

7 Essential Steps To Straw Bale Success - Day 4

Framing Considerations



■ POST AND BEAM SYSTEMS

Straw bale buildings are not the same as conventional buildings. This is an advantage and precisely why I build them. I have heard of people trying to create conventional frames and then add the bales in. These people try to convince me that it will save time to build the home conventionally and simply use the bales as insulation. Invariably, this does not work. The best thing to do is use a system that works with the bales you have on site. For most non-loadbearing homes, this is a post and beam or modified post and beam frame.

The frame of the home plays a number of important roles. In non loadbearing construction, it is the structural strength of the home. It provides a load path for the roof and floor systems. It plays a role in the lateral shear strength for the building. In all, it is the system that holds the house up. That said, the bales themselves play a large role in the strength of the structure too; however, most engineers are only now learning to give appropriate values to the strength of the bales and as such, the frame is often considered to be *the* structural system.

■ SPECIAL CONSIDERATIONS

To accommodate the engineering requirements associated with straw bale construction, the frame is changed in a number of ways. First of all, there needs to be enough room for adequate nailing of the lateral shear welded wire mesh around all the doors and windows. To accommodate this, an additional trimmer may be required depending on the inclusion of exterior trim. In addition, there needs to be enough nailing surface along the base of the wall systems for the welded wire mesh. For that reason, I use 4 x 4 mudsills in straw bale construction. The 4 x 4 sills are also stronger and resist breaking during both uplift and lateral stress structural testing.

Knowing that we will be using plaster on the interior and exterior of the building, I like to strengthen my window trimmer details to offset the movement of the wood framing around windows and doors. A little extra detail in these areas can help prevent cracks in the plaster, something that no owner likes to see. By pinching the header and sill framing members between the trimmer sections, the corners are stronger and able to resist movement during the drying of the lumber in the frame.

■ FRAMING LAYOUT

Unlike conventional construction, the framing does not land on four foot centers and in four foot modules

to accommodate plywood sheets. Instead, the layout of the framing is designed to fit the size of the bales and support the calculated loads. The more accurate you are with framing to the bale sizes, the less notching you will have to do during the baling stage. It is also important to pay attention to the header and plate heights around the house. The goal is to fit the bales tightly under the top plates to help squeeze the bales and strengthen the wall. The window and door header heights should be lined up so that numerous layers of stuffing are not required to continue the running bond of the bales.

ROOF DESIGNS

Roof designs do not have to change with straw bale construction; however, some roof designs take more work to incorporate into a bale home. For example, a gable roof design will mean the creation of more custom bales than a hip roof. Roof designs can also help alleviate the darkness sometimes created by the thick straw bale walls. By utilizing an open roof design or dormers, more natural light can reach the room, thus brightening a room that may otherwise seem dark due to window size and orientation.



TOE UPS



Part of the framing process involves the creation of toe ups. Toe ups are an absolute requirement with straw bale construction. As mentioned earlier, they provide adequate nailing surface for the welded wire mesh. In addition, they separate the bales from the concrete and create a moisture break. Should a water line or appliance ever break and spread water through out the house, the toe ups will keep the bales dry and protected. The toe ups are made from pressure treated 4x4 material, gravel, and tar paper. They also provide a base for the bale anchors, something required by code. The bales need to be attached to the toe ups which are, in turn, attached to the concrete. This is a way to anchor the entire system to the foundation. I no longer

use rebar impalers for this purpose as required by many code books, but a series of nails applied to the toe ups. The nails create a much stronger connection for the bales and do not interrupt the separation of bales from concrete the way a rebar section buried in the concrete does. All of the building departments I have worked with have easily accepted the change.

Tomorrow we'll cover the essential topic of making custom bales

Happy Baling,

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Professional Straw Bale Contractor

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