

SEALY ENGINEERING

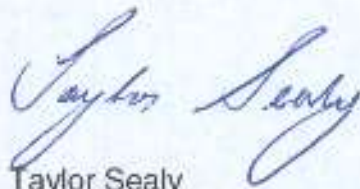
3818 Glen Arbor #5
Houston, Texas 77025
Telephone: 713 6673994, Fax: 713 6672905
sealyeng.com

January 14, 2009

Ben Nonnenmacher
8181 Fannin St., Apt. 128
Houston, TX 77054

Enclosed is the report of the visual inspection that was conducted on the structural components of the residence located at 11727 Wickhollow Ln., Houston, Texas 77043, by Taylor Sealy, PE. This inspection was conducted for you on the date of January 14, 2009.

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

STRUCTURAL INSPECTION REPORT

1.0 INTRODUCTION

The purpose of this report is to document the results of a visual inspection that was conducted on the residential building which is described below and to document our agreement regarding these services. The information contained in this report takes precedence over any communications that may have occurred prior to the issuance of this report, although an attempt is made to give the final conclusions on the checklist. This inspection was conducted for you, as our client, in accordance with the Inspection Agreement to provide you with opinions regarding the performance of the primary load-bearing structural components of this building and to assess if these components are performing the function for which intended or are in need of immediate repair. The primary load bearing components considered are the foundation, along with the wall, second floor, and roof framing. Level readings will be taken on the ground and other floors as deemed necessary to help with the assessment. 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. Other items not directly considered to be structural in nature which we inspect include fireplace, windows, and water-tightness of the walls and roof. The engineer performing this inspection may, at his option, mention conditions observed throughout this building on a "for information" basis; however, the use of such information is at the option of the client. Items not ordinarily assessed include, but are not limited to, driveways, fences, sidewalks, drainage, sprinklers, gutters, insulation, screens, carpeting, toxic materials, hazardous materials (including asbestos), buried materials (including fuel tanks), paint, out buildings (not to include detached garages), cosmetic damage, etc. This inspection was limited, in accordance with the Inspection Agreement, to a visual examination of those portions of the structure that were visually accessible and Sealy Engineering assumes no responsibility should hidden items be discovered in the future. The clients should understand that we could miss something during the inspection and it is our policy not to reimburse the clients for such items. Compliance with any government or industry code or standard, or with any other legal requirement, is not within the scope of this inspection unless discussed herein. By law, inspections to determine the presence and the extent of damage created by wood destroying organisms, which includes all rotted/decayed wood, can only be done by individuals who are so licensed by the State for such purposes, and we are not so licensed.

In the conduct of this work, Sealy Engineering has acted as an engineering consultant to provide visual observations and opinions with regard to the visible condition of the load bearing structure of this building. Recognizing that latent defects could exist which inherently may not be detected during an inspection of this type, Sealy Engineering does not represent that the observations described herein and their analysis thereof represent every structural condition that may exist. You, as the client, should not rely on this report as the sole basis for any decision you may make concerning the purchase of this property nor should you conclude that all of the repairs that may be needed are described herein. Any recommendations for repair that may be contained in this report should be correctly implemented prior to the closing of the purchase of this property since such repairs may result in the discovery of additional defects which, for correct reasons, may not have been discovered during the original inspection. Design calculations for solutions of structural problems go beyond the scope of this inspection. Monitoring of repairs is also not included. Sealy Engineering does not assume any responsibility whatsoever for any action that may or may not be taken as the result of the information provided during this inspection. Finally, this report was written to satisfy the

objectives of you, as our client. Neither the author nor Sealy Engineering assumes any responsibility whatsoever for the use of this report, or the information contained herein, 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 11727 Wickhollow Ln., Houston, Texas. The client for this inspection was Ben Nonnenmacher. The residence was not occupied and the clients and listing agent were present.

The residence inspected was a two-story, single family wood frame dwelling with brick veneer and vinyl siding. Fireplaces were located in the master bedroom and rear family room. The structure had a gable roof with a composition shingle covering. Porches were located at the front and rear of the house. The garage was attached. The structure probably had a post-tensioned concrete slab on grade foundation, but the grade beam could not be seen to verify this because of the later addition of mortar over it. The house was built in 1984 according to HCAD. The residence outline is depicted in the attached sketch.

3.0 INSPECTION RESULTS

3.1 FOUNDATION

The foundation of this residence was observed to have incurred deflections which caused damage to other structural components. The level deviations were measured using an electronic version of a waterlevel, a Zipllevel 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 3.0 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 front living room by the support column and the low area at the north side of the garage. Brick cracks or separations to about 1/4" were noted. Sheetrock cracks were seen upstairs over the garage, along with door misalignments in that area also. We observed no exposed slab reinforcement steel or honeycombing in the edge of the slab. Large cracks were not observed in the visible part of the foundation grade beam. Cosmetic slab corner cracks are present. As far as other 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 assume any responsibility whatsoever should cracks be found which were not mentioned. It is our 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.

In its 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 Aris 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 21 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 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 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 usually 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 are trees close enough to affect the foundation and the trees in the front yard are most likely responsible for the garage settlement. Removal of close trees, deep cutting of their roots, or installation of root barriers would help prevent further damage in the future. This should include the large tree in this backyard along with the neighboring trees near there.

In my opinion, the deflections in the foundation of this residential building are of a sufficient magnitude and the damage these deflections have caused is sufficiently severe that restoration procedures are in order. It is also my opinion that restoration of foundation integrity can best be accomplished through the correct application of driven piles. The reason for that is to minimize further damage to the foundation which can sometimes limit the degree of levelness that can be obtained during the repairs. Piles tend to be "self-testing" as far as capacity due to the method of installation. 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. 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 our engineering judgement; 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 our 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 the 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. We have found that most new houses of this size are level within about 1.5" and it should be possible with the pile layout shown to level the house to within approximately 1.9 inches from the high point to the low point, keeping in mind that other considerations come into play when trying to determine the original position of the house. This would mean that the lowest point in the house after leveling would be -0.6", which is present at the rear of the house. 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 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 in order that foundation heave will not result from future changes in soil moisture. 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.

3.2 FRAMING

The roof support structure in the attic was observed to be a typical rafter and ceiling joist type of construction. Although access to the attic area was limited, inspection of those portions of the attic that were amenable to visual examination showed this portion of the structure to be typical of others we have inspected in the greater Houston area; except a cracked rafter is present in the front attic space and should be lifted back into position and reinforced by the addition of more 2 x 6 lumber alongside us of the rafter, extending several feet from the affected area. No large dips were measured on the second story floor, with the exception of the sloping in the second floor over the garage area due to foundation movement. Otherwise, no visible defects were observed in the floors, ceilings, or load-bearing walls.

Upper story level readings are taken in most cases unless spans between supporting walls below are short enough to eliminate the likelihood of floor sagging. Sometimes the upper floor level readings can be used to document the levelness of the foundation below in places level readings cannot be readily taken, such as over porches or sometimes garages. In order to detect sagging of upper floors, an effort is made to take level readings over supporting walls at either end of the span, and then near the middle of the span. If no sag whatsoever were present at midspan, the level reading there would equal the average of the readings at either end of the span. As an example of such a case, the midpoint average of a span with readings of 1.0" and 0.8" at the ends would be 0.9". If the actual level reading at midspan was 0.6", then the amount of sag would be 0.3". A certain amount of sag is considered acceptable by the building code, with the acceptable value usually equal to the span divided by 360. A 10' span would give an acceptable "deflection", or sag, of 0.028', or 0.33". Some variation in floor levelness can be expected from normal construction tolerances, as with the foundation level readings.

3.3 OUTER WALL WATERTIGHT INTEGRITY

Soil levels are excessively high around parts of the foundation and should be lowered to expose several inches of slab, with provisions made to assure proper drainage away from the house. Leaking from the high soil levels may be part of the reason that mortar was used cover the weep holes and lower courses the brick around the house. The weep holes at least should be cleared to allow any moisture behind the brick to escape. Window frames need to be touchup caulked. Loose vinyl siding was observed at the rear of the breakfast room and should be resecured. There was an absence of water spotting on the surface of the interior floors and upon the inside of the exterior walls, nor were any other indications of water penetration through the walls of the structure observed. It should be noted that wall stains are often difficult to see and depend on lighting conditions at that point. Also, while we check for gaps around lower story window frames, the upper frames are poorly accessible and are not checked except from the ground. Any sprinklers should be prevented from spraying onto the house to avoid water penetration.

3.4 ROOF COVERING

The composition shingles were observed to be laying properly on the roof. Shingles were not excessively deteriorated or damaged, as would be expected with what was reported to be a 5 year old roof. Leaves and pine needles are building up and roof valleys at the front of the house and should be clear to avoid water backups. Rusted sheet metal on the roof should be painted to prolong its life. There was no sign that rain had penetrated into the attic nor were water spots found on interior ceilings. Detection of ceiling stains are usually very difficult unless major leaks are present since the lighting has to be just right to see faint stains. The amount of attic ventilation opening appears to be sufficient for a house of this size. It must be emphasized that these observations were based on those component parts that were visible and the existence of latent defects which could feasibly produce a leak cannot be discounted.

A roof covering begins to age immediately after it has been placed on a residential building. We have found that composition shingles tend to last approximately 15 -18 years in the Houston area. It is important to understand that the aging rate of any roofing material cannot be determined with a great degree of accuracy based upon a visual inspection of the type that is the subject of this report. Further, any roof can leak at any time and such an event cannot be accurately predicted. Although the roof of this building was found to be performing the function for which intended and was not in immediate need of recovering, any accelerated aging could possibly result in the need for recovering in the foreseeable future. It is also important to understand that a roof can leak at any time, regardless of the age of the material. In the event such a leak should occur, its presence does not necessarily mean that the roof is in need of recovering. The author of this report does not assume any responsibility whatsoever for the future performance of this roof covering.

3.5 FIREPLACE

The fireplace chimneys were visibly secured to the residential structure and there were no signs of them pulling away. The fireplace dampers opened and closed freely, but the one in the rear fireplace was not stay in the closed position and adjustments are needed. There were no large visible cracks in the firetiles or metal liners of the fireboxes. Although there was some soot in the visible part of the firebox, smoke chamber and flue, an excessive build-up of creosote and tar was not observed. A 1/8" buildup is usually considered enough to warrant cleaning. There were covers/screens over the top of the chimney flue. Operability could not be verified during this type of inspection.

3.6 MISCELLANEOUS ITEMS

The stairs and landings leading to the second story of this structure appear to be performing their intended functions. The stair step geometry generally appears to be within the allowable amounts and there were no excessive height changes in the steps. The windows that were tested on the exterior walls of this structure were observed to be performing their intended barrier functions. The windows that we tested opened and closed with only a slight amount of difficulty. Window operability does not correlate well with a lack of structural problems, in my experience, and therefore we only spot check them for fire safety reasons. Hence, there could be some undetected problems with them. The plastic window pane retaining strips on most windows are deteriorated and need to be replaced. Windows in the breakfast room have a plastic film installed over them which is wrinkled and damaged and needs to be removed.

4.0 CONCLUSIONS

Based upon the observations made during this inspection, it is our opinion that the following structural components of this residence were either defective in performance or are in need of attention:

1. The plastic window pane retaining strips on most windows are deteriorated and need to be replaced. Windows in the breakfast room have a plastic film installed over them which is wrinkled and damaged and needs to be removed.
2. The fireplace dampers opened and closed freely, but the one in the rear fireplace was not stay in the closed position and adjustments are needed.
3. Leaves and pine needles are building up and roof valleys at the front of the house and should be clear to avoid water backups. Rusted sheet metal on the roof should be painted to prolong its life.
4. Soil levels are excessively high around parts of the foundation and should be lowered to expose several inches of slab, with provisions made to assure proper drainage away from the house. Leaking from the high soil levels may be part of the reason that mortar was used cover the weep holes and lower courses the brick around the house. The weep holes at least should be cleared to allow any moisture behind the brick to escape. Window frames need to be touchup caulked. Loose vinyl siding was observed at the rear of the breakfast room and should be resecured.
5. A cracked rafter is present in the front attic space and should be lifted back into position and reinforced by the addition of more 2 x 6 lumber alongside us of the rafter, extending several feet from the affected area.
6. Sufficient foundation unlevelness was a was measured in the garage area, along with damage on both floors, to warrant foundation repairs in my opinion as described in section 3.1.

It is our opinion that the performance characteristics of the other load-bearing structural components of this residence that were inspected are performing the function for which intended to a reasonable degree and are not in need of immediate repair.

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. 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. This value, and the difference between any two points for that matter, is independent of the location of the reference point. 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 the house. Please note that the scale of the drawings can change with faxing or copying of the original sketches.

It is extremely important to understand that this inspection was conducted in accordance with the Inspection Agreement and, as such, there are definite limitations to the results thereof. The inspection was limited to only those parts of the structure that were visible without removing any of the structural

coverings. It is entirely possible that latent defects could be discovered if these structural coverings were to be removed; during remodeling, for example. The purpose of the inspection was to report any conditions which could be an indication that one of those structural components listed in the Inspection Agreement was either failing to perform the function for which intended or was in need of immediate repair. There are no provisions in this document for citing conditions which might be construed as unconventional or not in accordance with building code requirements and/or accepted practices. Also, there is no provision in the Agreement for personal opinion regarding the relative goodness of any condition. The items described in this report are the authors opinion of the visible conditions, as they existed at the time of the inspection; and nothing more. The client may rely on these opinions, only to the extent of the limitations used in their formulation. It is entirely possible that another individual inspecting this property might have differing opinions than those cited above. Further, it is also the nature of residential construction in the greater Houston area for the condition of building structures to change, often over a short period of time. Neither the author nor Sealy Engineering assume any responsibility whatsoever for the existence of latent defects that were not amenable to visual detection during this inspection, for items not specifically identified in this report as having been inspected, for changes that occur in items subsequent to this inspection, for structure that has deteriorated because of wood destroying insects and/or organisms, or for opinions expressed by others that may differ from those expressed in this report. No warranty, either expressed or implied, is hereby made, and the client hereby waives all warranties, except for such waivers or disclaimers that may be prohibited by law. In using the information provided by Sealy Engineering the user accepts these limitations and their attendant risks and agrees to limit any future claims for damages to the amount of the inspection fee. In using this report, the client further agrees, except as may be limited by law, that there are no other agreements or understandings concerning the standard, grade, quality, or amount of the services provided by Sealy Engineering, other than what is contained in this report and the Inspection Agreement. Finally, no other representations and/or statements have been made that this report and the Inspection Agreement include rights, remedies, or obligations which are not contained in these instruments.

5.0 CERTIFICATION

I hereby certify that I did inspect the structural components of the residence located at 11727 Wickhollow Ln., Houston, Texas, on the date of January 14, 2009, and that I have reported my findings and opinions based upon my observations and my experience. I am a Licensed Professional Engineer in the State of Texas, whose registration number is 64962. I further certify that the information contained in this report is based upon evidence and that no attempt was made to investigate those latent defects not readily detectable from visual observations. No responsibility is assumed for events that occur subsequent to this inspection and no warranty, either expressed or implied, is hereby made.


Taylor Sealy
Licensed Professional Engineer

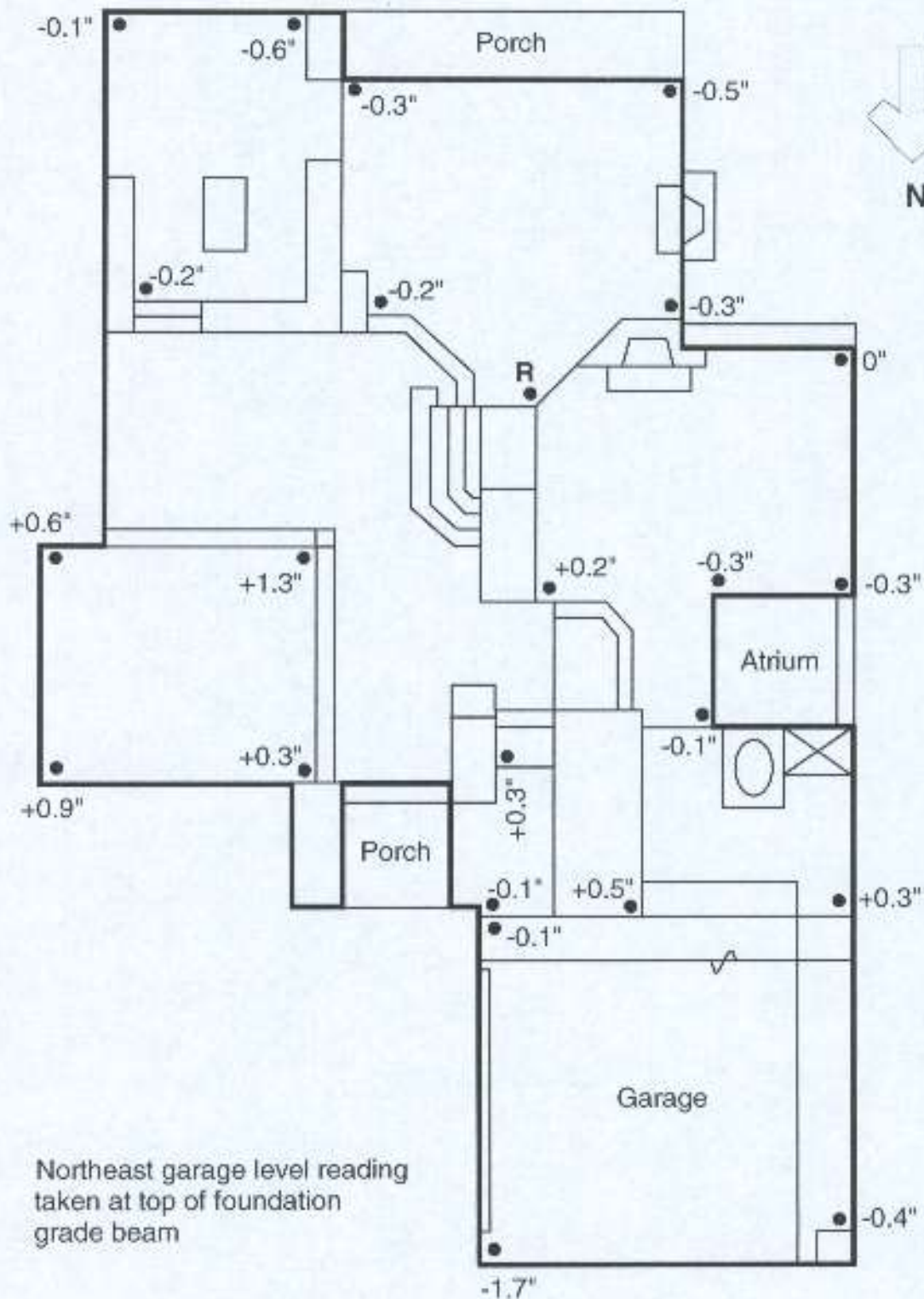


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January 14, 2009

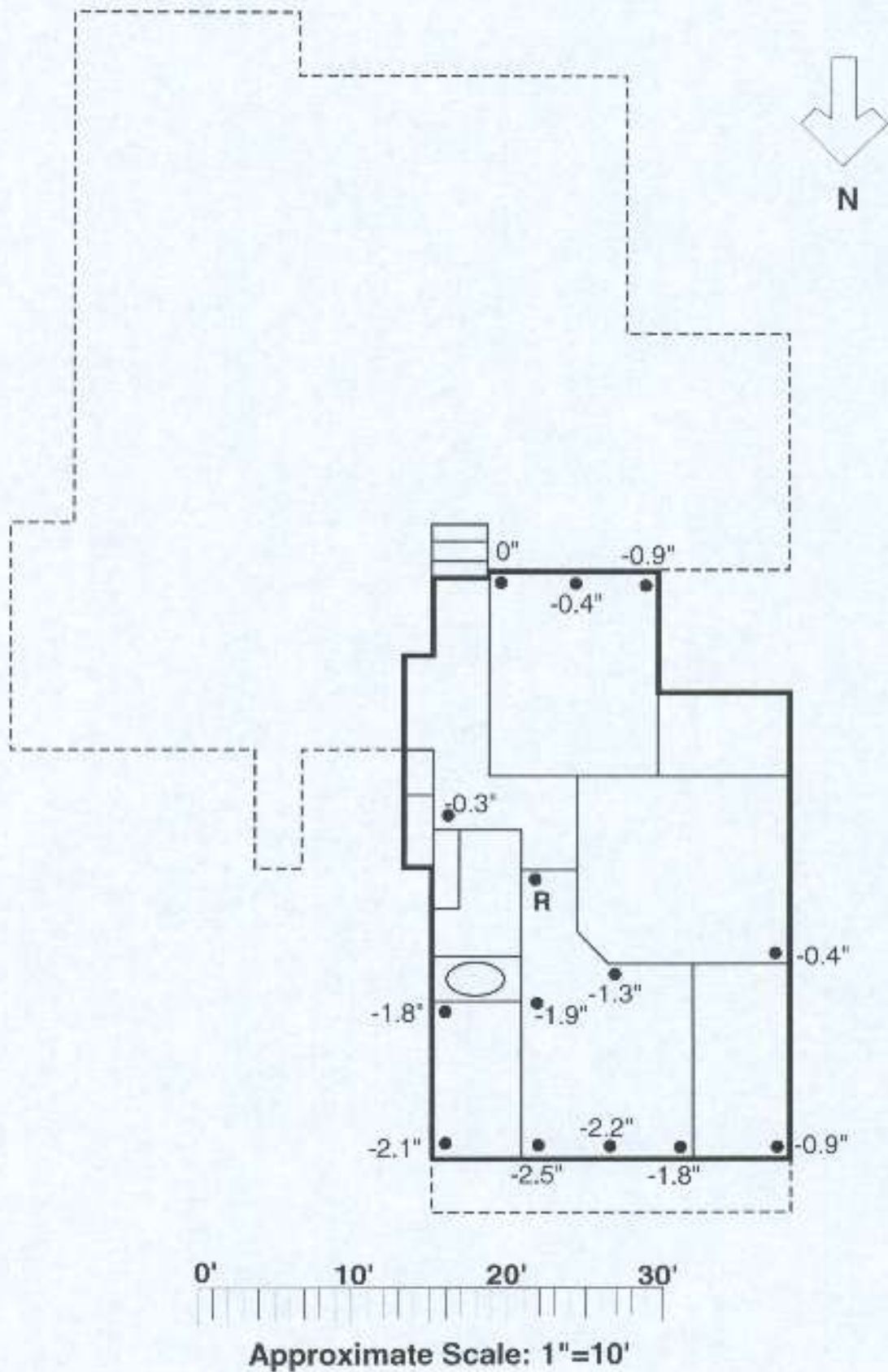
11727 Wickhollow Ln.
Level Readings



Approximate Scale: 1"=10'



Northeast garage level reading
taken at top of foundation
grade beam

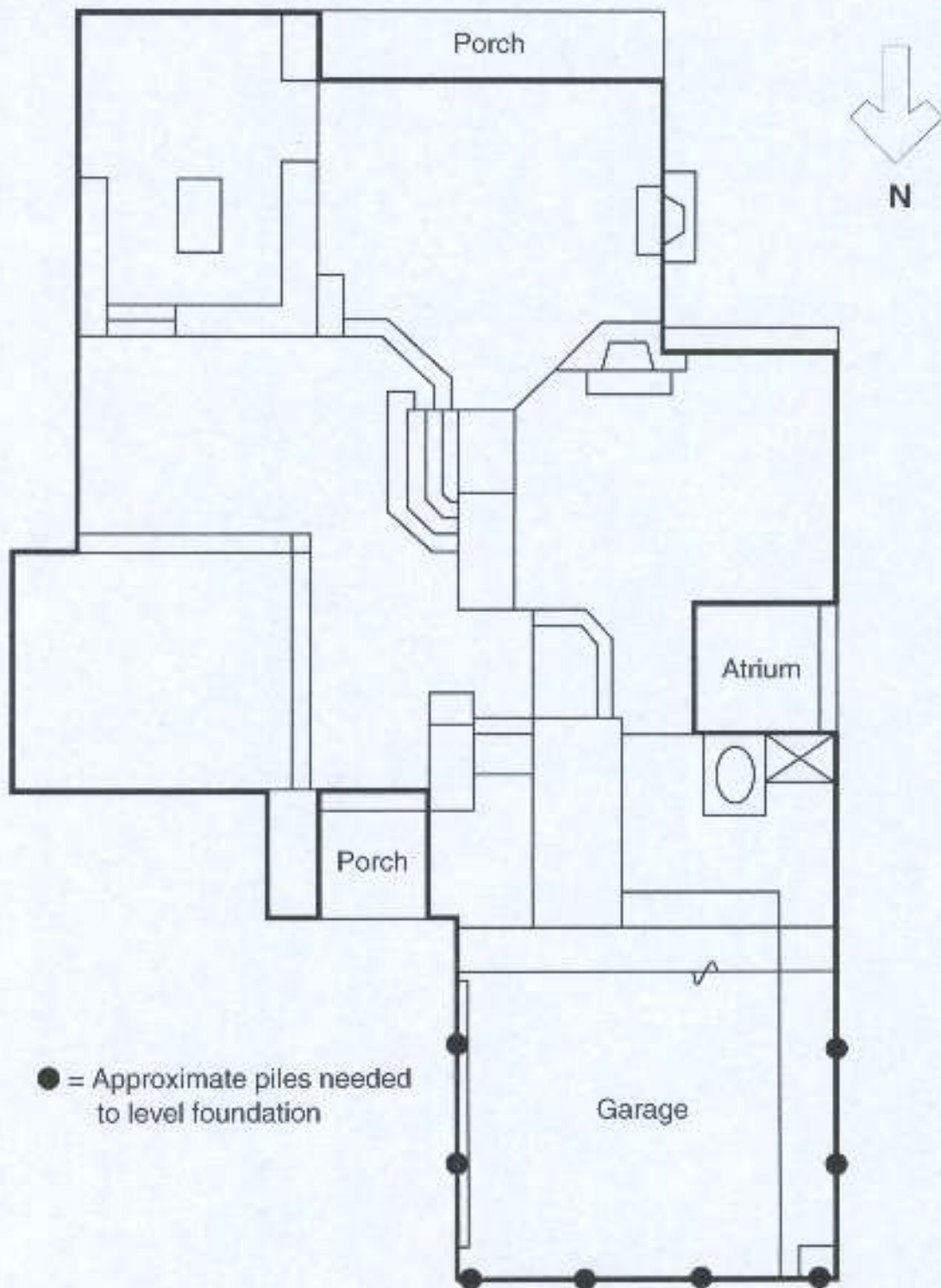


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January 14, 2009

11727 Wickhollow Ln.
Pile Layout



Approximate Scale: 1"=10'





1/14/2009
11727 Wickhollow Ln.



1/14/2009
Mortar or some material on side of house



1/14/2009
Loose vinyl siding at back of breakfast room



1/14/2009
Caulk window frames



1/14/2009
Decayed plastic window pane strips



1/14/2009
Cracked floor tiles



1/14/2009
Pine needles on roof



1/14/2009
Leaves on front roof valley



1/14/2009
Rusted roof jack



1/14/2009
Rust on chimney cap



1/14/2009
View of roof showing attic ventilation



1/14/2009
Soil above slab in spots



1/14/2009
Cracked rafter in front attic