

# RSH ENGINEERING, INC

## FOUNDATION ANALYSIS

Jan 1, 2011

Subject: XYZ Anytown, TX

Mr. ABC,

At your request, I examined the foundation of the structure located at **XYZ Anytown, TX**. My inspection consisted of a visual examination of the structure and an elevation survey using a Zip-Level and/or self leveling laser level. No soils reports or structural diagrams were examined. No destructive or invasive testing procedures were employed.

- The structure is a two story single-family type of dwelling, which rests on a concrete slab on grade type of foundation.
- There were evidence of prior foundation repairs seen and no reports of prior foundation repairs were provided or reviewed.
- The structure does have cosmetic damage that is typically symptomatic of foundation movement. (Brick & mortar cracks, door sticking, horizontal and diagonal drywall cracks, etc.)
- Drainage on the lot does seem to be adequate. However the flowerbeds and slab sides have **flat to negative slope**. Soil needs to be added around the foundation and sloped at 1" of drop every foot for the 1<sup>st</sup> five feet away from the foundation.
- Vegetation and lack of soil and inadequate positive drainage around the structure seems to be contributing to the foundation movement.

ANALYSIS

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In our opinion, the condition of the property, considering the foundation deflections measured with the Zip-Level and/or self-leveling laser and the degree of cosmetic damage, indicates that foundation repairs are needed at this time.

The elevation diagram indicates that the foundation is not within allowable limits and acceptable tolerances. The foundation exhibits differential movement that needs to be adjusted. It also has a crack that runs from the garage entrance to the inside breakfast room under the tiles to the patio slab. There was also a slab edge crack on the back side of the patio slab.

A possible cause of the differential movement is the poor drainage and gutters that discharges directly adjacent to the slab on the right side, front and back. Some areas around the foundation are experiencing more moisture than the other areas. This will affect the soil conditions resulting in foundation movement.

The results of our elevation survey are shown on the attached diagram.

## RECOMMENDATIONS

The foundation is in need of adjustment. The elevation diagram indicates that the foundation is not within acceptable tolerances and allowable limits. It is recommended the installation of **4 new piers** as shown on the attached foundation repair plan. The foundation plan also shows areas that may have the existing piers, per the homeowner, in the locations shown. If after the excavation, they do not find the existing piers, install the piers at the missing locations.

The installation of the piles will help lift the foundation to within acceptable limits and allowable tolerances and help stabilize the slab.

It is recommended that a good controlled watering system be used around the perimeter foundation grade beam. This type of system will help keep the soil at relatively consistent moisture content. When the soil is at consistent moisture content there is less possibility that the structure will experience differential movement.

It is further recommended that there be maintained a positive slope away from the foundation on all sides of the structure. This type of condition will prevent water from accumulating adjacent to the foundation. If water should pond adjacent to the perimeter foundation grade beam it can result in the saturation of the soil, which reduces its bearing capacity and therefore results in the

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differential movement of the structure. A gutter system can also be used to channel water away from the foundation.

**It is recommended to have plumbing tests performed before and after the foundation repair for both the water lines and the drain lines by a licensed plumber.**

## **DISCLAIMER**

The positions and conditions of foundations change continuously in response to changes in weather, climate, vegetation, drainage, and other factors. This report, including the conclusions and recommendations contained herein, is based on the condition of the subject property at the time the property was inspected.

No warranty what so ever, expressed or implied, is given with respect to the future performance of the foundation, structure, vegetation, and soils at the subject property.

The failure to properly maintain a foundation can lead to significant foundation movement over relatively short periods of time. In response to droughts, foundations can settle at rates in excess of an inch a month for several consecutive months. In response to heavy rains following droughts, foundations can be lifted at rates that substantially exceed an inch per month.

Since relatively minor foundation movement can sometimes cause cosmetic damage to homes, the condition of the subject property may change rapidly.

## **CERTIFICATION**

I hereby certify that I personally inspected the foundation and structure at **XYZ Anytown, TX**

I further certify that I am a Registered Professional Engineer in the State of Texas.

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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 experience. No responsibility is assumed for the events that occur after the inspection and submission of this report and no warranty, either expressed or implied, is made.

Yours truly,



3/7/11

Mathew Joseph, P.E.  
Registered Professional Engineer  
Registration No. 78695  
Firm Registration # F-10619

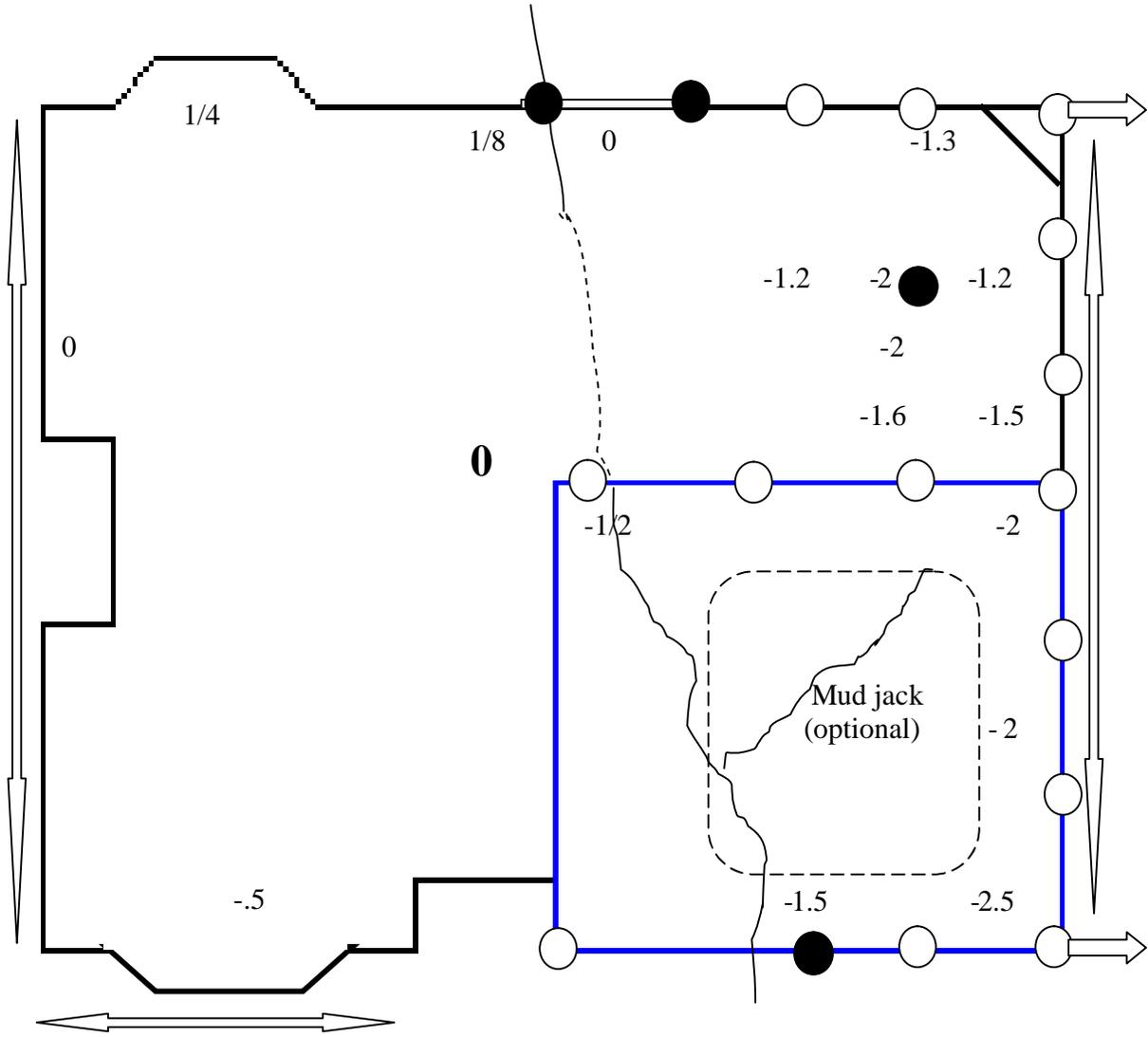
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*M. Joseph*

3/7/11

Mathew Joseph, P.E., Registered Professional Engineer # 78695  
Firm Registration #: F-10619



NOTE: All measurements are in inches.

- Add Pressed Piers
- Jack up these areas and adjust/shim the existing Pressed Piers. See notes below regarding concrete breakouts. **RSH is not sure if existing piers are present. If piers are missing, add the piers at these locations.**

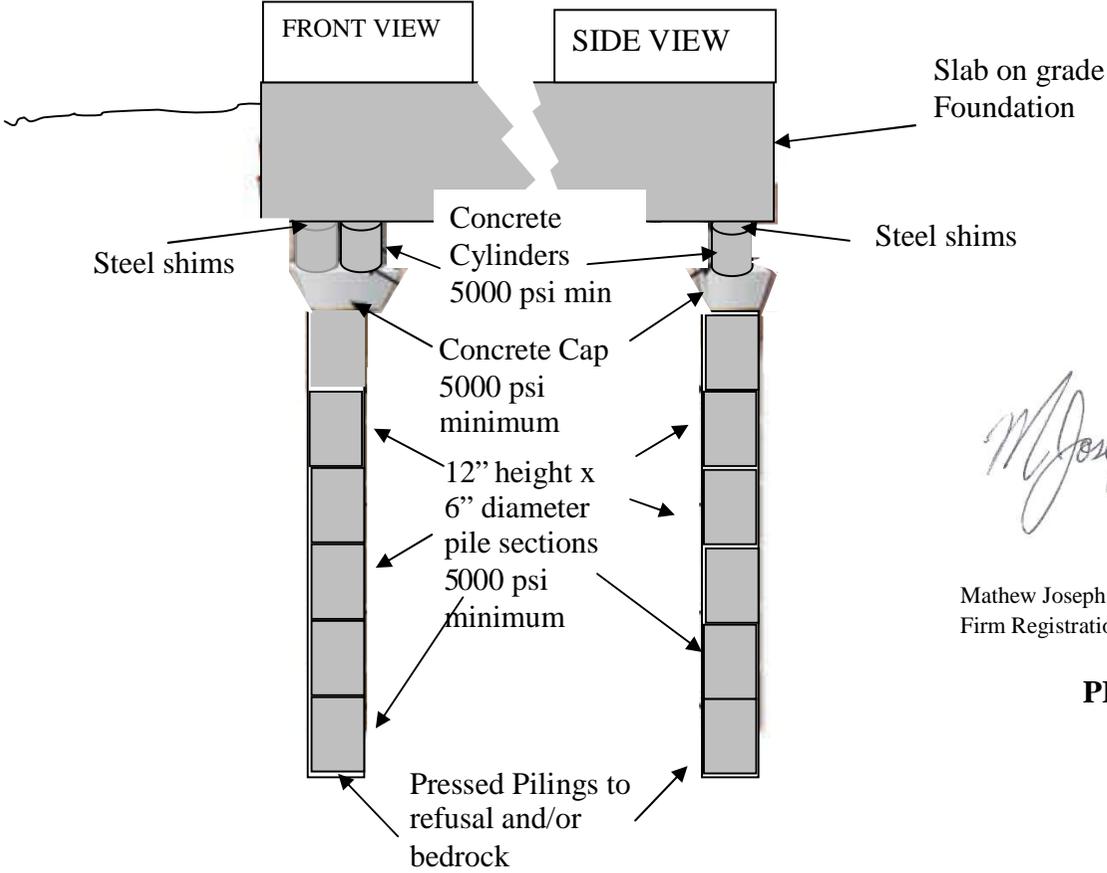
- ↔ Provide positive drainage  
Slope of 1-inch of drop for the 1<sup>st</sup> five feet away from the foundation
- Provide minimum of 3-foot downspout extenders to all gutter downspouts around the house.

⋮ Mud jack this area (optional)

~ Existing cracks (not all shown)  
NOTE: Use saw to cut concrete in square or rectangular cutouts where breakouts are required. Make sure all the cutouts are the same dimensions. Check with homeowner regarding the size of the cutouts and concrete finish out. Provide a clean, smooth finish out.

**FOUNDATION REPAIR PLAN-XYZ  
Anytown, TX**

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## PRESSED PIER DETAIL PLAN

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