CASE STUDY

DOROTHY DAY RESIDENCE & OPPORTUNITY CENTER

Part of the larger two-building Dorothy Day Place Project in St. Paul, Minn. Currently pursuing Minnesota B3 certification

emanuelson-podas
consulting engineers

MINNESOTA B3 BUILDINGS, BENCHMARKS & BEYOND
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PROJECT OVERVIEW

Catholic Charities' Dorothy Day Residence and Opportunity Center – a part of the larger two-building Dorothy Day Place complex in St. Paul – is a 169,000-square-foot, six-story community shelter that sits on a 1.82 acre site. Situated across the street from the Higher Ground complex, it features four stories of permanent supportive housing above two floors of emergency support and service spaces for those experiencing homelessness. The Dorothy Day Residence project cost was approximately $55 million as part of the total Dorothy Day Place development cost of $110 million.

The project, designed alongside longtime Emanuelson-Podas architectural partner Cermak Rhoades Architects, is pursuing Minnesota B3 certification.

ARCHITECTURAL DESIGN HIGHLIGHTS:

Roof:	R-value of 50 (versus baseline R-value of 20.8).
Exterior Walls:	R-value of 18.6 (versus baseline R-value of 15.6).
Fenestration:	U-value of 0.31 (versus baseline of 0.45).
Of Note:	Bird-Safe Glass was also installed throughout the project.

ELECTRICAL DESIGN FEATURES:

Daylighting:	Daylighting practices utilized throughout the design to achieve a more than 60% reduction in interior lighting (versus baseline).
LED Lighting:	The design calls for the project to be lit by 100% LED lighting to achieve a total watts-per-square-foot of 0.24 (versus a baseline of 0.60 w/sf).

PROJECT TEAM

Scott Vander Heiden, PE, LEED AP BD+C

Mechanical Engineer, Managing Partner

Jon Wessling, PE, LEED AP

Mechanical Engineer

Ben Bahr, PE

Mechanical Engineer, Energy Modeling

Justin Artz, PE, LEED AP

Electrical Engineer

CATHOLIC CHARITIES
of St. Paul and Minneapolis

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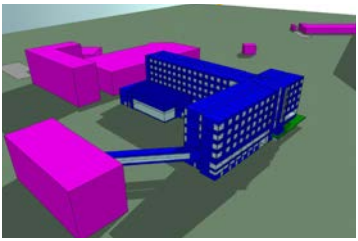
HVAC FEATURES:

Heating Systems:	The design calls for Hot Water District Energy provided by the city of Saint Paul to heat the building. This system serves hot water heating coils in dedicated outdoor air units (DOAS), air handling units (AHU), unit heaters (UH), chilled beams (CB), variable air volume boxes (VAV), finned tube radiation (FTR) and the domestic hot water system (DHW).
Cooling Systems:	The design calls for Chilled Water District Energy provided by the city of Saint Paul to cool the building. This system serves chilled water-cooling coils in dedicated outdoor air units (DOAS), air handling units (AHU) and chilled beams (CB). Premium efficiency motors or ECM will be installed where applicable.
Ventilation Controls	Demand Controlled Ventilation is called out with multiple CO_2 sensors throughout the project.
Energy Recovery:	Energy efficient DOAS units with high efficiency fans and Energy Recovery wheels bring outdoor air to the chilled beams to maximize energy savings in the building.

PLUMBING FEATURES:

Water Heater:	A heat exchanger between the domestic water and the hot water district energy loop is used to efficiently heat the domestic water in the project.
Low-flow Fixtures:	EPA water sense certified fixtures are used throughout the project with a notable 1.5 gpm for showers (versus a 2.5 gpm baseline).

ENERGY MODELING:



Procedure:	The project was energy modeled using IES VE 2017. Energy modeling began in early SD
MN B3 Requirements:	The design achieved the SB2030 MN B3 requirement by exceeding the SB2030 energy use intensity (EUI) requirement of 73 Kbtu/yr sqft. By achieving this requirement, the project was able to show that it would use less than 30% of the energy that an identical 2003 baseline building would. That's an energy savings of over 70%.