

Welcome to the AccessibilityOnline Webinar Series



A collaborative program between the
ADA National Network and the
U.S. Access Board



The Session is Scheduled to begin at 2:30pm Eastern Time
We will be testing sound quality periodically

Audio and Visual are provided through the on-line webinar system. This session is closed captioned. Individuals may also listen via telephone by dialing 1-712-432-3100 code 930098 (This is **not** a Toll Free number)

The content and materials of this training are property of the US Access Board and the Great Lakes ADA Center and cannot be used and/or distributed without permission. This program is funded through a contract agreement with the U.S. Access Board. For permission to use training content or obtain copies of materials used as part of this program please contact us by email at adata@adagreatlakes.org or toll free (877)232-1990 (V/TTY)

www.AccessibilityOnline.org



Listening to the Webinar



- ▶ The audio for today's webinar is being broadcast through your computer. Please make sure your speakers are turned on or your headphones are plugged in.
- ▶ You can control the audio broadcast via the Audio & Video panel. You can adjust the sound by "sliding" the sound bar left or right.
- ▶ If you are having sound quality problems check your audio controls by going through the Audio Wizard which is accessed by selecting the microphone icon on the Audio & Video panel



2



Listening to the Webinar, *continued*

If you do not have sound capabilities on your computer or prefer to listen by phone, dial:

1-712-432-3100

**Pass Code:
930098**

This is **not** a Toll Free number

3



Listening to the Webinar, *continued*

MOBILE Users (iPhone, iPad, or Android device and Kindle Fire HD)

Individuals may listen** to the session using the Blackboard Collaborate Mobile App (Available Free from the Apple Store, Google Play or Amazon)




**Closed Captioning is not visible via the Mobile App and limited accessibility for screen reader/Voiceover users

4



Captioning

- ▶ Real-time captioning is provided during this webinar.
- ▶ The caption screen can be accessed by choosing the  icon in the Audio & Video panel. ↓



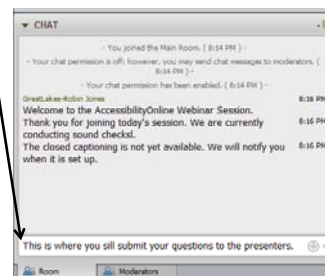
- ▶ Once selected you will have the option to resize the captioning window, change the font size and save the transcript.

5



Submitting Questions

- ▶ You may type and submit questions in the Chat Area Text Box or press **Control-M** and enter text in the Chat Area
- ▶ If you are connected via a mobile device you may submit questions in the chat area within the App
- ▶ If you are listening by phone and not logged in to the webinar, you may ask questions by emailing them to webinars@accessibilityonline.org



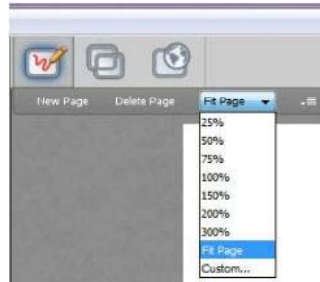
Please note: This webinar is being recorded and can be accessed on the AccessibilityOnline website at www.accessibilityonline.org/Archives within 24 hours after the conclusion of the session.

6



Customize Your View


- ▶ Resize the Whiteboard where the Presentation slides are shown to make it smaller or larger by choosing from the drop down menu located above and to the left of the whiteboard. The default is “fit page”



7



Customize Your View *continued*

- ▶ Resize/Reposition the Chat, Participant and Audio & Video panels by “detaching” and using your mouse to reposition or “stretch/shrink”. Each panel may be detached using the  icon in the upper right corner of each panel.

8



Technical Assistance



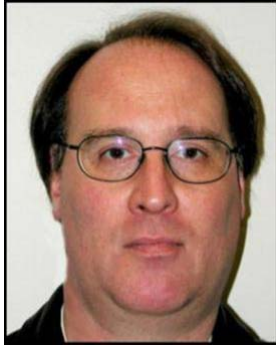
- ▶ If you experience any technical difficulties during the webinar:
1. Send a private chat message to the host by double clicking “Great Lakes ADA” in the participant list. A tab titled “Great Lakes ADA” will appear in the chat panel. Type your comment in the text box and “enter” (Keyboard - F6, Arrow up or down to locate “Great Lakes ADA” and select to send a message); or
 2. Email webinars@accessibilityonline.org ; or
 3. Call 877-232-1990 (V/TTY)

9

Accessible Fire Alarm Systems

10

Presenters



Jim Pecht
U.S. Access Board



Lee Richardson
Senior Electrical Engineer,
NFPA

11

Scoping

12

Where Required (§215.1 & §F215.1)

New construction:

“Where fire alarm systems provide audible alarm coverage, alarms shall comply with §215.”

13

Where Required (§215.1 & §F215.1)

Existing Facilities:

“EXCEPTION: In existing facilities, visible alarms shall not be required except where an existing fire alarm system is upgraded or replaced, or a new fire alarm system is installed.”

14

Where Required (§215.2 & §F215.2)

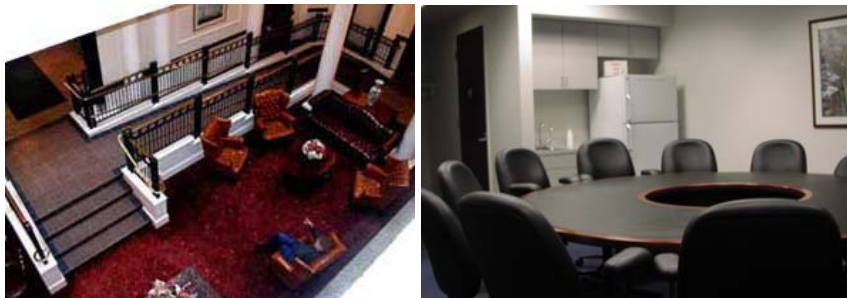
Public and Common Use Areas:

Areas of a facility open to the general public and employee areas not used solely for work must meet the standard if protected by a fire alarm system.

15

Where Required (§215.2 & §F215.2)

Public and Common Use Areas:



16

Where Required (§215.3 & §F215.3)

Employee Work Areas:

“Where employee work areas have audible alarm coverage, the wiring system shall be designed so that visible alarms complying with §702 can be integrated into the alarm system.”

17

Where Required (§215.3 & §F215.3)

Employee Work Areas:



18

Where Required (§215.4 & §F215.4)

Transient Lodging Facilities:

“Guest rooms required to comply with §224.4 or §F224.4 shall provide alarms complying with §702.”

§224.4 & §F224.4 covers Transient lodging room requiring accessible communication features.

19

Where Required (§215.4 & §F215.4)

Transient Lodging Facilities:



20

Where Required (§215.5 & §F215.5)

Residential Facilities:

“Where provided in residential dwelling units required to comply with §809.5, alarms shall comply with §702.”

§809.5 covers residential dwelling units with communication features.

21

Technical Requirements

22

Fire Alarms §702

“Fire alarm systems shall have permanently installed audible and visible alarms complying with NFPA 72 (1999 or 2002 edition)”

23

Fire Alarms §702



**Audible and
Visual
Combination
Appliance**

24

Fire Alarms §702



Audible Horn Speaker

25

Fire Alarms §702



Visible Alarm Appliance

26

Medical Facilities §702.1

“EXCEPTION: Fire alarm systems in medical care facilities shall be permitted to be provided in accordance with industry practice.”

27

Transient Lodging Facilities §806.3

“Where emergency warning systems are provided, alarms complying with §702 shall be provided.”

28

Residential Facilities §809.5.1

“Where a building fire alarm system is provided, the system wiring shall be extended to a point within the residential dwelling unit in the vicinity of the residential dwelling unit smoke detection system.”

29

Residential Facilities §809.5.1

“Where alarm appliances are provided within a residential dwelling unit as part of the building fire alarm system, they shall comply with §702.”

30

Residential Facilities §809.5.2

“Residential dwelling unit smoke detection systems shall comply with NFPA 72.”

31

Residential Facilities §809.5.2

“All visible alarm appliances provided within the residential dwelling unit for smoke detection notification shall be activated upon smoke detection.”

32

Smoke Alarms §809.5.2.1



Hardwired Smoke Alarm with Visible Strobe

33

Fire Alarm Pulls §205, §F205, & §309



- Operable with one hand
- Not require tight grasping, pinching, or twisting of the wrist
- Maximum force required of 5 pounds to activate

34

NFPA 72

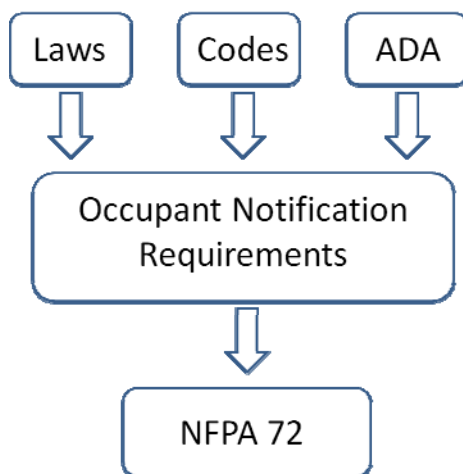
35

NFPA 72 **National Fire Alarm Code**

Requirements for Notification
Appliances
(2002 Edition)

36

Codes and Standards



37

Codes and Standards

- NFPA Codes
 - NFPA 101 *Life Safety Code* www.nfpa.org/101
 - NFPA 5000 *Building Construction and Safety Code* www.nfpa.org/5000
 - NFPA 1 *Fire Code* www.nfpa.org/1
- NFPA “Installation Standards”
 - NFPA 13, *Standard for the Installation of Sprinkler Systems* www.nfpa.org/13
 - NFPA 72, *National Fire Alarm and Signaling Code* www.nfpa.org/72

38

Codes and Standards

- What edition of the installation standard should be used?
 - The edition being enforced
 - By reference from law, code or ADA
- The ADA and ABA Accessibility Guidelines for Buildings and Facilities
 - The 2002 edition of NFPA 72

39

Occupant Notification

- What is needed?
 - From laws, codes and ADA
 - Usually depends on occupancy
- Possibilities
 - Audible (tone, voice)
 - Visible (strobe, textual)
 - Often both audible and visible signaling is required
- Off site forces notification
 - May be required

40

Audible Notification Appliances

- Types of audible notification
 - Operating modes
 - Public mode – see 3.3.122.2
 - Private mode – see 3.3.122.1
 - Audible signals (tones) – chimes, bells, horns or speakers
 - Audibility (sound pressure level)
 - Voice communications – speakers
 - Intelligibility (not audibility)

41

Audible Notification Appliances

- Audibility – 7.4.1 (general requirements)
 - Average ambient sound levels greater than 105 dBA require visible signaling
 - Average ambient sound level – see 3.3.18
 - Total sound pressure level (ambient + alarm) can not exceed 120 dBA - changed later to 110 dBA
 - Sound pressure level is measured using the A-weighted scale (dBA)

42

Audible Notification Appliances

- Audibility – 7.4.2 (public mode)
 - General areas – the greater of:
 - 15 dB above average ambient sound level
 - 5 dB above the maximum sound pressure level having a duration of at least 60 minutes
 - Measure 5 feet above the floor
 - Continued, next slide

43

Audible Notification Appliances

- Audibility – 7.4.2 (public mode)
 - Allowances to reduce or eliminate audible signal
 - Must be approved and must use visible signaling
 - Allowances to use private mode
 - Elevators and bathrooms
 - Allowance to stop or reduce ambient noise
 - Must be approved and must use visible signaling

44

Audible Notification Appliances

- Audibility – 7.4.3 (private mode)
 - General areas – the greater of:
 - 10 dB above average ambient sound level
 - 5 dB above the maximum sound pressure level having a duration of at least 60 minutes
 - Measure 5 feet above the floor
 - Allowances to reduce or eliminate audible signal
 - Must be approved and must use visible signaling
 - Allowance to stop or reduce ambient noise
 - Must be approved and must use visible signaling

45

Audible Notification Appliances

- Audibility – 7.4.4 (sleeping areas)
 - Sleeping areas – the greater of:
 - 15 dB above average ambient sound level
 - 5 dB above the maximum sound pressure level having a duration of at least 60 minutes
 - 75 dBA minimum
 - Measure at pillow level
 - Measure with doors closed or barriers in place

46

Audible Notification Appliances

- **Audibility – 7.4.6 (location of appliances)**
 - **Listed wall-mounted**
 - Tops at least 90 inches above finished floor
 - Tops at least 6 inches below the ceiling
 - Combination horn/strobe must follow mounting requirements for visible signaling in 7.5.4
 - **Listed ceiling-mounted permitted**
 - **Location/spacing**
 - Any location/spacing that results in the required audibility (public mode, private mode, sleeping area) in the occupiable area

47

Audible Notification Appliances

- **Narrow Band Tone Signaling – 7.4.5**
 - Can be used instead of public mode or private mode audibility requirements
 - Use for troublesome situations
 - high ambient levels such as machinery areas
 - Requires narrow band analysis

48

Audible Notification Appliances

- Voice communications – 7.4.1.4
 - Voice Intelligibility
 - Free from distortion, capable of being understood
 - Guidance in A.7.4.1.4
 - Not the same as audibility
 - Requirements and guidance completely updated in the 2010 & 2013 editions – see later slides

49

Visible Notification Appliances

- Types of visible notification
 - Operating modes
 - Public mode (strobes)
 - Private mode (control unit displays, etc)
 - Public mode visible signaling – strobes
 - Indirect viewing – spacing in rooms
 - Direct viewing – spacing in corridors
 - Textual and graphical displays

50

Visible Notification Appliances

- Basic requirements for strobes – 7.5.2, 7.5.3
 - Flash rate must be between 1 and 2 flashes per second
 - Color must be clear or white
 - Must be listed to ANSI/UL 1971, *Standard for Safety Signaling Devices for Hearing Impaired*
 - Strobe ratings are given as Effective Intensity (cd)

51

Visible Notification Appliances

- Wall-mounted strobes
 - Mounting – 7.5.4
 - Bottom of lens at least 80 inches above floor
 - Top of lens not more than 96 inches above floor
 - Indirect viewing – room spacing – 7.5.4.1
 - Use wall-mounted spacing table
 - See next set of slides

52

Visible Notification Appliances

Table 7.5.4.1.1(a) Room Spacing for Wall-Mounted Visible Appliances

Maximum Room Size		Minimum Required Light Output (Effective Intensity, cd)		
		One Light per Room	Two Lights per Room (Located on Opposite Walls)	Four Lights per Room (One Light per Wall)
m	ft			
6.10 × 6.10	20 × 20	15	NA	NA
8.53 × 8.53	28 × 28	30	Unknown	Unknown
9.14 × 9.14	30 × 30	34	15	NA
12.2 × 12.2	40 × 40	60	30	15
13.7 × 13.7	45 × 45	75	Unknown	Unknown
15.2 × 15.2	50 × 50	94	60	30
16.5 × 16.5	54 × 54	110	Unknown	Unknown
18.3 × 18.3	60 × 60	135	95	30
21.3 × 21.3	70 × 70	184	95	60
24.4 × 24.4	80 × 80	240	135	60
27.4 × 27.4	90 × 90	304	185	95
30.5 × 30.5	100 × 100	375	240	95
33.5 × 33.5	110 × 110	455	240	135
36.6 × 36.6	120 × 120	540	305	135
39.6 × 39.6	130 × 130	635	375	185

NA = Not allowable.

53

Visible Notification Appliances

ft	One Light per Room
20 × 20	15
28 × 28	30
30 × 30	34
40 × 40	60
45 × 45	75
50 × 50	94
54 × 54	110
60 × 60	135
70 × 70	184
80 × 80	240
90 × 90	304
100 × 100	375
110 × 110	455
120 × 120	540
130 × 130	635

54

Visible Notification Appliances

- Square rooms – 7.5.4.1.3
 - The maximum room size for wall-mounted strobes assumes the appliance is mounted at the halfway distance on the wall
 - See next slide for square room configuration

55

Visible Notification Appliances

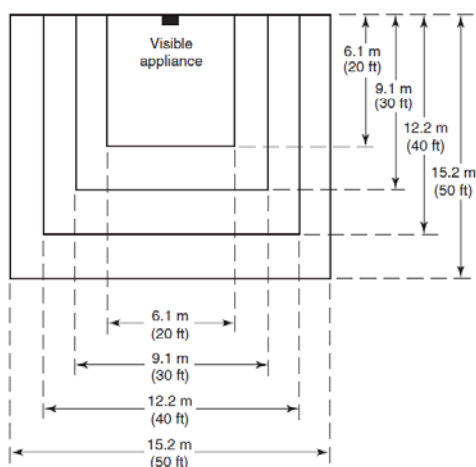


FIGURE 7.5.4.1.1 Room Spacing for Wall-Mounted Visible Appliances.

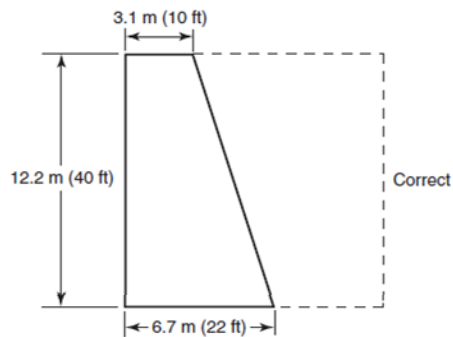
56

Visible Notification Appliances

- Non-square or large rooms –
7.5.4.1.5
 - If the room is not square or is very large, subdivide the room into squares that will work
 - See next two slides

57

Visible Notification Appliances



Note: Broken lines represent imaginary walls.

FIGURE A.7.5.4.1(a) Irregular Area Spacing.

58

Visible Notification Appliances

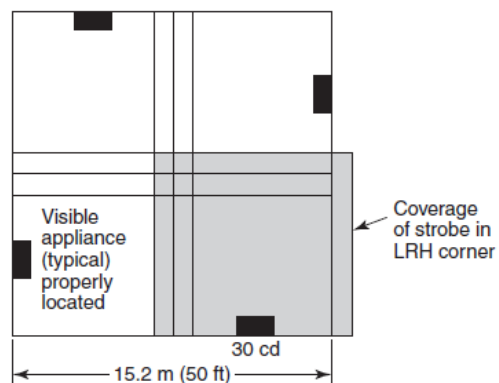


FIGURE A.7.5.4.1(c) Room Spacing Allocation — Correct.

59

Visible Notification Appliances

- Ceiling-mounted strobes – 7.5.4.1.6
 - Mounting
 - Mount on the ceiling
 - Suspend below the ceiling
 - Indirect viewing – room spacing
 - Use ceiling-mounted spacing table
 - 30 feet maximum height above floor
 - See next slide

60

Visible Notification Appliances

Table 7.5.4.1.1(b) Room Spacing for Ceiling-Mounted Visible Appliances

Maximum Room Size		Maximum Ceiling Height		Minimum Required Light Output (Effective Intensity); One Light (cd)
m	ft	m	ft	
6.1 × 6.1	20 × 20	3.05	10	15
9.14 × 9.14	30 × 30	3.05	10	30
12.2 × 12.2	40 × 40	3.05	10	60
15.2 × 15.2	50 × 50	3.05	10	95
6.1 × 6.1	20 × 20	6.1	20	30
9.14 × 9.14	30 × 30	6.1	20	45
12.2 × 12.2	40 × 40	6.1	20	80
15.2 × 15.2	50 × 50	6.1	20	115
6.1 × 6.1	20 × 20	9.14	30	55
9.14 × 9.14	30 × 30	9.14	30	75
12.2 × 12.2	40 × 40	9.14	30	115
15.2 × 15.2	50 × 50	9.14	30	150

61

Visible Notification Appliances

- Room configuration – 7.5.4.1.7
 - The maximum room size for ceiling-mounted strobes assumes the appliance is mounted at the center of the room
 - If the room is not square or is very large, subdivide the room into squares that will work

62

Visible Notification Appliances

- Performance-based alternative for indirect viewing – 7.5.4.3
 - Use instead of room spacing tables
 - Requires calculations
 - Use polar distribution for strobe
 - Use the *Inverse Square Law*
 - Result in a minimum of 0.0375 lumens/ ft² illumination throughout the covered area

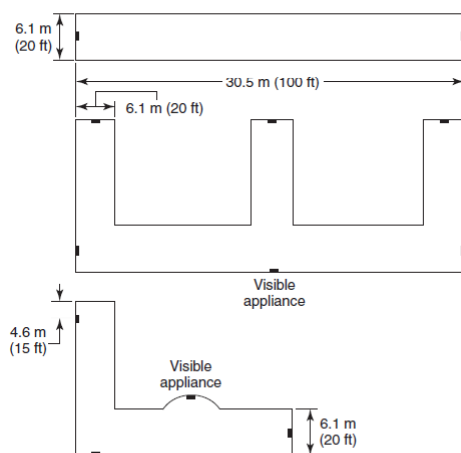
63

Visible Notification Appliances

- Direct viewing – spacing in corridors – 7.5.4.2
 - Corridors 20 ft wide or less
 - Strobe rating 15 cd minimum
 - Strobe spacing 100 ft maximum
 - Strobe within 15 ft from the end of the corridor
 - Interruption in viewing path treated as new corridor
 - See next slide

64

Visible Notification Appliances



| FIGURE A.7.5.4.2 Corridor Spacing for Visible Appliances.

65

Visible Notification Appliances

- Synchronization
 - More than two strobes in the same room or space within the field of view require synchronization
 - Two or less **do not** require synchronization

66

Visible Notification Appliances

- Sleeping areas – 7.5.4.4
 - Special rules apply
 - Wall-mounted appliances must still comply with 7.5.4 for mounting height
 - Appliances must be located within 16 ft of the pillow
 - High intensity strobes must be used
 - 177 cd if within 24 inches of ceiling
 - 110 cd if greater than 24 inches of ceiling

67

Updated Requirements

- Strobe synchronization
 - 2007 and later editions of NFPA 72
 - Groups of synchronized strobes
 - Where appliances in each group are synchronized, two groups can be used without the need to synchronize the two groups
 - Must include groups from any system

68

Updated Requirements

- Low frequency audible signals - commercial
 - 2010 and later editions of NFPA 72 – 18.4.5.3
 - Audible appliances for sleeping areas
 - Audible appliances of commercial systems
 - Effective January 1, 2014
 - 520 Hz \pm 10% fundamental frequency
 - Square wave or equivalent awakening ability

69

Updated Requirements

- Low frequency audible signals - household
 - 2010 and later editions of NFPA 72 – 29.3.8
 - For those with mild to severe hearing loss
 - Where required by governing laws, codes or standards or where installed voluntarily
 - Effective with code adoption
 - 520 Hz \pm 10% fundamental frequency
 - Square wave or equivalent awakening ability
 - Those with moderately severe to profound hearing loss
 - Use strobes and tactile appliances

70

Updated Requirements

- New requirements for voice intelligibility
 - 2010 and later editions of NFPA 72 – 18.4.10
 - Acoustically Distinguishable Space (ADS)
 - New defined term – see Chapter 3
 - Not all spaces must have voice intelligibility
 - ADS assignments must be determined and documented by system designer
 - New Annex D Speech Intelligibility
 - Provides design and testing guidance

71

Updated Requirements

- New design requirements
 - 2013 edition of NFPA 72
 - Audible appliances – 18.4.1.4
 - Designer must identify areas that need appliances
 - For covered areas the designer must document
 - expected ambient sound levels
 - design sound levels of audible appliances
 - Visible appliances – 18.5.2
 - Designer must document areas that need appliances
 - Designer must provide cd ratings for AHJ review, if requested

72

Updated Requirements

- Textual and Graphical Visible Appliances
 - 2010 and later editions of NFPA 72
 - Types of displays
 - Location of displays
 - Display height
 - Character & symbol requirements
 - Size versus viewing distance
 - Style & spacing

73

Questions?

**You may type and submit questions in the
Chat Area Text Box or press Control-M
and enter text in the
Chat Area**

74



U.S. Access Board

(800) 872-2253 (voice)

(800) 993-2822 (TTY)

E-mail: ta@access-board.gov

www.access-board.gov

75

**Thank you for participating
in today's webinar**



Next session:

Section 508 – Accessible Web Content (WCAG 2.0)

July 11, 2013

2:30 - 4:00 (ET)

www.accessibilityonline.org

(877) 232-1990 (v/TTY)

76