

## The Next Step in Green?

By Franco Montalto and Patricia Culligan



The population of New York City is expected to rise by one million people over the next two decades. How will the city's aging sewer infrastructure keep up?

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System has been a good first step in encouraging green building practices. LEED provides credits for meeting specific requirements associated with sustainable site development, including water savings.

But this initiative focuses primarily on building performance and not on the constraints implied by local water infrastructure. There is the real possibility that a building that has earned LEED credits for water use reduction could contribute more wastewater to the combined sewer system (CSS) than the structure it replaced, especially if the new building has higher occupancy and/or a larger footprint. Hence, even green buildings can increase the need for, and cost of, water infrastructure.

This is not the case for 7 World Trade Center, which will have a lower occupancy and smaller footprint than the building it replaced.

But we need to be thinking of new ways to optimize individual, or collective, site designs to minimize the water consumed and the wastewater discharged. This requires the optimization of all possibilities onsite, and may also involve the incorporation of offsite solutions within an appropriate service area.

Imagine a situation, for example, where all onsite opportunities for water conservation and reuse have been exhausted, yet there is still a net increase in load to the CSS at a development. This net increase would ordinarily result in an increase in sewer overflows.

Mitigation for the net increase could be implemented offsite at distributed locations, all located within the local sewershed. Specifically, water conservation and stormwater-capture measures subsidized by the developer could be used to reduce flows in the sewer system in proportion to the net increase in flows resulting from the development itself. Such a plan would be the water infrastructure analog to the emissions trading program outlined in the International Kyoto Protocol, or the compensatory wetland mitigation program described in Section 404 of the Federal Clean Water Act.

Mitigation strategies could include water conservation measures, as well as neighborhood rainwater harvesting and reuse schemes, green roofs, and curbside infiltration galleries, all of which would reduce the total volume and rate of flow to the local CSS infrastructure. Considered in this context, even new developments of large scale could result in a net zero or even a reduction in the number of sewer overflows in local surface water bodies.

Green urban development requires new, comprehensive models and guidelines regarding how development and redevelopment projects relate to local water infrastructure capacity. Current development in New York City, including development at the World Trade Center site, provides the opportunity for leadership in achieving this goal.

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guage wall is also a security blanket. Not only does it screen the private precincts of the building, its lamination acts as a blast shield and its high-strength steel members will yield if they counter an explosion.

Further than this, the architects' principal answer to disaster at Seven is its massive concrete central core, which extends from the base to the top, placing a shield around the stairways, the elevators, sprinkler pipes, and electrical conduits.

The base-to-top core, for the most part two feet thick, is double-constructed with steel reinforcing bars. Its two stairwells will be located at opposite sides of the core, about 110 feet apart, cutting down the possibility that they could be damaged at the same time.

The stairways are oversized, five and a half feet wide—20 percent wider than required by the city code—to permit rapid evacuation. They are fitted with independent emergency lighting and glow-in-the-dark paint and are pressurized to prevent the intrusion of smoke in case of a fire. The stair landings are extra deep—8 feet by 11 feet—to enable employees in wheelchairs to wait for rescue while the more mobile are able to step past them. The stair treads are wide enough to permit people to walk down, Silverstein said, while emergency workers are walking up. The four fire stairs exit directly to the building's exterior, preventing bottlenecks or the possible confusion that might result from exits that lead through the main lobby.

### A RENAISSANCE, WITH A VIEW

The beauty of the execution is that the Academy's visitors will remain indifferent to all this contingency planning. They can simply enjoy the building's location, elegant architecture and the Academy's striking new offices on the 40th floor (see page 14). Seven will be a welcoming landmark on the route from trendy Tribeca, with its mix of shopping and restaurants, to the cultural institutions of Lower Manhattan (see page 22). Looking out the Academy's office windows, or pausing in Seven's park, its new tenants will have a privileged close-up view of New York's oldest neighborhood being made new again. ■

*Glenn Collins reports on Ground Zero for The New York Times.*