TABLICE I DIJAGRAMI
iz predmeta
BETONSKE KONSTRUKCIJE II

TABLICA 1: PARCIJALNI KOEFICIJENTI SIGURNOSTI ZA DJELOVANJA

Djelovanje	Parcijalni koeficijenti sigurnosti γF		
	Vrsta djelovanja		
	Stalno γ_G	Promjenjivo γ_Q	Prednapinjanje γ_P
Nepovoljno	1.35	1.5	1.0 ili 1.1
Povoljno	1.0	0	1.0 ili 0.9

TABLICA 2: KARAKTERISTIČNE VRIJEDNOSTI KORISNOGA OPTEREĆENJA ZA ZGRADE RAZLIČITIH KATEGORIJA

Kategorija objekta	Vertikalno promjenjivo opterećenje q_k [kN/m^2]
A- stambene prostorije, sobe u zgradama, sobe u bolnicama i hotelima, kuhinje, toaleti.....	2.00
- stubišta.....	3.00
- balkoni.....	4.00
B- poslovne prostorije.....	3.00
C- prostorije za okupljanje ljudi	
C_1- prostorije sa stolovima (škole, restorani, čitaonice).....	3.00
C_2- prostorije s fiksnim sjedištima (kina, kazališta, čekaonice).....	4.00
C_3- prostorije bez ograničenja kretanja ljudi muzeji, pristupne površine u javnim administrativnim zgradama i hotelima).....	5.00
C_4- prostorije za posebne fizičke aktivnosti (prostorije za ples, gimnastičke dvorane, bine).....	5.00
C_5- površine s izrazitim ljudskim okupljanjem (koncertne dvorane, sportske dvorane sa stajanjem, terase i sl.).....	5.00
D- prodavaonice	
D_1- maloprodajne trgovine.....	5.00
D_2- robne kuće, skladišta, trgovine kancelarijskog materijala.....	5.00
E- skladišta i biblioteke.....	min 6.00
F- prometne i parkirne površine za laka vozila ukupne težine $\leq$ 30kN i s $\leq$ 8 sjedišta.....	2.00
G- za vozila srednje ukupne težine od 30 do 160 kN na dvije osovine.....	5.00

Kategorije krova	Nagib krova	q_k [kN/m^2]
Kategorija **H**	< 20°	0.75
	> 40°	0.00

TABLICA 3. KOEFICIJENTI KOMBINACIJE

Koeficijenti kombinacije			
Djelovanje	Ψ_0	Ψ_1	Ψ_2
Pokretno opterećenje na ploče	**0.7**	**0.5**	**0.3**
- stanovi, uredi, trgovine do 50m², predvorja, balkoni, bolnice			
- prostor za skupove, garaže, zgrade za parkiranje, gimnastičke dvorane, predvorja učionica, knjižnice, arhivi	**0.8**	**0.8**	**0.5**
- prostor za izložbe i trgovinu, trgovačke i robne kuće	**0.8**	**0.8**	**0.8**
Vjetar	**0.6**	**0.5**	**0**
Snijeg	**0.7**	**0.2**	**0**
Sva druga djelovanja	**0.8**	**0.7**	**0.5**

Za osnovnu kombinaciju računske se veličine reznih sila proračunavaju po izrazu:

$$S_d = S_d\left[\sum_j \left(\gamma_{G,j} \cdot G_{k,j}\right) + \gamma_Q \cdot Q_{k,1} + \sum_{i>1} \left(\gamma_Q \cdot \psi_{o,i} \cdot Q_{k,i}\right) + \gamma_p \cdot P_k\right] \qquad (6.3)$$

gdje su:

γ_G, γ_Q, γ_P - parcijalni koeficijenti sigurnosti za djelovanje dani u tablici 6.3.

$G_{k,j}$,$Q_{k,i}$ - karakteristične veličine za stalno i promjenjivo opterećenje (djelovanje)

$Q_{k,1}$ - karakteristična veličina nepovoljnog jedinog ili vodećeg promjenjivog djelovanja kad istodobno djeluje više promjenjivih opterećenja

P_k - karakteristična veličina prednapinjanja

$\Psi_{0,i}$ - koeficijenti kombinacije za promjenjiva djelovanja dani u tablici 6.2.

TABLICA 4. PARCIJALNI KOEFICIJENTI SIGURNOSTI ZA MATERIJALE

Vrsta kombinacije	Parcijalni koeficijenti sigurnosti γ_m	
	Beton γ_C	Betonski i prednapeti čelik γ_S
Osnovna kombinacija	1.50	1.15
Slučajna kombinacija	1.30	1.00

Parcijalnim koeficijentima sigurnosti za materijale γ_M obuhvaća se:
- razlika u čvrstoći gradiva dobivena preko uzorka i one u konstrukciji;
- moguće lokalno slabljenje materijala ili konstrukcije za vrijeme građenja;
- eventualne netočnosti u određivanju otpornosti elementa na osnovi otpornosti gradiva.

TABLICA 5. KLASE I OPISI OKOLIŠA

Klasa okoliša		Primjeri za navedeni okoliš
1 Suhi okoliš		Unutrašnji elementi zgrade
2 Vlažni okoliš	a[2)]	Unutrašnji elementi u jako vlažnom okolišu Vanjski elementi Elementi koji nisu u agresivnom tlu ili/i vodi
	b[3)]	Kao 2a, ali elementi izloženi povremeno smrzavici
3 Vlažni okoliš, smrzavanje, odmrzavanje		Elementi izloženi vremenskim nepogodama, smrzavanje, odmrzavanje solju
4 Blizina mora	a	Elementi izloženi kapljicama mora ili djelomično uronjeni u more
	b	Kao 4a, ali elementi izloženi mrazu
5 Kemijski agresivan okoliš[1)]	a	Slabo kemijski agresivan okoliš, agresivna atmosfera (industrija)
	b	Umjereno kemijski agresivan okoliš
	c	Jako kemijski agresivan okoliš

1) Kemijski agresivan okoliš posebno je klasificiran preko internacionalne organizacije za standardizaciju (ISO),
2) bez smrzavanja,
3) sa smrzavanjem.

TABLICA 6. DEBLJINE ZAŠTITNIH SLOJEVA U OVISNOSTI O KLASI OKOLIŠA

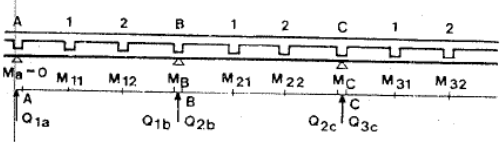
		Klasa okoliša								
		1	2a	2b	3	4a	4b	5a	5b	5c
Minimalna debljina zaštitnog sloja "c" (mm)	Betonski čelik	15	25	25	40	40	40	25	30	40
	Prednapeti čelik	25	30	35	50	50	50	35	40	50

Najmanje zaštitne slojeve valja korigirati i to:

- povećati za 0.5 cm ako su površine betona teško dostupne kontroli;
- povećati za 0.5 cm za marke betona manje od 25 N/mm^2;
- povećati za 1.0 cm kada se površine betona naknadno obrađuju;
- povećati za 1.0 cm za konstrukcije koje se izvode klizajućom oplatom;
- smanjiti za 0.5 cm za montažne elemente proizvedene u tvorničkim uvjetima.

TABLICA 7. PRORAČUN MOMENATA SAVIJANJA I POPREČNIH SILA KONTINUIRANIH NOSAČA

Nosači sa 2 do 5 jednakih polja s jednakim rasporedom opterećenja u poljima (kontinuiranim ili koncentriranim)

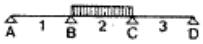
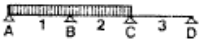
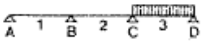


Nosač preko dva jednaka raspona

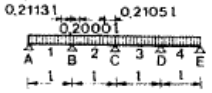
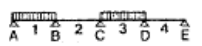
Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju: x = (0.4 ÷ 0.5)l, p	P, l/2 l/2	P P, l/3 l/3 l/3	P P, l/4 l/2 l/4	P P P, l/4 l/4 l/4 l/4	P P P, l/6 l/3 l/3 l/6	l/2 l/2, K = 0.5 · q · l	0.4l 0.2l 0.4l, K = 0.6 · q · l	0.3l 0.4l 0.3l, K = 0.7 · q · l
0.2001 0.200 l A 1 B 2 C l l Za stalno opterećenje stavlja se G umjesto P, odnosno g, umjesto p	M_{11}	0.070 pl^2	0.156 Fl	0.222 Fl	0.180 Fl	0.258 Fl	0.184 Fl	0.095 Kl	0.094 Kl	0.089 Kl
	M_{12}	-	-	0.111 F	0.039 Fl	0.266 Fl	0.219 Fl	-	-	-
	M_{13}	-	-	-	-	0.023 Fl	-0.080 Fl	-	-	-
	$M_{B\min}$	-0.125 pl^2	-0.188 Fl	-0.333 Fl	-0.281 Fl	-0.469 Fl	-0.396 Fl	-0.156 Kl	-0.155 Kl	-0.151 Kl
	$R_A = Q_{1A}$	0.375 pl	0.313 F	0.667F	0.719 F	1.031 F	1.104 F	0.344 K	0.345 K	0.349 K
	$R_{B\max}$	1.250 pl	1.375 F	2.667 F	2.563 F	3.938 F	3.792 F	1.312 K	1.310 K	1.302 K
	$Q_{1B\min}$	-0.625 pl	-0.688 F	-1.333 F	-1.281 F	-1.969 F	-1.896 F	-0.656 K	-0.655 K	-0.651 K
A 1 B 2 C	$M_{11\max}$	0.096 pl^2	0.203 Fl	0.278 Fl	0.215 Fl	0.316 Fl	0.217 Fl	0.129 Kl	0.126 Kl	0.121 Kl
	$M_{12\max}$	-	-	0.222 Fl	0.145 Fl	0.383 FL	0.318 Fl	-	-	-
	$M_{13\max}$	-	-	-	-	0.200 Fl	0.085 Fl	-	-	-
	M_B	-0.063 pl^2	-0.094 Fl	-0.167 Fl	-0.141 Fl	-0.234 Fl	-0.198 Fl	-0.078 Kl	-0.078 Kl	-0.076 Kl
	$R_A = Q_{1A\max}$	0.438 pl	0.406 F	0.833 F	0.859 F	1.266 F	1.302 F	0.422 K	0.422 K	0.424 K
A B C	$M_{11\min}$		-0.047 Fl	-0.056 Fl	-0.035 Fl	-0.059 Fl	-0.033 Fl	-0.035 Kl	-0.035 Kl	-0.034 Kl
	$M_{12\min}$		-	-0.111 Fl	-0.106 Fl	-0.117 Fl	-0.099 Fl	-	-	-
	$M_{13\min}$		-	-	-	-0.176 Fl	-0.165 Fl	-	-	-
	$R_A = Q_{1A\min}$	-0.063 pl	-0.094 F	-0.167 F	-0.141 F	-0.234 F	-0.198 F	-0.078 K	0.078 K	-0.076 K

7.1 NOSAČI PREKO TRI JEDNAKA RASPONA

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju: x = (0.4 ÷ 0.5)l, p	P, l/2 l/2	P P, l/3 l/3 l/3	P P, l/4 l/2 l/4	P P P, l/4 l/4 l/4 l/4	P P P, l/6 l/3 l/3 l/6	l/2 l/2, K = 0.5 · q · l	0.4l 0.2l 0.4l, K = 0.6 · q · l	0.3l 0.4l 0.3l, K = 0.7 · q · l
0,2105 l 0,2000 l A 1 B 2 C 3 D l l l	M_{11}	0.080 pl^2	0.175 Fl	0.244 Fl	0.194 Fl	0.281 Fl	0.197 Fl	0.108 Kl	0.107 Kl	0.102 Kl
	M_{12}	-	-	0.156 Fl	0.081 Fl	0.313 Fl	0.258 Fl	-	-	-
	M_{13}	-	-	-	-	0.094 Fl	-0.014 Fl			
	M_{21}	0.025 pl^2	0.100 Fl	0.067 Fl	0.025 Fl	0	-0.067 Fl	0.042 Kl	0.040 Kl	0.063 Kl
	M_{22}	-	-	0.067 Fl	0.025 Fl	0.125 Fl	0.100 Fl	-	-	-
	M_B	-0.100 pl^2	-0.150 Fl	-0.267 Fl	-0.225 Fl	-0.375 Fl	-0.317 Fl	-0.125 Kl	-0.124 Kl	-0.121 Kl
	$R_A = Q_{1A}$	0.400 pl	0.350 F	0.733 F	0.775 F	1.125 F	1.183 F	0.375 K	0.376 K	0.379 K
	R_B	1.100 pl	1.150 F	2.267 F	2.225 F	3.375 F	3.317 F	1.125 K	1.124 K	1.121 K
	Q_{1B}	-0.600 pl	-0.650 F	-1.267 F	-1.225 F	-1.875 F	-1.817 F	-0.625 K	-0.624 K	-0.621 K
	$Q_{2B} = -Q_{2C}$	0.500 pl	0.500 F	1.000 F	1.000 F	1.500 F	1.500 F	0.500 K	0.500 K	0.500 K
A 1 B 2 C 3 D	$M_{11\max}$	0.101 pl^2	0.213 Fl	0.289 Fl	0.222 Fl	0.328 Fl	0.224 Fl	0.136 Kl	0.134 Kl	0.128 Kl
	$M_{12\max}$	-	-	0.244 Fl	0.166 Fl	0.405 Fl	0.338 Fl	-	-	-
	$M_{13\max}$	-	-	-	-	0.234 Fl	0.118 Fl			
	$M_{21\min}$	-0.050 pl^2	-0.075 Fl	-0.133 Fl	-0.113 Fl	-0.188 Fl	-0.158 Fl* (-0.167 Fl)	-0.063 Kl	-0.062 Kl	-0.061 Kl
	$M_{22\min}$	-	-	-0.133 Fl	-0.113 Fl	-0.188 Fl	-0.158 Fl	-	-	-
	M_B	-0.050 pl^2	-0.075 Fl	-0.133 Fl	-0.113 Fl	-0.188 Fl	-0.158 Fl	-0.063 Kl	-0.062 Kl	-0.061 Kl
	$R_A = Q_{1A\max}$	0.450 pl	0.425 F	0.867 F	0.886 F	1.313 F	1.342 F	0.375 K	0.376 K	0.379 K

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0.4 ÷ 0.5)l, P	1/2 P 1/2	P P 1/3 1/3 1/3	P P 1/4 1/2 1/4	P P P 1/4 1/4 1/4 1/4	P P P 1/6 1/3 1/3 1/6	1/2 1/2, K = 0.5 · q · l	0.41 0.21 0.41, K = 0.6 · q · l	0.31 0.41 0.31, K = 0.7 · q · l
	M_{11min}	$-0.025\ pl^2$	-0.038 Fl	-0.044 Fl	-0.028 Fl	-0.047 Fl	-0.026 Fl	-0.028 Kl	-0.028 Kl	-0.027 Kl
	$M_{12\ min}$	-	-	-0.089 Fl	-0.084 Fl	-0.094 Fl	-0.079 Fl	-	-	-
	$M_{13\ min}$	-	-	-	-	-0.141 Fl	-0.132 Fl			
	$M_{21\ max}$	$0.075\ pl^2$	0.175 Fl	0.200 Fl	0.138 Fl	0.188 Fl	0.092 Fl* (0.100 Fl)	0.104 Kl	0.102 Kl	0.096 Kl
	$M_{22\ max}$	-	-	0.200 Fl	0.138 Fl	0.313 Fl	0.258 Fl	-	-	-
	M_B	$-0.050\ pl^2$	-0.075 Fl	-0.133 Fl	-0.113 Fl	-0.188 Fl	-0.158 Fl	-0.063 Kl	-0.062 Kl	-0.061 Kl
	$R_A = Q_{1A\ min}$	-0.050 pl	-0.075 F	-0.133 F	-0.113 F	-0.188 F	-0.158 F	-0.063 K	-0.062 K	-0.061 K
	$M_{B\ min}$	$-0.117\ pl^2$	-0.175 Fl	-0.311 Fl	-0.263 Fl	-0.438 Fl	-0.369 Fl	-0.146 Kl	-0.145 Kl	-0.142 Kl
	M_C	$-0.033\ pl^2$	-0.050 Fl	-0.089 Fl	-0.075 Fl	-0.125 Fl	-0.106 Fl	-0.041 Kl	-0.041 Kl	-0.041 Kl
	$R_{B\ max}$	1.200 pl	1.300 F	2.533 F	2.450 F	3.750 F	3.633 F	1.251 K	1.249 K	1.244 K
	$Q_{1B\ min}$	-0.617 pl	-0.675 F	-1.311 F	-1.263 F	-1.937 F	-1.869 F	-0.646 K	-0.645 K	-0.642 K
	$Q_{2B\ max}$	0.583 pl	0.625 F	1.222 F	1.188 F	1.813 F	1.764 F	0.605 K	0.604 K	0.602 K
	$M_{B\ max}$	$0.017\ pl^2$	0.025 Fl	0.044 Fl	0.038 Fl	0.063 Fl	0.053 Fl	0.022 Kl	0.021 Kl	0.021 Kl
	M_C	$-0.067\ pl^2$	-0.100 Fl	-0.178 Fl	-0.150 Fl	-0.250 Fl	-0.211 Fl	-0.083 Kl	-0.083 Kl	-0.081 Kl
	$Q_{1B\ max}$	0.017 pl	0.025 F	0.044 F	0.038 F	0.063 F	0.053 F	0.022 K	0.021 K	0.021 K
	$Q_{2B\ min}$	-0.083 pl	-0.125 F	-0.222 F	-0.188 F	-0.313 F	-0.264 F	-0.105 K	-0.104 K	-0.102 K

7.2 NOSAČI PREKO ČETIRI JEDNAKA RASPONA

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0.4 ÷ 0.5)l, P	1/2 P 1/2	P P 1/3 1/3 1/3	P P 1/4 1/2 1/4	P P P 1/4 1/4 1/4 1/4	P P P 1/6 1/3 1/3 1/6	1/2 1/2, K = 0.5 · q · l	0.41 0.21 0.41, K = 0.6 · q · l	0.31 0.41 0.31, K = 0.7 · q · l
	M_{11}	$0.077\ pl^2$	0.170 Fl	0.238 Fl	0.190 Fl	0.275 Fl	0.193 Fl	0.104 Kl	0.103 Kl	0.098 Kl
	M_{12}	-	-	0.143 Fl	0.069 Fl	0.299 Fl	0.247 Fl	-	-	-
	M_{13}	-	-	-	-	0.074 Fl	-0.033 Fl	-	-	-
	M_{21}	$0.037\ pl^2$	0.116 Fl	0.079 Fl	0.029 Fl	0.007 Fl	-0.070 Fl	0.056 Kl	0.053 Kl	0.049 Kl
	M_{22}	-	-	0.111 Fl	0.069 Fl	0.165 Fl	0.134 Fl	-	-	-
	M_{23}	-	-	-	-	0.074 Fl	0.005 Fl	-	-	-
	M_B	$-0.107\ pl^2$	-0.161 Fl	-0.286 Fl	-0.241 Fl	-0.402 Fl	-0.339 Fl	-0.134 Kl	-0.133 Kl	-0.130 Kl
	M_C	$-0.071\ pl^2$	-0.107 Fl	-0.190 Fl	-0.161Fl	-0.268 Fl	-0.226 Fl	-0.089 Kl	-0.088 Kl	-0.086 Kl
	$R_A = Q_{1A}$	0.393 pl	0.339 F	0.714 F	0.759 F	1.098 F	1.161 F	0.366 K	0.367 K	0.370 K
	R_B	1.143 pl	1.214 F	2.381 F	2.321 F	3.536 F	3.452 F	1.179 K	1.178 K	1.174 K
	R_C	0.929 pl	0.892 F	1.810 F	1.839 F	2.732 F	2.774 F	0.910 K	0.910 K	0.912 K
	Q_{1B}	-0.607 pl	-0.661 F	-1.286 F	-1.241 F	-1.902 F	-1.839 F	-0.634 K	-0.633 K	-0.630 K
	Q_{2B}	0.536 pl	0.554 F	1.095 F	1.080 F	1.634 F	1.613 F	0.545 K	0.545 K	0.544 K
	Q_{2C}	-0.464 pl	-0.446 F	-0.905 F	-0.920 F	-1.366 F	-1.387 F	-0.455 K	-0.455 K	-0.456 K
	M_{11max}	$0.100\ pl^2$	0.210 Fl	0.286 Fl	0.220 Fl	0.325 Fl	0.222 Fl	0.134 Kl	0.132 Kl	0.126 Kl
	M_{12max}	-	-	0.238 Fl	0.160 Fl	0.400 Fl	0.332 Fl	-	-	-
	M_{13max}	-	-	-	-	0.224 Fl	0.109 Fl	-	-	-
	M_{21min}	$-0.045\ pl^2$	-0.067 Fl	-0.127 Fl	-0.110 Fl	-0.184 Fl	-0.160 Fl* (-0.170 Fl)	-0.056 Kl	-0.056 Kl	-0.055 Kl
	M_{22min}	-	-	-0.111 Fl	-0.090 Fl	-0.167 Fl	-0.141 Fl	-	-	-
	M_{23min}					-0.151 Fl	-0.123 Fl* (-0.134 Fl)	-	-	-
	M_B	$-0.054\ pl^2$	-0.080 Fl	-0.143 Fl	-0.121 Fl	-0.201 Fl	-0.170 Fl	-0.067 Kl	-0.067 Kl	-0.065 Kl
	M_C	$-0.036\ pl^2$	-0.054 Fl	-0.095 Fl	-0.080 Fl	-0.134 Fl	-0.113 Fl	-0.045 Kl	-0.045 Kl	-0.044 Kl
	$R_A = Q_{1Amax}$	0.446 pl	0.420 F	0.857 F	0.879 F	1.299 F	1.330 F	0.433 K	0.433 K	0.435 K

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0,4 ÷ 0,5)l	1/2 | 1/2	1/3 | 1/3 | 1/3	1/4 | 1/2 | 1/4	1/4 | 1/4 | 1/4 | 1/4	1/6 | 1/3 | 1/3 | 1/6	1/2 | 1/2	0,4 | 0,2 | 0,4	0,3 | 0,4 | 0,3
								K = 0,5 · q · l	K = 0,6 · q · l	K = 0,7 · q · l
A 1 B 2 C 3 D 4 E	M_{11min}	-0.023 pl^2	-0.040 Fl	-0.048 Fl	-0.030 Fl	-0.050 Fl	-0.028 Fl	-0.030 Kl	-0.030 Kl	-0.029 Kl
	M_{12min}	-	-	-0.095 Fl	-0.090 Fl	-0.110 Fl	-0.085 Fl	-	-	-
	M_{13min}	-	-	-	-	-0.151 Fl	-0.141 Fl	-	-	-
	M_{21max}	0.080 pl^2	0.183 Fl	0.206 Fl	0.140 Fl	0.191 Fl	0.090 Fl* (0.099 Fl)	0.111 Kl	0.108 Kl	0.102 Kl
	M_{22max}	-	-	0.222 Fl	0.160 Fl	0.333 Fl	0.275 Fl	-	-	-
	M_{23max}	-	-	-	-	0.224 Fl	0.127 Fl* (0.139 Fl)	-	-	-
	M_B	-0.054 pl^2	-0.080 Fl	-0.143 Fl	-0.121 Fl	-0.201 Fl	-0.170 Fl	-0.067 Kl	-0.067 Kl	-0.065 Kl
	M_C	-0.036 pl^2	-0.054 Fl	-0.095 Fl	-0.080 Fl	0.134 Fl	-0.113 Fl	-0.045 Kl	-0.045 Kl	-0.044 Kl
	$R_A = Q_{1Amin}$	-0.054 pl	-0.080 F	-0.143 F	-0.121 F	-0.201 F	-0.170 F	-0.067 K	-0.067 K	-0.065 K

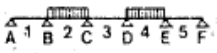
* Označeni način opterećenja ne daje točnu max. odnosno min. vrijednost jer se ova točka nalazi na vanjskom potezu nosača (između stalne točke i ležaja). Granična vrijednost dobivena drugačijim načinom opterećenja dana je u zagradi.

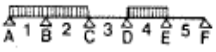
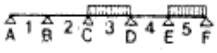
Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0,4 ÷ 0,5)l	1/2 | 1/2	1/3 | 1/3 | 1/3	1/4 | 1/2 | 1/4	1/4 | 1/4 | 1/4 | 1/4	1/6 | 1/3 | 1/3 | 1/6	1/2 | 1/2	0,4 | 0,2 | 0,4	0,3 | 0,4 | 0,3
								K = 0,5 · q · l	K = 0,6 · q · l	K = 0,7 · q · l
A 1 B 2 C 3 D 4 E	$M_{B\,min}$	-0.121 pl^2	-0.181 Fl	-0.321 Fl	-0.271 Fl	-0.452 Fl	-0.382 Fl	-0.151 Kl	-0.150 Kl	-0.146 Kl
	M_C	-0.018 pl^2	-0.027 Fl	-0.048 Fl	-0.040 Fl	-0.067 Fl	-0.057 Fl	-0.023 Kl	-0.022 Kl	-0.022 Kl
	M_D	-0.058 pl^2	-0.087 Fl	-0.155 Fl	-0.131 Fl	-0.218 Fl	-0.184 Fl	-0.072 Kl	-0.072 Kl	-0.070 Kl
	$R_{B\,max}$	1.223 pl	1.335 F	2.595 F	2.502 F	3.837 F	3.707 F	1.279 K	1.278 K	1.270 K
	$Q_{1B\,min}$	-0.621 pl	-0.681 F	-1.321 F	-1.271 F	-1.952 F	-1.882 F	-0.651 K	-0.650 K	-0.646 K
	$Q_{2B\,max}$	0.603 pl	0.654 F	1.274 F	1.231 F	1.885 F	1.825 F	0.628 K	0.628 K	0.624 K
A 1 B 2 C 3 D 4 E	$M_{B\,max}$	0.013 pl^2	0.020 Fl	0.036 Fl	0.030 Fl	0.050 Fl	0.042 Fl	0.017 Kl	0.017 Kl	0.016 Kl
	M_C	-0.054 pl^2	-0.080 Fl	-0.143 Fl	-0.120 Fl	-0.201 Fl	-0.170 Fl	-0.066 Kl	-0.066 Kl	-0.064 Kl
	M_D	-0.049 pl^2	-0.074 Fl	-0.131 Fl	-0.110 Fl	-0.184 Fl	-0.156 Fl	-0.062 Kl	-0.061 Kl	-0.060 Kl
	$R_{B\,min}$	-0.080 pl	-0.121 F	-0.214 F	-0.181 F	-0.301 F	-0.254 F	-0.100 K	-0.100 K	-0.096 K
	$Q_{1B\,max}$	0.013 pl	0.020 F	0.036 F	0.030 F	0.050 F	0.042 F	0.017 K	0.017 K	0.016 K
	$Q_{2B\,min}$	-0.067 pl	-0.100 F	-0.178 F	-0.151 F	-0.251 F	-0.212 F	-0.083 K	-0.083 K	-0.080 K
A 1 B 2 C 3 D 4 E	M_B	-0.036 pl^2	-0.054 Fl	-0.095 Fl	-0.080 Fl	-0.134 Fl	-0.113 Fl	-0.045 Kl	-0.045 Kl	-0.044 Kl
	$M_{C\,min}$	-0.107 pl^2	-0.161 Fl	-0.286 Fl	-0.241 Fl	-0.402 Fl	-0.339 Fl	-0.134 Kl	-0.133 Kl	-0.130 Kl
	$R_{C\,max}$	1.143 pl	1.214 F	2.381 F	2.321 F	3.536 F	3.452 F	1.176 K	1.176 K	1.172 K
	$Q_{2C\,min}$	-0.571 pl	-0.607 F	-1.191 F	-1.160 F	-1.768 F	-1.726 F	-0.589 K	-0.588 K	-0.586 K
A 1 B 2 C 3 D 4 E	M_B	-0.071 pl^2	-0.107 Fl	-0.190 Fl	-0.161 Fl	-0.268 Fl	-0.226 Fl	-0.089 Kl	-0.088 Kl	-0.086 Kl
	$M_{C\,max}$	0.036 pl^2	0.054 Fl	0.095 Fl	0.080 Fl	0.134 Fl	0.113 Fl	0.045 Kl	0.045 Kl	0.044 Kl
	$R_{C\,min}$	-0.214 pl	-0.321 F	-0.571 F	-0.482 F	-0.804 F	-0.679 F	-0.268 K	-0.266 K	-0.260 K
	$Q_{2C\,max}$	0.107 pl	0.161 F	0.286 F	0.241 F	0.402 F	0.339 F	0.134 K	0.133 K	0.130 K

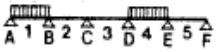
7.3 NOSAČI PREKO PET JEDNAKIH RASPONA

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0,4 ÷ 0,5) l, p	p, 1/2 1/2	p p, 1/3 1/3 1/3	p p, 1/4 1/2 1/4	p p p, 1/4 1/4 1/4 1/4	p p p, 1/6 1/3 1/3 1/6	1/2 1/2	0,41 0,21 0,41	0,31 0,41 0,31
								K = 0,5 · q · l	K = 0,6 · q · l	K = 0,7 · q · l
0,2113 l 0,2113 l 0,2105 l 0,2000 l A 1 B 2 C 3 D 4 E 5 F 1 1 1 1 1	M_{11}	0.078 pl^2	0.171 Fl	0.240 Fl	0.191 Fl	0.276 Fl	0.194 Fl	0.106 Kl	0.104 Kl	0.099 Kl
	M_{12}	-	-	0.146 Fl	0.072 Fl	0.303 Fl	0.250 Fl	-	-	-
	M_{13}	-	-	-	-	0.079 Fl	-0.026 Fl	-	-	-
	M_{21}	0.033 pl^2	0.112 Fl	0.076 Fl	0.028 Fl	0.005 Fl	-0.069 Fl	0.052 Kl	0.050 Kl	0.046 Kl
	M_{22}	-	-	0.099 Fl	0.058 Fl	0.155 Fl	0.125 Fl	-	-	-
	M_{23}	-	-	-	-	0.054 Fl	-0.014 Fl			
	M_{31}	0.046 pl^2	0.132 Fl	0.123 Fl	0.072 Fl	0.079 Fl	0	0.068 Kl	0.066 Kl	0.061 Kl
	M_{32}	-	-	0.123 Fl	0.072 Fl	0.204 Fl	0.167 Fl	-	-	-
	M_B	-0.105 pl^2	-0.158 Fl	-0.281 Fl	-0.237 Fl	-0.395 Fl	-0.333 Fl	-0.131 Kl	-0.130 Kl	-0.127 Kl
	M_C	-0.079 pl^2	-0.118 Fl	-0.211 Fl	-0.178 Fl	-0.296 Fl	-0.250 Fl	-0.099 Kl	-0.098 Kl	-0.096 Kl
	$R_A = Q_{1A}$	0.395 pl	0.342 F	0.719 F	0.763 F	1.105 F	1.167 F	0.369 K	0.370 K	0.373 K
	R_B	1.132 pl	1.197 F	2.351 F	2.296 F	3.494 F	3.417 F	1.163 K	1.162 K	1.158 K
	R_C	0.974 pl	0.960 F	1.930 F	1.941 F	2.901 F	2.917 F	0.968 K	0.968 K	0.969 K
	Q_{1B}	-0.605 pl	-0.658 F	-1.281 F	-1.237 F	-1.895 F	-1.833 F	-0.631 K	-0.630 K	-0.627 K
	Q_{2B}	0.526 pl	0.540 F	1.070 F	1.059 F	1.599 F	1.583 F	0.532 K	0.532 K	0.531 K
	Q_{2C}	-0.474 pl	-0.460 F	-0.930 F	-0.941 F	-1.401 F	-1.471 F	-0.468 K	-0.468 K	-0.469 K
	Q_{3C}	0.500 pl	0.500 F	1.000 F	1.000 F	1.500 F	1.500 F	0.500 K	0.500 K	0.500 K

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0,4 ÷ 0,5) l, p	p, 1/2 1/2	p p, 1/3 1/3 1/3	p p, 1/4 1/2 1/4	p p p, 1/4 1/4 1/4 1/4	p p p, 1/6 1/3 1/3 1/6	1/2 1/2	0,41 0,21 0,41	0,31 0,41 0,31
								K = 0,5 · q · l	K = 0,6 · q · l	K = 0,7 · q · l
A 1 B 2 C 3 D 4 E 5 F	$M_{11\ max}$	0.100 pl^2	0.211 Fl	0.287 Fl	0.220 Fl	0.326 Fl	0.222 Fl	0.135 Kl	0.132 Kl	0.126 Kl
	$M_{12\ max}$	-	-	0.240 Fl	0.161 Fl	0.401 Fl	0.333 Fl	-	-	-
	$M_{13\ max}$	-	-	-	-	0.227 Fl	0.111 Fl	-	-	-
	$M_{21\ min}$	-0.046 pl^2	-0.069 Fl	-0.129 Fl	-0.111 Fl	-0.185 Fl	-0.160 Fl* (-0.169 Fl)	-0.058 Kl	-0.058 Kl	-0.056 Kl
	$M_{22\ min}$	-	-	-0.117 Fl	-0.096 Fl	-0.173 Fl	-0.146 Fl	-	-	-
	$M_{23\ min}$	-	-	-	-	-0.160 Fl	-0.132 Fl* (-0.144 Fl)	-	-	-
	$M_{31\ max}$	0.086 pl^2	0.191 Fl	0.228 Fl	0.161 Fl	0.227 Fl	-0.125 Fl* (0.138 Fl)	0.117 Kl	0.114 Kl	0.109 Kl
	$M_{32\ max}$	-	-	0.228 Fl	0.161 Fl	0.352 Fl	0.292 Fl	-	-	-
	M_B	-0.053pl^2	-0.079 Fl	-0.140 Fl	-0.118 Fl	-0.197 Fl	-0.167 Fl	-0.066 Kl	-0.066 Kl	-0.064 Kl
	M_C	-0.039 pl^2	-0.059 Fl	-0.105 Fl	-0.089 Fl	-0.148 Fl	-0.125 Fl	-0.050 Kl	-0.050 Kl	-0.048 Kl
	$R_A = Q_{1A\,max}$	0.447 pl	0.421 F	0.860 F	0.882 F	-1.303 F	1.333 F	0.434 K	0.434 K	0.436 K

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0,4 ÷ 0,5)l, P	1/2 P 1/2	P P 1/3 1/3 1/3	P P 1/4 1/2 1/4	P P P 1/4 1/4 1/4 1/4	P P P 1/6 1/3 1/3 1/6	1/2 1/2	0,41 0,21 0,41	0,31 0,41 0,31
								K = 0,5 · q · l	K = 0,6 · q · l	K = 0,7 · q · l
	M_{11min}	-0.026 pl^2	-0.039 Fl	-0.047 Fl	-0.030 Fl	-0.049 Fl	-0.028 Fl	-0.030 Kl	-0.030 Kl	-0.029 Kl
	M_{12min}	-	-	-0.094 Fl	-0.089 Fl	-0.099 Fl	-0.083 Fl	-	-	-
	M_{13min}	-	-	-	-	-0.148 Fl	-0.139 Fl	-	-	-
	M_{21max}	0.079 pl^2	0.181 Fl	0.205 Fl	0.139 Fl	0.190 Fl	0.090 Fl * (0.100 Fl)	0.109 Kl	0.106 Kl	0.101 Kl
	M_{22max}	-	-	0.216 Fl	0.154 Fl	0.327 Fl	0.271 Fl	-	-	-
	M_{23max}	-	-	-	-	0.215 Fl	0.118 Fl * (0.130 Fl)	-	-	-
	M_{31min}	-0.040 pl^2	-0.059 Fl	-0.105 Fl	-0.089 Fl	-0.148 Fl	-0.125 Fl * (-0.138 Fl)	-0.050 Kl -	-0.050 Kl	-0.048 Kl
	M_{32min}	-	-	-0.105 Fl	-0.089 Fl	-0.148 Fl	-0.125 Fl	-	-	-
	M_B	-0.053 pl^2	-0.079 Fl	-0.140 Fl	-0.118 Fl	-0.197 Fl	-0.167 Fl	-0.066 Kl	-0.066 Kl	-0.064 Kl
	M_C	-0.039 pl^2	-0.059 Fl	-0.105 Fl	-0.089 Fl	-0.148 Fl	-0.125 Fl	-0.050 Kl	-0.050 Kl	-0.048 Kl
	$R_A = Q_{1Amin}$	-0.053 pl	-0.079 F	-0.140 F	-0.118 F	-0.197 F	-0.167 F	-0.066 K	-0.066 K	-0.064 K

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0,4 ÷ 0,5)l, P	1/2 P 1/2	P P 1/3 1/3 1/3	P P 1/4 1/2 1/4	P P P 1/4 1/4 1/4 1/4	P P P 1/6 1/3 1/3 1/6	1/2 1/2	0,41 0,21 0,41	0,31 0,41 0,31
								K = 0,5 · q · l	K = 0,6 · q · l	K = 0,7 · q · l
	M_{Bmin}	-0.120 pl^2	-0.179 Fl	-0.319 Fl	-0.269 Fl	-0.449 Fl	-0.379 Fl	-0.149 Kl	-0.148 Kl	-0.144 Kl
	M_C	-0.022 pl^2	-0.032 Fl	-0.057 Fl	-0.048Fl	-0.081 Fl	-0.068 Fl	-0.027 Kl	-0.027 Kl	-0.027 Kl
	M_D	-0.044 pl^2	-0.066 Fl	-0.118 Fl	-0.100 Fl	-0.166 Fl	-0.140 Fl	-0.055 Kl	-0.055 Kl	-0.053 Kl
	M_E	-0.051 pl^2	-0.077 Fl	-0.137 Fl	-0.116 Fl	-0.193 Fl	-0.168 Fl	-0.064 Kl	-0.063 Kl	-0.062 Kl
	R_{Bmax}	1.218 pl	1.327 F	2.581 F	2.490 F	3.817 F	3.689 F	1.271 K	1.269 K	1.261 K
	Q_{1Bmin}	-0.620 pl	-0.679 F	-1.319 F	-1.269 F	-1.949 F	-1.879 F	-0.649 K	-0.648 K	-0.644 K
	Q_{2Bmax}	0.598 pl	0.647 F	1.262 F	1.221F	1.868 F	1.811 F	0.622 K	0.621 K	0.617 K
	M_{Bmax}	0.014 pl^2	0.022 Fl	0.038 Fl	0.032 Fl	0.054 Fl	0.045 Fl	0.018 Kl	0.018 Kl	0.017 Kl
	M_C	0.057 pl^2	-0.086 Fl	-0.153 Fl	-0.129 Fl	-0.215 Fl	-0.182 Fl	-0.072 Kl	-0.071 Kl	-0.069 Kl
	M_D	-0.035 pl^2	-0.052 Fl	-0.093 Fl	-0.078 Fl	-0.130 Fl	-0.110 Fl	-0.044 Kl	-0.043 Kl	-0.043 Kl
	M_E	-0.054 pl^2	-0.081 Fl	-0.144 Fl	-0.121 Fl	-0.202 Fl	-0.170 Fl	-0.067 Kl	-0.067 Kl	-0.065 Kl
	R_{Bmin}	-0.086 pl	-0.129 F	-0.230 F	-0.194 F	-0.323 F	-0.273 F	-0.108 K	-0.108 K	-0.103 K
	Q_{1Bmax}	0.014 pl	0.022 F	0.038 F	0.032 F	0.054 F	0.045 F	0.018 K	0.018 K	0.017 K
	Q_{2Bmin}	-0.072 pl	-0.108 F	-0.191 F	-0.161 F	-0.269 F	-0.227 F	-0.090 K	-0.089 K	-0.086 K

Način opterećenja	Statička veličina	Način opterećenja u opterećenom polju								
		x = (0,4 ÷ 0,5)l, P	P, l/2, l/2	P P, l/3, l/3, l/3	P P, l/4, l/2, l/4	P P P, l/4, l/4, l/4, l/4	P P P, l/6, l/3, l/3, l/6	l/2, l/2	0,41 0,21 0,41	0,31 0,41 0,31
								K = 0,5 · q · l	K = 0,6 · q · l	K = 0,7 · q · l
	M_B	-0.035 pl^2	-0.052 Fl	-0.093 Fl	-0.078 Fl	-0.130 Fl	-0.110 Fl	-0.044 Kl	-0.043 Kl	-0.042 Kl
	$M_{C\ min}$	-0.111 pl^2	-0.167 Fl	-0.297 Fl	-0.250 Fl	-0.417 Fl	-0.352 Fl	-0.139 Kl	-0.138 Kl	-0.134 Kl
	M_D	-0.020 pl^2	-0.031 Fl	-0.054 Fl	-0.046 Fl	-0.076 Fl	-0.064 Fl	-0.025 Kl	-0.025 Kl	-0.024 Kl
	M_E	-0.057 pl^2	-0.086 Fl	-0.153 Fl	-0.129 Fl	-0.215 Fl	-0.182 Fl	-0.071 Kl	-0.071 Kl	-0.069 Kl
	$R_{C\ max}$	1.167 pl	1.251 F	2.447 F	2.377 F	3.628 F	3.530 F	1.209 K	1.208 K	1.202 K
	$Q_{2C\ min}$	-0.576 pl	-0.615 F	-1.204 F	-1.172 F	-1.787 F	-1.742 F	-0.595 K	-0.595 K	-0.592 K
	$Q_{3C\ max}$	0.591 pl	0.636 F	1.242 F	1.205 F	1.841 F	1.788 F	0.614 K	0.613 K	0.610 K
	M_B	-0.071 pl^2	-0.106 Fl	-0.188 Fl	-0.159 Fl	-0.265 Fl	-0.223 Fl	-0.087 Kl	-0.087 Kl	-0.085 Kl
	$M_{C\ max}$	0.032 pl^2	0.048 Fl	0.086 Fl	0.073 Fl	0.121 Fl	0.102 Fl	0.040 Kl	0.040 Kl	0.038 Kl
	M_D	-0.059 pl^2	-0.088 Fl	-0.156 Fl	-0.132 Fl	-0.220 Fl	-0.186 Fl	-0.074 Kl	-0.073 Kl	-0.072 Kl
	M_E	-0.048 pl^2	-0.072 Fl	-0.128 Fl	-0.108 Fl	-0.179 Fl	-0.152 Fl	-0.060 Kl	-0.059 Kl	-0.058 Kl
	$R_{C\ min}$	-0.194 pl	-0.291 F	-0.517 F	-0.436 F	-0.727 F	-0.614 F	-0.241 K	-0.240 K	-0.233 K
	$Q_{2C\ max}$	0.103 pl	0.154 F	0.274 F	0.232 F	0.386 F	0.326 F	0.127 K	0.127 K	0.123 K
	$Q_{3C\ min}$	-0.091 pl	-0.136 F	-0.242 F	-0.205 F	-0.341 F	-0.288 F	-0.114 K	-0.113 K	-0.110 K

7.4 NOSAČI PREKO PET I VIŠE JEDNAKIH RASPONA

	Oznake	Sva polja potpuno opterećena					Minimum					Maksimum				
		Broj polja					Broj polja					Broj polja				
		5	6	7	8	∞	5	6	7	8	∞	5	6	7	8	∞
		α					γ					β				
Moment na ležaju	M_1	-0.1053	-0.1058	-0.1056	-0.1057	-0.1057	-0.1196	-0.1199	-0.1198	-0.1198	-0.1198	+0.0143	+0.0141	+0.0142	+0.0142	+0.0141
	M_2	-0.0789	-0.0769	-0.0775	-0.0773	-0.0774	-0.1112	-0.1102	-0.1106	-0.1105	-0.1105	+0.0323	+0.0333	+0.0331	+0.0331	+0.0331
	M_3		-0.0865	-0.0845	-0.0851	-0.0848		-0.1154	-0.1144	-0.1147	-0.1147		+0.0289	+0.0299	+0.0295	+0.0299
	M_4				-0.0825	-0.0830				-0.1134	-0.1136				+0.0309	+0.0306
	M_5					-0.0835					-0.1139					+0.0304
	M_6					-0.0833					-0.1138					+0.0305
Moment u polju	M_{p1}	+0.0779	+0.0777	+0.0778	+0.0777	+0.0777	-0.0222	-0.0223	-0.0221	-0.0222	-0.0222	+0.1002	+0.0999	+0.0999	+0.0999	+0.0999
	M_{p2}	+0.0332	+0.0341	+0.0338	+0.0339	+0.0339	-0.0458	-0.0454	-0.0455	-0.0454	-0.0454	+0.0790	+0.0795	+0.0793	+0.0794	+0.0793
	M_{p3}	+0.0461	+0.0433	+0.0440	+0.0438	+0.0439	-0.0394	-0.0408	-0.0405	-0.0406	-0.0405	+0.0855	+0.0841	+0.0845	+0.0844	+0.0844
	M_{p4}			+0.0405	+0.0412	+0.0411			-0.0423	-0.0432	-0.0419			+0.0828	+0.0844	+0.0830
	M_{p5}					+0.0417					-0.0418					+0.0835
	M_{p6}					+0.0416					-0.0417					+0.0833
		ξ										ψ				
Udaljenost maksimalnog momenta od lijevog ležaja	X_1	0.395	0.394	0.394	0.394	0.394						0.441	0.447	0.447	0.447	0.447
	X_2	0.526	0.533	0.528	0.528	0.528						0.513	0.514	0.514	0.514	0.514
	X_3	0.500	0.490	0.493	0.492	0.492						0.500	0.495	0.496	0.496	0.496
	X_4			0.500	0.503	0.502								0.500	0.501	0.501
	X_5					0.499										0.499
	X_6					0.500										0.500

Nosač preko pet i više jednakih raspona opterećen kontinuiranim opterećenjem

	Oznake	Sva polja potpuno opterećena					Minimum					Maksimum				
		Broj polja					Broj polja					Broj polja				
		5	6	7	8	∞	5	6	7	8	∞	5	6	7	8	∞
		a					c					b				
Poprečna sila lijevo i desno od ležaja	Q_0	+0.3947	+0.3942	+0.3944	+0.3943	+0.3943	-0.0526	-0.0529	-0.0528	-0.0528	-0.0528	+0.4473	+0.4471	+0.4472	+0.4471	+0.4471
	Q_1^l	-0.6052	-0.6058	-0.6056	-0.6056	-0.6057	-0.6196	-0.6199	-0.6198	-0.6198	-0.6198	+0.0144	+0.0141	+0.0142	+0.0142	+0.0142
	Q_1^d	+0.5263	+0.5288	+0.5282	+0.5284	+0.5284	-0.0718	-0.0705	-0.0709	-0.0708	-0.0707	+0.5981	+0.5993	+0.5991	+0.5991	+0.5991
	Q_2^l	-0.4737	-0.4712	-0.4718	-0.4717	-0.4717	-0.5765	-0.5753	-0.5757	-0.5756	-0.5755	+0.1029	+0.1042	+0.1038	+0.1039	+0.1038
	Q_2^d	+0.5000	+0.4903	+0.4930	+0.4922	+0.4924	-0.0909	-0.0959	-0.0946	-0.0949	-0.0947	+0.5909	+0.5862	+0.5875	+0.5871	+0.5871
	Q_3^l		-0.5096	-0.5070	-0.5078	-0.5076		-0.5962	-0.5949	-0.5953	-0.5951		+0.0865	+0.0879	+0.0875	+0.0875
	Q_3^d			+0.5000	+0.5025	+0.5020			-0.0915	-0.0902	-0.0903			+0.5915	+0.5927	+0.5923
	Q_4^l				-0.4974	-0.4980				-0.5902	-0.5904				+0.0928	+0.0924
	Q_4^d					+0.4994					-0.0917					+0.5911
	Q_5^l					-0.5006					-0.5918					+0.0912
	Q_5^d					+0.5001					-0.0914					+0.5914
	Q_6					-0.5000					-0.5914					+0.0914
		r					t					s				
Ležajna reakcija	R_0	+0.3947	+0.3942	+0.3944	+0.3943	+0.3943	-0.0526	-0.0529	-0.0528	-0.0528	-0.0528	+0.4473	+0.4471	+0.4472	+0.4471	+0.4471
	R_1	+1.1316	+1.1346	+1.1338	+1.1340	+1.1341	-0.0861	-0.0847	-0.0850	-0.0849	-0.0849	+1.2177	+1.2195	+1.2188	+1.2189	+1.2190
	R_2	+0.9737	+0.9615	+0.9649	+0.9639	+0.9641	-0.1938	-0.2000	-0.1983	-0.1989	-0.1985	+1.1675	+1.1615	+1.1632	+1.1626	+1.1626
	R_3		+1.0192	+1.0070	+1.0103	+1.0065		-0.1731	-0.1794	-0.1778	-0.1779		+1.1923	+1.1864	+1.1881	+1.1874
	R_4				+0.9948	+0.9974				-0.1856	-0.1841				+1.1804	+1.1815
	R_5					+1.0007					-0.1826					+1.1833
	R_6					+0.9999					-0.1830					+1.1829

Minimalni ležajni moment $M_n = (ag + \gamma p)\ l^2$
Maksimalni moment u polju $M_{pn} = (mg + \beta p)\ l^2$
Udaljenost maksimalnog momenta od lijevog ležaja
$x_n = \xi\ l$ - za totalno opterećenje
$x_n = \psi\ l$ - za opterećenje u najnepovoljnijem položaju za M_{max}

Maksimalna poprečna sila $Q_n = (s\ g + b\ p)\ l$ (s s predznakom plus)
Minimalna poprečna sila $Q_n = (a\ g + c\ p)\ l$ (a s predznakom minus)
Maksimalna reakcija $R_n = (r\ g + s\ p)\ l$
Minimalna reakcija $R_n = (r\ g + t\ p)\ l$

TABLICE 8. PRAKTIČNO DIMENZIONIRANJE PRAVOKUTNOG PRESJEKA

ε_{c2} (‰)	ε_{s1} (‰)	ξ=x/d	ζ=z/d	ω_1	μ_{Sd}	k_d
-0.1	20.0	0.005	0.998	0.000	0.000	∞
-0.2	20.0	0.010	0.997	0.001	0.001	31.623
-0.3	20.0	0.015	0.995	0.002	0.002	22.361
-0.4	20.0	0.020	0.993	0.003	0.003	18.257
-0.5	20.0	0.024	0.992	0.005	0.005	14.142
-0.6	20.0	0.029	0.990	0.007	0.007	11.952
-0.7	20.0	0.034	0.988	0.009	0.009	10.541
-0.8	20.0	0.038	0.987	0.011	0.011	9.535
-0.9	20.0	0.043	0.985	0.014	0.014	8.452
-1.0	20.0	0.048	0.983	0.017	0.017	7.670
-1.1	20.0	0.052	0.982	0.020	0.019	7.255
-1.2	20.0	0.057	0.980	0.023	0.023	6.594
-1.3	20.0	0.061	0.978	0.026	0.026	6.202
-1.4	20.0	0.065	0.977	0.030	0.029	5.872
-1.5	20.0	0.070	0.975	0.033	0.033	5.505
-1.6	20.0	0.074	0.973	0.037	0.036	5.270
-1.7	20.0	0.078	0.971	0.040	0.039	5.064
-1.8	20.0	0.083	0.969	0.044	0.043	4.822
-1.9	20.0	0.087	0.968	0.048	0.046	4.663
-2.0	20.0	0.091	0.966	0.052	0.050	4.472
-2.1	20.0	0.095	0.964	0.055	0.053	4.344
-2.2	20.0	0.099	0.962	0.059	0.056	4.226
-2.3	20.0	0.103	0.960	0.062	0.060	4.082
-2.4	20.0	0.107	0.959	0.066	0.063	3.984
-2.5	20.0	0.111	0.957	0.069	0.066	3.892
-2.6	20.0	0.115	0.955	0.073	0.069	3.807
-2.7	20.0	0.119	0.953	0.076	0.073	3.701
-2.8	20.0	0.123	0.951	0.080	0.076	3.627
-2.9	20.0	0.127	0.949	0.083	0.079	3.558
-3.0	20.0	0.130	0.947	0.086	0.081	3.514
-3.1	20.0	0.134	0.945	0.089	0.084	3.450
-3.2	20.0	0.138	0.943	0.093	0.088	3.371
-3.3	20.0	0.142	0.942	0.096	0.091	3.315
-3.4	20.0	0.145	0.940	0.099	0.093	3.279
-3.5	20.0	0.149	0.938	0.103	0.096	3.227
-3.5	19.5	0.152	0.937	0.105	0.098	3.194
-3.5	19.0	0.156	0.935	0.107	0.100	3.162
-3.5	18.5	0.159	0.934	0.109	0.102	3.131

ε_{c2} (‰)	ε_{s1} (‰)	ξ=x/d	ζ=z/d	ω_1	μ_{Sd}	k_d
-3.5	18.0	0.163	0.932	0.112	0.105	3.086
-3.5	17.5	0.167	0.931	0.115	0.107	3.057
-3.5	17.0	0.171	0.929	0.118	0.109	3.029
-3.5	16.5	0.175	0.927	0.120	0.112	2.988
-3.5	16.0	0.179	0.926	0.123	0.114	2.962
-3.5	15.5	0.184	0.923	0.127	0.117	2.924
-3.5	15.0	0.189	0.921	0.130	0.120	2.887
-3.5	14.5	0.194	0.919	0.133	0.123	2.851
-3.5	14.0	0.200	0.917	0.138	0.126	2.817
-3.5	13.5	0.206	0.914	0.142	0.130	2.774
-3.5	13.0	0.212	0.912	0.146	0.133	2.742
-3.5	12.5	0.219	0.909	0.151	0.137	2.702
-3.5	12.0	0.226	0.906	0.156	0.141	2.663
-3.5	11.5	0.233	0.903	0.160	0.145	2.626
-3.5	11.0	0.241	0.900	0.166	0.149	2.591
-3.5	10.5	0.250	0.896	0.172	0.154	2.548
-3.5	10.0	0.259	0.892	0.178	0.159	2.508
-3.5	9.5	0.269	0.888	0.185	0.164	2.469
-3.5	9.0	0.280	0.884	0.193	0.170	2.425
-3.5	8.5	0.292	0.879	0.201	0.177	2.377
-3.5	8.0	0.304	0.874	0.209	0.183	2.338
-3.5	7.5	0.318	0.868	0.219	0.190	2.294
-3.5	7.0	0.333	0.861	0.229	0.197	2.253
-3.5	6.5	0.350	0.854	0.241	0.206	2.203
-3.5	6.0	0.368	0.847	0.253	0.214	2.162
-3.5	5.5	0.389	0.838	0.268	0.224	2.113
-3.5	5.0	0.412	0.829	0.283	0.235	2.063
-3.5	4.5	0.438	0.818	0.301	0.247	2.012
-3.5	4.0	0.467	0.806	0.321	0.259	1.965
-3.5	3.5	0.500	0.792	0.344	0.272	1.917
-3.5	3.0	0.538	0.776	0.370	0.287	1.867
-3.5	2.5	0.583	0.757	0.401	0.304	1.814
-3.5	2.0	0.636	0.735	0.438	0.322	1.762
-3.5	1.5	0.700	0.709	0.482	0.342	1.710
-3.5	1.0	0.778	0.676	0.535	0.362	1.662
-3.5	0.5	0.875	0.636	0.602	0.383	1.616
-0.1	10.0	0.010	0.997	0.000	0.000	∞
-0.2	10.0	0.020	0.993	0.002	0.002	22.361
-0.3	10.0	0.029	0.990	0.004	0.003	18.257
-0.4	10.0	0.038	0.987	0.006	0.006	12.910

ε_{c2} (‰)	ε_{s1} (‰)	ξ=x/d	ζ=z/d	ω_1	μ_{Sd}	k_d
-0.5	10.0	0.048	0.984	0.009	0.009	10.541
-0.6	10.0	0.057	0.980	0.013	0.013	8.771
-0.7	10.0	0.065	0.978	0.017	0.017	7.670
-0.8	10.0	0.074	0.974	0.022	0.021	6.901
-0.9	10.0	0.083	0.971	0.027	0.026	6.202
-1.0	10.0	0.091	0.968	0.032	0.031	5.680
-1.1	10.0	0.099	0.965	0.038	0.036	5.270
-1.2	10.0	0.107	0.962	0.044	0.042	4.880
-1.3	10.0	0.115	0.959	0.050	0.048	4.564
-1.4	10.0	0.123	0.956	0.056	0.054	4.303
-1.5	10.0	0.130	0.953	0.062	0.059	4.117
-1.6	10.0	0.138	0.950	0.069	0.065	3.922
-1.7	10.0	0.145	0.947	0.075	0.071	3.753
-1.8	10.0	0.153	0.944	0.082	0.077	3.604
-1.9	10.0	0.160	0.940	0.088	0.083	3.471
-2.0	10.0	0.167	0.937	0.095	0.089	3.352
-2.1	10.0	0.174	0.934	0.101	0.094	3.262
-2.2	10.0	0.180	0.931	0.107	0.099	3.178
-2.3	10.0	0.187	0.928	0.113	0.105	3.086
-2.4	10.0	0.194	0.925	0.119	0.110	3.015
-2.5	10.0	0.200	0.922	0.125	0.115	2.949
-2.6	10.0	0.206	0.919	0.130	0.120	2.887
-2.7	10.0	0.213	0.915	0.136	0.125	2.828
-2.8	10.0	0.219	0.912	0.142	0.129	2.784
-2.9	10.0	0.225	0.910	0.147	0.134	2.732
-3.0	10.0	0.231	0.906	0.153	0.138	2.692
-3.1	10.0	0.237	0.903	0.158	0.143	2.644
-3.2	10.0	0.242	0.901	0.163	0.147	2.608
-3.3	10.0	0.248	0.898	0.168	0.151	2.573
-3.4	10.0	0.254	0.895	0.174	0.155	2.540
-3.5	10.0	0.259	0.892	0.178	0.159	2.508
-0.1	5.0	0.020	0.993	0.001	0.001	31.623
-0.2	5.0	0.038	0.987	0.003	0.003	18.257
-0.3	5.0	0.057	0.981	0.007	0.007	11.952
-0.4	5.0	0.074	0.975	0.012	0.011	9.535
-0.5	5.0	0.091	0.969	0.018	0.017	7.670
-0.6	5.0	0.107	0.963	0.025	0.024	6.455
-0.7	5.0	0.123	0.958	0.032	0.031	5.680
-0.8	5.0	0.138	0.952	0.041	0.039	5.064
-0.9	5.0	0.153	0.947	0.050	0.047	4.613

ε_{c2} (‰-	ε_{s1} (‰)	ξ=x/d	ζ=z/d	ω_1	μ_{Sd}	k_d
-1.0	5.0	0.167	0.942	0.059	0.056	4.226
-1.1	5.0	0.180	0.937	0.069	0.064	3.953
-1.2	5.0	0.194	0.931	0.079	0.074	3.676
-1.3	5.0	0.206	0.927	0.089	0.083	3.471
-1.4	5.0	0.219	0.921	0.100	0.092	3.297
-1.5	5.0	0.231	0.917	0.110	0.101	3.147
-1.6	5.0	0.242	0.912	0.121	0.110	3.015
-1.7	5.0	0.254	0.907	0.132	0.119	2.899
-1.8	5.0	0.265	0.902	0.142	0.128	2.795
-1.9	5.0	0.275	0.898	0.152	0.136	2.712
-2.0	5.0	0.286	0.893	0.162	0.145	2.626
-2.1	5.0	0.296	0.888	0.172	0.153	2.557
-2.2	5.0	0.306	0.883	0.181	0.160	2.500
-2.3	5.0	0.315	0.879	0.190	0.167	2.447
-2.4	5.0	0.324	0.874	0.199	0.174	2.397
-2.5	5.0	0.333	0.870	0.208	0.181	2.351
-2.6	5.0	0.342	0.865	0.216	0.187	2.312
-2.7	5.0	0.351	0.861	0.225	0.193	2.276
-2.8	5.0	0.359	0.857	0.232	0.199	2.242
-2.9	5.0	0.367	0.852	0.240	0.205	2.209
-3.0	5.0	0.375	0.848	0.248	0.210	2.182
-3.1	5.0	0.383	0.844	0.256	0.216	2.152
-3.2	5.0	0.390	0.840	0.262	0.221	2.127
-3.3	5.0	0.398	0.836	0.270	0.226	2.104
-3.4	5.0	0.405	0.832	0.277	0.230	2.085
-3.5	5.0	0.412	0.829	0.283	0.235	2.063

Limitirajuće vrijednosti za jednostruko armiranje - dostatna duktilnost

GA 240/360	**RA 400/500**	**B 500/550**	
$\varepsilon_{s1,lim}$=1.04 (‰)	$\varepsilon_{s1,lim}$=1.74 (‰)	$\varepsilon_{s1,lim}$=2.17 (‰)	
ξ_{lim}=0.771	ξ_{lim}=0.668	ξ_{lim}=0.617	α_v=0.8095
ζ_{lim}=0.679	ζ_{lim}=0.722	ζ_{lim}=0.744	
$\mu_{Rd,lim}$=0.360	$\mu_{Rd,lim}$=0.332	$\mu_{Rd,lim}$=0.316	k_a = 0.4160
$k_{d,lim}$=1.667	$k_{d,lim}$=1.736	$k_{d,lim}$=1.779	

Limitirajuće vrijednosti za jednostruko armiranje - izvanredna duktilnost

C 12/15 ÷ C 35/45	**C 40/50 i više**	**U teoriji plastičnosti**
ξ_{lim} = 0.45	ξ_{lim} = 0.35	ξ_{lim} = 0.25
$\mu_{Rd,lim}$ = 0.252	$\mu_{Rd,lim}$ = 0.206	$\mu_{Rd,lim}$ = 0.154
$k_{d,lim}$ = 1.993	$k_{d,lim}$ = 2.204	$k_{d,lim}$ = 2.547

TABLICA 9. TABLICA REBRASTE ARMATURE

RA-400/500-1
ϕ 6, 8, 10, 12 i 14

RA-400/500-2
ϕ 6, 8, 10, 12, 14, 16, 19, 22, 25, 28, 32, 36 i 40

ϕ mm	Površina presjeka u cm^2 za komada															Masa kg/m		Opseg cm	Promjer mm
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	RA 400-1	RA 400-2		
6	0.28	0.57	0.85	1.13	1.41	1.70	1.98	2.26	2.55	2.83	3.11	3.39	3.68	3.96	4.24	0.230	0.228	1.89	6
8	0.50	1.01	1.51	2.01	2.51	3.02	3.52	4.02	4.52	5.03	5.53	6.03	6.54	7.04	7.54	0.409	0.405	2.51	8
10	0.79	1.57	2.36	3.14	3.93	4.71	5.50	6.20	7.07	7.85	8.64	9.42	10.21	11.00	11.78	0.649	0.633	3.14	10
12	1.13	2.26	3.39	4.52	5.66	6.79	7.92	9.05	10.18	11.31	12.44	13.57	14.70	15.83	16.97	0.920	0.911	3.77	12
14	1.54	3.08	4.62	6.16	7.70	9.24	10.78	12.32	13.86	15.39	16.93	18.47	20.01	21.55	23.09	1.252	1.242	4.40	14
16	2.01	4.02	6.03	8.04	10.05	12.06	14.07	16.09	18.10	20.11	22.12	24.13	26.14	28.15	30.16		1.621	5.03	16
19	2.84	5.67	8.51	11.34	14.18	17.01	19.85	22.68	25.52	28.35	31.19	34.02	36.86	39.69	42.53		2.288	5.97	19
22	3.80	7.60	11.40	15.21	19.01	22.81	26.64	30.41	34.21	38.01	41.81	45.62	49.42	53.22	57.02		3.058	6.91	22
25	4.91	9.82	14.73	19.64	24.54	29.45	34.36	39.27	44.18	49.09	54.00	58.90	63.81	68.72	73.63		3.951	7.85	25
28	6.16	12.32	18.47	24.63	30.79	36.95	43.10	49.26	55.42	61.58	67.73	73.88	80.05	86.21	92.36		4.956	8.80	28
32	8.04	16.09	24.13	32.17	40.21	48.26	56.30	64.34	72.38	80.42	88.47	96.50	104.55	112.60	120.64		6.474	10.05	32
36	10.18	20.36	30.54	40.72	50.89	61.07	71.25	81.43	91.61	101.79	111.97	122.15	132.32	142.50	152.68		8.200	11.31	36
40	12.57	25.13	37.70	50.27	62.83	75.40	87.97	100.53	113.10	125.66	138.23	150.80	163.36	175.93	188.50		10.117	12.57	40
	100	50	33.34	25	20	16.67	14.30	12.50	11.11	10	9.10	8.33	7.70	7.14	6.67	Odgovarajući razmak u cm za 1m širine ploče			

TABLICA 10. TABLICA ZA ODABIR ARMATURE (PLOČA, ZID)

Razmak šipaka	Površina presjeka u cm^2 na širini ploče od 100 cm								
	Promjer šipke u mm								
t	6	7	8	10	12	14	16	18	20
7.0	4.04	5.50	7.18	11.22	16.16	21.99	28.73	36.36	44.87
7.5	3.77	5.13	6.70	10.47	15.08	20.52	26.81	33.93	41.88
8.0	3.53	4.81	6.28	9.82	14.14	19.24	25.14	31.81	39.26
8.5	3.33	4.53	5.91	9.24	13.31	18.11	23.66	29.94	36.95
9.0	3.14	4.28	5.59	8.73	12.57	17.10	22.34	28.28	34.90
9.5	2.98	4.05	5.29	8.27	11.90	16.20	21.17	26.79	33.06
10.0	2.83	3.85	5.03	7.85	11.31	15.39	20.11	25.45	31.41
10.5	2.69	3.67	4.79	7.48	10.77	14.66	19.15	24.24	29.91
11.0	2.57	3.50	4.57	7.14	10.28	13.99	18.28	23.14	28.55
11.5	2.46	3.35	4.37	6.83	9.84	13.39	17.49	22.13	27.31
12.0	2.36	3.21	4.19	6.54	9.42	12.83	16.76	21.21	26.17
12.5	2.26	3.08	4.02	6.28	9.05	12.32	16.09	20.36	25.13
13.0	2.17	2.96	3.87	6.04	8.70	11.84	15.47	19.58	24.16
13.5	2.09	2.85	3.72	5.82	8.38	11.40	14.90	18.85	23.27
14.0	2.02	2.75	3.59	5.61	8.08	11.00	14.36	18.18	22.44
14.5	1.95	2.65	3.47	5.42	7.80	10.62	13.87	17.55	21.66
15.0	1.89	2.57	3.35	5.24	7.54	10.26	13.41	16.97	20.94
15.5	1.82	2.48	3.24	5.07	7.30	9.93	12.97	16.42	20.27
16.0	1.77	2.41	3.14	4.91	7.07	9.62	12.57	15.90	19.64
16.5	1.71	2.33	3.05	4.76	6.85	9.33	12.19	15.42	19.04
17.0	1.66	2.26	2.96	4.62	6.65	9.05	11.83	14.97	18.48
17.5	1.62	2.20	2.87	4.49	6.46	8.79	11.49	14.54	17.95
18.0	1.57	2.14	2.79	4.36	6.28	8.55	11.17	14.14	17.46
18.5	1.53	2.08	2.72	4.25	6.11	8.32	10.87	13.76	16.94
19.0	1.49	2.03	2.65	4.13	5.95	8.10	10.58	13.39	16.54
19.5	1.45	1.97	2.58	4.03	5.80	7.89	10.31	13.05	16.11
20.0	1.41	1.92	2.51	3.93	5.65	7.69	10.05	12.72	15.72

TABLICA 11. TABLICA MREŽASTE ARMATURE

Standardne mreže uzdužno nosive (tip R)

Uzdužno nosive mreže (R mreže)									
Oznaka mreže	Promjer žica (mm)		Razmak žica (mm)		Površina presjeka žica (cm^2/m)		Duljina mreže (mm)	Masa kg/m^2	Masa kg/kom (tolerancija 1%)
	uzdužne D	poprečne d	uzdužno a	poprečno t	uzdužnih	poprečnih			
R-131	5.0	4.0	150	250	1.31	0.50	5000	1.52	16.34
R-139	4.2	4.2	100	250	1.39	0.55	5000	1.53	16.83
R-166	4.6	4.2	100	250	1.66	0.55	5000	1.74	19.14
R-196	5.0	4.2	100	250	1.96	0.55	5000	1.98	21.89
R-221	6.5	4.6	150	250	2.21	0.66	6000	2.27	30.57
R-238	5.5	4.2	100	250	2.38	0.55	6000	2.31	30.61
R-283	6.0	4.2	100	250	2.83	0.55	6000	2.66	35.23
R-335	8.0	5.0	150	250	3.35	0.78	6000	3.41	43.99
R-378	8.5	5.0	150	250	3.78	0.78	6000	3.77	48.63
R-385	7.0	5.0	100	250	3.85	0.78	6000	3.64	48.30
R-424	9.0	6.0	150	250	4.24	1.13	6000	4.22	57.02
R-503	8.0	6.0	100	250	5.03	1.13	6000	4.84	64.21
R-524	10.0	6.0	150	250	5.24	1.13	6000	5.24	67.60
R-636	9.0	6.0	100	250	6.36	1.13	6000	5.88	78.07
R-785	10.0	6.0	100	250	7.85	1.13	6000	7.06	93.78
R-1130	12.0	8.0	100	250	11.30	2.01	6000	10.46	138.98

l - duljina armaturne mreže

b - širina armaturne mreže

x_1, x_2 - prepusti uzdužnih žica preko krajnjih poprečnih žica

y_1, y_2 - prepusti poprečnih žica preko krajnjih uzdužnih žica

$$10\ mm \leq x_1,\ x_2 \leq \frac{t}{2}$$

$$10\ mm \leq y_1,\ y_2 \leq \frac{a}{2}$$

Širina za sve R mreže je 2150 mm.

Standardne mreže obostrano nosive (tip Q)

Oznaka mreže	Promjer žice (mm)		Razmak žica (mm)		Površina presjeka žica (cm^2/m)		Duljina mreže (mm)	Masa kg/m^2	Masa kg/kom (sa 1% tolerancije)
	uzdužne D	poprečne d	uzdužno a	poprečno t	uzdužnih	poprečnih			
Q-131	5.0	5.0	150	150	1.31	1.31	5100	2.12	23.25
Q-188	6.0	6.0	150	150	1.88	1.88	5100	3.05	33.44
Q-221	6.5	6.5	150	150	2.21	2.21	5100	3.60	39.47
Q-257	7.0	7.0	150	150	2.57	2.57	5100	4.16	45.61
Q-283	6.0	6.0	100	100	2.83	2.83	5100	4.44	49.68
Q-335	8.0	8.0	150	150	3.35	3.35	5100	5.44	59.65
Q-503	8.0	8.0	100	100	5.03	5.03	5100	7.90	88.49
Q-785	10.0	10.0	100	100	7.85	7.85	5100	12.34	138.18
Q-1130	12.0	12.0	100	100	11.30	11.30	5100	17.76	198.95

$$10\ mm \le x_1,\ x_2 \le \frac{t}{2}$$

$$10\ mm \le y_1,\ y_2 \le \frac{a}{2}$$

Širina za sve mreže 2150 mm.

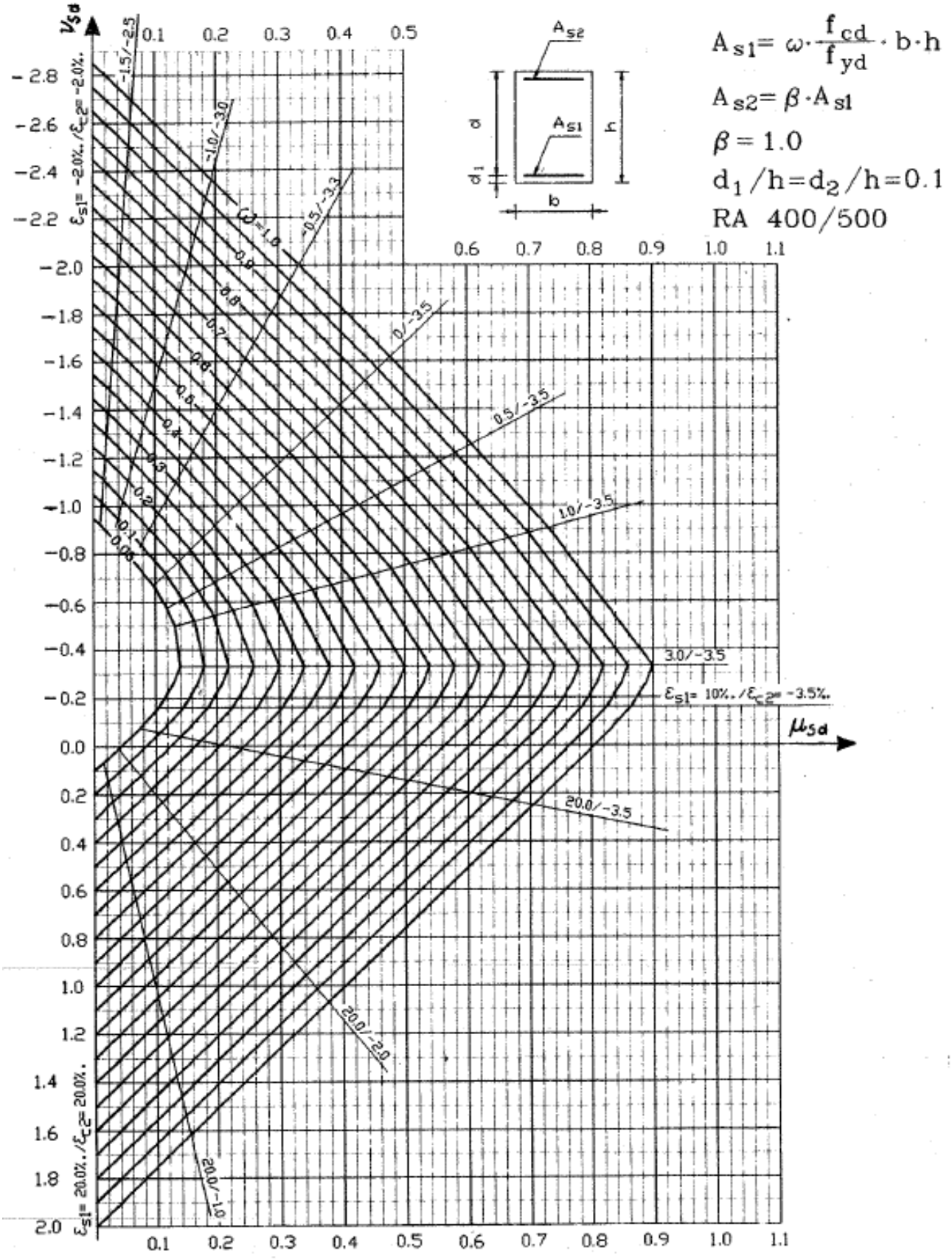
TABLICA 12. NAJVEĆI DOPUŠTENI BROJ KOMADA ARMAUTRE U JEDNOJ RAZINI ŠIRINE GREDE

Tablica 5.10 Najveći dopušteni broj komada armature u jednoj razini širine grede

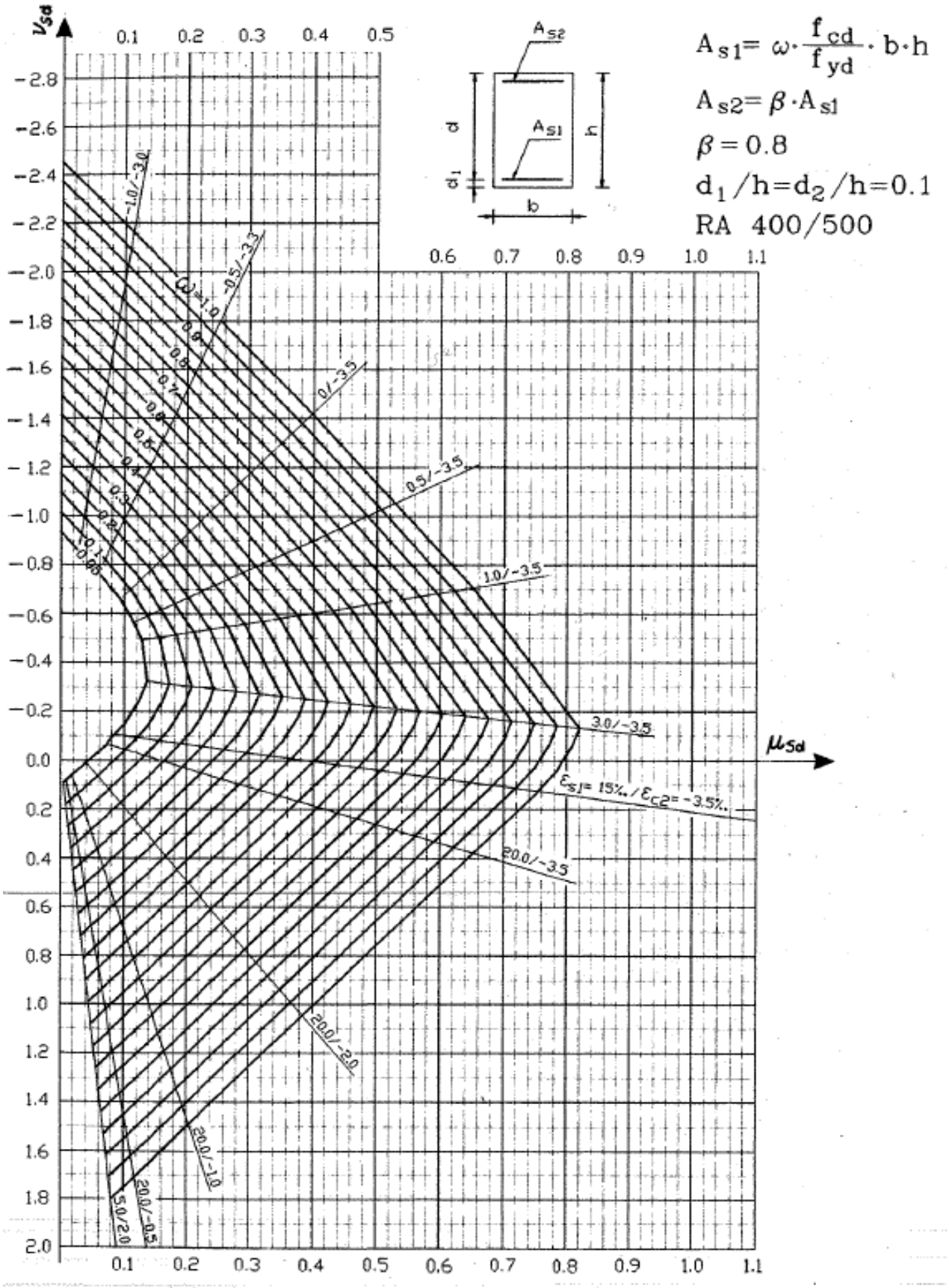
Širina grede	Promjer šipki armature ϕ (mm)								
b_w (cm)	10	12	14	16	18	20	22	25	28
20	5	5	(5)	4	4	4	3	3	3
25	7	6	6	(6)	5	5	(5)	4	4
30	(9)	8	7	7	7	6	(6)	5	4
35	10	(10)	9	8	8	(8)	7	6	5
40	12	11	10	10	9	9	8	7	6
45	(14)	(13)	12	11	(11)	10	9	8	7
50	15	14	13	(13)	12	11	10	9	8
60	(19)	17	16	15	(15)	14	12	11	10
Profil spona ϕ_v	$\phi_v = 6$ mm			$\phi_v = 8$ mm			$\phi_v = 10$ mm		

Brojevi u zagradama u tablici znače da se u gredu u jednom redu najviše može postaviti toliki broj šipki, ali se preporučuje staviti jednu manje.

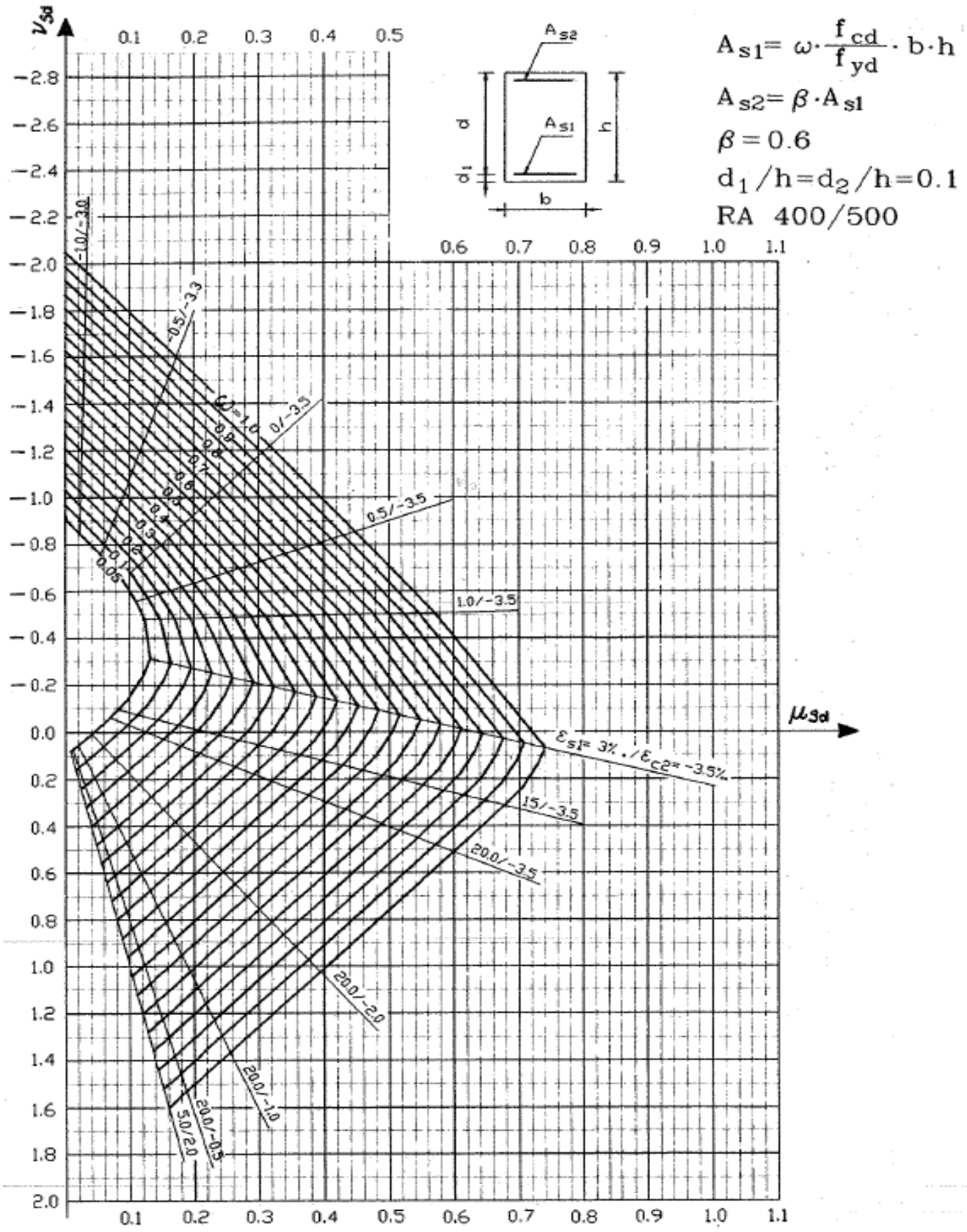
SLIKA 1: DIJAGRAMI INTERAKCIJE



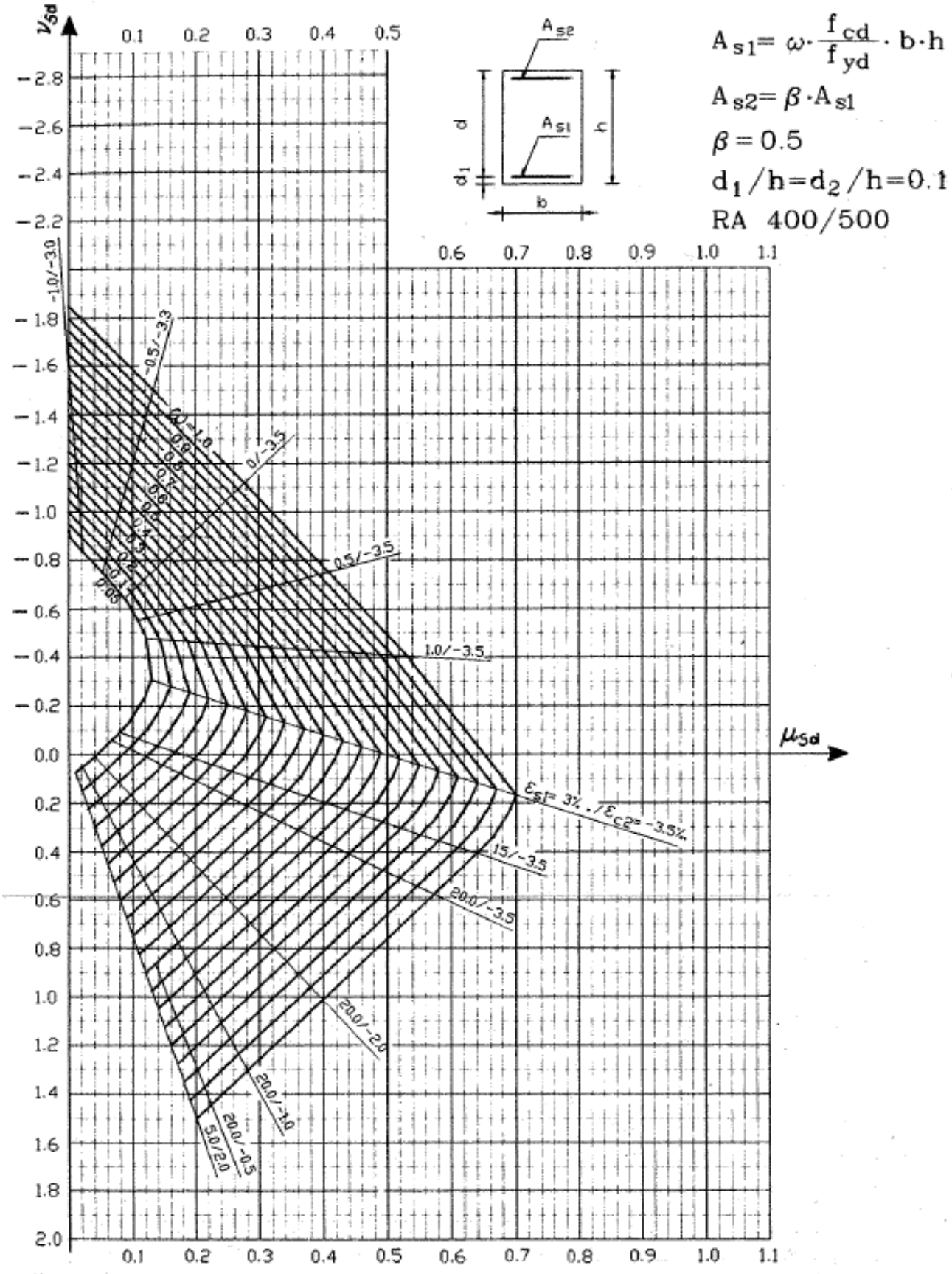
Sl. 6.20. Dijagrami interakcije - ekscentrični tlak i vlak (β=1.0)



Sl. 6.21. Dijagrami interakcije - ekscentrični tlak i vlak (β=0.8)



Sl. 6.22. Dijagrami interakcije - ekscentrični tlak i vlak (β=0.6)



Sl. 6.23. Dijagrami interakcije - ekscentrični tlak i vlak (β=0.5)

TABLICA 13. RAČUNSKE ČVRSTOĆE NA DJELOVANJE GLAVNIH KOSIH NAPREZANJA

$f_{ck}/f_{ck,cube}$	12/15	16/20	20/25	25/30	30/37	35/45	40/50	45/55	50/60
τ_{Rd}	0.18	0.22	0.26	0.30	0.34	0.37	0.41	0.44	0.48

TABLICA 14. MINIMALNI KOEFICIJENT ARMIRANJA POPREČNOM ARMATUROM

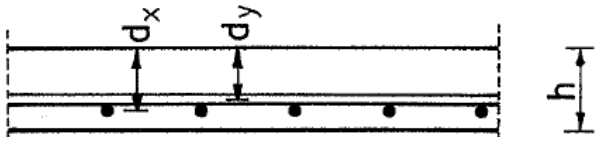
$\rho_{w,min}$	f_{yk} (N/mm^2)		
	220	400	500
C 12/15 i C 20/25	0.0016	0.0009	0.0007
C 25/30 i C 35/45	0.0024	0.0013	0.0011
C 40/50 i C 50/60	0.0030	0.0016	0.0013

TABLICA 15. SREDNJA VLAČNA ČVRSTOĆA BETONA

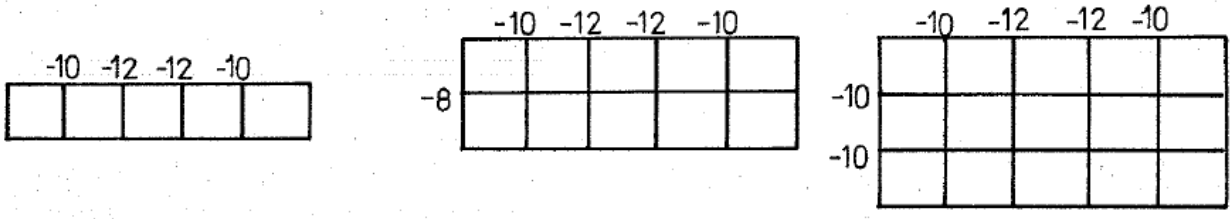
Klasa betona	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
$f_{ct,m}$	1,6	1,9	2,2	2,6	2,9	3,2	3,5	3,8	4,1

PLOČE NOSIVE U DVA SMJERA

Armatura pravokutnih ploča računa se iz maksimalnih momenata savijanja. Pri tome treba paziti da se donji sloj armature položi u smjeru kraćeg raspona i računa sa statičkom visinom presjeka d_x, a gornji sloj s d_y (sl. 21.24).

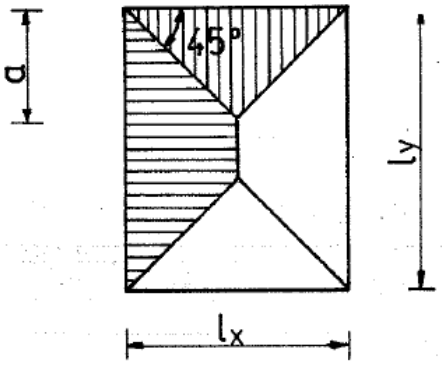


Koeficijenti "i" ispisani su na slici 21.22. ovisno o tlocrtnom položaju ležaja kao približne i zaokružene vrijednosti.



Sl. 21.22. Moguće sheme kontinuiranih ploča s pripadajućim koeficijentima za proračun ležišnih momenata savijanja

Podvlake se mogu proračunavati i sa zamjenjujućim jednolikim kontinuiranim opterećenjem:



za kraći raspon $q_1 = 5l_x \cdot q/16$;

za dulji raspon $q_2 = 0.5(1-2\alpha^2+\alpha^3)l_x \cdot q$,

gdje je:

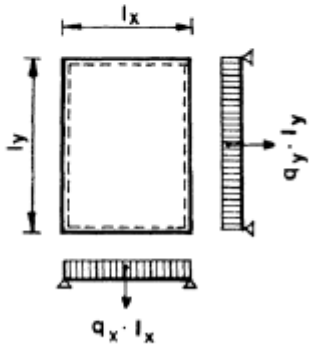
$$\alpha = a/l_y \approx l_x/2l_y. \qquad (21.27)$$

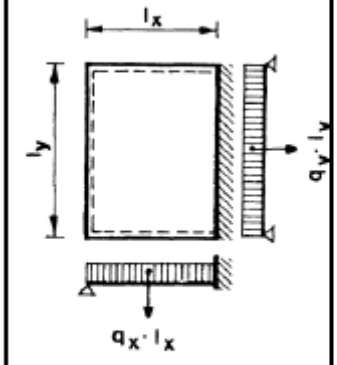
Sl. 21.23. Raspodjela opterećenja na okolne podvlake

TABLICE 16. Tablice za proračun ploča nosivih u dva okomita smjera opterećenih ravnomjerno podijeljenim opterećenjem po cijeloj ploči

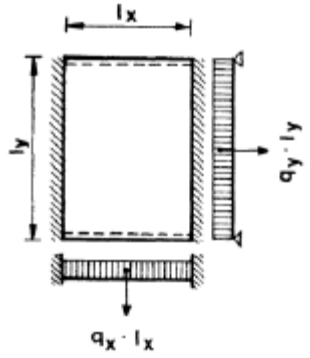
$\lambda = \frac{l_y}{l_x}$ $M_{xmaks} = \frac{q\,l_x^2}{\varphi_x}$ $M_{ymaks} = \frac{q\,l_y^2}{\varphi_y}$ qx=κ·q qy=(1-κx)q

++++++++++++ upeti ležaj ---------- slobodno položeni ležaj

Slučaj 1	λ	φ_{1x}	Δ	φ_{1y}	Δ	κ_{1x}	Δ
	1	2	3	4	5	6	7
	0.50	169.17		10.57		0.0588	
	0.55	125.10	8.814	11.35	0.156	0.0838	0.0050
	0.60	94.94	6.031	12.30	0.190	0.1147	0.0062
	0.65	75.31	3.927	13.44	0.228	0.1515	0.0073
	0.70	61.60	2.741	14.79	0.270	0.1936	0.0084
	0.75	51.69	1.983	16.35	0.313	0.2404	0.0093
	0.80	43.97	1.544	18.01	0.331	0.2906	0.0100
	0.85	38.29	1.136	20.15	0.427	0.3430	0.0105
	0.90	34.26	0.807	22.36	0.444	0.3962	0.0106
	0.95	30.44	0.764	24.79	0.486	0.4489	0.0105
	1.00	27.43	0.602	27.43	0.527	0.5000	0.0102
	1.10	22.79	0.464	33.37	0.594	0.5942	0.0094
	1.20	19.45	0.334	40.34	0.697	0.6747	0.0080
	1.30	17.02	0.244	48.60	0.826	0.7407	0.0066
	1.40	15.22	0.180	58.45	0.985	0.7935	0.0053
	1.50	13.87	0.135	70.22	1.176	0.8351	0.0042
	1.60	12.88	0.099	84.43	1.421	0.8666	0.0033
	1.70	12.06	0.082	100.77	1.634	0.8931	0.0025
	1.80	11.45	0.061	121.69	2.092	0.9130	0.0020
	1.90	10.97	0.048	143.00	2.131	0.9287	0.0016
	2.00	10.57	0.040	169.17	2.617	0.9412	0.0012

Slučaj 2	λ	φ_{2x}	Δ	φ_{2y}	Δ	κ_{2x}	Δ
	8	9	10	11	12	13	14
 ly UVIJEK PARALELNO S UKLIJEŠTENIM RUBOM	0.50	140.91		11.28		0.1351	
	0.55	107.37	6.707	12.38	0.217	0.1862	0.0102
	0.60	85.30	4.414	13.70	0.266	0.2447	0.0117
	0.65	70.59	2.942	15.29	0.320	0.3086	0.0128
	0.70	59.24	2.270	17.19	0.379	0.3751	0.0133
	0.75	50.86	1.676	19.41	0.444	0.4417	0.0133
	0.80	44.56	1.259	21.99	0.516	0.5059	0.0129
	0.85	39.70	0.971	24.96	0.595	0.5661	0.0121
	0.90	35.74	0.792	28.37	0.683	0.6212	0.0110
	0.95	32.54	0.640	32.30	0.786	0.6706	0.0099
	1.00	29.93	0.522	36.75	0.890	0.7143	0.0087
	1.10	26.02	0.391	47.58	1.083	0.7854	0.0071
	1.20	23.33	0.269	61.38	1.381	0.8383	0.0053
	1.30	21.43	0.191	78.75	1.736	0.8772	0.0039
	1.40	20.04	0.138	100.28	2.153	0.9057	0.0029
	1.50	19.02	0.103	126.64	2.636	0.9268	0.0021
	1.60	18.30	0.071	158.52	3.189	0.9425	0.0016
	1.70	17.63	0.067	196.69	3.817	0.9543	0.0012
	1.80	17.05	0.059	239.81	4.312	0.9633	0.0009
	1.90	16.67	0.037	295.08	5.527	0.9702	0.0007
	2.00	16.50	0.021	357.03	6.195	0.9756	0.0005

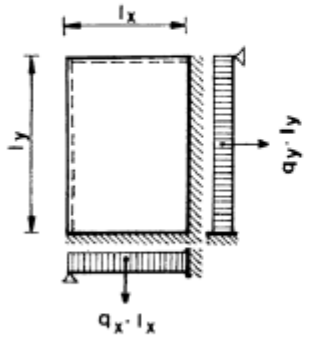
Slučaj 3



ly UVIJEK PARALELNO S UKLIJEŠTENIM RUBOM

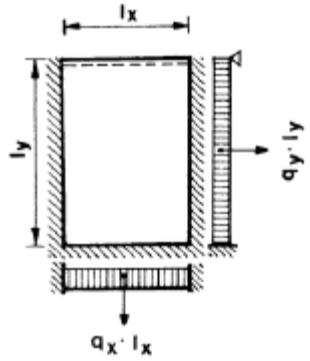
λ	φ_{3x}	Δ	φ_{3y}	Δ	κ_{3x}	Δ
15	16	17	18	19	20	21
0.50	136.06		12.48		0.2381	
0.55	107.42	5.728	14.10	0.323	0.3139	0.0152
0.60	87.62	3.960	16.12	0.404	0.3932	0.0159
0.65	73.76	2.772	18.60	0.496	0.4716	0.0157
0.70	63.69	2.014	21.16	0.603	0.5456	0.0148
0.75	56.16	1.505	25.24	0.725	0.6127	0.0134
0.80	50.42	1.148	29.56	0.864	0.6709	0.0116
0.85	45.97	0.891	34.66	1.021	0.7230	0.0104
0.90	42.48	0.698	40.65	1.199	0.7664	0.0087
0.95	39.70	0.555	47.64	1.398	0.8029	0.0073
1.00	37.47	0.446	55.74	1.620	0.8333	0.0061
1.10	34.18	0.329	75.33	1.959	0.8798	0.0046
1.20	31.93	0.225	101.68	2.635	0.9120	0.0032
1.30	30.34	0.159	134.65	3.298	0.9346	0.0023
1.40	29.18	0.116	175.88	4.123	0.9505	0.0016
1.50	28.31	0.087	226.65	5.077	0.9620	0.0012
1.60	27.64	0.067	288.36	6.171	0.9704	0.0008
1.70	27.12	0.052	362.50	7.414	0.9766	0.0006
1.80	26.71	0.041	450.72	8.822	0.9813	0.0005
1.90	26.37	0.034	555.49	10.377	0.9849	0.0004
2.00	26.09	0.028	675.81	12.132	0.9877	0.0003

Slučaj 4



λ	φ_{4x}	Δ	φ_{4y}	Δ	κ_{4x}	Δ
22	23	24	25	26	27	28
0.50	271.75		16.98		0.0588	
0.55	194.98	6.707	17.84	0.171	0.0838	0.0050
0.60	145.73	4.414	18.89	0.209	0.1147	0.0062
0.65	112.92	2.942	20.16	0.254	0.1515	0.0073
0.70	90.16	2.270	21.65	0.298	0.1936	0.0084
0.75	73.99	1.676	23.41	0.353	0.2404	0.0093
0.80	62.18	1.259	25.47	0.411	0.2906	0.0100
0.85	53.34	1.768	27.84	0.465	0.3430	0.0105
0.90	46.58	1.352	30.56	0.543	0.3962	0.0106
0.95	41.52	1.052	33.65	0.619	0.4489	0.0105
1.00	37.15	0.833	37.15	0.700	0.5000	0.0102
1.10	31.09	0.606	45.52	0.837	0.5942	0.0094
1.20	27.01	0.408	56.01	1.063	0.6747	0.0080
1.30	24.17	0.285	69.02	1.287	0.7407	0.0066
1.40	22.12	0.204	84.99	1.596	0.7935	0.0053
1.50	20.62	0.150	104.38	1.940	0.8351	0.0042
1.60	19.49	0.113	127.72	2.334	0.8676	0.0033
1.70	18.62	0.087	155.54	2.782	0.8931	0.0025
1.80	17.95	0.068	188.41	3.287	0.9130	0.0020
1.90	17.41	0.053	226.93	3.852	0.9287	0.0016
2.00	16.98	0.043	271.75	4.882	0.9412	0.0012

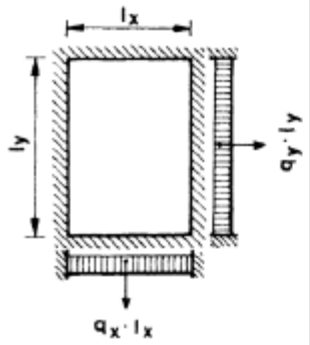
Slučaj 5



l_y UVIJEK PARALELNO SA SLOBODNO POLOŽENIM RUBOM

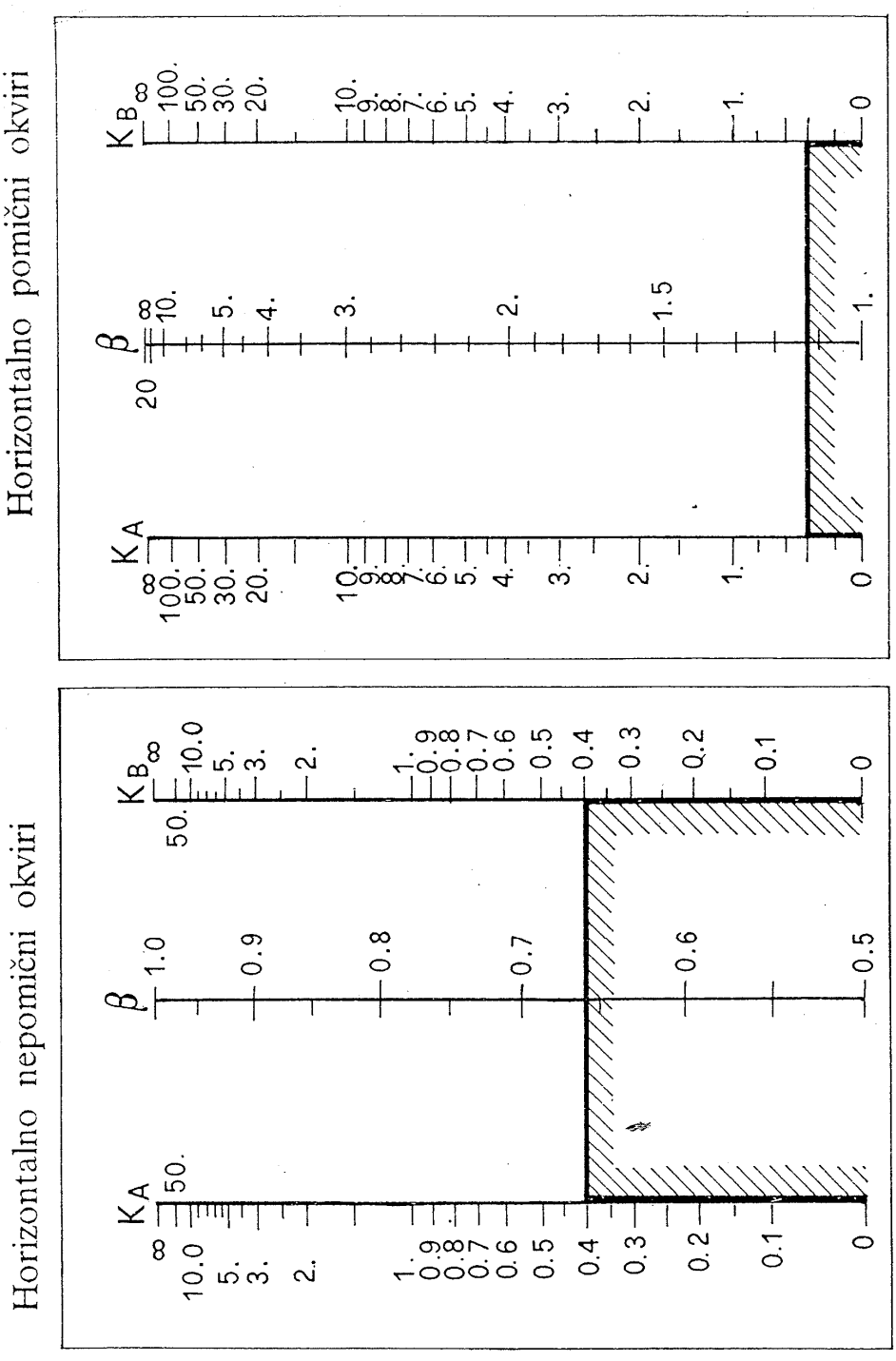
λ	φ_{5x}	Δ	φ_{5y}	Δ	κ_{5x}	Δ
29	30	31	32	33	34	35
0.50	246.42		17.88		0.1111	
0.55	186.97	11.891	19.12	0.251	0.1547	0.0087
0.60	138.61	9.671	20.68	0.313	0.2058	0.0102
0.65	110.30	5.661	22.60	0.384	0.2631	0.0114
0.70	90.65	3.931	24.92	0.464	0.3244	0.0123
0.75	76.58	2.814	27.69	0.555	0.3876	0.0126
0.80	66.24	2.068	30.98	0.658	0.4503	0.0125
0.85	58.46	1.556	34.84	0.772	0.5108	0.0121
0.90	52.51	1.191	39.35	0.900	0.5675	0.0114
0.95	47.86	0.980	44.56	1.043	0.6196	0.0104
1.00	44.18	0.736	50.57	1.201	0.6667	0.0094
1.10	38.84	0.535	65.30	1.474	0.7454	0.0079
1.20	35.27	0.357	84.25	1.895	0.8057	0.0060
1.30	32.79	0.248	108.24	2.398	0.8510	0.0045
1.40	31.01	0.178	138.11	2.987	0.8848	0.0038
1.50	29.71	0.130	174.79	3.669	0.9101	0.0025
1.60	28.73	0.093	219.29	4.450	0.9291	0.0019
1.70	27.97	0.075	272.66	5.337	0.9435	0.0014
1.80	27.38	0.059	336.02	6.337	0.9545	0.0011
1.90	26.92	0.047	410.58	7.456	0.9631	0.0009
2.00	26.54	0.038	497.61	8.702	0.9697	0.0007

Slučaj 6



λ	φ_{6x}	Δ	φ_{6y}	Δ	κ_{6x}	Δ
36	37	38	39	40	41	42
0.50	436.53		27.28		0.0588	
0.55	310.15	25.276	28.38	0.220	0.0838	0.0050
0.60	229.50	16.130	29.74	0.273	0.1147	0.0062
0.65	175.97	10.706	31.41	0.334	0.1515	0.0073
0.70	139.24	7.346	33.43	0.404	0.1936	0.0084
0.75	113.30	5.189	35.85	0.483	0.2404	0.0093
0.80	94.51	3.757	38.71	0.573	0.2906	0.0100
0.85	80.60	2.782	42.08	0.673	0.3430	0.0105
0.90	70.10	2.100	46.00	0.784	0.3962	0.0106
0.95	62.04	1.614	50.53	0.907	0.4489	0.0105
1.00	55.74	1.259	55.74	1.043	0.5000	0.0102
1.10	46.77	0.897	68.48	1.274	0.5942	0.0094
1.20	40.90	0.588	84.80	1.632	0.6747	0.0080
1.30	36.89	0.400	105.38	2.057	0.7407	0.0066
1.40	34.08	0.282	130.92	2.555	0.7935	0.0053
1.50	32.04	0.204	162.22	3.130	0.8351	0.0042
1.60	30.54	0.151	200.13	3.790	0.8676	0.0033
1.70	29.40	0.114	245.53	4.540	0.8931	0.0025
1.80	28.52	0.088	299.38	5.385	0.9130	0.0020
1.90	27.75	0.077	362.69	6.331	0.9287	0.0016
2.00	27.28	0.047	436.53	7.384	0.9412	0.0012

JACKSONOVI I MORELANDOVI NOMOGRAMI



Sl. 11.9. Jacksonovi i Morelandovi nomogrami

351