



Innovative Tile and Stone
Installation Systems

Al Hamra Tower, Kuwait City Project Spotlight: October 2011



PROJECT:

Al Hamra Tower
Kuwait City, Kuwait

CONSULTING ARCHITECT:

Richard Goldberg, AIA, CSI
Avon, CT, USA

ARCHITECT:

Ahmadiyah Contracting & Trading Co,
Kuwait City, Kuwait

INTERNATIONAL ARCHITECT:

SOM Architects,
New York City, NY, USA

LATICRETE soars to new heights with the Al Hamra Tower

By Ron Treister

The soon-to-be-completed Al Hamra Tower will not only be Kuwait's tallest building at 412.5 meters (1,353.346 feet); it will be the world's tallest sculpted building when slated to be completed in late 2011. Offering a massive construction area consisting of 180,000 square meters (1,937,504 square feet), the integrated, mixed-use development is being built at a cost of \$950 million US in the center of Kuwait City. The building will have 75 state-of-the-art stories dedicated for offices, in addition to a mammoth mixed-use complex featuring a mall with three basements, three shopping floors and a cinema floor containing nine IMAX theaters.

Having an exterior facade covered with 258,000 square meters (2,777,089 square feet) of limestone, (enough to tile all of New York City's Central Park) Al Hamra will become the tallest direct-adhered stone-clad structure on this planet. During the lengthy planning of the building's construction, there was an understandable concern over the structural integrity of the spiral cantilevered concrete shear walls if clad with thick, mechanically attached stone panels. Rather than changing the design aesthetic, engineers and architects developed a creative solution. Their solution: to install limestone tiles on the exterior walls of the lower floors and a mesh-mounted trencadis-style limestone tile system on the exterior walls of the higher floors, achieving the same "look" at a fraction of the weight. The LATICRETE® System was ultimately selected to make this design solution come to fruition.

Richard Goldberg, AIA, CSI, a consulting architect with Professional Consultants International, and one of the world's foremost experts regarding direct-

adhered exterior tile and stone wall cladding, was contracted to provide technical consulting services to both Ahmadiyah Contracting & Trading Company, Kuwait and SOM Architects, New York City. "Our engineers conducted cutting-edge computer modeling of the tile cladding assembly using finite element analysis. We utilized Abaqus FEA® commercial computer software, commonly used in the aerospace industry, now economically feasible in architectural building design," Goldberg stated, "This software provided accurate, robust simulations of the behavior of the proposed direct-adhered composite stone cladding assembly under extreme thermal expansion, concrete shrinkage, and wind loading typical of the unique geographic location. Most important, this technique allowed us to confidently specify the adhesive mortar and grout products with the necessary physical properties.

"We were also asked to analyze and review a number of direct-adhered stone façade installation systems," Goldberg continued. "After a highly detailed evaluation process, we selected the LATICRETE System. There were many reasons for this which included the quality of the products to be used, the strong warranty program which LATICRETE offers, and most important, the fact that the LATICRETE materials offered certified product test data of key physical characteristics which enabled us to conduct computer modeling simulations.

According to Sujit Singh, General Manager of LATICRETE RAK CO LLC, "This was a very challenging project for us due to the fact that it was going to be the tallest structure on the globe with direct-adhered stone exterior cladding. We had many meetings with the architects, contractors and façade specialists.



The finite element analysis was conducted before a final decision on the LATICRETE products was announced... there were many other competitive product manufacturers vying to get this unique project. One key to LATICRETE being awarded the contract was our commitment in assuring the quality by training and inspection during installation. There were many challenges on this project including the building's extraordinary height and also, having installation occur during hot weather where the mercury reached as high as 50 C (122 F)!"

The Trecadis Gaudi limestone was bonded to the exterior concrete walls of Al Hamra Tower with LATICRETE® 254 Platinum (white), a one-step, polymer fortified, thin-set mortar. "We selected this product for many reasons, one being its high shear-bond strength and balanced shear modulus properties," added Goldberg.

Once the thin-set cured, the subsequent grouting process on the Al Hamra Tower's exterior was implemented with LATICRETE 1500 Sanded Grout, a premium, factory-prepared product designed to be mixed with water. Formulated from a blend of high-strength Portland cement, graded aggregates, polymers and color-fast pigments, LATICRETE 1500 Sanded Grout provided The Tower's outside walls with grout joints that were dense, hard and highly durable... made from a product that could withstand the incredibly high heat index existing in Kuwait City.

Singh commented that LATICRETE 1776 Grout Enhancer was used in this project, as well. "LATICRETE 1776 Grout Enhancer is used in place of water to provide a dense, colorfast grout joint that inhibits stain causing bacteria, mold and mildew growth with Microban®. This was necessary for the Al Hamra Tower's limestone cladding, as it works perfectly with LATICRETE 1500 Sanded Grout."

The Al Hamra Tower is without question, a world-class, signature architectural project. When it is completed and can be seen from miles outside of Kuwait City either inland or from the Arabian Gulf, people will comment on how its initial appearance seemingly curves to its highest point like a "curled newspaper."

Visitors and tenants will be welcomed by a soaring, 20-plus meter high lobby, which frankly, will have to be seen firsthand for one to experience its awesome, futuristic designs. Very soon, The Tower's facilities will be open, which will include six levels of retail; a rooftop garden positioned atop the retail sector; the largest business center in Kuwait; the very posh, Sky Lounge restaurant; 40 rapid elevators to reach those very high floors; two "refuge floors" designed to be used in case of an emergency... and, a multi-story parking facility, as well. All of this, housed within a building that has an exterior professionally covered via the largest and quite possibly the most spectacular direct-adhered limestone cladding project found to date on this earth.

"We at LATICRETE are proud to be able to contribute to a project as ambitious as the Al Hamra Tower," stated Erno de Bruijn, President, LATICRETE International. "Some of the world's premier architects, engineers, consultants and contractors were called upon to make this construction dream a reality. We know it will stand tall as a major architectural statement for decades to come. Because of that, we are very confident that the LATICRETE products which were specified for The Al Hamra Tower will perform at optimal levels as long as the building is in use."

