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BUILDING CODE ENFORCEMENT FOLLOWING HURRICANE HUGO IN SOUTH CAROLINA

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QUICK RESPONSE RESEARCH REPORT
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**BUILDING CODE ENFORCEMENT
FOLLOWING HURRICANE HUGO
IN SOUTH CAROLINA**

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In the immediate aftermath of major disasters, homeowners and businessmen want to return to their residences and company structures, perform necessary repairs, and then get on with their lives as quickly as possible. Getting on with it, however, may not be a simple process which takes a few hours or even a few days. When structures are damaged and where building codes are strongly enforced, community leaders may be far more interested in the long term welfare of their citizens, putting them through a thorough building inspection and permit issuance process, than in guaranteeing speedy reconstruction by shortcutting the process. For public officials concerned with long term safety, a disaster can also provide a window of opportunity to enact more stringent building code requirements to regulate reconstruction and thereby improve the overall quality of structures in the community. Thus, how quickly a community recovers from a major disaster is partially determined by how community leaders trade off long term mitigation benefits against short term recovery needs.

The enforcement of building codes following a major disaster has not been well studied. The purpose of this research was to investigate how building codes were complied with in the city of Charleston and neighboring South Carolina cities and counties during the initial recovery period following Hurricane Hugo. It was hypothesized that the sheer volume of damaged and destroyed buildings (estimated at over 80% of the buildings in Berkeley, Charleston, Georgetown, and Horry counties alone) would overwhelm the resources and capabilities of local building officials. It was further hypothesized that building officials would face a community wide demand for rapid rebuilding and that they would incorporate coping mechanisms, such as the granting of variances to building codes, which could accelerate the rebuilding process but which would also allow the same officials to retain control over the process.

METHODOLOGY

This research was conducted using a case study approach. Data were gathered from open-ended interviews with community leaders, local and state building code officials, and civil engineers. Written documents were sought which recorded reconstruction decisions. (Interviewees and their communities will not be clearly identified for confidentiality reasons.)

This study was conducted over a fifteen month period in conjunction with a National Science Foundation funded study to investigate the political process in the city of Charleston and the state of South Carolina to mitigate future hurricanes and earthquakes following Hurricane Hugo. During that time period, which included four trips to South Carolina in November, 1989, and January, May, and September, 1990, interviews were conducted with over 75 politically influential persons, including 17 directly relevant persons. The extended length of time to collect data proved very valuable. In initial interviews, there was a reluctance on the part of some building officials to openly discuss details of the rebuilding process; in these cases, many interviews were needed to gain the confidence of the interviewee before accounts of what occurred were provided. Later interviews also revealed that initial damage assessments were often erroneous; with time to evaluate the true nature of the damage and their community's responses, interviewees were able to correct mistaken opinions given hastily while they were in the process of recovery. Because there was often no way to verify the statements of the interviewees and there was no attempt to systematically collect data, the results of the interviews should be viewed as tentative and should not be considered as definitive.

HISTORY OF BUILDING CODES AND CONSTRUCTION METHODS IN SOUTH CAROLINA

To place the events in South Carolina into perspective, a brief history of building codes in the state is provided. Currently, there is no mandatory

statewide building code. Cities and counties have the option of adopting building codes, although they must adopt the Standard Building Code if they choose to exercise their option.

The desire among local officials for the adoption and enforcement of standard building codes in their communities is relatively recent (SCAC, 1989). Until 1972, when the state legislature adopted a formal policy granting incorporated cities and counties the power to adopt the Standard Building Code, only a few cities and counties independently enacted building code ordinances to meet their needs. The cities of Charleston and Columbia were the first to adopt building regulations, in 1907 and 1916, respectively. Charleston County was the first to adopt the Standard Building Code for unincorporated areas in 1968. Slowly, other more populous counties like Greenville, Lexington, and Richland followed suit. By mid-1989, approximately half the cities and towns and 17 of the 46 counties (containing 75 to 80% of the total state population) had adopted mandatory codes (Lindbergh, 1989).

Although it is certainly important for communities to have building codes, the integrity of the structures is dependent on the **enforcement** of building codes. When the damage from Hurricane Hugo was first examined, it was clear that buildings constructed to code regulations fared far better than those which had not (AIRAC, 1989). Gary Wiggins, Director of the South Carolina Building Codes Council, claimed that more serious damage occurred in those areas without code enforcement (AIRAC, 1989: 4).

Besides lacking a mandatory statewide building code, South Carolina laws do not require that building inspectors be certified. Local jurisdictions determine the qualifications of their building inspectors. There is a great unevenness among local communities and counties in regard to the quality and qualifications of building officials. At the time of Hurricane Hugo, only one building inspector in the state was reported as having an engineering degree. Several respondents remarked that the majority of building officials were political appointees who were

educated through on-the-job training, although there was a conscientious movement in many localities to increase the number of trained, certified personnel. When Hurricane Hugo struck, most communities and counties had three or fewer certified building inspectors. The city of Charleston was recognized as having the most professional staff in the state.

Due to the fact that the adoption of building codes by a minority of counties in the state has been such a recent phenomenon, a significant number of buildings in the state were constructed without regard to building codes. Because the state had a history of recurring hurricanes and had been shaken by a major earthquake in 1886, many poorly constructed buildings had been destroyed through the years. Presumably learning from experience, many indigenous builders had employed methods and materials in the construction of their structures to withstand some degree of wind and shaking. However, there was no inventory of buildings which identified which were well built and which were poorly constructed.

The respondents generally agreed that the state and its communities were inadequately staffed with building officials, and they recognized the need for improved building standards. To overcome the deficiencies, concerned building officials and civil engineers formed Citizens and Organizations for Minimum Building Standards (COMBS) in 1987 to promote a mandatory statewide building code and to require certified building inspectors (Lindbergh, 1989). They drafted legislation, which was introduced by Senator Glenn McConnell and Representative Ralph Davenport in the South Carolina General Assembly in March, 1989, six months prior to Hurricane Hugo. The legislation failed to reach the floor of either house in the 1990 legislative session. (See Mittler, 1990, for a history of this bill.)

FINDINGS

The primary concern of this study was to investigate the degree to which local communities enforced or deviated from their building inspection and permit issuance

processes and then to document specific decisions which led to these outcomes. Because 16 of the 24 counties severely damaged by Hurricane Hugo did not have mandatory building codes, the findings are limited to the few counties that did.

1. *No community attempted to enforce the building code on all structures damaged by Hurricane Hugo.* The working hypothesis of this study was that the local building officials would be overwhelmed by the number of structures requiring inspection and would initiate ways to short circuit the official rebuilding process. That hypothesis proved to be true, especially in the most damaged counties. In one city with a relatively large professional staff, the building inspections department was tasked by the Mayor to survey the city and identify buildings that were structurally unsafe so they could be shored up or demolished. A decision was made for the building officials to concentrate their energies on the worst of the damage. Unable to deal with structures suffering minor damage, especially to roofs, the chief building inspector reported that home owners could repair their own residences without inspection and permits if they claimed the buildings had suffered no structural damage. As far as he was concerned, given the limitations of his resources, this was the only way the city could cope with the scope of the disaster. A county official supported this decision because the "immediate problem was fixing the structures, not permits."

In one inland city devastated by the hurricane, the director of public safety stated that his city suspended the enforcement of all building codes. Not being on the coast, the city was unprepared for a major hurricane and did not have the resources to deal with the destruction caused by one. In this city, public safety dictated that citizens be allowed to immediately repair their structures to provide needed shelter.

The small staffs of building officials at both the city and county levels were forced into tradeoffs concerning the repair of residences. Instead of inspecting residential structures with minor damage, some concentrated on licensing

contractors, who showed up from all over the country. By issuing licenses, the officials felt they could police the quality of repairs. In the city of Charleston, outside contractors were required to be fingerprinted and photographed; many refused and left the area.

Not all counties rejected their obligation to inspect all damaged structures. In one moderately damaged county, the County Council strictly forbade any suspension of inspections. To carry out his duties, the county's building and zoning administrator had his two certified building inspectors drive through the county and identify significant siding and structural damage. After identification, owners were notified that they would be required to obtain permits. So as not to make this an onerous task, all permit fees were waived. While the initial inspections took place, the administrator began hiring additional temporary inspectors. (FEMA funds were available to partially cover the costs.) Because of the high number of retired people in the local area, he was able to find two retired building inspectors and several tradesmen (e.g., electricians, plumbers, and contractors) who could be trained rapidly on the job.

The feeling among many county officials was that permit fees were a barrier to homeowner compliance. To encourage homeowners to seek permits, respondents from three counties reported that in two counties permit fees were waived and in one county permit fees were cut in half. All believed that fee reduction was a successful means of improving building code enforcement and homeowner compliance.

2. *No city or county advocated or implemented a policy to grant building code variances.* Universally, granting variances was not perceived as a method to speed up the rebuilding process. In fact, the opposite was cited as a reason not to employ this procedure. In both cities and counties, hearings would be needed to approve variances, adding to the bureaucratic steps needed to issue a building permit. Prior to Hurricane Hugo, cities and counties historically had routinely denied most variance requests, and, for the few granted, demanded that structural elements be

strengthened elsewhere to maintain a building's integrity. Clearly, granting variances was not considered a viable emergency procedure.

Even if building officials had elected to grant variances, many building officials and civil engineers said candidly that there was no reason in South Carolina for contractors to bother with variance requests. By simply ignoring code requirements, they could get what they wanted without the effort. Because building codes had been adopted so recently in most communities and many building officials had not been sufficiently trained to recognize when a structure was not being designed to code, there was no reason for contractors to indicate they were not going to build to code. They could claim their plans did comply with the code and expect to get their plans approved, or, if there was some doubt, they could enlist an engineer or an architect to approve the plans. With an architect's or a professional engineer's seal affixed to the documents, building officials would routinely approve their approvals. Most respondents concluded that enforcement of building codes was so spotty that requests for variances were unnecessary.

3. *The strictest code enforcement resulted from the insistence of the Federal Insurance Administration (FIA).* As part of the National Flood Insurance Program, the FIA was responsible for guaranteeing that structures undergoing repair meet the flood reconstruction guidelines, especially the elevation of structures above the 100-year flood level. Threatened with the possible loss of insurance for their communities if reconstruction did not comply with federal guidelines, local building officials were careful to enforce federal guidelines. Without the diligence of the FIA monitoring local actions, it is possible that the coastal regions would have been rebuilt without proper consideration given to mitigation.

4. *Damage assessment, project design, and reconstruction in the hardest hit areas were aided immensely by volunteer engineers and architects.* Almost immediately after the hurricane, the Volunteer Technical Assistance Group (VOLTAG) was established by the South Carolina Section of the American Society of Civil

Engineers and other professional architectural and engineering organizations. VOLTAG volunteers joined engineers from the Federal Emergency Management Agency (FEMA) to conduct damage assessments of public facilities in the 24 counties declared disaster areas by the President. Later, volunteers were able to conduct a damage assessment of the Town of Sullivan's Island, where virtually every building was damaged and many were destroyed. Because the town had no full-time building inspector, the volunteer engineers provided the technical assistance first to identify and mark public and private hazardous facilities and later to conduct detailed inspections which formed the basis of a demolition and reconstruction program.

Several months after the hurricane when the initial recovery period had passed, volunteers from VOLTAG assisted local communities in the design of new public buildings and in the supervision of project construction. These actions ensured that reconstruction met code requirements. (For a full description of the activities of VOLTAG, see Lindbergh, 1990).

DISCUSSION

How building codes were enforced in South Carolina after Hurricane Hugo should not be taken as a model for other states. The building officials coped as best they could, but underlying negative attitudes toward building codes and their enforcement hindered the application of improved construction methods. In most cases, public officials and private citizens were not sufficiently motivated to demand that damaged buildings be reconstructed to withstand future natural disasters. As far as most were concerned, immediate recovery was more important than long-term mitigation. (Although it is beyond the scope of this paper to compare the rebuilding of California cities following the Loma Prieta earthquake to the cities in South Carolina, the three cities hardest hit by the earthquake, Los Gatos, Santa Cruz, and Watsonville, and others enacted ordinances within days of the

earthquake to strengthen building codes, especially in regard to the repair of unreinforced masonry buildings.)

As one civil engineer reported, citizens in South Carolina will not demand more stringent building codes until their attitudes toward the consequences of natural disasters change. He holds the opinion that most citizens "do not believe that hurricane damage is an avoidable event." As far as the citizens are concerned, structural damage is "providential," not "preventable." This suggests that an effort to educate the public to the nature of disasters and how to prevent future destruction will be needed before construction practices throughout the state improve.

Despite the seeming lack of desire for citizens to demand the improvement of their building stock, they have generally been protected by their structures. Recent detailed inspections of the communities impacted by Hurricane Hugo have indicated that the majority of damage was minor but repeated on a large scale. Most building inspectors and civil engineers are now convinced that the majority of damage was caused by inferior roofing and siding techniques and materials. According to these experts, even if building codes were mandatory and strictly enforced, damage from future natural disasters might still be substantial because the Standard Building Code does not adequately prescribe hurricane resistant roofing techniques. They suggest that the code should be strengthened where it is weak.

Even though the state suffered considerable damage, the people of South Carolina did not demand much of the state in terms of repair and mitigation. There appear to be two main reasons for this attitude. First, citizens traditionally have considered themselves to be self-reliant. Most live in rural settings and rely upon themselves and their neighbors. Second, until recently, most local governments have not been actively involved in either disaster recovery or mitigation. Most citizens consider themselves conservative, defining "good

government as *no* government." In respect to their government bodies, most citizens expect little and do not complain when little is offered.

CONCLUSIONS

The response of building and other government officials in South Carolina was considered by every respondent to be "reasonable, given this was a time of great stress." The hypothesis that the amount of damage done to buildings in South Carolina due to Hurricane Hugo would overwhelm building officials so short cuts would have to be devised for recovery to take place proved to be true. Building officials concentrated their energies on identifying the worst of the damage, particularly to public buildings. In this endeavor, they were aided by volunteer engineers and architects.

For the most part, inspection of residential structures was left to homeowners. This proved to be one way that recovery was accelerated. In addition, the elimination or reduction of permit fees and the careful licensing and monitoring of outside contractors were successful methods to ensure that building codes were adhered to. No community employed building code variances to speed up the permit process.

Civil engineers believe there is no reason to believe that the built environment in South Carolina is any safer now than it was before the hurricane, except that many of the most vulnerable structures were destroyed and are being replaced by better buildings. The decisions made by city and county officials were aimed at short term recovery, not long term mitigation. As one civil engineer reported, for example, in some flood areas, houses and mobile homes are now mounted on blocks above the required FIA regulations, but they are so flimsy, they will probably be knocked over by wind and water forces.

Until citizens and government officials decide that the prevention of future damage from natural disasters is humanly possible, it is doubtful that South

Carolina will learn much from Hurricane Hugo. It will also not be surprising to read an analysis similar to this following the next disaster.

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