The Living Bridge: Connecting City with Space and Structure:
2012-2013 ACSA/AISC Student Design Competition
Category 1: Building to Bridge

[The Competition]

The 2012-2013 ACSA/AISC Student Design Competition is the thirteenth annual steel design student competition. Administered by the Association of Collegiate Schools of Architecture (ACSA) and sponsored by the American Institute of Steel Construction (AISC), the program is intended to challenge students to explore a variety of design issues related to the use of steel in design and construction. Steel must be used as the primary structural material and contain at least one space that requires long-span steel structure, with special emphasis placed on innovation in steel design. Steel has played an important role in bridge design. With the advances in structural materials and construction methods, longer spans have become possible, enabling the connections of places and cultures. Bridge design is one of the most pure areas for testing architectural ideas. With the primary function “to span”, the bridge can openly exploit its method of span as an integral driver to its architecture and detailing.

The bridge must include an ancillary function—anchor pavilion—that creates a destination and supports the cause for crossing and to enhance the location and the experience of crossing. Consider the user in your designs. Are there places to sit, view, live or work, can you add a more pragmatic and dynamic component to the bridge?

The project will concentrate on formulating specific thoughtful concepts and designs and carrying these ideas to a detailed level in both the exterior and interior of the building. The project should be developed with an integrative approach to building materials and systems—structural, environmental, enclosure, etc.—while maintaining an overall design concept. Participants will develop a selected physical area of the project in greater detail considering the building or bridge’s structural, technical and interior issues through larger-scale drawings. Through rendered perspectives and elevations, the proposals should demonstrate surface qualities including material, color, texture, and light. The design should include an understanding of the fabrication and erection of the bridge and its associated auxiliary components.
Along with structural, tectonic and technical issues above, designs should respond to context (larger regional influences of geography, topography and latitude), climate (sun, wind, light and water), and culture (patterns of interaction rising from human occupation of place). Projects should be designed in a socially and environmentally responsible manner.

[Program Background]

The Reading Viaduct, which carried trains into Center City for almost 100 years, is an abandoned elevated train track that transects diverse and rapidly redeveloping neighborhoods just north of the traditional boundary of Center City. A plan to redevelop the Viaduct is currently underway; it is hoped that this renewal would act as a magnet for residential and commercial development in the surrounding neighborhoods. Adaptive reuse of the Viaduct, in conjunction with ongoing investment and renovation in the surrounding neighborhoods, will both preserve and rejuvenate the former industrial heart of the City, while generating additional economic development and tax revenue for the City and Commonwealth.

Built in the 1890s, the Viaduct is a combination of embankment sections, bridged by steel structures and arched masonry bridges, that runs 10 blocks through the Callowhill and Chinatown North neighborhoods, from Vine Street to Fairmount Avenue. Reading Railroad commuter trains used the 4.7-acre, mile-long Viaduct to access the Reading Headhouse Terminal at 12th and Market Street (currently the Grand Hall of the Pennsylvania Convention Center). Service on the Viaduct was discontinued in 1984, when the Center City commuter tunnel was opened. Today the Viaduct’s four elevated tracks have been overtaken by grasses and trees. It’s two branches offer spectacular views of immediate neighborhoods and the Philadelphia skyline. In 2003, local residents formed The Reading Viaduct Project for the purpose of advocating for the transformation of the Viaduct into an elevated linear park, in conjunction with the ongoing redevelopment of the surrounding neighborhoods.

The Viaduct, with its 2 branches, is literally a bridge connecting several diverse communities. Beginning at Vine Street, between 11th and 12th, the Viaduct flows north from Chinatown to Callowhill Street where it branches to the west and northeast. The late 19th and early 20th Century industrial buildings that dot the landscape of this neighborhood (former automobile, bicycle, shoe, glass and balloon factories, to name a few), have attracted new investment, commercial development, and ever increasing numbers of new residents to the post-industrial landscape. The northeast leg of the Reading Viaduct continues to 915 Spring Garden Street (the former Reading Company Building, which has been successfully redeveloped into fully-occupied artists’ studios), and into the West Poplar and Brandywine East neighborhoods, reaching toward rapidly redeveloping Northern Liberties. This leg of the Viaduct ends at the 800 block of Fairmount Avenue. The western leg begins at Callowhill Street, sloping down to street level at 13th and Noble, and leads directly to North Broad Street. Here, the Viaduct could add a vibrant amenity to the rebirth of the northern section of the Avenue of the Arts.
As a reclaimed public space, the Reading Viaduct would successfully bring together economically and culturally diverse communities, generate economic development, and provide a catalyst for the redevelopment of this section of North Philadelphia. Similar projects in Paris, France (the Promenade Plantée) and in New York City (the Chelsea High Line) have contributed to the rebirth of surrounding neighborhoods and initiated economic development booms. In New York, for example, redevelopment of the High Line has generated an immense amount of public interest, sparking proposals for over 10 high-rise residential buildings along its path. As in Paris and New York, a new recreational amenity in this section of Philadelphia will result in additional economic investment and development.

In 2003, the City of Philadelphia obtained a grant to fund a study of alternatives for the development of the Viaduct. The study analyzed the cost to demolish the Viaduct compared to the cost of reclaiming the Viaduct for use as a linear park. Conducted by Urban Engineers, the study concluded that the estimated cost to demolish the Viaduct was almost 10 times greater than the cost to address existing environmental concerns and redevelop the structure into a park. Development as a park and recreational pathway, including landscaping, benches, access ramps and staircases, was estimated to cost $5.1 million, whereas demolition of the structure was estimated to cost between $35.5 million and $51.2 million. The Reading Viaduct Project is seeking the support of State and local officials and government agencies for its vision of a redeveloped Viaduct. They are also actively exploring partnerships with private developers who share in the vision of the adaptive reuse of the Viaduct as a catalyst for continued residential and commercial development of the surrounding neighborhoods.

[Issues]

- Interdisciplinary Teamwork
- Sustainable energy usage strategies. Take advantage of natural ventilation and use as much daylighting as possible to create the desired atmosphere and reduce lighting energy usage.
- Bring natural light into the lower floors and vent warm air up via use of skylights and openings in the first and second floors.
- Consider the exterior skin, it’s relationship to the street, and as well as the orientation of each elevation. In particular, the Vine St. Expressway.
- Consider the interior spaces. How can these best relate to the bridge’s user group(s) and support it’s function?
- Horizontal and vertical circulation
- The transition from the exterior to the interior
- The visual decoding of both exterior and interior form and space, and their compositional and tectonic relationships.
- Egress
- Structure
- Materials- interior and exterior. Where does one begin and one end? Are they seamless?

[Program]

Connect the Viaduct to Center City Philadelphia with an inhabited bridge. This long-span megastructure will include a Viaduct Visitor Center and Philadelphia Railway History Museum to be run by the National Park Service. However, this aerial complex will not only connect the rapidly growing Loft District to the city and vice versa, but become a living bridge in a New Philadelphia. Your design should be a seamless extension of the Viaduct and you should also consider access from Vine St., north and south. The minimum span for the bridge is 48 feet.

The Viaduct Visitor Center and Philadelphia Railway Museum
This structure should be integrated into the overall bridge design and be located within the primary span. The building must support or create a destination that will anchor the pedestrian bridge. All areas must be handicapped accessible. The Viaduct Visitor Center must contain the following spaces:

Main public space of the Viaduct Visitor Center 2,750sqft.
Include the following spaces:
Information/Reception
Viaduct and Philadelphia Railway Interpretive Exhibition Space
Some seating

(continued on following page)
### Café
400sqft.

### Gift Shop
400sqft.

### Offices
750sqft.

Include the following spaces:
- Administrative Assistant
- Conference Room
- Waiting Area
- (2) private offices
- Kitchenette

### Storage/Receiving/Mechanical
500sqft.

### Public Restrooms
Required by code

### Total Viaduct Visitor Center
5,000sqft. min.

### Outdoor Space(s)
TBD by team

---

### [Presentation Requirements]

Presentation/Documentation requirements are to be determined by each student. Remember, clarity of project intent is your goal. Listed below are the suggested minimum requirements.

Do not underestimate the importance of a clear, concise, and professional set of documents at every stage in the design process. Drawing is a tool; use hand drawing or digital techniques to best delineate architectural proposals, not to show off your drawing skills.

**Final Review:** **[4] digital boards at 20” x 20”**

- Concept / Parti Diagram(s)
- Sustainable Design Strategies
- Sun Studies
- Site Plan - Rendered
- Floor Plans [Ground. level(s) with context including furniture]
- All Elevations- Rendered
- (3) Building Sections [showing detailed interiors]
- (6) Interior and (6) Exterior Perspectives [digital]
- Physical Models [full and sectional]

### Recommended Reading

- Allen, Edward. *Fundamentals of Building Construction: Materials and Methods*
- Bell & Rand. *Materials for Design*
- Ching, Francis D.K. *Building Codes Illustrated*
- Ching, Francis. *Building Construction Illustrated*
- Deasy, C. M. and Laswell, T. *Designing Places for People*
- DeChiara, Joseph et. al. *Time Save Standards for Interior Design & Space Planning*
- Murray & Stevens, eds. *Living Bridges: The Inhabited Bridge, Past Present and Future*
- Ramsey & Sleeper. *Architectural Graphic Standards*
- Schüttich, Christian. *In Detail: Building Skins and, In Detail: Building Simply*
- Sharon Koomen Harmon & Katherine E. Kennon, *The Codes Guidebook for Interiors*
- Wakita & Linde. *The Professional Practice of Architectural Working Drawings*
- Wells, Matthew. *30 Bridges*

http://www.bustler.net/index.php/article/winners_of_london_bridge_800_design_an_inhabited_bridge_competition/
http://www.nrhs.com/ [National Railway Historical Society]
Your Name:

Teammate (who you are reviewing – use a separate sheet for each teammate):

Please evaluate your teammate using the scale below. The assessment scoring is as follows:

1 = teammate does not meet your expectations
2 = teammate somewhat meets your expectations
3 = teammate usually meets your expectations
4 = teammate exceeds your expectations

Note: Your teammate will not see this assessment. Rather, they will be assigned a summative score based on this evaluation.

Teammate is organized and focused on tasks 1 2 3 4
Teammate respects and values your opinions and specialty 1 2 3 4
Teammate was willing to teach you about their discipline 1 2 3 4
Teammate was willing to learn your discipline 1 2 3 4
Teammate offers feedback in a constructive manner 1 2 3 4
Teammate is accepting of your constructive feedback 1 2 3 4
Teammate is available to work with you on deadlines 1 2 3 4
Teammate contributes an equal amount to the project 1 2 3 4

Additional Comment or Clarifications as Necessary:

Final Teammate Evaluation
(Completed Individually)
According to competition jurors, the PhilaU team’s winning design “Is a bold and elegant merging of the two programs: building and bridge. The scheme is ambitious, while not being aggressive or overwrought. The presentation is comprehensive, illustrating a lot of well thought-out details from shading to sensible material selections.”

2013 ACSA 1st Place Award

Presentation Completed By:

Kaitlin Shenk, Interior Design; Christopher Garrow, Architecture; Heather Martin, Architecture
A Sampling of Enlarged Interior Perspectives from the 2013 ACSA 1st Place Award
Field Trips with Interior Design + Architecture Students and Faculty to Local Sites and Sustainable Buildings.
Interior Design + Architecture Students Collaborating with Community Partners