

**PSPE PHILADELPHIA CHAPTER
OUTSTANDING ENGINEERING ACHIEVEMENT AWARD NOMINATION FORM – 2024**

Project Information:

Name of Project:

Swarthmore College Sharples Dining Hall and Community Commons

Location of Project:

Swarthmore, PA

Description of Project, Include specific details (use two additional pages if necessary):

See following two pages.

Construction Cost: \$ 50M Completion Date: 12 / 31 / 24 Project or component must be complete in 2024

Primary Engineering Disciplines Represented by the Project (check those that apply):

Mechanical _____; Electrical _____; Civil ; Structural _____; Chemical _____

Organizations/Firms That Contributed to the Project and are Responsible for the Achievement (provide additional sheets as required):

Names: Langan Engineering and Environmental Services, LLC

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Title: Associate

Client/Owner:

Names: Swarthmore College

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Contact Person: Susan Smythe

Title: ADA Program Manager/Senior Project Manager

Submitted by:

Firm/Organization: Langan Engineering and Environmental Services, LLC

Phone: 215-845-8900

Signature: *Katherine Kubiak*

Email: kkubiak@langan.com

To be Presented on December 5th by: Kyle MacGeorge

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Addition Firms that contributed:

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Title: Southwest Region Leader

Names: Jonathan Alderson Landscape Architects

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Contact Person: Jonathan Alderson

Title: Owner

Names: ML Baird and Co.

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Contact Person: Mara Baird

Title: Landscape Architect

Names: O'Donnell & Naccarato

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Contact Person: Justin Walton

Title: Senior Constructability Manager

A \$50 Entry Fee is required and is to be submitted with the Nomination Form.

The entry fee is to be made payable to PSPE, Philadelphia Chapter.

Nomination is due: November 15, 2024 Presentations: Thursday, December 5, 2024

Send by Email or Fax Nomination to: oea@pspe-philly.org or 215-885-3732

Payment of the Application Fee may be check or by credit card.

To pay by credit card, click to [PAYPAL BUYNOW](http://www.pspe-philly.org/oea/entryfee.htm) button on our website <http://www.pspe-philly.org/oea/entryfee.htm>

To pay by check please mail to:

Fredric L. Plotnick, Ph.D., Esq., P.E. Chairman, Outstanding Engineering Achievement Awards

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email: oea@pspe-philly.org or oea@fplotnick.com or fplotnick@fplotnick.com

Langan paid \$50 by credit card on PAYPAL BUYNOW.

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Swarthmore College Sharples Dining Hall and Community Commons

Location of Project:

Swarthmore, PA

Description of Project, Include specific details (use two additional pages if necessary):

The Sharples Dining Hall at Swarthmore College has been expanded to create an improved dining experience and a campus community commons building to better serve the students and faculty. The project team aimed to establish a space where students and faculty could gather for meals and to form connections. To bring this vision to life, Langan collaborated with Swarthmore College, DLR Group, Jonathan Alderson Landscape Architects, ML Baird and Company Landscape Architects, O'Donnell and Structural Engineers and Warfel Construction. Langan provided survey, site/civil, geotechnical, and environmental engineering services, and led the land-use permitting effort for the expanding campus.

Langan closely collaborated with the architect and landscape architecture teams to integrate the building's expansion with the surrounding arboretum. Design considerations included circulation for supply-service access and pedestrian accessibility, utility relocations and enhancements, and stormwater-management facilities, all while preserving the college's beloved arboretum collections.

One key challenge was to improve service access to the site. As the college's primary dining center, the Sharples Dining Hall needs service access for daily deliveries and waste collection, which are critical, and which were underserved before the building's expansion. Previously, tractor trailers had to back up several hundred feet for loading and unloading. To improve safety and operations during daily deliveries for the expanded dining hall, Langan designed new loading docks with a service-vehicle access drive and a turn-around area. This access drive was planned early in the project and coordinated with the architectural team during the initial concept phase to minimize the amount of new paving required for the drive and to minimize undesired effects on the surrounding landscape. For safety, the access drive was situated to minimize the number of pedestrian crossings.

In addition to improving vehicular circulation, the college sought universally accessible walkways throughout the site to access the dining hall and to connect with other campus walkways. The campus topography has close to 50 feet of grade change across the project area. To navigate this steep campus terrain, ML Baird Landscape Architects and Langan worked with DLR to design a series of serpentine walkways that meet accessibility guidelines for access to all sides of the dining hall. As part of the overall accessibility plan, entrances to the dining hall expansion were provided by DLR at various floors of the building to connect them to the surrounding variable terrain.

Designing the dining hall expansion to meet the college's needs—while respecting valuable arboretum trees - was particularly challenging in the center of an active campus. The design required working with the topography, minimizing infrastructure impacts, and relocating sanitary sewer, stormwater, electrical, and telecommunication lines. During dining hall expansion, Langan, DLR, O'Donnell Naccarato, and Warfel collaborated to protect an underground tunnel that houses the college's aging steam infrastructure. Additionally, creative routing solutions for the gravity storm and sanitary systems were required to navigate their crossings of the tunnel. These solutions, which included locating key crossings where the proposed grades were to be raised above existing grades, allowed clearance over the tunnel while meeting minimal cover requirements on the new systems.

As part of its dining hall expansion, the college took the opportunity to incorporate aggressive energy- and carbon-reducing measures to demonstrate environmental responsibility and sustainability. As part of the dining hall's expansion, a new basement now accommodates equipment for the new campuswide geothermal systems. Langan provided support to the geothermal team by designing routes for geothermal exchange pipes and distribution lines throughout the development areas. Langan also performed a 3D scan of the steam tunnel to help the MEP team assess the feasibility of that tunnel housing the new campuswide geothermal pipes that will extend from the campus's utility plant to existing campus buildings. This campuswide geothermal system is a large part of Swarthmore College's ambitious energy plan, which is to reduce their carbon emissions and reach carbon neutrality by 2035. To further support this goal, the college lined the roof of the new dining hall with 800 solar panels to maximize renewable energy capacity of the building.

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To support the aggressive sustainability goals, Langan also designed stormwater management to optimize capturing and handling runoff from the dining hall expansion and other areas of the campus. These designs aligned the college's sustainability commitment to minimize downstream effects from runoff. As noted above, the 50-foot grade change at the project site created numerous challenges for preserving mature trees in the campus arboretum and minimizing rework of campus utility infrastructure and the topography itself.

One of the primary stormwater-management strategies was to reduce runoff by limiting the construction footprint—despite the aggressive program goals. One major step was to locate the geothermal utility plant in the dining hall basement. Locating the geothermal plant in the basement—rather than constructing another building to house the plant— allowed for preserving the integrity of landscaped areas and the arboretum. Locating the geothermal plant in the basement of the building, created additional challenges associated with coordinating competing program elements, introducing more utilities below ground, and addressing prior drainage issues from older infrastructure. Through close coordination with all design team members, the team was able to incorporate the additional utility program into a single building. Addressing these challenges, was worthwhile for the college to be able to preserve arboretum trees and understory plantings.

Preserving the surrounding arboretum included limiting removal of mature trees, amending the soil and restoring compacted areas, and planting native meadows and plants intercepting rain and snow before they become stormwater runoff. Jonathan Alderson Landscape Architects and Langan worked together on this integrated landscape stormwater-management approach.

In addition to the nonstructural stormwater-management measures described above, the stormwater design included structural stormwater-management practices such as green roofs, bioretention areas, a cistern for reusing rainwater, and an underground infiltration bed. All of these enhancements were carefully planned and coordinated with the project team to optimize space.

As noted above, the new roof was covered in solar panels to reduce the building's energy and carbon footprint. Because the solar panels took up much of the roof space, green-roof areas were generally limited to locations where lower roofs double as terraces where people can enjoy the outdoors. This green space provides a stormwater function and space for people to engage.

Bioretention areas were carefully planned around the root zones of arboretum trees so that no trees were removed while positioning new stormwater-management features. The spaces for bioretention areas were meticulously planned during site visits with the landscape architects and arboretum staff. Jonathan Alderson Landscape Architects designed the plantings in the bioretention areas to be highly water-absorbing species and an attractive amenity. The soil conditions in this area are relatively poor for infiltration, so a series of stone and underdrains were installed with a few overflow orifices to facilitate drainage and avoid drowning any plantings installed in the bioretention areas. These bioretention areas are a feature of the landscape and are an educational opportunity to raise awareness of the importance of proper stormwater management to prevent downstream erosion.

Finally, underground systems, including installing a cistern for reusing water within the building, and underground infiltration bed, were installed to manage the balance of stormwater runoff that could not be managed by the measures noted previously. These systems were located where new pavement was required (the service-vehicle drive) to avoid disturbing other areas of the landscape and to manage the runoff close to the source.

Langan also led the land-development approval process for this complex project through the Swarthmore Borough, Delaware County, and Pennsylvania Department of Environmental Protection.