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October 9, 2006

Mr. Gardner
520 CR 7712
Devine, Texas 78016

RE: Engineer's Completion of Foundation Underpinning

Job No: 06-760

To Whom It May Concern:

I. GENERAL

Project Description:	Re-elevation of Foundation For Single Story Residence
Project Location:	520 CR 7712, Devine, Texas 78016
Date of Inspection:	Monday, October 9, 2006
Contractor:	Advanced Foundation Repair

II. SUMMARY OF ACTIVITY

The firm of Couch Engineering was contracted to perform a site visit of segmental steel pilings under the foundation beams of the above referenced structure. This service was performed by a staff member of Couch Engineering on October 9, 2006.

On October 9, 2006, a site visit was performed and the following work was completed prior to arrival on site:

The contractor had installed forty-six segmental steel pilings. Each piling consisted of several steel sections, each approximately 12" in length, with one steel pipe inserted inside the other. The outer steel pipe was approximately 2 7/8" outside diameter and 2 1/2" inside diameter. The inner steel pipe was approximately 2 1/2" outside diameter and 2" inside diameter. The first section was conical and closed on the end, with the steel pipe sections being set on top of it and the inner pipe slid into the conical end thus connecting them. The sections were connected together as they were driven into the soil. Each section of steel tubing was individually hydraulically driven to the maximum depth possible or to the point of refusal. Upon achieving refusal, a cementitious grout mixture is placed in each piling. Then a final 12" long section of pipe with an inside diameter of 3" and an outside diameter of 3 1/2" was inserted over the pipe with a 6" diameter by 1" thick steel plate welded to the pipe. A trapezoidal pre-cast concrete block was placed on top of the 6" diameter steel plate. A 6" diameter by 12" long pre-cast concrete cylinder was placed on one end of the trapezoidal concrete block. The piling depth (ground surface to bottom of piling) ranged from 22 foot to 36 feet with an average depth of approximately 33 feet. The final driving pressure ranged from 18 tons to 25 tons with an average pressure of approximately 23 tons.

The following work was observed on October 9, 2006:

Hydraulic jacks were temporarily placed adjacent to the concrete cylinders. The structure was re-elevated 2 inches using these manual hydraulic jacks in a synchronized fashion. The floor elevations at the completion of the foundation re-elevation process are shown on the attached drawing.

After obtaining the optimum recovery in the floor surface elevation, steel shims were placed between the top of the pre-cast concrete members and the lower side of the foundation beams at each of the piling locations. This provided load transfer and maintained the established amount of elevation recovery. The manual hydraulic jacks were then removed and replaced with a pre-cast concrete cylinder and the required number of steel shims at each of the piling locations. The pilings will be backfilled and all the construction debris removed from the work area.

The results of the repair provided optimum recovery of loss in the floor surface without causing apparent damage to the foundation and/or the superstructure. The underpinning should prevent any further settlement of this portion of the foundation.

Without any extreme changes in soil moisture or significant loss of load bearing capacity of supporting soil beneath the foundation, the foundation for this structure should provide its owners and occupants with many years of continued service.

III. RECOMMENDATIONS

The following recommendations will serve as guidelines for cosmetic repairs and foundation maintenance after the underpinning of the foundation:

- A.) Perform any repairs to the exterior surfaces as soon as possible. This will prevent intrusion by insects or moisture.
- B.) Wait a minimum of 180 days after underpinning of the foundation before performing any cosmetic repairs on the interior walls or ceilings. This will allow the superstructure time to achieve a state of equilibrium following the re-elevation of the foundation.
- C.) Add soil and sod along the perimeter of the foundation to achieve positive drainage away from the foundation at the rate of 1-inch of fall for every 1-foot of distance away from the foundation for a total of 5-inches of fall 5-feet away from the foundation. This will provide proper drainage of rainwater and prevent water from ponding adjacent to the foundation.
- D.) Maintain a constant relative moisture content adjacent to the foundation perimeter beam. This can be accomplished by placing a soaker hose against the foundation and watering with a soaker hose twice a week for 2-3 hours during the months of October through April and every other day for 2-3 hours during the months of May through September or during dry periods. This will minimize future foundation movement.

IV. LIMITS OF THE SITE VISIT

This report is provided by an independent Licensed Professional Engineer and is valid as of the date of this site visit. It excludes conditions and events after this site visit. This report makes no guarantee that every possible discrepancy has been cited. The conclusions and recommendations are opinions based on professional training, years of experience and data retrieved from visual site observations at the time of the site visit.

Couch Engineering makes no claim concerning any activity or condition falling outside the specified purposes to which this report is directed. In addition, no warranty, expressed or implied, is made by the engineer for the professional services set forth. Guaranties or warranties for this type of work are typically provided by the contractor.

Only the items mentioned above have been reviewed. The structural capacity of the framing was not reviewed nor analyzed. Since there were no as-built foundation plans available, nor any information on the exact preparation of the subgrade beneath the foundation, the overall analysis and opinions are limited by these factors. This also precludes any structural calculations from being performed. It should be understood that the professional advice in this report neither implies nor establishes any warranty for the building.

In recognition of the relative risks, rewards, and benefits of this service to both the Client and Couch Engineering, the risks have been allocated such that the Client agrees to the fullest extent permitted by law, the liability of Couch Engineering to the Client, for any injuries, claims, losses, expenses, damages for claim expenses arising out of this inspection for any cause or causes, shall not exceed the value of the service provided. Such causes include but are not limited to the firm's negligence, errors, omissions, strict liability, and breach of contract or breach of warranty.

V. CERTIFICATION

The engineering seal on this report signifies that we believe that we have fulfilled our obligations as a Licensed Professional Engineer under the Texas Engineering Practice Act pursuant to its requirements to protect public health, safety, and welfare in the practice of engineering. As a Licensed Professional Engineer in the State of Texas, I do hereby certify that the foundation work performed on this project by the repair contractor, Advanced Foundation Repair, was completed in a satisfactory manner according to the generally accepted standards of practice for the underpinning of a residence.

This certification has no bearing, either stated or implied, on the contractor's warranty, which may be issued for the building. Questions or comments regarding the execution of this project may be directed to the contractor or Couch Engineering.

Respectfully,

Michael B. Couch
Michael B. Couch, P.E.
Attachment: Drawing (1)



