

IN THE CIRCUIT COURT OF THE ELEVENTH JUDICIAL CIRCUIT
OF FLORIDA IN AND FOR THE COUNTY OF DADE

SPRING TERM A.D. 1992

FINAL REPORT OF THE DADE COUNTY GRAND JURY

FILED

December 14, 1992

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I N D E X

	<u>PAGES</u>
"THOSE WHO CANNOT REMEMBER THE PAST ARE CONDEMNED TO REPEAT IT"	
I. INTRODUCTION	1
II. SOUTH FLORIDA BUILDING CODE	2
A. WIND LOAD STANDARDS	2
B. STRUCTURAL DESIGNS	4
C. MATERIALS AND PRODUCTS APPROVAL	6
D. ROOFING SYSTEMS	8
III. CODE ENFORCEMENT	10
IV. BUILDING PRACTICES AND PROFESSIONAL RESPONSIBILITY	13
V. UNLICENSED CONTRACTORS	15
VI. THE BOARD OF RULES AND APPEALS	17
VII. INSURANCE RELATED ISSUES	20
VIII. MOBILE HOMES	22
IX. PRE-DISASTER AND POST-DISASTER PLANNING	26
X. CONCLUSION	28
INDICTMENTS	31 - 42
ACKNOWLEDGEMENTS	43

"THOSE WHO CANNOT REMEMBER THE PAST ARE CONDEMNED TO REPEAT IT"

George Santayana

I. INTRODUCTION

Hurricane Andrew brought overwhelming devastation to Dade County. Almost 20% of Dade County's total population, approximately 375,000 people, bore the brunt of this storm's destruction. Ten percent of Dade County's total housing stock was rendered useless and 160,000 people became temporarily homeless. Over 8,200, or one third, of Dade County's mobile homes were totally annihilated. In addition to the human suffering, the financial cost of this storm is currently estimated at 30 billion dollars.

To all of us, Hurricane Andrew was an exceptional experience whose ferocity will never be forgotten. Like our community, many members of this Grand Jury lost their homes and their most treasured possessions. The storm left us disoriented, without electricity or telephones or the most basic conveniences of modern life. As we attempted to reconstruct our lives and rejoin the modern world, we found ourselves towards the end of our term as Grand Jurors. We wanted to use our remaining service to find the answers to the many questions raised by this disaster regarding the standards, designs and materials used in our local construction; the oversight and regulation provided to the construction industry; the responsibilities of the construction and insurance industries to our community; and our state of preparedness for the next hurricane. Understandably yet regrettably, the limited remaining time in our term, combined with the complexity of these issues and the demands of our other duties, did not allow us to fully complete this task. Fortunately, our successor grand jury has undertaken to continue this effort. It has committed to closely scrutinize these construction issues and recommend further actions and sanctions where appropriate.

A major failing of all Floridians has been our apparent inability to learn and retain the important lessons previous hurricanes should have taught us. Each of us has failed to be sufficiently responsible to ask the necessary questions of our

governmental regulators, of our construction industry and of ourselves. Collectively, we allowed the South Florida Building Code (SFBC) to become outdated; we allowed our builders to use questionable construction techniques and materials; we allowed our enforcement agencies to lessen their diligence in code enforcement; and we allowed ourselves the luxury of never asking questions about the structural integrity of our homes or the appropriateness of the materials used. Andrew's most obvious lesson was that we were not prepared for this hurricane, neither as individuals nor as a community. This mistake must not reoccur.

In the past, as we rushed to reestablish our pre-hurricane lives, we have historically repeated our previous mistakes and compounded our future misery. While careful post-hurricane analysis has previously occurred, such as the 1961 Hurricane Damage Study Committee report regarding Hurricane Donna, governmental action on resulting recommendations has been negligible. Likewise, actions undertaken to correct the weaknesses of our construction industry and code enforcement activities have been minimal. Eventually, another hurricane will hit this community. If we do nothing now, and we do not properly prepare, the extent of human suffering and economic loss the next time may be even more severe. Out of this disaster has come the opportunity to correct our past mistakes. We must do all that is within our power to build a stronger stock of structures and to prepare for the next storm. We feel that the rebuilding of our community, happening as we speak, is the vital key to our future. As a result, we have chosen to use the remainder of our term to focus on the necessary reforms that must occur now.

II. THE SOUTH FLORIDA BUILDING CODE

A. WIND LOAD STANDARDS

The actual wind speed of Andrew is still being analyzed and debated by meteorologists and wind experts. Some experts maintain that its speeds were at 135-145 mph with up to 200 miles per hour wind gusts. Others maintain it was between 110 and 125 miles per hour with up to 150 mph gusts. Predictably, many in

the construction industry favor the higher wind speed measurements to excuse poor construction performance. They argue that nothing could have withstood Andrew's winds. Regardless of this wind speed dispute, experts agree that the South Florida Building Code's (SFBC) wind load requirements are insufficient and need to be strengthened. We urge this to occur immediately. Andrew's most significant legacy should be the adoption of stronger wind load standards and generally strengthened pressure standards for vulnerable structure shapes and designs such as eaves and corners.

The SFBC has not been totally revised since its creation in 1957. It has failed to incorporate advanced performance designs that are based on recent wind testing research. Today, critics refer to it as a recipe book, not a technologically advanced code based on performance. They call it antiquated and no longer the "strongest building code in the country". Contrary to public perception, the SFBC does not provide protection against 120 mph winds for single story and some two story homes. The true wind load standard is around 95-100 mph at the level where most residential homes exist (15 feet) and it provides no additional protection for areas of the structures subject to higher wind pressures.

The experts have considered several different options for updating the code. The most widely promoted standard is that adopted by the American Society of Civil Engineers (ASCE), referred to as the ASCE 7-88. Unlike the SFBC, the ASCE 7-88 is based on the fastest one mile wind speed and it provides for higher design requirements for structure openings, such as windows and doors. It also increases pressure load requirements for necessary shape differentials of a structure, such as eaves and corners.

Additionally, the ASCE 7-88 incorporates higher wind load standards for coastal areas that are located up to 1500 feet inland. We have been advised that the American Society of Civil Engineers intends to modify the ASCE 7-88 and extend its coastal requirements inland twenty miles. The battering experienced by Homestead and Leisure City is the best evidence of the need to

consider all of Dade County as a coastal area to insure greater protection for all its residents.

These combined features of the ASCE 7-88 will provide stronger and safer construction performance against hurricane force winds. Construction experts expect these improved standards will only increase the cost of construction 3-5%. This is money well spent.

RECOMMENDATIONS

1. The Dade County Commission should immediately revise the SFBC to adopt the ASCE 7-88 standard for wind loads. Dade County, on its own, should adopt the forthcoming ASCE 7-88 coastal construction modification and extend its coastal construction standards inland 20 miles.

B. STRUCTURAL DESIGNS

Much of the destruction we witnessed from Andrew's wrath was directly attributable to design failures and ignorance. Incredulously, neither architects nor engineers are required to certify that structures comply with their plans or with code. Experts agree that much of the damage caused by Andrew is attributable to the inadequate resistance of non-engineered buildings to higher winds. Greater involvement of structural engineering evaluations for residential homes would have prevented many of the inherent design weaknesses discovered by Andrew, such as: fragile wood frame gables atop masonry walls, insufficient cross-bracing of roof trusses, hardboard exterior sheathing (commonly known as masonite exterior sheathing) and vulnerable roof eaves and corners. Engineers already play an important role in most commercial building designs. Unfortunately, their input is not required for the average residential structure in Dade County. Despite the added expense of using structural engineers, their professional skills should become a mandatory part of the home design and construction industry.

The alternatives to the mandatory use of engineers, which can be costly for the average sized home, are the "deemed-to-comply" standards. These are predetermined, structurally sound designs which comply with code and are a

useful hands-on tools for the builder. They also can reduce permit plan processors' time and simplify a code inspector's task. In the past, these "deemed-to-comply" standards have been utilized in Dade County. In 1955, the City of Miami produced such a booklet regarding small construction. The present Standard Building Code utilizes these "idiot proof" construction plans referred to as "Deemed-To-Comply Standard for Single & Multifamily Dwellings in High Wind Regions". Dade County should follow this national trend, which has been highly recommended by the Southern Building Code Congress International and modify them to the ASCE 7-88 coastal construction standards.

We were surprised to learn that architectural plans are not presently required to show the structural details of the proposed building. Nor are they required to show the necessary truss bracing. This must change. Builders, building plan processors and code inspectors must be advised of the precise manner in which a structure is to be built and the precise manner in which permanent bracing is to be installed. With structural design and proper truss bracing included as part of the on-site building plans, building inspectors will be better able to check proper construction and installation. Truss manufacturers only specify the temporary bracing needed to initially install the roof trusses. The fact that the industry and the county's plan processors relied on these, and not detailed plans, for truss bracing is inexcusable.

RECOMMENDATIONS

1. The SFBC should require a structural engineering evaluation for all construction, including residential structures. In the alternative, for less sophisticated structures, Dade County should recruit a team of structural engineers, architects and wind specialists to develop its own "deemed-to-comply" designs, based on the ASCE 7-88 coastal construction standards. The existing "deemed-to-comply" standards can be a useful tool for this development.
2. The SFBC should eliminate the use of wood frame gables atop masonry walls.
3. The SFBC should, in clear and unequivocal language, specifically mandate the use of poured concrete tie columns for all residential construction. For gable end structures, the poured concrete tie columns should transfer the lateral load from the roof system through the foundation. This

could be accomplished by requiring poured concrete tie columns at each end and in the middle of the wall being used as a gable.

4. Revise the SFBC to increase the number of poured concrete tie columns required per square footage area of a structure. Additionally, eliminate the confusing references in the SFBC for required placement of tie columns.
5. The SFBC should require double hurricane bracing rather than the present requirement of single bracing.
6. All architectural plans submitted to a building department must include both structural details and plans for permanent truss bracing.
7. All submitted plans must undergo structural and hurricane force wind analysis by plan reviewers.
8. Dade County also needs to review the effectiveness of its permit/plan processing staff. The work load and the qualifications of these plan approvers should be reviewed and improved upon. At minimum, all plan processors should be structural engineers. Regularly scheduled mandatory training, including hurricane resistant construction, should be instituted for all permit/plan processing staff.
9. Professionals who design a structure should be required to certify that the actual construction complies with the plans and with the code.

C. MATERIALS AND PRODUCTS APPROVAL

The use of building materials with evident design limitations also contributed greatly to the failures of many structures. Hardboard ("masonite") exterior sheathing, double-wide garage doors, exterior doors including sliding glass doors, French doors, windows and window frames did not have a sufficient ability to withstand even the minimal wind loads required by the SFBC. Although all were "approved" materials, their failures endangered building occupants and, by creating internal pressures, ultimately resulted in extensive roofing system destruction.

The increased use of storm shutters would have greatly reduced the extent of destruction and property damage. At the very least, if cladding and materials for exterior openings, such as windows and doors, were not known to comply with code, then storm shutters should have been required. Dade County should immediately develop tax incentives for all existing structures to stimulate the installation of appropriate storm shutters or a governmentally accepted alternative. For newly built structures,

the installation of storm shutters or an accepted alternative should be required. We believe the insurance industry should also develop incentives to stimulate the use of storm shutters.

The entire products approval process needs to be overhauled. The division of products approvals has become too reliant upon manufacturers' test results. Essentially, two engineers must review over 40 applications a month for product approvals and renewals. Even though it generates over \$500,000 in application fees, we are told this division lacks the staff and funds it requires to seek or perform independent testing and on-site inspections of products. The result is a pyramid of rubber stamping of the manufacturers' test results by the division, by the Board of Rules & Appeals and eventually by the Dade County Commission. Materials should be tested to insure they comply with the plans as submitted and with wind load requirements. A return to an independent ability to test, as the county once did, should occur.

Structural design and the use of materials, particularly for the exterior integrity of a building, need to be reviewed simultaneously by code plan processors and the products approval division. The present bifurcated system of plan approval and products approval denies a true analysis of a building's structural design integrity. Substitute materials intended to be used are not presently required to be specified on the plans when submitted for approval. This results in neither the architect/engineer nor the code inspector knowing whether or not the final structure complies with code. This makes no sense.

RECOMMENDATIONS

1. The Dade County Commission should restrict the use of all construction materials which are not proven to comply with the wind standards of the SFBC/ASCE 7-88 coastal construction standards.
2. The code must include the mandatory use of recognized wind resistant storm shutters or a tested, acceptable alternative on all new Dade County construction. The insurance industry and Dade County must develop incentives for the installation of the same for all existing structures.
3. The bifurcated system of products approval and plan

processing should be eliminated. Proposed use of materials, including requests for products approval, must be submitted with the plans and conversely, the drawings and plans should be submitted with the material requests.

4. Provide for independent testing in Dade County of all products approvals, renewals and substitutes. The costs of this testing can be recovered by using the fees currently charged for these applications or, if necessary, by raising them.
5. On-site inspections should occur to insure that substitute materials are utilized only for the purpose and manner for which they were approved. These inspections should also insure that the substitute material used is the same product as was approved.

D. ROOFING SYSTEMS

Around eighty-five percent of property destruction was related to roofing system and roofing material failures. Shingles, pneumatically applied roofing staples, an inferior quality underlayment and wafer board sheathing failed to withstand Hurricane Andrew's wind forces. Roof tiles, when poorly installed, became flying missiles. Shingle roofs peeled off like banana skins during Hurricane Andrew. Roofing felt underlayment became flying sails in Andrew's winds, exposing home interiors to post-hurricane rains and causing additional property destruction. In the wake of Andrew, a sea of roofing material debris covered South Dade.

Since Hurricane Andrew, the Board of Rules & Appeals (BR&A) has eliminated pneumatically applied staples and T-nails, wafer board, oriented strand board as sheathing and increased the weight of the felt underlayment. But these rushed attempts by the BR&A further convinced us that it seems to lack adequate knowledge on which materials will comply with minimum wind standards. This may, in part, be due to the lack of a roofing systems expert as a member of the BR&A.

Sadly, roofing materials have not generally been wind tested to meet the requirements of the SFBC. Shingles, tested years ago for up to 63 mph winds, seem to have failed extensively. There are no test assurances that the mortar now used to apply roof tiles is an adequate adhesive for high winds. No one can yet prove which underlayment provides greater protection when the

coverings fail. Some say to hot mop all underlayment, others say no. Manufacturers have not been required to prove their materials will meet code or withstand hurricane winds. They should be required to do so. The most critical and immediate need is to address roofing materials and their application immediately. Contractors, homeowners and inspectors have a desperate need to know now the appropriate materials to use and their required application.

Homeowners and builders, desperate to salvage their structures and protect them from rain, are presently being forced to use the most easily available roofing materials. Despite what Andrew has taught us, thousands of roofing systems are again being built in ways already known to fail. Swarms of licensed and unlicensed contractors are repairing and replacing roofs, many in sub-standard ways. For instance, 60% of the roofs presently being inspected by the Dade County Building and Zoning Department are failing. This failure rate cannot take into account the large number of uninspected, unpermitted, sub-standard roofs constructed by unlicensed contractors. While county officials debate the continued use of shingles, heavier gauge underlayment and other materials, the rebuilding and repairing of thousands of roofs continues.

Dade County must immediately examine the materials presently being used to repair damaged roofs. No final inspection is required for repaired or replaced roofs. The code must be revised to require mandatory final inspections for all roofing repairs and replacements. Too many roofs are being rebuilt without permits and therefore without needed inspections. It is critical that this be changed immediately. For every roof that is being repaired or replaced there should be a qualified roofing inspector regularly reviewing the job to completion.

RECOMMENDATIONS

1. Dade County must immediately require the testing of fiberglass shingles to insure their inherent capability to resist hurricane force winds and compliance with the ASCE 7-88 in coastal construction standards.
2. The underlayment for all roofs, regardless of ultimate

- coverings, must have, at minimum, the 30 lb covering felt and be hot mopped.
3. Dade County must seek independent lab testing for the adhesive qualities of the mortar currently used to secure tile roofs, and determine to what extent such mortar should be utilized.
 4. Dade County should, at minimum, require the use of 5/8" plywood as the only appropriate roof sheathing.
 5. Dade County must add a mandatory final inspection of both repaired and replaced roofs to its present list of required roofing inspections.
 6. Roofing contractors and general contractors who fail a roofing inspection more than twice should be reprimanded, ticketed and/or risk loss of their licenses when repeated failures occur.
 7. Dade County must increase the number of roofing inspections to insure every roof being repaired or rebuilt and the materials being utilized comply with the code.

III. CODE ENFORCEMENT

The effectiveness of this community's building inspection process has been questionable for decades. The process has remained vulnerable to innuendoes of corruption, at worst, and apathy, at best. We have been advised that once upon a time, the construction professionals, such as architects and engineers, were held more accountable for their final products. But this is no longer so. Certifications and assurances of code compliance have been replaced over the years by a system relying primarily upon building inspections. Even functioning at its best, the inspection process for residential homes cannot fully insure code compliance. Essentially, we have foolishly been a community dependent upon the building industry to police itself.

Numerous warnings regarding the ineffectiveness of Dade's inspection process have occurred. The 1961 post-Hurricane Donna report warned, "The adoption of an adequate building code or a hurricane structural code is no assurance of the adequacy of buildings or structures unless it is properly enforced". Dade County Grand Juries, in the Fall Terms of 1975 and 1989, criticized the manner and adequacy of Dade's building inspections. The poor or non-existent building inspections cited by these Grand Juries apparently contributed to poorly constructed buildings being sold to the unsuspecting public.

Lack of effective code enforcement contributed greatly to the property destruction and damage this community suffered. The evidence was abundantly clear as the rubble and remains of construction were observed. The opened guts of thousands of homes exposed countless violations of the SFBC and sound construction practices. No one, including the present staff of Dade County's largest inspection department, denies this blatantly unconscionable truth.

Historically, the Dade County Building and Zoning Department has had a high turnover of leadership and has lacked adequate, qualified staff, particularly during the boom years of construction. The department's staff has traditionally lacked adequate training and suffered from an ineffective inspection per inspector ratio. Shamefully, prior to 1991, no roofing systems expert existed for roofing inspections.

Inspectors lack adequate enforcement powers over contractors who violate code or whose workmanship is shoddy. The Dade County Department of Building and Zoning lacks an automated system that is able to document patterns of repeated violations of the code and repeated instances of shoddy work. Without such information, applying sanctions can be difficult. The department seems relatively powerless to prevent unlicensed contractors from operating in this community. Its ability to pull a contractor's local license is thwarted by the state's ability to grant one. Dade County's plan processors are only able to perform perfunctory spot checks of plans and lack the time and capability to fully analyze the plans submitted. The department's staff, as a whole, lacks education in wind resistant construction. The relatively new director of Dade's Building and Zoning Department readily acknowledges many of the department's failures and intends to take remedial action as quickly as possible. Such extensive remedial action, however, will demand the full support of other county administrators and departments.

The Office of County Compliance, no longer part of the Department of Building and Zoning, has the primary responsibility to act as a construction watchdog, enforcing proper construction practices and inspection effectiveness in our community. It is

responsible for conducting random, in-field inspections of new construction and acting as staff and consultant to the Board of Rules and Appeals. This staff, at one time, had the ability to conduct in-field inspections of substitute materials to insure their proper use as approved. While we were generally impressed with the leadership and quality of this division, it also has been enfeebled by a lack of staff. With a total staff of 8, including clerical, it lacks the resources and support to accomplish these tasks well.

The ongoing frenzy of rebuilding creates an unprecedented and urgent need for intense and competent regulation and enforcement. Every available county-wide resource must be devoted to insuring that the rebuilding, occurring as we speak, is sound and in compliance with code. Today's focus must necessarily be on our rebuilding effort. The future focus of this community's building inspection process should also address the stock of buildings that were not hit by Andrew. Many of these structures were built by the same contractors/developers who built in the devastated areas of South Dade. Although undamaged, it should not be assumed that these buildings comply with the SFBC or were better built than the properties in South Dade. Dade County must devise an inspection plan for these properties and insure that they were built soundly and presently comply with the code. Incentives should be developed to eliminate any discovered failures and to correct them. The insurance industry should logically be involved in this process. Only such a review will insure the integrity and safety of all of our buildings in Dade County.

RECOMMENDATIONS

1. For the present rebuilding effort, the Department of Building and Zoning should recruit a sufficient number of qualified inspectors to insure that every structure undergoing repair or replacement is regularly and properly inspected until completion. This should occur whether or not a permit is pulled.
2. The Building and Zoning Department should use other county employees to assist in its code enforcement efforts. These "auxiliary" employees could stop at all ongoing construction sites they see, within their assigned area, and verify that

the proper permits have been obtained. Failure to find the proper permits would lead to notification to the code enforcement office, possible "red-tagging" and subsequent enforcement efforts. Architectural and engineering students can also be recruited for this important task.

3. Dade County must completely analyze an appropriate inspection per inspector ratio for future assignments. In so doing, it should take into consideration the number of permits pulled. The increased certification of code compliance by architects, engineers and contractors and the addition of mandatory inspections to the code also need to be considered.
4. The Dade County Building and Zoning Department should mandate annual in-service training of all inspectors and supervisors. Training should include engineering analysis of structural design and materials with particular focus on hurricane wind forces.
5. The names of contractors/companies committing building code violations, having material usage problems and performing shoddy work should be identified and cross-indexed as potentially "problem" contractors. Absent mitigating circumstances, the county and/or the Department of Professional Regulation should then take aggressive action against these contractors and inspect other buildings built by these contractors anywhere in Dade County.
6. Dade County should add sufficient staff to the Office of Code Compliance to carry out its watchdog enforcement and product approval objectives.
7. Dade County must devise a plan of action to begin a compliance inspection for existing housing throughout Dade County with the goal of uncovering and correcting structural code violations.
8. The State Insurance Commissioner's Office and the local building and zoning departments should develop incentives to correct existing construction failures that are identified through a countywide inspection of all structures.

IV. BUILDING PRACTICES AND PROFESSIONAL RESPONSIBILITY

Many professionals in the building industry have performed admirably. Countless structures stand soundly and proudly as a tribute to them. However, the industry as a whole has failed to act against those who are incompetent, cut too many corners to save money or just generally exhibit shoddy workmanship.

The entire industry needs to be better educated in wind-resistant construction. Surprisingly, unlike many other professions, architects, engineers and building contractors are not required to take continuing education courses in their

respective fields. None of these professionals, not even contractors, are tested at any point in their professional lives on their knowledge of building codes. Architects and engineers, particularly for residential or uncomplicated projects, no longer regularly make on-site inspections throughout the construction process. They are no longer required to certify that the completed construction complies with code or with the plans. Too often, general contractors will leave the on-site supervision of construction to a less qualified and experienced worker. In other cases, contractors will simply be paid for "qualifying" the construction but have no involvement whatsoever with the construction. There are no minimal rules or guidelines as to what qualifications are required of a worker that is allowed to supervise on-site construction.

"Workmanship" standards, as provided for in the SFBC, are vague and unenforceable. Government and the industry itself have become too complacent about shoddy workmanship. Too often, construction failures have been dismissed as workmanship problems, as if such a classification mitigates its severe consequences. Both Dade County and the Department of Professional Regulation currently lack the ability to appropriately computerize their records to target these contractors who perform shoddy work. In short, what has evolved is a building profession that no longer is held to a standard of professionalism. This lackadaisical approach to regulation and professionalism by the industry itself and by the government which regulates it, is no longer tolerable.

RECOMMENDATIONS

1. Change the "workmanship standards" in the SFBC and establish "workmanship standards" for the Florida Statutes making both of them specific, enforceable and having them provide sanctions. Such standards should also provide an enforcement scheme and appropriate penalties for repeated workmanship failures ranging from greater education to loss of license.
2. Licensing and certification qualifications for contractors, journeymen, architects and engineers on the relevant state and local levels, should require a comprehensive knowledge of applicable building codes with particular emphasis upon

hurricane resistant construction. Mandatory continuing education courses should become a requirement of initial and renewed licensing and certification for these professionals and should require at least 40 hours of continuing education every two years, in their areas of specialty.

3. When a building fails an inspection, an easily retrievable record should be kept. After a specific number of failures, a complaint should be lodged against that contractor's license and penalties assessed to include such things as fines, additional education for recertification, suspension or loss of license. Dade County needs to develop and fund the automation of such a program. The Department of Professional Regulation should do the same for contractors licensed statewide.
4. Dade County and the State of Florida should require that all parties involved with the construction of a structure certify in clear, unequivocal language that the structure conforms to the applicable building code and conforms with the structural design plans.
5. Dade County and the State of Florida should require better on-site supervision of construction and of workers through the use of journeymen to provide a distinct standard of "workmanship" for these journeymen. Supervision of on-site construction should only be delegated by a contractor to a certified or licensed journeyman (Florida Statutes Chapter 489).
6. Dade County should require each professional involved in the design and execution of a structure to conduct an on-site inspection of that structure and certify compliance with the code.
7. All structures that are required by state law or by the SFBC to be designed by an architect or engineer must additionally be inspected and certified by a second or additional architect or engineer to insure compliance with code and the plans.
8. Engineers and architects should be tested and certified as having ample knowledge of our local codes as a prerequisite to sealing and submitting plans for construction approval and permitting.
9. As previously recommended by the Fall Term 1989 Grand Jury, the use of qualifying agents should be eliminated.

V. UNLICENSED CONTRACTORS

State and county enforcement inspectors have spent years battling the problem of unlicensed contractors. Despite such activity being a criminal violation, unlicensed contracting has reached crisis proportions since Hurricane Andrew. The Department of Professional Regulation (DPR) and Dade County Building and Zoning representatives claim that there are today

substantially more unlicensed than licensed contractors operating in South Dade County. This is staggering when one realizes that there are 10,000 state licensed contractors and nearly 8,000 county licensed contractors presently registered to operate in Dade County.

Desperate homeowners provide easy targets for these unlicensed contractors. Like the carpetbaggers of old, these unscrupulous individuals are swooping down upon hurricane victims anxious for immediate repairs. In some instances they perform inferior, sub-standard work and in others they obtain large deposits from homeowners with promises to return to repair the homes and then never do. These unlicensed contractors are practicing another form of looting. Of the 1,600 citizens' complaints county investigators reviewed in the month of November 1992 alone, 1,300 were related to unlicensed contractors. Even some general contractors, anxious to begin and complete construction, will knowingly subcontract the work to unlicensed contractors.

Despite yeoman attempts by the DPR and the county to take aggressive action against the recent deluge of these perpetrators, they admit their efforts are woefully failing. Since Hurricane Andrew they have only been able to refer five cases for criminal prosecution. Together, DPR and Building and Zoning have no more than eight construction specialists to respond to the overwhelming number of homeowner complaints and patrol the neighborhoods to snare these unlicensed workers. They simply do not have the staff or the resources to curb this ongoing criminal activity.

Additional staff must be dedicated to these inspection teams. Neighborhoods where intense rebuilding is occurring should be patrolled and proof of licensure from suspected contractors and their sub-contractors should be sought. Failure or an unwillingness to supply proof of licensure should result in the immediate halt of all construction work and arrests made if appropriate. Enforcement agencies from other county or state agencies should work with these inspectors. We suspect that if

asked, architectural and engineering students would also willingly volunteer their time to help in this vital effort.

Law enforcement has responded admirably to protect hurricane victims from looters and price gougers. We applaud the Metro-Dade Police Department, The Florida Department of Law Enforcement and other law enforcement agencies for their actions after Hurricane Andrew. By their high-profile presence and coordination of available resources, they offered much needed assistance and protection to our hurricane devastated areas. It is important to remember, however, that we are not out of the woods yet. All law enforcement agencies should continue to offer whatever assistance is needed to respond against these construction "wolves" that have come into our community wearing the sheep's clothing of alleged help and assistance. We urge the Metro-Dade Police Department, the Florida Department of Law Enforcement and all other law enforcement agencies to increase their assignments and resources to this task.

RECOMMENDATIONS

1. The Department of Professional Regulation must increase its staff of construction specialist enforcement inspectors to correspond to the unlicensed activity that is presently occurring. The Dade County Department of Building and Zoning must do the same. The use of other "auxiliary" personnel by these departments should be assigned, if necessary, to meet the immediate need.
2. The Metro-Dade Police Department, the Florida Department of Law Enforcement and all other law enforcement agencies need to assign additional full-time staff to aid DPR and the Dade County Building and Zoning Department in this effort.

VI. THE BOARD OF RULES AND APPEALS

One witness summed up the general impression of the Board of Rules & Appeals (BR&A) by describing it as a "tired old system" that requires an immediate overhaul. Witnesses, including board members, former members and staff, expressed far more criticism than praise for this board. Many felt that parts of the construction industry continually exert undue influence on the BR&A's decisions.

The BR&A has failed to update the SFBC which has become technically antiquated and based on outmoded engineering principles and building practices. When the SFBC was first drafted in 1957, it was considered around the county to be a "state of the art" code. But in the last 35 years, it has fallen behind nationally accepted standards. The BR&A has further eroded the code's effectiveness by diminishing the quality of materials required in construction. Particle board, wafer board, hardboard ("masonite") sheathing, pneumatically installed roofing staples, lower weight roofing felt, wood frame gables, glass windows and doors without storm shutters, wood and metal partitions instead of block partitions, were all materials that were ultimately recommended by the BR&A for approval and contributed considerably to the destruction caused by Andrew.

BR&A's record keeping has often been described as pathetic. BR&A members themselves have criticized the lack of organization and sophistication with which board minutes, rulings, amendments and product approvals are maintained. Presently, the recall of past decisions may depend on the reliability of the membership's memory. We echo the Independent Review Panel's expressed frustration with their attempts to make heads or tails of the BR&A's records.

The composition of the BR&A is in clear violation of the SFBC and woefully unrepresentative of this community. Nearly one third of the BR&A fails to be representative of the membership designations as defined in SFBC Section 203. For instance, the environmentalist slot is occupied by an electrical contractor. Each of the two mechanical engineers slots are filled by a sprinkler contractor and a structural engineer. The six non-professional slots, clearly intended to be filled by concerned citizens, are instead filled by five industry representatives. The BR&A's present structure is deficient in that, despite all our recent focus on the importance of roofing systems, no roofing systems contractor sits on the Board nor on its nine member roofing sub-committee. Women and minorities are blatantly underrepresented. All 28 BR&A members are male, and there were only five Hispanics and two Blacks appointed to the

Board. Many of the BR&A members have continued on the Board in unchecked perpetuity, some as long as 30 years. With the exception of a two year hiatus, the chair has remained the same for a total period of 24 years. The appointment of these members, in apparent perpetuity, results in a perception of stagnation and undue influence and control.

We were advised that some members and the Board's consultant, while serving, have been hired by a variety of developers and builders who have appealed to the BR&A on a variety of issues. The fact that so many members have served for so long insinuates either a tangible or intangible benefit. Suggestions, innuendoes and rumors of conflicts of interests at worst, and appearances of impropriety, at best, cloud the intended independence of the Board. Those who serve on and for the BR&A should not act as consultants for developers and builders who also appeal to the Board on which they serve. If terms are limited, this should not cause great financial hardship to anyone. The recently proposed county ordinance to amend the code regarding this Board, while a step in the right direction, does not go far enough. Generally, this Board should be either totally re-organized or disbanded.

RECOMMENDATIONS

1. Dade County needs to create a permanent committee of consultants to overhaul and rewrite the SFBC, to periodically critique and reevaluate the new SFBC with a charge to integrate into it recent technological, scientific and engineering advances. This committee should report its findings directly to the county manager as well as to the BR&A. The committee should include structural engineers, wind experts, fire experts, flood experts and a meteorologist among its membership. This same pool of experts should be called upon, from time to time, by the county manager and the BR&A in considering the approval of a variety of significant material and construction substitutes.
2. The BR&A should utilize a pool of qualified experts to act as its consultants and not regularly rely on the services of only one. This pool should be representative of experts or specialists in a variety of fields such as structural, electrical, mechanical and roofing. The numbers of times each person or a professional association can act as consultant should be limited in numbers (e.g. 10).

3. By February 1993, "clean house". Replace members of the BR&A who served prior to February 1991.
4. Staggered term limits of three years service should be implemented.
5. Appointments to the BR&A should be made based on expertise of trade. No person should be appointed to a designated seat unless that person is certified and/or licensed in the designated trade. For instance, the environmentalist position should be filled by a recognized environmentalist, not an electrician.
6. Minorities and women need to be better represented. The numbers of these appointments should be representative of the community at large.
7. Dade County should explore the possibility of allowing other consultative or community entities to make the non-professional appointments to the BR&A. Consumers and representatives from homeowners' associations should be among those appointed or making the appointments to the "non-professional" seats. No industry professional or tradesperson should fill these positions.
8. No BR&A member should serve as its chair more than once. The time of service as chair should not exceed two years.
9. A position for a roofing systems contractor should be created for the BR&A.
10. The present unfilled appointment by the League of Cities should be filled immediately. If there is no interest in filling the position, it should be eliminated or transferred to a community organization that would act in the League of Cities' place.
11. The Dade County Attorney's Office should develop a written code of ethics guidelines for all BR&A members and all BR&A consultants to eliminate actual and potential perceptions of conflicts of interest. All BR&A members and consultants should submit to the county attorney a list of all their clients for the two years prior to their service on or with the BR&A and should submit monthly updates of their new clients. Issues dealing with a client covered by these time periods should disqualify the BR&A member or consultant from participation.
12. The County Department of Performance & Budget Analysis needs to develop effective record keeping procedures for the BR&A and the staff of Code Compliance.

VII. INSURANCE RELATED ISSUES

The insurance industry should become a major force in the effort to assure code compliant construction and effective enforcement. This industry is initially footing the bill for the added expense created by poor construction and poor enforcement. For instance, it was estimated in 1988 that in Dade County alone

the industry insured over 112 billion dollars worth of property. Adding Broward and Palm Beach counties increases this number to 226 billion dollars. Despite these astronomical values, they have assumed little responsibility in protecting their insured properties.

The insurance industry can no longer merely insure property but must play an active role in maintaining the integrity and quality of construction in our community. For example, it should mandate or reward property owners for properly protecting their structures through the use of hurricane shutters. The insurance industry should not rely on government regulation alone. It should develop an independent plan that will insure proper construction and effective enforcement. Additionally, it should develop an educational program for its clients on the safety of their properties. An educated home buyer, in many ways, is the best "insurance" to force builders and code regulators to perform as they should. A check list could be developed of critical building practices and materials that a homeowner can refer to when purchasing, building or rebuilding a home.

Even a corporate giant like the Pillsbury Corporation, former owners of Burger King, felt little need to protect their Biscayne Bay headquarters from possible hurricane damage and removed hurricane shutters from its initial building plans. If the insurance industry plans to pay greater attention to the quality of building code enforcement when it sets its insurance rates, it needs to provide an incentive to the construction industry and to homeowners to stimulate the use of superior building techniques and hurricane safety measures. Additionally, if an insurance company feels that code enforcement agencies are insufficiently attentive to their duties, it is their responsibility to take public and vigorous action to improve it.

RECOMMENDATIONS

1. The State Insurance Commissioner's Office should immediately begin working with insurance companies selling homeowner's policies in Florida to create credit incentives for using window and door shutters or other proven hurricane-resistant alternatives on residential properties. The same should be developed for commercial properties. Similar incentives

should be developed for the creation of residential "safe-rooms".

2. Insurance companies should consider a policy of pro-rating insurance claims payments for those policy holders who fail to attempt to shutter their residences prior to a hurricane.
3. The State Insurance Commissioner's Office should develop an educational program and check list of critical building components and materials for consumers.

VIII. MOBILE HOMES

The total destruction of mobile home parks we saw will remain with us for many years to come. We were horrified by the contrasts between the damage done to these homes and the damage done to conventional, single family housing. The damage to mobile homes was so extensive that they were rendered totally unrecognizable. Ninety percent of all mobile homes in South Dade were totally destroyed. These represented over one third of all mobile homes in Dade County. The American Red Cross reported that of the 1,176 licensed & registered mobile homes in Homestead, 1,167 were completely destroyed.

The fragility of mobile homes had been known since at least 1961, after Hurricane Donna struck Florida. Consider the chillingly similar passages from post-Donna and post-Andrew expert committee reports:

1961 The highest proportionate loss from Hurricane "Donna" of dwellings by type occurred among mobile homes (house trailers). Estimates by the Mobile Home Association from insurance claims place the number of these dwellings completely destroyed at over 700. Other estimates have run as high as 1,500...Most of these trailers were abandoned and the occupants sheltered in more permanent structures. No estimates of the total number of mobile homes located in the affected areas is available. Of trailer parks visited by the Committee, all appeared to have sustained a minimum of ninety percent loss of mobile units.¹

1961 At the moment, although serving as habitation for well over a quarter of a million of Florida's residents, mobile homes do not afford the security from hurricanes required of even the simplest structures constructed in the very counties containing the greatest percentage of trailers.²

1992 Mobile homes and other forms of manufactured housing performed poorly (often completely destroyed) and as currently designed and constructed must be considered expendable in storms of this intensity. They cannot be

relied upon to provide for the safety and welfare of the inhabitants and wind resistant shelters must be identified to provide safe haven.³

1992 Manufactured homes in the subject area evidently possessed poor ability to sustain the high winds generated by Hurricane Andrew. In several subdevelopments, many of these homes suffered total losses, in spite of ground anchor connections that were observed to have held well. It was observed that the breakup of corrugated metal siding and roofed buildings such as manufactured homes and pre-engineered metal frame buildings contributed significantly to the generation of airborne debris.⁴

The lack of survivability of mobile homes against hurricane winds is a threat to those living around them as well as those living in them. Witnesses testified that countless buildings and homes were primarily destroyed by surrounding mobile homes that had been blown into them. As one witness testified, "If a hurricane is coming and you live in a mobile home...leave. If you live near a mobile home...move."

Federal law has pre-empted the South Florida Building Code (SFBC) from applying to mobile homes and instead requires them to meet standards promulgated by USHUD. These standards pale sharply when contrasted with the SFBC. For example, experts have told us that the USHUD standard of wind loads for mobile homes is 80 mph, a requirement substantially lower than that required by the SFBC. In fact, if the SFBC applied, mobile homes would be illegal. Interestingly, the only application of the SFBC to mobile homes not pre-empted by federal law is the method of foundation and tie-down of the mobile home itself. Experts noted that throughout the mobile home parks in South Dade many foundations and anchoring systems remained intact with no mobile home left standing above them.

Nearly all witnesses who appeared before us recommended equivalent construction standards or completely banning mobile homes. The City of Homestead is presently considering such a ban and has issued a moratorium to allow time for a comprehensive review of the issue. We applaud the thoughtfulness, concern and sensitivity with which this government has acted.

Proponents of mobile homes stress their need based on affordability. They superficially claim that mobile homes are as

safe as conventional housing in a hurricane. They argue that any banning of mobile homes would remove available affordable housing from those who have no other viable housing alternative. We do not dispute that mobile homes are less expensive than the majority of single family detached homes in Dade County. However, this perception is not always true. Alternatives, such as modular housing, steel frame construction or multi-family housing can be comparable in price to new mobile homes. Issues like lot leases, financing and insurance costs, depreciation and the cost of providing hurricane safe shelters in a mobile home park, all decrease their affordability.

Government has a responsibility to provide safe, affordable housing for those who want and need it. By allowing inferior construction, the federal government has created an unequal standard of protection for mobile home owners. Local and state government have complacently accepted this. We are unconvinced that the need to provide affordable housing permits for substandard protection. Affordable housing should provide safety and protection for its residents. To do less than that required for conventional housing is discriminatory. The safety of all of our citizens, regardless of their economic status, is paramount and should not be compromised for financial or political concerns.

After decades of ignoring this issue, it appears the compelling evidence of our mobile home destruction has convinced USHUD to upgrade its requirements. As we concluded our service, we learned that USHUD intends to increase its wind load construction standards to comply with the ASCE 7-88 for newly constructed mobile homes. Mobile home manufacturers should be required to test and prove they will comply with this new standard. The Dade County Commission was recently besieged by hundreds of citizens representing those hoping to keep mobile homes permissible and those requesting their elimination. Because Hurricane Andrew has caused a critical need for immediate housing, those who lost their mobile homes deserve compassion and every available resource should be devoted to meeting their desperate needs. But, they need more than that. These Dade

County residents cannot wait for the completion of the lengthy process involved in USHUD's adoption of this higher standard. The County Commission should send a constituency to meet with USHUD immediately to urge the passing of this new standard as soon as possible or obtain a waiver for Dade County to do so. Many mobile home buyers will then be able to purchase safer units with their insurance monies. They should not be forced by circumstances to purchase similar, substandard death traps again.

Based upon the testimony of witnesses, experts and our own observations, we are of the opinion that mobile homes, as currently constructed, are too dangerous to be allowed as a substitute for affordable housing; particularly when subjected to hurricane force winds. Until this standard is improved, a moratorium on the permanent use of mobile homes should occur. It takes courage to ask mobile home owners to wait, but it must be done. But the commission must act with deliberate speed. It would be shamefully irresponsible to allow droves of older and inferiorly constructed mobile homes into Dade, especially when a new stock of better constructed ones should be available in the near future. Once the immediate flurry of replenishing this stock has subsided, the commission also needs to study the problem of all the mobile homes in Dade that were built to the substandard code. It needs to design a plan for the ultimate elimination of these inferior units and develop an equitable means of replacing them. The insurance industry should also play a major role in insuring the stronger construction of mobile homes.

RECOMMENDATIONS

1. Dade County must issue a moratorium on the permanent replacement of mobile homes throughout the county.
2. During the moratorium, Dade County must demand that all new mobile homes entering Dade County comply with the ASCE 7-88 coastal construction standard.
3. Dade County must demand laboratory testing from mobile home manufacturers to prove they comply with the ASCE 7-88 coastal construction standard.
4. If USHUD fails to adopt the new standard, or fails to do so quickly enough, and these homes are not test proven to comply, then Dade County should:
 - a. Take legal action or petition USHUD on behalf of the

mobile home owners to either eliminate the pre-emption or adopt the ASCE 7-88 coastal construction standard;

OR

- b. Utilize its zoning powers to ban mobile homes that do not comply with the ASCE 7-88.
- 5. The Florida Department of Community Affairs should participate in this county effort and enforce this same action for all coastal counties throughout the state.

IX. PRE-DISASTER AND POST-DISASTER PLANNING

Having lived through the preparation for and aftermath of Hurricane Andrew, this Grand Jury feels that neither our community nor our state is adequately prepared for catastrophes of this magnitude. Part of this failure may be due to the fact that over 85% of our population had never experienced such a hurricane. An overall apathy toward hurricane preparedness prevailed prior to Andrew. Since Andrew, fear has replaced apathy. Today, hurricane experts anticipate an exodus of nearly 95% of our population when a similar storm threatens this community. Such a panic would result in untold deaths and injuries. This is a scenario which terrifies us.

Hurricane preparedness and post-disaster planning should begin today. But even with our recent experiences, we still have failed to make this need a priority. For example, despite its recent exceptional performance, the Dade County Office of Emergency Management is woefully understaffed. It has only one full-time staff member assigned to hurricane preparedness. There are insufficient numbers of disaster shelters in our community. No mandatory plan exists for the temporary placement of residents with special needs, such as the elderly and the disabled. Existing evacuation plans are totally inadequate for the numbers of evacuees planning to flee a future hurricane.

Another important failing is the lack of any regional plans in effect that would address the consequences of a hurricane striking several counties simultaneously. If Andrew had threatened Dade, Broward and Monroe counties, all the major roads would have been gridlocked, compounding the potential disaster. These neighboring counties would have been unable to offer

assistance to each other and they would have been simultaneously competing for the same state and federal recovery aid.

Experts participating in an April 1992 National Hurricane Conference expressed grave concern for the southeast and southwest regions of Florida. Their report developed a list of the "Top Ten Problem Areas" in the nation for worst case hurricane scenarios: Southwest Florida ranked number one; Southeast Florida number four; and the Florida Keys number five.

...Any major hurricane impacting the United States is likely to affect at least one of the [problem] areas listed ... Three of the top five problem areas incorporate most of South Florida. ...If you superimpose a Gilbert or a Hugo type storm over the southern peninsula of Florida, it is quite possible that Southwest Florida, Southeast Florida and the Florida Keys could all be carrying on concurrent major evacuations in response to this threat. The Tampa Bay area as well as the Treasure Coast area would likely join in the response at some point. Where would all the people go? Where would they be sheltered? What kind of traffic bottleneck could we expect at the junction of the Florida Turnpike and I-75 [or I-95, 826 and the Turnpike]? ... The worst scenario would be to have people sitting in cars on the roadways experiencing the effects of a category 4-5 hurricane and quite likely being killed.⁵

Despite the best of intentions, the State of Florida has failed to develop an effective leadership role on hurricane preparedness issues. Witnesses advised us that the State of Florida has no hurricane plan, no statewide shelter plan and no recovery plan. Distribution centers and operational command posts throughout the state have not been established. No regional plans have been established in the event a hurricane strikes more than one county simultaneously. The state's major action has been to develop legislative mandates for the counties to create sufficient plans. But there has been little follow-up to insure the implementation of these mandates.

Today, eighty percent of Floridians live in coastal counties with most living in evacuation zones. Their lives will literally depend on what we do now. Hurricanes grant Floridians the benefit of the opportunity to prepare. Other natural catastrophes, such as earthquakes, strike suddenly and without warning. We must not waste the sole opportunity afforded us.

State and local government can no longer ignore the need to prioritize pre-disaster and post-disaster planning. An essential part of today's recovery from Hurricane Andrew is our planning for the next one. As a community, we are fortunate to have the National Hurricane Center and many other exceptional experts in emergency management in our midst. We need to work with these experts, heed their warnings and provide them with the resources necessary to better prepare us for future disasters, natural or man-made. All government must integrate pre-disaster and post-disaster planning into the mainstream of its policy making process. Adequate building codes, enforcement, growth management and land use planning all need to be better intergrated at the state and local levels. The present rebuilding is a vital component of mitigation and pre-disaster planning for future storm events. Yet, despite their obvious interrelationship, there is little policy integration between the Dade County Department of Building and Zoning, the Office of Emergency Management and the Dade County Planning Department. Through proper planning, we can become disaster resilient and resistant.

RECOMMENDATIONS

1. The State of Florida, through its Department of Community Affairs, should assume a greater role in pre-disaster and post-disaster planning at a statewide level, regional level and local level. Follow-up enforcement and mandatory implementation of local plans must occur. The State of Florida should also provide local governments with the financial wherewithal to insure said implementation occurs.
2. Dade County must provide adequate staff for the Office of Emergency Management for hurricane preparedness.
3. Dade County must improve the integration and coordination between the departments related to emergency management, land use development and building and zoning to adequately address pre-disaster and post-disaster planning.
4. A statewide strategic plan for shelter utilization, including schools and other public buildings, needs to be created. Incentives also need to be developed for the use of privately owned buildings as shelters and for the creation of "safe-rooms" in residential properties.

X. CONCLUSION

While we, as a community, have suffered greatly as an unavoidable result of Hurricane Andrew, this suffering was

aggravated by the systemic failure of our construction industry and building regulation process. Had the failures not existed, much of this suffering would have been prevented. We must not allow this to reoccur as we rebuild Dade County. The reforms recommended must occur immediately in order to mitigate the now predictable consequences of another, similar hurricane. We hope our successor Grand Jury will closely monitor the implementation of this report's recommendations. Putting these recommendations into action would indicate our community's total commitment to creating a stronger and more hurricane resistant Dade County.

Footnotes

- 1 Florida Hurricane Damage Study Committee, Florida Hurricane Report Concerning Hurricane "Donna", (Tallahassee: Florida Hurricane Damage Study Committee, 1961), p. 17.
- 2 Ibid., p. 18.
- 3 Wind Engineering Research Council (WERC) Inc., Hurricane Andrew - Preliminary Observations of WERC Post-Disaster Team, (College Station: Wind Engineering Research Council, 1992), p. 3.
- 4 Building Performance Assessment Team, Preliminary Report in Response to Hurricane Andrew Dade County, Florida, (Washington D.C.: Federal Emergency Management Agency & Federal Insurance Administration, 1992), p. 21.
- 5 National Hurricane Conference, Coastline at Risk: The Hurricane Threat to the Gulf and Atlantic States, (Tallahassee, Florida: The 14th Annual National Hurricane Conference, 1992), p. 56.