



Invariants as a Design Element in the work of Mario Schjetnan and Grupo de Diseño Urbano

The term “invariant” means constant and unchanging. For landscape architect Mario Schjetnan Grupo de Diseño Urbano (GDU), the winners of the 2025 *Cornelia Hahn Oberlander International Landscape Architecture Prize*, the word denotes both tangible design elements—including elevated water tanks, plazas, dry-stacked stone walls, and other traditional features—and a theoretical concept. The term was coined by Fernando Chueca Goitia, a Spanish architectural historian and architect, who said that throughout history, certain design elements, including architectural features as well as agricultural and landscape practices of many cultures, are constants: they continue without significant variation within a universal tradition.¹ This thinking has informed Schjetnan’s practice and approach to landscape architecture.

Schjetnan considers invariants to be cultural touchstones, emblematic of Mexican identity.² Some can be traced to specific agricultural and landscape architectural practices existing before the Spanish conquest of Mexico. Through the study of invariants and their use, he believes a designer can profoundly understand a place or region.

Schjetnan also believes that invariants are simultaneously everyday landscape features, such as patios (which were first developed in Mexico some 400 years ago) that carry functional and aesthetic value and also reflect culture and land forms. He encourages landscape architects to reinterpret these elements, while also taking into account the needs of contemporary communities. In doing so, the designer is able to “participate in, while keeping alive, a tradition with deep roots in Pre-Columbian and Hispano-Arabic cultures that for centuries has shaped Mexican identity.” Schjetnan says that his firm Grupo de Diseño Urbano (GDU) “often turns to Mexico’s rich agricultural tradition in search of [these] constant elements, or invariants, that across the centuries have offered solutions to persistent environmental problems and design challenges.”

¹ Fernando Chueca Goitia, *Invariantes Castizos de la Arquitectura Española (Traditional Invariants of Spanish Architecture)* (Dossat, 1947) and “Invariantes de la Arquitectura Hispanoamericana,” *Revista de Occidente (Magazine of the West)* 4, no. 38 (May 1966): 241–73.

² Mario Schjetnan, “Landscape Design and Agriculture: A Mexican Perspective,” in ed. Raffaella Fabiani Giannetto, *The Culture of Cultivation: Recovering the Roots of Landscape Architecture* (Routledge, 2020), 48–63.

Acequia and Apantle

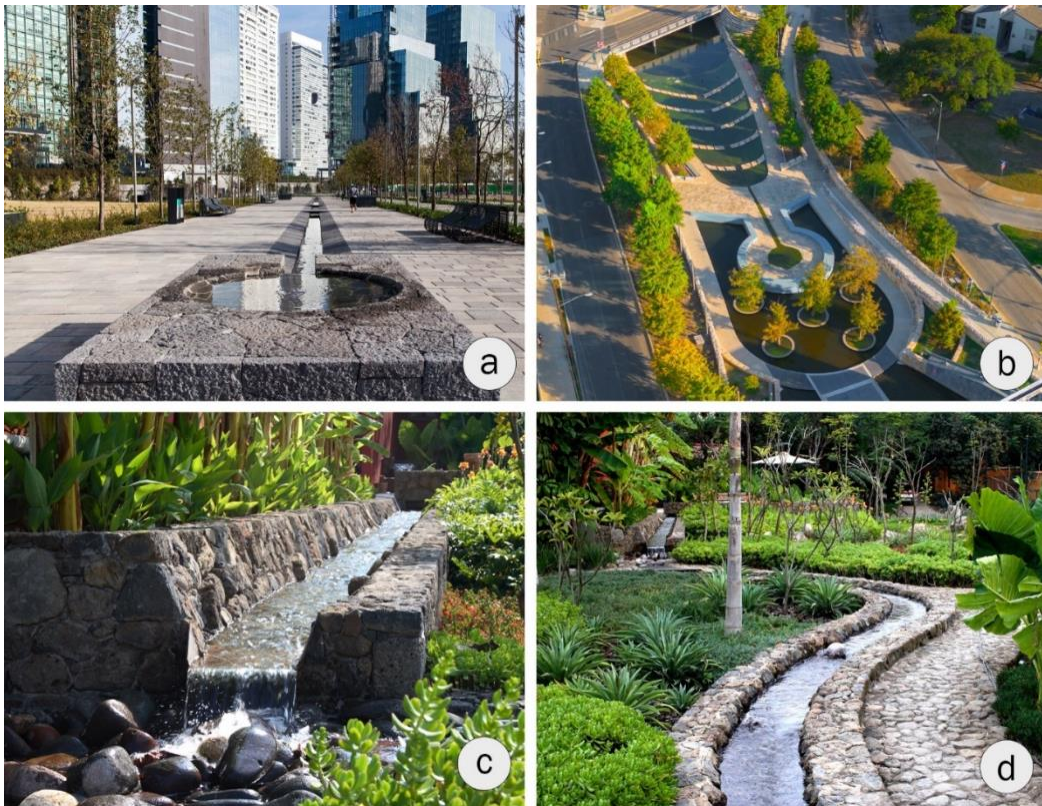
Acequia

Originally an Arabic word meaning “water bearer,” and dating to the late sixteenth century, this term is defined as an irrigation system used to manage the precious resource of water not only in Mexico but also the American Southwest and other arid areas, where it offers critical infrastructure for community irrigation and water governance. The central concept is that water is a communal resource to be shared. Because an acequia sometimes operates informally, without legal protections or requirements, it possesses special challenges for a community. Typically, its channels are made out of earth that allow water to be fed by gravity from streams and rivers. When water is scarce, all owners of irrigated properties work together to make sure the resource is shared equitably.

Apantle

Initially developed in the thirteenth century by the Tlahuicas people in the Cuauhnahuac Valley of Morelos, Mexico, an *apantle* (pl. *apantli*) is a channel that directs water flow for agricultural purposes. Typically built into the ground and constructed out of earth, stone, or, in more modern applications, concrete, the name originates from the Nahuatl language spoken by the Tlahuicas: “*atl*” means “water” and “*pantli*” means “row” or “file.” Enabling them to successfully maintain water and land control, the Tlahuicas created a large network of *apantli* that both transported and equally distributed water to farms to irrigate crop and provide water for animals.

Schjetnan incorporated these elements into the designs of (a) [La Mexicana Park](#), Mexico City; (b) [San Pedro Creek Culture Park](#), San Antonio, TX; (c and d) [Malinalco Residence](#), Mexico State.



Alberca, Aljibe, and Tanque Elevado

Alberca

Derived from the Arabic *al-birka* or *al-berka* (meaning “by the lake”), this term can be traced to Mexico’s colonial era (approximately 1521–1821) to refer to pools of water, such as those found in either public or private baths, including the Baths of Moctezuma in [Chapultepec Forest and Park](#) in Mexico City. Today the term most often refers to a swimming pool in a residential/private or commercial/communal setting.

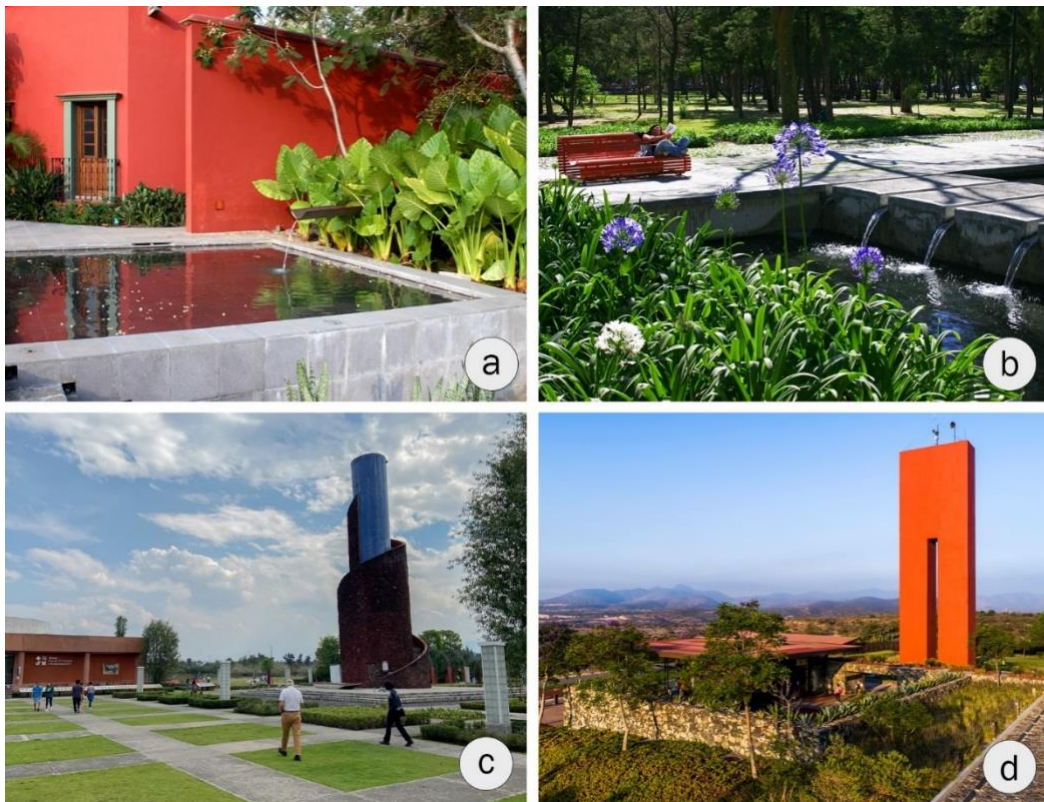
Aljibe

A functional and low-cost design element, *aljibes* are pools, dams, and cisterns that are utilized as water collection and storage tools. They are particularly prevalent in regions with arid climates prone to flooding; the water provides a consistent source of irrigation for agricultural lands.

Tanque Elevado

Positioned in a high location on the top of a building or a tower, the elevated tank is used as an efficient, reliable, and low-maintenance system for storing water in places where water supply is limited and/or variable and configured to release water when needed. It can be connected to a cistern or municipal water system and takes advantage of height and gravity to generate water pressure. They can also be integrated with pumping equipment. Commonly used in rural areas, they can be effectively used for irrigation, fighting fires, and general water supply.

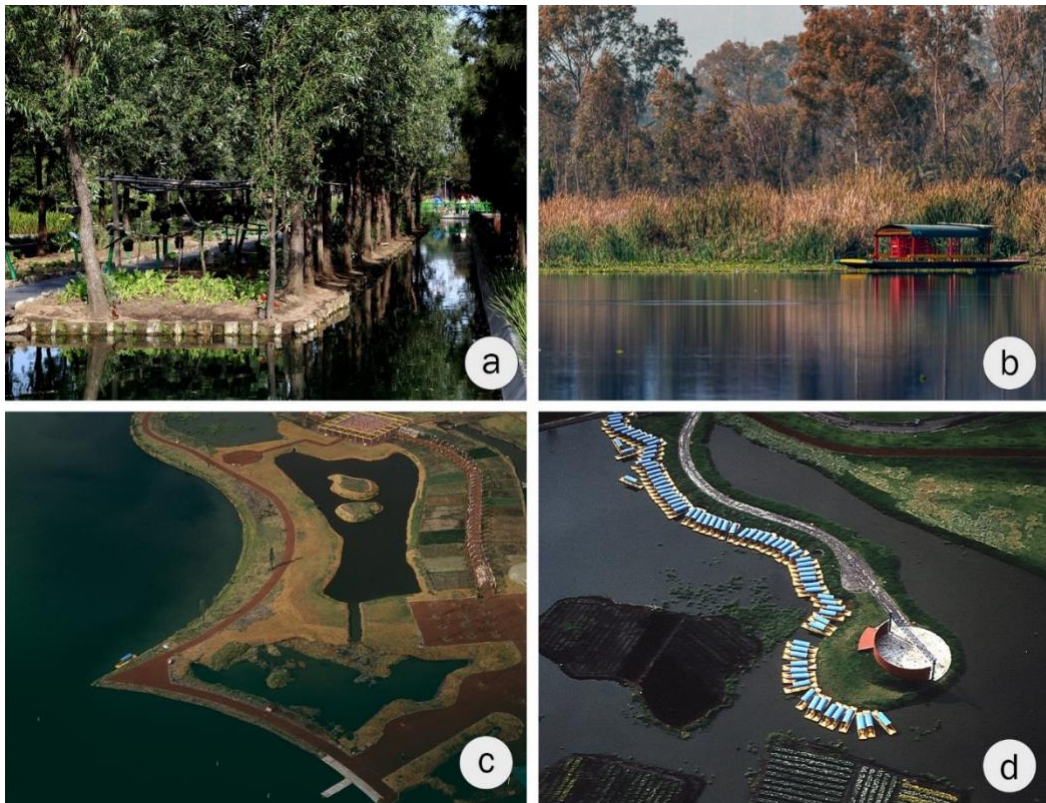
Schjetnan uses the *alberca* element (a) *Malinalco Residence*, Mexico State and (b) [Chapultepec Forest and Park](#), Mexico City; and the *tanque elevado* element in c) [Xochimilco Ecological Park](#), Mexico City and (d) *Amanali Country Club & Nautica*, Tepeji, Hidalgo.



Chinampa

Sometimes called floating gardens, these small, artificial, stationary islands constructed on lakes or other fresh bodies of water are used for agriculture. They date back more than 1,000 years to the Indigenous populations of Mexico, and are named for Chinampan, the ancient name for the southwestern region of the Valley of Mexico in present-day Xochimilco. Consisting of a raised bed of sediment, organic matter, and native Bonpland willow (*Salix bomplantiana*) trees planted at the perimeter to anchor this landscape feature, the *chinampa* is divided from others like it by fresh-water canals that provide water and nutrients to its plants and allow *chinamperos* (farmers) to travel between them by *trajineras* (traditional flat-bottomed boats).

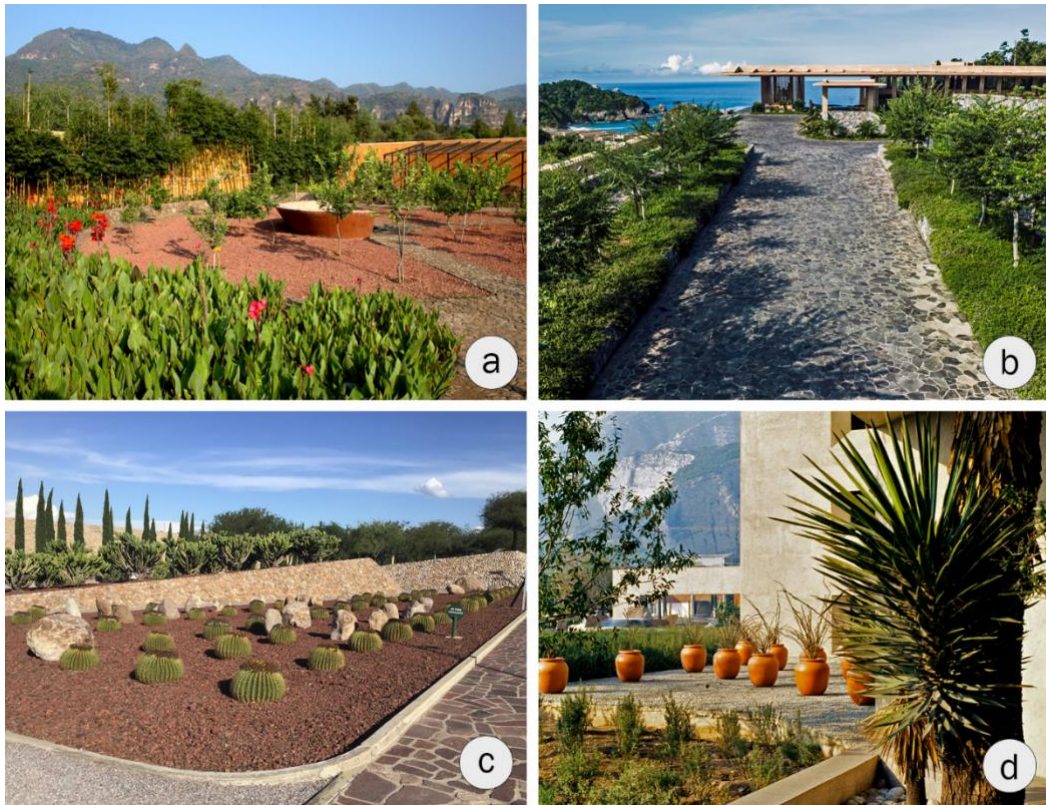
Schjetnan created new *chinampas* for (a) [Bicentennial Park – Nature Garden](#), Mexico City, and revitalized existing, historic *chinampas* in his design for (b, c, and d) [Xochimilco Ecological Park](#), Mexico City.



Huerto, Jardín de hierbas, and Maceta

Nicolás María Rubió y Tudurí, a Spanish architect and landscape architect from the Catalan region, says these three elements—*huertos* (orchards), *jardines de hierbas* (herb gardens), and *macetas* (pots)—were considered among the essential features of a historic Latin garden.³ Comprising rows of fruit trees for orchards, sculpted terraces planted with vegetables and herbs to create herb gardens, and pots with flowers arranged on a terrace, such gardens are typically irrigated by *acequias*.

Schjetnan deploys a modern interpretation of arrangement and placement of these key elements into his designs, including (a) *Malinalco Residence*, Mexico State; (b) *Four Seasons Resort Tamarindo*, La Manzanilla, Jalisco; (c) *San Luis Potosí Bicentennial Park*, San Luis Potosí, State of San Luis Potosí; and (d) *Offices Corporate Center*, Monterrey, Nuevo León.

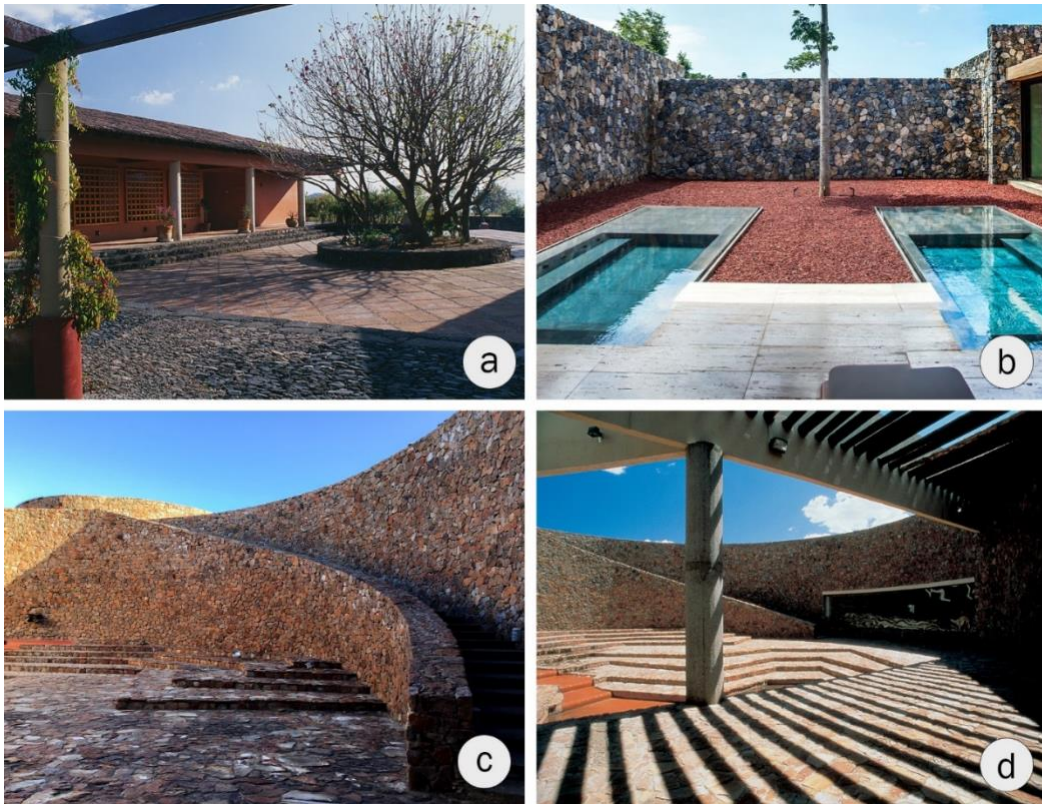


³ Nicolás María Rubió y Tudurí, *Del Paraíso al Jardín Latino (From Paradise to the Latin Garden)* (Tusquets Editores, 1953).

Patio

This form first developed in central Mexico approximately 400 years ago, likely influenced by the rise of Spanish colonialism and the subsequent implementation of Old-World precedents. The term refers to a defined space that is open to the sky, either nested in an interior location or situated adjacent to a building, utilized for people to congregate, relax, and/or share food. The walls adjacent to or around a *patio* are typically adobe—a mixture of sand, mud, and water that is formed and then dried by the sun. The ground plane of a *patio* is typically finished in dirt, brick, or tile, and the space can be shaded or unshaded depending on the architectural surroundings or landscape design. Sometimes this feature is linked to other elements, such as a passage (*pasillo* or *zaguán*) or portico (*pórtico*) that can help direct the flow of breezes into the interior of the connected building.

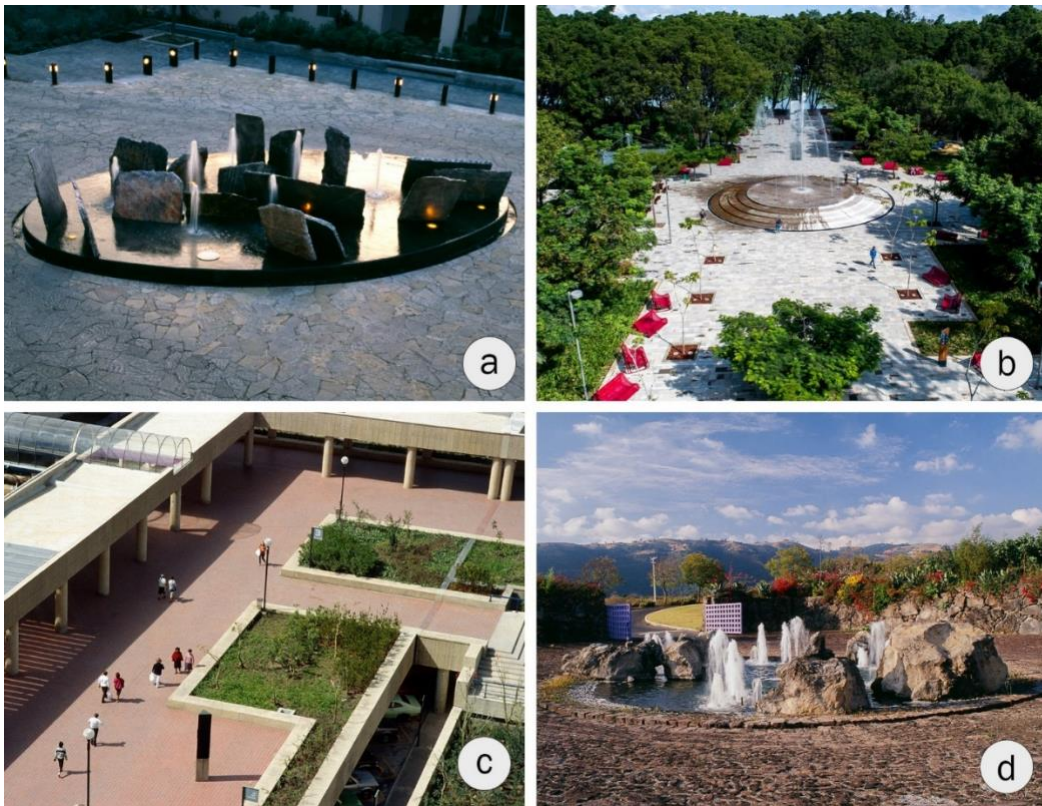
Patios can be seen in several of Schjetnan's landscapes, including (a) *Malinalco Golf Club*, Malinalco, Mexico State; (b) *Four Seasons Resort Tamarindo*, La Manzanilla, Jalisco; (c and d) [*Museum of the Northern Cultures, Paquimé*](#), Casas Grandes, Chihuahua.



Plaza

This term refers to a planning idea that originates from both the Mesoamerican architecture practices of the Aztec Empire and the religious sphere of European architecture. Today, this open-air, central meeting place is a hub of energy that resides in the heart of every Mexican neighborhood, town, or city for communal events, serving as an outdoor living room. Its form and use are characterized not only by the physical design of the *plaza* itself, but also by the religious, civic, and commercial entities located around or near it.

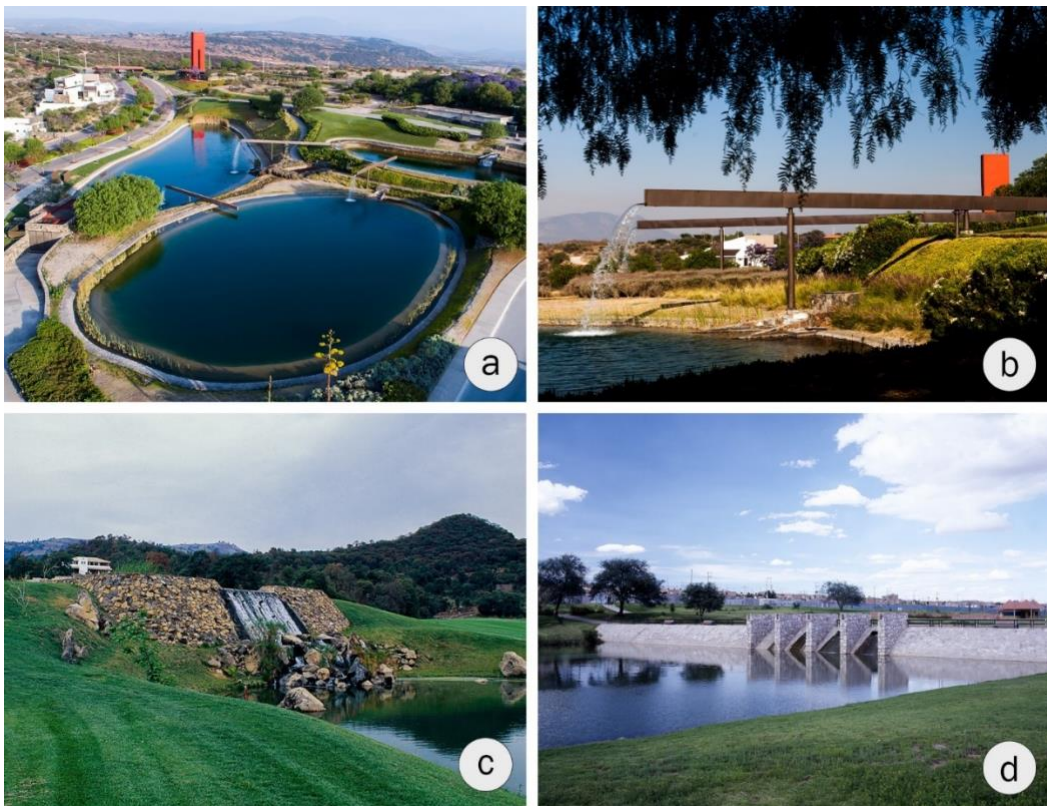
The *plaza* is embraced in many of Schjetnan's designs, including (a) *Offices Corporate Center*, Monterrey, Nuevo León; (b) *El Dean Park*, Guadalajara, Jalisco; (c) *Siglo XXI Medical Center*, Mexico City; and (d) *Malinalco Golf Club*, Malinalco, Mexico State.



Presas

This term refers to a small or large barrier, or dam, constructed to manage and store water behind retention walls. Used as an aid to irrigation, flood control, or to generate hydroelectric power, this landscape feature can still be found in vernacular landscapes along rural ways, local highways, ranches, and haciendas of Mexico.

At the (a and b) *Amanali Country Club & Nautica*, Tepeji, Hidalgo, Schjetnan utilized a *presa* to separate two ponds/lakes and created three structures to carry elevated channels of water into the ponds. At the (c) *Malinalco Golf Club*, Malinalco, Mexico State, he embedded a cascade in the exterior wall of the dam and surrounded the flow of water with a stone wall. A stone retention wall forms the *presa* at (d) *El Cedazo Park*, Aguascalientes, Aguascalientes State.



Tecorral

This type of wall is constructed by dry-stacking roughhewn stones of varying size to create dry-laid stone walls that are structurally efficient. Linked to the pre-Hispanic origins of Malinalco, in the Ixtapan Region of the State of Mexico, historically the *tecorral* was often used as a retaining wall in the development of agricultural terraces on sloped terrain, helping to prevent erosion. An additional benefit is that its absence of mortar provided an opportunity for lichens, mosses, wildflowers, and other flora to take hold and flourish in the gaps between rocks.

Admiring its cultural significance, humble simplicity, and environmental efficiency, Schjetnan integrated this historic wall-construction method into his design of the (a, b, c, and d) *Malinalco Golf Club*, Malinalco, Mexico State. Using existing stones found onsite, he created three *tecorrales* and applied the method to the construction of several tree planters.

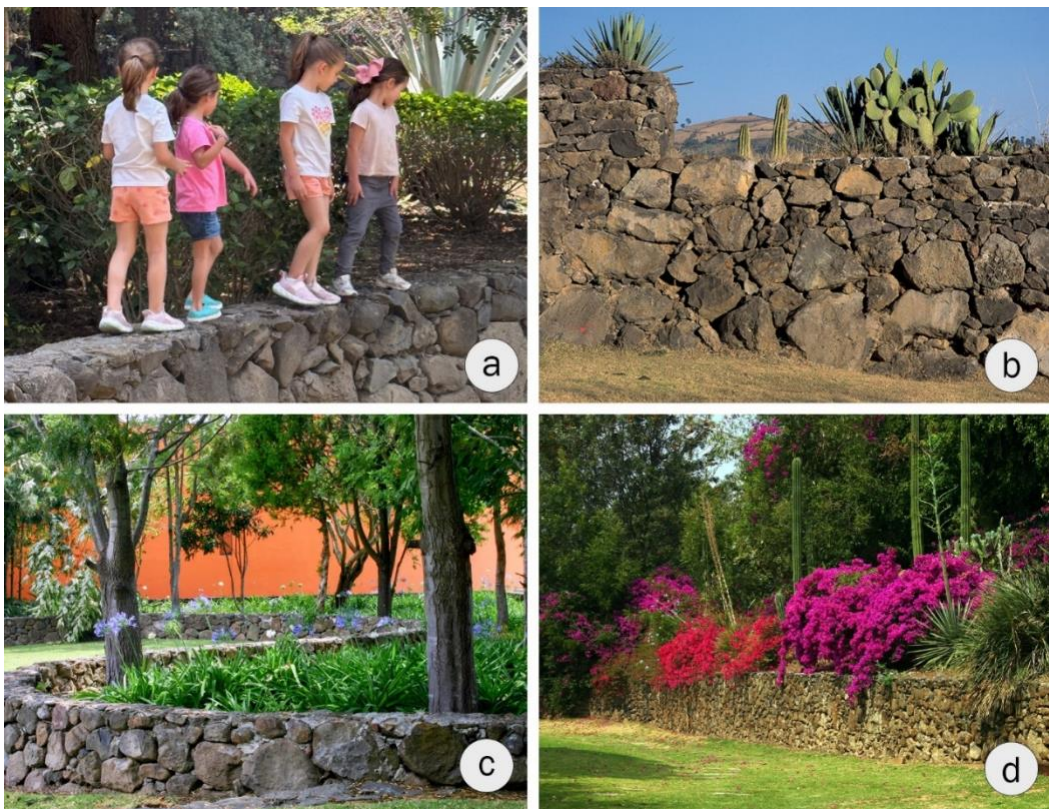


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Acequia and *Apantle*: (a, c, and d) Francisco Gómez Sosa, (b) Eric Calbillo; *Alberca*, *Aljibe*, and *Tanque Elevado*: (a, b, and d) Francisco Gómez Sosa, (c) Charles A. Birnbaum, The Cultural Landscape Foundation (TCLF); *Chinampa*: (a) Francisco Gómez Sosa, (b) photographer unknown, (c and d) Michael Calderwood; *Huerto*, *Jardín de hierbas*, and *Maceta*: (a and b) Francisco Gómez Sosa, (c) Mario Schjetnan, (d) photographer unknown; *Patio*: (a and b) Francisco Gómez Sosa, (c) Mario Schjetnan, (d) Gabriel Figueroa; *Plaza*: (a) photographer unknown, (b) Francisco Gómez Sosa, (c) Gabriel Figueroa, (d) Jerry Harpur; *Presa*: (a and b) Francisco Gómez Sosa, (c and d) Gabriel Figueroa; *Tecorral*: (a) Mario Schjetnan, (b) Gabriel Figueroa, (c and d) Francisco Gómez Sosa.