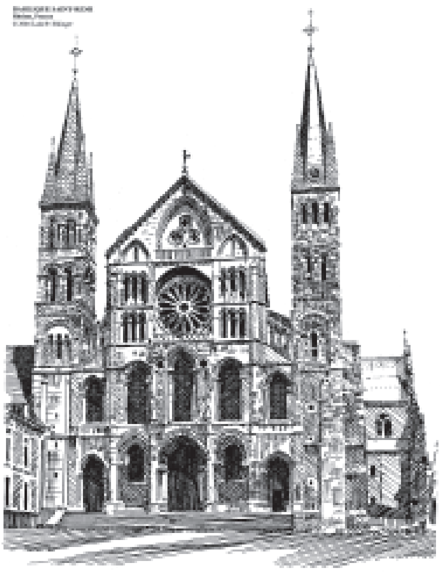
ARCHITECTURE

EHLINGER & ASSOCIATES **FIRST QUARTER 2004**

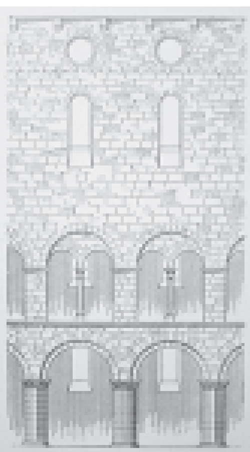


BASILIQUE SAINT-RÉMI

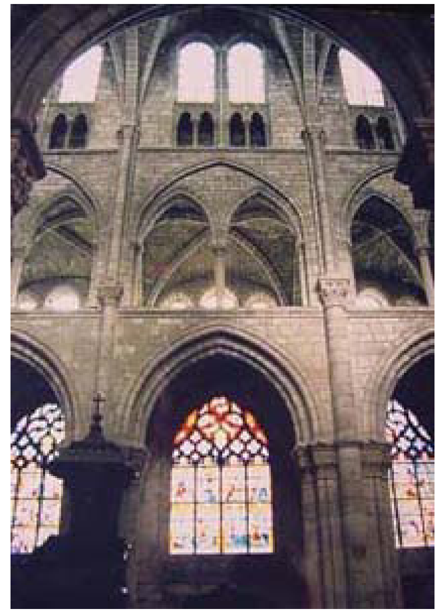
The Basilica of Saint-Rémi is an Abbey church that was begun in 1007 and was consecrated for use by Pope Léon IX in 1049. It was begun in the style of the time: Romanesque, which was a revival of Roman architecture that started at the end of the dark ages. The church became a continuing "work-in-progress" however, and was completed in the Gothic style with many modifications being made to the original Romanesque work to "Gothicize" it. So, it truly is a blend of the two styles and the sub-styles within them. The south tower of the west front (the tower on the right) in the sketch by Ladd Ehlinger is truly a remarkable Romanesque composition.

The Romanesque style is characterized by the use of circular arches with quite thick voussoirs (the wedge shaped arch stones), thick walls, and small windows - as if the architect were unsure of himself as to how minimal he could make the wall. The larger the window and the thinner the wall the more unstable the basic structure is. Romanesque construction is very conservative.

The Gothic style, on the other hand, is quite daring: it is characterized by the use of very large windows, thin walls, and the use of extravagant buttresses (braces) even to the use of flying buttresses, where the buttress has a diagonal brace up in the air that braces off to another structural wall or element. It is as if the Romanesque building was dissolving as it "morphed" into Gothic.



If one looks at the Nave elevation to the right as it was originally designed, it is plainly a Romanesque design with a wooden roof structure. When one looks at the "Gothicized re-make" below, there is hardly any change. The triforium gallery has a Gothic pointed arch superimposed on the wall and the pointed arch vaults at the top are fully Gothic - but nothing else is. There is no large window area added, no lightness of structure - only the superficial motif of the pointed arch has been added.



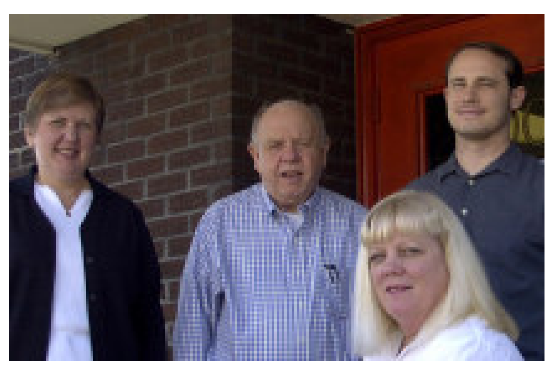
The choir shown in the upper right photo, however, is fully Gothic with the large windows and flying buttresses and the radiating chapels about the ambulatory.

The dimensions of Saint-Rémi are quite impressive and large: the length is 409.5'; the width of the Nave is 91'; the width of the central aisle is 44'; the length of the Transept is 184'; and the height of the Nave is 81'.

The Basilica was named for Saint Remigius. His name was originally in Latin. His tomb is in the Choir which was rebuilt in 1847. This was an important pilgrimage site, as well as a monastery in northern France in the Champagne region.

WELCOME ABOARD

From left to right: Frances Linares, Administrative Assistant; Don Burrow, Chief Architect; Elena Weitl, Intern Architect; and Jonathan Pertuit, Intern Architect. These four employees are new to E&A within the last six months.



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Fran is the globetrotter of the office. She was born in Pittsburgh, PA. She became an X-ray Technologist and worked first in Pittsburgh and later in New York.

While in New York, she met her husband who is a physician from Caracas, Venezuela when he was in a residency for neurosurgery. After living in Caracas for many years, they moved to New Orleans two years ago due to political problems in Venezuela. Chaves is unfavorable to her husband Jose'.

Fran speaks fluent Spanish and enjoys speaking it with whomever she has the opportunity to do so. She has two step-daughters that she is raising. They keep her very busy but she enjoys them very much.

Don Burrow is our most experienced architect, having spent many years designing buildings in other offices. He would rather be working than sitting at home. He also is the incoming President of the Metairie Rotary Club.

Don usually goes to Sidmar's Restaurant on the Lakefront on Friday night, plays tennis on Saturday, and takes in a movie on Sunday - so he stays busy even on week-ends. He says he is learning new words at work, and he still manages to talk about his Alma Mater Texas A&M. He has six grandchildren.

Elena is a transplant from California and a recent graduate of the Tulane University School of Architecture. Architecture is her second career - previously she was a professional steel detailer.

She has been living in New Orleans for five and one half years with her husband and son but is only now beginning to enjoy all that New Orleans has to offer because of the involvement with school. Her favorite activity is to walk her Pomeranian in Audubon Park.

As a recent LSU graduate, Jonathan Pertuit has chosen our office for his introduction to a career in Architecture. When not in the office Jonathan spends his free time chasing his five year old and her three year old twin sisters. He then looks for any opportunity to take long meditative walks around the city.

EXPANSIVE CLAY

South Louisiana and North Alabama both have expansive clays distributed in many areas. These clays are characterized by changing volume approximately 1% to 4%. when subjected to changing water content.

When wetted or fully hydrated, expansive clays swell with tremendous changes in volume which produce tremendous pressures. 2,500 to 3,000 pounds per square foot is not an unusual pressure to be produced by an expansive clay when swelling. Considering that most one to three story buildings don't weigh that much per square foot, it is very easy to see that the entire building can get "heaved" by pressures of this magnitude.

When dried, expansive clays shrink with the same volumetric change in reverse. However, when the expansive clay near the surface is the support for a building, the clay immediately under the center of the building away from the outer 5' of the perimeter is not subjected to the same evaporative environment as the outer 5' of the perimeter and the area beyond that is not shaded at all. Consequently the area in the center that is shaded does not evaporate the hydration at the same rate as the non-shaded area, and thus the clay does not shrink at the same rate.

This can have disastrous consequences for the support of the building. The outer 5' perimeter when in the shrink condition can totally lose the support of the ground and in effect the outer perimeter then has to be supported by the center portion where the clay did not shrink. If the foundation is not designed for this, the slab can crack and exhibit differential movement.

On the other hand, when in the swell condition, the building may be supported only by the outer 5' perimeter. The ground heave will lift the outer perimeter. If not designed for this condition, the same differential movement will take place and cracking may also result.

There are two basic methodologies for dealing with this phenomena, and sometimes they may be combined to an extent. Before either methodology is utilized, it is a good practice to reduce the amount of expansive material if possible by removing as much of the expansive clay as one can afford to and replace it with granular fill (sandy material) that doesn't swell and shrink, and perhaps can act as an overburden to hold down the expansive pressure with weight alone.

The first methodology is to design the slab as a ribbed mat wherein there are grade beams that are very stiff due to their depth (2' or more, even 4') and that are fairly close on center -say 10' to 15' apart. The beams are designed for no support at the outer 5' perimeter (for the shrink condition) or for only support at the outer 5' perimeter (for the swell condition). This type of foundation is very rigid.

The second methodology is to design the slab to be supported on drilled or augured piers of concrete drilled into the clay similar to driven piles. The bottom of the piers are taken to a depth sufficient for the strata above to counteract the swell pressures below and to hold down the piers when the upper strata swells. They are "belled out" such that they take the shape of an inverted cone which locks into the ground and prevents uplift. The shafts of the piers are reinforced to counteract the tensile stresses produced by the uplift. There are usually void forms of waxed cardboard placed under the grade beams of the slab and sometimes the slab itself, so that after the concrete is set, any upward pressure from swelling crushes the cardboard without contacting the slab itself The only problem with the void forms is their durability - they are known to collapse after multiple wettings before the concrete can be placed.

Trees affect the action of expansive clays, especially live oaks. Live oaks may transpire over a hundred gallons of water per day per tree from an expansive clay strata. This causes the clay to shrink. When the tree is removed, it may take a year or more for the clay to rehydrate and swell back to it's "native" volume. If the building is built upon it before the swelling takes place, there can be heaving with differential movement of as much as 5" in 50' (1" in 10'), which is very noticeable. Doors won't open, doors won't close. Plumbing waste lines will back up, because they have been changed to a reverse slope.