



High Temperature Linings Estimate Notes

Thank you for requesting budgeting services from High Temperature Linings (HTL). This free service is offered to assist fire training divisions in developing realistic estimates to repair, renovate or construct new live fire training structures (LFTS).

High Temperature Linings is a division of E. H. Glover Inc., a commercial general construction firm that has constructed hundreds of commercial structures since 1949. Our professional construction experience offers a valuable resource as you proceed with your plans to build a first class live fire training structure.

*Our clients are located all over the world! HTL therefore cannot actually construct most of the structures we work on. It simply does not make sense for us to manage a small construction project in Georgia, Washington State or Amsterdam from Fairfax, VA. However, we can offer our design and construction expertise to you to support and guide you in this process. We have developed a unique design approach to LFTSs that utilizes capital improvement funds most efficiently. Our designs offer a safe training structure while balancing your initial construction cost with your long term maintenance expenses (life cycle costing). We fully protect the structural components of the structure (interior columns and ceilings) with our advanced lining **System 203** which is quickly becoming the "standard" for progressive live fire training structures.*

*To control your initial cost, we design our facilities to minimize structural components requiring protection with **System 203** as this lining is expensive (\$55 to \$65 per square foot, installed). Indeed, our designs make sense for any lining system you choose as all linings are relatively expensive (\$20 to \$65) and will represent a major cost component for your project. To minimize this expense, our designs utilize exposed non-load-bearing concrete masonry exterior walls and interior partitions. Concrete masonry (CMU) walls, especially lightweight units, have proven to last for years without serious failure if they are non-load-bearing. We have inspected hundreds of burn buildings over the years to make this observation. CMU walls can be easily demolished and replaced as necessary (five to ten years in burn areas) for a cost of about \$15 per square foot. It therefore does not make sense to spend \$60 for one side or \$120 for both sides to line such a wall as long as it is a non-structural element of the building.*

*If the attached estimate is for a new building, we have lined all interior columns and ceilings with **System 203**. We have estimated to install fire brick on all floors. This "loose laid" fire brick provides excellent thermal shock protection for your concrete floors and can be easily repaired as necessary. Again, all walls are non-load-bearing CMU.*

We include very limited site development. We anticipate that you will provide a level site with adequate soils (capable of supporting 2500 pounds per square foot). We assume work will begin on a level prepared "pad". The estimate includes the structure, linings, temperature monitoring and a lightly reinforced eight inch thick concrete apron around the building. The apron sits on eight inches of stone base and extends 15' out from the exterior building walls.

HIGH TEMPERATURE LININGS ESTIMATE NOTES

Created on 4.13.01

Page 2 of 2



We do not include site utilities (water, storm or sanitary sewer) and we do not include electric service to the building. We do include \$5,000 to hire an electrician to install an electric panel, a light in the temperature monitoring room and power to the temperature monitoring system. This assumes someone else brings power into the building. We also normally include a temperature monitoring system that will measure and record temperatures in each burn room and those temperatures that “soak” through the protective lining system to the structural components. This system serves as a “watch dog” to monitor operations in the structure to ensure adherence to standard operating procedures.

If the attached estimate is for the renovation of an existing structure, please discuss the estimate in detail with HTL to understand the scope of work included as our recommendations vary dramatically from one structure to the next depending upon the type of construction and it’s use.

*Finally, we are providing this information to you as a free service. The estimates, especially for new construction, are designed to provide a reasonably accurate projection of what it will cost you to retain an engineer to develop working drawings and to hire a general contractor to construct the LFTS, including our products (**System 203** and temperature monitoring system (if desired)). We cannot be held responsible should your actual costs vary from this estimate. However, we have found our estimates to be accurate across the country as we do adjust the estimates to reflect the regional wage scales as needed. We are usually within 10% up or down. We have therefore included a 5% to 10% contingency allowance.*

We strongly encourage you to discuss this information in detail with HTL and your committee members. This communication will help to avoid unpleasant surprises or misunderstandings.

Thank you for your interest in our work and good luck with your project!