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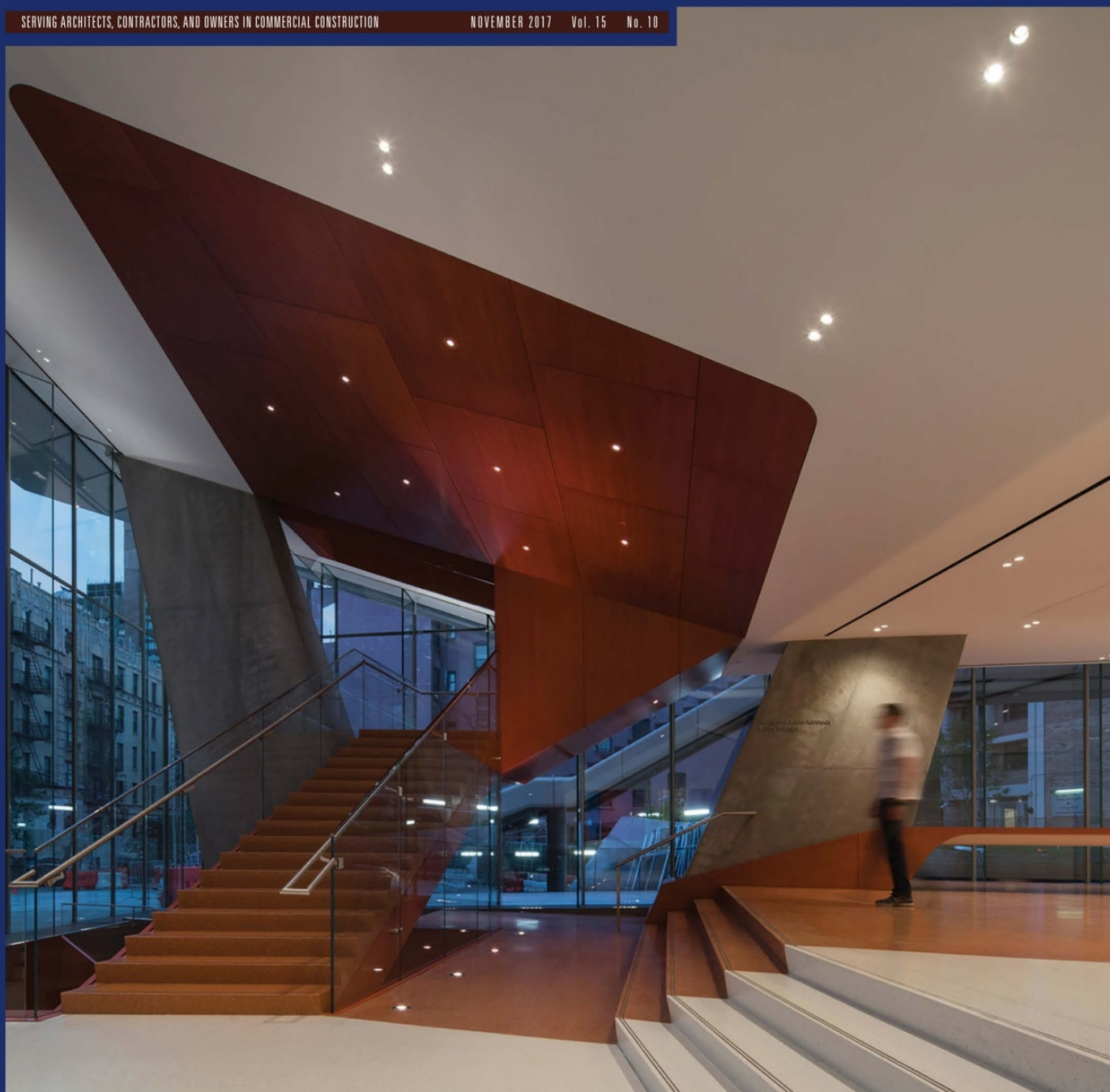
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The Architectural Team's (TAT) overarching goal was to use the appealing characteristics of the original building to create a vibrant, mixed-income residential community, financed in large part through federal and state historic and low-income-housing tax credits. Photo: Andy Ryan, courtesy TAT

# Adaptive Reuse Reknits Community

Historic Massachusetts textile mill gets new life as vibrant, mixed-income riverfront residences.

Looking over the Nashua River in the city of Fitchburg, MA, the Fitchburg Yarn Co.'s 182,500-sq.-ft., three-story brick mill building churned out more than 3.5-million miles of yarn each week from 1907 through the 1970s. One of 16 textile manufacturers whose operations formed a vital thread in the economy of this northern Massachusetts industrial city, the building's 95,000 spindles were also among the first in the U.S. to spin Rayon. This and other innovations placed the Fitchburg Yarn mill at the forefront of the American tex-

tile industry and kept the local economy afloat through the Great Depression.

As textile production shifted out of New England, though, the mill was forced to close its doors in the 1970s. Like many similar structures throughout the northeast, it went through a variety of other uses before eventually sitting vacant. When Fitchburg mayor Stephen DiNatale began a new revitalization effort in 2015, aimed at improving infrastructure and bringing more residents into the downtown, this massive building, less than a mile

from the city center, was an obvious choice for a residential conversion.

To handle the renovation, the City of Fitchburg brought in an experienced design and development team, led by Boston-based WinnDevelopment and longtime partners The Architectural Team Inc. (TAT), Chelsea, MA. The project team's overarching goal was to use the appealing characteristics of the original building to create a vibrant, mixed-income residential community, financed in large part through federal and state historic



and low-income-housing tax credits. TAT founder and partner Robert J. Verrier, FAIA, NCARB, pointed out that these tax-credit programs are crucial, “because from a municipality’s or developer’s perspective, the availability of tax incentives makes preserving local architectural legacies an economically attractive path.”

With a 45-year record of adaptive reuse and historic preservation projects throughout the northeast—many of those carried out in conjunction with Winn-TAT’s experience with design solutions, planning challenges, and tax-credit incentives gave firm leaders a clear understanding of the historical renovation process and its benefits. “Innovative conversions of decommissioned industrial buildings continue to be among the best ways for cities to leverage existing physical resources for new housing, mixed-use, and commercial purposes,” said Verrier. “These structures are often located close to central business districts, and their large floor plates and number of windows lend themselves to attractive unit layouts, retail uses, and collaborative spaces.”

#### MEETING THE GUIDELINES

In this instance, the development team would have been hard pressed to find a better site or building. Located within Fitchburg’s downtown, about a mile from the town square, the project, now called Yarn Works, is within walking distance of public transit, including a commuter rail line. It is also near several local parks and only half a mile from the Fitchburg Art Museum. According to Adam Stein, senior vice president at WinnDevelopment, “We’ve found that people really latch onto these residential conversions because they appreciate the combination of historical character with modern features and convenient downtown locations.” For WinnDevelopment, he said, taking on the Yarn Works project was particularly appealing, since “the building is a symbol of the community, and restoring, converting it, and making it viable again offers a connection to the past, to the people who lived and worked during Fitchburg’s industrial heritage.”

Originally built in 1907, the Yarn Works building was constructed over the course of just five months using a unique wood-and-steel I-beam configuration. TAT project manager Scott Maenpaa noted that it’s one of the largest mill buildings he’s helped to renovate, and the facts bear him out: its structure includes 2-million bricks, 1-million board feet of lumber, 500 tons of steel, and 7,000 tons of granite, according to archival materials. Overall, Maenpaa says, “the building was clean and in great shape. Because it had remained heated for much of its lifetime, there was little structural damage from the harsh New England winters.”

Hoping to use historic tax credit incentives (HTCs), the development team submitted the building to the National Park Service (NPS) for listing on the National Register of Historic Places. This, of course, meant staying within strict NPS guidelines during the renovation and conversion process. For the exterior renovation, the project team carefully repointed the brick façade and carried out other masonry



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Outside of the individual units, a primary goal for the design and development team was the creation of spaces that would encourage residents to interact with each other and help foster a sense of community. *Photo: Andy Ryan, courtesy TAT*

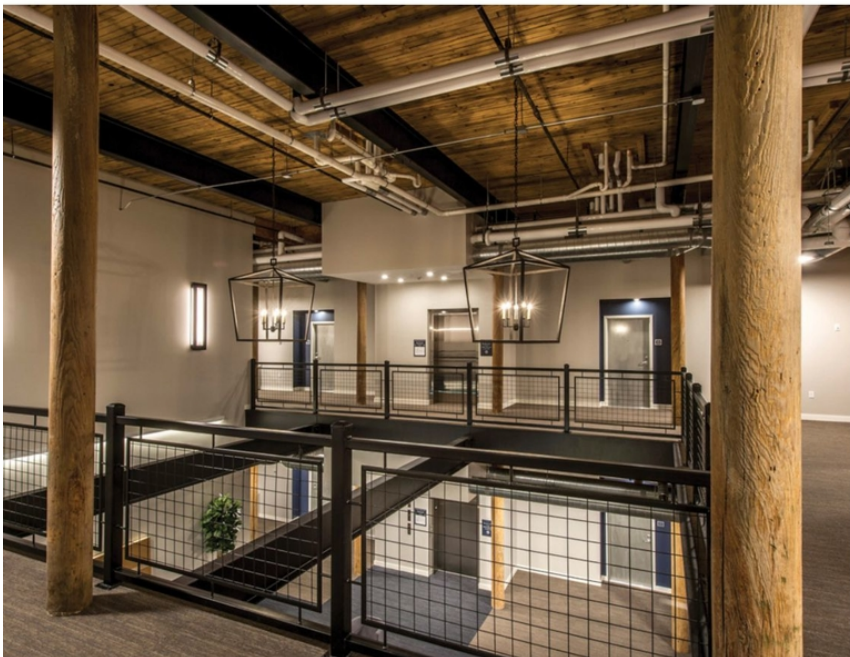




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This 25-ft.-tall space has exposed flat Pratt trusses with vertical wrought-iron tension rods and 17-ft.-tall windows; residents can take advantage of a warming kitchen, pool tables, TV and workspace areas, and a variety of different seating arrangements. *Photo: Andy Ryan, courtesy TAT*

The design team used an architectural insertion to transform this area, cutting a 30- by 20-ft. hole in the floor and creating a central atrium with a new stair tower. Original beams were kept in place to highlight the historic structure, and large, lantern-like chandeliers, selected by the interior designer, provide illumination. *Photo: Gregg Shupe, courtesy TAT*



repairs, including those to the large chimneystack. The original built-up tar roof also required structural reinforcement. Since NPS guidelines allow the addition of contextual canopies and storefront systems, the design team created a custom steel entry, matching the character of cast-iron and steel beams used throughout the original structure.

One of the building's most notable and distinctive features is its nearly 300 8-ft. x 10-ft. windows, which flood the interior with natural light. In order to meet NPS standards, the design team replaced original combinations of steel sash and wood frames with new, thermally broken aluminum frames featuring historically matched muntins and divided-lite windows. Here again the original structure proved distinctive, as the original window frames were black rather than the green typically found in local mill buildings. This of course meant the new frames would be black, too, which Maenpaa noted creates smoother visual transitions between window, frame, and façade, lending the building a much sleeker look than it would have had with green frames.

## SITE WORK, UNEXPECTED FINDS

The scenic riverfront location and low-lying 7 1/2-acre site meant that flood mitigation had to be a central concern for the design team—not least because FEMA's recently updated insurance maps placed the building's first floor within a floodplain. To address the dangers of potential storm surges, TAT and the project team removed the floor, subbing in additional structural steel, and rebuilt it 27-in. higher on a composite concrete-slab deck above the 100-year floodplain. To prevent moisture from infiltrating into residential units, new spray-foam insulation now creates a gas and vapor barrier. As a design benefit, the re-alignment brought the floor up to the bottom of the sill, essentially creating a floor-to-ceiling window and an even brighter, more open feel for the ground-level interior spaces.

All of this work near the building's foundation also unearthed a surprise that Maenpaa calls "an early architectural solution for flood mitigation, unlike anything we'd ever seen before." The original mill design featured an under-building wet crawlspace, with a series of equally spaced holes set in the foundation at 20-ft. intervals. By allowing river water to flow through this partial-earthen basement, the holes absorb flood surges and guide the water back out again as it recedes. The existence of these channels meant that the design team needed to carefully balance the removal and addition of soil as they raised the floor to keep this site-specific flood-mitigation system working correctly. By creating a retention pond elsewhere on the grounds, Maenpaa and his colleagues were able to compensate for necessary changes to the foundation.

## SETTING THE PROGRAM

When it came time to tackle interiors, the unique shape of the building also presented challenges that the designers rarely encounter in conversions of mills and factories. Usually, noted Maenpaa, "these structures are long and narrow, often 60 to 70 ft. wide." But at 500-ft. long and 110-ft. wide, "this one is nearly twice the typical width, so a central challenge for this project was the remarkable amount of space within the building—how could we utilize it in the best way possible?" He said the design team went back and forth on how interior space could be best distributed. "We ran through a number



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of different ideas—do we make standard-sized units with larger hallways that feel more open, or add square footage to the units?”

Ultimately the design team chose to make the units larger. While the hallways remain sizable at 10 ft. in width, homes are now between 45- and 50-ft. deep, rather than the 30 ft. initially planned. This decision enabled the inclusion of extra rooms—such as dens and separate kitchen and dining areas—that aren’t often found in homes at this price level, greatly increasing their appeal and value proposition. According to Maenpaa, “those extra feet and additional rooms make a huge difference in how expansive the units feel, which really broadens the appeal to people who might be downsizing from larger homes.”

The final unit mix ranges from one- to three-bedroom loft homes, with 29 one-bedroom, 58 two-bedroom, and nine three-bedroom apartments. Out of the 96 total units, 39 are affordable; all feature attractive details such as wood-plank ceilings and floors, exposed brick and original metal beams, and ceilings that are among the tallest Maenpaa has ever seen. “Most of the mill conversions we’ve done have a 12-ft. ceiling height,” he noted. “This structure has an average of 15-ft.-high ceilings.”

## SOLUTIONS AND INTERACTION

Outside of the individual units, a primary goal for the design-and-development team was the creation of spaces that would encourage residents to interact with each other and that would help foster a sense of community. One of the highlights is a large, 3,000-sq.-ft. common room, housed in the building’s former boiler house. “We tried to make this the hub or the core of the amenity space,” said Maenpaa, “with everything else built around it.” The 25-ft.-tall space has exposed flat Pratt trusses with vertical wrought-iron tension rods and 17-ft.-tall windows. Residents can take advantage of a warming kitchen, pool tables, TV, and workspace areas, and a variety of different seating arrangements.

Closer to the building’s core, the design team programmed amenities that didn’t require as much natural light. Across the hall from the bright and open community room, for example, a 2,000-sq.-ft. space now houses a fitness center and dedicated yoga studio, whose tall ceilings create an airy feel despite the lack of windows. The building also offers an indoor bike-storage room, complete with a small workshop area. Other spaces were configured as storage and work areas for the maintenance crew.

Some areas didn’t lend themselves quite so naturally



One of the building’s most notable features is its nearly 300 8-ft. x 10-ft. windows, which flood the interior with natural light. To meet NPS standards, the design team replaced original combinations of steel sash and wood frames with new, thermally broken aluminum frames featuring historically matched muntins and divided-lite windows. Photo: Andy Ryan, courtesy TAT

to the programming goals, and required creative design solutions to activate. At the main entrance, for example, the entry sequence led to an interior dead space. The design team used an architectural insertion to transform the area, cutting a 30- x 20-ft. hole in the floor and creating a central atrium with a new stair tower.

Original beams were kept in place to highlight the historic structure, and large, lantern-like chandeliers, selected by the interior designer, provide illumination and contribute to the sense of historic character. According to Maenpaa, this atrium forms a new focal point for the center of the building, and creates a venue for the sort of incidental resident interaction that helps people get to know their neighbors.

## IT’S HIP TO BE NEAR THE SQUARE

Despite provision for on-site parking, the walkable and transit-oriented location has become a selling point for

the building, which is already 50% leased after just a few months of availability. According to WinnDevelopment’s Stein, “we’re leasing units at a greater-than-expected pace, and Yarn Works is actually setting the local market in terms of rent. This success is a true testament to the design team’s innovative approach to unit layouts, amenity spaces, and the unique features only offered in a historic mill conversion. We’re by far the best product on the market.”


Now officially listed on the National Register of Historic Places, the \$24-million Yarn Works project also fills an important need in the community, providing high-quality housing for a range of income levels. Of its 39 affordable units, 29 are reserved for those earning 60% or less of the area median income (AMI) with the remaining 10 set aside for those earning 30% or less of AMI.

The design-and-development team believe this project, along with several other historic renovations now underway throughout the city, will act as a catalyst for a new era for formerly struggling neighborhoods in Fitchburg. “Historic renovations like Yarn Works really benefit their communities,” said Stein. “They provide quality, stable housing, and contribute to meaningful economic growth.”

According to TAT’s Verrier, adding new housing that attracts young professionals and older folks downsizing from elsewhere, and that allows current Fitchburg residents to remain in the city, will in turn help to attract and keep restaurants, retail operations, and other businesses. Local leaders agree. “It’s just a magnificent building,” Fitchburg Mayor DiNatale said of Yarn Works at a public event earlier this year. “They’ve transformed that whole area, and we couldn’t be happier.” CA

## DATA CACHE

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-  The Architectural Team (TAT)
-  WinnDevelopment
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