



## INNOVATION DESCRIPTION

### The FlexLock Wall System

2007 NOVA Awards, Sheet 2

**I. What Is the Innovation?** The FlexLock® Wall System is a complete mortarless, groutless, dry-stack, post-tensioned masonry wall system designed for residential, commercial, and industrial load-bearing structures.

**II. Why Is it Innovative?** Unlike other post-tensioned systems that use mortar between the head and bed joints, and unlike other dry-stack systems that grout the cores, FlexLock® uses neither mortar (with the exception of the first course) or grout. Instead, the units are sized using a calibration process that employs lasers to ensure that the end product meets the required tolerance. These units are then dry-stacked around all-thread steel tendons. At the top of the wall, a bond beam is poured and the structure is post-tensioned. This multi-patented technology (utility patents: 5,899,040, 6,224,009, 6,758,020; design patents: D463,040, D476,749) is also innovative in the following respects:

- **Dramatically Increases Productivity and Profitability** Both independent analysis and experience in the field prove that, using FlexLock®, total masonry costs decline by 24% and productivity increases by 106% (see full report: <http://www.cercorp.com/house%20cost%20analysis.htm>).
- **Configures Itself to the Changing Labor Pool** According to the Bureau of Labor Statistics (BLS), masons held 177,000 jobs in the year 2004. Approximately one-third or 59,000 of these masons are at retirement age. To quote BLS: "In some areas there are not enough applicants for the skilled masonry jobs to replace those that are leaving." Beyond this, the BLS anticipates a gradual increase in the amount of masons needed each year. Although FlexLock® requires a mason to lay the first course and QA the job, apprentices or unskilled workers can dry-stack the walls. Thus, FlexLock® applies a unique technological solution to a socio-economic labor problem.
- **Super Strong** Structural tests performed by the National Concrete Masonry Association demonstrate that FlexLock® has three to four times the reserve strength of standard masonry.
- **All Season Construction** FlexLock®'s unique post-tensioned substantially reduces cementitious material and thus enables contractors in northern climates to build later in the winter and earlier in the spring.
- **Integrated Technological Advancements** Beyond the technological advances in post-tensioning masonry, FlexLock® has also pushed manufacturing technology by pioneering masonry grinding for structural purposes, and the use of multiple lasers for quality control. The post-tensioning and manufacturing advances are complemented by system advances. The recently published *Mason's Guide to the FlexLock® Wall System* is a comprehensive manual that describes in detail masonry construction using hundreds of illustrations and drawings. This is further enhanced by a complete quality assurance program and mason certification program supplemented by 3D computer animations.

**III. What Did it Change or Replace?** Standard concrete masonry unit (CMU) construction.

**IV. Where and When it Originated?** The concept for FlexLock® originated in Ohio in 1996 out of the need to maintain masonry markets that were threatened by an ever-decreasing skilled workforce.

**V. Is it Expected to Be Used in the Future?** After years of research and development, FlexLock® is used in Texas and is currently being rolled out throughout the country. Beyond its commercial use, the cost savings, productivity, and strength aspects of the system is expected to make FlexLock® applicable to rebuilding the gulf coast. Innovative hurricane resistant variants can be seen at <http://www.cercorp.com/hrsystem.htm>. Finally, based on dynamic structural tests, FlexLock's unique ability to absorb external loads makes it also applicable to seismic regions.



**8" FlexLock Units**

## INNOVATION ILLUSTRATIONS

The FlexLock Wall System

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