

FIRE SPRINKLER SYSTEM PLAN REVIEW

Office of State Fire Marshal – Department of Fire Services
October 2009



THIS IS COPY N^o 732556 OF
THE MOST POPULAR WORK OF NON-FICTION OF OUR TIME

HOW TO WIN FRIENDS AND INFLUENCE PEOPLE



BY **FIRE PREVENTION**

1. What are the six ways of making people like you? See pages 75-133.
2. What are the twelve ways of winning people to your way of thinking? See pages 137-217.
3. What are the nine ways to change people without giving offense or causing resentment? See pages 221-253.



Department of Fire Services



OBJECTIVE & AGENDA

PART I – Identify Procedural Requirements/Issues

PART II – Identify Building Permit Requirements

PART III – Identify Key Design & Installation
Requirements



Department of Fire Services

PART I

Procedural Requirements & Issues



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SPRINKLERS REQUIRED?

780 CMR:
Use Group...



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SPRINKLERS REQUIRED?

780 CMR:

R-Use



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SPRINKLERS REQUIRED?



780 CMR: Size...

Construction Type...

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SPRINKLERS REQUIRED?

MGL
Chapter 148
Sections
26A & 26A½



Department of Fire Services

SPRINKLERS REQUIRED?

MGL
Chapter 148
Section 26G



Department of Fire Services

SPRINKLERS REQUIRED?



MGL
Chapter 148
Section 26G½



Department of Fire Services

SPRINKLERS REQUIRED?

MGL
Chapter 148
Section 26H



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SPRINKLERS REQUIRED?

MGL
Chapter 148
Section 26I



Department of Fire Services

SPRINKLERS REQUIRED?

MGL
Chapter 272

Sections
86, 86A, 86B,
86C & 86D



Horse Stables



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SPRINKLERS REQUIRED?



Local
Considerations



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SPRINKLERS REQUIRED?

Why do we care where the requirements for sprinklers came from?

Specifies design & installation standard



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SYSTEM TYPE?

Use NFPA 13
(NFPA 13R:
A.1.1)

Mixed Use
(780 CMR:302.2
& 302.1)



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SYSTEM TYPE?

NFPA 13R:
4-story
(780 CMR:502)
R-Use



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SYSTEM TYPE?

780 CMR:

Aggregate
Area

NFPA 13 v.

NFPA 13R

(780 CMR:

903.2.8)



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SYSTEM TYPE?

NFPA 13D:

Detached
1&2-
Family



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SYSTEM TYPE?

780 CMR:
903.2.8

3-family

(NFPA 13D
w/20-minute
water supply)



Department of Fire Services

VIOLATIONS

MGL Chapter 148 Section 28A:

The head of the fire department or any person designated by him who, in the performance of his official duties, observes any condition which he believes to be a violation of any provision of the state building code or any amendments thereto, shall report the same to the authority charged with the enforcement of such provision.

527 CMR:1.03(2)

Whenever an inspector from any agency or department observes an apparent or actual violation of some provision of some law, ordinance, code or by-law of the jurisdiction, not within the inspector's authority to enforce, the inspector shall report the findings to the code official having jurisdiction.



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PART II

Building Permit Review



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BUILDING PERMIT

780 CMR:110.8

- Who reviews sprinkler plans for approval/disapproval?
 - Head of the local fire department
- How long?
 - 10 Days (30 Days with notice to Building Official)
 - Automatic approval if no disapproval given on time
- Disapproval must cite 780 CMR sections of noncompliance



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BUILDING PERMIT

“113.2 Compliance with Code. The permit shall be a license to proceed with the work and shall not be construed as authority to violate, cancel or set aside any of the provisions of 780 CMR or any other law or regulation, except as specifically stipulated by modification or legally granted variation as described in the application.”



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BUILDING PERMIT – STEP 1

OVERALL SUBMITTAL

Do we have everything? (780 CMR:901.7.1.1 & 901.7.1.2)

- ◆ Narrative & design information
- ◆ Design drawings
- ◆ Water supply info & preliminary calculations
- ◆ Code summary (new) or

Chapter 34 Report (existing)

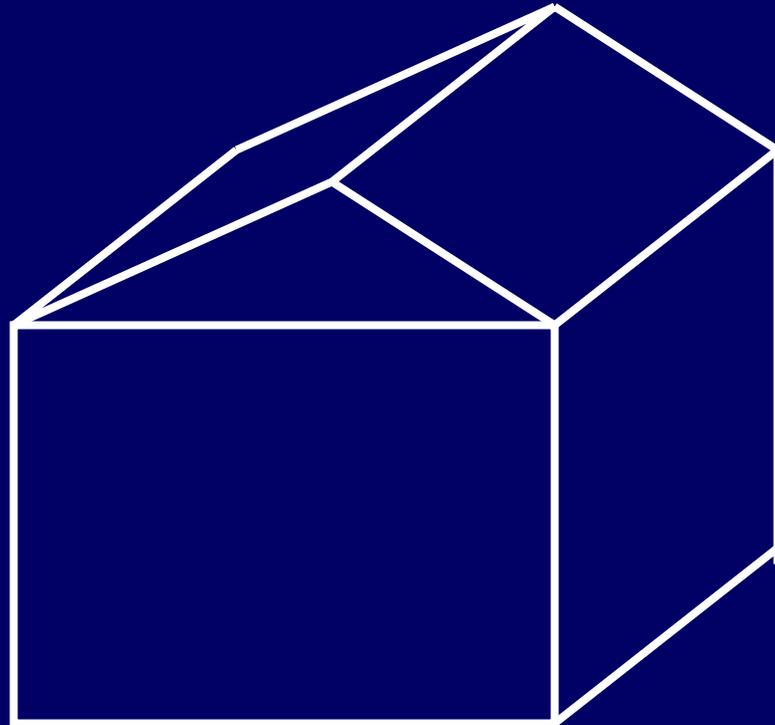


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BUILDING PERMIT – STEP 2

CONSTRUCTION CONTROL (780 CMR:116 & 901.7.1.3)?

On-site portion required if *volume* $\geq 35,000$ FT³



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BUILDING PERMIT – STEP 3

DESIGN PROFESSIONAL (MGL Chapter 112 Section 81M)

- All seals, approval stamps and signatures original?
- Who is Construction Control professional? Have they certified their scope of work? Is there seal/approval on submittals?
- Run any/all license numbers through database
 - ◆ www.mass.gov/dpl - engineers & architects
 - ◆ www.mass.gov/dps - sprinkler contractors



Department of Fire Services

BUILDING PERMIT – STEP 3

Division of Professional Licensure

www.mass.gov/dpl

BUILDING PERMIT – STEP 3

Division of Professional Licensure Complaint Form [PDF](#)



Consumer Fact Sheets

Consumer fact sheets will provide you with some "inside information" when engaging the services of any of the individual licensed professionals.

Information and Services

Division of Professional Licensure Boards

Subscribe to Receive DPL Notices

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BUILDING PERMIT – STEP 3

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Home > Division of Professional Licensure >

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By the [Division of Professional Licensure](#)

LICENSE NUMBER	BUSINESS INFO	PERSONAL INFO
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LICENSE NUMBER BUSINESS INFO **PERSONAL INFO**

Profession of the Licensee

^[1] Note: Please enter information in at least one of the fields below.

Last Name ^[1]

First Name

City ^[1]

State Zip ^[1]

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SEARCH CRITERIA

Profession: Engineer
Last Name: beginning with Stenberg

[NEW SEARCH](#)

SEARCH RESULTS

LIC. BOARD	LIC. TYPE	LIC. NUMBER	NAME	CITY/STATE	LIC. STATUS
Engineers & Land Surveyors	Mechanical Engineer	13683	ERIC R. STENBERG	YARMOUTH PORT, MA	Expired - Beyond 1 Renewal Cycle
Engineers & Land Surveyors	Mechanical Engineer	28988	JOHN T. STENBERG	FALMOUTH, ME	Expired - Beyond 1 Renewal Cycle
Engineers & Land Surveyors	Mechanical Engineer	41131	KURT A. STENBERG	PROVIDENCE, RI	License Suspended
Engineers & Land Surveyors	Mechanical Engineer	17269	MARTIN A. STENBERG	SPRINGFIELD, MA	Expired - Beyond 1 Renewal Cycle

Your search has resulted in 4 licenses

Note: If the licensee cannot be found by name and the name typically has apostrophes, spaces, hyphens or periods try doing the search again without these characters. Examples:
- If the last name is "O'Donnell", try searching for "ODonnell" or "O Donnell"
- If the last name is "McDonald", try searching for "Mc Donald"
- If the last name is "St. Helens", try searching for "StHelens" or "St Helens"

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LICENSEE

Name: KURT A. STENBERG
PROVIDENCE, RI

[NEW SEARCH](#)



LICENSEE INFORMATION

Licensing Board:	ENGINEERS & LAND SURVEYORS
License Type:	MECHANICAL ENGINEER
License Number:	41131
Status:	LICENSE SUSPENDED
Expiration Date:	6/30/2010
Issue Date:	3/25/1999
Exam Date:	
School:	BROWN UNIV



This web site displays disciplinary actions dating back to 1993.
[This license has had disciplinary actions taken during this time.](#)
[Click here to view this information.](#)

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CASE #	FINDINGS OF CLOSED COMPLAINTS	DATE CASE CLOSED
20051004EN012	LICENSE SUSPENDED	2/5/2009
20050802EN005	LICENSE SUSPENDED	2/5/2009

NOTE: This complaint information represents only closed complaints filed since 1993 in which disciplinary action has been taken. Open complaints are not yet fully investigated and are not included in the information presented on this Web site. If you require further information, please call the Office of Investigations (Division of Professional Licensure) at (617)727-7406.

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BUILDING PERMIT – STEP 3

Department of Public Safety

www.mass.gov/dps

BUILDING PERMIT – STEP 3

Public Safety

EOPSS Home Mass.Gov State Agencies State Online Services



PROGRAMS & SERVICES



Thomas G. Gatzunis
Commissioner - Welcome Message

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[Building Code / BBRS](#)

[Engineering Division](#)

[Trenches](#)

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INITIATIVES

[DPS Safety Topics Index](#)

[Code of Massachusetts Regulations \(CMR\)](#)

KEY RESOURCES

Home > Public Safety Agencies >

Massachusetts Department of Public Safety

DPS Incident Hotline

Please be advised that the Department of Public Safety (DPS) has instituted a new protocol for the reporting of incidents that require the immediate attention of the DPS. If there is an Emergency involving a DPS regulated activity please contact the Massachusetts Emergency Management Agency at (508) 820-1444 to report DPS related incident.

This number should be used for all DPS related events, including but not limited to the following: Incident involving:

1. Building collapse/failure
2. Elevators/escalators
3. Boiler or air tank failure/explosion
4. Amusement or tramway incidents
5. Horse carriage incidents
6. Incidents involving hoisting and excavating equipment.

For all Non-Emergency calls please dial 617-727-3200

DPS License Lookup



All licenses issued, renewed or otherwise updated by the Department of Public Safety, are posted to the DPS Website within 48 hours

Home Improvement Contractor has moved to the Office of Consumer Affairs

SEARCH

Public Safety

NEWS & UPDATES

[ANNOUNCEMENT OF EMERGENCY AMENDMENT](#)

[Amendments to the Recreational Tramways Regulations](#)

[Board of Building Regulations and Standards \(BBRS\) News](#)

[BBRS August Public Hearing Proposed Code Changes](#)

[Energy Conservation 'Appendix 120 AA' Approved](#)

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- * Watch DPS Video
- * Apply for a job at DPS
- * File a Complaint
- * DPS Licenses and Permits
- * Inspection Applications

BUILDING PERMIT – STEP 3

The Official Website of the Executive Office of Public Safety and Security (EOPS)

Public Safety

DPS Home EOPSS Home Mass.Gov Home State Agencies State Online Services



Department of Public Safety Licensee Lookup

The list is current as of Thursday, September 29, 2009.
You can search/filter the licensee list by any of the criteria below.

License **Businesses** **Individuals**

Select a License Type

Search by License Number

You must select A License Type and one or more of the above search criteria

BUILDING PERMIT – STEP 3

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Department of Public Safety Licensee Lookup

The list is current as of Tuesday, September 29, 2009.
You can search/filter the licensee list by any of the criteria below.

License **Businesses** **Individuals**

Select a License Type 

Search by Business Name

Search by Contact Last Name First

Search by City Zip Code

You must select A License Type and one or more of the above search criteria

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Department of Public Safety Licensee Lookup

The list is current as of Tuesday, September 29, 2009.
You can search/filter the licensee list by any of the criteria below.

License **Businesses** **Individuals**

Select a License Type: Sprinkler - Contractor License

Search by Business Name: jrW ASSOC

Search by Contact Last Name: First:

Search by City: Zip Code:

Search Results

LICENSE TYPE	BUSINESS NAME	CONTACT NAME	LICENSE	RESTRICTION	ADDRESS	STATUS
Sprinkler - Contractor License	Jrw Assocaites	Wheelen, John R	3078	00	Po Box 1291 Lawrence, MA 01842	Expired



BUILDING PERMIT – STEP 3

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Department of Public Safety Licensee Complaints

License Type	Sprinkler - Contractor License
License #	3078
Restriction	00
Company	Jrw Assocaites
Name	John R Wheelen
Address	Po Box 1291
City, State, Zip	Lawrence, MA, 01842
Expiration Date	9/28/2005
Status	Expired

No complaints found for this Licensee.

[Back To Search](#)

BUILDING PERMIT – STEP 4

SYSTEM TYPE

- Design standard correct? (780 CMR:903.3)
- Edition of standard correct? (780 CMR:35.00)
- Extent of sprinkler coverage correct?
 - ◆ 780 CMR Exemptions (780 CMR:903.2)
 - ◆ NFPA 13 Exemptions (NFPA 13:8.15)



Department of Fire Services

BUILDING PERMIT – STEP 5

HAZARDS

- Have all the hazards been identified correctly?
 - Storage - NFPA 13:Chapter 5 & 12-20
 - Special Occupancy – NFPA 13:Chapter 21
 - NFPA 13:Chapter 5 & 11
 - Light Hazard
 - Ordinary (Group 1 or 2) Hazard
 - Extra (Group 1 or 2) Hazard



BUILDING PERMIT – STEP 7

OVERALL INSTALLATION

- Correct # of systems? (NFPA 13:8.2)
- [Storage] Hose station layout? Hose connection type?
(780 CMR:901.5 & NFPA 13:8.17.5)



Department of Fire Services

BUILDING PERMIT – STEP 6

WATER SUPPLY

- What is water source? (NFPA 13:Ch. 23)
- Has the source been properly tested for adequacy? (NFPA 291)
- Do preliminary calculations show that water supply is adequate?
- Is the layout adequate?
 - Accessible Valve Room (NFPA 13:8.16.1.1.1.1)
 - PIV's & Yard Hydrants (780 CMR:913)
 - Fire Pump Rooms (780 CMR:914.2)



BUILDING PERMIT – STEP 8

EXTERIOR FEATURES

- You need to approve the type and location of the Fire Department Connection (FDC) & verify each FDC serves all systems in building. (780 CMR:912)
- You need to approve the location and type of exterior audible and visual fire sprinkler waterflow alarm notification devices. (780 CMR:903.4)



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BUILDING PERMIT – STEP 9

INTERIOR WATERFLOW ALARMS

- Confirm that the fire sprinkler system waterflow alarm is part of a building fire alarm system.
(780 CMR:903.4)
- Confirm that the fire sprinkler system will be supervised per 780 CMR:907.14.2
- Confirm that the fire sprinkler system is arranged such that the alarm system can be zoned by floor.
(780 CMR:907.8)



Department of Fire Services

PART III

Installation Permit Review



Department of Fire Services

INSTALLATION PERMIT

- 527 CMR:1.06(2) [Red Book] & 10.03(15) require an installation permit from the head of the fire department for the installation of any fire protection equipment.

- Permit issued by FD to Sprinkler System Contractor

prior to work

(528 CMR:12.04[1])

- FP-6 based on

MGL Ch. 148 S. 10A

- Review time???



Department of Fire Services

The Commonwealth of Massachusetts
Department of Fire Services - Office of the State Fire Marshal
P.O. Box 1025, State Road, New, MA 01775

FF6 (rev. 2003)

APPLICATION FOR PERMIT

City or Town _____ DIG SAFE NUMBER _____
Date _____ Start _____

In accordance with the provisions of M.G.L. Chapter 148, as provided in Section _____ application is hereby made by _____
(Full name of person, firm or corporation)

Address _____
(Street or P.O. Box) (City or Town)

For permission to (state clearly purpose for which permit is requested) _____

Name of competent operator (if applicable) _____ Cert. No. _____
Date issued/rejected _____ By _____ (signature of applicant)

Date of expiration _____ Fee \$ _____ Paid _____ Due _____

The Commonwealth of Massachusetts
Department of Fire Services - Office of the State Fire Marshal
P.O. Box 1025, State Road, New, MA 01775

FF6 (rev. 2003)

PERMIT

City or Town _____ DIG SAFE NUMBER _____
Date _____ Start Date _____

Permit Number (if applicable) _____

In accordance with the provisions of M.G.L. Chapter 148, as provided in _____ this permit is granted to _____
(Full name of person, firm or corporation)

for _____

Restrictions: _____
at _____
(Give location by street and no., or describe in such manner as to provide adequate identification of location)

Fee Paid \$ _____ This Permit will expire on _____

Signature of Official Granting Permit _____ Title _____

➡ This permit must be conspicuously posted upon the premises ⬅

INSTALLATION PERMIT

527 CMR:1.04 (3) Conditions of Permit. A permit shall constitute permission to maintain, store or handle materials, or to conduct processes which produce conditions hazardous to life or property, or to install equipment used in connection with such activities in accordance with the provisions of 527 CMR. *Such permission shall not be construed as authority to violate, cancel or set aside any of the provisions of 527 CMR.* Said permit shall remain in effect until revoked, or for such period of time specified on the permit. Permits are not transferable and any change in use, operation or tenancy shall require a new permit.



Department of Fire Services

INSTALLATION PERMIT

QUICK (MUST DO) REVIEW



Department of Fire Services

INST. PERMIT – Quick STEP 1

OVERALL SUBMITTAL

Do we have everything?* (780 CMR:901.7.1.1 & 901.7.1.2)

- ◆ Narrative & design information
- ◆ Shop Drawings
- ◆ Manufacturers' information sheets
- ◆ Water supply info & hydraulic calculations
- ◆ Code summary (new) or

Chapter 34 Report (existing)



Department of Fire Services

INST. PERMIT – Quick STEP 1



**What about modifications??*



Department of Fire Services

INST. PERMIT – Quick STEP 2

INSTALLING CONTRACTORS

- Contractor license number, name & address (528 CMR:12.03[2])
- Run any/all license numbers through database
 - ◆ www.mass.gov/dps - sprinkler contractors



Department of Fire Services

INST. PERMIT – Quick STEP 3

DESIGN APPROVAL

PE seal – Drawings and calculations prepared by
PE (or under direct supervision of PE)
250 CMR:3.05[3]

PE approval stamp – Drawings and calculations
reviewed by PE as conforming to
design?/codes?/standards?



Department of Fire Services

INST. PERMIT – Quick STEP 3

DESIGN APPROVAL

MGL Ch. 112 S. 81R – “nothing in said sections shall be construed to prevent or to affect -- the practice of any other legally recognized profession including... the practice of any trade, including... the preparation of plans, specifications or shop drawings by any person, firm, partnership, corporation or association practicing any such trade, *for work to be installed or being installed by the same* person, firm, partnership, corporation or association preparing such plans, specifications or shop drawings.”



Department of Fire Services

INST. PERMIT – Quick STEP 3

DESIGN APPROVAL

PE Design & Shop

- PE seal (design PE)

PE#1 Design/PE #2 Shop

- PE#2 seal (contractor PE)*
- PE#1 approval stamp
(design PE)

* Check PE license



Department of Fire Services

INST. PERMIT – Quick STEP 3

DESIGN APPROVAL

PE Design & 81R Shop

- Contractor #, info,
81R claim
- PE approval stamp
(design PE)

81R Design & Shop

(Build-Design)

- Contractor #, info,
81R Claim



INST. PERMIT – Quick STEP 4

Review Shop Drawing submittals using
Building Permit Step 3 thru Step 9

➤ Changes??



Department of Fire Services

INST. PERMIT – Quick STEP 5

Walkthrough of site for:

- plan discrepancies
- areas not shown on plans
- areas < 40 degrees Fahrenheit
- coordination/obstruction issues



Department of Fire Services

INSTALLATION PERMIT

INTERMEDIATE (SPOT CHECK) REVIEW

Wet stuff on
the red stuff??



Department of Fire Services

INST. PERMIT – Intermediate STEP 6

Review manufacturers' sheets:

- All products submitted/identified (NFPA 13:22.1.4)
- Listed for fire protection systems (except all-thread rod, certain pipe types & non-impact equipment) – NFPA 13:6.1.1.2
- Confirm all listing conditions and manufacturers information are complied with. (NFPA 13:6.1.1.1)



Department of Fire Services

INST. PERMIT – Intermediate STEP 7

Review design area on plans

- Density/Area Design:
 - Required & allowed design area increases/reductions (NFPA 13:11.2.3.2 or per storage/special)
 - Actual floor area of Design Area \geq design requirements & Correct shape (Length along branch lines $\geq 1.2 * \sqrt{\text{Area}}$) (NFPA 13:22.4.4.1.1)
- Residential Design: 4 sprinklers (NFPA 13:11.3.1.1)
- Room Design: Bounded by proper fire-resistance rating (NFPA 13:11.2.3.3)
- Storage Design: Certain designs by # of sprinklers (NFPA 13: Chapter 12-20)



INST. PERMIT – Intermediate STEP 8

Review all sprinklers in design area:

- Orifice size in calculations correct - K factor (NFPA 13:22.4.4.9.3)
- Design pressures ≥ 7 psi (NFPA 13:22.4.4.10.1)
- Discharge in calculations \geq design requirements (NFPA 13:22.4.4.6.1)
- Area of coverage limits met (NFPA 13:8.5.2.2)
- Spacing limits met (NFPA 13:8.5.3)
- Discharge calculations correct (NFPA 13:22.4.4.6.1)



INST. PERMIT – Intermediate STEP 9

Review random sprinklers on plans (try some near walls):

- Area of coverage limits met (NFPA 13:8.5.2.2)
- Spacing limits met (NFPA 13:8.5.3)



Department of Fire Services

INST. PERMIT – Intermediate STEP 10

Review calculations for hydraulic most remote fire sprinkler (NFPA 13:22.4.3 & 22.4.4.7)

- Correct lengths of pipe
 - Straight pipe lengths
 - Equivalent lengths - Fittings, valves, equipment
- Pipe sizes & types
- Elevation changes



INST. PERMIT – Intermediate STEP 11

Has the designer specified provisions for seismic protection? Not just seismic bracing!
(780 CMR:1614.1 & NFPA 13:9.3)

- Lateral braces
- Longitudinal braces
- Restraints
- Hanger restrictions



INSTALLATION PERMIT

DETAILED REVIEW



Department of Fire Services

INST. PERMIT – Detailed STEP 12

Review ALL sprinklers on plans:

- Area of coverage limits exceeded
- Spacing limits exceeded



Department of Fire Services

INST. PERMIT – Detailed STEP 13

Review EVERY segment of hydraulic calculations for all design area sprinklers:

- Correct length of pipe
 - Straight pipe lengths
 - Equivalent length - Fittings, valves, equipment
- Pipe sizes & types
- Elevation changes



INST. PERMIT – Detailed STEP 14

System support & seismic protection:

- Hanger spacing
- Seismic protection
 - Brace/restraint spacing
 - Brace calculations



Department of Fire Services

SPRINKLER PLAN REVIEW

DO YOU REALLY HAVE THAT MUCH TIME?



Department of Fire Services

CONTACTS

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