system** tunes the color temperature of the all-LED lighting system to the exterior daylight color temperature – subtly adjusting from 2800 Kelvin during the early morning and evening to 4000 Kelvin during the middle of



the day – which has demonstrated health benefits with respect to melatonin levels, fatigue and overall well-being.

### **Resiliency & Nature:**

1. **Recessed gardens, outdoor terraces, and green roofs** provide beautiful places to connect while improving air quality, managing rainwater runoff via transpiration, and reducing heat island effects.
2. **The Greenway** along Western Ave was transformed from industrial, brownfield land into a continuous park-like setting that joins residential neighborhoods, University spaces, and commercial development. **Overtime, Greenway will Expand** tree canopy coverage. Beautiful & important managing stormwater runoff.
3. Building grade level elevation is raised above 100-year stormwater level. Landscaping creates natural barriers to floodwater infiltration around the site perimeter, and critical infrastructure is above design flood elevation. Lower level facilities are hardened against flooding via elevated structures, flood-proof barriers, and storm doors.

### **Water Reduction/Storm water management:**

1. Main building elevation above street level to avoid impact from regional flooding and **Rainwater management system** designed to manage runoff on-site for an 85th percentile rainfall event and to recharge up to a 100-year storm event.
2. Rainwater is captured via **bioretention basins forming a continuous bioswale from east to west** and directed into a **75,000-gallon rainwater reuse tanks** located in the below-grade portion of the building. Runoff not collected in the tank is treated to remove at least 80% of the total suspended solids.
3. Indoor water use reduced 70% through installed **low flow fixtures** and **use of reclaimed water**.



## Appendix/Additional Information:

- **34 items used in the building were salvaged** from other construction projects and most building products came from within a 500 km radius of the building supporting our local community.
- Allston Campus was designed to offer **multi-modal transportation** opportunities that reduce reliance on driving and create a healthier, resilient, thriving district.
- Harvard Shuttle Bus to our main campus in Cambridge. Real-time tracking for Harvard shuttles is also available at [shuttle.harvard.edu](http://shuttle.harvard.edu). The Harvard Shuttle Bus is free to students, faculty, and staff. Employees can also receive discounted MBTA passes. **Harvard has four (30% of the fleet) new 100% electric buses and electric charging station infrastructure.**
- Bicycle lanes on Western Avenue buffered from traffic by parking lanes and raised curbs. Science Drive, Academic Way South, and Stadium Way offer protected bicycle facilities as well. There is also a bicycle path next to Stadium Way between Rotterdam Street and Western Avenue.
- **SEC 570 bike parking spots**
- Bluebikes; Harvard offers subsidized Bluebike memberships to students, faculty, and staff. We also offer discounted bike helmets and lights.
- The campus was designed to **positively impact the community and integrate with nature** through the creation of vibrant, climate-friendly, outdoor spaces that prioritize street activation, multi-modal transportation, livability, and placemaking.
  - Resiliency – Main building elevation above street level to avoid impact from regional flooding/100yr storm.
  - Stormwater Retention – Nearly 100% of stormwater is/can be retained on site, through stormwater tanks (75,000 gallons) and bioretention basins within the landscape. This water is also used to support building functions such as toilet flushing and irrigation.
  - Energy Reduction – State of the art heat recovery units used to capture and reuse “wasted heating” through the HVAC systems. Radiant flooring and ceiling systems contribute to both heating and cooling of the building significantly reducing energy use. Also implementing continuous commissioning.
  - Indoor Air Quality – IAQ plan implemented during construction and V4.1, Path 1 IAQ achieved (shameless plug). Building HVAC systems are served by 100% outside air.