by **W**alter **L**umpp

Sandblasting SAVES TIME *and* MONEY

Sandblasting can save structural lumber and help eliminate smoke odor in badly-damaged buildings.

Sandblasting, properly done, can save the property owner and insurance company both time and money in insurance reconstruction. As part of a three-step procedure (sandblasting, odor treatment, resinous sealer), it can also assist in *guaranteeing* that the odors of a fire will not become a future reminder of the owner's loss.

The cleaning of heavy smoke residue and char from structural lumber after a fire can be a time consuming and labor intensive operation. On the other hand, if the smoke and/or fire damage is extensive, and has seeped into cracks and crevices which are difficult to reach by hand, sandblasting might be a better choice.

It's important to note, however, that sandblasting is not a cure-all in reconstruction. It does change the appearance of the surface being sandblasted, and the changed appearance may not be acceptable to the client. Its use is not recommended on finished wood-trim, sun-cured or fire brick, or on historic properties.

One of the best applications of sandblasting might be in those areas in which structural members have been -badly burned and might normally have to be removed and replaced. Through the process of sandblasting, the char can be removed, the smoke residue eliminated, and an additional member can then be laminated to the existing member. The important feature is that it can be accomplished without disturbing the surfaces adjacent to it. Removing a structural member or two may not present a difficult problem; however, removing an entire ceiling joist system, for instance, may result in damaging areas that were not necessarily affected by the fire.

Let's take, for example, a first floor room in which the ceiling joists have sustained enough damage to require their replacement because the structural lumber has been charred more than 1/4 inch in depth (see Figure 1). The Code says that these members must be replaced since they no longer have the same strength and size for which their load-bearing capacity was designed. Those same ceiling joists may be covered with plywood that sustained only smoke damage. That plywood may be the subfloor to a hardwood floor that sustained no damage whatsoever. To further complicate the situation, the hardwood floor may be the finished floor of a second floor bedroom, which is tied into interior partitions, moldings and wall coverings that were not affected by the fire either. It's easy to see that removing and replacing the damaged ceiling joists would therefore affect many of the finished surfaces above the subfloor.

This would be an ideal opportunity to use sandblasting. Through this procedure, the contractor can remove the char, eliminate the smoke residue, and an additional member can then be laminated to the existing member. In this way, the old joists do not have to be removed. The procedure of laminating the new member to the old is referred to as "sistering," and would yield a structural load bearing capacity of *almost twice* the original member (see Figure 2). The most important feature is that it can be accomplished without disturbing the surfaces adjacent to it. This example was an actual job handled by our company, and the cost savings to the customer amounted to $1,920.

It is extremely important for the contractor to make every effort to offer guidance in evaluating where sandblasting will produce the desired results. In addition to using sandblasting to clean structural lumber, there are a number of other surfaces that can be cleaned in this manner, such as structural and ornamental steel, metal decking and siding, steel tanks and containers, cement block, brick and stone. Each of these surfaces will have special requirements that will need to be addressed to insure the success of the procedure. For instance, if you are considering sandblasting brick, and the brick has an applied finish such as a sand finish, paint, or even glazing, these finishes will be removed or significantly changed in appearance in the sandblasting process. If the removal of the finish does not create a problem, the difference in appearance can be compensated for by lightly sandblasting the remaining brick after the damaged brick has been sandblasted.

One type of brick that should not be sandblasted under any circumstance is "sunbaked" brick. This brick was probably made before 1900, and because it was allowed to dry in the sun, this curing process caused the outer surface of the clay to become hard to the depth of only 1/16 to 1/8 inch. The process of sandblasting could remove this hardened shell, exposing the soft powdery interior of the brick to the elements. If this happens, in a very short period of time the brick will erode, hollowing out the interior of the brick, which eventually results in structural failure. For those interested in historical restoration, the penalty for violating this requirement is the automatic loss of any and all historical tax benefits on that property.

Let's look at another example of how sandblasting can save time and money. Recently, one of our dealers was involved in a job that required the replacement of an exterior studwall connected to a brick veneer. The problem facing him was to remove the charred studs without losing the wall ties. The Code says there must be at least one wall tie for every 16 inches vertically and for every 24 inches horizontally. If more than one or two studs must be removed, the Code can require you to remove and replace the brick in order to replace the wall ties. As our dealer and his staff checked out the damaged area to determine how many studs had been damaged, they recognized the possibility that smoke and odor may have also seeped into the cavity between the wall sheathing and the backside of the brick veneer. From experience they know that this could become a source of odor problems in the future. After removing just a section of the sheathing, they could see that their suspicions were correct (see Figure 3). The rest of the sheathing was removed, and both the brick and the studs were sandblasted to remove the smoke residue and char. New studs were then sistered to the sandblasted studs, and the entire area was treated for odor before the new sheathing was installed. Not only was the contractor able to eliminate the possibility of smoke odor, but he was also able to save the wall ties. The cost savings that resulted from this procedure amounted to $6,350.

An entirely different application of sandblasting can be seen in Figures 4 and 5. The central hallway of the McGuffy Art Center in Charlottesville, Virginia was badly damaged during a fire. Fortunately, the damage to the plaster walls was only to the top layer or white coat. We were able to remove this damaged portion of the white coat by sandblasting at a low pressure level. The area was then treated for odor, and a bonding compound was applied to the sandblasted surface. This was followed by a new white coat of plaster and finally the repaired wall was painted with a resinous sealer. A special note: the resinous sealer must not be put on before either the bonding agent or the new white coat of plaster has been applied. The reason for this is that the sealer has a molecular structure which will keep the white coat of plaster from adhering to the sandblasted surface. Again the cost savings were substantial—$6,982 in the hallway alone.

Although sandblasting is the first and very important step in this three-step procedure, the other steps must also be followed to insure a successful reconstruction. The second step is to treat for odor. There are a number of ways to do this and there is no excuse for odor to be present in a structure after the work is completed.

After all charred debris has been removed, it is important to seal the

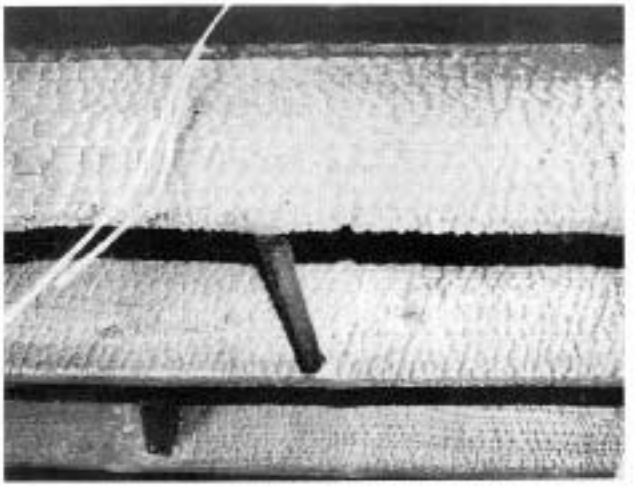

Fig 1. Charring of structural lumber to more than 1/4 inch depth ordinarily warrants replacement of ceiling joists.

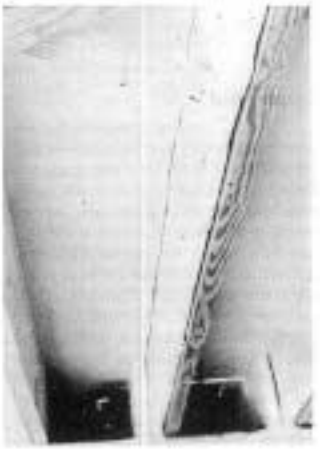

Fig. 2. Sandblasting charred lumber and laminating new structural member to old is a cost-effective alternative to replacement of ceiling joists.

Fig. 3. Sandblasting removes smoke residue and char in cavity between wall

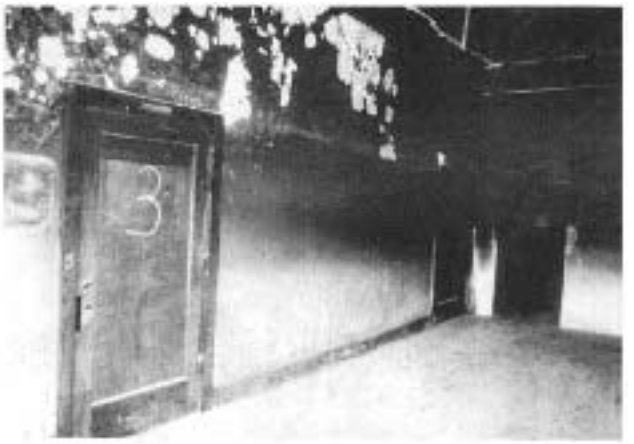

Fig. 4. The central hallway of the McGuffy Art Center in Charlottesville, Virginia was badly damaged during a fire.

Fig. 5. Sandblasting removed damaged portion of walls. Bonding compound was applied, followed by new coat of plaster and resinous sealer.

structure from the elements and raise the temperature inside the building before starting the odor treatment. Among the many ways to remove odor, we have found that neutralizing it by wet fogging, dry fogging, or electrically by ozone, to be the most effective way to accomplish this. Provided the area producing the odor can be reached, it is possible to remove the odor *permanently.*

The final step in this three-part reconstruction process involves the application of a resinous sealer. This type of sealer-primer hides stains and primes the surface. In addition to preventing stains from bleeding through, the resinous sealer insures that any odor particles that may have escaped the source removal and neutralization process will be prohibited from causing problems by being covered and sealed.

Unfortunately, however, this material cannot be used on all types of surfaces. Resinous sealers have very poor bonding properties on non-porous surfaces. If it is applied to metal, for instance, it may quickly "pop off" when there is a change in temperature.

For those surfaces that can be covered, the sealer may be applied by brush, roller or by spraying. One important point—you must complete an entire section once you start. You cannot spot seal. Usually the entire job of primer and top coat can be completed in one day because it is very fast drying.

From our experiences, these three steps—sandblasting, odor treatment and applying a resinous sealer—have resulted in one of the most successful and cost effective reconstruction procedures.

To experience a fire disaster is traumatic enough for a family, but to be reminded of it months later by a faint odor of smoke that creeps out in rainy or damp weather is more than most people will tolerate. Today's consumer looks to the reconstruction contractor to make sure that no smoke odor will persist.

We feel strongly that it is time for a *written* no smoke odor guarantee to be provided, not only to the consumer, but to the insurance industry as well. We have already done this and we are hopeful that other responsible contractors will follow suit. ■

Don't under any circumstances sandblast "sunbaked" brick. It would remove its hard shell, and expose the soft powdery interior of the brick to the elements.

Walter L. Lumpp is the founder and president of Forest Hill Enterprises, Inc., an organization of insurance reconstruction specialists located in Charlottesville, Virginia. *This article is reprinted with permission from the October 1986 issue of* Cleaning and Restoration Magazine, *published by ASCR International, Falls Church, Virginia.*