The new Perot Museum of Nature and Science is another beautiful structure that will be an icon for Dallas. Driving through Dallas on Woodall Rogers, one cannot miss the large concrete cube emerging from below the highway overpass. Its architecture is uniquely Thom Mayne and Morphosis. This unique and dramatic 6-story (170 foot tall) cast-in-place concrete museum has a very special precast concrete façade, an escalator on the exterior face of the building, a low, curving, and sloping green roof constructed of structural steel over the auditorium. By maintaining a LEED Gold Certification, the structure incorporates energy, water and material sustainability concepts throughout. This building is unique in many ways. The design and construction of many different techniques can be seen throughout this structure. Remarkable precast concrete planks create the cube superstructure and exposed concrete structure was intended to be the “canvas” for exciting exhibits for children and adults alike. The concrete frame is a simple pan and joist system stabilized with a cast-in-place concrete wall system at the core of the building. The core sits on a 4 foot thick mat slab supported on 64” diameter concrete drilled piers. The reinforced concrete drilled piers extended 60’ down to the limestone bearing stratum.

But, that’s where the “standard construction” stops and the creativity of the Datum/JAMA TEAM begins. The team created several physical models to study and understand the complex geometry of the building. In the initial stages of design, these models helped the structural team visualize and create solutions to difficult three-dimensional problems. As the design process matured, the physical models were replaced with three dimensional computer models using Revit and a Building Information Model (BIM). On the first level, sloping concrete columns create more open spaces, supporting an eight-foot tall perimeter concrete transfer girder. Morphosis envisioned an open atrium, encompassed with curving precast and large glass expanses. Long space stairways crisscross through the atrium, connecting floors and mezzanines. Post-tensioned cantilevering concrete beams where used periodically to achieve the architect’s vision in some places.

The first and second floors were carefully designed to accommodate these special imposed loads in addition to the typical museum loads anticipated. There are massive cantilevering and buttressed retaining walls throughout the project and beautiful concrete lightwells on the north side of the museum allowing light in to the children’s study areas. The building design allows a collection of storm water run-off into two underground, on-site cisterns. The water is treated and reused for various purposes. The water recycling strategy meets 100% of the sites irrigation needs. There are unique post tensioned concrete Vierendeel trusses, one story tall, between the 5th and 6th floor to create a relatively column free space on the 4th floor. It’s a 64 foot long; 15 foot tall concrete truss designed to be hidden through the fifth floor office space. The vertical elements are seen as columns. Mezzanines constructed between the concrete floor systems were constructed of structural steel to allow the concrete frame to be constructed without delay and the mezzanines were built later. This mezzanine is hung from the Vierendeel concrete truss above, leaving a columnless space below.

Construction of the Perot museum was truly a team effort between the Owners, Contractors and the Design Team.