

A117 Task Group on
Obstructed Reach Range and Extreme Physical Size
Task Group Report
September 28, 2001

I. TASK GROUP PARTICIPANTS

A. MEMBERS

Angela Van Etten, J.D. – CHAIR - Little People of America, Inc. (LPA)
Carlisle Bean - National Institute for Tall People (NITP) (resigned 9/20/01).
Ed Donoghue - National Elevator Industry, Inc. (NEI)
Nessa Feddis - American Bankers Association (ABA)
William Marletta - American Society of Safety Engineers (ASSE) (non-participant)
Ron Nickson - National Apartment Association (NAA)
Larry Perry - Building Owners & Managers Association International (BOMA)
John Salmen – Self
Hale Zukas - World Institute on Disability (WID)

B. INTERESTED PARTIES

Mark Wales - American Institute of Architects (AIA)

C. GUEST CONSULTANTS

Dan Bartz - Kohler design team
Patrick Higgins - Self
Michael Tierney - Building Hardware Manufacturers Association (BHMA)

II. ISSUES ADDRESSED:

Report Page Index

Report Section	TOPIC	Page
III	Scope of work.....	2
IV	Research.....	3
V	Define reach ranges according to the operating activity at the end of the reach.....	3
VI	National Institute for Tall People (NITP) Issues.....	4
VII	308.2.2. Obstructed High Forward Reach, generally.....	4
VIII	308.3.1 Unobstructed Side Reach.....	5
IX	404 Doors and Doorways	
	A. Door Hardware And Vision Lites	6
	B. 404.3.5 Automatic Door Control Switches.....	
X	407 Elevators, Call Buttons in Lobbies and Halls.....	7
XI	606 Lavatories	
	A. Faucets And Soap Dispenser Controls	8
	Towel Dispensers and Air Blowing Units.....	
XII	603 Toilet and Bathing Rooms, Mirrors.....	10
XIII	Fold Down Shelves.....	11
XIV	Refrigerator/Freezer.....	12

III. SCOPE OF WORK:

The original scope of the Obstructed Reach Range and Extremes of Physical Size Task Group was submitted on June 15, 1999 and reads as follows:

"To recommend standards for obstructed high reach in ICC/ANSI A117.1 1998, Accessible and Usable Buildings and Facilities §§308.2.2 and 308.3.2 that provide access for a greater percentage of people with disabilities."

However, the Obstructed Reach Task Group subsequently agreed to also consider unobstructed reach issues.

IV. RESEARCH:

Lack of data has severely restricted the Task Group's ability to make recommendations to the ANSI A117.1 Committee. There is an overwhelming need for research before the Committee can come to any conclusions on multiple issues. Without research the Committee will continue to go around in a circle. Meanwhile there is a high level of frustration.

V. DEFINE REACH RANGES ACCORDING TO OPERATING ACTIVITY AT END OF REACH:

PROBLEM STATED BY JOHN SALMEN: Different things happen at the end of a reach i.e. touch, finger, grip, turn, pull, push, etc. The reach criteria could be affected by the operating activity needed to engage the element. For example, operating activities that require strength and power need to be closer to the body; things that need to be touched can be further away than things that need to be grasped. It appears, therefore, that reach ranges may need to vary according to the operating activity involved.

PROPOSAL: Define each of the reach ranges in terms of the operating activity at the end of the reach.

DISCUSSION: This is a valid point that should be considered. However, no recommendations can be made without research and further discussion. The Task Group could not reach consensus as time and resources do not allow for this research to be undertaken.

RECOMMENDATION: The Commentary should bring this issue to the attention of designers.

VI. NATIONAL INSTITUTE FOR TALL PEOPLE (NITP) ISSUES:

PROBLEM STATED BY LISLE BEAN FOR NITP: The following issues were outlined: definition of obstruction; distinguishing between visual and physical obstructions; raising the height of some elements where there are multiple installations e.g. drinking fountains; and increasing minimum clearances (306 Knee and Toe Clearance; 307 Protruding Objects; 404 Doors and Doorways; etc.).

PROPOSAL: No specific proposals were submitted.

DISCUSSION: The Task Group acknowledged that these issues affect many people, but hesitated jumping in without data as to the extent of the problem. Although NITP indicated they had raw data based on a study of 500 people, this data was not presented to the Task Group.

RECOMMENDATION: No action is being recommended due to the lack of specific proposals and supporting data.

VII. 308.2.2, 308.2.3 OBSTRUCTED HIGH REACH, GENERALLY

PROBLEM STATED BY ANGELA VAN ETTEN FOR LPA: Unlike people who use wheelchairs, individuals with dwarfism cannot improve their forward reach by moving their legs under an obstruction. Moreover, it is impossible for individuals with dwarfism to reach anything over an obstruction of more than 11 inches even when the obstruction is as low as 34 inches. Indeed, the only way for a dwarf to reach 48 inches is if there is virtually no obstruction.

Source: Obstructed Reach Range Survey of Adult Dwarfs (August 1996). The survey results are summarized in the following Table:

Obstructed Reach of Adult Dwarfs (August 1996)						
	inches (mm)	inches (mm)	inches (mm)	inches (mm)	inches (mm)	inches (mm)
Reach depth	0.66 (16.764)	2.06 (50.927)	4.74 (120.650)	6.46 (162.560)	9.32 (234.950)	10.89 (279.400)
Reach height	48 (1220)	46 (1170)	42 (1065)	40 (1015)	36 (915)	34 (865)

PROPOSAL: LPA recognized that removing the obstructed reach for Little People could result in changing the nature of an element and its usability by others. For example, removing the obstructed reach for dispensing equipment in cafeterias would require that the equipment be brought so far forward--9 inches from the front of a 36-inch counter height--that virtually no usable counter space is left. Thus, LPA did not propose changes in this building block section. Rather, LPA proposed identifying those elements in which the obstructed reach could be removed without affecting the usability of the element by others or altering the nature of the element.

DISCUSSION: Typical elements that permit an obstructed high forward reach were identified, namely bathroom amenities, telephones, vending equipment mounted on counter, dispensing equipment in cafeterias, cash counters, and study carrels. Bathrooms were earmarked as having elements in which the obstruction is not integral to the design; for example, a soap dispenser on the mirror behind the counter.

RECOMMENDATIONS: See XI. 606 Lavatories, below.

VIII. 308.3.1 UNOBSTRUCTED SIDE REACH:

PROPOSAL STATED BY ANGELA VAN ETTEN FOR LPA: The exception, "Existing elements shall be permitted at 54-inches (1370 mm) maximum above the floor or ground," should be removed as a scoping provision that Section 201 reserves for the administrative authority to specify the extent to which these technical criteria apply.

DISCUSSION: After discussing what triggers the accessibility provisions for an alteration, the Task Group saw the exception as necessary because of the broad reaching impact of the 48-inch standard in new construction and alterations. Specific language permitting 54-inches is needed.

RECOMMENDATION: Although it is technically correct to classify this exception as scoping, the Task Group does not recommend removing this exception.

IX. 404 DOORS AND DOORWAYS:

A. DOOR HARDWARE AND VISION LITES

Michael Tierney, Building Hardware Manufacturers Association (BHMA), greatly assisted the Task Group in answering questions relating to door hardware. As a result of the information received, LPA withdrew its proposals relating to door hardware and vision lites.

B. 404.3.5 AUTOMATIC DOOR CONTROL SWITCHES

1. PROPOSAL BY HALE ZUKAS FOR WID: Add the following text to the standard:

404.3.5.1: Height. The centerline of control switches shall be 32" above the floor or ground surface.

SUPPORTING INFORMATION: A program on whose 'board' I sit moved to new quarters and had a manually activated powered entry door installed, but when I complained that the switch plate was too high for many people (not me), they said it met the standard. Sure enough, it does, its bottom edge being 45" from the floor. That does not mean it's not too high for the many wheelchair users who cannot raise their arms above shoulder height, not to speak of some Little People.

The reach ranges in 308 are intended to provide the widest latitude in locating many different elements while meeting the needs of the largest number of people. Door control switches, on the other hand, are intended to serve a very small population, so their height should meet the needs of as large a proportion of that population as possible.

RECOMMENDATION: The Task Group does not recommend this proposal to the ANSI Committee for the following reasons:

- a. ANSI is trying to get away from the center lining convention and does not favor absolute measurements.
- b. These switches are placed on heavy doors and are used by a lot of people, for example, people who use canes, crutches and walkers, push strollers and carry luggage. They are not special buttons used only by people with disabilities. The

switch should not be dropped to a height that is unusable by others and 32" is far below the usable height for a lot of people.

- c. No justification is given for why a door switch that is within the unobstructed side reach range needs special consideration. Hitting a button on the wall is one of the easier functions. It is hard to justify this change because it could affect other portions of the code.
- d. A standard range of where things should be located is needed. Standardization is important for enforcement purposes.
- e. Even if the proposed height were raised to 35" or 40," there is still concern about justifying numbers going below the established reach range.
- f. See also discussion on item V, above.

2. PROPOSAL BY HALE ZUKAS FOR WID: to add a second switch near the ground at the height of the average footrest--about 9 inches--which can be hit with a footrest or wheel.

SUPPORTING INFORMATION: Even at 32", a switch is no help to high quadriplegics and other disabled people who cannot use their arms at all. The City of Berkeley, the University of California and others put in a second switch to accommodate this population. Whether or not 404.3.5 requires such switches, it needs to specify their location.

RECOMMENDATION: The Task Group recommends that the need for a footrest height switch be placed in the Commentary.

X. 407 ELEVATORS, CALL BUTTONS IN LOBBIES AND HALLS:

PROPOSAL STATED BY ANGELA VAN ETTEN FOR LPA: to amend sections 407.2.2, 407.3.1, 407.4.2, 407.5 to lower the maximum reach range for call buttons in elevator lobbies and halls from 48 to 42 inches.

SUPPORTING INFORMATION: CABO/ANSI A117.1-1992, Section 4.10.1.3 provided that "Call buttons in elevator lobbies and halls shall be centered at 42 inches (1065 mm) above the floor." It is access regression to raise the height standard from 42 to 48 inches when it is known that 94 percent of individuals with dwarfism can reach 42 inches while only 79 percent can reach 48 inches. See Anthropometric National Survey of Adult Dwarfs (July 1995).

There is no technical reason for why hall call buttons cannot be lowered to 42 inches. Individuals unable to reach an elevator call button are effectively denied access into a building or are trapped on hallways. It is not inconsistent to require elevator call buttons to be lower than some floor designation buttons inside the car because once inside the car the user may be riding to a level where the button is within reach, can ride to a level where assistance is available, or will ride until someone else boards the elevator and is available to press the desired button.

RECOMMENDATION: The Task Group does not recommend this proposal to the ANSI Committee for the following reasons:

- a. 42" was specified in the 1992 document because it was the industry standard, not because it made call buttons more accessible.
- b. 48" is an acceptable number within the established reach ranges.
- c. No justification is given for why a call button that is within the unobstructed side reach range needs special consideration.
- d. See also discussion on item V, above.

XI. 606 LAVATORIES:

A. FAUCETS AND SOAP DISPENSER CONTROLS

PROBLEM STATED BY ANGELA VAN ETTEN FOR LPA: Individuals with dwarfism can only reach faucets and soap dispensers up to a reach depth of 11 inches in lavatories with a height of 34 inches. Because faucets and soap dispensers are mostly installed at a reach depth greater than 11 inches, Little People are unable to wash their hands in public bathrooms.

INVESTIGATION: The Task Group investigated the problem with the able assistance of Patrick Higgins and Dan Bartz. A number of possible solutions were considered and rejected, namely: mandating side access to vanities, moving the sink bowl as close to the front of the vanity as possible, or requiring an unobstructed side reach for hand drying units.

TASK GROUP PROPOSAL: Add the following text to the standard:

606.x. Lavatory faucets and soap dispenser controls shall have a maximum reach depth of 11 inches (280 mm) or, if automatic, shall be activated within a maximum reach depth of 11 inches. Water and soap flow shall be provided with a maximum reach depth of 11 inches.

RECOMMENDATION: The Task Group recommends this proposal to the ANSI Committee for the following reasons:

1. 606.x is broken out as a separate section in 606 to facilitate the scoping of this provision by the administrative authority. For example, the administrative authority may decide that the technical criteria provided in this section will only be required where there are multiple elements.
2. Patrick Higgins and Dan Bartz advise that it is preferable to locate the faucet within a reachable position and advised against modifying lavatory dimensions.
3. Patrick Higgins and Dan Bartz advise that it is technically feasible for lavatory faucets, soap dispenser controls, and water and soap flow to meet a maximum reach depth of 11 inches.
4. Dan Bartz advised that electronic faucets are plentiful and many have sensory devices that act in proximity to the faucet. The proximity ranges go anywhere from 1 to 8 inches and some may be adjusted to a greater distance.
5. Patrick Higgins and Dan Bartz advise that a second approach involves the relocation of the faucet on the counter:
 - (a) Faucets could be mounted on sidewalls.
 - (b) Widespread faucet designs separate the spout from the operating controls, which allows installation flexibility.
 - (c) The installation of a faucet on the side of the bowl within the counter-top is not prohibited by code and it would allow greater accessibility for all users.
 - (d) The side-mounted installation could still be piped to provide the required knee and toe clearance.
 - (e) Single control non-electronic faucets would serve the purpose well. They are easy to turn on/off and control the flow and temperature.

B. TOWEL DISPENSERS AND AIR BLOWING UNITS

PROBLEM STATED BY ANGELA VAN ETTEN FOR LPA: Towel dispensers and/or air blowing units are often installed with an obstructed reach on sidewalls above the lavatory counter. Unless such units are installed above a counter within the obstructed reach range specified in the Table below, Little People are denied access to towel dispensers and/or air blowing units.

TASK GROUP PROPOSAL: Add the following text to the standard:

606.x.1. Operable parts on towel dispensers and air blowing units shall comply with the following table:

	<u>inches</u> <u>(mm)</u>	<u>inches</u> <u>(mm)</u>	<u>inches</u> <u>(mm)</u>	<u>inches</u> <u>(mm)</u>	<u>inches</u> <u>(mm)</u>	<u>inches</u> <u>(mm)</u>
<u>Reach</u> <u>depth</u>	<u>½ (15)</u>	<u>2 (50)</u>	<u>5 (130)</u>	<u>6 (155)</u>	<u>9 (230)</u>	<u>11 (280)</u>
<u>Reach</u> <u>height</u>	<u>48</u> <u>(1220)</u>	<u>46 (1170)</u>	<u>42 (1065)</u>	<u>40 (1015)</u>	<u>36 (915)</u>	<u>34 (865)</u>

RECOMMENDATION: The Task Group recommends this proposal to the ANSI Committee for the following reasons:

1. 606.x.1 is broken out as a separate section in 606 to facilitate the scoping of this provision by the administrative authority. For example, the administrative authority may decide that the technical criteria provided in this section will only be required where there are multiple elements.
2. There are a wide variety of towel dispenser designs that can fit above a counter and meet these obstructed reach dimensions. For example, the arm on a towel dispenser unit can be adjusted to a 6-inch throw instead of the usual 12 inches.

XII. 603 TOILET AND BATHING ROOMS, MIRRORS:

PROBLEM STATED BY ANGELA VAN ETTEN FOR LPA:

1. Eighty-three percent of individuals with dwarfism have an eye height of 40 inches or higher. Anthropometric National Survey of Adult Dwarfs (July 1995). Thus, most dwarfs can only see the tops of their heads in a bathroom mirror installed at 40 inches.

2. Because the average or mean shoulder height of individuals with dwarfism is 39 in (991 mm) with a standard deviation of 4.5 in (114.03 mm), it appears that visibility at 34 or 35 inches is necessary for dwarfs to be able to see in a bathroom mirror. Anthropometric National Survey of Adult Dwarfs (July 1995).

TASK GROUP PROPOSAL: Add the following text to the standard:

603.3 Mirrors. Mirrors located above lavatories, sinks or counters shall be mounted with the bottom edge of the reflecting surface 40 inches (1015 mm) maximum above the floor or ground. Mirrors not located above lavatories, sinks or counters shall be mounted with the bottom edge of the reflecting surface 35 inches (890 mm) maximum above the floor or ground.

RECOMMENDATIONS:

1. The Task Group recommends the revised text in 603.3 to the ANSI Committee for the following reasons:
 - a. The mirror over the sink cannot be lowered without interfering with the 4-inch back splash and mirror frame above the 34-inch counter height.
 - b. However, there is no reason why mirrors not over the sink should be as high as 40 inches and inaccessible to Little People.
2. Commentary language should be written to explain the value of having a lower, separate mirror in another location.

XIII. FOLD DOWN SHELVES:

PROBLEM STATED BY ANGELA VAN ETTEN FOR LPA: Individuals with dwarfism can reach 6.5 inches (165 mm) over an obstruction at a height of 40 inches and 0.5 inches (15 mm) over an obstruction at a height of 48 inches. See Anthropometric National Survey of Adult Dwarfs (July 1995).

PROPOSAL STATED BY ANGELA VAN ETTEN FOR LPA to amend sections 603.4, 604.8.5, 803.5 to fix the shelf height at 40 inches or give a range from 34 to 40 inches above the floor or ground.

RECOMMENDATION: The Task Group does not recommend this proposal to the ANSI Committee because there is a lot going on below 40 inches. For example, grab bars and wheelchair-turning space needs to be clear of protrusions.

XIV. REFRIGERATOR/FREEZER:

PROPOSAL STATED BY ANGELA VAN ETTEN FOR LPA to amend sections 804.7.6 and 1002.12.6.6 so that combination refrigerators and freezers shall have at least 50 percent of the freezer space 48 inches (1220 mm) ~~54 inches (1370 mm)~~ maximum above the floor or ground.

SUPPORTING INFORMATION: To conform to the 48 inch building block in Section 308 Reach Ranges.

RECOMMENDATION: The Task Group does not recommend this proposal to the ANSI Committee because this effectively mandates side-by-side refrigerators and side-by-side refrigerators do not provide greater accessibility to Little People.