



Andrew Morrison's Straw Bale Strategies- Day 8

Bales Over Framed Floors



Although most of the straw bale homes I build are built on a concrete slab, I do occasionally build on raised floor foundations as well. Some people are interested in a crawlspace foundation because they want to minimize the use of concrete. Others want to build over a full or half basement to house their utility rooms and/or create root and wine cellars. People I hear from often assume that a bale house cannot be built over a basement or crawlspace. This is most likely because they have never seen it done that way. The good news, for those of you who want to build a bale house over a basement or

crawlspace, is that it is absolutely possible to build a bale house over a framed floor.

■ Straw Bale on a Raised Floor System

A raised floor system, either over a basement or crawlspace, is no different than building a second floor on a bale home. Interior footings, i.e. footings inside the span of the floor system, will likely be necessary to carry the load of the floor system. In some cases, you may need to step these down into a lower sectional basement for continued support as shown in the picture above. Once the footers are poured and in place, you can build your stem walls. The stem walls can be poured concrete or masonry block, depending on the look you are going for in the finish product.



With the stem walls in place, simply add your floor system to the top of the wall as with any floor system. Be sure to account for the "dead load," the weight of the bales themselves, of the bale walls when calculating your floor joist size and spacing and when considering how many interior beams or girders will be required to split the load across the span of the house. You may want to consult with an experienced engineer when making the calculations. I typically factor 40 pounds per square foot for the dead load of the bales; however, this is a number your engineer will have to accept or determine on their own. When making calculations like this, most building inspectors will want to see your actual calculations and ensure that they are based on data, not assumptions.

■ Building a Secondary Bearing Wall



In some cases, it may be necessary to build a secondary bearing wall directly below the interior face of the bale walls to transfer that load off of the floor joists. When used, the extra wall creates a great place for running plumbing and electrical in a finished basement making the installation of both systems considerably simpler. If the interior bearing wall is used, it will have to be placed on a bearing footing so more concrete may be required. When possible, I always prefer to either increase the size of my floor joists or reduce the spacing between

them instead of adding more concrete. The floor joists I use are engineered and are made of small, renewably harvestable trees while concrete is an environmental nightmare due to the inclusion of Portland Cement.

■ Summary

No matter what reasons inspire you to build over a framed floor, you can build that system with confidence. In fact, I find it much easier to build over a framed floor than over a slab. The biggest reason for this is that a slab is usually going to be used as the finish floor which means it must be protected throughout the construction process. This is difficult and time consuming to do. Secondly, a framed floor makes bracing exterior walls easier because nailers can be attached anywhere on the interior floor system. The biggest downside to building over a framed floor is that all of the thermal mass properties of a slab floor are lost. In every framed floor house I build, the owners choose a heat pump over a radiant floor system. This is okay because heat pumps are getting more and more efficient, but a radiant system is still my favorite. As with any choice in construction, there are always pros and cons to be considered; it is nice to know that there are several choices out there when it comes to foundations.

Happy Baling,

Andrew Morrison
Professional Straw Bale Contractor

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