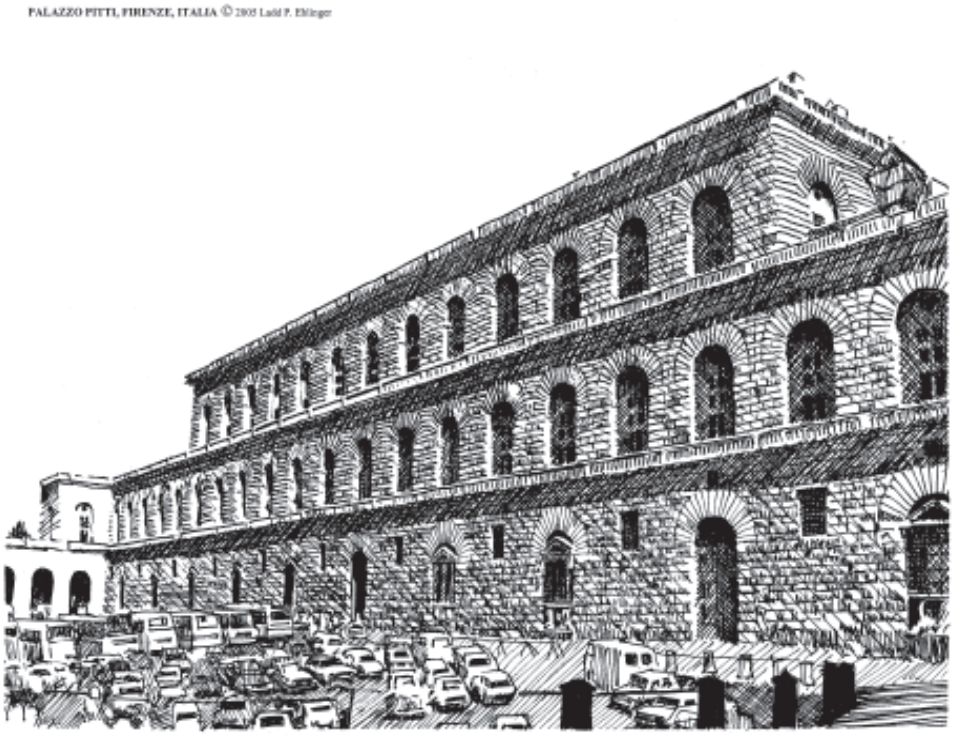
ARCHITECTURE

EHLINGER & ASSOCIATES SECOND QUARTER 2005



PALAZZO PITTI

The design of the Palazzo Pitti (Pitti Palace) in Firenze (Florence) has been attributed to Brunellesci, and to Alberti as well. This palace is the largest in Italy, except for the Vatican. It was designed for Luca Pitti, who thought of himself as Cosimo dé Medici's rival, and thus was thought to have been a vain and silly old man at the time.

The Brunellesci design for the Medici Palace that had been rejected by Cosimo is probably the model for the Pitti Palace, although Brunellesci may have had nothing to do with it. More than likely, it was Luca Fancelli, a student of Alberti's, that designed it, although the grand scale of the building is why many people associate the design to Brunellesci, even though it was never listed by Brunellesci as one of his works. It is thought that the Pitti is certainly a lot grander and larger than the Medici Palace, and that it was intended to make the Medici look insignificant..

The original design only contained the central block. The lower stories were extended and the wings added by successor architects; Luca Fancelli, Ammanati, G. and A. Parigi, and Ruggeri. The rear has a wonderful cortile and overlooks the Boboli Gardens. It was erected piecemeal over many years beginning in 1458 (12 years after Brunellesci's death) with the major completion in 1640. Minor remodelings continued after that. With so many different architects, it is a wonder that the final effect is so harmonious and integrated.

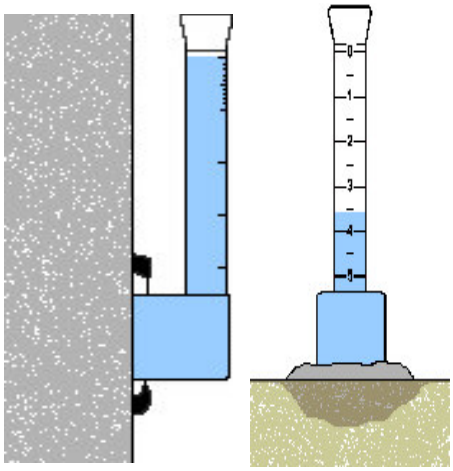
The palace typifies the Renaissance Palazzo style. It is of astylar treatment, where the masonry is incised and sculpted to look rugged. The arches are of horseshoe style, with the same incised treatment of the stone. The windows were by Ammanati, and the lions heads below the sills were added much later.

The palace became the Grand Ducal residence and is partly occupied by the famous picture gallery, remodeled for Ferdinand II (1640-7) by P. Cortona. The Baroque paintings were displayed in elaborate stucco frames painted white and gold.

As you can see from the sketch, the Piazza is filled with vehicles of tourists who come to visit and admire the palace and the gardens. This is one of the simplest and grandest of all of the Palazzos, and well worth seeing.

RILEM Tube Testing

E&A has recently added RILEM Tube Testing along with Thermal Imaging to determine when a cladding surface, such as stucco or EIFS (Exterior Insulation & Finish System: synthetic stucco), is too porous and thus absorbing too much water. RILEM Tubes are about 6" long, with an interior diameter equal to that of your little finger, hold 5 ml of water, and have a reservoir that holds an additional 3 ml at the bottom end either at right angles to the tube or on axis, with a flange at its bottom to which one applies a roll of putty to stick it to the cladding surface. One then fills the tube with water from a rubber bulb device and times how long it takes (up to an hour) the cladding surface to absorb the water, if at all.



RILEM (Reunion Internationale des Laboratoires D'Essais et de Recherches sur les Materiaux et les Constructions) — is the European equivalent to ASTM (American Society of Testing Materials), with headquarters in Paris. RILEM tube testing is a simple method to determine if the cladding on the walls absorbs water

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and at what rate. RILEM tube testing was developed by RILEM to field test masonry (clay, concrete, and stone) water absorption. ASTM only has a laboratory test where the porosity test of masonry is performed in a pressure chamber inside a laboratory. There is no ASTM field porosity test of masonry. Stucco is a porous, cementitious type of cladding that absorbs water in a manner similar to masonry, and is frequently classed as a type of masonry by some authors. EIFS, (a synthetic stucco) if it is porous (and it now appears that it is from E&A testing of a couple of projects), may well be classed the same, and thus the RILEM tube test is appropriately extrapolated to test it.

My Old House

I live in an old house, built in 1938. Among many other problems, the house was not insulated; at all. The previous owners had sprayed cellulose insulation in the ceiling joists, but it was getting dirty and old, and was definitely not doing the job.

As I've been renovating, I've been placing new wall insulation. The energy savings have been noticeable from this, but definitely not enough to make the house truly comfortable. In the long, dry spell from mid-July through August, the central air unit can't keep up, and often the inside temperature would climb up to 80 degrees by mid-afternoon.

It was definitely time to do something about the attic. Now, this is a small house that I live in, about 1200 s.f. - too small for a growing family, so if I'm going to put any money into this house, I want to get some space out of it. Therefore, instead of just replacing the horrible, smelly, dirty sprayed in cellulose insulation with the same stuff, I decided that I was going to insulate between the rafters, and claim what floor space I could from the attic.

There was a problem, though. The roof. The roof deck of my house is made of batten boards, with gaps of up to 1/4" between them. The felt and shingles are laid directly on them. This means I couldn't put batt insulation inbetween the rafters, or they would get wet just from the moisture that comes into the attic between the shingles (a process called vapor drive - which in a properly built roof isn't a problem for the interior of the attic).

So, in order to insulate my attic properly with batt insulation, I was looking at ripping off all of the shingles and the batten boards, and replacing them with a proper roof deck (osb board or plywood) and new shingling. This was quickly going beyond the scope of work I'd planned for this summer...

I looked for another solution, and I found it. Closed-cell Foaming Insulation. Now, perhaps you've already heard of foaming insulation. Do-it-yourself products, like Great Stuff, are a type of foaming insulation. Most foaming insulations are open-cell, which means the air that's in the foam communicates between the different bubbles of the foam, and the interior and exterior sides.

In fact, most insulations allow air transmission. If you go into an attic with sprayed in cellulose insulation, you can see where air is being drawn into the interior of the house from the big dirty spots. If you take a wall down that has batt insulation, you can also see similar spots where the insulation is acting as a ventilation filter (you actually shouldn't see this, because of house-wrap, but nothing is ever installed perfectly). This air movement and filtering action reduces the effectiveness of most insulations over time, as the particles and dirt that replaces the air pockets reduces the insulation value of the material.

Closed-cell insulation, on the other hand, doesn't allow air transmission, nor does it allow vapor transmission. So, in addition to providing a better insulation, it also prevents humidity from entering the house, and acts a vapor barrier. This means I wouldn't have to worry about the gaps between the batten boards, and when I do need to replace the roof, I can just pull up the shingles, and lay a new deck on top of the old batten boards.

This was the perfect material for my attic! I wouldn't have to replace the roof this summer. There was only one catch - the cost. This stuff is pretty expensive. In order to get an R-19 insulation value, I would need about 3 inches thick of the material. The surface area of the attic I need to spray is 1000 square feet. From the provider I had chosen, the closed-cell insulation costs about $0.80/SFt/inch; that's $2.40/SF. for 3 inches of it!

So, I had to think even harder about doing this. In order to replace the roof, deck and all, I was looking at a similar cost. But then I would still have to insulate the attic, at about $0.50/SF for regular R-19 batts, and I would have to wait 2 months, for the dry spell to hit, put up with the heat in my house, pray for no rain, keep an eye on workers, and expect cost overruns (which are just unavoidable on a house this old).

I also looked at it from the energy savings perspective. This isn't the first time our firm has used closed-cell insulation. In fact, for the past several years we've been designing it for metal roofs, and low-slope roofs, in both new buildings and renovations. Not the sprayed foaming insulation I was looking at, but as pre-made panels that are screwed in place and taped together. Our New Orleans office, in fact, had this insulation installed when it was reroofed it a couple of years back.

I discovered I could realize savings of up to 50% or more in my heating/cooling bill, even with the added square footage in the attic that would now have to be conditioned. For summer months, I was looking at saving nearly $100 month. The recovery time in savings looked to be about 2 years. This is what made the decision for me.

I made the leap. I spent about 2 weeks moving the boxes and boxes that had been piling up there over the years, and then another week filling up over 30 lawn bags with the old cellulose insulation. In contrast, it only took the contractor 4 hours to spray the attic, and a 1/2 hour visit 2 days later to spot fill a couple of shallow spots.

The difference was noticeable immediately. The temperature reading on the thermostat stopped climbing up to 80 in the afternoons; it stopped climbing at all. Even with a couple of hot walls that I haven't insulated yet, the house is suddenly comfortable all of the time. I've even gotten used to hearing the A/C turn itself *off*, frequently, which is a wonderful sound.

I have yet to see my first power bill since the installation, but I am confident I will be pleased.

Closed-cell foaming insulation, which I once considered a specialty item that I'd probably have no use for, has earned itself a place in my book as not only a worthwhile product, but one I'll be using again - probably under the floor next!

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