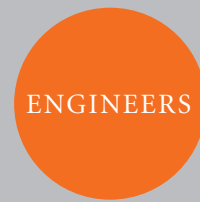




WEIDLINGER

ASSOCIATES[®] INC

CONSULTING



ENGINEERS

STRUCTURAL ENGINEERING
CIVIL ENGINEERING

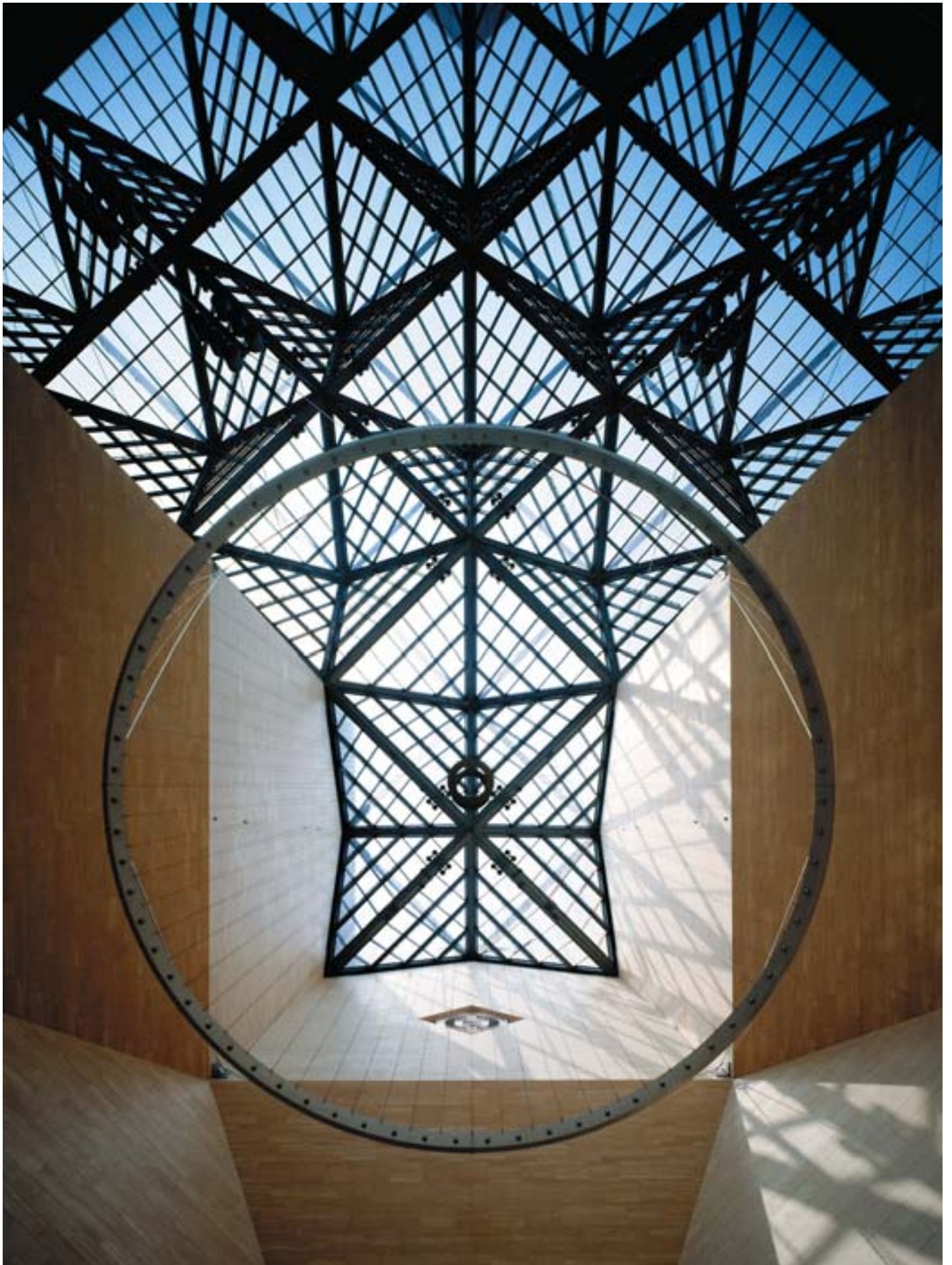
BUILDINGS
SPECIAL STRUCTURES

INFRASTRUCTURE
GEOSTRUCTURES

TRANSPORTATION
BRIDGES AND TUNNELS

INVESTIGATIONS
FORENSIC ENGINEERING

ADVANCED ANALYSIS
PROTECTIVE DESIGN



Bank of China | Beijing, China | Pei Partnership Architects

Innovation in structural and civil engineering and applied mechanics continues to define Weidlinger Associates after more than half a century. Our main business is designing and rehabilitating buildings, bridges and infrastructure, but we also try to be creative in other areas, such as project management, design/build, geostructures, forensics, protective design and visualization software.

Diversification, marked by an expanding array of services, is our response to a world of changing markets, cultures and technologies. Diversification improves communications and the bottom line. It helps in meeting the many challenges clients bring us, from relatively simple reconstructions to complicated new designs for stadiums with clear spans of hundreds of feet, high-rises with unique shapes and multiple functions, courthouses and embassies that must be stately and secure, and infrastructure under threat of attack.

Collaboration across disciplines promotes the synergy of structural engineering and applied science that has always set our firm apart. It gives us access to projects of all scopes and sizes, many of them of national and international significance. A history of iconic designs and scientific achievements is one measure of our success. Equally important is how well we support the practical needs of all our clients.



American Museum of Natural History | Rose Center for Earth and Space | New York, New York | *Polshek Partnership Architects* | Jeff Goldberg/Esto Photographics
Tomorrow Square | JW Marriott Hotel | Shanghai, China | *John Portman & Associates*

Inventing Structures | Elegance and Economy A pioneer in high-rise, long-span, cable and fabric structures, Weidlinger designs structural systems for all types of buildings – museums, embassies, courthouses, laboratories, stadiums, convention centers, office headquarters, housing and more – in the U.S. and abroad. Our engineers are sensitive to environmental impact and sustainability, and expert in seismic and protective design, historic restoration, failure investigation and forensic engineering.

Whether collaborating on a high-profile embassy, a stadium with a retractable fabric roof or an urban academic center, we weigh the aesthetic and economic advantages of lightness against the need for security and constructibility. Innovative and cost-effective solutions permit architectural exploration and complexity, but reaching greater heights and longer spans is a balancing act. Advanced analysis helps us optimize the structure, resolve disciplinary conflicts, and protect the safety and comfort of users.





United States Capitol Visitor Center | Washington, District of Columbia | *Architect of the Capitol*
Tunnel Jacking | Central Artery/Tunnel Section C09A4 | Boston, Massachusetts | *Slattery/White/Perini JV* | Peter Vanderwarker

INVENTING STRUCTURE



One Lincoln Street
Boston, Massachusetts
Jung/Brammen Associates
Peter Vanderwarber



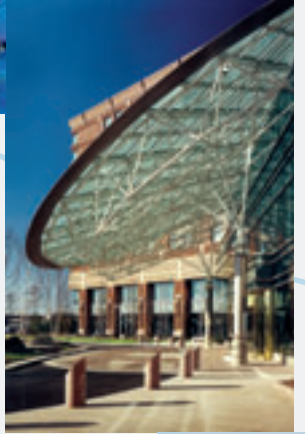
Dongbu Securities Headquarters
Seoul, Korea
Kohn Pedersen Fox Associates



Baruch College Academic Complex
New York, New York
Kohn Pedersen Fox Associates



TEDA Convention Center
Tianjin, China
Lee Harris Pomeroy Architects
Paul Warchoł



Logan Airport Hilton Hotel
Boston, Massachusetts
Cambridge Seven Associates
Steve Rosenthal



SHAPING *the* WORLD

we LIVE *in*



One Lincoln Street

September 11th Memorial
Staten Island, New York
Masayuki Sano, Architect



U.S. Embassy Complex
Tunis, Tunisia
Tai Soo Kim Partners
Paul Warchol



Naismith Basketball Hall of Fame
Springfield, Massachusetts
Gwathmey Siegel & Associates
Scott Frances/Esto Photographics

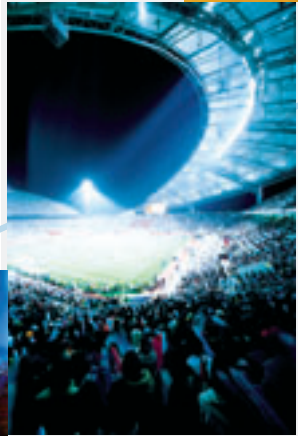


Oklahoma City Federal Building Protective Design
Oklahoma City, Oklahoma
Ross Barney + Jankowski Architects
Steve Hall, Hedrich Blessing Photography



Smith College Campus Center
Northampton, Massachusetts
Weiss/Mannfredi Architects
Jeff Goldberg/Esto Photographics

Cheju Stadium
Cheju Do, Korea
Ilkum Architects & Engineers Ltd.



Shanghai Stadium
Shanghai, China
Shanghai Institute of Architectural Design
Birdair



Bronx-Whitestone Bridge Wind Fairings
Bronx, New York



Rockefeller University Bridge
New York, New York
Wendy Evans Joseph Architecture

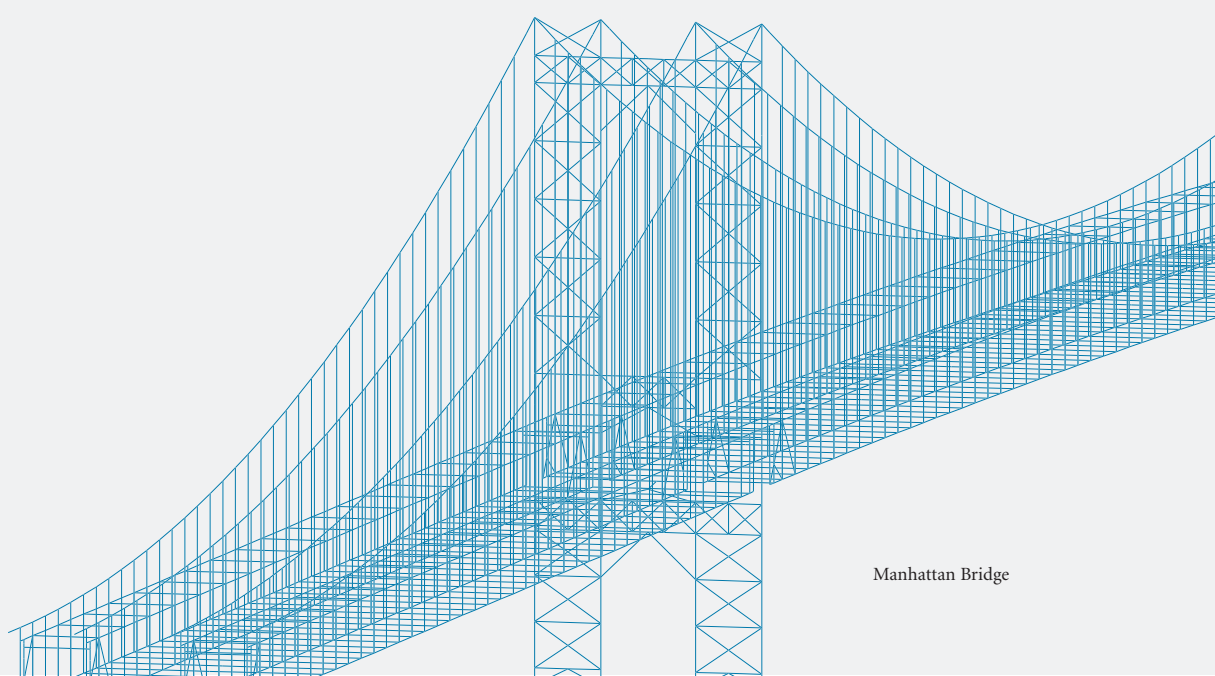


Richmond-San Rafael Bridge
San Francisco, California



Franklin Square Bridge (Brooklyn Bridge)
New York, New York

ADVANCED ANALYSIS



Manhattan Bridge

Tappan Zee Bridge
Tarrytown, New York



High Street Ramp Relocation
Boston, Massachusetts
The Chiofaro Company
Peter Vandervarker



Sunnyside Intermodal Facility, Planning
Queens, New York
Ehrenkrantz Eckstut & Kuhn Architects/WAI JV

Logan Airport U.S. Airways Terminal
Boston, Massachusetts
HNTB Corporation



Central Artery/Tunnel Section C09A4
Boston, Massachusetts
Slattery/White/Perini JV
Peter Vandervarker



North Station Tunnel Extension
Boston, Massachusetts



RESTORING INFRASTRUCTURE

From the Underground Up | Building a Firm Foundation Designing underground structures to perform their function is only half the story; Weidlinger engineers also recommend the best way to build them. We adapt designs to a unique site, tight schedule, public access or contractor preference, or refine a construction method to increase its cost-effectiveness, for example in the choice of a more efficient excavation technique or type of foundation. Public agencies and contractors hire us for our proven ability to control costs and meet schedules. Our field experience can streamline the process; we also provide testing and inspection and resident engineering as needed.

GeoStructures is a hybrid discipline born of our extensive work on the Boston Central Artery/Tunnel project, where we designed new ramps and tunnels, structures for underpinning and support of excavation, and we performed value engineering for all the major contractors. On Boston's Big Dig, we proved the benefit of combining soil, foundation and structural analyses into a single nonlinear model. A group of our structural engineers, who are also expert in geotechnical engineering, underground structures and utilities, is now using this approach to improve the design and constructibility of other infrastructure and building projects.





Victory Bridge | Perth Amboy, New Jersey | *George Harms Construction Company* | AC Photo

San Francisco-Oakland Bay Bridge Eastern Span | San Francisco, California | *TY Lin/Moffatt & Nichol JV; Donald MacDonald Architects* | CALTRANS

Bronx-Whitestone Bridge Rehabilitation | Bronx, New York

Reweaving the Urban Fabric | On the Road to the Future Weidlinger

designs and rehabilitates the transportation facilities and infrastructure crucial to a well-functioning modern city. By considering design in the larger context of security, maintenance and traveler convenience, Weidlinger strives to set new standards for the transportation industry, introducing new structural methods and strategies to hold the line on spiraling costs. We also offer advanced visualization and risk analysis methods to obtain the highest level of security for bridges, highways, tunnels and airports at the lowest cost consistent with program goals and aesthetics.

State and city transportation authorities rely on us to design and rehabilitate their bridges, and to provide a variety of services from segmental concrete and urban interchange design to biennial inspection and seismic retrofit. Our new designs and innovations benefit from the knowledge we gain in curing the fatigue and cracking of century-old structures. Recently, we designed major structural elements of the self-anchored suspended span of the San Francisco-Oakland Bay Bridge to stand up to an 8.0-magnitude earthquake. We improved the aerodynamic stability of the Bronx-Whitestone Bridge with the addition of wind fairings, the largest application of FRP composite panels on a bridge to date. We also authored the first-ever guidelines for inspecting and evaluating suspension bridge cables.



Models of Reality | Drawing the Line against Disaster

Weidlinger uses computational modeling and visualization to support clients in court, to define aerodynamic loads on buildings, to distinguish between pre- and post-earthquake damage for insurance loss estimates, to rehabilitate damaged structures, and to design seismic retrofits with base isolators, structural dampers and new composite materials. Our hazard models and risk analyses help clients make objective management decisions about purchasing insurance, planning upgrades, and responding to and recovering from disaster.

Our forensic engineering practice is extensive, encompassing routine disputes and major court cases. Weidlinger experts offer litigators fifty-plus years of design and field experience and the resources to perform advanced analyses and render them visually. We are adept at presenting complex findings in simple terms, as we did recently in testimony before the Guam Supreme Court on the post-earthquake collapse of a hotel, and in our analysis of the World Trade Center towers, the most comprehensive to date.

Understanding what happened and why, or what could happen, is one way Weidlinger works to protect structures and the people who use them.

World Trade Center South Tower Analysis (FLEX) | New York, New York



Advanced analysis distinguishes Weidlinger from traditional engineering companies. We take a leadership role in solving problems of national importance that concern the safety of tall buildings, infrastructure and military installations. Our mathematical modeling produces new ideas, such as shielding naval vessels against mine explosions with bubble screens and protecting loading docks against blast with lightweight composites. From protective design of civilian and public buildings to defeat of military hard targets, clients value the unique insight we gain from correlating analysis with testing. NLFLEX and other Weidlinger-licensed software have become the industry and government standard.

Simulations of a structure or device enhance design. They require good models of material behavior, a Weidlinger trademark. Our 3-D progressive collapse visualizations combine the effects of several types of loads, such as blast, seismic shaking and crash impact, into one analysis to support a more inventive architecture of skylit atriums and glass facades for at-risk buildings. Imaging, the inverse of simulation, uses electromagnetic waves for mapping objects in integrated circuits to improve their manufacture, and elastic waves for mapping underground petroleum reservoirs to establish their location. Weidlinger's multiscale imaging software is also employed to track underwater targets and to design ultrasonic probes for the medical industry.

Ultrasound beam from phased array (PZFLEX)



WEIDLINGER ASSOCIATES® INC

WEIDLINGER ASSOCIATES®
CONSULTING ENGINEERS PC

WEIDLINGER ASSOCIATES® LTD

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CAMBRIDGE MA

WASHINGTON DC

LOS ALTOS CA

SANTA MONICA CA

MOUNTAIN LAKES NJ

ALBUQUERQUE NM

SCOTLAND UK

<http://www.wai.com>

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