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Ben the Builder

When they say it can't be done, this engineer gets inspired.

BY LEIGH NEWMAN

IT DIDN'T TAKE A REALITY SHOW to make Ben Brungraber famous—at least not in certain timber-framing circles. He's the guy who, while working in the Empire State Building at a firm that builds luxury log cabins, hooked his toes into the radiator grill and hung out of the 61st-floor window to take in the view . . . twice. He's the guy who, after building a wooden ski lodge in Sugarbush, Vt., rode his bicycle around the 20-degree-pitched, circular, silo-style roof. He's the guy who, having obsessed over structural connections while completing his PhD in civil engineering at the Farm, became known as "Doctor Joint."

And then there are the kilts. Yes, kilts, which Brungraber, MS '84, PhD '85, wears while building timber-framed houses—for their comfort (air flow), practical design (hanging mailbags for nails, hammer loops) and the never-ending sociological study. "If you want somebody to come up and make some kind of dumb, nervous joke about your sexual orientation," he says, "slap on a kilt."

This blue-eyed, silver-haired structural engineer talks at full throttle, holding a book he's reviewing for an industry journal, picking at a rare hamburger and riffing from topic to topic: covered wooden bridges, beater Mazda Miatas, the climbing wall he built for his two sons at his old home in Keene, N.H.

This kind of energy comes in handy for his chosen profession—designing, repairing and erecting wooden houses, churches, barns, mills and bridges using heavy timber beams for structural support and ancient joints. Timber framing is a kind of construction invented before the Iron Age. Beams can weigh anywhere from 50 to 5,000 pounds. "That's where cranes come in," he adds, laughing. "I'm a sucker for a crane."

His newest venture is Fire Tower, a seven-person company housed in an industrial brick building in Providence, R.I., decorated with deer heads, a vintage Old Milwaukee beer sign and a 1962 BMW parked smack dab in the middle of the action. Essentially, he says, "We build anything out of wood,



WOOD WORKS: His portfolio includes a Nantucket, Mass., recording studio (below left) based on a classic Bernard Maybeck design, and a lodge at Sugarbush, Vt. (below right).

Courtesy Fire Tower





Courtesy Fire Tower

except for boring mass-produced townhouses."

That can mean repairing colonial-era church roofs with overstressed trusses, designing new covered bridges in Delaware, building a New Hampshire house that's cantilevered over a river or one in Colorado that's sitting directly in an avalanche path.

His most publicized project, however, is the green barn kit, which Fire Tower sells to owners direct, or, depending on the purchasers' timber-framing skills, sells and then helps them construct. In a nutshell, it's an eco-barn in a bag. Each kit includes wall panels, timber frame posts, braces, joists, rafters, prefab stairs and insulated roof panels. The wood is sourced locally (to

the construction site) to reduce its carbon footprint. And the barn can function as either a two-story home or a loft apartment above a shop or garage. Costs range from less than \$20,000 for the simplest kit to more than \$50,000 for a larger, more complete and fully installed structure.

"Baby-boomer couples love them," says Brungraber. "They're downsizing out of larger homes, after the kids have left. Plus there's the energy component." The wood barns are highly insulated and heating efficient, due to panels with foam insulation sandwiched inside. "Essentially, it's a 12th-century structure wrapped in a 20th-century envelope."

Brungraber and his kilt-wearing team were filmed by the Discovery Channel's reality show *Renovation*

Nation as they constructed one of their green barns on an isolated Maine island—in one week. "I learned how to nod on command," jokes Brungraber. "With a reality show, they take a lot of shots of you nodding, so that when they do the voiceovers much later, you look like you're agreeing with the narrator."

Brungraber took a winding road to founding his own company. He earned his bachelor's in civil engineering from Cornell and MSCE in timber structures and solar energy at Colorado State. He inspected and repaired covered wooden bridges in Pennsylvania before heading to Stanford. He remembers spending his free time windsurfing on Lagunita and playing badminton with a devoted group of sari-clad Indian graduate students.

His first true job was with a huge structural engineering firm, where he worked on the D.C. subway and constructed steel mills. After deciding to focus exclusively on wood, he designed and analyzed log cabin homes with a Manhattan firm. There was a detour into university teaching but, "It turns out I like more practical, hands-on work."

Benson Woodworking in New Hampshire hired Brungraber as the first full-time



Courtesy Fire Tower

timber-framing engineer in the country. During his 20-year tenure, the industry grew rapidly as back-to-the-land 1970s ideas met the go-go economy of the '80s and '90s. He supervised the building of timber ski lodges, including Sugarbush and Stratton in Vermont, and a cathedral in Chatham, Mass.

Finally, in 2006 he started Fire Tower—named after a structure near his old home in New Hampshire. "The tower's kind of a touchstone. I used to head out there after a long day and hike up to it, snowshoe up to it."



EXPOSED: X braces in a Nova Scotia residence.

Courtesy Fire Tower

As engineering consultants, the company has weighed in on an eclectic variety of projects, including a modern sod home in Wyoming (where Brungraber and his team created an aesthetically pleasing version of sod walls, stabilized against the crumpling and collapse that can befall traditional counterparts) and an installation for the Denver Public Library (where they figured out how to assemble a 45-foot-high wooden model of a derrick by Michael Graves).

"My favorite client," Brungraber explains, "calls up and says 'Ben, we've been told we can't build this.' "

"Ben's extraordinarily insightful," says Mack Magee, '85, MS '86, his partner in Fire Tower. "He can flip through a set of structural drawings and see exactly what the problem will be much later on, a problem that no one sees. It's challenging sometimes, because he's several steps ahead of you, bringing a design eye and a sensitivity to the actual building. And then

there's the whimsy gene. That comes into play in all kinds of unexpected ways."

After hours, Brungraber works on a tree house behind his summer home on Cape Cod, complete with insulated windows, a staircase and a coffee table made from an old wire spool. Or attends the annual tree-house conference in Seattle, which he describes as "a weekend of Birkenstocks and outlaws." Or builds a boat, his latest project a sailing canoe. "It's essentially a canoe with two sails, making it go really fast, sort of like riding a unicycle while somebody sprays you with a fire hose."

Brungraber's dream timber-framing project is a Boys Club gym built in Oakland at the turn of the last century by Arts and Crafts architect Bernard Maybeck. The design, incredibly modern for its time, used construction concepts that date back to the Druids. Unfortunately, it was torn down in the 1930s. Brungraber hopes to reconstruct it exactly in a new location.

To him, the deceptively simple wooden gym epitomizes why he founded Fire Tower. "So much of our work is to find not the cheapest way, but the most empowering way to build a building. Not to hide what's wrong, but to expose what's right and celebrate it. That's the real joy of structural engineering, combining the science of holding a structure up with the art of sculpture."

LEIGH NEWMAN, '93, is a writer in Brooklyn.

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