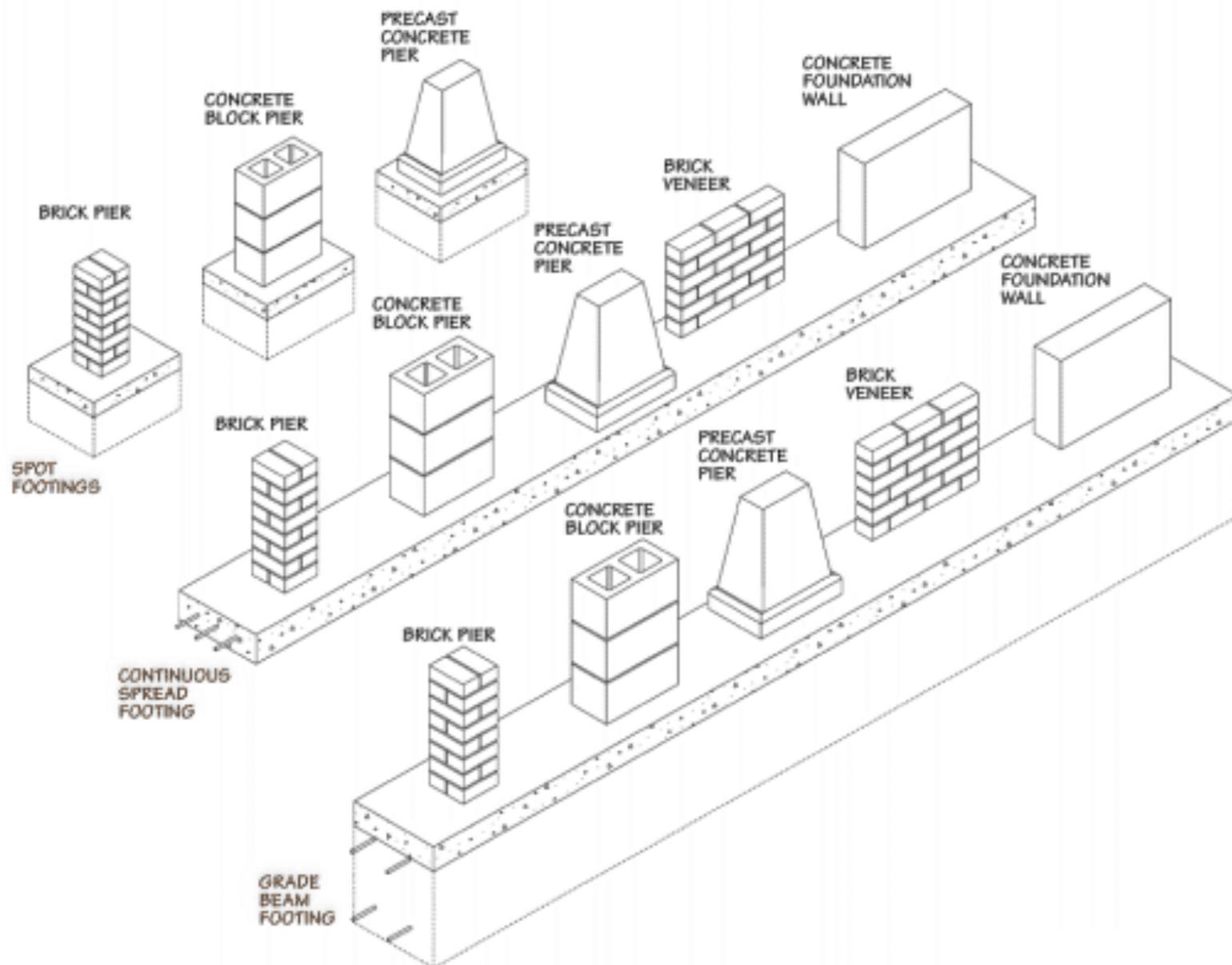


# Pier and Beam Construction

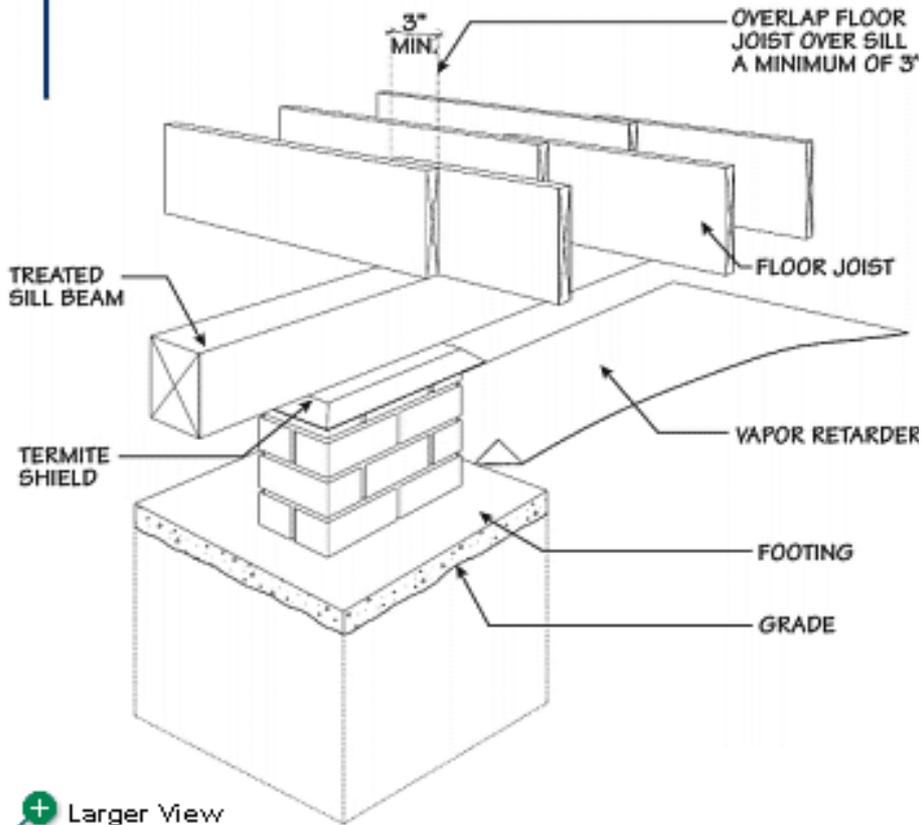
Tyler Gentry

**Figure 10 Pier or Foundation Wall Options by Footing Type**

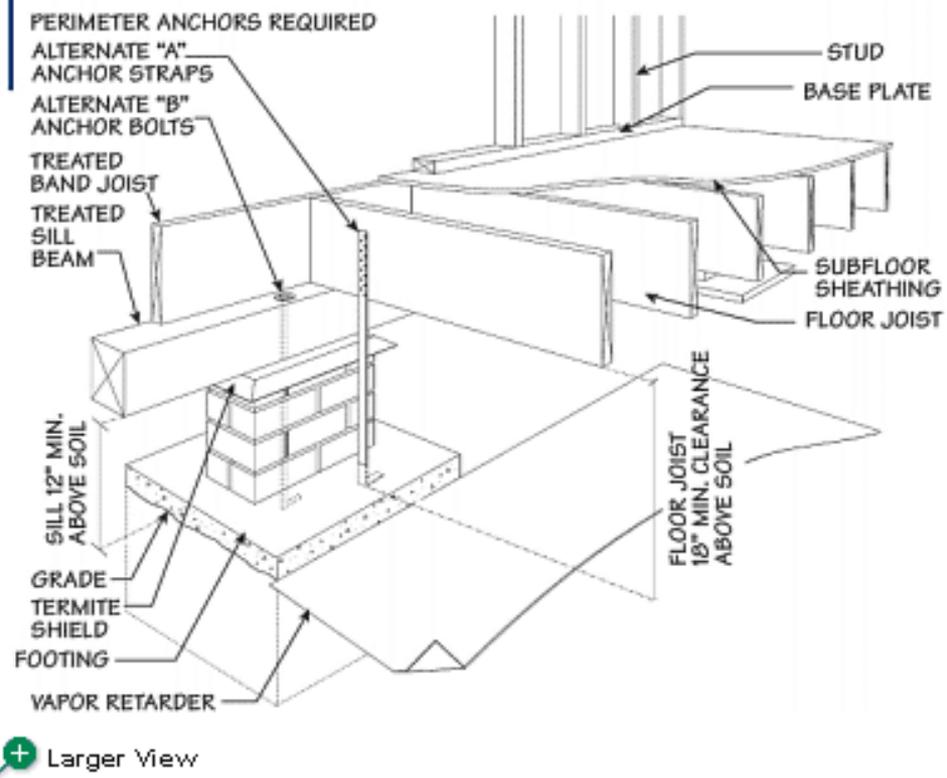


Note: See additional footing detail for Permanent Wood Foundation (PWF) option, Figure 16.

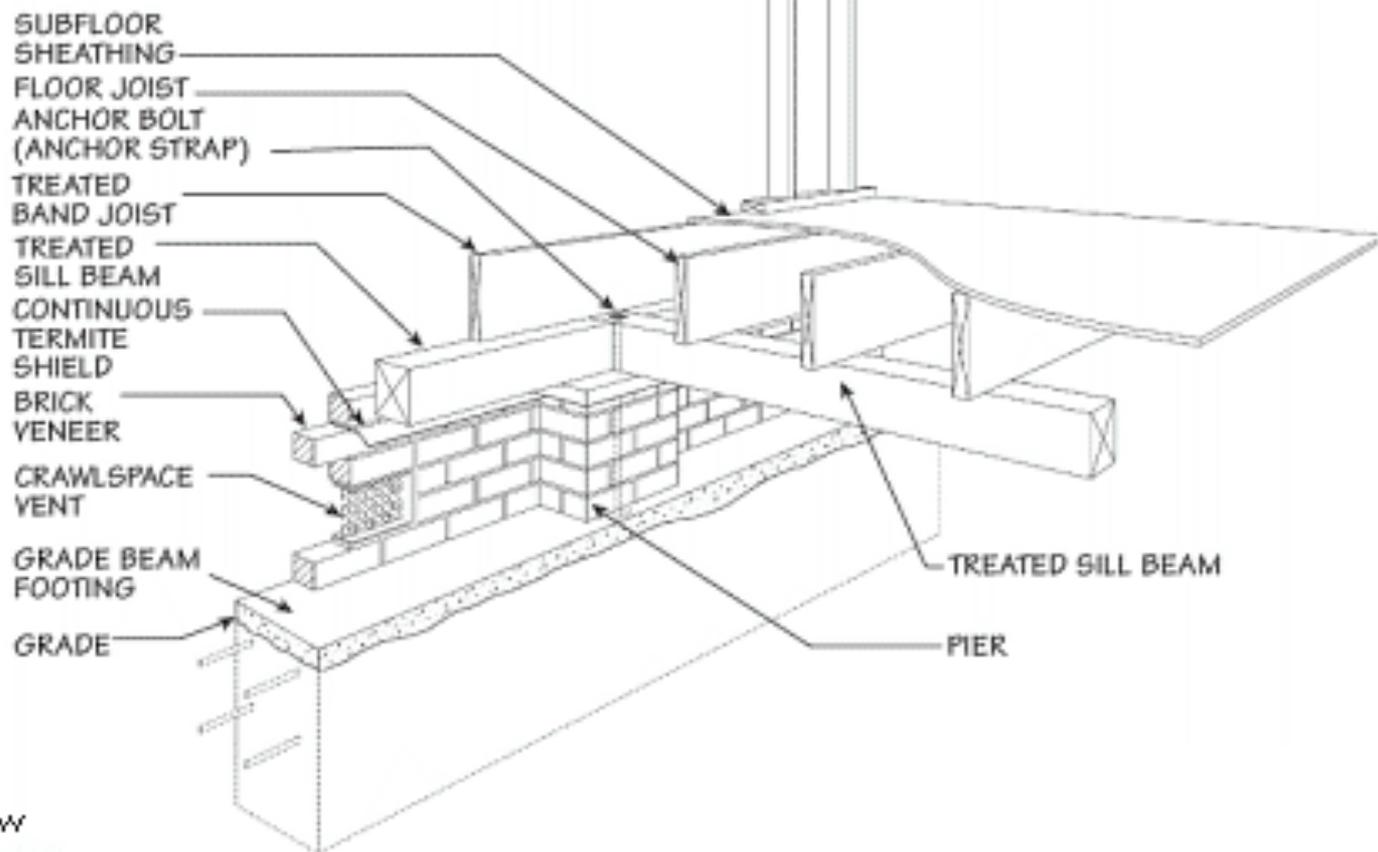
**Figure 11 Interior Pier Detail**



**Figure 12 Framing Anchorage at Perimeter Pier**



**Figure 13 Pier and Beam with Brick Veneer**



Larger View

SO FLOOR SYSTEMS

# Advantages

- Satisfying the higher expectations of today's homebuyer can present challenges to the design-build professional. Meeting these challenges begins with a premium floor system.

Designers and builders who offer the raised floor option, framed with strong, durable, renewable wood, create value for themselves and their clients. In regions where raised floors are not common, builders can establish a market niche by offering a distinctive and affordable alternative. Clients who invest in this type of home accrue lifelong benefits such as curb appeal, comfort, practicality, and lasting value.

# Sustainable

- The raised floor is also the right choice for the environment — it is a sustainable construction system. First, wood is a renewable resource that takes far less energy to produce than concrete or steel. Furthermore, future structural modifications, additions, or repairs can be performed more easily, extending the useful life of the structure. Builders can complete these tasks with less environmental impact, consuming less energy and avoiding expensive technologies. Finally, construction of a pier-and-beam foundation in association with the raised floor system is far less disruptive to the natural surroundings than a slab-on-grade (slab-on-ground) foundation. With a pier-and-beam foundation, less damage occurs to the root systems of neighboring vegetation.

# Added Value

- The raised floor system gives the builder and client an opportunity to explore ideas that can expand the livability and appeal of the home. The raised floor takes full advantage of amenities such as a front porch, a screened back porch, or a deck because they are natural extensions of the structure's elevated platform.
- Inside the home, attractive wood flooring is a great upgrade to offer the client, adding a dash of sophistication. A wood floor installed over wood joists also makes for a very comfortable, allergy-free walking surface.
- Another value-added option becoming quite popular in coastal areas of the United States, where decay and termite infestation is a problem, is "whole-house" pressure-treated framing. Pressure-treated lumber can readily be used throughout the whole house or in the floor system alone. Today, a variety of wood preservatives offer the homeowner and builder even more choices.

# Higher Expectations

- Homebuyers expect more from their home than ever before, and more is not always measured in total square feet of living area. After all, a home is often a person's largest investment, so value is placed on both the tangible and intangible elements that make a home livable, not merely functional.

A recent national [survey<sup>1</sup>](#) asking consumers to define their American Dream House revealed more interest in comfort and style than size. And almost half the respondents — 49% — characterized their dream house as a safe, comfortable haven instead of a designer show house.

So, homebuyers of today desire a living environment that nurtures and protects. The home should nurture the spirit with amenities that provide comfortable, special places for family gatherings, personal retreat and self-expression. The home should offer occupants protection from moisture and pests, providing a healthy indoor environment and a structurally sound, long-lasting living space.

# Peace of Mind

- Although no system is perfect for all conditions, the raised floor offers some real advantages when it comes to design reliability, especially where moisture is an issue. By design, the raised floor removes a structure from contact with the ground, isolating the living space from ground moisture. Therefore, a raised floor system is less susceptible to foundation-related moisture problems.
- Callbacks for foundation-related problems are much easier to fix. For example, a plumbing leak below a slab is difficult and costly to locate, access and repair. The leak may also drive moisture into the living area. This is not a problem with the raised floor.
- The raised floor helps keep moisture and termites at bay. Properly installed termite shields help repel these unwelcome visitors and the crawlspace makes termite inspection simple and infestation easier to spot. In slab construction, termite infestation or moisture intrusion may not be apparent until it is too late, and cracks in the slab can be expensive to repair.

# Foundation Repair in Houston

- Foundation repair can be the most expensive repair that you will make to a property. One of the saddest things I've heard in the investment community are the stories of investors who have purchased a property, rehabbed it, and put it on the market only to have the buyer's inspector tell them there was a problem with the foundation. Foundations can be very expensive to repair, and repairing them after the house has already been fixed up and painted can mean redoing a lot of sheetrock and paint work. All of this means money out of the investor's pocket, and if the expense goes deep enough, it just might wipe out your profit.

# Function

- The foundation of a house, whether it is a concrete slab (slab on grade) or a block and beam (pier and beam) foundation has a job. The job is to keep the house level and stable. When the foundation moves up or down or side to side, then the platform that the house is sitting on enters a state of failure. It is failing to perform the function for which it was intended. What this means is that everything that was depending on the foundation for support is now in jeopardy, because the support is no longer there. It is like one of your legs suddenly becoming 2" shorter than the other one ... it has consequences for the way you stand and the way you walk.

# Simplicity

- Pier and beam houses are a lot simpler. First of all, pier and beam houses are houses that sit up on blocks. Pier and beam is the name commonly applied to this type of foundation in much the same way as soft drinks are commonly referred to by the name Coke. Pier and beam means that piers were put into the ground before the house was built and masonry blocks were placed on top of them to form the foundation to build the house on. Some houses have this system, most have a block and base system, which is a block of cement about 20" square and 4" thick that has concrete blocks or brocks built up on top of it. Either way, the sills (4" X 6" timbers or beams) are put on top of the blocks, and floor joists on top of these. Next comes a layer of ship lap or plywood that covers all of this structural material, and that forms the sub-floor of the house. This sub-floor is what we nail wood floors to, or put padding and carpet or vinyl over. With the slab foundation we just put flooring over the concrete.

# Slab vs. Pier and Beam

- Slab-on-grade foundations are constructed with reinforced concrete and are usually shallow, quickly built, and inexpensive. For a builder that doesn't have to live in the homes that he builds, slab foundations are a dream. Slab foundations are used with homes that do not have basements. A major disadvantage to slab-on-grade foundations is that they are not resistant to seasonal movement changes and moisture disbursement due to root growth. In other words, slab foundations are not a long-term option for homes in North Texas. Another disadvantage is that generally all piping is placed under the slab foundation causing a very costly procedure should a water pipe burst.
- Pier and beam foundations, on the other hand, rate a few steps above a slab-on-grade foundation. Pier and beam foundations incorporate a crawl space (usually at least 18 inches) beneath the home and footings filled with concrete to support the slab. This type of foundation is not considered a time saver, but it is safer and more convenient. The crawl space allows access to heating and plumbing utilities without having to break through the concrete slab. The piers mean foundations are less susceptible to damage due to ground shifting, a problem many North Texas homes with slab foundations experience. If extreme ground shifting does occur, the foundation is easily adjusted, a process that is much less expensive than slab foundation repairs, a process most homes in North Texas will have to undergo.

# 99K House Competition



- Denver's JG Johnson Architects describes its entry in the \$99K House Competition using 4 terms:
  - MODULAR: three modules, numerous configurations, structural insulated panels allow flexible opening installation, mass production
  - ADAPTABLE: responsive to different site orientations, ratios, topographies
  - INDIVIDUAL: different users, multifunctional spaces, architectural style variations, pride in ownership supports demographically diverse neighborhoods
  - ECOLOGICAL (AND ECONOMICAL): ductless climate control system, inclusion of surplus materials, highly insulated, well sealed envelope, minimal built space through inclusion of exterior spaces, glazing orientation, solar shading



# “A Simple House” - TheOddGroup



- The 1,235 square foot wood-frame house is simple and straightforward – two rectangular sheds under a single roof plane are attached on a pier and beam foundation and wrapped by an exterior deck and walkway. In response to Houston’s hot and humid climate, the house is oriented to take advantage of shade and summer breezes and to let abundant natural light into its interior. Large, open spaces are cross ventilated by operable windows and sliding doors that allow the house to “breathe.” Pitched roofs with wide overhangs provide solar shading and shed rain during Houston’s heavy downpours. The single story, budget conscious house respects local vernacular traditions and engages the street to encourage interaction with neighbors.





522

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# Resources

- <http://www.raisedfloorlivingpro.com/footings.shtml>
- [http://www.houstonrealty.us/articles/foundation\\_and\\_foundation\\_repair.htm](http://www.houstonrealty.us/articles/foundation_and_foundation_repair.htm)
- <http://www.dot.state.ak.us/stwddes/desbridge/assets/pdf/akbrjnt.pdf>
- <http://info.sos.state.tx.us/fids/200705663-3.pdf>
- <http://ezinearticles.com/?Why-Choose-a-Pier-and-Beam-Foundation?&id=1089536>
- <http://swamplot.com/99k-house-series-adaptable-habitat/2009-03-02/#more-6923>
- <http://www.bestofinnerloopliving.com/images//list/res/136998/Front.jpg>
- <http://www.theoddgroup.com/forsale-asimplehouse.php>
- [http://www.diychatroom.com/attachments/f14/12224d1248316885t-lattice-under-pier-beam-house-img\\_1279.jpg](http://www.diychatroom.com/attachments/f14/12224d1248316885t-lattice-under-pier-beam-house-img_1279.jpg)