WYDZIAŁ INŻYNIERII LĄDOWEJ I TRANSPORTU
POLITECHNIKA POZNAŃSKA

POZNAN UNIVERSITY OF TECHNOLOGY
INSTITUTE OF BUILDING ENGINEERING
DIVISION OF BUILDING AND BUILDING MATERIALS

NON-DESTRUCTIVE CONCRETE TESTS

Sclerometer Schmidt Hammer – Measurement Report

Type of construction _____ Date _____

Name of element _____ Schmidt Hammer type _____

Age of concrete _____ Nominal range of rebound (L_{nom}) _____

Relative humidity of concrete _____ Range of rebound from the anvil (L_k) _____

Position	Angle α	Rebound value L									Mean rebound value L_{ia}	Mean rebound value L_i	$L_i - \bar{L}$	$(L_i - \bar{L})^2$
		1	2	3	4	5	6	7	8	9				
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
											Σ			

Arithmetic mean $\bar{L}$=
Standard deviation s_L =
Coefficient of variation v_L =
Mean compressive strength of concrete f_{cm} = MPa

Final compressive strength of concrete f'_{cm} = MPa

Standard deviation $s_{fcm,}$ =
Minimum compressive strength of concrete f_{min} =
Homogeneity factor k_f =
Coefficient of variation v_f =

@M. Ratajczak

Mean rebound value	$L_i = L_{ia} + \alpha$
Arithmetic mean	$\bar{L} = \frac{\sum_{i=1}^{n} L_i}{n} \cdot \frac{L_{nom}}{L_k}$
Standard deviation	$s_L = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(L_i - \bar{L})^2}$
Coefficient of variation	$v_L = \frac{s_L}{\bar{L}}$
Mean compressive strength of concrete (Regression curve according to The Building Research Institute (ITB) instruction N^0 210 – hammer type N)	$f_{cm} = \bar{L} \cdot \left[0{,}0356 \cdot \bar{L} \cdot (v_L^2 + 1) - 0{,}795 + \frac{6{,}4}{\bar{L}}\right]$
Final compressive strength of concrete	$\mathbf{f_{cm}' = f_{cm} \cdot w \cdot z}$
Standard deviation (Regression curve according to The Building Research Institute (ITB) instruction N^0 210 – hammer type N)	$s_{fcm} = \bar{L} \cdot v_L \cdot \sqrt{0{,}00254 \cdot \bar{L}^2 \cdot (v_L^2 + 2) - 0{,}1134 \cdot \bar{L} + 0{,}633}$
	$s_{fcm}' = s_{fcm} \cdot w \cdot z$
Minimum compressive strength of concrete	$f_{min} = f_{cm}' - 1{,}64 \cdot s_{fcm}'$
Homogeneity factor	$k_f = \frac{f_{min}}{f_{cm}'}$
Coefficient of variation	$v_f = \frac{s_{fcm}'}{f_{cm}'} = \frac{1 - k_f}{1{,}64}$

Correction coefficients

Hammer type	L_{nom}
N	80±2
L	74±2
P	177±2

Relative humidity	w parameter
full water	1,12
air-dry	1,00
dry	0,96

Rebound value L	α parameter			
	Upward positions		Downward position	
	Angle 90^0	Angle 45^0	Angle 45^0	Angle 90^0
20	-5,4	-3,5	+2,5	+3,4
30	-4,7	-3,1	+2,3	+3,1
40	-3,9	-2,6	+2,0	+2,7
50	-3,1	-2,1	+1,6	+2,2
60	-2,3	-1,6	+1,3	+1,7

Age of concrete (days)	z parameter
10	1,20
20	1,04
28-100	1,00
150	0,92
200	0,86
300	0,78
360	0,75
500	0,70
1000	0,63
>1000	0,60