INTERNATIONAL CODE COUNCIL (ICC)
Code Technology Committee (CTC)

FINAL REPORT OF THE CTC
AREA OF STUDY – BALANCED FIRE PROTECTION
Code Issue – Features (formerly Heights and Areas)

April 8 & 9, 2009
Birmingham, Alabama

This report was presented to the CTC at Meeting #17 On April 9, 2009 and accepted by the CTC.

The ICC Board of Directors established the CTC Balanced Fire Protection Area of Study to examine the issues surrounding questions of passive versus active fire protection. The Balanced Fire Protection Area of Study was established in May of 2004, the Features Study Group was established by the CTC in October 2006 to study the height and areas provisions of the IBC.

Area of Study:
BALANCED FIRE PROTECTION. The study of balanced fire protection includes an assessment of the appropriate amount of active (ie fire sprinkler) versus passive (ie rated compartments) requirements to be required by the code. In this regard, many proposals have been considered in past cycles to revise the height and area provisions as well as the level of fire sprinkler trade-offs. The scope of this activity would be an investigation of the requirements in the code and the establishment of a clearly defined scope of work for the CTC to consider. Depending on the scope of work, the effort may result in a long term activity.

Summary/Recommendations:
After nine meetings and the completion of one code change cycle, the Features Study Group successfully made recommendations to change the base height limits for specific occupancies and specific construction types in Table 503 of the 2006 edition of the *International Building Code* (IBC). These were a result of the Study Group's examination of the process used in the initial development of Table 503, the background information from the legacy codes, and the BCMC report on Height and Area. An optional approach to Height and Area based on fire-flow was also studied and recommended to the membership, but was not successful.

The Study Group has subsequently reexamined its charge and the issues remaining to be answered; what is wrong with the current methodology and what changes would we recommend? The unanimous conclusion of the Study Group is that there is insufficient evidence or data to assist us in making a determination that the current provisions of the code are not adequate for achieving the goals of the IBC to protect life and safety of occupants and emergency personnel.

Therefore, the Study Group recommends that the Features Study Group be disbanded.

CTC Study Group History:
The Study Group was established to conduct a holistic review of the height and area limits in Table 503 of the IBC because of the numerous code changes submitted since the initial development of the 2000 edition of the IBC, culminating with 26 code changes submitted in the 2006/2007 cycle. A large number of code changes raised questions regarding the initial development of the limits on height and area, and their appropriateness to protect life and property. The Study Group was directed by the CTC to examine these questions and to make recommendations for change as it perceived necessary.

To achieve this objective, representatives of industry, consultants, professionals in design as well as fire and building code officials were asked to participate in the work of the Study Group. During the nine meetings that the Study Group held, additional representatives actively participated in the discussion of the Study Group.

Legacy Codes:
Initial meetings of the Study Group focused on the procedures and the data (including legacy code provisions) used by the code drafting committee to develop the original provisions of Table 503 and the table modifiers found in the 2000 edition of the IBC. The Study Group reviewed the tables from the legacy codes and discovered some elements that did not easily fall within the legacy code limits. While there was differences of opinion among the members of the Study Group, code changes were proposed to the height limits of Groups B, M, R (R-1, R-2, R-4), S-1 and S-2 occupancies for Types IIB, and IIIB construction

for inclusion in the 2009 edition of the IBC (code changes G115, G117, G118, G119 and G120-07/08, respectively). Code changes to revise the height limits for Groups B, M, S-1 and S-2 were successful.

Moving Forward – Fire Flow:
Efforts to propose additional changes to the base areas within Table 503, modifiers for increases for use of fire suppression systems, and the total areas allowed were all unsuccessful within the Study Group. Given the conclusion that justification was lacking to change the existing system, the question was expanded to examine other issues that also affect the height and area of buildings. One of these is Appendix B of the *International Fire Code* (IFC) which limits building area based on fire flow.

From that single element of the current code, a system of limits combining fire flow and hazard indexes was developed and proposed to the membership (G110-07/08). This effort was not successful with either the code change committee or the membership. Its failure was fundamentally based on our inability to identify problems associated with the current system. The membership fundamentally said "if it isn't broke, don't fix it."

The Problem:
The problem for this Study Group is access to or development of reliable data or information that can justify change. Resources both within and outside of the industry are limited to support work that can examine the question of what works and doesn't work and how the height and area of buildings affect the results. The Study Group was unable to locate cause and effect data that tied the legacy code provisions for height and area, and then the provisions of the IBC, to specific loss incidents.

Conclusion:
There is little more that the Study Group can do to bring a greater level of understanding and direction to the membership of ICC on this subject without research and development of additional data. Our examination of the current system within the IBC for limiting height and area does not reveal any significant issues that must be addressed to achieve a higher level of safety for building occupants, users or responding personnel.

Therefore, the members of the Study Group wish to thank the Board of Directors of ICC, and particularly Past President Wally Bailey, for their support in the development of a CTC Study Group, and to the CTC for its support and encouragement to examine a broad range of questions associated with this issue. However, we recommend that the Study Group on Features be terminated.

We do intend to complete our work on this subject by the creation of a "white paper" that chronicles the work we have done to resolve many of the debates over how the limits on height and area were developed, as well as the information providing the background for the fire flow concept of building compartments. It is hoped that this "white paper" may form the basis for funding of additional study and research on this subject and provide a base of information for any future study of this subject.

The following are the members of the CTC BFP Features Study group:

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Dave Collins (CTC, Co-Chair), The Preview Group, American Institute of Architects
Kate Dargan (Co-Chair), State of California/Office of the State Fire Marshal, California Office of State Fire Marshal
Sean DeCrane, Cleveland Fire Department, Association of Cleveland Fire Fighters
Dave Frable, U.S. General Services Administration, U.S. General Services Administration – Public Bldg. Services
Sam Francis, American Forest & Paper Association, American Forest & Paper Association
Jim Messersmith, Portland Cement Association, Portland Cement Association
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