

Case Study

Environmental Living Center Highlights Innovative and Technologically Cutting-Edge Building Systems and Components



Waldsee BioHaus Environmental Living Center, Moorhead, Minnesota

StoTherm NExt™ from Sto Corp. is featured in the Waldsee BioHaus Environmental Living Center, part of the Concordia Language Villages, a program of Concordia College, Moorhead, Minn. The Concordia Language Villages are located on Turtle River Lake near Bemidji, Minn.

The project is a cutting-edge environmental living center, based upon the German Passivhaus (Passive House) standards for efficient energy use.

According to architect, Stephan Tanner, AIA, of Intep LLC, the two-story building is approximately 5,000 square feet and meets the need for residential space, together with the opportunity to support environmental and science education programs. By constructing this unique environmental living center, it is a model of Germany’s best environmental planning and sustainable environmental building concepts. It houses 28 people and provides space for environmental activities that the entire Language Villages community can use. The focus of their learning is on everything environmental, reflecting authentic German culture.

“Our mission is to prepare people for responsible citizenship and the BioHaus fits our environmental education focus,” said Martin Graefe, director for year-round programs at Concordia Language Villages. “The BioHaus will expose many people to the possibilities of building environmentally friendly and energy efficient homes. They can see that it is very achievable and ecologically the right thing to do.”

To receive certification as a Passivhaus, a building must undergo physical testing as verification it has met the required targets. The results from the BioHaus, and the corresponding Passivhaus requirements, are shown below:

| Annual Specific Space Heating Energy Requirement | 13.7 kWh/m ² (4350 BTU/ft ² yr) | 15 kWh/m ² (<4760 BTU/ft ²) |
|---|---|--|
| Airtightness at 50 Pa (1.0 psf) pressure difference | 0.18 ach* | 0.6 ach |

*ach = air changes per hour

The BioHaus achieved these results mainly through its insulation, elimination of thermal bridging, and airtightness. While it may be financially impractical for all structures to meet this level of performance, significant strides can be made toward achieving sustainable buildings through research and consultation with manufacturers. While not all EIFS are created equal, the system can generally be considered environmentally responsible through its practical use of exterior insulation, reduction of thermal bridging, and increased airtightness.

Intep LLC, the Minneapolis-based architectural and consulting company, specializes in high-performance and sustainable construction. Features of this design include a Passivhaus standard building envelope, an extensive green roof, low impact and healthy building materials, simple building technology, use of alternative energy resources and low energy use appliances and equipment. The BioHaus used StoGuard™, a spray-on waterproofing/air barrier, providing superior protection against air and moisture intrusion in a variety of applications. Problems that can occur because of air leakage and condensation are minimized because StoGuard is an effective and economical means of controlling moisture in wall assemblies. By constructing an airtight building envelope the risk of moisture problems – decay, corrosion, loss of insulation value, mold growth and IAQ (Indoor Air Quality) – may be minimized.

StoTherm™ NExT (New Exterior Technology) served as the cladding choice for the BioHaus and incorporates StoGuard into its system. It is an evolutionary cladding that incorporates the best of EIFS design flexibility, color range, great insulation, and light weight, and adds the best moisture protection system. StoTherm NExT is comprised of components that are physically and chemically compatible with each other for assured performance including StoGuard, Sto adhesive, Sto expanded polystyrene (EPS) insulation board, Sto base coat with embedded glass fiber mesh, and finish (100% acrylic polymer-based or silicone-enhanced textured finish coat). According to Tanner, the BioHaus uses 85 percent less energy compared to Minnesota building code. Six of these buildings would use the same amount of energy as one building built using the regular standards. This was such a unique project that the firm got more involved than usual. “Usually we do consultant work only, however we were so excited about this project we decided to do it ourselves with our own design team,” said Tanner. Tanner was instrumental in getting Sto Corp. involved in the project as his first task was to contact and offer German-based manufacturers to assist in the BioHaus. “We are proud that Sto materials were selected to be a part of this high profile energy-efficient project, combining the technology of Germany and America to be the best of the best,” said Rick Braun, Sales Representative for Sto Corp. “StoTherm NExT is the perfect building material for this center and we are thrilled to be a part of it.”



About Waldsee BioHaus Environmental Living Center

Waldsee, established in 1961, was the first of 13 Language Villages sponsored by Concordia College of Moorhead, Minnesota, a private, four-year liberal arts institution. Concordia Language Villages annually serves over 11,000 young people and is accredited by the North Central Association on Accreditation and School Improvement. During the summer Waldsee offers one-, two-, and four-week living and learning experiences in German language and culture for beginning through advanced 7-18 year old students of German from all 50 U.S. states. In addition, programs for school groups, families, and adults are offered September through May. Waldsee has been acclaimed as a model of language learning by language educators, and featured in a variety of U.S. and international media. The German Village is the finest educational facility in North America devoted exclusively to the training of young Americans to become linguistically and culturally proficient in German. Visit <http://clvweb.cord.edu> for more information.

About Sto Corp.

Sto Corp., based in Atlanta, Georgia, is an innovative world leader and producer of a broad range of versatile cladding and coating systems for building construction, maintenance and restoration. Sto Corp. is ISO 9001 certified and operates production plants strategically located to serve more than 200 distributor shipping locations across North America. At research and development laboratories in the U.S. and Europe, Sto continues to revolutionize the industry with the highest quality products and application technology. For more information, visit www.stocorp.com or call toll free (800) 221-2397 or (404) 346-3666.

For information on the Passive House Institute, please visit <http://www.passivehouse.us/passiveHouse/PHIUSHome.html>.