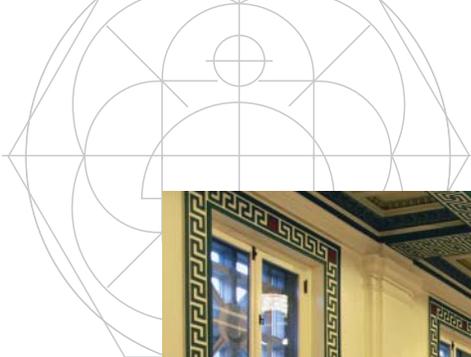


## Case Study: Soldiers & Sailors Memorial Hall and Museum

Soldiers & Sailors Memorial Hall and Museum is a Pittsburgh History and Landmarks Foundation site and is listed in the National Register of Historic Places. It was designed by architect Henry Hornbostel following the passing of a resolution by Allegheny County residents in 1905 to create a memorial in honor of soldiers and sailors from Allegheny County who fought in the Civil War. Construction began in 1908 and finished in 1910. Over the years, it has grown in scope and purpose with each generation of service members from each branch of service serving in every US conflict, as well as peacetime. Today, it is the largest memorial in the United States dedicated solely to honoring all branches of military veterans and civilian service personnel.



Original wood casement windows



New vinyl tilt/turn windows



Original wood double hung window / New vinyl double tilt/turn window



Tilt/turn window with horizontal mull



Concrete window façade frame

After 101 years of operation, the single pane wood windows on the first level had reached the end of their life cycle. Although it was assumed that the glass had been replaced at least once in the history of the building, it is likely that occurred at least 50 years prior. Building managers, concerned about rising energy costs in Pittsburgh's four-season climate and sustainability interests, initiated a "Conservation of Energy" plan. Following an energy audit in 2010, Soldiers & Sailors identified key areas of energy loss or energy efficiency requiring attention.

The Memorial consists of two major levels. The first level, on which the majority of replacement windows were installed, contains a 2300-seat auditorium, over 40 museum displays and exhibits contained within different halls, plus offices and meeting rooms. The second major level contains a grand ballroom and offices. Additionally, two front grand spiral staircases and two rear staircases connecting the two levels also contain windows that required replacement. The windows and doors on the first floor were identified as energy eaters and negatively impacting the overall energy efficient envelope of the building.

After researching their options, Soldiers & Sailors chose vinyl Tilt/Turn windows for their convenient functionality, excellent energy efficiency, and their potential to replace the existing windows with a style and a color to match the historic interior and exterior characteristics.



Old windows vs new vinyl circle top windows used to protect historic stained glass windows



Interior view of stained glass windows shown above



Woodgrain laminate tilt/turn windows



Roof access door with panic hardware

### Unique Requirements/Solutions

- The concrete window façade frames block access from the exterior which means the windows cannot be cleaned from the exterior. The inswing "Turn" feature of the Tilt/Turn window solves this problem plus, the "Tilt" function provides ventilation. The dual-function advantages of these windows easily met the requirements of the project.
- The lamination capabilities of the vinyl system allowed the replacement units to match original interior wood trim. Nussbaum (a deep brown) was chosen for the halls, Golden Oak was used in the lobby.
- A fixed mullion was added to the sash to emulate the original divided mull casements.
- Five large stained glass circle top windows were leaking badly. To protect these pieces of history, fixed vinyl windows were built to match the outside openings. Low-E glass was added to keep the stained glass visible while protecting against further deterioration.
- Because the location of the windows is in close proximity to the museum displays and guest areas as well as the rental facilities, the installation schedule had very specific parameters to be followed in order to minimize interruption to the daily activities.

The 71 windows and 4 doors required for the project were fabricated by Ventana USA (Export PA) out of the Euroview 70DS system from Veka, Inc. (Fombell PA) and installed by Bruce Construction (Plum PA).

Since replacing the windows, Soldiers & Sailors has begun to see energy costs reduced with initial findings reflected in current/past utility cost comparisons. Additional byproduct benefits include sound abatement and reduced UV damage to the thousands of artifacts on display in the exhibits located on the first level which are often lit by the natural light entering the building.

This magnificent structure is now ready for the next 100 years.



## The Manufacturer

Ventana USA began manufacturing architectural shapes and specialty window and door products for the North American market in 1987. As a pioneer in vinyl bending technology, Ventana's reputation for innovation, quality and service has maintained us as a leader in the business today. Our products are designed to meet the demands of architectural style; superior engineering and precision manufacturing help ensure the lasting performance and value of each unit.

For over 25 years, Ventana has served the American, Canadian and Caribbean window and door fabricator from our headquarters in Export PA (25 miles east of Pittsburgh). Part of Ventana International, Ventana USA has sister companies operating in Germany, France, Poland and Italy.

[www.ventana-usa.com](http://www.ventana-usa.com)

## The Window System

Veka, Inc. is the North American division of Veka AG, one of the world's largest extruders of vinyl lineals for the residential and commercial window and door industry. Veka serves customers globally from 25 plants worldwide, with over 40 years of leadership in helping fabricators deploy technologically advanced materials for residential and commercial building applications. Architects and builders now recognize that those advances have erased their doubts about vinyl and that it can stand up to the demands of the market and the environment.

The Veka Euroview 70DS system has a 70 mm (2-3/4 in.) frame depth. Its thermal properties are achieved by a 5-chamber air pocket system in all frames and sashes. Frame and sash profiles are steel reinforced to provide structural strength and decrease the thermal expansion factors inherent in a PVC system. The system meets ENERGY STAR standards and achieves excellent design pressure ratings depending on glazing.

[www.vekainc.com](http://www.vekainc.com)

## The Contractor

Bruce Construction of Plum PA is well-known for their excellent quality and accountability in both renovation and new construction. Their dedication to sustainability and eco-friendly building practices are integral to the overall design and function of their many projects in Pittsburgh and the surrounding area. Working under one umbrella, Bruce Construction also provides solutions through divisions that focus on storm water management practices, landscape design and environmental consultation.

On the Soldiers & Sailors project, scheduling of the work around functions and activities was crucial. With the help of the museum staff, Bruce Construction was able to successfully plan their work around major events such as weddings, graduation ceremonies, concerts and museum tours to name a few.

[www.bruceconstructionllc.com](http://www.bruceconstructionllc.com)



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