

Saguaro Man -Fire Art Guidelines

Purpose

The following guidelines describe the general construction of safe fire art for use at Saguaro Man. The list is not intended to be all-inclusive, and in all cases the judgement of the Fire Art Team.

These guidelines are based on over 25 years of experience with public fire art in the Burning Man Community and advice from worldwide experts in the safe design and operation of fire art and flame effects. Where appropriate, these guidelines are harmonized with the requirements of **NFPA 50: LP Gas Code** and **NFPA 160: Use of Flame Effects Before an Audience**

This document is not intended to be an instruction manual- it is expected that fire art fabricators get the instruction, training and research needed for proper operation of their art. If you have questions, please ask the Art Grant Committee, ArizonaArts@azburners.org.

Large Burnable Structures

Large Burnable Structures are essentially big bonfires, assembled with artistic intent. These burns are large, carefully scheduled, and demand huge resources. They are prohibited during any stage of burn ban.

Structure Guidelines

- Materials must be fully combustible, or easily removed after burning. If metal components are needed, mild steel is recommended for easy removal by magnet-rake. Aluminum and Stainless Steel can be very difficult to remove from the ashes.
- Paper or cloth are discouraged due to high ember production.
- Paint should be kept to a minimum, and prefer latex, tempera, milk or other “less toxic” varieties. Paint should be thinned with water wherever possible to reduce the amount of non-wood material being burned.

- Structures should be designed for an orderly collapse - top-heavy structures should have weak-points for collapse. Avoiding thick vertical beams will result in a quicker collapse.
- If accelerants are used to initiate burning, recommended fuels are 100% Diesel Fuel or 20% Gasoline/80% Diesel blend. *100% Gasoline or White Gas is not permitted.* A huge fire can be lit with careful lighting and 2-3 gallons of accelerant. If you think you need more you should be re-evaluating how your structure will burn.
- Pyrotechnics are not allowed - no pyrotechnic chemical effects may be included. Limited use of colorants in liquid fuel may be allowable with discussion.

Site Guidelines

- The *minimum* “inner perimeter” beyond which no one should enter during burning should be 1.5X the height of the sculpture, measured from the edge of the structure. The actual safe inner perimeter dimensions may change based on the type of structure, effects in use, and conditions.
- The *minimum* “outer perimeter” beyond which no participants should enter during burning should be 2.0X the height of the sculpture, measured from the edge of the structure. The actual safe outer perimeter dimensions may change based on the type of structure, effects in use, and conditions.
- Site protection during burning should consist of a minimum of 3 pressurized water extinguishers, the BAMF Fire Apparatus and Draft Tank, and 6 BAMF Fire volunteers. Actual requirements and staffing are dependent on the situation.

General Guidelines

- Structure artists are expected to provide accelerants, and their lighting instrument of choice (8' wooden stick with road flare securely attached is a recommended method). The Fire Art team can advise on choices, but *procurement is an artist responsibility*.
- The artist may light the structure themselves, or ask for assistance from the Fire Art team. In all cases the Fire Art team has discretion on who may light the structure, and may override in cases such as fuel-contaminated clothing, or intoxication. Individuals involved in fueling the sculpture cannot also light the structure.
- Saguaro Man provides Fire volunteers and Rangers for primary perimeter of the art burns, but the artist may serve as an additional perimeter volunteer if desired.
- For burns other than the Temple, the artist is responsible for supplying perimeter volunteers - enough to span the circumference of the perimeter at 10' intervals.

It is an artist responsibility to mind the final burn pile, raking regularly to ensure complete combustion of all wood. Careful tending will result in dramatically easier cleanup. Seek volunteers for this task early - many people like to whittle the night away on a camp-chair near a fire - give this person a rake and shovel and they are your crew!

- Final Leave No Trace planning is an artist responsibility. Removal of ashes and unburned metal or debris is the artist's responsibility.
- Presenting a burn plan is an artist responsibility. Burn plans, at a minimum, will contain the following information:

- Diagram of the sculpture, showing max height and diameter, the inner perimeter (1.5X), and the outer perimeter (2.0X) dimensions, and indicating location where structure is to be lit.
- Team list, including who will be preparing the structure for burning, who will apply fuel to the structure, who is lighting the structure, and who is managing the final burn-down of the ashes for cleanup.
- Accelerant fuel requirements.
- Any special actions needed to prepare the sculpture for burning (adding mementos, removing flame effects, weakening the structure, etc.).
- Proposed timeline for the burn, from closing the sculpture to the public through cleanup. NOTE: Exact timing will get worked out in concert with Conclave, Fire Team and Rangers - the intent of the artist's initial timeline is to capture all of the actions needed, put them in order, and assign a time estimate.

Small Wood-Burning Art (Burn Barrels)

Small wood-burning art refers to burn barrels, burn barrel-like sculptures, extra-large cooking apparatus like smokers or BBQs, and the like. The burning of wood, charcoal, or any other material without an “off” switch is prohibited during any stage of burn ban.

Sculpture Guidelines

- Burn barrels must be fully enclosed - including a metal grate over the top. Cutouts for art are acceptable, as long as they are small enough to contain the fire and major debris. If a metal grate on your fire art is not practical, exceptions may be granted with restrictions such as increased clearing of combustible debris.

- You must bring your own wood. Saguaro Man does not provide wood for burn barrels.
- You must bring your own extinguishing water. 5 gallons *minimum*. This can be as simple as a plastic bucket of water placed near the burn barrel in a visible location. Water is not supplied by Saguaro Man - you must pack in your extinguishing water.
 - An ABC “dry chemical” extinguisher is a helpful addition, but *not sufficient*. Standard extinguishers will NOT put out a burn barrel.
- Burn barrels must be raised at least 4” off the ground, and must be secured to the ground with stakes.

Site Guidelines

- You must clear a 10-foot radius around your barrel of all combustible debris, including dry grass.
- Do not place burn barrels under trees, near tents or near other structures. 10’ clearance should be considered a minimum.
- Burn barrels must be attended at all times. Don’t light it if you aren’t hanging around!
- Burn only wood in your barrel - no cardboard or paper products, please.
- No accelerants, please. If you can’t start a fire in a barrel, find a Boy Scout.
- Keep fires as small as practical - don’t load the thing up if you don’t have to!

Propane Flame Effects

Flame Effects are devices that use pressurized LP (Liquefied Petroleum, AKA Propane) gas to make visible fire, either in the form of gentle flames in a table or fire pit (AKA Static Effects), or big bursts in a “poofer” style effect (AKA Dynamic Effects). Propane flame effects are prohibited during a Stage 2 burn ban, but *may* be allowable during a Stage 1 burn ban, at the discretion of BAMF and the Fire Art team.

Low pressure (less than 10psi) LP devices using off-the-shelf BBQ style regulators and off-the-shelf flow-restrictors do not require special inspections
Devices running high pressure (greater than 10psi) regulators and/or modified or defeated flow restrictors require inspection (photo/verbal or in-person, as needed).

Sculpture Guidelines

- Saguaro Man uses **NFPA 58 “Liquefied Petroleum Gas Code”** and **NFPA 160 “Standard for Use of Flame Effects Before an Audience”** as guidelines for proper design of flame effects.

- Tanks and Pressure Vessels
 - Tanks must be in good condition, have valid stamped certifications, and be fully rated for the pressures they will be exposed to. Tanks should have a valid certification stamp not more than 5 years old, and not more than 12 years from the manufacture date of the tank.

 - Tanks and accumulators should be free of rust (especially the bottom).

 - Welding or modifications to tanks or pressure vessels is not allowed (unless such welds are completed by a certified welder qualified to repair LP tanks).

 - Tanks should not be placed in an environment where they will be exposed to extreme heat.

- Tanks should be secured to prevent tip-overs. Do not modify or remove valve-guards.
- Tank connectors must be listed for use with LP gas.
- Plumbing Systems
 - *1/4-turn ball valves must be provided for rapid shut-off.* At a minimum these valves need to be placed at the tank, and again at the point where the art is operated (if that is a different location than the tank).
 - Fittings and hoses must be fully rated for the pressures they will be exposed to. NOTE: Because unregulated LP tanks can reach over 300psi at high ambient temperatures, this means that standard Schedule 40 steel pipe connectors are not sufficient for connections on the supply-side of your regulator! Schedule 80 steel or high-pressure brass or copper fittings are required on the supply-side of regulators.
 - Pressurized systems must have pressure-rated fittings and pipes. Copper, steel and reinforced flexible LP gas lines are acceptable. PVC or vinyl tubes are not.
 - Pipe and hoses in the pressurized system must not have any welds or modifications. Pipes and hoses in the egress system may have modifications since they are not expected to hold pressure.
 - Copper flexible lines must have flare fittings, not compression.
 - Copper lines may be brazed or silver soldered, but *standard plumbing solder is not sufficient.*
 - Copper flexible lines must be types K, L or ACR for use with LP gas.

- Flexible LP gas hoses must be rated for use with LP gas and the pressures they are exposed to (usually 350 psi max). Listed crimp fittings are acceptable - hose clamps are not. Flexible Hoses should be in good condition without cracking or fraying, and must be kept at least 1' from all egress outlets, and shielded from excessive heat.
- Teflon tape or pipe dope should be listed for use with LP gas (yellow color). All NPT fittings should be taped or doped, but flare fittings must be installed clean.
- Quick Connect fittings must be designed for LP gas, and be of the DESO "Double End Shut-Off" style to hold back pressure on both sides - air-compressor fittings are not generally acceptable because they will release pressure on one side of the fitting when disconnected, potentially venting propane from tanks or accumulators in an unsafe manner.
- Control Systems
 - Controls should always be "fail safe", IE, an electrical fault or loss of power should result in the system shutting down, NOT opening up. Generally, this means NO (normally open) solenoid valves are not acceptable unless there is a backup automatic shutoff.
 - Publicly controllable installations are acceptable, but the individual responsible for the art must be present and supervising.
 - Control systems should be lockable to disable them while not in use. Key-locks, removal of a proprietary battery or control panel are all possible methods.

- **General Guidelines**
 - Pilot systems should be reliable and easy to light.
 - Automatic HVAC-style flame detector/igniter systems are highly recommended.
 - Wind protection for the pilot is highly recommended.
 - If manual re-lighting is necessary, shut down all gas flow and wait 60 seconds before attempting to re-light.
 - Accumulator outlets must be 10' or higher, OR you must stake a suitable perimeter around your effect.
 - Accumulator outlets should always point up, unless a suitably large perimeter is set (and staffed) during operation.

Site Guidelines

- Clear combustible material around your effect to a minimum of 10' radius. Larger effects may require more clear area.
- Place the effect away from trees, tents, structures and overhanging branches. Remember that your poof may emit at a 90 degree angle during windy conditions!
- You must provide ABC extinguishers suitable for your installation. These must be placed away from the main flame effect, but in clear sight of the public (a stranger may be the one to save you!).
- Post "No Smoking" signs around your fuel storage area.
- Portable effects are allowed as long as clear areas are chosen for operation, the effects are aimed safely (straight up), and clear over people's heads and surrounding structures.
- Operators must be sober!