Case Study: Aramark Student Training and Recreation Center

Temple University

Temple University's Newest Classroom, Fitness and Athletic Facility

The Temple University Aramark Student Training & Recreation Center (ASTAR) is a unique new classroom, fitness and athletic facility located extremely close to the heart of the campus as well as multiple transportation hubs. Construction began for the building in May 2016 and was completed in August 2017. The structure is on a nearly 3-acre lot and includes classroom and lab space for the College of Public Health as well as an indoor 70-yard football field that is used by intercollegiate athletics, campus club sports, and intramural teams. The building's lobby includes a climbing wall and a juice bar and the building also contains administrative offices for Business Services and Athletics. ASTAR offers double the amount of free weight recreation space previously offered on campus, plus the facility also includes an exterior jogging track, green stormwater infrastructure, and a landscaped entry plaza. The building is meant to give students a place to get active, plus encourage physical activity and education for both students and surrounding community members.

Address : 1816 N15th street on Montgomery Ave

Size : 109,825 sq ft

Program : Core Learning Space: College/University

Date of Completion : August of 2017

Owner : Temple University

Project Team

Architecture:	Moody Nolan Architecture
MEP (Mechanical, Electrical, Plumbing) Fire Protection:	Brinjac Engineering
Landscape Architecture:	Langan Engineering & Environmental Services
Construction:	E.P. Guidi
Sustainability and Certification Consultant:	Moody Nolan Architecture

Sustainable Strategies

Sustainable Sites

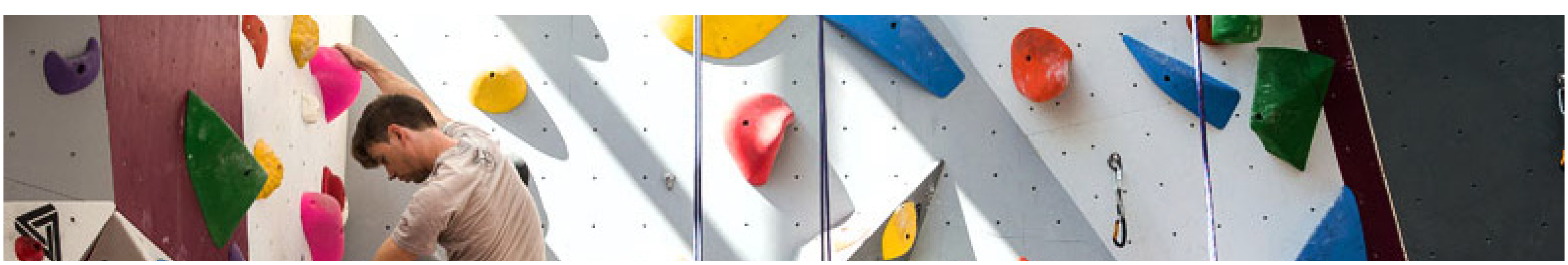
Temple is easily accessible by regional rail, bus and subway lines. The ASTAR complex is located 1/2 mile to an existing commuter rail and is within one block of three stops for four public bus lines. The project provides twelve bike racks at the buildings main entrance for a total of 24 spaces. Among all of these means of public transportation SEPTA'S website states there are over 800 rides available on an average day, and over 500 on an average weekend day, providing the flexibility to encourage transit commuting in lieu of individual auto travel. A highly reflective white roof was installed to reduce cooling cost and heat island effect on the classroom portion of the building. The shed roof that houses the interior football field has a light gray metallic roof. The "cool roof's" on the building reflect and emit the sun's heat back to the sky instead of transferring it to the building below.

Water Efficiency

The ASTAR Complex has about 16,900 square feet of pervious asphalt pavement and pavers on site collect, and manage 1.5 inches of rainfall. A rain garden, retention pond and gabion retention walls aid in stormwater management on site. Rain water on site is collected through drains, traps and sumps to be filtered and used. A combination of efficient landscape design with drought tolerant plantings and an efficient irrigation system on the property uses approximately 35% less water than a conventional landscape design. The site also contains a combination of low-flow and low-flush fixtures so the building water systems use 30% less water than a conventional design and saves approximately 240,000 gallons of water per year. There is an underground L-shaped Basin that serves 63,575 square feet as well as a Biorientation Basin that serves 6,600 square feet.

Energy and Atmosphere

Temple University engaged in a five year contract with Community Energy Inc. which provides 35% of the universities electricity from wind energy, a renewable energy source. The base building lighting controls utilize a lighting control panel with local override switches for automatic on/off lighting control of the main corridor areas and practice field. The classrooms and remainder of the building utilize local controls with occupancy sensors for automatic off when the space is not occupied. All controls are in accordance with ASHRAE 90.1-2007.Windows lining the Montgomerey Street facade have shades for lighting control and help in the passive cooling process. The field house contains an ARU supply air CFM that circulates air when people are using the space. ASTAR also contains a heat/reheat system that is used throughout the building. The building overall has saved 14.6% for total energy use.



Sustainable Strategies

Materials and Resources

ASTAR has dedicated collection and storage areas for the recycling of materials; including paper, cardboard, glass, plastic and metals, as well as compact fluorescent and e-waste collection. This project was designed with the intent to reduce the amount of virgin materials used in construction. This both lowers the embodied energy of the project and kept 86,6% amount of waste entering the landfill. This project kept 261.39 tons of materials out of the landfill. Materials used throughout the building were closely sourced. The structure of the building is made of steel and materials with a high level of recycled content. All the wood used in the building was FCS lumber.

Indoor Environmental Quality

This project used low-emitting materials in construction, including adhesives, sealants, paints, coatings, floor systems and composite wood and agrifiber products which reduces the concentration of volatile organic compounds inside the building this fosters a healthier working and learning environment. The project installed permanent CO2 monitoring sensors that provide feedback on system performance to ensure that ventilation systems maintain design minimum ventilation requirements for superior air quality. They also work in conjunction with the building automation system to identify occupied areas, ensuring building systems run only when necessary. In addition, the school features ventilation systems that provide constant supply of fresh air to increase productivity and keep occupants more alert. The window shades for the building shade building spaces from direct sunlight and windows on south and south east facade provide ambient illumination for building occupants reducing the use of artificial light. In addition, very efficient light fixtures, occupant sensors and time clocks were installed to ensure a reduction in energy consumption. The occupant sensors and time clocks make sure that the lights are only on when the room is in active use. The field house also contains an occupant senor systems when circulating exterior fresh air.

Innovation and Design

One of the major impacts of a demolition and construction project is waste - on this job the construction team carefully managed this process and diverted nearly 86.6 percent, or 261.39 tons of construction waste away from landfill sites. Some of this was recycled, other items were salvaged and sent for reuse in other buildings. The project reduces the amount of mercury in landfills by establishing an Induction Lamp Recycling Program in conjunction with the University's Office of Sustainability. This mercury recycling program provides for the safe recovery of the mercury in the lamps. By specifying almost exclusively LED lighting, there is nearly zero mercury in the project's light fixture lamps, which minimizes the potential impact to the operations staff and the waste management teams.

Temple Student Health & Wellness Center

LEED 2009 New Construction

Project ID: 1000070054
Status: Silver Certified
Certification level: Silver
Certification date: 01/06/2020

Attempted: 53, Denied: 2, Pending: 0, Awarded: 51 of 110 points

SUSTAINABLE SITES	18 OF 26
SSp1 Construction Activity Pollution Prevention	Y
SSc1 Site Selection	1 / 1
SSc2 Development Density and Community Connectivity	5 / 5
SSc3 Brownfield Redevelopment	0 / 1
SSc4.1 Alternative Transportation-Public Transportation Access	6 / 6
SSc4.2 Alternative Transportation-Bicycle Storage and Changing Rooms	1 / 1
SSc4.3 Alternative Transportation-Low-Emitting and Fuel-Efficient Vehicles	0 / 3
SSc4.4 Alternative Transportation-Parking Capacity	2 / 2
SSc5.1 Site Development-Protect or Restore Habitat	0 / 1
SSc5.2 Site Development-Maximize Open Space	0 / 1
SSc6.1 Stormwater Design-Quantity Control	1 / 1
SSc6.2 Stormwater Design-Quality Control	1 / 1
SSc7.1 Heat Island Effect, Non-Roof	0 / 1
SSc7.2 Heat Island Effect-Roof	1 / 1
SSc8 Light Pollution Reduction	0 / 1

WATER EFFICIENCY	3 OF 10
WEp1 Water Use Reduction-20% Reduction	Y
WEc1 Water Efficient Landscaping	0 / 4
WEc2 Innovative Wastewater Technologies	0 / 2
WEc3 Water Use Reduction	3 / 4

ENERGY AND ATMOSPHERE	8 OF 35
EAp1 Fundamental Commissioning of the Building Energy Systems	Y
EAp2 Minimum Energy Performance	Y
EAp3 Fundamental Refrigerant Mgmt	Y
EAc1 Optimize Energy Performance	1 / 19
EAc2 On-Site Renewable Energy	0 / 7
EAc3 Enhanced Commissioning	0 / 2
EAc4 Enhanced Refrigerant Mgmt	2 / 2
EAc5 Measurement and Verification	3 / 3
EAc6 Green Power	2 / 2

MATERIALS AND RESOURCES	6 OF 14
MRp1 Storage and Collection of Recyclables	Y
MRc1.1 Building Reuse-Maintain Existing Walls, Floors and Roof	0 / 3
MRc1.2 Building Reuse - Maintain 50% of Interior Non-Structural Elements	0 / 1
MRc2 Construction Waste Mgmt	2 / 2
MRc3 Materials Reuse	0 / 2
MRc4 Recycled Content	2 / 2
MRc5 Regional Materials	2 / 2
MRc6 Rapidly Renewable Materials	0 / 1
MRc7 Certified Wood	0 / 1

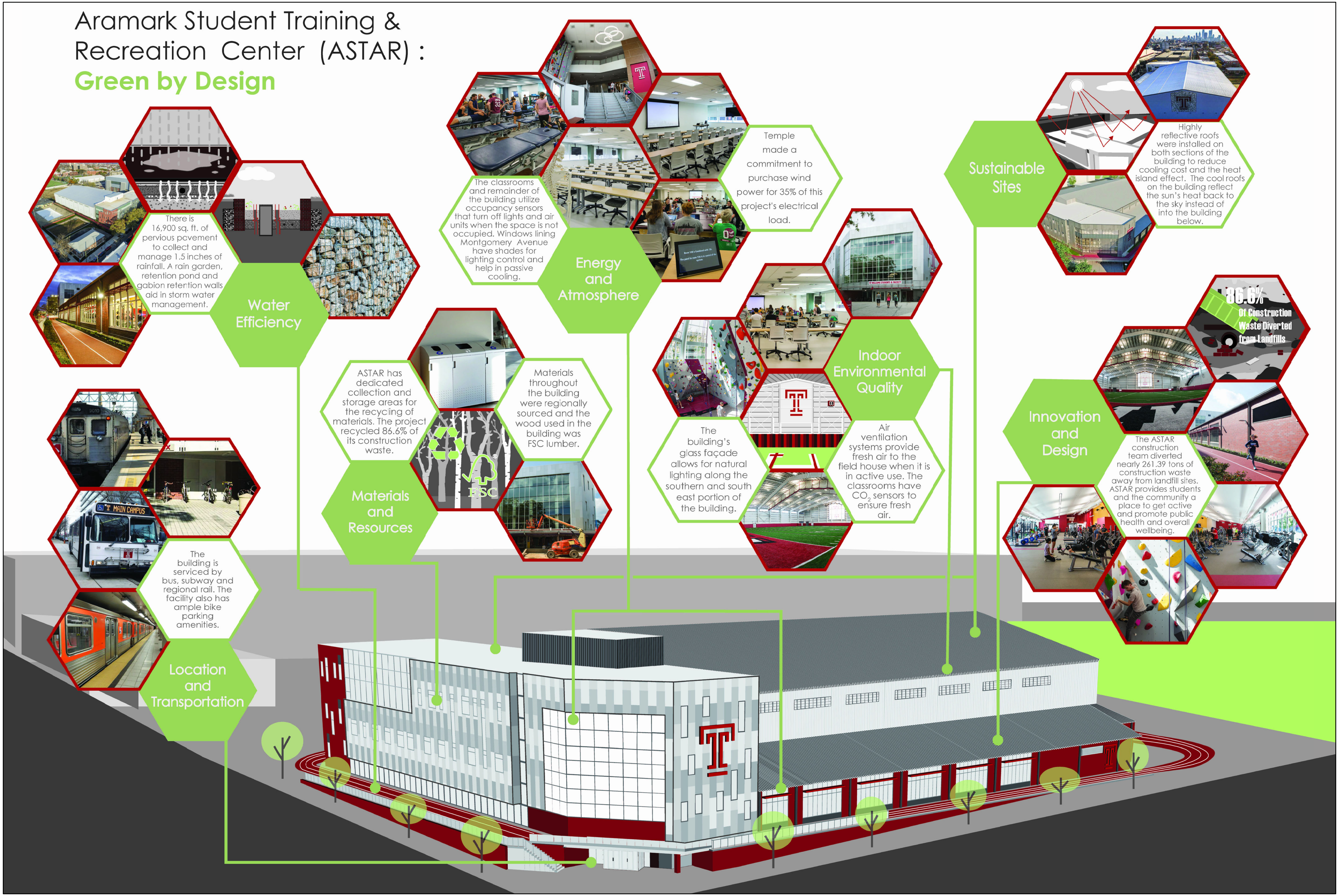
INDOOR ENVIRONMENTAL QUALITY	9 OF 15
IEQp1 Minimum IAQ Performance	Y
IEQp2 Environmental Tobacco Smoke (ETS) Control	Y
IEQc1 Outdoor Air Delivery Monitoring	0 / 1
IEQc2 Increased Ventilation	0 / 1
IEQc3.1 Construction IAQ Mgmt Plan-During Construction	1 / 1
IEQc3.2 Construction IAQ Mgmt Plan-Before Occupancy	0 / 1
IEQc4.1 Low-Emitting Materials-Adhesives and Sealants	1 / 1
IEQc4.2 Low-Emitting Materials-Paints and Coatings	1 / 1
IEQc4.3 Low-Emitting Materials-Flooring Systems	1 / 1
IEQc4.4 Low-Emitting Materials-Composite Wood and Agrifiber Products	1 / 1
IEQc5 Indoor Chemical and Pollutant Source Control	0 / 1
IEQc6.1 Controllability of Systems-Lighting	1 / 1
IEQc6.2 Controllability of Systems-Thermal Comfort	0 / 1
IEQc7.1 Thermal Comfort-Design	1 / 1
IEQc7.2 Thermal Comfort-Verification	1 / 1
IEQc8.1 Daylight and Views-Daylight	0 / 1
IEQc8.2 Daylight and Views-Views	1 / 1

INNOVATION IN DESIGN	6 OF 6
IDc1.1 Green Cleaning	1 / 1
IDc1.1 Innovation in Design	0 / 1
IDc1.2 WELL Feature 61: Interior Fitness Circulation	1 / 1
IDc1.2 Innovation in Design	0 / 1
IDc1.3 SSc4.1: Alternative Transportation, Public Transit	1 / 1
IDc1.3 Innovation in Design	0 / 1
IDc1.4 Green Building Education	1 / 1
IDc1.4 Innovation in Design	0 / 1
IDc1.5 Green Power	1 / 1
IDc1.5 Innovation in Design	0 / 1
IDc2 LEED® Accredited Professional	1 / 1

REGIONAL PRIORITY CREDITS	1 OF 4
SSc4.2 Alternative Transportation-Bicycle Storage and Changing Rooms	1 / 1

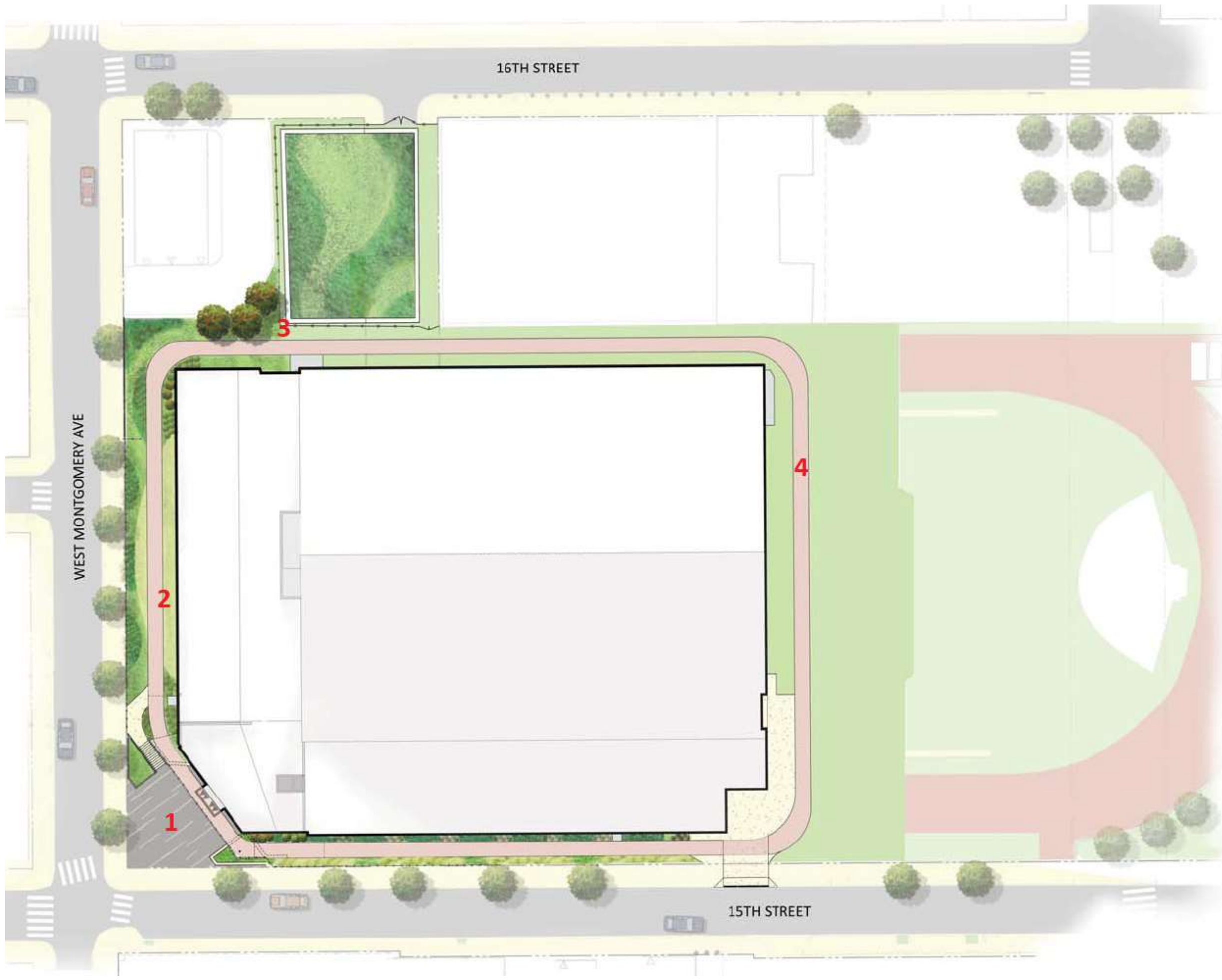
TOTAL	51 OF 110

40-49 Points	50-59 Points	60-79 Points	80+ Points
CERTIFIED	SILVER	GOLD	PLATINUM



Aramark Student Training & Recreation Center (ASTAR) :
Green by Design
Water Efficiency
There is 16,900 sq. ft. of pervious pavement to collect and manage 1.5 inches of rainfall. A rain garden, retention pond and gabion retention walls aid in storm water management.
Energy and Atmosphere
The classrooms and remainder of the building utilize occupancy sensors that turn off lights and air units when the space is not occupied. Windows lining Montgomery Avenue have shades for lighting control and help in passive cooling.
Temple made a commitment to purchase wind power for 35% of this project's electrical load.
Sustainable Sites
Highly reflective roofs were installed on both sections of the building to reduce cooling cost and the heat island effect. The cool roofs on the building reflect the sun's heat back to the sky instead of into the building below.
Materials and Resources
ASTAR has dedicated collection and storage areas for the recycling of materials. The project recycled 86.6% of its construction waste.
Materials throughout the building were regionally sourced and the wood used in the building was FSC lumber.
FSC
Indoor Environmental Quality
The building's glass façade allows for natural lighting along the southern and south east portion of the building.
Air ventilation systems provide fresh air to the field house when it is in active use. The classrooms have CO₂ sensors to ensure fresh air.
86.6%
Of Construction Waste Diverted from Landfills
Innovation and Design
The ASTAR construction team diverted nearly 261.39 tons of construction waste away from landfill sites. ASTAR provides students and the community a place to get active and promote public health and overall wellbeing.
Location and Transportation
The building is serviced by bus, subway and regional rail. The facility also has ample bike parking amenities.
MAIN CAMPUS

Green Building Education Tour



Starting at the front of the building the tour will discuss site features that support sustainable design [Location and Transportation].

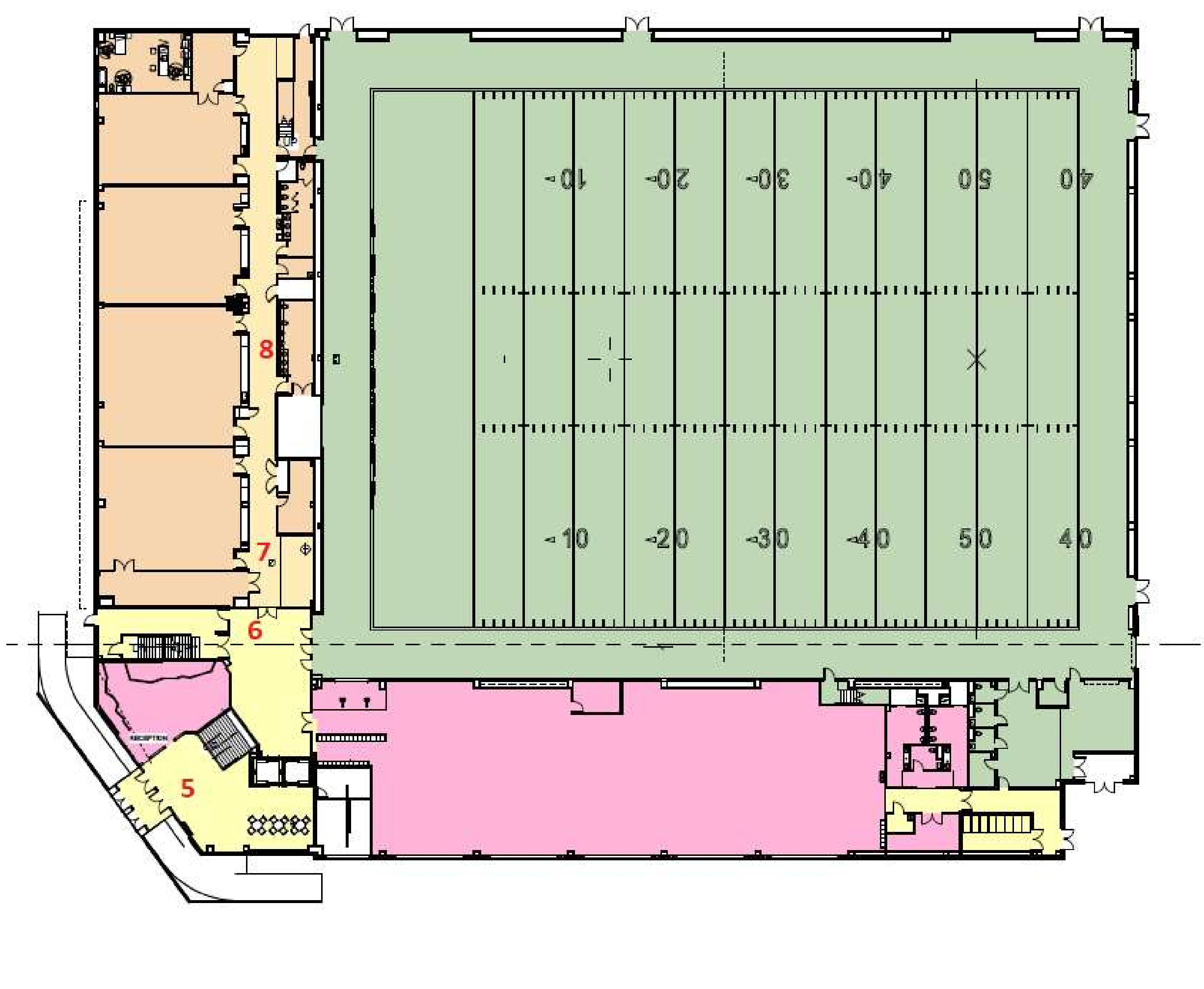
Temple University is easily accessible by regional rail, bus, and subway lines.

- **Stop 1** – Buildings maximizing support of existing infrastructure – public transit, pedestrian paths, bicycle networks – are buildings that encourage alternate transportation, responsible siting, and connection to nearby amenities.
    - West Montgomery provides access to public transit lines on N. Broad Street, connecting students to downtown.
    - Traveling South on N. Broad street provides access to the Cecil B. More subway station, providing access to the Broad Street Line (Orange) and the Trolley Line (Green).
    - Collectively, these assets contribute to the city's strategic transportation plan, CONNECT – aiming to affordable transportation that serves to connect and support communities and commerce.

From here, the tour will travel around the exterior track – circling the facility. The focus of the discussion will be stormwater management [Sustainable Sites].

A number of stormwater management strategies are implemented at the ASTAR facility to support the reduction of runoff and treatment of stormwater during rain events.

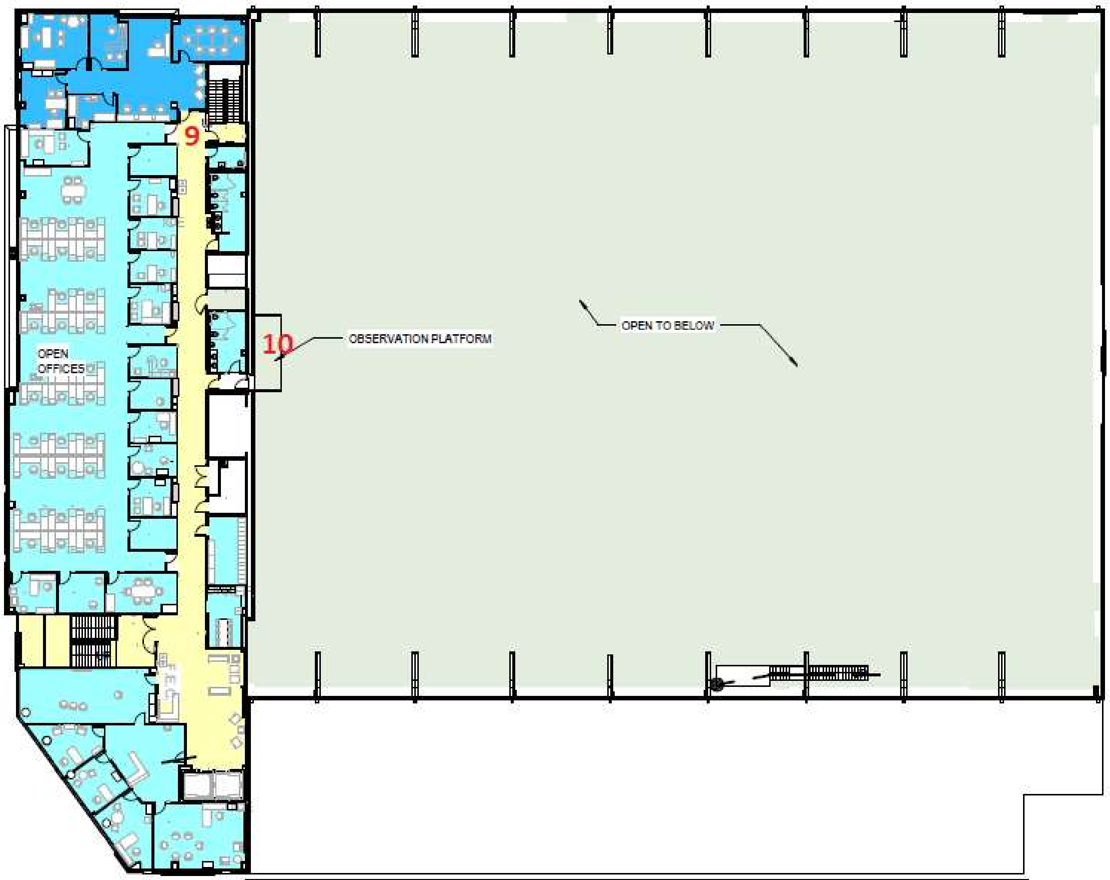
- **Stops 2-4 –** When rain falls on impervious surfaces, such as streets and sidewalks, it captures the pollutants on these surfaces (oil, gasoline, trash, etc.) and carries them to the storm sewers and eventually to streams and rivers. This is a key contributor to pollution of our waterways.
    - A combination of native plantings and permeable surfaces support natural stormwater filtration on site, reducing runoff to the nearby streetscape. They also have added benefit, reducing the amount of impervious surface that is able to absorb sunlight, reducing heat-island effect around the property.
    - A bioretention area captures stormwater into a treatment area consisting of soil and plants – allowing for natural ponding and water filtration, further reducing stormwater runoff. Bioretention systems help to remove a range of pollutants from the water such as suspended solids, metals, hydrocarbons and bacteria.
    - Reducing stormwater runoff also lessens the burden on the combined sewer system of Philadelphia – helping to contribute to the reduction of combined sewer overflows in our waterways.



Working your way into the interior of the building, indoor environmental quality and active design strategies will be the primary topics of discussion on the main level and second floor [Indoor Environmental Quality, Water Efficiency, Innovation].

ASTARS prioritizes indoor environmental quality for building occupants, leveraging concepts such as daylight and active design to enhance occupant experience.

- **Stop 5** – Active design strategies are those that promote regular physical activity into daily life – both outdoors and in.
    - A centrally located stair that includes elements of visual interest is shown to increase stair usage among occupants. You see these elements employed in the design of this staircase and those throughout the space.
    - We've talked about the site location supporting active transportation – down the hall are changing facilities and lockers to further support these uses.
- **Stop 6–** In the common spaces and within the classrooms, you'll notice an extensive amount of natural light designed to enter the space. Access to daylight and views allows for reduced energy consumption, provides visual connection to nature, and is proven to increase occupant well-being and productivity.
- **Stop 7** – To further support water conservation, low flow fixtures are employed throughout the facilities. These reduce the amount of water used to flush the toilet or employ sensors to control the length of time the water runs within the faucet. These fixtures contributed to a 34.65% reduction in potable water use consumption within the project.



On the third floor, occupants will have a chance to view the practice field and discuss strategies related to air quality, energy use reduction, and acoustic performance [Indoor Environmental Quality, Energy and Atmosphere].

- Stop 8 – You'll notice continued daylighting within the classrooms and windows within the corridors carried throughout the building to continue to support daylighting and reduced energy consumption.
    - Windows are also located within the stair wells to promote use of the stair over the elevator. Collective energy cost savings for the project as a result of daylighting and high-efficiency systems was 14.6%.
- Stop 9 – Looking down at the field, there are a number of unique features that promote indoor air quality and energy conservation.
    - A large air rotation unit on the first floor blows air across the fieldhouse saving materials by eliminating the use for ductwork. Sensors allow for tempered air to be used when the space is unoccupied to reduce energy consumption.
    - Translucent panels allow for daylighting within the field space.
    - Several acoustic features are in place including double walls to the corridor spaces and acoustic doors and gaskets to reduce noise from the field.