

ENTRY FORM



DVASE 2020 Excellence in Structural Engineering Awards Program

PROJECT CATEGORY (check one):

Buildings under \$5M		Buildings Over \$100M	
Buildings \$5M - \$15M		Other Structures Under \$1M	✓
Buildings \$15M - \$40M		Other Structures Over \$1M	
Buildings \$40M - \$100M		Single Family Home	

Approximate construction cost of facility submitted:	\$500,000
Name of Project:	Philadelphia Magic Gardens Wall Stabilization
Location of Project:	Philadelphia, PA
Date construction was completed (M/Y):	03/2019
Structural Design Firm:	Orndorf & Associates, Inc.
Affiliation:	All entries must be submitted by DVASE member firms or members.
Architect:	N/A
General Contractor:	N/A

Company Logo (insert .jpg in box below)



Important Notes:

- Please .pdf your completed entry form and email to bsagusti@barrhorstman.com.
- Please also email separately 2-3 of the best .jpg images of your project, for the slide presentation at the annual 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.

The Philadelphia Magic Gardens (PMG) is an open-air, multi-level garden that showcases the creativity of Isaiah Zagar. Since 1994, Zagar has been building up a once vacant lot beside his studio with abstract sculptures and winding paths using a variety of found objects and recycled materials such as glass bottles, bicycle tires, pottery and mosaic tiles. Today, the Magic Gardens is one of Philadelphia's premier cultural attractions. To help protect the Garden's structural integrity and ensure the safety of its visitors, Orndorf & Associates (O&A) began a partnership with PMG to review at-risk areas of the space and provide engineered solutions to extend the life of the artwork.

There were three key areas of potential instability within the outdoor garden area: (1) the arched decorative walls lining the upper central path, (2) the freestanding walls linking the upper central path to the garden's west walkway, and (3) the freestanding wall at the east side of the garden's low (below-grade) area (separating the garden from a driveway). The freestanding and arched walls were very sensitive to applied force, and could easily be moved by firmly pressing and applying a moderate force to the wall by hand. With the walls lacking any planned structural support, and having extreme irregularity of geometry, section modulus, and material properties, O&A took an unique and innovative design approach to adding stability and communicating our design to the client and contractor.

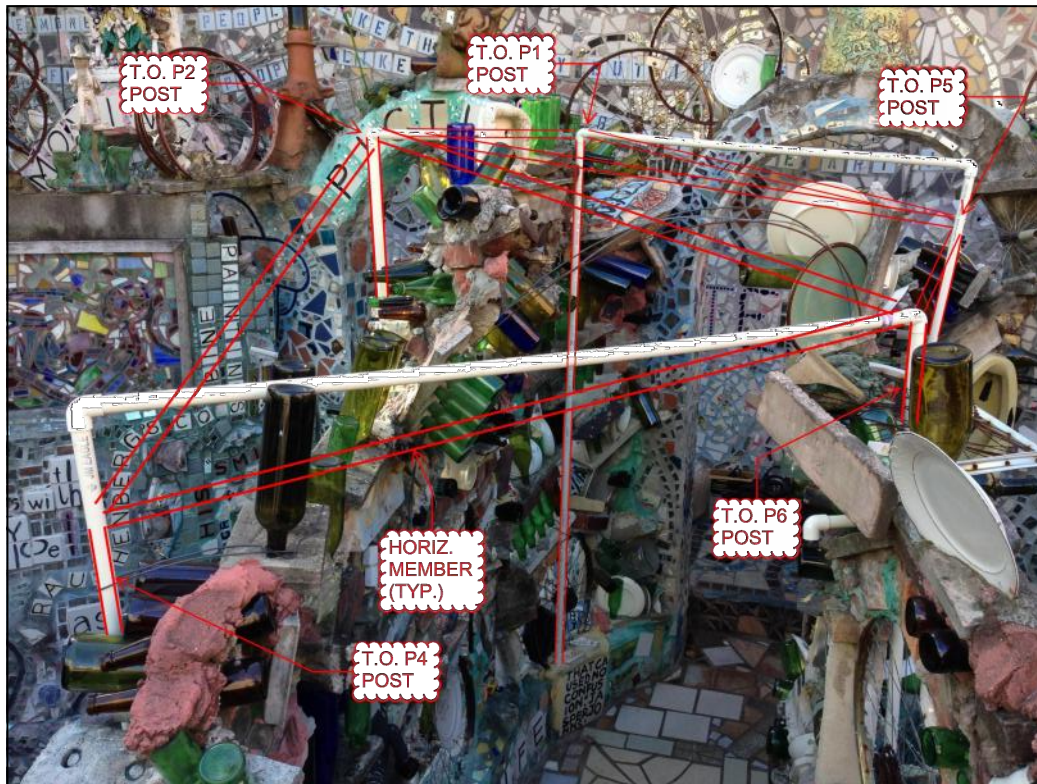
With structural stability of the walls being our main focus, we also were concerned about the appearance of the new reinforcement within the context of the garden. Our structural components needed to be non-intrusive to the overall aesthetic of the space, be comprised of readily available material for cost considerations, and be flexible enough to weave through and fit within extremely tight tolerances of the garden sculpture. At the same time, the finished system needed enough lateral stiffness that the surrounding artwork could rely on in the event of high winds or interactions with gallery visitors. The system also needed to support the weight of future art installations to be formed around the structure. To accomplish these design requirements, O&A devised a system of #8 rebar space frames threading through and between the delicate pieces of pottery and glass making up the existing walls and arches. During our analysis phase, we created 3-dimensional models of the frames and applied wind pressures taking into account various levels of perforation in order to mimic the existing conditions as well as future conditions.

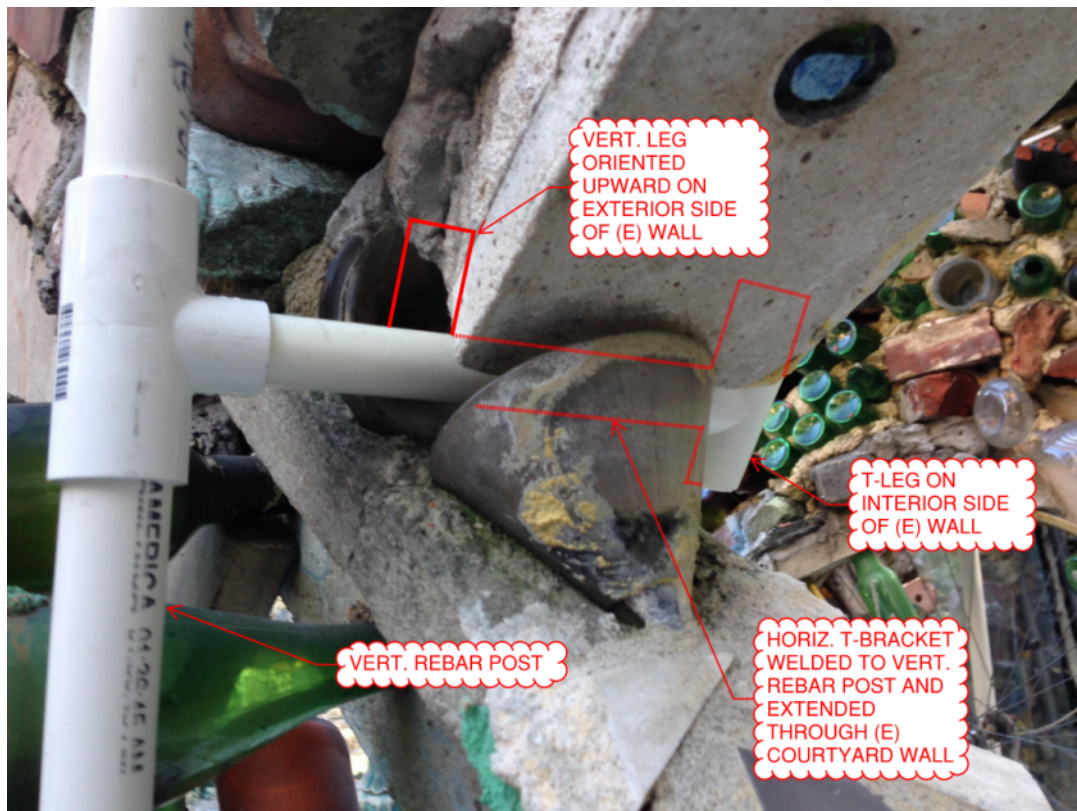
With such a wide array of existing materials, shapes and wall heights, it would be nearly impossible to convey accurate information to a contractor using a traditional structural drawing format. Instead, we opted to build to-scale models of the frames in the field using PVC pipe and connections. This approach provided two main benefits: (1) an accurate depiction of the rebar frames and their interaction with the existing materials, including outrigger supports, anchorage locations, and areas where the rebar would fit with respect to the existing decorative pieces, and (2) a real-life 3D visual example for our client showing how the structural reinforcement would interact with the existing space and its aesthetic impact on the walls and arches.

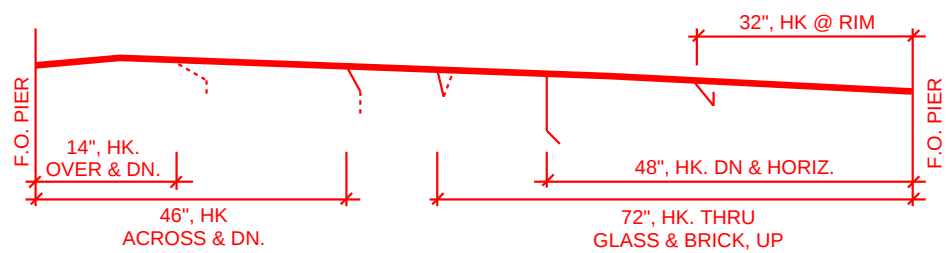
Once a final frame configuration was agreed upon with consideration to its visual and structural implications, we produced a set of drawings that utilized photos and structural details for how to permanently anchor and weld the frame members together. For the sake of the general contractor, the PVC example frames were left in place until work started so that they could simply be replaced with the permanent steel frames. In short: we provided to-scale, real life reinforcement placement models in lieu of drawings. The outcome is a much more stable wall condition that can be used to add artistic elements in the future.

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

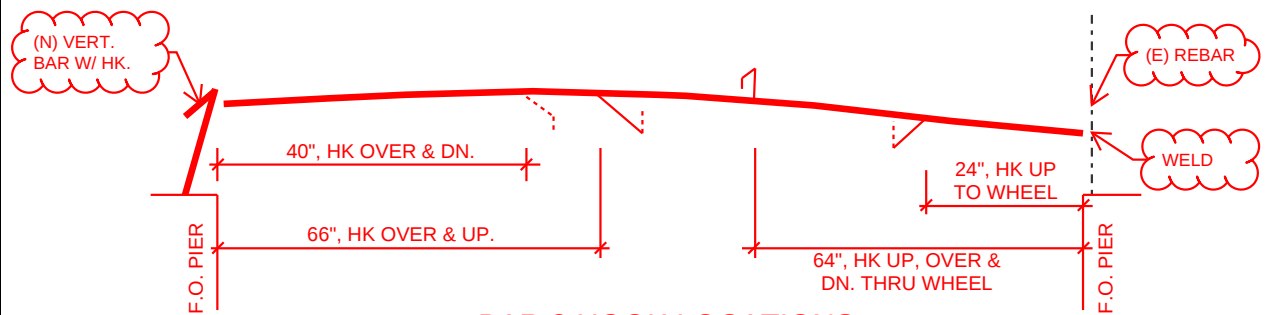








BAR 2 HOOK LOCATIONS



BAR 3 HOOK LOCATIONS

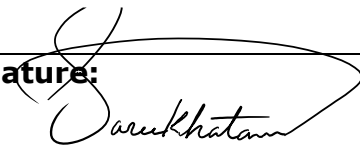


By signing, signatory agrees to the following and represents that he or she is authorized to sign for the structural design firm of record.

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.

If selected as an award winner, you may be offered the opportunity to present your project at a DVASE breakfast seminar. Would you be willing to present to your colleagues? ☒ **YES** ☐ **NO**

Submitted by:

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