



**INTEGRAL CONSULTANTS**

*for Buildings & Business*

**"WE OFFER PEACE OF MIND THROUGH KNOWLEDGE AND EXPERTISE"**

# NEWSLETTER

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**JULY, 2008**

## WELCOME

We wish to welcome a new feature this newsletter, from our colleagues south of the border, Chris Bacon of Ram Jack who produces the Ram Jack Ramblings newsletter in the U.S. as a contributor to our newsletter.

## NEW & IMPROVED

We have a couple of new & improved website to take you to ..... Our sponsors ..... please visit [www.integralconsultants.ca](http://www.integralconsultants.ca) and [www.mainlandlifters.com](http://www.mainlandlifters.com) Both sites have been updated with additional information on them.



# FROM THE GROUND UP

## **FRAMING**

June 23, 2008

The building needs a structural frame that gives it support, shape and a shell for all of the exterior coverings and trim. There are a number of methods to frame a building, steel, masonry which incidentally can be a part of the exterior shell, and wood. The vast majority of buildings in North America are wood. The parts to this wooden framework are beams, floor joists, wall studs, roof rafters, and their ancillary components. The frame is constructed in accordance with construction principles, which are usually engineered and building codes.

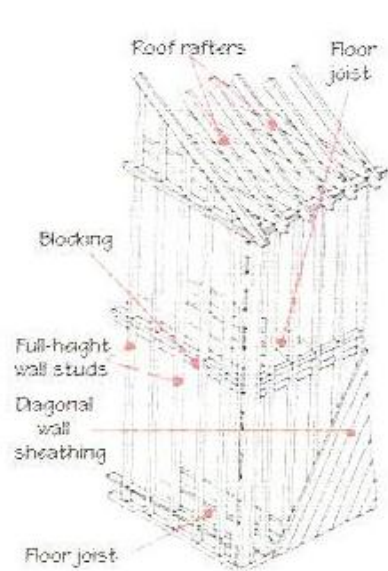
It is important to note what parts of the structure are critical so that the integrity of the strength of the structure is not compromised when completing remodeling or renovations. Non bearing walls which run the same direction as the joists can be removed usually without compromising the structure, however due to the span of the floors and roof structure, all too often, the unsupervised removal of these walls can produce problems.

Because the building code is minimum code requirements, all too often buildings are over spanned and under constructed, therefore exterior and bearing walls are critical in keeping the structure from collapsing. These walls generally run at right angles to the joists and roof rafters or trusses. All of these components manage the wind and seismic loads placed upon the structure from time to time.

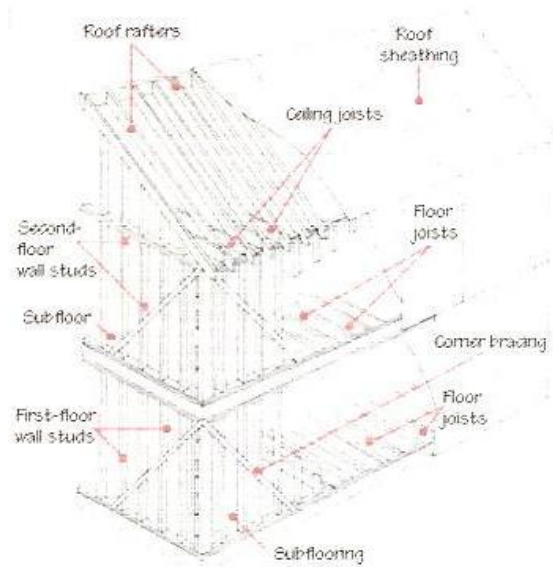
There are two methods of framing, balloon and platform. Masonry and Concrete framing is if truth be told is an extension of the foundation and is in the form of balloon framing. Framing really applies to wood or stick built buildings of a low rise design.

Balloon frame had its hay day up until the first building code of 1941 whereas the code stipulated that platform framing was minimum code requirements. The exterior and bearing walls are built in one section from the main floor built on top of the foundation to the roof that includes all floors. The floors are then attached to the walls.

Platform framing is that all exterior, bearing and partition walls are built on top of the each floor and the floor above is built on top of these walls. The framework consists of studs on either 16" centers or 24" centers with sheathing sheets or boards fastened to the exterior walls. The interior bearing and partition walls are left open. All walls have fire blocks inserted in them along with seismic strapping attached. Openings such as doorways, windows, and archways are reinforced with headers. Plates are attached to the top and bottom of each studded wall to form a box. The top plate has a second plate attached to it to help keep all walls in place and give more support for the roof or upper floor to be attached.



Balloon



Platform

These principles are also applied when constructing floors only the studs are called joists and the plates are called boxed ends. The fire blocks are called bridging. The sub floor is placed on top with either sheathing or boards.

The roof structure is a little different although the studs are called rafters, there are ties called rafter and ceiling ties to hold the rafters in place. The ridge board is what is placed at the peak to connect the two rafters together that come up from each side of the building. Sheathing panels or boards are fastened on top to strengthen the roof and give it a base.

There are three types of roofs, flat; cottage and gable. They can be of different pitches. The open ends for a gable roof are framed in accordance with wall framing.

Today a system has been designed to encompass the entire roof parts into one called a truss which is built in a factory, delivered, lifted and installed in place.



Engineering E-Newsletter [TM](#)

Case Study: Rabobank  
Chris Bacon



In the early spring of 2007, Scott Kremke and Ram Jack of California were contacted for a bid on the repairs needed on a Rabobank property in Calexico, California. The bank building had a large crack across the floor, and the windows and doors were misaligned. The bank owners were concerned that the vault might become inoperable due to the building settling. Working with Grenier Engineering of Phoenix, Arizona, Ram Jack of California proposed a repair design consisting of 70 Ram Jack® Deep Driven Steel Piles on the perimeter foundation of the structure and 30 Ram Jack® Helical Piles on the interior slab.

Due to the condition of the structure and the extent of the repair and remodeling plan, a complete relocation was required. Earlier attempts at repairing the structure presented some challenges within the scope of the project. One of the support beams for the roof system was placed directly over the rear opening and was causing the header to fail and had opened a large crack in the above wall.

During the concrete removal for the pile locations on the interior slab, the header and roof system began to go into further failure. A design and repair of the failing header and roof system was installed and a decision was made to remove the entire interior floor system and use the 30 Ram Jack® Helical Piles as reconstruction anchors.



In order to perform the required lifting of the structure, a Ram Jack® Manifold Lift System was purchased for this. This lift system allows for a uniform lift to be made at several pile locations. With an ultimate lift capacity of 50 Kips per location, most residential and commercial structures are within the design capacity of the system.

The Ram Jack® Deep Driven Steel Piles were driven to a final depth of 60' with an ultimate capacity of 60 Kips and the Ram Jack® Helical Piles were driven to a final depth of 20' with an ultimate capacity of 40 Kips. With all of the piles installed, a lift was made on the structure using the Ram Jack® Manifold Lift System. The final elevation recovery was 3.5", leveling the front of the structure with the built-in concrete vault system. This corrected the misaligned windows and doors and allowed for the new slab to be installed without any slope. Ram Jack of California was able to provide Rabobank with all of the services they required to get their property back in a safe, stable working condition. The versatility and strength of the Ram Jack® Systems allows for most residential and commercial applications to be completed with ease.



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**Without them, this newsletter would not be possible.**



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