



MOVING BARNs

An Introduction to Barns of Timber Frame Construction

Few buildings exhibit the character prevalent in our heritage barns. Most Michigan barns are of timber frame construction, a craft brought to North America largely by shipwrights tasked to maintain the similar structural design in the small wooden ships used to cross the Atlantic Ocean. Because of ethnic-based shipwright- turned-barnwright influence, the barns of North America are unique from those of other countries and further unique by local geographic areas. A barn in a specific area may have a completely different design from one in an area not more than 30 miles away. A seasoned barnwright will tell you there are no two barns alike, a testament to continuous improvement and customization by the barnwright working a region. This design influence relates to barn moves as barn frames purchased in one area may contradict those of the area to which they are moved. Additionally, the surface finish of the timbers is frequently used to date a heritage barn. Out of necessity, hand-hewn surfaces may have been driven by the lack of sawmills of suitable bed length in a given area and time. It is not uncommon to see sawn post with longer hand-hewn tie beams, sill beams, main girders, and plates. When a barn of all hand-hewn timbers is found, it could be an indication of its approximate date of construction. Bed lengths in excess of 20' were rare; most timbers longer than that will be hand-hewn. In Michigan, I have seen a barn with 60' long, 8" x 8" timbers.

Timber-framing remains a common building practice in Europe and Asia. Here in the USA, the craft is in resurgence through instruction by impassioned groups such as the nonprofit Timber Framing Guild and specialty contractors. Timber-framing is distinguished in joinery from post and beam construction; a timber frame uses mortise and tenon with wood pegs where post and beam uses steel plates and bolts. At this time, examples of post and beam construction are showcased in our many Michigan freeway rest areas. Our oldest Michigan barns, most frequently date roughly to the 1830 time frame and timber framing as a construction method dates back thousands of years. The uniqueness of timber-frame construction simplifies moving regardless of method. It is not uncommon to find barns that were moved long ago within an area.

The passion to have a heritage barn is largely based on their unique character. This passion has created a surge in barn moving and the need for suitable information to access the feasibility of doing so. This essay offers considerations in anticipation of discussion with a seasoned timber-frame barn contractor with move experience.

A Move in Whole

Many times, disassembly is not a necessity if a suitable barn can be located within several miles distance. The primary consideration of a barn move should first be to assess the feasibility of leaving it intact and moving the barn “in-whole.” The notion that, within a couple of days, you could place a foundation and set a large-scale “finished” barn is noteworthy. To speak further of the simplicity of doing so often provokes skepticism. Buildings are being moved in-whole every day. An average barn weighs less than a single block of stone in an ancient pyramid. Here, in Michigan, the GEM Theater was lifted, moved four city blocks and, in route, turned 90 degrees. The GEM Theater weighs 5,400,000 pounds. A move-in-whole is complex for the mover but quite simple for the owner. Comparatively this move option is much more affordable than the other options. The elements of feasibility are definable and creativity can overcome many perceived obstacles. To minimize lost time and effort, the barn mover or move coordinator should complete the feasibility study. The principle elements of evaluation are:

1. Building condition – just because the building may sit ugly and crooked does not mean it is a bad building. From an appearance standpoint, irregular roof lines and bulging walls are most frequently the result of rotted sill beams and failed foundations. Largely due to the uniqueness of timber-frame construction, a barn of this appearance will straighten when set on a suitable foundation - the improvement in appearance can be quite dramatic. A good roof and siding are two very strong financial incentives for a move-in-whole. Additionally, there is no labor or material investment associated with disassembly.
2. Intended end use vs. existing use – if a section of the structure will not be reused, don’t move it.
3. Can the building be moved in one piece or does it necessitate two or more pieces? A barn with a sister wing can be moved as two buildings. A roof can be moved separate from the walls.
4. Building move fixture/apparatus – Simplicity represents value so moving the barn without drilling a hole, in something, can be expensive. Be prepared to discuss what you are willing to do to optimize the efforts to “attach” the barn to the move apparatus/beams etc.
5. Pathway egress – is there access to local, county, state, and private roadways? Can open land be used within seasonal sensitivities to crop & stability?
6. Pathway obstacles
 - a. Tree clearance – public sensitivities vs. rights to the road right-of-way.
 - b. Size constraints - width, length, height, turning radii, grade transitions, and abutments.
 - c. Utilities - electric, phone, communications, street lights, and traffic lights. Cost for their lifts, removals, and optionally, driving over dropped lines.
 - d. Road signs, mail boxes, and other unique oversize load obstructions.
 - e. Timing – seasonal weight restrictions, ice, rain, crops, holiday restrictions.
7. Landscape restoration on the origination site, destination route, and destination site. Trees removed, grades cut, and ditches filled may require reconstruction.

8. Foundation installation – should it be done before move, after move, or after the building is spotted in its new position? Considerations are timing sensitivities with the building removal, storage of the building until a foundation is ready, and rental on move equipment while waiting for a foundation to be completed.
9. Placing the building in position – multiple pieces require sequencing.
10. Placing the building – move apparatus/beams, require foundation pocket considerations to facilitate landing the building and beam apparatus removal.

Disassembly & Reassembly

In the case of historic barns, most of which are timber frame, they can be disassembled in the reverse order in which they were built. The timber-frame superstructure itself will disassemble and reassemble with little damage to the members. The advantage of disassembly and reassembly is the mobility of the individual parts – you simply ship them via truck, train, or container anywhere in the world they are desired. The down side of disassembly is that every shingle, board, and beam needs to be removed.

Members including boards, rafters, nail girders, and purlin beams are frequently hardwood - well aged and very hard. The softwood board of each siding and roof skip sheathing tend to be dry and brittle. Removing a nail through aged softwood anchored in aged hardwood is quite difficult and may lead to a high percentage of loss, dependent on labor hours associated with finesse in recovery. To save a board, the most efficient way of disassembly is frequently to “bump” the board from behind and cut the nail off between the board and member. The interior side of a reclaimed board will have witness shadows in the area it was joined with a member. If this board is not located in exactly the same manner, the interior may look blotchy.

New replacement boards will differ in surface finish and aged character. A smooth planed board adjacent to a weather faced will look unique and be exaggerated with paint finishes. A rough-faced board minimizes this dissimilarity. Frequently, it is the best plan to utilize all new boards on your reclaimed timber frame barn. It could be considered a benefit because the fresh board surface tends to dramatically accent the historic frame elements. If dry hardwood nailing members are reused, even pneumatic nail guns may not seat a nail – expect to drive the occasional nail home by hammer.

Panelizing

Panelizing is creatively dismantling a barn in larger pieces. Panelizing a barn minimizes the disassembly effort required with associated cost savings. This saving may be offset by the need for large equipment. Similar to a move in-whole, the benefit tends to be a higher level of preservation in character due to limited disassembly. With the size of cranes, large spreader bars, and extendable length trailers available today, the whole side of a barn can be loaded on a trailer lying flat. All four sides may go on a single trailer. With wall height removed, there is even the potential of moving the roof itself in-whole.

By Hand http://www.youtube.com/watch?v=o83W0gj_CRE

While it remains posted, the above youtube link showcases the ability of what can be done when people work together. The video shows a group of 344 individuals carrying a 17,000 lb heritage barn (50 lbs average lift per individual) across a parcel of land. It is notable, the unique apparatus assembled to accommodate such a grouping of people. The group was coordinated by one individual with a hand held bullhorn, they lifted and rested several times in unison.

Alternative

If your passion is for a timber-frame barn and a suitable historic candidate is not available, there is the option of a new build. As previously noted, no two barns are alike and as such, it is encouraged to utilize the best design features represented. The circular saws utilized in the 1800's are still common today. Although frequently done for appearance sake only, hand-hewn surfaces can reproduce common surfaces of the historic counterparts. Within months, the new rough circular sawn or hand hewn timbers will start to gray like their historic counterparts. Like your predecessors, it would be your legacy to leave a barn for future generations.

Summary

Moving a barn is as easy as you make it and information is of critical importance. Rights to a specific barn in a known location and an understanding of where you would like to relocate it are required to do a thorough move feasibility study. Ask a professional barnwright with experience in moving barns to do the feasibility study. Be ready to describe what you would like it to represent when done; that is, begin with the end in mind. This combination of expertise and understanding will result in a speedy assessment and avoid failed expectations when completed.

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