



# Stucco in New Residential Construction

A Position Paper

Includes Updates to Original Information

City of Woodbury  
Building Inspection Division

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# Stucco In Residential Construction Updates

## Introduction

This is an update to Stucco in Residential Construction, a position paper by the City of Woodbury Building Inspection Division, dated March 26, 2003.

## The Situation

It became apparent in 1999 that many of the stucco homes built in Woodbury since 1990 were experiencing major durability problems, but there was no data available when these first problems began. The City of Woodbury Building Inspection Division initiated research to determine the scope of the problem and its causes, and became the leader in addressing the stucco problem in Minnesota, more by circumstance than by choice.

The division began an informal, from the street, observation of stucco homes in Woodbury and determined from these assessments that twenty six percent of the 670 stucco homes had visible signs of moisture damage. This observation was enough to convince the inspection division that the failures were not isolated incidents but the emergence of a wide spread problem with stucco homes. After only a few years, these houses were showing signs of leaks and major structural damage. It was evident that the structural deterioration and cost of repair would be well beyond any local historical precedent for construction defects.

The stucco problem is widely distributed throughout the state and nation. Woodbury has a high level of repairs due to the proactive stance the city has taken in addressing the situation and communicating the signs and symptoms of the problem to its residents. In addition, Woodbury stucco homeowners are proactive in making repairs.

## Major Causes

It became very apparent that having knowledge of the problem is not enough, it was also important to have a better understanding of the causes of failure. This was achieved primarily through the thorough inspection of buildings under repair. The inspection division spent many hours in observation, evaluation, and review of repair efforts in its endeavor to understand the standard construction methods and why they failed. The inspectors looked for common factors of failure at each house and did not conduct a statistical review of the extent of problems within the building stock.

Window leaks, a lack of kickout flashing, improper deck flashing, and grade above the wood framing are the primary causes that account for the majority of the damage. All other causes are secondary. Generally, walls without windows or other openings sustained little or no damage. Unfortunately, even after five years of conducting thorough investigations there remains many "mystery areas" where the cause of damage is unknown.

There are claims that the damage is from interior moisture or excessively high humidity levels in the home. Interior moisture may be a secondary cause in some cases but these buildings are rotting from the outside, a clear indication of outside moisture. It is our position that if buildings do not have exterior moisture intrusion (leaks), most will tolerate minor amounts of moisture from interior sources. However, if there is excessive exterior moisture intrusion, the building will fail and secondary and interior sources of moisture will accelerate the failure.

## **Current Discussion**

Stucco homes built in the critical time period continue to fail. To date, 276 of the 670 stucco homes in Woodbury in 1999 have failed and been repaired, a rate of 41 percent. The average time from new construction to repair is 8.7 years. Thirteen of the repaired homes have been repaired more than once. Since moisture problems take time to develop and present themselves, the failure rate continues to increase.

Any current discussion of stucco homes now is now clarified with reference to homes as either built “pre” or “post” 1999. This is essential to determine the method of construction used on each home. County records show 74 additional stucco homes have been built since 1999 and as such were built and inspected to the current standard for stucco installation. Repair permits have been issued for 8 of those homes, an 11 percent failure rate for post-1999 stucco homes. Clearly the problem is not solved.

The city continues to question the viability of stucco on current wall systems. The failure rate of post 1999 homes using currently accepted practices reinforces this position. Meeting the minimum prescriptive standards of the state building code for stucco installation is not enough. The state building code is a minimum standard for construction and, although it is insufficient as it relates to stucco, can not be amended or modified by cities. It is up to the industry to discover and prove new methods are effective.

## **Other Sidings** (Aluminum, Vinyl, Cedar, Hardboard, Plywood, etc)

Much has been made that this is not only a stucco problem. There are claims that all sidings are equally vulnerable and rotting appears at the same rate as stucco. Most of these claims were made by those involved in the stucco installation, moisture testers, or others with an interest in the construction industry, and were made without the benefit of factual information or data.

In an effort to effectively gauge the extent of the problem for non-stucco sidings, in March 2001 Woodbury started to require sheathing inspections on all residing projects to verify the condition of walls and sheathing. The inspectors also have an opportunity to inspect wall conditions during the addition of rooms, porches and other remodeling projects. Since 2001, the city has issued 1,170 residing permits and performed several thousand wall and sheathing inspections on existing buildings with all types of siding. Inspections covered a wide variety of both age of construction and types of siding throughout the city. There are approximately 18,000 dwelling units in Woodbury with other sidings but less than 1/10<sup>th</sup> of 1% with confirmed significant structural damage and the damage is normally localized in relatively small areas around the leaks. The percentage and extent of failure on these homes, compared to that of stucco, is statistically insignificant. This does not minimize the importance of failure in other sidings, as such failures can be equally devastating for the property owner. However, when looking at the moisture intrusion issue it is important to put other sidings in proper perspective. The stories that persist about widespread failure are greatly exaggerated.

## **Public Reaction**

When the city first went public with the information about stucco there was backlash from homeowners who believed that since they couldn't see damage, there was truly nothing wrong with their home. Contractors believed that the information would create unnecessary concern among homeowners. Many who questioned the information and the city's position were in disbelief. However, the detractors are now silent. The number and significance of the repairs has proven the city delivered a necessary message. The Woodbury Inspections Division continually receives positive feedback from homeowners in Woodbury, as well as other areas of Minnesota, who were able to discover the problem in time to have it repaired under warranty or before the problem got worse.

## **Summary**

The stucco problem is the largest construction defect problem in local history. Installation methods changed in 1999, but as yet the new methods are unproven and show an unacceptable failure rate. The physical, emotional, and financial toll on owners of stucco homes can be devastating. Installations with drainage planes that show promise are seldom used. It is up to the industry to discover and prove the new methods are effective. Until the issues are resolved and proven to be effective, the city must question the viability of stucco on current wall systems.

## **UPDATES**

### **Final Report - February 2011**

This will be the final update of this position paper by the Woodbury Building Inspection Division. The stucco issue is now self-evident and well documented.

As of February 2011, the city continues to question the viability of stucco on current wall systems. Meeting the minimum prescriptive standards of the state building code for stucco installation is not enough. The state building code is a minimum standard for construction and, although it is insufficient as it relates to stucco, can not be amended or modified by cities. It is up to the industry to discover and prove new methods are effective.

### **Final statistics - February 2011**

To date, 451 of the 670 stucco homes existing in Woodbury in 1999 have failed and been repaired, a rate of 67 percent. The average time from new construction to repair is 9.9 years. Fifty-three of the homes have been repaired more than once. Repair permits have been issued for 56 post-1999 stucco homes. We do not have statistics related to how many post-1999 stucco homes have been built, but it appears the post-1999 failure rate may become similar to the pre-1999 failure rate.

### **Current statistics - February 2009**

To date, 418 of the 670 stucco homes in Woodbury in 1999 have failed and been repaired, a rate of 62 percent. The average time from new construction to repair is 9.8 years. Forty-seven of the homes have been repaired more than once. Repair permits have been issued for 46 post-1999 stucco homes. We do not have statistics related to how many post-1999 stucco homes have been built, but it appears the post-1999 failure rate may become similar to the pre-1999 failure rate.

### **Current Statistics – October 2007**

To date, 392 of the 670 stucco homes in Woodbury in 1999 have failed and been repaired, a rate of 58 percent. The average time from new construction to repair is 9.4 years. Forty-three of the homes have been repaired more than once. Repair permits have been issued for 30 post 1999 stucco homes. We do not have statistics related to how many post 1999 stucco homes have been built, but it appears the post 1999 failure rate may become similar to the pre 1999 failure rate.

The statistics indicate both pre and post-1999 stucco houses continue to fail at an alarming rate. There are no new technical data, causes or cures to report.

# Stucco in Residential Construction

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## Introduction

Although stucco has been used as a building material for over a century, several failures, including mold, rot and structural deterioration of stucco homes in 1999 made the city aware of what has since become a widespread problem in homes built since the late 1980s. While the installation methods have changed, there are still questions about whether the stucco problem has been solved. The city questions the viability of stucco installations on current wall systems and recommends that prospective homeowners and builders consider carefully the pros and cons of stucco and alternate types of siding.

## Background

In 1999, the Building Inspection Division initiated extensive research into the cause of the stucco failures and the standard installation methods being used at the time. The research indicated standard installation practices that had been used for years were no longer effective. A meeting was held with stucco contractors, builders, industry representatives, building inspectors from other communities and other interested parties to introduce a newly-created Woodbury stucco inspection program and requirements. Standard installation practices that were implemented in May 1999 include:

### Old Method

One layer of type 15 felt was the most common. Less than 10 percent used 2 layers of type 15 felt. Grade D paper was not available.

Flanged windows were considered to be self-flashed.

Paper was installed over the window flanges.

Paper was not sealed at the windows.

Paper stopped at the soffit line.

Kickout flashing was mostly an unknown term.

Weep screeds were not used.

### New Method

Two layers grade D felt are required by the State Building Code.

Flashing is required over all windows and doors.

Paper is required to be under the sides and bottom window flange.

Paper must be sealed at the windows with tape or caulk.

Paper is required to the top of the wall.

Kickout flashing is required at wall intersections where the roofline does not extend past the wall.

Weep screeds are required.

## Extent of the Problem

In 1999, an informal observation from the street of stucco homes indicated 26 percent of the 670 stucco exterior homes in Woodbury had visible signs of moisture problems. As of this writing, 140 permits have been issued since May 1999 for stucco repair. Because moisture problems take time to develop, this number continues to increase as newer houses age and have time to develop symptoms.

Discussions with other municipalities and state personnel verify the stucco problem is widely distributed throughout the state and nation. Woodbury has more repairs than other locations because more stucco homes were built during the critical time frame, information about the problem is readily available here, and Woodbury stucco homeowners are proactive in making repairs.

## Current Debate

Not all stucco homes have experienced problems. Also, homes with other types of siding may have moisture intrusion problems. However, stucco is much more likely than other types of exterior claddings to have catastrophic failure. Permits issued for stucco repair since 1999 represent 20 percent of the 670 homes with stucco exterior. Most of the stucco repairs included structural damage and mold remediation, with many costing \$150,000 or more. Of the 17,000 dwelling units with other types of exterior cladding, the city has seen a small number with significant structural damage caused by other types of siding.

There is currently a national debate on the cause of these stucco problems. Some say the stucco failures are not the fault of the stucco, but that interior moisture or wall systems being built too tight are to blame. While there are other factors, this is certainly part of the problem. Unfortunately, this indicates that stucco may not be compatible with the wall systems being built today.

## **Data Analysis of Building Permits in the City of Woodbury**

In January 2004, the city received the results of a statistical study of building permits issued in Woodbury. This study was performed by an independent statistician. The study concluded that:

- The repair rate is significantly higher for stucco homes (109 of 555 stucco homes required repairs while 147 of 4,867 non-stucco homes have been repaired).
- The repair rate is higher for some builders than for others. There are large differences among the builders that are statistically significant.
- While not all stucco homes will have problems, there is no time after construction that a homeowner can feel “safe” or unlikely to have problems. According to the statistician, “One interpretation ... is that about half of all stucco homes will require repair within ten years of construction”.

While the data clearly indicate that stucco homes are more prone to failure, and staff experience indicates the extent of failure is much greater in stucco, it should not be interpreted as a clean bill of health for homes with other sidings. There are a growing number of reports of failures in these homes as well. The city continues to urge all homeowners to be aware of the signs of moisture intrusion and take appropriate action at the first sign of a potential problem.

## Conclusions

There is no doubt that stucco installed from the late 1980s until 1999 has an unacceptable failure rate. The installation methods have since changed, but there is no proof that any current installation method will prevent similar catastrophic failures. Contractor guarantees are good only if the contractor is still in business and financially capable of honoring the guarantee. Until installation methods are proven to work, the City of Woodbury Building Inspection Division questions the viability of stucco installations on current wall systems and recommends people consider carefully the pros and cons of stucco and alternate types of siding. We will continue to investigate this issue and will update our information as new information becomes available.

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