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97-SF-229-1004

TO: Yvielle Edwards-Lee, Fresno Area Coordinator and
Director, Single Family Housing Division, 9BS

FROM: Glenn S. Warner, District Inspector General for Audit, 9AGA

SUBJECT: Oakbrook Village/Village Landing I and II Subdivision
Campus North 1 and 2 Subdivision
Single Family Operations
Merced, California

## INTRODUCTION

We completed our audit of construction deficiencies in single family houses at two Merced, California, subdivisions, Oakbrook Village/Village Landing I and II, and Campus North 1 and 2. Our interim report, issued to you on September 24, 1996, provided initial results of our concerns with construction in certain Merced subdivisions. Copies of that report and your response thereto are included in this report in Appendix C and D, respectively.

## SUMMARY

Our audit confirmed that certain FHA-insured houses in the two subdivisions have developed structural damages, some rather significant, because of inadequate preparation of the soil and deficient construction of the foundation slabs. The damages allowed underground moisture to penetrate into the houses, creating conditions for molds to grow. The damaged houses and the molds pose safety and health hazards to the occupants.

## BACKGROUND

Oakbrook Village/Village Landing I and II and Campus North 1 and 2 are located in fairly close proximity in Merced. They were, however, developed at different times and by different builders. The subdivisions are described separately as follows.

Oakbrook Village/Village Landing I and II

Builder/contractor Warren W. Wainwright, Inc. developed 257 houses in this Merced subdivision in three phases, Oakbrook Village, Village Landing I, and Village Landing II. Wainwright, dba Coordinated Building Concepts, started Oakbrook Village in the mid-1980s. Under another entity, S&W Realty & Development, Wainwright developed Village Landing in the late 1980s.

Veteran Affairs (VA) processed both developments using the Veterans Affairs Master Certificate of Reasonable Value (VA-MCRV) procedure. Thus, VA had the responsibility to review, approve, and inspect the construction of the houses HUD/FHA subsequently insured the mortgages for individual homes in this subdivision under Section 203b of the Housing Act. At least 19 FHA insured houses are in this subdivision.

Seventeen homeowners, including four with FHA insured mortgages, have filed lawsuits against Wainwright alleging faulty construction.

Campus North 1 and 2

Builder/contractor Alan Grant, dba Grant Homes, Inc., started development of Campus North 1 and 2 in 1992. VA also processed this development under the VA-MCRV procedure. Of 109 single family houses in this subdivision, 55 are FHA-insured.

Twenty of the homeowners, including 12 with FHA insured mortgages, have filed lawsuits against the builder alleging faulty construction. The houses involved are three to four years old.

Both the VA and the City of Merced Planning Department had the responsibility to review and approve the construction plans and make periodic on-site inspections of the construction work at the two subdivisions. These inspections were intended to ensure VA and HUD that the newly constructed houses met local building codes and HUD construction standards.

## OBJECTIVE AND METHODOLOGY OF THE AUDIT

We made the audit to determine (a) whether the houses had structural damage and molds/fungi, (b) the cause of any damage and molds/fungi, (c) any adverse effects to the occupants and (d) any financial impact to HUD and the Government. Our audit generally covered the period 1992 through February 1997.

To carry out the audit, we:

- interviewed present and former homeowners
- made on-site observations of the structural damages and molds/fungi
- discussed the problems with:
  - the Fresno, California, HUD Office,
  - the City of Merced Planning Department,
  - the County of Merced Department of Public Health,
  - California Department of Real Estate,
  - Environmental Protection Agency, San Francisco,
  - Veterans Affairs officials,
  - the attorneys representing the homeowners, and
  - builder Wainwright, his attorney and construction supervisor.
- contracted with an engineer to make inspections of the damaged houses - obtained data from engineers hired by either the homeowners, the homeowners' insurance companies, or Wainwright's insurance company's engineer
- obtained copies of depositions taken by the attorneys representing the homeowners

Because our audit objectives were limited and specific, we did not study, evaluate or rely on the systems of internal controls to carry out our audit.

We conducted the audit in accordance with generally accepted government auditing standards, however we did not have an exit conference with builders Wainwright or Grant. We did have an interview with Mr. Wainwright and his attorney. Mr. Wainwright stated that his homes were built to UBC standards and he will guarantee them to the length of his 10 year commitment. We have provided copies of the report to builders Wainwright and Grant.

Within 60 days, please furnish us a status report on the corrective action taken, the proposed corrective action and the date to be completed,or why action is not considered necessary for the recommendations.

If you have any questions, please contact Assistant District Inspector General for Audit Richard Bahr at 415-436-8101.

Appendices:

Appendix A - Pictures
Appendix B - Response to Report
Appendix C - Interim Report
Appendix D - Response to Interim Report
Appendix E - Distribution

## RESULTS OF AUDIT

## Finding - Some Houses Have Developed Structural Damage and Health Hazards

At two Merced, California, subdivisions, Oakbrook Village/Village Landing I and II, and Campus North 1 and 2, at least eight of the 366 FHA-insured single family houses have developed structural damage and/or growth of molds. In some cases, the damage subsequently allowed underground moisture to penetrate into the houses. Geotechnical engineers hired by HUD Office of Inspector General (OIG) or the homeowners, concluded that, for the houses they inspected, the builders did not prepare the soil or construct the foundation slabs as the soil engineers had recommended. These construction irregularities went undetected even though the City of Merced (City) and the Veteran Affairs (VA) fee inspectors made on-site inspections. These inspections were made to assure that the houses were constructed in accordance with approved plans, specifications and building standards. The resultant structural damage created a safety hazard, while the moisture created conditions for the molds to grow, posing a health hazard to the occupants. At least four homeowners/renters have vacated their houses because of the molds. One of the four also lost her home through foreclosure. The builders certified to HUD that they had complied with HUD construction requirements, but actually they did not. Foreclosure of the damaged FHA-insured houses could also result in financial losses to HUD.

## What HUD Had Required

### Certifications For Oakbrook Village/Village Landing

To induce HUD/FHA to insure the mortgages on the single family houses, the builder certified that his construction plans and specifications had complied with the local building codes and 24 CFR 200.926d construction requirements and that the home(s) were constructed in accordance with those plans and specifications. Subparagraph (b)(3) site conditions (i) says "The property shall be free of those foreseeable hazards and adverse conditions which may affect the health and safety of the occupants or the structural soundness of the improvements, or which may impair the customary use and enjoyment of the property. The hazards include toxic chemicals, radioactive materials, other pollution, hazardous activities, potential damage from soil or other differential ground movement, ground water, inadequate surface drainage, flood, erosion, or others located on or off site...."

The 1985 Uniform Building Code (UBC) required a minimum 12 inch depth for footings. Additionally, it stated that the recommendations included in the soils engineering report and approved by the building official were to be incorporated in the grading plans or specifications.

### Certifications For Campus North 1 and 2

To qualify for HUD/FHA mortgage insurance on the single family houses, the builder certified that his construction plans and specifications for the homes had complied with the requirements of the HUD Minimum Property Standards, and those in HUD Handbook 4145.1 REV-2, Architectural Processing & Inspections for Home Mortgage Insurance.

Chapter 2, in part, says that where soils are expansive, the builder must incorporate the recommendations in the soils reports in its grading and foundation plans. Thus, soils report recommendations normally become part of the construction plans and specifications. In addition, the builder certified that he had complied with Handbook 4145.1 REV-2, Appendix 8, Site Grading & Drainage Guideline, as well as local building codes.

## Structural Damages And Molds Developed At Some Houses

Details of the damages and the related problems at the houses are discussed below by subdivision.

### A. Oakbrook Village/Village Landing Subdivision

The houses were built during a drought

The builder constructed the houses in Oakbrook in the mid-1980s and Village Landing in the late 1980s on vacant pasture or crop land which had irrigation ditches running through the property. During the construction of the houses, the Merced area was suffering from a prolonged drought which left the ground very dry.

The structural damages started after the drought ended

By the time the drought ended in the early 1990s, homeowners at 3703 Duke Court, 3743 Duke Court, 3763 Duke Court and 854 Princeton Court began to notice cracks developing outside and inside their houses, and intrusion of moisture inside (except 854 Princeton Court). Complaints from three of the homeowners to HUD, the VA, and the builder brought no relief. One owner told us that the Campus North 1 and 2 subdivision had similar problems.

With time, the extent of damage at the houses has increased and additional houses have developed similar problems. During our site visits to seven houses (four were FHA-insured), the homeowners showed us cracks in the walls, counter tops, concrete floor slabs, concrete garage pads, and driveways. We also noted fireplaces separating from the wall, uneven floors, sinking concrete patio slabs, mis-aligned doors, and molds that were causing discoloration of carpeting, vinyl floor coverings and other fabric materials.

Subsequently, we contacted by telephone nine additional homeowners, five who were referred to us and four others that we identified with FHA-insured mortgage loans. Seven of the nine described conditions similar to those we noted during our visits to the previous

seven houses. These additional homeowners brought up new problems such as damp carpets, broken pipes, cracked shower pans and unpleasant odors. Two of these additional homeowners said they had no problems.

The site grading plan prepared for the development of Oakbrook showed an abandoned irrigation canal running through probable building areas on 24 lots. Several of the houses which were built on these lots now suffer from structural damage and settling of the ground.

The homeowners filed lawsuits alleging faulty construction

Because complaints to the builder resulted in unsatisfactory responses, at least 21 FHA and non-FHA-assisted homeowners have filed lawsuits against the builder and contractor, Warren Wainwright.

To mitigate the homeowners' concerns, the builder's insurance carrier hired a geotechnical engineer to inspect houses at any homeowner's request and provide the owner a written report on the condition of the house. Any defects would be repaired. To date, over 200 homes have been inspected. The builder told us that he has bought back three houses. One, he said, had no damage, the other two had insignificant settling and a very small crack. All three had FHA insured mortgages. He has made repairs to several houses and more have work underway or scheduled. He told us that only 5 to 10 houses in the subdivisions have significant problems.

One homeowner at 4023 Glendale, after replacement of the garage floor (twice) driveway, carpet, and linoleum, and repair of defective pipes by the builder, sought the builder's guarantee that any subsequent problems of settling would be corrected if the property is sold. Wainwright advised the homeowner that as a builder he guaranteed the structural integrity for 10 years after completion. He told the homeowner in a September 19, 1994, letter that the expansive clay caused only minor settling and inconvenience, that all construction work met industry practice at the time and the work complied with all City and State codes and was inspected.

Unsure of the reliability of the reports prepared by the engineer hired by the builder's insurance company, several homeowners either hired their own geotechnical engineers or relied on engineers their own insurance companies had hired to examine the damage and determine the cause. They also sought help from medical sources to investigate the effects of the molds inside their houses.

## The Cause Of Construction Defects At Oakbrook Village/Village Landing

Expansive soils require more stringent specifications

Prior to the construction of the houses at Oakbrook (the first of three phases), the builder had hired a soils engineer, Kleinfelder and Associates (Kleinfelder), to evaluate the soil conditions at the subdivision site. On November 26, 1984, Kleinfelder issued his November 21, 1984, report to the builder. Kleinfelder advised the builder of the expansive nature of the soil (expansive soil contracts when it is dry, but expands significantly when wet). Because the expected substantial expansion and contraction of the soil could affect the physical alignment of the houses, the specifications for the soil preparation and foundation footings were necessarily more stringent than the normal UBC requirements.

Kleinfelder had recommended footings 18 inches in depth (the depth of the footing excludes the depth of the slab) instead of the 12 inches the UBC required. The report further advised that "strict control of the native surface clay moisture content, along with the density and moisture content of fills, will be needed where concrete slab-on-grade floors are to be used."

The report included specific instructions on how to moisture condition the soil. The slab was to be at least 4-inch thick and reinforced with 6 x 6 x 10 x 10 wire mesh. A 4-inch layer of crushed rock or gravel was to be placed under the slab to act as a capillary moisture break. Compaction standards for the building and street sites were given and the irrigation ditches were to be filled in with engineered fill.

Engineers said the builder did not follow specifications

During our interviews of homeowners, two gave us engineering reports which disclosed that geotechnical engineers who had inspected some of the deteriorated houses concluded that the builder/contractor either ignored certain soils report recommendations or did not comply with the UBC. They said that improper preparation of the soil and construction of the concrete foundation allowed the swelling and contracting of the expansive soil to cause an up and down movement of the ground beneath the houses. As a result, the houses shifted, causing interior and exterior cracks, and misalignment.

The effect of the ground movement was compounded in at least one house, 3743 Duke Court, by the concrete foundation slab developing cracks because it was not properly reinforced with the correct size steel mesh which was improperly placed at the bottom, instead of inside the slab. The cracked concrete foundation subsequently allowed intrusion of ground moisture into the house. Also, footings at several homes have been measured and found to be less than the recommended depth.

Excerpts from the engineering reports given us by the homeowners are summarized as follows:

869 Redlands Court

An October 2, 1995 engineering report for 869 Redlands Court in Village Landing concluded that:

"All of the damage in your house was due to up and down movement as a result of seasonal moisture changes in the underlying expansive clay soil." It further reported that the foundation of the house was improperly constructed (not up to UBC standards). One excavation made on the west side of the foundation showed the footing measured only six inches although the soils engineer had recommended 18 inches. (See Appendix A p.19, figure 1)

3743 Duke Court

Similarly, an August 12, 1996 environmental geology and engineering firm's report on an Oakbrook house, 3743 Duke Court, said:

"The purpose of this investigation was to determine the general conformance of the construction of the residence to the specifications set forth in the soils report... dated November 21, 1984...." "The footing...was found to be embedded 11 3/4 inches, or 6 1/4/inches less than what was recommended. Footings that were excavated by (another firm) showed embedments of 10 inches on the east, 12 inches on the west, 11 inches on the south and 10 inches on the north side of the residence." Thus, all the perimeter footings were 33 to 44 percent less than the recommended 18 inches.

The report further disclosed that the contractor apparently used other than 6 x 6 - 10/10 size wire mesh in the concrete slab. The purpose of the wire mesh in concrete slabs is to minimize the potential for large slab cracks to develop and propagate completely through the slab, thereby preventing the intrusion of vermin and water. The report also determined "the reason that this slab cracked all the way through to the sub-base is that the steel (mesh) was placed at the bottom of the slab and provided no structural resistance to prevent the crack from forming. Structural steel placed at the bottom of a slab is a construction defect."

Grading contractor was given no specifications to follow

In a deposition given by the contractor who graded the Oakbrook subdivision, he said that the builder told him to merely level the ground, but gave no specifications he had to follow. The contractor said he usually levelled land for agricultural use, though he had done some grading for construction work. He said he was not told to and did not compact the soil, nor was he instructed on how to fill in the abandoned irrigation ditches.

## OIG Inspection Confirmed Construction Defects

On January 9, 1997, a geotechnical engineer hired by OIG inspected, along with OIG staff, four damaged houses, 3732 Duke Court, 3762 Duke Court, 854 Princeton, and 3763 Duke Court in the Oakbrook Village (3) and Village Landing I (1) subdivision. His report, based upon the results of his inspection and review of various construction plans

and engineering reports concluded that several factors contributed to the observed distress. They include:

- Presence of upper expansive clay soil which has swelled since construction resulting in damage to both exterior and interior portions of the structures.

- The location of three homes over old drainage ditches has resulted in observed settlement and resultant distress in these structures.

- Inadequate vapor barriers and capillary moisture breaks were installed below the slab. This allows water vapor to move through the slab causing damage to the floor coverings, including the development of mold. Review of the gradation of the sand (Atwater sand) apparently used for capillary moisture break material for this subdivision indicates that it is fine to medium grained sand. In our opinion, this is not a clean, free draining material that will provide a more satisfactory capillary moisture break.

Additionally, the engineer stated that the soils report "...recommendations that the upper 24 inches below the slab be moisture conditioned prior to construction is not verified by any of the construction reports reviewed. With regard to the filled ditches, there is no available documentation that these ditches were properly stripped of any soft compressible soils or that the ditch fill was properly compacted" (See Appendix A pp 19-20, figures 2-4 and p.21).

**B. Campus North 1 and Campus North 2 Subdivision**

<u>The houses were built on expansive soil</u>

Built in 1993-1994 on a site that a 1990 soils report described as a flat open field with a meandering irrigation canal and expansive soil, Campus North 1 contains 66 houses Forty-three houses were built in Campus North 2 in 1993 on adjacent property which a 1992 soils report disclosed had highly plastic (expansive) clay soil.
In 1994, some of the houses in Campus North 2 began to develop damage. The damage included cracks in exterior walls and concrete patio slabs as well as accumulations of mold inside the houses, resulting in discolored carpet and linoleum.

Our September 1996 site visits to two of the houses, 165 Westmont Court and 360 Buena Vista Court in Campus North 2 where problems surfaced about one year after construction, showed cracking exterior walls and concrete pads, a sagging roof, discolored linoleum and carpets, and presence of extensive mold inside. The homeowner at 165 Westmont Court said that the ground in her front yard was always wet. A civil engineer's drawings showed that the other house, 360 Buena Vista Court, had been built over a former irrigation ditch that had been realigned from the Campus North 1 area to Campus North 2 area. At the time of our review, these houses were only three

years old (built in 1993).

Two homeowners' complaints to the builder brought no offers of help. One telephoned the Fresno HUD office but no one returned her call. Because these two FHA-assisted homeowners did not know that they could have brought their complaints to HUD, they are among the 20 homeowners in Campus North 1 and 2 who have filed a lawsuit against the builder.

## The Cause of Construction Defects At Campus North 1 and 2

Kleinfelder also prepared the soils study for Campus North 2. The September 2, 1992 report described the site as essentially level, dissected by a canal that flowed through the central area. The soil was identified as highly plastic (expansive) clay. Based upon their experience with soil types in the Merced area, Kleinfelder had recommended that the soil beneath the foundations and concrete slabs-on-grade be moisture conditioned in excess of optimum moisture for site development. He warned that, "failure to properly moisture condition the subgrade soils could result in structural distress due to future variations in the subsurface soil moisture conditions."

For this subdivision, Kleinfelder had recommended footings of at least 24 inches and the slabs were to be placed on top of a capillary break consisting of at least 4 inches of coarse, free draining gravel or coarse sand. The capillary break was to be covered with a moisture-proofing membrane having a 1 to 2 inch layer of moist sand placed on top to protect it during construction and to aid in curing the concrete.

### Engineering Studies Disclosed Defects In Construction

#### 360 Buena Vista Court and 425 Buena Vista Drive

Preliminary data from an engineer who excavated corings through concrete slabs at 360 Buena Vista Court in Campus North 2 and 425 Buena Vista Drive in Campus North 1, disclosed .."widespread evidence of excessive moisture coming from the slab. Based on these two corings, it seems likely to us that there is an inadequate capillary break in drainage of the underslab area. This has resulted in the moisture barrier being subjected to actual water intrusion, which it is not designed to withstand. The result is that the water comes in contact with the base of the slab and is carried to the surface by capillary action, resulting in mildew, carpet staining, damaged linoleum, and other nuisances." The engineer said more work was needed to evaluate the capillary break.

Subsequently, the engineer took five corings at 360 Buena Vista Court and found defects in the construction work. Three of the five corings showed the wire mesh was improperly placed on the bottom rather than the normal middle of the slab. The corings also showed the gravel layer was only 1, 3, 2 (with 1/2 sand), 2, and 1 1/2 inches instead of the 4 inches recommended in the soils report and specified in the foundation construction plan.

## OIG Inspection Confirmed The Intrusion of Moisture In Houses At Campus North 2

On January 9, 1997, the geotechnical engineer hired by OIG inspected, along with OIG staff, two houses, 360 Buena Vista Court and 165 Westmont Court in the Campus North 2 subdivision. The engineer reported that the "..structures..did not indicate distress from the apparent upper moderately expansive soils in that area. Since this is a relatively new subdivision, distress from the shrink/swell characteristics of underlying expansive clays...may not yet have had time to develop". The damage he observed in these homes was "discolored tile and carpet coverings and development of mold"...which "appears to be caused by moisture vapor seepage through the slab into the overlying carpet and tile floors. The vapor barrier and capillary moisture break apparently were not effective". (See Appendix A p.20, figures 5 and 6)

## City And VA Inspections Did Not Detect The Deficient Construction At The Two Subdivisions

The City inspectors had the responsibility to ensure that the construction met the UBC, and followed the City-approved construction plans and other specified conditions. The VA fee inspectors were to monitor the developments to ensure that the builders followed the VA-approved construction plans. To carry out these responsibilities, both the City and VA inspectors had to make periodic on-site inspections of the construction work. Neither the City nor the VA inspections detected the builders' failure to follow the soil engineer's recommendations.

### City inspections

The City's chief building official told us that when he took the job in February 1987, the City did not have a plan checker who would have had the responsibility to review the construction plans and ensure that the builder had incorporated the soils engineer's recommendations into the plans. Instead, the plan checking duty was the responsibility of the inspector. On September 23, 1996, when we interviewed an inspector who had inspected many of the Oakbrook houses, he could not recall whether he had verified that the soils report recommendations had been included in the construction plans.

The Director of the Single Family Branch in the California State Office, who had eight years previous experience as a builder/contractor, said that the City inspections should have detected the construction defects. He said that in normal practice, the City would have been called to the construction site to inspect the work before the City gives the approval to pour the concrete foundation slabs. As a common procedure, the inspector would measure the excavation depth for the footings to ensure compliance with the soil engineer's recommendations. Apparently, the City either did not make the inspection or made inadequate inspections.

### VA inspections

VA officials told us that the VA inspectors did not inspect homes for compliance with the UBC requirements. Instead, they only ensure that the construction complied with the VA-approved plans and specifications. They said that the soils reports were simply information that no one actually used.

When we initially tried to discuss the construction defects with VA officials they did not appear eager to assist us. Subsequently, they cooperated but said that even inspections would not have ensured that the builder had followed the approved plans unless VA staff was at the site during the time the soil was compacted, the gravel laid down and the concrete foundations and footings were poured.

However, a May 24, 1995 deposition of the former Merced VA inspector, taken by an attorney representing one homeowner, revealed that while the construction of the houses at Oakbrook was in progress, he had taken a 16 day vacation and had given signed blank inspection forms to the builder to avoid delaying the construction during his absence. The inspector also said that normally he would have measured or eye-balled the excavation for the footings. He was unable to recall specifically what he did at the Oakbrook site.

The current VA inspector in Merced who inspected the construction work at Village Landing 2 and Campus North 2 was unwilling to talk to us.

The San Francisco Single Family Director said that had the inspector made proper inspections, he would have made measurements of the forms for the concrete slabs and footings during a compliance inspection.

**The Homeowners Are Exposed To Health and Safety Hazards**

Because of the damage to their houses, the homeowners are exposed to health and safety hazards, and are unable to enjoy their homes as HUD had intended.

Health hazards from molds

In addition to the safety hazard, the molds and fungi have created potentially an even more serious health hazard to the occupants of the damaged houses. At least four of the nineteen homeowners or family members we talked to have reported health problems from the molds. In one of the most serious cases, a physician told the family of four, including two children, to vacate their house at Duke Court. Renters vacated another house, at De Paul Court, fearing the substantial concentration of mold in the master bedroom reported to them by the Merced Public Health Department might be a risk to their family's health.

Increasing focus on molds as a health threat

Long thought to be only a cosmetic problem, molds/fungi are now known to trigger asthma attacks and to cause allergies, including potentially life threatening allergic

responses such as hypersensitivity pneumonitis. Adverse health effects are mainly respiratory and/or allergenic in nature and are especially serious for children. Other effects can range from minor to severe illness, particularly after long exposure. Some exposed individuals have reported they are unable to work due to their inability to concentrate and extreme fatigue. A new and alarming concern is that exposure to molds may produce toxic substances which suppress immunity and may affect vital organ systems and the nervous system. Such health problems are occurring nationally and are being studied by the Center for Disease Control.

Health agencies confirmed the hazard of molds inside the houses

Although molds are not uncommon in shower stalls, they have, however, been detected under floor carpets and linoleum in at least fourteen (FHA and non-FHA) houses in the two subdivisions. The Director of the Division of Environmental Health in Merced County has inspected over 35 houses for molds/fungi and identified three houses with the highest concentrations. Laboratory tests revealed presence of aspergillus, penicillium, stachybotrys and cladosporium species from samples taken from three houses on Duke Court, De Paul Court and Redlands Court. These fungi, when their concentration indoors is extensive enough to produce odors or visible growth, may cause adverse human health effects. The occurrence and type of health problems depends on many factors including, species and strain of fungus, environmental conditions such as temperature and humidity, and susceptibility of the exposed persons.[+]

In May 1996, the Director of Environmental Health alerted Wainwright, the builder of the three houses, in an attempt to speed repair work to eliminate the mold contamination. To date, the builder has not made any repairs. One family moved because a physician advised them to vacate the house at Duke Court..."so obviously full of mold". The family members have since been tested and show exposure to many different fungi in their blood. The Director reported this to the California Environmental Protection Agency, Department of Toxic Substances Control, stating that he had told the affected occupants that the "mold/fungi growth inside the home can be a potential health hazard".

Another physician has attributed a child's serious respiratory problems to living in a damp house at Buena Vista Court... "secondarily colonized by ...fungi/mold" and said, "the house she lives in is a hazard to her health". An environmental geology and engineering firm analyzing moisture problems at a Duke Court house, reported "The development of molds and mildews in residences is common in subdivisions where slabs are not sealed properly. Often these molds and mildews will aggravate existing health problems of family members, or create new ones."

Dr. Eckardt Johanning, Medical Director, Eastern New York Occupational Health Program and instructor at the Mount Sinai School of Medicine, an internationally-known

[+]Levetin E. Fungi in Bioaerosols. Indoor Air Research Services, Max Eisenberg, ed. CRC Press Inc, 1995, pp 87-120; American Industrial Hygiene Association Biosafety Committee. Field Guide for the Determination of Biological Contaminants in Environmental Samples. American Industrial Hygiene Association, Fairfax, VA, 1996.

expert in exposure to indoor fungal contamination, reviewed medical and building technical data of one home in Oakbrook Village. He concluded that the homeowner "has symptoms and signs of a medical condition which we typically see in individuals after intense exposure to toxigenic (poisonous) and allergenic fungi, such as stachybotrys atra. He advised that the individual... "should avoid in the future any further exposures to such fungal materials. The house appears not to be fit for occupancy and needs to be remediated by professionals following established guidelines."

Safety hazards

In cases where large cracks in the concrete have developed, the occupants face the risk of injury if they should trip on the cracks or on elevated edges. For example, one house we inspected on January 9, 1997, 854 Princeton Court in Village Landing, had large cracks in the backyard patio with some broken concrete slabs protruding about two inches above adjacent slabs. Other houses had cracks in the garage driveways and/or inside the garage concrete floor.

HUD had intended the houses to be free of foreseeable hazards and adverse conditions which can affect the health and safety of the occupants. The houses should be structurally sound so that the occupants may enjoy the property. The safety and health hazards in the houses curtailed the occupants' ability to enjoy their homes.

**The Homeowners And The Government Could Suffer Financial Losses**

Because of the deteriorated condition of two damaged houses, the County Assessor appraised both houses at zero value. The owner of one of these houses who had vacated her house because of health problems caused by molds, eventually lost her house through foreclosure. The builder bought the house back at the foreclosure sale. The owner had the house for over eight years, however, and suffered a financial loss. The builder told us that he bought back her house so he could evaluate the problems and that he had found no damage to the house. Yet the insurance carrier had dropped coverage on the house because of ..."the increase in hazard posed by your home not being built to code causing your home's foundation to sink" and the County had appraised it at zero.

Adverse Financial Effect On HUD And The Government

As a result of the structural damage and the molds, some of the FHA homes in the three subdivisions are deteriorating. This deterioration increases the chances of default and subsequent loss to the FHA insurance fund. The potential financial losses involve not only FHA, but also VA and CalVet, as well as conventional lenders.

In the case of the homeowner who vacated her house and lost it through foreclosure, health problems from the molds have forced her to go on disability. Thus, her need to rely on disability is a premature expense to social security and medicare funds.

## The Builders Certified That They Had Complied With HUD Requirements But Did Not

Builder Wainwright Made Certifications

The builder had certified to HUD that he had complied with HUD construction requirements when, in fact, he did not. He made the certifications to induce HUD to insure the mortgage loans on the single family houses. He acknowledged in the certificate that false certification is a violation of 18 U.S.C.1001 and 1010 and is punishable by a fine and/or imprisonment and, in addition, may result in debarment and civil liability for damages suffered by HUD.

To induce HUD/FHA to insure the mortgage on the single family houses, builder Warren Wainwright certified for each insured mortgage that his construction plans and specifications had complied with the local building codes and 24 CFR 200.926d construction requirements. Subparagraph (b)(3) Site conditions (i) says the property should be free of foreseeable hazards and adverse conditions which may affect the health and safety of the occupants or the structural soundness of the improvements, or which may impair the customary use and enjoyment of the property. The hazards include, in part, potential damage from soil or other differential ground movement and/or ground water.

However, as discussed earlier, various geotechnical engineers have found that the builder did not properly prepare the soil, construct the concrete foundation slabs or handle the soil in the abandoned irrigation ditches before constructing the houses on top of the ditches. For example, for the houses inspected, the builder had constructed footings of 12 or less inches instead of the soils engineer's recommended 18, and provided no evidence that he removed the soft materials from the ditches and compacted the soil, as the soils engineer had recommended.

Wainwright told us that he understood what he was signing when he signed the certification forms to HUD but that he relied upon the City and VA inspections to ensure proper construction. He also said that he knew the UBC code and would have known if something was not built to code.

In our opinion, the contractor is ultimately responsible for assuring that his staff/subcontractors build the houses in conformance with the plans and specifications. The contractor cannot lay the blame for noncompliance on the inspectors. The contractor is certified by the state that he is knowledgeable of the UBC requirements and will comply with any unusual site conditions he is aware of. The contractor was put on notice that there were unusual site conditions when he received the soils report. However, it appears he made no instructions/directions to his employees/subcontractors to incorporate the soils report recommendations into the plans and specifications.

Builder Grant Made Certifications

Builder Alan Grant certified to HUD/FHA that he had complied with HUD construction requirements when, in fact, he did not. He made the certifications to induce HUD to insure the mortgage loans on the single family houses. He acknowledged in the certificate that false certification is a violation of 18 U.S.C.1001 and 1010 and is punishable by a fine and/or imprisonment and, in addition, may result in debarment and civil liability for damages suffered by HUD.

To induce HUD/FHA to insure the mortgage on the single family houses, the builder certified that his construction plans and specifications had complied with the requirements of the HUD Minimum Property Standards, and in HUD Handbook 4145.1 REV-2, Architectural Processing & Inspections for Home Mortgage Insurance.

Chapter 2, in part, says that where soils are expansive the foundation plans must be accompanied by supporting soil and structural design information. Per the 1991 UBC, soils report recommendations normally become part of the grading plans and specifications. In addition, the builder certified that he had complied with Handbook 4145.1 REV-2, Appendix 8, Site Grading & Drainage Guideline as well as local building codes.

As stated above, corings taken from a sample of two houses showed thatbuilder Alan Grant did not follow the soil engineer's recommendation for preparation of the ground underneath the houses. The gravel layer was less than the recommended depth and the wire mesh was improperly placed on the bottom rather than the middle of the slab.

**Possible Financial Assistance To Qualified Homeowners**

Under 24 CFR Part 200, Subpart K-Correction of Structural Defects, financial assistance is available from HUD to correct construction deficiencies if an application for aid is filed within four years after the date of the first insured mortgage certificate

"...if the mortgagor had made reasonable efforts to obtain a correction of a structural defect in his or her property by the builder, seller, or other persons, and that the defect has not been corrected." Assistance is defined as paying expenses in connection with having the defect corrected, paying claim of mortgagor for corrected damages to property arising out of defect, or acquiring title to property with approval of mortgagor. This assistance .."shall be available only in connection with a structural defect in the property which the Commissioner has determined to be of such a nature as to seriously affect the livability of the property." The houses in the Campus North 1 and Campus North 2 subdivisions are mostly less than four years old and thus may qualify for assistance under 24 CFR Part 200, Subpart K-Correction of Structural Defects.

The 1991 Uniform Housing Code, published by the International Conference of Building Officials, defines a building as substandard if it contains inadequate sanitation or structural hazards to the "extent that endangers the life...health...safety or welfare of the ... occupants." Dampness of habitable rooms, deteriorated or inadequate foundations, portions of roofs which sag are examples of unsanitary or structural hazards.

Homeowners in Oakbrook Village and Village Landing do not qualify for assistance because the houses have passed the four year deadline for assistance.

## Field Office Comments and OIG Evaluation

The Field Office generally agreed with our draft report and recommendations. Their complete comments are attached in Appendix B.

The issue of responsiveness to complaints from homeowners discussed in our draft report was the major area of concern. The Fresno HUD Office feels that it is very responsive to the public. Since we only had one incidence of possible failure to respond to the public, and the fact that we can not expect all complaints to be resolved to everyone's satisfaction, we revised our comments regarding the assistance provided by the Fresno Office.

We also changed the wording in our draft to reflect that the inspectors are not required to measure completed concrete slabs or footings, but would measure the set-up for the pour of the concrete, and the forms for the footings.

At the exit conference we discussed the issue of pursuing debarment versus suspension of Wainwright. We believe that Wainwright's failure to comply with HUD construction requirements demands an appropriate administrative sanction to protect the government's interest and restrict him from further business activities involving the federal government.

## RECOMMENDATIONS

To protect present and future HUD/FHA assisted homeowners/homebuyers from construction defects and health hazards from molds, we recommend that you:

1A. Seek debarment against builder Warren Wainwright and any related firms for certifying that his houses met HUD construction requirements when they did not.

1B. Evaluate City of Merced inspections of newly-built houses to verify that houses to be insured by HUD/FHA meet HUD standards. If the City cannot show that inspections are satisfactory for HUD purposes, you should take action to see that HUD/FHA assistance is not provided to houses that were inspected by that office.

1C. Meet with Grant Homes Inc. to resolve complaints from HUD/FHA assisted homeowners. If Grant Homes is unresponsive, seek debarment against builder Alan Grant and his firm.

1D. Determine which homeowners in Campus North 1 and 2 have FHA-insured mortgages and advise them of the procedures for seeking HUD assistance in

resolving defective construction complaints against builder Grant Homes.

1E. Evaluate whether VA inspections of newly-built houses are sufficient to ensure adherence to HUD minimum property standards and compliance with the approved construction plans and specifications. If you determine they are not, you should take action to see that HUD/FHA asssitance is not provided to houses that were inspected by that office.

APPENDIX A

APPENDIX A

Appendix A

APPENDIX B

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APPENDIX B

APPENDIX B

APPENDIX B

Appendix C

**U.S. Department of Housing and Urban Development**
**Pacific/Hawaii**
**Office of Inspector General for Audit**
**450 Golden Gate Avenue, P.O. Box 36003**
**San Francisco, California 94102-3448**

September 24, 1996

**AUDIT RELATED MEMORANDUM**
**96-SF-229-1809**

MEMORANDUM FOR: Yvielle Edwards-Lee, Fresno Area Coordinator, 9BS

FROM: Gary E. Albright, District Inspector General for Audit, 9AGA

SUBJECT: Interim Report
Construction Deficiencies in FHA Single Family Homes
Merced, California

## INTRODUCTION

We are issuing this interim report to alert you to significant concerns about construction deficiencies in FHA insured single family homes in the City of Merced, California.

Over the last few months, our office has reviewed many homeowner concerns involving the accelerated deterioration of insured (and uninsured) homes built in certain Merced subdivisions. Homeowners reported their homes had experienced settlement problems resulting in cracked foundations, walls separated from foundations and other construction deficiencies. These conditions create unsafe living conditions, increase the FHA's financial exposure for insured homes, and may indicate a pattern of substandard construction. More importantly homeowner health problems may be directly related to the construction deficiencies.

Our review confirmed that homes in at least two Merced subdivisions are suffering from serious settlement problems. As a result of these conditions, the local assessor's office has already reduced the value of two homes to zero. Certain homes with construction deficiencies also contain mold and spores which have affected or may affect the health of the FHA homeowners.

The two subdivisions were inspected, processed and approved using the Veterans Affairs Master Certificate of Reasonable Value (VA-MCRV) process. The contractors, VA fee inspectors, and City of Merced inspectors certified all the homes complied with Minimum Property Standards and the Uniform Building Codes (UBC). During our review, we obtained engineering reports which refute these certifications and state that either the soils were not properly prepared prior to construction and/or foundations were not built to code. As a result, some FHA homes are deteriorating at an accelerated rate. This deterioration increases the risk of default and subsequent loss to the FHA insurance fund, and poses a threat to the health and safety of homebuyers. The conditions disclosed thus far indicate the need to address current risks and limit future exposure for both FHA and the homeowners.

APPENDIX C

## BACKGROUND

Subdivisions processed using VA-MCRV procedures are inspected by Veteran Affairs fee inspectors and the City of Merced Planning Department personnel. These VA and local inspections, provided at sequential stages of construction, are to provide assurances to VA and HUD that newly constructed homes meet local building codes and Minimum Property Standards as required by 24 CFR 200.926. In addition, the contractor certifies to FHA compliance with HUD Minimum Property Standards and HUD Handbook 4145.1 REV-2 Architectural Processing & Inspections for Home Mortgage Insurance including Appendix 8, Site Grading & Drainage Guidelines, and local building codes.

The conditions cited in this report involve FHA, VA, and CalVet insured mortgages, as well as conventional mortgages. Within FHA insurance, there are provisions in 24 CFR 200.500 for assistance to eligible homeowners to correct structural defects within four years of issuance of the first mortgage certificate. Older homes do not qualify for this assistance.

**REVIEW RESULTS**

Our review shows that the contractor did not always comply with either the Uniform Building Codes or HUD Minimum Property Standards. We compared soils report recommendation requirements with conclusions reached by geotechnical engineers hired to determine the cause of settlement experienced by homes in the subdivisions. The reports concluded that settlement problems were caused by contractors either ignoring certain soils report recommendations or not complying with the UBC. Our review included the following two subdivisions:

1. **Campus North 1 and 2.** Of the approximately 109 homes in this subdivision, at least 55 are FHA insured. Twenty of the homeowners (including 12 FHA homeowners) have filed suit against the contractor because of faulty construction. Our inspection of two FHA insured homes showed cracking exteriors, a sagging roof and a large accumulation of mold inside the homes. These conditions are alarming considering the homes are three to four years old. A September 11, 1996 inspection report completed by soils and foundation engineer concluded:

"...there is widespread evidence of excessive moisture coming from the slab. Based on these two coringst, it seems likely to us that there is an inadequate capillary break in drainage of the underslab area. This has resulted in the moisture barrier being subjected to actual water intrusion, which it is not designed to withstand". The report further stated the lack of adequate capillary break "... does answer the question of how water is able to get through and damage the slab." The engineers indicated more work should be required to evaluate the capillary break.

2. **Village Landing.** These 189 homes were built approximately 10 years ago in two phases. There are currently at least 18 FHA insured homes in this subdivision. Fourteen homeowners (3 FHA) have sued the contractor because of faulty construction. Homeowners have complained about serious wall and slab cracking, and mold accumulations of mold. Walls are separating from the slab floor, the linoleum is discolored, and the interiors are deteriorating. Residents have moved out of two homes because of the health related conditions discussed below. Because of their deteriorated condition, the County Assessor has appraised both homes at zero value. We obtained several engineering reports to determine the extent of



problems with the homes. Following are synopses of two engineering reports:

An August 12, 1996 report from an environmental geology and engineering firm stated:

"The purpose of this investigation was to determine the general conformance of the construction of the residence

to the specifications set forth in the soils report...dated November 21, 1984....The footing...was found to be embedded 11-3/4 inches, or 6-1/4 inches less than what was recommended. Footings that were excavated by [another company] report embedments of 10 inches on the east, 12 inches on the west, 11 inches on the south and 10 inches on the north side of the residence."

The report further stated the contractor apparently used 10 gauge wire mesh in the slab versus the 6 gauge specified. The purpose of the wire mesh in concrete slabs is to minimize the potential for large slab cracks to develop and propagate completely all of the way through the slab, thereby preventing the intrusion of vermin and water. The report also states "The reason that this slab cracked all the way through to the sub-base is that the steel was placed at the bottom of the slab and provided no structural resistance to prevent the crack from forming. Structural steel placed at the bottom of a slab is a construction defect."

Another engineering report dated October 12, 1995 for another home in the subdivision stated the following:

"...all of the damage in your house was due to up and down movement as a result of seasonal moisture changes in the underlying expansive clay soil...the foundation of your house was improperly constructed. It does not meet the minimum depth levels required by the (UBC)... had the footings been built to the proper depth, the amount of movement suffered would have been much less." The contractor failed to use crushed rock under the foundation of the house, "... and the foundation only extended about 6 inches into grade, but the (UBC) required that footings penetrate at least twelve inches into grade."

We are awaiting the results of 13 engineering reports on other homes in this subdivision.

**Health Concerns:** In addition to the structural issues, there are potential health concerns. The presence of excessive moisture within some homes has allowed the growth of mold/fungi. Long thought to be solely a cosmetic problem, it is now known that mold/fungi exposure may cause allergies and asthma including potentially life threatening allergic responses such as hypersensitivity pneumonitis. A new and alarming concern is that toxicoses may be resulting from exposure to molds capable of producing toxic substances which suppress immunity and can affect other vital organ systems including the nervous system. Reports suggesting this possibility are arising all over the country, are being studied by the Center for Disease Control and are the subject of considerable discussion both nationally and internationally at professional conferences. As noted, adverse health conditions tend to be principally of a respiratory and/or allergenic nature and are especially serious for children. Other effects can range from minor to severe illness particularly after long exposure. Numerous exposed individuals have reported inability to work due to loss of mental capacity and extreme fatigue.

The incidences of mold/fungi have been detected under carpets and linoleum at several homes in the Merced subdivisions. The Director, Merced Division of Environmental Health has

APPENDIX C

conducted over 30 inspections of homes for mold/fungi and identified three houses with the highest concentrations. Laboratory reports revealed levels of aspergillus, penicillium, stachybotrys and cladosporium species from samples taken from the three homes. In May, 1996 the Director alerted the builder of these homes in an attempt to speed repair work to correct the moisture intrusion. To date the builder has not undertaken any repairs. Family members of one home whose physician advised them to vacate a house ..."so obviously full of mold", have since been tested and found to have evidence of stachybotrys exposure in their blood. The Merced Director of Environmental Health reported this to the California Environmental Protection Agency, Department of Toxic Substances Control, stating that he had told people with mold/fungi problems that "mold/fungi growth

inside the home can be a potential health hazard". Another physician has attributed a child's serious respiratory problems to living in a damp house "secondarily colonized by ...fungi or mold", and stated, "the house she lives in is a hazard to her health". A report by an environmental geology and engineering firm, analyzing one home's moisture problems, reported "The development of molds and mildews in residences is common in subdivisions where the slabs are not sealed properly. Often these molds and mildews will aggravate existing health problems of family members, or will create new ones."

**SUMMARY**

The cited conditions have serious implications, considering the accelerated home deterioration and the effect on the homeowners' health and safety. The certifications by builders and inspections by both the City of Merced and Veterans Affairs fee inspectors are questionable based on a comparison of building standards to subsequent engineering reports. While our immediate concern is with the existing homeowners, corrective action must also be applied to future construction. The City of Merced is currently processing a development called Bellevue Ranch which involves between 4,800 and 6,600 residential dwelling units.

Before we issue a final report, we need to complete additional research into the extent and sources of construction deficiencies, and gather additional data on the health risks for the homeowners. We expect to issue a final report by December 1996.

In the interim, we need to work closely with your staff, and consider an effective method to make existing and potential homeowners aware of construction deficiencies, potential health risks, and any available assistance to remedy construction deficiencies (such as the assistance available under 24 CFR 200.500 for homes less than four years old).

Within 30 days, we are requesting that you provide my office with a response to the conditions cited in this interim report - and any suggestions to improve existing home construction practices in the City of Merced. If you have any questions, or would like to discuss our ongoing review, please call me at (415) 436-8101.

APPENDIX C

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Appendix E

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Mr. Alan Grant