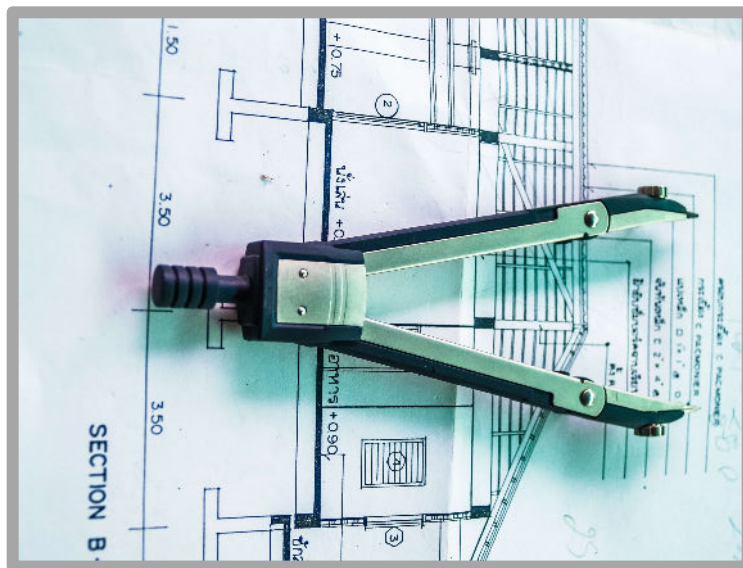




## Fire Inspector I

### CHAPTER SIX

### READING PLANS



<b>Slide 1</b>	<p>Welcome to the Chapter 6 Reading Plans. In this Chapter we will discuss:</p> <ul style="list-style-type: none"><li>• An overview of the plan review &amp; permit process</li><li>• Goal of plan review process</li><li>• The authority of the local jurisdiction to conduct plan reviews</li><li>• Different types of plans</li><li>• Information contained in drawings</li><li>• Drawing scales</li><li>• Building permit application</li><li>• Site visits during construction</li><li>• Building commissioning</li></ul>
<b>Slide 2</b>	<p>This chapter provides an overview of plan review and building permitting process that fire inspectors should be familiar with. Not all jurisdictions have the same requirements, so this chapter is presented in general terms, but the inspector must also be familiar with the specific requirements in their jurisdiction. The plan review process usually involves multi departments within the jurisdiction such as Planning, Building Inspection, Zoning, Health, and the Fire Department. Each department has their own areas of expertise and working together as a team provides the best opportunity to meet the needs of the jurisdiction. A team approach also deters contractors in making unapproved changes to the building during construction.</p>
<b>Slide 3</b>	<p>From a fire prevention perspective, the plan review process provides a unique opportunity to review, address, and perhaps improve fire and life safety issues before the building is built. This is perhaps the fire inspectors best or only chance to play a proactive role to ensure that the building meets all applicable codes and standards.</p> <p>The goal of the plan review process is to make sure buildings are safe for the occupants and the public but also for your firefighters should they be called upon in an emergency. This is the opportunity to review fire department access to the building, water supplies for firefighting, fire protection systems which include both active and passive systems including fire separation, early detection, and exiting. It is also the opportunity to review or establish occupant loads within the building.</p>
<b>Slide 4</b>	<p>The intent of the plan review process is to ensure all applicable codes and standards have been met. The approval process may differ jurisdiction to jurisdiction but in most cases depends on the size and occupancy classification of the building. Large buildings usually require the involvement of a registered professional like an architect or professional engineer while the owner or contractor may apply for a permit for smaller buildings.</p>

<b>Slide 5</b>	<p>Most building and fire codes provide the authority for the local jurisdiction to conduct plan reviews prior to the start of construction. In most cases, the local jurisdiction creates a building bylaw to regulate construction within the jurisdiction and to provide limited review and inspection programs for public health and safety. The bylaw is not intended to protect owners or contractors from economic loss nor accept any liability, for it is normally the owner's responsibility to comply with the Building Code.</p> <p>Local bylaws usually apply to the construction, alteration, repair or demolition of buildings and structures where the occupancy or use of a building, or any part of it, is changed. For example, in a strip mall a drop-in medical clinic moves out and is replaced by a restaurant. The occupancy classification and level of hazard has changed so a building permit would be required.</p>
<b>Slide 6</b>	<p>When an unsafe condition exists in a building or structure the local bylaw often applies to the work necessary to correct the deficiency.</p> <p>Most local bylaws give the building inspector the authority to:</p> <ul style="list-style-type: none"><li>(a) Administer the bylaw</li><li>(b) Issue a permit to the owner</li><li>(c) Issue an occupancy certificate upon satisfactory completion of the work</li><li>(d) Require applicants for a permit to provide certification by a registered professional (professional architect or engineer) that the plans comply with the Building Code and other applicable codes and standards &amp;</li><li>(e) Require progress inspections from a registered professional assuring that the applicable codes are substantially complied with.</li></ul>
<b>Slide 7</b>	<p>Usually, the bylaw authorizes the building and/or fire inspector to enter any property at all reasonable times to determine if the requirements and regulations under the bylaw are being complied with. Having said that, inspectors normally have to obtain consent from the occupant before entering any occupied dwelling.</p> <p>The building inspector is usually empowered to issue a stop work Order if the work is proceeding in contravention of this bylaw, or if an unsafe condition is observed.</p> <p>Fire inspectors should familiarise themselves with the local building and fire bylaws and the authority and procedures these provide for.</p>

	The administrative Chapter of most Building and Fire Codes provide the authority having Jurisdiction (AHJ) the authority to review plans and issue permits.
<b>Slide 8</b>	There are several different types of plans that can be submitted to the AHJ for review. At first glance, reviewing these drawings can seem like a daunting task due to the size and number of pages provided but most sets of plans contain standardized information that can be easily interpreted once the reviewer is familiar with the process. It is important however, for the reviewer to have the experience and qualifications required by their jurisdiction before reviewing plans.
<b>Slide 9</b>	Years ago, most plans were referred to as blueprints because they were created on a blue background with white lines. More recently the lines were blue on a white background. Today, plans are often still referred to as blueprints, but that term is interchangeable with drawings, construction drawings, shop drawings or prints. They are usually created, stamped and signed by a registered professional who specialises in a given discipline. For example, site plans are a diagram usually created by a civil engineer which depicts the placement of structures on a property including details such as a detached garage, power lines, driveways, right of ways, water lines and easements, etc. In many cases, it is necessary to provide a site plan to obtain building permits. Other engineers may create, stamp and sign off on mechanical, electrical, or fire protection system drawings based on their specific discipline. Architects usually create the overall building plan for larger projects.
<b>Slide 10</b>	An architect designs and draws up plans for buildings, bridges, and other structures. The key difference between an architect and an engineer is that an architect focuses more on the artistry and design of the building, while the engineer focuses more on the technical and structural side.
<b>Slide 11</b>	A scaled drawing is a drawing which has been reduced or enlarged from its original size to a specified scale using either metric or imperial measurements, for example a scale of 1/8" equals 1' up to 3" equals 1' is frequently used by architects. Engineers commonly use ratios like 1":10', 1":100', 2:1, and 4:1. When the first number is smaller than the second, it represents scaling down or reducing. When the first number is larger than the second, it represents scaling up or enlarging. When scaling down images that are especially large, expect the second number in the ratio to also be large. A 1:5000 ratio might be used to fit a building-sized object on a single sheet of paper.
<b>Slide 12</b>	A set of plans may be made up of many pages that will be examined during the plan review process. Each page should have a description of what is on that page. For example, a site plan is usually one of the first pages in the set. The site plan provides information about the location of the building on the property. The site plan shows existing buildings and

	where new buildings, or additions will go. It should also include a directional symbol identifying North which orients the reader to the proposed building. It should provide the dimensions of the lot, property lines, and distance the building will be from the property lines as that can affect the required fire-resistance rating of the building walls and number and size of allowable openings in the walls.
<b>Slide 13</b>	<p>Of particular concern to the fire inspector is fire department access to the property, fire department connections to the building, dead end routes, width of travel, weight limitations, bridges, potential overhead obstructions, and parking. The distance from the fire apparatus to access to the building for firefighters should also be determined as acceptable. Fire hydrant locations and spacing will also be important so the plan reviewer can determine that this meets the required fire flows, based on the size, use, and construction type of the building. Fire flow requirements will be discussed in detail in Chapter 9 Fire Flow and Fire Suppression Systems.</p> <p>Landscaping design should also be reviewed as over time plants may grow to a point where they obstruct fire department operations, fire hydrants, and fire department connections. Also, there may be a Fire Smart program in your community which limits the type of vegetation around buildings.</p> <p>Site plans can also be used during future inspections to ensure that changes in access have not been made that would adversely affect the fire department response. They can also play a role in pre-fire planning.</p>
<b>Slide 14</b>	<p>There are basically four types of views in a plan set. They are Plan View, Elevation View, Sectional View and Detail View.</p> <p>A plan view is an orthographic projection of a 3-dimensional object from the position of a horizontal plane through the object. In other words, a plan view is a section viewed from the top. In such views, the portion of the object above the plane is omitted to reveal what lies beyond. In the case of a floor plan, the roof and upper part of the walls may be left out. Basically, a plan view is just another name for the top view of a 3D object. Floor plans and site plans are examples of Plan Views.</p>
<b>Slide 15</b>	An Elevation Plan shows the exterior of the building. It is an orthographic projection that shows one side of the house. The purpose of an elevation drawing is to show the finished appearance of a given side of the house and furnish vertical height dimensions. Four elevations are customarily drawn, one for each side of the building.
<b>Slide 16</b>	A sectional view or cross section represents a vertical view of a building as if it were cut in half from top to bottom. Sectional views are used to show the relationship between different levels of a building that would be difficult to understand from plans alone. Sectional drawings can also be

	used to show structural members as they are positioned vertically. Sectional drawings can be used to show construction details such as the roof construction as shown in this photo.
<b>Slide 17</b>	Detailed views show features that have been enlarged for ease of viewing and understanding. The view is provided in a larger scale which will show the exact construction of the object. Detail drawings are used to show construction details that would not be possible to see on more general drawings. Detailed drawings are provided for things that will need to be constructed or assembled on site to exact specifications.
<b>Slide 18</b>	Building permits are usually required for new construction, renovations, alterations, or when there is a change in use or occupancy classification of a building. Building permits are normally issued by the AHJ. Part of the permitting process is the submission of an application and plans by the owner or their agent. The actual process goes something like this:
<b>Slide 19</b>	<ul style="list-style-type: none"> <li>• An informal meeting is held between the owner, their registered professional, the builder and the AHJ to discuss the proposed undertaking. The meeting helps to set out the expectations of the AHJ and communications amongst various parties. This provides the opportunity to explain the plan approval process and the fee structure of the AHJ.</li> <li>• The application for a permit is made by the owner or their agent</li> <li>• The application and plans are reviewed by the AHJ, usually the building department with input from the fire inspector</li> <li>• Feedback is given to the builder by the AHJ</li> <li>• Changes are made by the applicant and the plans are re-submitted</li> <li>• The approval is granted</li> <li>• Construction begins</li> <li>• Site inspection visits are made &amp;</li> <li>• At the completion of construction, the building is commissioned, and occupancy is granted</li> </ul> <p>That sounds pretty straight forward but it is not always so simple.</p>
<b>Slide 20</b>	<p>Once the permit application is submitted to the AHJ, the following process takes place:</p> <p>Usually, the first step is to conduct a Zoning Review. Most jurisdiction have Zoning By-laws that set out rules governing land use and the placement of buildings on a lot.</p> <p>Zoning bylaws can cover things like:</p> <ul style="list-style-type: none"> <li>• Land and building uses</li> <li>• Building size or density</li> <li>• Location of buildings and other structures on a lot</li> </ul>

	<ul style="list-style-type: none"> <li>• Minimum lot sizes and dimensions, parking requirements and building height</li> </ul> <p>The AHJ will need to confirm that the application complies with the zoning bylaw. If it is non-compliant, an application for a variance may be made. If the variance is approved a Building Permit application can then be submitted for a Building Code Review.</p>
<b>Slide 21</b>	<p>Once the plans are approved and the permit is granted construction can start. The process of approving the construction requires site visits to ensure the building is being constructed in accordance with the approved plans and that no unauthorized changes have been made. You should review the plans prior to attending the site.</p> <p>Upon arrival at the site be sure to check in with the person in charge and explain your reason for being there. You will be expected to don personal protective equipment appropriate for the hazard. This would normally include hard hat, eye protection, steel-toed boots, and hearing protection but other items may be required depending on conditions at the site.</p> <p>If the work is not being done in accordance with the approved plans this should be brought to the attention of the site manager immediately. If the issue can't be resolved, then a "stop work order" may have to be issued in accordance with your jurisdictional bylaws and policies.</p>
<b>Slide 22</b>	<p>The commissioning of a building is the final step in the plan review and construction approval process.</p> <p>The term commissioning comes from shipbuilding. A commissioned ship is one deemed ready for service. Before being awarded this title, however, a ship must pass several milestones. Equipment is installed and tested, problems are identified and corrected, and the prospective crew is extensively trained. A commissioned ship is one whose materials, systems, and staff have successfully completed a thorough quality assurance process.</p> <p>Building commissioning takes the same approach to new buildings. When a building is initially commissioned it undergoes an intensive quality assurance process that begins during design and continues through construction, occupancy, and operations. Commissioning ensures that the new building operates initially as the owner intended and that building staff are prepared to operate and maintain its systems and equipment.</p>
<b>Slide 23</b>	<p>The fire inspector is primarily concerned with the commissioning of the fire protection systems. The specifics on how each system is commissioned is contained in the installation standard identified in the building and fire codes. You should be familiar with the test procedures,</p>

	but the work should be carried out by a qualified technician. Records of the verification and testing should be made available to you upon request.
<b>Slide 24</b>	<p>In this Chapter we discussed:</p> <ul style="list-style-type: none"><li>• An overview of the fire inspection process and that it may vary from community to community</li><li>• That the goal of the plan review process is to make sure that buildings are safe for the occupants and the public and that the applicable codes and standards have been met</li><li>• The authority for the local jurisdiction to conduct plan reviews usually comes through local bylaws</li><li>• The bylaw normally empowers the building inspector to issue a stop work order if the work contravenes the bylaw</li><li>• The titleblock on the plans which contains important information about the project</li><li>• Drawing scales incorporated to reduce or enlarge the original size of the drawing</li><li>• Four typical views in a plan set, being plan view, elevation view sectional view, and detail view</li><li>• When building permits are required and the application process</li><li>• Site visits during construction and we finished the chapter with</li><li>• Building commissioning which ensures that the fire protection systems undergo a quality.</li></ul>