



ENCLAD STRUCTURES
residential engineering & inspections

Level "B" Foundation Inspection:

1234 Your Address
Your Town, TX 12345

Your Name

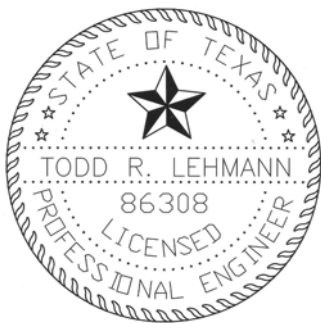
Homeowner

January 1st, 2006

Foundation Inspection Report

References:

- **ASCE, "Guidelines for the Evaluation and Repair of Residential Foundations."**
Version 1
Texas Section, 2002. (adopted June 2005 by TRCC RULE §304.100)
- **2003 "International Residential Code,"**
For one and two-family dwellings.
- **FPA 201 - 2001 Supplement #1 Revision A**
"Criteria for the Inspection of and the Assessment of Residential Slab-on-Ground Foundations."
13 April, 2003



This is a Confidential Report specially prepared by our client. Use of the report by unauthorized persons is prohibited.

11914 JEREME TRAIL • FRISCO, TX • 75035
PHONE: (469)556-2497 • FAX: (972)334-9313

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Inspection Conditions

Inspection & Site Data

Subject Property:

1234 Your Address

Property: City/State/Zip:

Your Town, TX 12345

Inspected By:

Todd R. Lehmann, P.E.

Texas PE/EIT:

Texas Professional Engineer

License #:

License No. 86308

Type of Inspection:

This is a level "B" foundation inspection as defined by the American Society of Civil Engineers in section 3.1.2 of "*Guidelines for the Evaluation and Repair of Residential Foundations*." In the following attachments you will find a written report including a determination of relative foundation elevations in sufficient detail to represent the shape of the floor adequately. [D1-D3]

Type:

Level "B"

Scope:

At the request of our client, our firm performed an evaluation of the foundation at the above mentioned address. The evaluation was limited to a visual inspection of the exterior and a visual inspection of the interior. This report conforms to the standards set forth in "*Guidelines for the Evaluation & Repair of Residential Foundations*" published by the Texas section of the ASCE. Unless otherwise stated, Enclad Structures has had no access to the original foundation documents. Because we did not witness the original construction of this house, we make no statements concerning the structural quality, and make no predictions concerning future foundation performance. Unless otherwise stated, no building plans were reviewed, no soil samples were taken, no soil tests were performed, and no destructive testing or invasive procedures were employed. No siding, wall coverings, landscaping, furniture, or any other items causing obstruction of visual observations were removed.

The objective of this report is to determine if the foundation is performing its intended function and whether or not any remedial foundation repairs are necessary at this time.

Client & Site Information

ENCLAD Job No:

06-999

Date of Inspection:

January 1st, 2006



Time of Inspection:

9:00 A.M.

Client Name:

Your Name

Homeowner Info:

Homeowner

Mailing Address:

1234 Your Address

City/State/Zip:

Your Town, TX 12345

Client Phone:

123-123-1234

Client Fax:

123-123-1234

Client Cellular:

123-123-1234

Client Email Address:

YourName@YourEmail.com

Climatic Conditions

Weather:

Clear

Soil Conditions:

Damp

Outside Temp. in F:

70-80

Building Characteristics

Main Entry Faces:

For the purpose of this report, the structure faces north.

Estimated. Age of House:

The home was built in 1985.

Building Type:

Contemporary

Number of Stories:

1



Structural Description

Major Structural Components:

Type of Construction:

The house is a one-story single-family dwelling with wood framing.

Foundation Type:

The structure has a slab on grade foundation which appears to be reinforced with rebar.

Perim Beam:

There is a perimeter grade beam.

Existing Foundation Work 1:

The homeowner has no record of any previous foundation work.

Additions:

The garage has been converted to an additional room.

Property Characteristics:

Type of Cladding:

There is a brick facade which appears to be a part of the original construction.

Adjacent Flatwork:

The patio is on the north side of the house and is monolithic, or connected to the slab.

Adjacent Masonry:

There are wing-walls on the east and west sides of the north end of the house. Because the wing-walls are monolithic, they will be analyzed as a part of the foundation.

Gutters:

There are gutters controlling the moisture runoff from the roof.

Trees:

There are mature trees that are close enough to the foundation to have a significant impact on the performance of the foundation. When tree root systems encounter soil beneath the foundation, they may utilize this as an additional water source during the dry summer seasons to supplement their moisture needs. This often creates an area with less moisture saturation than areas without trees. The changing saturation levels can cause the areas that have less moisture to settle. This happens because the clay soils in Texas have thousands of small voids that absorb moisture and expand like a sponge. As the tree roots pull the moisture out of the soil, it contracts and can cause the affected area to settle.



Client Comments

Occupant Interview:

Damage Indication:

According to the client, the condition first appeared during the last year. The condition has worsened since it first occurred.

Documents:

The client provided an inspection report by (other engineer) dated 1/1/06.

Client Comment 1:

The client noted the sheetrock crack on the north side of the living room. [I1]

Client Comment 2:

The client noted the sheetrock crack on the south side of the structure. [I7]

Client Comment 3:

The client noted the slab crack on the south side of the garage apron. [E12]

Client Comment 4:

The client noted the brick crack on the west side of the structure. [E5]



Interior Observations

Observations Referenced on Page [D1]

I-1:

On the north wall there is a sheetrock crack below the west end of the window.



I-2:

On the north wall there is a sheetrock crack above the east and west ends of the window.



I-3:

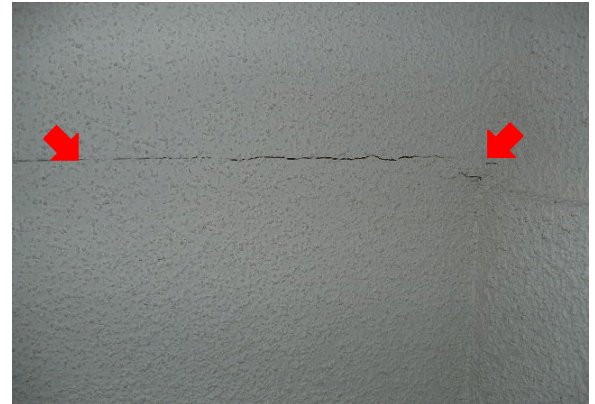
On the south wall there is a sheetrock crack above the east and west ends of the windows.





I-4:

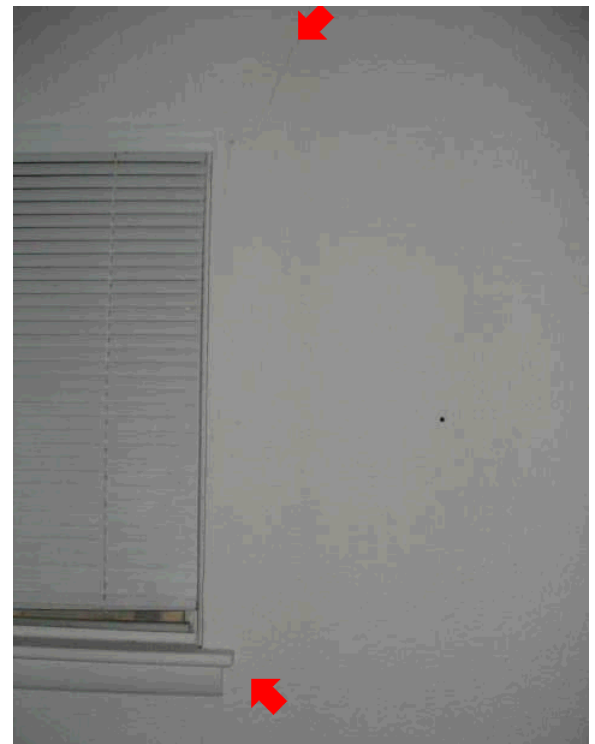
On the west side of the living room there is a ceiling sheetrock crack.



ceiling sheetrock crack

I-5:

On the south wall there is a sheetrock crack above and below the west end of the window.



sheetrock cracks



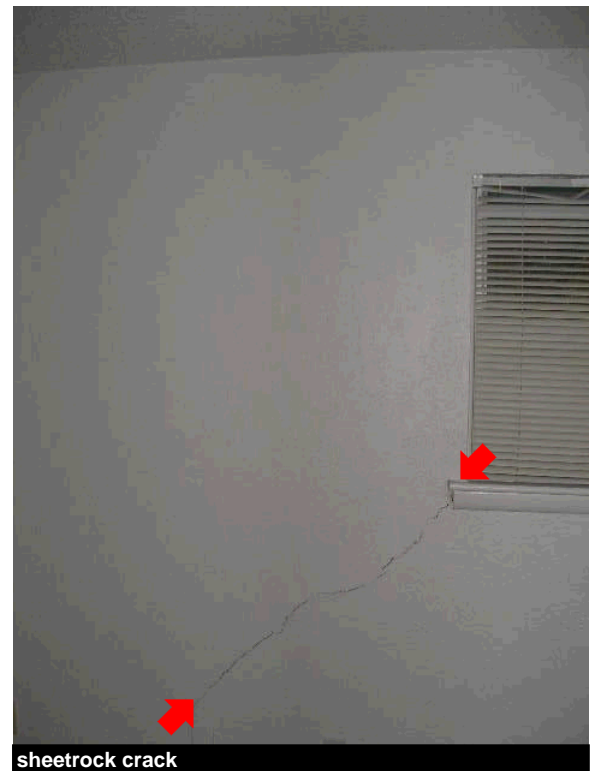
I-6:

On the north side of the bathroom there is a ceiling sheetrock crack.



I-7:

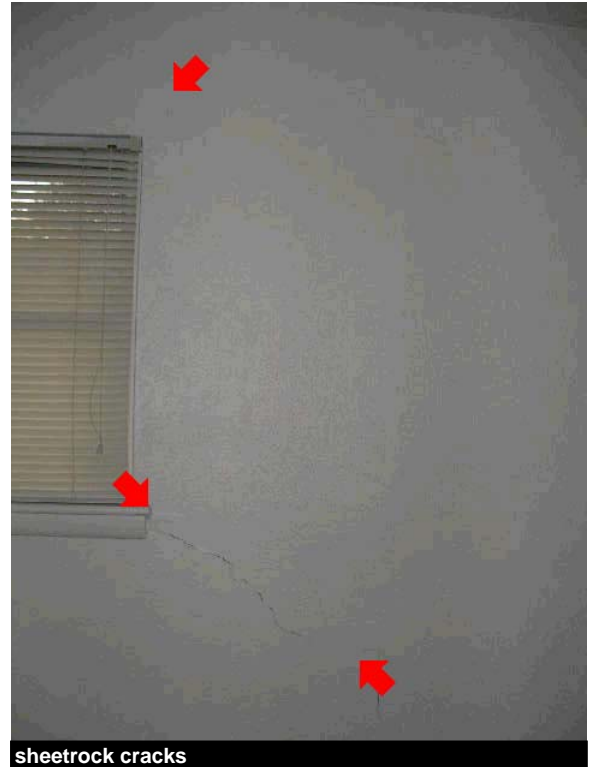
On the south wall there is a sheetrock crack above and below the east end of the window.





I-8:

On the west wall there is a sheetrock crack above and below the north end of the window.



I-9:

On the south side of the hallway there is a ceiling sheetrock crack.





Exterior Observations

Observations Referenced on Page [D1]

E-1:

On the south side of the structure there is a 1/2 inch trim separation at the southeast corner of the house.



E-2:

On the south side of the structure there is a 1 inch brick separation at the edge of the window.





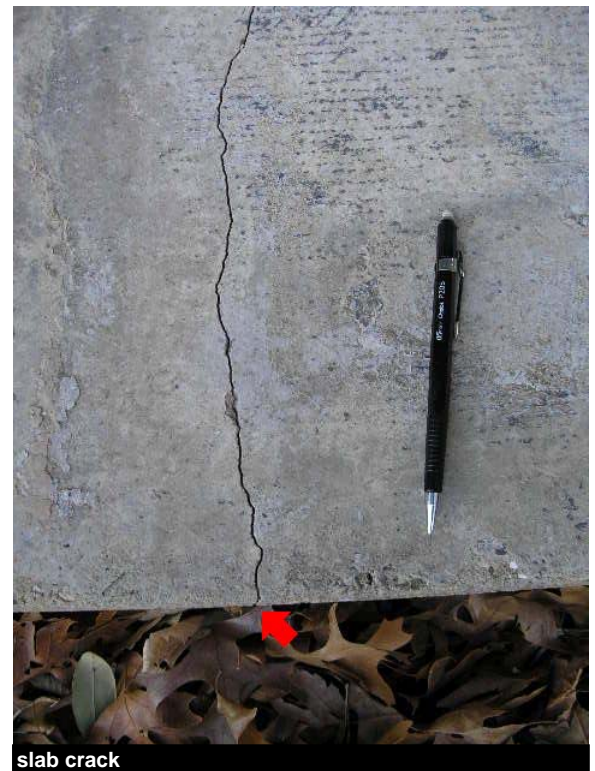
E-3:

On the south side of the structure there is an 1/8 inch brick mortar crack from the slab to the bottom of the window opening.



E-4:

On the south side of the structure there is a slab crack.





E-5:

On the west side of the structure there is a slab crack.



slab crack

E-6:

On the west side of the structure there is an 1/8 inch brick mortar crack from the slab to the bottom of the window opening.



brick mortar crack

E-7:

On the west side of the structure there is an 1/8 inch brick mortar crack from the slab to the bottom of the window opening.

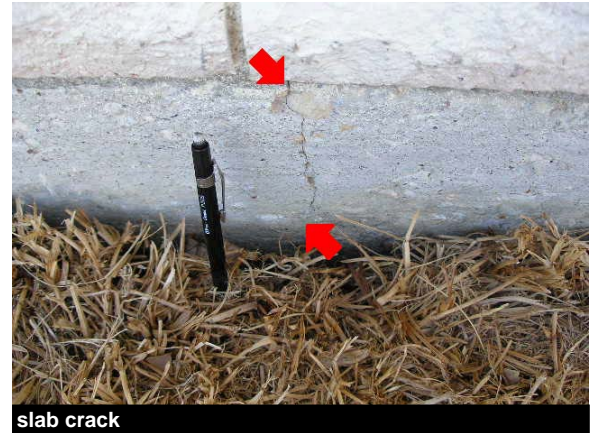


brick mortar crack



E-8:

On the west side of the structure there is a slab crack.



E-9:

On the north side of the structure there is a slab crack.





E-10:

On the north side of the structure there is a 1 inch brick separation at the trim.



E-11:

On the north side of the structure there is a 1 inch trim separation at the northeast corner of the house.





E-12:

On the south side of the structure there is a slab crack.



E-13:

On the south side of the property there is a 2 foot diameter tree.





Drainage Observations

Observations Referenced on Page [D1]

Drainage 1:

On the north side of the property the water drains toward the foundation.

Drainage 2:

At various locations along the perimeter of the structure the gutter downspout drains directly adjacent to the foundation.



Conclusions

Foundation Movement:

Movement 1:

Our relative elevation measurements and observations indicate that the foundation has settled. The settlement has caused the edge to drop with a deflection ratio of $[L/80]$ or 3 inches across 20 feet of distance at the northeast portion of the structure.

Cosmetic Damages:

The size, shape and location of the interior and exterior cosmetic damages indicate some movement has occurred after completion of the structure. In order to determine how much movement has occurred we feel that copies of the Final Grade Certification to include original slab elevations would be informative. Some of the drywall cracks, trim separations and similar distress symptoms were partially due to shrinkage of construction materials over time with changing moisture conditions.

Contributing Factors:

There is a mature tree that is close enough to the foundation to have a significant impact on its performance. When tree root systems encounter soil beneath the foundation, they may utilize this as an additional water source during the dry summer seasons to supplement their moisture needs. This often creates an area with less moisture saturation than areas without trees. The changing saturation levels can cause the areas that have less moisture to settle.

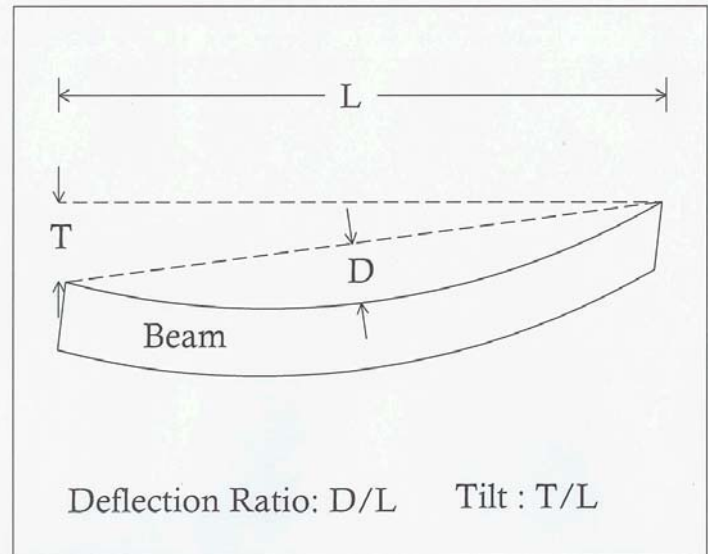
Testing:

There was insufficient data to determine if conditions such as sewer leaks, improper lot preparation, soil consolidation, tree removal and root penetration, or other factors have contributed to foundation movement without performing invasive testing. We feel that plumbing leak testing and geotechnical testing would be informative in determining if these or other factors have contributed to foundation movement. In the absense of such testing, we have recommended some remedial measures which will help prevent further damage to the foundation and the cosmetic components which it supports.



Deflection vs. Tilt:

See following
pages for
definitions:



EVALUATION CRITERIA

(Section 5) "Guidelines for the Evaluation & Repair of Residential Foundations."

Residential foundations are expected to remain reasonably flat and level to provide acceptable performance. The criteria herein are intended to lend rationality and reasonable uniformity, supported by a consensus of practitioners, to the evaluation of performance and the need for repair of residential foundations.

The bases of these evaluation criteria are structural integrity (strength) and performance (serviceability). Both may be affected by foundation deformation and tilt. Evaluations may be interpreted from the body of evidence or demonstrated by calculations.

In evaluating a foundation, structural integrity considers the capability of the foundation to support its design loads as well as results and effects on other load bearing members of the superstructure. Elements of concern are stability, component strength and condition, and material soundness.

Lack of structural integrity may be indicated by excessive deflection, cracking, partial collapse, loss of section, material deterioration, or demonstrated by calculations.

Examples of lack of structural integrity include loss of shear capacity in concrete through excessive cracking, excessive tilt of structural elements such as posts or piers, unstable conditions in non load-bearing masonry, and rotting of wood structural members.

The engineer should evaluate the following, if they are observed:

1. Observed cracks. Cracks may make concrete structural members weaker, although the majority of cracks do not compromise structural integrity.
2. Tilting of posts or piers above grade. Tilting can affect structural integrity or stability, although posts or piers above grade designed for eccentricity of load can tolerate some tilting without overstress. However, ordinary construction tolerances may result in vertical members being built out of plumb.



3. Tilt, if any, of masonry veneer panels. Excessive tilt can lead to catastrophic panel collapse. Masonry veneer or infill is normally non load-bearing, and in some cases the veneer or infill may not be held in place except by its own weight. Wall tilt large enough to cause the weight vector (or center of gravity) to fall outside the middle third of bearing area is sufficient to cause tension in masonry veneer.

Deflection - (Bending or angular distortion)

-Maximum deviation from a straight line between 2 points divided by the distance between the 2 points.

Overall Deflection - (deflection over distance)

-The overall deflection is defined as the deflection ratio or (D/L).

Tilt - (planar rotation)

-The entire foundation or a complete portion of the foundation's total elevation range (rise) divided by the shortest distance between the highest and lowest points (run).

-[(rise) / (run)] * 100 = tilt %

-Tilts in excess of 1% from original grade in combination with actual observable damage can be considered to be a problem.



Structural Recommendations

Remedial Measures

Repair I:

We recommend that 5 concrete pressed pilings , or steel pressed pilings be installed as shown on the attached Foundation Repair Plan drawing.

Support Placement:

Contractors should not attempt to affect an area of the house more than ten feet from the perimeter of the structure using an exterior piling. Again, the lift amount is left to the discretion of the contractor however, never attempt to affect an area of the house more than ten feet from the perimeter of the structure using an exterior piling. Also, piling location may be adjusted by the contractor with the following limitations:

- a) Pilings may be moved a maximum of 1.5 ft in either direction to avoid obstructions provided that there is a maximum distance of 8 ft between any 2 pilings.
- b) Also, pilings may not be moved a distance more than one half the beam depth away from any corner.
- c) Finally, if structural conditions appear during the project that were not visible at the time of the inspection (such as inadequate reinforcing steel or cable), do not continue without having a your contractor or a licensed professional verify that the structure can handle the stresses associated with the repair.

Plumbing Test:

We recommend a plumbing test once foundation repairs are completed. The sanitary drain system should be hydrostatically tested to slab elevation. Also, the city water supply on the incoming water system should be tested to ensure that there are no leaks adjacent to or under the slab. Any leaks encountered should be immediately repaired to prevent future foundation damage.

Trees:

We recommend that 15 ft. of "root barrier" material be installed at 36 in. of depth. Whenever possible place the "root barrier" a minimum of 3 ft. away from the outside edge of the perimeter grade beam.

Follow On Instructions:

Consult with and select a foundation repair contractor to implement our plan of repair. It would be prudent to have a professional engineer licensed by the state of Texas complete a compliance inspection to ensure that the design specifications are met. Your repair contractor can usually provide this service, or you can contact Enclad Structures and we will inspect the work ourselves. A list of qualified contractors is available upon request. (See attached submittal for minimum piling specifications.)



Drainage Recommendations

Remedial Measures

Drainage 1:

Add a 3-5 foot extension to all gutter downspouts in order to move excess rainwater away from the foundation.

Drainage II:

We also recommend that you implement a controlled watering program in order to stabilize the moisture content around the perimeter of your home.

REMEDICATION CRITERIA

(Section 5.8) "Guidelines for the Evaluation and Repair of Residential Foundations"

If the residence is found to be unsafe due to structural inadequacies, the client and/or civil authorities should be informed immediately. The Engineer should recommend repair, restoration, remediation, adjustment, or use alternatives if the structural integrity is inadequate. The engineer should provide alternatives for the client's consideration if performance is inadequate.

Recommendations and alternatives should be commensurate with the nature and cause of the inadequacy, and the seriousness of its consequences. The engineer should consider the cost effectiveness and practicality of the recommendations, the projected performance, and the needs of the client. For example, an owner may choose to perform periodic cosmetic repairs and door adjustments, rather than comprehensive foundation underpinning.

Risks of continued diminished performance are involved in all remedial measures. The engineer can, however, provide recommendations for remedial measures that reduce risks. Not implementing the entire remedial plan may increase such risks.

GENERAL FOUNDATION MAINTENANCE INFORMATION

Slab-on-grade foundations are designed to sit on top of the ground and float or flex with movement in the bearing soils. The foundations are built with a certain amount of rigidity, however, they are allowed by normal design parameters to deflect and bend a certain amount. Typically, foundation movements are caused by some change in the bearing soils beneath and directly surrounding the house. The most critical "changeable" factor in the sub-grade soils is the moisture content. This is important because most of the clay soils in the Dallas area are "active", that is, they have an electromagnetic attraction for water and swell or heave upward when they can absorb water. On the other hand, these clays shrink and subside when they become dry. Thus it is said that in order to stabilize and control the movement of clay soils, it is necessary to control their access to water. If the moisture content under the foundation is maintained in a stable condition, the foundation itself will tend to be more stable, and deflection or cracking in the walls of the home should be minimized.

When a home is constructed, the moisture content of the soil beneath the foundation is fairly uniform and evenly distributed. The slab foundation acts as a lid or covering, and protects and stabilizes it, except at the edges. Around the edges, swelling or subsidence can take place, depending upon environmental influences. If the soil outside the foundation along the perimeter is not well-drained, rainwater, sprinkler water or other irrigation water may puddle and slowly saturate the adjacent soil under the foundation. The saturated soil will swell and heave upward, causing "edge lift". On the other hand, if watering is neglected, and the soil is exposed to summer sun and hot breezes, the soil will dry out, shrink, crack visibly, and subside, causing "edge drop" or "center lift". Either of these conditions may progress to the point where the foundation of the home is deflected and the frame structure above is distorted and develops severe cracking.



It is important that as a homeowner you realize that your foundation is more than just inert, passive concrete and steel. It is an element that will respond to changing conditions, and it needs understanding and maintenance if it is going to give satisfactory service.

The following are several recommended procedures, which will be helpful in this regard:

- Be certain that the yard around the house slopes away from the foundation. Any standing or ponding water next to the foundation can cause undue unnecessary soil and foundation movement. Be sure the builder has sloped the yard for good drainage and that all drainage swales are working.
- Even and consistent watering should be performed regularly and increased during dry or "drought" periods. Watering should be done around all sides of the home. If a sprinkler system is installed, it should water the entire perimeter. Zoning the system is recommended where over-saturation might otherwise occur along various portions of the home. During dry periods and if it is intended to water only the foundation, a soaker hose laid approximately 18" from the foundation can be allowed to drip moisture slowly into the soils several hours a week. This procedure has been used successfully. (How much water is enough? The answer is that soil should be damp to the touch and should be able to be squeezed into a ball, which will retain its shape. If the soil is hard or dusty or cracked, it is too dry. If it is saturated or "squishy", it is too wet.)
- Trees and shrubs can absorb large quantities of water and their root systems can undermine your foundation. It is typically recommended that new trees be planted more than ½ the canopy width of the mature tree away from the foundation. Existing trees adjacent to the foundation should be removed. The larger the tree, the greater the threat. Deep planter beds filled with absorbent planter mix soils should not be placed adjacent to the foundation.
- It is recommended that you check for leaky hose bibs and air conditioner condensation drain pipes which could induce localized water into the sub-grade.
- Gutters can typically be used to help prevent roof-run-off from dumping concentrated quantities of water into the ground at re-entrant areas and roof valley locations. Homes with gutters should have downspout extensions and splash blocks and the systems should be cleaned regularly. The splash blocks should not direct the flow into planter beds.
- Be aware that alterations and improvements such as new landscaping, addition, pools, decks, sidewalks, etc., can change the drainage patterns of your home and could induce problems if area drainage is not properly addressed. Note changes in surrounding of adjacent lots since additional water could be directed at your residence.

IMPORTANT LIMITATIONS

The opinions given in this report are based on my assessments made at the time of the review. The items observed during this site visit represent general conditions observed and do not necessarily represent all defects which may be present in the house. It should be noted that if the house has been recently repaired, remodeled and/or repainted, many times defects are covered up which might be an indication of differential foundation movement. 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 it was inspected.

This report is prepared for the exclusive use of the homeowner. Permission for use of this report by any other persons for any purpose or by the client for any other purpose is denied unless otherwise obtained and stated in writing.

The failure to properly maintain a foundation can lead to significant foundation movement over a relatively short period of time. In response to droughts, foundations can settle at rates in excess of an inch per month for several consecutive months. In response to heavy rains following droughts, foundations can be lifted at rates that substantially exceeding an inch per month. Since relatively minor foundation movement can sometimes cause cosmetic damage to homes, the condition of the subject property can change rapidly. In response to changes in the soil moisture level of the soils beneath the slab, some or all portions of the foundation may experience additional foundation movement after these repairs.



The original design of the foundation is typically based upon economic considerations balanced against acceptable risk, type, foundation geometry and structural loadings. Unless specified, our firm has had no access to original foundation documents. Because we did not witness the original construction of this building, we make no statements concerning structural quality and make no predictions concerning future foundation performance.

Verification of the existing foundation supports and/or foundation repair work was not part of this investigation. Neither examination nor performance evaluation of any retaining walls located on this property was included as part of this investigation. Therefore, we make no statements as to the condition or extent of such work or the expected future performance of such work.

Mechanically lifting the foundation may cause cosmetic damage to the interior sheetrock and exterior brick veneer that was not present prior to the foundation repair work being accomplished. Damage to plumbing systems may occur during the lifting operation.

Some exterior and interior cracks are normal for homes located in this area and will probably occur as a result of seasonal moisture changes in the soil beneath the foundation. Periodic repair of this type of cracking is a normal maintenance item and does not necessarily indicate a structural problem. A proper maintenance and watering program may help control this type of seasonal foundation movement.

CERTIFICATION PAGE

I hereby certify that our firm inspected the concrete slab foundation located at 1234 Your Address, Your Town, TX 12345.

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

I further certify that the findings and conclusions in this report have been, to the best of my knowledge, correctly and completely stated without bias, and are based upon my assessment and review of the data made available at the time of my review. No responsibility is assumed for any events that occur after the inspection and submission of this report and no warranty, either expressed or implied, is made or given with respect to the suitable purpose of any portion of the subject property, need for repair or future performance of the foundation, structure, vegetation, and soils at the subject property.

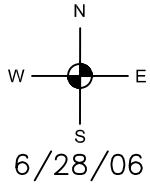
Certified on 06/29/2006



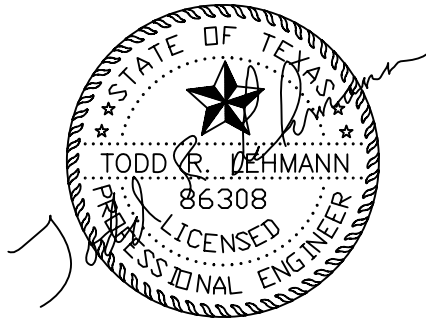
Todd R. Lehmann, P.E.
President
Registered Professional Engineer
State of Texas



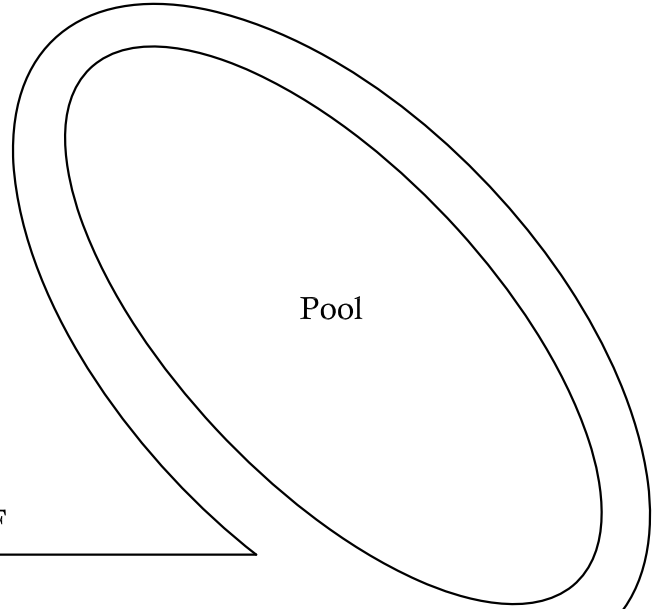
Observations – Pictures



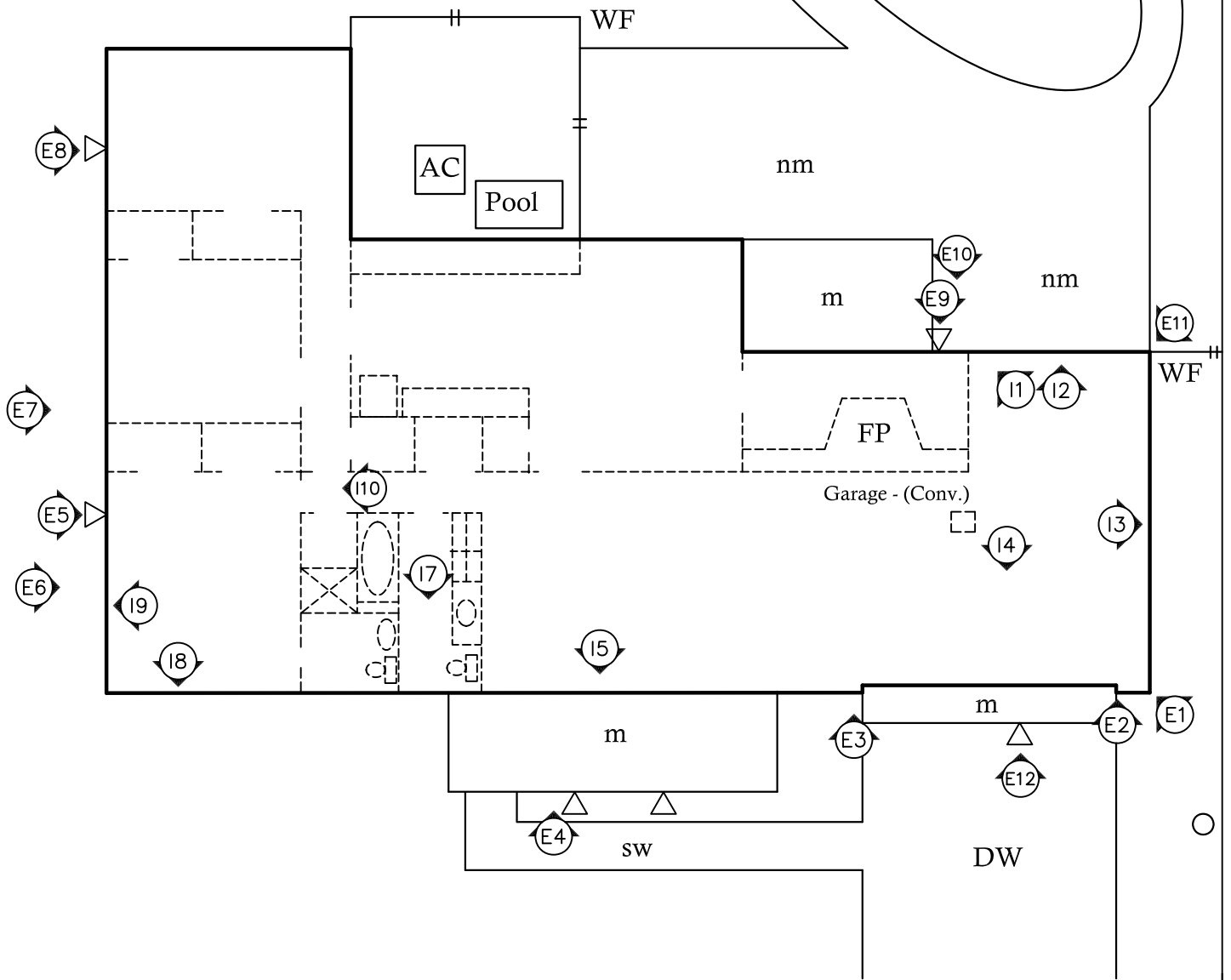
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Pool



ENCLAD STRUCTURES

11914 Jereme Trail, Frisco, TX 75035
Office:(469)556-2497 Fax:(972)334-9313

STREET ADDRESS: Your Address, Your Town, TX 12345

HOME OWNER: Your Name

ENGINEER: Todd R. Lehmann, PE

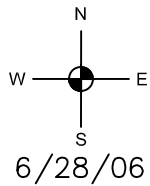
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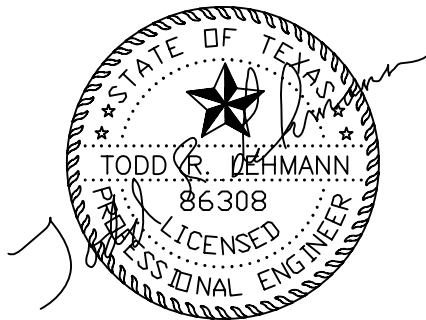
SHEET:

D1

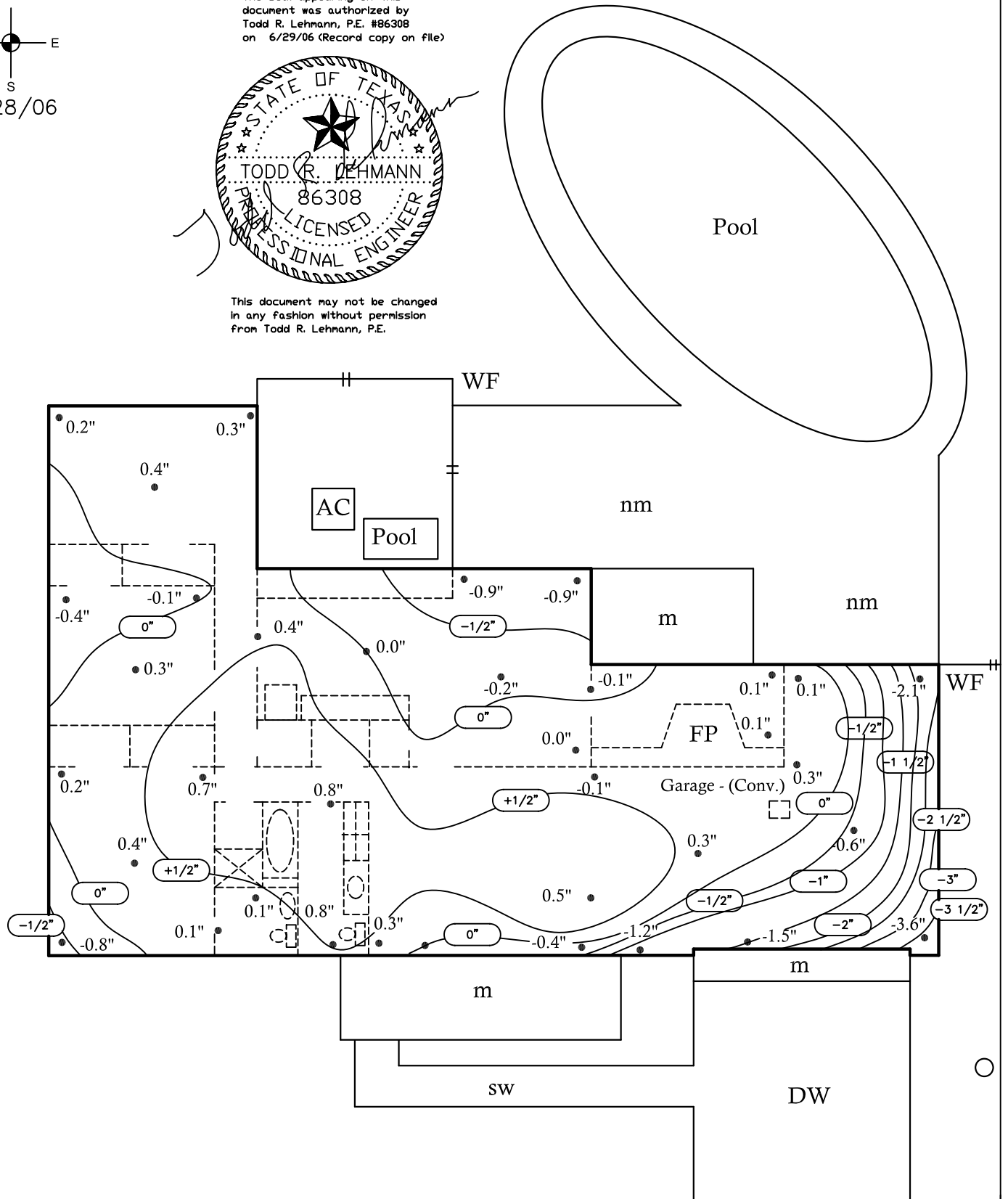
Relative Elevation Readings – Contour Diagram



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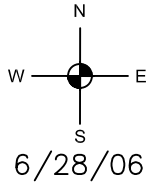
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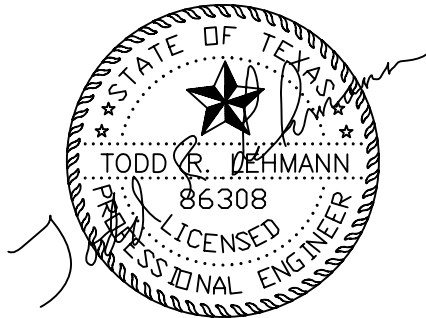
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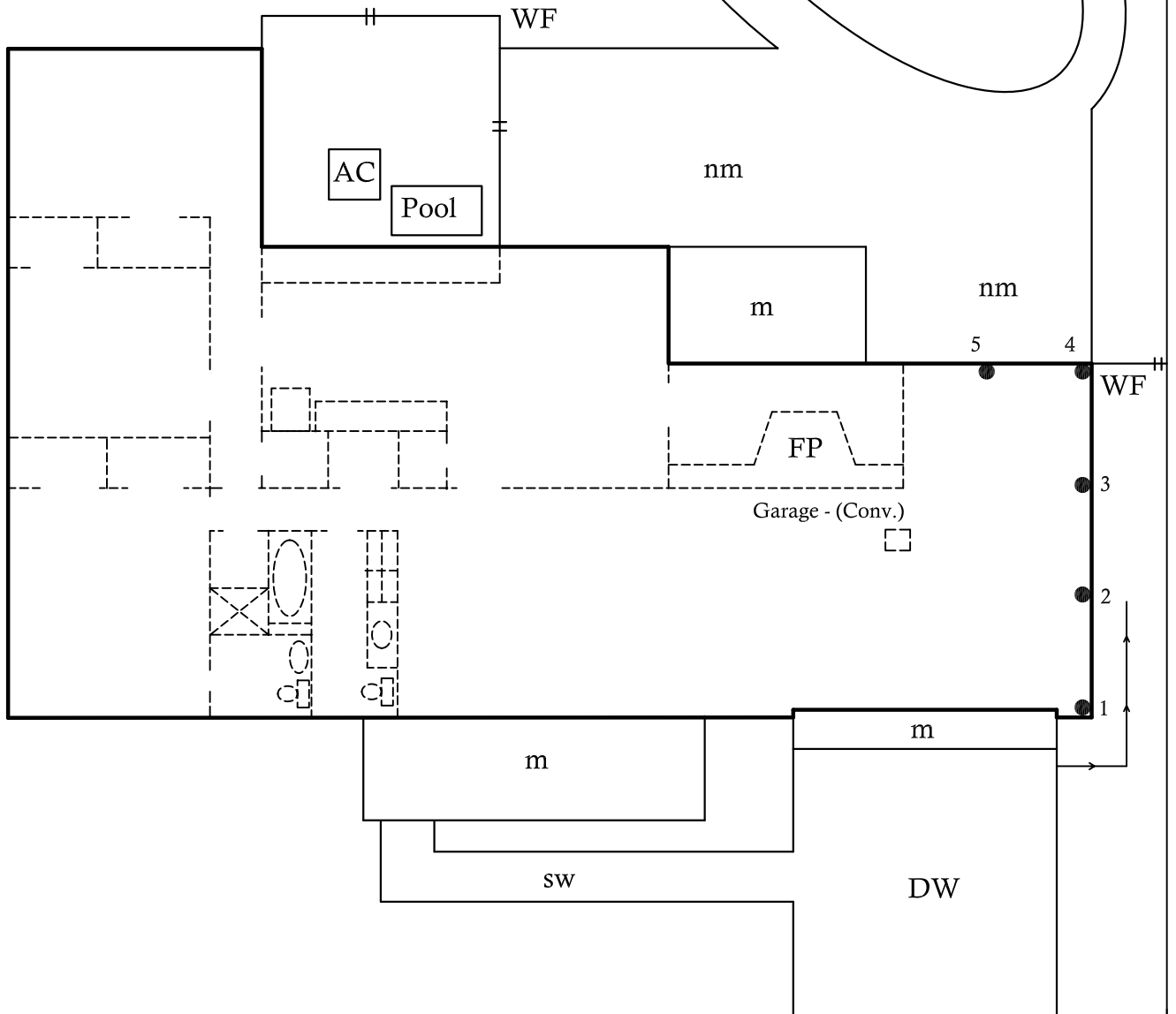
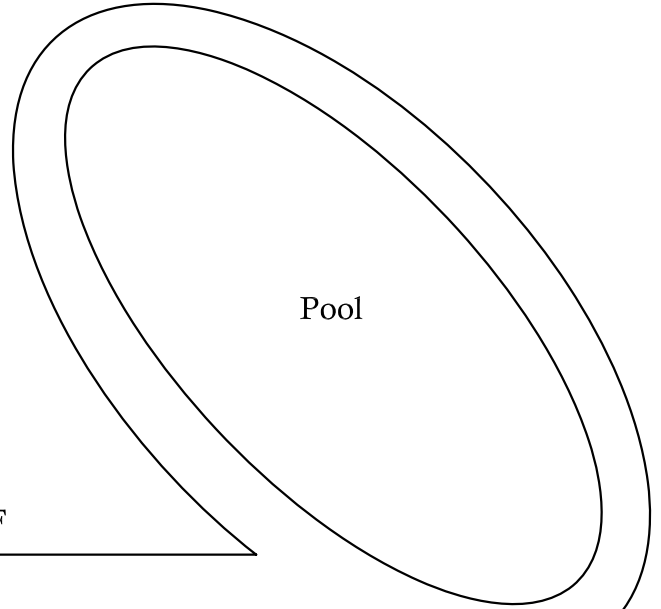
Remedial Measures – [Repair Plan]



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STREET ADDRESS: Your Address, Your Town, TX 12345

HOME OWNER: Your Name

ENGINEER: Todd R. Lehmann, PE

DATE: 6/29/06

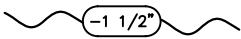






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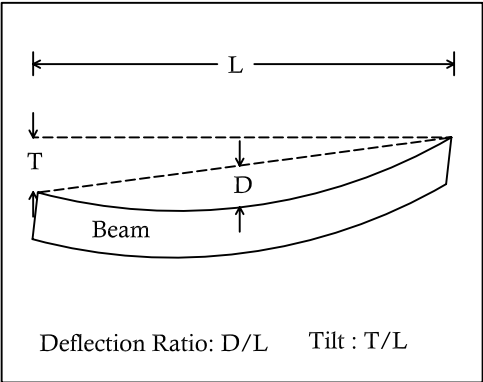
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D3

General Notes:

Legend:

- WF/CLF —+— = Wood Fence/Chain Link Fence
-  = Elevation Contour Line
- = Exterior Wall
- = Interior Wall
-  = Standing Shower Unit
-  = Commode
-  = Bath Tub
- 0.0" ● = Adjusted Zip Level Reading
- m/nm = monolithic/non-monolithic
-  = Tree Location
-  = Exterior Observation
-  = Interior Observation
- △ = Slab Crack
- 1 = Support Location
- > = Root Barrier



ENCLAD STRUCTURES

11914 Jereme Trail, Frisco, TX 75035

Office:(469)556-2497 Fax:(972)334-9313

STREET ADDRESS: Your Address, Your Town, TX 12345

HOME OWNER: Your Name

ENGINEER: Todd R. Lehmann, PE

DATE: 6/29/06

SCALE: N/A

SHEET:

D4

STRUCTURAL SUPPORTS FOR RESIDENTIAL HOMEOWNERS

PART 1

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract. Any other materials provided by the homeowner such as: foundation plans, previous structural repair documents from contractors or engineers, and any other documents pertaining to the structure to be inspected.
- B. In the attached inspection report, all references to “concrete-pressed piling,” “steel-pressed piling,” or “drilled pier” pertain to the following specifications.
- C. ACI 318 *“Building Code Requirements for Structural Concrete”*.
- D. 2003 *“International Residential Code,”* For one and two-family dwellings.
- E. 2000 *“International Building Code.”*
- F. FPA 201 - 2001 Supplement #1 Revision A. "Criteria for the Inspection of and the Assessment of Residential Slab-on-Ground Foundations." 13 April, 2003.
- G. FPA-SC-08-0 "Design, Manufacture, and Installation Guidelines of Precast Concrete Segmented Piles for Foundation Underpinning." 17 July, 2005, FPA Structural Committee.

1.02 SUMMARY

- A. All work in this section as specified shall be in accordance with requirements of the contract documents associated with the specific inspection.
- B. Provide all labor, materials, tools, equipment and services required to manufacture, furnish and install the repair(s) listed in the attached inspection report.
- C. Provide all items not specifically mentioned below but necessary to complete the installation. Specified Items include:

“Concrete-Pressed Pilings”

- 1. Pre-Cast Concrete Piling Sections and caps (min 5000 psi concrete compressive strength)
- 2. Rebar (min 3/8" diameter, Grade 60, minimum ASTM A615)
- 3. Concrete Grout / Epoxy / Portland Cement. (to bond piling sections to reinforcing steel.)
- 4. Minimum 26 ton capacity hydraulically powered jack.
- 5. High pressure water injection equipment. (Min 3000 psi)
- 6. Hand operated jacks for lifting. (Min 30 ton capacity and at least one for every support to be installed.)

“Steel Pressed Pilings”

1. Piling shaft material 4” diameter standard weight (ASTM A53 Grade B or A501) for outside pipe with double wall design.
2. Minimum 26 ton capacity hydraulically powered jack.
3. High pressure water injection equipment with (Min 3000 psi)
4. Hand operated jacks for lifting. (Min 30 ton capacity and at least one for every support to be installed.)

“Drilled Piers”

1. Minimum 12 inch diameter hand operated auger or drill with minimum 24 inch retractable bit for bell.
2. Any piers deeper than 12 feet require machine-mounted drilling apparatus.
3. Minimum 12 feet depth below grade or to rock whichever comes first.
4. Pier cap should be centered under exterior face of perimeter grade beam.
5. Metal Shims should be used between the grade beam and pier to make fine adjustments in finish floor elevations.
6. Excavations for pier shafts must be maintained to remain dry. Ground-water seepage could be encountered during installation of the shafts particularly if construction proceeds during a wet period of the year. In some cases, seepage rates could be sufficient to require the use of temporary casing for the installation of some of the shafts.
7. For strait-sided shafts any required temporary casing should be seated in limestone with all water and loose material removed prior to beginning the design penetration. Care must be taken that a sufficient head of plastic concrete is maintained within the casing during extraction.
8. The concrete should have a slump of 6 inches plus or minus 1 inch and be placed in a manner to avoid striking reinforcing steel and walls of the shaft during placement.
9. Complete installation of individual shafts must be completed within an 8 hour period in order to prevent deterioration of bearing surfaces and to reduce the probability of seepage problems and desiccation of the exposed clays.
10. Steel reinforcement should be in accordance with applicable building codes, or rebar (min 3/8” diameter, minimum ASTM A615), whichever is the most stringent.
11. Must allow 7-10 day curing period before lift depending on weather conditions.
12. Hand operated jacks for lifting. (Min 30 ton capacity and at least one for every support to be installed.)

Minimum compressive strength f'_c 3000 psi @ 28 days (verified by supplier or tested on site)

Compliance inspection is required before pouring concrete and at 7 day curing period.

- D. Single Subcontractor Responsibility: Retain a single firm or company to provide and install work of this section to establish undivided responsibility for repairs.

- A. Written or verbal confirmation of required specifications will be provided prior to compliance inspection.
- B. Estimated date and time of lift will be provided 24 hours prior to compliance inspection.
- C. Any changes to foundation repair design not specifically mentioned above must be discussed prior to compliance inspection.
- D. Pile-Driving-Records: The contractor will provide a record of the specific piling depth and pressure at "refusal" as for each piling location.

4 PERFORMANCE REQUIREMENTS

- A. Comply with requirements of current local code and these specifications. In the event of conflicts, the more stringent requirements shall apply.
- B. Static Load Testing:
 - 1. Per 2000 IBC, Method one shall be employed to determine capacity of pressed pilings, (concrete or steel). Using this method, the capacity of the piling shall be considered to be 0.5 times the yield point, or "refusal" point of the piling.
 - 2. The term "refusal," is defined as the point at which a pressed piling cannot be driven any deeper using the weight of the structure above it.
 - 3. For both concrete and steel pressed pilings, to determine refusal depth, no more than one piling can be pressed in a given area at one time.
 - 4. All pressed pilings shall penetrate a minimum of 10 feet below grade and have a minimum hydraulic pressure reading of 16 Tons.
 - 5. In the event that a piling does not reach either of the above required conditions the contractor will use pressurized water jetting to increase penetration. (2000 IBC 1807.2.13.)
 - 6. All pressed pilings must remain under pressure from the driving phase through the end of the job.
 - 7. Pile Caps
- C. WARRANTY REQUIREMENTS
 - 1. A minimum 10 year warranty against any settlement is required on all structural supports.
 - 2. The warranty must be transferable for its duration.
- D. QUALITY ASSURANCE
 - 1. A qualified job foreman shall be on site during all phases of the project.
 - 2. The work of this section shall be performed by one contractor who shall demonstrate to the satisfaction of the inspecting authority that all specifications have been met.
 - 3. We reserve the right to visit and inspect any job site where our firm is under contract for the compliance inspection.

