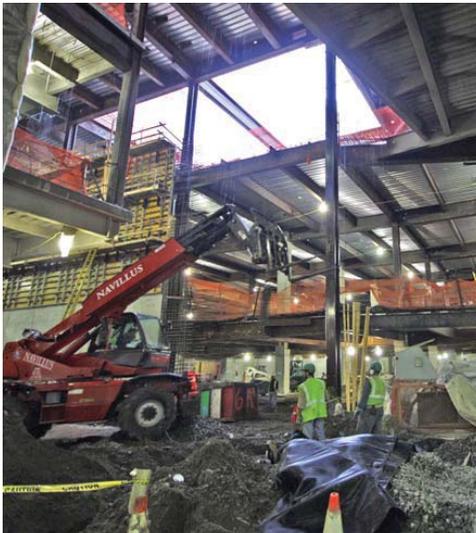




## Central Chiller Plant and River Water System: Improving on the Past to Move Forward



The Central Chiller Plant is being constructed below grade, inside the National 9/11 Memorial & Museum.

The World Trade Center (WTC) site consists of many features, including buildings, subway tunnels, retail and various centers for everything from vehicle access to security. All of these will require chilled water to keep their systems running as well as for air conditioning purposes. To help provide these necessary services to non-commercial areas, The Port Authority of New York and New Jersey is constructing a Central Chiller Plant and River Water System, a project as complex as it is crucial.

The original WTC site had two chiller plants. The plants, which supplied chilled water for the base buildings and tenant air conditioning, were in turn supplied with condenser water from the Hudson River by a river water pump station, located in Battery Park City, using river water lines

that connected to the two WTC chiller plants. Both chiller plants were destroyed in the 9/11 attacks, and while the river water lines and the pump station were left intact, they will remain inactive until they are upgraded and the new plant is complete.

The Port Authority is meeting an intricate challenge: It is constructing a new Centralized Chiller Plant – with a footprint similar to that of the previous plants – which will serve all the public facilities on the site, such as the Memorial Museum and Pavilion, the Transportation Hub and Retail. It is also in the process of rehabilitating and restructuring the existing river water lines, pump station and the power and communications ductbank to align their capabilities with those of the new Centralized Chiller Plant. The Port Au-

thority will meet the latest environmental standards through use of Best Technology Available, such as energy efficient variable speed pumps.

In order to serve many of the buildings at the WTC site, the Central Chiller Plant, itself located below grade inside the National 9/11 Memorial & Museum, will have to carry chilled water through other stakeholder spaces to deliver it to all the target points. This requires not only engineering ingenuity but coordination with multiple stakeholders.

The completed Central Chiller Plant will adhere to all of the site-wide and national water and energy codes. Its partial opening will concur with the opening of the below-grade National 9/11 Memorial & Museum.

# One World Trade Center Surges Ahead, Helped by the Ultimate Crane

Surveying the World Trade Center (WTC) construction site from any vantage point, one thing always stands out from its surroundings: The Port Authority's One WTC, future pride of Downtown Manhattan. Currently the tallest structure on site, the skyscraper keeps up its steady progress pace as more and more goals are achieved and elements are added.

The progress is not always apparent to an outsider: The building isn't just going up, it's getting fleshed out. The ground floor concrete slab is substantially complete on the building's north side, approximately 41 inches at its thickest point. The building has also been ringed by 24 jumbo perimeter steel columns rising to the third floor above ground level. Each one weighing 70 tons and measuring approximately 60 feet in length, the columns were erected by crawler cranes which have been mobilized on both east and west sides. And then there's the 18000.

Big projects require big machinery. In order to erect the largest skyscraper on the WTC site, The Port Authority brought in the Manitowoc Model 18000, currently the largest crane on location and bigger than any crane that preceded it. The 18000 stands over 390 feet in height, a rough equivalent of a 15-story office building. The crane, stationed at ground level, rises almost as high as the east and west cranes, which are currently set at the building's highest level. Its lifting capacity is 660 tons, which made it ideal for erection of the jumbo columns. Bright red in color, it is impossible to miss. Once it completes its purpose at the One WTC proj-



The Manitowoc 18000 crane (left) is helping to erect One World Trade Center.

ect site, the 18000 will be rotated to work on the PATH Transit Hall. Construction is moving forward.

Below ground, the six basement levels of One WTC have been completed. Numerous trucks enter the site daily, bringing concrete and other building materials. There is a stronger presence of electrical and mechanical trades at the work site – a clear indication that con-

struction is moving forward. While it currently reaches approximately 110 feet above Vesey Street, the completed One WTC will be 1335 feet above grade – that's 105 stories, enough to count it among the tallest buildings in the world.

## In the Spotlight:



**Carla Bonacci, AIA, PP**  
Assistant Director  
Infrastructure & Project  
Development

**Q: Most readers of this newsletter have a concept of what the WTC Transportation Hub, the Memorial and Tower One projects are and what they will look like – but what is Infrastructure?**

A: Infrastructure at the WTC site consists of the “invisible” components that many of those signature projects

require to open and operate. It is the glue that holds everything together. Buildings at the site rely on the electrical power plant; the Central Chiller Plant for air conditioning; and public and private utilities such as water, storm, sanitary, steam and gas, as well as security and operations facilities, communications systems, and other emergency systems. Infrastructure requires intensive coordination with the multitude of project stakeholders to harmonize elements, from street grades and paving materials to radio channels and utility load requirements. The most visible aspect of WTC Infrastructure will be the new streetscape and public open spaces throughout the site – the Streets project visually unifies the WTC site and creates a cohesive district and “sense of place” that was envisioned in the Master Plan.

**Q: Speaking of the WTC Site Master Plan, what is the current status of the Master Plan? Is it still relevant?**

A: Yes, the Master Plan is still very relevant and is being implemented. As with all master plans of this magnitude, there have been continual refinements and adjustments over the years since the Memory Foundations plan by Studio Daniel Libeskind was adopted. Nearly all of the Master Plan changes have been “inside the lines” of specific projects, as designs were developed and coordinated with adjacent projects to eliminate gaps or overlaps in design and construction phasing. Nevertheless, the street grid and open spaces, the alignment of the office towers at descending heights around the Memorial, and the development of the Southern Site are key features that have been established.

**Q: Are the Infrastructure projects currently under construction? What are the deadlines?**

A: Yes, structural portions of Infrastructure facilities – the “core and shell” – have been under construction in conjunction with the Memorial and Tower 4 projects. We have completed equipment purchases for the Chiller Plant, and awarded contracts for equipment installation, as well as work to rehabilitate a river water pumping station; you will see fieldwork by the end of this year. We should have the Chiller Plant operational for the opening of the below grade Memorial Museum. Construction contracts for streets, sidewalks and utilities are planned to be awarded during the first quarter of 2010 to support the opening of the Memorial Plaza.

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