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AEI Team  
#04-2013

February 22, 2013

**Building Integration Design**

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**ASCE** | STUDENT  
COMPETITION

Team 04-2013



Our one true aim is to enhance the quality of the communities we work with through innovative ideas and an integrated design approach.

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Ingenuity | Quality | Enjoyment | Integrity

## Executive Summary: The Challenge

Our team has addressed the design and construction issues that were essential for the development of a new construction elementary school project to be located in the urban setting of Reading, Pennsylvania. Per the competition guidelines, the submittal addresses the following items:

**1)** Construction and design issues related to a high performance building that meet the needs of both the school district and community. In the Energy Independence and Security Act of 2007, section 401, a high performance building is defined as follows:

*The term 'high-performance building' means a building that integrates and optimizes on a life cycle basis all major high performance attributes, including energy conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations.*

Our team's Innovative Building Design choices are showcased in the **Innovative Building Systems** section within this submittal. These systems include a Rammed Aggregate Pier Foundation System, Economical Structural Steel System, Prefabricated Concrete Enclosure System, and lightweight green roof system. Additionally, our team proposes to renovate the existing elementary school for the indoor community natatorium and clinical space. This strategy is explained in the Master Plan section of the proposal.

**2)** The school board would like the new building to achieve Leadership in Energy and Environmental Design (LEED) certification under the LEED 2009 for Schools New Construction and Major Renovations. (LEED 2008)

Based upon our LEED analysis, our team will deliver a LEED Silver building under the LEED 2009 for School New Construction and Major Renovations. The design and construction of the elementary school is currently achieving 52 points *without significant added cost to the project*. Please reference Appendix P in the supporting documents for a breakdown of the earned points and example documentation for achieving a LEED point.

**3)** Provide a budget for the school district for the design and construction of the project focusing on both the short term and lifetime cost-benefits of the design solution.

The construction budget for the new construction elementary school is set at \$16,000,000, with an add/alternate for the indoor natatorium and clinical space budgeted for \$3,000,000. The construction schedule for the new elementary school begins with Notice to Proceed on June 1, 2013 and concludes July 24, 2014 before the new school year, totaling 14 months. The add/alternate schedule for the natatorium and clinical space begins June 2, 2014 and concludes September, 19 2014. If the add/alternate is chosen the total construction schedule spans 16 months. This budget breakdown is justified in Appendix B in the supporting documents and the Innovative Construction Management and Construction Methods Report can be referenced for a foldout of the schedule.

In addition to these requirements, our team has responded to the context in which this project will exist. The interest of the community was heavily considered in the design and construction planning of the building. The design provides creative solutions for an indoor pool, 24 hour clinic, multi-purpose space, and green roof. Our team validates that our final design is sustainable, accessible, and secure for the occupants of the buildings and Reading community.

Additionally, the population of Reading is approximately 88,000 people, making it the fifth largest city in the state of Pennsylvania. According to the 2010 census, Reading has the largest share of citizens living in poverty in the nation at approximately 37% and a crime index of 480.8 when compared to the U.S. average of 319.1. Because of these statistics, security is a large design factor for the building.

(United States Census Bureau 2013)