

Baku Beauty

It was the second time that proved to be the charm in the Azerbaijani capital as a beautiful landmark hotel rose from the excavation of an earlier, abandoned project. The design team for the Four Seasons Hotel Baku also had to contend with the site's close proximity to the Caspian Sea and with medieval walls included on the World Heritage List.

By Robert L. Reid

The Four Seasons Hotel Baku was constructed atop a 12 m deep excavation from an earlier project that had been abandoned.

HERE IS A LEGEND in Azerbaijan of how a beautiful rose bloomed in a garden—but only after certain plans and wishes went wrong and a village was destroyed. The legend, as recounted in the spring 2005 edition of the magazine *Azerbaijan International*, could serve as the metaphorical prelude to the real-life drama of how the Four Seasons Hotel Baku was designed and constructed in the Azerbaijani capital, for here again success came only after the early plans of the original developer had gone awry, a new developer took over the project, and some of the early work was demolished by the new design and construction team.

The 10-level, 50,000 m² luxury Four Seasons hotel in Baku (Baki) was designed by London-based ReardonSmith Architects and engineered by URAL Engineering Co., Ltd., based in Ankara, Turkey, for the new developer, Baku-based PASHA Construction, LLC. This was the same design team and client that recently completed another landmark hotel in Baku, the JW Marriott Hotel Absheron Baku (see "Urban Oasis," by Robert L. Reid, *Civil Engineering*, April 2013, pages 46–50). But while the construction of the Four Seasons hotel had actually started earlier, the distinctly modern-style Absheron hotel opened first, in the spring of 2012; the far more ornate Four Seasons property, designed in a French classical style with Beaux-Arts detailing, was not completed until later that year. It was partially opened late in the summer in 2012, and full opening came in January 2013, according to Conrad Smith, RIBA, the managing director of ReardonSmith.

Like the rose that bloomed only after earlier travails, the Four Seasons hotel was constructed on a site that, as mentioned above, had been excavated as part of an earlier project under a different developer and design team but never completed. When the Four Seasons project began, in 2008, the site featured an approximately 12 m deep excavation for the three basement levels, a partially completed concrete raft foundation, the start of the lower-level shear walls and columns, and a partially completed secant pile wall along the perimeter to prevent water ingress, explained Ahmet Sureyya Ural, the company director of URAL Engineering, who provided written answers to *Civil Engineering* questions.

An early challenge for the new project involved the infiltration of water at the construction site, Ural noted. Located within 300 m of the Baku waterfront and overlooking the Caspian Sea, the site is separated from the water by a major arterial road, Neftçilər Avenue, and by a long promenade and park. The lowest of the basement levels is more than 32 m below sea level; indeed, most of Baku near the Caspian is as much as 23 m below sea level, making the city what is believed to be the lowest-lying national

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the colonnade to the entrance to the underground parking; that entrance is located within one of the three turrets that adorn the building's corners, each turret rising the full height of the structure and topped by a decorative dome. The columns in the colonnade are robust, steel-reinforced concrete structures that support the eight levels of hotel rooms and other amenities above the porte cochere space, notes Bhatia. Because they are exposed, the columns also feature a steel casing more than 20 mm thick as an additional security measure, noted Ural, who explained that the columns are designed to prevent progressive collapse in the event of an explosion.

The corner turrets were included in the design of the hotel because in Azerbaijani architecture the corners of buildings are often given special prominence, notes Bhatia. In the case of the Four Seasons, the roughly 7 m diameter turrets provide space for special suites and form part of the large spa located on the top floor; a marble-encased hot tub and changing room there extend into one of the domes, and the other domes provide space for private dining.

The hotel's ornamentation was intended to respect and reflect the heritage of Baku, including quite specifically the French influences that date from the period just before World War I, Smith notes. The majority of the hotel structure, which Smith characterizes as an "unashamedly grand building," is framed in concrete. The exterior is clad in local limestone, which aesthetically complements some of the stone-clad government buildings that are located nearby, including the presidential palace. Since temperatures in Baku range from 0°C in winter to 30°C in summer, the stonework on the hotel facade had to be protected against cracking as the structure expands and contracts. The differences between internal and external temperatures also meant that the facade design had to consider how to prevent the infiltration of condensation into the wall cavities.

The hotel's top floor, the prepatinated copper roof of the main portion of the building, and the separate roof of the main ballroom, are framed in steel to reduce the loads they impose on the structure, Smith adds. The ballroom itself is located on the hotel's second level above grade but is outside the footprint of the main structure of the building and is separated by a movement joint. Thus, while it is aesthetically similar to the rest of the hotel, the ballroom is structurally separate, which enabled the designers to create a 600 m² column-free space with 7.5 m high ceilings because there would be

no guest rooms or other hotel amenities rising above it. Locating the ballroom outside of the main body of the hotel building also meant that the major structural elements of the hotel could pass through the building and down to the foundations.

The ballroom roof accommodates a formal garden space designed by Capita Symonds Ltd (now Capita Property and Infrastructure Ltd), of London, to provide aesthetically pleasing views from the guest rooms, Smith says. But it is purely a visual amenity; there is no public access to the grass, plants, and gravel borders that crown the ballroom space.

Because the topography of Baku means that the roof of the

Four Seasons hotel can be seen from buildings 1 km or more away, the client requested both the garden space above the ballroom and the decorative domes and spires, as well as the copper cladding atop the main portion of the hotel, says Bhatia. But that also meant that, in contrast to normal practice, those spaces would not be

Topped by a barrel-vaulted skylight, the hotel's pool is located within a four-story open area that forms a sort of elevated atrium in the center of the structure with a column-free span of more than 11 m.



The entrance lobby features a grand staircase that is clad in marble and has an intricate ironwork railing. The central, decorative arch conceals the concrete column from which portions of the stair cantilever 1.5 m.

Constructed as a concrete box within another concrete box in order to prevent water leakage, the pool was located in the center of the hotel to accommodate the client's wish that every guest room have an external view, either over the old walled city or across the water, says Smith. That requirement, however, presented structural challenges because the pool is located just a few floors above the large, column-free spaces of the ballroom lobby and, below that, the main entrance foyer at ground level, noted Ural. The changing column grids between the large spans of the lower floors and the smaller spans of the guest room floors also posed problems. The installation of transfer beams on the second and third levels ultimately resolved these issues, Ural noted.

Within the entrance lobby is a large grand staircase that is oval in plan and ascends through the first three levels of the hotel, ending in the ballroom lobby, a "grand journey" that "adds an element of spectacle as you make your way to the ballroom," explains Bhatia. Clad in marble and featuring an intricate ironwork railing, the stairs wrap around a central decorative arch that conceals the concrete column from which portions of the stair cantilever 1.5 m, Smith says. The grand staircase is also supported by the floor slab at each level through which it passes.

Baku is a city of more than 2 million people in which "East meets West and where sculptured high-rise towers coexist with centuries-old buildings," according to ReardonSmith's press announcements relating to the Four Seasons project. Within that context, the Four Seasons Hotel Baku strives to provide the best of both worlds: modern amenities within a classical design. It is like that legendary rose, and while it may not grace a garden, it is at least very close to an urban park. **CE**

available for the installation of mechanical systems, he says. Instead, a plant room was installed in the basement levels, along with water tanks for the fire sprinklers, and another plant room was constructed at the back of the ballroom itself, this one too outside the footprint of the main building.

The proximity of mechanical systems to the elegant diners and other events planned for the ballroom created acoustic issues that "we had to take care to avoid," notes Bhatia. This was accomplished via a series of breaks in the structure to prevent sound transmissions, and use was also made of acoustic pads to isolate certain equipment so as to minimize the vibrations that would pass through the structure, Bhatia notes.

The roof of the main section of the hotel also features a barrel-vaulted skylight approximately 25 by 15 m in plan supported via trusses. This skylight covers a four-story open area that starts roughly halfway up the building and forms a sort of elevated atrium in the center of the structure with a column-free span of more than 11 m. Designed in the style of a Roman basilica, according to information provided by ReardonSmith, this space houses the hotel's pool, which is roughly 22 m long and 7.5 m wide. Since the depth is a relatively shallow 1.2 m, no lifeguard is required, notes Smith. The pool area is adorned with two levels of "blind" arcades, that is, arches without openings that are set against the solid walls.



Robert L. Reid is the senior editor of Civil Engineering.

PROJECT CREDITS Client:

PASHA Construction, LLC, Baku, Azerbaijan **Hotel operator:** Four Seasons Hotels and Resorts, Toronto

Architect: ReardonSmith Architects, London **Structural engineer:** URAL Engineering Co., Ltd., Ankara, Turkey **General contractor:** Codest International S.r.l., Pozzuolo del Friuli, Italy **Hotel interiors:** Richmond, London **Landscape architect:** Capita Symonds Ltd (now Capita Property and Infrastructure Ltd), London **Acoustical consultant:** Swallow Acoustic Consultants Limited, Mississauga, Ontario