OUR ROLE IN THE REBIRTH OF NYC

WORLD TRADE CENTER AND 9/11 MEMORIAL & MUSEUM
Credit: NOAA, September 23, 2001
The New 7 World Trade Center is the first building to be rebuilt after 9/11.

The new tower is taller than its predecessor and outfitted with a host of life-safety and environmental features never before incorporated into a commercial skyscraper.

The first 10 floors house an electrical substation servicing the entire lower Manhattan area, on top of which there are 42 office levels totaling 1.7 million SF of space.

The project has been awarded LEED Gold status.
LONDON BRIDGE TOWER, “SHARD”
WSP Building Structures provided structural engineering services for One World Trade Center, the tallest building in the Western Hemisphere.

The tower is one of four planned buildings as part of the World Trade Center Reconstruction in Lower Manhattan, New York City.

The overall height of the tower reaches 1776 feet as a tribute to the “freedoms” emanating from the Declaration of Independence adopted in 1776.

The 1WTC program includes 3.0M square feet of new construction above ground and 500,000 square feet of new subterranean levels.
Ht. 1776’-0”
Spire

Ht. 1368’-0”
MEP, Restaurant & Ob. Deck

Ht. 1107’-8”
Office Floors

Ht. 186’-8”
MEP

Ht. 66’-8”
Lobby

Ht. 0’-0”
Basement

Ht. -70’-0”
The tower structure is comprised of a “hybrid” system combining a robust concrete core with a perimeter ductile steel moment frame.

The reinforced concrete core wall system at the center of the tower acts as the main spine of the tower providing support for gravitational loads and resistance to wind and seismic forces.

Along the height of the tower, the tapering multifaceted geometry creates unique structural conditions which necessitated the design and fabrication of special nodal elements using relatively large plating with significant capacity for load transfer.
Concrete Core + Perimeter Steel Moment Frame = Hybrid Lateral Force Resisting System
The collapse of the Twin Towers created a major debate in engineering communities worldwide for mitigation strategies to be implemented for future high-rise buildings.

The design team, faced with numerous and unique challenges, paramount among them being security related issues, was charged with the design of 1WTC and expected to meet or exceed future codes and standards that had not yet been published.

The unique site conditions with existing infrastructure also added additional challenges for the design and construction team.
The design and construction of this project is the result of a relentless collaborative effort between numerous design and construction teams over a period of several years.

Diligent management of site and building stakeholders, each with unique priorities and schedules, required strict attention to detail as well as open, effective communication by WSP Building Structures.

To ensure successful completion of 1WTC, WSP Building Structures provided innovative structural and managerial solutions.
THREE WORLD TRADE CENTER

- 3 World Trade Center is a bold design by Pritzker Prize winning architect Richard Rogers.
- Rising 83-stories, 3 WTC will include 2.8 million SF of office space spread across 53 floors and five trading floors.
- Office levels will range from 29,000 to 44,000 SF, and trading floors will include 68,000 SF of space.
- 3 WTC will have five levels of retail at and below grade.
TWO WORLD TRADE CENTER
Born in tragedy, the WTC Memorial and Museum emerges as an expression of unity and a physical representation of our nation’s most noble values.

It is a grotto to remember all those lost on Sept. 11, 2001, and a place to pay tribute to our heroes.

WSP is the Structural Engineer of Record for the entire WTC Memorial Complex site, which is delineated by a landscaped plaza containing the Memorial reflecting pools, the Museum and the core and shell of the Central Chiller Plant.
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WSP is the Structural Engineer of Record for the entire WTC Memorial Complex site, which is delineated by a landscaped plaza containing the Memorial reflecting pools, the Museum and the core and shell of the Central Chiller Plant.
Several innovative techniques were used to design and build the Memorial and Museum. Among them was the creation of an 80 foot long self-supporting corridor/tunnel to relieve the load on the structure below as well as the “socketing” of the up to 170 foot long shear walls into the bedrock to resist the earth pressures. Another original technique was the use of fiber reinforced polymers for local reinforcing of the blast walls.
From the start, the owners and the project team were focused on maintaining a development program that would be environmentally responsible.

As part of this effort the project was designed using a minimum of 20% coal fly ash in the concrete design mix.

The reinforcing steel contains a minimum of 33% recycled content; likewise the use of framework and bracing followed sustainable guidelines.

All products were acquired from within a 500 mile radius of the site. The manufacture of the concrete was performed within a 500 miles as well.

The project is designed to achieve a LEED Gold rating.
The interplay of seven simultaneous projects and numerous project teams as well as the pervasive spirit of cooperation evidenced in this endeavor has not gone unnoticed.

Few projects in modern history have been as subject to the attention and scrutiny of the public as the WTC site has, particularly the Memorial.

Yet the intensity of emotions connected with the WTC and its destiny has resulted in something extraordinary.

As much as the Memorial is about loss, it is equally about the power of hope.
QUESTION
PERIOD