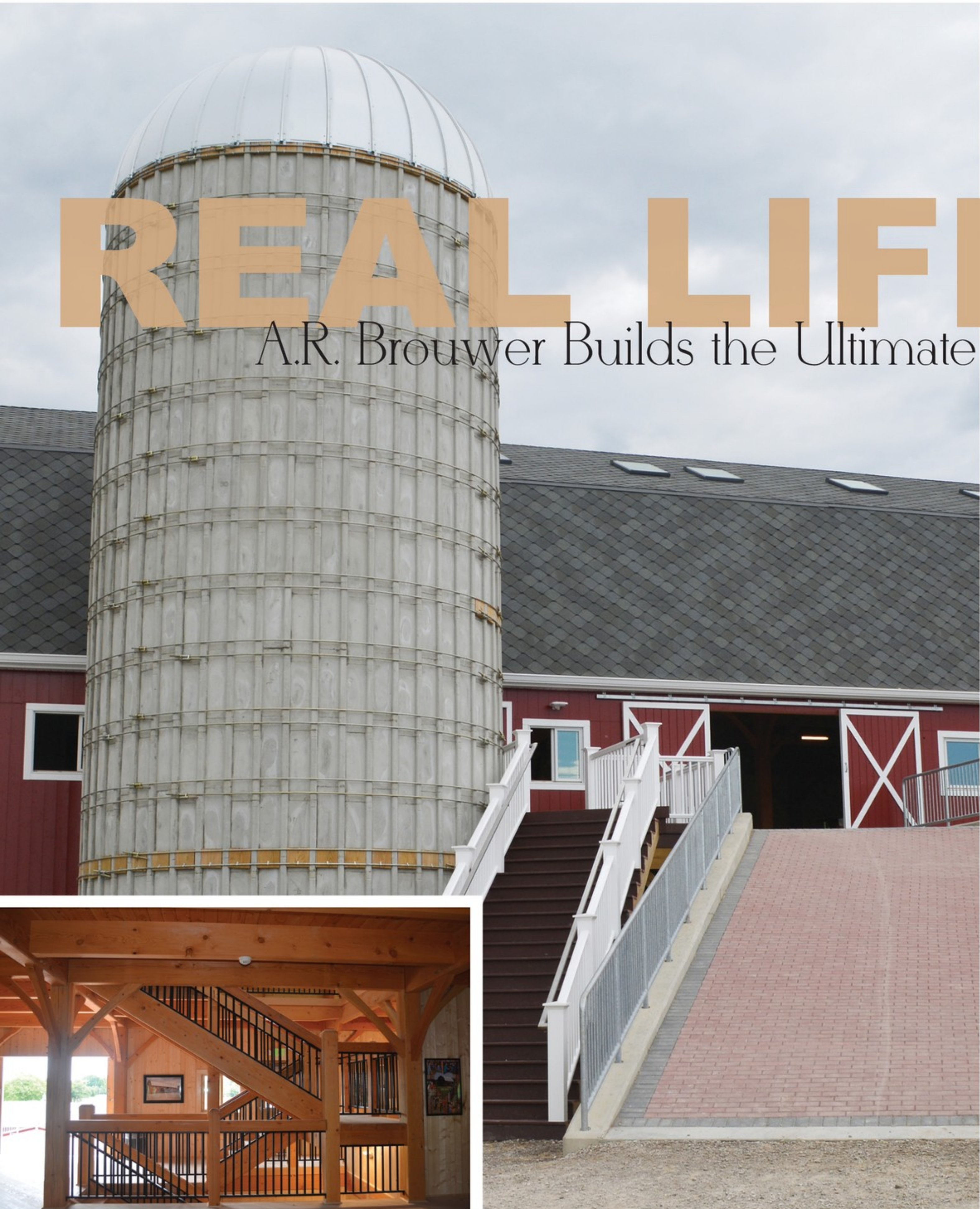


REAL LIFE

A.R. Brouwer Builds the Ultimate



THE BARN 2.0

Summer Camp

In the mindset of many an urban and suburban child, farm animals are made of LEGOs and a Funky Barn is the name of a video game on Nintendo's Wii U. At Real Life Farm in Canton Township, video games and plastic ponies give way to actual rides on miniature horses and the chance to bottle-feed a baby piglet in a Real Life Barn. Set along a peaceful stretch of Geddes Road in Canton Township, the facility offers summer day camps, hayrides and even a fully licensed nursery school and kindergarten. When owners and directors, Don Fraser, aka Farmer Don, and his wife Mary Ann, needed a new barn for their child- and animal-friendly facility, they turned to the A.R. Brouwer Company, a design/build, construction management and general contractor based in Dexter. This is the fifth project that A.R. Brouwer has completed for Farmer Don and Mary Ann. A.R. Brouwer joined forces with the Novi-based architectural firm of Wah Yee Associates to build a new 12,500-square-foot barn for this unconventional school and playhouse.

The original Real Life Barn was demolished, paving the way for construction of a new three-story, heavy timber frame structure. The new barn is traditional in appearance but not in function. A stave silo serves as the elevator shaft and the fire-rating accommodates both farm animals and children. More than the fire rating alone, A.R. Brouwer had to meet a double set of building codes to build a facility capable of sheltering both a large number of farm animals and a summer day camp filled with the children who love them. "Some of the toughest challenges we experienced were designing the barn according to the owner's criteria and still meeting all of the building codes," said A.R. Brouwer President Steve Brouwer. "The building is classified as a daycare with farm animals on the first floor and child activities on the second and third

▼
The barn accommodates farm animals on the first floor and activities for children on the second and third floors. The stave silo actually houses the elevator shaft for those not able to take the beautifully crafted wood stairs. An outdoor ramp also provides access to the barn interior. Photos Courtesy of A.R. Brouwer Company and Real Life Farm





▲ The owner's preference for a lack of visible fire suppression materials in an exposed structural frame led to the selection of the heavy timbers shown here in the first floor. *Photo Courtesy of A.R. Brouwer Company*

floors. Therefore, we had to work closely with township officials to accommodate the building code requirements for both farm animals and children."

At launch of construction in November 2015, this contemporary barn-raising began with actually raising the elevation of the building, all because the existing building was located in a flood plain. A.R. Brouwer Company, Professional Engineering Associates, Inc. and the owner worked with the Michigan Department of Environmental Quality to obtain permitting and approval to ensure the new barn could be constructed above the flood plain elevation.

Once the foundation was put in place at the required elevation, the work of building the heavy timber frame could begin. The timbers were trucked in from Washington State, fabricated in Michigan and erected on site. The heavy timber design is one of the most distinctive but complex features of the project. "We worked with a structural engineering firm out of Idaho specializing in timber frame design to meet the unique needs of the structure," said Brouwer. The Idaho firm of Tamarack Grove Engineering worked with TimberCraft.

The owner's preference for a lack of visible fire suppression materials in an exposed structural frame led to the selection of the heavy timbers, along with a 1 x 4 tongue-and-groove system installed diagonally over a 3 x 6 tongue-and-groove subfloor. "To provide the fire rating between the first and second floors, we had to enclose the timber frame stairs in a fire-rated wall assembly and then cover it with shiplap siding," said Brouwer. "The exterior walls also required a fire rating. Due to the timber frame structure and the vertical exterior and interior shiplap siding, these walls were framed horizontally instead of vertically."

Compounding the level of difficulty, the project team worked together to engineer and to erect the walls to support the third-floor roof rafters. This floor level has a 40-foot-wide clear span of Douglas Fir rafters. Additionally, the timber frame itself is primarily held together with oak dowels; the only steel bolts utilized were on the rafter system.



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The next step was construction of that quintessential Automotivel farm country icon: the silo. At Real Life Farm, a unique 37-foot-six-inch-high and 16-foot-wide concrete stave silo was constructed to contain the machine room-less hydraulic elevator. "The silo was fabricated in Wisconsin, erected on site and was structurally modified to accommodate the elevator," said Brouwer. "Since the barn is not heated, foam insulation was used around the elevator shaft to prevent condensation from forming."

The weather rules life on the farm and work on a construction site. Because A.R. Brouwer had to wait until the late fall before beginning construction, "this meant that construction took place during the winter months, and included challenges brought on by winter conditions," said Brouwer.

A.R. Brouwer Company completed the project in April 2016 right on time for the fresh flurry of spring and summer activities - and the birth of dozens of baby lambs, goats, chickens and piglets - in this unusual classroom and playground that brings a taste of the country into the lives of urban- and suburban-raised children.

-Information courtesy of A.R. Brouwer Company with CAM Magazine editorial input.

The following trade contractors contributed to the project:

- **Fire Alarm System** - Allstar Alarm, Whitmore Lake
- **Demolition** - Blue Star, Inc., Warren
- **Building Materials** - Chelsea Lumber Company, Chelsea
- **Rough Carpentry** - Conquest Construction Company, Livonia
- **Site Utilities** - Fanelli Construction, Inc., Farmington Hills
- **Landscaping** - Gee Farms, Stockbridge
- **Toilet Partitions and Hardware/Doors, Frames and Hardware** - FBH Architectural Security, Inc., Ann Arbor
- **Caulking** - JC Pattock Company, Pinckney
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"Paver Ramp for The Real Life Barn Project."

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- **Roofing** - RAS Construction Services, LLC, Howell
- **HVAC** - S & M Heating Sales Company, Inc., Southfield
- **Handrails** - South Lyon Fence, New Hudson
- **Building and Site flatwork** - Spring Valley Landscaping, LLC, Milan
- **Elevator** - ThyssenKrupp Elevator Corp., Livonia
- **Timber Frame** - Timbercraft Homes, Tecumseh
- **Painting** - Tom Furnari Painting, LLC, Rochester Hills
- **Earthwork** - Top Grade, Manchester
- **Structural Steel** - Utica Steel, Inc., Chesterfield Township
- **Stave Silo** - Wisconsin Silo, Inc., Plover, Wisconsin
- **Masonry** - Zimmerman Masonry, Howell



▲ **Running with Calves**, a different version of the '90s classic movie **Dances with Wolves**, is only one of many new experiences for children at this wonderful camp and school in the country. *Photo Courtesy of Real Life Farm*

The general contractor/construction manager provides the names of all project participants.

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TIMBERCRAFT: A REAL-LIFE BARN-RAISING FOR THE REAL LIFE BARN

For construction of the Real Life Barn timber frame, the client turned to Bob Sternquist, owner of Timbercraft, for design, engineering and manufacturing of this massive barn. Located in Tecumseh, Timbercraft focuses exclusively on heavy timber construction, architectural design code 06130.

The Real Life Barn presented many design challenges for Timbercraft, including managing increased wind loads, being three stories and having a 40-foot clear span gambrel roof system. The Real Life Barn timber frame is manufactured using Douglas fir, a strong lightweight wood species indigenous to the Pacific Northwest and a perfect fit for this project.

Timbercraft harvested the Real Life Barn timbers from the coastline of Oregon. According to Sternquist, “the timber we use are very large and slow-growth timbers with a very tight ring count, and they are technically old-growth, enormous size trees. In fact, many of the trees are over 60 feet, all with a five-foot or great radius. Since these beams are so big it allow us to use “free of heart center” timbers. The checking/cracking and movement in timbers is in these heart centers. Locally, Michigan has pine, oak and ash. The diameter of these trees is only so big around. This means you will have heart centers in the beams, which will lead to large checks or cracks, along with twisting and a lot other potential issues.”

Another unique aspect of the project that may go unnoticed is the “housed joinery” of the timbers. “In traditional heavy timber construction you have a mortise and a tenon joint,” said Sternquist. “But as wood dries and ages, it will slightly shrink and twist. Since the timbers are free of heart the twisting is solved but shrinkage is still an issue. If you ever go into an old barn you will see gaps at the joinery intersection. Structurally, there is nothing wrong with these gaps, but visually it is not appealing. As a remedy, we went with a housed joint, meaning every joint is recessed $\frac{3}{4}$ to 1 inch into the next beam. When it shrinks, it’s in a pocket. You will never see it, and it cannot twist because it is in a pocket. When my great grandkids visit this project 100 years from now the joinery will look exactly same as it does now. Now that is pretty cool!” 🍷



▲ The Real Life Barn presented many design challenges for Timbercraft, including managing increased wind loads, being three stories tall and having a 40-foot clear span gambrel roof system. *Photo courtesy of Timbercraft*