

G. D. FRIESENHAHN PLUMBING, INC.
18838 FM RD 2252
SAN ANTONIO, TEXAS 78266

(210) 651-5598

**Repair
by
Excavation Proposal**

**DEBRA W. ALLEY
12006 W. Cowpath
Austin Tx.78727**

DATE: MAY 24, 2002

*executed
7/23/02*

**Repair
By
Excavation Proposal**

DEBRA W. ALLEY
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Work is to consist of excavating below the foundation to make the necessary repairs to the sanitary drain system. Sch 40 PVC pipe and fittings will be used for all repairs.

I. SPECIFICATIONS

- A. This proposal is for piping that is below grade only. The connections to the existing drain risers are to be made below grade Once the riser(s) are exposed, if we find that they are in poor condition and have to bring them above grade an adjustment to the contract can be expected.
- B. If rock is encountered while excavating below the foundation an adjustment to the cost of the contract as well as the estimated time of completion can be expected.
- C. All material and repairs for the sanitary drain system are in accordance with state and city codes.
- D. A flowable fill mixture will be pumped into the tunnel(s) from the exterior to close up the excavation tunnel(s). The only time the flowable fill mix will not be used for mud pumping is if we are otherwise instructed by the homeowner, the homeowner's agent or an engineer.
- E. Access holes will be filled in with a base material or with the original soil removed during excavation.
- F. G. D. Friesenhahn Plumbing, Inc. does not assume responsibility for any structural damage to the building or foundation as a result of excavation below the foundation, penetration of the slab and the backfilling procedure.
- G. G. D. Friesenhahn Plumbing is not responsible for providing engineering services. If there is an engineer already involved through the insurance carrier or the homeowner, we will correspond with them as needed.

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II. LANDSCAPING

- A. Extreme care will be taken to minimize damage to the landscaping and shrubbery. We are only responsible for replacing the dirt we removed for excavation and/or trenching.
- B. If concrete removal is necessary to make repairs we will restore to the best of our ability.

III. GENERAL CONDITIONS

- A. G.D. Friesenhahn Plumbing, Inc. is not responsible for any cosmetic repairs caused from any necessary plumbing repairs.
- B. G.D. Friesenhahn Plumbing, Inc. is not responsible for damage delays due to the acts of God or Mother Nature.

IV. WARRANTY

- A. There is a one-year warranty for the repair(s) made to the sanitary drain system by Friesenhahn Plumbing, Inc.
- B. G. D. Friesenhahn Plumbing, Inc. does not assume any responsibility for existing warranties that may be voided due to the repairs and/or tunnel process, this includes any termite protection warranty. All plumbing warranties will be voided if the foundation is pried, leveled, stabilized or repaired after plumbing excavations are backfilled. No guarantee, certification and/or warranty is made or offered in regards to the plumbing repair if the structure continues to shift based on the expansive nature of the soils underlying the structure.

I, _____, have read and understand the above proposal and fully agree to the terms and conditions stated within.

SIGNATURE _____ DATE _____

**Repair
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DEBRA W. ALLEY

DATE: MAY 24, 2002

Work to consist of excavating below the foundation to expose and repair leaks on the sanitary drain at the kitchen sink, hall bathroom and master bathroom.

G.D. Friesenhahn Plumbing, Inc. is not responsible for landscaping.

Estimated time of completion for repairs is 18 to 21 days. The total contract cost including material and labor in accordance with above specifications shall be the sum of **\$16,431.00**

PAYMENTS ARE TO BE MADE AS FOLLOWS:

50 %	UPON START OF JOB	\$8,215.50
50 %	UPON COMPLETION OF JOB	\$8,215.50

This proposal will be null and void if not accepted within 60 days.

PERMIT	0.00
LABOR TO INSTALL PIPING	0.00
ACCESS HOLES (3)	0.00
TUNNELING BELOW FOUNDATION (70)	0.00
RETESTING OF THE SEWER SYSTEM	0.00
PIPING AND FITTINGS	0.00
BACKFILLING (70)	0.00
JOB SITE CLEAN-UP	0.00
CONCRETE REMOVAL & RESTORATION	0.00
TOTAL	\$16431.00

ACCEPTANCE OF PROPOSAL

The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified.

AUTHORIZED SIGNATURE _____ DATE _____

**Authorization Sheet
Repair by Excavation**

DEBRA W. ALLEY

DATE: MAY 24, 2002

\$16,431.00

ACCEPTANCE OF PROPOSAL

The prices, specifications and conditions stated herein are satisfactory and hereby accepted. You are authorized to do the work as specified. I agree to the payments as specified in the schedule. I understand that any balance obligated by execution of this contract and past due by sixty (or more) days will be subject to 18% per annum interest rate charges until such balance is paid. The insurance company is authorized to make the loss draft payable to G. D. Friesenhahn Plumbing, Inc. and the insured. I understand that G. D. Friesenhahn Plumbing, Inc. reserves the right to file a lien if payment is not made according to terms and conditions of the contract, and is entitled to compensation for any costs of collection, including attorneys fees, as may be incurred in seeking remedy under the law for non-payment.

AUTHORIZED SIGNATURE 

DATE 6/11/02

ATTACHMENT

If a mortgage company is involved, please fill in the following information:

Mortgage Company Name: _____

Address: _____

Phone No.: _____ Contact Person: _____

Loan No.: _____

Questions can be directed to Jimmie Ploch at 210-651-5598.

SECTION 8A OF THE PLUMBING LICENSE LAW REQUIRES THAT ANY PLUMBING CONTRACT IN THE STATE OF TEXAS MUST CONTAIN THE NAME, MAILING ADDRESS, AND TELEPHONE NUMBER OF THE TEXAS STATE BOARD OF PLUMBING EXAMINERS. THAT ADDRESS IS AS FOLLOWS:

TEXAS STATE BOARD OF PLUMBING EXAMINERS

929 EAST 41ST STREET-P.O. BOX 4700

AUSTIN, TX 78765

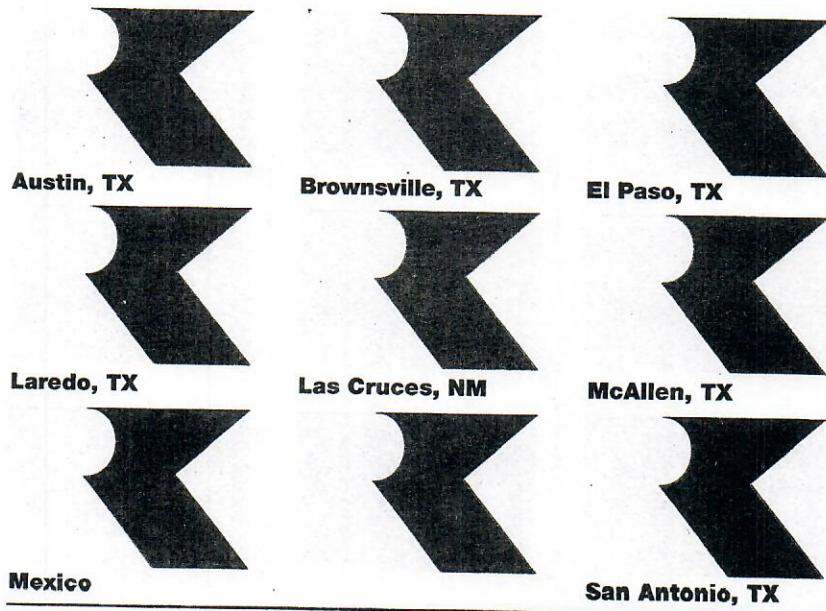
512/458-2145 - FAX 512/450-0637 - 1-800-845-6584



Engineers, Geologists, Hygienists and Environmental Scientists

**RESIDENTIAL OBSERVATION
12006 WEST COW PATH
AUSTIN, TEXAS**

RKBCI PROJECT NO. AAQ02-005-01



Project No. AAQ02-005-01
April 17, 2002



Raba-Kistner-Brytest Consultants, Inc.
8200 Cameron Rd., Suite C-154
Austin, Texas 78754
(512) 339-1745 • FAX (512) 339-6174

Mr. Jack Greenfield
USAA Foundation Unit
P. O. Box 690770
San Antonio, Texas 78269

Reference: Residential Observation – March 12, 2002
12006 West Cow Path
Austin, Texas 78727-6516
Member: Debra W. Alley
Member No.: 7801875-90A

Dear Mr. Greenfield:

Raba-Kistner (R-K) is pleased to submit the report of our residential observation for the above referenced project. The purpose of this study was to provide our opinion concerning whether or not the multiple sanitary sewer line leaks discovered by G. D. Friesenhahn Plumbing Inc. on March 12 and 20, 2002 caused damage to the concrete foundation and/or to the wood frame of the home.

GENERAL INFORMATION

On March 12, 2002, Mark A. Mendel, E.I.T. and Gabriel Ornelas, Jr., P.E., of R-K conducted visual observations at the home as authorized by Mr. Jack Greenfield of the USAA Foundation Unit. The home is constructed in a residential neighborhood in Austin, Texas. The home is about 30 years old and is a one-story, single-family dwelling constructed on a concrete beam and slab-on-ground foundation. The foundation is supporting a wood frame with rock veneer cladding and wood paneling covering the exterior walls. The wall framing is supporting a wood roof framing system with a composition shingle roof covering. The front, back, left, and right directions described in this document are determined by standing on West Cow Path Street and facing the home. A General Site Layout is presented on Sheet 1 of the attachments.

BACKGROUND INFORMATION

Mr. and Mrs. Alley, the homeowners, who were present at the home during our site visit, provided some of the following information:

- The home was constructed in about 1972.
- The Alleys' purchased their home in 1988.
- Primrose & Associates (Primrose) inspected the home in 1988. Primrose indicated to the homeowner that the right-front corner of the foundation was at a lower elevation but within acceptable floor slope tolerances.
- There has been previous crack repairs, on and off, since 1988.
- It is our understanding that the Alleys' have had a history of plumbing problems with the sanitary sewer line system since purchasing the home, including: frequent sanitary sewer line backups at the hall bathroom; the

sanitary sewer line in the yard was replaced because it was full of roots (6-7 years ago); the kitchen sink would periodically back up, but has not backed up in the past two years; the hall bathroom commode was replaced on two occasions (no problems in the past 2 years); the washing machine drain was periodically "snaked" (last snaked in Fall 2001); and more recently, the master bathroom commode backs up.

- The home has undergone some remodeling.
- The homeowners have experienced storm drainage problems on occasion. During large rain events, the culverts crossing diagonally across their yard back up due to increased runoff from upstream development. The storm water flows through their back yard and has backed up at their patio and seeped into the home.
- Mr. Alley noticed a pronounced slope at the right-front corner of home, when he moved into his office in 2001. The office was originally designed as a garage and it was enclosed during the original construction of the home.

PLUMBING AND LEAK TEST INFORMATION

G. D. Friesenhahn Plumbing, Inc. of San Antonio, Texas performed leak testing on the domestic water line system and the sanitary sewer line system on March 12 & 20, 2002. A copy of the 4-page plumbing report, dated March 26, 2002 was provided to R-K for our review. No leaks were identified on the domestic water line system.

According to the plumbing report, the overall sanitary sewer line system showed a 3-inch loss in a 30-minute test cycle. Pinpoint testing found leaks at the following locations:

- Waste and overflow at master bathroom bathtub (1/16-inch in 30-minutes)
- The lead joint for the master bathroom commode (1/8-inch in 30 minutes)
- The sanitary tee for the hall bathroom commode (1/16-inch in 30-minutes) Three roots were removed during the testing
- The quarter bend to the kitchen sink (1/4-inch in 30-minutes)
- The quarter bend for the washing machine (3/16-inch in 30-minutes)
- The sanitary tee for the utility commode (1/16-inch in 30-minutes)
- The condition of the 2-inch branch line extending from the utility area to the left-front of the home is unknown due to a lack of monitoring points.

The rate of loss presented above for each segment of pipe found to be leaking was provided by G.D. Friesenhahn Plumbing, Inc. via a telephone conversation.

Flow testing was conducted at the home to simulate normal use conditions. No losses were recorded at the six drain fixtures flow tested.

RELATIVE FLOOR ELEVATIONS

The relative floor elevations were determined using elevation measuring equipment placed on the floor surface in each room throughout the home. Presented on Sheet 2 are the relative floor elevation measurement values to the nearest hundredth of a foot. The elevation values were adjusted uniformly throughout to account for floor covering differences and/or changes in grade (slab steps), except at the sunken living room.

OBSERVATIONS

Visual observations of existing conditions were made from floor or ground level at the interior and exterior of the home. Although our observations were made with care and diligence, it is likely that not all existing conditions were documented. The intent of these visual observations was to identify conditions generally representative of those at the home.

Exterior Observations

The surface grading at the home is generally fair around the perimeter except at the rear of the home where it visually appears poor. Surface drainage may back up and pond adjacent to the foundation during large rain events at the rear of the home. There are no gutters attached to the roof eaves of the home, except along the patio. The downspout drains adjacent to the foundation at the right-rear corner of the home. Randomized mortar joint separations were observed in the rock veneer cladding of the exterior walls of the home. There is a 3/8-inch wide vertical mortar joint separation in the rock veneer cladding from the concrete perimeter beam to the top of the rock veneer cladding at the right side of the home located adjacent to the electric meter.

Interior Observations

Cracks, compression bulges, and separations of the Sheetrock walls and ceilings were noted throughout the entire home, except at the kitchen, which has been recently remodeled. Remodeling of the home and previous crack repairs were noted at several areas. More pronounced indications of differential foundation movement were noted at the right side and the right-front area of the home. The front legs of the table in the office have been shimmed to level the table due to the lack of levelness of the floor slab.

COMMENTS

When sewer line leaks induce a sufficient quantity of moisture upon underlying expansive soils, the foundation can be heaved upward at the area of the leak due to the soils swelling and exerting pressures beneath the foundation. The sanitary sewer line system was tested under static pressure. As previously stated, the entire system lost (drop in water level) 3-inches in a 30-minute test cycle. The total loss is distributed over six leak areas. The highest loss recorded when testing individual leak areas was 3/16-inch in 30-minutes at the washing machine. The results of these tests are indicative of relatively small test leaks that may not discharge water under normal operations (gravity flow conditions).

The flow tests conducted support this conclusion. According to the plumbing report, there were 100 percent recoveries in the flow tests conducted at all six leak locations. These results indicate that no water is lost from the leak area under gravity flow conditions.

The relative floor elevations (Sheet 2 of attachments) demonstrates an isolated high in the foundation located in the hall bathroom lavatory sink area and the portion of the hallway to the rear of the hall bathroom. The test on the sanitary tee for the hall bathroom commode, which is located to the front of the high spot of the foundation, showed a 1/16-inch loss in a 30-minute test cycle. According to the flow testing, this leak does not discharge water during normal operating conditions.

In addition, the hall bathroom area has been remodeled and the only indication of differential foundation movement noted was a previously repaired vertical Sheetrock tape joint compression bulge above the door to the commode area. Therefore, we believe that the foundation movement at this area is due to factors other than this leak. The relative floor elevations in the vicinity of the remaining leak areas demonstrated no indications of foundation upheaval.

The right-front corner of the home is experiencing the most significant differential foundation movement. There are isolated floor slopes in the office area of up to 1.6 percent. This area was originally intended to be a garage. Garage slabs are typically constructed with a slope to direct surface drainage away from the main portion of the home and to the door. Also, Primrose and Associates, noted that this corner was lower than the rest of the home, but was within accepted floor slope tolerances at that time. Although this area may have been constructed with a "built-in" floor slope, the cracks on the Sheetrock walls and ceilings within the interior and the largest crack in the rock veneer cladding located at the right exterior wall of the office are all indications that the foundation has experienced differential movements at this area. We believe that the differential foundation movements at the home are due to factors other than the plumbing leaks.

OPINIONS/CONCLUSIONS

On the basis of our visual observations, plumbing and leak test information, relative floor elevations, and our knowledge of structures constructed on reinforced concrete beam and slab-on-grade foundations, it is our opinion that:

- The multiple sanitary sewer line leaks have not caused the cracking in the home or the differential movement of the foundation.
- Variations in seasonal moisture conditions, vegetation effects, and varying surface drainage conditions have contributed to differential foundation movement.

LIMITATIONS

The information provided in this document is directed to our client, USAA Foundation Unit and may not contain information for others and/or for other uses. Foundation plans and details were not available during this observation. No observations were conducted on the roof, in the attic, or of the mechanical/electrical systems. Some of our observations were limited due to vegetation, finishes, room contents, etc. Additional conditions may exist or may have existed at the time of our observation.

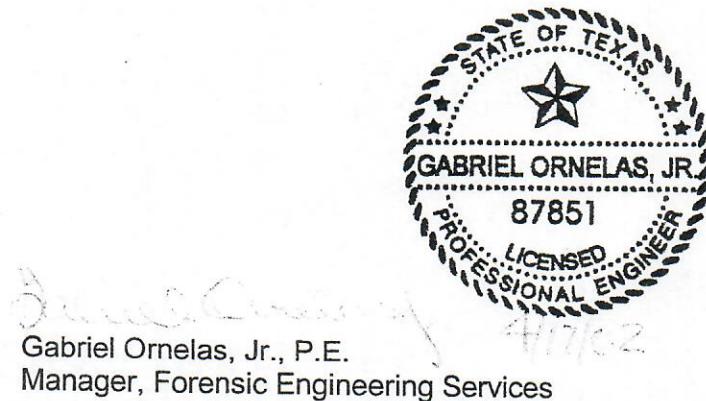
This report includes observation and testing information regarding the home as obtained by R-K and from various other sources. Our comments, opinions and recommendations are based upon that data. If the information described in this document provided by others is incorrect, or if additional information becomes available, Raba-Kistner (R-K) may need to revise the comments, opinions and recommendations presented in this document.

We appreciate the opportunity to be of service to you on this project. Should you have any questions about the information presented in this report, or if we may be of additional service, please call.

Very truly yours,
RABA-KISTNER CONSULTANTS, INC.

Mark A. Mendel

Mark A. Mendel, E.I.T.
Graduate Engineer



Gabriel Ornelas, Jr., P.E.
Manager, Forensic Engineering Services

MAM/GO/cjk
Copies Submitted: Above (2)
Attachments