



CHIEF'S FILE CABINET

Ronny J. Coleman

Fire Protection and Building Construction

Before a person becomes a physician they must become very knowledgeable with two basic elements of the human body. They must understand anatomy and physiology. No matter what practice of medicine they follow in the pursuit of their careers, the most fundamental of their decisions are based upon how much they know about those two topics.

Fire protection, the act of designing, preplanning and fighting fires in buildings has a corollary to this. It is knowledge of building construction and fire behavior. Just as anatomy tells the doctor where to look for the organs to be located and dealt with surgically, the type of construction can be used by the fire service to understand what is likely to happen when events occur. And just as physiology is used to diagnosis a disease that is ravaging a human body, fire growth is used to diagnosis what the effects the fire will have on a building.

Successful physicians are those that can use their knowledge to treat an injury or illness to save a life. Successful fire protection professionals are those that can use their knowledge to assure that buildings are kept healthy too.

The human body has not changed that much in the time of modern medicine. But new diseases are constantly putting pressure on the medical profession to create new remedies and medicines. In the case of fire protection the process of combustion has not changed since the dawn of time. However, the manner and materials used in building structures has constantly been evolving over time. Moreover, the development of technology has accelerated in the last 100 years more than it has for the entire millennia.

The last ingredient that makes up the analogy is that of the intervention of the professional. The doctor treats sick and injured people. The fire service responds to problems in which buildings are under assault from fire, flood or seismic activity. The doctor hopes to save the patient and the fire professional hopes to save lives and minimize property loss, without unnecessary risk to their lives.

In the fire service, the challenge is in keeping pace with the changes that have an effect upon the way buildings are built and how they will perform under stressful conditions. It is true that buildings burn down. They also fall down. Sometimes we have to tear them down to stop the process of self-destruction from fire. This requires that the fire professional be a well-informed and knowledgeable person about the anatomy of buildings. For purposes of this article I will further limit that discussion to wood buildings. Wood is, by far, the most common building material that is used in constructing the buildings that are struck by fire in most communities.



CHIEF'S FILE CABINET

Ronny J. Coleman

One of the best ways to obtain that knowledge is to search out the sources of the material that reflects the industries current practices. In general most fire agencies have a need to acquire this knowledge for two separate and distinct reasons. They are Fire Prevention and Training. In the case of the former, fire marshal's and their staffs need to have a broad background in building materials for purposes of understanding the plan review and field inspection process. This same information belongs in the training curriculum of the fire department to assure that the material is being distributed to the operational decision makers in the field, i.e. the Captains and Battalion Chiefs that must make operational decisions.

It is unfortunate that there is often a disconnection between these three components. For example, there may be material available, but not well known to the fire prevention personnel. Then, even if they are aware of it and use it in the code enforcement area, it may not be distributed to the operations division. Contemporary wisdom is that we should do everything we can to prevent that disconnect.

The reality is that the way we build buildings and the materials we are using is changing rapidly due to technological innovations. That rate of change is unlikely to reverse itself any time soon. The other reality is that fires and other stressful events will continue to happen in buildings over their life span and fire fighters will find themselves inside and on top of many buildings that will be undergoing damage from some type of emergency scenario.

There is valuable information on the fire performance of wood products on the website of the American Forest & Paper Association's American Wood Council. (www.awc.org) One of the best publications that person can obtain from this website is entitled Calculating the Fire Resistance of Exposed Wood Members, Technical Report 10.

You can download that document for free from the website. You can also locate 5 other wood product documents that may be of use by the fire prevention bureau. The series is entitled Design for Code Acceptance (DCA) and contain 5 separate documents. They include Flame Spread Performance of Wood Products (DCA-1), Design of Fire Resistive Exposed Wood Members (DCA-2), Fire Rated Wood Floor and Wall Assemblies (DCA-3), Component Additive Method (CAM) for Calculating and Demonstrating Assembly Fire Endurance (DCA-4) and Post – Frame Buildings (DCA-5).

On this same website is a complete listing of websites of associations and organizations that have additional information that can be used to raise the reader's level of knowledge of wood products.

Spend some time on the Internet and raise your departments' level of awareness of what is being done in the area of wood product development. A few minutes on the web might save countless hours in dealing with some factor in the future. As has been said many times before; Information is power.



CHIEF'S FILE CABINET

Ronny J. Coleman

Lastly, there is a project underway to increase the awareness of the fire service on these types of issues. The United States Fire Administration (USFA), in partnership with the American Forest & Paper Association (AF&PA) is developing nationally -applicable education and demonstration materials to enhance fire fighter awareness of the performance of different forms of lightweight construction components such as trusses, glue laminated beams, I-Joists, structural composite lumber and wood structural panels will be described. The American Iron and Steel Institute will likewise, contribute information on lightweight steel framing

This partnership involves development of educational materials to enhance firefighter awareness of the performance of lightweight construction during fires and its impact on firefighter safety. The partnership is working through national as well, as state and local fire training and educational systems to develop a curriculum that can be shared. This project also involves review of existing USFA Courseware, review of existing publications and other course of instruction to update them with the most current information.

The outcome of this project will be the development of print and web-based media that will be useful for fire protection professionals to use in both the fire prevention and operational aspects of the fire service.

In summary, the role of the fire service in saving lives and property is to be the best informed they can be regarding the design and performance characteristics of the most common building material we see in the community; wood. That knowledge will allow the profession to build safer buildings, but will also allow us to combat fires in those buildings in a safer fashion. That knowledge will allow the profession to build safer buildings, but will also allow us to combat fires in a safer fashion.