

***Exhale* Overview**

Artist - Mikyoung Kim Design, Inc.
Cost - \$527,000
Commissioning Body – Ram Realty Co.
Project Administrator – Town of Chapel Hill
Installed – 2013

Exhale is more than just a sculptural form. It's folded, layered, and perforated stainless steel skin allows for fog to emanate through the textured surfaces, thus animating the sculpture. The imbedded, computer-programmed LED lights intermittently create waves of color across the sculpture's surface. The artist-designed plaza paving and other hardscape elements compliment the sculpture by repeating the curvilinear flow of *Exhale* throughout the plaza. According to the artist: "*Exhale* moves beyond art as object, and suggests transition, interaction, and activation - a place to observe people on the plaza, making them an active, integrated part of the art piece."

The Sculpture

Length – 65' 2"
Height – varies from 6' 11" at the highest to 2'4" at the lowest point
Width – varies from 7' 7" at the widest to 2' 3" at the narrowest
Weight - ?

The sculpture consists of 20 folded and perforated 316, marine grade, stainless steel panels, welded together with 16 stainless steel ribs. The sculpture was mostly assembled by the fabricator and shipped in 3 large pieces. These segments were then bolted into place to ½" thick, stainless steel base plates imbedded 4" below the concrete plaza. It is engineered to withstand 100 psf live load

The Cold Fog System (mechanical, electrical and computer components)

As described above, cold fog emanates from 139 caged nozzles located throughout the sculpture. The system used to create the fog is perhaps the most complex part of the project. There are seven fog zones. Each zone has a pipe running from below the sculpture through the plaza/garage roof to a pump room in the garage connected to a water system and hydraulic pump. This is controlled by a computerized programmable system. The computer opens and closes the zone valves intermittently to keep the water pressure from building up and shutting off the system, due to valve failure. Water accumulation from the mist is removed from the plaza via drains in the concrete surface. The drained water is stored in a below ground cistern and reused for the planter sprinkler system. It is this pump system which requires the majority of maintenance as the pump oil must be changed out every 500 operation hours, and valves, nozzles

and filters need to be replaced as necessary. The system also needs to be flushed and cleaned twice yearly for peak operating condition.

Reverse Osmosis Water Purification System (mechanical, electrical and computerized components)

Originally the project was conceived as a water collection and reuse project, collecting the rain water from the plaza, filtering it and re-using it as fog. Because the Orange County Health Department required that the fog/mist be swimming pool quality, that plan was abandoned at the 70% design stage as being too costly, in favor of using filtered OWASA water. A Reverse Osmosis System collects the OWASA water coming in, stores it in a large tank in the pump room, then runs it through a charcoal filtering system before dispersing it through the pipes leading up to the sculpture. This system also requires scheduled maintenance and periodic parts replacement to keep it operating properly.

Lighting (electrical and computerized systems)

The sculpture contains 7, 12 ½" x 7" LED lighting fixtures, each with 20 programmable LED lights. The lighting sequences are activated via a controller attached to a computer. The on/off times are controlled via a standard plug in timer also attached to the light control box. Electrical conduit for the lighting system also runs under the plaza to the junction box in the pump room. The lighting system is nearly maintenance free. Individual fixtures can be replaced.

Hardscape

As part of the overall project, Mikyoung Kim collaborated with the landscape architect to design the plaza hardscape elements (paving, seat walls, benches, planters) and the overall design of the public portion of the plaza was designed with a variety of activities and pedestrian traffic flow in mind.

Operation Schedule

The fog aspect of Exhale functions from early April to mid-November. It is shut off during the winter months as the water run-off from the fog/mist could possibly freeze on the plaza, creating a hazard and liability. When in operation mode, the fog is programmed to come on between 11:00 am – 1:00 p.m and then again between 6:00 p.m. and 10:00 p.m. The lights are programmed to operate from 5:00 p.m. to 10:00 p.m. and stay on at during those times throughout the winter months.

Exhale Expenditures

Item	One Time	Ongoing/Annual	Total (4/2013-4/2018)
Design, Fabrication, Installation	\$527,000		\$527,000
Water Usage		\$1,200	\$6,000
Maintenance Contract*		\$9,000	\$45,000
Service & Repairs**	\$3,700		\$3,700
			\$581,702

* Annual Maintenance Contract covers monitoring the system for water quality, changing the pump oil every 500 hours of operation, checking and replacing fog nozzles and filters as necessary, checking the complete RO system and replacing filters and parts as needed, and handling mid-November shut down and the early-April cleaning and restarting the system. Fee includes all travel, services fees, parts still in warranty. Does not include unwarranted parts and repairs. Maintenance contract for 2018-19 will increase to \$9,600

** There have been a number of repairs and service calls that were not covered by the Maintenance Contract, including:

11/14/13 – replacement of system atomizer	\$ 368
10/11/14 – replacement of worn seals	\$ 187
06/23/14 - install new valves in all zones	\$ 1,513
06/20/16 – replace damaged lighting connector	\$ 230
07/19/17 – replace damaged electrical outlet	\$ 750
04/18/18 – purchase nozzles & filters	\$ 117
04/19/18 – RO membrane and membrane housing	\$ 537

Now that warranties have expired on all mechanical and computer equipment associated with the sculpture, and as the age of the plaza and sculpture increases, additional equipment replacement or repair costs may be incurred (LED light fixtures, pump parts, RO equipment, pipes, computer equipment, etc.)