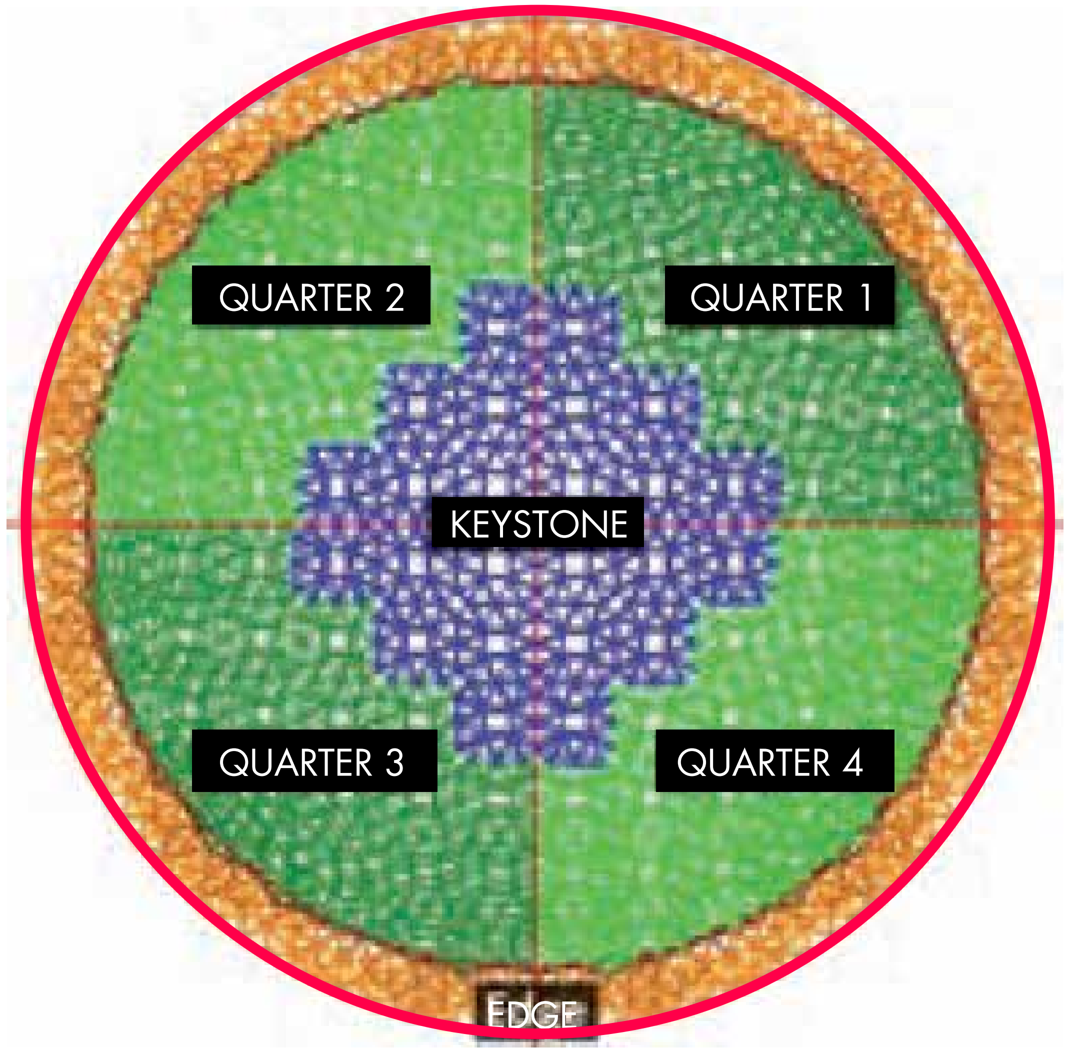

BUT HOW DOES HE EXPECT DOME TO FLOAT IN MID AIR?!
OH.. ITS MAGIC.. HEHE PLS SOMEBODY CALL A.G.G.. QUICK!
180 M
LOUVRE ABU DHABI, EXPECTED COMPLETION 2015

the design proposes a few contradiction in terms of forces. First domes create outward thrust with usually requie bottom support but in this case only 4 supports will be made available. This will also leave the structure with cantivered edges susceptible to sagging

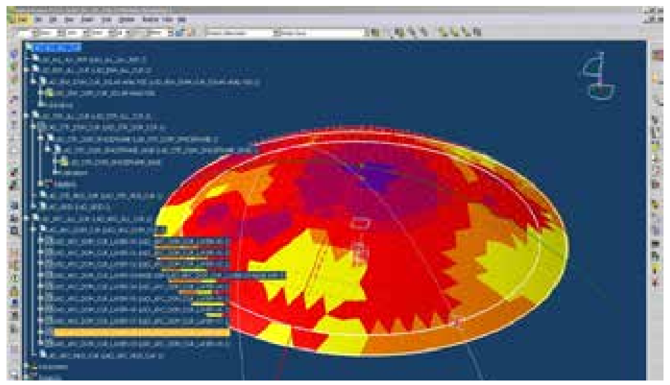


because of the above structural issues it was decided to create two kinds of support conditions divided into two parts:

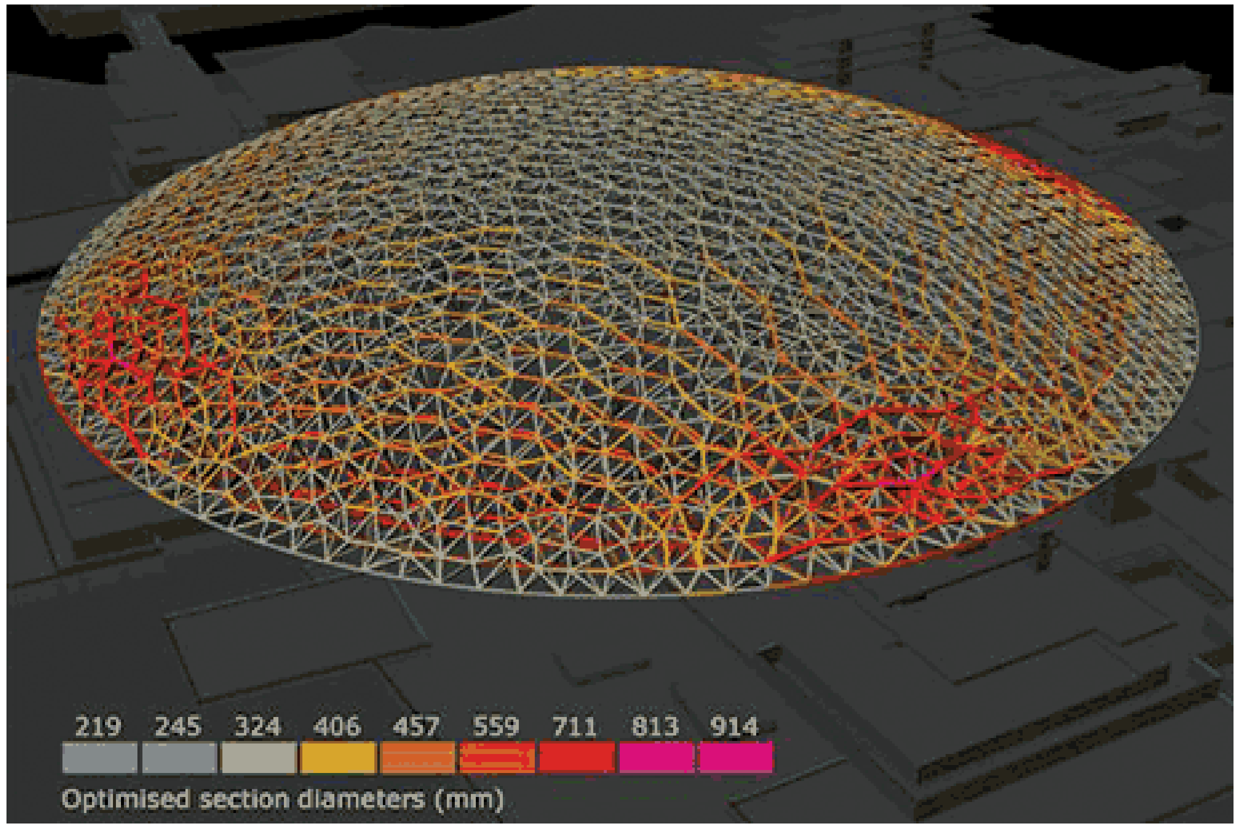
1. INNER(keystone + 4 quarters):-
separate elements (knots and bars) mechanically pinned together

2. OUTER EDGE:-
welded out of steel tubes, forming a tension ring along its perimeter

Basic structural analysis verified the structural behavior of this strategy for the optimized form

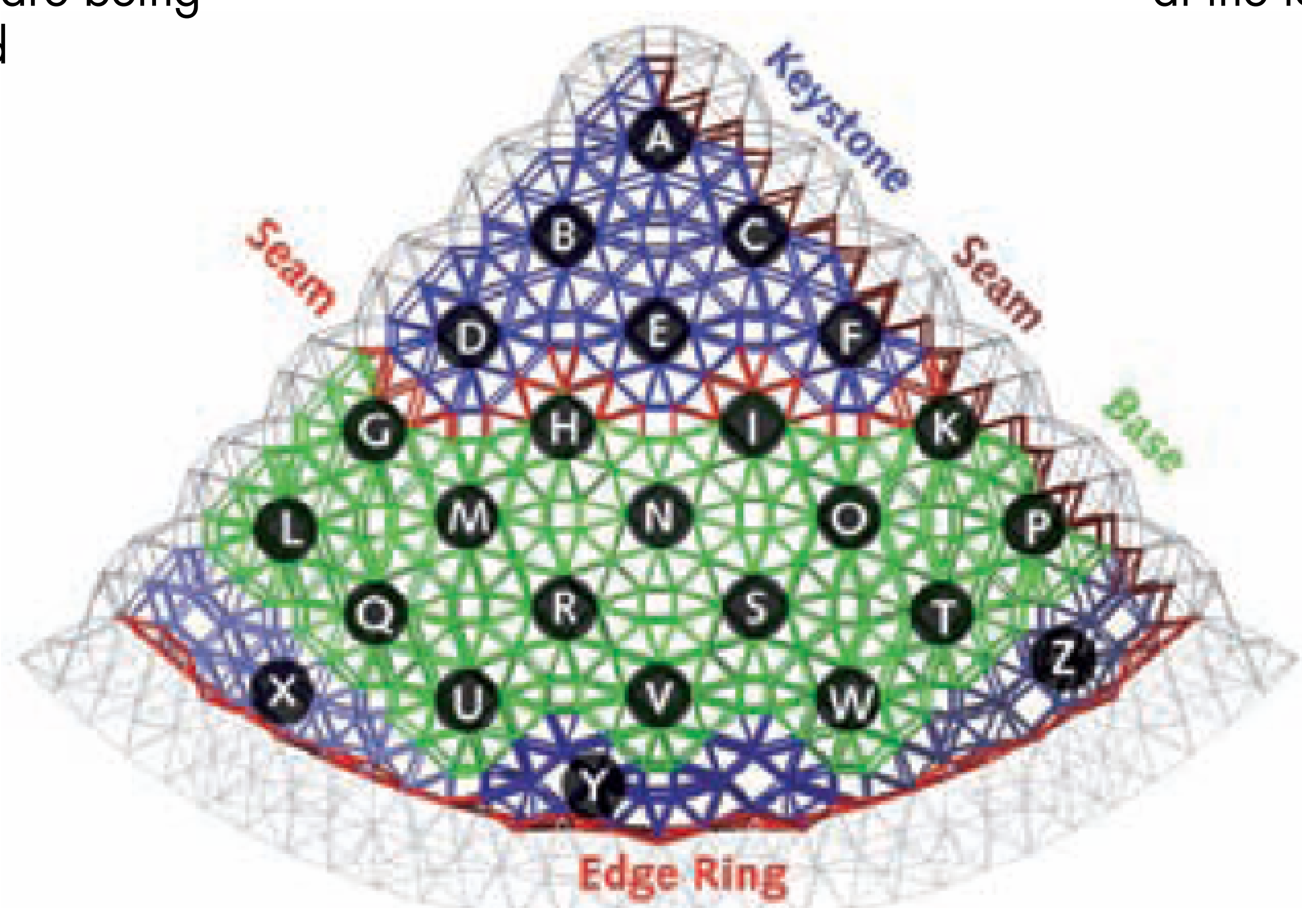


SUPPORT CONDITIONS



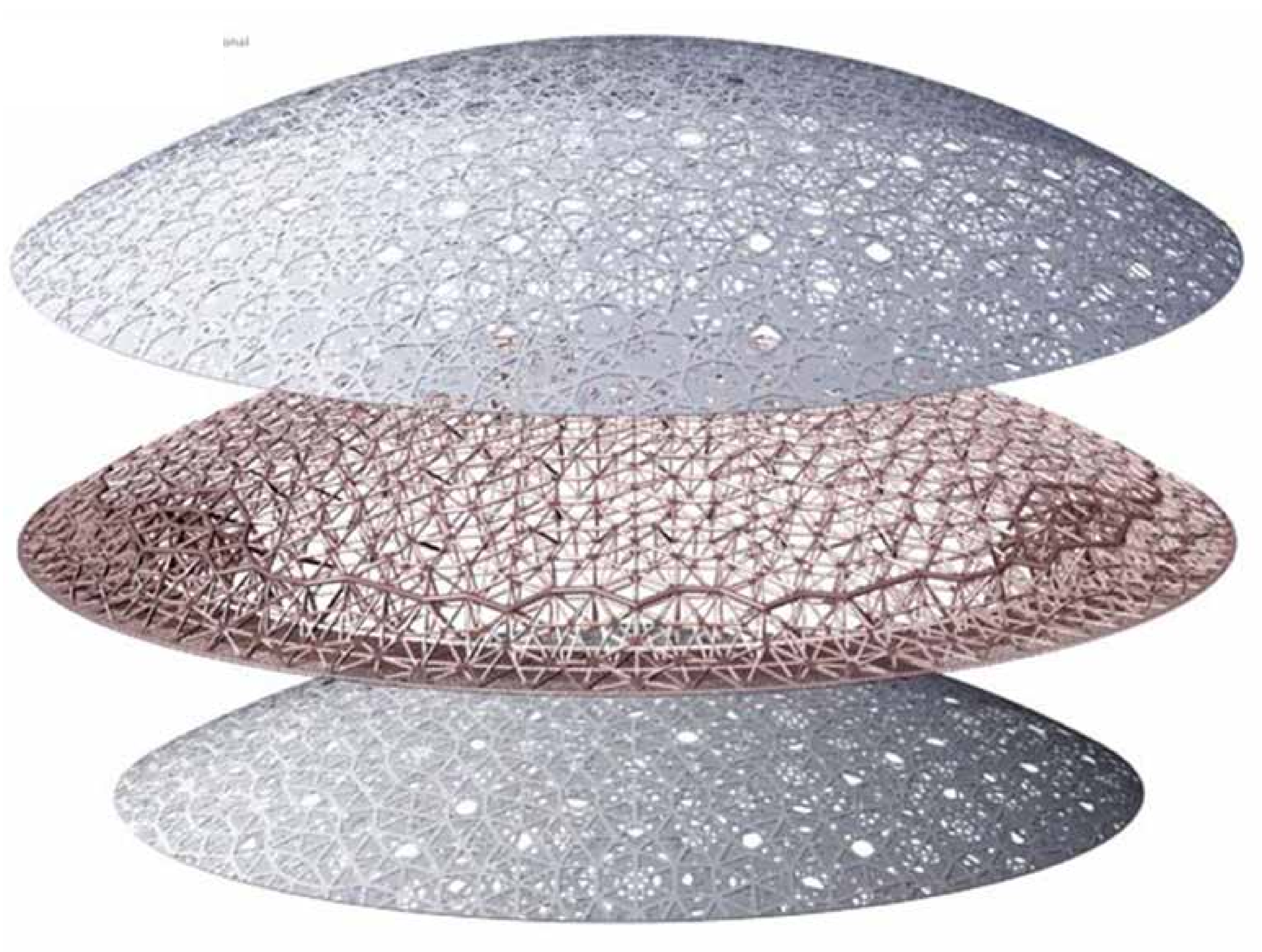
the structural similation marks out
where forces are maximum in the dome.
At the base where most forces are being
detected more mass is required

model at scale 1/33 showing
massing at the bottom and openings
at the top.



modules showing connections between keystone and base with the help of a seam

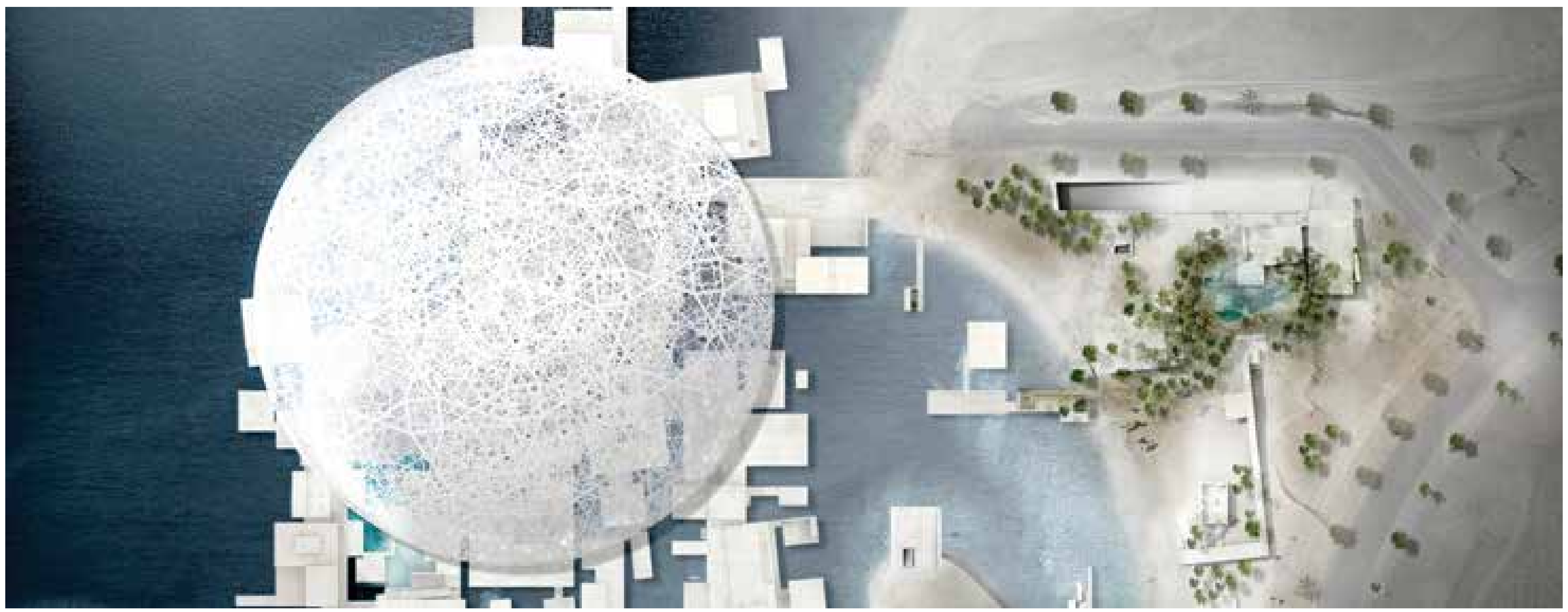
SIZE OF OPENINGS



REPETITIVE EUCLEDIAN PLANE TILING

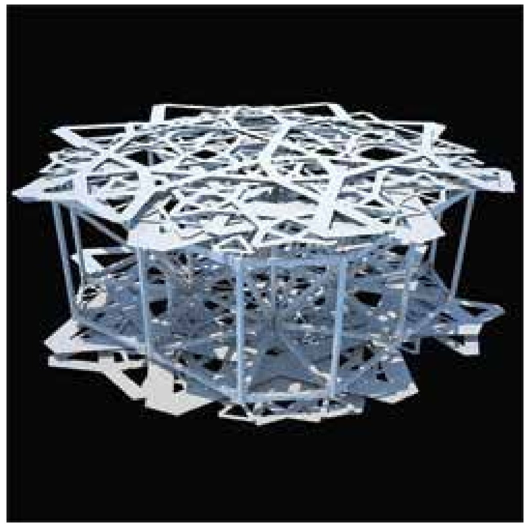
SPACE FRAME STRUCTURE

REPETITIVE EUCLEDIAN PLANE TILING
DUE TO THE PERFECT SPHERICAL
SURFACES(TOP & BOTTOM)



Resting on four supports, the building engineers working with Nouvel have rationalized the structure to the point where it is point- symmetrical, each quarter being identical (mirror and rotational symmetry), each quarter in turn exhibiting bilateral symmetry

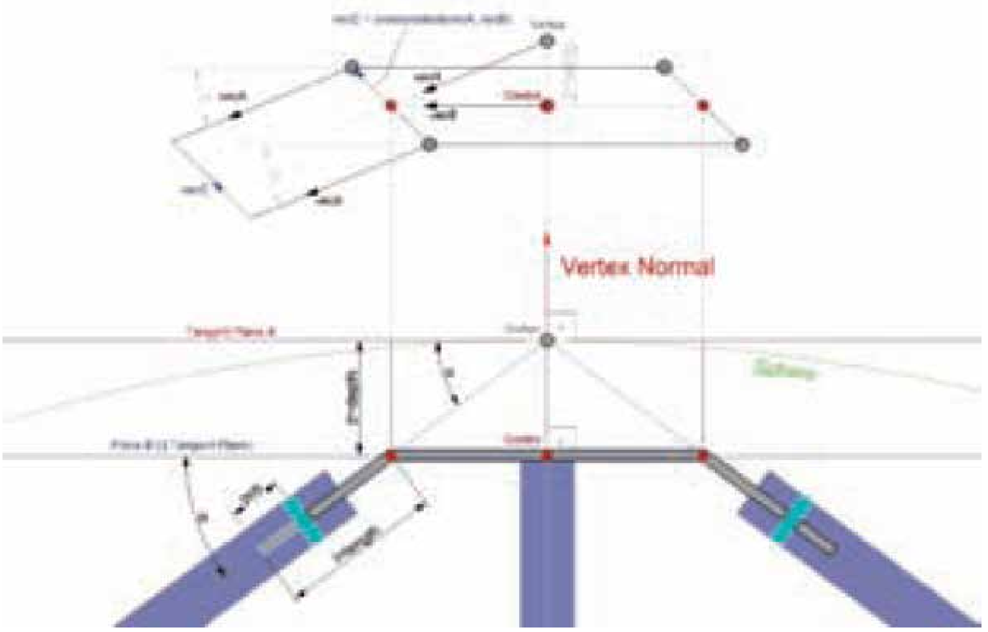
OVERALL GEOMETRY



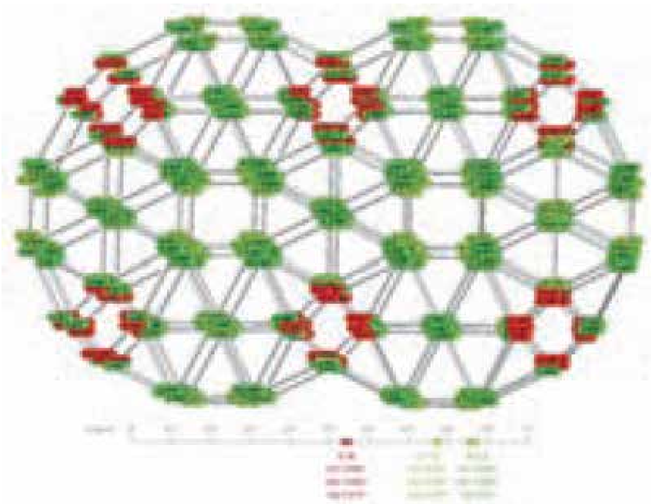
keystone, seam and base using
non-standard stainless-steel knots,
laser-cutout of flat metal sheets,
and lathe-manufactured
solid aluminum bars

bar & knot - MECHANICAL JOINT

allowing stiffnes, strenth & taughness
but also some flexibility. The
shape also allows distribution
of forces from tension to compression
when in position.



a plugin was created on rhino to keep the bar length standard
while allowing change in the know which could be easily
custimised due to laser cutting.



knot angle analysis
as for the knots; angles ranging from approximately 0.5°-1.0° for
knots lying on the surface of the spheres and approximately 55° for diagonal
members (fig. 11). The flat knots were consequently pre-bent to a standard 1° and
55° respectively, slight variations in angles were compensated for.

the entire structurewas eventually assembled element by element, module by module,
and quarter byquarter into the final structure of the whole dome

GRID LAYOUT OF ELEMENTS