

## **The Race To Resilience Has Begun**

In the next five years, at least 13,000 Los Angeles city property owners face an immediate challenge to retrofit or demolish their soft-story buildings thanks to city [ordinance 183893](#). As neighboring communities follow LA's lead with similar requirements, industry experts believe 10,000 more soft-story buildings will need retrofits during the same time.

You'd think these mandated repairs would be a windfall for contractors since costs are estimated to range from \$50,000 to \$125,000 just to meet minimal requirements. And if building owners want to increase their property's seismic performance to reduce repair following a severe earthquake, the retrofits could cost much more. But seasoned contractors know being busy doesn't always mean making more money.

### **This Retrofit Initiative Is Different**

Answering the call of a community-mandated seismic retrofit isn't new to seasoned Southern California contractors. Back in the 1980's, LA was one of the first California cities to require seismic brick retrofits on unreinforced buildings. The city's bold step resulted in zero fatalities from brick building damage in the 1994 Northridge quake. During that time, many of today's contractors used the increased work opportunity to launch their businesses.

But the business climate for this new soft-story retrofit requirement is vastly different from the 1980's. Bidding will be more complicated and time-consuming, retrofits will be needed by more than three times the buildings and each one will require its own engineer-approved design. Since each project is custom, the chances to benefit from any economies of scale will be slim.

Also, many of the 1980's masonry retrofit candidates were iconic buildings, often listed as historically significant with strong funding for preservation. Funding is more of a question mark with the current requirement. Building owners will be reluctant to make the investment because of costs and potential loss of income that the repair may cause. Owner delaying a commitment to a repair may take a toll on available contractor resources too.

And finally, labor was relatively cheap and readily available back in the 1980's.

### **How To Make Retrofits Pay Off**

Fortunately, there are newly developed options for contractors that streamline the entire soft-story retrofit process. Smart contractors can develop a plan to increase revenue and profits by using prefabricated products like special moment frames. Here are five ways these innovative products can increase a contractor's profitability.

### **You'll Need To Be Better At Bidding**

One of the least productive uses of a contractor's time is bidding, especially when you're not sure about your chances of winning the project. Preparing bids for soft-story building owners will be time-consuming. Few buildings will share a design or starting point. Projects will be all over the city. And you may have to consider three design options.

Next, there's the pre-bid inspection. Even if you aren't preparing engineering documents, you'll want to do your own detailed building survey. The pre-job survey should include:

- Wall locations and size of openings
- Floor, roof, and wall assembly descriptions
- Diaphragm geometry
- Wall sheathing materials, nailing size and spacing
- Condition of walls
- Direction of floor and roof framing
- Locations and sizes of hold-downs
- Existence of anchor bolts (size and spacing)
- Existence of structurally connected walls
- Existence of continuous load path through walls to resist overturning
- Existence of foundation elements

Managing all of this data without a standard review system will be tedious. And then there's the analysis. The LA Soft-Story Ordinance lets structural engineers choose from three different approaches to demonstrate compliance. Because of differences in each building, the Structural Engineers Association of Southern California (SEASC) encourages owners to use this part of the law. They recommend that owners authorize engineers to perform this review at the start of the design phase.

Even though the three-approach review may cost more, the SEASC believes there are two benefits. It gives owners an option to choose a minimal repair approach that meets the building code – and it may unearth retrofit alternatives with better seismic performance and less hardship for inhabitants after severe quakes for just a bit more.

While all three approaches will provide a design that addresses the building's risk during a quake, differences in the details might change the scope-of-work portion of the bid. But if you choose prefabricated seismic products, you can use the manufacturer-supplied engineering software and design support to streamline the bid process. Using data from your initial survey, the software provides a structural evaluation and repair plan with the three approaches that can be approved by a licensed structural engineer.

## **Working Smaller And Smarter**

A sure way to increase margins is to improve your crew's jobsite efficiency. Because of today's tight job market, contractors are choosing to invest in techniques that streamline workflow instead of adding people. Industry efficiency experts suggest that using prefabricated components is one of the best ways to maintain workforce levels when work is cyclical.

And the industry agrees. In a 2016 National Institute of Building Science survey, 33% of responding contractors anticipated using more prefabricated products in the next year, 50% anticipated using the same and 9% anticipated using less.

Prefabricated special moment beams offer an answer for seismic contractors looking to eliminate unknowns and risks often encountered in the field while retrofitting soft-story buildings. They help contractors meet project schedules. Other big benefits of using prefab products are:

- Expect quick turnarounds on customized frames from manufacturers. Many can ship immediately after receiving engineering drawings
- Get prefab moment frames delivered directly to your jobsite. The frame assembly arrives complete, requiring fewer deliveries - and since the elements are shipped disassembled, packaging is compact
- Hire fewer crew members. Prefab elements are easy to move on the jobsite. A minimum of lifting equipment is needed to safely position in place
- Have more flexibility in employee assignments because installation workers can easily be cross-trained. Fewer worker skills are needed since the only tools necessary are typically a standard socket set and spud wrench
- Decrease field worker exposure to unsafe conditions

## **Give Customers Better Service**

Keeping the owner happy is what it's all about. Project delays, workmanship, product liability, and post-installation inspections can quickly erode margins and the owner's enthusiasm for the project. Since most soft-story retrofits involve inhabited buildings, contractors must also be concerned about delays that displace the building-owner's renters. Using prefab moment frames can reduce common property owner complaints in these ways:

- Control scheduling better with prefab frames. The number one owner complaint is missed deadlines
- Give your work a polished, professional look. Prefab frames are made in a production environment with tight quality-control measures. Field-bolted connections eliminate questions about the quality of field welds. And all elements have pre-drilled holes for utilities (typically

11/16" diameter holes in the flanges and 3" holes in the column webs) to make installation of electrical wiring and plumbing simple and easy

- Manufacturers provide all documentation for quality assurance. All specialty tension-controlled bolted connections are performed in the factory under third-party witnessed inspection. All field-bolted connections are snug-tight. Manufacturers can also provide documentation that the frames are code-listed under jurisdictions such as the ICC Evaluation Service, and ANSI.
- Building owners can get city inspections and approvals faster using a factory-made quality-assured product. LA requires visual observation of the structural system for conformance to approved plans and specifications at significant construction stages and at completion of the structural system
- Return the project area to its owner's use more quickly. Faster installation means less contractor-renter interaction, and in most cases, there's no need to vacate. And no welding means a leading cause of jobsite fires within older, wooden structures is eliminated along with unwanted fumes and gases

## **Using Assets More Efficiently**

Using prefabricated moment beams as an integral part of your retrofit game plan can help reduce your overall capital investment. Field-built, and even shop fabricated moment frames can be time-intensive to design and make. And that can derail your cash flow management. Using these factory-made products also eliminates the need to purchase stock steel and other shop supplies. You also save on shipping since the products are transported directly to your jobsite.

You can expect to invest less in tools and equipment too. Installation requires only standard hand tools because moment frames feature 100% bolted connections. You won't need a welder and his equipment on your jobsite. Moment frames use direct-tension-indicator washers that feature an easy, effective technique to assure proper setting. But on some installations, a heavy-duty socket wrench power tool may be necessary if fully tensioned bolts are required.

The bottom line? Using tighter jobsite scheduling to create faster completion rates helps you bill faster and increase your cash flow.

## **Follow A Systematic Approach**

When you first set foot on the jobsite of a retrofit, take a look at the building to identify any additional opportunities to increase structural performance. If you use prefabricated moment frames, you'll be able to offer a complete package of seismic product upgrades to the building owner. Manufacturers offer a wide array of structural and repair products designed to work together to make buildings safer.

Many structural manufacturers offer printed guides for residential retrofits that help educate property owners about how quakes affect a dwelling. They usually outline the steps that can be taken to reinforce the structural frame of their property. These guides make great marketing tools to help explain the process of increasing the structural integrity of their building, making it stronger

and safer.

There are a number of important seismic structural improvement products that supplement special moment frames. Hold-downs provide a tension connection between a site-built shear wall and the foundation. Contractors attach connections to the wood member with a screw and into the concrete with an anchor bolt, anchoring adhesive or a mechanical anchor.

For smaller load requirements, using tension ties also creates a connection between site-built shear walls and the foundation. Tension ties often complement hold downs, depending on a building's specific retrofit needs.

In situations where there's minimal vertical clearance, the URFP retrofit foundation plate is the ideal choice to secure first-floor framing to the foundation to prevent a building from sliding off its foundation during a "big one".

And finally, don't forget the product selection for the repair materials. For many retrofits, you'll need to provide a footing or foundation at the base of the columns for the moment beams. Choosing the right material can help speed up the process.

## **Interested in a free interactive tool to help you find potential retrofit customers?**

**In the built:LA project**

[http://cityhubla.github.io/LA\\_Building\\_Age/#12/34.0267/-118.2621](http://cityhubla.github.io/LA_Building_Age/#12/34.0267/-118.2621)

Urban designer Omar Ureta estimated L. A. County is home to roughly three million buildings. The project's website features an interactive web map that locates and determines the construction date of area buildings constructed from 1890 to 2008. Just hover over a building to see when it was built - or search for buildings by the decade in which they were built. Most area soft-story buildings were developed from 1930 to 1950.

Check out our intro article on [Soft-Story Retrofit](#) and seismic considerations that are of specific interest to [contractors](#), [structural engineers](#) and [building owners](#).