

September 25, 2006

Att: Mr. William [REDACTED]

Ref: Foundation Movement Inspection

[REDACTED]
Garland, Texas
Geo No. 06 - 347

[REDACTED]

Today, I inspected the foundation of the above referenced residence. This is a single story house with a slab-on-grade foundation. For the purposes of this report, assume that the house faces north. There are mature trees near portions of this foundation.

The purpose of this inspection was to examine the current condition of the foundation for evidence of significant, differential foundation movement. The opinions expressed herein this report are based solely on the observations made at the time of the inspection and do not take into consideration any change in the condition of the foundation after the date of the inspection. This report does not predict or warrant the future performance of the subject foundation. This report is provided for the exclusive use of the addressee. We have no contractual relationship with, or obligation to, any party other than the addressee of this report. This investigation was conducted as a Level B evaluation as defined by the "Guidelines for the Evaluation and Repair of Residential Foundations". The client should be aware that there are other levels of inspections available that include additional services and will result in a more thorough examination of the foundation. These services include but are not limited to items such as geotechnical testing, testing of concrete strength, plumbing leak tests, determining location of interior grade beams, photographs of distressed items, etc. If the client is interested in obtaining a more in depth report, contact the undersigned engineer for a proposal.

General Discussion

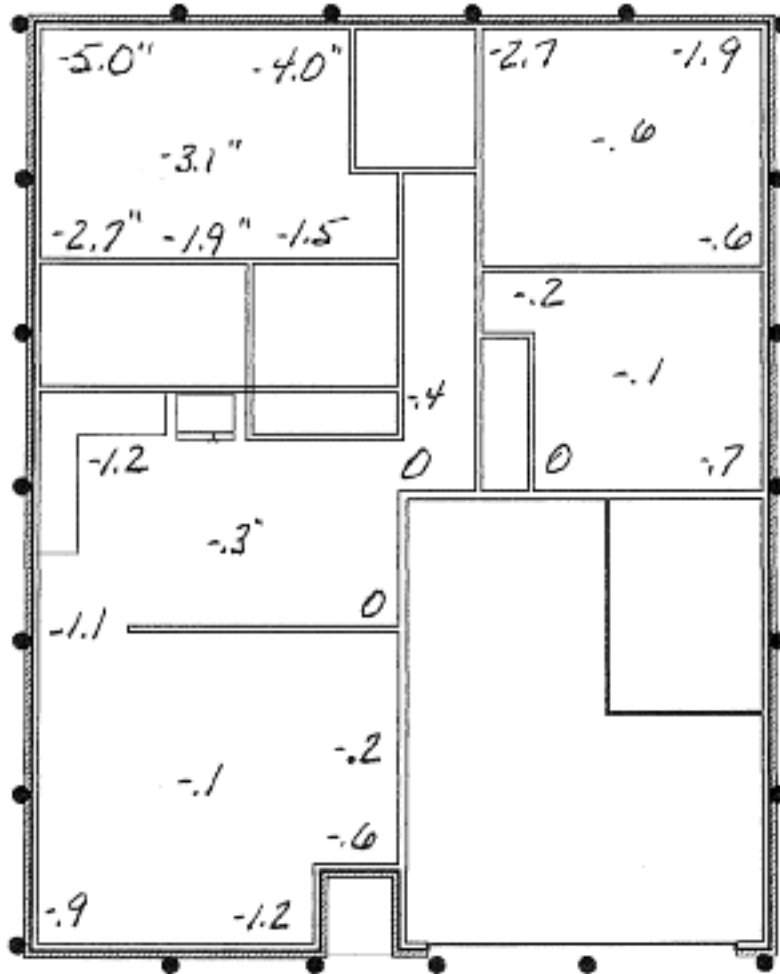
Differential foundation movement can be caused by several factors, some of which are:

1. The drying out of the soils around the outer perimeter of the foundation.
2. The effects of the root structure of mature trees / landscaping near the foundation.
3. Inadequate watering of the foundation during dry weather.
4. Seasonal considerations.
5. Poor drainage conditions.
6. Plumbing leaks under the slab.
7. Loosely compacted fill materials.

It is not unusual for slab foundations in the DFW metroplex to move in response to the moisture variations that normally attend seasonal changes. This is because the soils in this area are known for their expansive, highly plastic characteristics. This means when the moisture content of the soil increases, the soils expand, sometimes significantly. It also means when the soils dry out, they can shrink significantly. This expansion / shrinkage of the soils can easily cause a slab-on-grade foundation to move differentially (up and/or down).

Settlement of a foundation that is induced by seasonal considerations usually occurs during the hot dry summer months where the clay soils can dry out to varying depths, ranging from of 10 to 20 or so feet, depending upon climate and environmental

Root Barrier (consult an Arborist)
Approx 25 l.f. long



● represents the location of new piers to be installed

[Handwritten signature]
STATE OF TEXAS
JAMES V. McVENE
73026
REGISTERED
PROFESSIONAL ENGINEER
2/28/06

[Redacted]
Garland, Texas

Pier Location Plan
not to scale

GeoDynamics

centerline - grade beam, pier & pier steel

Center pier and rebar cage
beneath centerline of grade beam

sonotube filled w/concrete

4 - # 5 vertical bars, grade 60
with #3 ties @ 16" c-c

pier concrete to be 3000 psi,
28 day strength, 6" slump

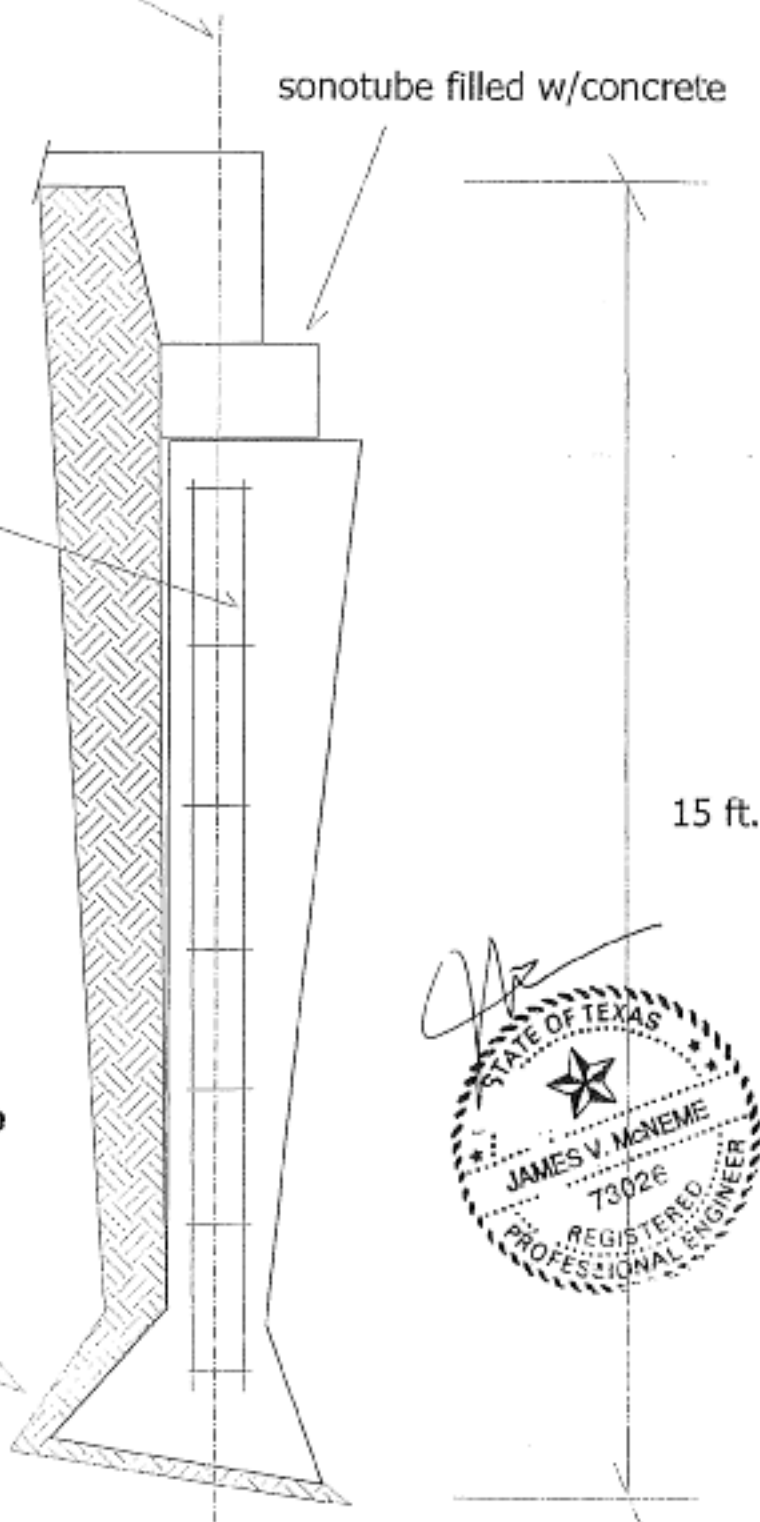
3" clear between rebar and
dirt

shave the back side of the pier
shaft as necessary to allow the
rebar cage to stand vertically

Either bell the pier to a min 30" dia
or embed the pier a min of 2 ft into
unweathered shale/limestone

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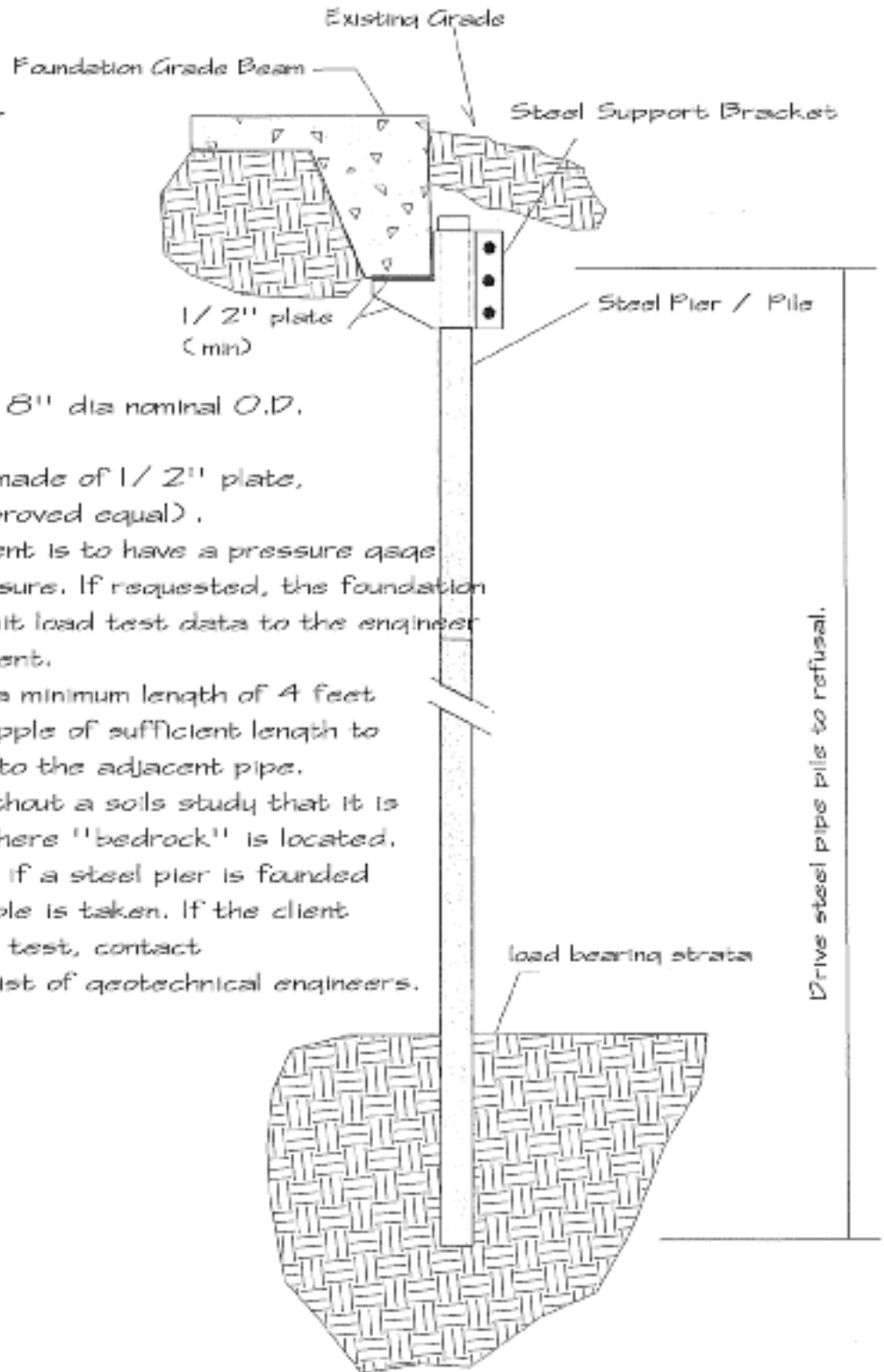
Garland, Texas



12" Diameter Concrete Pier

15pier30

n.t.s



Notes:

1. Steel piers are to be 2 7/8" dia nominal O.D. Sch 40 pipe (min.)
2. The support bracket to be made of 1/2" plate, continuously welded (or approved equal).
3. The pier installation equipment is to have a pressure gauge that shows the driving pressure. If requested, the foundation repair contractor is to submit load test data to the engineer and/or the homeowner/ client.
4. All pipe sections are to be a minimum length of 4 feet with a minimum connection nipple of sufficient length to allow a 8" min protrusion into the adjacent pipe.
5. It should be stated that without a soils study that it is not possible to determine where "bedrock" is located. So, it is not possible to say if a steel pier is founded in "rock" unless a soil sample is taken. If the client would like to conduct a soils test, contact GeoDynamic's office for a list of geotechnical engineers.

Drive steel pipe piers to refusal.

September 25, 2006

[Redacted Signature]
Garland, Texas

Steel Pipe Pier / Pile

Recommended Pier Contractors & Inspection Guidelines

Pier Contractors

A-1 Contractors

Professional Foundation Repair

Ramjack of Texas

Accurate Foundation Repair

972-291-9437 (steel pipe piers)

972-241-3479 (drilled concrete piers)

972-494-3800 (steel pipe piers)

972-623-2500 (steel pipe piers)

If you want the name of other foundation repair contractors, please call our office.

I always recommend that any work being done by any contractor be inspected during the construction process. Many times, lending institutions not only require this work-in-process (interim) inspection, but also an additional inspection upon completion of the work. Following the completion of the work, it is suggested that the inspecting engineer send the homeowner a letter stating that the work he inspected was installed in accordance with his specifications.

It is the homeowner's responsibility to ensure that the repair contractor has adequate insurance, warranty programs, etc. It is important that the contractors visit the site during the bidding process. If they can not do the job as specified, then they should either tell the homeowner or decline to bid. Because of limited access to the pier locations, installing piers around a house requires special drilling / installation equipment – this is especially important with drilled concrete piers. The contractor should tell you during the bidding process if his equipment is not capable of installing the piers as specified (with a 30" diameter bell at the bottom). For example, if his equipment is too big for a small side yard, then he should decline to bid. If concrete piers are being installed and there is a reasonable chance that conditions might be such that he can not use his normal equipment to install the proper size bell (30"), if so, he should tell you before beginning work. It is recommended that the concrete pier contractor measure the depth of each pier shaft and the diameter of each bell (this requires a special L-shaped tool usually made from PVC pipe) and give this information to the homeowner with his final invoice.

I suggest that the foundation repair work be inspected as much as possible, however, finances may not allow for continuous inspections. So, an engineer might be asked to conduct interim or "spot inspections" of the work while it is in progress. For example, if only one inspection of the work is to be conducted, then it is suggested (if concrete piers are being installed) that the excavated pier shafts be inspected prior to the placement of the concrete. Obviously, an engineer can not certify work that he does not inspect. So, if the homeowner does not want the engineer to inspect every pier hole, then the homeowner (or the client) is assuming that the contractor will continue to follow the specifications, even in the absence of the engineer. In other words, if there are no continuous inspections by the engineer, then the responsibility is on the repair contractor and the homeowner/client to ensure that the uninspected portions of contractor's work comply with the specifications.

If the homeowner/client requires a letter from GeoDynamics that certifies that the pier installation was conducted in accordance with the engineering specifications (or as modified due to onsite conditions), then the fee for providing this letter is **\$300** – payable at the time of the visit or prior to the release of the report. This fee includes up to a total of 2 trips.

Typically, on an average size project, two interim inspections are required: one interim inspection while the work is in progress and one final inspection upon completion of the work. Typically, a pier contractor can install 10 to 15 piers a day. It is recommended that at least one inspection be made each day (in the event of drilled concrete piers, the inspection should be made prior to placing the concrete in the pier shafts). Also, if the contractor has problems during the drilling operations or does not follow the engineer's specifications, additional inspections may be required. A minimum trip fee of an additional \$150 is due for these wasted trips. So, it is important that the repair contractor advise the engineer of any problems or construction delays. This fee assumes that the piers/pier shafts will be ready for the engineer to inspect when he arrives on site. If the contractor does not have the pier shafts ready for inspection and the engineer needs to leave and return to conduct the inspection, then an additional fee of **\$150** is required. (It should be remembered that the engineer has previously scheduled appointments, many of which have been scheduled for weeks.) It is the contractor's responsibility to warrant to the homeowner that his work will be free of defects and will provide adequate service. Unless otherwise specifically contracted for, a construction inspection includes only a visual inspection of the pier and/or the pier shaft if drilled concrete piers are used (prior to the placement of rebar and concrete); and the measurement of the depth of the pier shaft and the bell diameter. No code or legal requirements have been included in this report and no guarantee or warranty as to the future life or performance of the piers or the house foundation is intended or implied. The liability limits to Geo Dynamics and its personnel will be limited to the fees received for the services provided.

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conditions. The drying of the soils occurs because of both evaporation and transpiration (water being removed because of trees and shrubs). As the soils dry, they tend to consolidate and as they consolidate, a slab-on-grade foundation settles – especially the outer perimeter. Usually the winter months are wet so the clay soils tend to swell upward, however, during the dry summer months, the soils shrink. This swelling and contraction of the soils sometimes can cause a slab-on-grade foundation to move up and down.

Trees can affect the soil's moisture content under and around foundations. A large shade tree can transpire as much as 200 gallons of water per day. Trees "transpire" or release water into the air in the form of vapor. The water for transpiration must come from the soil by the way of the roots. This is why trees are known to "pull" water from under a foundation, but only when water in the surrounding soil is inadequate or unavailable. Since water naturally moves through the soil from high-moisture areas to low moisture areas, simply not watering at all can cause foundation problems regardless of nearby trees. Trees can add to the problem, but may not be the primary cause of moisture loss from the soil (taken from the Dallas Master Gardeners Website).

One method of reducing the effects of the seasonal action and to help preclude significant upheaval from occurring is to ensure that there is good drainage around the foundation – there should be no place where water is allowed to pond within 10 feet of the foundation. All rain gutters should have an adequate number (and size) of downspouts to ensure that the gutters do not overflow during a heavy rain. Furthermore, all downspouts should either be installed in a buried drain pipe or positioned such that the water is deposited several feet (10' or so) away from the foundation and into an area where the water will drain rapidly away from the foundation.

Where possible, the ground surface (including flowerbeds) should be sloped at a minimum rate of 5% (i.e. 3 inch drop over a 5 feet distance) away from the foundation for the first 5 feet all around the foundation. At this point (5 feet from the foundation) the ground surface should slope adequately to drain the surface water away from the house. Do not allow water to pond within 10 feet of the foundation. Drainage swales should, if possible, have longitudinal slopes of at least 2% (i.e. 6 inches over a 25 foot distance) or a 1% minimum slope (3 inches over 25 feet).

Also important in reducing the effects of seasonal movement and settlement is to institute a watering program, which is designed to allow the water to soak deeply into the soils. A moisture maintenance program is required around the entire perimeter of the foundation. It is the homeowner's responsibility to maintain constant soil moisture near and under the house foundation, at all times. To do otherwise, will probably cause foundation movement.

If the client / homeowner desires additional information concerning homeowner maintenance procedures (of the foundation) he is highly encouraged to examine the documents at the following website: <http://www.foundationrepair.org> – see the information section. If the client does not have internet access, call GeoDynamics office and we will mail you a copy. Also, refer to the GeoDynamics website for additional information: www.GeoDFW.com.

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Discussion

During this inspection, I noted items that usually indicate that differential foundation movement has occurred. Some of these items were: several sheetrock cracks in several of the rooms. For example there is a sheetrock crack in the ceiling on the east side of the kitchen that, according to the homeowner, opens and closes at various times of the year (this is an obvious indication that the foundation is sensitive to variations in the soil moisture content). There are sheetrock cracks in the garage and a network of slab cracks.

There are several doors out of level. For example the closet door in the SW bedroom is out of level over an inch with sheetrock cracks above; the master bedroom door is also out of level about 1" - low to the south, etc.

There are brick mortar cracks on the front exterior wall of the living room. There is a ¼" + wide brick mortar crack on the west side of the SW bedroom with a grade beam crack below.

As can be seen on the attached drawing, the foundation is about 5" out of level. The high area is in the middle of the house and the low area is in the master bedroom. It is my opinion that most of the slab diselevation is the result of post construction foundation movement, but a portion of the diselevation may have been built into the slab at the time of its construction.

It should be noted that the accuracy tolerance for conducting this elevational study is about + / - ¼" or so. This is because of possible differences in carpet pad thickness, inconsistencies in carpet condition (some areas are worn more than others, etc.), accuracy of the surveying equipment used, etc. Adjustments were made to the elevations making corrections for differences in flooring thicknesses. Some smoothing of the raw data may occur. Many foundations are not installed perfectly level, so just because there may be a 5 inch difference in the floor levels, it does not mean that there has been 5 inches of post construction foundation movement. The slab elevations shown in this report are the cumulative result of the original construction tolerances, any post construction foundation movement and any previous foundation repairs (if any).

There are several standards that engineers use to determine if a floor is unacceptably out of level. One standard is that a floor should not slope more than ¾" over a 17 foot distance (localized deflection). It should be stated that this is an arbitrary standard, but it is my opinion that it is a reasonable standard. This standard is exceeded in the master bedroom, the SW bedroom, the middle bedroom on the west side of the house and the kitchen and living room areas.

As we discussed at length today, if time allows, I recommend that the root barrier in the back yard be installed as soon as possible. Then I recommend that the foundation at the back portion of the house be observed for a year or so. This is to allow the soils to rehydrate from the negative effects of the tree. As the rehydration occurs, some upward rebound of the foundation will occur, including in the middle of the master bedroom. However, this typically takes several months. During the observation period, the homeowner should be diligent in watering the soils around the foundation, especially if the ongoing drought continues; this will aid in the rehydration process.

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The primary reason for waiting a year to install the piers around the exterior (a year after the root barrier installation or the tree removal) is to allow the slab elevations in the interior of the master bedroom area to improve (as the soils expand). As we discussed, if the piers are installed at this time, the amount of elevational recovery will be limited to the elevation in the middle of the master bedroom (- 3.1"). However, if a significant portion of the current slab diselevation is the result of the desiccation caused by the tree, then once the tree is removed from the settlement equation, there will be a better chance of making significant improvements in the floor levels. If time does not allow for the observation period and if the piers are installed immediately (along with the root barrier), then it may be necessary to adjust the piers in the future, after the soils rehydrate.

It is possible that the tree in the front yard has also impacted the foundation. However, at this time, it is my opinion that the impact can be managed via the installation of piers across the front. As the tree grows and if the roots extend under the slab, then at that time, it may be necessary to consider installing a root barrier.

There is no one, single reason for the foundation to have moved. The most basic reason is that the foundation is not able to adequately resist the movements of the soils. It is also reasonable to conclude that the desiccation of the soils has contributed to a portion of the settlement.

Recommendations

1. Install a root barrier between the tree in the back yard and the foundation. Typically, the root barrier ditch is 10 to 12" wide. For estimating purposes, the root barrier should be 3 feet deep and installed the barrier no closer than 4 to 5 feet from the foundation. An Arborist should be consulted prior to the installation of the root barrier and he should determine the proper depth of the root barrier (a function of how deep the roots are for the particular species of tree) and also the length of the barrier. Preferably, the root barrier should be a permanent barrier and not be subject to future penetration by roots as they attempt to grow back towards the foundation. An excellent & permanent barrier is to completely fill the ditch with a low strength concrete. However, because of the expense of this technique (using concrete as the barrier), many homeowners decide to install a plastic membrane in the ditch and backfill the ditch with dirt. This latter technique, using a plastic membrane, is considered a temporary barrier because the tree roots will, after a few years, eventually be able to penetrate through the barrier - or grow over, around or under the plastic membrane. This will require additional homeowner maintenance. A plastic barrier (in lieu of the concrete) that is typically used is a 20 mil thick reinforced plastic sheeting, **Permalon X210R** (available from Reef Industries 800-231-6074) (or approved equal). Another product that can be used is **Polyguard 650** (Polyguard Products, Ennis, Texas 972-875-9425).

All penetrations in the membrane because of buried pipes, etc. must be sealed tight so roots can not grow through the penetrations. All roots are to be trimmed smooth with the trench side so as to NOT penetrate the barrier membrane as a result of the installation process. A salt layer is to be added along the bottom of the trench. The trench is to be backfilled with clay soils. However, the clay must be compacted tightly in the trench. Otherwise voids will be present in the backfill material and water will

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probably tend to gather in the trench, possibly causing the soil to expand. It is possible that once a root barrier is installed, there could be some "rebound" of the slab in that area where the roots are (as the soils gain in moisture content, they will expand). However, this is not a "sure thing" and could take a while. The barrier should preferably extend to the surface. However, if not, then it will be needed to sever the surface roots on a regular basis. Also, since the installation of the root barrier will probably have an adverse impact on the tree, it is suggested that an Arborist be consulted to determine if the tree should be trimmed.

2. I recommend that portions of this foundation be underpinned. Refer to the attached Pier Location Plan and Pier Details for additional information.

It is recommended that spot inspections of the work be done during the pier installation process. Spot inspections are required if the client desires a **Letter of Compliance** concerning the foundation repairs from the engineer. It is the client's responsibility to arrange with the engineer for these interim inspections. There is a fee for these inspections. Refer to the last page of this report for additional information.

A properly designed and installed, drilled, concrete pier must be founded in a stable soil strata which is typically between 12 and 17 feet deep, depending on the location. Generally speaking, much of the metroplex has deep clay formations. This means that, in these areas, a shallow pier / piling has the potential for experiencing additional movement – unless it is solidly founded in the proper bearing strata.

There are two pier designs which are well suited for the soil conditions in this neighborhood. They are:

- Concrete, drilled pier with a "bell" shaped bottom
- Steel pipe pier (piling)

If the owner chooses to use concrete piers, I recommend that the pier shaft be a 12" diameter shaft, reinforced with four number 5 steel bars, grade 60. The bottom of the pier shaft must be underreamed (belled) to a minimum diameter of 30". The bottom of the belled pier should be at the 15 feet depth or be bearing on top of limestone. If a contractor chooses to install straight shaft piers (no bell), the pier shaft is to penetrate into the **unweathered** limestone a minimum of 24".

If the owner chooses to use a steel pipe pier (piling) system, the steel pipe must penetrate into a stable bearing strata, which is usually at the point where the pipe pier can not be driven any deeper (point of refusal). This bearing strata is to be a minimum of 15 feet deep unless the bottom of the pier is bearing on shale / limestone. It is usually not possible to ascertain how deep the shale / limestone strata is, unless soil testing is conducted. It is always advisable for a homeowner to do geotechnical (soil) testing. Industry standard for installing steel pipe piers is to hydraulically drive the piers to a point of refusal. The only way to ensure that a pier is placed into "bedrock" is to conduct a soils test. If the homeowner/client desires to have a soil testing/investigation conducted, contact the undersigned engineer for a referral to a geotechnical engineer.

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There are basically two reasons to install piers:

- To stop any further downward movement (settlement) of the foundation – in the area of the piers. Under normal circumstances, a pier will only influence an area within a 7 or so foot radius. In other words, it is possible that the unpiered portions of the foundation may experience settlement/upheaval in the future. This includes settlement caused by seasonal factors, improperly compacted fill materials and settlement caused by trees. The entire slab will still be susceptible to upward movement (upheaval of the soils) and / or settlement in the unpiered areas. This means that the foundation may heave upward off of the newly installed piers.
- To help bring portions of the foundation to a more “level” position – in the area where the piers were installed. However, new defects can appear during the leveling process, if this occurs, the foundation repair contractor is to immediately stop the leveling process – unless otherwise directed by the homeowner. It should be stated that sometimes it is not possible to bring a foundation to a level position. This can occur for several reasons (the foundation was initially constructed out of level, the foundation was out of level because of upheaval, or repairs/remodeling were made to the structure when the foundation was out of level, etc.) In these cases, it may not be feasible to attempt to “level” the foundation. To do otherwise may cause additional damage. Also, additions such as patio roof covers can limit elevations improvements when those additions are attached to the roof of the house as is the case on the east side of the kitchen. Unless the client specifically asks the undersigned engineer to be present during the leveling process, the leveling process is the foundation repair contractor’s responsibility. The foundation repair contractor is to take a new set of slab elevations following the leveling process and give a copy of the elevations to his client. If the client so desires, GeoDynamics will conduct these post repair elevations for a fee of \$150.00.

These repair recommendations are based on the assumption that the foundation is of normal strength, construction and design and that the reinforcing steel is either convention steel bars or post-tensioned cables (not steel wire fabric).

There are some foundations that have been constructed with too few or inadequate interior grade beams and/or inadequate steel reinforcement. If this condition is determined to exist once the foundation repairs are started, then it will possibly be necessary to modify the repair plan to include additional piers or strengthening of the foundation by other means. It is not possible to determine if this condition exists without additional investigation. This type of investigation is beyond the scope of this Level B investigation. However, if the homeowner/client desires these services, the undersigned engineer will provide a proposal for doing so.

Depending upon several onsite conditions, there may be limitations to the effectiveness of installing piers (i.e., just because a foundation has been underpinned, it does not mean that the foundation will never move again). For example, if the outer perimeter of a foundation is underpinned with piers and the soil

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under the interior of the slab shrinks/swells (usually because of a soil moisture change), then it is possible that the interior of the foundation may settle/upheave. If so, then, at that time, additional piers may need to be installed in the interior of the house. The only way to stop all future foundation movement is to completely isolate the foundation from the soil – if the homeowner is interested in pursuing this option, please call the undersigned engineer. For additional information on the limitations of foundation repairs, refer to the document "Expectations of Underpinning" by Tom Witherspoon, P.E.. This document can be seen at the following website: <http://www.foundationrepair.org>. Or call the undersigned engineer to discuss the possible limitations inherent in installing piers under only a portion of a foundation.

It is recommended that during the installation of the piers, the work be inspected by an engineer to ensure that the work meets the specifications of the design engineer. Upon completion of the inspection, the engineer should write the owner a letter verifying that the work performed by the pier contractor was done in accordance with his specifications. It is the client's responsibility to notify the engineer if these inspections are desired. These inspections are "spot" inspections only and do not include supervising the work crew. The repair contractor shall be totally responsible for the direction of the workmen and equipment in accomplishing the work, techniques and methods for doing the work. This includes the leveling process, however, if the homeowner desires the undersigned engineer to be present during the leveling process to give advice to the homeowner during the leveling process, please call GeoDynamics to inquire about the inspection fees and/or schedule an appointment. Be advised that GeoDynamics does not monitor, supervise or direct the construction practices of the foundation repair contractor.

The contractor is responsible for obtaining all permits required to conduct the work. It is the clients/homeowner's responsibility to ensure that the foundation repair contractor has adequate insurance and a warranty program. This includes the contractors recommended by the undersigned engineer. To more fully restate the issue, the undersigned engineer has NOT checked on the validity of ANY foundation repair company's insurance!

If, while the foundation repair contractor is attempting to level the foundation, new defects begin to appear, he is to stop the lift immediately. The leveling of a foundation must be governed by field judgment exercised by experienced technicians. It may not be possible to fully bring the foundation to a level position. If it is determined by others that the foundation movement was caused by a below the slab plumbing leak, then it is recommended that the homeowner wait approximately 4 to 6 months after the leak is repaired to underpin the foundation.

If portions of the foundation are lifted over 1 ½" or so, it will be necessary to fill the resultant void under the slab with a soil/cement slurry. This slurry injection should be done only when the soil is in its normal expanded state (this generally occurs soon after normal winter/spring rains). It is always recommended that a plumbing leak test be conducted after the leveling process and/or prior to the slurry injection. It is the client's responsibility to arrange for this test.

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Repair work specified in this report is based upon limited data, designed to help improve distortion and disclevation of the slab, but not necessarily to completely eliminate foundation movement and/or recurring signs of distress. In other words, it may be necessary, even following foundation repairs/drainage improvements and diligent homeowner watering of the soil around the foundation to perform periodic cosmetic repairs and door adjustments. Repair work is remedial in nature and cannot transform an inferior foundation into one of higher standards than foundation of similar type and age in similar locations. Furthermore, such remedial work will not control movement at other locations such as at unsupported perimeters or interior areas and cannot prevent movement due to variations in moisture content of supporting soils. *As stated elsewhere in this report, a pier, under normal circumstances, can only impact an area in about a 7 foot radius from the pier. This means that additional foundation movement may occur in the unpiered areas. For example, even after a portion of the outer perimeter of a foundation is underpinned with piers, if the soils under the interior of the foundation are allowed to dry because of a lack of diligent homeowner watering of the soils around the foundation, then settlement of the foundation in the interior of the house is possible. It is important that the soil moisture content be maintained after the installation of piers. To do otherwise, will possibly cause foundation settlement in the "unpiered" areas.*

The client is reminded that a slab foundation is a ground supported structural system and, as such, will always be subject to differential foundation movement accompanying the gain or loss of moisture in the supporting soils. Therefore, it is important to institute a watering program which will keep the ground around the foundation at a constant moisture content - year around. Gradually increase the length of time that each zone is watered and attempt to water in such a manner that the water penetrates the subsurface soils several feet deep, especially in the dry seasons. This will help to minimize (not eliminate) any additional seasonal foundation movement.

If it is determined (by others) that the soil around this foundation has not been properly maintained (not adequately watered) prior to this inspection, then it is very important that "normal" watering procedures proceed slowly and with caution. This is because it is possible to cause permanent expansion of the soil with a sudden increase in moisture content. Sometimes, this can only be predicted by obtaining a current soils analysis and other additional information. If the client desires this information, contact the undersigned engineer for a recommendation to a soils engineer.

This visual site survey was not intended to be all inclusive but was limited in scope to a visual examination of the items called to our attention during the Site Survey and areas around the foundation that could reasonably be inspected. This is a report based on first visual impressions and does not include any invasive services such as soils testing, plumbing tests, photographs, excavations, detailed distress survey, removal of veneer, carpet, concrete strength testing, etc. These services are available from GeoDynamics if so desired by the client. Please call GeoDynamics for a proposal to provide these services.

It should be noted that if the house has been recently repaired, remodeled and or repainted, that many times defects are covered up which that, if observed, be an indication of differential foundation movement. Any recommendations included in this report are only a professional opinion and do not constitute a structural warranty or performance contract with the purchaser of this report or with any other party. Unless otherwise stated or requested by the client, site drainage across this property is not a part of this report, unless the drainage conditions adjacent to the foundation are such that, in the opinion of the undersigned engineer, they have had a noticeable, significant, negative impact on the stability of the foundation.

It should be noted that some level of risk is associated with all types of foundations and there is no such thing as a risk free foundation. GeoDynamics can not certify that future foundation movement will or will not occur. It is not usually possible to bring "perfection" to a slab foundation as far as stopping all differential foundation

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movement. It is common for homeowners to make periodic cosmetic repairs because of foundation movement.

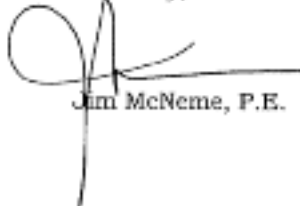
If the client has any questions/comments concerning the data, conclusions and/or recommendations of this report, they are to call the undersigned engineer. If additional information concerning this foundation and/or additional information and conclusions of this report is discovered, following the issuance of this report, the undersigned engineer reserves the right to modify the conclusions and/or recommendations if deemed necessary. The report is based on visual observations without the availability of specifications on the residence and without destructive entry into any location.

Any use made of this investigation and/or the conclusions and recommendations contained herein and any reliance thereon shall be specifically subject to the following limitation of liability: In recognition of the relative risk and benefits of the project to user and GeoDynamics, the risks have been allocated such that user/client agrees, to the fullest extent permitted by law, to limit the liability of Geo to user for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, including attorney's fees and costs and expert witness fees and costs, so that the total aggregate liability of Geo to the user/client shall not exceed the cost of this report unless otherwise specifically agreed in writing. It is intended that this limitation apply to any and all liability or causes of action however, alleges or arising, unless otherwise prohibited by law. For the purpose of this provision, Geo shall include all employees, owners and agents of GeoDynamics. This limitation is applicable to Geo's negligence or other fault in whole or in part.

A complete history of this foundation was not available to the undersigned engineer. This includes several items but includes the original position and surface configuration of the foundation [i.e., the foundation may have been out of level or moved during the construction process of the residence]. Unless otherwise stated, this report is based on the assumption that the foundation was installed in a reasonably level position. This report and its conclusions represent the current position of the foundation. If time permits, prior to performing foundation remediation, it is preferable to observe the behavior of the foundation over a period of time, typically to determine how it responds to variations in the soil moisture content as the seasons go through wet/dry cycles. If the client wants additional information on this, please call the undersigned engineer. The conclusions and recommendations mentioned in this report represent the opinion of the undersigned engineer. All drawings attached to this report represent the general location of some of the walls of this house, the drawing is not to scale and may not include all features in the floor plan. If the client desires a more detailed drawing, they should contact our office for a proposal to do so. This report is provided for the exclusive use of the addressee and is not for use by any other person or organization. GeoDynamics has no contractual relationship with, or duty or obligation to any party other than the addressee of this report.

This Site Condition Survey represents the present condition of the foundation (within the limits of a Level B inspection) and is not to be construed in any way as a guarantee or warranty as to future life or performance of the property at [REDACTED], Garland, Texas.

Sincerely,



Jim McNeme, P.E.

