

SEALY ENGINEERING

5454 Newcastle St. #1713
Houston, Texas 77081
Telephone: 713-927-5472
sealyeng.com, Firm Reg. #3605

September 14, 2018

Regina and Casey Woods

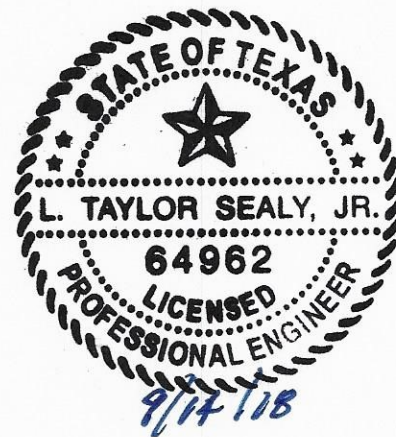
Enclosed is the report of the visual inspection that was conducted on the structural foundation of the residence located at 2711 Everest Ln., Houston, Texas 77073, by Taylor Sealy, PE. This inspection was conducted for you on the date of September 14, 2018.

The information you need should be contained in the attached report. A summary of the items of concern may be found in Section 4.0 near the end. Information specific to this house starts in Section 2.0. If you should have any questions, however, please give us a call. It was a pleasure to have done business with you, and we hope we may be of additional service to you some time in the future.



Taylor Sealy
Licensed Professional Engineer

TS/ts



FOUNDATION INSPECTION REPORT

1.0 INTRODUCTION

The purpose of this report is to describe the results of an inspection that was conducted on the foundation of the residence described below. This inspection was conducted at the request of the client to provide an opinion regarding the performance of this foundation as a primary load-bearing structural member of this building.

In the conduct of this work, Sealy Engineering has acted as an engineering consultant to provide information to the client for use as the client may see fit. As such, Sealy Engineering involvement in any activities related to this residence shall terminate when the final report is submitted unless otherwise requested in writing by the client. Monitoring of repairs is not included in this inspection. As a consultant to the client, it is the sole function of Sealy Engineering to provide information to the client regarding the condition of the foundation and not to make any binding judgments on any condition reported nor to determine the need for repair. Such judgments are, of course, left to the client.

This inspection consisted of a visual examination of the accessible portions of the foundation and the remainder of the structure. The clients should understand that we could miss something during the inspection and it is my policy not to reimburse the clients for such items. In such an examination, it is recognized that a diagnosis of foundation performance can possibly be compromised by the inability to gain access to large portions of the foundation for visual examination, the lack of definition of design and construction parameters that often govern the foundation performance, and inherent limitations to the state of the art of engineering analysis of foundation performance. For safety reasons we do not inspect within the foundation crawl space of pier and beam type houses but will look underneath if an access hatch is readily accessible. Condition of the subfloor framing on these houses is generally reported by the pest control inspectors since wood deterioration is the main cause of distress usually noted within that area. Sealy Engineering has conscientiously utilized all visual data available to every extent reasonable and has attempted to acquire available information such that a reasonably accurate diagnosis could be made. Where specifically requested by the client, Sealy Engineering has provided recommendations for remedial action, should such be warranted. Such recommendations are provided for information, and Sealy Engineering assumes no responsibility in the event such repair work should be done. Finally, this report was written to satisfy the specific objectives of the client. Neither the author of this report nor Sealy Engineering assume any responsibility whatsoever for the use of this report by any third party person. The client(s) agrees in using this report that Sealy Engineering is not required to give testimony or attendance in court or at any other hearing with reference to matters discussed herein, unless prior arrangements are made.

2.0 PROJECT DESCRIPTION

The residence inspected was located at 2711 Everest Ln., Houston, Texas. The clients for this inspection were Regina and Casey Woods. The residence was not occupied and Casey Woods was present.

The residence inspected was a two-story, single family wood frame dwelling with brick veneer and fiber cement siding. A fireplace was located in the family room. The structure had a combination gable and hip roof with a composition asphalt shingle covering. A patio and swimming pool were located in the backyard. The garage was detached except for the breezeway roof connecting it to the house. The structure had a posttensioned concrete slab on grade foundation. The house was built in 2000 according to HCAD. The residence outline is depicted in the attached sketch.

3.0 INSPECTION RESULTS

The foundation of this residence was observed to be more unlevel than would normally be expected and there was foundation-related damage. The level deviations were measured using an electronic version of a waterlevel, a Ziplevel by Technidea in this case, and the results have been superimposed upon an attached sketch. Compensation was made for variations in the height of the floor coverings so that the measurements shown should reflect the relative height of the top of the concrete slab. From this sketch, it can be seen that the slab was measured to be level within approximately 3.6 inches from the high point to the low point. Based upon my experience, this is more than would normally be expected, with a more typical average usually being in the range of about 1.5". That also is the recommended slab construction tolerance given by the American Concrete Institute. The high area was located in the master bedroom at the north corner of the house and the low area was in the dining room at the south corner. Brick cracks or separations to about $\frac{1}{4}$ inch were noted. Brick lines which could be observed were generally straight within normal limits. Significant sheetrock cracks were not seen. The front door and master bedroom door were slightly misaligned. Almost all of the walls that were checked were tilting in the direction of the foundation slope, which indicates to me that the house was not built in this unlevel condition but has moved since construction.

I observed no exposed slab reinforcement steel or honeycombing in the edge of the slab. It is important to keep the slab post tension cable ends from rusting in order to preserve the integrity of the cables. Large cracks were not observed in the visible part of the foundation grade beam. As far as cracks which may be present in the grade beam it should be understood that cracks can be extremely difficult to see and could possibly be detected by the client at some time after the inspection has been completed. Since cracking is a normal property of brittle materials, such as concrete, neither the author nor Sealy Engineering assumes any responsibility whatsoever should cracks be found which were not mentioned. It is my opinion that other indications are more important in determining whether a house has a foundation problem since cracks may be present in slabs due to shrinkage or minor movements. There is a large existing tree opposite the east corner of the house.

In its online report titled "Soil Survey of Harris County", the U. S. Natural Resources Conservation Service (formerly Soil Conservation Service) has classified the soil in this general area to be a member of the Katy sandy loam family of soils. The soil maps are generally considered to be accurate enough for most purposes, although only a soil analysis by means of a boring at the specific site can determine the precise characteristics. The report shows soils in this classification to have low shrink/swell potentials on the surface to about 25 inches, with moderate shrink/swell potentials from there to about 28 inches, and high shrink/swell potentials below that because of the greater percentage of expansive clays present. While soil moisture withdrawal by trees can still be a big problem with this soil, the lesser expansive nature of the upper two feet provides somewhat of a buffer against foundation movement due to moisture changes. However, since the active soil zone is usually considered to extend to about 6 to 10 feet, foundation watering and excluding tree roots from under foundations are still effective in preventing damage to structures due to moisture variations in this type of soil. Trees generally result in foundation settlement due to its effect on the soils, although the roots can lift sidewalks or driveways. Trees are generally capable of affecting house foundations out to about the limits of their untrimmed limbs, although their roots may extend farther. Trees act on house foundations by withdrawing moisture from the expansive clay, which then shrinks and allows the foundation to settle. Cutting of trees or their roots does not apply to those which may have existed on the site before construction or foundation repairs involving slurry or foam injections since heave can result in such cases as soil moisture returns. Cutting to a minimum depth of about 2' below the ground will sever the majority of the roots since they tend to stay near the surface. Cuts should not be made too close to a tree since they can fall over in high winds. Ten feet is often considered the minimum distance, but this should be confirmed by a tree expert. Caution should be exercised so as not to cut underground utility lines. There is a large existing tree opposite the east corner of the house and there were a number of trees on the lot before construction of the house according to the historicaerials.com website. It doesn't look to me like any of the currently existing trees are responsible for the foundation movement. Removal of the pre-existing trees before construction could have affected the foundation, especially if construction was carried out during dry weather. Another possibility to explain the large movement on a relatively new house such as this would be that fill soil could have been added to the lot before construction and it was not well compacted. It does look like the soil in the yard to the northeast is at a higher level and the soil on the lot of this house is higher than the ones across the street to the southwest. The time for stabilization of poorly compacted fill soil varies with the thickness of the layer. However, in 18 years since construction that type of settlement could have stopped.

How removal of trees before construction can affect the foundation is described as follows. When a tree is alive and thriving, it requires large quantities of water for its survival. Such water must be extracted from the soil. When expansive soils, such as are on this site, are in a desiccated state, they tend to be in a shrunken state. For more information, please see the attached technical paper with this report, starting on page 6 of that paper. It has been reported that large trees can desiccate the soils to depths of 12 to 15 feet, and possibly beyond. When a tree is removed, the moisture content of the soil under that tree will tend to rise as moisture is drawn from the surrounding soils until

moisture stabilization is achieved. As the formerly desiccated soils imbibe the moisture, they tend to swell. Since the soils at depth are spatially surrounded on 5 of their 6 sides, the only direction in which the swelling can occur is upward. The results of studies conducted elsewhere have shown that the swelling can continue for an extended period of time; perhaps for as long as 20 to 30 years. Examination of such swelling data that has occurred in the greater Houston area seems to indicate that a swelling period of about 10 years is the maximum in most cases. Since the house is now about 18 years old, it would be expected that any movement from foundation heave due to tree removal would have long since ceased.

In my opinion, there is enough unlevelness such that foundation leveling could be considered because the levelness is so far beyond new construction tolerances in spite of a minimal amount of foundation-related damage. It is also my opinion that leveling could best be accomplished through the correct application of driven piles, possibly installed by means of tunneling for interior locations. Piles tend to be "self-testing" as far as capacity due to the method of installation as long as they are driven to refusal. Not all companies do this. This is true as long as any hard upper clay layer, such as occurs in dry weather, is penetrated. This usually requires a penetration of at least 10' unless sandy soils are involved. In the event the foundation leveling option is chosen, the attached sketch shows a reasonable arrangement for the piles. This information may be used by the client for the process of obtaining bids for this work. It is important to understand that this arrangement is based upon my engineering judgment; however, the warranty will be provided by the contractor who is solely responsible for the work and should, therefore, make the final selection. Any prospective contractor should be given a complete copy of this report in order that they may understand the goals desired here. The client may wish to resolve any significant differences between my suggestions and the recommendations made by the contractor. In any case, neither the author nor Sealy Engineering assumes any responsibility whatsoever for the results of the work of the contractor.

The degree of levelness to be expected from any foundation repairs should be discussed in advance with the contractor in order to avoid any misunderstandings. No foundation repair contract with which I am familiar discusses the degree of levelness to be obtained. It has also been my experience that the majority of the less expensive contractors are incapable of proper leveling. Most of them do not even use a water level type device when checking the foundation or leveling it, which makes getting it back within limits less likely. I have found that most new houses are level within about 1.5" and it should be possible with the pile layout shown to level the house to within that range, in my opinion. The fact that the house is connected to the garage with a breezeway roof could limit the leveling unless the garage is lifted also or the breezeway roof structure is disconnected from the house or garage. After leveling, brick lines in the areas to be lifted should be straight and approximately level. Other components of the house, such as door frames, window sills, counters, etc. should also be level after foundation repairs. Overlifting in an attempt to close cracks should be avoided since debris in them can sometimes prevent them from closing. Additional sheetrock, tile, or other cracks can be expected as a result of this operation. It is important that any void space created by foundation leveling not be filled at all in order that foundation heave

will not result from future changes in soil moisture. There should be plenty of pilings to support the weight of the structure without any additional fill material underneath the house. Under slab drain lines should be checked in some manner after leveling since that process can cause damage that would need to be repaired. It is recommended that an additional foundation inspection be obtained as soon after leveling as possible so that the success of the repairs may be evaluated and also in order to obtain an independent set of level readings for contractor warranty purposes. This would preferably be done while the foundation company is leveling the slab since changes can more readily be made at that time if necessary.

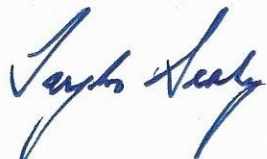
4.0 CONCLUSIONS

Based upon the observations made during this inspection, it is my opinion that there is enough unlevelness from foundation movement such that foundation leveling could be considered. It is possible that the foundation is already stable depending on the cause of the movement. This can only be determined for sure by taking additional level readings in the future and comparing them with the current ones.

The drawing at the end of this report is provided to aid in determining the condition of the foundation. "R" on the drawing represents the reference point from which all other level readings are taken and it is arbitrary. Changes in floor coverings such as the transition from carpet to tile etc. are taken into consideration when taking level readings. Taking the largest positive reading and adding the largest negative reading will give the overall levelness of the structure. Generally, when new houses are finished, a certain amount of slope is built in. This slope is generally in the range of 1.5 inches for the average size house. Level readings are valuable not only as a diagnostic tool but can be used as a reference for any suspected foundation movement that may occur in the future. Readings can also verify the stability of a house. Please note that the scale of the drawings can change with faxing or copying of the original sketches.

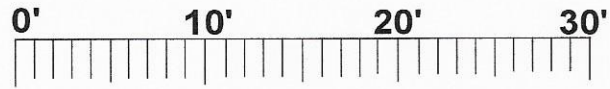
5.0 CERTIFICATION

I hereby certify that I did conduct the assessment of the foundation performance of the residence located at 2711 Everest Ln., Houston, Texas, on the date of September 14, 2018. I am a Licensed Professional Engineer in the State of Texas, whose registration number is 64962. I further certify that the findings and conclusions contained in this report have been, to the best of my knowledge, correctly and completely stated without bias and are based upon my observations and my experience. No responsibility is assumed for events that occur subsequent to the submission of this report and no warranty, either expressed or implied, is hereby made.



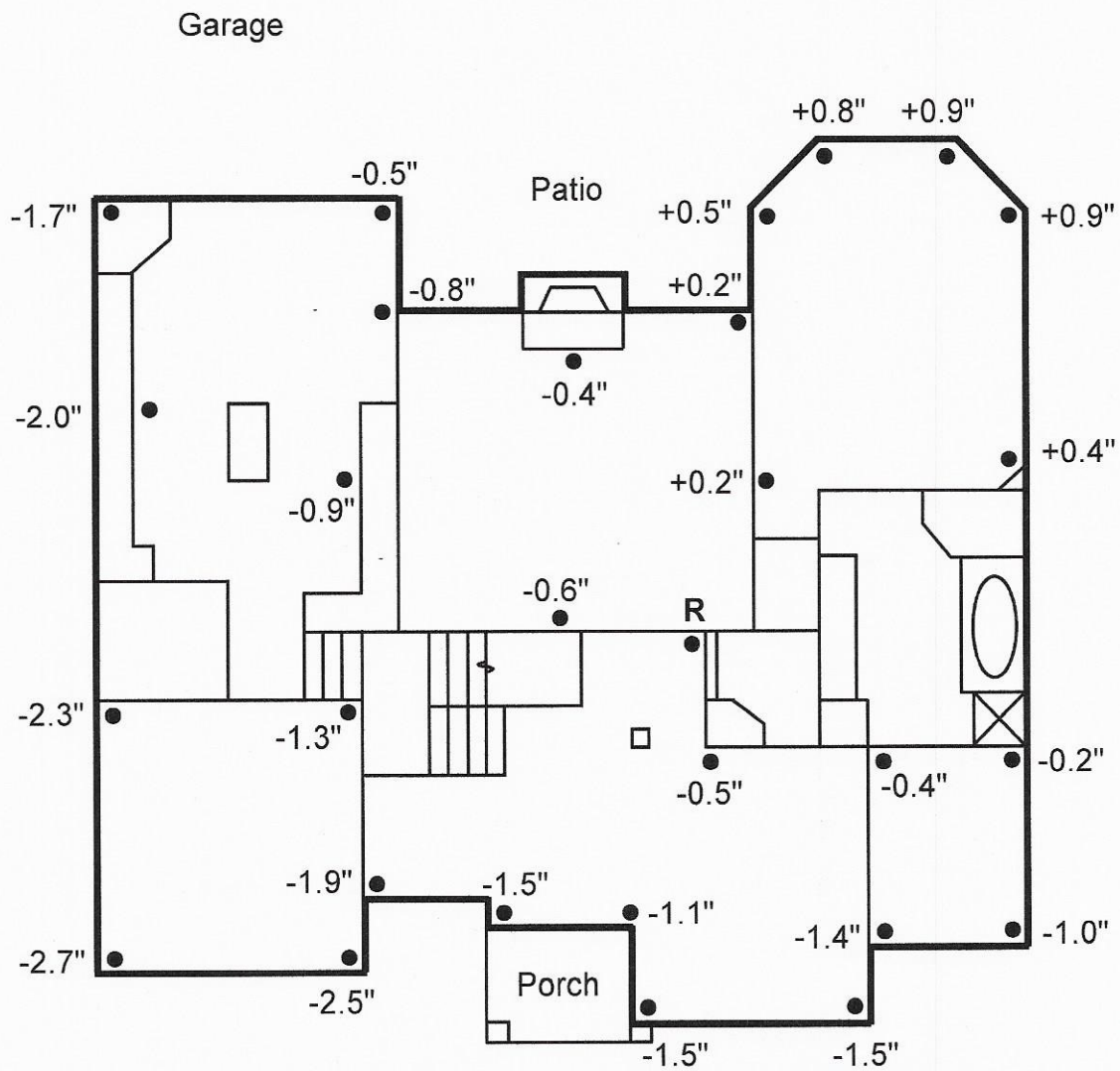
Taylor Sealy
Licensed Professional Engineer

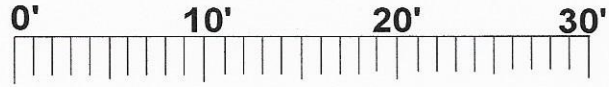




Scale: 1"=10'

Levels Adjusted For Floor Coverings

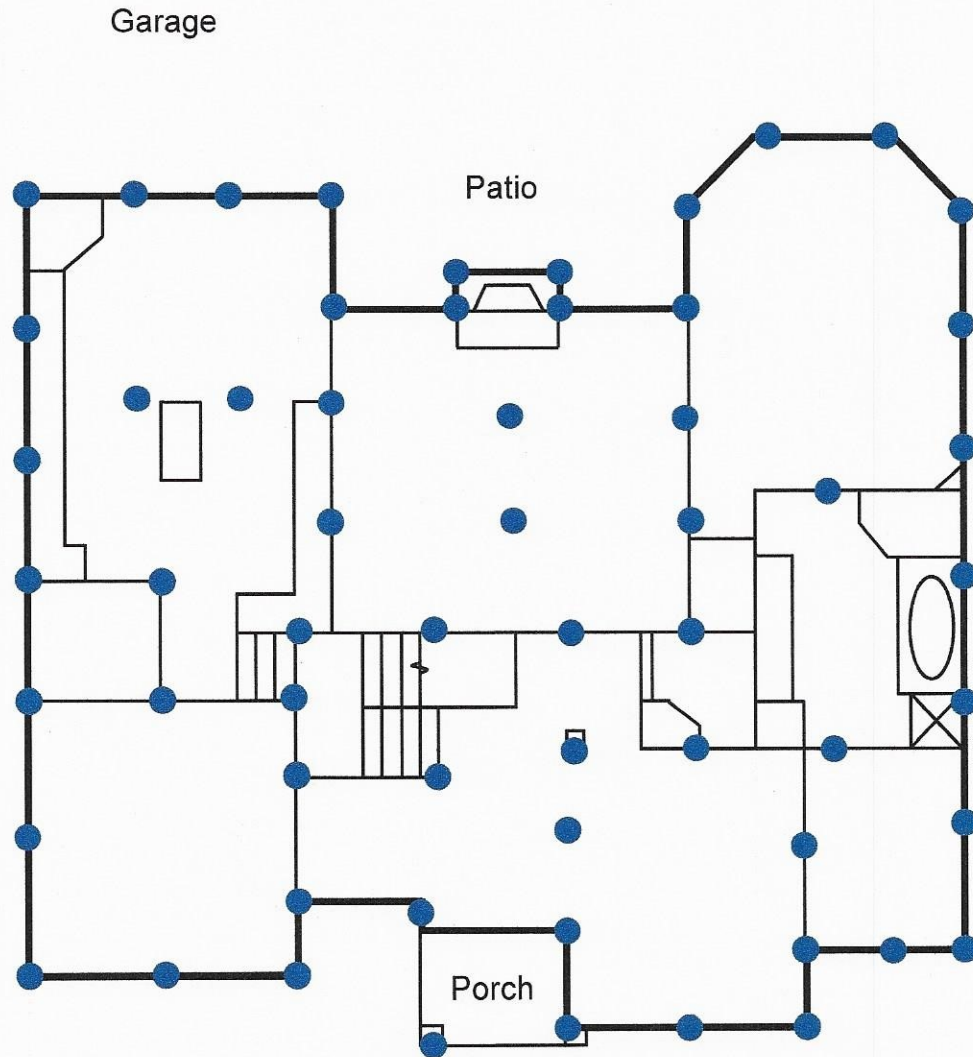


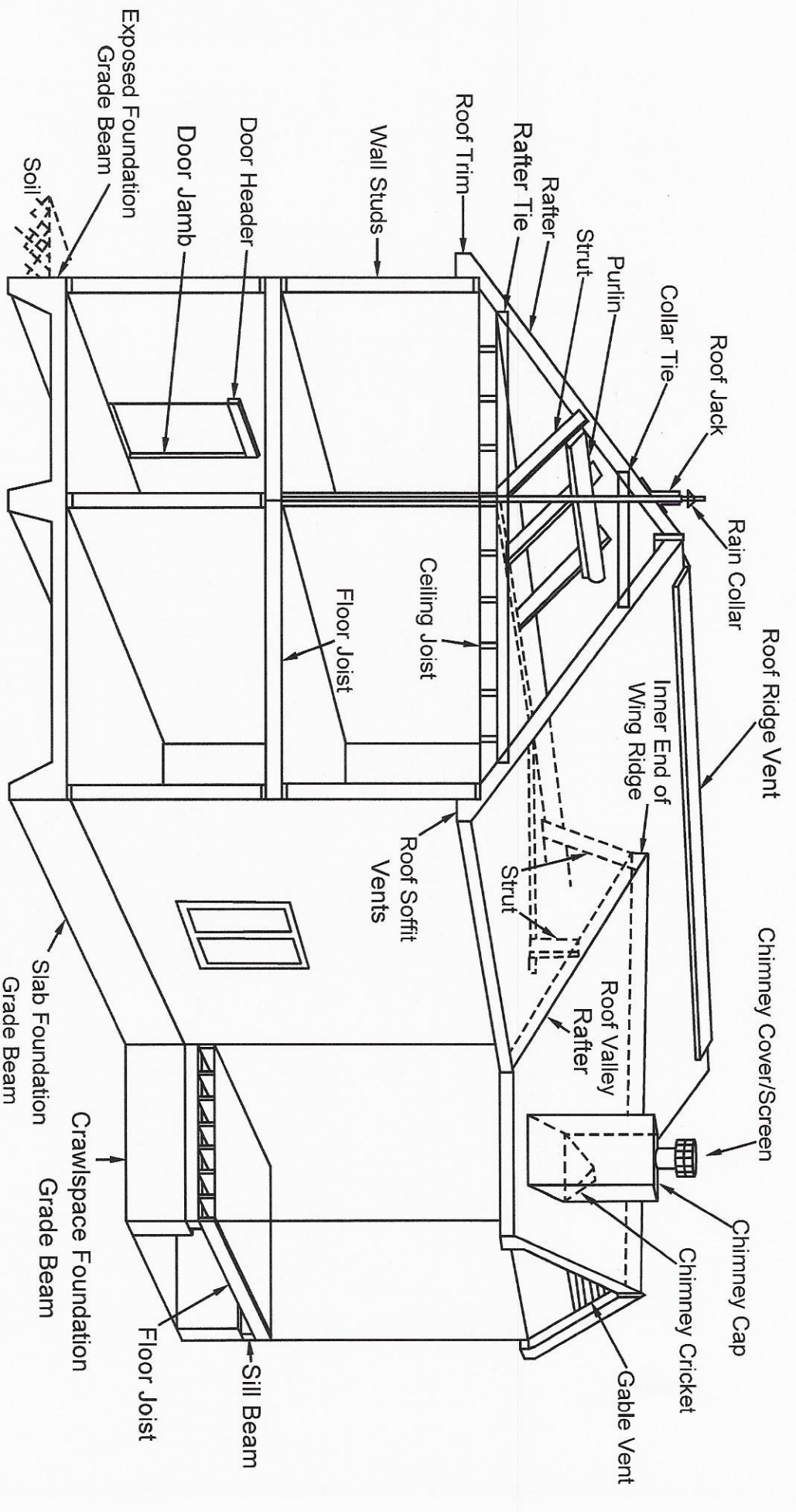


Scale: 1"=10'



● = Approximate Piles Needed To Level Foundation To Within 1.5" Or Better

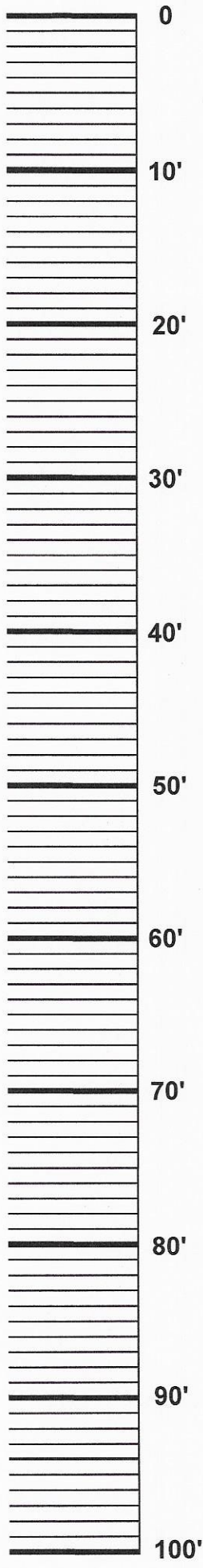




HOUSE TERMINOLOGY

SEALY ENGINEERING

Scale: 1"=10'



Inspection Agreement, Release from Liability, and Invoice

Sealy Engineering
5454 Newcastle #1713, Houston, TX 77081
Phone: (713)9275472

Email: taylorsealy2@gmail.com Website: sealyeng.com

Inspection Address: 2711 EVEREST LN.

AGREEMENT

For a fee of \$ 380, Sealy Engineering, agrees to provide to the Client subjective opinions based on a visual examination of the foundation structure of the residential building listed above. The objective of this examination is to provide the Client a subjective opinion of whether the foregoing structural components were performing the function for which intended or were in need of immediate repair, at the time of the inspection. Sealy Engineering will provide the Client a written report of Taylor Sealy's opinion which will be provided to the client. Receipt of this report by the client will then conclude the inspection process. The information contained in the written report will govern and supersede any prior or inconsistent oral statements. SE has agreed to visually inspect the items listed above. I do not normally go underneath crawlspace foundations but instead look from outside for general condition. The inspection process will be complete once the Client receives the final report.

RELEASE OF LIABILITY

By signing this document, the client agrees to the waivers and limitations described below and in the written report, and that any and all information provide by SE, verbally or in writing, is strictly limited to subjective judgement, or opinion, and as a result, agrees not to rely on our report as the basis for the establishment of property values or as the basis for the purchase of this property. While we commit to doing our best for the client to inspect the foundation, it is the policy of Sealy Engineering not to reimburse the client for missed items or mistakes. We do not perform detailed investigations and /or specific Code inspections, for the purpose of assessing the adequacy of the installation or repair of the structural items on this property. For purchasers, the Client is advised to have any repairs to this building, which may be necessary or desired, made prior to purchasing this property since corrective work may uncover additional defects. It is important to understand that I use visual techniques and a level, combined with my education and experience, to arrive at the conclusions. As such, it is possible that latent defects may be discovered subsequent to this inspection, for which I cannot be held responsible. This inspection may not uncover all defects or repairs needed at this address. A copy of the written report will be provided to the Client and the Client's Agent if the Client so designates below. I hereby Release and Waive any claim against Sealy Engineering, and Owner(s), their present and former staff and agents, for all damages or injuries, and agree not to sue Sealy Engineering, and /or Owner(s) for any non visible damage or non accessible portion of the structure where damage or defects may subsequently be found. This release agreement includes, but is not limited to losses, or injury caused by any of the following: NEGLIGENCE, GROSS NEGLIGENCE, NEGLIGENCE PER SE, and/or STRICT LIABILITY of Sealy Engineering under the Texas Deceptive Trade Practice Act, (DTPA) or acts of any person, employee, contractor, subcontractor and hazards associated with either me, my agents, employees acting on my behalf because of my entry into, upon the construction site or owners property. I agree that the terms of this Release From Liability/ Agreement will be governed by the laws of Texas and that jurisdiction and venue for resolution of any dispute regarding the terms in this Release From Liability/ Agreement shall lie in a Texas Court of competent jurisdiction in Harris County, Texas. I agree to the terms and conditions above and acknowledge receipt of this agreement.

Casidy Wood
Client

9/14/18
Date

FEE PAID

FEE DUE

Authorization to fax
report to client's agent:

YES

NO