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Codes and Code Administration

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By

Matthew J. Klaus

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Professor Robert Fitzgerald, Advisor

ABSTRACT

This project was related to building codes, code administration, and the fire department activities related to their enforcement. An in depth analysis of fire codes and the Massachusetts State Building Code was used as a basis for creating a computer program which would allow the fire department to become more efficient in certain aspects of the code regulatory process. Applicable codes were reviewed, and selected parts were organized in a manner that would make their code enforcement responsibilities easier and more consistent.

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Introduction

One of the reasons this IQP was so intriguing was because there was direct work with the Worcester Fire Department involved. The goals of the project were undefined at first while the organizational tasks of the project were being taken care of. At the first meeting with Captain Metterville of the Fire Prevention Division the main goal of the project became very clear to me "help the fire department do their jobs more efficiently". After a few meetings with the captain and various inspectors at the fire prevention division it clear that there was some confusion dealing with various codes that needed to be regulated.

After sitting down and reviewing the different codes that fire departments are responsible for, many problems arose. First there are roughly a half dozen codes that fire departments must follow ranging from National Fire Protection Codes and Standards all the way down to the Local Ordinances. One of the major problems with these codes is understanding who is responsible for regulating what. Many of these codes are vague as to which party is responsible for the enforcement of the regulations. Often times these laws contradict each other? When this occurs, which regulation should be followed? The organization of these codes must also come into question. In certain cases these codes send the reader on a wild goose chase to find what they are looking for, while with simple re-organization, it would be much easier to find.

During the research of various codes it became evident that in addition to assisting the fire department another main goal would be understanding codes and how and why they work, because without this knowledge I would be pretty much useless to anyone. In order to do this it was necessary to find all codes applicable to the Worcester

Fire Department and line-by-line read them to understand the who's, what's, where's and why's of code enforcement.

Once the general idea of codes and code administration is understood, the next goal was to create something to assist the Worcester Fire Department in their daily operation. One area that all fire departments across the country struggle with is time. The department is strapped for time because in addition to actual fire fighting tasks, the codes require they inspect buildings, issue permits, investigate scenes, and attend court hearings, just to name a few. Unfortunately time cannot be created, nor can additional employees be hired to increase the department's capabilities. However there was one way to help them save time while making their work somewhat less tedious. After learning how tedious searching through thousands of lines of code to find a specific item was, the development of a software program and condensed versions of the codes could be used to minimize the time it takes to find data.

When a new structure is built codes require that, depending on the use of the building and its location, the height, area, and construction are specified. Depending on the specific parameters and usage, the building may require fire protection systems. Again, depending on use group. Height, and other factors, these systems will all have requirements that differ from building to building. As can be seen there a many factors that go into finding all the requirements that a building needs. It can take quite a bit of time sifting through codes to find what exactly is necessary. If someone could go through the codes once, and knew a bit about computer programming, it would be feasible to create a program that could list all the fire protection requirements of a building if given the height, area, and use group.

This project focused on the following areas:

- Code and code administration is described in chapter 1.
- The building code organization is presented in chapter 2.
- The specific expectations of the fire department administration is in chapter 3
- Conclusions are presented in chapter 4
- The scope of the laws that are to be administered are found in Appendix A
- The basis for the computer program "Building Code Assistant 1.0" can be found in Appendix B.

CHAPTER 1

Code and Code Administration

Ever since there have buildings, there has been a need for some set of laws to govern the manner in which these buildings were erected. It can be traced all the way back to 1700 B.C. when King Hammurabi would have the builder slain if his work collapses and injures someone. Although the codes we have in place today are not that severe, they still must be respected by all whose work will be encompassed by them.

Before discussing how codes are enforced or even why they exist it is important to understand what they are. Richard Sanderson gives us his definition in his book Codes and Code Administration:

> "A building code is a legal document which sets forth requirements to protect the public health, safety and general welfare as they relate to the construction and occupancy of buildings and structures. This is accomplished by establishing the minimum acceptable conditions for matters found to be in need of regulation. Topics generally covered are exits, fire protection, structural design, sanitary facilities, light and ventilation, and etc."

Sanderson's definition is very simple, but it is consistent with what building codes mean today.

Generally building codes are classified as either specification codes or performance codes. The specification code describes in detail exactly what materials are to be used, the size and spacing of units, and the methods of assembly. The performance codes on the other hand are a little more complex. The performance code prescribes the

"objective to be accomplished" and allows the designer a larger scope of possibilities in choosing what materials will be used and also what type of system would produce the best results. By definition, it would be impossible to enforce a true performance code because the only proof of inadequate design would be the failed structure. The basis of these performance codes is that the materials used and the design methods chosen cannot be at random but rather should be carefully chosen using nationally recognized and accepted test standards. It would then appear that the designer is again being told what materials to use indirectly. The designer is certainly limited to acceptable standards, but they do have some choices, which they would not have if the code was a specification code. All of the model national building codes which will be identified later are performance codes.

The standards used in codes come from all different agencies and are based various tests and information depending on the type of law. There are many agencies that develop and publish standards which are usually specific to an individual field. As far as the building codes are concerned there are 4 major agencies that set up the standards for building construction.

- The first of these agencies is the American Society for Testing of Materials. ASTM standards are developed for both materials and methods used in the construction process. Technical committees examine data and set up tentative standards which are often administered for several years and later evaluated to see if it is worth including them as an approved standard.
- The second major agency that's standards are commonly used in the building codes is the National Fire Protection Association. The NFPA develops and publishes fire

protection, fire prevention, and fire safety standards. In addition to developing and monitoring there own standards they review and evaluate other standards relating to fire and adopt or modify those standards to their publications.

- The American National Standards Institute also creates standards which are often used in governing the building codes. ANSI, like the NFPA, deals with both existing standards and developing their own. ANSI reviews other proposed standards and adopts them and assigns each standard an ANSI ID number regardless of whether they developed the standard or simply reviewed someone else's work.
- The final agency which creates standards that govern building codes is the United States Department of Commerce. The USDC, like the ASTM, does not simply deal with construction standards but standards in all walks of life. The problem with the USDC is that because it is a direct part of the national government there has to be a distinct separation between industry and government. Therefore the USDC has a very strict set of guidelines they must follow in order to set a standard.

Most people in the building profession have no idea where these codes come from. Do they come from a bunch of people sitting around a table making suggestions? Are they based on calculations and formulas? The answer is both. Most of the laws found in a set of codes are based on scientific laws, known properties of materials and the inherent hazards of uses or occupancies. In order to establish the criteria for these laws, code officials examined in depth records of fires, building failures, earthquakes, tornadoes, hurricanes, and floods to see how they effect the structural integrity of a building. Most of the laws that specify a particular size or type of material are based on historical data and formulas for material properties. The more general laws that simply

state something should be there are often not calculated with formulas or data, but rather discussed by a panel of building officials who, using common sense and knowledge specific to their field, decide whether something shall be required.

Rudolph Miller, founder of BOCA in 1915 states that the purpose of a building code is as follows:

> "The building laws should provide only for such requirements with respect to building construction and closely related matters, as are absolutely necessary for the protection of persons who have no voice in the manner of construction or the arrangement of buildings with which they involuntarily come in contact. Thus, when buildings are comparatively small, are far apart, and their use is limited to the owners and builders of them, so that, in case of failure of any kind they are not a source of danger to others, no necessity for building restrictions would exist."

Although Miller's idea is out of date, the general ideas he created for the buildings that require regulations still remain today.

The United States' code history can be traced back to 1625 when the first building law was passed in the Dutch city of New Amsterdam. It was a simple set of rules, but covered major areas such as rules on the types of houses, their locations and also their roof coverings. The population of the city was only 200, but still they felt that there was some need for laws controlling the construction of buildings.

One of the major reasons for instituting building codes was the growing number of fires that were wiping out whole cities. Back in the 17th century private homes had chimneys made of wood, and roofs made of straw and thatch. The smallest spark coming from the already flammable chimney could set the entire house on fire. Homes at this time were also built relatively close, and one of these small chimney fires would end up wiping out an entire city block. The number of fires continued to grow as the populations grew. Despite having better building materials and a rough idea of how to prevent these fires from causing so much damage, the fires got worse and worse. It was because of these major disasters that the National Board of Fire Underwriters finally published a Recommended National Building Code in 1905. Although this set of codes was created due to the major fires, the codes also included structural safety regulations, something that had not yet been considered in a detailed manner for residential construction projects.

The Recommended National Building Code was the recognized model building code in the United States for 22 years until The Uniform Building code was published in 1927. The UBC was set up by the Pacific Coast Building Officials Conference (now the International Conference of Building Officials) simply to create a *model* national building code. The UBC is still used on the West coast and is maintained as a "living document". This means the code is updated regularly to keep up with the rapid technological advancements of the construction industry.

This code was an excellent model for the homes in the western portion of the country, but other areas of the country experienced other problems that this code did not directly cover. In 1945 local building officials in the South created the Southern

Standard Building Code to directly combat specific problems the South was having in regards to construction.

The final national model code, and probably then most well known throughout the country was created in 1950 by The Building Officials Conference of America. It was simply called the Basic Building Code, but is best known today as BOCA.

Despite the fact that there are several model codes available, it appears that the major cities in the U.S. use there own codes. These codes however are based on the BOCA code. In 1968 New York spent $1.5 Million (at that time a huge sum of money) to create a building code for New York City which was latter confessed to be patterned after BOCA. Philadelphia was another city that thought it would be best create their own building code. In the end however, their code looks astonishingly like the BOCA code.

Code enforcement has traditionally been a function of state and local governments, which is why there is no national code in which each city in each state must follow. There are however many reasons that the model codes are a good foundation for codes established by state and local governments. The first of these reasons is that the model codes provide sound regulations for building construction. The model codes are based on sound principles of safety while differentiating between codes and standards. The model codes contain only the necessary requirements to provide for the safety of the occupants of the building as well as surrounding property and people. The model codes also establish performance requirements. This is useful for the local governments in modeling their codes because instead of specifying the materials that must be used as well as the methods in which they shall be erected, they simply state the required performance that the building style and materials must contain. This allows the designer

more leeway in a design and lets creativity play a role in the design of the structure. One of the major reasons builders like the performance based codes is that they can often reduce the overall cost of a structure by using lighter materials or quicker erection methods as long as they fit into the performance standards. The model codes also provide broad background results in unbiased provisions. The laws that are established by the model codes are free of personal bias because they are for the most part formulated on facts and physical data. It is never the case where a model code is simply added because one person believes that would be best. On the more general laws that are not based on specific data or historical occurrences, the decision to instate a law in the model code is never the decision of one person but rather a board of building officials. For this reason the personal prejudices are sifted out and only appropriate, well-thought ideas are discussed as standards.

The model codes also benefit the local governments because they encourage the use of new ideas. The model codes are living codes, so as new ideas come along they are added to provide as much information as possible. The method of preparing the code provisions assures the public reasonable safeguards while permitting the use of new materials and methods of construction. As the new materials and methods are used more and more, building agencies can evaluate them and add to the provisions to make them as accurate as possible. As always, money is a key issue with government agencies including building departments. The model codes benefit these local governments in a financial sense because there is a very small initial cost. If a local government were to prepare and develop their own individual set of laws they would spend hundreds of thousands of dollars hiring consultants and experts on building construction. By adopting

certain provisions from the model codes the local governments save lots of money they otherwise would have had to spend to develop their codes. The model codes also permit convenient and economical upkeep. Changes approved under the sponsor-organizations' procedure after careful study are made available to help communities keep them up to date. When these codes become adopted by local governments, the changes bring the advantages of having completely up to date codes at their fingertips. The final major advantage for local governments who adopt the model codes is that it secures uniformity among code requirements. The adoption of the same codes by all communities in an area allows the uniformity of regulations without sacrificing "individual autonomy" by any community. This also saves money because it makes it possible to eliminate the high cost to the public by circumventing the creation of many independent codes for one area. Although local governments do not have to follow these model codes it would seem that there is good reason to. That brings us to a very important question which has been thrown back and forth for decades with great debate. Should there be one set of national building codes?

It appears that a large number of communities across the United States have either adopted one of the model codes or have based their individual codes on them. So "Why isn't there a national building code?" is a question that has been asked for quite some time. To answer the question there are many factors that have to be examined.

The first thing that is important to recognize is who is it that wants a national building code? There are 3 main parties that keep the drive for a federal building code alive and oddly enough it is often one of the same three parties for some reason that keeps any serious attempt from occurring. The first of these parties is the USDC. The

USDC would like to have a federal code simply because it would appear in all likelihood that they would both develop and control it. They would gain power, indirectly, over all of the state and even larger municipal governments. The local governments also would like a national code because it takes pressure off of them as far as citing specific reasoning for their regulations as well as the annual revisions to their codes that can get very expensive. The final party that would like to see a national building code is the building official agencies. They would like to see a standard developed in which they could aid in the development and annual revisions. The reason why they all prevent this from occurring is that they all have to look out for their own best interest. There is no way to balance the power so that each of the parties can play a major role and have some say without obtaining too much control.

Another major problem with creating a federal building code is to know exactly what is needed. To answer this question several commissions were undertaken to see what exactly was necessary. The advisory Commission on Intergovernmental Relations as well as the La Que Committee both advocate a single federal building code, while the Douglas Commission and the Kaiser Committee both felt that individual codes would better serve the population. The one point that all of these reports cited as key is the fact that local governments have a constitutional right to develop and enforce their own building regulations. It was this fact that the two parties opposing the single code felt they could not get past. The agencies that support a federal building code said they felt despite the right to "promulgate and enforce" building regulations, it was in their best interest to sit back and allow this one hypothetical document to govern every community. Despite the fact that these commissions could not conclude a major need for a single

national code, they made some recommendations they felt would help guide individual communities but not limit them. The recommendations that topped the lists of the two parties who opposed a national code are as follows:

- There should be a national program for the development and furtherance of building standards and technology.
- There should be development of a model code and/or model code standards for building construction.
- All federal agencies should be required to use the same uniform standards for building construction.
- States should not adopt a mandatory state building code based on and not more restrictive than one of the existing nationally recognized model codes and should not permit local governments to alter the model code without state approval.
- States should adopt enabling legislation permitting local governments to adopt nationally recognized model codes by reference and provide for the adoption of future changes by administrative means.
- States should establish appeals boards to reconcile local government's interpretations of the code.
- States should establish product approval procedures for materials and methods used in construction.
- States should have research programs, and provide technical assistance to local government and government agencies.

- States should conduct training programs for building inspectors and code enforcement administrators.
- States should test and examine and license building inspectors and code enforcement administrators.

This is not a full list of the recommendations made by these committees but rather notes on some of the more important issues. Some of these recommendations are not practical but are rather ideal recommendations. The head of each of the two commissions felt that if these recommendations were taken into account than there would be no need for a national code. The commissions that supported the national building code simply felt that instead of following all of the procedures above that an easier solution was to hold everyone to a single set of laws from which there could be no variance without an appeal in a federal court. Leaders of these committees felt that it was more cost effective as well as a less drastic change to simply follow a new code than to start implementing other ideas that did not directly affect the codes themselves but rather how they are enforced. The enforcement or administration of these codes is a completely separate problem than the actual collection of regulations themselves.

Although it seems like a completely different position, a building official is considered a police officer, and the "building department" is considered to be in the field of law enforcement. Former BOCA president Rudolph Miller states it as:

> The official called upon to enforce the building laws, whether he is called commissioner, superintendent, inspector, or anything else, *is a police officer*; not, of course, in the restricted sense of a person whose business it is to patrol a certain

> beat for a fixes period of time for the purpose of arresting offenders against the provisions of the criminal laws, but in the broader sense of a guardian of the peace. His immediate concern however is to see that the public safety to life and limb is secured by the observance of such laws as it has been found necessary to make with respect to the construction of buildings.

Although its seems an unreasonable definition the most clear way to view the administrative position of the person who is in charge of buildings is as a police officer. The building official's main task is the prevention and correction of violations pertaining to building codes. The building official is not responsible for designing a building but his responsibility is to see that the people who design, build, repair and demolish buildings due so in a manner that is within the guidelines.

The building department of any local government is a considered a law enforcement agency in the same manner as the building official is considered a police officer. As a whole the building department is responsible for enforce all laws or ordinances that pertain to building construction. It must be specified by the local government or ordinance that the building department is responsible for overseeing specific provisions. In most situations there is one building official who is in charge of the department and it is he who shall have final say on all in-house decisions.

For the most part regulations that are enforced by the building official are local ordinances that the local government adopted under the police power that the state delegates to them. In some cases the regulations are state laws that require enforcement by the local government. If state and local building regulatory codes are in conflict the

state code takes precedence except when the local code is more specific. The job of a building official is not is for this reason. His responsibilities are vague and his jurisdiction is not very well defined. It is an established principle of municipal law that legislative bodies cannot delegate arbitrary power to administrative officials. Often times the building official is instructed to make a ruling or judgement on a matter in which he has no right to judge. It also works in the other direction, when the building official is supposed to act on a matter they often have no idea because they are very unclear on exactly what their responsibilities are. For these reasons and others being a building official is no easy job.

One responsibility often placed on the official or a committee in the building department is to suggest specific ordinances they feel it would be beneficial for the municipality to adopt. There are thousands of ordinances they can be adopted so whose to say which ones need to be adopted by a specific community? Even further how do they decide if they should follow certain model ordinances? There are a few general questions that a building official or building department in determining whether an ordinance should be adopted.

- Necessity-Is the ordinance necessary to protect the public morals, health, safety or general welfare?
- Feasibility-Is it feasible, by virtue of being fair, general, impartial, and not in conflict with the common rights of individuals nor unduly oppressive to them?
- Enforceability-Can it be efficiently enforced under the limitations of: the remedies available under civil law; and/or, the sanctions of criminal law; and/or, the capabilities of enforcement personnel?

If a regulatory ordinance does not answer yes to one of these questions than it will usually prove to be troublesome at some stage of the enforcement process.

Although it seems to most members of our society that the police and other law enforcement agencies, such as the building administration offices, are solely responsible for the suppression of crime and the enforcement of laws, that simply isn't true. In a perfect world the public would be able to rely 100% on the government to ensure all laws are enforced. The ratio of citizens to law enforcement officers shows how this is just not possible. Each law enforcement officer would be responsible for enforcing laws tens of thousands of people. Many people naively think that the US government is self-enforcing. In the original intention of all laws established in the US government, the public not only had the right, but also the duty to their country to report on other citizens in violation of the law. This idea is still valid, although it is only seen now in rare cases. Until the later half of the century the government relied heavily on "aggrieved citizens" to bring action against violators. Although this doesn't seem to have much correlation with building codes it in fact has a very large impact. Because it is impossible for one person to enforce and regulate the laws special position had to be added. The position of building inspector has become synonymous with trouble from the vantagepoint of most contractors, but building inspectors are a necessary part of keeping the public safe. Many people who do not support the idea of a building inspector simply feel that no one should have the right to actively seek wrongdoing in the building system:

> Writers on administration frequently distinguish administrative regulation from judicial regulation by saying the former is preventative while the latter is

> corrective or retributive. The chief difference, however, is that the administrative agencies actively seek out violations that would never be reported under judicial regulation with its reliance on regular police and public prosecutors. As a consequence, administrative regulation achieves more compliance because it engages in more enforcement, (and has) a more highly organized complaint system.

It is clear to see that despite not being the most popular way to enforce codes, having inspectors regulate code compliance is a very effective way to make sure that nobody is endangering citizens by circumventing the laws. Inspectors are responsible making inspections on both new construction as well as certain existing structures It is the inspection of these existing structures which causes most of the problems and gives codes officials a bad name. The searches are only controversial because there is no search warrant obtained to enter the premises. The owners of such buildings often claim that the search is unconstitutional because it is a deprivation of due process of law within the Fourteenth Amendment of the US Constitution. Technically because the constitution states the rights of all US citizens it supercedes all local and state ordinances that may require such inspections take place. After years of building inspectors battling with building owners, a case went to the Supreme Court, and to the dismay of local governments the ruling of the Camara vs. Municipal Court of San Francisco was as follows:

"...the citizen may lawfully refuse to admit the housing inspector in a non-emergency situation, were such inspector is not possessed of a search warrant or probable cause to believe the local housing ordinance is being violated."

In these situations where an inspector is turned away, it often because a personal battle, not just a case of municipal law, this is how building inspectors often get a bad name. Often times building inspectors will go to all costs to get a search warrant or at least provide probable cause so that they will be allowed to enter the premises by court ruling. Inspectors often spend their time talking to neighbors and digging up other infractions on the building owner until something gives. If the inspector is doing this "investigating" many people question if he doing his job as far keeping people safe. We use this example simply to present some of the difficulties faced by code enforcement personal. As you can see code enforcing is not an exact science and lack of cooperation from the public and even laws and rights afforded by the country often work against the code enforcers.

Because the code enforcement agencies have so much going against them to start with, it is imperative that the system in which the administration operates is efficient. One of the major problems with code administration is that they do not operate at peak levels for whatever reason. So what does it take for an administrative body in the field of code enforcement to run efficiently? Chester Barnard the "most quoted American author" in the field of administrative order gives some of the following ideas on what characteristics are necessary to create an efficient and effective administrative code enforcement body:

- Support from local legislature

- Support from local chief executive figure
- All code enforcement functions must be restricted to one agency
- Code enforcement must be the sole function of the administration
- The code enforcement agency must have department status
- The administrator of code enforcement must be responsible directly and exclusively to the chief executive

No administrative code enforcing organization can be effective without the support of the local government. As stated in the above example, indifference on the part of local legislative bodies usually does not bode well for code officials. It is the legislative portion of the local governments that can create local ordinances to aid the building officials so that they can do their job better and create a safer environment for citizens. It also the local government that can provide financial support so that code officials have the necessary technological support to do their job properly.

Possibly even more important than the legislative body is the executive. Whether it be an executive on a local, state or even national level, when the code enforcers have the support of the chief executive figure they again will be aided both financially and by various legal aspects the executive has the authority to establish. Although it would often appear (on the national level) that the legislature and the executive figures do not see eye to eye, from a code enforcement point of view it is seldom where a power struggle occurs, especially on the local levels. Therefore the importance of having the executive power is crucial for the department to run effectively.

One of the most difficult aspects of code enforcement is that certain codes are to be inspected and regulated by one department where other codes in the same set of

bylaws must be regulated by another department. For example in the Massachusetts State Building Code, codes established in chapter 9 are to be regulated, inspected and enforced by the head of the local fire department. Other chapters such as 4 & 5 are to be regulated by the building code, and other chapters dealing with electrical code involve both the fire department and the building department. In some cases the separate departments have certain ideals that they feel are quite important, where the other department may think it is trivial. It is these situations where problems can occur. Although the departments are both trying to accomplish the same task, they often end up butting heads due to differences in opinions. As stated above in the inspection without a search warrant example, often these little differences become personal and the separate departments go to all lengths so that they "win" the argument. All they are doing however is creating a gap for future relations and more importantly making their jobs more difficult. In many situations the I'll scratch your back if you scratch mine" philosophy comes into play in these situations. The only problem with that it is often the citizens who pay because certain laws may not be enforced to the degree in which they were intended. By creating an agency where all code enforcement is controlled from within, everyone is working together towards the same goal. In an ideal sense this code enforcement agency would not be connected to any department such as the police, fire, building or hosing departments, but rather an independent "Code Enforcement Department". In this ideal sense the department would consist of specialists in the various fields where codes would need to be enforced. This would include electrical, plumbing, fire and a handful more specialists all with the common interest of making sure all statutes are being followed in the manner in which they were intended. . This is not economically feasible because the

extra department would require up to two dozen more employees than would normally be needed under the conventional municipal government structure. The reason why this is ideal and not real, is because this department would have nothing to do establishing new codes, nor could they have anything involvement with the other departments they would normally fit into.

The idea that the sole function of the enforcement agency should be code enforcement seems pretty obvious, but unfortunately that is not always the case. Often times the municipal government tries to create an "ideal" community where everything runs smoothly, however the smaller agencies within the government cannot allow this if they are to do their jobs properly. The goals of the component agencies must be more narrow and defined. When the goals set forth by the municipality are broad and undefined, it often means that each department must take on additional varying tasks they normally would not be responsible for so that the government's lofty goals become attainable. When this occurs, and it does more so than not, the enforcement agencies become distracted with the "other" tasks they must undertake. Therefore, these specialized agencies become just another part of the government without a one, single, concrete direction where they can focus all their energies.

In order for any administrative agency to be effective, they must be considered a separate and self-contained entity. As we said above, when one department is faced with more than one task in an unrelated field there is no finite direction given to that department. A single function department however has "organizational independence" which allows them to emphasize all of their time and energy on the sole purpose assigned to them. Often times however a unit of the municipal government will be placed within

another department which h as a much larger scope, and the goals of the smaller unit cannot be met due to the overall goals of the department. This is known in municipal and state government as the stepchild effect. Where the small, but important unit, is forgotten because the large department must take care of it's own needs first. A major example of this can be seen within many local fire departments. There is a portion of the fire department that is responsible for upholding portions of state and local building codes. In many cases the unit is known as the Fire Officials unit or Fire Code Division. This division is a separate entity and has nothing to do with the physical act of fighting fires. Often times this division is placed in the general Fire Department where they interact with individuals who fight fires as well as their superiors. Although this does not seem to be a big deal, often time the code specialists are distracted from doing their intended jobs because they are asked to fill in somewhere or undertake a task where regularly the fire department would be responsible. This is used as a cost-cutting measure by municipal governments. It is not intended to take away from the "Code Enforcement Units", but rather to get as much from each individual as possible. When a department has a wide range of functions, usually the most attention will be placed on the functions that are most glamorous and provide the most publicity. In the example of code specialists be treated in the stepchild manner, this is often what happens. Obviously the men who go out and fight the fires and save lives will receive the most glamour and press. Naturally the government would like to see these people rewarded by paying the utmost attention to them. But to do it at the cost of another department, which is equally important, cannot be justified. Often times had certain buildings been inspected properly and shown the

attention they deserved, fires would not occur and the firefighters themselves would not need to be used.

The final key to establishing a solid administrative foundation is allowing the administrator of code enforcement to be exclusively responsible to the chief executive. Often times the chief executive do not act on all the power that is bestowed upon them. This happens for many reasons, mostly however because the executive is unaware of exactly what power he has. However often times the executive is too concerned about public opinion to act on what he feels is right. The executive can use public opinion to his favor through tactful politics. In the case of code enforcement often times the executive needs the general public and often times specific "clientele groups" to show the importance of a new statute or method of enforcement. It is these clientele groups that can make the whole system flow better if they are dealt with properly. It is relatively easy to see that because the public and the clientele group are responsible through the democratic system for appointing the executive, that the executive and the public will always be closely linked. The importance of the code administrator having close contact with the executive is because programs established by the administered will be quickly adopted by the public if the administrator is well liked. If the executive is solely responsible for the administrators than it can be assumed that all the right steps will be taken to assure appropriate action in the manner of code enforcement. If the executive is not well liked is often difficult for the administrator to do his job properly because the executive often cuts corners trying to sway public opinion. The idea of the administrator being *solely* responsible to the executive is also quite easy to see. It does not take a political genius to know how governments work. Often time certain representatives are

at odds with others and it becomes a battle for power and personal namesake. If the administrator was to answer to more than one member of the local government there would be no finite direction for him to follow. He would have to do his job while appeasing multiple people, which obviously does not allow him to do his job as best as possible.

Now that we understand ways to allow code enforcement bureaus to operate better, we must now understand what it is they do. The code enforcement branch has many functions that are all in some way inter related. This is a list of the most important tasks in which every code enforcement branch must undertake:

- Examines Local Service Companies
- Licenses Local Service Companies
- Issues Permits
- Inspects Specific Municipal Matters
- Periodic Existing Structure Inspections
- Issues Violation Notices
- Conducts Show-Cause Hearings
- Enters Complaints in Court

By far the two most basic and grounding functions of any code enforcement agency are examinations and inspections. The two sound very similar but the major difference is the time at which each occur in the code enforcement process. The examination occurs *before the fact* and has the sole purpose of predetermining the possibility of code compliance. The inspection function occurs *after the fact.* The purpose of the inspection process is to determine if code compliance has been reached.

Depending on the outcome of the inspection either situation is resolved or further action is taken. Within the function of the examination process, many activities must be undertaken in order to reach the scope of its intention. The following is a list of activities that must be undertaken to ensure the examination is thorough:

- Devising and administering examinations-This aspect ensure s that local service providers are capable of doing the job they are advertising. The agency must devise an examination which covers all materials that some one in the desired service area would need to know. The exams are offered through the agency and often must be taken on an annual basis to ensure each service provider is keeping up with current technology.
- Devising and examining applications-The code enforcement bureau must also devise an application so that anyone who wishes to enter a field of public service will have his/her record properly checked, so that qualifications can be validated. The enforcement agency is responsible for examining local service providers to ensure that the public is being provided with appropriate attention. The agency must review all plumbers, electricians, contractors and dozens of other service providers to make sure that the companies history shows that they are following all pertinent statutes that are relative in their line of work.
- Examining plans-The agency is responsible to check construction documents to ensure that all applicable codes and statutes are being satisfied. This is a large portion of the work done by the agency and can be very time taking.

- Issuing Licenses-To ensure that only qualified individuals obtain permission to work in their desired field. The code enforcement department must than license the appropriate companies who have met the standards provided by the municipality. Without a license the service providers are not allowed to operate within that that municipality and usually within the state. This is often a forgotten part of the code enforcement process. By examining and licensing the appropriate companies it makes it easier on the part of the agency later on because when they know what to expect when it comes to the inspection process. If it was not required to obtain a license there would be no quality control within the industry, which would make the job of the code administrators exponentially tougher.
- Issuing permits-A permit is a simple registration method so that the department knows the activities at certain locations. Permits are required for various reasons such as construction, modifications, plumbing installation, demolitions, and dozens more. It is the job of the department to issue this so that their record-keeping is up to date as far as what is being done where.
- Collecting Fees-There are standard fees for licensing and permitting. It is the job of the code enforcement bureau to collect these fees and allocate them to the appropriate municipal government's branch.

The inspection function is the other major part of the code enforcement process. Like the examination function, the inspection process can be broken down into a few major categories that help comprise the overall inspection function:

- Inspecting construction as it progresses-The agency is responsible for checking on the progress of a construction progress periodically. This is done because often times violations can be hidden with time. If the builder violates a law they can build over it so that the inspector will never know. Obviously this can create a very dangerous situation.
- Inspecting building alterations-When a building is being altered, the new construction often means that new laws are applicable to the building. For example if a steel beam storage facility is altered into a volatile chemical facility, there are different and stricter laws that volatile chemical storage facilities must follow.
- Inspecting newly installed equipment-Equipment such as underground oil tanks and mechanical systems must be inspected for safety reasons. Oil leaks or faulty containment can lead to serious health hazards, and because it puts citizens in danger enforcement officials are responsible for it.
- Inspecting existing structures periodically-This is the most controversial duty that the code enforcers undertake. There are often differences of opinion in the reasoning for the periodic search which causes problems between owners and code enforcement agents.
- Investigating complaints of violations-As stated earlier code enforcement officials depend greatly upon the general public to help them do their jobs better. This function of the inspection activities can also become quite problematic if the citizens do not cooperate. This aspect of the job done by inspectors is taken very seriously because this is where they can show first

hand to both violators and other citizens how important code regulation is. In many cases when a violation occurs, the violator often does not think it is a serious offense. If they are dealt with by an agent in the fashion of a complaint, they often see how serious these violations can be.

- Issuing field violation notices-In many cases an agent will be out in the field doing something totally irrelevant to violation inspecting, and will come upon a blatant code violation and will right up the violation to the building owner to notify them of the violation.

Another function that takes a lot of the department's time is issuing permits. Because permits are required for so many reasons, depending on the size of the city hundreds of permits can be granted in a day. The code enforcement agency grants permits to electricians, contractors, and various other professionals who are providing a service which requires by state law they receive permission to perform such act. By requiring permits the agencies also set up a system for record keeping. Permits are stored by location and date so that the department knows exactly when a permit is expired. This also allows the department to keep track of all activities at a particular location.

The final major area that takes up a large portion of the department member's time is conducting show-cause hearings and entering complaints in court. Both of these involve legal proceedings which often can become long and drawn out which wastes becomes a waste of time for the department. A show-cause hearing is conduct to allow the violators time to arrange for compliance. These are usually arranged for minor and innocent infractions. The code official also has to enter complaints in court against violators who have not arranged for compliance due to neglect or difference of opinion.

CHAPTER 2

Required Code Organization

There are a few codes that the local fire departments of Massachusetts are required to enforce. For the most part all of these codes are set up in a similar fashion from an organizational standpoint. One of the major codes that must be regulated by the fire department is the Commonwealth of Massachusetts Board of Fire Prevention Regulations. This set of codes is more commonly referred to as the 527 CMR. We will examine the 527's in terms of organization.

The 527's are set up so that initially it would appear that the codes are only applicable for the fire department and no other municipal department. The set up would also suggest that the regulatory obligations of the department would be clearly defined. Neither of these are the case. This is not to say that this code is poorly constructed, but rather in achieving the certain affects of organization the code designers wanted, certain areas had to suffer. The code is set up in a manner where each topic is a separate chapter. For example there is one chapter for model rockets, one for fireworks and one for mortar and cannon firing. This set up is appropriate for persons wanting to know what the regulations are for a specific area. However from the view of the head of the fire department, the regulations that he is responsible for enforcing are spread throughout the pages. Also subtopics of each chapter are broken down into specific sections. These sections, are again, not based on the fire departments responsibilities, therefore the code enforcers for the fire department have to search paragraph to paragraph within each chapter to find what is necessary. This is a complete waste of time for the inspectors whose days are filled with important, life-saving duties.

The two main goals of this project were to get a better understanding of codes, and to assist the Worcester Fire Department in anyway possible. A perfect means of achieving theses two goals would be to create a condensed version of the code that dealt specifically with the responsibilities of the fire department as they pertain to specific tasks. This Condensed version of the codes can be found in appendix A-1.

After considering the format of the work done with the 527 CMR, the prospect of creating a form for each of the other codes, from the perspective of department responsibility, became quite reasonable. The Worcester Fire department is responsible for following several codes. As stated above their responsibilities are not always clearly defined in these codes. For the sake of clarity, condensed versions of the following codes were created for the purpose of quickly identifying responsibilities of the department:

- The Commonwealth of Massachusetts
  Board of Fire Prevention Regulations- 527 CMR
  APPENDIX A-1
- Massachusetts General Laws: Fire Prevention-Chapter 148
  APPENDIX A-2
- Revised Ordinances of the City of Worcester Massachusetts
  APPENDIX A-3

As stated before, these appendices were not created because the original version of the code was poorly constructed, but rather to view the codes from a different organizational standpoint.

CHAPTER 3

Organization of Chapter 9 of the MSBC

Chapter 9 of the Massachusetts State Building code is the portion of the code that deals with fire protection systems. This section is the thorn in the side of all fire prevention divisions. Many problems arise from this section of the code because there are so many possibilities that can occur from one misinterpretation of the code. Much of this section of the code is based on other parts of the Massachusetts State Building Code. In addition to that most of the regulations established in Chapter 9 are based on the other regulations in Chapter 9. This causes many "if" and "then" type situations for someone trying to get through this section of the code. It is almost as if one needs a map to get from point A to point B in Chapter 9.

After some studies it was decided to create a "map" to help guide people through chapter 9. The basic idea of Chapter 9 is to determine exactly what forms of fire protection systems are necessary for a particular structure. On top of that after finding out what systems are required Chapter 9 also describe what specifically is required of each system in its specific use. Because the chapter is broken down system by system, not use group by use group, the code regulators have to go back and forth between sections of the code to find out what is necessary. This procedure can take hours because of all of the if and then statements. After creating a map (APPENDIX B-1) I figured that by making a series of maps based on the height, area, and use group of a structure, the entire chapter could be dealt with in a more efficient and sane manner.

After creating the model map for Use group B, maps were created in question form based on the requirements in Chapter 9. In order to do this, Chapter 9 was studied

and each required regulation was identified and categorized by use group. Often times these regulations are based on the physical properties of the building. It is in these cases where the "if"/"then" statements occur. After compiling the specific requirements for each use group (APPENDIX B-2) and the general requirements for all use groups regardless of height and area (APPENDIX B-5), each of these requirement lists were put into question form. The question form documents (APPENDIX B-3) simply derive the requirements of a building by simply answering a series of yes no answer based on the physical properties of the building. After answering the series of questions, it can be easily determined which systems are necessary for the particular building. Each system has it own separate list of requirements (APPENDIX B-4) which can be found after the system is identified.

Using this series of maps saves a lot of time compared with delving through Chapter 9 for each individual case. After discussing the project with Michael Szelag, who is working on a similar project, the idea for creating a computer program to facilitate the search through the maps became a distinct possibility. A computer software system was created that allowed one to find the requirements for a building in literally seconds. After simply entering the height, area and use group, the program will identify not only the construction types that are applicable for the entered data, but also the lists of questions that need to be answered to further identify requirements. After just clicking the appropriate answer to the question, Building Code Assistant 1.0 will provide an in depth printout of all necessary systems. The program can also provide all of the requirements each individual system's needs simply by highlighting the particular system.

After test running the system a few times it was much easier to use than manually finding all of the requirements. Hopefully, this program will be useful in assisting people through Chapter 9 of the MSBC. A copy of this program was given to the Worcester Fire Department.

Conclusion

As time goes on building codes and fire prevention codes become more and more complicated. It is easy to see that this is done to make communities safer for the people who live there. Unfortunately, the deeper that these codes get, the more confusing and harder to follow they become. This puts a heavy burden on the code enforcers of every municipality.

After reviewing each line of each code and analyzing and organizing the structural and textural aspects of the code one can realize that it is not something that many people will ever have to deal with. An alternate reference for code administrators may alleviate some of the stresses and time pressures that are felt each day dealing with the code. The condensed versions of each of the codes is not a substitute for the code itself, but rather a quick reference guide for the fire department to use when they are try to find out which regulatory responsibilities they have dealing with a specific topic.

New building construction is an area that has been time consuming for fire departments all across the country. Most people assume that the building department is responsible for reviewing the plans and determining what the structure should contain to make it safe. The fire department however plays a large role in this as well. Often times members of the fire prevention division spend hours searching through the chapters to find something, where in the end there is no concrete answer, but simply an interpretation of what the code requires. A program that can provide required systems and also system requirements in a matter of minutes, can free up time for the local code enforcers so they are not spending the entire day searching through complex lexicons.

This project has been quite beneficial on several levels. I now have a solid understanding of various types of code, and understand the complexity of enforcement. I also had an opportunity to interact with the Worcester Fire Department, and to learn how things are run inside a fire prevention division. I have also gained some experience on computer programming. Overall, I learned a great deal from undertaking this project and hope that the work I have done will be beneficial to others.

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APPENDIX A

A-1

The Commonwealth of Massachusetts Board of Fire Prevention Regulations- 527 CMR

The Commonwealth of Massachusetts
Board of Fire Prevention Regulations
527CMR

Chapter 1-Administration and Enforcement

Code 1.01 General

The provisions of 527 CMR are not intended to prevent the use of any material or method of work not specifically prescribed by 527 CMR, provided such alternative has been approved by the head of the fire department.

Said alternate approval shall be allowed only when the head of the fire department is provided with such sufficient proof as he may require.

A copy of the approval of the head of the fire department shall be provided to the applicant and kept on file by the head of the fire department

Code 1.02 Applicability

Buildings built in compliance with the codes at the time of construction are exempt from anything in 527 CMR pertaining to the following matters:

Isolation of hazardous operations and mixed uses, provided however that the head of the fire department shall require the installation of fire safety devices or systems.

Code 1.03 Enforcement Authority

1. It shall be the duty and responsibility of the Marshal or the head of the fire department or his designee, to enforce the provisions of the code as herein set forth
2. Whenever an inspector from any agency or department observes an apparent or actual violation of some provision of some law ordinance, code or bylaw of the jurisdiction, not within the inspector's authority to enforce the inspector shall report the findings to the code official having said jurisdiction.
3. The marshal, an inspector, the head of the fire department may enter at any reasonable hour any building or other premises or any ship or vessel, to make an inspection or investigation without being held or deemed guilty of trespass.
4. The head of the fire department shall investigate the cause and circumstances of every fire or explosion to determine if such fire was caused by carelessness or design.
5. The head of the fire department shall keep a record of all fires or explosions, with the results of such investigations, and such records shall be open to the public.
8. The head of the fire department is hereby authorized and empowered to take such action as may be necessary to abate such dangerous or unsafe conditions including the evacuation of buildings and/or the transport of hazardous materials, the speed, routes, amounts, and hours of transport through the city, town or district shall also be regulated.

Code 1.04: Permits

1. The head of the fire department shall grant permits as required by 527 CMR or as required by M.G.L. c. 148 and make such inspections as required in M.G.L. c. 148.
2. Application for a permit required by 527 CMR shall be made on form furnished by the head of the fire department.
4. Plans approved by the head of the fire department are approved with the intent they comply in respects to 527 CMR.
5. The head of the fire department may revoke a permit or approval issued under the provisions of CMR if upon inspection any violation of the code exists, or if conditions of a permit have been violated.
8. The head of the fire department or his designees shall have the authority to issue the following permit types, as described in 527 CMR and M.G.L. c. 148.

Code 1.06: Orders to Eliminate Dangerous or Hazardous Conditions

1. Whenever the marshal or the head of the fire department finds in any building or upon any premises a violation of 527 CMR or any condition likely to cause fire or ant obstacle to easy ingress or egress from such building, they shall, in writing, order the same to be remedied. Notice of the violation shall be served in accordance with the provisions of M.G.L. c. 148 including but not limited to:

(a) Dangerous conditions which are liable to cause or contribute to the spread of fire or explosion in or on said premises, building or structure or endanger the occupants thereof;
(b) Conditions which interfere with the efficiency and use of any fire protection equipment;
(c) Obstructions to or on fire escapes, stairs, passageways, doors or windows, liable to interfere with the egress of occupants or the operation of the fire department in case of fire;
(d) Accumulations of dust or waste material in air conditioning or ventilating systems or grease in the kitchen or other exhaust ducts;
(e) Accumulations of grease on kitchen cooking equipment, or oil, grease or dirt upon, under or around any mechanical equipment;
(f) Accumulations of rubbish, waste, paper, boxes, shavings, or other combustible materials, or excessive storage of any combustible material;
(g) Hazardous conditions arising from defective or improperly used or installed electrical wiring, equipment or appliances.
(h) Hazardous conditions arising from defective or improperly installed equipment for handling or using combustible, explosive or otherwise hazardous materials;
(i) Dangerous or unlawful amounts of combustible, explosive or otherwise hazardous materials;
(j) All equipment, materials, processes or operations which are in violation of the provisions and intent of 527 CMR.

2. Fire protection systems shall not be disconnected or otherwise rendered unserviceable without first notifying the fire department. Installation of, or modification to, any automatic fire protection system shall require a permit from the head of the fire department.
4. When, in the opinion of the head of the fire department, there is actual and potential danger to the occupants or those in the proximity of any building, structure or premises because of unsafe structural conditions, or inadequacy of any means of egress, the presence of explosives, explosive fumes or vapors, or the presence of toxic fumes, gases or materials, the head of the fire department shall order the immediate evacuation of said building, structure, or premises. All of the occupants so notified shall immediately leave the building, structure, or premises and persons shall not enter or re-enter until authorized to do so by the head of the fire department.
5. The head of the fire department observes any condition which he believes to be a violation of any provision of 780 CMR, shall report the same to the authority charged with the enforcement of such provision.
6. The head of the fire department is delegated to inspect buildings and structures in respect to the maintenance of safe conditions of use and occupancy shall immediately notify the respective official of any CMR violation promulgated by and agency of the Commonwealth of Massachusetts.
7. The head of the fire department may request the legal counsel of the jurisdiction to institute the appropriate legal proceedings to restrain, correct or abate such violation or to require removal or termination of the provisions of 527 CMR or of any order or direction made pursuant thereto.

Code 1.07: Penalties

1. Violation of any lawful rule or order of the head of the fire department, punishment whereof id not otherwise provided for, shall be punished by a fine of $50 for each day during which such violation continues after actual notice of regulation, rule, or order.

Chapter 2 The manufacturing, storage, transportation and use of fireworks

Code 2.04: Certificates of Competency and Permits for Supervised Displays of Fireworks

1. No person shall conduct a Fireworks Display unless they possess a Certificate of Competency (Fireworks Display) granted by the marshal.
2. No person or firm shall detonate or use fireworks unless they possess a Permit to Display Fireworks obtained from the head of the fire department.
   (a) Applications for a Permit to Display Fireworks shall be made by a competent operator and shall be in writing on forms furnished by the Department of Fire Services.
   (b) Application shall be made in writing to the head of the fire department.
   (c) 6. The head of the fire department shall notify the Marshal of such substitution within two working days following the display.

9. The head of the fire department shall make or cause to be made an investigation of the pertinent facts set forth in the application and a physical inspection of the display grounds for the purpose of determining compliance with the provisions of 527 CMR 2.00. The head of the fire department shall transmit one copy of the said application to the Marshal and one copy to the applicant with his endorsement thereon in compliance with provisions of law, or his reason or reasons for withholding such endorsement.

(f) A valid Permit to Display Fireworks (Supervised Display of Fireworks) and a Certificate of Competency (Fireworks Display) shall be in possession of the operator at the display site and shall be produced for inspection, in hand, when requested by the head of the fire department.

(g) The head of the fire department or the Marshal may restrict the terms and conditions of a Permit to Display Fireworks.

(h) A Permit to Display Fireworks (Supervised Display of Fireworks) may be suspended or revoked by the head of the fire department for any violation of 527 CMR 2.00, or M.G.L. c. 148.

Code 2.05: Manufacture of Fireworks

3. A fire safety analysis shall be required. A registered fire protection engineer shall conduct such analysis.

Code 2.06: Transportation of Fireworks

3. Application for this permit shall be made to the Marshal.

(i) 2. Motor vehicle transporting fireworks shall not be towed while containing fireworks unless directed by a police officer, the head of the fire department, the Marshal or his designees.

Code 2.07: Storage of Fireworks, Pyrotechnic and Explosive Compositions

3. (b) All buildings where fireworks are manufactured, kept or stored shall be open to inspection by any officer or inspector of the Office of the State Fire Marshal or the head of the fire department or their designees.

(c) A permit from the head of the fire department or the Marshal shall be required for the storage of explosive material not specifically covered by 527 CMR

(d) The head of the fire department or the Marshal may authorize, by stating on a permit to Display Fireworks (Supervised Display of Fireworks) the temporary keeping or storing of Fireworks pursuant of the fireworks display authorized by the display permit.

4. (a) Fireworks may be kept in a building if it is kept secure from the public and is guarded under such conditions as required by the head of the fire department.

1. Fireworks kept in excess of 2,000 lbs shall be kept or stored in a building located at a distance not less than 1,000 ft from any other building under such conditions as required by the head of the fire dept.

(b) All premises used for keeping or storing of fireworks shall be provided with such fire extinguishing equipment as may be required by the Marshal or head of the fire department.

Code 2.08: Supervised Display of Fireworks Outdoors.

3. (a) After a permit has been granted the permittee shall keep the plan available at the site for inspectors or other designated agents of the head of the fire department or the Marshal. Any performance adding fireworks different from the performance described in the permittee's plan shall require approval by the head of the fire dept.

(d) A test shot shall be provided to check for high level winds at the request of the head of the fire department or the Marshal.

(e) The competent operator, the Marshal or the head of the fire department may order the postponement of the display for any violations of this code.

(g) Upon completion of the search, a competent operator shall report all findings to the head of the fire department

(h) The head of the fire department shall designate the location and the type of fire extinguishing equipment as may be required.

(k) Any explosion, fire or other accident, occurring in connection with the keeping, storage, manufacture, handling, transportation, supervised display or other disposition of fireworks causing loss of life or injury to any person or damage to property shall be reported by the competent operator immediately to the Marshal, giving a detailed account of same and confirmed writing.

8. (b) After a permit has been granted, the permittee shall keep the plan available at the site for the inspectors or other designated agents of the head of the fire department. Any display adding fireworks shall require approval by the head of the fire department.
(c) All barges and vessels used as launch platforms for the supervised display of fireworks shall be open to inspection by the Marshal, head of the fire department, harbormaster having jurisdiction, or to any person delegated by the aforementioned.
(j) Each such barge or vessel shall be equipped with at least two portable fire extinguishers as directed by the head of the fire department, the Marshal or their designees.
(k) All barges and vessels shall be subject to assignment as to cargo loading and display locations by the head of the fire department.

Code 2.09 Theatrical special effects or pyrotechnical display before a proximate audience

4. (a) Every supervised display of "special effects" shall be handled by a competent operator who shall have been approved by the Marshal.
(b) 5. Evidence of a valid certificate of insurance for liability to the city or town, in an amount approved by the head of the fire department
5. The head of the fire department may waive the requirements of 527 CMR if he or his designee has witnessed essentially the same display at a similar separate location
8. Only those pyrotechnic compositions, devices, containers, and detonating devices listed in the application and approved by the Marshal shall be used.
15. The Marshal, or head of the fire department may order the cancellation of any display for violation of this code.

Chapter 4 Oil burning equipment

Code 4.03 General Requirements

1. (b) The head of the fire department may grant a temporary permit for the keeping and use of fuel oil under such terms as he may prescribe.
No fuel oil burner shall be installed in any building or other structure without a permit first having been obtained by the head of the fire department.
(d) No persons shall make an installation or alteration of any fuel oil burning equipment unless an application for a permit from the head of the fire department has been submitted
(f) The person shall file with the head of the fire department a certificate of completion on a form provided in 527 CMR
Upon receipt the head of the fire department shall make an inspection; if same is found to be in accordance with this code, the head of the fire department shall issue to the owner or occupant a permit for the keeping, storage and use of fuel oil in connection therewith.
(h) If any oil tank, oil burner, oil burner control or wiring related to an oil burner has been exposed to fire and is suspected of being damaged the entire installation shall be made inoperative by the head of the fire department who shall so notify the owner or occupant of the building or structure. Said installation shall not be operated until approved by the head of the fire department.
(i) Unless otherwise provided for in 527 CMR a permit shall be obtained from the head of the fire department for the removal of a fuel oil storage tank.

Code 4.04 Oil burners light fuel type

5. 5. Where an appliance is installed in a location in which the operation of exhaust fans, kitchen ventilation systems, clothes dryers, or fireplaces be made subject to the approval of the head of the fire department.

Chapter 5 Operation and maintenance of buildings keeping and using gasoline or other motor fuel.

Code 5.03 Location and Construction

4. When motor vehicles which are kept in a garage are loaded with merchandise which is of such a flammable nature as to be readily ignitable, such garage shall, if in the opinion of the head of the fire department it is deemed necessary, be equipped with automatic sprinklers.

Code 5.06: Inventory

1. The records shall be kept on the premises or readily available for inspection by any member of the Department of Public Safety or head of the fire department.
4. The operator of the location shall be responsible to notify the head of the fire department of situation, and to notify the owner or person(s) in control of the facility to take action to correct any abnormal loss or gain not explainable by spillage, temperature variations or other causes. The term owner shall mean the person(s) who owns, as real property, the tank storage system used for the storage and dispensing of flammable and combustible liquids.
5. (e) If 527 CMR 5.06 (a) through (d) do not explain the apparent loss, the situation shall be reported promptly to the head of the fire department.
7. The owner and operator will conduct an inventory verification program on a scheduled basis, at least once every year. A copy of the record of this verification program shall be kept on the premises available for inspection by any member of the Department of Public Safety or head of the fire department.

   Note: Upon the cessation of the exercise of a license, the holder of said license shall notify the local licensing authority and head of the fire department in his area or district. The head of the fire department shall prescribe rules to eliminate hazardous conditions incident to such cessation.

Code 5.07: Dispensing Equipment

1. Dispensing devices shall not be installed inside a building or less than ten feet from the outside of a building unless specifically approved by the head of the fire department.

Code 5.08 Delivery

Facilities of more that 1000sq ft of retail sales area and eight or less fueling positions may be operated by one attendant during non peak business hours after revue by the head of the fire department and included as an addendum to plans submitted to and approved by the Marshal as described in 527 CMR.

Records of customer counts and motor fuel sales and receipts shall be maintained by the owner/operator and shall be made readily available upon request of the office of the State fire Marshal and/or head of the fire dept.

6. A permit has been obtained by the owner of the premises for such fueling operation from the head of the fire department of the city or town where the fueling is to take place. Such permit shall be granted provided the owner of the fuel truck complies with this code.

   The head of the fire department may prescribe the conditions under which the fueling may be conducted.

Code 5.09 Operation and Maintenance

8. Extinguishers shall be located at the direction of the head of the fire department

Code 5.10 General Provisions

2. All garages and the manner of keeping, storing or using gasoline in connection therewith shall be subject to inspection by the state fire marshal, the head of the fire department or their designees.

Chapter 6 Liquefied petroleum gas containers and systems

Code 6.04 Approval of Equipment

1. The head of the fire dept. shall approve all LP-gas installations or the State fire marshal as herein provided
3. LP-Gas installations having a product vapor pressure greater than that allowed for commercial propane each measured at 100 degrees F shall be subject to approval by the Marshal.

Code 6.07 Installation Standards and Procedures

3. The head of the fire department may increase the distances herein provided where, in his opinion, conditions are such as to warrant such increases
4. No underground container may be abandoned in place and any abandoned underground container must be removed by the tank owner under the direction of the head of the fire dept.

Code 6.08 Permits and Licenses

1. No person shall install or connect any LP Gas equipment unless a permit to install LP Gas has been obtained from the head of the fire department

The head of the fire dept. may limit the quantity of LP gas that may be stored under a permit or order the installer of a system to meet additional requirements:

1. Where unusual conditions exist
2. When it is necessary for the protection of life and property
3. Provided the additional requirements are within the intent and purpose of 527 CMR

Upon completion of an installation or connection shall certify in writing on a form approved by the marshal to the head of the fire department that the work has been completed and in conformity with the requirements of 527 CMR

2. The permit for the keeping, storage, manufacture or sale of LP Gas must be obtained from the head of the fire department as provided by MGL 148

The permit for the keeping, storage, manufacture or sale of LP Gas may be revoked by the head of the fire department as provided by MGL 148

Chapter 8 Transportation of Flammable and Combustible Liquids

Code 8.03 Transportation of flammable and combustible liquids

2. Transport vehicles used in the transportation of flammable or combustible liquids as herein provided for shall be subject to inspection by any member of the department.

Code 8.04 Permits

2. The head of the fire dept. in the city or town of where the vehicle is parked overnight shall issue a permit to transport combustible liquids.
5. No cargo tank portable tank, or transfer tank shall be parked overnight unless a permit for such storage has been obtained from the head of the fire dept.
6. Tank vehicles transporting combustible liquids in specification containers in accordance with US DOT title 49 CFR for flammable liquids shall be exempt from 527 CMR through provided a certificate of exemption has been obtained from the head of the fire dept
7. Application for a certificate of exemption shall be on a form furnished by the dept. giving such information in full as requested, containing the address of the permitted land in accordance with this code where the vehicle is parked overnight

Code 8.21 General

The head of the fire dept. may assume control of the vehicle and its contents if the owner is unable or unwilling to remove the vehicle or its contents within a reasonable time

Chapter 9 Tanks and Containers

Code 9.03 Above ground storage containers greater than 10,000 gallons capacity and tanks storing combustible liquids

(A)1. An applicant for a permit to construct a tank or container of more than 10,000 gal capacity for the storage of any fluid other than water, to be located aboveground, shall make application in duplicate to the commissioner on forms furnished by the Dept. One set of plans shall be retained by the dept. and one set returned to the applicant

(B)6. The Commissioner may require any tank to be provided in such quantity and so located as the head of the fire dept. may prescribe.

(E)5. The distance requirements shall not apply to replacements of existing tanks unless the head of the fire dept determines that their continued use shall constitute a fire hazard

Code 9.04 Above ground storage tanks equal to or less than 10,000 gallons capacity for storing ClassI Liquids

(A)3. For the above ground storage of Class I liquids at other than motor fuel dispensing facilities, local fire departments may accept the installation practices outlined in NFPA 30 Flammable and Combustible Liquids Code.

4. The head of the fire dept. may further prescribe the manner in which flammable liquids may be stored above ground in accordance with this code.

(E)9. The owner shall furnish the head of the fire dept. with a certified copy of all testing required by 527 CMR which the fire dept. shall keep with the records of the storage facility

(F)1. Separation distance of chain link protective fencing located at commercial, industrial, governmental, manufacturing establishments, construction sites or other business sites, not open to the general public, used in connection with their business, may be reduced to less than ten ft. with the approval of the head of the fire dept.

Code 9.05 Underground storage Tanks

(A)4.e Any other "state of the art" type of tank construction providing equal or better protection against leakage than the above-mentioned tanks and approved by the Marshal.

(D)2.c If the monitor activates, whether a trouble or an alarm mode, the owner shall immediately notify the local fire dept.

d Upon a failed result the owner and the SIR vendor shall immediately notify the head of the fire dept.

e Upon a failed result the owner shall immediately notify the head of the fire dept. If the analysis result is ten still inconclusive the owner shall have the tank tested in accordance with this code and or conduct an investigation which shall determine to the head of the fire dept's satisfaction that factors other than a leak caused an inconclusive report.

7. These records shall be made readily available upon request of the Office of The State Fire Marshal.

(E)1g For every storage facility covered by the inventory control requirements of this code the operator shall maintain record on the premises or readily available for inspection by an member of the Dept of Public Safety or the head of the Fire Dept.

(F)6 With respect to any tank to which the inventory control requirements of this code are applicable the head of the fire dept shall require the operator to have it and its piping promptly tested at the owners expense whenever the operator fails to prepare, reconcile, and maintain the daily inventory records or fails to perform the required monthly calculations.

7 The head of the fire department may require the owner of any existing tank to have it and its piping tested, at the owner's expense, in any case in which the owner has failed to make timely application for a permit required under 527 CMR 9.07(M).

12. The person performing any test under 527 CMR 9.05(F) shall promptly supply the owner and the head of the fire department with certified copies of all test results for a tank and its piping. The head of the fire department shall keep his copy with the records of that storage facility.

(G) 4d. All monthly monitoring records shall be kept for the remaining operating life of the facility and shall be made readily available upon request of the Marshal or the head of the fire department or his designee.

Note 1: Environmental Protection Agency Underground Storage Tanks Technical Requirements – shall be deemed acceptable unless the head of the fire department determines that more stringent measures are required.

11. The person providing any assessment shall furnish the head of the fire department with the protocol to be used prior to performing such assessment.

14. Written notification shall be given to the head of the fire department before upgrading begins clearly describing what devices will be installed.

Code 9.06: Waste Oil Storage Tanks

(A)1a. For quantities in excess of 500 gallons capacity, the tank shall be located a minimum of 25ft from any building or structure and shall require a license in accordance with MGL 148. in addition to a permit from the head of the fire dept.

b. Shall require a permit to install, maintain, and store from the head of the fire dept.

r. The head of the fire dept. may allow for alternative means of compliance provided the design is satisfactory and complies with the intent of this and other applicable regulations.

2d. Shall have a drip pan or accidental spill containment at the discretion of the head of the fire dept.

e. The type of protection shall be steel posts, I-beams, or similar protection at the discretion of the head of the fire dept.

r. The head of the fire dept. may allow for alternative means of compliance provided the design is satisfactory and complies with the intent of this and other applicable regs.

3.b Shall require a permit to install, maintain, and store from the head of the fire dept.

c Shall have a drip pan at the discretion of the head of the fire dept

Code 9.07 General Provisions

1.(H) The head of the local fire dept. shall take charge of all containment procedures and shall take whatever measures are necessary to prevent fire and explosion, or in the case of a fire or explosion, to protect the persons and property within the vicinity from such hazards.
The head of the dept. shall verify that the requirements of this code are complied with
Upon arrival of the representative of the DEP the head of the dept. shall advise him of the conditions at the site.
The head of the dept shall have the responsibility of the containment procedures as long as, in his opinion, a fire or explosion hazard exists.

(I)2. The head of the dept. decides whether or not to repair or replace a tank, he notifies the owner.

5. If the head of the dept. determines that a tank should be remove the owner must first get a permit from him. Any removal shall e completed within 90 days

(J)2. Any owner of a tank who abandoned it shall obtain a permit from the head of the dept. and have it removed.

3. The owner of every underground tank which the owner has decided to take out of service for a period of less than 6 months shall tell the head of the dept. of his decision
Before returning said tank to service the head of the dept. can request to have the tank and pipes tested

5. The examination of the tank will include a visual inspection of the tank welds walls, foundation and an ultrasound test of the floor. File a copy with the dept.

(K)1. Any person granted a permit to remove a tank shall within 72 hours provide the granting authority with a receipt for delivery of said tank to the site on the permit

(L) Upon request of the head of the fire dept. the licensing authority and the town shall take legal action necessary to enforce the provisions of this code.

APPENDIX A

A-2

Massachusetts General Laws: Fire Prevention-Chapter 148

Chapter 148 of the Massachusetts General Laws : Fire Prevention

148:2 Investigations of fires or explosions by local officials ; notice to marshal of suspicious origins or undetermined causes; reports; records.

Investigate fire/explosion for cause and circumstances.

If it is determined to be of suspicious origin, or is in violation of the law, or the cause is unknown the marshal shall be notified.

148:4 Persons authorized to enter and inspect premises; inspections of institutions; reports.

The marshal/head of the fire department/delegate may enter at any reasonable hour any building or premises to make an inspection without being guilty of trespass.

Institutions shall be inspected every three months and reports of these inspections must be submitted to the correct departments.

Premises specified in innholder's licenses issued under chapter 140 must also be inspected every three months.

148:5 Investigation of premises and alleys as to fire hazards; remedy of conditions; lien; penalty.

The head of the fire department shall, upon complaint, investigate a building or premises (including alleys) to investigate for conditions likely to cause fire .
The fire department shall in writing order such conditions to be remedied.

148:8 Reports of marshal and Boston fire commissioner to heads of fire depts., insurance companies, property owners and persons interested in cause of fire .

The marshal shall report, to the fire department head. the results of any investigations into fires of suspicious origin reported to him by such head as required by section 2

148:10A Heads of fire department; grants and revocations of permits; records; fees; inspections, powers, duties ar information directed and required by marshal; names and addresses transmitted to commissioner.

The head of the fire department shall grant permits in accordance with the rules and regulations of the board .

A record of all such permits will be kept and the marshal will be given information regarding these permits as he may require.

The clerk of each city/town shall annually transmit the name and official address of the head of the fire department to the marshal .

The head of the fire department may charge a fee of $5 and has the right to revoke or suspend any permit grante

148:10D Certificate as oil burner technician; minimum age application; fee; examination: duration of certificate; electrical work.

Any person 18 years of age may apply to the fire department for a certificate as an oil burner technician.

148:13 Licenses for land for explosives and inflammable materials; certificate of approval; record; certificate of registrations; fees; replacements and alterations of, and regulations for buildings; explosion hazard; appeals to marshal.

No building shall be used for the keeping or sale of explosives and inflammable materials unless

licensed by the local authority and approved by the fire department head.

When a fire hazard exists due to the exercise of such license, the fire department head, shall order the licensee cease and desist in the exercise of the license.

The head of the fire department shall direct that reasonable measures to insure safety be undertaken at the expense of the holder of such license.

148:19 Bonds for blasting permits; filing fee.

The marshal or officer granting the permit shall determine the necessary amount in order to cover the risk of damage that might ensue from the blasting.

148:20B: Certificate of competency to conduct blasting operations; application; fee; examination; issuance; duration; expiration; renewal; duplicate.

No person shall conduct blasting operations unless he holds a certificate of competency issued by the department.

To obtain a certificate of competency to conduct blasting operations shall apply to the department.

148:26A Automatic in high rise buildings; enforcement, appeals

Every building or structure more than seventy feet in height above the mean grade shall have adequate sprinkler systems.

Whoever fails to act under the provisions of this section may within forty-five days after the service of notice thereof appeal to the board of appeals.

The head of the fire department shall enforce the provisions of this section.

148:26.5 Automatic sprinklers in older high rise buildings; enforcement; installation schedule.

Exceptions to 148:26A : patient rooms in hospitals, libraries, houses of religious worship, or in houses constructed prior to Jan. 1 1975, telephone central office equipment building.

148:26B automatic fire warning and smoke detection systems in certain buildings; enforcement ; appeals.

Every building or structure not more than seventy feet in height above the mean grade for residential purposes shall have automatic fire warning systems.

148.26C Certain public accommodations; automatic smoke or heat detectors.

Apartment houses, hotels, boarding or lodging houses , or family hotels not regulated by section 26A shall have automatic smoke or heat detectors.

148:26E Residential buildings or structures; installation of smoke detectors.

In any city or town which accepts this subsection: family dwellings shall be equipped with smoke detectors.

The head of the fire department shall allow the installation of approved monitored battery powered smoke detector

Approved smoke detectors will be placed in the following manner: on the ceiling of each stair way, near the base of each stairway and outside each bedroom.

In multiple residential units not previously regulated, all common hallways and basements a series

of interconnected smoke detectors must be installed.

148:26F Residential buildings or structures ; equipping with smoke detectors upon sale or transfer.

All residential units not previously regulated must be equipped with smoke detectors as in section 26E upon sale or transfer.

148:26G Buildings or additions; automatic suppression or sprinkler systems.

In any city or town which accepts this subsection: any building or addition of more than 7500 gross square feet must be equipped with automatic sprinklers.

In the case of an addition the system need only be installed in said addition.

This does not apply to buildings used for agricultural purposes.

The head of the fire department may allow for other fire suppressant systems to be installed in the place of automatic sprinklers.

148:26H Lodging or Boarding Houses; automatic sprinkler systems.

In any city or town which accepts the provisions of this subsection: any lodging or boarding house shall be equipped with an automatic fire suppression system.

148:26I Multiple dwelling units; new construction; automatic sprinkler systems.

Newly built or constructed residential buildings not less than four units of dwelling shall require automatic sprinkler systems.

In the event that adequate water supply is not available the head of the fire department shall permit the use of other automatic fire suppression units.

148:27A Shutting off, disconnection, obstruction, removal or destruction, of fire protection devices; permit; report; violation of statute; enforcement.

No person shall shut off, disconnect, obstruct, remove or destroy any part of any sprinkler system water main, hydrant or other device used for fire protection.

This can be allowed only by first procuring a written permit from the head of the fire department.

The head of the fire department must be notified when the system is returned to working order.

148:28A Reports of violations of building laws.

The head of the fire department upon observing a violation of any provision of the state building code shall report it to the authority charged with enforcement of the provision.

148:28B Buildings with canine guards, reports.

The head of the fire department shall require that any person in control of an establishment using canine guards shall notify the head of the fire department.

148:30 Violation, notice and enforcement of orders or regulations.

The superior court shall have jurisdiction in equity to enforce any lawful rule upon application of the marshal or the head of the fire department.

148:32 Sharing information by insurers; liability of insurer or arson squad; confidential information.

The fire department may ask an insurer to share information relative to an investigation.

Insurance companies may report information if they believe the damage may have been caused by incendiary means.

Insurance companies may request access to information gathered during investigations.

148:33 Duties and powers of marshal.

The marshal shall hear suggestions and complaints and help to make improvements in laws in all matters relating to fire prevention.

The marshal may ask the head of the fire department to assist in the provisions of this section.

148:37 Tanks for storage of fluids; permits; violation of statute or regulation; annual inspection; fees.

No person shall maintain or use a tank of more than 10 000 gallons capacity for anything other than water without permit from the marshal.

The marshal shall cause tanks to be inspected annually.

The owner and fire department shall be notified of the date of intended inspection.

148:38A Removal or Relocation of underground tanks; permit fees.

No underground tank which has been used for the keeping of flammable materials shall be removed or relocated without permit.

148:38C Underground regulated substances tanks; notification.

An owner of an underground tank shall notify the fire department within thirty days after the tank is put into operation.

148:38D Fire prevention regulations board ; purposes.

The board may adopt regulations to prevent any condition of an underground tank that may cause a fire hazard.

148:38F Underground storage tanks; inspection of records, equipment and contents; testing.

Upon request owners of underground tanks shall furnish information the fire department.

148:38G Violations or potential violations of rules, regulations, etc.; order of fire department heads.

Whenever it appears that there is a violation of any provisions of section 38 the head of the fire department may issue an order based on the violation.

148:39A regulations for permits for displays of fireworks; fees.

Application for permits shall be made in writing at least fifteen days in advance of the date of display.

The fee for the permit will be set by the chief but shall be no higher than 25 dollars.

Every such display shall be handled by a competent operator deemed so by the chief.

148:58 Fire Extinguishing systems, issuance of certificates for installation and servicing

The board may make rules and regulations regarding fire departments recharging portable fire extinguishers for no charge as a public service.

APPENDIX A

A-3

Revised Ordinances of the City of Worcester Massachusetts

Revised Ordinances of the City of Worcester Massachusetts

1. Hydrants

The location and discontinuance of all fire hydrants shall be under the authority of the commissioner of public works subject to approval of the chief engineer of the fire department.

No person except a firefighter shall open any fire hydrant without the consent of the commissioner of public works.

No person shall place any kind of rubbish so as to hinder the free access of the hydrant.

No person shall maliciously destroy or injure any hydrant.

Any person who violates the provision of this section shall, upon conviction. be fined 300 dollars.

2. Smoke Detectors in certain buildings.

Every building or structure occupied for residential purposes containing not less than three nor more than five dwelling units shall be equipped with a smoke detector.

The placement of the smoke detectors must conform with the general laws chapter 148 section 26D.

3. Open Flame

No open flame grills shall be used on porches or balconies of multi-family residence buildings.

The owner shall notify their tenants of this provision at the time the tenant initially occupies the dwelling.

This does not apply to town houses or rowhouses or other side by side multi-family dwellings.

Any person who violates this provision shall be punished by a fine not less than 20 dollars and not more than 50 dollars.

4. Malicious Bonfires

No person shall willfully and maliciously set fire to set or attempt to set fire to any real or personal property, anyone who attempts or arranges for such a fire shall be punished by a fine of 300 dollars.

5. Fireworks

No persons shall sell or use fireworks or firecrackers without permit and in compliance of the rules of public safety.

Any person who violates this provision shall be punishable by a 300 dollar fine.

6. Flammable fluids

No person shall keep use or sell flammable fluids without license or permit by the chief.

7. Garages and Lubritoriums

No person shall operate any auto garage or lubritorium without annual license issued by the chief.

The fees for such annual licenses shall be set by the chief.

Garages and Lubritoriums shall apply for a separate license to contain volatile inflammable fluids.

8. Light and Power Companies

Light and power companies shall provide and maintain suitable switches and cut out boxes as directed by the chief.

All light and power companies shall send to all alarms of fire from boxes, designated by the chief engineer, competent workers to remove and care for dangerous wires.

Such personnel shall immediately report to the officer in charge and be under his control.

9. Communications equipment

No person maintaining poles to which wires of communication are attached shall remove or replace such poles without giving notice to the dept. of communications.

No person shall interfere with the communications wires without permission in writing of the dept. of communications.

No person moving a building shall interfere with communications equipment of the city unless under permission and direction of the dept. of communications.

10. Interference With Firefighters

No person shall insult, menace, hinder, obstruct, oppose, or without authority give an order to any officer or firefighter while on duty.

No person shall drive any vehicle on or over any hose in use at a fire except by order of an officer of the fire department.

No person except emergency personnel shall enter into the area closed off at a fire, except with the permission of the fire officer in charge.

11. Removal of vehicles

At any time during firefighting operations an officer of the fire department, at the scene of a fire. may remove vehicles, left unattended or parked, as necessary.

12. Alarm Systems

Every alarm user must submit to the chief the names addresses and phone numbers of the user and at least 2 other persons who can be reached to respond.

The list of names addresses and phone numbers shall be kept current at all times and submitted during the first month of each year.

All alarm devices that use an audible bell or horn must be equipped with an automatic shut off.

Any alarm system which fails to comply with this section and emits a signal for more than 30 min. Shall constitute a public nuisance. The chief shall record complaints.

The chief shall endeavor to contact the alarm user in such an event.

In the event the fire chief is unable to contact the user, or those persons designated to turn the alarm off, he may direct a police officer or alarm technician to disarm the alarm.

The property will be secured once the alarm is shut down and the fees shall be assessed to the user (not to exceed 50 dollars).

No alarm system designed to transmit messages directly to the fire department shall be worked on or demonstrated without permission of the fire department communications section.

An unauthorized test constitutes a false alarm.

Alarm fines are as follows: 4th=$25 5th=$50 6th=$75 7th=$100 8th=$125 9th and all subsequent alarms=$150.

An alarm user who fails to comply with any of the requirements of relative to control and curtailment or testing of alarms is subject to a fine of 25 dollars.

13. Fees for Certain Licenses, Permits and Services

Every person shall pay the fees established by the chief for the following permits, items and services: Flammable liquid storage, gun powder, model rocket (sales), paint removal, tank removal, tank installation, tank registration, tank truck inspection, blasting, fireworks display, oil burner, Christmas tree location, propane storage, flammable decorations, smoke detector inspections, copies of reports, quarterly inspections, fumigation.

14.Fire Alarm service fees

Every person utilizing the telephonic fire alarm service shall pay a service fee of 300 dollars annually.

City buildings shall be exempt from the payment of the services fee.

The service fee payment shall be made to the city treasurer.

The chief of the fire department shall thereupon issue s permit for the use of the service.

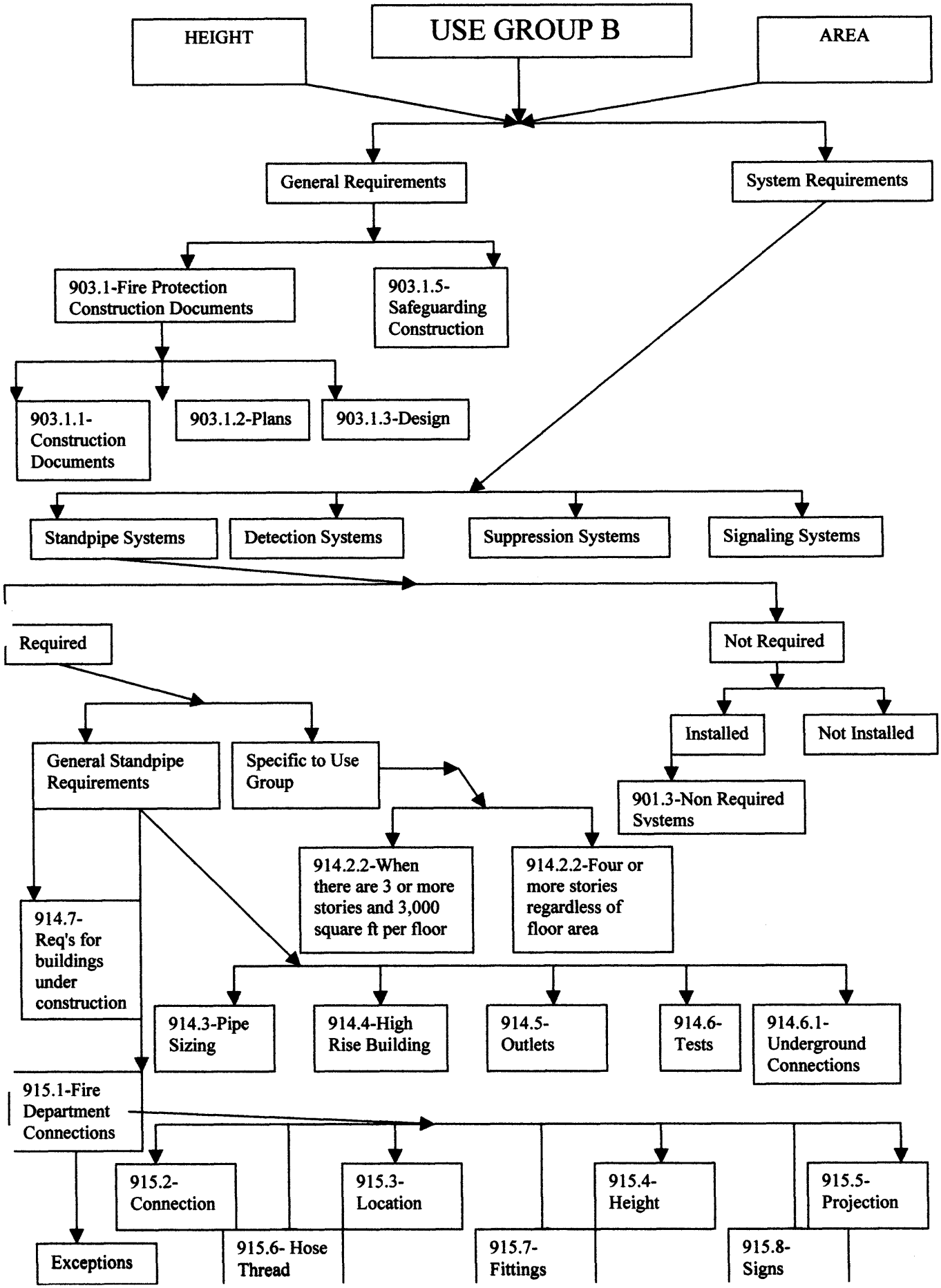
A fee for a permit issued by the chief for approval of plans and inspection of the installation of fire alarm systems shall be ten dollars.

This shall not apply to municipal, county, state, or federal projects.

APPENDIX B

B-1

Flow Chart for Chapter 9


USE GROUP B
HEIGHT
AREA
General Requirements
System Requirements
903.1-Fire Protection Construction Documents
903.1.5-Safeguarding Construction
903.1.1-Construction Documents
903.1.2-Plans
903.1.3-Design
Standpipe Systems
Detection Systems
Suppression Systems
Signaling Systems
Required
Not Required
Installed
Not Installed
901.3-Non Required Svstems
General Standpipe Requirements
Specific to Use Group
914.2.2-When there are 3 or more stories and 3,000 square ft per floor
914.2.2-Four or more stories regardless of floor area
914.7-Req's for buildings under construction
914.3-Pipe Sizing
914.4-High Rise Building
914.5-Outlets
914.6-Tests
914.6.1-Underground Connections
915.1-Fire Department Connections
915.2-Connection
915.3-Location
915.4-Height
915.5-Projection
Exceptions
915.6- Hose Thread
915.7-Fittings
915.8-Signs

APPENDIX B

B-2

Required Systems by Use Group

Chapter Nine Outline

USE GROUP A-1

903.1.4-As built plans- As built plans are required for this occupancy if the total occupancy exceeds 1000.

904.2-An automatic fire suppression system shall be required throughout all portions of any building which contains this use group ***if*** the building has at least 12,000 square feet in aggregate area.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 12,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.1-All buildings of this occupancy shall require an standpipe system if:

A) If there are three or more stories in height **OR**

B) If the auditorium has seating for more than 500, standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room. **OR**

C) The occupancy has a stage, standpipes shall be located on either side of the stage **OR**

D) The buildings have two or more stories in height and have an occupant load of more than 300.

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

917.3-Any building of this occupancy shall contain a fire protective signaling system.

917.5-A manual alarm box is required next to the lighting control panel for the stage.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP A-2

903.1.4-As built plans- As built plans are required for this occupancy if the total occupancy exceeds 1000.

904.3-An automatic fire suppression system shall be required in any building containing this use group provided that the structure has an aggregate area of greater than 5,000 square feet.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 5,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.1-All buildings of this occupancy shall require an standpipe system if:

A) If there are three or more stories in height **OR**

B) If the auditorium has seating for more than 500, standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room. **OR**

C) The occupancy has a stage, standpipes shall be located on either side of the stage **OR**

D) The buildings have two or more stories in height and have an occupant load of more than 300.

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

917.3-Any building of this occupancy shall contain a fire protective signaling system.

917.5-A manual alarm box is required next to the lighting control panel for the stage.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline
USE GROUP A-3

903.1.4-As built plans- As built plans are required for this occupancy if the total occupancy exceeds 1000.

904.2-An automatic fire suppression system shall be required throughout all portions of any building which contains this use group ***if*** the building has at least 12,000 square feet in aggregate area.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 12,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.1-All buildings of this occupancy shall require an standpipe system if:

A) If there are three or more stories in height **OR**

B) If the auditorium has seating for more than 500, standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room. **OR**

C) The occupancy has a stage, standpipes shall be located on either side of the stage **OR**

D) The buildings have two or more stories in height and have an occupant load of more than 300.

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

917.3-Any building of this occupancy shall contain a fire protective signaling system.

917.5-A manual alarm box is required next to the lighting control panel for the stage.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline
USE GROUP A-4

903.1.4-As built plans- As built plans are required for this occupancy if the total occupancy exceeds 1000.

904.2-An automatic fire suppression system shall be required throughout all portions of any building which contains this use group ***if*** the building has at least 12,000 square feet in aggregate area.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 12,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.1-All buildings of this occupancy shall require an standpipe system if:

A) If there are three or more stories in height **OR**

B) If the auditorium has seating for more than 500, standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room. **OR**

C) The occupancy has a stage, standpipes shall be located on either side of the stage.

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER. EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

917.3-Any building of this occupancy shall contain a fire protective signaling system.

917.5-A manual alarm box is required next to the lighting control panel for the stage.

918.4-Any building of this occupancy shall contain a fire detection system.

Chapter Nine Outline
USE GROUP A-5

903.1.4-As built plans- As built plans are required for this occupancy if the total occupancy exceeds 1000.

914.2.1-All buildings of this occupancy shall require an standpipe system if:

A) If there are three or more stories in height **OR**

B) If the auditorium has seating for more than 500, standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room. **OR**

C) The occupancy has a stage, standpipes shall be located on either side of the stage.

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

917.3-Any building of this occupancy shall contain a fire protective signaling system.

917.5-A manual alarm box is required next to the lighting control panel for the stage.

Chapter Nine Outline

USE GROUP B

903.1.4-As built plans- As built plans are required for this occupancy if the total occupancy exceeds 1000.

904.2-An automatic fire suppression system shall be required throughout all portions of any building which contains this use group ***if*** the building has at least 12,000 square feet in aggregate area.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 12,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.5-All buildings of this occupancy shall require an standpipe system if:

A) There are 3 or more stories and 3,000 square feet of area **OR**

B) There are 4 or more stories present.

Chapter Nine Outline
USE GROUP E

904.2-An automatic fire suppression system shall be required throughout all portions of any building which contains this use group ***if*** the building has at least 12,000 square feet in aggregate area.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 12,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.3-All buildings of this occupancy shall require an standpipe system if there are 3 or more stories or if there is an auditorium present which falls under 914.2.1.

917.3-Any building of this occupancy shall contain a fire protective signaling system.

918.4-Any building of this occupancy shall contain a fire detection system.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP F-1

904.2-An automatic fire suppression system shall be required throughout all portions of any building which contains this use group ***if*** the building has at least 12,000 square feet in aggregate area.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 12,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.4-All buildings of this occupancy shall require an standpipe system if:

A) There are 3 or more stories in height and more than 3,000 square feet of area **OR**

B) There are more than 4 stories present.

Chapter Nine Outline

USE GROUP F-2

914.2.4-All buildings of this occupancy shall require an standpipe system if:

A) There are 3 or more stories in height and more than 3,000 square feet of area **OR**

B) There are more than 4 stories present.

Chapter Nine Outline

USE GROUP H-1

903.1.4-As built plans- As built plans are required for this occupancy.

904.4- An automatic fire suppression system shall be required for all buildings of this use group.

EXCEPTION-Magazines used for storage of H-1 materials which are constructed in accordance with NFPA 495 and 527 CMR.

914.2.5-All buildings of this occupancy shall require an standpipe system if:

A) There are 3 or more stories and 10,000 square feet of area OR

B) There are 4 or more stories present.

917.3-Any building of this occupancy shall contain a fire protective signaling system.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline
USE GROUP H-4

903.1.4-As built plans- As built plans are required for this occupancy.

904.4- An automatic fire suppression system shall be required for all buildings of this use group.

914.2.5-All buildings of this occupancy shall require an automatic standpipe system if:

A) There are 3 or more stories and 10,000 square feet of area **OR**

B) There are 4 or more stories present.

917.3-Any building of this occupancy shall contain a fire protective signaling system.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP I-1

904.5-An automatic fire suppression system shall be required for all buildings of this use group.

914.2.6-All buildings of this occupancy shall require an automatic standpipe system if there are 3 or more stories present.

917.3-Any building of this occupancy shall contain a fire protective signaling system.

918.4-Any building of this occupancy shall contain a fire detection system.

919.3.3-Single and multi station smoke detectors shall be required in all sleeping areas of this occupancy, except where the building is equipped with a sprinkler system.

919.5-Battery Backup-In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline
USE GROUP I-2

903.1.4-As built plans- As built plans are required for this occupancy.

904.5- An automatic fire suppression system shall be required for all buildings of this use group.

914.2.6-All buildings of this occupancy shall require an automatic standpipe system if there are 3 or more stories present.

917.3-Any building of this occupancy shall contain a fire protective signaling system.

918.4-Any building of this occupancy shall contain a fire detection system unless the building contains a sprinkler system.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP I-3

903.1.4-As built plans- As built plans are required for this occupancy.

914.2.6-All buildings of this occupancy shall require an automatic standpipe system if there are 3 or more stories present.

917.3-Any building of this occupancy shall contain a fire protective signaling system.

918.4-Any building of this occupancy shall contain a fire detection system.

920.2-Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location available to the staff. Access to the portable extinguishers shall be permitted to be locked.

Chapter Nine Outline
USE GROUP R-2

904.7- An automatic fire suppression system shall be required for all buildings of this use group in accordance with NFPA 13 or NFPA 13 R systems.

EXCEPTIONS-Buildings having no more than 3 dwelling units may have the automatic fire suppression system installed in accordance with NFPA 13D regulations.

914.2.8-All buildings of this occupancy shall require an automatic standpipe system if:

A) There are 3 or more stories and more than 10,000 square feet of area **OR**

B) There are 4 or more stories.

917.3-Any building of this occupancy shall contain a fire protective signaling system if the building contains 13 or more dwelling units where any one dwelling unit is more than 2 stories above the lowest level of exit discharge or more than 1 story below the highest level of exit discharge.

918.4-Any building of this occupancy shall contain a fire detection system except:

A) in a building that does not have interior corridors serving guestrooms or dwelling units.

B) in actual dwelling units or guestrooms

919.3.2-Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

919.4-Interconnection-Where more than one detector is required within an individual dwelling unit the detectors shall be wired in a fashion so that the actuation of one alarm will actuate all alarms on that system.

919.5-Battery Backup-In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline
USE GROUP R-3

919.3.2-Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

919.4-Interconnection-Where more than one detector is required within an individual dwelling unit the detectors shall be wired in a fashion so that the actuation of one alarm will actuate all alarms on that system.

919.5-Battery Backup-In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline
USE GROUP R-4

919.3.2-Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

919.4-Interconnection-Where more than one detector is required within an individual dwelling unit the detectors shall be wired in a fashion so that the actuation of one alarm will actuate all alarms on that system.

919.5-Battery Backup-In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline
USE GROUP R-5

919.3.2-Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

919.5-Battery Backup-In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline

USE GROUP S-1

904.2-An automatic fire suppression system shall be required throughout all portions of any building which contains this use group ***if*** the building has at least 12,000 square feet in aggregate area.

EXCEPTIONS-Any existing building that is modified so that the modifications create this use group in the building shall require an automatic suppression system :

A) In the portions of the building which have been changed in use and only when such changed spaces exceed 12,000 square feet.

B) If the modifications can be constituted as substantial renovations, as defined by 780 CMR 3401.

914.2.8-All buildings of this occupancy shall require an automatic standpipe system if:

A) There are 3 or more stories **OR**

B) There are 4 or more stories.

Chapter Nine Outline

USE GROUP S-2

914.2.9-All buildings of this occupancy shall require an automatic standpipe system if:

A) There are 3 or more stories and more than 10,000 square feet of area **OR**

B) There are 4 or more stories.

APPENDIX B

B-3

Question Forms for Use Groups

Chapter Nine Outline

USE GROUP A-1

Does the total occupancy of the building exceed 1000?

IF YES-As built plans needed

Does the building have at least 12,000 square feet in aggregate area?

IF YES-Sprinkler system required

IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 12,000 square feet?

IF YES-Sprinkler system required

IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?

IF YES- Sprinkler system required

IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

Does the auditorium have seating for more than 500?

IF YES- standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room

Does the occupancy has a stage?

IF YES- standpipes shall be located on either side of the stage

Does the buildings have two or more stories in height and have an occupant load of more than 300?

IF YES- Standpipe system required

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

Any building of this occupancy shall contain a fire protective signaling system.

A manual alarm box is required next to the lighting control panel for the stage.

In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP A-2

Does the total occupancy of the building exceed 1000?

IF YES-As built plans needed

Does the building have at least 5,000 square feet in aggregate area?

IF YES-Sprinkler system required

IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 5,000 square feet?

IF YES-Sprinkler system required

IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?

IF YES- Sprinkler system required

IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

Does the auditorium have seating for more than 500?

IF YES- standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room

Does the occupancy has a stage?

IF YES- standpipes shall be located on either side of the stage

Does the buildings have two or more stories in height and have an occupant load of more than 300?

IF YES- Standpipe system required

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

Chapter Nine Outline

USE GROUP A-3

Does the total occupancy of the building exceed 1000?

IF YES-As built plans needed

Does the building have at least 12,000 square feet in aggregate area?

IF YES-Sprinkler system required

IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 12,000 square feet?

IF YES-Sprinkler system required

IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?

IF YES- Sprinkler system required

IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

Does the auditorium have seating for more than 500?

IF YES- standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room

Does the occupancy has a stage?

IF YES- standpipes shall be located on either side of the stage

Does the buildings have two or more stories in height and have an occupant load of more than 300?

IF YES- Standpipe system required

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

Chapter Nine Outline

USE GROUP A-4

Does the total occupancy of the building exceed 1000?

IF YES-As built plans needed

Does the building have at least 12,000 square feet in aggregate area?

IF YES-Sprinkler system required

IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 12,000 square feet?

IF YES-Sprinkler system required

IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?

IF YES- Sprinkler system required

IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

Does the auditorium have seating for more than 500?

IF YES- standpipes are required on each side of the auditorium. on each tier, one in each mezzanine, one in each tier of dressing rooms. and one protecting each property store or work room

Does the occupancy has a stage?

IF YES- standpipes shall be located on either side of the stage

Does the buildings have two or more stories in height and have an occupant load of more than 300?

IF YES- Standpipe system required

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1 2 INCH DIAMETER. EQUIPPED WITH APPROVED 1 1 2 INCH HOSE STATION

Any building of this occupancy shall contain a fire detection system.

Chapter Nine Outline

USE GROUP A-5

Does the total occupancy of the building exceed 1000?

IF YES-As built plans needed

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

Does the auditorium have seating for more than 500?

IF YES- standpipes are required on each side of the auditorium, on each tier, one in each mezzanine, one in each tier of dressing rooms, and one protecting each property store or work room

Does the occupancy has a stage?

IF YES- standpipes shall be located on either side of the stage

Does the buildings have two or more stories in height and have an occupant load of more than 300?

IF YES- Standpipe system required

SUCH STANDPIPES SHALL NOT BE LESS THAN 2 1/2 INCH DIAMETER, EQUIPPED WITH APPROVED 1 1/2 INCH HOSE STATION

Any building of this occupancy shall contain a fire protective signaling system.

A manual alarm box is required next to the lighting control panel for the stage.

Chapter Nine Outline

USE GROUP B

Does the building have at least 12,000 square feet in aggregate area?

IF YES-Sprinkler system required

IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 12,000 square feet?

IF YES-Sprinkler system required

IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?

IF YES- Sprinkler system required

IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

IF NO:

Are there 4 or more stories in the building?

IF YES-Standpipe system required

IF NO-No system required

Does the building contain occupied floors that are two or more stories above or below the main level of exit discharge?

IF YES-Fire protective signaling system required

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline
USE GROUP E

Does the building have at least 12,000 square feet in aggregate area?
IF YES-Sprinkler system required
IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?
IF YES
Have the modifications caused the occupancy space to exceed 12,000 square feet?
IF YES-Sprinkler system required
IF NO:
Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?
IF YES- Sprinkler system required
IF NO-No system required

Are there 3 or more stories in height?
IF YES-Standpipe system required

Is there an auditorium present?
IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Any building of this occupancy shall contain a fire detection system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP F-1

Does the building have at least 12,000 square feet in aggregate area?

IF YES-Sprinkler system required

IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 12,000 square feet?

IF YES-Sprinkler system required

IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?

IF YES- Sprinkler system required

IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

Does the building have 4 or more stories regardless of area?

IF YES-Standpipe system required

Chapter Nine Outline

USE GROUP F-2

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

Does the building have 4 or more stories regardless of area?

IF YES-Standpipe system required

Chapter Nine Outline

USE GROUP H-1

As built plans are required for this occupancy.

Does the building contain magazines used for storage of H-1 materials which are constructed in accordance with NFPA 495 and 527 CMR?

IF YES-Sprinkler System Required

Are there 3 or more stories in height and more than 10,000 square feet?

IF YES-Standpipe system required

Does the building have 4 or more stories regardless of area?

IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP H-2

As built plans are required for this occupancy.

An automatic fire suppression system shall be required for all buildings of this use group.

Are there 3 or more stories in height and more than 10,000 square feet?
IF YES-Standpipe system required

Does the building have 4 or more stories regardless of area?
IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP H-3

As built plans are required for this occupancy.

An automatic fire suppression system shall be required for all buildings of this use group.

Are there 3 or more stories in height and more than 10,000 square feet?
IF YES-Standpipe system required

Does the building have 4 or more stories regardless of area?
IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline
USE GROUP H-4

As built plans are required for this occupancy.

An automatic fire suppression system shall be required for all buildings of this use group.

Are there 3 or more stories in height and more than 10,000 square feet?
IF YES-Standpipe system required

Does the building have 4 or more stories regardless of area?
IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP I-1

An automatic fire suppression system shall be required for all buildings of this use group.

Are there 3 or more stories present?

IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Any building of this occupancy shall contain a fire detection system.

Single and multi station smoke detectors shall be required in all sleeping areas of this occupancy, except where the building is equipped with a sprinkler system.

In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline

USE GROUP I-2

As built plans are required for this occupancy.

An automatic fire suppression system shall be required for all buildings of this use group.

Are there 3 or more stories present?
IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Any building of this occupancy shall contain a fire detection system unless the building contains a sprinkler system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline

USE GROUP I-3

As built plans- As built plans are required for this occupancy.

Are there 3 or more stories present?

IF YES-Standpipe system required

Any building of this occupancy shall contain a fire protective signaling system.

Any building of this occupancy shall contain a fire detection system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location available to the staff. Access to the portable extinguishers shall be permitted to be locked.

Chapter Nine Outline

USE GROUP M

As built plans are required for this occupancy.
Does the building have at least 12,000 square feet in aggregate area?

IF YES-Sprinkler system required
IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 12,000 square feet?

IF YES-Sprinkler system required
IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?
IF YES- Sprinkler system required
IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required
IF NO:

Are there 4 or more stories in the building?
IF YES-Standpipe system required
IF NO:

Is the building a covered mall?
IF YES-Standpipe system required
IF NO:

Is it classified as a merchandising warehouse?
IF YES-Standpipe system required
IF NO-No system required.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline
USE GROUP R-1

An automatic fire suppression system shall be required for all buildings of this use group.

Are there 3 or more stories in height and more than 3,000 square feet?
IF YES-Standpipe system required
IF NO:
Are there 4 or more stories in the building?
IF YES-Standpipe system required
IF NO-No system required

Any building of this occupancy shall contain a fire protective signaling system.

Any building of this occupancy shall contain a fire detection system except:

A) in a building that does not have interior corridors serving guestrooms or dwelling units.

B) in guest rooms or dwelling units which contain smoke detector systems that operate under the following conditions:

- Provide occupant notification
- Annunciate at a constantly attended location from which a signaling system can be manually activated
- Does not automatically notify the building notification appliances
- Does not automatically activate the supervision requirements of chapter 923
- Capable of operation including the required annunciation from stand by batteries

Single and multi station smoke detectors shall be installed in the following locations:

A) all sleeping areas

B) Every room or hallway in the path of the means of egress from the sleeping area to means of egress.

C) In each story within the guestroom or suite, including basements

Where more than one detector is required within an individual dwelling unit the detectors shall be wired in a fashion so that the actuation of one alarm will actuate all alarms on that system.

Fire extinguishers-In buildings of this use group a fire extinguisher of an *approved agency* is required in a location visible and available to occupants.

Chapter Nine Outline
USE GROUP R-2

904.7- An automatic fire suppression system shall be required for all buildings of this use group in accordance with NFPA 13 or NFPA 13 R systems.

Does the building have more than 3 dwelling units?
IF YES-A sprinkler system is required of NFPA 13 or 13R type
IF NO-A sprinkler system is required and can be of NFPA 13 D type

Are there 3 or more stories in height and more than 10,000 square feet?
IF YES-Standpipe system required
IF NO:
Are there 4 or more stories in the building?
IF YES-Standpipe system required
IF NO-No system required

Does the building contain at least 13 dwelling units?
IF YES:
Is one of the dwelling units at least 2 stories above the lowest level of exit discharge?
IF YES- Fire protective signaling system required
IF NO-
Is one of the dwelling units at least 1 story below the highest level of exit discharge?
IF YES- Fire protective signaling system required
IF NO-No system required

Does the building have interior corridors serving guestrooms or dwelling units?
IF YES-Fire detection system required
IF NO-No system required

Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

Where more than one detector is required within an individual dwelling unit the detectors shall be wired in a fashion so that the actuation of one alarm will actuate all alarms on that system.

In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline
USE GROUP R-3

Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

Where more than one detector is required within an individual dwelling unit the detectors shall be wired in a fashion so that the actuation of one alarm will actuate all alarms on that system.

In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline

USE GROUP R-4

Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

Where more than one detector is required within an individual dwelling unit the detectors shall be wired in a fashion so that the actuation of one alarm will actuate all alarms on that system.

In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline

USE GROUP R-5

Single and multi station smoke detectors shall be installed in all occupancies of this group in the following locations:

A) In the immediate vicinity of the bedrooms
B) In all bedrooms
C) In each story within a dwelling unit
D) In residential units 1200 square feet or more, an additional detector shall be required for each 1200 square feet of area or part thereof.

EXCEPT:

A) In dwelling units with split levels and without an intervening door between the adjacent levels, a smoke detector installed on the upper level shall suffice for the lower level provided that the lower level is less than one full story below the upper level.
B) In buildings equipped with a sprinkler system installed in accordance with 780 CMR, detectors are not required in bedrooms provided that the bedroom contains residential sprinklers.

In addition to the required primary AC primary power source, each detector in this occupancy shall receive power from a battery when the AC power is interrupted. Except when the occupancy contains a sprinkler system.

Chapter Nine Outline

USE GROUP S-1

Does the building have at least 12,000 square feet in aggregate area?

IF YES-Sprinkler system required

IF NO-No system required

Has the building been modified so that the modifications create this use group in the building?

IF YES

Have the modifications caused the occupancy space to exceed 12,000 square feet?

IF YES-Sprinkler system required

IF NO:

Can the modifications be constituted as substantial renovations, as defined by 780 CMR 3401?

IF YES- Sprinkler system required

IF NO-No system required

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

IF NO:

Are there 4 or more stories in the building?

IF YES-Standpipe system required

IF NO-No system required

Chapter Nine Outline

USE GROUP S-2

Are there 3 or more stories in height and more than 3,000 square feet?

IF YES-Standpipe system required

IF NO:

Are there 4 or more stories in the building?

IF YES-Standpipe system required

IF NO-No system required

APPENDIX B

B-4

System Requirements

Suppression System Compatibility
905

905.1-Agent compatibility- The extinguishing agent for each suppression system shall be compatible the type of hazard and fire. Each system shall be designed in accordance with the 780 CMR requirements.

905.1.1-Special Hazards-In buildings that contain combustibles that are incompatible with water, oother extinguishing agents shall be utilized.

Fire Sprinkler System Requirements
906

906.2-Wherever the 780 CMR requires an automatic suppression system, it shall be designed and installed in accordance to one of the following:

A) NFPA 13 Systems-The system shall be designed and installed in accordance with NFPA 13 in appendix A.

B) NFPA 13 R-In buildings four stories or less in height, systems may be designed and installed in accordance with NFPA 13R if the buildings is of use group I-1, or any R use group with no more than 16 occupants.

C) NFPA 13 D-In use group R-3 buildings with at least two-hour fireresistance rated fire separations assemblies between dwelling units, or in Use group I-1 buildings with not more than 8 occupants, systems can be designed in accordance with NFPA 13D.

906.3-Design- Design documentation must meet the requirements set forth in chapter 903.

906.4-Actuation- Water sprinkler shall be automatically actuated unless otherwise specified within the 780 CMR.

906.5-Sprinkler alarms-Approved audible and visual alarms shall be connected to every water sprinkler system. Alarms shall be activated by water flow and shall be located in approved location on both the interior and exterior of the building.

906.6-Water-control valve ID-All valves controlling an automatic suppression system shall be tagged with an ID card indicating the valves function and what it is controlled.

906.8-Signs-A sign shall be required on the entrance to any room where sprinkler control valves are located. Sign shall read:

SPRINKLER CONTROL VALVES

906.9-Acceptance test-All systems shall be tested in accordance with NFPA standards located in Appendix A.

906.9.1-Underground connections-All underground connections shall be made in accordance with NFPA 13 and 24.

906.9.2Hydrostatic tests-All systems shall have hydrostatic test done in accordance with NFPA standards.

915.1-All sprinkler systems shall be provided with appropriate fire department connections that are in accordance with the applicable NFPA standards. If the system has less than 20 sprinklers, no such connection is needed or if the fire department approves a single connection for a large diameter hose of at least 4 inches.

915.2-Connections- Fire department connections shall be arranged in a fashion where the attachment to any one water sprinkler connection will serve all sprinklers.

915.3-Connections shall be made on a street front or any place approved by the fire department that is in no way obstructed from common view.

915.4-Height-Connections shall not be less than 18 inches and not more than 42 inches in elevation, measured from ground level to the center line of the inlets.

915.5-Projection-In a case where the connection will project beyond the property line, a flush type connection shall be used.

915.6-Hose Thread-Hose thread used in the connection shall be uniform to the fire department thread type.

915.7-Fittings-Fire department inlet connections shall be fitted with check valves, ball drip valves and plugs with chains or frangible caps.

915.8-Signs-A metal sign with at least one inch letters shall be mounted on all connections. The sign shall read:

AUTOMATIC SPRINKLERS

Limited Area Sprinkler Systems
907

907.3-Wherever the 780 CMR requires a limited area automatic suppression system, it shall be designed and installed in accordance to one of the following:

A) NFPA 13 Systems-The system shall be designed and installed in accordance with NFPA 13 in appendix A.

B) NFPA 13 R-In buildings four stories or less in height, systems may be designed and installed in accordance with NFPA 13R if the buildings is of use group I-1, or any R use group with no more than 16 occupants.

C) NFPA 13 D-In use group R-3 buildings with at least two-hour fireresistance rated fire separations assemblies between dwelling units, or in Use group I-1 buildings with not more than 8 occupants, systems can be designed in accordance with NFPA 13D.

907.4-Actuation- Limited area water sprinkler systems shall be automatically actuated unless otherwise specified within the 780 CMR.

907.5-Sprinkler alarms-Approved audible and visual alarms shall be connected to every water sprinkler system. Alarms shall be activated by water flow and shall be located in approved location on both the interior and exterior of the building.

907.6-Standpipe Connection- The water supply for any limited area sprinkler system shall be from the buildings standpipe system where the building is equipped with a standpipe with a minimum capacity of 500 gallons-per-minute.

907.6.1-Domestic supply-When the system is supplied by the domestic water supply, the supply system shall be designed to adequately support the design flow of the largest number of sprinklers required to be hydraulically calculated by NFPA 13.

907.6.2-Cross Connection-The potable water supply shall be protected from backflow in accordance with the 248 CMR.

SIGNS-A sign shall be required on the entrance to any room where sprinkler control valves are located. Sign shall read:

SPRINKLER CONTROL VALVES

907.7-Acceptance test-All systems shall be tested in accordance with NFPA standards located in [redacted]

Water-Spray Fixed Systems
908

908.1-Water-spray fixed systems shall be designed in accordance with NFPA 15.

908.2-Design-Complete fire protection construction documents and hydraulic calculations shall be provided prior to installation. The submittal shall include nozzle layouts, friction loss, calculations, water supply data and a detailed layout of the covered area.

908.3-Actuation- Water-spray systems shall be automatically actuated and shall provide means for manual actuation.

908.4-Acceptance test-All systems shall be tested in accordance with NFPA 15 standards located in Appendix A.

Carbon Dioxide Systems
909

909.1-All CO2 systems shall be designed in accordance with NFPA 12.

909.2-Design-The submitted construction documents shall include information and calculations on the amount of CO2; the location and flow rate of each nozzle including equivalent orifice area; the location and size of the CO2 storage facility. Information shall be provided in relation to the location and function of the detecting devices, operating devices, auxiliary equipment and electrical circuitry.

909.3-Actuation- CO2 systems shall be automatically actuated and shall also contain manual actuation controls.

909.4-Safety Requirements-Where persons will enter or be trapped in areas of hazardous discharge, warning signs and discharge alarms shall be provided.

909.5-Acceptance test-All systems shall be tested in accordance with NFPA 12 standards located in Appendix A. A completed system shall be tested for tightness up to the selector valve, and for continuity of piping free from obstructed flow beyond the selector valve. The labeling devices with proper designations shall be checked. Operational tests shall be conducted on all devices except cylinder valves.

Dry-Chemical Systems
910

910.1-Where a dry chemical extinguishing system is required it shall be designed in accordance with NFPA 17.

910.2-Design-The details of the submitted construction documents hall include sufficient information and calculations of the amount of the dry chemical present. The size, length, and arrangement of connected piping shall be included. Finally the description and location of nozzles so that the adequacy of the system can be determined. . Information shall be provided in relation to the location and function of the detecting devices, operating devices, auxiliary equipment and electrical circuitry.

910.3-Actuation- Dry-Chem systems shall be automatically actuated and shall also contain manual actuation controls.

910.4-Safety Requirements-Where persons will be exposed in areas of discharge, warning signs and discharge alarms shall be provided.

910.5-Acceptance test-All systems shall be tested in accordance with NFPA 17 standards located in Appendix A. The labeling devices with proper designations instructions shall be checked. After testing, all piping and nozzles shall be blown clean using compressed air or nitrogen.

910.5.1-All systems shall be tested by a discharge of expellant gas through the piping and nozzles with observations being made.

910.6-Range Hoods-If a specific dry-chem system contains a range hood. it shall bear the label of an approved agency.

Foam Extinguishing System
911

911.1-All required foam extinguishing systems shall be installed and designed in accordance with NFPA 11, 11A, or 16.

911.2-DesignConstruction documents for any building containing a foam system shall include complete computations show-testing pressure drop in all system piping, friction loss calculations of liquid lines and detailed layout of the area protected.

911.3-Actuation- Foam systems shall be automatically actuated and shall also contain manual actuation controls.

911.4-Safety Requirements-Where persons will be exposed in areas of discharge, warning signs and discharge alarms shall be provided.

911.5-Acceptance test-All systems shall be tested in accordance with NFPA 11, 11A, or 16 standards located in Appendix A

Halogenated Systems
912

912-All halogenated systems shall be installed in accordance with NFPA 12A or 12 B.

912.2-Design-The details of the construction documents shall contain information and calculations of the amount of extinguishing agent, the container storage pressure, the local flow rate of each nozzle including equivalent orifice areas, the location , size and equivalent lengths of pipes fittings and hose, and finally the location and size of the storage facility.

911.3-Actuation- Halogenated systems shall be automatically actuated and shall also contain manual actuation controls.

9010.4-Safety Requirements-Where persons will be exposed in areas of discharge, warning signs and discharge alarms shall be provided.

912.5-Acceptance Tests- All acceptance tests for halogenated systems shall be administered in accordance with NFPA 12 A and 12B.

Wet-Chem Range Hood Systems
913

913.1-All Wet-chem extinguishing systems shall be installed in accordance with the BOCA Mechanical Code and NFPA 17A.

913.2-Design-Construction documents for buildings containing wet-chem systems shall include information and calculations on the amount of wet chemical, the size, length and arrangement of connected piping, a description and location of the nozzles so that the adequacy of the system can be determined.

913.3-Actuation- Wet-Chem systems shall be automatically actuated and shall also contain manual actuation controls.

913.4-Safety Requirements-Where persons will be exposed in areas of discharge, warning signs and discharge alarms shall be provided.

913.5-Acceptance Tests-All tests for a wet-chem system shall be administered in accordance with NFPA 17A.Tests shall include a check of the detection systems, the alarms and the releasing devices, including manual stations, fuel and power shutoff devices and other associated equipment.

913.5.1-All systems shall be tested by a discharge of expellant gas through the piping and nozzles with observations being made.

Standpipe Systems
914

914.1-All standpipe systems shall be of an approved type and be installed in accordance with NFPA 14.

914.3-Piping Sizes- All piping sizes for standpipe systems must be in accordance with NFPA 14.

914.5- Outlets-Standpipe system outlets shall comply with the provisions of class III systems of NFPA 14.

914.6-Acceptance tests-All systems shall be tested in accordance with NFPA regulations.

914.6.1-Underground connections-Underground mains and lead in connection shall be flushed and tested in accordance with NFPA 14 and NFPA 24.

915.1-All standpipe systems shall be provided with appropriate fire department connections that are in accordance with the applicable NFPA standards.

915.2-Connections- Fire department connections shall be arranged in a fashion where the attachment to any one standpipe connection will serve all standpipes in the building

915.3-Connections shall be made on a street front or any place approved by the fire department that is in no way obstructed from common view.

915.4-Height-Connections shall not be less than 18 inches and not more than 42 inches in elevation, measured from ground level to the center line of the inlets.

915.5-Projection-In a case where the connection will project beyond the property line, a flush type connection shall be used.

915.6-Hose Thread-Hose thread used in the connection shall be uniform to the fire department thread type.

915.7-Fittings-Fire department inlet connections shall be fitted with check valves, ball drip valves and plugs with chains or frangible caps.

915.8-Signs-A metal sign with at least one inch letters shall be mounted on all connections. The sign shall read:

STANDPIPE

Fire Protective Signaling Systems
917

917.1-All signaling system shall be of an approved type, and shall be installed in accordance with NFPA 72.

917.2-Construction documents-Where a signaling system is required, the submitted construction documents shall contain the location and number of all alarm initiating devices and alarm notification appliances. The documents shall also provide a description of equipment used, proposed zoning, a list of auxiliary control functions, location of control panels and annunciators, and a sequence of operation for the system.

917.3-Approval-All devices, combinations of devices, and equipment shall be approved for the purpose in which it is used for the system.

917.5-Manual alarm boxes shall be located not more than 5 feet from the entrance to each exit. Manual alarm boxes shall be located on every level, including basement stories.

917.5.1-Manual Alarm Boxes shall be at least 42 inches from the ground, but no more than 54 inches from the ground. Alarm boxes shall be red.

917.6-Power Supply-The power supply for a signaling system shall be provided in accordance with NFPA 72.

917.7-Wiring-The wiring for a signaling system shall be provided in accordance with NFPA 72.

917.7.1-Activation-The signaling system shall be activated by all of the following:

A) Smoke detectors that are not single or multi-station.

B) Sprinkler water flow devices

C) Manual Alarm boxes

D) Other approved detection devices

917.7.1.1-There shall be no automatic deactivation of the signaling system unless approved by the fire department.

917.1.2-Presignal or positive alarm sequence system. Presignal or positive alarm sequence system shall not be installed without consent from the code official, and 24-hour supervision by a trained professional.

917.7.3-Zoning-All floors shall be zoned separately in a manner where no zone is greater than 20,000 square feet in which no length of the zone shall exceed 300 feet in length. A zoning panel indicator shall be provided in a location approved by the fire department. The fire department shall approve all zone and point descriptions. In buildings which have occupied floors above 70 feet from ground level a separate zone by floor shall be provided for the following systems:

A) Smoke detectors

B) Sprinkler water flow devices

C) Manual Alarm boxes

D) Other approved detection devices

917.8-Alarm notification appliances of approved type shall be provided.

Fire Detection Systems
918

918.1-Detection systems shall be installed in accordance with NFPA 72.

918.2-Construction documents-The submitted documents shall contain the number and location of the detection devices, with specifications of the type of detector, proposed zoning, and sequence of operations for the system.

918.3-Approval -All devices, combinations of devices, and equipment shall be approved for the purpose in which it is used for the system. Where a detector is required, it is understood it is a smoke detector unl;ess otherwise noted.

918.5-Buildings containing sprinkler systems do not require detection systems except for the following use groups: I, R-1, R-2, and all high hazard buildings.

918.6-

917.7.3-Zoning-All floors shall be zoned separately in a manner where no zone is greater than 20,000 square feet in which no length of the zone shall exceed 300 feet in length. A zoning panel indicator shall be provided in a location approved by the fire department. The fire department shall approve all zone and point descriptions. In buildings which have occupied floors above 70 feet from ground level a separate zone by floor shall be provided for the following systems:
A) Smoke detectors

B) Sprinkler water flow devices

C) Manual Alarm boxes

D) Other approved detection devices

918.7-Alarm Verification-alarms activated by smoke detectors shall be activated by a single smoke detector monitored by an alarm verification zone.

918.8-Local control functions-Fire detectors utilized for the purpose of performing local control functions shall be part of a fire protective signaling system. The detector upon actuation shall perform the intended function and activate the alarm notification devices.

918.9-Acess-Acess shall be provided to each detector for periodic inspection. maintenance. and testing.

Single and Multi Station Smoke Detectors
919

919.1-All single and Multi station smoke detectors shall be installed in accordance with NFPA 72.

919.1.1-A control and associated equipment, single or multi station alarm devices shall be permitted to be used as a household fire warning system provided it meets the specifications set forth by NFPA 72 Chapter 2.

919.2-Construction Documents-Submitted construction documents shall show the location and number of smoke detectors with specifications of the type of detector.

919.3-Any smoke detector within 20 feet of the kitchen or bathroom shall be a photo electric type smoke detector.

919.6-Acceptance testing-When the installation of detectors is complete, each detector shall be subject to a 100% acceptance test in accordance with NFPA 72.

APPENDIX B

B-5

General Requirements for All Use Groups

Chapter Nine Outline

General

901.5-Threads-All threads provided for fire department connections shall be compatible with the fire departments.

901.6-SignsAll signs required to identify any fire protection equipment, equipment rooms and equipment locations shall be permanently installed. The letters must be at least two inches in height and shall have an appropriate width to height ratio. The signs shall be approved by the local FD.

903.1-Required Construction Documents-Complete fire protection construction documents shall be submitted with a permit before all fire protection systems are installed. This includes all modifications, alterations, additions, and deletions from existing systems. The documents must contain detailed information on the systems including operational features.

903.1.1- Required Construction Documents-

1)A. Methodology of design for the protection of the occupancy.(In a narrative report)
B. Sequence of operation of all fire protection systems and operation.(In a narrative report)
C. Testing criteria to be used for final acceptance tests. (In a narrative report)
2) Building and site access for fire fighting and or rescue vehicles and personal.
3) Fire Hydrant location and water supply info.
4) Type and design layout of the Automatic Sprinkler System
5) Sprinkler system control layout
6) Type and design layout of the Automatic Standpipe System
7) Standpipe system hose valve type and location
8) Fire Department siamese connection info.
9) Type and design layout of fire protective signaling system.
10) Signaling system control equipment and remote annunciator location.
11) Type and design layout of the smoke control system.
12) Smoke control system control location.
13) Building life safety system features required to be implemented as part of the fire protection system.
14) Type and design layout of fire extinguishing system.
15) Extinguishing system control location.
16) Fire Protection systems control room location.
17) Fire protection system equipment identification and operating signs.
18) Fire protection system alarm transmission method and location.

903.1.2-Plans-All fire protection system plans shall contain sufficient information to identify the occupancy, hazards, system arrangements, system sizing, specifications, sequence of operation and engineering calculations.

903.1.3-Design-All fire protection systems shall be designed and specified by a registered Professional Engineer.

904.8-Windowless story-All buildings require an automatic suppression system in all stories and basements where there is not provided at least on of the following:

A)An exterior stairway or ramp leading directly to grade in each 50 linear feet or fraction thereof of an exterior wall in the story or basement, on at least one side of the building.

B)Openings above the adjoining ground level totaling 20 square feet in each 50 linear feet or fraction thereof of exterior wall in the story or basement, on at least one side of the building. Opening must have a least dimension of not less than 22 inches and shall have a net clear opening of at least 5 square feet.