ARCHITECTURE

EHLINGER & ASSOCIATES **FIRST QUARTER 2000**

GALLERIA VITTORIO EMANUELE II

Galleria Vittorio Emanuele II in Milan, this issue's limited edition signed print by Ladd P. Ehlinger, is a paradigm of architecture for retail use. It was started in 1829, the same time the similar Galerie d'Orleans (now destroyed) in Paris was begun, and finished in 1877. The architect was G. Mengoni.

The Galleria is also an excellent example of an iron and glass barrel vault structure in an arcade. The most spectacular, pure example of cast iron and glass (as a greenhouse) was the Crystal Palace by Joseph Paxton, an exhibition building in Hyde Park in London for the Great Exhibition of 1851. The Crystal Palace has been torn down, but you can still shop at Galleria Vittorio Emanuele II today.

The plan of the Galleria is cruciform with an octagonal iron and glass dome at the crossing, and with all of the main entrances at the ends of the arms of the cross. One of these entrances fronts on the main square of Milan. All of the facades are of masonry in the Baroque style, three stories tall with huge pilasters spanning two of the three stories supporting the ribs of the iron and glass roof structure over the arcades. The peaks of the barrel vaults have operable sashes for ventilation and the entrances were left open for the same reason. The retail shops all have show windows on the exterior and on the interior under the vaults.

Galleria Vittorio Emanuele II is a lively place even today, filled with throngs of shoppers. There is something to look at on a very frequent basis within each arcade, and one is out of the weather when shopping. Today's shopping malls are an evolutionary development from the Galleria.

AN IMPENDING DISASTER

It has been a long time since a major hurricane has hit the Gulf Coast area of the U.S. -- since 1965 in New Orleans when Hurricane Betsy with 135 MPH winds (measured 30' above mean sea level) struck. There have been some minor storms of significantly lesser wind speed that have occurred with little damage to the structures in the area.

During this long period of time, changes have occurred in the home-building industry that will lead to a disaster when the next major storm does hit. Of particular note is the present day practice within the industry of "sheathing" the exterior walls with plastic foam insulation board. All brands of the product have zero strength in any structural capacity, but especially as sheathing to take out the lateral (wind) forces generated during a major hurricane. Plywood is now rarely used on outside corners of the walls, nor are there diagonal 1x4 braces notched into several corner studs.

The Standard Building Code (SBC) does not allow the gypsum board ("Sheetrock") of the interior walls to function as a diaphragm or sheathing when attached to wood stud construction, although the code does allow this when attached to metal stud construction. When the gypsum board is used for this purpose on metal studs, the thickness of the studs has to be a minimum of 20 gauge, at 24" centers minimum, and the fasteners on 4" centers rather than the usual 8" used for non-structural construction.

The SBC does allow for various wood sheet products (plywood, flake board, or oriented strand board) to function as sheathing, with various strength values assigned to each type of product, glued or not, blocked at the edges or not, and at various centers of fasteners.

While there is some structural strength achieved with the interior gypsum board walls, it is not reliably calculable, nor is it reliable if one loses the roof and the gypsum board is wetted, as there is a significant loss of strength to gypsum when wetted. This is a problem for the metal stud systems where it is allowed, and one of the reasons that the fasteners are required to be much closer on center.

You can expect significant damage, possibly total destruction if very high winds are encountered, to those homes built with foam board exterior walls, and possibly severe injuries and even death if these structural failures occur. Even without the personal injuries, the economic losses will be staggering.

E&A has been involved as experts in numerous residential construction litigation cases where the sheathing problem was discovered as a result of leaking walls or dampness problems evident on the interior surfaces. Investigative disassembly revealed the lack of proper sheathing, as well as the cause of the leaks and water vapor problems. Usually the air space or cavities of these walls are impacted with mortar due to the mason's failure to keep the cavities clean as he laid the wall up, or in some cases when the mason simply dumped his left-over mortar in the air space at the end of the day.

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SENIOR CENTER

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Rendered by: Keith W. Karlson

New 6,200 SF Senior Center with library, TV, crafts, kitchen, dining, medical exam and treatment facilities, offices, waiting area, and a recreation/assembly room with clerestory. Construction consists of metal frame with a metal joist supported standing seam metal roof, and metal stud infill walls with a stucco exterior. Services included Design, Structural, Contract Documents, Contract Administration.