

Tectonic Painting 02: Domes

HEATHER FLOOD

Woodbury University

Tectonic Painting 02 begins with an historical analysis of domes. The intelligence gleaned from the analysis is then used to push the dome typology into new spatial realms. A Tectonic Painting is an architectural object with a strong relationship between construction logic and graphic effect. The domes analyzed in this study demonstrate weak relationships between construction logics and graphic effects. Tectonic Painting 02 generates a new dome through the lens of this analysis that aligns the tectonic with the graphic, and in so doing, attempts to advance the typology.

The dome, perhaps more than any other formal typology, relates tectonic posture and graphic resolution to cultural meaning. The symbolic value of the hemisphere form prevents adulteration to shape for purposes of support, use or anything else. Domes must be structurally self-contained, maintain a clear span and hover well above ground. While each hemisphere in this study has a different structural resolution, they all require one, if not more, of the following secondary structures to transfer the load of the dome to ground: 1. drum wall, 2. pendentives, 3. squinches and 4. columns. In this study, the Pantheon demonstrates the use of a drum wall to support

a dome. Hagia Sophia demonstrates the use of pendentives to support a dome. The Basilica of San Vitale demonstrates the use of squinches to support a dome. And the Dome of the Rock demonstrates the use of columns to support a dome.

The interior surface of domes are often painted with a depiction of god's influence over man. In some instances god is depicted in imagery and in other instances god is depicted as light. The four domes analyzed for this study all locate god at the apex of the hemisphere and they all follow one of four underlying geometric patterns: 1. radial, 2. concentric, 3. spiral and 4. axial. The Church of the Chora in Istanbul demonstrates a radial organization. The Battistero in Padua demonstrates a concentric organization. Parma Cathedral in Parma demonstrates a spiral organization. The Cathedral of the Assumption in Moscow demonstrates an axial organization. In all instances focus is centralized creating a static relationship between the viewer and the image.

This project leverages the analysis above to produce a tectonic painting in the form of a dome. Tectonically, the new dome appropriates the concentric graphic organization of the Battistero in Padua and interprets it

structurally. The resulting structure is formally continuous from apex of dome to ground. It does not require a secondary system. Graphically, the new dome doubles the concentric organization of the Battistero producing multiple centers that are dislocated from the apex of the dome. The polycentric organization distributes incremental shifts in color and openings across the dome. The resulting dynamic range of graphic effects emerge from the structural logic of the form.

TECTONIC PAINTING 02: THE DOME

Tectonic Painting 02: Overview

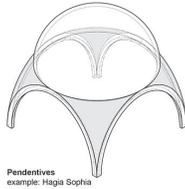
Tectonic Painting 02 begins with an historical analysis of domes. The intelligence gleaned from the analysis is then used to push the dome typology into new spatial realities. A Tectonic Painting is an architectural object with a strong relationship between construction logic and graphic effect. The domes analyzed in this study demonstrate a weak relationship between construction logic and graphic effects. Tectonic Painting 02 generates a new dome through the lens of this analysis that aligns the tectonic with the graphic, and in so doing, attempts to advance the typology.

Historical Analysis: Dome Tectonics

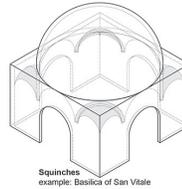
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Drum Wall
example: Pantheon



Pendentives
example: Hagia Sophia



Squinches
example: Basilica of San Vitale



Columns
example: Dome of the Rock



Pantheon
Rome, Italy
126 AD



Hagia Sophia
Istanbul, Turkey
532 AD



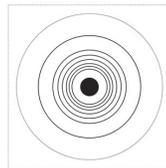
Basilica of San Vitale
Ravenna, Italy
547 AD



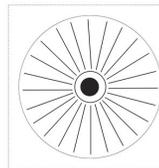
Dome of the Rock
Jerusalem, Israel
691 AD

Historical Analysis: Dome Graphics

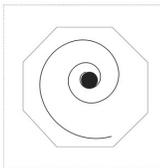
The interior surface of religious domes are often painted with a depiction of god's influence over man. In some instances god is depicted in imagery and in other instances god is depicted as light. The four domes analyzed for this study all locate god at the apex of the hemisphere and they all follow one of four underlying geometric patterns: 1. concentric, 2. radial, 3. spiral and 4. axial. The Battistero demonstrates a concentric organization. The Church of the Chora demonstrates a radial organization. Parma Cathedral demonstrates a spiral organization. And Cathedral of the Assumption demonstrates an axial organization. In all instances focus is centralized creating a static relationship between the viewer and the image.



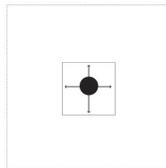
Concentric
example: Battistero



Radial
example: Church of the Chora



Spiral
example: Parma Cathedral



Axial
example: Cathedral of the Assumption



Battistero
Pistoia, Italy
1200 - 1378 AD



Church of the Chora
Istanbul, Turkey
1320 AD



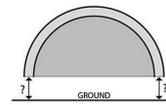
Parma Cathedral
Parma, Italy
1530 AD



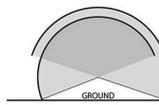
Cathedral of the Assumption
Moscow, Russia
1468 AD

Tectonic Painting: Dome Posture

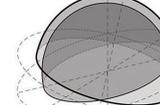
The analysis above of dome tectonics zeros in on the band of space between the circular rim of the hemisphere and ground. In each example, this band of space is occupied by a secondary structural system that transfers the load of the domes from their circular rim to ground. While each dome is able to hold shape, none of the domes are able to hover above ground without additional support. Tectonic Painting 02 reconceives the dome as a structurally autonomous object capable of elevating itself off of ground. This is achieved by delimitating the interior and the exterior surfaces of the dome. The interior and exterior surfaces are then sheared in section resulting in two off-axis hemispheres. The band of space between ground and the original circular rim of the hemisphere is filled with an undulating surface that touches ground at two points and lifts overhead in-between points.



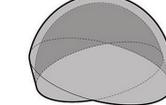
Typical Dome: Technically Dependent
Drum Wall
Pendentives
Squinches
Columns



Tectonic Painting Dome: Technically In-Dependent



Tectonic Painting Dome: Section Shear
The interior hemisphere and exterior hemisphere rotate in different directions around a central axis.



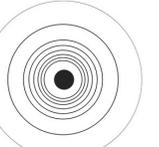
Tectonic Painting Dome: Variable Edge
The diameter of the interior and of the exterior hemisphere touch ground eliminating the need for secondary structure.

Tectonic Painting: Graphic Resolution

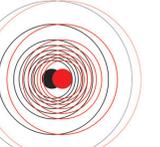
The analysis above of dome graphics identifies four organizational logics used to distribute images across the interior surface of a hemisphere. In all instances, the apex of the dome is the center of the image and in all instances the structural organization of the dome has a weak relationship to the graphic organization of the dome. Tectonic Painting 02 generates a strong relationship between structural organization and graphic organization. This is achieved by shearing the graphic organization of the surface in concert with shearing the structural surface of the dome. When two concentric graphic organizations rotate off-axis from one another they produce a grid of intersecting lines. These graphic lines are then interpreted as structural surfaces that interlock to form a coherent self-supporting dome.



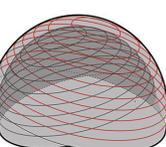
Typical Dome
Graphic Overlaid onto Structure



Typical Dome
Concentric Graphic Organization



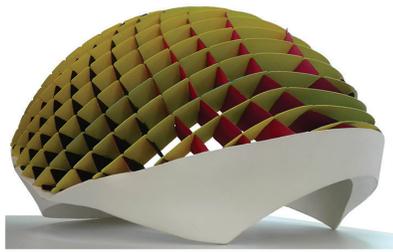
Tectonic Painting Dome
Double Concentric Organization



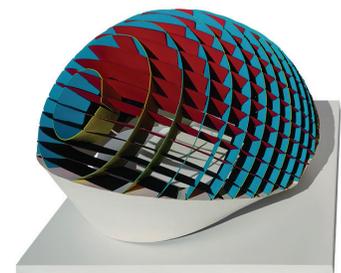
Tectonic Painting Dome
Graphic Integrated with Structure

Tectonic Painting 02

The historical analysis above provided a springboard for the evolution of the dome typology. The evolved dome, Tectonic Painting 02, takes the shape of two hemispheres rotated off-axis from one another. When each surface relates, the circular rim of its hemisphere is no longer parallel to ground. The resulting undulating mass touches down on multiple points for structural stability and lifts in multiple places for access. The 'double concentric' graphic organization is translated into a set of interlocking surfaces that absorb and direct load to ground as well as distribute color and opacity across the dome. One set of concentric surfaces is cyan on one side and yellow on the other. The other set of concentric surfaces is black on one side and magenta on the other. The spectrum of colors and the space between surfaces constantly shifts as one moves around and through the dome.



Tectonic Painting 02



Tectonic Painting 02