Abstract

What is the cost premium to have a LEED certified building? This is one of the great questions that exist in the construction industry today. Owners, architects, and contractors all want to know. There is a rather loose figure floating around the business that LEED certification adds an 8% to 12% premium to the initial construction costs for a building project. There is no feasible way to calculate an absolute value for the LEED premium. However, by compiling the estimated additional costs required for LEED-related design features, Mascaro Construction and Perkins Eastman offer a case study of the Children’s Museum of Pittsburgh project and the initial construction cost premium for LEED certification. For this poster case study presentation, Perkins Eastman highlights some of the LEED and green building-related design and construction features of the Children’s Museum and Mascaro Construction puts the 8%-12% premium figure to the test.

I N S P I R A T I O N

C H I L D R E N ’ S M U S E U M O F P I T T B U R G H

Imagining a children’s museum... A vivid imprint of actively engaged children, an historic post office with dollhouse details, and a storybook-like empty planetarium triggered the imagination of Design Architect Koning Eizenberg and Executive Architect Perkins Eastman, and resulted in an innovative expansion and renovation to create the new Children’s Museum of Pittsburgh.

The Children’s Museum of Pittsburgh expansion and renovation continues a commitment to Pittsburgh’s north side neighborhood by adaptively utilizing historic structures in an urban setting. The newly expanded facility (completed November 2004) is designed to offer innovative exhibits and programs for all families and children in western Pennsylvania and beyond. The facility is one of the few museums in the country to be housed in three buildings that architecturally span three millenniums: the original Children’s Museum housed in the old Allegheny Post Office (a registered Historic Landmark), the former Buhl Planetarium building (a nominated structure), and the new connecting structure referred to as the Lantern Building. The Lantern Building establishes a new front door for the museum and joins the two historic structures, while providing much needed additional exhibit space.

In collaboration with environmental artist Ned Kahn, fluttering plxi pixels shade the exterior glass of the new exhibit space addition and highlight the movement of the wind, casting shadows on interior circulation space. The seamless, flexible interior space features a veranda, bookstore, and café; three floors of exhibit space; classrooms, conference rooms, and a theater; as well as administrative space. Children can now tinker under the hood of a MiNi Cooper and pound nails in the Garage Workshop, build a boat and set it sailing on a 53-foot waterway in Waterplay.

D E S I G N

Koning Eizenberg Architecture Perkins Eastman IBE Consulting Engineers Tower Engineering Yerkes Lighting
ARUP Atlantic Engineering Services Le Quantra Bonci Associates Gateway Engineering Pentagram Design Inc.
H-Mak, Inc. Ned Kahn Springboard CTG Energetics: Sustainability International / Clearview Project Services
Burt Hill Kosar Rittleman Associates Fiesching Marsillier Rusbarsky and Wolf Engineering, Inc. Steed Services, Inc.

C O N S T R U C T I O N

Mascaro Construction Wyatt Incorporated Scalise Industries Kirby Electric, Inc. Grunau Company Inc. Franco
Phoenix Roofing Inc. Mascaro Industries, Inc. Libanti Painting Wright Interiors Estech H. B. Reynolds
Comm Steel, Inc. Schindler Elevator Corp. Allin Company Gateway Kitchen Equipment and Supply Inc.
I CAN SEE WHAT THE EYES CANNOT SEE.

Approach

As stated in our abstract, there is no feasible way to calculate an absolute value for the premium costs due to LEED. Mascaro, along with the trade contractors for the various packages, compiled the estimated additional costs associated with the LEED driven aspects of the design. Through this combined effort, Mascaro calculated a LEED premium for the Children’s Museum of Pittsburgh project.

IMAGINATION

CHILDREN’S MUSEUM OF PITTSBURGH

...and stage their own performances with costumes and makeup in the Theater. Creative interactive art works are located throughout the facility in exhibit spaces, public areas and corridors.

The Children’s Museum of Pittsburgh desires to be the first LEED®-NC Silver children’s museum in the country with the preservation of two important historic buildings along the way.

DESIGN

Kohnstienberg Architecture Perkins Eastman IBE Consulting Engineers Tower Engineering Yerger Lighting
ARUP Atlantic Engineering Services La Guanta Bonci Associates Gateway Engineering Pentagram Design Inc.
H-Mak, Inc. Nei Zarren Springboard CTG Energetics Sustaining International / Clearview Project Services
Burt Hill Kosar Rittleman Associates Fischo德 Maestillier Rusbaskey and Wolf Engineering, Inc. Steers Services, Inc.

CONSTRUCTION

Mascaro Construction Wyatt Incorporated Scalise Industries Kirby Electric, Inc. Grunau Company Inc. Franco
Phoenix Roofing Inc. Masaro Industries, Inc. Letanti Painting Wright Interiors ExTech H. B. Reynolds
Comm Steel, Inc. Schindler Elevator Corp. Allin Company Gateway Kitchen Equipment and Supply Inc.
Results

While compiling the data for this case study, and as the table shows, many of the work packages experienced no cost impact due to the LEED design criteria. Some items that did impact the cost of construction are listed below:

- Recycling and salvaging of construction debris
- Roof Top Unit Design
- Make-Up Air Unit Design
- Dehumidifier Design
- Temperature Control Design
- Low VOC Primer and Paints
- Low VOC Adhesive and Products
- Difference between standard tinted insulated glass and low iron "Starshine" glass with "Solarban 60" Low-E
- Upgrade the standard 60 mil EPDM to 60 mil TPO and apply a hypalon coating
- Adding automatic control sensors to lights and plumbing fixtures

EDUCATION

RESTORE

ADAPT

RECYCLE

SUSTAIN

REUSE

REVEAL

DESIGN

Koning Elzenberg Architecture Perkins Eastman IBE Consulting Engineers Tower Engineering Yorke Lighting
ARUP Atlantic Engineering Services La Quinta Bonci Associates Gateway Engineering Pentagram Design Inc.
H-Mark Inc. Neo Karn Springboard CTG Energetics Sustainablanse International / Clearview Project Services
Burt Hill Kosar Riceleman Associates Fisching Marstiller Ruschansky and Wolf Engineering, Inc. Stees Services, Inc.

CONSTRUCTION

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Comm Steel, Inc. Schindler Elevator Corp. Allin Company Gateway Kitchen Equipment and Supply Inc.
Conclusions

The estimated construction cost premium of LEED certification for the Children’s Museum of Pittsburgh was approximately 3.5%.

For the work packages that were significantly affected by the LEED design upgrades (HVAC, roofing and glass in the case of the Museum project), the resulting LEED premiums fell in the range of 11% to 13%. However, many of the work packages did not incur any cost impact due to LEED-related design features.

Therefore, our case study results show that an 8% to 12% premium may hold true for work packages that are significantly affected by LEED design upgrades. However, due to the fact that many of the project’s work packages were not affected by LEED-related design features, the LEED premium was for this case study, which was 3.5%, was significantly below the industry assumption of 8% to 12%.