**LAGI 2020 ARTWORK PROPOSAL: *VIEW/SHEDS***

Our proposed artwork (*View/Sheds*) for LAGI at Fly Ranch is a phased, inhabitable sculpture installation that begins with one view, one bed, and one material. The project is designed to allow scalable future expansion into a network of shelters and gathering spaces, which will also serve to power a micro-grid of vehicles enhancing connection between Fly Ranch and the Gerlach community. The main aim of this artwork is to offer visitors to Fly Ranch the resources to sustain immersion in the quiet solitude of the playa, while sharing that experience with others: *to be alone, together.*

Our proposal involves building *View/Shed* sheltersat three approved project sites, with increasing visitor capacity at each site. The two-person, eight-person and sixteen-person *View/Shed* sites are oriented so that each shelter provides one large glazed-wall, giving visitors an uninterrupted view from the interior to the open playa east of Fly Ranch. The inhabitable sculptures are created utilizing repurposed materials, and materials direct from the land.

Fly Ranch is a gathering space, yet also a remote and extreme physical location in terms of its landscape and relative isolation. Our team designed these sculptures for refuge from the intensities of weather (sun, wind, heat, cold nights) by providing shade, wind-block, geothermal heat, and space to rest. The inhabitable works aim to shelter and encourage meaningful discourse around land-based issues, created out of the land itself.

Earth is our core material, oriented as a passive solar structure, and heated and cooled with site-based sources. *View/Shed* walls repurpose soil from the site and are formed in hanging geo-textile fabric bags. This method of fabric-forming escapes the redundant forming methods of conventional architectural casting systems: the flexible membrane provides a lighter material to form the walls, upcycles into the building, and integrates with the landscape.

Each *View/Shed* is comprised of a simple full-size bed frame, a desk, table and shelving, lighting, a large picture window overlooking the playa, poured-earth walls, geothermal heated flooring, solar fabric roofing, a micro grid battery based in electric cars, and a water-catchment system.

The wood and fabric formwork initially utilized to build the walls is repurposed as roofing, flooring, and window framework. Glazing constructed of recycled sliding glass doors orient the structures on the large open playa. A passive solar heating system is built of repurposed car-windows supported by the reused wood forms. One *View/Shed* at each site extends the window wall into a greenhouse structure, capturing geothermal heat to allow food growth in extreme climate conditions. Shed-style roofing captures water flow.

DragonSCALES solar fabric in our roof structures enables high-efficiency, light weight, and flexible solar applications to directly integrate into remote off-grid infrastructure. The micro grid would store power in electric cars and provide a link and a service to Gerlach. Each inhabitable sculpture charges a vehicle. A fleet of cars can charge at the *View/Shed* sites and park near Gerlach for residents’ use.

The small two-person *View/Shed* provides the shelter necessary to sustain contemplative immersion in the quiet of the playa. The medium eight-person *View/Shed* incorporates a partially covered communal kitchen and eating area. The large sixteen-person *View/Shed* boasts a semi-covered amphitheater, carving a sheltered space for larger community gatherings, workshops, and events. The three sites are designed for phased fabrication, to align with Fly Ranch’s continuing development of outreach and community programming.

**SYSTEM INPUTS/OUTPUTS:**

Post construction, inputs will be largely site derived. Sun provides electricity, water comes from underground sources and rainwater collection, heat comes from geothermal sources. People will bring food to the shelters and their waste will be composted in composting toilets.

Maintenance will be cleaning the DragonSCALES to maintain their efficiency, with water and clean cloths. The ultra-efficient bulbs will require replacement in 20 years. The batteries in the vehicular micro-grid will require replacement once a decade, though that may change as technologies improve. The pump technology in the geothermal and waste-water systems will require replacement as needed.

Replacement of other appliances and comforts in this inhabitable sculpture will depend on use by visitors. Use of the solar and geothermal power will need to be balanced to support these draws on the power.

The system will output about 6 KWH per day.

**Energy Budget for Small 2-person *View/Shed* (scale up for Medium 8-person and Large 16-person):**

* DragonSCALES Solar fabric\* cover over west semi-covered entry (instead of roof); angled south/southwest
* 7 high-efficiency pumps @ 5 watts each // 10 hrs a day **= 0.35 kwh**
* 5 ultra-efficiency lights\* @ 0.5 watts each (40w equivalent) is 2.5 watts total // *conservative* 12 hours a day of illumination **= 0.03 kwh**
* One 1800 watt induction cooktop on full heat/power for cumulative 1 hr // 3 meals **= 1.8 kwh (max)**
* One mini fridge **= 0.09 kwh**
* Safety factor for plug in loads **= 0.07 kwh**

*\*Proprietary technologies contacted and partnerships established.*

Daily average load = 3 kWh (using conservative calculations for duration of consumption)

Area of single unit solar fabric roofing areas:  13.2sq m. Equivalent to (5) 280 watt solar panels – simulated to cover 188% of annual demands. Oversizing due to lack of net consumption with a grid system in order to meet the predicted winter demands with the reduction in winter solar production.

 

With a battery system attached, 12 kWh storage provides 4-5 days of backup power. (2015 Nissan Leaf battery = 24 kWh, 8-10 days of backup power).

**MATERIALS:**

Walls

* Site soil, clay and aggregate - *clays will come from areas with batholithic granitic rock outcrops, not from playa floor. Most of the clays in this area are likely bentonites. There are montmorillionites as well; illites will be found near granitic outcrops. Sources of clay are likely in the Phing sandy soil or Jaybee-Pickup association, as described in the NV Washoe County Soil Survey.*
* Geo-textile fabric, form-ties to receive poured earth
* Wooden 2”x 4”s and 2”x 6”s to support fabric bag and provide wooden forms for concrete posts and bond beam - *upcycled to wall formwork, and to laminated roof beams*

Foundation

* Recycled content concrete
* Reclaimed timber– *will be upcycled to wall formwork, interior furnishings, and then to laminated roof beams*

Roof

* DragonSCALES solar sheeting / fabric
* Battery for solar storage - *micro-grid scheme stores power in electric cars, providing a link to Gerlach: cars charged at View/Sheds and parked in green space near Gerlach for residents’ use*

View Window

* Matrix of repurposed sliding glass doors
* Wood – *upcycled from wall/foundation formwork*

Interior furnishings

* Wood – *upcycled from wall/foundation formwork*

Greenhouse

* Matrix of repurposed car windows – *procured from Sparks, NV Pick-n-Pull*
* Wood - *upcycled from wall/foundation formwork*
* Plants - *aquatic adapted*
* Cast concrete with recycled content bathtub – *for black-water system*

Amphitheater

* Woven erosion control geo textile fabric on mounded seating

**DIMENSIONS:**

* **Small 2-person View/Shed: 54.3 square meters**
	+ Semi public (Outdoor spaced enclosed by walls) - 25.5 sq m
	+ Private (Indoor spaces) - 28.8 sq m
* **Medium 8-person View/Shed: 408.7 square meters**
	+ Public (Outdoor kitchen and common area) - 113.8 sq m
	+ Semi public (Five outdoor spaces enclosed by walls) - 183 sq m
	+ Private (4 indoor living spaces) - 79.9 sq m
	+ Support (Communal bathrooms & mechanical) - 32 sq m
* **Large 16-person View/Shed: 1254.9 square meters**
	+ Public (Ampitheater) - 652.2 sq m
	+ Semi public (10 outdoor spaces enclosed by walls) - 381.8 sq m
	+ Private (8 indoor living spaces) - 166.5 sq m
	+ Support (Communal bathrooms & mechanical) - 54.4 sq m

**ORDER OF MAGNITUDE COST ESTIMATE:**

* Small 2-person *View/Shed*: Phase one = $30,000 - $60,000
* Medium 8-person *View/Shed*: Phase two = $135,000 - $500,000
* Large 16-person *View/Shed*: Phase three = $350,000- $1,000,000

**ON-SITE PROTOTYPE DEVELOPMENT**

This project has spent March- September 2020 (six months) materials testing poured earth - clay and aggregate mixes to create poured earth blocks. In September-October 2020 we have self-funded a partial scale mockup at CO’G Sculpture Alley, in Detroit, MI. Documentation of this process and resulting sculptural poured earth forms are included in our image boards, as well as this time-lapse video: <https://www.youtube.com/watch?v=dMfRWoEli2E&feature=youtu.be>

If we are selected to continue forward with the prototype, we will begin with site work at Fly Ranch in Spring 2021 and complete our poured earth structure in June 2021. Our material and time workflow for the on-site prototype has been tested at a partial full-scale. We would be able to complete the proposed site-to-structure prototype fabrication over the course of 3 months.

**TRAVEL:** Fly Ranch: Home state to NV (1085 miles @ 57.5c/mi) x 2ways X 3 vehicles: $3,745; Lodging and meals on site 6 weeks build out, 3 people: $150/day X 6 weeks = $6,300

**MATERIALS:** $15,000

The prototype proposed is a section of the 2-person *View/Shed,* with solar fabric and poured earth walls as a shelter. Two 12’ x 24’ walls (three 8’x 12’ panels with footing, posts and bond beam) utilizing fabric-formed poured earth, with solar sheeting roof (to charge donated electric car as prototype of micro-grid and collect water) would be fabricated.

**ENVIRONMENTAL IMPACT SUMMARY**

The *View/Shed* project resists systems of mass production and commodification of buildings through implementing a cradle-to-cradle design process. Workflows bring in as little material as possible to the site, extruding a structure from the site itself and reusing formwork materials throughout the fabrication process. Central to this goal is poured-earth as a low-cost, low embodied-energy process to provide site-derived buildings with concrete only as posts and beams for stabilization. Instead of the conventional practice of excavating earth from the building site to be discarded in another location, this project utilizes the earth from the immediate site. The overall structure uses a total of 1% Portland cement by volume of the building solely in posts and beams.

Any environmental impact is estimated, however the movement of soil from ground plane to wall requires heavy equipment and changes the soil profile of the site. We will need to test the site soils to find the appropriate clay type. We found through our material experimentation over the past six months that clays of the bentonite family crack and swell more than is optimal for a wall. The illite clays near the upthrusts of granitic rock will need to be used. The movement of recycled auto window glass will require fossil fuels and the timber supports for the walls would be sustainably harvested from a local Albuquerque mill that resaws downed trees in the city area.

The embodied energy of these inhabitable sculptures will be low as we are using site-based materials and recycled/local content. The movement of material is typically some of its highest impacts. This project is designed to avoid the movement of heavy material and thus emissions.