ARCHITECTURE

EHLINGER & ASSOCIATES THIRD QUARTER 2007

PONTE di RIALTO

The Ponte di Rialto (Rialto Bridge) is the main bridge in Venice over the Grand Canal that bisects the islands that comprise the city. This current bridge was designed by Antonio da Ponte (well named architect / engineer) who lived between 1512 and 1597. There were several predecessor bridges, the first having been built c. 1175. This was a wooden bridge and it was replaced several times following its deliberate destruction to isolate and quell uprisings led by Baimonte Tiepolo. There had also been previous bridges that had collapsed, probably from fungus rot, as they also were of wooden structure. At one time Palladio (1508-80) had proposed a three span stone arch bridge in Roman style, which had been rejected due to its impediment to boat traffic and the potential stagnation of the canal water..

The present bridge was the first stone span of the Grand Canal. It is 92 feet (28 M) long and stands 25 feet (7.5 M) high and spans in a single shallow arch to safeguard water flow and boat traffic. There is a central aisle or walkway that is covered, with covered shops formed by thin. delicate Renaissance style arches and barrel vaults and outer aisles on either side terminated by a strong balustrade. In the center of the rise is a cross vault that stands higher and interrupts the aisles as a focal point in the middle.

The Rialto was the only bridge over the Grand Canal until the mid 19th century when the Accademia and Scalzi bridges were built. Besides water transport as a means of getting around from island to island in Venice, walking is the main method of getting around. The boats are also slow, slower than walking. There are no automobiles whatsoever. Nor any motorscooters, or motor cycles, or bicycles. One has only one's feet to depend upon. It goes beyond simply walking on one level because of the plethora of bridges. Each bridge is actually a staircase. To provide for the boats, there has to be a sufficient rise in the bridge's span to clear the boats, which means that it is really a double staircase -- one flight up and one flight down. You get a lot of exercise moving about Venice!

BUYER BEWARE

One response to Hurricane Katrina has been for various governmental jurisdictions to adopt more stringent building codes, as they should have. However, many manufacturers have been circumspect about the compliance of their products with the new codal requirements. One critical area that E&A has been dealing with in this regard has to do with roofing.

The new International Residential Code 2006 (IRC) for the first time has a requirement that residential structures consider wind in the design of the structure and all its components, in the same fashion as the International Building Code (IBC) always has for larger structures. It seems that in the past the wind didn't blow on houses. Well, now it does — and with the same ferocity as on all other buildings.

The manufacturers of asphalt composition shingles (seal tab shingles) have been slow to advertise that they have shingle products that will meet the 140 MPH requirement of the IRC for coastal areas, which initially concerned us and the local codal authorities. While it is a fact that the actual pressure, positive or negative) is a function of the slope of the roof, the position of the shingle (edge or field), and the height of the roof, most people understand the simplification of being 140 MPH capable as opposed to 110 MPH. So, the warranties and certifications are stated in the simplified manner only.

But, the actual installation requirements are more stringent and very specific: that the proper starter strip be used, that six or even eight nails per shingle be used instead of four, and that extra roofing cement be encouraged to be used on the leading edge of the shingle. One has to be very sure that the shingles installed meet the code required 140 MPH — only three shingle products do meet the code. Insurers have recently been informing insureds that if they replaced their shingle roofs with products that are not new IRC code compliant, they won't pay to replace again after the next storm.

Of the three shingle products available, two are actually made by the same manufacturer. GAF recently bought out Elk. Owens Corning is the third available product. We believe one reason for the difficulty in finding a code compliant shingle is that the manufacturers are concerned about poor installation of the product and future claims resulting therefrom, and then the manufacturer gets blamed for the installer's bad installation. Consequently, the data available to the buyer is not prominently displayed. Certification is easier to obtain than a warranty. The certification simply says that the shingles when installed per the mfgr's. specs will withstand a 140 MPH wind.

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As Tall as You Can Make It, Please.

With Burj-Dubai nearing completetion in the United Arab Emirates, it will soon take the reigns of being the world's tallest man-made structure. It will tower over the previous record holding structure (the CN tower in Canada) by a good 50% in height. At 2,684 ft. to the top of its spire, it will stand over 1/2 mile in height, and dwarf the closest skyscraper in size, the Tapei 101 in Tawain, by over 1,000 ft.

Over the millenia, mankind has always strived to build things taller and taller. Most of the record holding structures we are intimately familiar with through our education in world history and American history. If we jump back in time, mankind's obessions appears to have started with pyramid building, culminating with the largest pyramid - the Pyramid of Khufu, in Giza, Egypt. Completed in 2570 B.C., and standing at 480 ft. tall (originally - it has since eroded to 455 ft), it held the record as the tallest structure for over 4,000 years.

It wasn't until the frenzied construction of cathedrals during the middle ages of Europe that another building surpassed the Great Pyramid: Lincoln Cathedral, England, finished in 1311, its spire stood at 525 ft, and was the tallest structure for over 200 years until the spire burnt down in 1549. Lincoln would have held it for another 300 years despite this. For over 500 years, nothing surpassed 525 ft, though a number of other cathedrals managed to also inch past the height of the Great Pyramid, including Cologne Cathedral, in Germany.

In 1884, another construction finally surpassed the spire of Lincoln Cathedral, and it was the last record holder to do so that was built of stone. The Washington Monument, measuring in at 555 ft, is the tallest load-bearing stone structure in the world. Close behind it is Philadelphia's City Hall. At 548 ft., it is the tallest load-bearing brick structure in the world, but it wasn't completed until after the Monument was finished, and so missed the record books.

The Washington Monument's grasp on the record was brief, however, as a mere 5 years later the Monument was literally dwarfed by one of the first towers of steel ever constructed. At 986 feet, it was almost twice as tall as our previous record holder. The Eiffel Tower amazed the world, and while it only held the record for 30 years, it still continues to amaze us today.

The introduction of steel into construction led to the birth of skyscrapers, which led to the famous race in New York to build the tallest skyscraper in the world. The Chrysler Building managed to finish first, in 1930, and grab the record at 1,046 ft, but just one year later, The Empire State Building topped it at 1,450 ft. in height to the top of its broadcast tower.

This record was held for 36 years, until an old technology was given a new twist: Concrete. During the height of the cold war, Russia erected the Ostankino Tower in Moscow, in 1969. A massive pylon of reinforced concrete, wrapped with broadcasting equipment and observation decks, this monstrosity reached a height of 1,762 ft., and held the record as the tallest structure until 1975, when Toronto completed their own tall tower. The CN Tower, at 1,815 ft., technically held the record until just this past month, when the Burj Dubai Tower, still under construction, surpassed 1815 ft.

This is also where the record-keeping splits. Some people don't like to consider the Ostankino Tower, nor the CN Tower, as buildings, especially since it means that The Sears Tower, the World Trade Center, the Petronas Towers, and Tapei 101 technically don't hold the record as tallest. Though these 2 structures have occupiable offices and restaurants, their primary purpose is communications and tourist attractions. Should they be discounted, then? If so, we must also remove the Eiffel Tower, and the Washington Monument, and perhaps even the Pyramid. Not to discount the achievements these buildings signify, but we can't have it both ways.

Burj-Dubai, on the other hand, is this generation's Eiffel Tower to the Washington Monument. New developments in high-strength lightweight concrete, high-grade steel production, and refinements of construction methods have made this achievement possible. Chances are, it's just the first of many to reach this scale. Already, planned for just down the street from Burj-Dubai, is Al Burj, rumoured with a design height of 2,800 ft., along with Madinat al-Hareer, in Kuwait, at 3,000 ft.

So how high can a structure feasibly be built? In the 1950's, Frank Lloyd Wright dreamed of a mile-high skyscraper; he dubbed it the Illinois Tower. Technology and engineering suggest that structures could be built a mile high, or higher yet, without any new technologies. It's just a matter of money, materials, and someone with a wild dream to see it through. Looking at the progression illustrated below, though, it's definitely going to be impressive.

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