# LifeGuard™ Structures

LifeGuard™ is the only protection available to all people and organizations that provides structural mitigation and non-structural mitigation in a cost effective, attractive and functional form.

Multi-hazard protection *including* complete building collapse for between 1% and 10% of the cost of other forms of mitigation.

EDUCATION • OFFICE • GOVERNMENT • RESIDENTIAL • WAREHOUSE

## PROBLEM

Millions of people are in locations that have high seismic risk and are unable to rebuild, retrofit or vacate. Many of these same people are unaware of the risks they face.

Modern advances in computer modeling, instrumentation and imaging have allowed scientists to form a clear picture of the seismic risks facing many citizens in the U.S. and abroad. The current U.S. infrastructure and building inventory has never been tested by a very large quake. Buildings may have been through quakes, but *no two quakes are the same*. With knowledge that the U.S. is facing a series of unprecedented large quakes, the pressure to mitigate the volume of risk is accelerating.

There is a wide array of mitigation techniques available, however, their effectiveness has been traditionally relative to their cost. Until recently, a large unaddressed "gap" in the mitigation puzzle has existed.

To compound the problem, mitigation options vary with level of control, *do you own the building or are you a tenant?* Are you an employee with no control?

## PREVIOUS OPTIONS

Traditional methods of mitigation have a wide range from non-structural to structural, from basic strapping systems to seismic retrofit and ultimately reconstruction.

Decision variables to retrofitting or reconstruction include:

- Access to capital
- Level of asset control
- Zoning and code conformance
- Temporary relocation

IF YOU DON'T OWN THE BUILDING, OR CANNOT AFFORD RETROFIT OR RECONSTRUCTION, THERE HAVE BEEN NO OPTIONS... UNTIL NOW.

*"In the Western United States alone, there are an estimated 400,000 buildings and 9 million people at risk from the structures that they live or work in during a large earthquake. There are countless more at risk from non-structural components and contents."*

## LIFEGUARD™ GOALS

LifeGuard™ Structures endeavored to find a solution to bridge the large gap between inexpensive small scale mitigation such as seismic straps and expensive large scale prevention such as seismic retrofit or reconstruction.

It was determined that any solution would need to:

- Be effective at protecting people against the building contents and the building itself should it collapse
- Be able to be implemented by any organization or individual whether they own their building or not
- Be affordable
- Compliment existing policies and procedures and ideally would require little to no additional training
- Be easy to install and not cause a displacement of the current use

## SOLUTION

A single device that mitigates the entire range of risks in a cost effective, easy to implement and useful form.

LifeGuard™ Bridges the Gap.

## LIFEGUARD™ TYPES

LifeGuards™ are utilized in a variety of forms with the most basic being desks and workstation "inserts." Although in some cases they may be built in, LifeGuards™ are primarily portable devices.

The LifeGuard™ receives a "skin" allowing it to look like a normal piece of office or home decor. LifeGuards™ can be owned by organizations or individuals, remaining with the structure as a tenant improvement or be taken with should relocation be required.

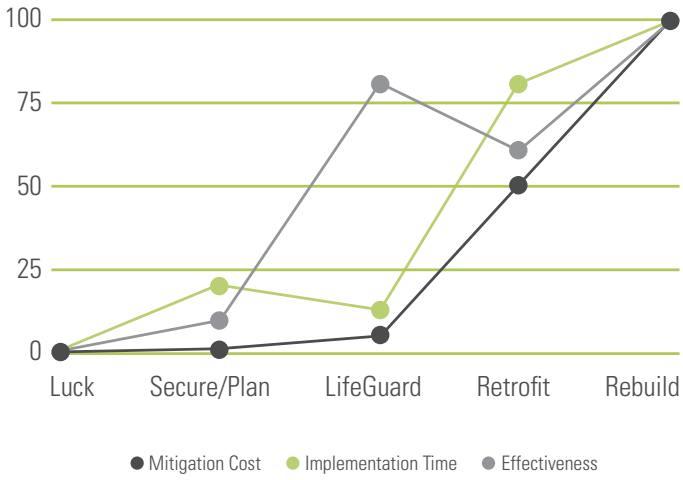
Types of Lifeguards:

- Desks
- Consoles
- Conference Tables
- Credenzas
- Work Station Inserts
- And More...

Ancillary benefits include:

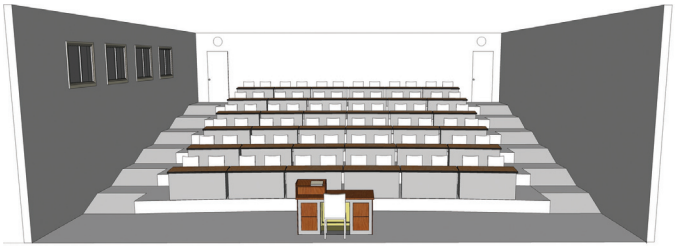
- Bullet and Blast Protection
- Last more than a lifetime
- Tornado and Hurricane Protection

## LIFEGUARDS™ PLACE IN MITIGATION




LifeGuards can fall into several categories:

- Safety Equipment
- Seismic Mitigation
- Furniture and Fixtures



## HOW LIFEGUARD™ WORKS

A LifeGuard™ is designed to be stronger than virtually all of its surroundings.

The LifeGuard™ has enough room to lie down low inside. Steel sides, top and floor prevent punctures and keep the person(s) entirely inside. On top is our "Crumple Zone" that absorbs energy from falling objects like the bumper system of a car. LifeGuards™ are designed to protect even on collapsing floors and retain their protective qualities even if they roll.

The inside of LifeGuards are heavily padded with handles and usually outfitted with food, water, HEPA quality mask, emergency lighting, signaling devices, medical supplies, blankets, provisions for sanitary waste and other life sustaining items.

Comprehensive analysis of beam angles, floor loading, sprinkler head/conduit/rebar puncture potential and a myriad of other factors contributed to the design of LifeGuard™, maximizing its protective capability.

Proof of concept was completed in 2011 during the implosion of the Oak Knoll Naval Hospital in Oakland, C.A. Four desks, two school desks and two regular desks were placed in a variety of locations inside the 10-floor concrete and steel structure. All four desks performed perfectly with no incursions into the protective void.

*School desk placed on the 6th floor during implosion. Four concrete floors pancaked down on top, but they were no match for the strength of the desk. The desk held the 6th and 7th floors apart with no deformation.*

## COMPARATIVE MATRIX

| | Reconstruction | Retrofit | LifeGuard™ | Strapping | Luck |
|---|---|---|---|---|---|
| Building Owners | Yes | Yes | Yes | Yes | Some |
| Tenants | No | No | Yes | Yes | Yes |
| Individuals | No | No | Yes | Yes | Yes |
| | | | | | |
| Structural | Yes | Yes | Yes | No | No |
| Non-Structural | No | Some | Yes | Some | No |
| Contents | No | No | Yes | Some | No |
| | | | | | |
| Portable | No | No | Yes | No | Yes |
| Easy Implementation | No | No | Yes | No | Yes |
| No Displacement | No | No | Yes | Yes | Yes |
| | | | | | |
| Affordable | No | No | Yes | Yes | Yes |
| Everyday useful | No | No | Yes | No | Yes |
| Multi-Hazard Protection | No | No | Yes | No | No |

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www.LifeGuardStructures.com