ROBERT SILMAN ASSOCIATES

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THE FIRM

Creating, Renewing, Preserving, Sustaining……this has been the vision of Robert Silman Associates since its inception in 1966. RSA fosters an approach centered on constant collaboration among owners, architects and consultants to provide the highest quality structural engineering services possible. Our engineers are trained to be effective listeners, creative problem solvers, and knowledgeable about all facets of the construction process.

RSA has served as structural engineering consultant on more than 14,000 projects. The firm is most noted for its collaborative spirit in the design of new architectural works and some of the largest and most noteworthy renovations and additions in this country. RSA's expertise as architectural engineers positions the firm among the leading engineering firms for large and technically complex projects. We are a proactive member of the design team, helping ensure an owners' goals for budget and schedule, while achieving the architectural goals by creative solutions to engineering challenges.

New construction accounts for 50% of our entire workload. Our experience with both historic and modern structures has taught us which technologies work best. We understand both new and old construction, are well versed in the use of all materials and are willing to create new systems.

Our engineers approach renovation with creativity and elegance. These projects require knowledge of a broad range of building systems, and may involve structural building frame modifications, integration of mechanical system upgrades into existing building with minimal cost impact or impact on visual elements, design of security measures and approvals by various agencies.

RSA promotes sustainable and environmentally responsible design and has consulted using sustainable design criteria for "green" buildings on scores of projects. In addition, the firm's long experience in the adaptive reuse of buildings allows a rapid analysis of the suitability of an existing structure and the possible sustainable conclusion of "no-build" when investigating new construction.

RSA has developed a special expertise in the engineering of historic buildings. In fact, we have consulted on more than 350 registered landmark buildings. Our proficiency in the use of preservation techniques has aided our efforts in saving America's architectural heritage. Special areas of expertise are in the assessment and monitoring of structures, façade investigation and repairs, investigation of building failures and response to emergency structural situations.

RSA makes use of state-of-the-art networked computer programs including: SAP2000, RISA 3D, SAFE, RAM Structural System, PCASlab, PCACOL, as well as AutoCAD 2007 and REVIT Structure 2008. RSA has offices in New York City, Washington, DC, and a satellite office in Boston. The firm presently numbers 110 of whom 34 have professional registration and 21 are LEED Certified Professionals.

Higher Education • Libraries • Medical & Laboratory Facilities • Museums • Office & Retail • Parks & Recreational • Performing Arts • Primary/Secondary Education • Public Buildings • Religious • Residential • Special Structures





EXPERIENCE




HISTORIC PRESERVATION
RELEVANT EXPERIENCE

Edison National Historic Site, West Orange, NJ
Renovations and additions to several buildings at the Edison National Historic Site. Structural work includes addition of a new combined elevator and staircase tower, ADA-compliant access, structural upgrades for mechanical, electrical, and plumbing renovations, reconstruction of a building No. 11, etc.

Tobacco Warehouse, Brooklyn, NY
RSA found that the 20" thick brick walls were relatively sound, needing isolated repairs and restoration. The collapsed beams and debris were cleared, fallen arches were restored from salvaged masonry, and joist pockets were infilled.

Fallingwater, Mill Run, PA
Structural investigation using non-destructive testing. Results indicated need for temporary shoring. RSA designed major repair of deflecting concrete cantilevers using external post-tensioning. This was achieved by lifting the stone floors to gain access to the cantilevers, and then applying exterior post-tensioning cables to stop the continuing deflection and raise the sag by a fraction of an inch.

Ellis Island, Museum of Immigration, NY/NJ Harbor
One of the largest historic preservation project ever undertaken in the US, the main building was adaptively converted into a museum. Structural features included new steel entry canopy, which replicates original shape but not details, new Registry Room stair of helical design in reinforced concrete, again replicating original location but not details. Ellis Island is a complex of more than 45 buildings. We are currently stabilizing structures in the south half. So far we have done structural reports on more than 30 buildings and performed major renovation and adaptive reuse on the main building: now the museum of Immigration; railroad ticket office: now part of the Museum of Immigration; bakery/carpentry: now used for administration; kitchen/laundry: now used for shops and storage; baggage and dormitory: temporarily stabilized but vacant.

OTHER RELEVANT EXPERIENCE

- Brooklyn Main Post Office, Brooklyn, NY
- Cathedral of St. John the Divine, New York, NY
- City Hall Rotunda & Clocktower, New York, NY
- Darwin Martin House Complex, Buffalo, NY
- Drayton Hall, Charleston, SC
- Fort Jefferson, Dry Tortugas National Park, FL
- Foundation Building, Cooper Union for the Advancement of Science & Art, New York, NY
- Historic Morven, Princeton, NJ
- MetLife Tower, New York, NY
- New Jersey State House Dome & Rotunda, Trenton, NJ
- New York State Capitol, Albany, NY
- Shepard Hall, The City College of the City of New York, New York, NY
- Solomon R. Guggenheim Museum, New York, NY
- Tweed Courthouse, New York, NY

FALLINGWATER
Mill Run, PA

Robert Silman Associates participated in the structural investigation of this Frank Lloyd Wright house, which was constructed in 1936.

Work included:

- Non-destructive testing of reinforced concrete structural members, including impulse radar and ultrasonic pulse velocity methods to evaluate material soundness of concrete and steel reinforcing, and to verify reinforcing bar sizes
- Development and installation of an in-service structural monitoring system, including vibrating wire crack meters and tiltmeters, with a datalogging microprocessor to gather data that will allow calculation of both short-term and long-term deflections
- Development of a finite element computer model of the cantilever structure to evaluate both general structural behavior and local stress distributions
- Report of findings with recommendations for treatment of the structure for future use
- A row of structural steel shoring was erected with steel grillages set on anchor rods drilled directly into the rock of the streambed allowing tours to continue for the public.

Repairs include:

- Investigation of strengthening schemes and development of final design documents for strengthening of cantilever structure
- Major repair of deflecting concrete cantilevers using external post-tensioning. Achieved by lifting stone floors to gain access to cantilevers, and then applying exterior post-tensioning cables to stop continuing deflection and raise sag by a fraction of an inch. Deflection was not completely corrected because raising it more would most likely cause cracking in windows and other places, but it will keep it from getting worse, and it will be historically representative of Fallingwater.

PROJECT DETAILS
Completed 2002
7,000 sf

Architect
Wank Adams Slavin Associates

Agency
Western Pennsylvania Conservancy

Awards
NY Association of Civil Engineers 2003 Engineering Excellence - Diamond Award

2003 International Concrete Repair Institute Award

ACEC National 2003 Engineering Excellence Honor Award

ELLIS ISLAND - MASTER PLAN & STABILIZATION
NY/NJ Harbor

Ellis Island is a complex of more than 45 buildings. Robert Silman Associates is currently stabilizing structures in the south half.

So far, we have done structural reports on more than 30 buildings and performed major renovation and adaptive reuse on the following:

- Main Building: now the Museum of Immigration
- Railroad Ticket Office: now part of the Museum of Immigration
- Bakery/Carpentry: now used for administration
- Kitchen/Laundry: now used for shops and storage

Stabilization on more than 25 buildings including:

- Measles wards
- Isolation wards
- Powerhouse
- Recreation building & shelter
- Administration building
- Staff house
- Roof covered connecting corridors

PROJECT DETAILS
Ellis Island Master Plan

Architect
Beyer Blinder Belle Architects

Agency
National Park Service

ADAPTIVE REUSE
RELEVANT EXPERIENCE

DoMA Gallery, Baltimore County, MD
Adaptive reuse of a 130 year-old hay barn into a private art gallery and guesthouse. The creative conversion preserves the character of the old barn while the Modernist form of a glass box is inserted. RSA designed new steel framing, cantilever plates at offset walls, new engineered wood framing, wood shearwalls, steel tension bracing and steel plate reinforcing to existing wood frames.

Aaron Davis Hall, The City College of the City of New York, New York, NY
This historic landmark was restored and converted to performing arts space. Work included a new addition and main entrance at the mid level, cut through stone aqueduct chamber retaining walls, new stairs and elevator in tower leading up to performance space and down to support spaces in basement, structural reinforcement of deteriorated existing roof trusses and new intermediate floors to meet performance space requirements.

New Children's Center at Bellevue Hospital, Administration for Children's Services, New York, NY
The exterior restoration of this McKim Mead & White landmark building included refurbishment of the existing decorative cast iron and cut stone balconies and windows and partial replacement of an elaborate terra cotta cornice and entablature replicating the original. RSA designed the conversion of what was formerly a city morgue, then the Morgan Laboratories. Interior renovations included offices, children's temporary housing, and the education center with classrooms. New construction of the interior courtyard includes a new auditorium and playroom and an atrium recreation area. Structural design features include complete floor restoration, four new sets of stairs, four new elevators, new bearing walls, mechanical equipment support, new entrances, new ceiling system, and new mezzanine floor.

Long Island Children's Museum, Hempstead, NY
Adaptive reuse of hangar building for use as a museum included survey and analysis of existing structure, repair and replacement of damaged elements, addition of mezzanine level, analysis and reinforcement to stiffen frame for new use, reuse of existing slab-on-grade as level floor with depressions and a variety of floor finishes and point loads.

Packer Collegiate Institute, Brooklyn, NY
An independent 5-story middle school was erected within the shell of the Landmark building. The complex includes an expansion with a new performing arts center. In addition the 1850s parish hall adjacent to the church was gutted and refurbished to become a new dining commons. A glass atrium links the original Packer buildings with the new middle school facility.

OTHER RELEVANT EXPERIENCE
- American Tobacco, Durham, NC
- Asphalt Green, New York, NY
- Brooklyn Tabernacle Church, Brooklyn, NY
- Center for Jewish Life, New York University, New York, NY
- King Juan Carlos I of Spain Center, New York University, New York, NY
- LoveJoy School, Washington, DC
- Rockefeller University Hospital & Nurses' Residence, New York, NY
- Sage Hall, Cornell University, Ithaca, NY

DOMA GALLERY
Baltimore County, MD

Robert Silman Associates designed structural modifications to turn a 130 year-old hay barn into a private art gallery and guesthouse. The creative conversion preserves the character of the old barn while the Modernist form of a glass box is inserted. Use of a glass storefront system in part of the barn required stringent attention to deflection criteria.

The stone-based timber structure was near collapse and was structurally strengthened by adding steel plates, tension bracing and new cantilevered concrete retaining walls. The design is based on upgrading the roof to function as a diaphragm spanning between upgraded wood frames and new shearwalls.

RSA designed new steel framing, cantilever plates at offset walls, new engineered wood framing, wood shearwalls, steel tension bracing and steel plate reinforcing to existing wood frames. We also worked with a contractor to reuse existing materials where possible.

PROJECT DETAILS
Completed 2003
3,480 sf

Architect
W Architecture & Landscape Architecture

Awards
AIA NY 2003 Award of Excellence - Historic Preservation & Adaptive Reuse




NEW CONSTRUCTION
RELEVANT EXPERIENCE

Stieren Orchestra Hall, Santa Fe Opera, Santa Fe, NM
New construction of a 13,000 square foot enclosed rehearsal hall behind the open-air opera house. A large hangar-like door at the rear allows for scenery and instruments to be brought from the main theater into the rehearsal space. Because the building was being built into the side of a hill creating an unbalanced soil load condition, the structural challenge was the foundation design. RSA and the geotechnical engineer came up with a solution that minimized excavation, provided shoring, and permanent soil retention. It contains climate-controlled storage for the company's costume collection and private rehearsal studios.

Whitehall Ferry Terminal, New York, NY
Replacement of existing fire damaged Manhattan terminal for the Staten Island Ferry. Project interfaces with significant transportation features that pass below or immediately adjacent to the new building, including the roadway tunnel linking the FDR Drive with the West Side Highway, as well as three subway lines, the 1 & 9, the 4 & 5, and the N & R trains. The new terminal houses the NYC Department of Transportation.

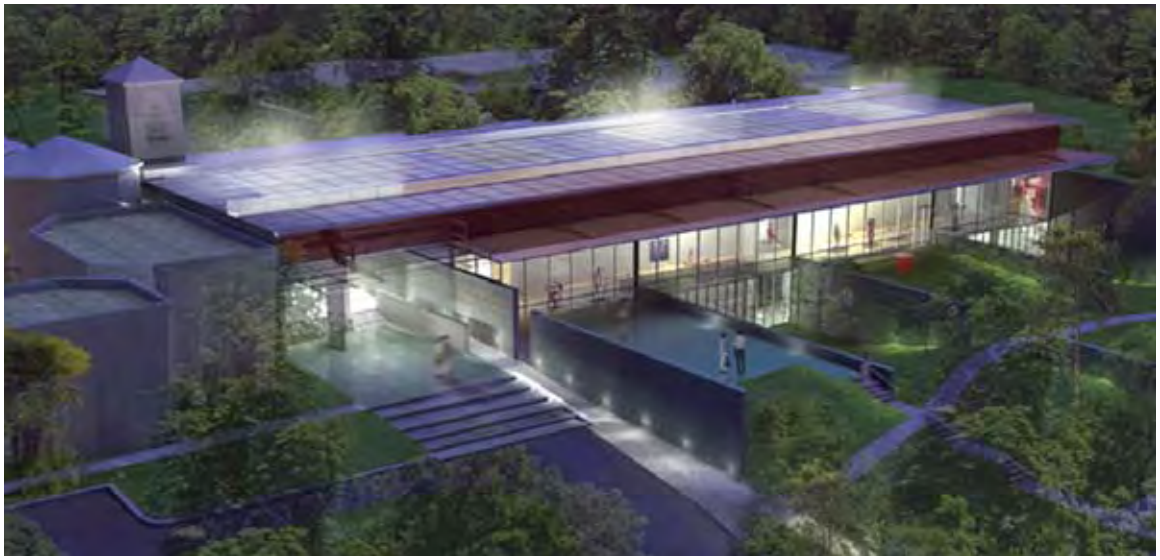
The Morgan Library & Museum, New York, NY
The new addition is a 70,000 square foot structure inserted between three historical buildings. The addition includes a subterranean vault, with drainage and waterproofing systems to house rare manuscripts, drawings and other objects. To prevent deterioration of its invaluable contents, the vault has a strictly controlled environment.

West Perry Towers, New York, NY
The new construction of two towers are cladded in clear glass with painted aluminum mullions and are 17 stories high. The apartments, which are floor to ceiling glass exposures, are 2,000 to 4,000 square feet. The structure and service core are located at the rear of each building. The ground floor in one of the towers houses a cafe and there is a private fitness center for residents.

OTHER RELEVANT EXPERIENCE

- Breast & Imaging Center, Memorial Sloan-Kettering Cancer Center, New York, NY
- Engine Company 201, Brooklyn, NY
- Frank Sinatra High School for the Performing Arts, Queens, NY
- Hackley School, Tarrytown, NY
- Harlem Hospital, New York, NY
- Judy & Arthur Zankel Hall, Carnegie Hall, New York, NY
- Lab of Ornithology, Cornell University, Ithaca, NY
- Lewis Katz Building, Dickinson School of Law, Pennsylvania State University, University Park, PA
- Marion Koogler McNay Art Museum, San Antonio, TX
- Milstein Hall, Cornell University, Ithaca, NY
- Natural History Museum of the Adirondacks, Tupper Lake, NY
- Peter Jay Sharp Boathouse, Swindler Cove Park, Harlem River, New York, NY
- Reingold Pavilion, Hebrew Home for the Aged, Riverdale, NY
- Scholastic Building, New York, NY
- Theater for a New Audience, Brooklyn, NY

MARION KOOGLER MCNAY ART MUSEUM
San Antonio, TX



Robert Silman Associates provided structural engineering services for a major 45,000 square foot museum expansion. Included are exhibition galleries, theater, public entry, museum store, orientation and special events spaces, art collection storage, sheltered loading dock, catering kitchen, security and support spaces, sculpture gardens and outdoor patios, modifications to existing buildings, and parking.

Steel vierendeel roof trusses span the main space and cantilever past the facade to support the exterior canopy. A saw-toothed glass roof alternately spans over and under these trusses. The roof is shaded by a combination of a fixed metal louver system over the top of the trusses, and a suspended patterned glass ceiling.

PROJECT DETAILS
Completed 2008
45,000 sf

Architect
Jean-Paul Viguir in conjunction
w/Ford, Powell & Carson Architects
& Planners





RENOVATION
RELEVANT EXPERIENCE

Virginia State Capitol, Richmond, VA
RSA performed the Phase I investigations of the capitol building structure which served to evaluate existing structural systems, conditions and capacities, and to establish the structural scope for Phase II renovations. Upon completion of Phase I, RSA was then selected to be part of the team to perform the extensive Phase II, full-building renovations, which include a large sub-grade addition for new mechanical and program space. The new construction consists of a steel roof frame with reinforced concrete walls and roof slab.

Brooklyn Academy of Music, Brooklyn, NY
Various projects including major building-wide renovation incorporating the LePerc Theater, Rose Theater, and the reconfiguration of the lobby and dining areas, as well as the installation of new vertical circulation. RSA also participated in the reconstruction of the ancillary Majestic Theater, now the Harvey, bringing it from a derelict building to a fully serviceable theater. We also completed a multi-million dollar envelope restoration campaign that included restoring the original cornice to the building, which had been removed 50 years before.

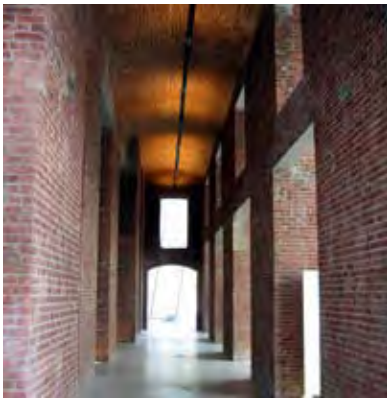
Brooklyn Museum, Brooklyn, NY
RSA is the prime structural consultant for the Brooklyn Museum 25-year master plan. Phase III consists of the re-introduction of a contemporary interpretation of the main entry steps that originally existed at the Eastern Parkway entrance of this McKim, Mead, & White landmark. This phase was broken up into four stages directed at improving the entrance to the museum and the surrounding landscape and included the interior renovation of Wing C and the temporary relocation of the entrance during construction of the new main entrance. Other completed master plan phases include the 10,000 square feet, 460-seat Cantor Auditorium, and the 35,000 square foot Schapiro Wing.

Bulgari, New York, NY
Renovation of the steel framed construction project. Among the unique features of this project was the installation of a monolithic interior marble wall that was designed and fabricated in Italy, then installed in the store. RSA designed a means to attach the new wall to existing structural steel columns in the building. Plans to remove the second floor in the space would have resulted in multiple overstressed columns. RSA designed a system to mitigate the challenge so that the floor could be removed, the columns braced, and the look of the building remain unblemished. RSA also framed out a brand new mezzanine.

Sage Hall, Cornell University, Ithaca, NY
Reconstruction/ renovation of several original historic buildings on the Cornell campus into one unified building. Only the exterior walls and mansards will remain, while the interior will be significantly expanded by replacing existing structure with new fire-resistant construction to house the Johnson Graduate School of Management. Features new structurally expressive central skylit atrium area and includes excavation of new basement level below sensitive historic construction.

OTHER RELEVANT EXPERIENCE
- Brooklyn Tabernacle Church, Brooklyn, NY
- Cartier, New York, NY
- Higgins Hall, North, South & Central Wings, Pratt Institute, Brooklyn, NY
- Tweed Courthouse, New York, NY

BROOKLYN MUSEUM
Brooklyn, NY



Robert Silman Associates is the prime structural consultant for the implementation of the Brooklyn Museum master plan. Japanese architect Arata Isozaki developed the 25-year plan in conjunction with the Polshek Partnership of New York City.

Phase III consists of the re-introduction of a contemporary interpretation of the main entry steps that originally existed at the Eastern Parkway entrance of this McKim Mead & White National Historic Landmark. This phase was broken up into four stages directed at improving the entrance to the museum and the surrounding landscape. It included the interior renovation of Wing C and the temporary relocation of the entrance to the rear of Wing C during construction of the new main entrance.

The new entrance pavilion required that modern structure be built around, under and through historic structure while not disturbing its integrity or closing the museum to the public. A full basement was needed for new mechanical equipment beneath the addition, requiring underpinning to a level significantly below existing 5-feet-thick foundation walls and six main building piers supporting the grand colonnade. With traditional underpinning methods taken to new extremes and constant monitoring for movement and vibration, the basement excavation safely proceeded over 10 feet into undisturbed soil.

PROJECT DETAILS
Entrance Pavilion
Completed 2004
24,000 sf

Architect
Arata Isozaki in conjunction w/ Polshek Partnership

Awards
AIA NY 1995 Excellence in Design Award

1995 NY Landmarks Conservancy Lucy G. Moses Preservation Award

NY Construction Best of 2004

American Engineering Companies NY Chapter 2005 Gold Award

AIA NY 2005 Design Merit Award

ACEC NY 2005 Engineering Excellence Award




STRUCTURAL INVESTIGATIONS
RELEVANT EXPERIENCE

Iglesia San Jose, Guaynabo, Puerto Rico
Iglesia San Jose, built in the 16th century, is one of the earliest examples of Gothic-influenced architecture in the western hemisphere. The church has been closed for five years due to structural problems such as falling plaster, water infiltration and structural cracks. Robert Silman Associates is providing emergency stabilization (scaffolding and shoring) services for Phase I of the conservation project.

Low Library, Columbia University, New York, NY
Survey and study was done to provide analytical results and recommendations on the structural integrity of the historic building using non-destructive testing, visual observation and laser measurement technology. This was followed by a program of roof, fire safety, heating, ventilation, and air-conditioning systems concentrating on the exterior dome and rotunda of this historic landmark, and modernization and upgrades to the rest of the building.

Orchard Beach Bath House, Bronx, NY
Visual survey and observation of probes at architectural concrete and masonry pavilions of 1930s public beach facility.

St. Francis de Sales, Philadelphia, PA
Visual survey of the entire interior and exterior. RSA developed scope for probes and a non-destructive evaluation of the portions of the structure were identified as damaged or likely to deteriorate. We prepared a report detailing our findings and recommendations for repair to the entire structure.

OTHER RELEVANT EXPERIENCE
- 33 Liberty Street Bank, New York, NY
- Bronx Victory Memorial, Bronx, NY
- Cleveland Tower, Princeton University, Princeton, NJ
- Fallingwater, Mill Run, PA
- Fifth Avenue Presbyterian Church, New York, NY
- Foundation Building, Cooper Union for the Advancement of Science & Art, New York, NY
- Harkness Tower, Yale University, New Haven, CT
- Historic Morven, Princeton, NJ
- New York City School Construction Authority, New York, NY
- Old Croton Aqueduct Bridge, Ossining, NY
- Pierce Mill, Washington, DC
- Plymouth Church, Brooklyn, NY
- Providence Cathedral, Providence, RI
- Roosevelt House, New York, NY
- SC Johnson Research Tower & Car Port, Racine, WI
- Sewall Belmont House, Washington, DC
- St. Thomas Church, New York, NY
- University Chapel, Princeton University, Princeton, NJ
- Whig & Clio Halls, Princeton University, Princeton, NJ
- Wingspread, Racine, WI

SHAKER MUSEUM & LIBRARY
Old Chatham, NY

Robert Silman Associates provided structural engineering services for the Historic Structures Report for the old stone barn, and ten other masonry and wood framed existing structures on the Mount Lebanon Shaker site. A feasibility study was also performed for further stabilization of the historic barn, and an adaptive reuse concept that would convert the 40,000 square feet ruin into a working museum for the Shaker collections. The proposed schemes included rebuilding the barn's original three wings to house classrooms, a cafe, collection storage, administrative space and mechanical space.

Currently RSA is working as the prime consultant in the stabilization effort to protect the ruin from further deterioration.

PROJECT DETAILS
Shaker Museum Stabilization
Project Ongoing
40,000 sf

Architect
Cooper, Robertson & Partners

HSR Architect
Page Ayers Cowley Architects





SUSTAINABLE DESIGN
RELEVANT EXPERIENCE

McLane & Fahey Residence Hall, Dartmouth College, Hanover, NH
The program for the new building includes common spaces and facilities that encourage socialization and collaboration among all residents of the cluster of residence halls. The largest commons room accommodates up to 250 people for activities such as lectures, films and banquets. One faculty apartment, administration offices and a seminar room are included. This project was awarded LEED Gold Rating in 2008.

Woods Hole Research Center, Woods Hole, MA
Renovation/adaptive reuse of a 120-year-old 7,500 square foot Victorian summer house, plus an addition to increase the total office and laboratory space to 19,300 square foot using sustainable design criteria. The campus design, including systems, site and positioning, draws upon the natural environment, and operates up to 60% below energy code. Main features include a two-story "commons" with panoramic views and a 100-person meeting facility that takes advantage of its lower level and northern exposure.

FDR New Visitor Center & Presidential Library Renovation, Hyde Park, NY
The gabled east end of the new 44,000 gross square foot building echoes the gabled end of the library, and together, the two buildings form an entry court and frame a stone paved public square at the entrance to the historic site. They include a suite of three connected public rooms and an access corridor links the two halves of the building. The project was designed to achieve LEED Accreditation. Renovations to the historic library provide a new gallery and elevator for installation of temporary exhibitions.

School of Business, Ithaca College, Ithaca NY
New 25,000 square foot building which is to take full advantage of the passive solar design and incorporate structure into energy performance goals through the use of thermal mass. The project certification goal is the highest rating, LEED Platinum.

Natural History Museum of the Adirondacks, Tupper Lake, NY
New 54,000 square feet double height, single floor, large volume building full basement museum and an experimental nature museum with living wildlife and educational exhibits. The museum includes live animal exhibits and include rails, wetland, observation tower, and amphitheater, and detached teaching and events building, the Snowshoe Hut. A man-made pond is adjacent to the building. The museum is expected to save 20-30 percent of normal operating costs and earned a LEED Silver certification in 2008.

OTHER RELEVANT EXPERIENCE

- Audubon House, New York, NY
- Brooklyn Poly Prep Lower School, Brooklyn, NY
- Burnet Park Zoo Education & Interpretation Center, Syracuse, NY
- Center for Wellness & Community Investment, College of New Rochelle, New Rochelle, NY
- Everglades National Park, Homestead, FL
- Jamaica Bay Visitor's Facility, Queens, NY
- New York State Department of Environmental Conservation, New Paltz, NY
- South Jamaica Branch Library, Jamaica, NY

DOROTHY D. & ROY H. PARK CENTER FOR BUSINESS & SUSTAINABLE ENTERPRISE
Ithaca College, Ithaca, NY

This is a 39,000 square feet 4-story steel-framed building designed to house lecture auditoriums, classrooms and offices. There is also an enclosed bridge walkway between the new Business School and the existing Job and Friends Hall.

The School of Business features a wide range of innovative green building features. The building has achieved a LEED Platinum rating. It includes a vegetated roof, extensive daylighting, a white roof, storm water reclamation for use within the building's plumbing, high-performance glazing, premium efficiency motors and boilers, waterless urinals, low-velocity displacement ventilation, locally-quarried rubble stone base, native vegetation, 50 percent of the electricity from renewable sources, extra insulation, south facing façade and Forest Stewardship Council-certified wood. Additionally, the project incorporated a majority of materials from within 500 miles, diverted over 90 percent of the waste from the landfill and provided numerous low-toxicity materials.

PROJECT DETAILS
Completed 2008
39,000 sf

Architect
Robert A.M. Stern Architects

Awards
ACEC NY 2009 Engineering Excellence Diamond Award




SPECIAL PROJECTS
RELEVANT EXPERIENCE

Stainless Steel Staircase, Viking Investors, Greenwich, CT
Robert Silman Associates provided full design services for a custom stainless steel staircase, including FEM nonlinear and dynamic analysis of slender stringer fabrication and ten, complete detailing, glass tread design and detailing and full coordination with contractors and fabricators.

Circle of Life, Sachem's Head, CT
Modeled after the original Stonehenge, the Circle of Life is 700 tons of Blue Pearl Norwegian granite with each slab approximately 6 by 13 feet. Sculptor Darrell Petit spent three months in a quarry in Norway because the local quarry in Connecticut was not big enough for a harvest of 700 tons. Robert Silman Associates designed a concrete mix for the foundations similar to those used by the ancient Romans and also used computer modeling to simulate natural stresses such as hurricanes and earthquakes as well as vandalism.

Labyrinth by Francois Stahly, Albany, NY
Comprehensive evaluation of François Stahly's Labyrinth, a wooden sculpture covering approximately 14,500 square feet and extending more than 30 foot in height. Its direct exposure to weather, including harsh New York winters, presents a challenge to maintenance and preservation. RSA evaluated the sculpture's existing conditions and made recommendations for future repair and maintenance efforts. The evaluation team used a non-destructive resistance drilling technique to locate internal voids and developed a numbering system in order to track the condition of each wooden element through future evaluations.

Vinik Hall, Riverdale Country School, Bronx, NY
To allow for installation of a soccer field, the house had to be moved approximately 100 yards and rotated about 90 degrees. Prior to the move, the structure had to be stabilized in several areas to allow for its move with minimal disturbance of historic fabric. The temporary shoring required to support the structure while the wheel assemblies were installed was placed in areas that were best suited for the stresses associated with the move. The wheel assemblies (747 wheels mounted on hydraulic carriages which were all synchronized) were then installed and the move was then initiated. The entire building was moved in one day to its current location. Upon completion of the move, a gut rehabilitation was performed, returning the structure to its original splendor. A new, architecturally sensitive steel stair was designed for emergency egress as well.

OTHER RELEVANT EXPERIENCE

- Alice Aycock Sculptures, Baltimore, MD & Queens, NY
- Breath by Houshiary & Horne, Battery Park City, NY
- Cantilever by Takashi Soga
- Creative Time by Jim Campbell
- DC Police 4th District Substation Ballistic Shielding, Washington, DC
- The High Line, New York, NY
- Lincoln Memorial Blast Analysis, Washington, DC
- Lyndhurst Greenhouse, Tarrytown, NY
- Moving of the Empire Theater, West 42nd Street, New York, NY
- Peter W. Rodino Federal Building Blast Resistance, Newark, NJ
- Perry Capitol Stairs, GM Building, New York, NY
- Pratt Sculpture Garden, Pratt Institute, New York, NY
- Washington Arch, Washington Square Park, New York, NY




ROBERT SILMAN, PE, President

Robert Silman, as president of his structural engineering firm for the past forty-three years, has directed all phases of its operations. The firm divides its time evenly between projects of new construction, alteration, renovation and preservation with Mr. Silman contributing his knowledge in all structural materials - steel, concrete, timber, fabric, aluminum, plastic, carbon fiber and glass.

In addition, Mr. Silman has particular expertise in historic preservation, as evidenced by his work on Carnegie Hall, Fallingwater and The Museum of Immigration at Ellis Island. The Secretary of the Interior appointed Mr. Silman to the National Center for Preservation Technology and Training Board representing the fields of engineering and preservation education. In 2006 he received the New York Historic Districts Council's Landmarks Lion Award, an honor bestowed each year on an individual who has made significant contributions to historic preservation.

Mr. Silman is Chairman of the Working Commission 7 on Sustainable Design for the International Association for Bridge and Structural Engineers (IABSE). In recognition of his dedication to excellence in structural engineering and his role as a mentor for young engineers IABSE awarded Mr. Silman the prestigious Anton Tedesco Medal in 2005. He has written a number of articles on sustainability for *Structural Engineering International,* and he was a member of the Consortium writing the High Performance Guidelines for New York City Capital Construction Projects sponsored by the Mayor's Office. And finally, he led his entire office in participating in an intense effort to completely revise specifications and design methodologies to incorporate principles of sustainability.

Education
- Master of Civil Engineering, New York University
- Bachelor of Civil Engineering, Cum Laude, New York University
- Bachelor of Arts, Cornell University

Experience
- Robert Silman Associates 1966-Present
- Ammann & Whitney 1964-65
- Ove Arup & Partners (London) 1963-64
- Severud Associates 1960-63
- Tishman Realty & Construction Co. 1957-58

Teaching
- Cornell University, College of Architecture Art & Planning, Visiting Critic, Building Renovation Technology
- City College of New York, Adjunct Professor, Philosophy of Technology
- Columbia University, Adjunct Professor of Architecture, Graduate School of Architecture
- Yale University, Adjunct Professor of Architecture, School of Architecture

Professional Affiliations
- International Association for Bridge and Structural Engineering, Working Commission 7, Chairman
- National Center for Preservation Technology & Training Board Member, Past Chairman
- American Society of Civil Engineers, Fellow
- American Concrete Institute, Member
- Architectural League of New York, Member (past Vice President)
- Association for Preservation Technology, Member
- American Institute of Architects, NY Chapter, Honorary Member
- New York State Preservation League, Member
- Structural Engineering Association of New York, Member

Registration Professional Engineer: NY, NJ, DC, CT, KY, MA, MD, ME, NH, PA, RI, TX, VA, VT




JOSEPH F. TORTORELLA, PE, Vice President
Since joining the firm in 1979, Mr. Tortorella has supervised projects of new construction, alteration, renovation, adaptive reuse, sustainable design and historic preservation. His hands on approach to project management on all phases of design and production as well as through construction and his attention to detail has led to his expertise in project quality assurance.

Mr. Tortorella is active in industry organizations. As a member of International Association for Bridge and Structural Engineering (IABSE), he helped plan and attended their annual symposium in Shanghai in 2004. His duties as Chair of their Scientific Committee included planning the 2008 Symposium in Chicago. He is also Vice-Chair of Working Commission 8 (Rehabilitation of Structures).

Closer to home, Mr. Tortorella is member and Past-President of the Structural Engineers Association of New York (SEAoNY) and is on the Executive Board of New York New Visions in the evaluation of the designs for the redevelopment of the World Trade Center Site. He also serves on the board of the Center for Architecture Foundation through which he previously taught primary school children through the Learning by Design program.

Education
Bachelor of Science in Civil Engineering, Manhattan College, NY

Experience
- Robert Silman Associates 1979-Present
- Lapeka Construction Company 1978-79

Professional Affiliations
- SEAoNY, Member, (Past President)
- New York New Visions, Executive Board
- IABSE, Chair of United States Group
- IABSE, Chair-Science Committee & Co-Chair-Working Commission 8
- Center for Architecture Foundation, Board Member
- American Society of Civil Engineers, Member
- American Institute of Architects, Associate Member, Committee Member
- Town of Yorktown Landmarks Preservation Committee, Member (Past Chairman)

Teaching
AIA Learning By Design Program, Instructor

Registration
Professional Engineer: NY, NJ, CT, GA, UT, LA, MO, MS, WI, OH, NC, Puerto Rico





NAT OPPENHEIMER, PE, LEED AP, Principal
Mr. Oppenheimer joined Robert Silman Associates in 1988. Besides his day-to-day project management responsibilities, Mr. Oppenheimer is the Principal-in-charge of technical advancement, standards and quality assurance. He has extensive experience in the areas of new construction, renovation, historic preservation, and sustainable engineering and is LEED Accredited.

Nat is on the Executive Committee of the Board of Directors of the Salvadori Center, a non-profit organization that uses the built environment as a motivational tool to teach math and science to at-risk, inner-city students. He has worked as a volunteer teacher, recruiter, and fundraiser while on the Salvadori Board.

Nat is devoted to several facets of engineering education and has taught at the Graduate Schools of Architecture at Columbia and Princeton Universities since 2000. He has been an invited jury critic in the School of Architecture at Columbia, Princeton, Penn, Parsons, and Pratt.

Education
Bachelor of Science in Civil Engineering, Clarkson University

Experience
- Robert Silman Associates, 1988-93; 1997-present
- Friedman & Oppenheimer, 1994-96

Professional Affiliations
- The Salvadori Center, Executive Committee
- American Forest Products Association, Member
- American Institute of Steel Construction, Member
- American Society of Civil Engineers, Member
- Association for Preservation Technology, Member
- Structural Engineers Association of New York, Member (Past Director)

Teaching
- Princeton University, Lecturer, Graduate School of Architecture & Engineering, 2000-Present
- Parsons School of Architecture, Adjunct Assistant Professor, 2004-Present
- Columbia University, Adjunct Assistant Professor, Graduate School of Architecture & Engineering, 2000-2002

Publication
- The Design of Renovations, (WW Norton), 1997 Co-Author
- Modern Steel Construction, September 2008, "Moving In", pp. 33-34 Co-Author

Registration
- Professional Engineer: NY, NJ, CO, CT, FL, IL, IN, MA, MI, MN, NM, SC, TN
- LEED Accredited Professional




EDMUND P. MEADE, PE, Principal & Director of Preservation
Mr. Meade has managed many large preservation projects ranging from the restoration of the New Jersey State House Dome to Columbia University's Low Library. He has designed innovative structural solutions while preserving and maintaining the original architectural and structural elements. He has been instrumental in saving significant historic buildings—in the process giving them decades of new life and productive use. As Director of Preservation, Mr. Meade provides RSA's staff of structural engineers with information and guidance in conjunction with their direct field experience. This enhances their knowledge of the historic preservation approach to older buildings and permits our knowledge of existing buildings to be applied to new construction. Mr. Meade shares his understanding and expertise by lecturing at industry events across the US, Canada, the Caribbean, and Europe.

Mr. Meade has worked on projects focusing on the historic preservation, stabilization, and/ or reuse of existing buildings. These projects have included numerous national historic landmarks. The range of his work includes the preservation of a five hundred year old stone church in Puerto Rico to the sensitive study and restoration of the wood structure of Gustav Stickley's Craftsman Farms in New Jersey. He guided the team of engineers who evaluated the structural condition of the Solomon R. Guggenheim Museum in New York. His experience has taught him to become an advocate for respect for historic materials, use of modern analysis techniques and materials, and the importance of a collaborative team approach to surveying, analyzing, designing repairs, and implementing repairs for existing buildings. His work has included use of advanced non-destructive evaluation techniques, sustainable design, leading-edge analysis, monitoring, measuring techniques and leading-edge structural analysis techniques.

Education
- Master of Architectural History & Certificate in Historic Preservation, University of Virginia, 1989
- Bachelor of Science in Civil Engineering, Johns Hopkins University, 1986

Experience
- Robert Silman Associates, 1989-Present
- Higgins Gardner & Partners (London), 1988
- Watkins & Vitale Engineers, Inc., 1984-85
- National Institutes of Standards & Technology, 1983

Professional Affiliations
- Association for Preservation Technology International, Member
- American Society for Testing and Materials, Committee E06 on Performance of Buildings, Member
- Association for Preservation Technology, Northeast Chapter, President
- International Concrete Repair Institute, Member
- ASM International, Member

Teaching
- Adjunct Faculty Member, Drew University, Madison, NJ; Certificate Program in Historic Preservation, Office of Continuing Education. 2004 – Present
- Visiting Lecturer, Columbia University, New York, NY; Historic Preservation Program, Graduate School of Architecture, Planning, & Preservation; 2001 – Present

Registration
Professional Engineer, New Jersey