
Structural Report

San Mirasol Hope IV Revitalization Program Single Family Housing Design/Build Project

San Antonio, Texas

February 2007
Project CTR001-F



**AccuTech
Consultants, LLC**

Structural Report

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Single Family Housing Design/Build Project**
San Antonio, Texas

prepared for:

San Antonio Housing Authority
818 South Flores Street
San Antonio, Texas 78201

February 2007
Project CTR001-F



2/9/07

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1 of 3 Originals

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Appendix A - Assumptions and Limiting Conditions

Introduction

At the request of the San Antonio Housing Authority, AccuTech Consultants, LLC conducted an investigation of the San Mirasol Hope IV Revitalization Program - Single Family Housing Design/Build Project located in San Antonio, Texas. This project consisted of the investigation of the following twenty-five homes:

- Eleven homes on Precious
- Six homes on Villa Grande
- Three homes on Villa Linda
- Two homes on Villa Arboles
- One home on Villa Flores
- One home on NW 26th Street
- One home NW 27th Street.

The investigation was made by qualified personnel from AccuTech Consultants on January 18, January 25, January 26, February 6, and February 9, 2007. A “Level A” investigation (as defined by the ASCE Guidelines for the Evaluation and Repair of Residential Foundations) of each of these homes was conducted. This type of investigation generally consists of visual walk-through observations of the interior and exterior of each structure. The purpose of this investigation was to evaluate the structural condition of these homes.

General

The houses were one-story or two-story, wood-framed structures and were located in a residential neighborhood (See Photographs No. 1 and No. 2). Our investigation of the houses indicated:

- They were constructed with brick veneer and/or siding.
- The roofs were a combination of gabled and hip construction with composition shingles.
- The roof framing consisted of prefabricated trusses.
- The foundations were monolithic concrete slabs-on-grade. We understand that the slabs were conventionally reinforced.
- Porch slabs were typically located along the front of the structures. These slabs were a concrete slabs-on-grade that were monolithic with the main foundation slabs.
- “Stoop slabs” were typically located at the side or rear structures at the exterior door. These slabs were concrete slabs-on-grade that were separate from the main foundation slabs.



Photograph No. 1



Photograph No. 2

As part of our investigation, the characteristics of the near surface soils were determined by reviewing the SOIL SURVEY of Bexar County, Texas as published by the United States Department of Agriculture – Natural Resources Conservation Service. Based on this publication, the naturally existing soils at the sites were determined to be highly expansive.

Background

We understand that the residences were approximately 6 years old and were originally constructed in 2001. During our site visits, attempts were made to interview each tenant. However, at ten of the homes, the tenant was not available and we were therefore unable to obtain any background information. Of the remaining fifteen tenants (or their representatives) that were interviewed, seven reported that they were unaware of and/or did not have any problems with the home. The final eight reported building problems related to the following issues:

- Grass growing into the house through the floor.
- Cracks in the concrete.
- Excessive floor slopes in the garage.
- Cracks in the side of the foundation.
- Patching of the joints between the foundation and the flatwork.
- Patching of the siding.
- Sticking/unbalanced doors.
- Cracks in the interior finishes (walls and ceilings).
- Bowed or “wavy” walls.

Additionally, some of the tenants (or their representatives) identified several miscellaneous problems related to window leaks, vinyl flooring, electrical outlets, and kitchen cabinets, etc. However, these issues were determined to be non-structural issues and were not addressed by this study.

Observations

Observations were made by walking through and around the building, with special attention to indicators of structural problems or distress. It was not the intent of this report to document all cracks and conditions that were noted, but to show typical conditions that affect the conclusions and recommendations of this report. In general, we noted the following:

- The homes had little to no cosmetic distress.
- Patching of the interior finishes was noted in some of the structures.
- No out-of-plumb walls were noted.
- One of the houses located on Precious had two interior walls that were out of alignment.
- A few of the one-story structures included handicap ramps at the door from the garage to the house.
- There was a noticeable floor slope in one of the two-story structures located on Precious.
- Cracks were noted in the garage and porch areas of some of the structures. Some of these cracks had been sealed.
- Foundation rub coat cracks were noted at some of the structures.
- Sealant had been added to the control joints between the foundation and the adjacent flatwork at some of the structures.

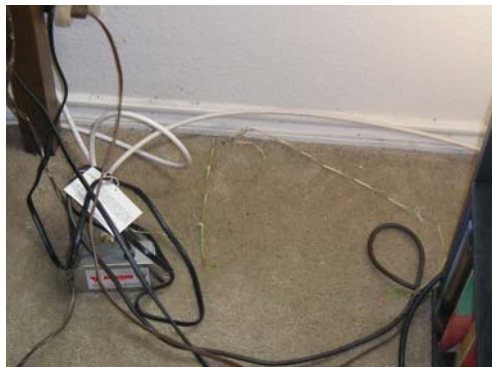
- Soil erosion was noted along the foundation grade beams at several of the structures.
- Landscaping generally consisted of sparse vegetation and exposed soil.
- The exterior siding joints at many of the structures had been sealed.
- At one structure located on Villa Grande, the wooden porch columns appeared to be “twisted”.
- There were no signs of structural damage or distress at any of the structures.

Discussion/Conclusions

Based on our investigation, several items were identified by the tenants or noted during our investigation. For the purpose of addressing each of these items, we have compiled the following list of items along with our comments:

- 1. Issue:** Grass growing into the structure through the floor.

Comment: At two of the structures on Precious, it was reported that there was grass growing into the structure through the foundation. However, our observations revealed that the grass was not growing up through the foundation. The grass was found entering the structure along an exterior wall at the base of the wall (See Photographs No. 3 and No. 4). We understand that



Photograph No. 3



Photograph No. 4

the builder (K-B Homes) has identified this problem and determined that the grass was growing up through a gap between the siding and the foundation. We also understand that the builder is addressing this issue and has already made repairs at one of the structures.

2. Issue: Cracks in the concrete slab.

Comment: We noted cracks in the concrete slabs (See Photographs No. 5 and No. 6) at



Photograph No. 5



Photograph No. 6

some of the structures. These cracks were determined to be typical shrinkage cracks and were not structural cracks. Shrinkage cracks occur due to normal volumetric changes associate with the drying of the concrete. These cracks develop as the concrete cures and are random hairline cracks (less than 1/16 of an inch) that often extend to the perimeter of the slab. However, these cracks often widened due to the vehicular and pedestrian traffic, particularly in the garage areas. These cracks can also widen due to flexural movement

of the foundation due to seasonal moisture changes. Shrinkage cracks are not unusual in concrete construction and are considered cosmetic in nature.

3. **Issue:** Patched cracks in the porch slab.

Comment: Some of the tenants reported problems with cracks in the porch that had been patched. Based on our observations, these cracks also appeared to be typical shrinkage cracks as indicted in item #2, which have been patched (See Photographs No. 7 and No. 8). It is our opinion that the quality of the workmanship used in patching these cracks has negatively magnified the appearance of the cracks. As a result, these patches are apparently being interpreted as a structural problem with the foundation. However, they are cosmetic in nature and not a structural problem.



Photograph No. 7



Photograph No. 8

4. **Issue:** Excessive floor slope in the garage.

Comment: One tenant on Precious reported excess floor slope of the foundation, which occurs at the door from the garage to the house. However, our observations

revealed that this reported floor slope was actually a handicap ramp (See Photograph No. 9). It appears that the foundation was originally constructed



Photograph No. 9

with a “step down” between the entry and the garage (See Photograph No. 10). In this instance, a topping slab had been added to provide wheelchair access.



Photograph No. 10

Similar handicap ramps were constructed at a few other residences (See Photograph No. 11). Therefore, the reported slope is not a foundation problem, but is actually an “as-built” condition.



Photograph No. 11

5. Issue: Cracks in the side of the foundation.

Comment: Based on our observations, the reported cracks in the side of the foundation were actually cracks in the foundation rub coat (See Photographs No. 12 and No. 13). The foundation rub coat is a thin finish coat applied to the foundation to give the foundation a uniform finish. These cracks in the rub coat are cosmetic in nature.



Photograph No. 12



Photograph No.13

6. Issue: Patching of the joint between the foundation and the flatwork.

Comment: During our investigation, we noted that a sealant had been added to some of the control joints between the foundation and the adjacent flatwork (See Photographs No. 14 and 15). However, the purpose of these control joints is to



Photograph No. 14



Photograph No.15

allow movement between the flatwork and the main foundation. These joints should also be maintained to prevent moisture intrusion into the underlying soils. Therefore, it is our opinion that the addition of sealant to these joints is appropriate and not an indicator of a building problem.

7. **Issue:** Patching of the siding joints.

Comment: At most of the structures, we noted that a sealer had been applied to the siding joints (See Photographs No. 16 and No. 17). However, we found that the



Photograph No. 16



Photograph No.17

sealant had been liberally applied and has “discolored” in most applications. Based on our observations, it is our opinion that this joint sealing was of poor workmanship and has negatively magnified the appearance of the siding. As a result, these patches are apparently being interpreted as a structural problem. However, they are cosmetic in nature and not a structural problem.

8. Issue: Twisted porch columns.

Comment: At one of the structures on Villa Grande, we noted that the porch columns appeared to be twisted (See Photographs No. 18 and No. 19). Based on our



Photograph No. 18



Photograph No.19

observations, it appears that the wooden columns were “warped” at the time they were installed. Therefore, it is our opinion that this was an as-built condition and not the result of differential movement of the porch slab. This condition is cosmetic in nature.

9. **Issue:** Cracks to the interior finishes reported by the tenants.

Comment: During our investigation, we noted sheetrock cracks in the interior finishes (walls, ceiling, etc.) in some of the houses (See Photographs No. 20, No. 21, No. 22, and No. 23). The majority of these cracks were very small. However,



Photograph No. 20



Photograph No. 21



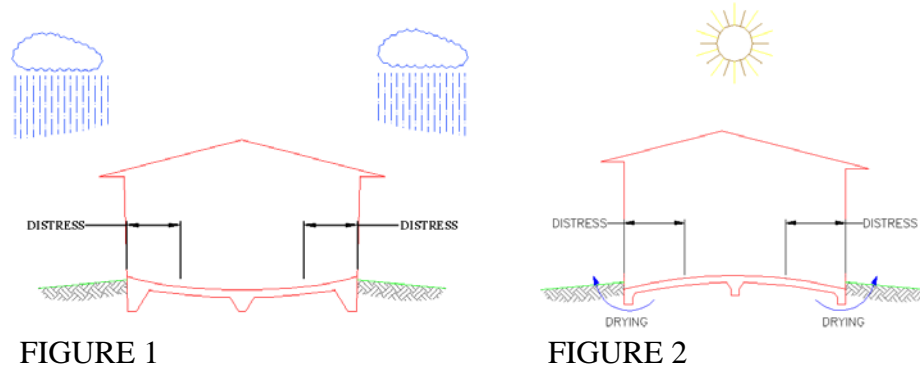
Photograph No. 22



Photograph No. 23

the majority of the houses contained little or no sheetrock cracking. It is our opinion that these cracks are typical of a houses constructed in the San Antonio area, which are supported on expansive clay soils. In this instance, the geological survey indicated that the naturally existing soils at the site were highly expansive. Therefore, when moisture increases along the

building perimeter, it can cause the underlying soils to swell and raise the perimeter (edges) of the foundation (See Figure 1). On the other hand, as the moisture contained in the soil around the foundation's perimeter decreases (dries out), the perimeter of the foundation can move in a downward direction (See Figure 2). The drying out effect can be caused by the natural



loss of moisture through evaporation, or this drying may be significantly increased by the effect of vegetation located near the foundation. These movements can cause walls and ceilings to crack, and doors to stick throughout the structure. Therefore, it is our opinion that the cracking was a result of differential foundation movement due to seasonal moisture changes.

10. Issue: Doors sticking and/or swinging open or closed on their own.

Comment: Some of the tenants indicated that some of the doors in the home would swing open or closed on their own. A few tenants reported that some of the doors were sticking and had to be “shaved down”. It is our opinion that these

conditions were the result of differential foundation movement due to seasonal moisture changes in the underlying highly expansive clay soils as indicated in item 9.

11. Issue: Bowed or “wavy” walls

Comment: One of the tenants located on Precious reported that two of the walls of the structure were “bowed or wavy”. At this particular residence, we did note some “waviness” in the sheetrock of one of the interior walls and along the baseboard of another interior wall (See Photographs No. 24 and No. 25). Based on our observations, it appears that these are an as-built condition. They are primarily a workmanship issue (alignment) and are not due to foundation movement. It is therefore our opinion that these conditions are cosmetic in nature.



Photograph No. 24



Photograph No. 25

12. Issue: Soils cracks and erosion

Comment: Several of the tenants reported problems with soil cracks and erosion of the soil along the foundation (See Photographs No. 26, No. 27, No. 28 and No. 29). Based on our observations, it is our opinion that landscaping along the perimeter of the structures (See Photographs No. 30 and No. 31) is not being



Photograph No. 26



Photograph No. 27



Photograph No. 28



Photograph No. 29



Photograph No. 30



Photograph No. 31

being maintained (watered). This condition contributes to the cracking of the soils. In addition, since there is no vegetation to hold the soils in place, they are very susceptible to erosion during heavy rains.

13. Issue: Tilting of the structure

Comment: Although we found little to no distress to the interior and exterior finishes of the structure, our office found a noticeable floor slope in one of the two-story homes located on Precious. Based on these items, we have determined that the foundation has undergone a significant uniform tilt (See Figure 3). Foundation tilt occurs when the foundation moves uniformly as a unit. Due to the floor slope, we would recommend that this condition be brought to the builders attention for the purpose of addressing the need for remedial foundation repair.

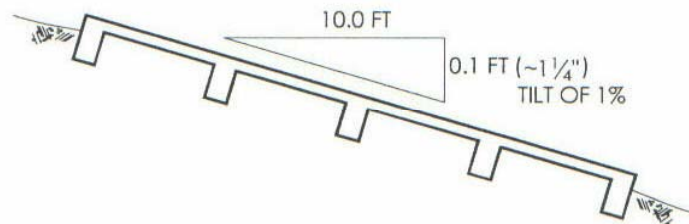


FIGURE 3 – Tilt Schematic

In summary, we found twenty-four of the twenty-five homes observed by our office to be in good structural condition and are capable of performing for their intended use. It is our opinion, the distress reported by the tenants or noted by our office during the investigation are cosmetic in nature and are not indicator of a structural problem.

This report is subject to the Assumptions and Limiting Conditions included in Appendix A.

Appendix A

Assumptions and Limiting Conditions

ASSUMPTIONS AND LIMITING CONDITIONS

This report is subject to the following:

- I. Descriptions and conclusions have been based upon observed conditions at the time of our visit. AccuTech Consultants, LLC assumes no responsibility for any deficiencies not visible by external observation. There is the possibility that conditions may exist which are hidden from view, which could affect some of the conclusions contained herewith.
- II. Observations/discoveries identified in this report are representative of items noted during our investigation and should not be considered a comprehensive listing.
- III. Various information contained herein was received from third parties and no responsibility is assumed as to accuracy of same.
- IV. This report shall not be considered a detailed document to be used in securing bids or proposals to execute necessary repairs.
- V. This investigation does not include a detailed analytical study of the structural elements, nor does this report address the structural condition of framing members which are not exposed to view.
- VI. The opinions expressed in this report are limited to the matters expressly stated herein, and no opinions are implied, or should be inferred, beyond the matters stated.