

2/ ORDINANCE No. 115400

2/ COUNCIL BILL No. 108152

The City of

AN ORDINANCE relating to building construction; amending Section 3802 of the Seattle Building Code (Chapter 22.100 Seattle Municipal Code) to establish standards for automatic sprinkler protection for residential occupancies.

PSE 10/19/90  
PASS 3-0

Honorable President:  
Your Committee on \_\_\_\_\_

to which was referred the within Council report that we have considered the same

COMPTROLLER FILE No. \_\_\_\_\_

|                                       |  |
|---------------------------------------|--|
| Introduced:<br>AUG 13 1990            | By:<br>NOLAND  |
| Referred:<br>AUG 13 1990              | To: Public Safety and Environment  |
| Referred:                             | To:  |
| Referred:                             | To:  |
| Reported:<br>10/21/90                 | Second Reading:<br>10/29/90  |
| Third Reading:<br>10/29/90            | Signed:<br>10/29/90  |
| Presented to Mayor:<br>10/29/90       | Approved:<br>NOV 3 1990  |
| Returned to City Clerk:<br>NOV 3 1990 | Published:   |
| Vetoed by Mayor:                      | Veto Published:  |
| Passed over Veto:                     | Veto Sustained: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">OK</span> |

Full Council vote

*Blain Department*

# The City of Seattle—Legislative Department

3802 of  
(Code) to  
residential

Date Reported  
and Adopted

## REPORT OF COMMITTEE

President:

Submitted on \_\_\_\_\_

was referred the within Council Bill No. \_\_\_\_\_

we have considered the same and respectfully recommend that the same:

*Council vote 9-0*

\_\_\_\_\_  
Committee Chair

ORDINANCE 115400

AN ORDINANCE relating to building construction; amending Section 3802 of the Seattle Building Code (Chapter 22.100 Seattle Municipal Code) to establish standards for automatic sprinkler protection for residential occupancies.

BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:

Section 1. That Section 3802(h) of the Seattle Building Code, Chapter 22.100 Seattle Municipal Code, as adopted by Ordinances 113700 and 113701, is amended to add a new subsection 6 to read as follows:

6. Group R Occupancies. A. General. An automatic sprinkler system shall be installed in any Group R occupancy hereafter constructed which does not have approved fire department access, which does not have adequate fire flow or which is located more than 500 feet from the nearest hydrant.

EXCEPTION: For Group R, Division 3 Occupancies, the Chief may authorize a greater distance but in no case more than 1000 feet to the nearest hydrant.

B. Group R, Division 1 Occupancies. An automatic sprinkler system shall be installed in Group R, Division 1 Occupancies as follows:

- (i) Any building having three or more stories of height; or
- (ii) Any building having two stories of height and located above another occupancy other than:
  - (A) Group M;
  - (B) Group B, Division 1 parking garage; or
  - (C) Storage, mechanical or laundry or similar rooms accessory to the R-1 occupancy.
- (iii) Any apartment building containing five or more dwelling units; or
- (iv) Any hotel containing ten or more guest rooms.

C. Determination of Stories. For the purpose of this section, in mixed occupancy buildings, the number of stories shall be determined based on the

1 total building, not just those stories occupied by the Group R, Division 1  
2 occupancy, provided other occupancies shall be sprinklered when specifi-  
3 cally required for each occupancy.

4 D. Area Separation Walls. Area separation walls may be used as provided  
5 in Section 505 of this code (of the Building Code) provided, for the pur-  
6 pose of this subsection, the total number of dwelling units or total number  
7 of guest rooms shall be determined based on the complete, attached building  
8 regardless of any area separation walls.

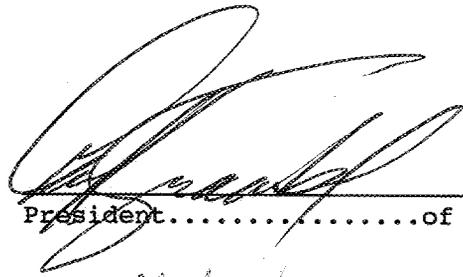
9 E. Sprinkler Systems. Sprinkler systems installed in Group R, Division 3  
10 occupancies may comply with NFPA Standard 13D. Sprinkler systems installed  
11 in Group R, Division 1 occupancies may be installed in accordance with NFPA  
12 Standard 13R in buildings of 4 stories or less. In buildings of more than  
13 4 stories, or where a sprinkler system is required throughout, the sprin-  
14 kler system shall comply with NFPA Standard No. 13, provided that quick  
15 response or residential sprinkler heads shall be used in the dwelling unit  
16 and guest room portions of the building according to Section 7.4 of that  
17 standard.

18 Sprinkler systems which have 100 or more sprinkler heads shall com-  
19 ply with Section 3803.

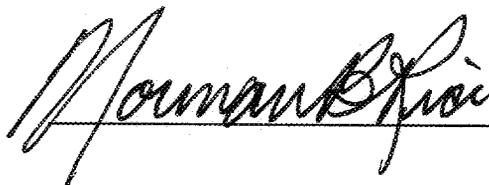
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Section 2. This ordinance shall take effect and be in force thirty days from and after its passage and approval by the Mayor; otherwise it shall take effect at the time it shall become a law under the provisions of the City Charter.

Passed by the City Council the 29th day of October, 1990, and signed by me in open session in authentication of its passage this 29th day of October, 1990.

  
\_\_\_\_\_  
President.....of the City Council

Approved by me this 6th day of November, 1990.

  
\_\_\_\_\_  
Mayor

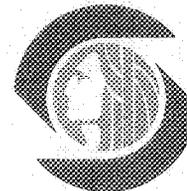
Filed by me this 6th day of November, 1990.

Attest: Norman J. Brooks  
\_\_\_\_\_  
City Comptroller and City Clerk

(SEAL)

Published \_\_\_\_\_ By Margaret Carter  
\_\_\_\_\_  
Deputy Clerk

Seattle  
Department of Construction and Land Use



Dennis J. McLerran, Director  
Norman B. Rice, Mayor

**M E M O R A N D U M**

**TO:** Paul Kraabel, President  
Seattle City Council

**VIA:** Andrew Lofton, Director  
Office of Management and Budget

*OMA 108  
8 450 85*

**FROM:** Dennis McLerran *D.J.M.*  
Director

**DATE:** March 14, 1990

**SUBJECT:** Fire Protection Measures Recommended to be Added  
to the Seattle Building Code and Seattle Fire Code

I have enclosed a copy of a proposed ordinance amending the Seattle Building Code regarding residential sprinkler systems. This ordinance is a companion ordinance to that provided by the Fire Department amending the Seattle Fire Code. The proposal originated with the Seattle Fire Department. It was reviewed by a joint subcommittee of the Building Code Advisory Board (BCAB) and the Fire Code Advisory Board. The joint committee recommended a revised proposal that was then reviewed by the full boards. The BCAB has recommended approval of this revised proposal.

The Building Code would be amended to adopt the same residential sprinkler standards as are proposed for the Seattle Fire Code. In addition, the Seattle Fire Code would be amended to add requirements for fire detection systems in most new buildings, a process to allow the Fire Department to review Master Use Permits in order to assess the impact of development on fire protection capabilities of the Fire Department and standards for sprinkler system maintenance.

**Residential Sprinkler Systems**

This proposal requires sprinklers in more residential buildings than the State Building Code. It requires residential-type sprinkler systems in all R-1 buildings (apartments, condominiums and hotels) which are more than 3

**Paul Kraabel, President**  
**March 14, 1990**

stories high, have 2 stories above another occupancy other than a parking garage, or have 5 or more apartments or 10 or more hotel rooms. The 1988 edition of the Uniform Building Code as adopted by the state of Washington requires sprinklers in residential buildings more than 3 stories high or with more than 15 apartments or more than 20 hotel rooms. In addition, this proposal requires sprinkler systems in one- and two-family homes when Fire Department access to a water source is inadequate. The single-family provision does not change current practice.

The City is required by State law to adopt the standards of the 1988 Uniform Building Code as a minimum, but also allows the City to adopt more stringent standards. This proposal is more stringent than the state adopted code.

The sprinkler requirements will have some impact on the cost of housing in Seattle. Under current Building/Fire Code regulations 40 to 45 percent of all apartment and hotel buildings have sprinklers. If only the state minimum standards are adopted, approximately 87 percent of all apartments will be constructed with sprinklers. If this proposal is adopted, it is estimated that 95 to 97 percent of all such buildings will have sprinklers. We have estimated the cost impact and have enclosed a copy of a report which outlines our findings. In general, we concluded that, when compared to the State Building Code, the increase in sprinkler protection will have little additional effect on the cost of housing in Seattle.

A minor amendment, suggested by BCAB, has been made since BCAB review. We have discussed this amendment with the Fire Department and Chair of the Board. We did not take the change back to BCAB in the interest of time. The change is an added exception which makes clear that a two-story building may include small basement-level storage areas and other uses normally found in apartment buildings without adding sprinklers.

#### **Report of Fire Protection Impacts**

The ordinance amending the Fire Code would adopt a requirement for a "Report of Fire Protection Impact". This proposal requires DCLU to notify the Fire Department when certain types of permit applications are received. The Fire Department then has the opportunity to assess the impact the project may have on the Fire Department's services. It will be able to notify the applicant early in the application process if mitigation measures will be required. This change in the application review process is a continuation of the philosophy that development requirements should be

**Paul Kraabel, President**  
**March 14, 1990**

identified as early in the review process as possible. This proposal allows the Fire Department to review projects earlier than current procedures allow. This should reduce the incidents where costly revisions would be required in the field after a permit was issued.

SFD and DCLU have developed a memorandum of understanding to implement this new procedure. The procedure will have a small impact on DCLU staff which must make files available for SFD staff to review. This DCLU staff which provides this function is already available. The SFD review must be done in a short time, according to the proposal, and will not result in any delay for the vast majority of projects. Where SFD wishes to impose conditions on a project to mitigate fire protection impacts, they will work with DCLU's Land Use staff. This will add slightly to the time spent preparing a small percentage of MUP decisions.

#### **Other Administrative Impacts**

The new sprinkler standards proposed for both codes and the new fire detection system requirements proposed for the Fire Code will not result in more permit applications being routed to, and reviewed by the Fire Department. Currently nearly all applications for new construction are reviewed by SFD. There should be no additional impact on our plans routing system or staff. The primary impact will be on the building plans examination staff which reviews residential plans. Under current operation procedures, approximately 30 minutes of additional review time is needed to coordinate final review of shop drawings. Depending on the permit volumes in any year this will add 35 to 45 hours of plans examination. This team of plans examiners is currently backlogged with many applications submitted to the city to vest to previous land use code standards. There should be minimal impact on the construction inspection staff which coordinates inspections with Fire Department inspectors because there will be a small increase in the number of developments with Fire Department inspection.

#### **Environmental Assessment - SEPA**

Adoption of building and fire codes in compliance with Chapter 19.27 of the Revised Code of Washington is categorically exempt from environmental review under the Washington Administrative Code.

## BACKGROUND REPORT

### COST OF SPRINKLERS IN APARTMENT CONSTRUCTION

#### Introduction

The 1988 edition of the Uniform Building Code requires all apartment buildings of 15 units or more, or 3 stories or more to be protected by an automatic sprinkler system. The 1988 UBC has been adopted by the State of Washington. Seattle must adopt this provision and may adopt a more stringent provision. The Seattle Fire Department and the Department of Construction and Land Use have developed a more stringent proposal which would require sprinklers in buildings of 5 or more dwelling units and buildings of 2 1/2 stories.

The cost impacts of requiring sprinklers vary by the size of the building and the materials used in the sprinkler installation. There are two main components to this cost which are summarized below: 1. The direct and indirect construction costs to the developer, and 2. The City of Seattle imposed costs to provide water service to a sprinkler system.

#### Background

Apartment construction occurs throughout the city in the multi-family, downtown and neighborhood commercial zones. The size and design of apartments in multi-family zones has recently undergone intense scrutiny by the City Council and the result was a significant change in the regulations in the multi-family zones.

Based on information provided in the EIS for the Multi-family Land Use Policy Revisions there are approximately 4150 acres in the city zoned for multi-family construction. Of that area more than 65% is zoned with heights of 30 feet or more. In addition all of the commercial zones have heights of 30 feet or more. Almost all of the multi-family construction in those zones are of 3 stories or more in height. Regardless of the sprinkler requirement adopted by the City, an estimated 80% will be required to include sprinklers.

In three zones, LDT, L-1, and L-2, the height limit was set at 25 feet. It is in these three zones that the difference between the UBC sprinkler standard, and the SFD/DCLU proposal will have its biggest impact.

The Multi-family Policy EIS predicts that approximately 20% of new apartment construction will occur in the LDT, L-1 and L-2 zones. For the next 20 years the EIS estimated that

4,000 new units will be built in these 3 zones. Under the UBC, only those buildings in excess of 15 units would be provided with sprinklers. A study of building size has not been conducted, however the zoning requirements prohibit buildings of this size in the LDT and will probably discourage them in L-1. If half of the units projected for L-2 are in buildings this large, approximately 1,500 will have sprinklers. The result is that about 87% of all new apartments outside of downtown will have sprinklers.

If the SFD/DCLU proposal is adopted, nearly all new apartments will be sprinklered except those located in the LDT zone. This increase results from two factors. Construction of 2 and 1/2 stories can easily be accomplished within the 25 foot height limit of these zones. Secondly, applications for new buildings of less than 5 units are very unusual, although the new density restrictions may lead to more buildings of this size..

#### Cost of Sprinklers

The cost of sprinklers vary by the type of the material used in the construction of the sprinkler system. The SFD/DCLU proposal and the State adoption do allow the use of plastic piping and other cost saving features. However even systems using plastic can cost \$1.00 to 1.25 per square foot. These are the costs of the actual sprinkler installation. There are additional soft costs (contractor mark-up, financing, etc) which add to this cost. As a result the additional costs can be as much as \$1.69 to 1.93 per square foot. (In other jurisdictions which adopted similar residential sprinkler requirements, the average cost of sprinkler systems dropped as the construction industry became more experienced with residential sprinklers.)

Apartments generally average between 600 and 800 square feet in area. Based on 1990 DCLU building construction data, the average cost per unit is between \$27,060 and \$36,080 per unit. The Multi-family EIS stated that in recent years developers experienced costs per unit of \$32,075 on average. The additional direct cost of sprinklers will add between \$1,014 and \$1,544 per unit which represents and increase in cost per unit in the range of 3.7 to 4.3 percent. This assumes that sprinkler installation costs stay fairly constant, although other jurisdictions which have adopted stringent sprinkler ordinances have reported significant declines in the cost of sprinkler installation due to volume and competition factors.

#### Costs resulting from City Water Department Standards.

These costs are highly variable depending on the size of the project and the continued operating agreement between the Fire Department and Water Department. The Water Department

related costs of concern are the installation of water meters, the size of the service and the need to provide backflow prevention device(s).

As background, the sprinkler systems designed for installation in apartment buildings are based on a "4-head" design. The design assumption of a "4-head" sprinkler system is when the sprinkler system is triggered by fire (heat) that a maximum of 4 sprinkler heads will be flowing to control a fire. This will generally be true unless fires start in more than one unit at the same time. It is the belief of the Fire Department that this type of system can be serviced off of the "domestic" water service to the building. Under the current agreement, the Water Department is accepting this determination by Fire, but they have reservations. Water Department is concerned that more than 4 heads will be triggered by a fire. In such a scenario, which is remote in residential buildings, a domestic service line and meter will not be adequate to the flow demands. A separate service for the sprinkler system would eliminate this "worst case" scenario.

For all new buildings the Water Department charges a fee for the installation of water service. For most apartment buildings of 15 units or more, the service is a 2 inch service, or larger. Adding sprinklers (based on the new requirements) will not result in any significant increase in costs from the city charges, provided Water Department continues to allow sprinklers to be served from the domestic line. If, however, a separate service is required, then an additional cost to the development of \$2,000 to 4,000 is incurred. This is approximately \$133 to \$267 per unit additional, or 1/2 to 1 percent greater costs.

When a sprinkler system is installed with heads located more than 30 feet above the height of the service, the Water Department requires an additional backflow prevention device. These devices prevent water which sits for long periods in the sprinkler piping from backing up and contaminating the City's water supplies. These devices generally cost about \$500. (The City doesn't supply or sell backflow devices, but it represents an additional cost resulting from a Water Department requirement.) Because of the height limits, the backflow preventer costs will not apply in the LDT, L-1 or L-2 zones.

For buildings of only 3 or 4 units which might be three stories (or 2-1/2 stories under the SFD/DCLU proposal) there is an additional cost impact. Typically 3 and 4 unit buildings would be served by a 1" service for which the city charges \$775. Adding a sprinkler system, would require upsizing to either a 1-1/2 or 2" service which cost \$1,950 and \$2,150 respectively. For a 4 unit building, the increased service size the increase in cost of approximately

\$295 per unit, means a .8 to .95 percent increase in overall cost per unit. Because the cost of construction per unit is generally higher for units in smaller buildings, the percent increase in cost should tend to the lower end of this range.

#### Summary

The costs of the sprinkler requirement vary by the building size and may vary depending on the Water Department requirements for combined or separate service.

If Seattle adopts the UBC standards only, the impact on the cost of apartment construction will be in the range of 3.7 to 4.3 percent increase. An estimated 87% of all new apartments outside of downtown will be sprinklered. Since this standard (15 units or more, 3 stories or more) is mandated by the state, we will see these increased costs for this major portion of the new apartments market. All apartments downtown would be sprinklered. Even in the event the water department requires a separate service, the increase in cost is only slightly higher - generally in the 4.0 to 4.5% range.

If we adopt the SFD/DCLU proposal as revised by the Advisory Boards, (5 units or more, 2-1/2 stories or more), the impact on the construction costs will still be in the 3.7 to 4.5 percent range for the buildings of more than 15 units. But for smaller buildings, the costs increase would range between 3.7 and 5.5 percent. The greater percent increase is completely a result of water department requirements. It is estimated that with the SFD proposal 95 to 97 percent of new apartment buildings will be sprinklered.

The difference between the UBC and the SFD/DCLU proposal is of limited impact. Approximately eight to ten percent more apartments will have sprinklers than under the UBC standards. In addition, this 8 to 10 percent will have a slightly higher per unit increase in cost when compared to the larger buildings which will have sprinklers under the UBC standards.

# City of Seattle

Executive Department - Office of Management and Budget

Andrew J. Lofton, Director  
Norman B. Rice, Mayor



March 20, 1990

COPY RECEIVED  
90 JUN 14 PM 2: 18  
SEATTLE CITY ATTORNEY

MAR 22 1990

SEATTLE CITY ATTORNEY

The Honorable Mark Sidran  
City Attorney  
City of Seattle

Dear Mr. Sidran:

The Mayor is proposing to the City Council that the enclosed legislation be adopted.

REQUESTING  
DEPARTMENT: Construction and Land Use

SUBJECT: AN ORDINANCE relating to building construction; amending Section 3802 of the Seattle Building Code (Chapter 22.100 Seattle Municipal Code) to establish standards for automatic sprinkler protection for residential occupancies.

Pursuant to the City Council's S.O.P. 100-014, the Executive Department is forwarding this request for legislation to your office for review and drafting.

After reviewing this request and any necessary redrafting of the enclosed legislation, return the legislation to OMB. Any specific questions regarding the legislation can be directed to Mona Goode at 4-8080.

Sincerely,

Norman B. Rice  
Mayor

by

ANDREW J. LOFTON  
Budget Director

AL/mg/bpc

Enclosure

cc: Director, Department of Construction and Land Use

*Schneider / ok 9/26/90*

STATE OF WASHINGTON - KING COUNTY

31936  
City of Seattle

—ss.

No.

Affidavit of Publication

The undersigned, on oath states that he is an authorized representative of The Daily Journal of Commerce, a daily newspaper, which newspaper is a legal newspaper of general circulation and it is now and has been for more than six months prior to the date of publication hereinafter referred to, published in the English language continuously as a daily newspaper in Seattle, King County, Washington, and it is now and during all of said time was printed in an office maintained at the aforesaid place of publication of this newspaper. The Daily Journal of Commerce was on the 12th day of June, 1941, approved as a legal newspaper by the Superior Court of King County.

The notice in the exact form annexed, was published in regular issues of The Daily Journal of Commerce, which was regularly distributed to its subscribers during the below stated period. The annexed notice, a

ORD: 115400

was published on

11/09/90

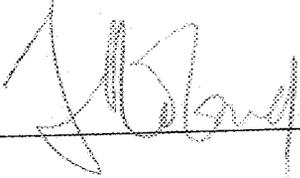
The amount of the fee charged for the foregoing publication is the sum of \$ \_\_\_\_\_, which amount has been paid in full.

*[Signature]*  
Subscribed and sworn to before me on  
*[Signature]*  
Notary Public for the State of Washington,  
residing in Seattle

TIME AND DATE STAMP

**SPONSORSHIP**

THE ATTACHED DOCUMENT IS SPONSORED FOR FILING WITH THE CITY COUNCIL BY THE MEMBER(S) OF THE CITY COUNCIL WHOSE SIGNATURE(S) ARE SHOWN BELOW:

  
\_\_\_\_\_  
\_\_\_\_\_  
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**FOR CITY COUNCIL PRESIDENT USE ONLY**

COMMITTEE(S) REFERRED TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
PRESIDENT'S SIGNATURE

# City of Seattle

## ORDINANCE 115488

AN ORDINANCE relating to building construction; amending Section 3802 of the Seattle Building Code (Chapter 22.100 Seattle Municipal Code) to establish standards for automatic sprinkler protection for residential occupancies.

BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:

Section 1. That Section 3802(h) of the Seattle Building Code, Chapter 22.100 Seattle Municipal Code, as adopted by Ordinances 113700 and 113701, is amended to add a new subsection 6 to read as follows:

6. Group R Occupancies. A. General. An automatic sprinkler system shall be installed in any Group R occupancy hereafter constructed which does not have approved fire department access, which does not have adequate fire flow or which is located more than 500 feet from the nearest hydrant.

EXCEPTION: For Group R, Division 3 Occupancies, the Chief may authorize a greater distance but in no case more than 1000 feet to the nearest hydrant.

B. Group R, Division 1 Occupancies. An automatic sprinkler system shall be installed in Group R, Division 1 Occupancies as follows:

- (i) Any building having three or more stories of height; or
- (ii) Any building having two stories of height and located above another occupancy other than:

- (A) Group R;
- (B) Group R, Division 1 parking garage; or
- (C) Storage, mechanical or laundry or similar rooms accessory to the R-1 occupancy.

- (iii) Any apartment building containing five or more dwelling units; or
- (iv) Any hotel containing ten or more guest rooms.

C. Determination of Stories. For the purpose of this section, in mixed occupancy buildings, the number of stories shall be determined based on the total building, not just those stories occupied by the Group R, Division 1 occupancy, provided other occupancies shall be sprinklered when specifically required for each occupancy.

D. Area Separation Walls. Area separation walls may be used as provided in Section 505 of this code (of the Building Code) provided, for the purpose of this subsection, the total number of dwelling units or total number of guest rooms shall be determined based on the complete, attached building regardless of any area separation walls.

E. Sprinkler Systems. Sprinkler systems installed in Group R, Division 3 occupancies may comply with NFPA Standard 13D. Sprinkler systems installed in Group R, Division 1 occupancies may be installed in accordance with NFPA Standard 13R in buildings of 4 stories or less. In buildings of more than 4 stories, or where a sprinkler system is required throughout, the sprinkler system shall comply with NFPA Standard No. 13, provided that quick response or residential sprinkler heads shall be used in the dwelling unit and guest room portions of the building according to Section 7.4 of that standard.

Sprinkler systems which have 100 or more sprinkler heads shall comply with Section 3803.

Section 2. This ordinance shall take effect and be in force thirty days from and after its passage and approval by the Mayor; otherwise it shall take effect at the time it shall become a law under the provisions of the City Charter.

Passed by the City Council the 29th day of October, 1990, and signed by me in open session in authentication of its passage this 29th day of October, 1990.  
PAUL KRAABEL,  
President of the City Council