



Structural bearings

LASTO®BLOCK elastomeric bearings

Selection of bearings

mageba LASTO®BLOCK elastomeric bearings accommodate the following demands:

- Vertical loads
- Transient external horizontal forces
- Horizontal movements in all directions (by shear deformation)
- Rotation about all axes

In order to determine bearing dimensions, the following parameters must be known:

- Vertical loads: N_{dmax} and N_{dmin}
- Displacements: v_{xyd}
- Rotations: α_{ab}
- Bearing shape (round or rectangular) and maximum dimensions (if space is limited)
- Contact surfaces (steel or concrete)

Basis of design

According to EN1337, the following verifications must be performed for elastomeric bearings:

- Maximum strain (strain resulting from vertical loading, shear strain from horizontal displacement, and strain from rotation)
- Thickness of internal and external reinforcing plates
- Limiting condition for rotation
- Stability in terms of sliding

The load bearing capacity of a bearing depends on several factors. The suitability of a bearing must be verified on a case by case basis, with consideration of all relevant factors.

Principles of load table use

A bearing of any size can be subjected to various load / deformation conditions; as vertical load on the bearing increases, the allowable horizontal deformation (displacement) decreases. Each bearing size is capable of allowing a certain maximum horizontal deformation, $V_{xy,max}$ which is only allowed when the vertical load is sufficiently low. If a lower horizontal deformation arises ($V_{xyd} < V_{xy,max}$), then the permissible vertical load increases. To standardise bearing production and selection, the following three conditions are defined:

- Condition 1: $V_{xyd} = 20\%$ of $V_{xy,max}$
- Condition 2: $V_{xyd} = 50\%$ of $V_{xy,max}$
- Condition 3: $V_{xyd} = 100\%$ of $V_{xy,max}$

Each bearing size can support varying vertical loads, depending on which condition is considered. Therefore, a bearing size should be selected for each of the three conditions, to enable the most economical to be selected.

Support

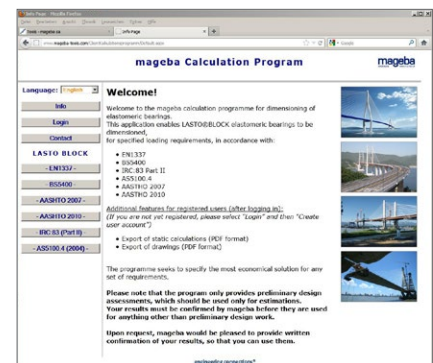
Our product specialists are always ready to advise you in selecting the optimal solution for your project, and to provide you with quotations for supply.

You can also find further information at www.mageba.ch and in the relevant product brochure.



Online Dimensioning Programme

A freely accessible design programme on our website www.mageba.ch offers a simple and efficient way of dimensioning the LASTO®BLOCK bearings required for your project. The user can choose from various national / international design standards. The static design of the bearings is based on the data specified by the user, including loading and deformation data, bearing types and material quality. Registered users can also generate static design proofs and bearing drawings in PDF format, for use in their projects.





Process for choosing bearing dimensions

Condition 1: $v_{xyd} = 20\% \times v_{xy,max}$				Condition 2: $v_{xyd} = 50\% \times v_{xy,max}$				Condition 3: $v_{xyd} = 100\% \times v_{xy,max}$				Bearing dimensions / parameters						
N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	a	b	t	T_e	Weight	K_z	K_{xy}
[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[mm]	[mm]	[mm]	[mm]	[kg]	[kN/mm]	[kN/mm]
172	(51 / 51)	4.2	2.0	159	(47 / 47)	10.5	1.7	139	(45 / 90)	21.0	1.3	100	200	30	21	1.8	55.3	0.86
391	(79 / 79)	5.8	1.8	366	(74 / 74)	14.5	1.6	325	(68 / 135)	29.0	1.0	150	200	41	29	3.8	104.0	0.93
1'720	(326 / 326)	15.4	3.0	1'576	(299 / 299)	38.5	2.7	1'337	(270 / 540)	77.0	2.3	300	400	105	77	37.8	293.2	1.40

1 Bearing dimensions determined based on Condition 1

2 Bearing dimensions determined based on Condition 2

3 Bearing dimensions determined based on Condition 3

Instructions for using the tables

Selection of the required bearing dimensions is performed in three steps (using typical loading conditions), with the aid of the following tables (see pages 3 – 18). A suitable bearing size, which satisfies the specified design requirements (N_d , N_{dmin} , v_{xyd} , α_{ab}), should be chosen for each load condition.

The bearing dimensions should preferably be initially selected based on the movement capacity to be accommodated. Vertical loads and rotations should then be checked (see example).

After the three bearing sizes have been determined, the smallest can generally be selected as the most economical.

<p>Example:</p> <ul style="list-style-type: none"> Bearing type: B Connecting material: concrete at both sides Loads: $N_d = 114$ kN N_{dmin} (actual) = 74 kN Displacement: $v_{xy} = 13.5$ mm Rotation: $\alpha_{ab} = 1.0$ % 	<p>1. Determination of bearing dimensions based on Condition 1: $v_{xyd} = 20\% \times v_{xy,max}$</p> <p>→ Bearing dimensions: 300 × 400 × 105 mm $(v_{xyd} = 15.4 \text{ mm} > 13.5 \text{ mm}, N_d = 1720 \text{ kN} > 114 \text{ kN}, \alpha_{ab} = 3.0\% > 1.0\%)$ Note: N_{dmin} (required to prevent sliding) = 326 kN > N_{dmin} (actual) (Because the min. load required to prevent shifting by friction is not available, this bearing size must be prevented from becoming displaced by other measures, e.g. upstands at each corner. An alternative is to use an elastomeric bearing of Type C with shear lugs or bolts)</p> <p>2. Determination of bearing dimensions based on Condition 2: $v_{xyd} = 50\% \times v_{xy,max}$</p> <p>→ Bearing dimensions: 150 × 200 × 41 mm $(v_{xyd} = 14.5 \text{ mm} > 13.5 \text{ mm}, N_d = 366 \text{ kN} > 114 \text{ kN}, \alpha_{ab} = 1.6\% > 1.0\%)$ Note: N_{dmin} (required to prevent sliding) = 74 kN = N_{dmin} (actual)</p> <p>3. Determination of bearing dimensions based on Condition 3: $v_{xyd} = 100\% \times v_{xy,max}$</p> <p>→ Bearing dimensions: 100 × 200 × 30 mm $(v_{xyd} = 21.0 \text{ mm} > 13.5 \text{ mm}, N_d = 139 \text{ kN} > 114 \text{ kN}, \alpha_{ab} = 1.3\% > 1.0\%)$ Note: N_{dmin} (required to prevent sliding) = 45 kN < N_{dmin} (actual)</p> <p>→ Result: A bearing with the dimensions 100 × 200 × 30 mm represents the most economical solution.</p>
--	---

Note: Please note that the following tables should only be used to determine approximate bearing dimensions. More precise dimensions / optimised sizes can be advised by mageba on request.

Variables

a : bearing width (shorter side in case of a rectangular bearing)	N_d : vertical load bearing capacity (design level)
b : bearing length (longer side in case of a rectangular bearing)	N_{dmin} (concrete) : required min. vertical load with concrete connection (design level)
t : bearing height	N_{dmin} (steel) : required min. vertical load with steel connection (design level)
T_e : nominal thickness of all elastomer layers	v_{xyd} : resultant horizontal displacement
K_z : vertical stiffness of bearing	$v_{xyd,max}$: maximum resultant horizontal displacement
K_{xy} : horizontal stiffness of bearing	α_{ab} : resultant rotation



Structural bearings

Load table – Type B round

Condition 1: $v_{xyd} = 20\% \cdot v_{xy,max}$				Condition 2: $v_{xyd} = 50\% \cdot v_{xy,max}$				Condition 3: $v_{xyd} = 100\% \cdot v_{xy,max}$				Bearing dimensions/Parameters					
N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	d	t	T_e	Weight	K_z	K_{xy}
[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[mm]	[mm]	[mm]	[kg]	[kN/mm]	[kN/mm]
13'672	(1'453 / 1'453)	13.8	0.6	13'308	(1'414 / 1'414)	34.5	0.6	12'702	(1'350 / 2'262)	69.0	0.4	800	94	69	143.8	3'659.4	6.56
13'616	(1'447 / 1'447)	17.0	0.8	13'168	(1'399 / 1'399)	42.5	0.7	12'421	(1'320 / 2'262)	85.0	0.6	800	115	85	174.1	2'970.6	5.32
13'560	(1'441 / 1'441)	20.2	1.0	13'027	(1'384 / 1'384)	50.5	0.8	12'140	(1'290 / 2'262)	101.0	0.7	800	136	101	204.4	2'500.0	4.48
13'503	(1'435 / 1'435)	23.4	1.1	12'887	(1'369 / 1'369)	58.5	1.0	11'859	(1'260 / 2'262)	117.0	0.8	800	157	117	234.6	2'158.1	3.87
13'447	(1'429 / 1'429)	26.6	1.3	12'746	(1'354 / 1'354)	66.5	1.1	11'578	(1'230 / 2'262)	133.0	1.0	800	178	133	264.9	1'898.5	3.40
13'391	(1'423 / 1'423)	29.8	1.6	12'606	(1'339 / 1'339)	74.5	1.3	11'297	(1'200 / 2'262)	149.0	1.1	800	199	149	295.2	1'694.6	3.04
13'335	(1'417 / 1'417)	33.0	1.7	12'465	(1'325 / 1'325)	82.5	1.6	11'016	(1'171 / 2'262)	165.0	1.1	800	220	165	325.4	1'530.3	2.74
15'469	(1'644 / 1'644)	13.8	0.6	15'083	(1'603 / 1'603)	34.5	0.6	14'438	(1'534 / 2'554)	69.0	0.4	850	94	69	162.5	4'523.8	7.40
15'409	(1'637 / 1'637)	17.0	0.7	14'933	(1'587 / 1'587)	42.5	0.7	14'139	(1'502 / 2'554)	85.0	0.6	850	115	85	196.7	3'672.2	6.01
15'350	(1'631 / 1'631)	20.2	0.8	14'784	(1'571 / 1'571)	50.5	0.8	13'840	(1'471 / 2'554)	101.0	0.7	850	136	101	230.9	3'090.5	5.06
15'290	(1'625 / 1'625)	23.4	1.1	14'634	(1'555 / 1'555)	58.5	1.0	13'542	(1'439 / 2'554)	117.0	0.8	850	157	117	265.0	2'667.9	4.37
15'230	(1'618 / 1'618)	26.6	1.3	14'485	(1'539 / 1'539)	66.5	1.1	13'243	(1'407 / 2'554)	133.0	1.0	850	178	133	299.2	2'346.9	3.84
15'170	(1'612 / 1'612)	29.8	1.4	14'335	(1'523 / 1'523)	74.5	1.3	12'944	(1'375 / 2'554)	149.0	1.0	850	199	149	333.4	2'094.9	3.43
15'111	(1'605 / 1'605)	33.0	1.6	14'186	(1'507 / 1'507)	82.5	1.4	12'645	(1'344 / 2'554)	165.0	1.1	850	220	165	367.6	1'891.8	3.10
13'851	(1'840 / 1'840)	17.0	0.8	13'447	(1'786 / 1'786)	42.5	0.8	12'775	(1'697 / 2'863)	85.0	0.7	900	110	85	196.0	3'214.0	6.74
13'788	(1'831 / 1'831)	21.0	1.1	13'289	(1'765 / 1'765)	52.5	1.0	12'458	(1'655 / 2'863)	105.0	0.8	900	135	105	237.8	2'601.8	5.45
13'724	(1'823 / 1'823)	25.0	1.4	13'131	(1'744 / 1'744)	62.5	1.3	12'141	(1'613 / 2'863)	125.0	1.0	900	160	125	279.6	2'185.5	4.58
13'661	(1'814 / 1'814)	29.0	1.7	12'972	(1'723 / 1'723)	72.5	1.4	11'825	(1'570 / 2'863)	145.0	1.3	900	185	145	321.4	1'884.1	3.95
13'598	(1'806 / 1'806)	33.0	1.8	12'814	(1'702 / 1'702)	82.5	1.7	11'508	(1'528 / 2'863)	165.0	1.4	900	210	165	363.1	1'655.7	3.47
13'534	(1'797 / 1'797)	37.0	2.1	12'656	(1'681 / 1'681)	92.5	2.0	11'192	(1'486 / 2'863)	185.0	1.6	900	235	185	404.9	1'476.7	3.09
13'471	(1'789 / 1'789)	41.0	2.4	12'498	(1'660 / 1'660)	102.5	2.1	10'875	(1'444 / 2'863)	205.0	1.8	900	260	205	446.7	1'332.6	2.79



Structural bearings

Load table – Type C round

Condition 1: $v_{xyd} = 20\% \cdot v_{xy,max}$				Condition 2: $v_{xyd} = 50\% \cdot v_{xy,max}$				Condition 3: $v_{xyd} = 100\% \cdot v_{xy,max}$				Bearing dimensions/Parameters					
N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	d	t	T_e	Weight	K_z	K_{xy}
[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[mm]	[mm]	[mm]	[kg]	[kN/mm]	[kN/mm]
13'690	(1'455 / 1'455)	12.8	0.6	13'352	(1'419 / 1'419)	32.0	0.6	12'790	(1'359 / 2'262)	64.0	0.4	800	115	64	241.4	3'945.3	7.07
13'633	(1'449 / 1'449)	16.0	0.8	13'212	(1'404 / 1'404)	40.0	0.7	12'509	(1'329 / 2'262)	80.0	0.6	800	136	80	271.6	3'156.3	5.65
13'577	(1'443 / 1'443)	19.2	1.0	13'071	(1'389 / 1'389)	48.0	0.8	12'228	(1'299 / 2'262)	96.0	0.7	800	157	96	301.9	2'630.2	4.71
13'521	(1'437 / 1'437)	22.4	1.1	12'931	(1'374 / 1'374)	56.0	1.0	11'947	(1'269 / 2'262)	112.0	0.8	800	178	112	332.1	2'254.5	4.04
13'465	(1'431 / 1'431)	25.6	1.3	12'790	(1'359 / 1'359)	64.0	1.1	11'666	(1'240 / 2'262)	128.0	1.0	800	199	128	362.4	1'972.7	3.53
13'409	(1'425 / 1'425)	28.8	1.6	12'650	(1'344 / 1'344)	72.0	1.3	11'385	(1'210 / 2'262)	144.0	1.1	800	220	144	392.7	1'753.5	3.14
13'352	(1'419 / 1'419)	32.0	1.7	12'509	(1'329 / 1'329)	80.0	1.6	11'103	(1'180 / 2'262)	160.0	1.1	800	241	160	422.9	1'578.1	2.83
15'488	(1'646 / 1'646)	12.8	0.6	15'129	(1'607 / 1'607)	32.0	0.6	14'532	(1'544 / 2'554)	64.0	0.4	850	115	64	272.7	4'877.2	7.98
15'428	(1'639 / 1'639)	16.0	0.7	14'980	(1'592 / 1'592)	40.0	0.7	14'233	(1'512 / 2'554)	80.0	0.6	850	136	80	306.9	3'901.8	6.38
15'368	(1'633 / 1'633)	19.2	0.8	14'830	(1'576 / 1'576)	48.0	0.8	13'934	(1'481 / 2'554)	96.0	0.7	850	157	96	341.0	3'251.5	5.32
15'309	(1'627 / 1'627)	22.4	1.1	14'681	(1'560 / 1'560)	56.0	1.0	13'635	(1'449 / 2'554)	112.0	0.8	850	178	112	375.2	2'787.0	4.56
15'249	(1'620 / 1'620)	25.6	1.3	14'532	(1'544 / 1'544)	64.0	1.1	13'336	(1'417 / 2'554)	128.0	0.8	850	199	128	409.4	2'438.6	3.99
15'189	(1'614 / 1'614)	28.8	1.4	14'382	(1'528 / 1'528)	72.0	1.3	13'037	(1'385 / 2'554)	144.0	1.0	850	220	144	443.6	2'167.6	3.55
15'129	(1'607 / 1'607)	32.0	1.6	14'233	(1'512 / 1'512)	80.0	1.4	12'738	(1'354 / 2'554)	160.0	1.1	850	241	160	477.8	1'950.9	3.19
13'867	(1'842 / 1'842)	16.0	0.8	13'487	(1'791 / 1'791)	40.0	0.8	12'854	(1'707 / 2'863)	80.0	0.7	900	131	80	319.7	3'414.9	7.16
13'804	(1'833 / 1'833)	20.0	1.1	13'329	(1'770 / 1'770)	50.0	1.0	12'537	(1'665 / 2'863)	100.0	0.8	900	156	100	361.4	2'731.9	5.73
13'740	(1'825 / 1'825)	24.0	1.4	13'170	(1'749 / 1'749)	60.0	1.3	12'220	(1'623 / 2'863)	120.0	1.0	900	181	120	403.2	2'276.6	4.77
13'677	(1'816 / 1'816)	28.0	1.7	13'012	(1'728 / 1'728)	70.0	1.4	11'904	(1'581 / 2'863)	140.0	1.3	900	206	140	445.0	1'951.4	4.09
13'614	(1'808 / 1'808)	32.0	1.8	12'854	(1'707 / 1'707)	80.0	1.7	11'587	(1'539 / 2'863)	160.0	1.4	900	231	160	486.8	1'707.4	3.58
13'550	(1'800 / 1'800)	36.0	2.1	12'695	(1'686 / 1'686)	90.0	2.0	11'271	(1'497 / 2'863)	180.0	1.6	900	256	180	528.6	1'517.7	3.18
13'487	(1'791 / 1'791)	40.0	2.4	12'537	(1'665 / 1'665)	100.0	2.1	10'954	(1'455 / 2'863)	200.0	1.8	900	281	200	570.3	1'366.0	2.86



Structural bearings

Load table – Type B / C round

Condition 1: $v_{xyd} = 20\% \cdot v_{xy,max}$				Condition 2: $v_{xyd} = 50\% \cdot v_{xy,max}$				Condition 3: $v_{xyd} = 100\% \cdot v_{xy,max}$				Bearing dimensions/Parameters					
N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	d	t	T_e	Weight	K_z	K_{xy}
[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[mm]	[mm]	[mm]	[kg]	[kN/mm]	[kN/mm]
13'681	(1'454 / 1'454)	13.3	0.6	13'330	(1'416 / 1'416)	33.2	0.6	12'746	(1'354 / 2'262)	66.5	0.4	800	104.5	67	192.6	3'797.0	6.80
13'625	(1'448 / 1'448)	16.5	0.8	13'190	(1'401 / 1'401)	41.2	0.7	12'465	(1'325 / 2'262)	82.5	0.6	800	125.5	83	222.9	3'060.6	5.48
13'568	(1'442 / 1'442)	19.7	1.0	13'049	(1'387 / 1'387)	49.2	0.8	12'184	(1'295 / 2'262)	98.5	0.7	800	146.5	99	253.1	2'563.5	4.59
13'512	(1'436 / 1'436)	22.9	1.1	12'909	(1'372 / 1'372)	57.2	1.0	11'903	(1'265 / 2'262)	114.5	0.8	800	167.5	115	283.4	2'205.2	3.95
13'456	(1'430 / 1'430)	26.1	1.3	12'768	(1'357 / 1'357)	65.2	1.1	11'622	(1'235 / 2'262)	130.5	1.0	800	188.5	131	313.6	1'934.9	3.47
13'400	(1'424 / 1'424)	29.3	1.6	12'628	(1'342 / 1'342)	73.2	1.3	11'341	(1'205 / 2'262)	146.5	1.1	800	209.5	147	343.9	1'723.6	3.09
13'344	(1'418 / 1'418)	32.5	1.7	12'487	(1'327 / 1'327)	81.2	1.6	11'060	(1'175 / 2'262)	162.5	1.1	800	230.5	163	374.2	1'553.8	2.78
15'479	(1'645 / 1'645)	13.3	0.6	15'106	(1'605 / 1'605)	33.2	0.6	14'485	(1'539 / 2'554)	66.5	0.4	850	104.5	67	217.6	4'693.8	7.68
15'419	(1'638 / 1'638)	16.5	0.7	14'956	(1'589 / 1'589)	41.2	0.7	14'186	(1'507 / 2'554)	82.5	0.6	850	125.5	83	251.8	3'783.5	6.19
15'359	(1'632 / 1'632)	19.7	0.8	14'807	(1'573 / 1'573)	49.2	0.8	13'887	(1'476 / 2'554)	98.5	0.7	850	146.5	99	286.0	3'168.9	5.18
15'299	(1'626 / 1'626)	22.9	1.1	14'658	(1'557 / 1'557)	57.2	1.0	13'588	(1'444 / 2'554)	114.5	0.8	850	167.5	115	320.1	2'726.1	4.46
15'239	(1'619 / 1'619)	26.1	1.3	14'508	(1'542 / 1'542)	65.2	1.1	13'289	(1'412 / 2'554)	130.5	1.0	850	188.5	131	354.3	2'391.9	3.91
15'180	(1'613 / 1'613)	29.3	1.4	14'359	(1'526 / 1'526)	73.2	1.3	12'991	(1'380 / 2'554)	146.5	1.0	850	209.5	147	388.5	2'130.7	3.49
15'120	(1'606 / 1'606)	32.5	1.6	14'209	(1'510 / 1'510)	81.2	1.4	12'692	(1'349 / 2'554)	162.5	1.1	850	230.5	163	422.7	1'920.9	3.14
13'859	(1'841 / 1'841)	16.5	0.8	13'467	(1'789 / 1'789)	41.2	0.8	12'814	(1'702 / 2'863)	82.5	0.7	900	120.5	83	257.8	3'311.4	6.94
13'796	(1'832 / 1'832)	20.5	1.1	13'309	(1'768 / 1'768)	51.2	1.0	12'498	(1'660 / 2'863)	102.5	0.8	900	145.5	103	299.6	2'665.3	5.59
13'732	(1'824 / 1'824)	24.5	1.4	13'151	(1'747 / 1'747)	61.2	1.3	12'181	(1'618 / 2'863)	122.5	1.0	900	170.5	123	341.4	2'230.1	4.67
13'669	(1'815 / 1'815)	28.5	1.7	12'992	(1'725 / 1'725)	71.2	1.4	11'864	(1'576 / 2'863)	142.5	1.3	900	195.5	143	383.2	1'917.1	4.02
13'606	(1'807 / 1'807)	32.5	1.8	12'834	(1'704 / 1'704)	81.2	1.7	11'548	(1'534 / 2'863)	162.5	1.4	900	220.5	163	425.0	1'681.2	3.52
13'542	(1'799 / 1'799)	36.5	2.1	12'676	(1'683 / 1'683)	91.2	2.0	11'231	(1'492 / 2'863)	182.5	1.6	900	245.5	183	466.7	1'496.9	3.14
13'479	(1'790 / 1'790)	40.5	2.4	12'517	(1'662 / 1'662)	101.2	2.1	10'914	(1'450 / 2'863)	202.5	1.8	900	270.5	203	508.5	1'349.1	2.83



Load table Type C-RB round

Condition 1: $v_{xyd} = 20\% \cdot v_{xy,max}$				Condition 2: $v_{xyd} = 50\% \cdot v_{xy,max}$				Condition 3: $v_{xyd} = 100\% \cdot v_{xy,max}$				Bearing dimensions/Parameters					
N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	N_d	N_{dmin} (concrete/steel)	v_{xyd}	α_{ab}	d	t	T_e	Weight	K_z	K_{xy}
[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[kN]	[kN]	[mm]	[%]	[mm]	[mm]	[mm]	[kg]	[kN/mm]	[kN/mm]
13'690	(1'455 / 1'455)	12.8	0.6	13'352	(1'419 / 1'419)	32.0	0.6	12'790	(1'359 / 2'262)	64.0	0.4	800	99	64	230.5	3'945.3	7.07
13'633	(1'449 / 1'449)	16.0	0.8	13'212	(1'404 / 1'404)	40.0	0.7	12'509	(1'329 / 2'262)	80.0	0.6	800	120	80	260.8	3'156.3	5.65
13'577	(1'443 / 1'443)	19.2	1.0	13'071	(1'389 / 1'389)	48.0	0.8	12'228	(1'299 / 2'262)	96.0	0.7	800	141	96	291.0	2'630.2	4.71
13'521	(1'437 / 1'437)	22.4	1.1	12'931	(1'374 / 1'374)	56.0	1.0	11'947	(1'269 / 2'262)	112.0	0.8	800	162	112	321.3	2'254.5	4.04
13'465	(1'431 / 1'431)	25.6	1.3	12'790	(1'359 / 1'359)	64.0	1.1	11'666	(1'240 / 2'262)	128.0	1.0	800	183	128	351.5	1'972.7	3.53
13'409	(1'425 / 1'425)	28.8	1.6	12'650	(1'344 / 1'344)	72.0	1.3	11'385	(1'210 / 2'262)	144.0	1.1	800	204	144	381.8	1'753.5	3.14
13'352	(1'419 / 1'419)	32.0	1.7	12'509	(1'329 / 1'329)	80.0	1.6	11'103	(1'180 / 2'262)	160.0	1.1	800	225	160	412.1	1'578.1	2.83
15'488	(1'646 / 1'646)	12.8	0.6	15'129	(1'607 / 1'607)	32.0	0.6	14'532	(1'544 / 2'554)	64.0	0.4	850	99	64	260.4	4'877.2	7.98
15'428	(1'639 / 1'639)	16.0	0.7	14'980	(1'592 / 1'592)	40.0	0.7	14'233	(1'512 / 2'554)	80.0	0.6	850	120	80	294.6	3'901.8	6.38
15'368	(1'633 / 1'633)	19.2	0.8	14'830	(1'576 / 1'576)	48.0	0.8	13'934	(1'481 / 2'554)	96.0	0.7	850	141	96	328.8	3'251.5	5.32
15'309	(1'627 / 1'627)	22.4	1.1	14'681	(1'560 / 1'560)	56.0	1.0	13'635	(1'449 / 2'554)	112.0	0.8	850	162	112	363.0	2'787.0	4.56
15'249	(1'620 / 1'620)	25.6	1.3	14'532	(1'544 / 1'544)	64.0	1.1	13'336	(1'417 / 2'554)	128.0	0.8	850	183	128	397.2	2'438.6	3.99
15'189	(1'614 / 1'614)	28.8	1.4	14'382	(1'528 / 1'528)	72.0	1.3	13'037	(1'385 / 2'554)	144.0	1.0	850	204	144	431.3	2'167.6	3.55
15'129	(1'607 / 1'607)	32.0	1.6	14'233	(1'512 / 1'512)	80.0	1.4	12'738	(1'354 / 2'554)	160.0	1.1	850	225	160	465.5	1'950.9	3.19
13'867	(1'842 / 1'842)	16.0	0.8	13'487	(1'791 / 1'791)	40.0	0.8	12'854	(1'707 / 2'863)	80.0	0.7	900	115	80	305.9	3'414.9	7.16
13'804	(1'833 / 1'833)	20.0	1.1	13'329	(1'770 / 1'770)	50.0	1.0	12'537	(1'665 / 2'863)	100.0	0.8	900	140	100	347.7	2'731.9	5.73
13'740	(1'825 / 1'825)	24.0	1.4	13'170	(1'749 / 1'749)	60.0	1.3	12'220	(1'623 / 2'863)	120.0	1.0	900	165	120	389.5	2'276.6	4.77
13'677	(1'816 / 1'816)	28.0	1.7	13'012	(1'728 / 1'728)	70.0	1.4	11'904	(1'581 / 2'863)	140.0	1.3	900	190	140	431.3	1'951.4	4.09
13'614	(1'808 / 1'808)	32.0	1.8	12'854	(1'707 / 1'707)	80.0	1.7	11'587	(1'539 / 2'863)	160.0	1.4	900	215	160	473.0	1'707.4	3.58
13'550	(1'800 / 1'800)	36.0	2.1	12'695	(1'686 / 1'686)	90.0	2.0	11'271	(1'497 / 2'863)	180.0	1.6	900	240	180	514.8	1'517.7	3.18
13'487	(1'791 / 1'791)	40.0	2.4	12'537	(1'665 / 1'665)	100.0	2.1	10'954	(1'455 / 2'863)	200.0	1.8	900	265	200	556.6	1'366.0	2.86