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February 26, 2009

**RE: Severe Ice Damage to HTL Lining System  
Creating Serious Threat to the Safety / Life of Personnel**

Dear Customer:

After nearly 18 years of incident free experience and nearly two hundred installations of our structural thermal lining system, System 203, we have experienced a serious failure of the system, caused not by fire, nor the thermal shock associated with live fire training, but caused by the tremendous forces created when water freezes to ice.

For the first time, we have seen portions of our system fail as a result of this condition at three burn buildings over the last few months. In all three cases, water leaked through cracks in structural slabs in sufficient quantities to saturate the insulation behind our fire tiles. And, with the hard freezes we experienced in Pennsylvania and New York, that water turned to ice, causing the insulation to expand. When water turns to ice, it expands in volume by 10%, and creates thousands of pounds of pressure per square inch. This pressure tore our concrete tiles apart in the isolated areas of the water leaks. See pictures on attached drawing. The anchors supporting the tile did not fail. Instead, the concrete tile failed in tension, causing a cone shaped spall in the back of the unit. See the attached drawing showing the types of failures we found when repairing this damage.

We are making you aware of this condition to encourage you to inspect your building in an attempt to detect the existence of this type of damage. We are primarily concerned that it may not be easy to detect the condition if the heaving action of the developing ice only cracks the tile, but does not cause a complete failure. Such a condition could result in a future failure when the lining expands and contracts with fire training. This would be a condition that could threaten the safety and/or life of training personnel.

Please keep in mind that HTL has always advised Owners of the importance of making the structures resistant to allowing any water behind our lining. Further, HTL always checks for leaks or signs of water before lining any existing structure, and we ask that any leaking structure be corrected before we install our product. Consequently, we have gone for 18 years without this type of failure. Further, all three of the subject projects were recently completed, which might indicate that, if your building has already gone through many winters without an issue your structure could be less likely to have a problem. Regardless, HTL and all Owners of live fire training structures must be diligent about continuously inspecting all structures to address potential problems that may exist.

We believe that the potential for this type of problem is far greater in an old structure that has been repaired and lined, than in one of the new structures that has been designed to shed water and was never subjected to live fire training without the lining system in place. Of course, if you are lucky enough to be in a climate that does not see continuous freezing temperatures, you will not have a problem.

**HIGH TEMPERATURE LININGS  
ICE DAMAGED LININGS  
February 26, 2009**

As HTL has been confronted only recently with this issue, we have limited experience in understanding what signs to look for to definitively detect this problem. But we are offering the following advice.

You should inspect your building on a regular basis. NFPA 1403 requires that the structure be inspected before each training day. But with respect to this issue, we encourage you to perform special inspections to look for specific signs of this condition.

**WHAT TO LOOK FOR**

1. Any obvious damp and/or wet ceilings or walls that is not associated with training. Perhaps a ceiling area is damp days after training, when the rest of the ceiling has dried out.
2. Any ceiling or wall that appears markedly damper or wetter than the surrounding areas.
3. Any build up of white powder on the fire tiles. This is called efflorescence and is a pretty sure sign that water is building up behind the lining.
4. From the top of slabs, any open cracks, expansion joints, or holes that look like they could be a potential leak behind the linings. If these are found, inspect the lining directly under the slab with this condition.
5. Any hump or deflection in the ceiling lining. Note that there are almost always individual fire tiles that are slightly thicker than adjacent tiles and therefore hang down slightly more (1/16" to 1/8"), and that is not an issue. But if you detect a group of tiles that all seem to be hanging lower than the surrounding ceiling, like a hump or deflection in the ceiling, that might indicate a problem.

**WHAT TO DO**

If you detect any of the above, you should inspect the lining in (or below) the area of concern. Please feel free to contact either of the two HTL personnel listed below for any questions you may have with the following. Wearing appropriate construction safety equipment (goggles, hardhats, gloves and steel toe boots), we recommend that a rolling scaffold be erected and that two people perform the inspection.

First, simply push on the tiles to see if they appear to be intact or not. Note that all tiles in our system are intended to be somewhat loose, and will "rattle" when struck with your hand. That is normal and is necessary for the system to "float" with the high temperatures and thermal shock that is associated with live fire training. If the units obviously appear to be damaged, stop, and call HTL. The room should be shut down until the issue is resolved.

If the tiles appear to be intact, choose a unit of concern and carefully remove the bolt hole mortar material with a hammer and a flat head screw driver. Work at an angle to the face of the tile rather than hammering straight into the plug material. If you hammer straight into the ceiling, you can crack the tile with the impact of the blow.

With the plug material removed, remove the nut and washer (for 2" tiles), or the concrete screw and washer (for the 1 1/2" tiles) and inspect the bottom of the countersunk bolt hole. Check to see if the tile has a crack around the bottom of the counter-sink hole. If you see that type of crack, you have a problem and should close that room and contact HTL. Note that in the middle of a field of tiles, each tile is supported by its anchor and the adjacent tiles that overlap that tile; so the anchor can be removed without concern. However, a tile at the end of a ceiling or wall panel might be supported only by its own anchor. Always replace the anchor before checking the next tile. Using this method

**HIGH TEMPERATURE LININGS  
ICE DAMAGED LININGS  
February 26, 2009**

one may check a group of tiles in the area of concern. We suggest checking at least nine to sixteen units, an area measuring 3'x3' to 4'x4.

If you do not see that problem, and if the tiles appear to be intact, then you probably do not have tiles damaged due to ice. However, you were attracted to that area of the lining for a reason; so that issue must still be addressed. If you have efflorescence or dampness, we recommend that you contact HTL for further advice.

Finally, if you are still not sure whether you have this problem, we recommend that you burn in the affected area a few times without personnel entering the room. Heating and cooling the lining will cause it to expand and contract. This movement might reveal an issue.

HTL does not wish to overly concern you, because we have gone for eighteen years without this, or any other type of problem. Nevertheless, we feel that we would be negligent if we did not take a proactive approach with such a problem. Please take this issue seriously and take an active role in identifying areas that might be of concern.

Again, the older your structure was when it was lined, the higher the likelihood of a problem. Of course, if your lining has been in place for many years, you probably do not have to be concerned, but we still ask that you be diligent in inspecting the structure.

Over the next few months, HTL will be performing our own inspections of buildings that we consider to be higher risks for this type of problem. Such inspections will be conducted without charge to the customer. In the meantime, if you are concerned with your structure, please advise us and we will take action to address your concerns. Do not hesitate to call.

Finally, HTL is developing a maintenance service that will be offered to existing customers which will include annual visits to check for problems like this and to perform routine maintenance. Let us know if you are interested in this service.

Thank you for your time in addressing this important issue and please let us know if we can be of assistance.

**CONTACTS:** Feel free to contact us 24 / 7 / 365.

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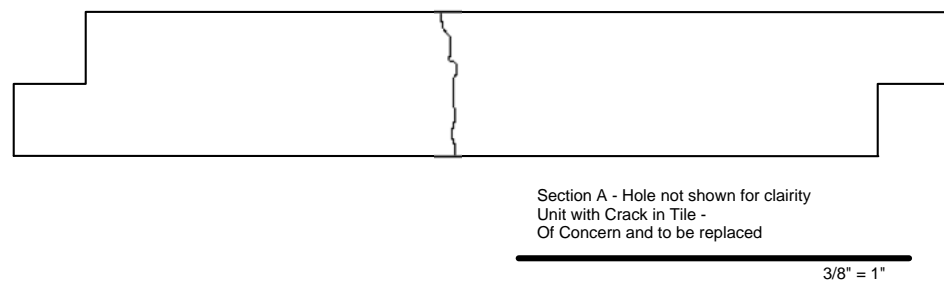
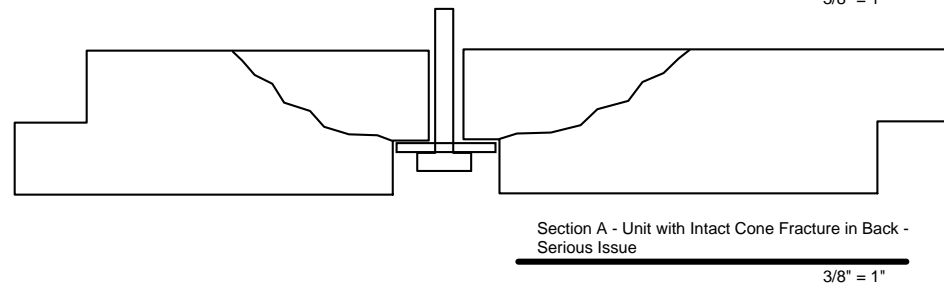
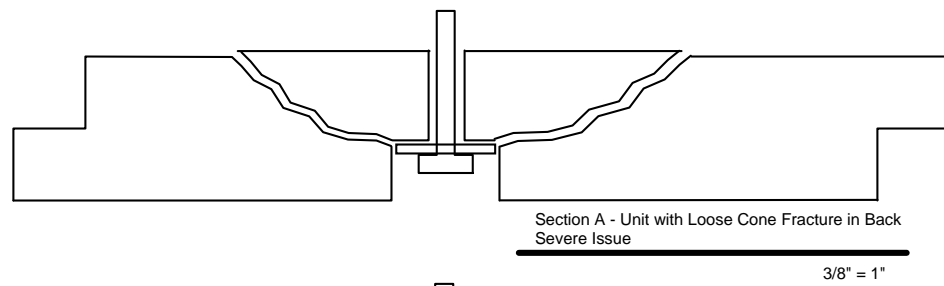
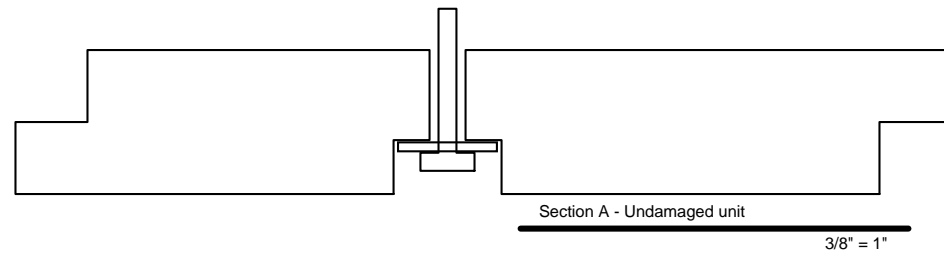
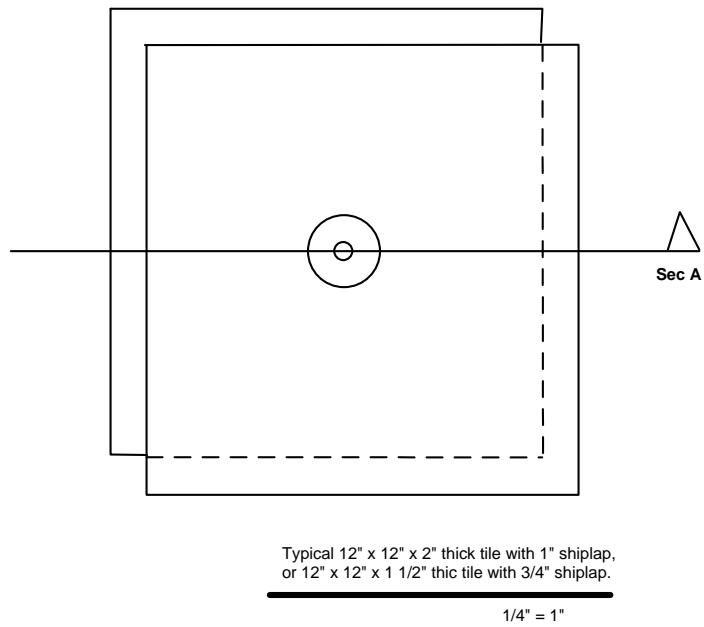
Jackie Cunningham  
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Sincerely,

**HIGH TEMPERATURE LININGS**



William E. Glover



Anchor is no longer supporting tile. This is a severe issue and room should be closed off until leaks are corrected and repairs are completed. Problem might be identified by dampness, the existence of efflorescence and/or a gap, or a crack that can be seen around the bottom of the bolt hole after the washer has been removed.

Anchor is still supporting tile but the tile has little strength left. Room should be closed off until leaks are corrected and repairs are completed. Problem might be identified by dampness, the existence of efflorescence and/or a crack that can be seen around the bottom of the bolt hole after the washer has been removed.

This tile is still supported by the anchor and the tile is able to support itself. You cannot detect this crack by inspecting the bolt hole. However, this crack only occurs if the adjacent tiles have been pushed away from the ceiling by the ice and "pry" against this tile, causing the crack. This tile will be found and replaced during the process to replace those tile with cone cracks shown above.



**HIGH TEMPERATURE LININGS**

**TYPES OF TILE FAILURES CAUSED BY EXPANSION OF ICE BEHIND LINING**

**WEG**                      **02/26/2009**