1 WHAT IS TIMBER FRAMING?

Timber framing is a construction method where a structures’ frame is built from interlocking vertical and horizontal timbers. Today, building techniques often use small timbers with dimensions such as 2x4 inches. However, Timber framing is unique because it instead utilizes large timbers that support the weight of the entire building. Timber framing has been present through much of mankind’s history. Evidence of timber framing dates back all the way to 6220 B.C. in Macedonia, northern Greece (Chappel 3). Evidence of timber framing was discovered to be in the south of Germany by 1000 B.C., Japan by 200 B. C., India by 200 B. C., and most of Europe by 300 A.D. (Chappel 3; Benson, 3). Timber framing’s reach was wide and far, touching many different cultures and regions of the world.

So where is timber framing today? A building technique so sturdy, reliable, and widely used, one would assume that it would still be present in today’s world. However, timber framing takes a lot of time and effort. In a society that lives for speed and efficiency, the slow timber framing process cannot compete against other speedy but less durable construction techniques. Houses are now another product off the assembly line, not a piece of art (Benson and Gruber 7).
2 Why Build a Timber Frame Structure at the Sustainability Semester?

1. The Sustainability Semester needed a greenhouse to help start seeds in the cold North Country spring as well as a tool shed to store garden supplies.

2. Timber framing provides very durable structures that last significantly longer than those built with techniques such as the common stud-framing method (Benson 7).

3. Timber framing is an art. It requires builders to form a connection with their structure as they are creating a masterpiece (Benson, 34).

4. As an educational semester focusing on sustainability, the timber frame promotes sustainability as a structure that takes more time to build, but lasts longer (Benson 7). By promoting a connection to a building, timber framing supports the idea of an appreciation for one’s home and the land it sits on. It also teaches students to be self-sufficient, helping to give them some skills to build their own home.

3 Parts of Our Timber Frame

Posts & Beams:

The goal in timber framing is to transfer pressure through the frame to the foundation. This foundation is made up of very large vertical posts and horizontal beams and is pictured to the right (Benson 8).
**Braces:**

Braces help to maintain the timber frames shape as it is weathered. Braces are most effective when forces are pushing each end of the brace, allowing brace shoulders to take on full force. When subjected to tension, wooden pegs take on force. Braces need to be in place so that no matter what direction wind or pressure comes from, there is an equal number of braces resisting this force. It is very difficult to correctly place braces because there are so many of them and they require careful placement (Chappell, 176). Pictured to the left is a brace from the Sustainability Semesters’ timber frame.

**Mortise and Tenon Joints:**

A mortise and tenon joint is one of the most common joineries used and is the traditional way of connecting large posts and beams. It is used for beams that are subjected to little horizontal force (Chappell, 82). The mortise and tenon joint is a straight projection from one timber (the tenon) into a slot in another (the mortise) and is a good way to lock timbers (Benson, 40). Wooden pegs should also be used to secure this joint if it is not subjected to tension (Chappell, 82). Pictured right is an example of a mortise and tenon joint. For the Sustainability Semester’s timber frame, the types of mortise and tenon joints used were wedge half-dovetailed joints, scarf joints, and spline joints. All of these are described below.
**Wedged Half-Dovetailed Joints:**

This joint is used for high tension situations where the post is extended above the tie beam. It is used because the wedged half-dovetailed joint incorporates tension into the joint and not just the pegs holding it in place against the beam and post. The wedged half-dovetail joint is a wedge at the end of a beam that can be inserted into a post as pictured below (Chappell, 84).

![Wedged Half-Dovetailed Joint Image]

**Scarf Joints:**

A scarf joint is pictured on the right. Scarf joints combine two timbers end to end to make a long timber. Joints where timbers are combined should have support underneath or nearby. When settlers first arrived to America, timbers were most often long enough for structures being built. However, with rapid deforestation, these long timbers were becoming very rare. A system to join shorter timbers had to be created (Benson, 42).

![Scarf Joint Image]
Spline Mortise:

Spline joinery is used to connect two beams at the same height, to the same post, from across one another. A thin piece of wood is put through the post and into two mortises carved out of both beams. This is then secured with wooden pegs. (“A Glossary of Joinery”)

4 THE PROCESS

1. Students from the 2014 Sustainability Semester helped draw out measurements for each of the timbers. Measurements below were used for some of the beams.
2. Summer interns and students from the Sustainability Semester helped the Homesteader in Residence shape timbers to fit desired measurements using a chisel and mallet.

3. Materials were then moved outside and the frame was assembled with help from students in an independent study class and a CBL class from the fall of 2014.
4. With the help of many volunteers from St. Lawrence University, the timber frame was assembled step by step.
Work Cited

