



NYU LANGONE HEALTH SCIENCE BUILDING
SUSTAINABLE DESIGN

NYU Langone
Health

ennead

atelier ten

NYU Langone Health Science Building

The NYU Langone Health Science Building is a state-of-the-art facility encompassing more than 365,000 square feet and 10 floors of laboratory space dedicated to research. It includes wet laboratory space, core facilities, a new vivarium, conference spaces, and public amenities in an expansive, integrated environment. The Science Building has been awarded LEED Platinum Certification from the U.S. Green Building Council.

Building Energy Summary

Approximate Building Energy Savings against ASHRAE 90.1-2007 Baseline: 52%

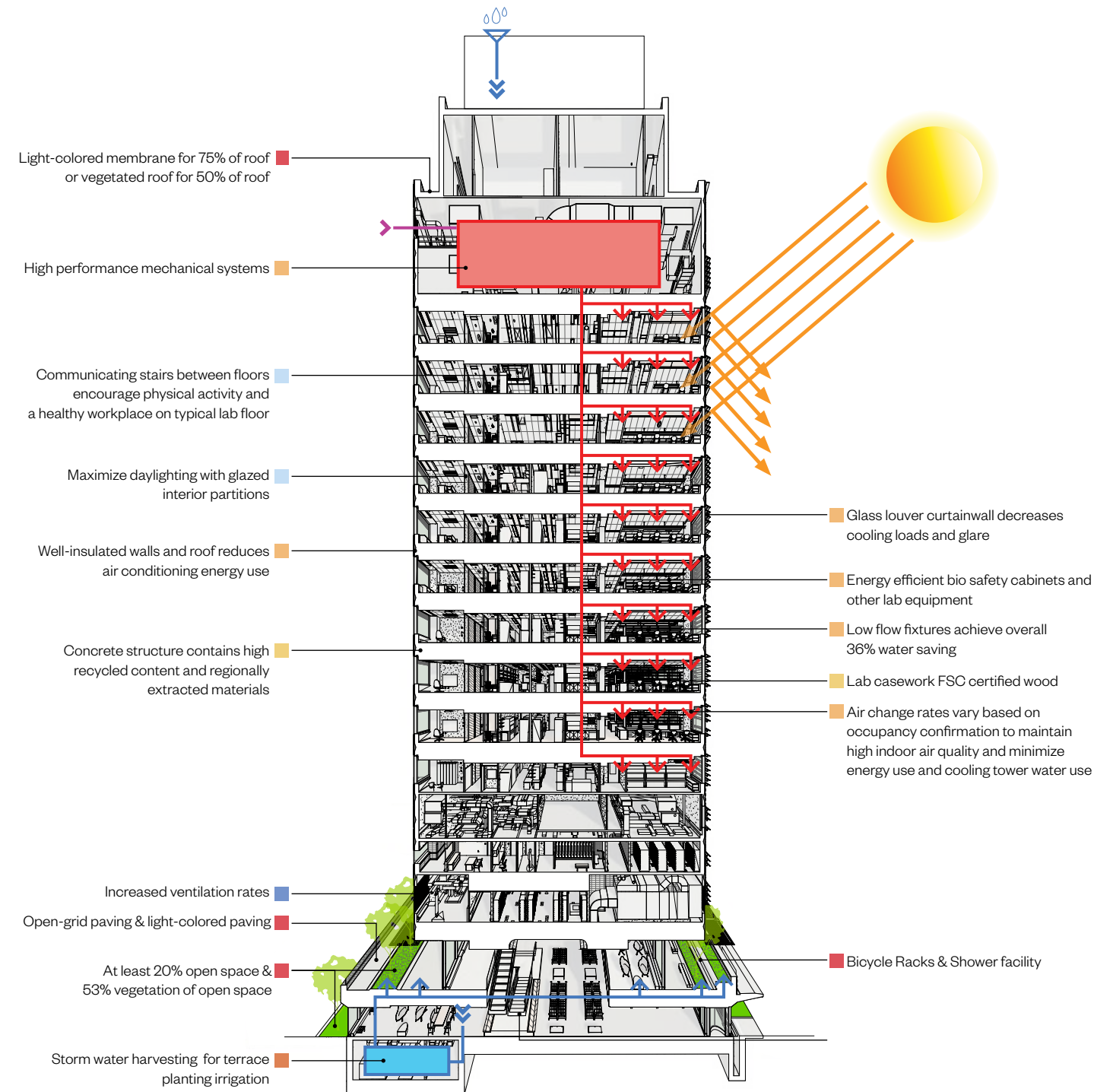
Approximate Building Energy Cost Savings against ASHRAE 90.1-2007 Baseline: 35%
Energy Use Intensity (EUI): 249 kBtu/sf/Yr



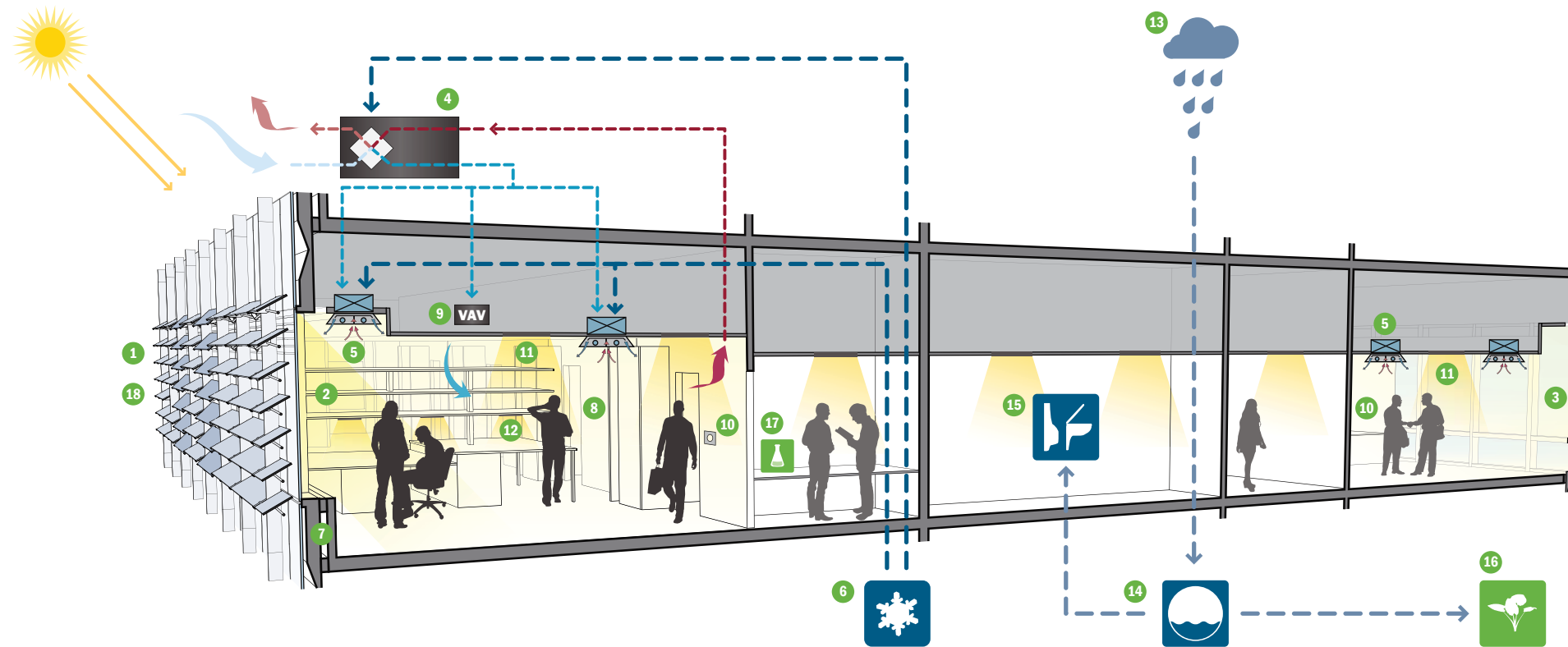
LEED Platinum

Points Achieved / Available

SUSTAINABLE SITES	23 / 26
WATER EFFICIENCY	8 / 10
ENERGY & ATMOSPHERE	26 / 35
MATERIALS & RESOURCES	7 / 14
INDOOR ENVIRONMENTAL QUALITY	11 / 15
INNOVATION IN DESIGN	6 / 6
REGIONAL PRIORITY	3 / 4



NYU Langone Health Science Building



* Illustration courtesy of Atelier Ten

Environmental Strategies

- 1 External Louvers Mitigate Direct Sun & Glare
- 2 Well Daylit Interior Labs
- 3 Glazing Optimized for North Private Offices
- 4 DOAS w/ Heat Recovery Provide 100% Outside Air
- 5 Active Chilled Beams
- 6 Low & High Temperature Chilled Water From Chiller Plant
- 7 Perimeter Heating
- 8 VAV Fume Hoods
- 9 Night time Set Backs
- 10 Occupancy Sensors
- 11 High Efficiency Lighting w/ Daylighting Dimming
- 12 Task Lighting at Lab Benches for Occupant Control
- 13 Rain Water Collected from Roofs and Retained for Reuse
- 14 Rain Water Reuse for Flush Fixtures
- 15 Low Flow Fixtures
- 16 Rain Water Reuse for Irrigation
- 17 High Efficiency Lab Equipment
- 18 Views of Manhattan Skyline

- - - - - → Outside Air
- - - - - → Return Air
- - - - - → Chilled Water
- - - - - → Rain Water

Various environmental strategies are utilized in the NYU Langone Health Science Building to increase occupant comfort and reduce energy and potable water usage. External glass louvers on the south facade mitigate direct sun and glare while allowing daylight to penetrate the interior labs and preserving views of the Manhattan and Brooklyn skyline. Occupancy sensors, high efficiency lighting with daylight dimming, and task lighting at the lab benches reduce the electrical loads from lighting. Rain water is collected from the roofs and retained for reuse for irrigation and low-flow flush fixtures. High efficiency lab equipment, VAV fume hoods, and active chilled beams provide occupant comfort and reduce energy consumption, while dedicated outdoor air systems (DOAS) with heat recovery provide 100% outside air.

ENVIRONMENTAL STRATEGIES

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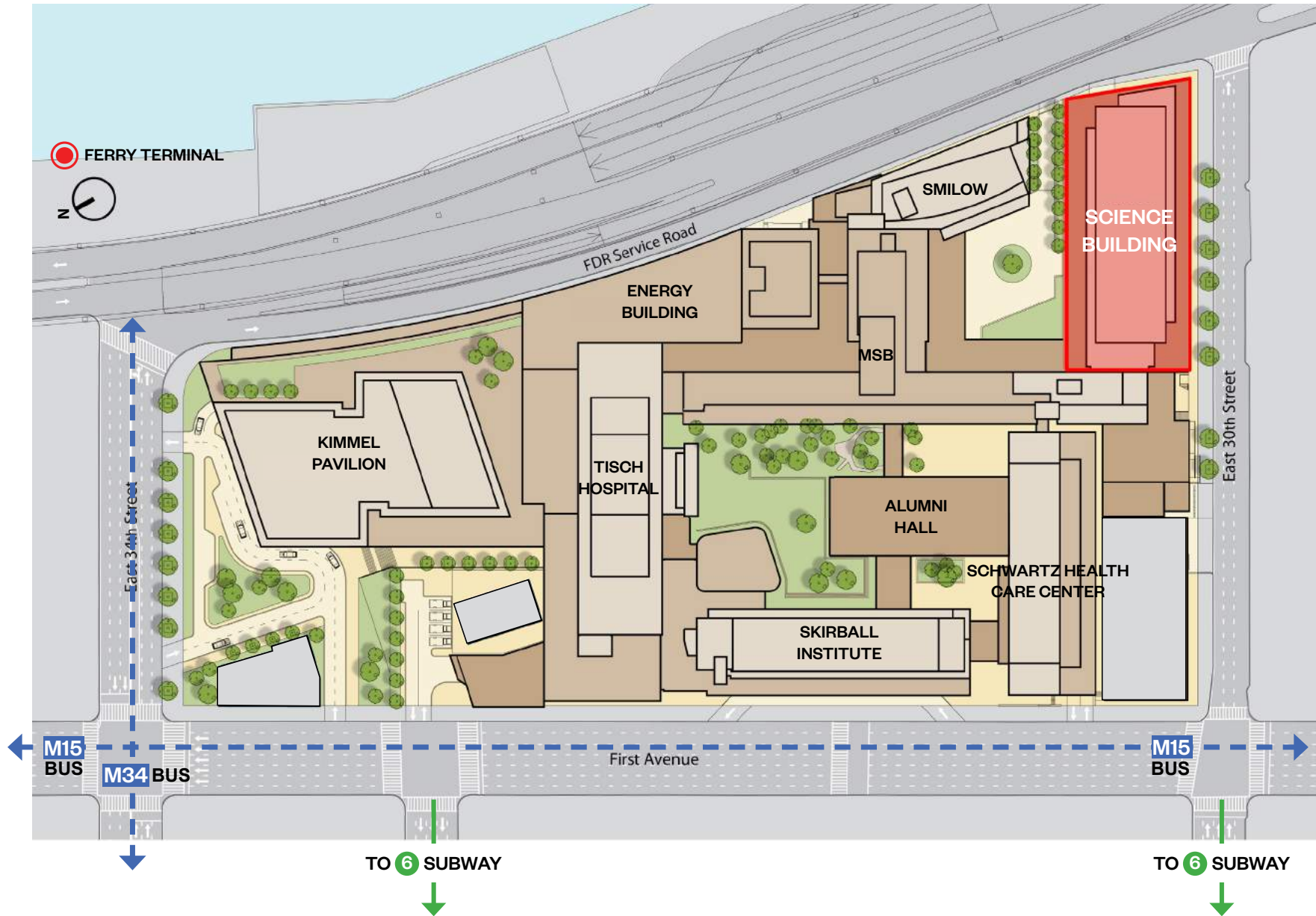
NYU Langone Health Science Building

The NYU Langone Health Science Building is located on the East Side of Manhattan on the southeast corner of the institution's campus. Public transportation is readily available, with bus service, subway service and a public ferry terminal within 1/4 mile of the building site. Numerous stores and community services are provided within close proximity. Bicycle racks and showers are provided for employees, faculty and students. Landscaped areas are provided as part of the project site development, including open space and vegetated terraces. Materials used for paving at the Ground Floor and First Floor terraces and the roofing materials all have a high Solar Reflectance Index, which reduces heat island effect.



URBAN CAMPUS

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Public Transportation Access

-Locate project within 1/4 mile of four bus lines

Maximize Open Space

-The open space provided is equal to 53.11% of the total site area

Encourage Alternative Transportation

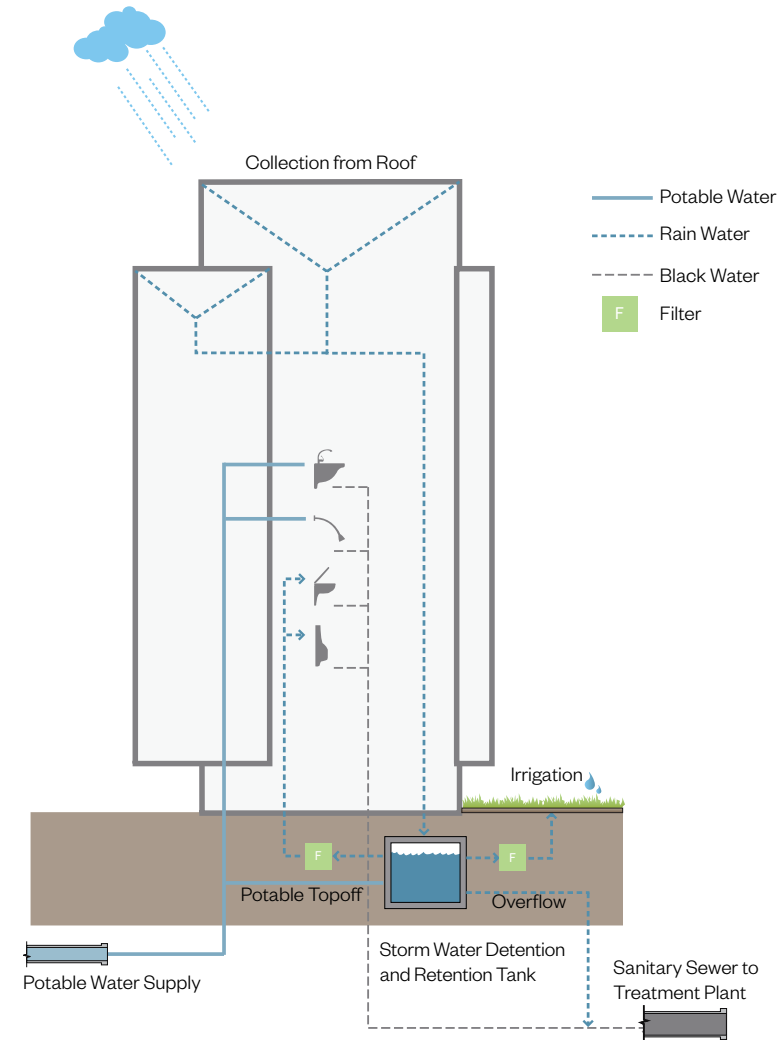
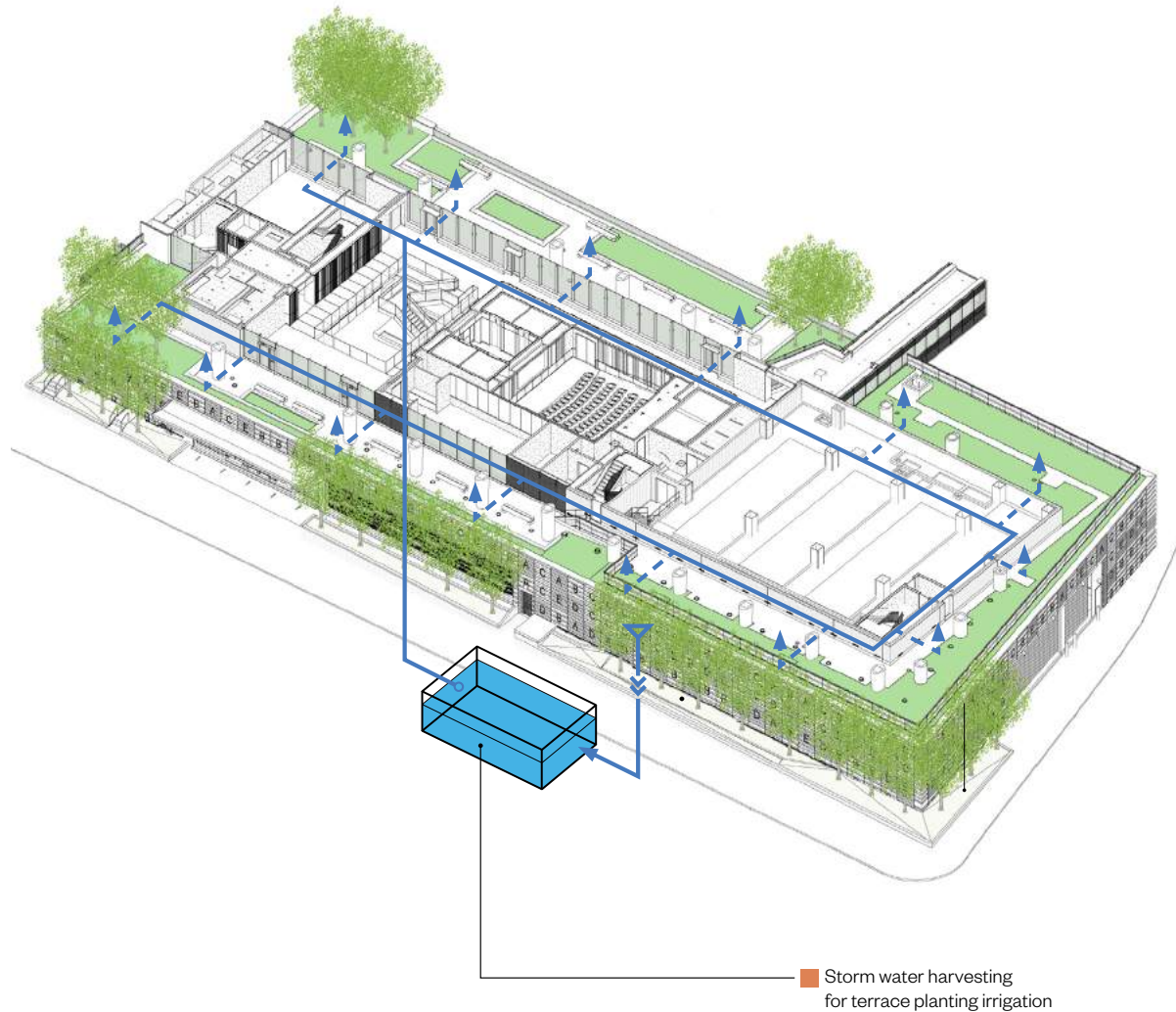
-Installed 54 bike racks and bike commuting shower facility

Reduce Heat Island Effect

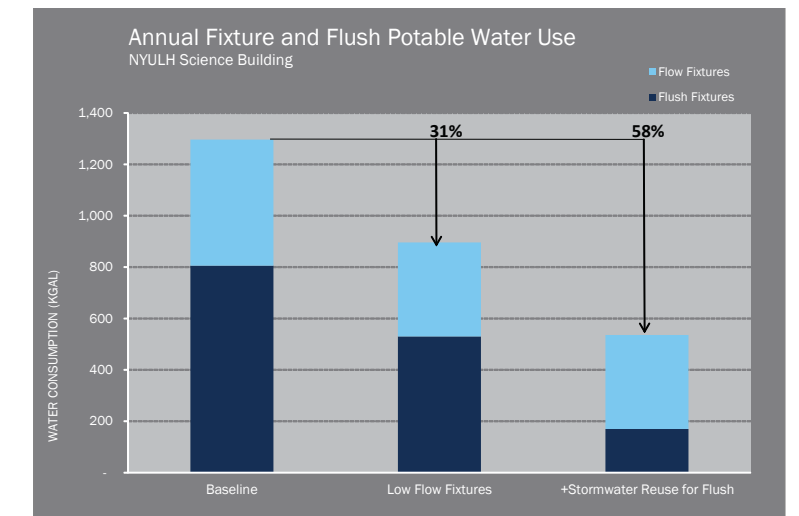
-The weighted average roof area for the combined SRI compliant and vegetated roofing surfaces is greater than or equal to the total building roof area.
Light-colored and vegetated site and roof areas contribute reduce the heat island effect

NYU Langone Health Science Building

High efficiency plumbing fixtures, including low-flow fixtures and dual flush toilets, greatly reduce the potable water demand, reducing water consumption by 36 percent. Storm water is captured and used for landscape irrigation, reducing potable water consumption. Water use for sewage conveyance is also reduced.



* Illustration courtesy of Atelier Ten



	BASELINE FIXTURE FLOW RATE	LOW-FLOW RATES
TOILETS	1.6 GPF	1.28 GPF
URINALS	1.0 GPF	0.125 GPF
TAPS	0.25 GPC	0.17 GPC
SHOWERS	2.5 GPM	1.6 GPM

* Graph courtesy of Atelier Ten

WATER CONSERVATION SAVINGS

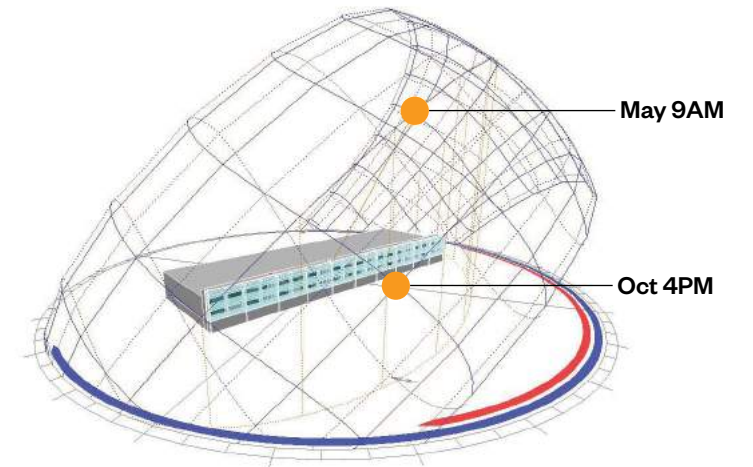
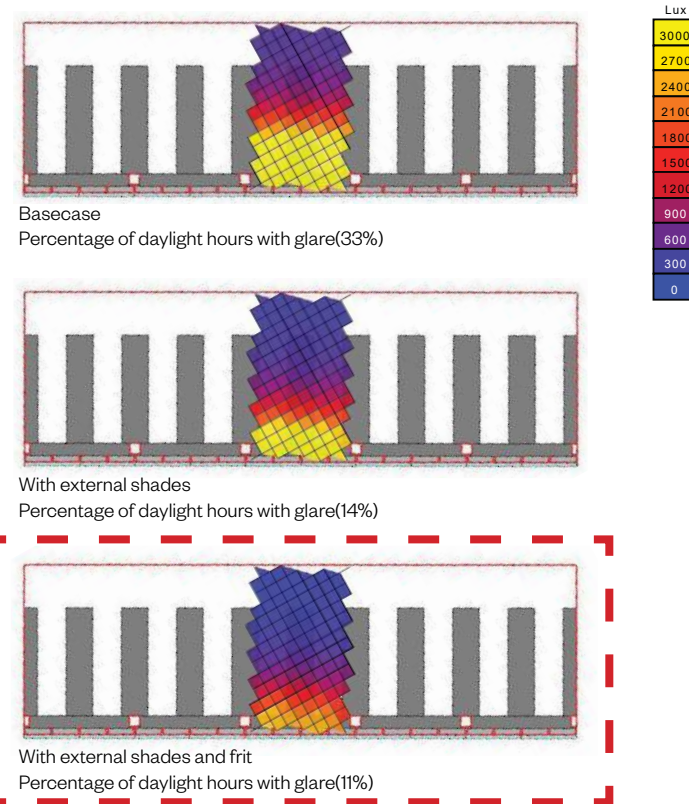
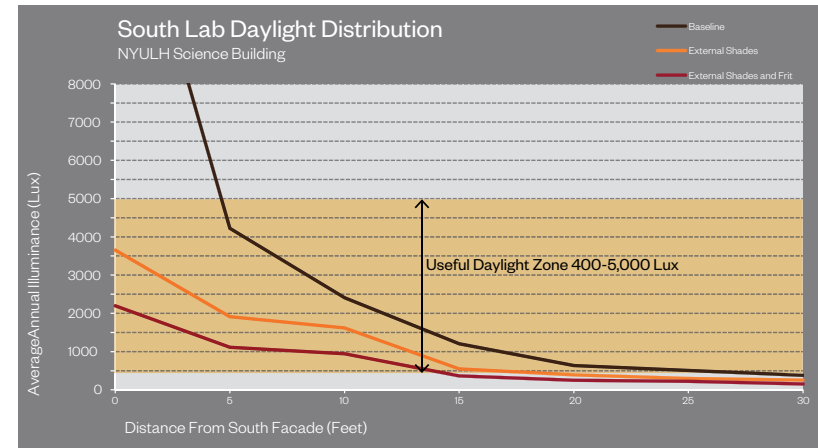
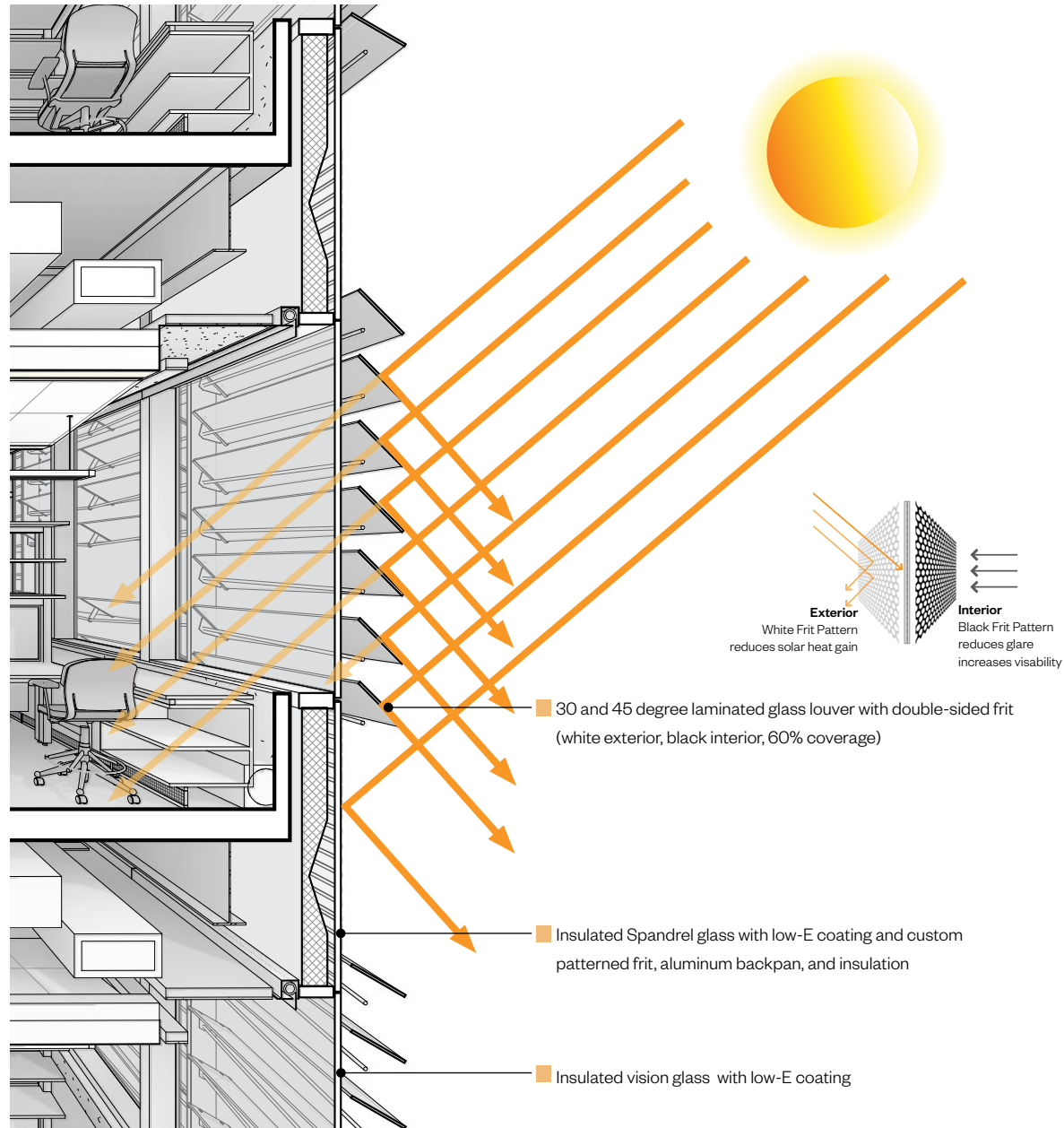
- Compartmented storm water tank (35,000 gallon), filter, and irrigation pump reducing potable water required for irrigation
- High efficiency fixtures achieves overall 36% water savings

WATER EFFICIENCY

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NYU Langone Health Science Building

Optimizing the building envelope, particularly of the south side laboratory spaces, is critical for controlling daylight distribution into the spaces and minimizing the potential for visual discomfort caused by glare. While the whole building energy consumption profile is driven by internal loads and ventilation requirements typical for a laboratory building, high-performance glazing and external shading strategies contribute towards energy savings, and they are critical in maintaining optical indoor environmental quality.



* Daylight analysis courtesy of Atelier Ten

DAYLIGHT & FACADE

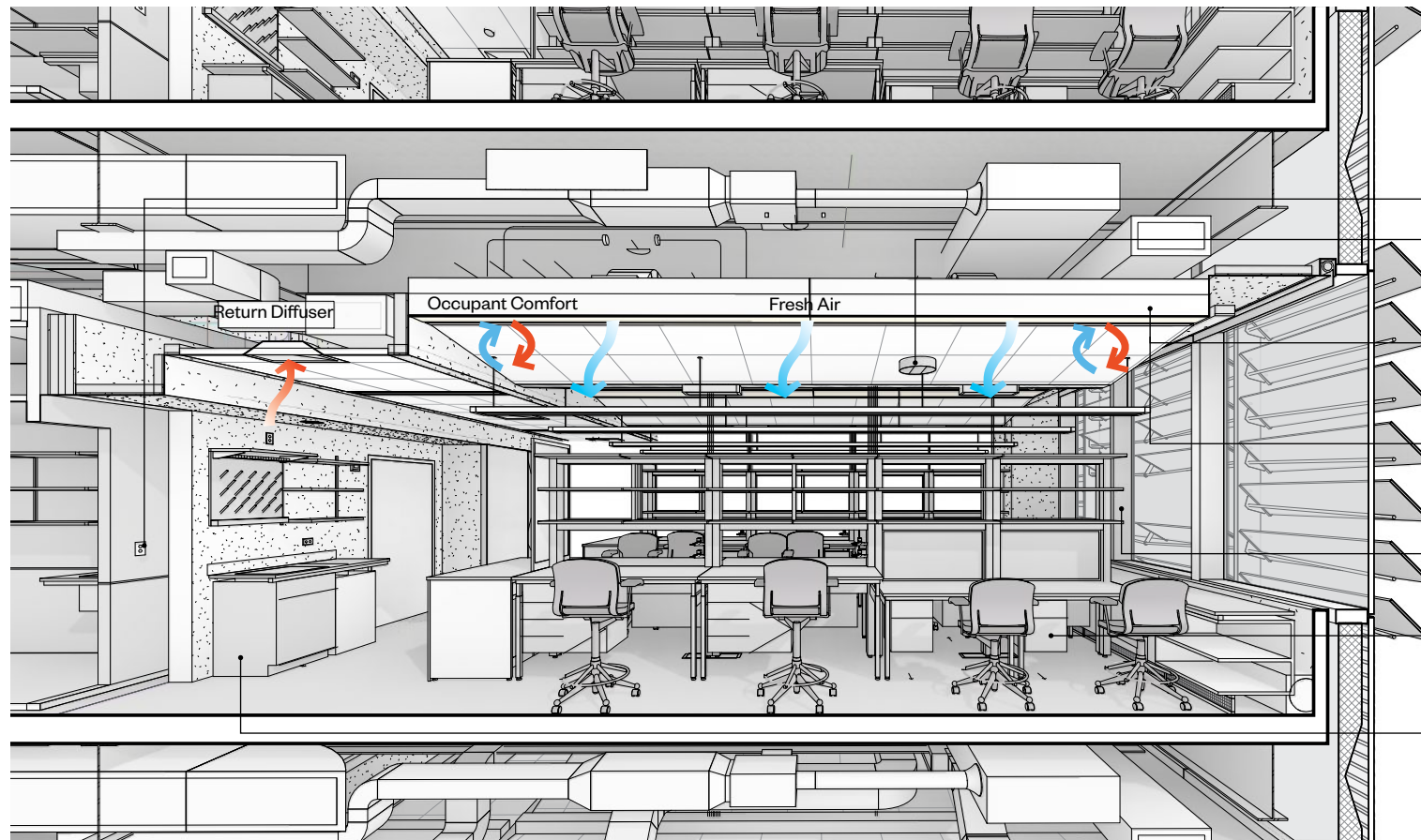
South Facade Energy Savings

- The external shades and frit are very effective in reducing solar heat gain in the labs, and greatly reduce annual hours of glare (11%).
- The external shades and frit greatly reduce the perimeter daylight levels and the daylight zone to approximately 14 feet from the south facade

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NYU Langone Health Science Building

The building's high performance envelope and careful lighting design reduce conditioning loads, which are then met with an efficient mechanical system design. The mechanical systems, including variable speed drives on fans and pumps, air-side heat recovery, active chilled beams, premium efficiency motors, and enhanced mechanical controls (including unoccupied system setbacks), reduce the energy required to remove the large heat loads and condition the building.



- Lighting user controls & overrides
- Occupancy sensor for mechanical & lighting systems
- Air change rates vary based on occupancy confirmation to maintain high indoor air quality and minimize energy use and cooling tower water use
- Use of chilled beam decreases air change rates & energy usage
- Daylight dimming full range lighting
- Lab casework FSC certified wood
- Energy efficient bio safety cabinets and other lab equipment

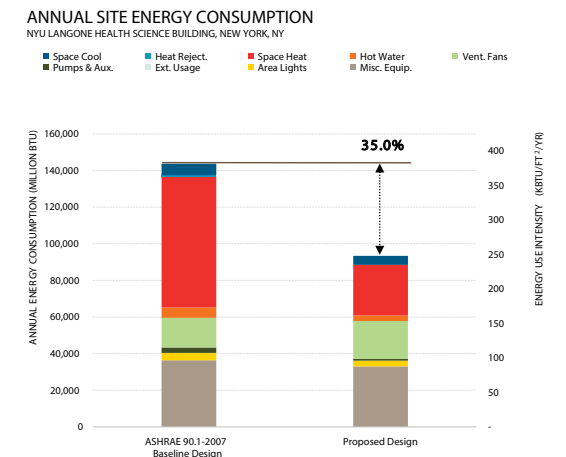


Figure 1: Annual Site Energy – Baseline Design and Proposed Design

Design Case	Site Energy Intensity (kBtu/ft ² /yr)	Site Energy Savings	Energy Cost Savings	LEED EAc1 Points
Baseline Design	384	-	-	-
Proposed Design	249	35.0%	52.9%	19 (+1 EP)

Table 1: Summary of Results – Baseline, Proposed & Potential Designs
*Graph/Table courtesy of Atelier Ten

Mechanical Systems Energy Savings

-Reduces annual energy cost by 52% below ASHRAE 90.1-2007 and energy consumption by 35% below ASHRAE 90.1-2007.

Measurement & Verification

- Measurement and verification of all HVAC and lighting systems.
- Post-occupancy thermal comfort survey

MECHANICAL SYSTEMS

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Wood Casework
FSC Certified Wood



Carpet
High Recycled Content



Resilient Flooring
High Recycled Content



Interior Glazing
Regional Materials



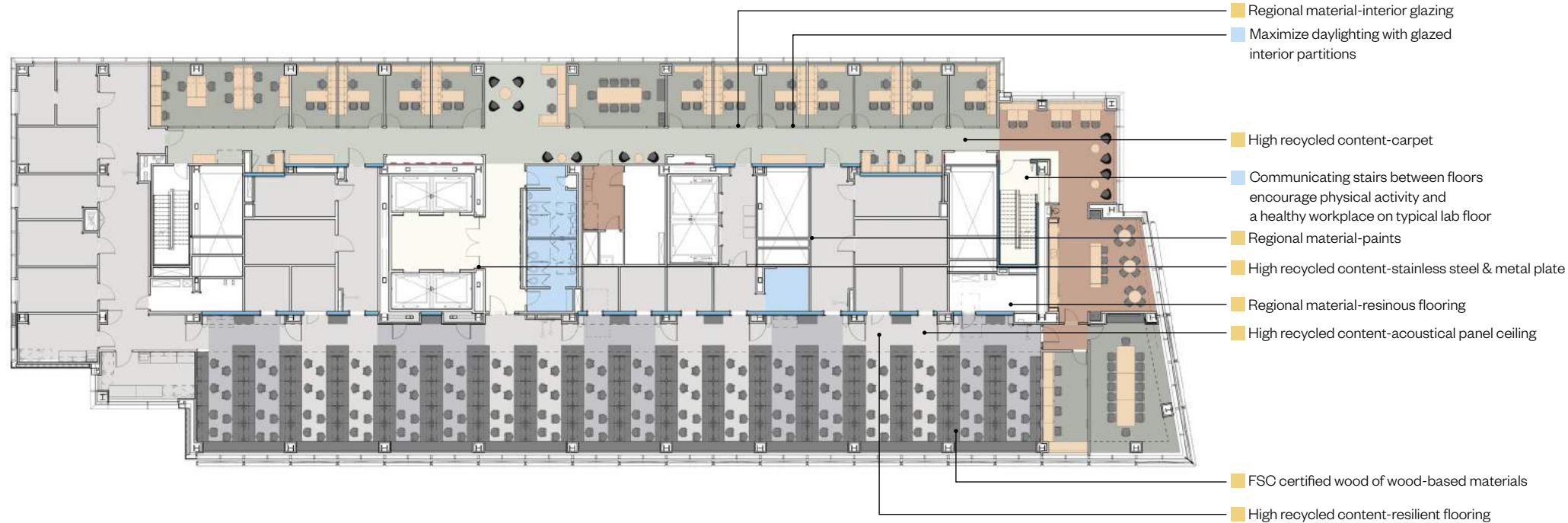
Wood Wall
FSC Certified Wood



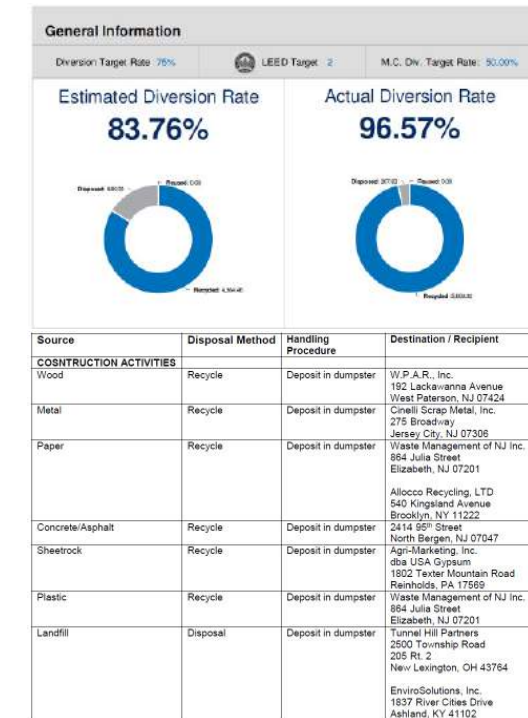
Acoustical Panel Ceiling
High Recycled Content

NYU Langone Health Science Building

Materials within the NYU Langone Health Science Building were selected based upon several environmental criteria. Materials were selected for their high recycled content, and wherever possible, local extraction and manufacture. Additionally, the majority of building woodwork was sourced from sustainably managed forests, and all materials were carefully selected for low emission of contaminants to maintain good indoor air quality.



Typical Lab floor Finish Plan



Construction Waste Management Plan

Regional & Recycled Materials

- 28.27% extracted, processed, and manufactured regionally
- 35.8% (post-consumer + 1/2 pre-consumer) recycled content

Certified Wood

- 78.6% FSC certified wood used

Construction Waste Management

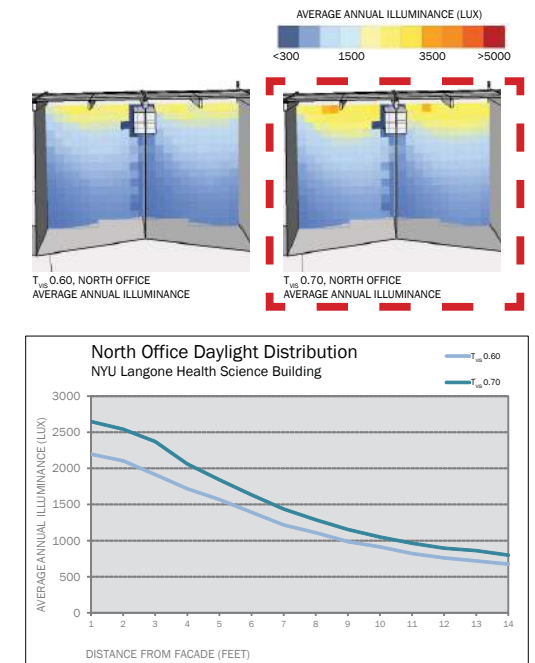
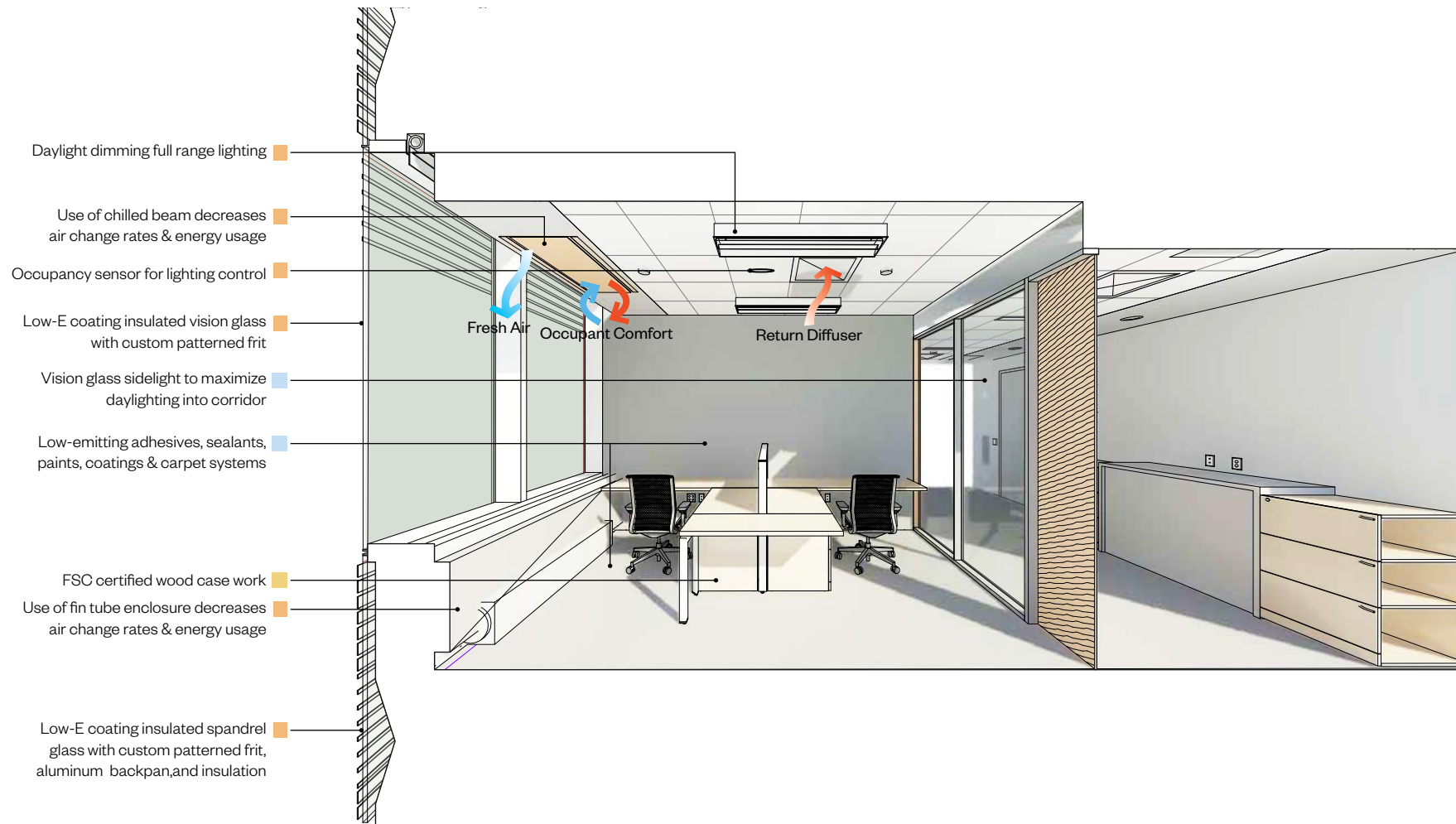
- Construction waste management plan developed and implemented
- 93.14% of the construction waste was recycled

MATERIALS

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NYU Langone Health Science Building

High indoor environmental quality is achieved at the NYU Langone Health Science Building through numerous environmental strategies. This includes the selection of low-emitting (low-E) adhesives, sealants, paints, coatings and carpet systems and the use of chilled beams to provide fresh air while decreasing the air change rates and energy usage. Daylight dimming full range lighting with occupancy sensors provides occupant comfort while vision glass sidelights maximize daylight into the corridor.



* Daylight analysis courtesy of Atelier Ten

Lighting Controls

-Individual lighting controls for most occupants

Low VOC Materials

-Low-emitting adhesives, sealants, paints, coatings & carpet system

Improved Air Quality

-Ventilation rates are 30% above ASHRAE 62.1-2007

-Direct outdoor airflow measurement devices

-Building flush-out implemented prior to occupancy

WORKING ENVIRONMENT

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