ENTRY FORM

DVASE
2017 Excellence in Structural Engineering Awards Program

PROJECT CATEGORY (check one):

Buildings under $2M		Buildings Over $100M	
Buildings $2M-$10M	x	Other Structures Under $5M	
Buildings $10M - $30M		Other Structures Over $5M	
Buildings $30M - $100M		Single Family Home	

Approximate construction cost of facility submitted:	**$6.8 million**
Entry Fee:	**FREE**
Name of Project:	**Milton & Catherine Hershey Conservatory**
Location of Project:	**Hershey Gardens, Hershey, PA**
Date construction was completed (M/Y):	**July 2016**
Structural Design Firm:	**Keast & Hood Structural Engineers Philadelphia, PA**
Affiliation:	**All entries must be submitted by DVASE member firms or members.**
Architect:	**LSC Design, Inc.**
General Contractor:	**Reynolds Construction, LLC**

Company Logo (insert .jpg in box below)

KEAST & HOOD
STRUCTURAL ENGINEERS

Important Notes:

- Please .pdf your completed entry form and email to bkoroncai@barrpino.com.
- Please also email separately 2-3 of the best .jpg images of your project, for the slide presentation at the May dinner and for the DVASE website. Include a brief (approx. 4 sentences) summary of the project for the DVASE Awards Presentation with this separate email.

- Provide a concise project description in the following box (one page maximum).

Include the significant aspects of the project and their relationship to the judging criteria.

Milton & Catherine Hershey Conservatory at Hershey Gardens
Hershey, PA

The addition of a conservatory at Hershey Gardens pays homage to the legacy and wishes of Milton and Catherine Hershey. The design was inspired by a conservatory that was erected next to their home's garden in 1909. Located just south of "Swan Lake" the building serves as the new entrance for Hershey Gardens and provides visitors with a stunning view of the Lake and Historic Rose Garden.

In addition to becoming the Garden's new main entrance, the 16,000 SF building provides a year-round space for a number of education and exhibition areas. Most notable is the large atrium, which houses hundreds of exotic butterflies year round. Additional spaces include a children's garden, garden terrace for summer months, and an events area for weddings and other special occasions. Significant structural features include a complex design for the large barrel atrium and support for the architecturally exposed lantern roof framing element. Completed without interrupting the garden's normal operations, the project was successfully finished on schedule.

Structural Design
The new building's structure consists of intermediate reinforced masonry shear walls, which also serve as perimeter bearing elements. Due to poor soil conditions and to reduce surcharge loading, a framed slab supported on grade beams was provided at the lowest building level. Slab on metal deck floors were supported on composite structural steel beams. A complex roof lantern structure was framed using curved steel framing, which incorporated a perimeter tension ring assembly to resist lateral thrust. A complex roof framing load path, required due to large skylight openings, was resolved using in-plane diaphragm bracing. The exterior stone cladding elements involved significant detailing and structural coordination with the architectural team. Precast arches were detailed by Keast & Hood in order to provide the required geometry and to maintain the integrity of the building's lateral system.

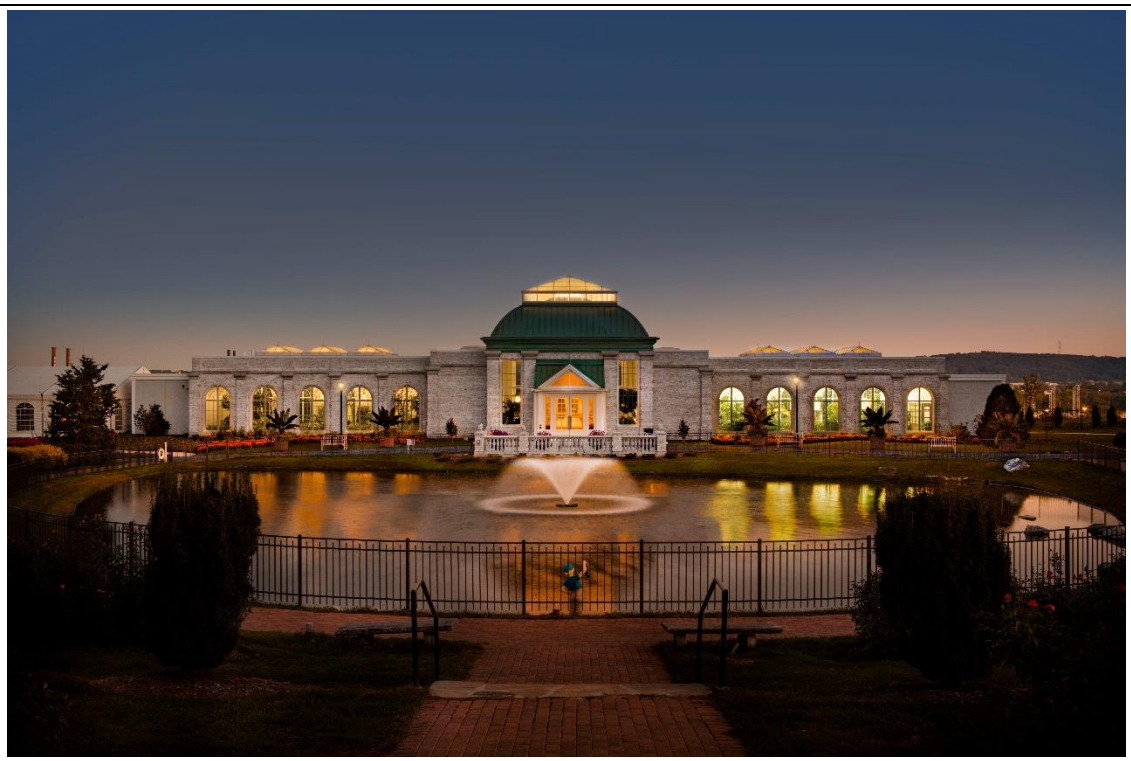
Keast & Hood reviewed available site documentation and addressed any foreseen issues throughout the project and coordinated with Architect and Landscape Architect to produce working drawings. Prepared plans, elevations, sections and schedules as part of the scope of work. Along with the team, KH reviewed and reached agreement on structural, mechanical, electrical and other building systems needed. Draft specification with narratives were provided early on to the Construction Manager to validate the project budget, which included all major materials that were anticipated to use as well as finishes and building systems.

Structural engineering design work was needed to accommodate cost-control revisions to the building façade, which included but were not limited to, revised anchorage details. Structural analysis and re-design of the barrel vault roof system was required to provide stick built (cold formed metal framing) roof assembly in lieu of originally desired SIP panels.

Key structural design challenges:

- Poor soil conditions and necessary reduction of surcharge loading
- Design for barrel vaulted atrium with tension ring
- Architecturally exposed lantern roof framing element
- Large skylight openings in roof, increased the diaphragm loading

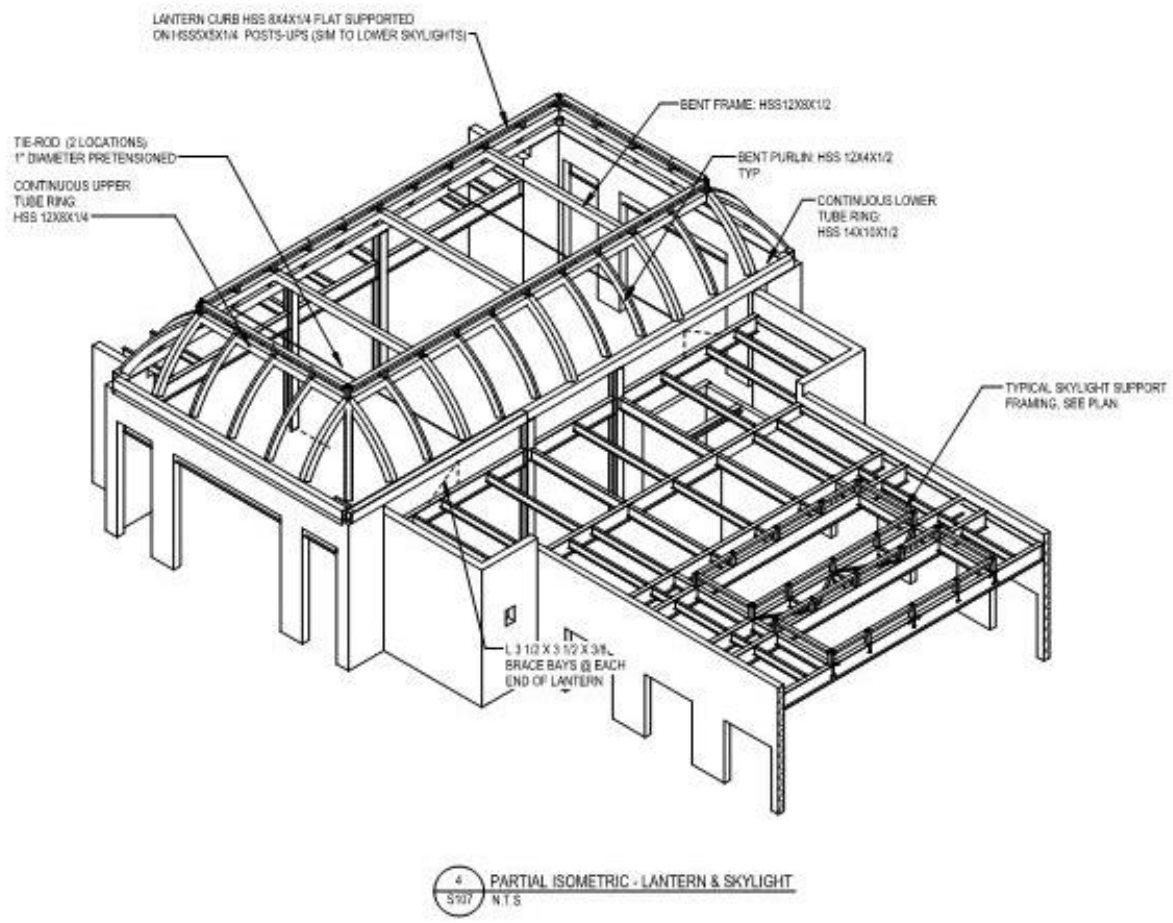
- The following 5 pages (maximum) can be used to portray your project to the awards committee through photos, renderings, sketches, plans, etc…



Exterior overall view of the completed new Hershey Conservatory, as viewed from across Swan Lake. (Photograph © LSC Design)

Interior view of the butterfly atrium with its high vaulted ceilings. (Photograph © LSC Design)

In construction view of the architecturally exposed curved steel framing for the atrium. (construction photographs © Keast & Hood)



Structural detail of the barrel vaulted atrium with lantern roof element and in-plane diaphragm bracing for skylights. (structural detail © Keast & Hood)

Reinforced masonry shear walls with under construction. (photograph © Keast & Hood)

Overall view of the conservatory during construction, from the rose garden area. (photograph © Keast & Hood)

Interior view of one of the conservatory’s wings with large skylights under construction. (photograph © Keast & Hood)

Completed interior view of conservatory wing. (photograph © LSC Design)

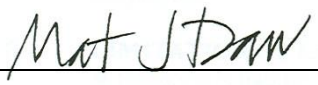
Basement and wall under construction. (photograph © Keast & Hood)

Completed view of conservatory. (photograph © Keast & Hood)

By signing, signatory agrees to the following and represents that he or she is authorized to sign for the structural design firm of record:

All entries become the property of DVASE and will not be returned. By entering, the entrant grants a royalty-free license to DVASE to use any copyrighted material submitted.

Submitted by:

Print name:	**Signature:**	**Date:**
Matthew J. Daw, PE, LEED AP		**Apr 13, 2017**

Submitting Firm:	**Keast & Hood**	
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