



THE ADHESIVE AND SEALANT COUNCIL, INC.

December 9, 2006

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Office of Policy Development and Research, Room 8134
451 Seventh Street, SW
Washington, DC 20410

SUBJECT: Progress Report – November 2006

Contract No. H-21521CA, Investigation of Adhesive Applications for Strong and More Disaster-Resistant Roof Assemblies – Phase 1

Period of Performance: 4/7/06 – 10/7/07

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Email Attachments which Accompany this Report:

- None

SECTION I – INTRODUCTION

The HUD Office of Policy Development and Research has been extensively involved in supporting research and development on building technology innovations, construction systems, products, standards, regulations, and code issues which affect the affordability, safety and livability of the nation's housing. As the interrelationships of these topics become more complex, the continued need to conduct research and demonstrations becomes even more critical.

In addition to the research and demonstration efforts administered directly by the Office of Policy Development and Research, HUD administers the Partnership for Advancing Technology in Housing (PATH) program. PATH provides private and public sectors for the U.S. housing industry an unprecedented opportunity to advance state of the art practices in the design and construction of affordable housing for the public by accelerating the process of developing and introducing new and innovative technologies and new materials through demonstrations and pilot projects throughout the nation.

This cooperative agreement with the PATH program will investigate and characterize the use of adhesives to fasten roof sheathing materials to underlying roof structures in residential buildings. This application of adhesives holds the potential for improvements in roof system durability and disaster resistance, and applies to both new and existing construction.

SECTION II – PROGRESS AND SCHEDULE

Phase 1 of this project consists of 4 tasks. The status of each task is presented below.

Also, this monthly report reflects a period of performance of 18 months – which is the period of performance specified in the Cooperative Agreement dated 04/07/06. Previously the tasks were planned around a 12 month period of performance. Using the full 18 months of the Cooperative Agreement will allow us to engage both manufacturers and insurance industry groups more closely to meet the objectives of this program. Dates for several of the deliverables have been adjusted to reflect this period of performance.

Task 1. Assess Performance Requirements and Develop Criteria for Adhesive Consideration

Start Date: 04/15/06

Deliverable & Due Date: Summary of adhesive-based roofing attachment systems, relevant building code, relevant product standards, and related research programs. Submitted to GTR 8/22/06.

Progress and Deliverables:

Task 1 called for ASC and its subcontractor Newport Partners (NP) to better understand the performance requirements needed from adhesives used in roof assemblies by a) canvassing building code and product standards, and b) investigating related research and product testing. Together ASC and NP have completed this task by engaging dozens of industry stakeholders, including ASC members and non-member adhesive manufacturers, researchers from academia and private firms, industry associations, building code bodies, and international groups involved in research and testing. Findings can be grouped into the following categories:

- Similar research and product development efforts
- Findings on the most suitable applications for similar systems (e.g. retrofit of existing roofs)
- Relevant building code issues that affect the application (e.g. issues with fire blocking for foam plastics)
- Relevant building performance and installation issues which have been raised (e.g. restricting ability of sheathing panels to expand/contract with ambient humidity changes)

The results of these research efforts are presented in the Task 1 summary report submitted to HUD in August 2006.

We are also attempting to gain access to the recent PATH-funded research conducted by Virginia Tech on use of acrylic tapes in wall construction. We have discussed this

possibility with both Virginia Tech and the GTR, and will continue to monitor the availability of the research findings.

Task 2: Assessment of Industry and Market Factors

Complete by March 1, 2007

The objectives of this task are to:

- Conduct assessment of jobsite factors which are involved when using adhesive-based systems (especially in new construction). More information is needed on these issues to understand the magnitude of potential barriers.
- Investigate and characterize insurance industry programs focused on encouraging improved water resistance and uplift resistance for roof systems (new and existing) to mitigate future damages. This will improve our understanding of industry interest in applications involving adhesives.
- Determine the most feasible application(s) moving forward based on performance, building code, “constructability”, and market factors. This effort involved a roundtable discussion of adhesive manufacturers at the ASC Fall Convention to get their input. A retrofit and/or new construction application will then be the focus of Tasks 3 and 4.

Task 2 Deliverables:

- Summary report of jobsite factors, including assessments of different application strategies
- Summary report on insurance industry initiatives which could impact adoption of adhesive-based systems

Task 2 Progress:

In November we held a conference call with staff from the Texas Department of Insurance (TDI). TDI oversees regulation of insurers in the state of Texas and works with the Texas Windstorm Insurance Association, which is the “insurer of last resort” for windstorm and hail insurance coverage for structures located in designated catastrophe areas along the Texas Gulf Coast. In this role TDI evaluates building specifications for new and existing structures, and plays a role in the adoption of mitigation measures that could result in an insurance premium discount for homeowners.

The purpose of our November conference call was to introduce TDI to our project, provide them with background on the use of adhesives to strengthen residential roof systems, and look for opportunities to introduce adhesive-based applications to Texas code provisions that provide an insurance discount to homeowners. Results of this dialogue include:

- TDI was very interested in our research on adhesive-based systems to strengthen residential roof systems, especially for existing homes
- In the context of new houses, TDI saw some value in using adhesives plus traditional nailing because: 1) hand nailing often results in wider-than-permitted spacing of nails

because the roofer gets tired, 2) nail misses and overdriving often occurs, 3) it represents a belt-and-suspenders approach which would increase roof strength

- They emphasized that outside of the band of coastal counties where the TWIA code is mandatory, that any measures in their specifications are only voluntary
- Insurers in Texas are generally becoming more proactive. That is, instead of simply pulling out of the state, they are taking a harder look at measures they can take to still insure homeowners but mitigate their risk. The TWIA building specifications are one resource insurers are looking at to mitigate risk, by either requiring that policy holders incorporate measures of the TWIA specs or offering incentives for them to undertake certain measures
- The process to incorporate a measure into TWIA building specifications is similar to promulgating a proposal through a national building code, meaning it is a formal process and can be difficult unless a coalition generally supports the proposal.
- When asked if there were certain aspects of adhesive-based roof assemblies they would like to see tested or better documented to understand their performance value, they responded with:
 - More information on the bounds of where the application is effective. E.g. is there a point where a roof pitch is too shallow for adhesives to be applied effectively, therefore meaning that only roof pitches of 4:12 or higher (for example) should be considered for this measure. Are there any other bounds for which this application would not be effective?
 - More information on long-term durability of adhesives applied in attics – how do they hold up over time?
 - More information on the previous testing that has taken place. E.g. did the Clemson work which reported uplift capacities of 150 psf and greater include a safety factor?
- They would like to be kept informed of our program and we move ahead.

Over the next several months we will continue our dialogue with TDI, and work to provide them with more information on our research as well as learn how this application may fit into the developing framework of insurance incentives for undertaking mitigation measures in Texas.

Task 3: Code Evaluation and Preliminary Tests

Complete by June 1, 2007

The objectives of this task are to:

- Explore solutions to code issues for the chosen applications: including the fire protection issue and the pathway for meeting performance-based suction load requirements. Work under this task would include interacting with adhesive manufacturers to develop potential approaches, such as making an adhesive less flammable per ASTM testing.
- Conduct preliminary testing (in conjunction with ASC members or other manufacturers) to evaluate system performance and assess potential solutions to constructability issues. For

example, testing of mocked-up new construction roof systems might employ a pre-applied adhesive tape applied to the top surface of the truss.

Task 3 Deliverables:

- Summary of relevant code issues and strategies for compliance
- Summary of preliminary testing – including test design, findings, and recommendations

This task depends on the output of Task 2 and is not yet underway.

Task 4

Complete by October 30, 2007

The objectives of this task are to:

- Summarize, based on results of Task 3, current “gaps” in adhesive-based roof sheathing attachment systems in three core areas: 1) performance testing, 2) codes, and 3) solutions to constructability issues.
- Develop a primer on using adhesives to strengthen roof systems. Guidance document would be aimed at the appropriate audience, e.g. if the application is new construction the audience would be builders and contractors; for retrofit applications the audience would be contractors, roofers, and DIY homeowners. The short (~ 2 page) primer will explain the benefits of using an adhesive-based system, the intended application, and recommendations for materials.

Deliverables:

- Report on findings and remaining information gaps
- Primer on using adhesives to strengthen roof systems

Task 4 Progress:

While the main outreach primer for this project will not be developed for several months, our project team has picked up interest in this work from the industry publication Adhesive and Sealant Industry (ASI). We have shared the goals of the program with them and updated them on our work plan and current findings, and have prepared a press release on the project which will appear in the January 2007 issue. This will increase the visibility of the project within the adhesives industry and potentially enhance the contributions of manufacturers to the research.

SECTION III – KEY STAFF CHANGES

None to report.

SECTION IV – PLANNED EFFORT

Activity for December 2006 will focus primarily on researching the state of the insurance industry with respect to incentivizing enhanced construction techniques which bolster housing disaster resistance. We will also hold a project update call with the manufacturer stakeholders involved in the program in December.