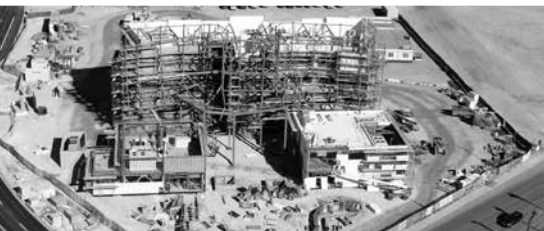


The Building | The Facts





By the Numbers | Keep Memory Alive Event Center

145,000 shop drawing sheets guided the fabrication of the steel • **65,000** hours of engineering • **30,000** steel bolts • **18,000** stainless steel shingles • **875.5** total tons of steel • **544** individual fabricated steel elements, each weighing **2,000-10,000** pounds • **199** windows • **2.2**-acre lot size • **68,800** total square feet of interior space: **52,000** in the medical facility; **16,800** non-medical • **9,800**-square-foot Event Center with capacity for **400** seated; **700** standing • **3,000**-square-foot Wolfgang Puck-designed kitchen with equipment donated by Culinary Design & Fixture • **75**-foot ceiling • **30** lifts used simultaneously during the busiest construction periods • **\$80** million cost of construction • **0** major injuries during construction • **3** continents, **2** bodies of water, and **1** desert: distance covered during transportation of the building's components



"Walking into this building took my breath away.
I can't remember the last time that happened...
somewhere over the rainbow."

—Frank Gehry





Frank Gehry, Architect

Cleveland Clinic Lou Ruvo Center for Brain Health is an iconic architectural landmark in downtown Las Vegas. Designed by world-renowned architect Frank Gehry, its unique design and welcoming atmosphere are a tribute to the patients, families and staff who come to the center.

Groundbreaking on February 9, 2007. Grand opening festivities on May 21, 2010.

Designed in Los Angeles. Engineered in Germany. Fabricated in China. Built in Las Vegas.

Now delivering world class Cleveland Clinic care in Las Vegas to patients with Alzheimer's, Huntington's and Parkinson's disease, frontotemporal dementia, multiple sclerosis and multiple system atrophy.

Precision





Matthew Carbone Photography

Complexity

Ours is the most complex Frank Gehry design. The curvatures of the steel constitute a self-supporting shell structure despite the skylight and window openings incorporated in its design — openings that are inherently a source of weakness. This unorthodox design is a marked contrast to conventional orthogonal structures in which the support structure remains at defined angles. The magical contrast between the swirling exterior and soaring interior reflects this complexity.

No Room For Error

Each piece of steel contains 60 to 100 bolts that lock together its smaller components. The more points of connection, the less tolerance for error. In fact, the pieces of the latticed trellis needed to fit within 1/16 inch of each other. Any errors would have required a complete tear-down and rebuild of 544 steel elements and 30,000 steel bolts.

Barcode Tracking

During fabrication, unique barcode identification tags provided by the engineering team were affixed to each piece of steel.

With the installation of each module in Las Vegas, surveyors came onsite to scan the barcodes, whose information was transmitted back to the engineering team in Germany for verification. This system allowed the engineers to examine an individual piece, consider its relationship to adjacent pieces, account for any settling into the ground and determine if any adjustments were needed.

Stainless Steel Shingles

Prior to fabrication, sheets of stainless steel were laid out on the exterior surface of the building, which had been marked with white gridlines similar to graph paper.

The steel was then measured, fabricated, and its edges bent to overlap or interlock, one behind the other, when installed.

The “angel hair” stainless steel finish is shop produced and machine finished. It is a non-directional, random finish that effectively diffuses direct sunlight, unlike polished surfaces or reflective glass, which can directly reflect the sun’s light in a focused-beam effect.

Building Acoustics

Due to the uniqueness and complexity of the canopy, the acoustics were computer modeled in the planning phases and then checked, verified and tuned onsite to confirm. Testing was conducted onsite, with acoustic technicians making adjustments while a live band played as directed.

BASWaphon, a pumice-type coating that absorbs sound, was installed over fiberglass, which in turn was placed over dry wall. BASWaphon is an effective absorptive material that seamlessly blends in appearance with painted drywall. It was applied to all concave surfaces that can create an uncomfortable “focusing” of sounds and to additional surfaces as directed by the acoustic engineer. The acoustic engineer for the Keep Memory Alive Event Center, Yasuhisa Toyota, also engineered the sound in Los Angeles’ Walt Disney Concert Hall.



Practical Details

Windows

Size, shape, and plane differ in each of the 199 windows in the Event Center, creating challenges for shading and maintenance.

Surrounding each window is a narrow space that allows for air circulation, thus maintaining temperature and minimizing expansion/contraction.

Window-washing system

Accessing the windows is a challenge because they are set on various planes in a canopy with myriad curves. However, the majority of the windows are lift-accessible. A fall-arrest system was included on the highest roof surfaces, facilitating safe roof and window access for maintenance and washing purposes.

The cleaning solution consists of water that has been processed via reverse osmosis (thus eliminating spotting during the drying process).

Waterproofing

A layer of black rubber was installed to encase the building and keep it watertight. However, waterproof rivets with integrated screw inserts were subsequently drilled to hang clips, which in turn attach the stainless steel shingles from behind so that no nails or obvious attachments are visible from the exterior of the building.

Having punctured the waterproofing, each of these rivets became an opportunity for a leak. Given the undulations of the canopy, it would be impossible to know where a leak causing a puddle of water on the floor of the Event Center originated. Therefore, during construction, scrupulous water testing was conducted section by section in an attempt to identify and repair leaks prior to installation of the shingles. The \$135,000 spent on this water testing was a small up-front cost that will prevent costly water damage during the building's life. We are delighted to report that our building does not leak.





Longevity & Sustainability

The building has been designed for posterity, with features that will aid it in withstanding the harsh desert climate.

- There is no exposed concrete in the footing of the building, which has been waterproofed and covered with steel.
- Throughout the building, areas not covered by steel or glass have been covered by a 3 layer, 1” thick stucco system.
- The “curtain wall,” or north-facing glass and aluminum entrance to the Event Center, is 63 feet tall at its highest point. Due to the temperature extremes in Las Vegas, spacers have been installed in the aluminum support system to allow for its expansion of 2 ¼ inches over the 63 vertical feet.

The building has many environmentally sensitive features, including:

- Motion sensors on all light switches in the medical building.
- Climate control only on the lower (occupied) 15 feet of the Event Center.
- A custom-fit, computerized shade on each window within the stainless steel canopy structure. Lights sensors track the sun throughout the day as needed to conserve on heat/air conditioning.
- Energy-efficient windows comprising three to four layers of glass with “frit” (a semi-opaque composite) and a shatterproof material sandwiched in between.
- The medical building has mostly north-facing glass. The courtyard canopy structure additionally acts as a sunshade facade (“Brise Soleil”), screening the harsh southern light onto the medical building.



 **Cleveland Clinic**
Lou Ruvo Center for Brain Health
888

Photo: Iwan Baan

“What does the building mean? It symbolizes hope.”

—Frank Gehry





Cleveland Clinic Lou Ruvo Center for Brain Health is a unique and exciting concept in medicine, featuring clinical care, clinical trials, active family caregiver programs, and educational programs for individuals and their families who are living with brain disorders including Alzheimer's, Huntington's, Parkinson's disease, frontotemporal dementia, multiple sclerosis and multiple system atrophy.

Keep Memory Alive

Keep Memory Alive was founded in 1996 by Las Vegas philanthropist Larry Ruvo to raise awareness and funds for brain disorders. In 2009, he partnered with Cleveland Clinic, perennially named among the nation's top five hospitals by *U.S. News & World Report*, and the Lou Ruvo Center for Brain Health was born.

Our Headquarters: Located in the Las Vegas Medical District

We've created a 21st century building to address 21st century diseases. There's no denying the breathtaking elements of architect Frank Gehry's design inspire employees and visitors alike. Whether visitors are impressed, intrigued, or speechless, they are engaged. They come in. They ask questions. They learn the role that early detection and a healthy lifestyle play in delaying the onset of brain disorders. They learn what the Lou Ruvo Center for Brain Health is doing to advance care and treatments for these disorders.

We invite you to do the same.

For an appointment,
please call 702.483.6000
clevelandclinic.org/brainhealth



To support our work,
please call 702.263.9797
keepmemoryalive.org

KEEP MEMORY ALIVE

Supporting the Mission of Cleveland Clinic Lou Ruvo Center for Brain Health

ALZHEIMER'S | HUNTINGTON'S | PARKINSON'S
MULTIPLE SYSTEM ATROPHY | MULTIPLE SCLEROSIS



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