

A series of steel trees welcomes visitors to Dickinson College's new squash-centered athletic facility.

SQUASHING the Competition

BY STEPHANIE J. HAUTZINGER, S.E.



Photos: CannonDesign/Scott Frances

DICKINSON COLLEGE in Carlisle, Pa., has a long and successful history in sports—specifically squash.

And the Dickinson College Red Devils have consistently excelled in athletics despite facilities that have not always been on par with the quality of and commitment to their athletic programs. The Kline Fitness Center Addition is the first component of a campus athletics master plan, focused on elevating sports facilities at the college. Completed in the fall of 2014,

the project is a 30,000-sq.-ft, state-of-the-art fitness facility that includes five international-sized squash courts to support a new varsity men's and women's squash program.

The existing 1980s structure has a unique and active roof form created by a series of hyperbolic paraboloid-shaped timber-framed roofs. While the existing structural system was an efficient means of enclosing the large spaces within, the interior of the Kline Center is dark and disconnected from the exterior. Per client and architectural goals, the addition was designed to counteract that dark and disconnected quality by bringing in natural light and views.

From the beginning, there was a commitment to express the structural solution as the primary architectural feature while complementing the exposed structure of the existing Kline Center. Much consideration was given to the appropriate means to harmoniously add on to the strong roof form of the existing building. A steel frame was the clear choice to provide a sculptural and aesthetically beautiful frame while allowing maximum transparency of the exterior wall, thus creating a light-filled and open interior space. No material was more appropriate or cost-effective than structural steel in creating this dramatic architectural expression, as well as in meeting the



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◀ ▲ ▼ ▶ The independent canopy structure is comprised of four HSS8x8 tree columns, rotated at 45° in plan, with four W8x28 wide-flange branches springing from each column face and rising to support framing for the glass roof plane above. Select exposed structural steel members close to view were designated as AECS.



▶ The project is a 30,000-sq.-ft. state-of-the-art fitness facility that includes five international-sized squash courts to support a new varsity men's and women's squash program.

tight construction schedule. The structurally significant aspects of the project include the fitness center roof, the porch and sunshade and the entry canopy and concourse. Again, exposed structural steel framing is the primary architectural feature at each of these key components.

Building Elements

The main fitness space is a two-story volume with a partial mezzanine. The roof structure is comprised of exposed wide-flange beams in an X configuration, spanning 43 ft and supporting long-span 3½-in.-deep acoustical deck. The X-shaped layout of the beams references the crisscrossing form of the glulam members in the existing Kline Center. From the interior of the building, the system achieves the architectural goal of creating a conceptual link to the roof structure of the existing Kline Center.

The porch is an exterior athletic space, its roof supported by slender Y-shaped columns comprised of W6×25 shapes. The Y-columns are 26 ft tall and approximately 23 ft wide. Angles of the Y's subtly mirror the angles of the existing Kline Center roof structure.

The Y-columns continue around the building; beyond the porch, however, they become a second layer of framing, supporting only an exterior sunshade, with the primary building

columns located behind the exterior wall. The sunshade is comprised of 1¼-in.-diameter vertical aluminum tubes supported off of the Y's and serves to filter daylight through the expansive glass walls.

The Kline Center forms the western terminus of a major campus pedestrian route called Dickinson Walk. The architectural intent of the addition was to continue the tree-lined walk metaphorically with structural steel "trees" supporting the exterior glass canopy as well as marching along the interior sky-lit concourse.

The independent canopy structure is comprised of four elegantly detailed HSS8×8 tree columns, rotated at 45° in plan, with four W8×28 wide-flange branches springing from each column face and rising to support framing for the glass roof plane above. Select exposed structural steel members close to view were designated as AESS.

Design-Assist Process

A design-assist approach was chosen to enhance architectural design through thoughtful detailing, ensure ease of construction, reduce cost and save time in the construction schedule through early preparation of shop fabrication drawings.

From our design perspective, there was some added time to provide information to the detailer early in the process; a detail-



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- ▲ The main fitness space is a two-story volume with a partial mezzanine.
- ▼ The entrance canopy. The existing Kline Center is visible in the background to the right.

- ▲ ▼ Structural steel is exposed prominently throughout the facility, both inside and out.



- ▼ Steel trees support the exterior canopy.

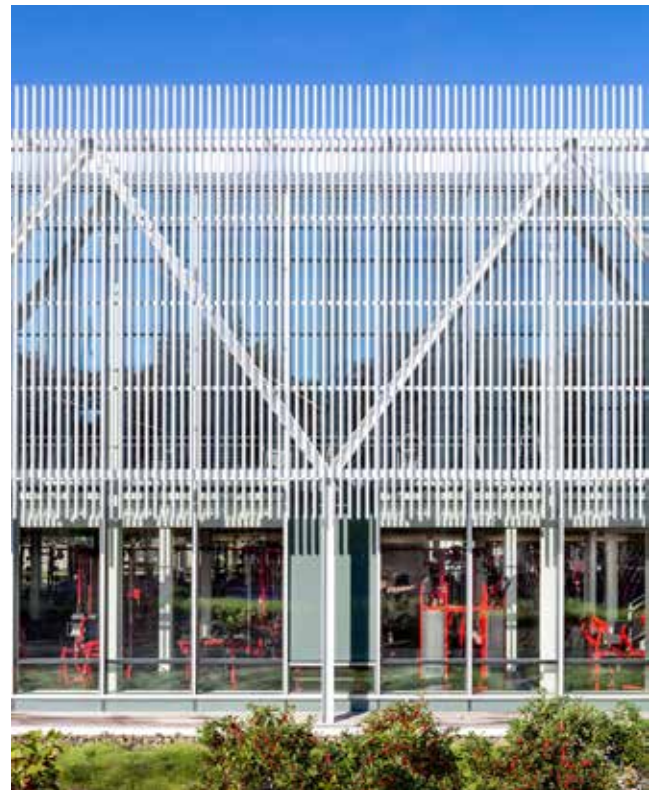




▲ Framing for the roof.

▼ Natural daylighting is prominent throughout the building.

▼ Y-columns supporting the sunshade.



ing model was started off of CannonDesign's 50% construction document set. The 100% construction document/issue for bid package included a complete set of structural steel shop drawings. A "soft approval" of the shop drawings was completed by CannonDesign during the four-week bidding phase of the project. This sped up the traditional process in that all steel shop drawings were complete at the issue-for-bid date, and tighter bids were received due to full steel detailing being complete.

A number of cost-saving ideas were incorporated into the design, including making the main fitness roof flat instead of sloped

to keep the typical skewed roof beam connection details identical, increasing column sizes at some skewed connections to simplify detailing and careful consideration of detailing of the Y-column joints and canopy tree column joints for ease of shop fabrication and field assembly (while bearing shipping limitations in mind).

The Kline Fitness Center addition begins the transformation of the existing Kline Center into a modern athletic complex. It puts physical fitness on display with its graceful exposed structure and expansive glazed walls and draws visitors in through its metaphoric continuation of Dickinson Walk.



▲ The sunshade is comprised of 1¾-in.-diameter vertical aluminum tubes supported off of the Y-columns and serves to filter daylight through the expansive glass walls.

This project exceeds the college's needs by providing a state-of-the-art athletics facility that addresses its continued commitment to fitness and participation in competitive sports, and it does so with a structurally expressive, signature piece of architecture that the college is very proud of and that has become a prominent and celebrated building on campus. ■

Owner

Dickinson College

Architect

CannonDesign

Structural Engineer

CannonDesign

General Contractor

Wagman Construction, Inc.

Steel Fabricator

Myers Steel Works, Inc.

