



## **HEDDERMAN ENGINEERING, INC.**

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Date

TO: Mr.

REF: CONDITION OF PROPERTY SURVEY

Dear Mr. :

At your request, a visual survey was made of the structural components of the house located at Houston, Texas, by Tim Hedderman.

Transmitted herewith is the inspection report stating my subjective, professional opinion on the quality of original workmanship of the items included in this inspection.

Thank you for asking HEDDERMAN ENGINEERING, INC. to perform this important inspection work for you. If you have any questions after reviewing this report, please feel free to call me at my office.

Sincerely,

HEDDERMAN ENGINEERING, INC.  
Tim Hedderman, President



## **Property Address**

## **INTRODUCTION**

### **PURPOSE**

The purpose of the inspection was to view the structural components of the house and give a subjective, professional opinion on the quality of workmanship evident in the fabrication of the building, with the most significant deficiencies observed being pointed out for your consideration. These observations are made in order to provide a basis for the opinions which will be stated within the body of the report.

The list of deficiencies is not claimed to be a complete list of all irregularities that exist, but a representative list used as a basis to form an opinion as to the quality of workmanship evident in the construction of the building.

The main structural components that were viewed included the foundation, primary load-carrying framing members, and the roof surface.

### **SCOPE**

The scope of the inspection included limited, visual observations at the interior and exterior of the structure, the attic as viewed from the accessible interior, and the roof as

viewed from the ground. Only those items readily visible were viewed. Any items causing visual obstruction were not moved.

Although this report may include observations of some code violations, total compliance with codes, specifications, and/or legal requirements are specifically excluded.

Although this inspection was made by a Registered Professional Engineer, it cannot be considered to be a formal engineering inspection since no analysis or physical testing was performed.

**FOR THE PURPOSES OF THIS INSPECTION, NORTH WILL BE ASSUMED TO BE FROM THE REAR OF THE HOUSE TOWARDS THE FRONT.**

### **DESCRIPTION OF HOUSE**

The house inspected was a four bedroom, 3-1/2 bath, wood frame dwelling with brick veneer, a composition shingle roof, and was supported on a post tensioned slab-on-grade concrete foundation. The house was under construction at the time of the inspection, with the framing completed, and the plumbing and electrical roughed in. The roof was completely installed.

## **FOUNDATION**

### **Observations**

Normally horizontal surfaces, such as floors, door tops, counters, window sills, etc., were observed to be acceptably level throughout the house. The floors were checked with an electronic level, and the difference in elevation between the high point and low point was 0.8 inch. The high point was located at the west side of the house at the dining room, and the low point was located on the east side of the house at the center bedroom.

See our field sketch showing the elevation readings at the end of this report. Note that the "R" on the sketch is our randomly chosen starting reference point, where the elevation is 0, and all other elevation readings are taken relative to the reference point, and are measured in inches to the nearest 1/10 inch. Note also that elevation readings taken at the garage area are relatively large numbers relative to the reference point due to the step down into the garage area.

We typically point out that foundations are rarely constructed perfectly level, so most houses have some unlevelness (typically  $\frac{3}{4}$  to 1-1/2 inches) built into the foundation as part of original construction.

Nails were observed to be protruding from the face of the concrete grade beams at the post tensioned cables, and the nails need to be cut off.

We observed anchor bolts to be installed, connecting the bottom plate of the wall framing to the foundation. The bolts were installed within one foot of the corners, and spaced approximately every four feet around the perimeter of the house.

We observed that the ends of the post tension cable have not been cut off, nor have the pockets in the concrete grade beam been grouted.

The post tension cables have been tensioned, and the anchor wedges installed. You can see in the photos below from the white paint mark on the cable, that the cables have been elongated approximately 4-5 inches during the tensioning process. When the wedges are set and the pulling force on the cable is released, the residual compression in the cable provides the reinforcement for the concrete slab.



Photos of the anchoring wedges installed in the anchor. The cable ends will be cut off inside the face of the concrete grade beam, and will be covered by grout.





We observed that a piece of black plastic has been installed and is properly covering the brick ledge where the bricks will be installed on the foundation. The plastic is needed as a bond breaker between the brick mortar and the concrete foundation.



### Perimeter Drainage

The lot has not been final graded in both the front and back yards. The final grade should ensure proper drainage to the street.

## **STRUCTURAL FRAMING**

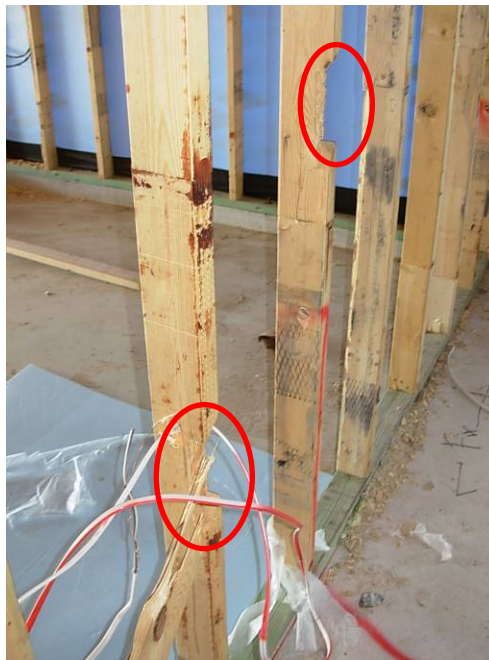
### Observations

The house was observed to be a wood frame structure that includes the standard major framing components, including wall studs, ceiling joists, floor joists, and roof rafters with purlins and strut supports.

1. We observed that many of the metal nailing plates were missing from the wall studs where the electrical wiring was closer than one inch to the surface of the stud. This can allow a sheetrock screw to penetrate the wiring, and metal plates need to be installed to protect the wiring. The electricians were present at the time of the inspection, and were installing the plates.



2. We observed in the bedroom between the garage and the master bedroom closet that a diagonal brace has been removed, and some of the studs that were notched out have been replaced. Further investigation with the builder is needed concerning the missing diagonal brace, which is an important framing member, and why it has been removed. (see photos below)



3. We observed a steel beam has been installed in the garage over the garage door, to be used at the header over the garage door. This is better and stronger than the normal beams that are installed over garage doors, and will prevent sagging of the header. (see photo below)



4. One of the wall studs was broken, and needs to be replaced, at the upstairs game room.



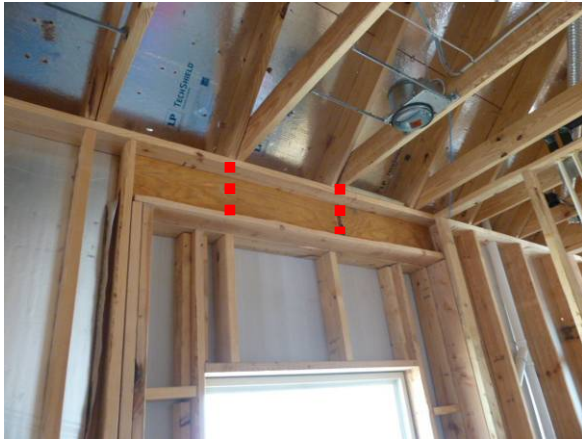


5. The prefabricated truss joists did not have 2 x 4 squash blocks installed on both sides of each truss joist, where there is a load from a wall above. Further investigation with the manufacturer of the truss joists is recommended to determine if their system requires squash blocks at these locations. Squash blocks are pieces of 2 x 4 that are 1/16 inch longer than the height of the truss joist, and are nailed to either side of the truss joist to help carry the load from the wall above, and transfer the load to the framing below.



6. We observed that cripple studs were missing above many of the windows and it is recommended that they be installed to provide proper support for the loads above the windows.





7. We observed missing nailing plates at several locations.





8. We observed a broken brace in the wall at the master suite, where a notch had been cut in the brace for the air conditioning refrigerant lines.



9. The column at the back porch did not show any evidence that it was anchored to the concrete patio area, to prevent uplift from wind forces. Further investigation with the builder is recommended and to make needed repairs.





10. We observed wind uplift clips and straps to have been installed at the bottom of the wall framing to attach the wall framing to the foundation; at the top of the wall framing to attach the walls and roof framing; and at windows. The clips and straps were properly installed with no repairs needed.





11. We observed major beams in the house which are connected together with bolts. However, many of the nuts were missing from the bolts, and need to be installed.



### Conclusions

The primary load carrying members of the structural framing were in need of repair as detailed above.

# **ROOF**

## **Life expectancy**

The roof surface was constructed of composition shingles. The life expectancy of a composition shingle roof has been observed to vary from 10 to 20 years, with most requiring replacement at about 15-18 years.

## **Observations**

After observing the interior of the structure, evidences of roof leaks were not visible. The absence of evidences of roof leaks does not imply that roof leaks were not present; rather, that no evidences of leaking were visible at the time of the inspection.

The PVC plumbing vent pipes that protrude through the roof jacks on the roof need to be painted to prevent deterioration of the PVC from the sunlight. Also, the metal vent pipes



We observed a damaged shingle on the front elevation of the roof, and the damaged shingle needs to be replaced before it causes a roof leak.

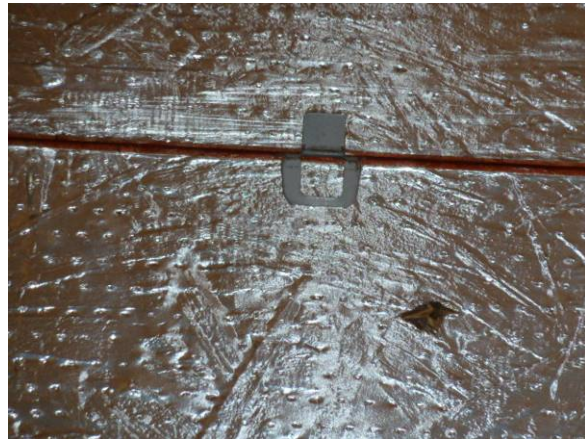






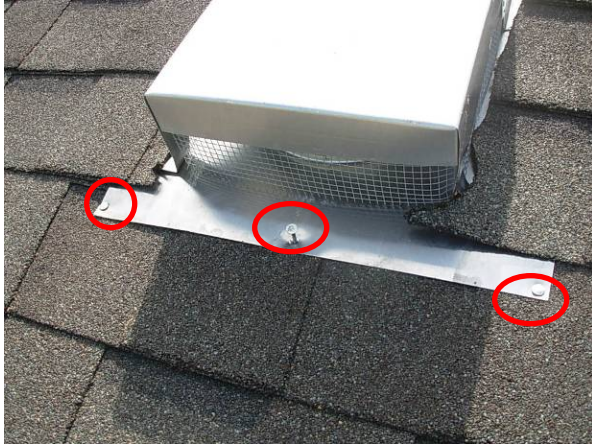
The roof decking was observed to be “Tech-Shield”, which is roof barrier roof decking that has an aluminum foil on the underside of the roof decking. This will help to keep the attic cooler by reflecting radiant heat from the roof.

The roof decking was observed to have spacer clips installed between the adjacent sheets of roof decking to allow for expansion of the roof decking due to heat.



We observed that the nails used to secure the shingles to the roof deck were penetrating the roof deck, and were visible from the attic. This shows that the roofers used nails rather than staples, and that the nails were a proper length.

Some of the flashing on the roof jacks were not sealed at the nail heads, and caulking needs to be applied to the nail heads to prevent roof leaks. Most of the nail heads on the other flashings and roof jacks were properly sealed. (see photos below)

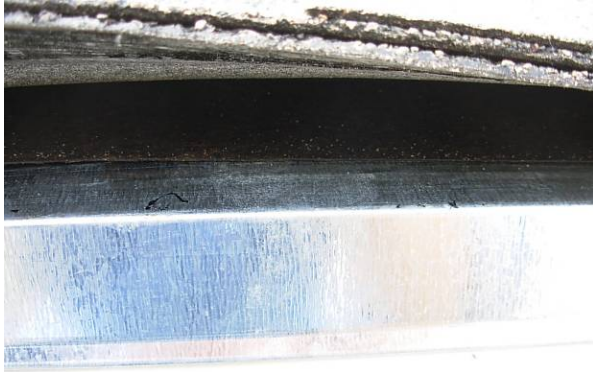


We observed a valley at the front part of the roof that narrows down, and will have a tendency to trap leaves and other debris. The area needs to be maintained to prevent a build up of debris. The area was flashed with metal flashing, which will help to prevent leaks in the area.

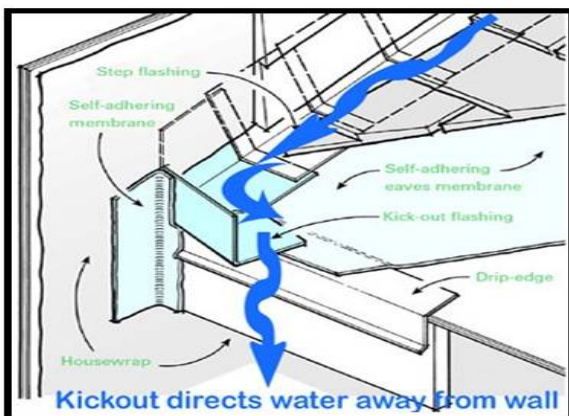


We lifted the edge of the shingles to verify that the tar paper underlayment was properly lapped on top of the drip edge flashing, and it was. No repairs are needed.





We observed that the lower roof at the rear of the house empties onto the vent pipe for the fireplace. It is recommended that a piece of kickout flashing be installed to route water away from the vent pipe to prevent water penetration.



## Conclusions

The roof is in serviceable condition at this time, and is performing its intended function with some repairs indicated to the roof surface.

## WINDOWS

Most of the windows in the house have had a piece of plastic installed under the window, and wrapping over the window sill. This is to prevent any water that leaks through or around the window from going to the inside wall cavity, but rather routes the water to the outside of the wall. The plastic laps over the outside of the window sills, and the windows were sealed with Window Wrap tape.



Below is a photo(s) of the manufacturers specifications for the window(s). These stickers will be removed before you close on the house, so we include the photo(s) so that you will have a record.

PP2



**CHAMPION WINDOW**  
 Series 40 PWF  
 Picture Window Frame  
 Aluminum Frame • Insulated Glass  
 PP2 Low-E Glass

**ENERGY PERFORMANCE RATINGS**

U-Factor (U.S./I-P)		Solar Heat Gain Coefficient	
	w/ Argon		w/ Muntins
<b>0.47</b>	<b>0.42</b>	<b>0.37</b>	<b>0.34</b>

**ADDITIONAL PERFORMANCE RATINGS**

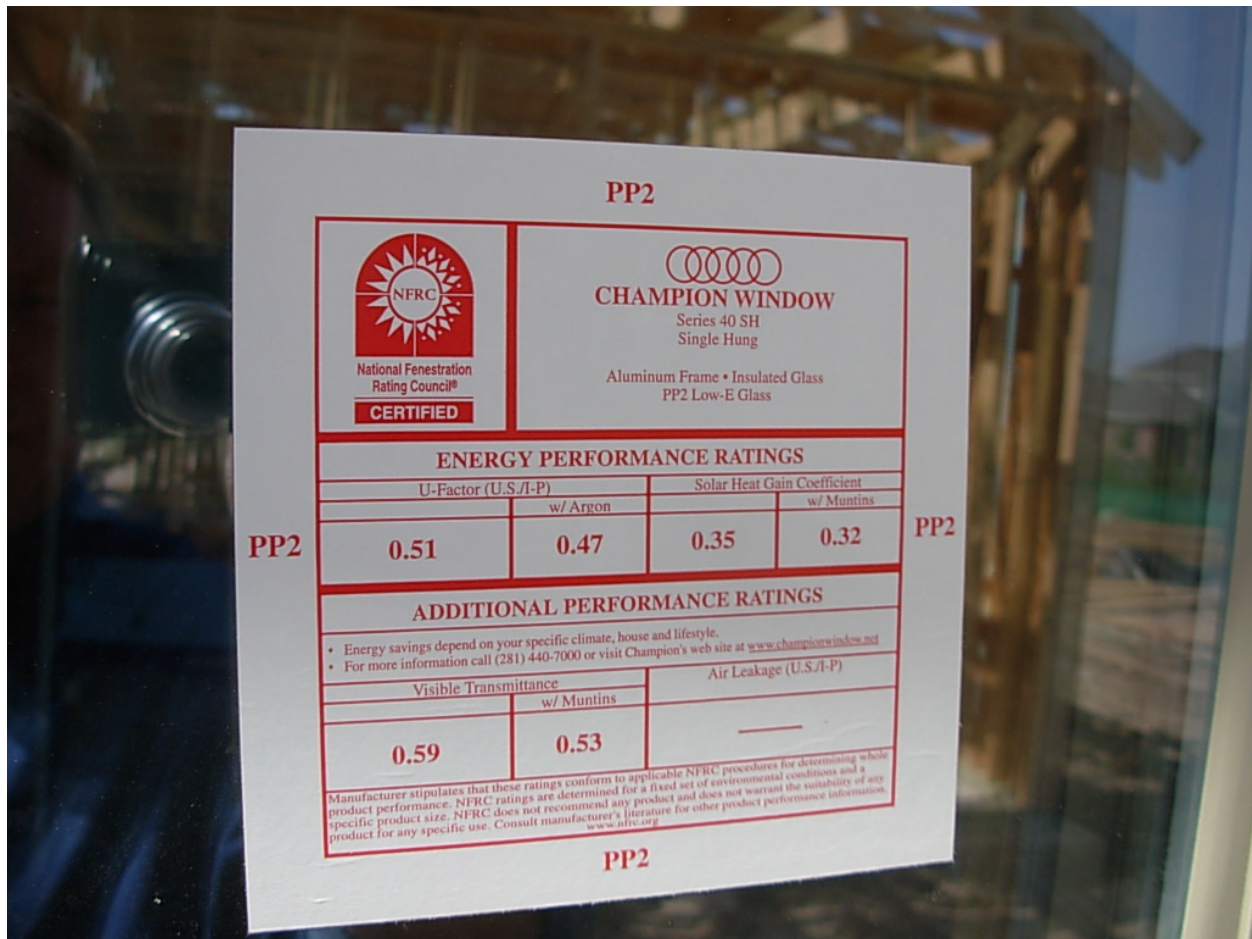
- Energy savings depend on your specific climate, house and lifestyle.
- For more information call (281) 440-7000 or visit Champion's web site at [www.championwindow.net](http://www.championwindow.net)

Visible Transmittance		Air Leakage (U.S./I-P)
	w/ Muntins	
<b>0.62</b>	<b>0.56</b>	—

Manufacturer stipulates that these ratings conform to applicable NFRCC procedures for determining whole product performance. NFRCC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRCC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information.  
[www.nfrc.org](http://www.nfrc.org)

PP2





## PLUMBING

The water piping throughout the house was CPVC and PEX piping.

The shower stall at the master bathroom has not been constructed at the time of the inspection, so we could not determine if the shower will have a seat built into the shower. The reason we mention this at this time is because it has been our experience that these seats are not typically built with a watertight detail, where the shower pan material extends across the bottom of the shower, and up over the seat detail. Without the shower pan material covering the seat, water will get under the tile or synthetic marble covering when the grout or caulking deteriorates, and will cause a leak. It is recommended that you check with your builder to determine if a seat will be installed in the shower, and to verify that he intends to extend the shower pan material up over the seat to make a watertight detail. (see photo below)





Another typical detail that we see repeatedly on new houses, is a lack of proper and adequate access under the whirlpool tub at the master bathroom for access to the water piping and drain. It is recommended that you check with your builder concerning the tub so that proper access can be built into the tub here at the framing stage of construction.



## **ELECTRICAL**

The electrical wiring from the breaker panel in the garage was observed to be bundled together in the wall and also in the ceiling. Electrical wires are not allowed to be bundled for a distance of more than two feet, before having to apply a derating factor to the capacity of the wiring. Further investigation with your builder is recommended to separate the wiring. Following is the section of the International Residential Code that relates to bundling of wires.

International Residential Code - E3605.3 Adjustment factor for conductor proximity.

Where the number of current-carrying conductors in a raceway or cable exceeds three, or where single conductors or **multiconductor cables are stacked or bundled for distances greater than 24 inches**

(610 mm) **without maintaining spacing** and are not installed in raceways, the allowable ampacity of each conductor shall be reduced as shown in Table E3605.3. **(NOTE: Emphasis by HEI)**

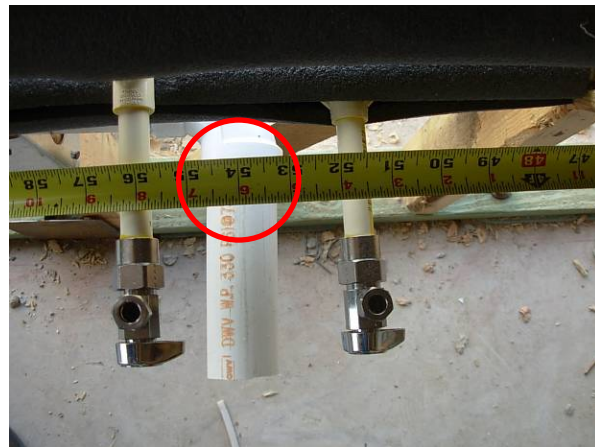


No 120-volt circuit has been provided in the front bedroom #3 at the Direct Connect control panel for the low voltage wiring, for a modem. Further investigation with your builder is recommended.

The light fixture rough in was missing from the kitchen pantry.

No electrical outlets have been provided at the kitchen island for the dishwasher and disposal.

The outlet in the master bathroom was located 54 inches from the centerline of the sink on the adjacent wall. Bathroom outlets are required to be no farther than 36 inches from the outside edge of the sink. Further investigation with your builder is recommended.



The required reinforcing steel stub up was observed in the garage, where a piece of rebar from the foundation is extended up into the garage wall. However, the bonding wire from the breaker panel to the rebar was not installed at the time of the inspection.



## **AIR CONDITIONING/HEATING/DUCTWORK**

The air conditioning ductwork was in contact with each other in several places. This condition can cause condensation at the contact points and it is recommended that the ducts be separated.





## **CLOSE**

Opinions and comments stated in this report are based on the apparent performance of the items included within the scope of the inspection, at the time of the inspection. Performance standards are based on the knowledge gained through the experience and professional studies of the inspector. There is no warranty or guarantee, either expressed or implied, regarding the habitability, future performance, life, merchantability, and/or need for repair of any item inspected.

Sincerely,

Tim Hedderman  
Registered Professional Engineer #51501  
Texas Firm Number: 7942



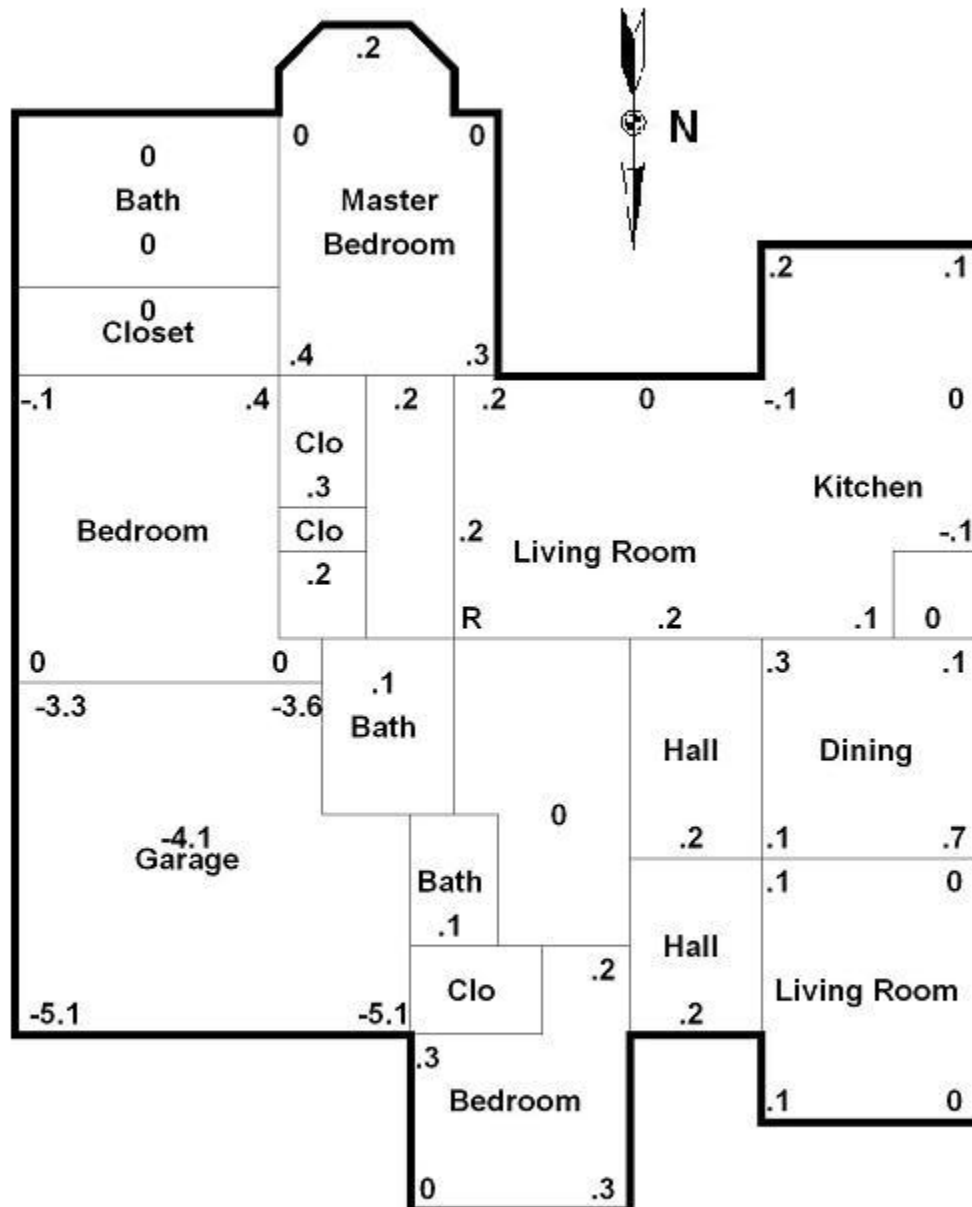
*The seal appearing on this document was authorized by Tim Hedderman, P.E. 51501. Alteration of a sealed document without proper notification to the responsible engineer is a violation under the Texas Engineering Practice Act.*



Date

HEI

Name



## ELEVATION READINGS

### Property Address

2000 by Alex Corp