



winner 2009 SCDF Design Award

PROJECT LIGHT FRAMES

ТҮРЕ

INSTALLATION

LOCATION

MATERIALS & APPLICATIONS SILVER LAKE, CA DATE

2010-2011

COST

\$ 6,600



This is a project founded in material. Begun with the fundamentals of its capabilities; engaged with a distinct process for generating components; developing systems out of these components; deploying media and representation to confront, challenge and experiment with the formal capabilities; and ultimately deriving form, experience and effect from the collaboration of all of these systems, the methodology comes from an intrinsic dialogue with making. This project is an engagement of material geometry, and the deployment of these tectonics to generate a light space experience. The front figure of the conduit tower holds the urban edge while sitting delicately on the ground. The two nested figures provide a double density moiré effect of the superimposed frames. The galvanized surface plays with the light, evaporating yet leaving the densities of the shadow field below. The first figure is about the shadow of presence. As one ascends the existing steps and slides past the fountain, the pneumatic chapel reaches out its entry. The transparent surface of the outer skin reveals the complexity of the inner figure. The geometry evolves from a conical entry into a bent barrel vault connecting an apsidal end and a chimney vaulted dome. The primal architectural elements, clad in a parametrically controlled PVC, reinterprets the shape while providing referential glimpses to historical architectural forms.



VIEW FROM STREET

Material History and Reference

Conduit/// The use of conduit in the contemporary history of Los Angeles architecture made it a perfect reference. Like the fragmented structure of the early chain link works of Frank Gehry, the material as a ubiquitous, but under celebrated element is further deployed here. Similar to the effect of the "two running violet V forms" by Robert Irwin building a fence in the canopies of the trees to create a diffused line, here the density is folded back on itself like a crumpled piece of paper to allow the re-layering of the field upon itself. The intricacy of the delicate frame replicates a three-dimensional line drawing in the space. The common material is refigured into a three sided fractal element using its overlapping field densities to allow for the concentrated layers to create a visual density. Two elements, one nested inside the other create and inner figurative shape and an outer structural one. The interlocking of the two creates the double density. The figure serves as an effectual generator. As an object its intention is to produce a cloud of shadow in its wake. The frame structure projects light on the space below and the objects around provide the urban void of the existing room and the powerful light of Southern California to collaborate. The galvanized color reflects the evaporative color of the sky as daylight slowly diminishes at sunset. The effect of light allows for the multiple readings of the figure as it evolves and changes through the day and under varied light conditions. The result is an immaterial presence.







CUT AWAY PLAN

PVC /// The PVC figure is founded in pure descriptive geometries. As an evolutionary element, it is the hybridization of a dome, a vault and an apse. The figure comes from the inter-relationships of each of their forms and the adaptive responses each geometry must make to the other. To provide entry a truncated cone engages at the knuckle of the vault and the open chimney dome. The resulting figure creates a chapel like enclosure focused on the spirituality and effects of its light space. The resolution of the material, through process and its translation into form arrive and collaborate in the generation of the experience. The projected light effects that define the architecture are possible through the systematized and regularized understanding of the material, methods of fabrication, and the effectual experience of the final composition.









EXPLODED AXONOMETRIC

REFERENCES







SECTION THROUGH PNEUMATIC LIGHT CHAPEL

PVC CHAPEL GEOMETRIES AND COMPONENTS









TRANSVERSE SECTION

CONDUIT TOWER COMPONENTS + EFFECT













VIEW FROM CONDUIT TOWER TOWARDS PVC INFLATABLE



GEOMETRIES





PROJECT LIGHT FRAMES

SPECIFIC THINKING:

[1] MATERIAL /// The doubling of the material arose from the individually desired expression of each pavilion piece as well as the interrelationship of the two. Chosen for their cultural identities and well as their effectual qualities, their existence in the realm between transparent and opaque began the conversation about their optical potential and light effects with an ambiguity between the two worlds and their ability to create even further ambiguity with their effectual results. The mode of plastic and conduit each deal with the idea of density. A density of the material that is neither solid nor void, but rides the edge between. Hiding in the realm of translucency and multiplicity, the intrinsically enigmatic nature of their material properties established them as fertile ground to accelerate these properties effectually and test their other formal, structural and functional capabilities. Plastic as a continuous surface material with translucent capabilities forms as a planar material and engages temperature based forming that lends itself to panelization. Conduit as a linear material woven into field configurations allows for the mesh effect of the line within the confines of the surface. One with translucency intrinsic, the other with a translucency through the moiré effect of the density of the field the two meet to produce a dialogue through their light effects of emissivity, transmission and shadow. They compose the spaces bound within and refract and reflect to impact the spaces around.

[2] MATERIAL TRANSLATION /// The action of fabrication and development of tectonic. From the intrinsic material properties, plastic as sheet and conduit as extruded section, the material properties introduce themselves to define the derivation of form. Plastic, used here as a laminated PVC fabric is available in a modular two-dimensional sheet material and welded under heat and pressure, provides specific formal opportunities. As a futuristic material, glossy and reflective, formally flexible and able to be a self supporting skin, the potential of plastic challenges the idea of two-dimensional surface. The limitation of factory dictated flat dimension with the organicism of an air-inflated structure allows for the framework of the formal system to engage with the flexibility of a natural system. Embracing the capability of introducing depth to the material through pressure, as a weldable fabric it provided an opportunity for a panelized, but choreographed depth and form to the surface. The galvanized conduit [EMT] evolved from the ubiquitous fencing material and the legacy of is use in Los Angeles architecture. Seen as a vertical liner surface, the dense figure produced through its implied surfaces allowed for opportunity to engage the density of field, the associated moiré effect of dynamically layered and performatively figuratively formed surfaces. The translation comes through the method of deployment and the density of its overlap.

[3] SYSTEMIZATION /// The organization of the material comes through its panelization and effect. In the light cones chapel, the four sided truncated pyramid defines the individual units. Projecting out of the inner opaque surface, they act as accumulated variably figured forms that produce aggregated effects through their unitization as well as structural bridges. Modular in their construction and gradient effect, they link to generate the overarching forms: conical entry, taper conical open topped drum, and a bending barrel vault culminating in an apse. In the conduit tower, the panelization relies upon a triangulated three sided unit. A combination of structural requirements combined with the double domes [one shallow and one highly arced] produce the collective figuration of the whole. The localized composition is determined by the combination of the structural requirements and the tectonic regulation of the joint.

[4] GEOMETRIC GOVERNENCE + REPRESENTATIONAL METHODOLOGY /// The PVC light cone chapel was designed and fabricated through parametric models in CATIA. Using a regimented system to allow for diversity of form with a simplicity of fabrication, the system starts with a four sided flat sheet. Maintaining planarity with the inner and outer surface, the depth of each cone is determined by the structural taper of the wall and the overlap of descriptive geometries determining the overarching form. The variability of the cone angle and size gradients vertically from more to less wall [allowing a visual evaporation of the wall] and from more to less away from the structural overlaps of the primal geometric forms. To allow simultaneous flexibility built into the system of formal investigation, [a flexibility of allowing a formal variation without losing the standardization of the units and the template production], parametric digital control allowed for the simultaneous maintenance of the two. Similarly, on the conduit tower, the regulation of the three-sided faceted system occurs at the joint. This detail moment requires an engagement of the overall system to prevent an over complexity of any one connection. Defined by economy of fabrication and to minimize complexity, all joints were limited to crimped and bolted connections. Thus the gradient length density of the individual members illustrates the structural forces.

[5] PERFORMATIVE REQUIREMENTS /// The variable cones of the PVC chapel are governed by light. Creating a scalar dimension as they ascend, each of the panels varies in depth and perimeter frame size. The composition is based on experience of light. The conduit tower similarly works with light, but as opposed to framing, funneling and projecting, it works in the opposite direction, with the projection of shadow. The density of the frame and the pattern of the infill serve to project shadows. The effect is not generated from an emphasis on the form, but the projected figure resulting from its presence.

[6] FABRICATION /// PROCESS /// TOOL /// Using standard controls and geometries derived from the CATIA model, the formal structure is derived from the varying wall thickness and the relative position of the cone in the field effect of the surface. Upon removal from the form they now have both the shape of their individuated conical body and flat skirt perimeters for welding. Each piece is cut from the fabric and then heat welded into place to develop the volume. The parabolic section creates vertical and lateral thrusts that are internally resolved by the cones linking the two faces. The lattice of the inner and outer surfaces with their varied wall thickness allows the production of the final form and light effect. The conduit tower uses simple fabrication techniques: crimping, bending and bolting. The system is calibrated digitally, fabricated in individual units, chunked for prefabrication then grouped for final installation. Base on a triangulated module, the structure generates its density through the double domed canopy.

[7] INSTALLATION /// CONSTRUCTION /// The installation is the actualization of the units to define their relationship to the collective whole. The precision of the process permitted the translation of the digital model through templates and fabrication models. The accuracy of dimensional pieces all output to directly and accurately, cut the flat sheet material, and collectively weld the figure of the chapel. The conduit tower similarly relies upon the dimensional precision and output to allow for the component fabrication that then precisely regiments and allows for the tolerances and cohesion of the whole.

[8] EXPERIENCE /// The experience of the piece[s] comes through its engagement. The layering of light and shadow, the density of the projected light, funneled light, cast light, patterns of light and dark, and translucency of skin and surface all aggregate to allow for an array of visual affects. The individual effect of each of these systems allows for a transitional chamber. The result is a place that one can engage oneself and the ambient environment around oneself. The experience of light becomes a compositional interplay.





WIREFRAME

JOINTS

EMT PIPES





CONDUIT TOWER PREFABRICATION COMPONENTS - AXONOMETRIC





CONDUIT TOWER PREFABRICATION COMPONENTS - PLAN







INTERIOR VIEW PVC CHAPEL













LIGHT FRAMES



PVC CHAPEL COMPONENT TEMPLATES







VIEW INSIDE PNEUMATIC PVC CHAPEL LOOKING BACK TOWARD ENTRY















MODEL VIEW FROM STREET





BENCH STUDIES - 3 AND 4 SIDED GEOMETRIES



INNER AND OUTER FORM STUDIES







PNEUMATIC PROTOTYPES



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PROJECT LIGHT FRAMES





() ATTACH CHUNK "D" AND MOVE INTO FINAL POSSITION





(1) ATTACH CHUNK "E"

PHASED CONSTRUCTION

















ASSEMBLY SEQUENCE





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ASSEMBLY PROCESS







REAR LEG AND TRANSLUCENT INFLATABLE







CONDUIT TOWER







JUXTAPOSED GEOMETRIES







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VARIOUS VIEWS - LIGHT FRAMES



