PRINCETON UNIVERSITY

Stadium Neighborhood: Quantum Institute for Quantum Science & Engineering and School of Engineering and Applied Science

Concept Presentation

February 15, 2024

mecanoo HGA

1. 2026 Campus Plan

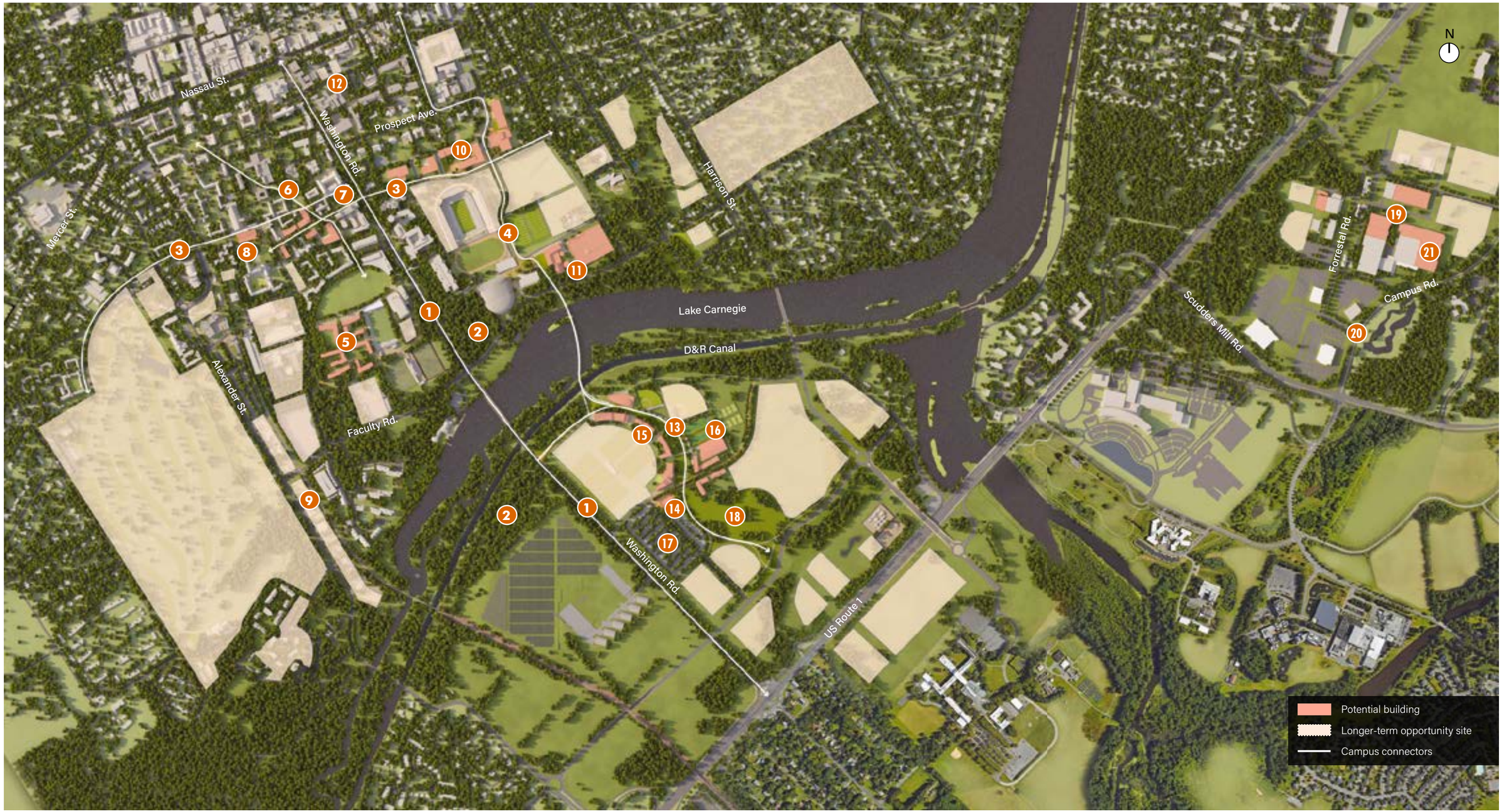
2. Project Overview

3. Sustainability Goals

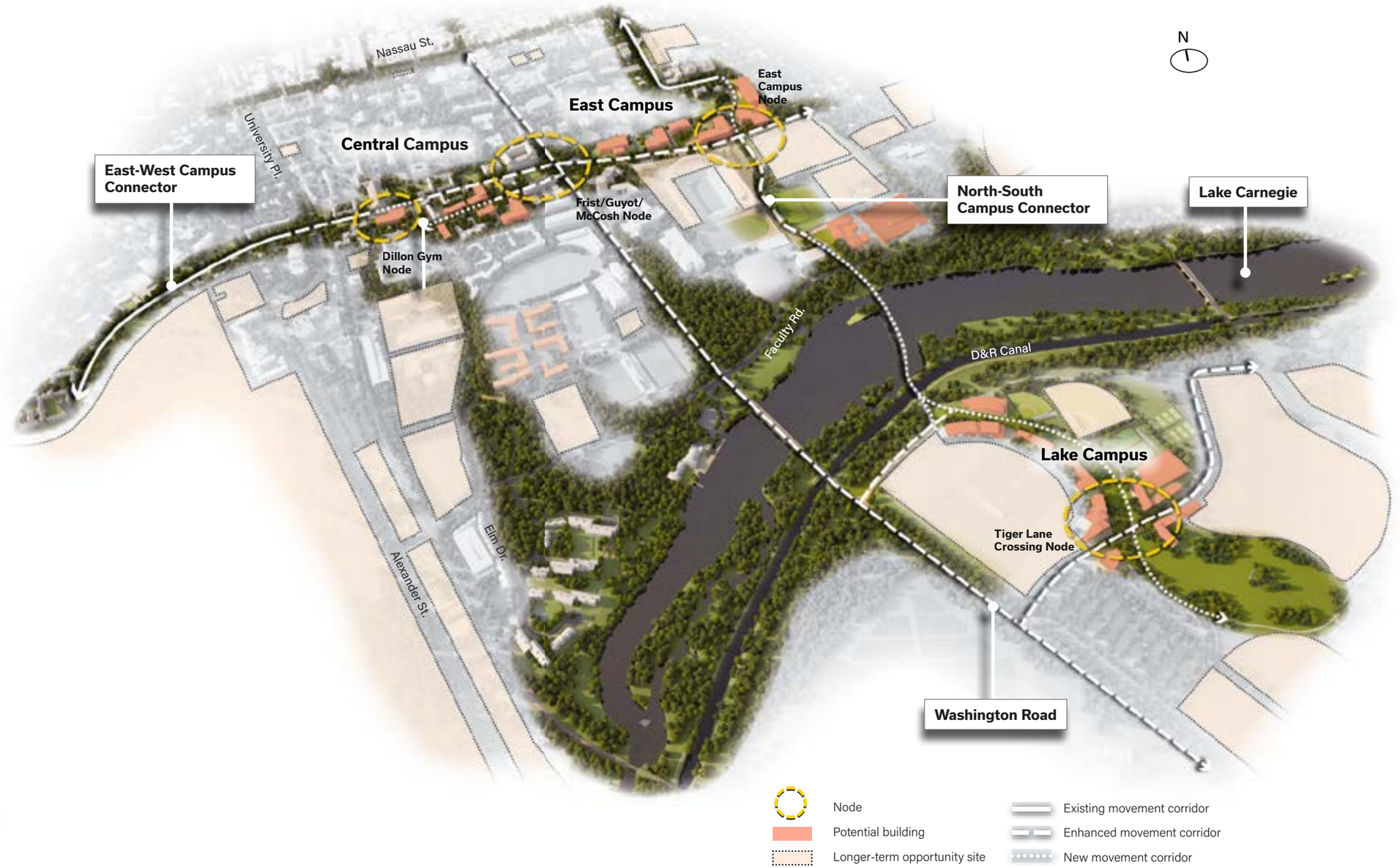
4. Geo-Exchange system

5. Project Sequencing

Campus Plan 2026



Campus Plan 2026



Campus Plan Principles

- Provide an integrated environment for teaching, living, learning and research

- Enhance the campus's distinctive sense of place

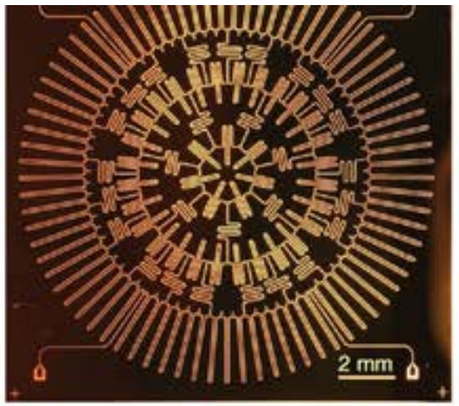
- Foster a setting that is welcoming and supportive and encourages positive interaction and exchange

- Create a climate that encourages thoughtful and creative approaches to sustainability

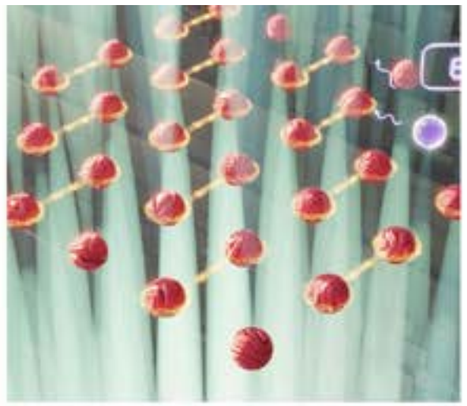
- Serve communities that extend beyond the campus

Quantum Science

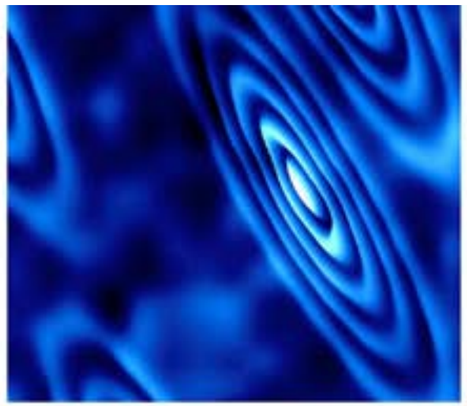
PRINCETON
QUANTUM INITIATIVE



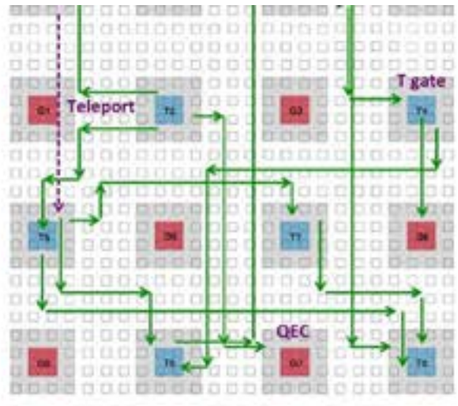
Quantum Systems Experiment



Quantum Systems Theory



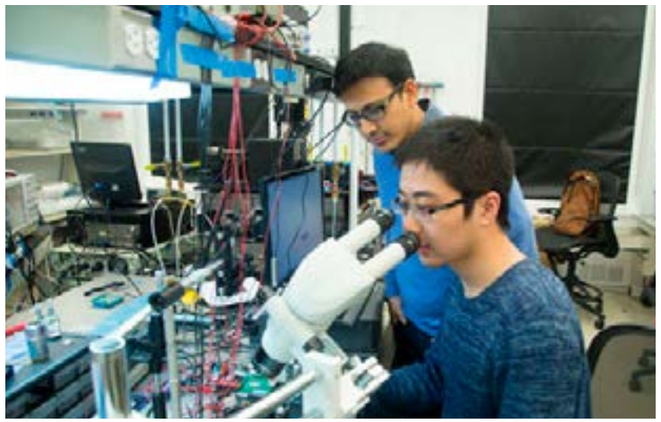
Quantum Material Science



Quantum Computer Science

There is a vibrant community at Princeton working on quantum science and engineering across many departments. The Princeton Quantum Initiative brings together faculty and students across engineering and the natural sciences who are working on a wide range of topics in quantum information science.

Quantum Institute Value Proposition



- Utilize on site geo-exchange to advance the goal of achieving carbon neutrality by 2046
- Accommodate world-leading systems for quantum science
- Provide shared facilities in specialized high-end fabrication and characterization
- Foster cross-pollination among researchers from disparate backgrounds with overlapping interests
- Support new collaborations between Princeton University and the Princeton Plasma Physics Laboratory
- Attract world-class talent
- Integrate into the broader campus and create an open and connected community
- Contemporary building that respects the campus traditions and anticipates the evolving campus
- Create a welcoming academic home with world-class research facilities

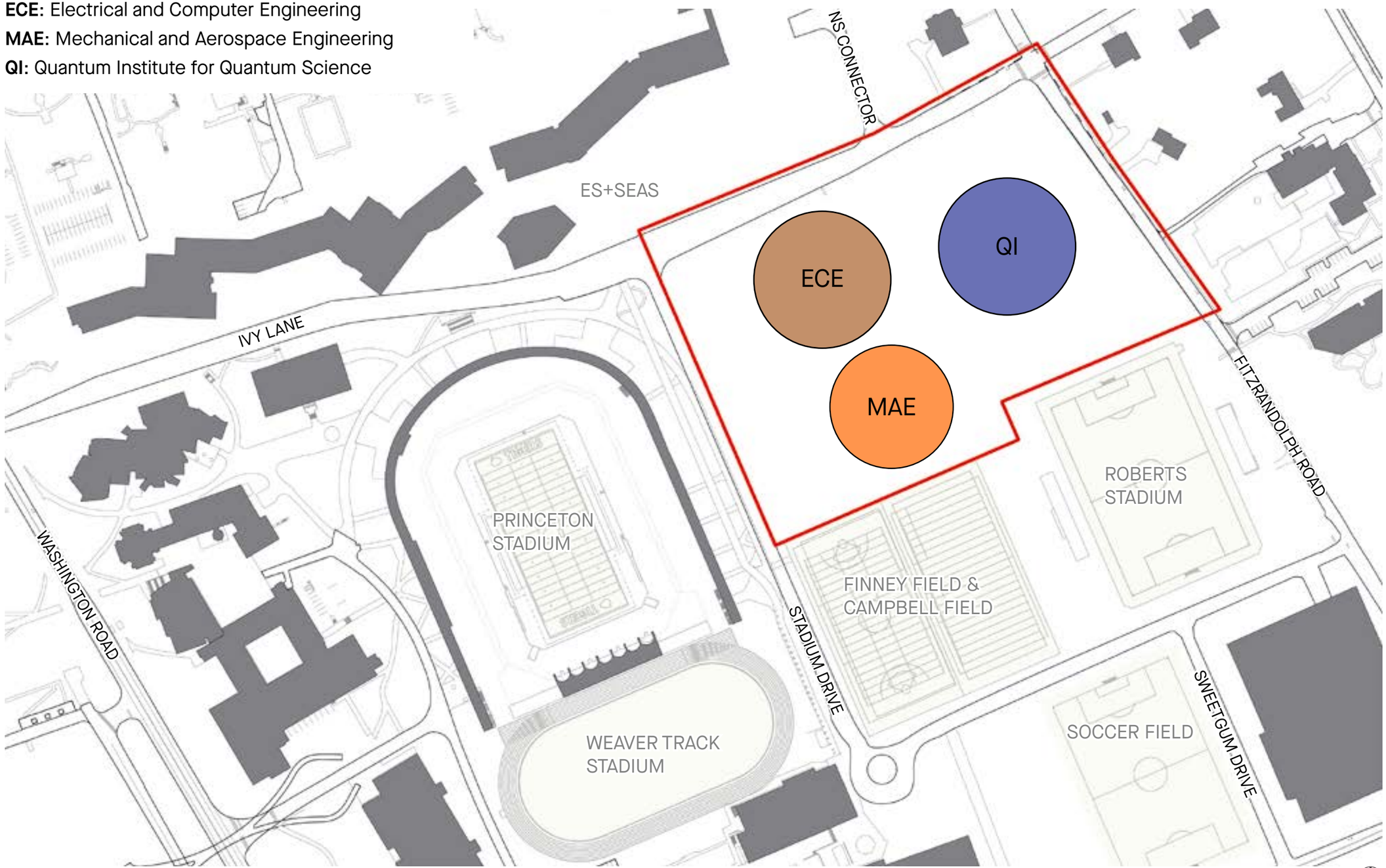
School of Engineering and Applied Sciences (SEAS) Value Proposition

- Accommodate a rapidly growing community in state-of-the-art facilities
- Enhance interdisciplinary approaches to teaching and research
- Ensure strong identity of the new SEAS campus
- Help attract and retain world-class faculty and students
- Create a strong sense of community
- Maximize flexibility, promote communication of knowledge, cultivate new ideas, and allow for a natural evolution of research priorities
- Foster design thinking, innovation and entrepreneurship
- Complement and create synergies with academic departments located throughout the campus
- Advance the sustainability ethos of the university and create a vibrant and healthy environment

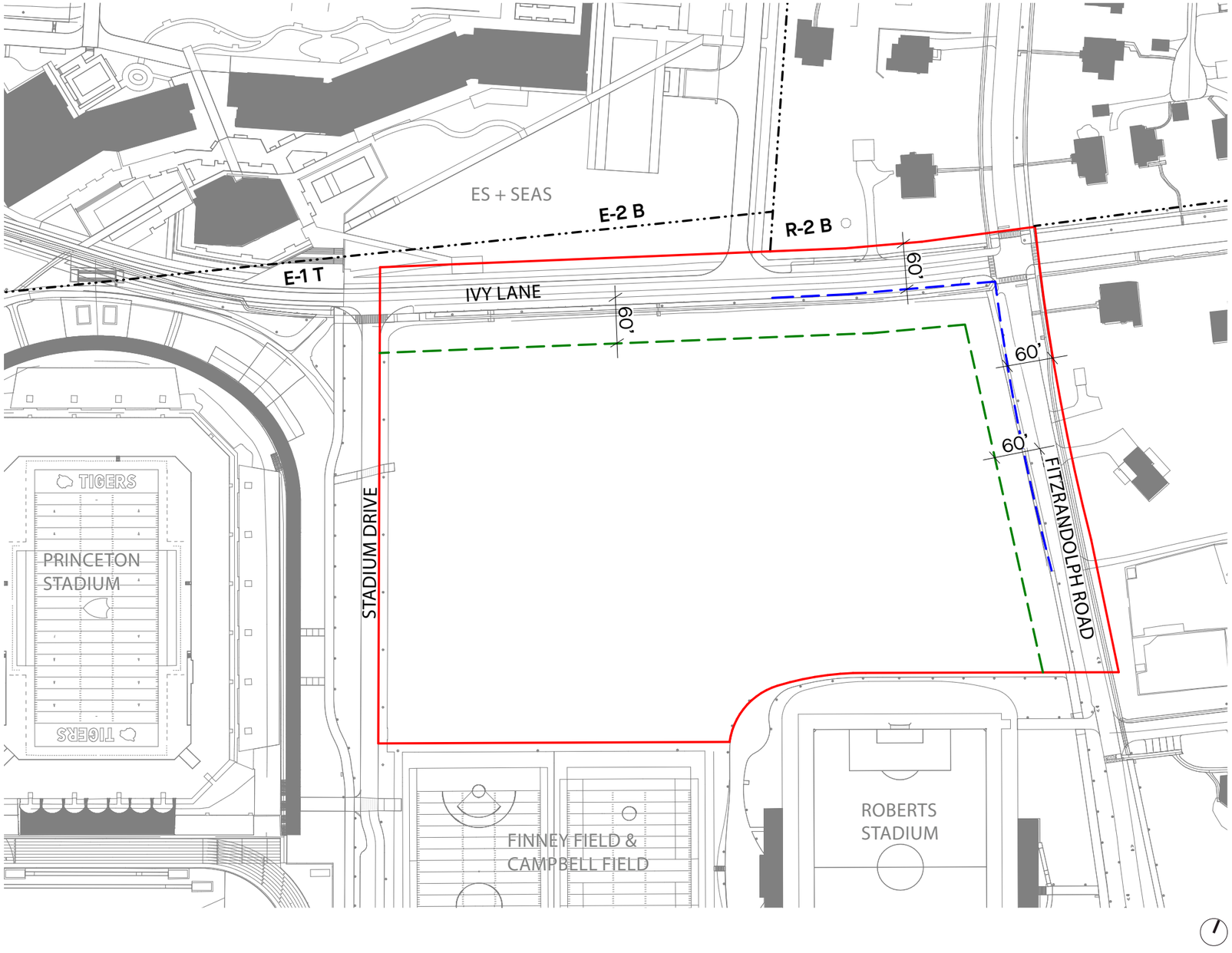
Existing Site

Site and Program Locations

ECE: Electrical and Computer Engineering
MAE: Mechanical and Aerospace Engineering
QI: Quantum Institute for Quantum Science



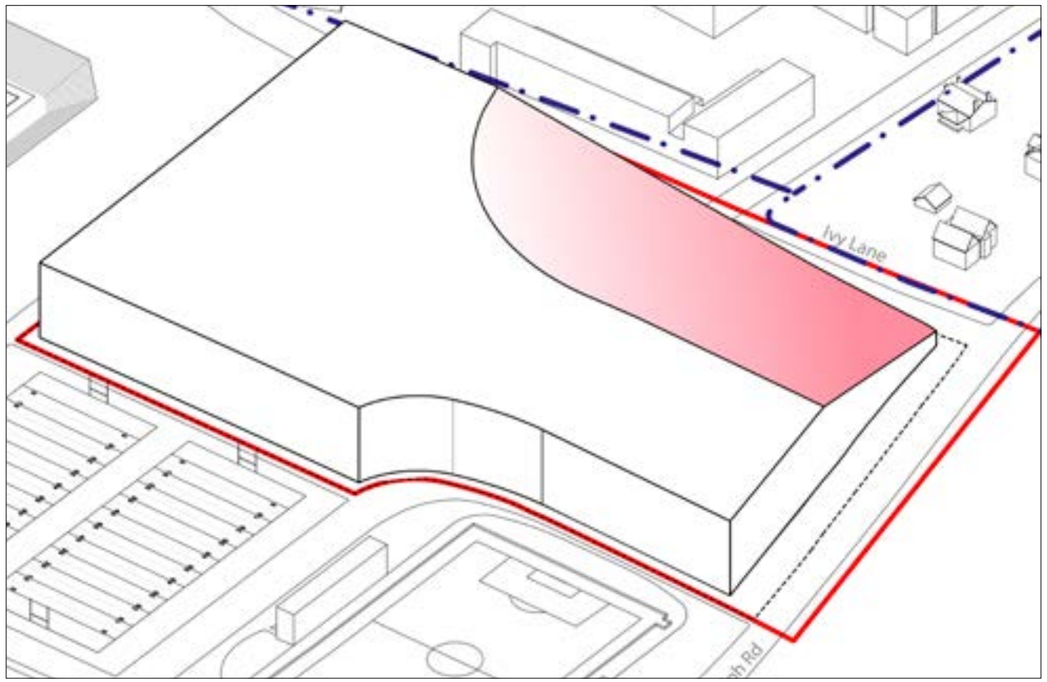
Required and Enhanced Setbacks



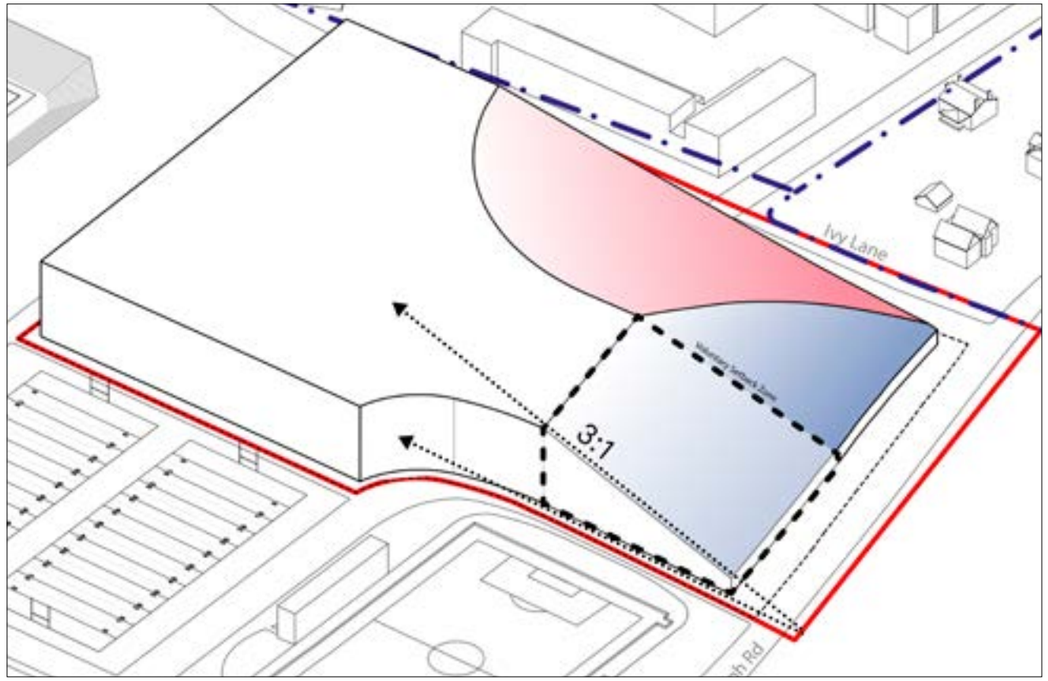
- Zone boundaries
- Project boundary
- Required building setback
- Enhanced setback from the nearest curb
- Existing building footprints

- Design provides enhanced zoning setbacks
- Design follows the building height to setback ratio along the entire FitzRandolph Road frontage

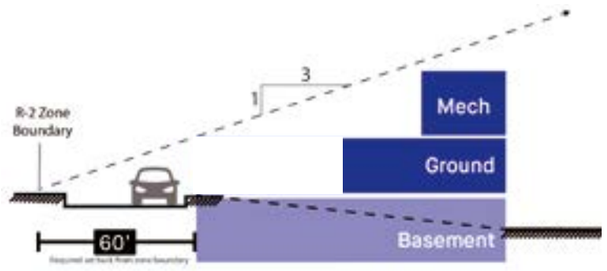
Setback to Height Ratio



3:1 Required Setback



Enhanced Envelope



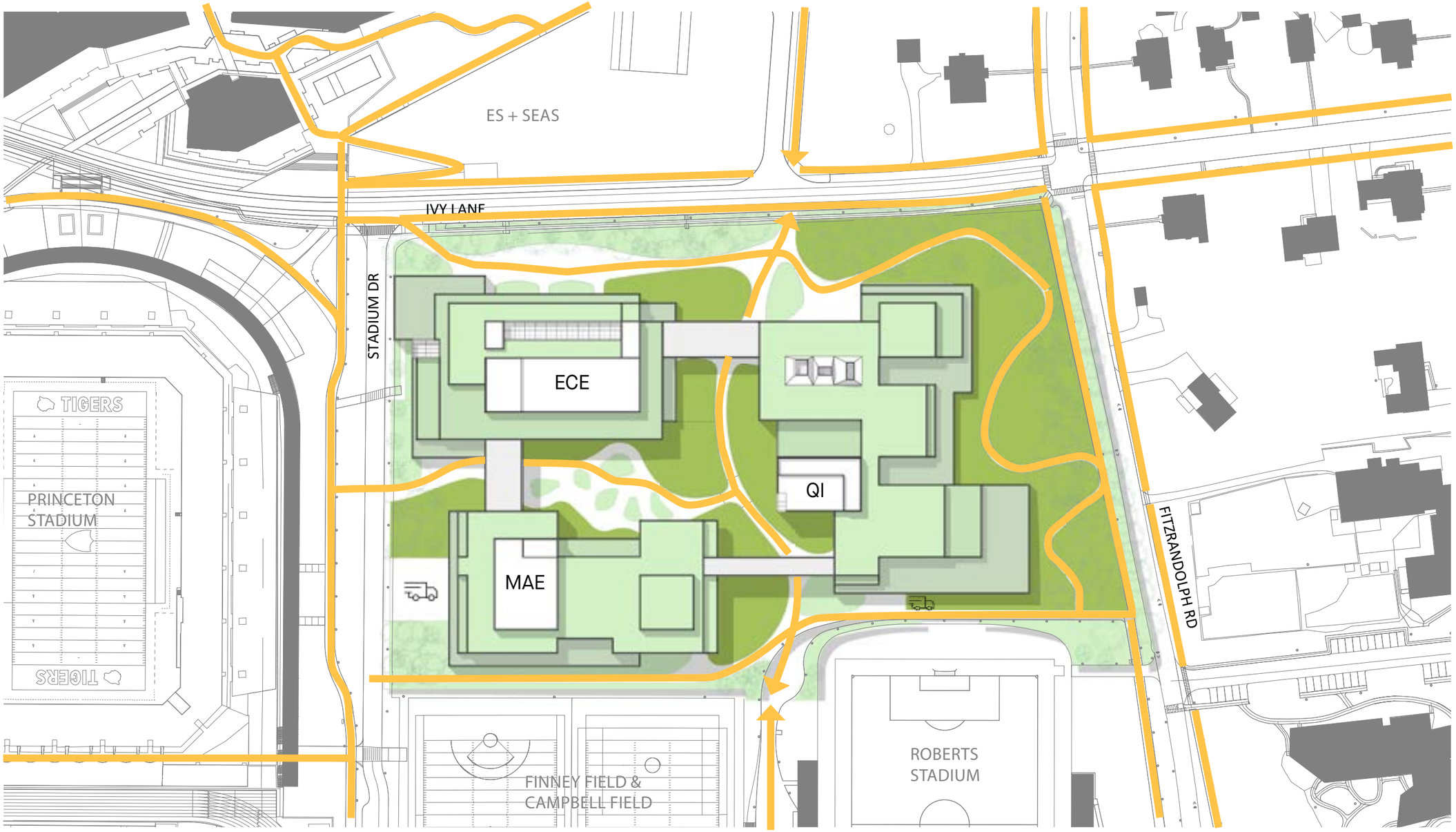
3:1 Setback to height ratio

Concept Site Plan

LOADING DOCK

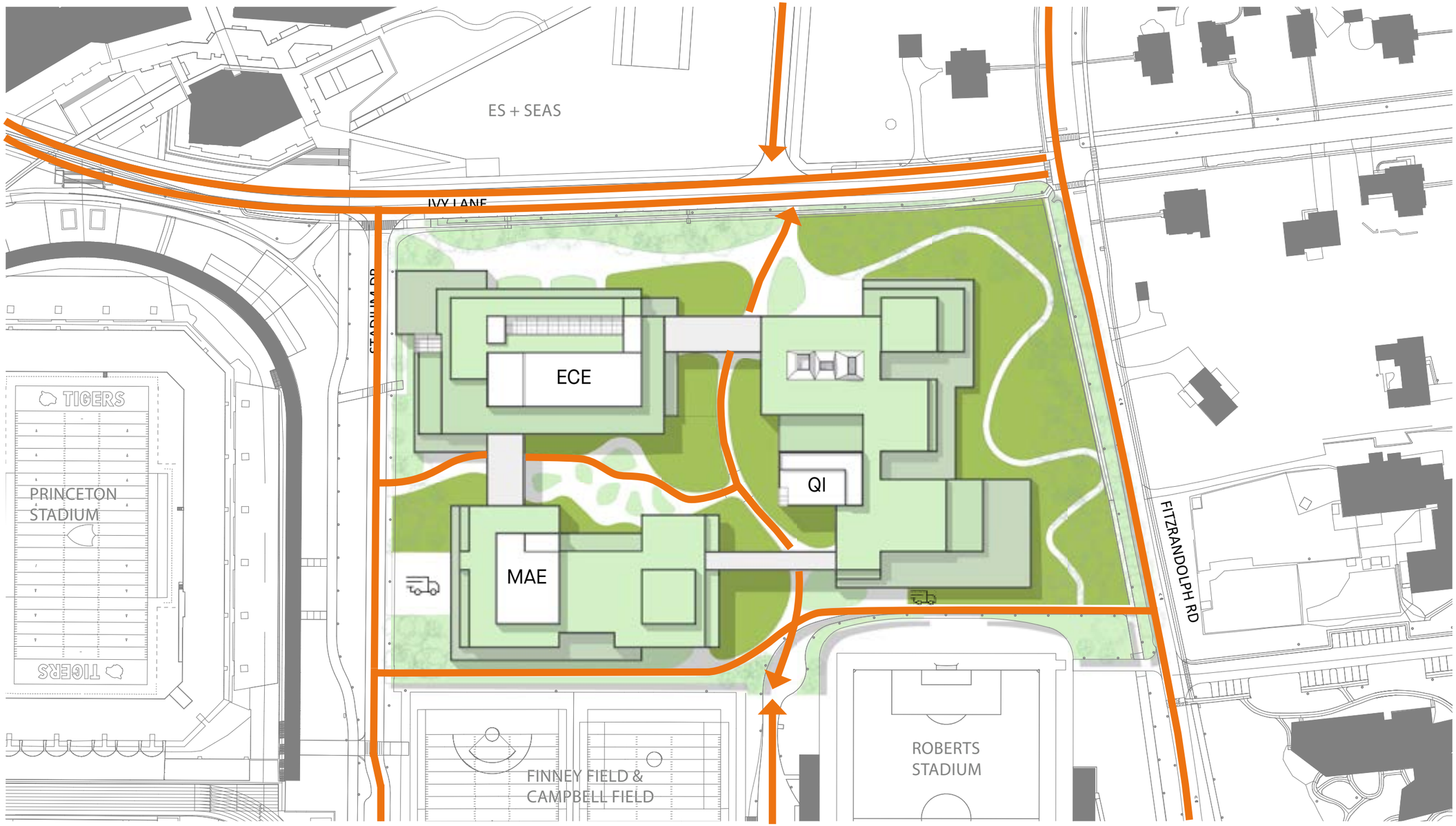
Site Circulation

Pedestrian



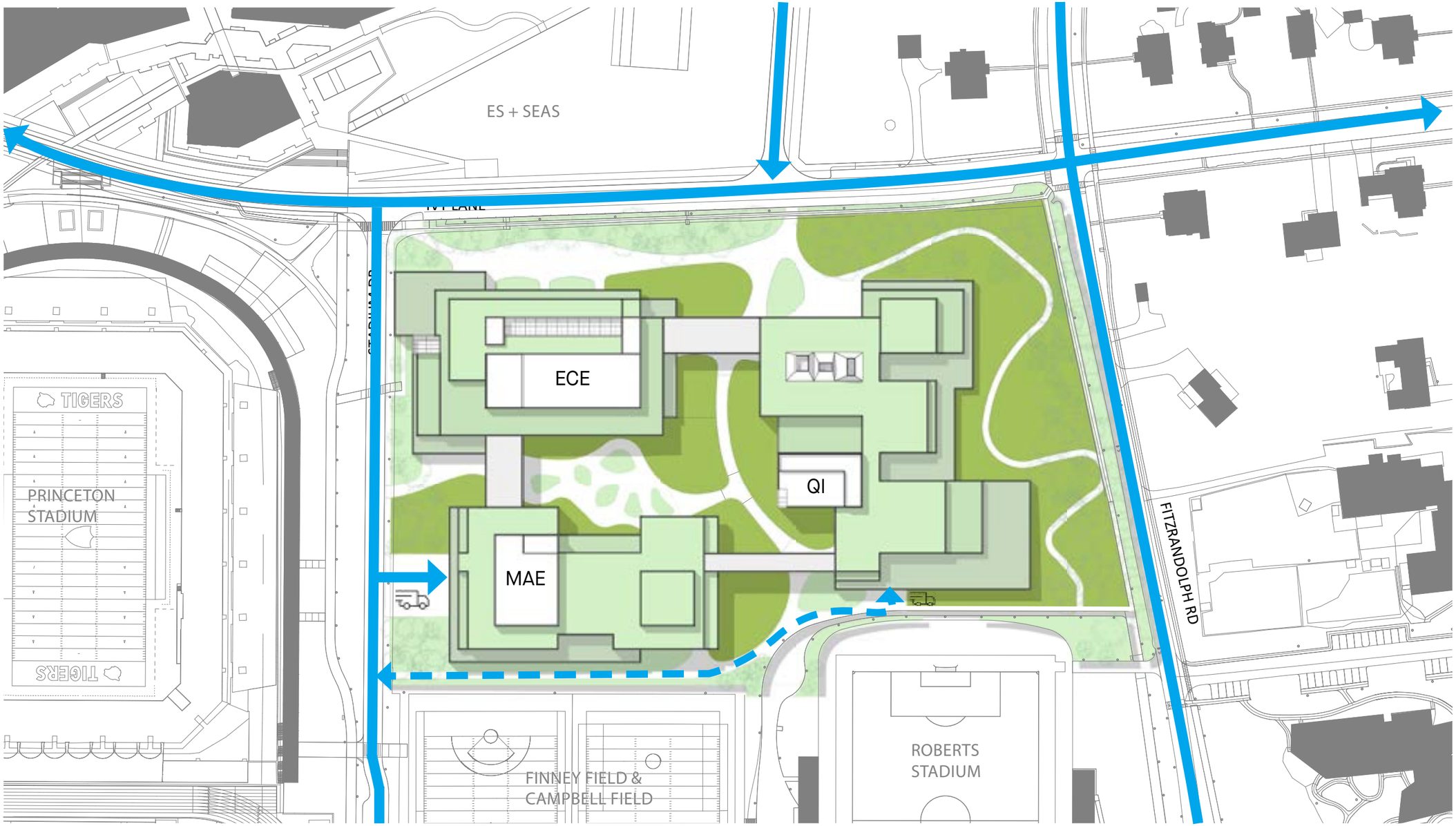
Site Circulation

Bike paths



Site Circulation

Vehicular

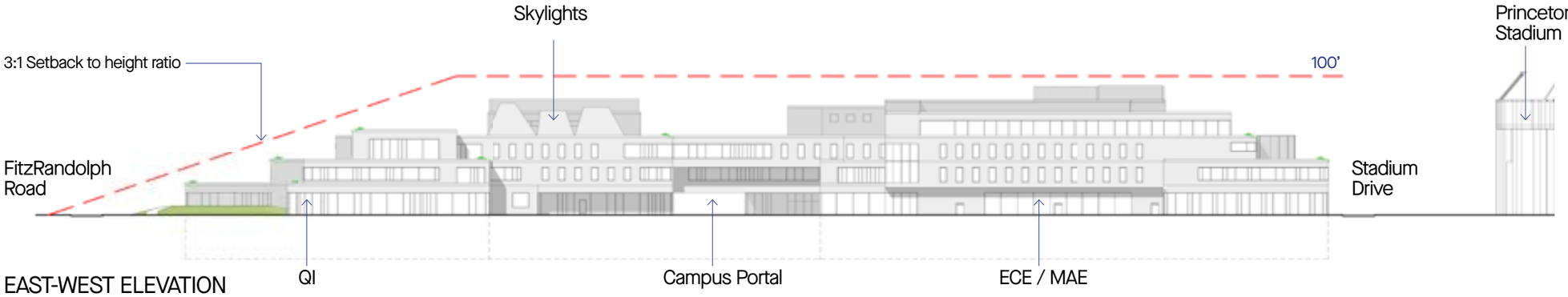


VEHICULAR ROAD

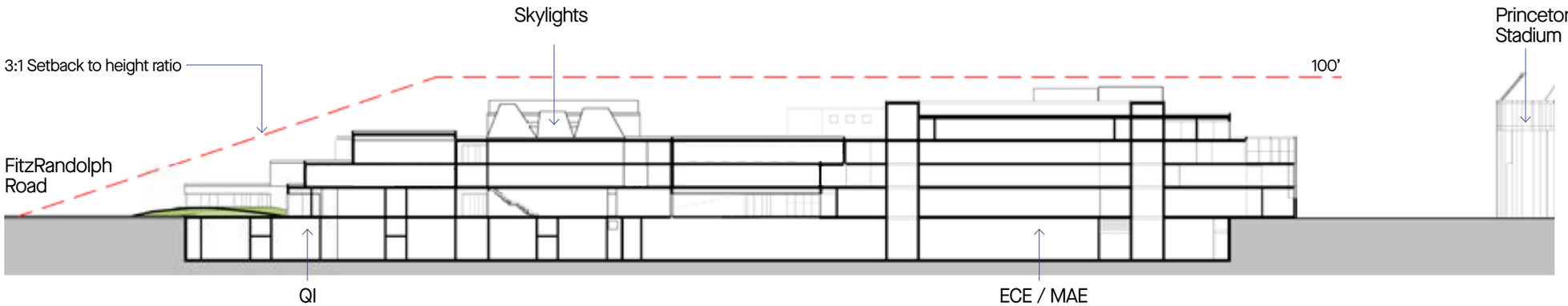
RESTRICTED ACCESS DRIVE

LOADING DOCK

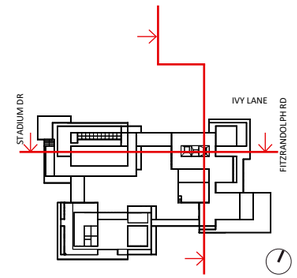
Setback to Height Ratio

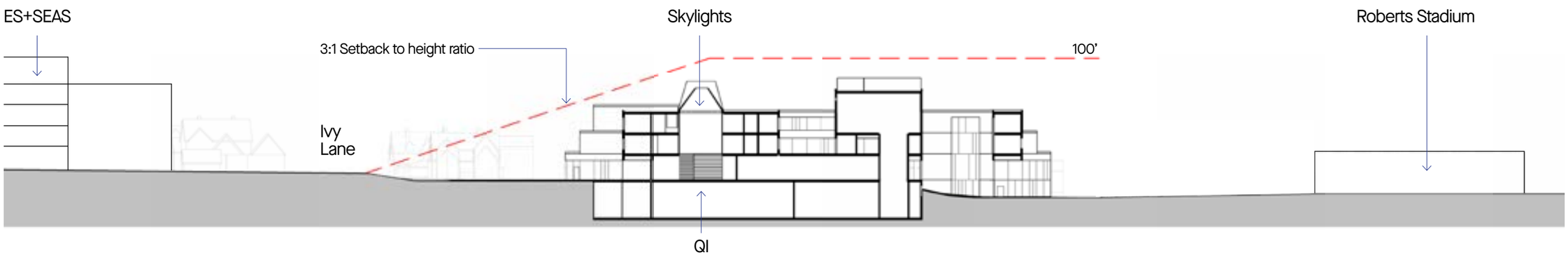


EAST-WEST ELEVATION



EAST-WEST SECTION

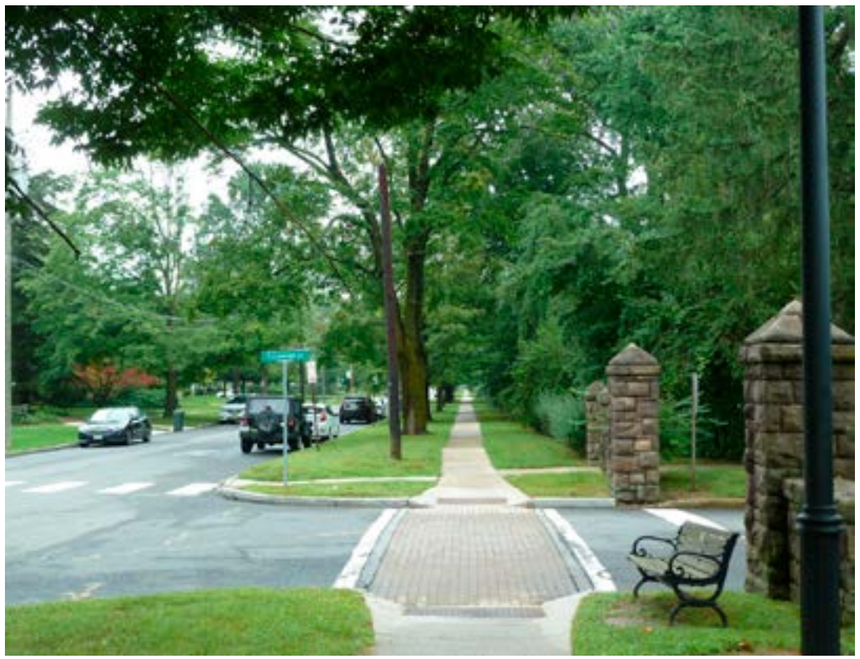


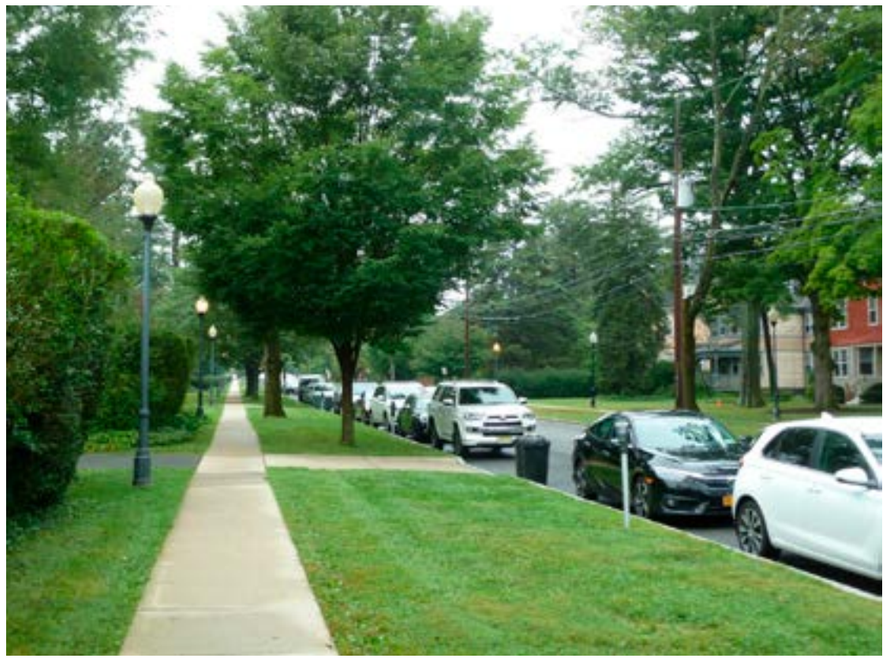


NORTH-SOUTH SECTION

Landscape Palette

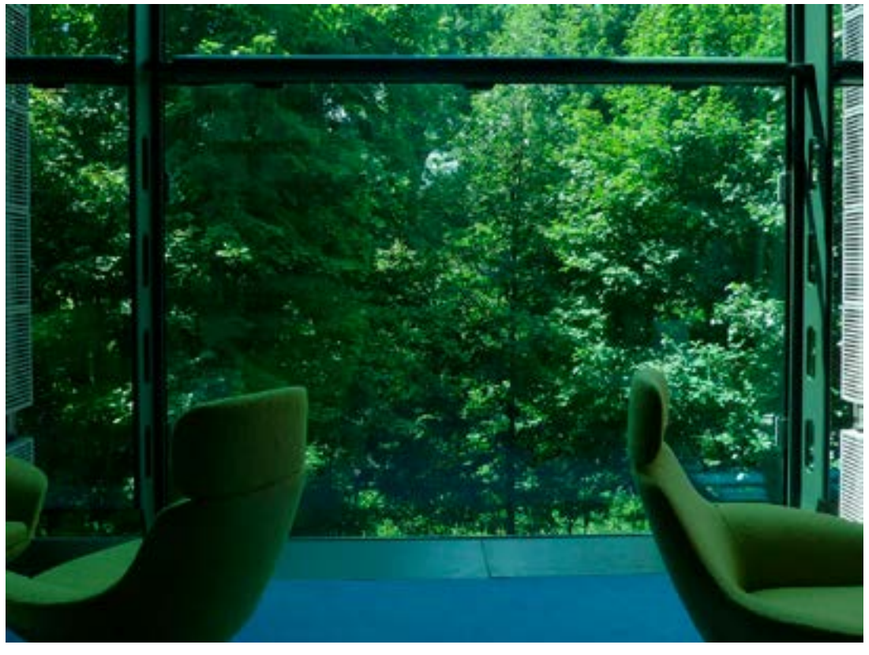
Tree lined streets

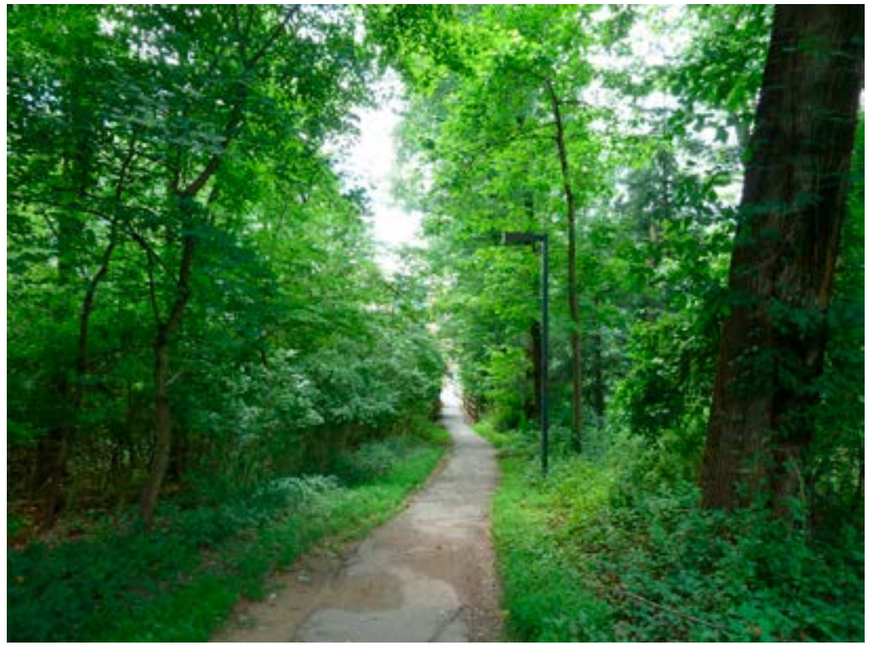




Landscape Palette

Native woodland





Landscape Palette

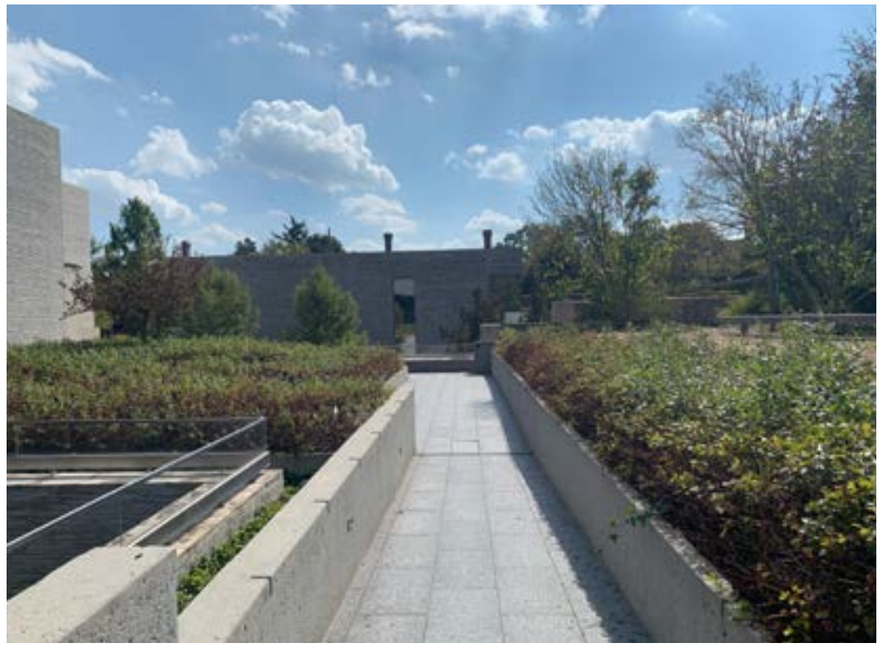
Seasonal Native Plantings

Landscape Palette

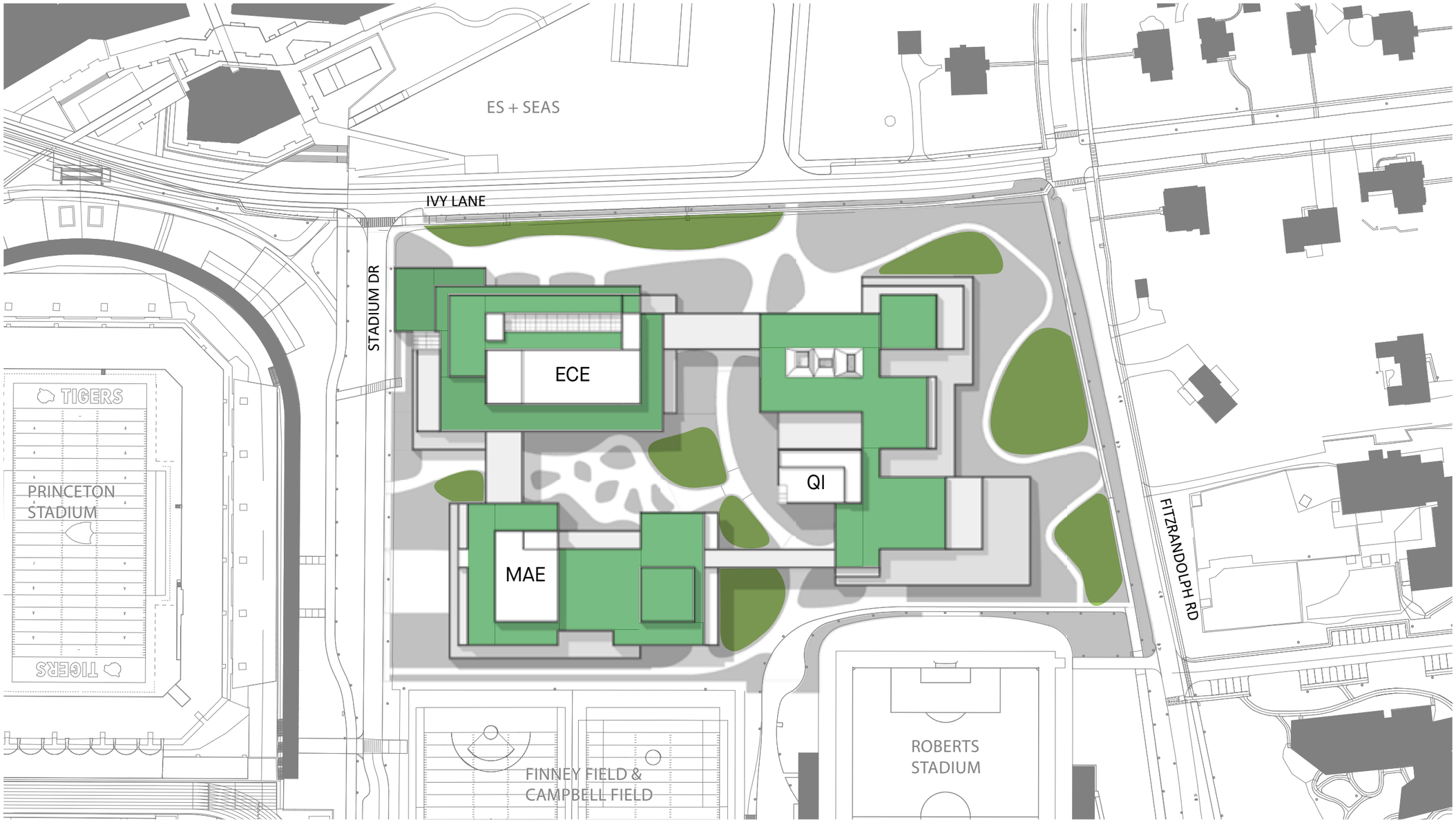
Quads and Courtyards

Landscape Palette

Green roofs



Stormwater



GREEN ROOF

BIORETENTION/ RAIN GARDENS

POROUS AND PERMEABLE PAVEMENT SYSTEMS

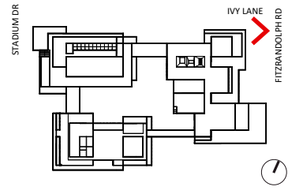
Aerial view looking Southwest

1. Quantum Institute for Quantum Science
2. Electrical and Computer Engineering
3. Mechanical and Aerospace Engineering

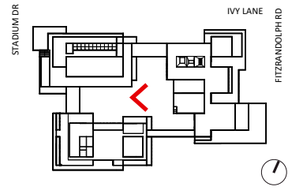
Aerial view of looking Northeast

1. Quantum Institute for Quantum Science
2. Electrical and Computer Engineering
3. Mechanical and Aerospace Engineering

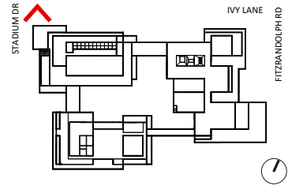
Ivy Lane view looking West



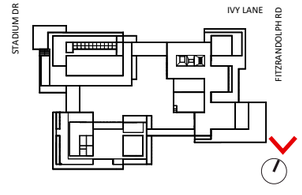
Internal courtyard view looking East



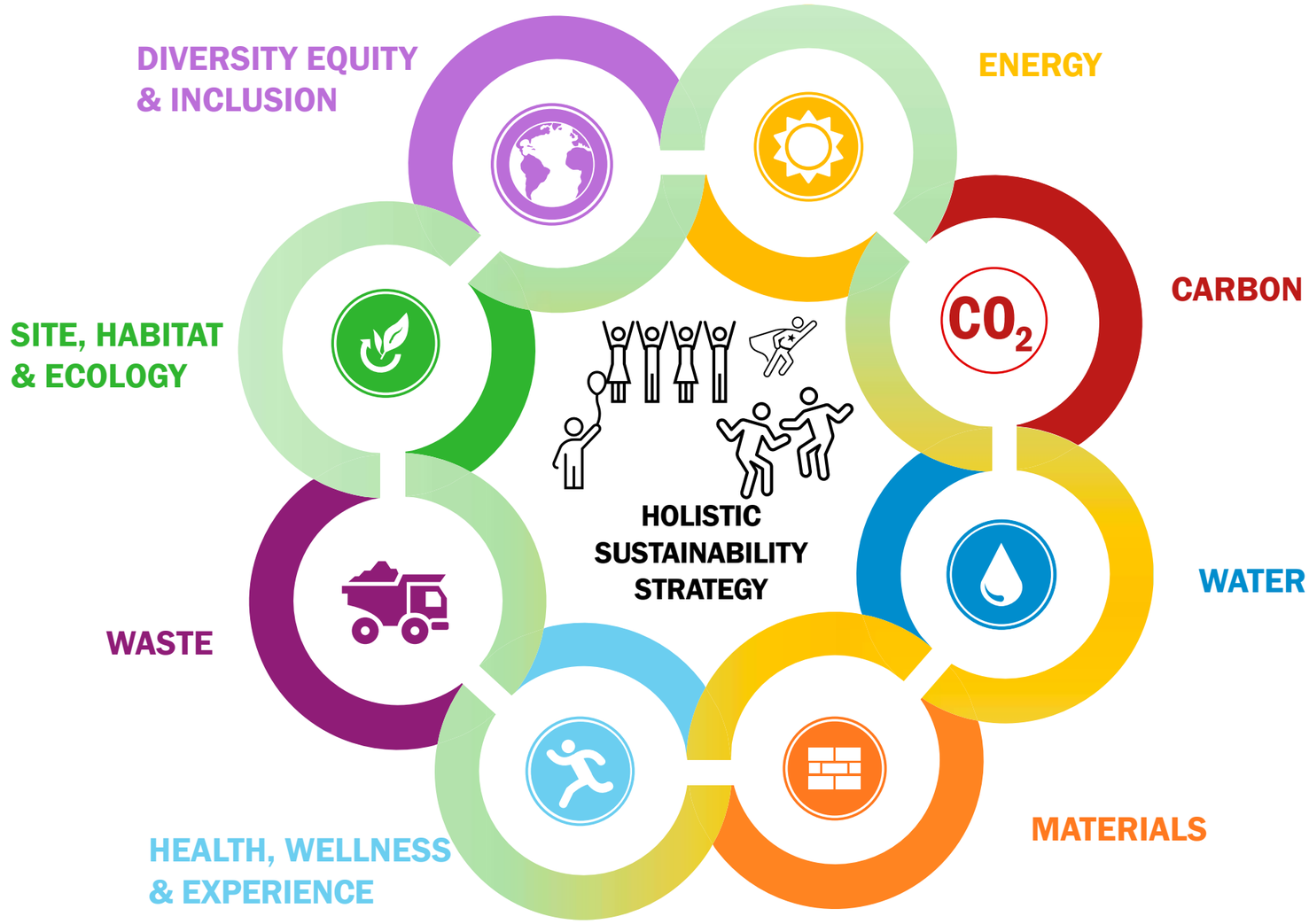
Stadium Drive view looking South



FitzRandolph Road view looking North



Holistic Sustainability Goals and Strategies are synergistic, not discrete.



Sustainability Goals

ENERGY & CARBON

• Design systems and building energy flows to enhance campus net zero and geo-exchange goals.

• Optimize buildings for passive solar design

• Design high performance, energy efficient buildings and site.

• Track and reduce embodied carbon emissions across the project and set and an embodied carbon reduction target.

• Use Lower carbon construction practices and track fuel use.

WATER

• Promote water stewardship: Manage and treat stormwater close to source using landscape-integrated nature based systems

• Design for a resilient site, able to mitigate and treat current and projected future storm events using green infrastructure

• Conserve water across potable and non potable uses

• Offset non-potable uses with collected rainwater

WASTE

• Pursue best practices in construction and demolition, diverting waste from landfill, and reusing materials and products.

• Maximize on-campus soil reuse

• Target zero waste operations across building and site areas

SITE: HABITAT + ECOLOGY

• Enhance connections to natural habitats and existing green spaces.

• Encourage life long sustainable transportation habits for project users and optimize alternative transit connectivity

• Increase soil health and ecology.

• Support a compact campus development footprint

Sustainability Goals

EXPERIENCE: HEALTH & WELLNESS

• Design for a healthier and comfortable site and interior environment

• Design for high quality interior environment

• Design for continued operations in hazard events

MATERIALS

• Procure healthier building materials considering the full supply chain

• Create a low carbon and carbon sequestering materials palette

BENCHMARKING

• **LEED Gold** – at minimum achieve LEED v4 Gold

• **SITES and LEED ND** Select Credits Consider adopting the East Campus and / or Meadows Neighborhood Site Criteria adapted from SITES and LEED ND

DEI: DIVERSITY EQUITY + INCLUSION

• Understand the opportunities to go beyond ADA. All people feel included and cared for as part of the design proposal.

• Responsible Sourcing Create a procurement strategy that is transparent to 2nd and 3rd tier suppliers and consider a Design for Freedom pilot.

• Social Justice The project provides opportunities to Minority, Women, or Disadvantaged Business Enterprises (MWDBE) organizations

Geo-Exchange System

- Support the campus transition to geo-exchange and carbon neutrality.
- Geo-exchange bores will be integrated with the phased development of the entire site.
- Advanced sound attenuation techniques will be used to reduce noise impacts from drilling.

BOUNDARY FOR INSTALLATION OF GEO-EXCHANGE BORES

Concept Hearing - February 15, 2024

Site Plan 1 - Excavation and Geo-exchange

Site Plan 2 - Quantum Institute Building

Site Plan 3 - Electrical and Computer Engineering Building

Site Plan 4 - Mechanical and Aerospace Engineering Building