



NRC Publications Archive Archives des publications du CNRC

Stair calculator

Strelka, C. S.

For the publisher's version, please access the DOI link below./ Pour consulter la version de l'éditeur, utilisez le lien DOI ci-dessous.

Publisher's version / Version de l'éditeur:

<https://doi.org/10.4224/20338249>

Building Practice Note, 1984-07-01

NRC Publications Record / Notice d'Archives des publications de CNRC:

<https://nrc-publications.canada.ca/eng/view/object/?id=012efe48-ddef-4994-9c53-1eb46f67f615>

<https://publications-cnrc.canada.ca/fra/voir/objet/?id=012efe48-ddef-4994-9c53-1eb46f67f615>

Access and use of this website and the material on it are subject to the Terms and Conditions set forth at

<https://nrc-publications.canada.ca/eng/copyright>

READ THESE TERMS AND CONDITIONS CAREFULLY BEFORE USING THIS WEBSITE.

L'accès à ce site Web et l'utilisation de son contenu sont assujettis aux conditions présentées dans le site

<https://publications-cnrc.canada.ca/fra/droits>

LISEZ CES CONDITIONS ATTENTIVEMENT AVANT D'UTILISER CE SITE WEB.

Questions? Contact the NRC Publications Archive team at

PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca. If you wish to email the authors directly, please see the first page of the publication for their contact information.

Vous avez des questions? Nous pouvons vous aider. Pour communiquer directement avec un auteur, consultez la première page de la revue dans laquelle son article a été publié afin de trouver ses coordonnées. Si vous n'arrivez pas à les repérer, communiquez avec nous à PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca.



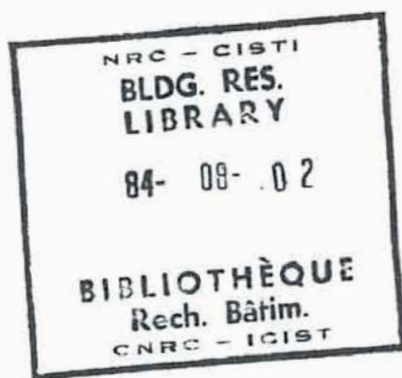
Ref
Ser
TH1
N21b8
no. 48

ISSN 0701-5216

BLDG

IRC PUE

BUILDING PRACTICE NOTE



STAIR CALCULATOR

by

C.S. Strelka

ANALYZED

Division of Building Research, National Research Council of Canada

Ottawa, July 1984

NATIONAL RESEARCH COUNCIL OF CANADA

DIVISION OF BUILDING RESEARCH

STAIR CALCULATOR

by

C.S. Strelka

Ottawa

July 1984

In the planning of buildings and in site development the designer encounters a number of problems concerning the movement of people and goods from one level to another. To do this either mechanical means (elevators, escalators) or static building elements (stairs, ramps, ladders) must be used. Both of these groups are important to proper design for the comfort and safety of the user.

This Note concentrates on the design of the stairs only. The attached "Metric Stair Calculator", when assembled according to the instructions given on the sheet, can be used for fast calculations of the number and height of risers for a given floor-to-floor difference in elevation. All dimensions are given in millimetres.

For quick reference the following are the minimum and maximum dimensions of various stair design elements according to the National Building Code of Canada (1985).

STAIR DESIGN LIMITS

INDIVIDUAL DWELLING		MAX. mm	MIN. mm	NBC 85 Clause	PUBLIC USE		MAX. mm	MIN. mm	NBC 85 Clause
Exterior Stair	Riser Run Tread width	200 - -	- 210 235	9.8.3.1	Exterior Stair	Riser Run Tread width	200 355 -	125 230 250	9.8.3.2
Interior Stair (except to service rooms)	Riser Run Tread width	200 - -	- 210 235	9.8.3.1	Interior Stair	Riser Run Tread width	200 355 -	125 230 250	9.8.3.2
Nosing or backslope	When run Less than 250 mm	-	25	9.8.3.3	Nosing or backslope	When run Less than 250 mm	-	25	9.8.3.3
Landing	Two flights Straight run Landing to landing height difference	- - 3700	equal to stair width 1100 -	9.8.4.1 9.8.4.1 9.8.4.5	Landing	Two flights Straight run Landing to landing height difference	- - 3700	equal to stair width 1100 -	9.8.4.1 9.8.4.1 9.8.4.5
Headroom /vertically over line drawn through edge of nosings/	Stairs Landing	- -	1950 1950	9.8.3.6 9.8.4.6	Headroom /vertically over line drawn through edge of nosings/	Stairs Landing	- -	2050 2050	9.8.3.6 9.8.4.6
Handrail	Stairs Landing	920 -	800 900	9.8.7.7 9.8.8.5	Handrail to be extended min. 300 mm beyond the top and bottom of stair (*)	Stairs Landing	920 -	900 1070	9.8.8.4 9.8.8.4 *9.8.7.4

		218.2	220.4											
		200.0	202.1	204.2	206.2	208.3	210.4	212.5	214.6	216.7	218.7	220.8		
		184.6	186.5	188.5	190.4	192.3	194.2	196.1	198.1	200.0	201.9	203.8	205.6	207.7
		171.4	173.2	175.0	176.8	178.6	180.4	182.1	183.9	185.7	187.5	189.3	191.1	192.9
		160.0	161.7	163.3	165.0	166.7	168.3	170.0	171.7	173.3	175.0	176.7	178.3	180.0
2400	2425	2450	2475	2500	2525	2550	2575	2600	2625	2650	2675	2700		
		150.0	151.7	153.1	154.7	156.2	157.8	159.4	160.9	162.5	164.1	165.6	167.2	168.7
		141.2	142.6	144.1	145.6	147.1	148.5	150.0	151.5	152.9	154.4	155.9	157.3	158.8
		133.3	134.7	136.1	137.5	138.9	140.3	141.7	143.1	144.4	145.8	147.2	148.6	150.0
					130.3	131.6	132.9	134.2	135.5	136.8	138.2	139.5	140.8	142.1
										130.0	131.2	132.5	133.7	135.0

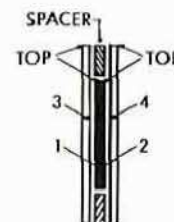
METRIC STAIR CALCULATOR

HOW TO ASSEMBLE THE CALCULATOR

- 1) CUT OUT ALL FOUR PARTS OF CALCULATOR PRINTED ON THIS SHEET ALONG THE THIN BORDER LINES
- 2) PASTE PARTS 1, 3, 4 TO A THIN SHEET OF CARDBOARD, CUT ALONG THE BORDER LINES, CUT OUT THE VISOR OPENINGS ON PARTS 3 AND 4
- 3) PASTE PART 2 TO THE OTHER SIDE OF CARDBOARD WITH PART 1 ATTACHED
- 4) PREPARE CURSOR (PARTS 3 & 4) USING STRIPS OF CARDBOARD AT TOP AND BOTTOM AS SPACERS

HOW TO USE THE CALCULATOR

- 1) SET VISOR OVER GIVEN "FLOOR-TO-FLOOR" HEIGHT
- 2) FOR GIVEN NO. OF RISERS IN STAIR FLIGHT READ RISER HEIGHT AT THE RIGHT EDGE OF CURSOR



3	NO. OF RISERS
	11
	12
	13
	14
	15
FLOOR	
TO	
FLOOR	16
mm	17
	18
	19
	20

4	NO. OF RISERS
	16
	17
	18
	19
	20
FLOOR	
TO	
FLOOR	21
mm	22
	23
	24
	25

		170.3	171.9	173.4	175.0	181.2	187.5	196.9	206.2					
		160.3	161.6	163.2	164.7	170.6	176.5	185.3	194.1	219.8				
		151.4	152.8	154.2	155.6	161.1	166.7	175.0	183.3	200.0	216.7			
		143.4	144.8	146.0	147.4	152.6	157.9	165.8	173.7	189.5	205.3	221.0		
		136.3	137.5	138.8	140.0	145.0	150.0	157.5	165.0	180.0	195.0	210.0		
2725	2750	2775	2800	2900	3000	3150	3300	3600	3900	4200	4500	4800		
		129.8	130.9	132.1	133.3	138.1	142.9	150.0	157.1	171.4	185.7	200.0	214.3	228.6
		123.9	125.0	126.1	127.3	131.8	136.4	143.2	150.0	163.6	177.3	190.9	204.5	218.2
						126.1	130.4	137.0	143.5	156.5	169.6	182.6	195.6	208.7
							125.0	131.2	137.5	150.0	162.5	175.0	187.5	200.0
								132.0	144.0	156.0	168.0	180.0	192.0	