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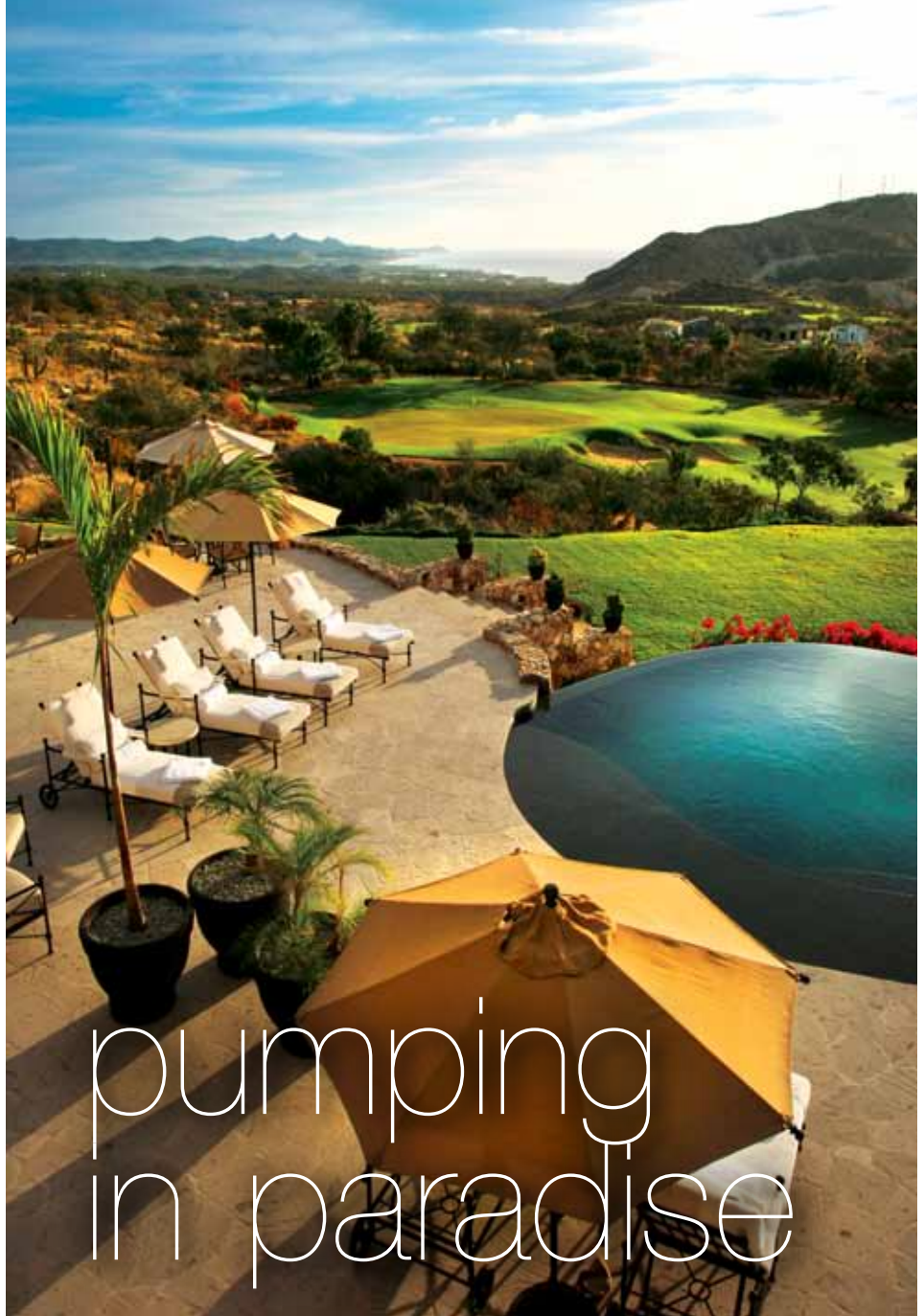
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pumping
in paradise

Resort features effective
low-pressure sewer system



By Joseph Harmes

Resort boasts effective low-pressure sewer system with grinder pumps

Querencia, Baja California Sur, Mexico, the tip of the Baja California peninsula, is a mesmerizing landscape where the sparse, rugged elegance of the mountainous Sonoran Desert tumbles lazily into the sparkling blue convergence of the Pacific Ocean and Gulf of Cortez.

Author John Steinbeck explored Baja more than 70 years ago, penning, “A dream hangs over the whole region.” He predicted, “Probably the airplanes will bring weekenders from Los Angeles before long.” And he was right: Today it is one of Mexico’s fastest-growing resort areas and hottest real estate plays.

A building boom for mostly foreign

homebuyers hit the area about 15 years ago, drawing retirees, Hollywood A-listers and jetsetters adding another trophy home to their international portfolios. The region’s most exclusive luxury communities—like Querencia—lay along The Corridor, a spellbinding 18-mile journey amid the spring break atmosphere and renowned marina of Cabo San Lucas, and the tranquil cobblestone plazas and art scene of San José del Cabo.

Whatever amenity nature did not already provide, Querencia was ready to deliver: Tom Fazio and Gil Hanse-designed 18-hole championship courses, swimming pools, a 31,000-sq.-ft. Club Village, the beachfront Surf Club and up to 500 lots set on cliffs



with gentle breezes and mountain and ocean views for condos that start around \$1 million and villas ranging up to 12,000 sq ft and commanding prices today of \$12 million or more.

But to accomplish the design of one of Mexico's most desirable properties, Querencia's site engineers were obligated to think creatively and summon strength and character to master Baja's unique development hurdles—or be saddled with nothing more than an expensive, albeit captivating, seaside cactus farm.

Precious Water & Infrastructure

The logistical obstacles are formidable and infrastructure is as scarce as rainfall (less than 10 in. annually). Sewer connections and water treatment facilities are inadequate even within Los Cabos' two municipalities. The corridor lacks wastewater infrastructure. Authorities forbid septic systems anywhere near the coastline.

Water, not surprisingly, was therefore the first priority. The developers tapped San Lázaro lake, an important source of non-potable water for the region, by constructing a 14-mile pipeline through rugged mountains that connects with a water treatment plant built by Querencia.

Yet a bigger challenge lay ahead: wastewater discharge. The viability of each lot (prices for one acre can command \$1 million) is hostage to the developers' ability to reach and sewer it in order to maximize the value of every corner of Querencia's 1,800 acres of prime real estate without destroying its pristine surroundings.

The most viable solution, developers concluded, was a low-pressure sewer system (LPS) that has already found an avid following in other Baja builders and was approved by Mexican authorities. When one provider could not meet Querencia's

performance standards, Environment One Corp. (E/One) was summoned.

"There was research to find the best option according to our topography and needs," said Luís Cordero, Querencia's development infrastructure manager. "E/One gave us the best product."

E/One developed low-pressure, gravity-independent, contour-following sewage collection systems in the 1970s, providing a method of sewerage otherwise difficult land areas, such as flat, wet, rocky and hilly terrain. At the heart of the sewer is the grinder pump, which accepts household sanitary waste, grinds it into fine slurry and pressurizes it to permit transport through small-diameter pipes.

A traditional gravity system, a sewer system that has been in existence since Roman times, could not be built. The hilly terrain and elevations played against it, as did the fragile Sonoran Desert ecosystem. Additionally, the lift stations alone for a gravity system would cost into the millions, much less extending the system throughout the nearly three-square-mile area. Deep trenching into bedrock for 24-in. pipe would devastate much of the natural landscape of blue agave, various cactus and palo blanco trees.

The Workings of an LPS

In contrast, the LPS incorporates a 2- to 4-in. PVC pipe buried inches below the surface (intemperate climates require burial just beneath the frost line) and can be as flexible and easy to install as a sprinkler system, with minimal disruption to the terrain.

E/One's completely closed system dovetailed nicely with the requirements of Querencia's topographical map with the freedom to sewer anywhere, unrestrained by formerly customary obstacles.

Sewers do not have to follow a straight line downhill anymore: the E/One LPS

can reinvent the land for the developer by sneaking through forests, winding around decorative boulders, creeping along the edge of a cliff and conforming to even the declines and elevations of arroyos.

The LPS meanders underneath Querencia's tricky terrain from the quiet El Rincón neighborhood perched high into the mountains to La Loma and La Vista, a collection of 1-acre-plus lots positioned nearest to the Sea of Cortez. Around the Surf Club, the grinder pump's pressurization brings the ability to sewer up above the bluffs.

"We can develop in different elevations ranging from 114 to 738 ft, no matter where our water treatment plant is located," Cordero said.

The grinder pump is the lynchpin. The unit, barely bigger than a washing machine, utilizes a 1-hp semi-positive pump housed in a tough corrosion-resistant high-density polyethylene tank with rated flows of 1,500 gal per day (large, multiple-pump stations can handle more than triple that). Large houses, mansions, multiple-family units and office complexes usually incorporate stations with two to four pumps.

The high-torque, progressing-cavity pump produces a nearly constant flow rate over a range of head conditions, making the LPS effective up to two miles from a sewer connection or water treatment facility.

Consequently, it can bring a higher quality location to market at an economical price to the builder. Often, a lot deemed unusable or "orphaned" without a wastewater connection because of distance or unaccommodating terrain now can be salvaged at minimal cost, potentially fetching hundreds of thousands of dollars.

Analyzing the Benefits

A cost analysis of LPS versus gravity and septic systems often means an LPS

can make the difference between building and not building.

In a low-pressure system, the developer installs the lines, but the expense of laying them is much less. Because the initial outlay of LPS can be back-end loaded, up to 40% of the upfront expenditure can be deferred until the specific lot is sold, and final pump installation can be scheduled after each home is sold. Some developers have seen savings of up to 80% or 90% in front-end investment.

If it had opted for a gravity system, Querencia might have found itself like other developers who spend millions up front and then wait to sell their lots—the investment in limbo, especially in slow build-outs.

Costs are economized for the homeowner as well. Because it runs infrequently and for very short periods, its annual electrical consumption is similar to that of a personal computer.

According to George A. Vorsheim, communications director of E/One, the grinder pump experiences “eight to 10 years mean time between service calls, and no preventive maintenance.” Housed in a buried container with an easily camouflaged lid at ground level, the grinder pump removes easily if service is required.

A Surprising Novelty

Querencia currently utilizes 75 grinder pumps. Virtually noiseless and out of sight, they service sales offices, recreational facilities, condo units, medium-sized homes and the extreme demands of hacienda-like estates, some containing more than six bathrooms, indoor and outdoor kitchens, a Jacuzzi, outdoor shower and even a waterfall.

Seemingly no amenity demanded by sophisticated buyers was overlooked. The architecture oozes Old Mexico from hand-forged iron gates to intricately carved cantera (quarried limestone) framing windows, doorways and stately fireplaces. Custom mahogany cabinetry, Egyptian tile and granite flooring were not afterthoughts.

Yet, the grinder pump might be Querencia's least expensive—and elegantly engineered—refinement chosen, Cordero said, because it matches “the quality and level of products (houses and lots) we offer.”

“The E/One system is the best solution

we found to promote within Querencia and works great with our LPS,” Cordero said. “Today, it is the only grinder pump we allow at the development.”

The E/One grinder pump also is found in the modest homes of small communities. In one instance, a U.S. town of 2,500 homes supporting a population of 20,000 was retrofitted from septic to LPS. At the other end of the spectrum is prestigious Fallingwater, a Frank Lloyd Wright design voted “the best all-time work of American architecture.”

The grinder pump is approaching middle age—yet many in the U.S. still consider it newfangled, perhaps due to the perceptual barrier that this remains a futuristic technology or, more likely, because builders simply are not familiar with it.

In comparison, foreign builders in the world's most high-octane markets appear more accepting of innovative or so-called “alternative” technologies and are becoming the fastest adapters of LPS.

As awareness grows, however, builders are quickly warming up to LPS as they become increasingly strapped for usable land or want to develop prime lots previously stranded because of remoteness or regulations. In other instances, municipalities are converting to LPS as their outdated systems—especially in the case of septic tanks—begin to fail and budget or terrain restraints make gravity systems increasingly cost-prohibitive.

The grinder pump came as a surprising “novelty” to some of Querencia's worldly homeowners who, despite their architectural savvy, were previously never exposed to an LPS. Like Querencia's developers, they quickly believed in it.

“At the beginning, because it's unknown, they have some doubts,” Cordero said. “But after explaining the system, everything changes.” **WWD**

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