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"Foundation Repair 101" For The Texas Homeowner

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"Foundation Repair 101" For The Texas Homeowner

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by **Gcoffing**

Posted: **April 30th, 2008, 12:56 pm**

Foundation Repair "101" for the Texas Homeowner.

As a Real Estate Owner, you want your foundation to do two things; (1) Support the structure above it, and (2) Keep your feet out of the dirt. Q.) How do we know if it is supporting the structure? A.) Function! All doors and windows should be square in their openings, should work without dragging or sticking, and should latch and lock easily. Exterior joints around these openings should be uniform and caulk-able. Exterior/interior finishes such as brick or rock veneers and sheetrock should be free of cracks or patches covering old cracks and nails shouldn't be popping out. Floors should be fairly level and should not slope noticeably.

That's fairly vague huh? For simplicities sake, use a four foot long builder's level (available for as little as ten dollars at any hardware store). Place the level on the floor along all of the walls at 4 foot intervals and observe the bubble (in the little vial centered in your tool). If you must lift either end of the level more than one quarter of an inch to get the bubble dead center between the lines, you probably have foundation failure.

The Federal Housing Authority (FHA) and the Veterans Administration (VA) consider 1 inch of rise or fall, in a sixteen foot span, as acceptable for their loan programs. The foundation can't be level for twelve feet and drop an inch in four feet; it must be a uniform slope of no more than $\frac{1}{4}$ inch every four feet. There are 3 types of houses in Texas; Ones that need foundation repair, Ones that have had a foundation repair and the ones that will be repaired again because they weren't fixed right the first time! Call a reputable foundation contractor for a no or low cost estimate or you can pay a Structural Engineer around \$350.00 for his professional opinion which could be even more generous than the FHA/VA in situations where the home has had expensive remodeling upgrades. The education and experience of the Engineer allows them to sign off on slopes, up to twice as much as the FHA/VA and still be fund-able. In the old days, the FHA/VA would require the entire structure be repaired under an Engineer's supervision. Today, you can fix only the area that has moved with an Engineer's Inspection and your foundation repair contractor has to provide a minimum 5 year warranty. If you do the repair and hold the house for more than One year, you don't need the Engineer's blessing as long as 4 years remain on the warranty and the house has not moved past the 1 inch in 16 feet requirement. If your home is fairly new, you should expect to be crack free for about the first 10 to 15 years and your floors should not slope more than 1 inch in 30 feet. The homebuilder is on the hook with the Texas Residential Construction Commission (TRCC) to warrant the home against such defects for at least 10 years.

That being said, you do have to perform some maintenance to prevent future foundation movement. No one gives you a handbook on the care and feeding of your new home when you buy a house in Texas and that results in a lot of "Victimized Yankees". No offense intended, it's just that the black dirt up north is not alive like the Black Gumbo clays we have in the south. You need to maintain positive drainage away from your homes foundation to avoid over watering isolated areas and should water around your foundation, to the tune of about an inch of water per week, when mother nature does not provide rainfall of an equal amount. Soaker hoses attached to a ten pound pressure reducer, buried even a few inches deep, work best. That allows a slow even deep watering and conserves water.

I am available to answer any questions you may have, as a result of this sparse introduction to the joys of homeownership and look forward to serving you.

Gary A. Coffing, Sr.
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Re: "Foundation Repair 101" For The Texas Homeowner

by **Mike**

Posted: **April 30th, 2008, 1:49 pm**

Mr. Coffing,

First I would like to say thank you for donating your time and knowledge to our website and to our Hutto homeowners. It is appreciated very much.

I have two questions:

Q1)

I have cracks in my driveway. See photos below.

This is a concern of mine as I have seen numerous driveways replaced in the neighborhood regardless of age. See photo of spot light home that was just repaired and the home is so new that the grass has not even taken yet.

During the summer when the clay has dried up we can actually stick our hands underneath the driveway as the expansive clay pulls away from the concrete. See below

My question is, would having the driveway repoured fix this and if so, what extra measure can one take to help prevent future cracking?

Q2)

I have a hairline crack running from the driveway, up through my garage and into the main slab of the house. My home is 2 years old. The crack seems to be in the center of the slab. Our PI level of the soil for my lot is 46 and this number is "conservative" quoted from the technician at the lab.

Our doors are not square, by far. Our underpinning is cracking in the back (see photos below) where our patio is turning into a future water slide if it keeps sloping at the rate it is. My question is....Is this "cosmetic"? I'm trying to keep a straight face when I ask that but you know those Lennar reps love that word.

"Foundation Repair 101" For The Texas Homeowner

by **Gcoffing**

Posted: **April 30th, 2008, 3:29 pm**

Yes, You could re-pour your driveway and if you were to prepare the site properly, could fix the problem. Please understand that all concrete cracks. It is supposed to crack at the expansion joints, but, sometimes cracks because it can. Driveways, sidewalks and patios are among the first structures to settle when sited on expansive clay soils. They are very light and ride the soil up and down as it expands and contracts with moisture changes. Many builders don't use steel in driveways. If your lucky, they put wire down and then walk all over it during the pour. They often use 3000psi concrete and wet it to the point of soup. This results in pretty good concrete if you could flip the flatwork upside down and add an inch or two on top. I bet your soil PI is higher than reported, if not on the surface, a few soil layers down. You can go to <http://www.websoilsurvey.nrcs.usda.gov/app/> , click on the start wss button, enter your address and check it. A watering system can help expand and maintain the soil in contact with the structure but, won't fix the crack or increase the rigid aspect of poorly reinforced concrete. You can chip a deep V into the drive the length of the crack, and trowel some hydraulic cement into the V to mend the surface damage and keep rain water from undermining the drive and/or patio. As for your second question. If your doors were square and now are not, you have foundation movement that may progress to the point of failing. As before, watering your slab can stop the progression if it is normal soil movement. If it is caused by fill soil graded in to level the site for your homes construction, that was not compacted properly, adding water will make it worse. Cosmetic damage is as common as the term normal settlement, however there is nothing normal about a two year old house with doors out of square unless it was built that way. Gary

Re: "Foundation Repair 101" For The Texas Homeowner

by **natty**

Posted: **May 1st, 2008, 8:18 am**

I have been taking photos of three new houses being built and I would appreciate your opinion on the photos during their pre-pour foundation and then during and after the pour. Right now the three houses are in pre-pour. There has been no remediation of the soil as the photos will show, merely a box made and fill dirt brought in and then pushed around to even it out within the box. I would also like to know if nails popping out of sheet rock on our upstairs rooms would be caused by our foundation moving around. Some of our neighbors have actual chunks of rock falling off of the fronts of their houses, any idea about what would cause that? Thank you so much for your time and expertise, they are greatly appreciated.

Re: "Foundation Repair 101" For The Texas Homeowner

by **natty**

Posted: **May 1st, 2008, 8:35 am**

Another question for you sir, you mentioned the fill dirt being compacted properly, how does a contractor do that and what equipment would be used and how long does it take to compact the soil properly for highly expansive soil. If you were to build a home on highly expansive soil, would you remediate the soil or just use fill dirt?

Re: "Foundation Repair 101" For The Texas Homeowner

by **Gcoffing**

Posted: **May 1st, 2008, 10:57 am**

Thank you for the pictures! They trigger my pet peeve instincts. Concrete is a wonderful building material. When poured at a uniform depth, each 1 inch of slab thickness over 4 inches, nearly doubles its load bearing capacity. Thus 3000psi concrete can bear over 5000psi at 5 inches of thickness. It would stand to reason each 1 inch of slab thickness less than 4 inches would weaken the overall result. I loathe when builders run plumbing lines of any kind in the concrete slab. It is placing a void, the entire length of the pipe, in the concrete and invites cracking at those weak spots. This is a typical, Cable reinforced, slab installation. The key word above is "Uniform". I fail to see a uniform thickness in the photos. Pipes contacting cables, dirt piles beneath the vapor barrier making contact with cables and even forming stakes contacting the beam rebar, stop the concrete from properly encasing the cables or steel rebar and prevent reaching the ideal goal of uniform thickness of the concrete and greatly reduces the function of the cables/steel. On the question of soil/fill compaction. The Texas highway department starts stacking and compacting soils for an overpass to be constructed, 2 to 5 years before starting. Machines designed to compact soil, can not compact soil to the density of undisturbed earth. Time, moisture and gravity create undisturbed earth. Home builders don't have the luxury of that kind of time, nor would it be practical or economical to bring in heavy compacting equipment on a residential slab preparation. The builder depends on, the grade beams of the Engineer designed slab to rest on undisturbed earth and the cables, after being stressed, to make the slab rigid enough to float like a barge on the ocean of expansive clay soils. I prefer to have grade beams beneath load bearing walls rather than in a waffle pattern and prefer rebar reinforcement over the cables, but that costs more to install. The fill soils compacted with a bob cat type machine will allow the concrete to be placed and the cables tensioned, however, soon will continue to compact and will separate from the bottom of the slab. That can pose a problem if the vapor barrier is breached as moisture could permeate the slab causing a mold perfect environment. Nails popping in the second story and rock veneers falling off, as it relates to foundation movement. We refer to this as the rule of sevens. If there is movement of the slab, the stress amplifies as it radiates away from the source like an upside down 7. If you look at a crack that is tight at the bottom and gets increasingly wider as you move toward the top you can visualize it getting more pronounced the further from the source you travel. If I were to build a house on expansive clay soils, I would bring in truck mounted drilling equipment and drill deep piers down to soils that are load bearing and below the zone of moisture change. This would be the same as a bridge being constructed and would not depend on soils at the surface for support. This would be faster and less expensive than soil remediation and in my opinion, more permanent.

Gary

Re: "Foundation Repair 101" For The Texas Homeowner

by **Mike**

Posted: **May 1st, 2008, 11:43 am**

Damn this guy is good.

You can expect more photos. A lot more.

Re: "Foundation Repair 101" For The Texas Homeowner

by **natty**

Posted: **May 1st, 2008, 12:04 pm**

More pics of the foundations that are being poured.

Re: "Foundation Repair 101" For The Texas Homeowner

by **Gcoffing**

Posted: **May 2nd, 2008, 9:39 am**

Thanks for the compliment Mike. Not much to comment on from what I can see in these pictures. Sure hope it didn't rain as soon as they finished pouring. Concrete is at its strongest when you use as little water as possible and place it quickly. The more water you add and the more you agitate the concrete, the more likely the cement, rocks and sand will settle to the bottom half of the pour. You do have to vibrate the concrete to remove air pockets in deep areas like the grade beams and I didn't see anyone with the proper equipment, performing that task. Since they used a concrete pump to move the concrete from the street to the forms, they have had to add more water than I like to use and probably thought they didn't need to vibrate the soup. It is a fairly standard practice for tract home builders. Keep the questions and pictures coming. Gary

Re: "Foundation Repair 101" For The Texas Homeowner

by **Mike**

Posted: **May 2nd, 2008, 11:20 am**

I can honestly say I have seen many foundations poured and never have I seen a vibrator on site or in use. The weather was cloudy all day with random precipitation when this foundation was poured. No real rain but sprinkles here and there.