



Fire Sprinkler Plans Examination Checklists

for the

NFSA Fire Sprinkler Plan Review Course

2015 IBC
2013 NFPA 13
2010 NFPA 13

Seminar Information Sheet

Seminar Title: Fire Sprinkler System Plan Review (1-day)

Seminar Description: Examining fire sprinkler shop drawings, cut sheets and hydraulic calculations is a primary duty of the authority having jurisdiction. This course will provide a method of reviewing plans and other fire sprinkler documents that is efficient and thorough. Attendees will learn what documents to accept to start a review, what steps to take through the fire sprinkler design and systems review, and how to have confidence while reviewing hydraulic calculations. This course applies current codes and standards to fire sprinkler systems from the initial site plan review, through the construction documents, to the as-built drawings. Significant time on how to effectively communicate deficiencies to the design professional. Students will receive a handout that provides detailed checklists with expert commentary that is useful to the fire sprinkler plan reviewer for years to come.

Materials needed: 2010 or 2013 NFPA 13, pencil, paper

Duration: 1 Day

Total Instructional Contact Minutes: 390 min.

Learning Objectives:

At the conclusion of this seminar the participant will be able to:

1. Apply the requirements for plans examination according to NFPA 13, building and fire codes.
2. Discuss the importance of a systematic review process.
3. Identify the documents required for a complete plan review process
4. Evaluate the hydraulic calculations presented with a set of working plans submitted for review and approval

Seminar Format(s): Lecture, discussion and in-class activity

Participant Materials: Slides, commentary, checklists

Assessment Method(s): Review of in-class exercises

Seminar Schedule

Day 1 – 8:00 AM – 4:00 PM

Module 1: How to Review

Module 2: Submittal Review

Module 3: Design Review

Module 4: Hydraulic Review

Submittal Review Checklist

		NFPA 13 2010	NFPA 13 2013
201	Architectural plans		
202	Owner's certificate	4.3, 22.1.4	4.3, 23.1.4
203	Water supply treatment	23.1.5	24.1.5
204	Shop drawings		
205	Pipe schedule system	22.5	23.5
206	Hydraulic calculations	22.3	23.3
207	Water supply	22.2	23.2
208	Summary sheet	22.3.5.1.2(a)	23.3.5.1.2(a)
209	Graph sheet	22.3.5.1.2(b)	23.3.5.1.2(b)
210	Supply analysis	22.3.5.1.2(c)	23.3.5.1.2(c)
211	Node analysis	22.3.5.1.2(c)	23.3.5.1.2(c)
212	Detailed worksheet	22.3.5.1.2(d)	23.3.5.1.2(d)
213	Cut sheets	22.1.4	23.1.4
	Sprinklers		
	Piping		
	Equipment		
	Hangers		
	Seismic bracing		
214	Codes and standards		
	Codes		
	Standards		
	Other		
215	Use group		
216	Classification of hazards	5.2	5.2
217	Commodity	5.6	5.6
218	System protection area limitation	8.2	8.2

Design Review Checklist

		NFPA 13 2010	NFPA 13 2013
301	Water demand	11.2.3.1.1	11.2.3.1.1
302	Density/Area curves	Fig 11.2.3.1.1	Fig 11.2.3.1.1
303	Water supply	11.2.3.2.1	11.2.3.2.1
304	Sprinklers	11.2.3.2.2	11.2.3.2.2
305	Quick response decrease	11.2.3.2.3	11.2.3.2.3
306	Sloped ceiling increase	11.2.3.2.4	11.2.3.2.4
307	Dry pipe and dbl interlock increase	11.2.3.2.5	11.2.3.2.5
308	High temperature increase	11.2.3.2.6	11.2.3.2.6
309	Sum of multiple increases/decreases	11.2.3.2.7	11.2.3.2.7
310	Room design	11.2.3.3	11.2.3.3
311	Opening protection	11.2.3.3.5	11.2.3.3.5
312	Special design area and approaches	11.2.3.4 & 11.3	11.2.3.4 & 11.3
313	Service chutes	11.2.3.4.1	11.2.3.4.1
314	Canopies	11.2.3.4.2	11.2.3.4.2
315	Duct sprinklers	11.2.3.4.3	11.2.3.4.3
316	Residential sprinklers	11.3.1	11.3.1
317	Exposure protection	11.3.2	11.3.2
318	Water curtain	11.3.3	11.3.3
319	Comb. concealed space 4/12 pitch	11.3.4	11.3.4
320	Adjacent hazards	11.1.2	11.1.2
321	Hose stream	11.1.6	11.1.6
322	Pipe schedule design	22.5	23.5
323	Water supply	11.2.21	11.2.2.1
324	Size of risers	22.5.1.4	23.5.1.4
325	Light hazard	22.5.2.2.1	23.5.2.2.1
326	Ordinary hazard	22.5.3	23.5.3
327	Special situations & exemptions	8.1.1 & 8.15	8.1.1 & 8.15
328	Concealed spaces	8.15.1.1	8.15.1.1
329	Unsprinklered concealed spaces	8.15.1.2	8.15.1.2
330	Vertical shafts	8.15.2	8.15.2
331	Stairways	8.15.3	8.15.3
332	Vertical openings	8.15.4	8.15.4
333	Elevators	8.15.5	8.15.5
334	Exterior projections	8.15.7	8.15.7
335	Soffits, eaves, overhangs	8.15.1.2.18	8.15.1.2.18
336	Dwelling unit bathrooms & closets	8.15.8	8.15.8
337	Hospital closets	NA	8.15.9

Hydraulic Review Checklist

		NFPA 13 2010	NFPA 13 2013
401	Working plans	22.1	23.1
402	Summary sheet analysis	22.3.5.2	23.3.5.2
403	General information	22.3.5.2	23.3.5.2
404	Contractor, technician, name	22.3.5.2	23.3.5.2
405	Type, use, hazard, commodity	22.3.5.2	23.3.5.2
406	System configuration		
407	Remote design area(s)	22.4.4.6	23.4.4.6
408	System design		
409	Type: wet, dry, single, dbl, preaction, deluge		
410	Dry/preaction system volume	A.7.2.3	A.7.2.3
411	Design area (square feet)		
412	Density		
413	Area per sprinkler		
414	Total water		
415	Graph sheet analysis	22.3.5.3	23.3.5.3
416	Supply analysis	22.3.5.4	23.3.5.5
417	Node analysis	22.3.5.5	23.3.5.5
418	Worksheet analysis	22.3.5.6	23.3.5.6
419	Node tags	22.3.5.6	23.3.5.6
420	Pressure	22.4.2.1.1	23.4.2.1.1
421	K-factor	T A.6.3.2.1	T A.6.3.2.1
422	Flow		
423	Pipe diameters	T A.6.3.2	T A.6.3.2
424	Pipe lengths	22.4.3	23.4.3
425	Equivalent pipe length for fittings	22.4.3	23.4.3
426	Sprig and drop lengths	22.4.3	23.4.3
427	C-factor	T 22.4.3.1.1	T 23.4.4.7.1
428	Equipment friction losses	22.4.4.7	23.4.4.7
429	Hose stream and Duration	T 11.2.3.1.2	T 11.2.3.1.2
430	Calculation path	22.4.1.5	23.4.1.5
431	Graph sheet	22.3.5.3	23.3.5.3

Systems Review Checklist

		NFPA 13 2010	NFPA 13 2013
501	Listings	6.1.1	6.1.1
502	Pipe and fittings	6.3, 6.4	6.3, 6.4
503	Fire department connection (also Step 803)		
504	Installation	8.17.2.2	8.17.2.2
505	Size	8.17.2.3	8.17.2.3
506	Arrangements	8.17.2.4	8.17.2.4
507	System attachments		
508	Waterflow alarms	8.17.1.1	8.17.1
509	Gauge connection	8.17.3	8.17.3
510	Hangers	9.1	9.1
511	Trapeze	9.1.1.7	9.1.1.7
512	Rods	9.1.2	9.1.2
513	Fasteners(concrete)(steel)(wood)	9.1.3,9.1.4,9.1.5	9.1.3,9.1.4,9.1.5
514	Hanger spacing	9.2.2, 9.2.4	9.2.2, 9.2.4
515	Unsupported lengths	9.2.3.4	9.2.3.4
516	Unsupporte armoover lengths	9.2.3.5	9.2.3.5
517	Seismic bracing	9.3	9.3
518	Flexible couplings	9.3.2	9.3.2
519	Separation assembly	9.3.3	9.3.3
520	Clearance criteria	9.3.4	9.3.4
521	Sway bracing	9.3.5	9.3.5
522	Lateral bracing	9.3.5.5	9.3.5.5
523	Longitudinal bracing	9.3.5.6	9.3.5.6
524	Riser bracing	9.3.5.8	9.3.5.8
525	Fasteners	9.3.5.12	9.3.5.12
526	Restraints	9.3.6	9.3.6
527	Wet pipe systems	7.1	7.1
528	Pressure gauges	7.1.1	7.1.1
529	Relief valves	7.1.2	7.1.2
530	Drainage	8.16.2.2	8.16.2.2
531	Inspectors test	8.17.4.2	8.17.4.2
532	(Dry)(Preaction) pipe systems		
533	Pitch	8.16.2.3	8.16.2.3
534	Pressure gauges	7.2.1, 7.3.1.3	7.2.1, 7.3.1.3
535	Sprinklers	7.2.2, 7.3.2.5	7.2.2, 7.3.2.5
536	Releasing devices	7.3.1.6	7.3.1.6
537	Size/volume	7.2.3, 7.3.2.2	7.2.3, 7.3.2.2
538	Quick opening devices	7.2.4	7.2.4
539	Air pressure and supply	7.2.6	7.2.6
540	Inspectors test	8.17.4.3	8.17.4.3
541	Deluge system	7.3	7.3
542	Pressure gauges	7.3.1.3	7.3.1.3
543	Releasing devices	7.3.1.6	7.3.1.6

Positioning Review

2010 NFPA 13 2013 NFPA 13		Standard Upright/ Pendent 8.6	Sidewall 8.7	Extended Coverage Upright/ Pendent 8.8	Extended Coverage Sidewall 8.9	Residential 8.10	CMSA 8.11	ESFR 8.12
		A	B	C	D	E	F	G
601	Area of coverage 8.X.2.2							
602	Distance of sprinklers 8.X.3.1							
603	Maximum distance from walls 8.X.3.2							
604	Minimum distance from walls 8.X.3.3							
605	Below ceiling 8.X.4							
606	Obstruction less than 18 inches 8.X.5.2					8.10.6.2	<36" wide	
607	Obstruction greater than 18 inches 8.X.5.2					8.10.6.3	>24" wide	
608	Clearance to storage 8.X.6							
609	Skylights 8.5.7							
610	Ceiling pockets 8.X.7		NA		NA	8.10.8	NA	NA

Underground Review

701 _____ Piping materials
702 _____ Depth of cover
703 _____ Damage protection
704 _____ Method of joint restraint

NFPA 13 2010	NFPA 13 2013
10.1	10.1
10.4	10.4
10.5	10.5
10.8	10.8

Codes Review

		NFPA: 2013	IBC/IFC 2015
801	Architectural plans		
802	Tradeups(NPFA 13)(NPFA 13R)		
803	Fire Department Connection Location		912.2
804	Access		912.4
805	Clear space and Protection		912.4.2
806	Riser and fire pump rooms		901.8
807	Sufficient working clearance		901.8
808	Clearance around electrical equip.	70: 110-26	
809	Fire pump suction flange	20: 4.14	
810	Equipment removal and path		901.8
811	Fire pump room ratings		913
812	Fire pump room preplanning	20: 4.3.1	
813	Room temperature		913
814	Location of dry pipe valve	13: 7.2.5.1	
815	Location of preaction or deluge val	13: 7.3.1.8.2	
816	Exempt areas		
817	NFPA 13 areas	8.1.1, 8.15.	
818	IBC areas w/fire detection		903.3.1.1.1
819	Balconies, decks, patios		903.3.1.2.1
820	High rise		
821	Water supply for over 420 feet		403.3.2
822	Secondary water		403.3.3
823	Floor control valves	13: 8.16.1.5	403.3.3
824	Hose thread compatibility		903.3.6
825	Supervision		903.4
826	Monitoring		903.4.1
827	Exterior alarm		903.4.2
828	Backflow prevention		IPC: T 608.1