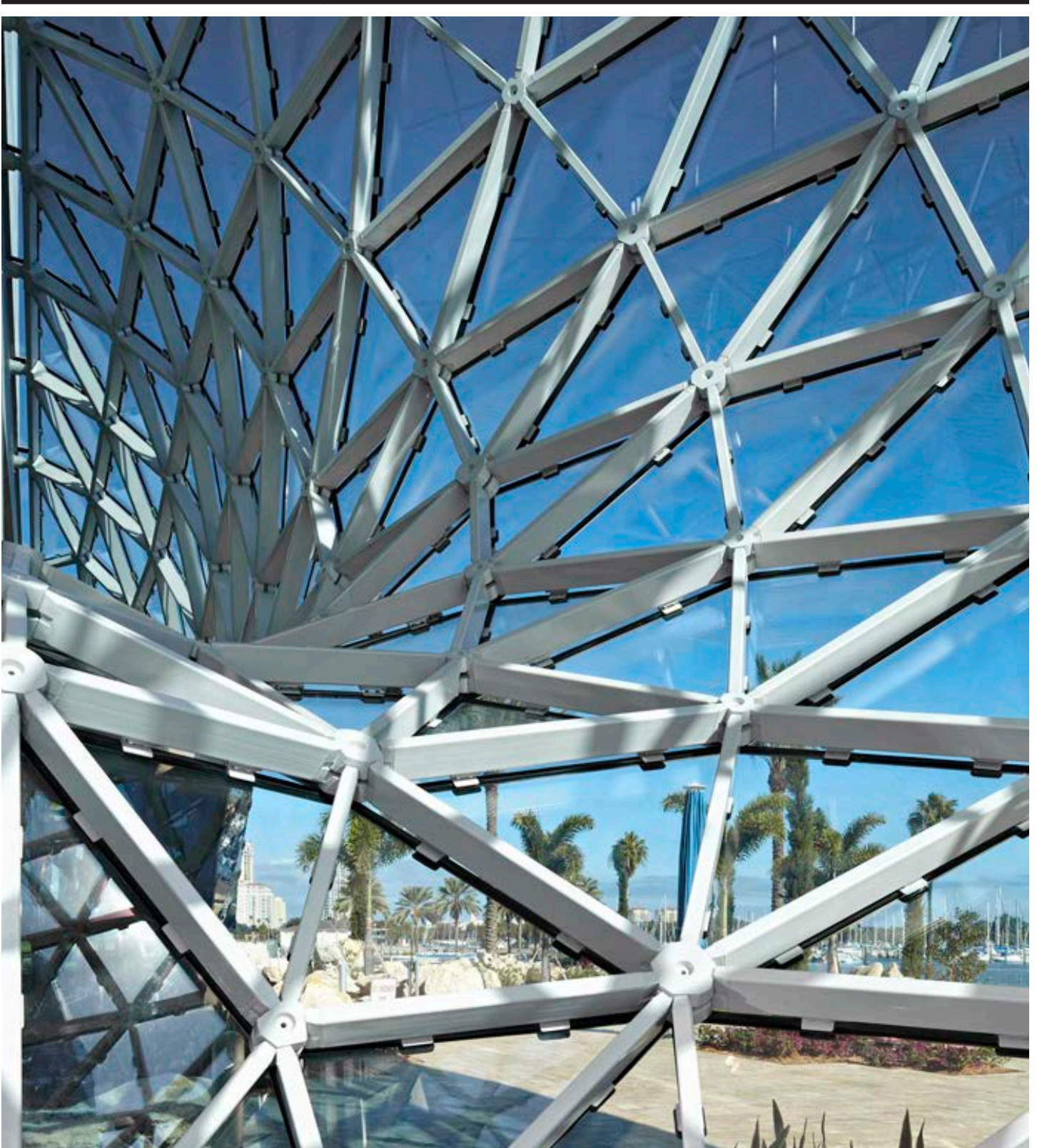


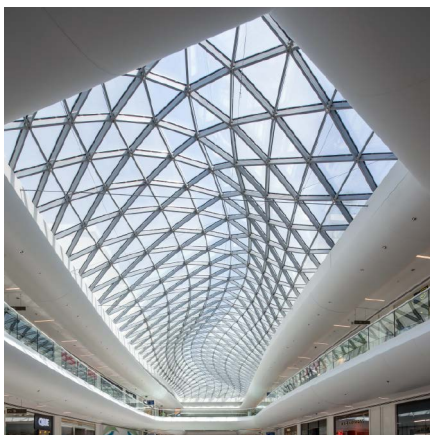
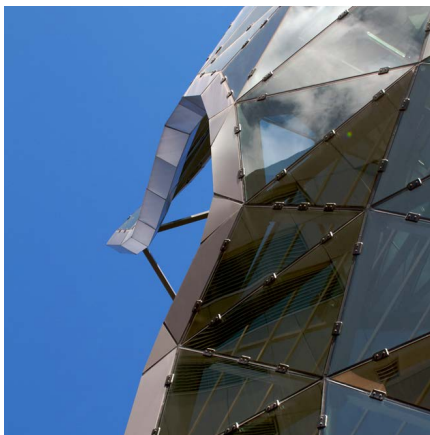
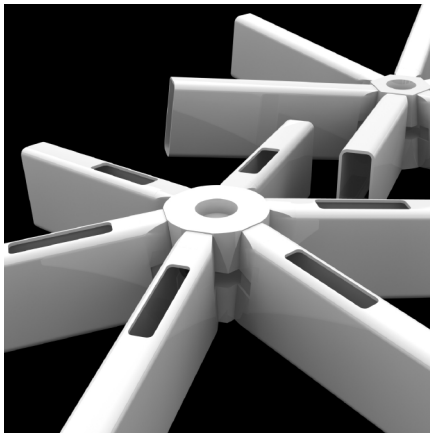
FF-System

Free Form

Structural System

NOVUM





### System Components

01. FF node discs are from C45 forged or S355 steel, precision machined and then plated and painted. There are two discs at each beam intersection to optimize the weight and size of the connection
02. FF structural members are typically hollow rectangular sections A500 Gr B or C or S355 European standard with factory welded cast tapered adaptor ends which allow for smaller nodes and full transfer of loads via two bolts
03. Concealed high strength steel fasteners with zinc plated and special corrosion resistant coating depending on environmental conditions
04. Bolts are DIN 912 Grade 8.8 or 10.9 depending on applications and strength

### Applications

01. Single layer three-dimensional grid structures for atriums, facades, roofs, walls and canopies
02. Typically used for triangulated freeform single layer grids. More conventional curved, double curved and orthogonal forms are also readily achieved
03. Designed to achieve angular changes in surface planes and where angles between tubes are typically over 30 degrees

### System Attributes

01. State-of-the-art mechanically fastened three-dimensional space grid technology
02. Nodes are custom machined for tight tolerance and full geometric freedom using CNC equipment
03. Hidden high strength fasteners which are prestressed during install with special tools. Limited field welding
04. Semi rigid connections comfortably provide spans to 120' (35m) or more as a single layer
05. Structural profiles are optimized using varied wall thicknesses
06. Member sizes typically are 3" (80mm) wide and vary in depth from 5" (120mm) to 20" (500mm). Deeper sections are wider
07. Grid and beam sizes are determined by spans, loading and cladding type
08. Requires no secondary steelwork between structure and cladding
09. Glass, panels and membrane claddings fully integrate with the FF-System using Novum Edge Clamps, Point Supported Glass and Air Filled Pillows
10. Structures are designed by Novum's in-house engineers complete with cladding. The FF-System can be used integral with other Novum Structural Systems such as AES, KK and BK to increase its spanning capabilities
11. With the TOG Solution (Triangulated Optimized Glazing), the FF-System adopts a large module triangular grid and four pieces of glass are used to fill the panel using Novum PSG and ECG Systems. This can be a very economical and lightweight enclosure with nominal structure
12. This system is quick to fabricate due to highly integrated design and production software, robotic production and optimized processes. It installs rapidly as it is inherently stable and self-aligns when fully tightened

### Options/Materials/Finishes

01. Standard member finish is hot dip galvanized inside and out after fabrication and then finish painted
02. Options include powder coating over hot dip galvanizing or galvanized only