



THE ADHESIVE AND SEALANT COUNCIL, INC.

September 8, 2006

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U.S. Department of Housing and Urban Development  
Office of Policy Development and Research, Room 8134  
451 Seventh Street, SW  
Washington, DC 20410

SUBJECT: Progress Report – August 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 – 4/7/07

Contractor: The Adhesive and Sealant Council, Inc.  
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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. This report updates the status of Task 1 and establishes revised objectives for the remaining 3 tasks of the project. The status of each task is presented below.

### **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.

We are also hoping to gain access to the recent PATH-funded research conducted by Virginia Tech on use of acrylic tapes in wall construction. Assistance from the GTR (if possible) on gaining access to this research would be helpful.

### **Updates on Tasks 2-4**

Based upon the Task 1 findings, the initial goal of Task 2 – to develop a list of potential adhesive products to assess based upon known performance criteria for this application – is no longer a

logical next step. Given the open-ended nature of research projects this should not be viewed as a barrier but as an opportunity to generate more useful findings in the next steps of the project.

Therefore our recommended actions for Tasks 2-4 are laid out below:

**Task 2** (complete by January 7, 2007):

- 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. This work will consist of constructing roof mock-ups using different adhesive-based fastening schemes or an actual trial on a jobsite.
- 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 will involve a roundtable discussion of adhesive manufacturers 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 impacting adoption of adhesive-based systems

Task 2 Progress:

In late August we conducted an initial assessment of jobsite factors tied to the use of adhesives to attach roof sheathing in new construction. During this assessment, adhesives were used in tandem with nails to attach plywood roof sheathing to roof trusses. The adhesives used were construction adhesives meeting the AFG01 product standard (in keeping with the recommendations from the Clemson University research). A few sample pictures are shown below, and a more complete report (including pictures, video clips, and installer comments) will be developed in September.



Application of Roof Sheathing Panels



Adhesive Application to  
Roof Truss Top Chord



Mechanical Lift to Bring  
Plywood to Roof

**Task 3** (complete by February 26, 2007):

- 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

**Task 4** (complete by April 15, 2007):

- Based on results of Task 3, summarize 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 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 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

### **SECTION III – OUT OF TOWN TRAVEL AND FUNDING**

#### ***Travel:***

In August 2006 no out of town travel occurred, with limited local travel to a construction site. Out of town travel in September or October may include a site assessment in keeping with Task 2.

We are making arrangements to attend the ASC Fall Convention in Nashville on October 16-17. We will hold a face-to-face meeting there of the manufacturer members participating in this project (we currently have contacts with 16 firms) on Tuesday October 17 at 9 a.m. Two Newport staff will attend the convention and the associated project meeting, along with ASC staff.

### **SECTION IV – KEY STAFF CHANGES**

None to report.

### **SECTION V – PLANNED EFFORT**

Activity for September 2006 will focus on the revised Task 2, including lining up a site assessment and researching insurance industry factors which could influence adhesive applications in roof systems.