

## **SAFETY IN THE PITS**

**By Scott Cohen**

**As more and more homeowners and commercial property owners seek to enhance the outdoor experience, a new generation of fire features has emerged with renewed popularity. Among the most popular, fire pits provide an opportunity for close interaction with the flames, explains Scott Cohen, owner of The Green Scene Landscaping and Pools, a licensed contractor in landscape, swimming pool, and general construction. With that proximity comes not only excitement, he says, but also the need to create systems that minimize risk of injury.**

It's strange to consider fire pits in terms of being some kind of new trend. After all, human beings have been gathering around outdoor fires since the dawn of our species. Just as water holds an almost hypnotic or even spiritual appeal, so too there's something about fire that is pre-wired within our psyche.

In terms of exterior design, although fire pits have been around a long time, there's no question that over the past few years, we've seen a dramatic uptick in their use in both residential and commercial settings, along with outdoor fireplaces and fire bowls.

Fire pits in particular are attractive to many clients in the way they provide gathering places, destinations, and focal points within a given setting. Whether it's waiting for a table at a restaurant enjoying a cocktail or roasting marshmallows poolside, people love to put their feet up and warm their toes while enjoying the fire's almost hypnotic visual dance.

What's interesting is that despite their widespread use, there's a surprising lack of standards and regulations regarding fire pit design. There are plenty of rules governing the manufacturer of components and natural gas service lines, but when it comes to how fire pits themselves are designed and built, there's not much to go by.

As a contractor who's had extensive experience with all types of fire features, across a range of residential and commercial settings, and as an expert witness in situations where something's gone terribly wrong, I'd like to share some of the basic guidelines I use to maximize both safety and enjoyment of fire pits.

As is the case with so many exterior design issues, hitting the right marks is mostly a matter of common sense.

## **MINDFUL MEASURES**

Let's start with a brief look at some basic measures that help minimize risks in fire pit operation in both residential and commercial settings. It bears mentioning that with fire, as with water, there is always an element of risk, and it's impossible to design with every remote possibility in mind. The fact is, sometimes people do careless things that lead to injury. That said, we can still set things up so that there is less risk for people who use their features appropriately.

**[] Fire-Ready Materials:** A big issue I see in fire pits is that they're built only using CMUs, which are not designed for use with fire. The aggregates will heat up and expand and might potentially pop or explode. I assert that *all* fire pits should be lined with firebrick and fire clay mortar. These materials are the same as those used in a kiln and various types of furnaces. They are fired during the manufacturing process and are designed to provide insulation over a range of temperatures.

The same holds true for the materials you use to fill the fire pit. Whether stone or glass, you should *always* use materials designed for high temperatures. Not all recycled glass is suitable to be installed in a fire-pit.

**[] Manual Control:** In spite of the fact that we live in a time where fire feature systems can include automated control, I still advocate use of the old-fashion manual key valve to control the flow of gas. The reason being, the person holding the key is responsible for the height of the flames. He or she can set the flames relative to the wind conditions or how many people will be around the flame or the nature of the gathering. (It's probably smart to maintain low flames when hosting a gathering of small children or inebriated adults.) The idea is to prevent the flame from blowing into the surrounding area, which might, for example, set fire to a woman's sundress or singe a child who comes too close or set someone's hair on fire.

For fire features that are set in locations where there's very little or no chance of human contact – a fire bowl set on a pilaster on a vanishing edge, for example -- there's less of an issue with having a preset flame height or on/off schedules. There, an automated control may be appropriate. But with a fire pit where people come within a few inches of the flame, having the ability to manually raise and lower the flame on the spot provides an extremely important element of safety.

I advise both residential and commercial clients to designate someone responsible for the fire pit operation whenever the flame is lit. Possession of the key itself is a nice clear way to establish that expectation.

**[] Proper Spacing:** The dimensions of the pit will go a long way in determining the proximity of people to the flames. You should always maintain at least four inches clearance between the burner assembly and the edge of your coping. For rings where people will put up their feet or set drinks, I recommend a minimum 12-inch wide coping.

I also like to build raised pits to 10-12 inches above the deck, perfect footrest height. There's a tendency for some to raise the coping surface to 18 inches, which is standard bench height. When you put your feet up on an 18-inch raised surface, it's likely that your toes will get numb, which can present a safety hazard if your shoes get over heated or catch fire. Only build your fire-pits at 18 inches tall if it is your intention that guests sit directly on the coping of the fire feature. In that instance the coping width should be 16-18 inches wide (standard seat depth) to ensure clearance from the flames.

**[] Burner Installation:** Fire elements have changed over the past few years. Not long ago there was a debate as to whether or not you installed fire rings with the holes pointing

up or down. Pointing up could lead to water entering the manifold. Flipping the ring over solved that problem but lead to uneven flame distribution.

Fortunately, these days, manufacturers make units that can be installed upward but also allow water to drain from the tubing.

An important caveat: Unless you are a licensed plumber, don't try to make your own burner assembly. Manufacturers do follow specific guidelines critical to proper function and safety. Always read and follow manufacturers' installation instructions. Using a product manufactured by a reputable company that specializes in such products relieves you of some of the liability associated with the construction of fire features.

## **PUBLIC SAFETY**

As mentioned above, fire pits are no longer just for the home backyard. Fire pits, fire bowls and fire conversation pits are growing in popularity in hotels, restaurants, bars, and poolside decks. The romantic ambiance of the dancing flames provides warmth and light, as well as encourages conversation and relaxation. Restaurant owners have learned that patrons don't mind waiting a little longer for a table while sitting around fire features, while bar and club owners know that that the warm glow of an outdoor fire pit prolongs the cocktail hours, which translates directly into profits.

The problem is that if the fire feature is not built or managed correctly, guests can inadvertently catch fire, resulting in very serious burn injuries -- or worse.

I know personally how potentially dangerous fire features are, especially in commercial settings. In the course of my practice as a construction expert witness, I've investigated incidents where patrons' clothing and hair have caught fire, resulting in months of burn treatments, discomfort, and permanent scarring. Naturally all of which translates into expensive lawsuits and hundreds of thousands of dollars in medical bills.

Commercial fire pits are more susceptible to accidents than residential fire features and only with proper planning, design and construction, can liability exposure be greatly reduced.

Let's begin with the control issue. At my own home I have a large outdoor fire pit that I enjoy often with family and friends. There I take my own advice, listed just above, and control the flame using a manual keyed valve. We take into consideration the wind, number, and age of guests when setting the height of the flame. It is enjoyed in a controlled environment and the burning flame is never left unattended.

Commercial fire features are different. They are exposed to a large population and are largely unattended and left unprotected from mischievous children who might touch the hot coals or toss flammable material in, or even from inebriated patrons who might pull any number of poorly calculated stunts. After all, commercial fire pits are often placed in proximity to a bar where adult guests may well be distracted and/or drunk.

Because of these added hazards, I recommend a protective clear shield be placed around commercial fire pits. Indeed, many architects design commercial fire features with a low protective glass (or Pyrex) shield around the feature, which provides a barrier to children's hands, limits the wind's influence on the feature, and greatly reduces the chance that clothing may accidentally enter the fire zone and catch. Clear shields do not distract from the ambiance of the feature, warmth is still provided, and they protect against wind related problems.

Because residential fire-pits are in a controlled environment and mostly supervised by the home-owner, I don't believe a shield is appropriate. Also, a shield impedes the ability of homeowners to roast marshmallows and hot dogs, a favorite family ritual.

It's critical that personnel be trained on the proper operation and maintenance of the fire feature and the safety hazards associated with wind and crowds. If an accident does occur, personnel should be trained how to properly use a fire extinguisher, and other emergency procedures for help. Also, it's my view that anywhere you have a fire feature, residential or commercial, a fire extinguisher (or swimming pool) should be located nearby, visible and maintained in operating condition.

Also in my opinion, in commercial settings it's the management's responsibility to monitor fire features and maintain gas ring burners, valves and lines. Certainly some responsibility lies with the guest – we learn early in life to respect fire and that it is dangerous to get too close -- but, guests of any public establishment like a hotel or restaurant make the reasonable assumption that the space is a safe environment, and that special care has been taken to protect visitors from harm.

As such, their guard may be down, and injuries can result.

## **Side Bar**

### **In Greater Detail**

As mentioned in the adjoining text, there is limited available information about the proper design and construction of outdoor fire features, which is what prompted me to write *Scott Cohen's Outdoor Fireplaces and Fire-Pits* (available at [OutdoorFireplaceDesignIdeas.com](http://OutdoorFireplaceDesignIdeas.com) or [Amazon.com](http://Amazon.com)). The book includes construction diagrams, layout and safety tips, and many color photographs and diagrams.

**About the Author:** Scott Cohen is owner of The Green Scene Landscaping and Pools, a licensed contractor in landscape, swimming pool, and general construction. He offers landscape design, and construction defect expert witness services nationwide, and has served as an expert witness for the CSLB for over a decade.

A 3 time Masters of Design Award winner, Scott has been featured on several television shows and published in numerous local and national print media. He is the award-winning author of *The Candid Contractor*, *Outdoor Fireplaces and Fire Pits*, *Poolsapes*, *The Big Book of BBQ Plans*, *Scott Cohen's Outdoor Kitchen Design Workbook*, and *Petscaping*.