

SCAFFOLDING

## Trinity Church braces itself against the winds of change

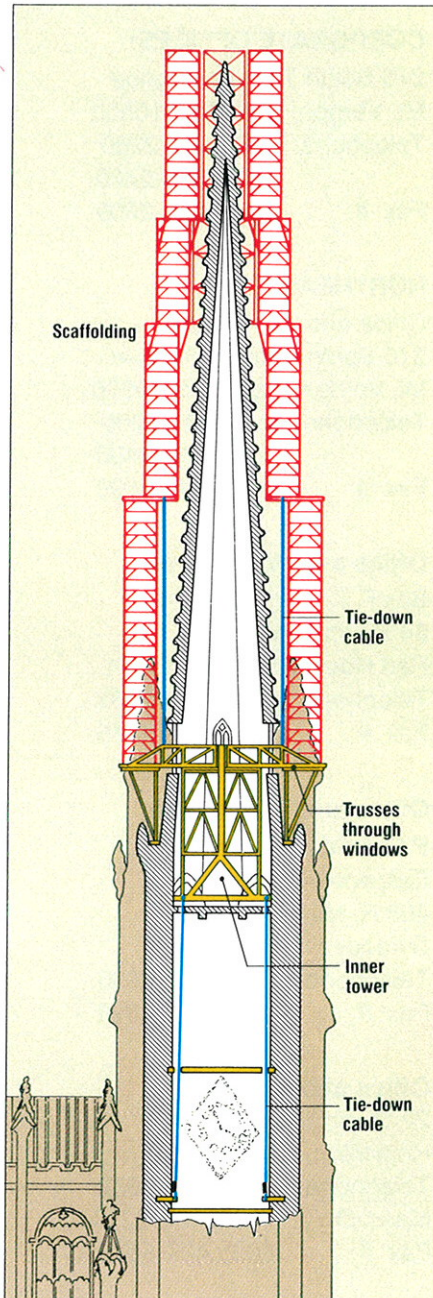
Although the scaffolding currently visible on the steeple of New York City's 143-year-old Trinity Church looks like any other scaffolding from the outside, the success of the system depends on a second, scaffold-like tower hidden behind the steeple's masonry walls.

That internal aluminum-and-steel tower is wedged into an octagonal open area at the base of the steeple, about 120 ft above the street. The internal tower accepts lateral forces transferred from the scaffolding and allows the building to weather loads of up to 180,000 lb imposed upon the scaffolding by hurricane-force winds.

The unusual approach was needed because the landmark building's load-bearing masonry walls cannot withstand heavy lateral loads, says scaffold designer Alan Shalders, chief engineer with Universal Builders Supply Inc. (UBS), Mount Vernon, N.Y.

**Cleaning surface.** Four tiers of aluminum scaffolding were erected around the steeple last spring as part of a \$3-million to \$4-million cleaning and rehabilitation project expected to take from three to four years. John F. Jones, construction manager for the church, says the project will include the removal of a layer of black carbon that has accumulated on the building's brownstone surface, the repair or replacement of damaged decorative stonework, and a thorough inspection of the building's exterior surfaces. The work is being done by Brisk Waterproofing Co. Inc., New York City, under the supervision of engineer-of-record Maxwell Lincer, principal with Leichtman & Lincer P.E., P.C., New York City.

The vertical loads from the 130-ft, free-standing scaffold are supported by a balcony at the base of the steeple, says Shalders. To accommodate lateral loads, UBS designed a cruciform truss that protrudes through four lancet windows, one located on each face of the steeple's base. The loads are transferred from the exterior scaffolding to the intersecting aluminum trusses through 7/8-in. tie-down cables. Loads are then transferred to the interior tower, which is in turn connected with tie-down cables to steel inserts drilled into the steeple's masonry walls about



Scaffolding designed for lateral loading.

50 ft below. Shalders says the system makes use of the 1,000-ton weight of the steeple itself.

Although the exterior scaffolding will be removed when the first phase is complete, Shalders says the interior tower will remain for future use. ■