BUILDING
COMMON GROUND

MAX FRANK®

Egcobox® XL

ETA-19/0046 (EU)

Concrete quality

C25/30 & C20/25

Edition International

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Contents

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Concrete quality C25/30

Design table Egcobox® type MXL - C25/30

for cantilever slabs for transmission of moment and shear force, insulation 120 mm

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500
	concrete cover [mm]			M_{Rd} [kNm/element]																	
	C30	C35	C50																		
height of connection [mm] good bonding conditions		**160**	175	-10,5	-16,5	-20,7	-21,1	-24,8	-26,4	-31,6	-36,9	-41,1	-44,3	-47,6	-50,7	-53,8	-26,7	-30,5	-35,6	-39,4	-48,3
	160	165	**180**	-11,1	-17,5	-21,9	-22,4	-26,3	-27,9	-33,5	-39,1	-43,5	-47,0	-50,4	-53,7	-57,0	-28,3	-32,4	-37,8	-41,8	-51,4
	165	170	185	-11,7	-18,5	-23,1	-23,6	-27,7	-29,5	-35,4	-41,3	-45,9	-49,6	-53,2	-56,7	-60,2	-29,9	-34,3	-40,0	-44,3	-54,5
	170	175	190	-12,4	-19,5	-24,3	-24,9	-29,2	-31,1	-37,3	-43,5	-48,4	-52,2	-56,1	-59,7	-63,4	-31,5	-36,2	-42,2	-46,7	-57,5
	175	**180**	195	-13,0	-20,5	-25,6	-26,1	-30,7	-32,6	-39,2	-45,7	-50,8	-54,9	-58,9	-62,7	-66,6	-33,1	-38,0	-44,4	-49,1	-60,6
	180	185	**200**	-13,6	-21,4	-26,8	-27,4	-32,2	-34,2	-41,1	-47,9	-53,3	-57,5	-61,7	-65,8	-69,8	-34,7	-39,9	-46,6	-51,5	-63,6
	185	190	205	-14,2	-22,4	-28,0	-28,6	-33,6	-35,8	-42,9	-50,1	-55,7	-60,1	-64,6	-68,8	-73,0	-36,3	-41,8	-48,8	-54,0	-66,7
	190	195	210	-14,8	-23,4	-29,3	-29,9	-35,1	-37,4	-44,8	-52,3	-58,2	-62,8	-67,4	-71,8	-76,2	-37,9	-43,7	-51,0	-56,4	-69,8
	195	**200**	215	-15,4	-24,4	-30,5	-31,1	-36,6	-38,9	-46,7	-54,5	-60,6	-65,4	-70,2	-74,8	-79,4	-39,5	-45,6	-53,2	-58,8	-72,8
	200	205	**220**	-16,0	-25,4	-31,7	-32,4	-38,1	-40,5	-48,6	-56,7	-63,1	-68,1	-73,1	-77,8	-82,6	-41,1	-47,5	-55,4	-61,3	-75,9
	205	210	225	-16,6	-26,4	-32,9	-33,7	-39,5	-42,1	-50,5	-58,9	-65,5	-70,7	-75,9	-80,8	-85,8	-42,7	-49,3	-57,6	-63,7	-78,9
	210	215	230	-17,3	-27,3	-34,2	-34,9	-41,0	-43,6	-52,4	-61,1	-67,9	-73,3	-78,7	-83,9	-89,0	-44,2	-51,2	-59,8	-66,1	-82,0
	215	**220**	235	-17,9	-28,3	-35,4	-36,2	-42,5	-45,2	-54,2	-63,3	-70,4	-76,0	-81,5	-86,9	-92,2	-45,8	-53,1	-62,0	-68,6	-85,1
	220	225	**240**	-18,5	-29,3	-36,6	-37,4	-44,0	-46,8	-56,1	-65,5	-72,8	-78,6	-84,4	-89,9	-95,4	-47,4	-55,0	-64,2	-71,0	-88,1
	225	230	245	-19,1	-30,3	-37,9	-38,7	-45,4	-48,3	-58,0	-67,7	-75,3	-81,2	-87,2	-92,9	-98,6	-49,0	-56,9	-66,4	-73,4	-91,2
	230	235	250	-19,7	-31,3	-39,1	-39,9	-46,9	-49,9	-59,9	-69,9	-77,7	-83,9	-90,0	-95,9	-101,8	-50,6	-58,8	-68,6	-75,9	-94,2
	235	**240**	255	-20,3	-32,3	-40,3	-41,2	-48,4	-51,5	-61,8	-72,1	-80,2	-86,5	-92,9	-98,9	-105,0	-52,2	-60,6	-70,8	-78,3	-97,3
	240	245	**260**	-20,9	-33,2	-41,6	-42,4	-49,9	-53,1	-63,7	-74,3	-82,6	-89,2	-95,7	-101,9	-108,2	-53,8	-62,5	-73,0	-80,7	-100,4
	245	250	265	-21,5	-34,2	-42,8	-43,7	-51,3	-54,6	-65,5	-76,5	-85,1	-91,8	-98,5	-105,0	-111,4	-55,4	-64,4	-75,2	-83,2	-103,4
	250	255	270	-22,2	-35,2	-44,0	-45,0	-52,8	-56,2	-67,4	-78,7	-87,5	-94,4	-101,4	-108,0	-114,7	-57,0	-66,3	-77,3	-85,6	-106,5
	255	**260**	275	-22,8	-36,2	-45,2	-46,2	-54,3	-57,8	-69,3	-80,9	-89,9	-97,1	-104,2	-111,0	-117,9	-58,6	-68,2	-79,5	-88,0	-109,5
	260	265	**280**	-23,4	-37,2	-46,5	-47,5	-55,8	-59,3	-71,2	-83,1	-92,4	-99,7	-107,0	-114,0	-121,1	-60,2	-70,1	-81,7	-90,4	-112,6
	265	270	285	-24,0	-38,2	-47,7	-48,7	-57,2	-60,9	-73,1	-85,3	-94,8	-102,3	-109,9	-117,0	-124,3	-61,8	-71,9	-83,9	-92,9	-115,7
	270	275	290	-24,6	-39,1	-48,9	-50,0	-58,7	-62,5	-75,0	-87,5	-97,3	-105,0	-112,7	-120,0	-127,5	-63,3	-73,8	-86,1	-95,3	-118,7
	275	**280**	295	-25,2	-40,1	-50,2	-51,2	-60,2	-64,0	-76,8	-89,7	-99,7	-107,6	-115,5	-123,1	-130,7	-64,9	-75,7	-88,3	-97,7	-121,8
	280	285	**300**	-25,8	-41,1	-51,4	-52,5	-61,7	-65,6	-78,7	-91,9	-102,2	-110,3	-118,4	-126,1	-133,9	-66,5	-77,6	-90,5	-100,2	-124,8
	285	290		-26,4	-42,1	-52,6	-53,7	-63,1	-67,2	-80,6	-94,0	-104,6	-112,9	-121,2	-129,1	-137,1	-68,1	-79,5	-92,7	-102,6	-127,9
	290	295		-27,0	-43,1	-53,8	-55,0	-64,6	-68,7	-82,5	-96,2	-107,1	-115,5	-124,0	-132,1	-140,3	-69,7	-81,4	-94,9	-105,0	-131,0
	295	**300**		-27,7	-44,1	-55,1	-56,3	-66,1	-70,3	-84,4	-98,4	-109,5	-118,2	-126,8	-135,1	-143,5	-71,3	-83,2	-97,1	-107,5	-134,0
	300			-28,3	-45,0	-56,3	-57,5	-67,6	-71,9	-86,3	-100,6	-111,9	-120,8	-129,7	-138,1	-146,7	-72,9	-85,1	-99,3	-109,9	-137,1

Shear force level		concrete cover [mm]			V_{Rd} [kN/element]																
		C30	C35	C50																	
height of connection [mm] good bonding conditions	VS	160-190	160-195	175-210	18,2	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5
		195-300	200-300	215-300	24,3	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7
	V1	160-190	160-195	175-210	32,4	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9
		195-300	200-300	215-300	43,3	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5
	V2	160-170	160-175	175-190	48,6	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	-	97,3	97,3	97,3	97,3
		175-190	180-195	195-210	48,6	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	101,3	97,3	97,3	97,3	97,3
		195-300	200-300	215-300	64,9	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	122,9	129,8	129,8	129,8	129,8
	V3	160-190	160-195	175-210	64,9	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	-	-	-	-
		195-300	200-300	215-300	86,5	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	-	-	-	-	-
	V4	175-190	180-195	195-210	-	156,9	156,9	156,9	196,2	196,2	202,7	202,7	202,7	202,7	202,7	202,7	202,7	126,7	126,7	126,7	126,7	126,7
		195-300	200-300	215-300	-	210,7	210,7	210,7	245,8	245,8	245,8	245,8	245,8	245,8	245,8	245,8	245,8	153,6	153,6	153,6	153,6	153,6
	V6±	160-190	160-195	175-210	+18,2/-18,2	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+18,2/-18,2	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5	+36,5/-36,5
		195-300	200-300	215-300	+24,3/-24,3	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+24,3/-24,3	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7	+48,7/-48,7
	V7±	160-190	160-195	175-210	+36,5/-27,4	+73/-54,7	+73/-54,7	+73/-54,7	+73/-54,7	+73/-54,7	+73/-54,7	+97,3/-64,9	+97,3/-64,9	+97,3/-64,9	+97,3/-64,9	+97,3/-64,9	+97,3/-64,9	+48,6/-32,4	+97,3/-64,9	+97,3/-64,9	+97,3/-64,9	+97,3/-64,9
		195-300	200-300	215-300	+48,7/-36,5	+97,4/-73	+97,4/-73	+97,4/-73	+97,4/-73	+97,4/-73	+97,4/-73	+129,8/-86,5	+129,8/-86,5	+129,8/-86,5	+129,8/-86,5	+129,8/-86,5	+129,8/-86,5	+64,9/-43,3	+129,8/-86,5	+129,8/-86,5	+129,8/-86,5	+129,8/-86,5
	V8±	175-190	180-195	195-210	+76/-76	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+152/-152	+76,0/-76,0	+126,7/-126,7	+126,7/-126,7	+126,7/-126,7	+126,7/-126,7
		195-300	200-300	215-300	+92,2/-92,2	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+184,4/-184,4	+92,2/-92,2	+153,6/-153,6	+153,6/-153,6	+153,6/-153,6	+153,6/-153,6

Shear force level VS to V4 also possible with lifting shear force (-18.2 or -24.3 kN/element depending on height of connection/concrete cover) (designation: VS±, V1±, V2±, V3± or V4±)

Reinforcement Egcobox® type MXL

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
length of element [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**	**500**
tensile bars	4 ø 8	4 ø 12	5 ø 12	6 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	11 ø 12	12 ø 12	13 ø 12	14 ø 12	7 ø 12	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of tensile bars [mm]	1130	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1620	1620	1620	2560
compression bearings	2 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	11 ø 12	12 ø 12	6 ø 12	-	-	-	-
compression bars	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of compression bars [mm]															1620	1620	1620	2560
shear force bars VS	2 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6
shear force bars V1	2 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8
shear force bars V2	3 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	4 ø 10	6 ø 8	6 ø 8	6 ø 8	6 ø 8
shear force bars V3	4 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	-	-	-	-	-
shear force bars V4	-	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	5 ø 10	5 ø 10	5 ø 10	5 ø 10	5 ø 10
shear force bars VS±	-	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6
shear force bars V1±	-	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6
shear force bars V2±	-	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	4 ø10 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6
shear force bars V3±	-	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	-	-	-	-	-
shear force bars V4±	-	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6
shear force bars V6±	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6
shear force bars V7±	4 ø6 / 3 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	3 ø8 / 2 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8
shear force bars V8±	3 ø10 / 3 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	3 ø10 / 3 ø10	5 ø10 / 5 ø10	5 ø10 / 5 ø10	5 ø10 / 5 ø10	5 ø10 / 5 ø10
applicable expansion joint distances [m]	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**17,0**

The Egcobox® is also available as semi-prefab version in variant "FO" (from height 185 mm) or "F" (from height 160 mm): e.g. MXL50-FO-V1-C35-h200

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
	length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**	**500**
	concrete cover [mm]			**banking factor k [1/kNm]**																	
	C30	**C35**	**C50**																		
height of connection [mm] good bonding conditions		**160**	175	1,625	1,137	0,957	0,836	0,789	0,704	0,608	0,535	0,478	0,433	0,395	0,363	0,336	0,672	0,898	0,770	0,674	0,595
	160	165	**180**	1,451	1,013	0,852	0,745	0,703	0,627	0,541	0,477	0,426	0,385	0,352	0,323	0,299	0,599	0,797	0,683	0,598	0,526
	165	170	185	1,304	0,908	0,764	0,668	0,630	0,562	0,485	0,427	0,382	0,345	0,315	0,290	0,268	0,537	0,712	0,610	0,534	0,469
	170	175	190	1,178	0,819	0,689	0,602	0,568	0,506	0,438	0,385	0,344	0,311	0,284	0,261	0,242	0,484	0,640	0,548	0,480	0,420
	175	**180**	195	1,070	0,742	0,624	0,546	0,515	0,459	0,396	0,349	0,312	0,282	0,258	0,237	0,219	0,439	0,578	0,495	0,433	0,379
	180	185	**200**	0,976	0,675	0,568	0,497	0,469	0,418	0,361	0,318	0,284	0,257	0,234	0,216	0,200	0,399	0,525	0,450	0,393	0,343
	185	190	205	0,893	0,617	0,519	0,454	0,429	0,382	0,330	0,291	0,260	0,235	0,214	0,197	0,182	0,365	0,478	0,410	0,359	0,312
	190	195	210	0,821	0,567	0,477	0,417	0,393	0,351	0,303	0,267	0,238	0,216	0,197	0,181	0,167	0,335	0,438	0,375	0,329	0,286
	195	**200**	215	0,757	0,522	0,439	0,384	0,362	0,323	0,279	0,246	0,220	0,198	0,181	0,167	0,154	0,308	0,403	0,345	0,302	0,262
	200	205	**220**	0,700	0,482	0,406	0,355	0,335	0,298	0,258	0,227	0,203	0,183	0,167	0,154	0,143	0,285	0,371	0,318	0,278	0,241
	205	210	225	0,650	0,447	0,376	0,329	0,310	0,276	0,239	0,210	0,188	0,170	0,155	0,143	0,132	0,264	0,343	0,294	0,258	0,223
	210	215	230	0,605	0,415	0,349	0,305	0,288	0,257	0,222	0,195	0,175	0,158	0,144	0,133	0,123	0,245	0,319	0,273	0,239	0,207
	215	**220**	235	0,564	0,387	0,326	0,285	0,269	0,239	0,207	0,182	0,163	0,147	0,134	0,124	0,114	0,229	0,296	0,254	0,222	0,192
	220	225	**240**	0,527	0,361	0,304	0,266	0,251	0,224	0,193	0,170	0,152	0,137	0,125	0,115	0,107	0,214	0,277	0,237	0,207	0,179
	225	230	245	0,494	0,338	0,285	0,249	0,235	0,209	0,181	0,159	0,142	0,129	0,117	0,108	0,100	0,200	0,259	0,222	0,194	0,167
	230	235	250	0,464	0,317	0,267	0,233	0,220	0,196	0,170	0,149	0,134	0,121	0,110	0,101	0,094	0,188	0,242	0,208	0,182	0,157
	235	**240**	255	0,436	0,298	0,251	0,219	0,207	0,185	0,159	0,140	0,125	0,113	0,104	0,095	0,088	0,176	0,227	0,195	0,171	0,147
	240	245	**260**	0,411	0,281	0,236	0,207	0,195	0,174	0,150	0,132	0,118	0,107	0,098	0,090	0,083	0,166	0,214	0,183	0,160	0,138
	245	250	265	0,388	0,265	0,223	0,195	0,184	0,164	0,142	0,125	0,111	0,101	0,092	0,085	0,078	0,157	0,202	0,173	0,151	0,130
	250	255	270	0,367	0,250	0,211	0,184	0,174	0,155	0,134	0,118	0,105	0,095	0,087	0,080	0,074	0,148	0,190	0,163	0,143	0,123
	255	**260**	275	0,347	0,237	0,199	0,174	0,165	0,147	0,127	0,112	0,100	0,090	0,082	0,076	0,070	0,140	0,180	0,154	0,135	0,116
	260	265	**280**	0,329	0,225	0,189	0,165	0,156	0,139	0,120	0,106	0,094	0,085	0,078	0,072	0,066	0,133	0,170	0,146	0,128	0,110
	265	270	285	0,313	0,213	0,179	0,157	0,148	0,132	0,114	0,100	0,090	0,081	0,074	0,068	0,063	0,126	0,162	0,138	0,121	0,104
	270	275	290	0,298	0,203	0,170	0,149	0,141	0,125	0,108	0,095	0,085	0,077	0,070	0,065	0,060	0,120	0,153	0,132	0,115	0,099
	275	**280**	295	0,283	0,193	0,162	0,142	0,134	0,119	0,103	0,091	0,081	0,073	0,067	0,062	0,057	0,114	0,146	0,125	0,109	0,094
	280	285	**300**	0,270	0,184	0,155	0,135	0,128	0,114	0,098	0,086	0,077	0,070	0,064	0,059	0,054	0,109	0,139	0,119	0,104	0,089
	285	290		0,258	0,175	0,147	0,129	0,122	0,108	0,094	0,082	0,074	0,067	0,061	0,056	0,052	0,104	0,132	0,113	0,099	0,085
	290	295		0,246	0,167	0,141	0,123	0,116	0,104	0,089	0,079	0,070	0,064	0,058	0,053	0,049	0,099	0,126	0,108	0,095	0,081
	295	**300**		0,235	0,160	0,135	0,118	0,111	0,099	0,085	0,075	0,067	0,061	0,056	0,051	0,047	0,095	0,121	0,103	0,091	0,077
	300			0,225	0,153	0,129	0,113	0,106	0,095	0,082	0,072	0,064	0,058	0,053	0,049	0,045	0,090	0,115	0,099	0,087	0,074

Rotation spring stiffness Egcobox® type MXL

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]																	
	C30	C35	C50																		
height of connection [mm] good bonding conditions		**160**	175	615	879	1045	1196	1267	1421	1645	1868	2090	2312	2533	2754	2975	1488	1113	1299	1484	1681
	160	165	**180**	689	987	1173	1342	1422	1596	1847	2097	2347	2596	2844	3092	3340	1670	1255	1464	1673	1901
	165	170	185	767	1101	1309	1497	1586	1780	2060	2340	2618	2895	3172	3449	3726	1863	1405	1639	1873	2134
	170	175	190	849	1221	1452	1661	1759	1974	2285	2595	2904	3212	3519	3826	4133	2066	1563	1824	2085	2380
	175	**180**	195	935	1348	1602	1833	1942	2179	2522	2864	3204	3544	3883	4222	4561	2280	1731	2019	2307	2640
	180	185	**200**	1025	1481	1760	2013	2133	2393	2771	3146	3520	3893	4266	4638	5010	2505	1906	2224	2542	2914
	185	190	205	1120	1620	1925	2202	2333	2618	3031	3441	3850	4258	4666	5073	5480	2740	2090	2439	2787	3201
	190	195	210	1218	1765	2098	2399	2542	2853	3302	3749	4195	4640	5084	5528	5971	2986	2283	2663	3044	3501
	195	**200**	215	1321	1916	2278	2605	2760	3097	3586	4071	4555	5038	5521	6002	6484	3242	2484	2898	3312	3815
	200	205	**220**	1428	2074	2465	2820	2987	3352	3881	4406	4930	5453	5975	6496	7017	3508	2693	3142	3591	4142
	205	210	225	1539	2238	2660	3042	3223	3617	4187	4754	5320	5884	6447	7009	7571	3786	2911	3397	3882	4483
	210	215	230	1654	2408	2862	3274	3468	3892	4505	5116	5724	6331	6937	7542	8147	4074	3138	3661	4184	4837
	215	**220**	235	1773	2584	3072	3513	3723	4177	4835	5490	6143	6795	7445	8095	8744	4372	3373	3935	4497	5205
	220	225	**240**	1897	2767	3289	3762	3986	4472	5177	5878	6577	7275	7971	8667	9361	4681	3616	4219	4822	5586
	225	230	245	2025	2956	3513	4018	4257	4777	5530	6279	7026	7771	8515	9258	10000	5000	3868	4513	5157	5981
	230	235	250	2157	3151	3745	4283	4538	5093	5895	6694	7490	8284	9077	9869	10660	5330	4129	4817	5505	6389
	235	**240**	255	2293	3352	3984	4557	4828	5418	6272	7121	7968	8813	9657	10499	11341	5671	4397	5130	5863	6810
	240	245	**260**	2433	3559	4231	4839	5127	5753	6660	7562	8461	9359	10255	11149	12043	6022	4675	5454	6233	7246
	245	250	265	2577	3773	4485	5130	5435	6099	7060	8016	8970	9921	10870	11819	12766	6383	4961	5787	6614	7694
	250	255	270	2726	3993	4746	5429	5752	6455	7472	8484	9492	10499	11504	12508	13511	6755	5255	6131	7007	8156
	255	**260**	275	2878	4219	5015	5736	6078	6820	7895	8964	10030	11094	12156	13216	14276	7138	5558	6484	7410	8632
	260	265	**280**	3035	4452	5291	6052	6413	7196	8330	9458	10583	11705	12825	13944	15062	7531	5869	6847	7825	9121
	265	270	285	3196	4690	5575	6377	6756	7582	8776	9965	11150	12332	13513	14692	15870	7935	6189	7220	8252	9623
	270	275	290	3361	4935	5866	6710	7109	7977	9235	10485	11732	12976	14218	15459	16698	8349	6517	7603	8689	10139
	275	**280**	295	3531	5186	6165	7051	7471	8383	9704	11019	12329	13637	14942	16246	17548	8774	6854	7996	9138	10668
	280	285	**300**	3704	5444	6470	7401	7842	8799	10186	11566	12941	14313	15683	17052	18419	9209	7199	8399	9599	11211
	285	290		3882	5707	6784	7759	8221	9225	10679	12126	13568	15006	16443	17877	19311	9655	7553	8812	10070	11767
	290	295		4063	5977	7104	8126	8610	9662	11184	12699	14209	15716	17220	18722	20224	10112	7915	9234	10553	12337
	295	**300**		4249	6253	7433	8502	9008	10108	11701	13285	14865	16441	18015	19587	21158	10579	8286	9667	11048	12920
	300			4440	6535	7768	8885	9414	10564	12229	13885	15536	17184	18828	20471	22113	11056	8665	10109	11553	13517

On-site reinforcement Egcobox® type MXL - C25/30

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
length of element [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**	**500**
Egcobox ø rebar [mm]	ø 8	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 16
Egcobox l_0 rebar [mm]	475	580	580	580	580	580	580	580	580	580	580	580	580	580	720	720	720	1190
item ① - lapping reinforcement / element																		
≥ a_s [cm²] B500	2,81	4,52	5,65	5,78	6,79	7,22	8,66	10,11	11,24	12,13	13,02	13,87	14,73	7,32	8,66	10,11	11,55	14,07
suggested on-site reinforcement [mm]	ø 10	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 16
item ② - suspension reinforcement shear force / element																		
shear force level VS ≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level V1 ≥ a_s [cm²] B500	1,00	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99
shear force level V2 ≥ a_s [cm²] B500	1,49	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,83	2,99	2,99	2,99	2,99
shear force level V3 ≥ a_s [cm²] B500	1,99	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	-	-	-	-	-
shear force level V4 ≥ a_s [cm²] B500	-	4,85	4,85	4,85	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	3,53	3,53	3,53	3,53	3,53
shear force level VS± ≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level V1± ≥ a_s [cm²] B500	-	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99
shear force level V2± ≥ a_s [cm²] B500	-	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,83	2,99	2,99	2,99	2,99
shear force level V3± ≥ a_s [cm²] B500	-	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	-	-	-	-	-
shear force level V4± ≥ a_s [cm²] B500	-	4,85	4,85	4,85	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	3,53	3,53	3,53	3,53	3,53
shear force level V6± ≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	0,56	1,12	1,12	1,12	1,12
shear force level V7± ≥ a_s [cm²] B500	1,12	2,24	2,24	2,24	2,24	2,24	2,24	2,99	2,99	2,99	2,99	2,99	2,99	1,49	2,99	2,99	2,99	2,99
shear force level V8± ≥ a_s [cm²] B500	2,12	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	2,12	3,05	3,05	3,05	3,05

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

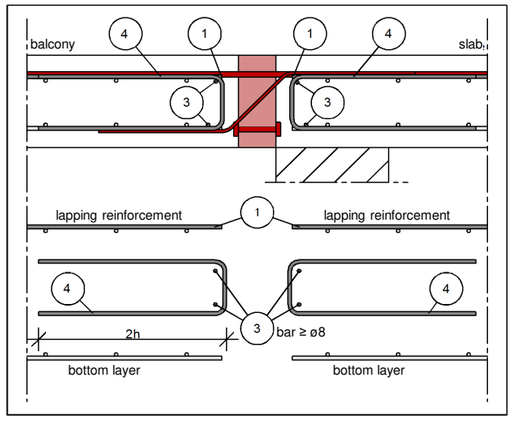
The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox® (height Egcobox® = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

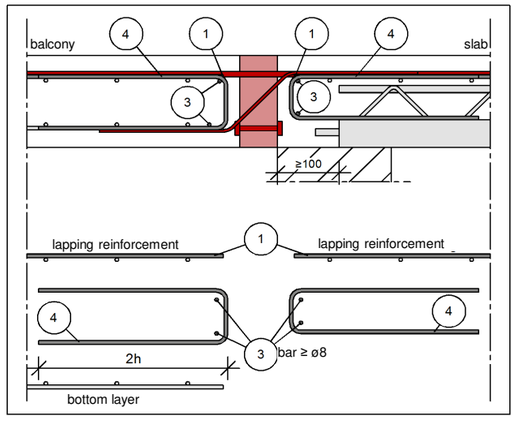
The specifications apply to good bonding conditions.

design proposal

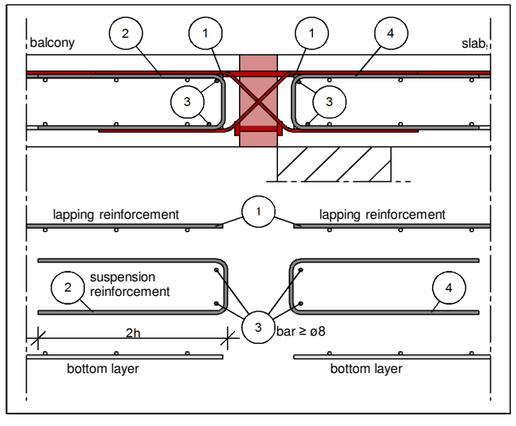
direct support



direct support (semi-prefab slab)



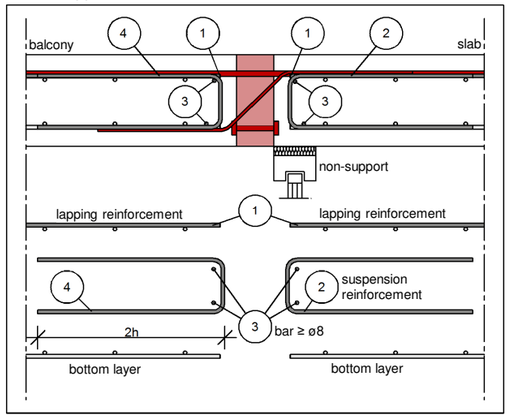
direct support with alternating shear force (V6±, V7±, V8±)



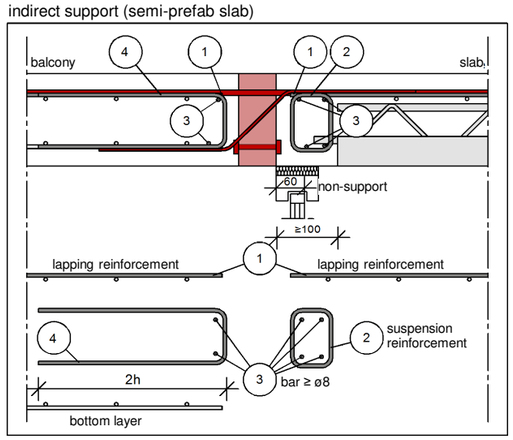
For the Egcobox shear force levels VS± to V4±, a constructive edging on the balcony side is generally sufficient.

design proposal

indirect support



indirect support (semi-prefab slab)



Note indirect support (semi-prefab slab):
The adviced u-bar reinforcement item ② is not replacing the required statical reinforcement of the beam. The reinforcement of the beam has to be calculated by the project engineer in additional.

Semi-prefab balcony

direct support: Egcobox in semi-prefab balcony

direct support: Egcobox with V_± in semi-prefab balcony

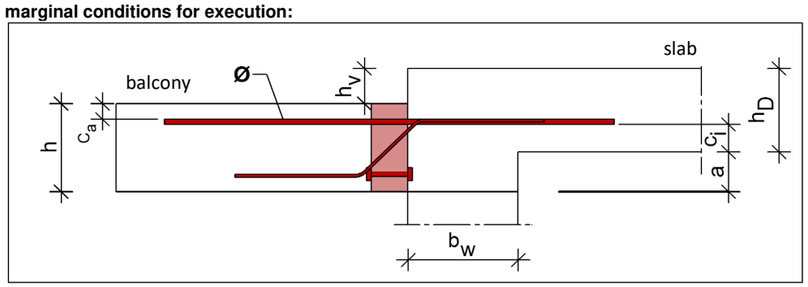
indirect support: Egcobox with V_± in semi-prefab balcony

Note Egcobox in semi-prefab balcony:
It is advisable to include the constructive edging on the balcony side (item ④) or the suspension reinforcement (item ②) in the semi-prefab part.
For the Egcobox shear force levels VS± to V4±, a constructive edging on the balcony side is generally sufficient.

On-site reinforcement Egcobox® type MXL - C25/30

for balconies with low offset of height

marginal conditions for execution:



offset of height $h_v < h_D - c_a - d_s - c_i$

If $h_v \leq h_D - c_a - d_s - c_i$, the offset of height balcony can execute with a standard Egcobox®-element MM.

If the marginal conditions do not match, the Egcobox® should be designed with a offset of height MXL-HV.

required minimum width of the joist b_W : 175 mm MXL10-K bis MXL60,
220 mm MXL65 bis MXL80-K

Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**
reqired minimum width of joist **b_w** [mm]			175	175	175	175	175	175	175	175	175	220	220	220	220	220
Egcobox ø rebar [mm]			ø 8	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12
Egcobox l_0 rebar [mm]			475	580	580	580	580	580	580	580	580	580	580	580	580	580
item ① - lapping reinforcement / element																
≥ as [cm²] B500			2,81	4,52	5,65	5,78	6,79	7,22	8,66	10,11	11,24	12,13	13,02	13,87	14,73	14,73
suggested on-site reinforcement [mm]			ø 10	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12
item ⑤ - link reinforcement slabsides / element at <u>direct support</u> (all shear force level - a_s lapping reinforcement)																
offset height	**a= 50 mm**	≥ a_s [cm²] B500	0,78	1,25	1,56	1,60	1,88	2,01	2,42	2,83	3,15	2,56	2,75	2,95	3,13	1,56
offset height	**a= 100 mm**	≥ a_s [cm²] B500	1,89	3,03	3,79	3,90	4,58	4,87	5,89	6,87	7,64	6,23	6,69	7,16	7,60	3,78
offset height	**a= 200 mm**	≥ a_s [cm²] B500	4,10	6,60	8,24	8,48	9,96	10,60	12,81	14,95	16,63	13,56	14,55	15,58	16,55	8,22
item ⑥ - link reinforcement / element at <u>indirect support</u> (a_s lapping reinforcement + a_s transverse shear force)																
shear force	**a= 50 mm**		1,12+0,56	1,25+1,12	1,56+1,12	1,60+1,12	1,88+1,12	2,01+1,12	2,42+1,12	2,83+1,12	3,15+1,12	2,56+1,12	2,75+1,12	2,95+1,12	3,13+1,12	1,56+1,12
level	**a= 100 mm**	≥ a_s [cm²] B500	1,89+0,56	3,03+1,12	3,79+1,12	3,90+1,12	4,58+1,12	4,87+1,12	5,89+1,12	6,87+1,12	7,64+1,12	6,23+1,12	6,69+1,12	7,16+1,12	7,60+1,12	3,78+1,12
VS / VS±	**a= 200 mm**		4,10+0,56	6,60+1,12	8,24+1,12	8,48+1,12	9,96+1,12	10,60+1,12	12,81+1,12	14,95+1,12	16,63+1,12	13,56+1,12	14,55+1,12	15,58+1,12	16,55+1,12	8,22+1,12
shear force	**a= 50 mm**		1,12+1,00	1,25+1,99	1,56+1,99	1,60+1,99	1,88+1,99	2,01+1,99	2,42+1,99	2,83+1,99	3,15+1,99	2,56+1,99	2,75+1,99	2,95+1,99	3,13+1,99	1,56+1,99
level	**a= 100 mm**	≥ a_s [cm²] B500	1,89+1,00	3,03+1,99	3,79+1,99	3,90+1,99	4,58+1,99	4,87+1,99	5,89+1,99	6,87+1,99	7,64+1,99	6,23+1,99	6,69+1,99	7,16+1,99	7,60+1,99	3,78+1,99
V1 / V1±	**a= 200 mm**		4,10+1,00	6,60+1,99	8,24+1,99	8,48+1,99	9,96+1,99	10,60+1,99	12,81+1,99	14,95+1,99	16,63+1,99	13,56+1,99	14,55+1,99	15,58+1,99	16,55+1,99	8,22+1,99
shear force	**a= 50 mm**		1,12+1,49	1,25+2,99	1,56+2,99	1,60+2,99	1,88+2,99	2,01+2,99	2,42+2,99	2,83+2,99	3,15+2,99	2,56+2,99	2,75+2,99	2,95+2,99	3,13+2,99	1,56+2,83
level	**a= 100 mm**	≥ a_s [cm²] B500	1,89+1,49	3,03+2,99	3,79+2,99	3,90+2,99	4,58+2,99	4,87+2,99	5,89+2,99	6,87+2,99	7,64+2,99	6,23+2,99	6,69+2,99	7,16+2,99	7,60+2,99	3,78+2,83
V2 / V2±	**a= 200 mm**		4,10+1,49	6,60+2,99	8,24+2,99	8,48+2,99	9,96+2,99	10,60+2,99	12,81+2,99	14,95+2,99	16,63+2,99	13,56+2,99	14,55+2,99	15,58+2,99	16,55+2,99	8,22+2,83
shear force	**a= 50 mm**		1,12+1,99	1,25+3,98	1,56+3,98	1,60+3,98	1,88+3,98	2,01+3,98	2,42+3,98	2,83+3,98	3,15+3,98	2,56+3,98	2,75+3,98	2,95+3,98	3,13+3,98	-
level	**a= 100 mm**	≥ a_s [cm²] B500	1,89+1,99	3,03+3,98	3,79+3,98	3,90+3,98	4,58+3,98	4,87+3,98	5,89+3,98	6,87+3,98	7,64+3,98	6,23+3,98	6,69+3,98	7,16+3,98	7,60+3,98	-
V3 / V3±	**a= 200 mm**		4,10+1,99	6,60+3,98	8,24+3,98	8,48+3,98	9,96+3,98	10,60+3,98	12,81+3,98	14,95+3,98	16,63+3,98	13,56+3,98	14,55+3,98	15,58+3,98	16,55+3,98	-
shear force	**a= 50 mm**		-	1,25+6,13	1,56+6,13	1,60+6,13	1,88+6,22	2,01+6,22	2,42+6,22	2,83+6,22	3,15+6,22	2,56+6,22	2,75+6,22	2,95+6,22	3,13+6,22	1,56+2,83
level	**a= 100 mm**	≥ a_s [cm²] B500	-	3,03+6,13	3,79+6,13	3,90+6,13	4,58+6,22	4,87+6,22	5,89+6,22	6,87+6,22	7,64+6,22	6,23+6,22	6,69+6,22	7,16+6,22	7,60+6,22	3,78+2,83
V4 / V4±	**a= 200 mm**		-	6,60+6,13	8,24+6,13	8,48+6,13	9,96+6,22	10,60+6,22	12,81+6,22	14,95+6,22	16,63+6,22	13,56+6,22	14,55+6,22	15,58+6,22	16,55+6,22	8,22+2,83
shear force	**a= 50 mm**		1,12+0,56	1,25+1,12	1,56+1,12	1,60+1,12	1,88+1,12	2,01+1,12	2,42+1,12	2,83+1,12	3,15+1,12	2,56+1,12	2,75+1,12	2,95+1,12	3,13+1,12	1,56+0,56
level	**a= 100 mm**	≥ a_s [cm²] B500	1,89+0,56	3,03+1,12	3,79+1,12	3,90+1,12	4,58+1,12	4,87+1,12	5,89+1,12	6,87+1,12	7,64+1,12	6,23+1,12	6,69+1,12	7,16+1,12	7,60+1,12	3,78+0,56
V6±	**a= 200 mm**		4,10+0,56	6,60+1,12	8,24+1,12	8,48+1,12	9,96+1,12	10,60+1,12	12,81+1,12	14,95+1,12	16,63+1,12	13,56+1,12	14,55+1,12	15,58+1,12	16,55+1,12	8,22+0,56
shear force	**a= 50 mm**		1,12+1,12	1,25+2,24	1,56+2,24	1,60+2,24	1,88+2,24	2,01+2,24	2,42+2,24	2,83+2,99	3,15+2,99	2,56+2,99	2,75+2,99	2,95+2,99	3,13+2,99	1,56+1,49
level	**a= 100 mm**	≥ a_s [cm²] B500	1,89+1,12	3,03+2,24	3,79+2,24	3,90+2,24	4,58+2,24	4,87+2,24	5,89+2,24	6,87+2,99	7,64+2,99	6,23+2,99	6,69+2,99	7,16+2,99	7,60+2,99	3,78+1,49
V7±	**a= 200 mm**		4,10+1,12	6,60+2,24	8,24+2,24	8,48+2,24	9,96+2,24	10,60+2,24	12,81+2,24	14,95+2,99	16,63+2,99	13,56+2,99	14,55+2,99	15,58+2,99	16,55+2,99	8,22+1,49
shear force	**a= 50 mm**		1,12+2,33	1,25+4,66	1,56+4,66	1,60+4,66	1,88+4,66	2,01+4,66	2,42+4,66	2,83+4,66	3,15+4,66	2,56+4,66	2,75+4,66	2,95+4,66	3,13+4,66	1,56+2,12
level	**a= 100 mm**	≥ a_s [cm²] B500	1,89+2,33	3,03+4,66	3,79+4,66	3,90+4,66	4,58+4,66	4,87+4,66	5,89+4,66	6,87+4,66	7,64+4,66	6,23+4,66	6,69+4,66	7,16+4,66	7,60+4,66	3,78+2,12
V8±	**a= 200 mm**		4,10+2,33	6,60+4,66	8,24+4,66	8,48+4,66	9,96+4,66	10,60+4,66	12,81+4,66	14,95+4,66	16,63+4,66	13,56+4,66	14,55+4,66	15,58+4,66	16,55+4,66	8,22+2,12

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox^{ov} (height Egcobox^{ov} = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox^{ov}. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ or item ⑥ applies to the specified required minimum widths of the joist (b_w) and the height of the offset (a= 50 mm; a=100 mm; a= 200 mm). For larger beam widths, a reduction of the required reinforcement is possible.
For balcony offset dimensions between 20 mm < a ≤ 230 mm, interpolation is possible; recommended minimum reinforcement ø6/250 mm.
For offset dimensions < 20 mm, item ⑤ or ⑥ can be reduced to a structural edge reinforcement (direct bearing - item ④) or suspension reinforcement (indirect bearing - item ②).

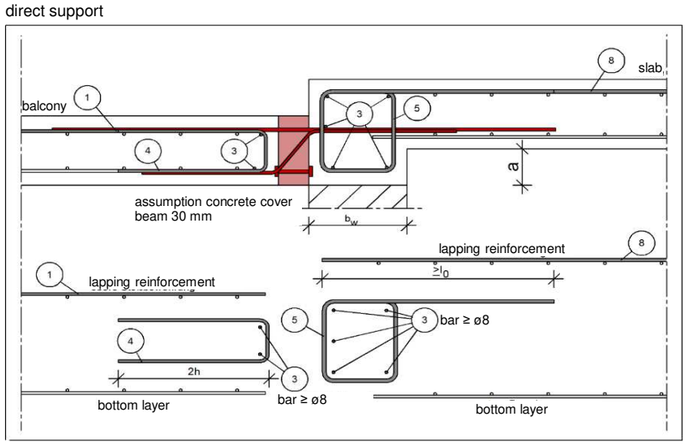
The specified connection reinforcement is to be used exclusively for The force transmission into the slab and the reinforcement required for this (item ⑧) must be verified by the structural engineer.

The specifications apply to good bonding conditions.

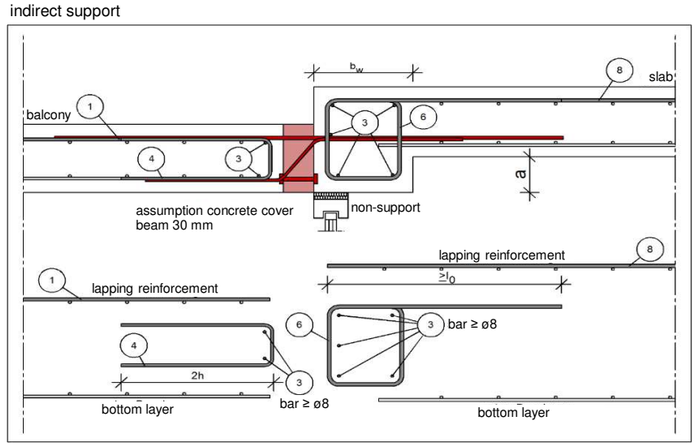
The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox^{ov} reinforcement and the required minimum beam widths must be observed. In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the beam width.

design proposal

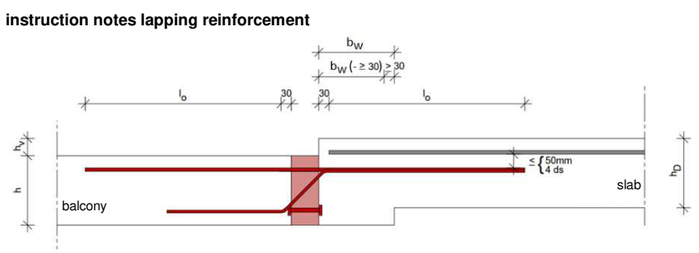
direct support

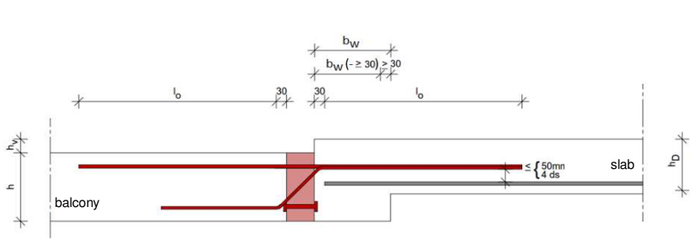


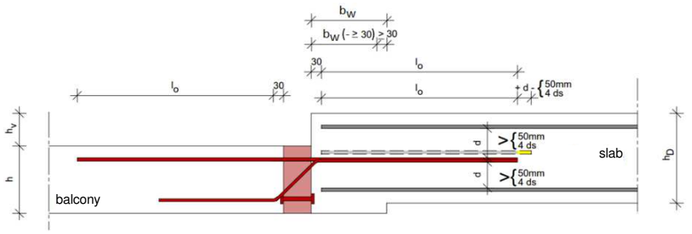
indirect support



instruction notes lapping reinforcement







Design table Egcobox® type MXL-CO - C25/30

for cantilever slabs for transmission of moment and shear force in corner situation, insulation 120 mm

	Egcobox type			MXL10-CO-L or MXL10-CO-R		MXL20-CO-L or MXL20-CO-R		MXL30-CO-L or MXL30-CO-R	
	length of element [mm]			500	620	500	620	600	720
				consists of subcomponents:		consists of subcomponents:		consists of subcomponents:	
	concrete cover [mm] 1. layer (2. layer)			MXL10-CO-S1L or MXL10-CO-S1R 1. layer	MXL10-CO-S2R or MXL10-CO-S2L 2. layer	MXL20-CO-S1L or MXL20-CO-S1R 1. layer	MXL20-CO-S2R or MXL20-CO-S2L 2. layer	MXL30-CO-S1L or MXL30-CO-S1R 1. layer	MXL30-CO-S2R or MXL30-CO-S2L 2. layer
	C30 (C45)	C35 (C50)	C50 (C65)	M_{Rd} [kNm/element]					
height of connection [mm] good bonding conditions		**160**	175	-	-	-	-	-	-
	160	165	**180**	-	-	-	-	-	-
	165	170	185	-	-	-	-	-	-
	170	175	190	-19,5	-16,5	-27,6	-25,7	-33,1	-30,4
	175	**180**	195	-20,5	-17,5	-29,1	-27,2	-35,0	-32,3
	180	185	**200**	-21,4	-18,5	-30,7	-28,8	-36,8	-34,1
	185	190	205	-22,4	-19,5	-32,3	-30,4	-38,7	-36,0
	190	195	210	-23,4	-20,5	-33,8	-32,0	-40,5	-37,8
	195	**200**	215	-24,4	-21,4	-35,4	-33,5	-42,4	-39,7
	200	205	**220**	-25,4	-22,4	-37,0	-35,1	-44,3	-41,5
	205	210	225	-26,4	-23,4	-38,5	-36,7	-46,1	-43,4
	210	215	230	-27,3	-24,4	-40,1	-38,2	-48,0	-45,2
	215	**220**	235	-28,3	-25,4	-41,7	-39,8	-49,8	-47,1
	220	225	**240**	-29,3	-26,4	-43,3	-41,4	-51,7	-48,9
	225	230	245	-30,3	-27,3	-44,8	-42,9	-53,5	-50,8
	230	235	250	-31,3	-28,3	-46,4	-44,5	-55,4	-52,6
	235	**240**	255	-32,3	-29,3	-48,0	-46,1	-57,2	-54,5
	240	245	**260**	-33,2	-30,3	-49,5	-47,7	-59,1	-56,3
	245	250	265	-34,2	-31,3	-51,1	-49,2	-60,9	-58,2
	250	255	270	-35,2	-32,3	-52,7	-50,8	-62,8	-60,1
	255	**260**	275	-36,2	-33,2	-54,2	-52,4	-64,6	-61,9
	260	265	**280**	-37,2	-34,2	-55,8	-53,9	-66,5	-63,8
	265	270	285	-38,2	-35,2	-57,4	-55,5	-68,4	-65,6
	270	275	290	-39,1	-36,2	-59,0	-57,1	-70,2	-67,5
	275	**280**	295	-40,1	-37,2	-60,5	-58,6	-72,1	-69,3
	280	285	**300**	-41,1	-38,2	-62,1	-60,2	-73,9	-71,2
	285	290		-42,1	-39,1	-63,7	-61,8	-75,8	-73,0
	290	295		-43,1	-40,1	-65,2	-63,3	-77,6	-74,9
	295	**300**		-44,1	-41,1	-66,8	-64,9	-79,5	-76,7
	300			-45,0	-42,1	-68,4	-66,5	-81,3	-78,6

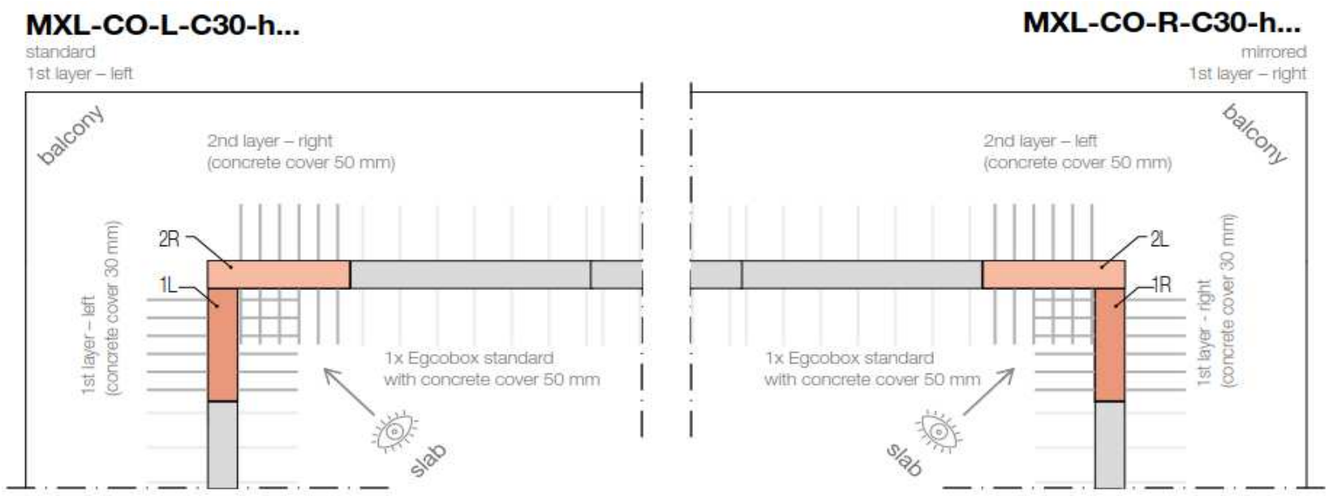
Shear force level		concrete cover [mm] 30 (C45)	35 (C50)	50 (C65)	V_{Rd} [kN/element]					
height of connection [mm] good bonding conditions	VS	170-185	175-190	190-205	48,6	48,6	48,6	48,6	48,6	48,6
		190-205	195-210	210-225	48,6	48,6	48,6	48,6	48,6	48,6
		210-300	215-300	230-300	64,9	64,9	64,9	64,9	64,9	64,9
	V1	170-185	175-190	190-205	95,6	95,6	95,6	95,6	95,6	95,6
		190-205	195-210	210-225	101,3	101,3	101,3	101,3	101,3	101,3
		210-300	215-300	230-300	122,9	122,9	122,9	122,9	122,9	122,9
	V2	170-185	175-190	190-205	-	-	-	-	-	-
		190-205	195-210	210-225	141,5	141,5	148,4	148,4	148,4	148,4
		210-300	215-300	230-300	180,0	180,0	180,0	180,0	180,0	180,0

The choice of the Egcobox® as a complete element, the specification of the concrete cover of the 1st layer is decisive, e.g. MXL20-CO-L-VS-C35-h200, consisting of subcomponents MXL20-CO-S1L-VS-C35-h200, MXL20-CO-S2R-VS-C50-h200; or MXL20-CO-R-VS-C35-h200, consisting of subcomponents MXL20-CO-S1R-VS-C35-h200, MXL20-CO-S2L-VS-C50-h200. "L" and "R" indicate the arrangement of the 1st layer (arrangement of 1st layer left or right of the corner). The Egcobox® corner elements can be planned as a complete element or, for example, as a partial element for centered load requirements.

Reinforcement Egcobox® type MXL-CO

Egcobox type	MXL10-CO-L or MXL10-CO-R		MXL20-CO-L or MXL20-CO-R		MXL30-CO-L or MXL30-CO-R	
length of element [mm]	**500**	**620**	**500**	**620**	**600**	**720**
	consists of subcomponents:		consists of subcomponents:		consists of subcomponents:	
	MXL10-CO-S1L or MXL10-CO-S1R **1. layer**	MXL10-CO-S2R or MXL10-CO-S2L **2. layer**	MXL20-CO-S1L or MXL20-CO-S1R **1. layer**	MXL20-CO-S2R or MXL20-CO-S2L **2. layer**	MXL30-CO-S1L or MXL30-CO-S1R **1. layer**	MXL30-CO-S2R or MXL30-CO-S2L **2. layer**
tensile bars	4 ø 12	4 ø 12	5 ø 14	5 ø 14	6 ø 14	6 ø 14
length of tensile bars [mm]	1340	1340	1620	1620	1620	1620
compression bearings	4 ø 12	4 ø 12	2 ø 12	2 ø 12	3 ø 12	3 ø 12
compression bars	-	-	3 ø 14	3 ø 14	3 ø 14	3 ø 14
length of compression bars [mm]	-	-	1620	1620	1620	1620
shear force bars VS	3 ø 8	3 ø 8	3 ø 8	3 ø 8	3 ø 8	3 ø 8
shear force bars V1	4 ø 10	4 ø 10	4 ø 10	4 ø 10	4 ø 10	4 ø 10
shear force bars V2	6 ø 10	6 ø 10	6 ø 10	6 ø 10	6 ø 10	6 ø 10
applicable expansion joint distances [m]	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**

Placement



On-site reinforcement Egcobox® type MM-CO - C25/30

Egcobox type	MXL10-CO-L or MXL10-CO-R		MXL20-CO-L or MXL20-CO-R		MXL30-CO-L or MXL30-CO-R	
length of element [mm]	**500**	**620**	**500**	**620**	**600**	**720**
	consists of subcomponents:		consists of subcomponents:		consists of subcomponents:	
	MXL10-CO-S1L or MXL10-CO-S1R **1. layer**	MXL10-CO-S2R or MXL10-CO-S2L **2. layer**	MXL20-CO-S1L or MXL20-CO-S1R **1. layer**	MXL20-CO-S2R or MXL20-CO-S2L **2. layer**	MXL30-CO-S1L or MXL30-CO-S1R **1. layer**	MXL30-CO-S2R or MXL30-CO-S2L **2. layer**
Egcobox ø rebar [mm]	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14
Egcobox l_0 rebar [mm]	580	580	720	720	720	720
item ① - lapping reinforcement / element						
≥ a_s [cm²] B500	4,52	4,52	7,22	7,22	8,53	8,53
suggested on-site reinforcement [mm]	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14
item ② - suspension reinforcement shear force / element						
shear force level VS ≥ a_s [cm²] B500	1,49	1,49	1,49	1,49	1,49	1,49
shear force level V1 ≥ a_s [cm²] B500	2,83	2,83	2,83	2,83	2,83	2,83
shear force level V2 ≥ a_s [cm²] B500	4,14	4,14	4,14	4,14	4,14	4,14

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

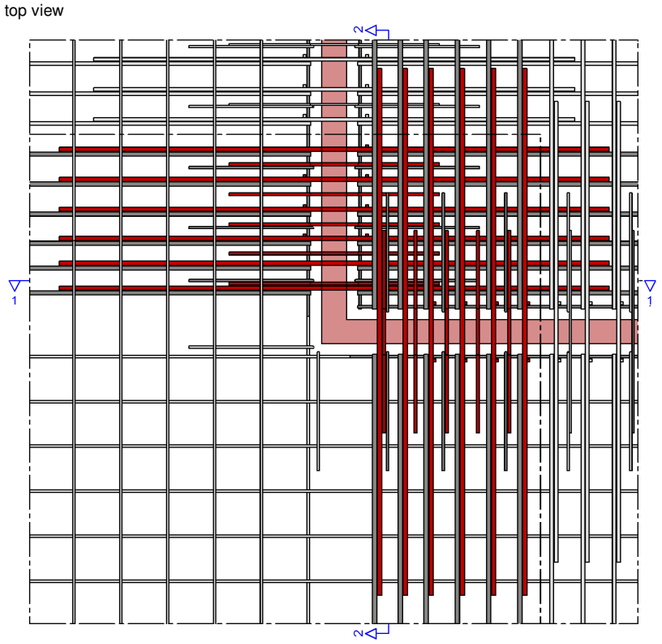
The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox® (height Egcobox® = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

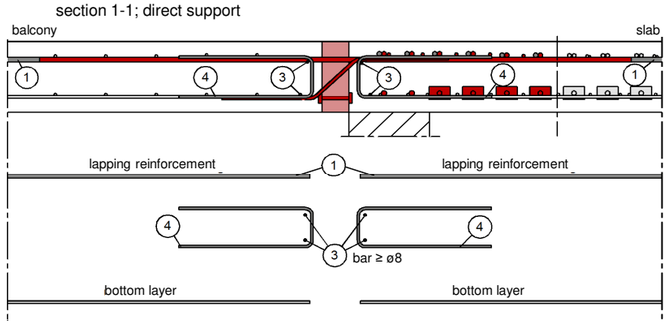
The specifications apply to good bonding conditions.

design proposal

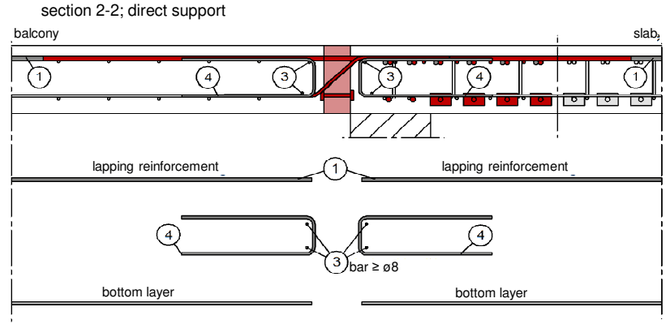
top view



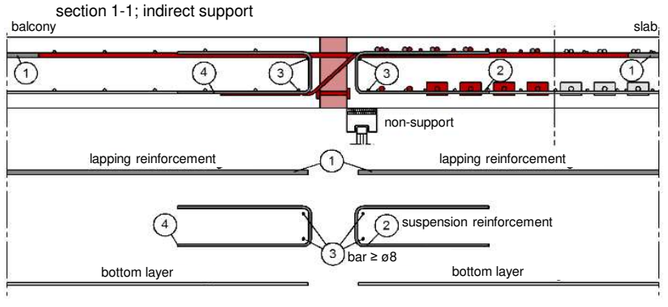
section 1-1; direct support



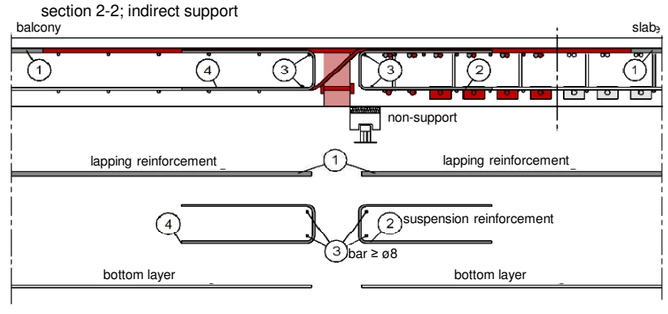
section 2-2; direct support



section 1-1; indirect support



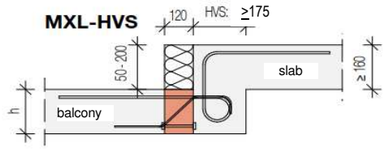
section 2-2; indirect support

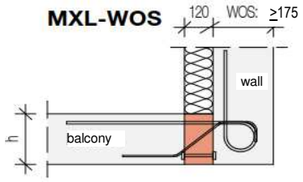


Design table Egcobox® type MXL-HVS / -WOS - C25/30

for cantilever slabs with height offset or wall connection for transmission of moment and shear force, insulation 120 mm

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
				-HVS / -WOS								
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			M_{Rd} [kNm/element]								
	C30	C35	C50									
height of connection [mm] good bonding conditions		**160**	175	-10,4	-15,8	-20,9	-23,5	-26,3	-28,9	-31,6	-36,8	-37,2
	160	165	**180**	-11,1	-16,7	-22,1	-24,9	-27,8	-30,6	-33,4	-39,0	-39,4
	165	170	185	-11,7	-17,6	-23,3	-26,2	-29,4	-32,3	-35,2	-41,1	-41,6
	170	175	190	-12,3	-18,5	-24,5	-27,6	-30,9	-34,0	-37,1	-43,3	-43,8
	175	**180**	195	-12,9	-19,5	-25,7	-29,0	-32,4	-35,7	-38,9	-45,4	-46,0
	180	185	**200**	-13,5	-20,4	-27,0	-30,3	-34,0	-37,4	-40,8	-47,5	-48,2
	185	190	205	-14,1	-21,3	-28,2	-31,7	-35,5	-39,0	-42,6	-49,7	-50,4
	190	195	210	-14,7	-22,2	-29,4	-33,1	-37,0	-40,7	-44,4	-51,8	-52,6
	195	**200**	215	-15,3	-23,1	-30,6	-34,4	-38,6	-42,4	-46,3	-54,0	-54,8
	200	205	**220**	-15,9	-24,0	-31,8	-35,8	-40,1	-44,1	-48,1	-56,1	-57,0
	205	210	225	-16,5	-25,0	-33,0	-37,2	-41,6	-45,8	-49,9	-58,3	-59,2
	210	215	230	-17,1	-25,9	-34,2	-38,5	-43,1	-47,5	-51,8	-60,4	-61,3
	215	**220**	235	-17,7	-26,8	-35,5	-39,9	-44,7	-49,1	-53,6	-62,5	-63,5
	220	225	**240**	-18,3	-27,7	-36,7	-41,3	-46,2	-50,8	-55,4	-64,7	-65,7
	225	230	245	-18,9	-28,6	-37,9	-42,6	-47,7	-52,5	-57,3	-66,8	-67,9
	230	235	250	-19,6	-29,6	-39,1	-44,0	-49,3	-54,2	-59,1	-69,0	-70,1
	235	**240**	255	-20,2	-30,5	-40,3	-45,4	-50,8	-55,9	-60,9	-71,1	-72,3
	240	245	**260**	-20,8	-31,4	-41,5	-46,7	-52,3	-57,6	-62,8	-73,2	-74,5
	245	250	265	-21,4	-32,3	-42,7	-48,1	-53,8	-59,2	-64,6	-75,4	-76,7
	250	255	270	-22,0	-33,2	-44,0	-49,5	-55,4	-60,9	-66,5	-77,5	-78,9
	255	**260**	275	-22,6	-34,1	-45,2	-50,8	-56,9	-62,6	-68,3	-79,7	-81,1
	260	265	**280**	-23,2	-35,1	-46,4	-52,2	-58,4	-64,3	-70,1	-81,8	-83,3
	265	270	285	-23,8	-36,0	-47,6	-53,6	-60,0	-66,0	-72,0	-84,0	-85,4
	270	275	290	-24,4	-36,9	-48,8	-54,9	-61,5	-67,6	-73,8	-86,1	-87,6
	275	**280**	295	-25,0	-37,8	-50,0	-56,3	-63,0	-69,3	-75,6	-88,2	-89,8
	280	285	**300**	-25,6	-38,7	-51,2	-57,7	-64,6	-71,0	-77,5	-90,4	-92,0
	285	290		-26,2	-39,7	-52,5	-59,0	-66,1	-72,7	-79,3	-92,5	-94,2
	290	295		-26,8	-40,6	-53,7	-60,4	-67,6	-74,4	-81,1	-94,7	-96,4
	295	**300**		-27,4	-41,5	-54,9	-61,8	-69,1	-76,1	-83,0	-96,8	-98,6
	300			-28,1	-42,4	-56,1	-63,1	-70,7	-77,7	-84,8	-98,9	-100,8





Shear force level		concrete cover [mm]			V_{Rd} [kN/element]								
		C30	C35	C50									
height of connection [mm] good bonding conditions	VS	160-190	160-195	175-210	18,2	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5
		195-300	200-300	215-300	24,3	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7
	V1	160-190	160-195	175-210	32,4	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9
		195-300	200-300	215-300	43,3	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5
	V2	160-190	160-195	175-210	48,6	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3
		195-300	200-300	215-300	64,9	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8
	V3	160-190	160-195	175-210	64,9	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7
		195-300	200-300	215-300	86,5	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1
	V4	175-190	180-195	195-210	-	151,8	151,8	170,7	199,5	202,7	202,7	202,7	202,7
		195-300	200-300	215-300	-	203,8	203,8	229,3	245,8	245,8	245,8	245,8	245,8
	V6±	160-190	160-195	175-210	+18,2/ -18,2	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5
		195-300	200-300	215-300	+24,3/ -24,3	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7
	V7±	160-190	160-195	175-210	+36,5/ -27,4	+73/ -54,7	+73/ -54,7	+73/ -54,7	+73/ -54,7	+73/ -54,7	+73/ -54,7	+97,3/ -64,9	+97,3/ -64,9
		195-300	200-300	215-300	+48,7/ -36,5	+97,4/ -73	+97,4/ -73	+97,4/ -73	+97,4/ -73	+97,4/ -73	+97,4/ -73	+129,8/ -86,5	+129,8/ -86,5
	V8±	175-190	180-195	195-210	+75,9/ -75,9	+151,8/ -151,8	+151,8/ -151,8	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152
		195-300	200-300	215-300	+92,2/ -92,2	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4

Shear force level VS to V4 also possible with lifting shear force (-18.2 or -24.3 kN/element depending on height of connection/concrete cover) (designation: VS±, V1±, V2±, V3± or V4±)

Reinforcement Egcobox® type MXL-HVS / -WOS

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
	-HVS / -WOS								
length of element [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
wall / beam width b_w: -HVS / -WOS [mm]	**≥175**								
tensile bars	4 ø 8	6 ø 8	8 ø 8	9 ø 8	10 ø 8	11 ø 8	12 ø 8	14 ø 8	10 ø 10
length of tensile bars [mm]	depending on bending form								
compression bearings	2 ø 12	4 ø 12	4 ø 12	5 ø 12	7 ø 12	8 ø 12	9 ø 12	12 ø 12	12 ø 12
shear force bars VS	2 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6
shear force bars V1	2 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8
shear force bars V2	3 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8
shear force bars V3	4 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8
shear force bars V4	-	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10
shear force bars VS±	-	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6
shear force bars V1±	-	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6
shear force bars V2±	-	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6
shear force bars V3±	-	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6
shear force bars V4±	-	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6
shear force bars V6±	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6
shear force bars V7±	4 ø6 / 3 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	6 ø8 / 4 ø8	6 ø8 / 4 ø8
shear force bars V8±	3 ø10 / 3 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10
applicable expansion joint distances [m]	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL-HVS / -WOS

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
				-HVS / -WOS								
	length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
	concrete cover [mm]											
	C30	**C35**	**C50**	**banking factor k [1/kNm]**								
height of connection [mm] good bonding conditions		**160**	175	1,625	1,009	0,813	0,702	0,599	0,540	0,492	0,411	0,429
	160	165	**180**	1,451	0,901	0,726	0,627	0,535	0,482	0,439	0,367	0,383
	165	170	185	1,304	0,810	0,652	0,564	0,481	0,433	0,395	0,330	0,343
	170	175	190	1,178	0,731	0,589	0,509	0,434	0,392	0,357	0,298	0,310
	175	**180**	195	1,070	0,664	0,535	0,462	0,394	0,355	0,324	0,271	0,281
	180	185	**200**	0,976	0,606	0,488	0,422	0,359	0,324	0,295	0,247	0,256
	185	190	205	0,893	0,554	0,447	0,386	0,329	0,297	0,270	0,226	0,234
	190	195	210	0,821	0,510	0,410	0,355	0,302	0,273	0,248	0,208	0,215
	195	**200**	215	0,757	0,470	0,379	0,327	0,279	0,252	0,229	0,191	0,198
	200	205	**220**	0,700	0,435	0,350	0,303	0,258	0,233	0,212	0,177	0,183
	205	210	225	0,650	0,403	0,325	0,281	0,239	0,216	0,197	0,164	0,170
	210	215	230	0,605	0,375	0,302	0,261	0,223	0,201	0,183	0,153	0,158
	215	**220**	235	0,564	0,350	0,282	0,244	0,208	0,187	0,171	0,143	0,147
	220	225	**240**	0,527	0,327	0,264	0,228	0,194	0,175	0,160	0,133	0,138
	225	230	245	0,494	0,307	0,247	0,213	0,182	0,164	0,149	0,125	0,129
	230	235	250	0,464	0,288	0,232	0,200	0,171	0,154	0,140	0,117	0,121
	235	**240**	255	0,436	0,271	0,218	0,189	0,161	0,145	0,132	0,110	0,114
	240	245	**260**	0,411	0,255	0,206	0,178	0,151	0,137	0,124	0,104	0,107
	245	250	265	0,388	0,241	0,194	0,168	0,143	0,129	0,117	0,098	0,101
	250	255	270	0,367	0,228	0,183	0,159	0,135	0,122	0,111	0,093	0,096
	255	**260**	275	0,347	0,216	0,174	0,150	0,128	0,115	0,105	0,088	0,091
	260	265	**280**	0,329	0,205	0,165	0,142	0,121	0,109	0,100	0,083	0,086
	265	270	285	0,313	0,194	0,156	0,135	0,115	0,104	0,095	0,079	0,082
	270	275	290	0,298	0,185	0,149	0,129	0,110	0,099	0,090	0,075	0,077
	275	**280**	295	0,283	0,176	0,142	0,122	0,104	0,094	0,086	0,072	0,074
	280	285	**300**	0,270	0,168	0,135	0,117	0,099	0,090	0,082	0,068	0,070
	285	290		0,258	0,160	0,129	0,111	0,095	0,086	0,078	0,065	0,067
	290	295		0,246	0,153	0,123	0,106	0,091	0,082	0,074	0,062	0,064
	295	**300**		0,235	0,146	0,118	0,102	0,087	0,078	0,071	0,060	0,061
	300			0,225	0,140	0,113	0,097	0,083	0,075	0,068	0,057	0,059

Rotation spring stiffness Egcobox® type MXL-HVS / -WOS

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
				-HVS / -WOS								
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]								
	C30	C35	C50									
height of connection [mm] good bonding conditions		**160**	175	615	991	1231	1424	1670	1852	2033	2433	2331
	160	165	**180**	689	1110	1378	1594	1870	2073	2276	2725	2614
	165	170	185	767	1235	1534	1774	2081	2307	2533	3032	2912
	170	175	190	849	1367	1697	1964	2303	2554	2804	3356	3227
	175	**180**	195	935	1506	1870	2163	2537	2813	3088	3697	3557
	180	185	**200**	1025	1652	2050	2372	2782	3085	3387	4054	3904
	185	190	205	1120	1804	2239	2590	3038	3369	3699	4427	4267
	190	195	210	1218	1962	2436	2818	3306	3666	4024	4817	4647
	195	**200**	215	1321	2128	2642	3056	3585	3975	4364	5223	5042
	200	205	**220**	1428	2300	2856	3304	3875	4297	4717	5646	5453
	205	210	225	1539	2479	3078	3561	4176	4631	5084	6085	5881
	210	215	230	1654	2665	3308	3827	4489	4978	5465	6541	6324
	215	**220**	235	1773	2857	3547	4103	4813	5337	5859	7013	6784
	220	225	**240**	1897	3056	3794	4389	5148	5709	6267	7502	7260
	225	230	245	2025	3262	4049	4685	5495	6093	6689	8007	7752
	230	235	250	2157	3474	4313	4990	5853	6490	7125	8528	8260
	235	**240**	255	2293	3694	4585	5305	6222	6899	7574	9066	8785
	240	245	**260**	2433	3920	4866	5629	6602	7321	8037	9621	9325
	245	250	265	2577	4152	5154	5963	6994	7756	8514	10191	9882
	250	255	270	2726	4391	5451	6307	7397	8203	9005	10779	10455
	255	**260**	275	2878	4637	5757	6660	7811	8662	9509	11382	11044
	260	265	**280**	3035	4890	6070	7023	8237	9134	10028	12003	11649
	265	270	285	3196	5149	6392	7395	8674	9619	10559	12639	12270
	270	275	290	3361	5415	6723	7777	9122	10116	11105	13292	12907
	275	**280**	295	3531	5688	7061	8169	9582	10625	11664	13962	13560
	280	285	**300**	3704	5968	7408	8571	10052	11147	12237	14648	14230
	285	290		3882	6254	7763	8982	10535	11682	12824	15350	14916
	290	295		4063	6547	8127	9402	11028	12229	13425	16069	15617
	295	**300**		4249	6846	8499	9832	11533	12788	14039	16805	16335
	300			4440	7153	8879	10272	12048	13360	14667	17556	17069

On-site reinforcement Egcobox® type MXL-HVS - C25/30

for balconies with offset of height

Egcobox type HVS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist b_w [mm]			175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612
item ① - lapping reinforcement / element											
≥ as [cm²] B500			2,79	4,22	5,59	6,28	7,04	7,74	8,44	9,85	10,08
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12
item ② - balcony-side suspension reinforcement shear force / element											
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,69	4,69	5,27	5,65	5,65	5,65	5,65	5,65
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	1,12	2,24	2,24	2,24	2,24	2,24	2,24	2,99	2,99
shear force level	V8±	≥ a_s [cm²] B500	2,12	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24

MXL-HVS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	1,65	2,50	3,30	3,74	4,19	4,61	5,06	5,91	6,04
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	2,97	4,49	5,94	6,73	7,54	8,29	9,11	10,63	10,88
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	5,39	8,15	10,79	12,22	13,68	15,05	16,54	19,29	19,74
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**a≤ 90 mm**		1,65+0,56	2,50+1,12	3,30+1,12	3,74+1,12	4,19+1,12	4,61+1,12	5,06+1,12	5,91+1,12	6,04+1,12
	a= 150 mm	≥ a_s [cm²] B500	2,97+0,56	4,49+1,12	5,94+1,12	6,73+1,12	7,54+1,12	8,29+1,12	9,11+1,12	10,63+1,12	10,88+1,12
	a= 260 mm		5,39+0,56	8,15+1,12	10,79+1,12	12,22+1,12	13,68+1,12	15,05+1,12	16,54+1,12	19,29+1,12	19,74+1,12
shear force level V1 / V1±	**a≤ 90 mm**		1,65+1,00	2,50+1,99	3,30+1,99	3,74+1,99	4,19+1,99	4,61+1,99	5,06+1,99	5,91+1,99	6,04+1,99
	a= 150 mm	≥ a_s [cm²] B500	2,97+1,00	4,49+1,99	5,94+1,99	6,73+1,99	7,54+1,99	8,29+1,99	9,11+1,99	10,63+1,99	10,88+1,99
	a= 260 mm		5,39+1,00	8,15+1,99	10,79+1,99	12,22+1,99	13,68+1,99	15,05+1,99	16,54+1,99	19,29+1,99	19,74+1,99
shear force level V2 / V2±	**a≤ 90 mm**		1,65+1,49	2,50+2,99	3,30+2,99	3,74+2,99	4,19+2,99	4,61+2,99	5,06+2,99	5,91+2,99	6,04+2,99
	a= 150 mm	≥ a_s [cm²] B500	2,97+1,49	4,49+2,99	5,94+2,99	6,73+2,99	7,54+2,99	8,29+2,99	9,11+2,99	10,63+2,99	10,88+2,99
	a= 260 mm		5,39+1,49	8,15+2,99	10,79+2,99	12,22+2,99	13,68+2,99	15,05+2,99	16,54+2,99	19,29+2,99	19,74+2,99
shear force level V3 / V3±	**a≤ 90 mm**		1,65+1,99	2,50+3,98	3,30+3,98	3,74+3,98	4,19+3,98	4,61+3,98	5,06+3,98	5,91+3,98	6,04+3,98
	a= 150 mm	≥ a_s [cm²] B500	2,97+1,99	4,49+3,98	5,94+3,98	6,73+3,98	7,54+3,98	8,29+3,98	9,11+3,98	10,63+3,98	10,88+3,98
	a= 260 mm		5,39+1,99	8,15+3,98	10,79+3,98	12,22+3,98	13,68+3,98	15,05+3,98	16,54+3,98	19,29+3,98	19,74+3,98
shear force level V4 / V4±	**a≤ 90 mm**		-	2,50+4,69	3,30+4,69	3,74+5,27	4,19+5,65	4,61+5,65	5,06+5,65	5,91+5,65	6,04+5,65
	a= 150 mm	≥ a_s [cm²] B500	-	4,49+4,69	5,94+4,69	6,73+5,27	7,54+5,65	8,29+5,65	9,11+5,65	10,63+5,65	10,88+5,65
	a= 260 mm		-	8,15+4,69	10,79+4,69	12,22+5,27	13,68+5,65	15,05+5,65	16,54+5,65	19,29+5,65	19,74+5,65
shear force level V6±	**a≤ 90 mm**		1,65+0,56	2,50+1,12	3,30+1,12	3,74+1,12	4,19+1,12	4,61+1,12	5,06+1,12	5,91+1,12	6,04+1,12
	a= 150 mm	≥ a_s [cm²] B500	2,97+0,56	4,49+1,12	5,94+1,12	6,73+1,12	7,54+1,12	8,29+1,12	9,11+1,12	10,63+1,12	10,88+1,12
	a= 260 mm		5,39+0,56	8,15+1,12	10,79+1,12	12,22+1,12	13,68+1,12	15,05+1,12	16,54+1,12	19,29+1,12	19,74+1,12
shear force level V7±	**a≤ 90 mm**		1,65+1,12	2,50+2,24	3,30+2,24	3,74+2,24	4,19+2,24	4,61+2,24	5,06+2,24	5,91+2,99	6,04+2,99
	a= 150 mm	≥ a_s [cm²] B500	2,97+1,12	4,49+2,24	5,94+2,24	6,73+2,24	7,54+2,24	8,29+2,24	9,11+2,24	10,63+2,99	10,88+2,99
	a= 260 mm		5,39+1,12	8,15+2,24	10,79+2,24	12,22+2,24	13,68+2,24	15,05+2,24	16,54+2,24	19,29+2,99	19,74+2,99
shear force level V8±	**a≤ 90 mm**		1,65+2,12	2,50+4,24	3,30+4,24	3,74+4,24	4,19+4,24	4,61+4,24	5,06+4,24	5,91+4,24	6,04+4,24
	a= 150 mm	≥ a_s [cm²] B500	2,97+2,12	4,49+4,24	5,94+4,24	6,73+4,24	7,54+4,24	8,29+4,24	9,11+4,24	10,63+4,24	10,88+4,24
	a= 260 mm		5,39+2,12	8,15+4,24	10,79+4,24	12,22+4,24	13,68+4,24	15,05+4,24	16,54+4,24	19,29+4,24	19,74+4,24

Egcobox type HVS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000

MXL-HVS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	1,40	2,12	2,80	3,17	3,55	3,91	4,29	5,01	5,12
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	2,52	3,82	5,05	5,71	6,40	7,04	7,72	9,01	9,22
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	4,58	6,92	9,16	10,37	11,61	12,77	14,02	16,35	16,73
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**a≤ 90 mm**		1,40+0,56	2,12+1,12	2,80+1,12	3,17+1,12	3,55+1,12	3,91+1,12	4,29+1,12	5,01+1,12	5,12+1,12
	a= 150 mm	≥ a_s [cm²] B500	2,52+0,56	3,82+1,12	5,05+1,12	5,71+1,12	6,40+1,12	7,04+1,12	7,72+1,12	9,01+1,12	9,22+1,12
	a= 260 mm		4,58+0,56	6,92+1,12	9,16+1,12	10,37+1,12	11,61+1,12	12,77+1,12	14,02+1,12	16,35+1,12	16,73+1,12
shear force level V1 / V1±	**a≤ 90 mm**		1,40+1,00	2,12+1,99	2,80+1,99	3,17+1,99	3,55+1,99	3,91+1,99	4,29+1,99	5,01+1,99	5,12+1,99
	a= 150 mm	≥ a_s [cm²] B500	2,52+1,00	3,82+1,99	5,05+1,99	5,71+1,99	6,40+1,99	7,04+1,99	7,72+1,99	9,01+1,99	9,22+1,99
	a= 260 mm		4,58+1,00	6,92+1,99	9,16+1,99	10,37+1,99	11,61+1,99	12,77+1,99	14,02+1,99	16,35+1,99	16,73+1,99
shear force level V2 / V2±	**a≤ 90 mm**		1,40+1,49	2,12+2,99	2,80+2,99	3,17+2,99	3,55+2,99	3,91+2,99	4,29+2,99	5,01+2,99	5,12+2,99
	a= 150 mm	≥ a_s [cm²] B500	2,52+1,49	3,82+2,99	5,05+2,99	5,71+2,99	6,40+2,99	7,04+2,99	7,72+2,99	9,01+2,99	9,22+2,99
	a= 260 mm		4,58+1,49	6,92+2,99	9,16+2,99	10,37+2,99	11,61+2,99	12,77+2,99	14,02+2,99	16,35+2,99	16,73+2,99
shear force level V3 / V3±	**a≤ 90 mm**		1,40+1,99	2,12+3,98	2,80+3,98	3,17+3,98	3,55+3,98	3,91+3,98	4,29+3,98	5,01+3,98	5,12+3,98
	a= 150 mm	≥ a_s [cm²] B500	2,52+1,99	3,82+3,98	5,05+3,98	5,71+3,98	6,40+3,98	7,04+3,98	7,72+3,98	9,01+3,98	9,22+3,98
	a= 260 mm		4,58+1,99	6,92+3,98	9,16+3,98	10,37+3,98	11,61+3,98	12,77+3,98	14,02+3,98	16,35+3,98	16,73+3,98
shear force level V4 / V4±	**a≤ 90 mm**		-	2,12+4,69	2,80+4,69	3,17+5,27	3,55+5,65	3,91+5,65	4,29+5,65	5,01+5,65	5,12+5,65
	a= 150 mm	≥ a_s [cm²] B500	-	3,82+4,69	5,05+4,69	5,71+5,27	6,40+5,65	7,04+5,65	7,72+5,65	9,01+5,65	9,22+5,65
	a= 260 mm		-	6,92+4,69	9,16+4,69	10,37+5,27	11,61+5,65	12,77+5,65	14,02+5,65	16,35+5,65	16,73+5,65
shear force level V6±	**a≤ 90 mm**		1,40+0,56	2,12+1,12	2,80+1,12	3,17+1,12	3,55+1,12	3,91+1,12	4,29+1,12	5,01+1,12	5,12+1,12
	a= 150 mm	≥ a_s [cm²] B500	2,52+0,56	3,82+1,12	5,05+1,12	5,71+1,12	6,40+1,12	7,04+1,12	7,72+1,12	9,01+1,12	9,22+1,12
	a= 260 mm		4,58+0,56	6,92+1,12	9,16+1,12	10,37+1,12	11,61+1,12	12,77+1,12	14,02+1,12	16,35+1,12	16,73+1,12
shear force level V7±	**a≤ 90 mm**		1,40+1,12	2,12+2,24	2,80+2,24	3,17+2,24	3,55+2,24	3,91+2,24	4,29+2,24	5,01+2,99	5,12+2,99
	a= 150 mm	≥ a_s [cm²] B500	2,52+1,12	3,82+2,24	5,05+2,24	5,71+2,24	6,40+2,24	7,04+2,24	7,72+2,24	9,01+2,99	9,22+2,99
	a= 260 mm		4,58+1,12	6,92+2,24	9,16+2,24	10,37+2,24	11,61+2,24	12,77+2,24	14,02+2,24	16,35+2,99	16,73+2,99
shear force level V8±	**a≤ 90 mm**		1,40+2,12	2,12+4,24	2,80+4,24	3,17+4,24	3,55+4,24	3,91+4,24	4,29+4,24	5,01+4,24	5,12+4,24
	a= 150 mm	≥ a_s [cm²] B500	2,52+2,12	3,82+4,24	5,05+4,24	5,71+4,24	6,40+4,24	7,04+4,24	7,72+4,24	9,01+4,24	9,22+4,24
	a= 260 mm		4,58+2,12	6,92+4,24	9,16+4,24	10,37+4,24	11,61+4,24	12,77+4,24	14,02+4,24	16,35+4,24	16,73+4,24

MXL-HVS: minimum width of joist b_w 220 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	1,25	1,89	2,50	2,83	3,17	3,49	3,82	4,46	4,56
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	2,25	3,41	4,51	5,10	5,71	6,28	6,88	8,03	8,22
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	4,09	6,18	8,18	9,25	10,35	11,39	12,49	14,58	14,91
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**a≤ 90 mm**		1,25+0,56	1,89+1,12	2,50+1,12	2,83+1,12	3,17+1,12	3,49+1,12	3,82+1,12	4,46+1,12	4,56+1,12
	a= 150 mm	≥ a_s [cm²] B500	2,25+0,56	3,41+1,12	4,51+1,12	5,10+1,12	5,71+1,12	6,28+1,12	6,88+1,12	8,03+1,12	8,22+1,12
	a= 260 mm		4,09+0,56	6,18+1,12	8,18+1,12	9,25+1,12	10,35+1,12	11,39+1,12	12,49+1,12	14,58+1,12	14,91+1,12
shear force level V1 / V1±	**a≤ 90 mm**		1,25+1,00	1,89+1,99	2,50+1,99	2,83+1,99	3,17+1,99	3,49+1,99	3,82+1,99	4,46+1,99	4,56+1,99
	a= 150 mm	≥ a_s [cm²] B500	2,25+1,00	3,41+1,99	4,51+1,99	5,10+1,99	5,71+1,99	6,28+1,99	6,88+1,99	8,03+1,99	8,22+1,99
	a= 260 mm		4,09+1,00	6,18+1,99	8,18+1,99	9,25+1,99	10,35+1,99	11,39+1,99	12,49+1,99	14,58+1,99	14,91+1,99
shear force level V2 / V2±	**a≤ 90 mm**		1,25+1,49	1,89+2,99	2,50+2,99	2,83+2,99	3,17+2,99	3,49+2,99	3,82+2,99	4,46+2,99	4,56+2,99
	a= 150 mm	≥ a_s [cm²] B500	2,25+1,49	3,41+2,99	4,51+2,99	5,10+2,99	5,71+2,99	6,28+2,99	6,88+2,99	8,03+2,99	8,22+2,99
	a= 260 mm		4,09+1,49	6,18+2,99	8,18+2,99	9,25+2,99	10,35+2,99	11,39+2,99	12,49+2,99	14,58+2,99	14,91+2,99
shear force level V3 / V3±	**a≤ 90 mm**		1,25+1,99	1,89+3,98	2,50+3,98	2,83+3,98	3,17+3,98	3,49+3,98	3,82+3,98	4,46+3,98	4,56+3,98
	a= 150 mm	≥ a_s [cm²] B500	2,25+1,99	3,41+3,98	4,51+3,98	5,10+3,98	5,71+3,98	6,28+3,98	6,88+3,98	8,03+3,98	8,22+3,98
	a= 260 mm		4,09+1,99	6,18+3,98	8,18+3,98	9,25+3,98	10,35+3,98	11,39+3,98	12,49+3,98	14,58+3,98	14,91+3,98
shear force level V4 / V4±	**a≤ 90 mm**		-	1,89+4,69	2,50+4,69	2,83+5,27	3,17+5,65	3,49+5,65	3,82+5,65	4,46+5,65	4,56+5,65
	a= 150 mm	≥ a_s [cm²] B500	-	3,41+4,69	4,51+4,69	5,10+5,27	5,71+5,65	6,28+5,65	6,88+5,65	8,03+5,65	8,22+5,65
	a= 260 mm		-	6,18+4,69	8,18+4,69	9,25+5,27	10,35+5,65	11,39+5,65	12,49+5,65	14,58+5,65	14,91+5,65
shear force level V6±	**a≤ 90 mm**		1,25+0,56	1,89+1,12	2,50+1,12	2,83+1,12	3,17+1,12	3,49+1,12	3,82+1,12	4,46+1,12	4,56+1,12
	a= 150 mm	≥ a_s [cm²] B500	2,25+0,56	3,41+1,12	4,51+1,12	5,10+1,12	5,71+1,12	6,28+1,12	6,88+1,12	8,03+1,12	8,22+1,12
	a= 260 mm		4,09+0,56	6,18+1,12	8,18+1,12	9,25+1,12	10,35+1,12	11,39+1,12	12,49+1,12	14,58+1,12	14,91+1,12
shear force level V7±	**a≤ 90 mm**		1,25+1,12	1,89+2,24	2,50+2,24	2,83+2,24	3,17+2,24	3,49+2,24	3,82+2,24	4,46+2,99	4,56+2,99
	a= 150 mm	≥ a_s [cm²] B500	2,25+1,12	3,41+2,24	4,51+2,24	5,10+2,24	5,71+2,24	6,28+2,24	6,88+2,24	8,03+2,99	8,22+2,99
	a= 260 mm		4,09+1,12	6,18+2,24	8,18+2,24	9,25+2,24	10,35+2,24	11,39+2,24	12,49+2,24	14,58+2,99	14,91+2,99
shear force level V8±	**a≤ 90 mm**		1,25+2,12	1,89+4,24	2,50+4,24	2,83+4,24	3,17+4,24	3,49+4,24	3,82+4,24	4,46+4,24	4,56+4,24
	a= 150 mm	≥ a_s [cm²] B500	2,25+2,12	3,41+4,24	4,51+4,24	5,10+4,24	5,71+4,24	6,28+4,24	6,88+4,24	8,03+4,24	8,22+4,24
	a= 260 mm		4,09+2,12	6,18+4,24	8,18+4,24	9,25+4,24	10,35+4,24	11,39+4,24	12,49+4,24	14,58+4,24	14,91+4,24

Egcobox type HVS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000

MXL-HVS: minimum width of joist b_w 250 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	1,08	1,63	2,16	2,44	2,73	3,00	3,29	3,84	3,92
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	1,94	2,93	3,88	4,38	4,91	5,40	5,92	6,91	7,06
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,52	5,32	7,04	7,96	8,91	9,80	10,74	12,53	12,82
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+0,56	1,63+1,12	2,16+1,12	2,44+1,12	2,73+1,12	3,00+1,12	3,29+1,12	3,84+1,12	3,92+1,12
	a= 150 mm		1,94+0,56	2,93+1,12	3,88+1,12	4,38+1,12	4,91+1,12	5,40+1,12	5,92+1,12	6,91+1,12	7,06+1,12
	a= 260 mm		3,52+0,56	5,32+1,12	7,04+1,12	7,96+1,12	8,91+1,12	9,80+1,12	10,74+1,12	12,53+1,12	12,82+1,12
shear force level V1 / V1±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+1,00	1,63+1,99	2,16+1,99	2,44+1,99	2,73+1,99	3,00+1,99	3,29+1,99	3,84+1,99	3,92+1,99
	a= 150 mm		1,94+1,00	2,93+1,99	3,88+1,99	4,38+1,99	4,91+1,99	5,40+1,99	5,92+1,99	6,91+1,99	7,06+1,99
	a= 260 mm		3,52+1,00	5,32+1,99	7,04+1,99	7,96+1,99	8,91+1,99	9,80+1,99	10,74+1,99	12,53+1,99	12,82+1,99
shear force level V2 / V2±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+1,49	1,63+2,99	2,16+2,99	2,44+2,99	2,73+2,99	3,00+2,99	3,29+2,99	3,84+2,99	3,92+2,99
	a= 150 mm		1,94+1,49	2,93+2,99	3,88+2,99	4,38+2,99	4,91+2,99	5,40+2,99	5,92+2,99	6,91+2,99	7,06+2,99
	a= 260 mm		3,52+1,49	5,32+2,99	7,04+2,99	7,96+2,99	8,91+2,99	9,80+2,99	10,74+2,99	12,53+2,99	12,82+2,99
shear force level V3 / V3±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+1,99	1,63+3,98	2,16+3,98	2,44+3,98	2,73+3,98	3,00+3,98	3,29+3,98	3,84+3,98	3,92+3,98
	a= 150 mm		1,94+1,99	2,93+3,98	3,88+3,98	4,38+3,98	4,91+3,98	5,40+3,98	5,92+3,98	6,91+3,98	7,06+3,98
	a= 260 mm		3,52+1,99	5,32+3,98	7,04+3,98	7,96+3,98	8,91+3,98	9,80+3,98	10,74+3,98	12,53+3,98	12,82+3,98
shear force level V4 / V4±	**a≤ 90 mm**	≥ a_s [cm²] B500	-	1,63+4,69	2,16+4,69	2,44+5,27	2,73+5,65	3,00+5,65	3,29+5,65	3,84+5,65	3,92+5,65
	a= 150 mm		-	2,93+4,69	3,88+4,69	4,38+5,27	4,91+5,65	5,40+5,65	5,92+5,65	6,91+5,65	7,06+5,65
	a= 260 mm		-	5,32+4,69	7,04+4,69	7,96+5,27	8,91+5,65	9,80+5,65	10,74+5,65	12,53+5,65	12,82+5,65
shear force level V6±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+0,56	1,63+1,12	2,16+1,12	2,44+1,12	2,73+1,12	3,00+1,12	3,29+1,12	3,84+1,12	3,92+1,12
	a= 150 mm		1,94+0,56	2,93+1,12	3,88+1,12	4,38+1,12	4,91+1,12	5,40+1,12	5,92+1,12	6,91+1,12	7,06+1,12
	a= 260 mm		3,52+0,56	5,32+1,12	7,04+1,12	7,96+1,12	8,91+1,12	9,80+1,12	10,74+1,12	12,53+1,12	12,82+1,12
shear force level V7±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+1,12	1,63+2,24	2,16+2,24	2,44+2,24	2,73+2,24	3,00+2,24	3,29+2,24	3,84+2,99	3,92+2,99
	a= 150 mm		1,94+1,12	2,93+2,24	3,88+2,24	4,38+2,24	4,91+2,24	5,40+2,24	5,92+2,24	6,91+2,99	7,06+2,99
	a= 260 mm		3,52+1,12	5,32+2,24	7,04+2,24	7,96+2,24	8,91+2,24	9,80+2,24	10,74+2,24	12,53+2,99	12,82+2,99
shear force level V8±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+2,12	1,63+4,24	2,16+4,24	2,44+4,24	2,73+4,24	3,00+4,24	3,29+4,24	3,84+4,24	3,92+4,24
	a= 150 mm		1,94+2,12	2,93+4,24	3,88+4,24	4,38+4,24	4,91+4,24	5,40+4,24	5,92+4,24	6,91+4,24	7,06+4,24
	a= 260 mm		3,52+2,12	5,32+4,24	7,04+4,24	7,96+4,24	8,91+4,24	9,80+4,24	10,74+4,24	12,53+4,24	12,82+4,24

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The dimension of the balcony offset HV [mm] must be specified in the element name, e.g. MXL20-HVS120-C35-h200.

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox^{cv} (height Egcobox^{cv} = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}. The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox^{cv}. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

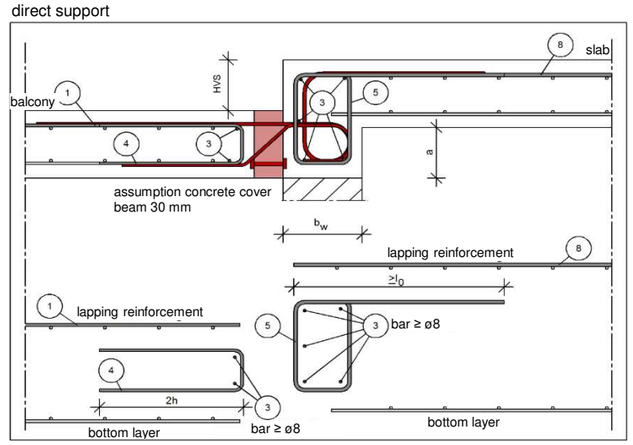
Item ⑤ or item ⑥ applies to the specified required minimum widths of the joist (b_w) and the height of the offset (a= 50 mm; a=100 mm; a= 200 mm). For larger joist widths, a reduction of the required reinforcement is possible.
In between, interpolation is possible; recommended minimum reinforcement ø6/250 mm.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.
For low offset heights ≤90 mm (connection height Egcobox from 160 mm) to 230 mm (connection height 300 mm), the use of Egcobox® standard elements without height offset is recommended as an alternative.

Item ⑧ must be verified and planned by the structural engineer (corresponds to item ① for slab thickness = balcony slab thickness;
for slab thickness ≠ balcony slab thickness, an allowance is required or reduction is possible). The load transmission into the slab must be verified by the structural engineer.

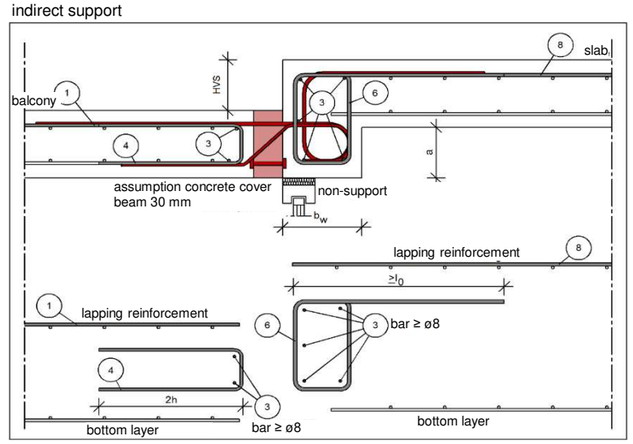
The specifications apply to good bonding conditions.

The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox$^{®}$ reinforcement and the required minimum beam widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the beam width.

design proposal
direct support



indirect support



On-site reinforcement Egcobox® type MXL-WOS - C25/30

for balconies with overlap in wall upwards

Egcobox type WOS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist b_w [mm]			175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612
item ① - lapping reinforcement / element											
≥ as [cm²] B500			2,79	4,22	5,59	6,28	7,04	7,74	8,44	9,85	10,08
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12
item ② - balcony-side suspension reinforcement shear force / element											
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,69	4,69	5,27	5,65	5,65	5,65	5,65	5,65
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	1,12	2,24	2,24	2,24	2,24	2,24	2,24	2,99	2,99
shear force level	V8±	≥ a_s [cm²] B500	2,12	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24

MXL-WOS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)											
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,98	2,99	3,96	4,49	5,03	5,53	6,08	7,09	7,25
height	**h= 250 mm**	≥ a_s [cm²] B500	3,96	5,99	7,92	8,98	10,05	11,06	12,15	14,18	14,50
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**h= 160 mm**	≥ a_s [cm²] B500	1,98+0,56	2,99+1,12	3,96+1,12	4,49+1,12	5,03+1,12	5,53+1,12	6,08+1,12	7,09+1,12	7,25+1,12
	h= 250 mm		3,96+0,56	5,99+1,12	7,92+1,12	8,98+1,12	10,05+1,12	11,06+1,12	12,15+1,12	14,18+1,12	14,50+1,12
shear force level V1 / V1±	**h= 160 mm**	≥ a_s [cm²] B500	1,98+1,00	2,99+1,99	3,96+1,99	4,49+1,99	5,03+1,99	5,53+1,99	6,08+1,99	7,09+1,99	7,25+1,99
	h= 250 mm		3,96+1,00	5,99+1,99	7,92+1,99	8,98+1,99	10,05+1,99	11,06+1,99	12,15+1,99	14,18+1,99	14,50+1,99
shear force level V2 / V2±	**h= 160 mm**	≥ a_s [cm²] B500	1,98+1,49	2,99+2,99	3,96+2,99	4,49+2,99	5,03+2,99	5,53+2,99	6,08+2,99	7,09+2,99	7,25+2,99
	h= 250 mm		3,96+1,49	5,99+2,99	7,92+2,99	8,98+2,99	10,05+2,99	11,06+2,99	12,15+2,99	14,18+2,99	14,50+2,99
shear force level V3 / V3±	**h= 160 mm**	≥ a_s [cm²] B500	1,98+1,99	2,99+3,98	3,96+3,98	4,49+3,98	5,03+3,98	5,53+3,98	6,08+3,98	7,09+3,98	7,25+3,98
	h= 250 mm		3,96+1,99	5,99+3,98	7,92+3,98	8,98+3,98	10,05+3,98	11,06+3,98	12,15+3,98	14,18+3,98	14,50+3,98
shear force level V4 / V4±	**h= 160 mm**	≥ a_s [cm²] B500	-	2,99+4,69	3,96+4,69	4,49+5,27	5,03+5,65	5,53+5,65	6,08+5,65	7,09+5,65	7,25+5,65
	h= 250 mm		-	5,99+4,69	7,92+4,69	8,98+5,27	10,05+5,65	11,06+5,65	12,15+5,65	14,18+5,65	14,50+5,65
shear force level V6±	**h= 160 mm**	≥ a_s [cm²] B500	1,98+0,56	2,99+1,12	3,96+1,12	4,49+1,12	5,03+1,12	5,53+1,12	6,08+1,12	7,09+1,12	7,25+1,12
	h= 250 mm		3,96+0,56	5,99+1,12	7,92+1,12	8,98+1,12	10,05+1,12	11,06+1,12	12,15+1,12	14,18+1,12	14,50+1,12
shear force level V7±	**h= 160 mm**	≥ a_s [cm²] B500	1,98+1,12	2,99+2,24	3,96+2,24	4,49+2,24	5,03+2,24	5,53+2,24	6,08+2,24	7,09+2,99	7,25+2,99
	h= 250 mm		3,96+1,12	5,99+2,24	7,92+2,24	8,98+2,24	10,05+2,24	11,06+2,24	12,15+2,24	14,18+2,99	14,50+2,99
shear force level V8±	**h= 160 mm**	≥ a_s [cm²] B500	1,98+2,12	2,99+4,24	3,96+4,24	4,49+4,24	5,03+4,24	5,53+4,24	6,08+4,24	7,09+4,24	7,25+4,24
	h= 250 mm		3,96+2,12	5,99+4,24	7,92+4,24	8,98+4,24	10,05+4,24	11,06+4,24	12,15+4,24	14,18+4,24	14,50+4,24

MXL-WOS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)											
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,68	2,54	3,37	3,81	4,26	4,69	5,15	6,01	6,15
height	**h= 250 mm**	≥ a_s [cm²] B500	3,37	5,09	6,73	7,62	8,53	9,38	10,30	12,01	12,29
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**h= 160 mm**	≥ a_s [cm²] B500	1,68+0,56	2,54+1,12	3,37+1,12	3,81+1,12	4,26+1,12	4,69+1,12	5,15+1,12	6,01+1,12	6,15+1,12
	h= 250 mm		3,37+0,56	5,09+1,12	6,73+1,12	7,62+1,12	8,53+1,12	9,38+1,12	10,30+1,12	12,01+1,12	12,29+1,12
shear force level V1 / V1±	**h= 160 mm**	≥ a_s [cm²] B500	1,68+1,00	2,54+1,99	3,37+1,99	3,81+1,99	4,26+1,99	4,69+1,99	5,15+1,99	6,01+1,99	6,15+1,99
	h= 250 mm		3,37+1,00	5,09+1,99	6,73+1,99	7,62+1,99	8,53+1,99	9,38+1,99	10,30+1,99	12,01+1,99	12,29+1,99
shear force level V2 / V2±	**h= 160 mm**	≥ a_s [cm²] B500	1,68+1,49	2,54+2,99	3,37+2,99	3,81+2,99	4,26+2,99	4,69+2,99	5,15+2,99	6,01+2,99	6,15+2,99
	h= 250 mm		3,37+1,49	5,09+2,99	6,73+2,99	7,62+2,99	8,53+2,99	9,38+2,99	10,30+2,99	12,01+2,99	12,29+2,99
shear force level V3 / V3±	**h= 160 mm**	≥ a_s [cm²] B500	1,68+1,99	2,54+3,98	3,37+3,98	3,81+3,98	4,26+3,98	4,69+3,98	5,15+3,98	6,01+3,98	6,15+3,98
	h= 250 mm		3,37+1,99	5,09+3,98	6,73+3,98	7,62+3,98	8,53+3,98	9,38+3,98	10,30+3,98	12,01+3,98	12,29+3,98
shear force level V4 / V4±	**h= 160 mm**	≥ a_s [cm²] B500	-	2,54+4,69	3,37+4,69	3,81+5,27	4,26+5,65	4,69+5,65	5,15+5,65	6,01+5,65	6,15+5,65
	h= 250 mm		-	5,09+4,69	6,73+4,69	7,62+5,27	8,53+5,65	9,38+5,65	10,30+5,65	12,01+5,65	12,29+5,65
shear force level V6±	**h= 160 mm**	≥ a_s [cm²] B500	1,68+0,56	2,54+1,12	3,37+1,12	3,81+1,12	4,26+1,12	4,69+1,12	5,15+1,12	6,01+1,12	6,15+1,12
	h= 250 mm		3,37+0,56	5,09+1,12	6,73+1,12	7,62+1,12	8,53+1,12	9,38+1,12	10,30+1,12	12,01+1,12	12,29+1,12
shear force level V7±	**h= 160 mm**	≥ a_s [cm²] B500	1,68+1,12	2,54+2,24	3,37+2,24	3,81+2,24	4,26+2,24	4,69+2,24	5,15+2,24	6,01+2,99	6,15+2,99
	h= 250 mm		3,37+1,12	5,09+2,24	6,73+2,24	7,62+2,24	8,53+2,24	9,38+2,24	10,30+2,24	12,01+2,99	12,29+2,99
shear force level V8±	**h= 160 mm**	≥ a_s [cm²] B500	1,68+2,12	2,54+4,24	3,37+4,24	3,81+4,24	4,26+4,24	4,69+4,24	5,15+4,24	6,01+4,24	6,15+4,24
	h= 250 mm		3,37+2,12	5,09+4,24	6,73+4,24	7,62+4,24	8,53+4,24	9,38+4,24	10,30+4,24	12,01+4,24	12,29+4,24

Egcobox Typ WOS	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
Elementlänge l [mm]	500	1000	1000	1000	1000	1000	1000	1000	1000

MXL-WOS: minimum width of joist b_w 220 mm (concrete cover 30 mm)

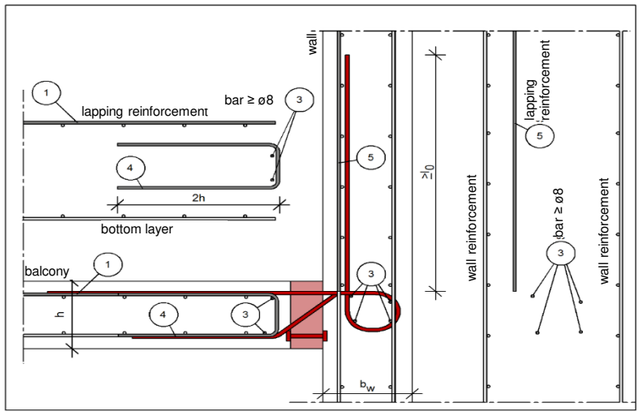
item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)										
connection	h= 160 mm	≥ a_s [cm²] B500	1,50	2,27	3,00	3,40	3,80	4,18	4,59	5,35	5,48
height	h= 250 mm	≥ a_s [cm²] B500	3,00	4,54	6,01	6,79	7,61	8,37	9,18	10,71	10,95
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)										
shear force level VS	h= 160 mm	≥ a_s [cm²] B500	1,50+0,56	2,27+1,12	3,00+1,12	3,40+1,12	3,80+1,12	4,18+1,12	4,59+1,12	5,35+1,12	5,48+1,12
/ VS±	h= 250 mm		3,00+0,56	4,54+1,12	6,01+1,12	6,79+1,12	7,61+1,12	8,37+1,12	9,18+1,12	10,71+1,12	10,95+1,12
shear force level V1	h= 160 mm	≥ a_s [cm²] B500	1,50+1,00	2,27+1,99	3,00+1,99	3,40+1,99	3,80+1,99	4,18+1,99	4,59+1,99	5,35+1,99	5,48+1,99
/ V1±	h= 250 mm		3,00+1,00	4,54+1,99	6,01+1,99	6,79+1,99	7,61+1,99	8,37+1,99	9,18+1,99	10,71+1,99	10,95+1,99
shear force level V2	h= 160 mm	≥ a_s [cm²] B500	1,50+1,49	2,27+2,99	3,00+2,99	3,40+2,99	3,80+2,99	4,18+2,99	4,59+2,99	5,35+2,99	5,48+2,99
/ V2±	h= 250 mm		3,00+1,49	4,54+2,99	6,01+2,99	6,79+2,99	7,61+2,99	8,37+2,99	9,18+2,99	10,71+2,99	10,95+2,99
shear force level V3	h= 160 mm	≥ a_s [cm²] B500	1,50+1,99	2,27+3,98	3,00+3,98	3,40+3,98	3,80+3,98	4,18+3,98	4,59+3,98	5,35+3,98	5,48+3,98
/ V3±	h= 250 mm		3,00+1,99	4,54+3,98	6,01+3,98	6,79+3,98	7,61+3,98	8,37+3,98	9,18+3,98	10,71+3,98	10,95+3,98
shear force level V4	h= 160 mm	≥ a_s [cm²] B500	-	2,27+4,69	3,00+4,69	3,40+5,27	3,80+5,65	4,18+5,65	4,59+5,65	5,35+5,65	5,48+5,65
/ V4±	h= 250 mm		-	4,54+4,69	6,01+4,69	6,79+5,27	7,61+5,65	8,37+5,65	9,18+5,65	10,71+5,65	10,95+5,65
shear force level	h= 160 mm	≥ a_s [cm²] B500	1,50+0,56	2,27+1,12	3,00+1,12	3,40+1,12	3,80+1,12	4,18+1,12	4,59+1,12	5,35+1,12	5,48+1,12
V6±	h= 250 mm		3,00+0,56	4,54+1,12	6,01+1,12	6,79+1,12	7,61+1,12	8,37+1,12	9,18+1,12	10,71+1,12	10,95+1,12
shear force level	h= 160 mm	≥ a_s [cm²] B500	1,50+1,12	2,27+2,24	3,00+2,24	3,40+2,24	3,80+2,24	4,18+2,24	4,59+2,24	5,35+2,99	5,48+2,99
V7±	h= 250 mm		3,00+1,12	4,54+2,24	6,01+2,24	6,79+2,24	7,61+2,24	8,37+2,24	9,18+2,24	10,71+2,99	10,95+2,99
shear force level	h= 160 mm	≥ a_s [cm²] B500	1,50+2,12	2,27+4,24	3,00+4,24	3,40+4,24	3,80+4,24	4,18+4,24	4,59+4,24	5,35+4,24	5,48+4,24
V8±	h= 250 mm		3,00+2,12	4,54+4,24	6,01+4,24	6,79+4,24	7,61+4,24	8,37+4,24	9,18+4,24	10,71+4,24	10,95+4,24

MXL-WOS: minimum width of joist b_w 250 mm (concrete cover 30 mm)

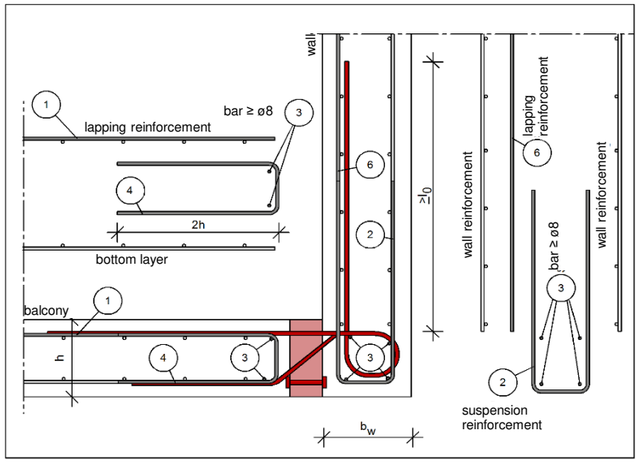
item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)										
connection	h= 160 mm	≥ a_s [cm²] B500	1,29	1,95	2,59	2,92	3,27	3,60	3,95	4,60	4,71
height	h= 250 mm	≥ a_s [cm²] B500	2,59	3,91	5,17	5,85	6,55	7,20	7,89	9,21	9,42
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)										
shear force level VS	h= 160 mm	≥ a_s [cm²] B500	1,29+0,56	1,95+1,12	2,59+1,12	2,92+1,12	3,27+1,12	3,60+1,12	3,95+1,12	4,60+1,12	4,71+1,12
/ VS±	h= 250 mm		2,59+0,56	3,91+1,12	5,17+1,12	5,85+1,12	6,55+1,12	7,20+1,12	7,89+1,12	9,21+1,12	9,42+1,12
shear force level V1	h= 160 mm	≥ a_s [cm²] B500	1,29+1,00	1,95+1,99	2,59+1,99	2,92+1,99	3,27+1,99	3,60+1,99	3,95+1,99	4,60+1,99	4,71+1,99
/ V1±	h= 250 mm		2,59+1,00	3,91+1,99	5,17+1,99	5,85+1,99	6,55+1,99	7,20+1,99	7,89+1,99	9,21+1,99	9,42+1,99
shear force level V2	h= 160 mm	≥ a_s [cm²] B500	1,29+1,49	1,95+2,99	2,59+2,99	2,92+2,99	3,27+2,99	3,60+2,99	3,95+2,99	4,60+2,99	4,71+2,99
/ V2±	h= 250 mm		2,59+1,49	3,91+2,99	5,17+2,99	5,85+2,99	6,55+2,99	7,20+2,99	7,89+2,99	9,21+2,99	9,42+2,99
shear force level V3	h= 160 mm	≥ a_s [cm²] B500	1,29+1,99	1,95+3,98	2,59+3,98	2,92+3,98	3,27+3,98	3,60+3,98	3,95+3,98	4,60+3,98	4,71+3,98
/ V3±	h= 250 mm		2,59+1,99	3,91+3,98	5,17+3,98	5,85+3,98	6,55+3,98	7,20+3,98	7,89+3,98	9,21+3,98	9,42+3,98
shear force level V4	h= 160 mm	≥ a_s [cm²] B500	-	1,95+4,69	2,59+4,69	2,92+5,27	3,27+5,65	3,60+5,65	3,95+5,65	4,60+5,65	4,71+5,65
/ V4±	h= 250 mm		-	3,91+4,69	5,17+4,69	5,85+5,27	6,55+5,65	7,20+5,65	7,89+5,65	9,21+5,65	9,42+5,65
shear force level	h= 160 mm	≥ a_s [cm²] B500	1,29+0,56	1,95+1,12	2,59+1,12	2,92+1,12	3,27+1,12	3,60+1,12	3,95+1,12	4,60+1,12	4,71+1,12
V6±	h= 250 mm		2,59+0,56	3,91+1,12	5,17+1,12	5,85+1,12	6,55+1,12	7,20+1,12	7,89+1,12	9,21+1,12	9,42+1,12
shear force level	h= 160 mm	≥ a_s [cm²] B500	1,29+1,12	1,95+2,24	2,59+2,24	2,92+2,24	3,27+2,24	3,60+2,24	3,95+2,24	4,60+2,99	4,71+2,99
V7±	h= 250 mm		2,59+1,12	3,91+2,24	5,17+2,24	5,85+2,24	6,55+2,24	7,20+2,24	7,89+2,24	9,21+2,99	9,42+2,99
shear force level	h= 160 mm	≥ a_s [cm²] B500	1,29+2,12	1,95+4,24	2,59+4,24	2,92+4,24	3,27+4,24	3,60+4,24	3,95+4,24	4,60+4,24	4,71+4,24
V8±	h= 250 mm		2,59+2,12	3,91+4,24	5,17+4,24	5,85+4,24	6,55+4,24	7,20+4,24	7,89+4,24	9,21+4,24	9,42+4,24

design proposal

direct support



indirect support



item ③+④ - structural reinforcement

In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox[®] (height Egcobox[®] = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox[®]. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ or item ⑥ applies to the specified required minimum widths of the wall (b_w) and the connection height (h) of the Egcobox.
In between, interpolation can be performed. For larger wall widths, a reduction of the required reinforcement is possible.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.

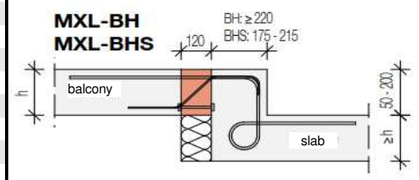
The specifications apply to good bonding conditions.

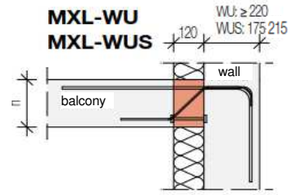
The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox® reinforcement and the required minimum wall widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the wall width.

Design table Egcobox® type MXL -BH / -WU / -BHS / -WUS - C25/30

for cantilever slabs with height offset or wall connection for transmission of moment and shear force, insulation 120 mm

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
									-BH / -WU / -BHS / -WUS							
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			M_{Rd} [kNm/element]												
	C30	C35	C50													
height of connection [mm] good bonding conditions		**160**	175	-10,5	-15,8	-21,1	-22,9	-26,3	-28,6	-31,6	-36,8	-40,6	-44,7	-48,1	-48,8	-52,8
	160	165	**180**	-11,1	-16,7	-22,3	-24,3	-27,8	-30,3	-33,4	-39,0	-43,0	-47,3	-51,0	-51,6	-55,9
	165	170	185	-11,7	-17,6	-23,5	-25,6	-29,4	-32,0	-35,2	-41,1	-45,4	-50,0	-53,8	-54,5	-59,0
	170	175	190	-12,4	-18,5	-24,7	-26,9	-30,9	-33,6	-37,1	-43,3	-47,8	-52,6	-56,6	-57,4	-62,1
	175	**180**	195	-13,0	-19,5	-25,9	-28,2	-32,4	-35,3	-38,9	-45,4	-50,2	-55,2	-59,5	-60,2	-65,3
	180	185	**200**	-13,6	-20,4	-27,2	-29,6	-34,0	-37,0	-40,8	-47,5	-52,6	-57,8	-62,3	-63,1	-68,4
	185	190	205	-14,2	-21,3	-28,4	-30,9	-35,5	-38,6	-42,6	-49,7	-55,0	-60,5	-65,1	-66,0	-71,5
	190	195	210	-14,8	-22,2	-29,6	-32,2	-37,0	-40,3	-44,4	-51,8	-57,4	-63,1	-68,0	-68,8	-74,6
	195	**200**	215	-15,4	-23,1	-30,8	-33,6	-38,6	-42,0	-46,3	-54,0	-59,8	-65,7	-70,8	-71,7	-77,7
	200	205	**220**	-16,0	-24,0	-32,1	-34,9	-40,1	-43,6	-48,1	-56,1	-62,1	-68,4	-73,6	-74,6	-80,8
	205	210	225	-16,6	-25,0	-33,3	-36,2	-41,6	-45,3	-49,9	-58,3	-64,5	-71,0	-76,4	-77,4	-83,9
	210	215	230	-17,3	-25,9	-34,5	-37,6	-43,1	-47,0	-51,8	-60,4	-66,9	-73,6	-79,3	-80,3	-87,0
	215	**220**	235	-17,9	-26,8	-35,7	-38,9	-44,7	-48,6	-53,6	-62,5	-69,3	-76,3	-82,1	-83,2	-90,1
	220	225	**240**	-18,5	-27,7	-37,0	-40,2	-46,2	-50,3	-55,4	-64,7	-71,7	-78,9	-84,9	-86,1	-93,2
	225	230	245	-19,1	-28,6	-38,2	-41,6	-47,7	-52,0	-57,3	-66,8	-74,1	-81,5	-87,8	-88,9	-96,3
	230	235	250	-19,7	-29,6	-39,4	-42,9	-49,3	-53,6	-59,1	-69,0	-76,5	-84,1	-90,6	-91,8	-99,4
	235	**240**	255	-20,3	-30,5	-40,6	-44,2	-50,8	-55,3	-60,9	-71,1	-78,9	-86,8	-93,4	-94,7	-102,5
	240	245	**260**	-20,9	-31,4	-41,9	-45,6	-52,3	-57,0	-62,8	-73,2	-81,3	-89,4	-96,3	-97,5	-105,7
	245	250	265	-21,5	-32,3	-43,1	-46,9	-53,8	-58,6	-64,6	-75,4	-83,7	-92,0	-99,1	-100,4	-108,8
	250	255	270	-22,2	-33,2	-44,3	-48,2	-55,4	-60,3	-66,5	-77,5	-86,1	-94,7	-101,9	-103,3	-111,9
	255	**260**	275	-22,8	-34,1	-45,5	-49,6	-56,9	-62,0	-68,3	-79,7	-88,4	-97,3	-104,8	-106,1	-115,0
	260	265	**280**	-23,4	-35,1	-46,8	-50,9	-58,4	-63,6	-70,1	-81,8	-90,8	-99,9	-107,6	-109,0	-118,1
	265	270	285	-24,0	-36,0	-48,0	-52,2	-60,0	-65,3	-72,0	-84,0	-93,2	-102,5	-110,4	-111,9	-121,2
	270	275	290	-24,6	-36,9	-49,2	-53,6	-61,5	-67,0	-73,8	-86,1	-95,6	-105,2	-113,3	-114,7	-124,3
	275	**280**	295	-25,2	-37,8	-50,4	-54,9	-63,0	-68,6	-75,6	-88,2	-98,0	-107,8	-116,1	-117,6	-127,4
	280	285	**300**	-25,8	-38,7	-51,6	-56,2	-64,6	-70,3	-77,5	-90,4	-100,4	-110,4	-118,9	-120,5	-130,5
	285	290		-26,4	-39,7	-52,9	-57,6	-66,1	-72,0	-79,3	-92,5	-102,8	-113,1	-121,8	-123,3	-133,6
	290	295		-27,0	-40,6	-54,1	-58,9	-67,6	-73,6	-81,1	-94,7	-105,2	-115,7	-124,6	-126,2	-136,7
	295	**300**		-27,7	-41,5	-55,3	-60,2	-69,1	-75,3	-83,0	-96,8	-107,6	-118,3	-127,4	-129,1	-139,8
	300			-28,3	-42,4	-56,5	-61,6	-70,7	-77,0	-84,8	-98,9	-110,0	-121,0	-130,2	-131,9	-142,9





Shear force level		concrete cover [mm]			V_{Rd} [kN/element]												
		C30	C35	C50													
height of connection [mm] good bonding conditions	VS	160-190	160-195	175-210	18,2	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5	36,5
		195-300	200-300	215-300	24,3	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7	48,7
	V1	160-190	160-195	175-210	32,4	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9	64,9
		195-300	200-300	215-300	43,3	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5	86,5
	V2	160-190	160-195	175-210	48,6	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3	97,3
		195-300	200-300	215-300	64,9	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8	129,8
	V3	160-190	160-195	175-210	64,9	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7	129,7
		195-300	200-300	215-300	86,5	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1	173,1
	V4	175-190	180-195	195-210	-	156,9	156,9	156,9	196,2	196,2	202,7	202,7	202,7	202,7	202,7	202,7	202,7
		195-300	200-300	215-300	-	210,7	210,7	210,7	245,8	245,8	245,8	245,8	245,8	245,8	245,8	245,8	245,8
	V6±	160-190	160-195	175-210	+18,2/ -18,2	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5	+36,5/ -36,5
		195-300	200-300	215-300	+24,3/ -24,3	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7	+48,7/ -48,7
	V7±	160-190	160-195	175-210	+36,5/ -27,4	+73/ -54,7	+73/ -54,7	+73/ -54,7	+73/ -54,7	+73/ -54,7	+73/ -54,7	+97,3/ -64,9	+97,3/ -64,9	+97,3/ -64,9	+97,3/ -64,9	+97,3/ -64,9	+97,3/ -64,9
		195-300	200-300	215-300	+48,7/ -36,5	+97,4/ -73	+97,4/ -73	+97,4/ -73	+97,4/ -73	+97,4/ -73	+97,4/ -73	+129,8/ -86,5	+129,8/ -86,5	+129,8/ -86,5	+129,8/ -86,5	+129,8/ -86,5	+129,8/ -86,5
	V8±	175-190	180-195	195-210	+76/ -76	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152	+152/ -152
		195-300	200-300	215-300	+92,2/ -92,2	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4	+184,4/ -184,4

Shear force level VS to V4 also possible with lifting shear force (-18.2 or -24.3 kN/element depending on height of connection/concrete cover) (designation: VS±, V1±, V2±, V3± or V4±)

Reinforcement Egcobox® type MXL -BH / -WU / -BHS / -WUS

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
	-BH / -WU / -BHS / -WUS												
length of element [mm]	500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
wall / beam width b_w: -HV / - WO / -BH / -WU [mm]	≥ 220												
wall / beam width b_w: -BHS / -WUS [mm]	175 ≤ b_w < 220												
tensile bars	4 ø 8	6 ø 8	8 ø 8	9 ø 8	10 ø 8	11 ø 8	12 ø 8	14 ø 8	10 ø 10	11 ø 10	12 ø 10	12 ø 10	13 ø 10
length of tensile bars [mm]	depending on bending form												
compression bearings	2 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	11 ø 12	12 ø 12
shear force bars VS	2 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6
shear force bars V1	2 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8
shear force bars V2	3 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8
shear force bars V3	4 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8
shear force bars V4	-	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10
shear force bars VS±	-	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6
shear force bars V1±	-	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6
shear force bars V2±	-	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6
shear force bars V3±	-	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6
shear force bars V4±	-	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6
shear force bars V6±	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6
shear force bars V7±	4 ø6 / 3 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8
shear force bars V8±	3 ø10 / 3 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10
applicable expansion joint distances [m]	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL -BH / -WU / -BHS / -WUS

height of connection [mm] good bonding conditions	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
				-BH / -WU / -BHS / -WUS												
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			banking factor k [1/kNm]												
	C30	**C35**	**C50**													
		160	175	1,625	1,009	0,813	0,747	0,650	0,607	0,542	0,464	0,467	0,422	0,385	0,377	0,348
	160	165	**180**	1,451	0,901	0,726	0,667	0,581	0,542	0,484	0,415	0,417	0,377	0,344	0,336	0,310
	165	170	185	1,304	0,810	0,652	0,600	0,522	0,487	0,435	0,373	0,374	0,338	0,309	0,302	0,278
	170	175	190	1,178	0,731	0,589	0,542	0,471	0,440	0,393	0,337	0,338	0,305	0,279	0,272	0,251
	175	**180**	195	1,070	0,664	0,535	0,492	0,428	0,400	0,357	0,306	0,306	0,277	0,253	0,247	0,228
	180	185	**200**	0,976	0,606	0,488	0,449	0,390	0,365	0,325	0,279	0,279	0,252	0,230	0,225	0,208
	185	190	205	0,893	0,554	0,447	0,411	0,357	0,334	0,298	0,255	0,255	0,231	0,211	0,206	0,190
	190	195	210	0,821	0,510	0,410	0,377	0,328	0,307	0,274	0,235	0,234	0,212	0,193	0,189	0,174
	195	**200**	215	0,757	0,470	0,379	0,348	0,303	0,283	0,252	0,216	0,216	0,195	0,178	0,174	0,161
	200	205	**220**	0,700	0,435	0,350	0,322	0,280	0,262	0,233	0,200	0,200	0,181	0,165	0,161	0,149
	205	210	225	0,650	0,403	0,325	0,299	0,260	0,243	0,217	0,186	0,185	0,167	0,153	0,150	0,138
	210	215	230	0,605	0,375	0,302	0,278	0,242	0,226	0,202	0,173	0,172	0,156	0,142	0,139	0,128
	215	**220**	235	0,564	0,350	0,282	0,259	0,226	0,211	0,188	0,161	0,161	0,145	0,132	0,130	0,119
	220	225	**240**	0,527	0,327	0,264	0,242	0,211	0,197	0,176	0,151	0,150	0,136	0,124	0,121	0,112
	225	230	245	0,494	0,307	0,247	0,227	0,198	0,185	0,165	0,141	0,140	0,127	0,116	0,113	0,105
	230	235	250	0,464	0,288	0,232	0,213	0,185	0,173	0,155	0,132	0,132	0,119	0,109	0,106	0,098
	235	**240**	255	0,436	0,271	0,218	0,201	0,174	0,163	0,145	0,125	0,124	0,112	0,102	0,100	0,092
	240	245	**260**	0,411	0,255	0,206	0,189	0,164	0,154	0,137	0,117	0,117	0,106	0,096	0,094	0,087
	245	250	265	0,388	0,241	0,194	0,178	0,155	0,145	0,129	0,111	0,110	0,100	0,091	0,089	0,082
	250	255	270	0,367	0,228	0,183	0,169	0,147	0,137	0,122	0,105	0,104	0,094	0,086	0,084	0,078
	255	**260**	275	0,347	0,216	0,174	0,160	0,139	0,130	0,116	0,099	0,099	0,089	0,081	0,080	0,073
	260	265	**280**	0,329	0,205	0,165	0,151	0,132	0,123	0,110	0,094	0,094	0,085	0,077	0,075	0,070
	265	270	285	0,313	0,194	0,156	0,144	0,125	0,117	0,104	0,089	0,089	0,080	0,073	0,072	0,066
	270	275	290	0,298	0,185	0,149	0,137	0,119	0,111	0,099	0,085	0,084	0,076	0,070	0,068	0,063
	275	**280**	295	0,283	0,176	0,142	0,130	0,113	0,106	0,094	0,081	0,080	0,073	0,066	0,065	0,060
	280	285	**300**	0,270	0,168	0,135	0,124	0,108	0,101	0,090	0,077	0,077	0,069	0,063	0,062	0,057
	285	290		0,258	0,160	0,129	0,118	0,103	0,096	0,086	0,074	0,073	0,066	0,060	0,059	0,054
	290	295		0,246	0,153	0,123	0,113	0,098	0,092	0,082	0,070	0,070	0,063	0,058	0,056	0,052
	295	**300**		0,235	0,146	0,118	0,108	0,094	0,088	0,078	0,067	0,067	0,060	0,055	0,054	0,050
	300			0,225	0,140	0,113	0,104	0,090	0,084	0,075	0,064	0,064	0,058	0,053	0,052	0,047

Rotation spring stiffness Egcobox® type MXL -BH / -WU / -BHS / -WUS

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
				-BH / -WU / -BHS / -WUS												
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]												
	C30	C35	C50													
height of connection [mm] good bonding conditions		**160**	175	615	991	1231	1338	1538	1647	1846	2154	2140	2367	2594	2651	2877
	160	165	**180**	689	1110	1378	1498	1722	1844	2067	2411	2400	2654	2908	2973	3225
	165	170	185	767	1235	1534	1668	1917	2052	2300	2684	2674	2957	3240	3312	3594
	170	175	190	849	1367	1697	1846	2122	2271	2546	2970	2963	3277	3590	3670	3982
	175	**180**	195	935	1506	1870	2033	2337	2502	2804	3272	3266	3613	3958	4046	4390
	180	185	**200**	1025	1652	2050	2230	2563	2743	3075	3588	3585	3965	4344	4440	4818
	185	190	205	1120	1804	2239	2435	2799	2996	3359	3918	3918	4333	4748	4853	5266
	190	195	210	1218	1962	2436	2649	3045	3260	3654	4263	4266	4719	5170	5285	5734
	195	**200**	215	1321	2128	2642	2873	3302	3535	3963	4623	4629	5120	5610	5734	6222
	200	205	**220**	1428	2300	2856	3105	3569	3821	4283	4997	5007	5538	6068	6202	6729
	205	210	225	1539	2479	3078	3347	3847	4118	4616	5386	5399	5972	6543	6688	7257
	210	215	230	1654	2665	3308	3598	4135	4427	4962	5789	5807	6422	7037	7193	7804
	215	**220**	235	1773	2857	3547	3857	4434	4746	5320	6207	6229	6889	7549	7716	8372
	220	225	**240**	1897	3056	3794	4126	4742	5077	5691	6639	6666	7373	8078	8257	8959
	225	230	245	2025	3262	4049	4404	5062	5418	6074	7086	7118	7872	8626	8817	9566
	230	235	250	2157	3474	4313	4691	5391	5771	6470	7548	7584	8388	9191	9395	10193
	235	**240**	255	2293	3694	4585	4986	5732	6135	6878	8024	8066	8921	9775	9991	10840
	240	245	**260**	2433	3920	4866	5291	6082	6511	7298	8515	8562	9470	10376	10606	11507
	245	250	265	2577	4152	5154	5605	6443	6897	7731	9020	9073	10035	10996	11239	12194
	250	255	270	2726	4391	5451	5928	6814	7294	8177	9540	9599	10617	11633	11890	12901
	255	**260**	275	2878	4637	5757	6260	7196	7703	8635	10074	10140	11215	12288	12560	13628
	260	265	**280**	3035	4890	6070	6601	7588	8123	9105	10623	10695	11829	12961	13248	14374
	265	270	285	3196	5149	6392	6952	7990	8553	9588	11186	11265	12460	13652	13955	15141
	270	275	290	3361	5415	6723	7311	8403	8995	10084	11764	11850	13107	14362	14679	15927
	275	**280**	295	3531	5688	7061	7679	8826	9448	10592	12357	12450	13771	15089	15422	16733
	280	285	**300**	3704	5968	7408	8056	9260	9913	11112	12964	13065	14450	15834	16184	17560
	285	290		3882	6254	7763	8443	9704	10388	11645	13586	13695	15147	16597	16964	18406
	290	295		4063	6547	8127	8838	10159	10875	12190	14222	14339	15859	17377	17762	19272
	295	**300**		4249	6846	8499	9242	10624	11372	12748	14873	14998	16589	18176	18578	20158
	300			4440	7153	8879	9656	11099	11881	13319	15538	15672	17334	18993	19413	21064

On-site reinforcement Egcobox® type MXL-BH / BHS - C25/30

for balconies with balcony offset

Egcobox type BH / BHS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL76	MXL80
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist b_w [mm]			175	175	175	175	175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10	ø 10	ø 10	ø 10	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612	612	612	612	612
item ① - lapping reinforcement / element															
≥ as [cm²] B500			2,81	4,22	5,63	5,78	7,04	7,22	8,44	9,85	11,00	12,10	13,02	13,19	13,02
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12	ø 10	ø 10	ø 10	ø 12
item ② - balcony-side suspension reinforcement shear force / element															
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,85	4,85	4,85	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	1,12	2,24	2,24	2,24	2,24	2,24	2,24	2,99	2,99	2,99	2,99	2,99	2,99
shear force level	V8±	≥ a_s [cm²] B500	2,12	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24

MXL-BHS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)															
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22	3,33	4,44	4,58	5,59	5,73	6,75	7,88	8,79	9,60	10,41	10,55	10,41
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	4,99	7,49	9,98	10,31	12,57	12,89	15,19	17,72	19,78	21,60	23,43	23,73	23,43
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)															
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22+0,56	3,33+1,12	4,44+1,12	4,58+1,12	5,59+1,12	5,73+1,12	6,75+1,12	7,88+1,12	8,79+1,12	9,60+1,12	10,41+1,12	10,55+1,12	11,43+1,12
VS / VS±	**a= 260 mm**		4,99+0,56	7,49+1,12	9,98+1,12	10,31+1,12	12,57+1,12	12,89+1,12	15,19+1,12	17,72+1,12	19,78+1,12	21,60+1,12	23,43+1,12	23,73+1,12	25,71+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22+1,00	3,33+1,99	4,44+1,99	4,58+1,99	5,59+1,99	5,73+1,99	6,75+1,99	7,88+1,99	8,79+1,99	9,60+1,99	10,41+1,99	10,55+1,99	11,43+1,99
V1 / V1±	**a= 260 mm**		4,99+1,00	7,49+1,99	9,98+1,99	10,31+1,99	12,57+1,99	12,89+1,99	15,19+1,99	17,72+1,99	19,78+1,99	21,60+1,99	23,43+1,99	23,73+1,99	25,71+1,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22+1,49	3,33+2,99	4,44+2,99	4,58+2,99	5,59+2,99	5,73+2,99	6,75+2,99	7,88+2,99	8,79+2,99	9,60+2,99	10,41+2,99	10,55+2,99	11,43+2,99
V2 / V2±	**a= 260 mm**		4,99+1,49	7,49+2,99	9,98+2,99	10,31+2,99	12,57+2,99	12,89+2,99	15,19+2,99	17,72+2,99	19,78+2,99	21,60+2,99	23,43+2,99	23,73+2,99	25,71+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22+1,99	3,33+3,98	4,44+3,98	4,58+3,98	5,59+3,98	5,73+3,98	6,75+3,98	7,88+3,98	8,79+3,98	9,60+3,98	10,41+3,98	10,55+3,98	11,43+3,98
V3 / V3±	**a= 260 mm**		4,99+1,99	7,49+3,98	9,98+3,98	10,31+3,98	12,57+3,98	12,89+3,98	15,19+3,98	17,72+3,98	19,78+3,98	21,60+3,98	23,43+3,98	23,73+3,98	25,71+3,98
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	3,33+4,85	4,44+4,85	4,58+4,85	5,59+5,65	5,73+5,65	6,75+5,65	7,88+5,65	8,79+5,65	9,60+5,65	10,41+5,65	10,55+5,65	11,43+5,65
V4 / V4±	**a= 260 mm**		-	7,49+4,85	9,98+4,85	10,31+4,85	12,57+5,65	12,89+5,65	15,19+5,65	17,72+5,65	19,78+5,65	21,60+5,65	23,43+5,65	23,73+5,65	25,71+5,65
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22+0,56	3,33+1,12	4,44+1,12	4,58+1,12	5,59+1,12	5,73+1,12	6,75+1,12	7,88+1,12	8,79+1,12	9,60+1,12	10,41+1,12	10,55+1,12	11,43+1,12
V6±	**a= 260 mm**		4,99+0,56	7,49+1,12	9,98+1,12	10,31+1,12	12,57+1,12	12,89+1,12	15,19+1,12	17,72+1,12	19,78+1,12	21,60+1,12	23,43+1,12	23,73+1,12	25,71+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22+1,12	3,33+2,24	4,44+2,24	4,58+2,24	5,59+2,24	5,73+2,24	6,75+2,24	7,88+2,99	8,79+2,99	9,60+2,99	10,41+2,99	10,55+2,99	11,43+2,99
V7±	**a= 260 mm**		4,99+1,12	7,49+2,24	9,98+2,24	10,31+2,24	12,57+2,24	12,89+2,24	15,19+2,24	17,72+2,99	19,78+2,99	21,60+2,99	23,43+2,99	23,73+2,99	25,71+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	2,22+2,12	3,33+4,24	4,44+4,24	4,58+4,24	5,59+4,24	5,73+4,24	6,75+4,24	7,88+4,24	8,79+4,24	9,60+4,24	10,41+4,24	10,55+4,24	11,43+4,24
V8±	**a= 260 mm**		4,99+2,12	7,49+4,24	9,98+4,24	10,31+4,24	12,57+4,24	12,89+4,24	15,19+4,24	17,72+4,24	19,78+4,24	21,60+4,24	23,43+4,24	23,73+4,24	25,71+4,24

MXL-BHS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)															
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88	2,83	3,77	3,89	4,74	4,86	5,72	6,67	7,45	8,19	8,82	8,94	9,68
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	4,24	6,36	8,48	8,75	10,66	10,94	12,87	15,02	16,76	18,44	19,85	20,11	21,79
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)															
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88+0,56	2,83+1,12	3,77+1,12	3,89+1,12	4,74+1,12	4,86+1,12	5,72+1,12	6,67+1,12	7,45+1,12	8,19+1,12	8,82+1,12	8,94+1,12	9,68+1,12
VS / VS±	**a= 260 mm**		4,24+0,56	6,36+1,12	8,48+1,12	8,75+1,12	10,66+1,12	10,94+1,12	12,87+1,12	15,02+1,12	16,76+1,12	18,44+1,12	19,85+1,12	20,11+1,12	21,79+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88+1,00	2,83+1,99	3,77+1,99	3,89+1,99	4,74+1,99	4,86+1,99	5,72+1,99	6,67+1,99	7,45+1,99	8,19+1,99	8,82+1,99	8,94+1,99	9,68+1,99
V1 / V1±	**a= 260 mm**		4,24+1,00	6,36+1,99	8,48+1,99	8,75+1,99	10,66+1,99	10,94+1,99	12,87+1,99	15,02+1,99	16,76+1,99	18,44+1,99	19,85+1,99	20,11+1,99	21,79+1,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88+1,49	2,83+2,99	3,77+2,99	3,89+2,99	4,74+2,99	4,86+2,99	5,72+2,99	6,67+2,99	7,45+2,99	8,19+2,99	8,82+2,99	8,94+2,99	9,68+2,99
V2 / V2±	**a= 260 mm**		4,24+1,49	6,36+2,99	8,48+2,99	8,75+2,99	10,66+2,99	10,94+2,99	12,87+2,99	15,02+2,99	16,76+2,99	18,44+2,99	19,85+2,99	20,11+2,99	21,79+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88+1,99	2,83+3,98	3,77+3,98	3,89+3,98	4,74+3,98	4,86+3,98	5,72+3,98	6,67+3,98	7,45+3,98	8,19+3,98	8,82+3,98	8,94+3,98	9,68+3,98
V3 / V3±	**a= 260 mm**		4,24+1,99	6,36+3,98	8,48+3,98	8,75+3,98	10,66+3,98	10,94+3,98	12,87+3,98	15,02+3,98	16,76+3,98	18,44+3,98	19,85+3,98	20,11+3,98	21,79+3,98
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	2,83+4,85	3,77+4,85	3,89+4,85	4,74+5,65	4,86+5,65	5,72+5,65	6,67+5,65	7,45+5,65	8,19+5,65	8,82+5,65	8,94+5,65	9,68+5,65
V4 / V4±	**a= 260 mm**		-	6,36+4,85	8,48+4,85	8,75+4,85	10,66+5,65	10,94+5,65	12,87+5,65	15,02+5,65	16,76+5,65	18,44+5,65	19,85+5,65	20,11+5,65	21,79+5,65
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88+0,56	2,83+1,12	3,77+1,12	3,89+1,12	4,74+1,12	4,86+1,12	5,72+1,12	6,67+1,12	7,45+1,12	8,19+1,12	8,82+1,12	8,94+1,12	9,68+1,12
V6±	**a= 260 mm**		4,24+0,56	6,36+1,12	8,48+1,12	8,75+1,12	10,66+1,12	10,94+1,12	12,87+1,12	15,02+1,12	16,76+1,12	18,44+1,12	19,85+1,12	20,11+1,12	21,79+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88+1,12	2,83+2,24	3,77+2,24	3,89+2,24	4,74+2,24	4,86+2,24	5,72+2,24	6,67+2,99	7,45+2,99	8,19+2,99	8,82+2,99	8,94+2,99	9,68+2,99
V7±	**a= 260 mm**		4,24+1,12	6,36+2,24	8,48+2,24	8,75+2,24	10,66+2,24	10,94+2,24	12,87+2,24	15,02+2,99	16,76+2,99	18,44+2,99	19,85+2,99	20,11+2,99	21,79+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,88+2,12	2,83+4,24	3,77+4,24	3,89+4,24	4,74+4,24	4,86+4,24	5,72+4,24	6,67+4,24	7,45+4,24	8,19+4,24	8,82+4,24	8,94+4,24	9,68+4,24
V8±	**a= 260 mm**		4,24+2,12	6,36+4,24	8,48+4,24	8,75+4,24	10,66+4,24	10,94+4,24	12,87+4,24	15,02+4,24	16,76+4,24	18,44+4,24	19,85+4,24	20,11+4,24	21,79+4,24

Egcobox type BH / BHS	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL76	MXL80
Elementlänge l [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**

MXL-BH: minimum width of joist b_w 220 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)														
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68	2,52	3,36	3,47	4,23	4,34	5,10	5,95	6,64	7,30	7,87	7,97	8,63
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,78	5,68	7,57	7,81	9,51	9,76	11,47	13,39	14,94	16,43	17,70	17,93	19,42
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)														
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68+0,56	2,52+1,12	3,36+1,12	3,47+1,12	4,23+1,12	4,34+1,12	5,10+1,12	5,95+1,12	6,64+1,12	7,30+1,12	7,87+1,12	7,97+1,12	8,63+1,12
VS / VS±	**a= 260 mm**		3,78+0,56	5,68+1,12	7,57+1,12	7,81+1,12	9,51+1,12	9,76+1,12	11,47+1,12	13,39+1,12	14,94+1,12	16,43+1,12	17,70+1,12	17,93+1,12	19,42+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68+1,00	2,52+1,99	3,36+1,99	3,47+1,99	4,23+1,99	4,34+1,99	5,10+1,99	5,95+1,99	6,64+1,99	7,30+1,99	7,87+1,99	7,97+1,99	8,63+1,99
V1 / V1±	**a= 260 mm**		3,78+1,00	5,68+1,99	7,57+1,99	7,81+1,99	9,51+1,99	9,76+1,99	11,47+1,99	13,39+1,99	14,94+1,99	16,43+1,99	17,70+1,99	17,93+1,99	19,42+1,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68+1,49	2,52+2,99	3,36+2,99	3,47+2,99	4,23+2,99	4,34+2,99	5,10+2,99	5,95+2,99	6,64+2,99	7,30+2,99	7,87+2,99	7,97+2,99	8,63+2,99
V2 / V2±	**a= 260 mm**		3,78+1,49	5,68+2,99	7,57+2,99	7,81+2,99	9,51+2,99	9,76+2,99	11,47+2,99	13,39+2,99	14,94+2,99	16,43+2,99	17,70+2,99	17,93+2,99	19,42+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68+1,99	2,52+3,98	3,36+3,98	3,47+3,98	4,23+3,98	4,34+3,98	5,10+3,98	5,95+3,98	6,64+3,98	7,30+3,98	7,87+3,98	7,97+3,98	8,63+3,98
V3 / V3±	**a= 260 mm**		3,78+1,99	5,68+3,98	7,57+3,98	7,81+3,98	9,51+3,98	9,76+3,98	11,47+3,98	13,39+3,98	14,94+3,98	16,43+3,98	17,70+3,98	17,93+3,98	19,42+3,98
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	2,52+4,85	3,36+4,85	3,47+4,85	4,23+5,65	4,34+5,65	5,10+5,65	5,95+5,65	6,64+5,65	7,30+5,65	7,87+5,65	7,97+5,65	8,63+5,65
V4 / V4±	**a= 260 mm**		-	5,68+4,85	7,57+4,85	7,81+4,85	9,51+5,65	9,76+5,65	11,47+5,65	13,39+5,65	14,94+5,65	16,43+5,65	17,70+5,65	17,93+5,65	19,42+5,65
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68+0,56	2,52+1,12	3,36+1,12	3,47+1,12	4,23+1,12	4,34+1,12	5,10+1,12	5,95+1,12	6,64+1,12	7,30+1,12	7,87+1,12	7,97+1,12	8,63+1,12
V6±	**a= 260 mm**		3,78+0,56	5,68+1,12	7,57+1,12	7,81+1,12	9,51+1,12	9,76+1,12	11,47+1,12	13,39+1,12	14,94+1,12	16,43+1,12	17,70+1,12	17,93+1,12	19,42+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68+1,12	2,52+2,24	3,36+2,24	3,47+2,24	4,23+2,24	4,34+2,24	5,10+2,24	5,95+2,99	6,64+2,99	7,30+2,99	7,87+2,99	7,97+2,99	8,63+2,99
V7±	**a= 260 mm**		3,78+1,12	5,68+2,24	7,57+2,24	7,81+2,24	9,51+2,24	9,76+2,24	11,47+2,24	13,39+2,99	14,94+2,99	16,43+2,99	17,70+2,99	17,93+2,99	19,42+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,68+2,12	2,52+4,24	3,36+4,24	3,47+4,24	4,23+4,24	4,34+4,24	5,10+4,24	5,95+4,24	6,64+4,24	7,30+4,24	7,87+4,24	7,97+4,24	8,63+4,24
V8±	**a= 260 mm**		3,78+2,12	5,68+4,24	7,57+4,24	7,81+4,24	9,51+4,24	9,76+4,24	11,47+4,24	13,39+4,24	14,94+4,24	16,43+4,24	17,70+4,24	17,93+4,24	19,42+4,24

MXL-BH: minimum width of joist b_w 250 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)														
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45	2,17	2,90	2,99	3,64	3,73	4,38	5,12	5,71	6,28	6,76	6,85	7,42
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,26	4,89	6,52	6,72	8,18	8,40	9,87	11,51	12,85	14,13	15,22	15,41	16,70
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)														
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+0,56	2,17+1,12	2,90+1,12	2,99+1,12	3,64+1,12	3,73+1,12	4,38+1,12	5,12+1,12	5,71+1,12	6,28+1,12	6,76+1,12	6,85+1,12	7,42+1,12
VS / VS±	**a= 260 mm**		3,26+0,56	4,89+1,12	6,52+1,12	6,72+1,12	8,18+1,12	8,40+1,12	9,87+1,12	11,51+1,12	12,85+1,12	14,13+1,12	15,22+1,12	15,41+1,12	16,70+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+1,00	2,17+1,99	2,90+1,99	2,99+1,99	3,64+1,99	3,73+1,99	4,38+1,99	5,12+1,99	5,71+1,99	6,28+1,99	6,76+1,99	6,85+1,99	7,42+1,99
V1 / V1±	**a= 260 mm**		3,26+1,00	4,89+1,99	6,52+1,99	6,72+1,99	8,18+1,99	8,40+1,99	9,87+1,99	11,51+1,99	12,85+1,99	14,13+1,99	15,22+1,99	15,41+1,99	16,70+1,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+1,49	2,17+2,99	2,90+2,99	2,99+2,99	3,64+2,99	3,73+2,99	4,38+2,99	5,12+2,99	5,71+2,99	6,28+2,99	6,76+2,99	6,85+2,99	7,42+2,99
V2 / V2±	**a= 260 mm**		3,26+1,49	4,89+2,99	6,52+2,99	6,72+2,99	8,18+2,99	8,40+2,99	9,87+2,99	11,51+2,99	12,85+2,99	14,13+2,99	15,22+2,99	15,41+2,99	16,70+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+1,99	2,17+3,98	2,90+3,98	2,99+3,98	3,64+3,98	3,73+3,98	4,38+3,98	5,12+3,98	5,71+3,98	6,28+3,98	6,76+3,98	6,85+3,98	7,42+3,98
V3 / V3±	**a= 260 mm**		3,26+1,99	4,89+3,98	6,52+3,98	6,72+3,98	8,18+3,98	8,40+3,98	9,87+3,98	11,51+3,98	12,85+3,98	14,13+3,98	15,22+3,98	15,41+3,98	16,70+3,98
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	2,17+4,85	2,90+4,85	2,99+4,85	3,64+5,65	3,73+5,65	4,38+5,65	5,12+5,65	5,71+5,65	6,28+5,65	6,76+5,65	6,85+5,65	7,42+5,65
V4 / V4±	**a= 260 mm**		-	4,89+4,85	6,52+4,85	6,72+4,85	8,18+5,65	8,40+5,65	9,87+5,65	11,51+5,65	12,85+5,65	14,13+5,65	15,22+5,65	15,41+5,65	16,70+5,65
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+0,56	2,17+1,12	2,90+1,12	2,99+1,12	3,64+1,12	3,73+1,12	4,38+1,12	5,12+1,12	5,71+1,12	6,28+1,12	6,76+1,12	6,85+1,12	7,42+1,12
V6±	**a= 260 mm**		3,26+0,56	4,89+1,12	6,52+1,12	6,72+1,12	8,18+1,12	8,40+1,12	9,87+1,12	11,51+1,12	12,85+1,12	14,13+1,12	15,22+1,12	15,41+1,12	16,70+1,12
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+1,12	2,17+2,24	2,90+2,24	2,99+2,24	3,64+2,24	3,73+2,24	4,38+2,24	5,12+2,99	5,71+2,99	6,28+2,99	6,76+2,99	6,85+2,99	7,42+2,99
V7±	**a= 260 mm**		3,26+1,12	4,89+2,24	6,52+2,24	6,72+2,24	8,18+2,24	8,40+2,24	9,87+2,24	11,51+2,99	12,85+2,99	14,13+2,99	15,22+2,99	15,41+2,99	16,70+2,99
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+2,12	2,17+4,24	2,90+4,24	2,99+4,24	3,64+4,24	3,73+4,24	4,38+4,24	5,12+4,24	5,71+4,24	6,28+4,24	6,76+4,24	6,85+4,24	7,42+4,24
V8±	**a= 260 mm**		3,26+2,12	4,89+4,24	6,52+4,24	6,72+4,24	8,18+4,24	8,40+4,24	9,87+4,24	11,51+4,24	12,85+4,24	14,13+4,24	15,22+4,24	15,41+4,24	16,70+4,24

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The dimension of the balcony offset BH [mm] must be specified in the element name, e.g. MXL20-BHS120-C35-h200.

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox℠ (height Egcobox℠ = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox℠. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ or item ⑥ applies to the specified required minimum widths of the joist (b_w) and the height of the offset (***a*** ≤135 mm; ***a*** = 260 mm). For larger joist widths, a reduction of the required reinforcement is possible.
In between, interpolation can be performed. For larger joist widths, a reduction of the required reinforcement is possible.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.

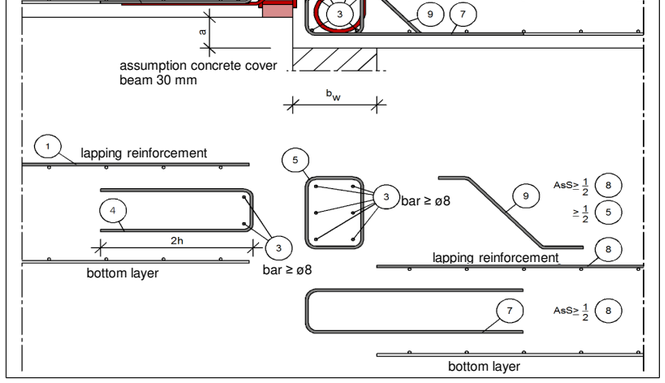
Item ⑧ must be verified and planned by the structural engineer (corresponds to item ① for slab thickness = balcony slab thickness;
for slab thickness ≠ balcony slab thickness, an allowance is required or reduction is possible). The load transmission into the slab must be verified by the structural engineer.
The slab-side stirrups Item ⑦ are structurally recommended at 50 % of the main reinforcement Item ⑧ according to DAfStb Booklet 600.
For reinforcing frame corners, we recommend inclined reinforcement item ⑨ according to DAfStb Booklet 600 with AsS > 50% Pos. ⑧ or > 50% Pos. ⑤ or ⑥.

The specifications apply to good bonding conditions.

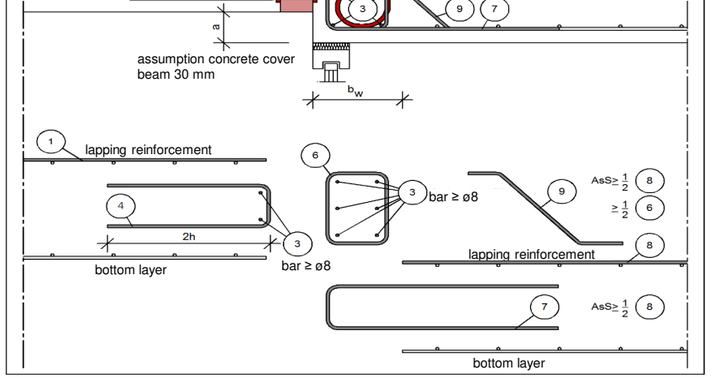
The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox℠ reinforcement and the required minimum beam widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the beam width.

design proposal

direct support



indirect support



On-site reinforcement Egcobox® type MXL-WU / WUS - C25/30

for balconies with overlap in wall downwards

Egcobox type WU / WUS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist **b_w** [mm]			175	175	175	175	175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10	ø 10	ø 10	ø 10	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612	612	612	612	612
item ① - lapping reinforcement / element															
≥ as [cm²] B500			2,79	4,22	5,59	6,28	7,04	7,74	8,44	9,85	10,08	12,10	13,02	13,19	14,29
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12	ø 12	ø 12	ø 12	ø 12
item ② - balcony-side suspension reinforcement shear force / element															
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,85	4,85	4,85	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	1,12	2,24	2,24	2,24	2,24	2,24	2,24	2,99	2,99	2,99	2,99	2,99	2,99
shear force level	V8±	≥ a_s [cm²] B500	2,12	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24

MXL-WUS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,98	2,99	3,96	4,49	5,03	5,53	6,08	7,09	7,25	8,64	9,37	9,49	10,28
height	**h= 250 mm**	≥ a_s [cm²] B500	3,96	5,99	7,92	8,98	10,05	11,06	12,15	14,18	14,50	17,28	18,74	18,99	20,57

MXL-WUS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,68	2,54	3,37	3,81	4,26	4,69	5,15	6,01	6,15	7,33	7,94	8,05	8,72
height	**h= 250 mm**	≥ a_s [cm²] B500	3,37	5,09	6,73	7,62	8,53	9,38	10,30	12,01	12,29	14,66	15,88	16,09	17,43

MXL-WU: minimum width of joist b_w 220 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,50	2,27	3,00	3,40	3,80	4,18	4,59	5,35	5,48	6,54	7,08	7,17	7,77
height	**h= 250 mm**	≥ a_s [cm²] B500	3,00	4,54	6,01	6,79	7,61	8,37	9,18	10,71	10,95	13,08	14,16	14,34	15,54

MXL-WU: minimum width of joist b_w 250 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,29	1,95	2,59	2,92	3,27	3,60	3,95	4,60	4,71	5,63	6,09	6,17	6,68
height	**h= 250 mm**	≥ a_s [cm²] B500	2,59	3,91	5,17	5,85	6,55	7,20	7,89	9,21	9,42	11,25	12,17	12,33	13,36

item ③+④ - structural reinforcement

In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox^{xy} (height Egcobox^{xy} = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

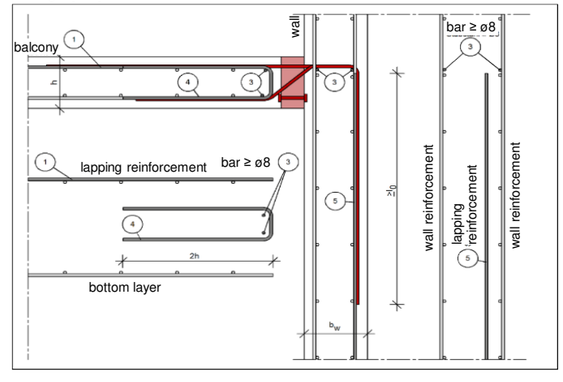
The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox^{xy}. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ applies to the specified required minimum widths of the wall (b_w) and the connection height (h) of the Egcobox.
In between, interpolation can be performed. For larger wall widths, a reduction of the required reinforcement is possible.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.

The specifications apply to good bonding conditions.

The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox® reinforcement and the required minimum wall widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the wall width.

design proposal



Design table Egcobox® type MXL± - C25/30

for cantilever plates for transmission of positive and negative moments and shear forces, insulation 120 mm

	Egcobox type			MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
	length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500
	concrete cover [mm]			M_{Rd} [kNm/element]														
	C30	C35	C50															
height of connection [mm] good bonding conditions		**160**	195	±13,9	±17,3	±20,8	±24,3	±27,8	±31,2	±34,7	±35,6	±40,7	±45,8	±50,9	±30,5	±35,6	±39,4	±48,3
	160	165	**200**	±14,7	±18,4	±22,1	±25,8	±29,4	±33,1	±36,8	±37,8	±43,2	±48,6	±54,0	±32,4	±37,8	±41,8	±51,4
	165	170	205	±15,6	±19,4	±23,3	±27,2	±31,1	±35,0	±38,9	±40,0	±45,7	±51,4	±57,1	±34,3	±40,0	±44,3	±54,5
	170	175	210	±16,4	±20,5	±24,6	±28,7	±32,8	±36,9	±41,0	±42,2	±48,2	±54,2	±60,3	±36,2	±42,2	±46,7	±57,5
	175	**180**	215	±17,2	±21,5	±25,8	±30,1	±34,4	±38,8	±43,1	±44,4	±50,7	±57,1	±63,4	±38,0	±44,4	±49,1	±60,6
	180	185	**220**	±18,1	±22,6	±27,1	±31,6	±36,1	±40,6	±45,1	±46,6	±53,2	±59,9	±66,5	±39,9	±46,6	±51,5	±63,6
	185	190	225	±18,9	±23,6	±28,3	±33,1	±37,8	±42,5	±47,2	±48,8	±55,8	±62,7	±69,7	±41,8	±48,8	±54,0	±66,7
	190	195	230	±19,7	±24,7	±29,6	±34,5	±39,5	±44,4	±49,3	±51,0	±58,3	±65,5	±72,8	±43,7	±51,0	±56,4	±69,8
	195	**200**	235	±20,6	±25,7	±30,9	±36,0	±41,1	±46,3	±51,4	±53,2	±60,8	±68,4	±76,0	±45,6	±53,2	±58,8	±72,8
	200	205	**240**	±21,4	±26,8	±32,1	±37,5	±42,8	±48,2	±53,5	±55,4	±63,3	±71,2	±79,1	±47,5	±55,4	±61,3	±75,9
	205	210	245	±22,2	±27,8	±33,4	±38,9	±44,5	±50,0	±55,6	±57,6	±65,8	±74,0	±82,2	±49,3	±57,6	±63,7	±78,9
	210	215	250	±23,1	±28,8	±34,6	±40,4	±46,1	±51,9	±57,7	±59,8	±68,3	±76,8	±85,4	±51,2	±59,8	±66,1	±82,0
	215	**220**	255	±23,9	±29,9	±35,9	±41,8	±47,8	±53,8	±59,8	±62,0	±70,8	±79,7	±88,5	±53,1	±62,0	±68,6	±85,1
	220	225	**260**	±24,7	±30,9	±37,1	±43,3	±49,5	±55,7	±61,9	±64,2	±73,3	±82,5	±91,7	±55,0	±64,2	±71,0	±88,1
	225	230	265	±25,6	±32,0	±38,4	±44,8	±51,2	±57,6	±64,0	±66,4	±75,8	±85,3	±94,8	±56,9	±66,4	±73,4	±91,2
	230	235	270	±26,4	±33,0	±39,6	±46,2	±52,8	±59,4	±66,0	±68,6	±78,4	±88,1	±97,9	±58,8	±68,6	±75,9	±94,2
	235	**240**	275	±27,3	±34,1	±40,9	±47,7	±54,5	±61,3	±68,1	±70,8	±80,9	±91,0	±101,1	±60,6	±70,8	±78,3	±97,3
	240	245	**280**	±28,1	±35,1	±42,1	±49,2	±56,2	±63,2	±70,2	±73,0	±83,4	±93,8	±104,2	±62,5	±73,0	±80,7	±100,4
	245	250	285	±28,9	±36,2	±43,4	±50,6	±57,9	±65,1	±72,3	±75,2	±85,9	±96,6	±107,4	±64,4	±75,2	±83,2	±103,4
	250	255	290	±29,8	±37,2	±44,6	±52,1	±59,5	±67,0	±74,4	±77,3	±88,4	±99,4	±110,5	±66,3	±77,3	±85,6	±106,5
	255	**260**	295	±30,6	±38,2	±45,9	±53,5	±61,2	±68,8	±76,5	±79,5	±90,9	±102,3	±113,6	±68,2	±79,5	±88,0	±109,5
	260	265	**300**	±31,4	±39,3	±47,2	±55,0	±62,9	±70,7	±78,6	±81,7	±93,4	±105,1	±116,8	±70,1	±81,7	±90,4	±112,6
	265	270		±32,3	±40,3	±48,4	±56,5	±64,5	±72,6	±80,7	±83,9	±95,9	±107,9	±119,9	±71,9	±83,9	±92,9	±115,7
	270	275		±33,1	±41,4	±49,7	±57,9	±66,2	±74,5	±82,8	±86,1	±98,4	±110,7	±123,1	±73,8	±86,1	±95,3	±118,7
	275	**280**		±33,9	±42,4	±50,9	±59,4	±67,9	±76,4	±84,9	±88,3	±101,0	±113,6	±126,2	±75,7	±88,3	±97,7	±121,8
	280	285		±34,8	±43,5	±52,2	±60,9	±69,6	±78,3	±86,9	±90,5	±103,5	±116,4	±129,3	±77,6	±90,5	±100,2	±124,8
	285	290		±35,6	±44,5	±53,4	±62,3	±71,2	±80,1	±89,0	±92,7	±106,0	±119,2	±132,5	±79,5	±92,7	±102,6	±127,9
	290	295		±36,5	±45,6	±54,7	±63,8	±72,9	±82,0	±91,1	±94,9	±108,5	±122,0	±135,6	±81,4	±94,9	±105,0	±131,0
	295	**300**		±37,3	±46,6	±55,9	±65,3	±74,6	±83,9	±93,2	±97,1	±111,0	±124,9	±138,7	±83,2	±97,1	±107,5	±134,0
	300			±38,1	±47,7	±57,2	±66,7	±76,2	±85,8	±95,3	±99,3	±113,5	±127,7	±141,9	±85,1	±99,3	±109,9	±137,1

Shear force level		concrete cover [mm]			V_{Rd} [kN/element]													
		C30	C35	C50														
height of connection [mm] good bonding conditions	VS	160-190	160-195	195-230	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5
		195-300	200-300	235-300	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7
	V1	160-190	160-195	195-230	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9
		195-300	200-300	235-300	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5
	V2	160-190	160-195	195-230	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3
		195-300	200-300	235-300	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8
	V3	160-190	160-195	195-230	±104,5	±129,7	±129,7	±129,7	±129,7	±129,7	±129,7	±129,7	±129,7	±129,7	±129,7	-	-	-	-
		195-300	200-300	235-300	±167,2	±173,1	±173,1	±173,1	±173,1	±173,1	±173,1	±173,1	±173,1	±173,1	±173,1	-	-	-	-
	V4	175-190	180-195	195-210	-	-	±152,0	±152,0	±152,0	±152,0	±152,0	±152,0	±152,0	±152,0	±152,0	±152,0	-	-	-	-
		195-300	200-300	215-300	-	-	±184,4	±184,4	±184,4	±184,4	±184,4	±184,4	±184,4	±184,4	±184,4	±184,4	-	-	-	-
	V5	175-190	180-195	195-210	-	-	-	-	±202,7	±202,7	±202,7	±202,7	±202,7	±202,7	±202,7	±202,7	-	-	-	-
		195-300	200-300	215-300	-	-	-	-	±245,8	±245,8	±245,8	±245,8	±245,8	±245,8	±245,8	±245,8	-	-	-	-

concrete cover:

C30: c_o = 30 mm, c_u = 30 mm

C35: c_o = 35 mm, c_u = 30 mm

C50: c_o = 50 mm, c_u = 50 mm

Reinforcement Egcobox® type MXL±

Egcobox type	MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**
tensile bars	4 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	7 ø 14	8 ø 14	9 ø 14	10 ø 14	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of tensile bars [mm]	1340	1340	1340	1340	1340	1340	1340	1620	1620	1620	1620	1620	1620	1620	2560
compression bars	4 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	7 ø 14	8 ø 14	9 ø 14	10 ø 14	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of compression bars [mm]	1340	1340	1340	1340	1340	1340	1340	1620	1620	1620	1620	1620	1620	1620	2560
shear force bars VS	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6
shear force bars V1	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8
shear force bars V2	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8
shear force bars V3	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	-	-	-	-
shear force bars V4	-	-	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	-	-	-	-
shear force bars V5	-	-	-	-	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	-	-	-	-
applicable expansion joint distances [m]	**23,0**	**23,0**	**23,0**	**23,0**	**23,0**	**23,0**	**23,0**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**17,0**

concrete cover:
C30: c_o = 30 mm, c_u = 30 mm
C35: c_o = 35 mm, c_u = 30 mm
C50: c_o = 50 mm, c_u = 50 mm

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL±

	Egcobox type	MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
	length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**
	concrete cover [mm]	**banking factor k [1/kNm]**														
	C30 / **C35** / **C50**															
height of connection [mm] good bonding conditions	**160** / 195	1,848	1,479	1,232	1,056	0,924	0,821	0,739	0,770	0,674	0,599	0,539	0,898	0,770	0,674	0,595
	165 / **200**	1,644	1,315	1,096	0,940	0,822	0,731	0,658	0,683	0,598	0,531	0,478	0,797	0,683	0,598	0,526
	170 / 205	1,472	1,178	0,981	0,841	0,736	0,654	0,589	0,610	0,534	0,475	0,427	0,712	0,610	0,534	0,469
	175 / 210	1,326	1,061	0,884	0,758	0,663	0,589	0,530	0,548	0,480	0,426	0,384	0,640	0,548	0,480	0,420
	180 / 215	1,200	0,960	0,800	0,686	0,600	0,533	0,480	0,495	0,433	0,385	0,347	0,578	0,495	0,433	0,379
	185 / **220**	1,092	0,873	0,728	0,624	0,546	0,485	0,437	0,450	0,393	0,350	0,315	0,525	0,450	0,393	0,343
	190 / 225	0,997	0,798	0,665	0,570	0,499	0,443	0,399	0,410	0,359	0,319	0,287	0,478	0,410	0,359	0,312
	195 / 230	0,914	0,732	0,610	0,523	0,457	0,406	0,366	0,375	0,329	0,292	0,263	0,438	0,375	0,329	0,286
	200 / 235	0,842	0,673	0,561	0,481	0,421	0,374	0,337	0,345	0,302	0,268	0,242	0,403	0,345	0,302	0,262
	205 / **240**	0,777	0,622	0,518	0,444	0,389	0,345	0,311	0,318	0,278	0,248	0,223	0,371	0,318	0,278	0,241
	210 / 245	0,720	0,576	0,480	0,411	0,360	0,320	0,288	0,294	0,258	0,229	0,206	0,343	0,294	0,258	0,223
	215 / 250	0,669	0,535	0,446	0,382	0,334	0,297	0,267	0,273	0,239	0,212	0,191	0,319	0,273	0,239	0,207
	220 / 255	0,623	0,498	0,415	0,356	0,311	0,277	0,249	0,254	0,222	0,198	0,178	0,296	0,254	0,222	0,192
	225 / **260**	0,581	0,465	0,388	0,332	0,291	0,258	0,233	0,237	0,207	0,184	0,166	0,277	0,237	0,207	0,179
	230 / 265	0,544	0,435	0,363	0,311	0,272	0,242	0,218	0,222	0,194	0,172	0,155	0,259	0,222	0,194	0,167
	235 / 270	0,510	0,408	0,340	0,291	0,255	0,227	0,204	0,208	0,182	0,161	0,145	0,242	0,208	0,182	0,157
	240 / 275	0,479	0,383	0,319	0,274	0,240	0,213	0,192	0,195	0,171	0,152	0,136	0,227	0,195	0,171	0,147
	245 / **280**	0,451	0,361	0,301	0,258	0,226	0,200	0,180	0,183	0,160	0,143	0,128	0,214	0,183	0,160	0,138
	250 / 285	0,425	0,340	0,284	0,243	0,213	0,189	0,170	0,173	0,151	0,134	0,121	0,202	0,173	0,151	0,130
	255 / 290	0,402	0,321	0,268	0,230	0,201	0,179	0,161	0,163	0,143	0,127	0,114	0,190	0,163	0,143	0,123
	260 / 295	0,380	0,304	0,253	0,217	0,190	0,169	0,152	0,154	0,135	0,120	0,108	0,180	0,154	0,135	0,116
	265 / **300**	0,360	0,288	0,240	0,206	0,180	0,160	0,144	0,146	0,128	0,114	0,102	0,170	0,146	0,128	0,110
	270	0,342	0,273	0,228	0,195	0,171	0,152	0,137	0,138	0,121	0,108	0,097	0,162	0,138	0,121	0,104
	275	0,325	0,260	0,217	0,186	0,162	0,144	0,130	0,132	0,115	0,102	0,092	0,153	0,132	0,115	0,099
	280	0,309	0,247	0,206	0,177	0,154	0,137	0,124	0,125	0,109	0,097	0,088	0,146	0,125	0,109	0,094
	285	0,294	0,235	0,196	0,168	0,147	0,131	0,118	0,119	0,104	0,093	0,083	0,139	0,119	0,104	0,089
	290	0,281	0,225	0,187	0,160	0,140	0,125	0,112	0,113	0,099	0,088	0,079	0,132	0,113	0,099	0,085
	295	0,268	0,214	0,179	0,153	0,134	0,119	0,107	0,108	0,095	0,084	0,076	0,126	0,108	0,095	0,081
	300	0,256	0,205	0,171	0,146	0,128	0,114	0,102	0,103	0,091	0,080	0,072	0,121	0,103	0,091	0,077
		0,245	0,196	0,163	0,140	0,122	0,109	0,098	0,099	0,087	0,077	0,069	0,115	0,099	0,087	0,074

Rotation spring stiffness Egcobox® type MXL±

	Egcobox type			MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
	length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]														
	C30	C35	C50															
height of connection [mm] good bonding conditions		**160**	195	541	676	812	947	1082	1217	1353	1299	1484	1670	1855	1113	1299	1484	1681
	160	165	**200**	608	760	912	1064	1216	1368	1521	1464	1673	1882	2091	1255	1464	1673	1901
	165	170	205	679	849	1019	1189	1359	1528	1698	1639	1873	2107	2341	1405	1639	1873	2134
	170	175	210	754	943	1131	1320	1509	1697	1886	1824	2085	2345	2606	1563	1824	2085	2380
	175	**180**	215	833	1042	1250	1458	1666	1875	2083	2019	2307	2596	2884	1731	2019	2307	2640
	180	185	**220**	916	1145	1374	1603	1832	2061	2290	2224	2542	2859	3177	1906	2224	2542	2914
	185	190	225	1003	1254	1504	1755	2006	2256	2507	2439	2787	3135	3484	2090	2439	2787	3201
	190	195	230	1094	1367	1640	1914	2187	2461	2734	2663	3044	3424	3805	2283	2663	3044	3501
	195	**200**	235	1188	1485	1782	2079	2376	2674	2971	2898	3312	3726	4140	2484	2898	3312	3815
	200	205	**240**	1287	1608	1930	2252	2574	2895	3217	3142	3591	4040	4489	2693	3142	3591	4142
	205	210	245	1389	1737	2084	2431	2779	3126	3473	3397	3882	4367	4852	2911	3397	3882	4483
	210	215	250	1496	1870	2244	2617	2991	3365	3739	3661	4184	4707	5230	3138	3661	4184	4837
	215	**220**	255	1606	2008	2409	2811	3212	3614	4015	3935	4497	5059	5621	3373	3935	4497	5205
	220	225	**260**	1720	2150	2581	3011	3441	3871	4301	4219	4822	5424	6027	3616	4219	4822	5586
	225	230	265	1839	2298	2758	3217	3677	4137	4596	4513	5157	5802	6447	3868	4513	5157	5981
	230	235	270	1961	2451	2941	3431	3921	4412	4902	4817	5505	6193	6881	4129	4817	5505	6389
	235	**240**	275	2087	2608	3130	3652	4173	4695	5217	5130	5863	6596	7329	4397	5130	5863	6810
	240	245	**280**	2217	2771	3325	3879	4433	4988	5542	5454	6233	7012	7791	4675	5454	6233	7246
	245	250	285	2351	2938	3526	4114	4701	5289	5877	5787	6614	7441	8268	4961	5787	6614	7694
	250	255	290	2488	3111	3733	4355	4977	5599	6221	6131	7007	7882	8758	5255	6131	7007	8156
	255	**260**	295	2630	3288	3945	4603	5260	5918	6576	6484	7410	8337	9263	5558	6484	7410	8632
	260	265	**300**	2776	3470	4164	4858	5552	6246	6940	6847	7825	8804	9782	5869	6847	7825	9121
	265	270		2926	3657	4388	5120	5851	6582	7314	7220	8252	9283	10315	6189	7220	8252	9623
	270	275		3079	3849	4619	5388	6158	6928	7698	7603	8689	9776	10862	6517	7603	8689	10139
	275	**280**		3237	4046	4855	5664	6473	7282	8091	7996	9138	10281	11423	6854	7996	9138	10668
	280	285		3398	4247	5097	5946	6796	7645	8495	8399	9599	10799	11998	7199	8399	9599	11211
	285	290		3563	4454	5345	6236	7127	8017	8908	8812	10070	11329	12588	7553	8812	10070	11767
	290	295		3733	4666	5599	6532	7465	8398	9331	9234	10553	11873	13192	7915	9234	10553	12337
	295	**300**		3906	4882	5859	6835	7811	8788	9764	9667	11048	12429	13809	8286	9667	11048	12920
	300			4083	5104	6124	7145	8166	9186	10207	10109	11553	12997	14441	8665	10109	11553	13517

On-site reinforcement Egcobox® type MXL± - C25/30

Egcobox type	MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**
Egcobox ø rebar [mm]	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 16
Egcobox l_0 rebar [mm]	580	580	580	580	580	580	580	720	720	720	720	720	720	720	1190
item ① - lapping reinforcement / element															
≥ a_s [cm²] B500	4,16	5,20	6,24	7,28	8,32	9,36	10,40	10,73	12,26	13,79	15,32	9,19	10,35	11,18	14,07
suggested on-site reinforcement [mm]	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 16
item ② - suspension reinforcement shear force / element															
shear force level VS ≥ a_s [cm²] B500	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level V1 ≥ a_s [cm²] B500	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99	1,99
shear force level V2 ≥ a_s [cm²] B500	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99	2,99
shear force level V3 ≥ a_s [cm²] B500	3,85	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	3,98	-	-	-	-
shear force level V4 ≥ a_s [cm²] B500	-	-	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	4,24	-	-	-	-
shear force level V5 ≥ a_s [cm²] B500	-	-	-	-	5,65	5,65	5,65	5,65	5,65	5,65	5,65	-	-	-	-

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

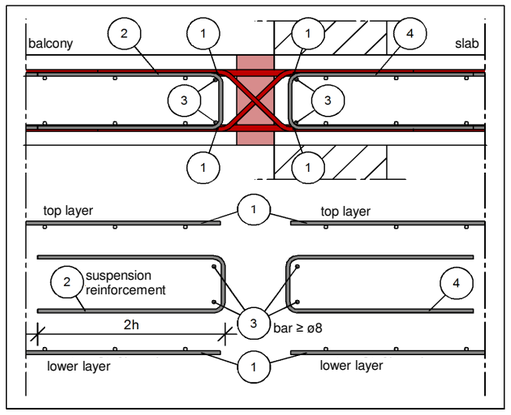
Depending on the moment load (negative or positive moment), the overlap of the bending tension reinforcement (item ①) can only be sufficient in the top or lower layer.
The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox® (height Egcobox® = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

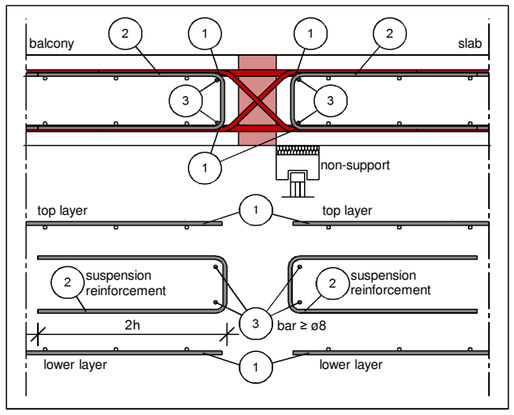
The specifications apply to good bonding conditions.

design proposal

direct support



indirect support



Design table Egcobox® type VXL - C25/30

for supported plates for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL36	VXL45	VXL65	VXL81	VXL97	VXL129	VXL157	VXL194	VXL235	VXL274
length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
concrete cover [mm]			V_{Rd} [kN/element]									
C30	C35	C50										
height of connection [mm] good bonding conditions												
160-170	160-175	175-190	36,5	45,6	64,9	81,1	97,3	129,7	-	-	-	-
175-190	180-195	195-210							156,9	194,6	235,4	274,6
195-300	200-300	215-300	48,7	60,8	86,5	108,2	129,8	173,1	216,3	259,6	307,3	368,8

Reinforcement											
shear force bars			4 ø 6	5 ø 6	4 ø 8	5 ø 8	6 ø 8	8 ø 8	10 ø 8	12 ø 8	10 ø 10	12 ø 10
minimum wall / beam width [mm]			180	180	200	200	200	200	200	200	220	220
compression bearings			4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	6 ø 12	8 ø 12
applicable expansion joint distances [m]			19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

Design table Egcobox® type VXL-K - C25/30

for supported plates for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL18-K	VXL32-K	VXL48-K	VXL65-K	VXL75-K	VXL97-K	VXL113-K	VXL152-K
length of element [mm]			200	250	300	300	400	400	500	510
concrete cover [mm]			V_{Rd} [kN/Element]							
C30	C35	C50								
height of connection [mm] good bonding conditions										
160-170	160-175	175-190	18,2	32,4	48,6	64,9	75,2	-	113,5	-
175-190	180-195	195-210						101,3		152,0
195-300	200-300	215-300	24,3	43,3	64,9	86,5	108,2	122,9	151,4	184,4

Reinforcement									
shear force bars			2 ø 6	2 ø 8	3 ø 8	4 ø 8	5 ø 8	4 ø 10	7 ø 8	6 ø 10
minimum wall / beam width [mm]			180	200	200	200	200	220	200	220
compression bearings			1 ø 12	1 ø 12	2 ø 12	2 ø 12	2 ø 12	3 ø 12	3 ø 12	5 ø 12
applicable expansion joint distances [m]			19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

On-site reinforcement Egcobox® type VXL / VXL-K - C25/30

Egcobox type	VXL36	VXL45	VXL65	VXL81	VXL97	VXL129	VXL157	VXL194	VXL235	VXL274
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
item ② - suspension reinforcement side shear force / element										
≥ a_s [cm²] B500	1,12	1,40	1,99	2,49	2,99	3,98	4,98	5,97	7,07	8,48
x = shear force bar embedment depth (slab) [mm]	155	155	175	175	175	175	175	175	195	195

Egcobox type	VXL18-K	VXL32-K	VXL48-K	VXL65-K	VXL75-K	VXL97-K	VXL113-K	VXL152-K
length of element [mm]	**200**	**250**	**300**	**300**	**400**	**400**	**500**	**510**
item ② - suspension reinforcement side shear force / element								
≥ a_s [cm²] B500	0,56	1,00	1,49	1,99	2,49	2,83	3,48	4,24
x = shear force bar embedment depth (slab) [mm]	155	175	175	175	175	195	175	195

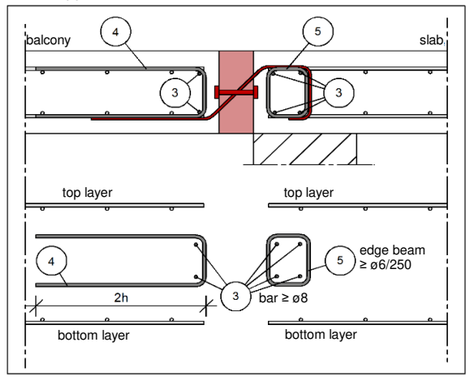
item ③+④+⑤ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②); on the floor side, an edge beam (item ⑤) ≥ ø6/250 is to be provided.

The proposed steel cross-section a_s The proposed steel cross-section as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

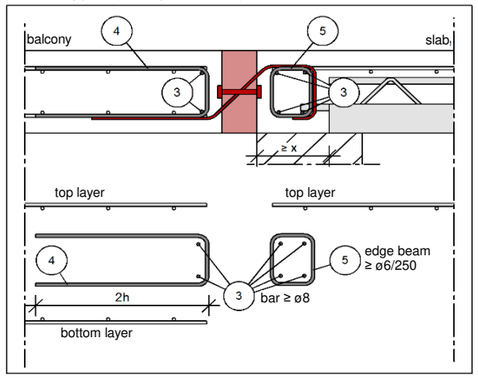
The specifications apply to good bonding conditions.

design proposal

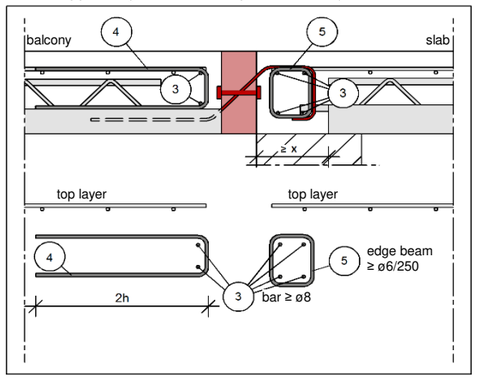
direct support



direct support (semi-prefab slab)

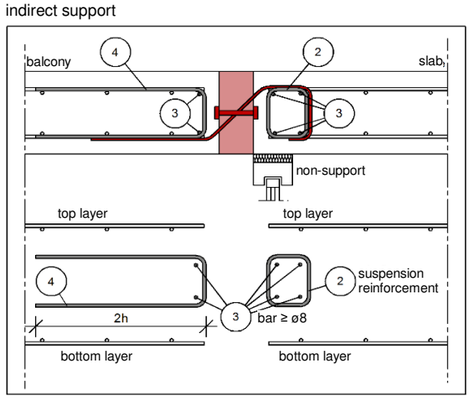


direct support: Egcobox in semi-prefab balcony

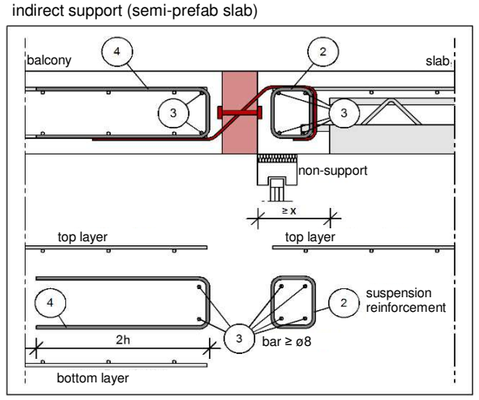


2 ø6 / 2 ø6
3 ø8 / 2 ø8

indirect support



indirect support (semi-prefab slab)



Note Egcobox in semi-prefab balcony:
It is advisable to include the constructive edging on the balcony side (item ④ vs. item ②) in the semi-prefab part.

Note indirect support (semi-prefab slab):
The information on the minimum required connection reinforcement of the Egcobox of the ceiling-side item ② does not replace the statically selected beam reinforcement of the structural engineer. This has to be considered additionally. The Pos ③ on the ceiling side, however, is only constructive and can be taken into account for the static specifications of the structural engineer.

Design table Egcobox® type VXL± - C25/30

for supported plates for transmission of positive and negative shear forces, insulation 120 mm

Egcobox type			VXL36±	VXL45±	VXL65±	VXL81±	VXL97±	VXL129±	VXL157±	VXL194±	VXL235±	VXL274±
length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
concrete cover [mm]			V_{Rd} [kN/element]									
C30	C35	C50										
height of connection [mm] good bonding conditions												
160-170	160-175	175-190	±36,5	±45,6	±64,9	±81,1	±97,3	±129,7	-	-	-	-
175-190	180-195	195-210							±156,9	±194,6	±235,4	±274,6
195-300	200-300	215-300	±48,7	±60,8	±86,5	±108,2	±129,8	±173,1	±216,3	±259,6	±307,3	±368,8

Reinforcement										
shear force bars	2x 4 ø 6	2x 5 ø 6	2x 4 ø 8	2x 5 ø 8	2x 6 ø 8	2x 8 ø 8	2x 10 ø 8	2x 12 ø 8	2x 10 ø 10	2x 12 ø 10
minimum wall / beam width [mm]	180	180	200	200	200	200	200	200	220	220
compression bearings	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	6 ø 12	8 ø 12
applicable expansion joint distances [m]	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

Design table Egcobox® type VXL-K± - C25/30

for supported plates for transmission of positive and negative shear forces, insulation 120 mm

Egcobox type			VXL18-K±	VXL32-K±	VXL48-K±	VXL65-K±	VXL75-K±	VXL97-K±	VXL113-K±	VXL152-K±
length of element [mm]			200	250	300	310	400	400	500	530
concrete cover [mm]			V_{Rd} [kN/element]							
C30	C35	C50								
height of connection [mm] good bonding conditions										
160-170	160-175	175-190	±18,2	±32,4	±48,6	±64,9	±75,2	-	±113,5	-
175-190	180-195	195-210						101,3		±152,0
195-300	200-300	215-300	±24,3	±43,3	±64,9	±86,5	±108,2	122,9	±151,4	±184,4

Reinforcement								
shear force bars	2x 2 ø 6	2x 2 ø 8	2x 3 ø 8	2x 4 ø 8	2x 5 ø 8	2x 4 ø 10	2x 7 ø 8	2x 6 ø 10
minimum wall / beam width [mm]	180	200	200	200	200	220	200	220
compression bearings	1 ø 12	1 ø 12	2 ø 12	2 ø 12	2 ø 12	3 ø 12	3 ø 12	5 ø 12
applicable expansion joint distances [m]	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

On-site reinforcement Egcobox® type VXL± / VXL-K± - C25/30

Egcobox type	VXL36±	VXL45±	VXL65±	VXL81±	VXL97±	VXL129±	VXL157±	VXL194±	VXL235±	VXL274±
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
item ② - suspension reinforcement side shear force / element										
≥ a_s [cm²] B500	1,12	1,40	1,99	2,49	2,99	3,98	4,98	5,97	7,07	8,48
x = shear force bar embedment depth (slab) [mm]	155	155	175	175	175	175	175	175	195	195

Egcobox type	VXL18-K±	VXL32-K±	VXL48-K±	VXL65-K±	VXL75-K±	VXL97-K±	VXL113-K±	VXL152-K±
length of element [mm]	**200**	**250**	**300**	**310**	**400**	**400**	**500**	**530**
item ② - suspension reinforcement shear force / element								
≥ a_s [cm²] B500	0,56	1,00	1,49	1,99	2,49	2,83	3,48	4,24
x = shear force bar embedment depth (slab) [mm]	155	175	175	175	175	195	175	195

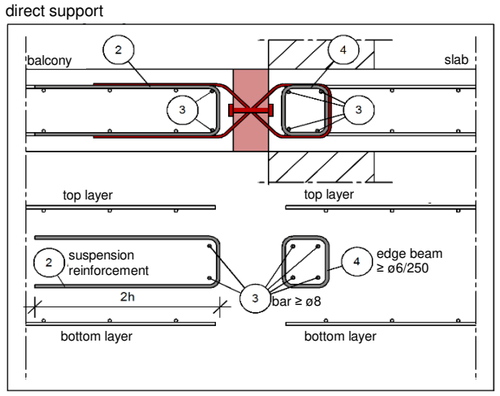
item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②); on the floor side, an edge beam (item ⑤) ≥ ø6/250 is to be provided.

The proposed steel cross-section a_s The proposed steel cross-section as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

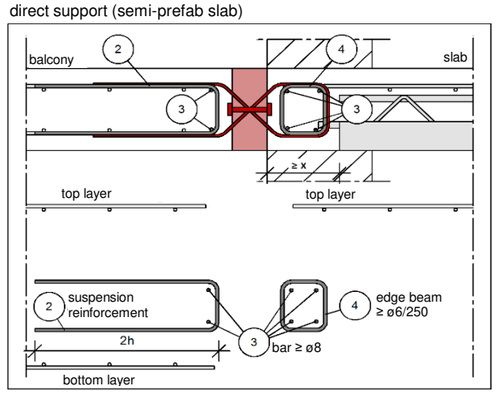
The specifications apply to good bonding conditions.

design proposal

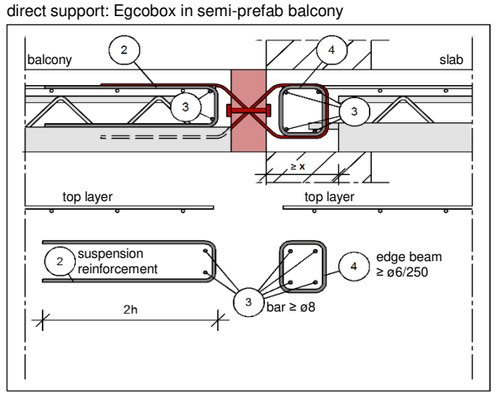
direct support



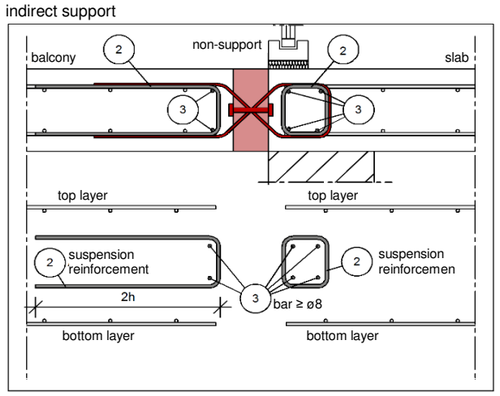
direct support (semi-prefab slab)



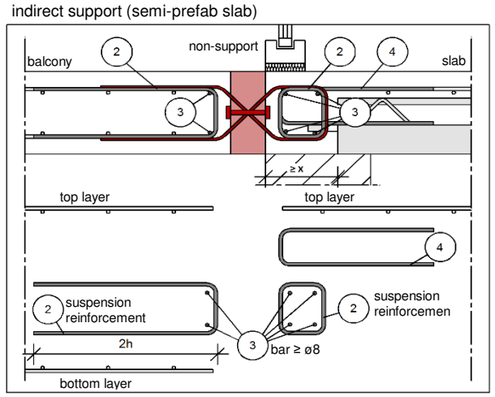
direct support: Egcobox in semi-prefab balcony



indirect support



indirect support (semi-prefab slab)



Note Egcobox in semi-prefab balcony:
It is advisable to include the constructive edging on the balcony side (item ④ vs. item ②) in the semi-prefab part.

Note indirect support (semi-prefab slab):
The information on the minimum required connection reinforcement of the Egcobox of the ceiling-side item ② does not replace the statically selected beam reinforcement of the structural engineer. This has to be considered additionally. The Pos ③ on the ceiling side, however, is only constructive and can be taken into account for the static specifications of the structural engineer.

Design table Egcobox® type VXL Z - C25/30

for zero-stress connection of loggias for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL Z 36	VXL Z 45	VXL Z 65	VXL Z 81	VXL Z 97	VXL Z 129	VXL Z 157	VXL Z 194	VXL Z 235	VXL Z 274
length of element [mm]			**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
concrete cover [mm]												
C30	**C35**	**C50**										
height of connection [mm] good bonding conditions			V_{Rd} [kN/Element]									
160-170	160-175	175-190	36,5	45,6	64,9	81,1	97,3	129,7	-	-	-	-
175-190	180-195	195-210							156,9	194,6	235,4	274,6
195-300	200-300	215-300	48,7	60,8	86,5	108,2	129,8	173,1	216,3	259,6	307,3	368,8

Reinforcement										
shear force bars	4 ø 6	5 ø 6	4 ø 8	5 ø 8	6 ø 8	8 ø 8	10 ø 8	12 ø 8	10 ø 10	12 ø 10
minimum wall / beam width [mm]	180	180	200	200	200	200	200	200	220	220
applicable expansion joint distances [m]	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0
span between elements [m]	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**

Also available as VM Z± version on request.

Design table Egcobox® type VXL Z -K - C25/30

for zero-stress connection of loggias for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL Z 18-K	VXL Z 32-K	VXL Z 48-K	VXL Z 65-K	VXL Z 75-K	VXL Z 97-K	VXL Z 113-K	VXL Z 152-K
length of element [mm]			**200**	**250**	**300**	**300**	**400**	**400**	**500**	**510**
concrete cover [mm]										
C30	**C35**	**C50**								
height of connection [mm] good bonding conditions			V_{Rd} [kN/Element]							
160-170	160-175	175-190	18,2	32,4	48,6	64,9	75,2	-	113,5	-
175-190	180-195	195-210						101,3		152,0
195-300	200-300	215-300	24,3	43,3	64,9	86,5	108,2	122,9	151,4	184,4

Reinforcement								
shear force bars	2 ø 6	2 ø 8	3 ø 8	4 ø 8	5 ø 8	4 ø 10	7 ø 8	6 ø 10
minimum wall / beam width [mm]	180	200	200	200	200	220	200	220
applicable expansion joint distances [m]	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0
span between elements [m]	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**

Also available as VXL Z-K± version on request.

The Egcobox VXL Z or VXL Z-K is to be used opposite each other in combination with the Egcobox VXL or VXL-K of the same bearing stage or an opposite bending resistant support.

On-site reinforcement Egcobox® type VXL Z / VXL Z -K - C25/30

Egcobox type	VXL Z 36	VXL Z 45	VXL Z 65	VXL Z 81	VXL Z 97	VXL Z 129	VXL Z 157	VXL Z 194	VXL Z 235	VXL Z 304
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
in combination with	VXL36	VXL45	VXL65	VXL81	VXL97	VXL129	VXL157	VXL194	VXL235	VXL274
	oder einem biegesteifem Auflager									
item ② - suspension reinforcement side shear force / element										
≥ a_s [cm²] B500	1,12	1,40	1,99	2,49	2,99	3,98	4,98	5,97	7,07	8,48
x = shear force bar embedment depth (slab) [mm]	155	155	175	175	175	175	175	175	195	195
item ⑤ - tie member (add. reinforcement) in the loggia for transmitting the horizontal tension forces from the Egcobox VM to VM Z										
≥ as [cm²] B500	1,12	1,40	1,99	2,49	2,99	3,98	4,98	5,97	7,07	8,48
item ⑥ - max. required add. reinforcement (tension) in the connection area of the Egcobox VM in case of e.g. asymmetrical loads on the loggia										
≥ a_s [cm²] B500	0,63	0,79	1,13	1,41	1,69	2,26	2,82	3,39	4,01	4,81

Egcobox type	VXL Z 18-K	VXL Z 32-K	VXL Z 48-K	VXL Z 65-K	VXL Z 75-K	VXL Z 97-K	VXL Z 113-K	VXL Z 152-K
length of element [mm]	**200**	**250**	**300**	**300**	**400**	**400**	**500**	**510**
in combination with	VXL18-K	VXL32-K	VXL48-K	VXL65-K	VXL75-K	VXL97-K	VXL113-K	VXL152-K
	oder einem biegesteifem Auflager							
item ② - suspension reinforcement side shear force / element								
≥ a_s [cm²] B500	0,56	1,00	1,49	1,99	2,49	2,83	3,48	4,24
x = shear force bar embedment depth (slab) [mm]	155	175	175	175	175	195	175	195
item ⑤ - tie member (add. reinforcement) in the loggia for transmitting the horizontal tension forces from the Egcobox VM-K to VM Z-K								
≥ as [cm²] B500	0,56	1,00	1,49	1,99	2,49	2,83	3,48	4,24
item ⑥ - max. required add. reinforcement (tension) in the connection area of the Egcobox VM-K in case of e.g. asymmetrical loads on the loggia								
≥ a_s [cm²] B500	0,32	0,56	0,85	1,13	1,41	1,61	1,97	2,40

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②); on the floor side, an edge beam (item ⑤) ≥ ø6/250 is to be provided.

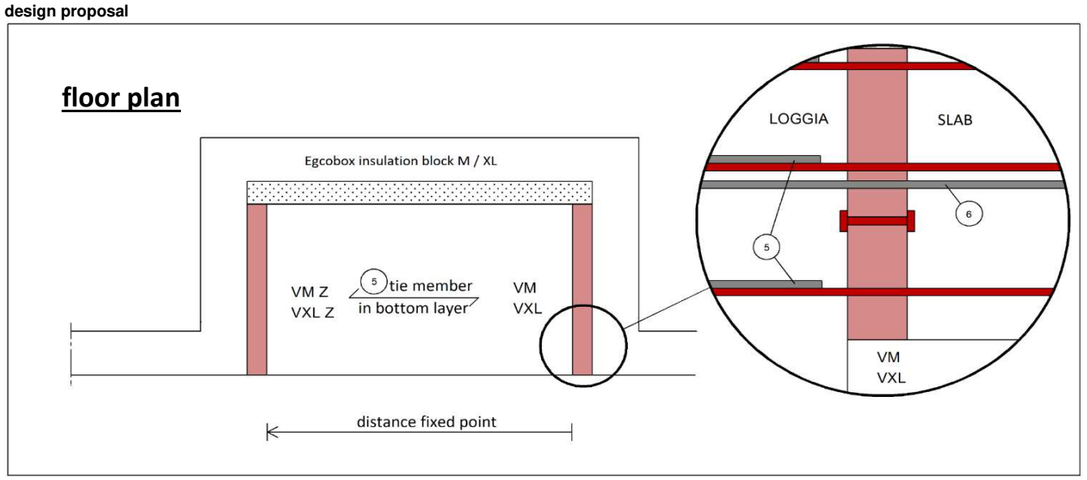
The proposed steel cross-section a_s The proposed steel cross-section as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

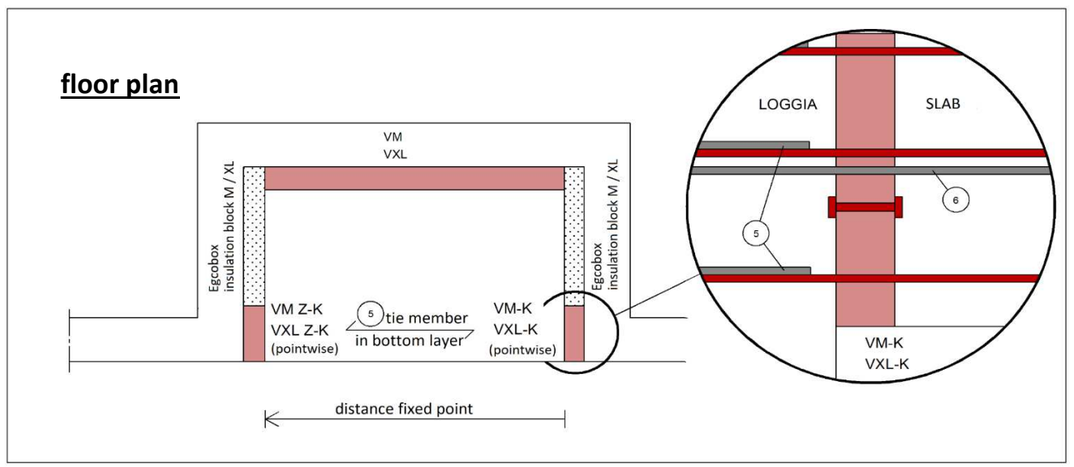
item ⑤+⑥ - additional reinforcement
When planning zero-stress elements, care must be taken to ensure that the resulting tensile forces are absorbed in the lower reinforcement layer of the loggia by a tie member (item ⑤).
At maximum design shear force V_{Rd} of Egcobox®, the reinforcement cross-section of the tension member should correspond to the transverse force bars.
In addition, additional tension forces may occur, e.g. due to asymmetrical loading of the balcony plate. These can be absorbed by arranging Egcobox® Short-Elements (modules) or by additional tension rods (V4A) in the Egcobox VXL_ or VXL_-K.
The proposed steel cross-section a_s The proposed steel cross-section (item ⑥) as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

2 ø6 / 2 ø6
3 ø8 / 2 ø8

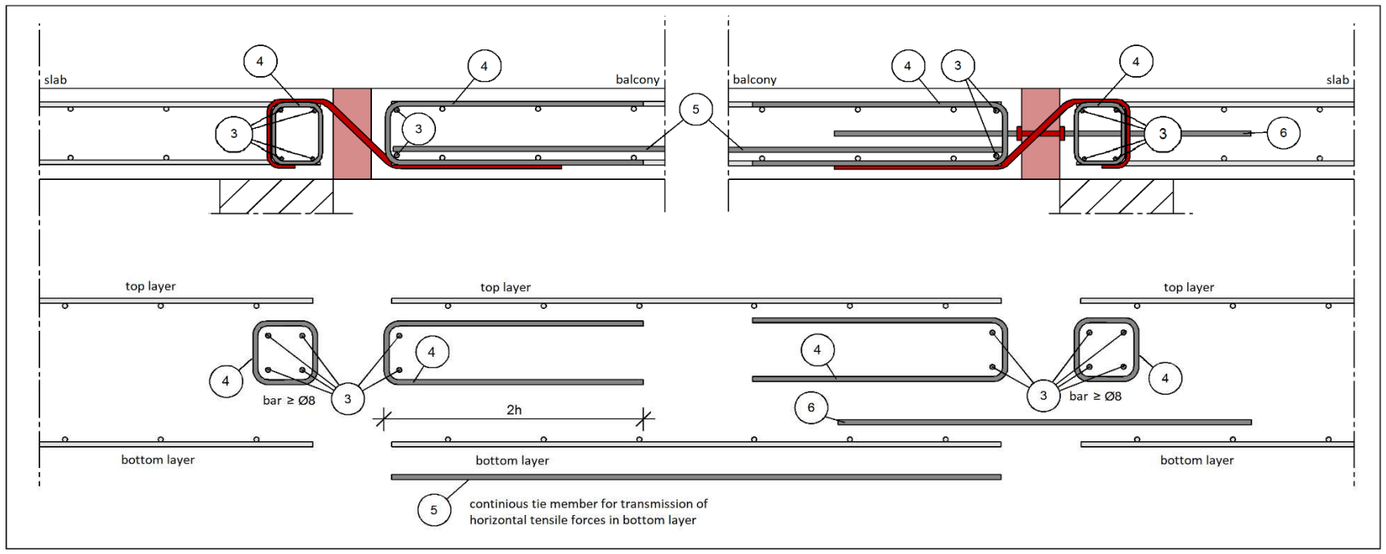
The specifications apply to good bonding conditions.

design proposal

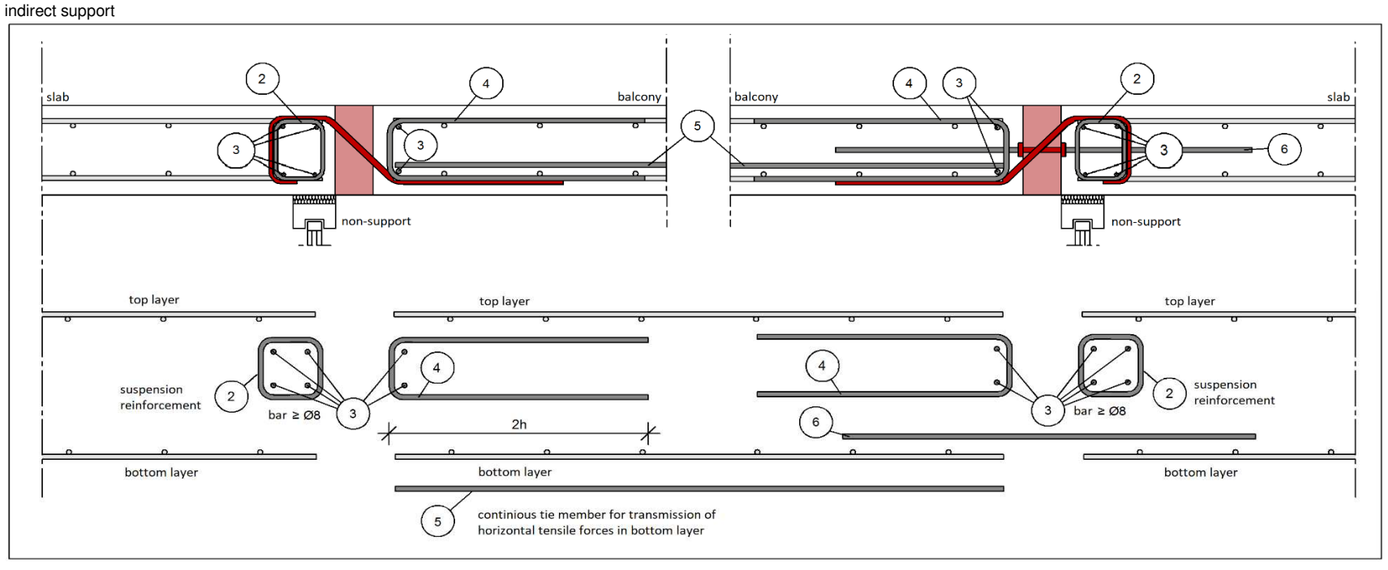




direct support



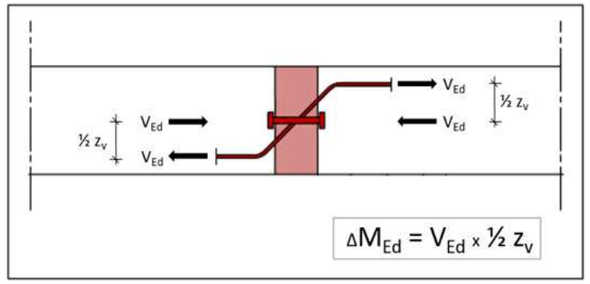
indirect support



Egcobox® type VXL, VXL±, VXL-K, VXL-K± - C25/30

Moments from eccentric connection

When using the Egcobox® V... for the transmission of shear force requirements only, a moment from eccentric connection has to be considered additionally when dimensioning the connection reinforcement.
The moment ΔM_{Ed} is determined under the assumption of a shear force utilisation of 100%.



Egcobox type			VXL36 VXL36±	VXL45 VXL45±	VXL65 VXL65±	VXL81 VXL81±	VXL97 VXL97±	VXL129 VXL129±	VXL157 VXL157±	VXL194 VXL194±	VXL235 VXL235±	VXL274 VXL274±
length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
concrete cover [mm]			ΔMEd [kNm/element] for height of connectionn									
C30	C35	C50										
height of connection [mm] good bonding conditions												
160-170	160-175	175-190	2,4	3,0	4,3	5,4	6,5	8,6	-	-	-	-
175-190	180-195	195-210	2,9	3,7	5,2	6,5	7,8	10,4	12,6	15,7	18,9	22,1
195-225	200-230	215-245	4,6	5,8	8,2	10,2	12,3	16,4	20,4	24,5	29,0	34,8
230-260	235-265	250-280	5,8	7,2	10,3	12,9	15,4	20,6	25,7	30,9	36,6	43,9
265-300	270-300	285-300	8,2	10,2	14,5	18,2	21,8	29,1	36,3	43,6	51,6	62,0

Egcobox type			VXL18-K VXL18-K±	VXL32-K VXL32-K±	VXL48-K VXL48-K±	VXL65-K VXL65-K±	VXL75-K VXL75-K±	VXL97-K VXL97-K±	VXL113-K VXL113-K±	VXL152-K VXL152-K±
length of element [mm]			200	250	300	300 310	400	400	500	510 530
concrete cover [mm]			ΔMEd [kNm/element] for height of connection							
C30	C35	C50								
height of connection [mm] good bonding conditions										
160-170	160-175	175-190	1,2	2,2	3,2	4,3	5,0	-	7,5	-
175-190	180-195	195-210	1,5	2,6	3,9	5,2	6,1	8,2	9,1	12,2
195-225	200-230	215-245	2,3	4,1	6,1	8,2	10,2	11,6	14,3	17,4
230-260	235-265	250-280	2,9	5,1	7,7	10,3	12,9	14,6	18,0	21,9
265-300	270-300	285-300	4,1	7,3	10,9	14,5	18,2	20,7	25,4	31,0

Design table Egcobox® type AXL

for parapet wall, insulation 120 mm

Egcobox type	AXL10-140	AXL10-150	AXL10-200	AXL20-140	AXL20-150	AXL20-200	AXL30-140	AXL30-150	AXL30-200
length of element [mm]	250			250			250		
height of element [mm]	140 - 250			140 - 250			140 - 250		
width of parapet wall [mm]	140	150 - 190	200 - 250	140	150 - 190	200 - 250	140	150 - 190	200 - 250

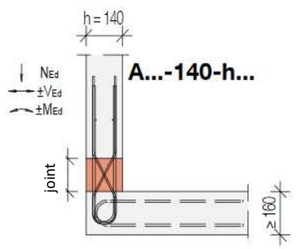
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]																	
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C20/25 parapet wall C20/25 slab C20/25	0,0	± 2,39	0,0	± 2,69	0,0	± 3,05	0,0	± 3,83	0,0	± 4,70	0,0	± 6,50	0,0	± 3,83	0,0	± 4,70	0,0	± 6,50
	10,0	± 1,99	10,0	± 2,24	10,0	± 2,43	10,0	± 3,43	10,0	± 4,25	10,0	± 5,85	10,0	± 3,43	10,0	± 4,25	10,0	± 5,85
	20,0	± 1,59	20,0	± 1,79	20,0	± 1,82	20,0	± 3,03	20,0	± 3,80	20,0	± 5,20	20,0	± 3,03	20,0	± 3,80	20,0	± 5,20
	30,0	± 1,19	30,0	± 1,34	30,0	± 1,20	30,0	± 2,63	30,0	± 3,35	30,0	± 4,55	30,0	± 2,63	30,0	± 3,35	30,0	± 4,55
	40,0	± 0,79	40,0	± 0,89	40,0	± 0,59	40,0	± 2,23	40,0	± 2,90	40,0	± 3,90	40,0	± 2,23	40,0	± 2,90	40,0	± 3,90
	50,0	± 0,39	50,0	± 0,44	49,6	± 0,00	50,0	± 1,83	50,0	± 2,45	50,0	± 3,25	50,0	± 1,83	50,0	± 2,45	50,0	± 3,25
	60,0	± 0,00	59,8	± 0,00	-	-	60,0	± 1,43	60,0	± 2,00	60,0	± 2,60	60,0	± 1,43	60,0	± 2,00	60,0	± 2,60
	V_{Rd} [kN/element]																	
	± 4,84		± 5,31		± 6,87		± 5,89		± 6,46		± 8,36		± 11,78		± 12,92		± 16,71	

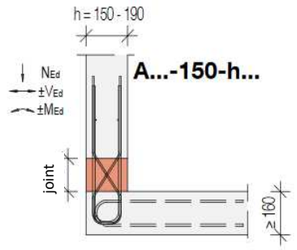
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]																	
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C25/30 parapet wall C25/30 slab ≥C20/25	0,0	± 2,40	0,0	± 3,12	0,0	± 3,18	0,0	± 3,83	0,0	± 4,70	0,0	± 6,91	0,0	± 3,83	0,0	± 4,70	0,0	± 6,91
	10,0	± 2,05	10,0	± 2,67	10,0	± 2,62	10,0	± 3,43	10,0	± 4,25	10,0	± 6,28	10,0	± 3,43	10,0	± 4,25	10,0	± 6,28
	20,0	± 1,71	20,0	± 2,22	20,0	± 2,07	20,0	± 3,03	20,0	± 3,80	20,0	± 5,66	20,0	± 3,03	20,0	± 3,80	20,0	± 5,66
	30,0	± 1,36	30,0	± 1,77	30,0	± 1,52	30,0	± 2,63	30,0	± 3,35	30,0	± 5,04	30,0	± 2,63	30,0	± 3,35	30,0	± 5,04
	40,0	± 1,02	40,0	± 1,32	40,0	± 0,97	40,0	± 2,23	40,0	± 2,90	40,0	± 4,42	40,0	± 2,23	40,0	± 2,90	40,0	± 4,42
	50,0	± 0,67	50,0	± 0,87	50,0	± 0,42	50,0	± 1,83	50,0	± 2,45	50,0	± 3,80	50,0	± 1,83	50,0	± 2,45	50,0	± 3,80
	60,0	± 0,32	59,8	± 0,42	57,5	± 0,00	60,0	± 1,43	60,0	± 2,00	60,0	± 3,18	60,0	± 1,43	60,0	± 2,00	60,0	± 3,18
	V_{Rd} [kN/element]																	
	± 5,62		± 6,16		± 7,97		± 6,22		± 6,93		± 8,82		± 12,42		± 13,85		± 17,61	

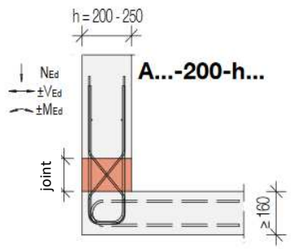
Reinforcement			
tension- / compression bars	2 ø 10	3 ø 10	3 ø 10
shear force bars	2 x 1 ø 6	2 x 1 ø 6	2 x 2 ø 6
u-bars ex works	2 ø 8	4 ø 8	4 ø 10
applicable expansion joint distances [m]	**21,7**	**21,7**	**21,7**

concrete cover parapet wall $c_a \geq 30$ mm; concrete cover slab $25 \geq c_v \geq 35$ mm shear force bars

The u-bars ex works are included in delivery.
The design talbe is also valid for other insulation thicknesses: 60 mm (AS), 80 mm (AM), 100 mm (AL)
The expansion joint distances vary depending on the joint thickness: 60 mm = 7,80 m; 80 mm = 13,0 m; 100 mm = 17,3 m







On-site reinforcement Egcobox® type AXL

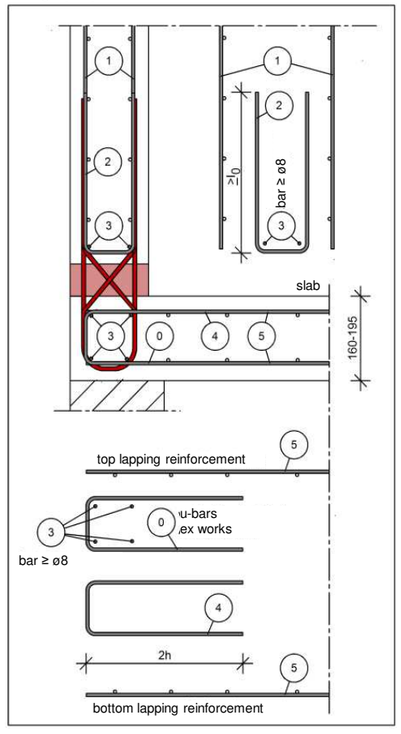
The additional reinforcement is suitable also for Egcobox with insulation thickness 60 mm (AS), 80 mm (AM) and 100 mm (AL).

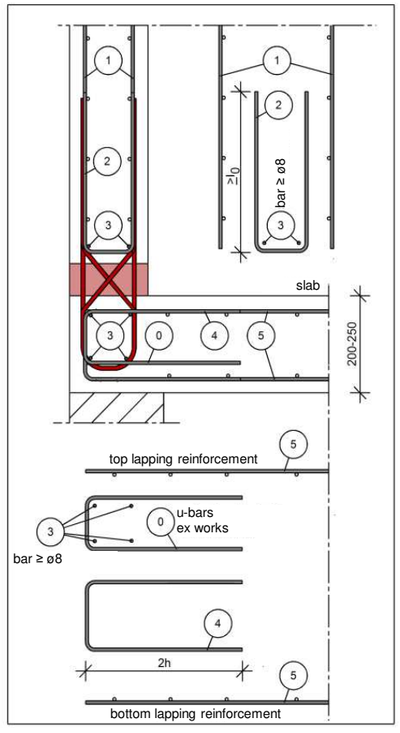
type Egcobox	AXL10-140	AXL10-150	AXL10-200	AXL20-140	AXL20-150	AXL20-200	AXL30-140	AXL30-150	AXL30-200
length of element [mm]	**250**								
height of element [mm]	**140 - 250**								
item ⓪ - u-bar reinforcement ex works									
rebar	2 ø8	2 ø8	2 ø8	4 ø8	4 ø8	4 ø8	4 ø10	4 ø10	4 ø10
item ① - lapping reinforcement in parapet									
≥ a_s [cm²] B500	1,57	1,57	1,57	2,36	2,36	2,36	2,36	2,36	2,36
rebar	2 ø10	2 ø10	2 ø10	3 ø10	3 ø10	3 ø10	3 ø10	3 ø10	3 ø10
item ② - u-bar reinforcement in parape									
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm
item ③ - rebars									
rebar	ø8	ø8	ø8	ø8	ø8	ø8	ø8	ø8	ø8
item ④ - structural reinforcement in the slab edge for thickness <200 mm									
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm
item ④ - structural reinforcement in the slab edge for thickness >200 mm									
rebar	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm
item ⑤ - lapping reinforcement in slab									
≥ a_s [cm²] B500	1,01	1,01	1,01	2,01	2,01	2,01	2,01	2,01	2,01
rebar	2 ø8	2 ø8	2 ø8	4 ø8	4 ø8	4 ø8	4 ø10	4 ø10	4 ø10

The suggested reinforcement is selected to transfer 100% of the M_{Rd} and V_{Rd} of the Egcobox®. An other reinforcement selection is possible.

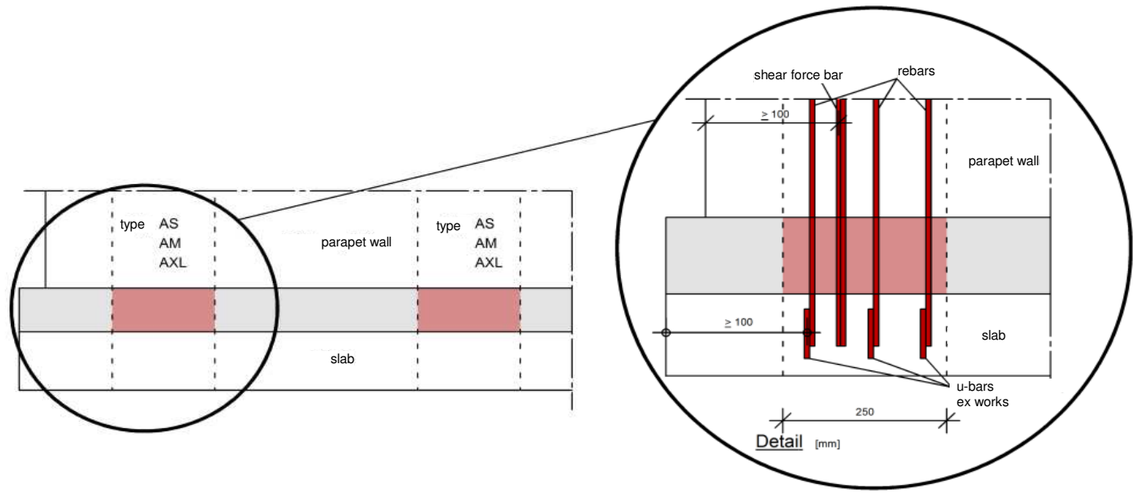
2 ø6 / 2 ø6
3 ø8 / 2 ø8

design proposal





boundery conditions



Design table Egcobox® type FXL

for console element parapet, insulation 120 mm

Egcobox type	FXL10-160	FXL10-200	FXL20-160	FXL20-200	FXL30-160	FXL30-200
length of element [mm]	250		250		250	
height of element [mm]	160 - 190	200 - 250	160 - 190	200 - 250	160 - 190	200 - 250
width of parapet wall [mm]	≥ 150		≥ 150		≥ 150	

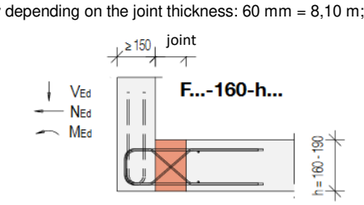
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]											
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C20/25 parapet wall C20/25 slab C20/25	- 28,0	± 0,00	- 28,0	± 0,00	- 42,0	± 0,00	- 42,0	± 0,00	- 56,0	± 0,00	- 56,0	± 0,00
	- 16,7	± 0,52	- 16,7	± 0,74	- 25,1	± 0,78	- 25,1	± 1,11	- 33,5	± 1,04	- 33,5	± 1,49
	- 9,2	± 0,86	- 9,2	± 1,24	- 13,9	± 1,29	- 13,9	± 1,86	- 18,5	± 1,73	- 18,5	± 2,48
	- 0,0	± 1,29	- 0,0	± 1,85	- 0,0	± 1,93	- 0,0	± 2,77	- 0,0	± 2,58	- 0,3	± 3,67
	0,0	± 1,73	0,0	± 2,48	0,0	± 2,59	0,0	± 3,67	0,0	± 3,34	0,0	± 3,67
	2,5	± 1,73	2,5	± 2,48	3,7	± 2,59	4,3	± 3,67	7,4	± 3,34	24,3	± 3,67
	17,5	± 1,04	17,5	± 1,49	26,2	± 1,55	26,2	± 2,23	35,0	± 2,07	35,0	± 2,97
	25,0	± 0,69	25,0	± 0,99	37,5	± 1,04	37,5	± 1,49	50,0	± 1,38	50,0	± 1,98
	32,5	± 0,35	32,5	± 0,50	48,7	± 0,52	48,7	± 0,74	65,0	± 0,69	65,0	± 0,99
	40,0	± 0,00	40,0	± 0,00	60,0	± 0,00	60,0	± 0,00	80,0	± 0,00	80,0	± 0,00
	V_{Rd} [kN/element]											
	± 13,80		± 17,60		± 13,80		± 17,60		± 13,80		± 17,60	

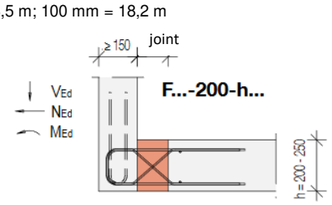
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]											
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C25/30 parapet wall C25/30 slab ≥C20/25	- 32,5	± 0,00	- 32,5	± 0,00	- 48,7	± 0,00	- 48,7	± 0,00	- 65,0	± 0,00	- 65,0	± 0,00
	- 21,2	± 0,52	- 21,2	± 0,74	- 31,8	± 0,78	- 31,8	± 1,11	- 42,5	± 1,04	- 42,5	± 1,49
	- 13,7	± 0,86	- 13,7	± 1,24	- 20,6	± 1,29	- 20,6	± 1,86	- 27,5	± 1,73	- 27,5	± 2,48
	- 4,5	± 1,29	- 4,5	± 1,85	- 6,7	± 1,93	- 6,7	± 2,77	- 9,0	± 2,58	- 9,0	± 3,70
	0,0	± 1,73	0,0	± 2,48	0,0	± 2,59	0,0	± 3,71	0,0	± 3,45	0,0	± 4,26
	8,9	± 1,73	8,9	± 2,48	13,3	± 2,59	13,3	± 3,71	17,8	± 3,45	28,3	± 4,26
	23,9	± 1,04	23,9	± 1,49	35,9	± 1,55	35,9	± 2,23	47,8	± 2,07	47,8	± 2,97
	31,4	± 0,69	31,4	± 0,99	47,1	± 1,04	47,1	± 1,49	62,8	± 1,38	62,8	± 1,98
	38,9	± 0,35	38,9	± 0,50	58,4	± 0,52	58,4	± 0,74	77,8	± 0,69	77,8	± 0,99
	46,4	± 0,00	46,4	± 0,00	69,6	± 0,00	69,6	± 0,00	92,8	± 0,00	92,8	± 0,00
	V_{Rd} [kN/element]											
	± 13,80		± 17,60		± 13,80		± 17,60		± 13,80		± 17,60	

Reinforcement			
tension- / compression bars	2 ø 8	3 ø 8	4 ø 8
shear force bars	2 x 2 ø 6	2 x 2 ø 6	2 x 2 ø 6
u-bars ex works	3 ø 8	3 ø 8	3 ø 8
applicable expansion joint distances [m]	**23,0**	**23,0**	**23,0**

concrete cover parapet wall c_a ≥ 40 mm; concrete cover slab c_{vo} = 35 mm shear force bars

The u-bars ex works are included in delivery.
The design talbe is also valid for other insulation thicknesses: 60 mm (FS), 80 mm (FM), 100 mm (FL)
The expansion joint distances vary depending on the joint thickness: 60 mm = 8,10 m; 80 mm = 13,5 m; 100 mm = 18,2 m





On-site reinforcement Egcobox® type FXL

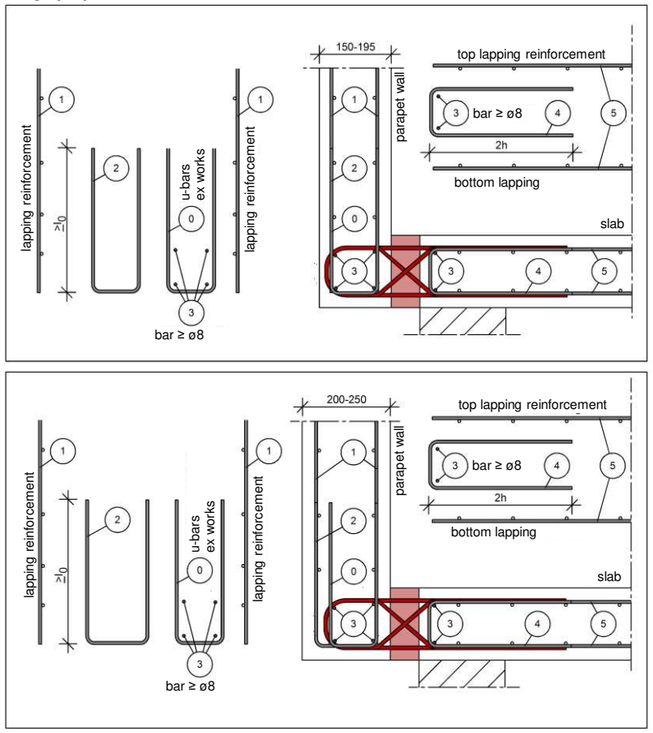
The additional reinforcement is suitable also for Egcobox with insulation thickness 60 mm (FS), 80 mm (FM) and 100 mm (FL).

type Egcobox	FXL10-160	FXL10-200	FXL20-160	FXL20-200	FXL30-160	FXL30-200
length of element [mm]	**250**					
height of element [mm]	**160 - 250**					
item ⓪ - u-bar reinforcement ex works						
rebar	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8
item ① - lapping reinforcement in parapet						
≥ a_s [cm²] B500	1,51	1,51	1,51	1,51	1,51	1,51
rebar	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8
item ② - u-bar reinforcement in parapet for thickness <200 mm						
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm
item ② - u-bar reinforcement in parapet for thickness >200 mm						
rebar	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm
item ③ - rebars						
rebar	ø8	ø8	ø8	ø8	ø8	ø8
item ④ - design reinforcement in the slab edge						
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm
item ⑤ - lapping reinforcement in slab						
≥ a_s [cm²] B500	1,01	1,01	1,51	1,51	2,01	2,01
rebar	2 ø8	2 ø8	3 ø8	3 ø8	4 ø8	4 ø8

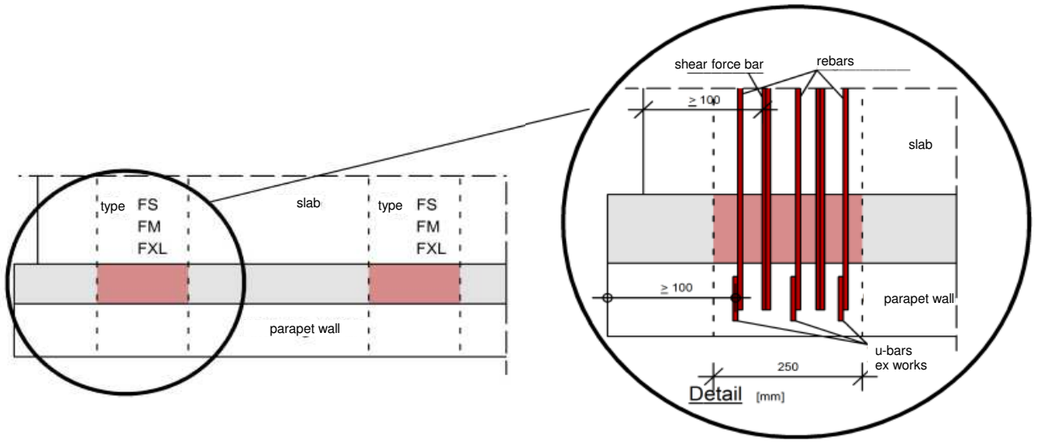
The suggested reinforcement is selected to transfer 100% of the M_{Rd} and V_{Rd} of the Egcobox®. An other reinforcement selection is possible.

2 ø6 / 2 ø6
3 ø8 / 2 ø8

design proposal



boundery conditions



Design table Egcobox® type OXL

for corbel elements, insulation 120 mm

Egcobox type	OXL16	OXL20
length of element [mm]	250	
height of element [mm]	180 - 250	
width of corbel element [mm]	160	200

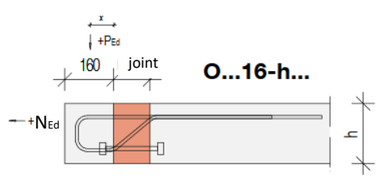
concrete strength	distance x [mm]	N_{Rd} [kN/element]	
	65 - 145	± 15,0	± 20,0
		V_{Rd} [kN/element]	
C20/25	65,0	26,7	29,1
	75,0	25,5	27,8
	85,0	24,4	26,7
	95,0	23,4	25,6
	105,0	22,5	24,6
	115,0	-	23,6
	125,0	-	22,8
	135,0	-	22,0
	145,0	-	21,2

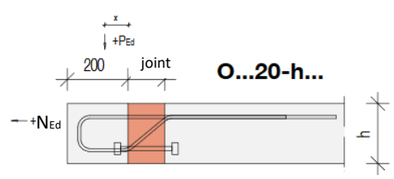
concrete strength	distance x [mm]	N_{Rd} [kN/element]	
	65 - 145	± 15,0	± 20,0
		V_{Rd} [kN/element]	
C25/30	65,0	27,7	30,5
	75,0	27,5	29,2
	85,0	26,3	27,9
	95,0	25,2	26,8
	105,0	24,2	25,7
	115,0	-	24,8
	125,0	-	23,9
	135,0	-	23,0
	145,0	-	22,2

Reinforcement	
tension- / compression bars	3 ø 10
compression bearings	2 ø 12
applicable expansion joint distances [m]	**19,8**

concrete cover corbel element $c_a \geq 30$ mm; concrete cover slab $c_{vo} = 30$ mm

The console must generally be designed with at least concrete strength C25/30.
The design talbe is also valid for other insulation thicknesses: 60 mm (OS), 80 mm (OM), 100 mm (OL)
The expansion joint distances vary depending on the joint thickness: 60 mm = 6,90 m; 80 mm = 11,7 m; 100 mm = 15,7 m





On-site reinforcement Egcobox® type OXL

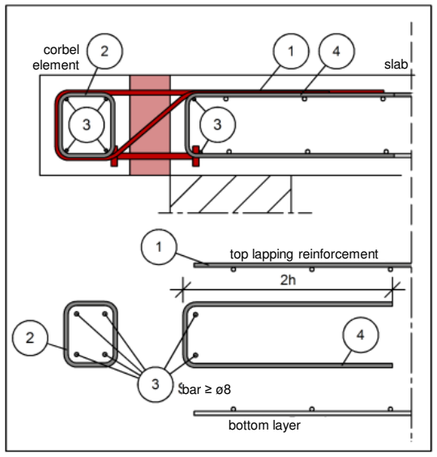
The additional reinforcement is suitable also for Egcobox with insulation thickness 60 mm (OS), 80 mm (OM) and 100 mm (OL).

type Egcobox	OXL16	OXL20
length of element [mm]	**250**	
height of element [mm]	**180 - 250**	
item ① - lapping reinforcement		
≥ a_s [cm²] B500	2,36	2,36
rebar	3 ø10	3 ø10
item ② - suspension reinforcement in corbel [1)]		
≥ a_s [cm²] B500	3,06	3,06
rebar	4 ø10	4 ø10
item ③ - rebars		
rebar	ø8	ø8
item ④ - structural reinforcement in the slab edge		
rebar	ø6 / 250 mm	ø6 / 250 mm

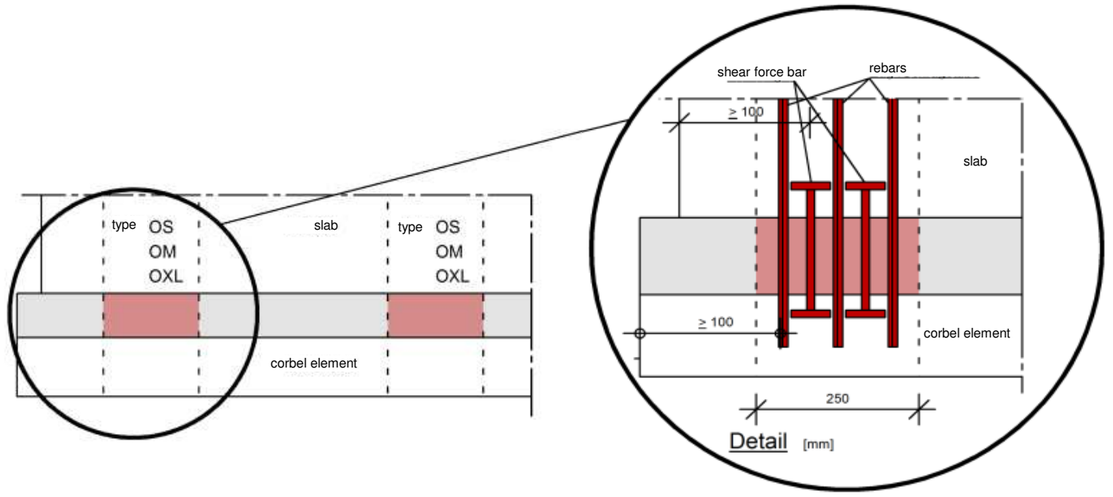
The suggested reinforcement is selected to transfer 100% of the M_{Rd} and V_{Rd} of the Egcobox®. An other reinforcement selection is possible.

[1)] The required reinforcement of the corbel itself has to be calculated by the responsible engineer in additional.

design proposal



boundery conditions



2 ø6 / 2 ø6
3 ø8 / 2 ø8

Design table Egcobox® type MXL-Module - C25/30

Supplementary elements for transmission of normal forces and horizontal shear forces, insulation 120 mm

	Egcobox type			MXL-VH10	MXL-NH10	MXL-NH15	MXL-NH20	MXL-VNH10	MXL-VNH15	MXL-VNH20	MXL-VNH-E10	MXL-VNH-E20
	length of element [mm]			150	150	150	150	150	150	150	150	150
	concrete cover [mm]			M_{Rd} [kNm/element]								
	C30	C35	C50									
height of connection [mm]		**160**	175	-	-	-	-	-	-	-	5,2	8,4
	160	165	**180**	-	-	-	-	-	-	-	5,5	8,9
	165	170	185	-	-	-	-	-	-	-	5,8	9,3
	170	175	190	-	-	-	-	-	-	-	6,1	9,8
	175	**180**	195	-	-	-	-	-	-	-	6,4	10,3
	180	185	**200**	-	-	-	-	-	-	-	6,7	10,8
	185	190	205	-	-	-	-	-	-	-	7,0	11,3
	190	195	210	-	-	-	-	-	-	-	7,3	11,8
	195	**200**	215	-	-	-	-	-	-	-	7,6	12,3
	200	205	**220**	-	-	-	-	-	-	-	7,9	12,8
	205	210	225	-	-	-	-	-	-	-	8,2	13,3
	210	215	230	-	-	-	-	-	-	-	8,5	13,8
	215	**220**	235	-	-	-	-	-	-	-	8,8	14,3
	220	225	**240**	-	-	-	-	-	-	-	9,1	14,8
	225	230	245	-	-	-	-	-	-	-	9,4	15,2
	230	235	250	-	-	-	-	-	-	-	9,7	15,7
	235	**240**	255	-	-	-	-	-	-	-	10,0	16,2
	240	245	**260**	-	-	-	-	-	-	-	10,3	16,7
	245	250	265	-	-	-	-	-	-	-	10,6	17,2
	250	255	270	-	-	-	-	-	-	-	10,9	17,7
	255	**260**	275	-	-	-	-	-	-	-	11,2	18,2
	260	265	**280**	-	-	-	-	-	-	-	11,5	18,7
	265	270	285	-	-	-	-	-	-	-	11,8	19,2
	270	275	290	-	-	-	-	-	-	-	12,1	19,7
	275	**280**	295	-	-	-	-	-	-	-	12,4	20,2
	280	285	**300**	-	-	-	-	-	-	-	12,6	20,7
	285	290		-	-	-	-	-	-	-	12,9	21,1
	290	295		-	-	-	-	-	-	-	13,2	21,6
	295	**300**		-	-	-	-	-	-	-	13,5	22,1
	300			-	-	-	-	-	-	-	13,8	22,6

	concrete cover [mm]			V_{Rdy} [kN/element]								
	C30	C35	C50									
connection -height [mm]	160-300	160-300	175-300	±10,5	-	-	-	±10,5	±10,5	±39,2	±17,9	±33,8

	concrete cover [mm]			N_{Rdx} [kN/element]								
	C30	C35	C50									
connection -height [mm]	160-300	160-300	175-300	-	±14,0	±21,2	±56,7	±14,0	±21,2	±56,7	60,0	98,3

Egcobox® MXL-VH and MXL-VNH only to be used in combination with other Egcobox® elements. Prerequisite pressure absorption with D_{Rd} > 10.5 kN resp. > 39,2 kN

Egcobox® MXL-VNH-E for transfer of uplifting moments MRd is to be used only in connection with other Egcobox® elements ≥ MXL20. The concrete cover refers to the adjacent Egcobox® ≥ MXL20. M_{Rd} and N_{Rdx} do not act simultaneously.

Reinforcement Egcobox® type MXL-Module

Egcobox type	MXL-VH10	MXL-NH10	MXL-NH15	MXL-NH20	MXL-VNH10	MXL-VNH15	MXL-VNH20	MXL-VNH-E10	MXL-VNH-E20
length of element [mm]	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**
tensile bars	-	-	-	-	-	-	-	2 ø 8	2 ø 12
length of tensile bars [mm]	-	-	-	-	-	-	-	1110	1340
tension / compression bars	-	1 ø 10	1 ø 10	1 ø 14	1 ø 10	1 ø 10	1 ø 14	-	-
length of tension / compression bars [mm	-	450	620	1140	450	620	1140	-	-
shear force bars	2x 1 ø 8	-	-	-	2x 1 ø 8	2x 1 ø 8	2x 1 ø 10	2x 1 ø 8	2x 1 ø 10
length of shear force bars l_0 [mm]	200				200	200	520	340	600
applicable expansion joint distances [n	**23,0**	**23,0**	**23,0**	**19,9**	**23,0**	**23,0**	**19,9**	**23,0**	**23,0**

BUILDING
COMMON GROUND

MAX FRANK®

Egcobox® XL

ETA-19/0046 (EU)

Concrete quality C20/25

Design table Egcobox® type MXL - C20/25

for cantilever slabs for transmission of moment and shear force, insulation 120 mm

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500
	concrete cover [mm]			M_{Rd} [kNm/element]																	
	C30	C35	C50																		
height of connection [mm] good bonding conditions		**160**	175	-9,1	-14,3	-17,9	-21,1	-21,4	-25,0	-28,6	-32,2	-35,7	-39,3	-42,9	-46,3	-49,0	-24,0	-28,3	-31,5	-34,0	-48,3
	160	165	**180**	-9,6	-15,1	-18,9	-22,4	-22,7	-26,5	-30,3	-34,1	-37,9	-41,7	-45,4	-49,0	-51,9	-25,4	-30,0	-33,4	-36,1	-51,4
	165	170	185	-10,1	-16,0	-20,0	-23,6	-24,0	-28,0	-32,0	-36,0	-40,0	-44,0	-48,0	-51,8	-54,8	-26,9	-31,7	-35,4	-38,2	-54,5
	170	175	190	-10,7	-16,8	-21,1	-24,9	-25,3	-29,5	-33,7	-37,9	-42,1	-46,3	-50,5	-54,5	-57,7	-28,3	-33,5	-37,3	-40,3	-57,5
	175	**180**	195	-11,2	-17,7	-22,1	-26,1	-26,5	-31,0	-35,4	-39,8	-44,2	-48,7	-53,1	-57,3	-60,6	-29,7	-35,2	-39,3	-42,4	-60,6
	180	185	**200**	-11,7	-18,6	-23,2	-27,4	-27,8	-32,5	-37,1	-41,7	-46,4	-51,0	-55,7	-60,0	-63,5	-31,2	-37,0	-41,2	-44,5	-63,6
	185	190	205	-12,2	-19,4	-24,3	-28,6	-29,1	-34,0	-38,8	-43,7	-48,5	-53,4	-58,2	-62,8	-66,5	-32,6	-38,7	-43,2	-46,6	-66,7
	190	195	210	-12,8	-20,3	-25,3	-29,9	-30,4	-35,4	-40,5	-45,6	-50,6	-55,7	-60,8	-65,5	-69,4	-34,0	-40,5	-45,1	-48,7	-69,8
	195	**200**	215	-13,3	-21,1	-26,4	-31,1	-31,7	-36,9	-42,2	-47,5	-52,8	-58,0	-63,3	-68,3	-72,3	-35,4	-42,2	-47,0	-50,8	-72,8
	200	205	**220**	-13,8	-22,0	-27,4	-32,4	-32,9	-38,4	-43,9	-49,4	-54,9	-60,4	-65,9	-71,0	-75,2	-36,9	-44,0	-49,0	-52,9	-75,9
	205	210	225	-14,4	-22,8	-28,5	-33,7	-34,2	-39,9	-45,6	-51,3	-57,0	-62,7	-68,4	-73,8	-78,1	-38,3	-45,7	-50,9	-55,0	-78,9
	210	215	230	-14,9	-23,7	-29,6	-34,9	-35,5	-41,4	-47,3	-53,2	-59,1	-65,1	-71,0	-76,5	-81,0	-39,7	-47,4	-52,9	-57,1	-82,0
	215	**220**	235	-15,4	-24,5	-30,6	-36,2	-36,8	-42,9	-49,0	-55,1	-61,3	-67,4	-73,5	-79,3	-83,9	-41,2	-49,2	-54,8	-59,2	-85,1
	220	225	**240**	-15,9	-25,4	-31,7	-37,4	-38,0	-44,4	-50,7	-57,1	-63,4	-69,7	-76,1	-82,1	-86,9	-42,6	-50,9	-56,8	-61,3	-88,1
	225	230	245	-16,5	-26,2	-32,8	-38,7	-39,3	-45,9	-52,4	-59,0	-65,5	-72,1	-78,6	-84,8	-89,8	-44,0	-52,7	-58,7	-63,4	-91,2
	230	235	250	-17,0	-27,1	-33,8	-39,9	-40,6	-47,4	-54,1	-60,9	-67,7	-74,4	-81,2	-87,6	-92,7	-45,5	-54,4	-60,7	-65,5	-94,2
	235	**240**	255	-17,5	-27,9	-34,9	-41,2	-41,9	-48,8	-55,8	-62,8	-69,8	-76,8	-83,7	-90,3	-95,6	-46,9	-56,2	-62,6	-67,6	-97,3
	240	245	**260**	-18,0	-28,8	-36,0	-42,4	-43,1	-50,3	-57,5	-64,7	-71,9	-79,1	-86,3	-93,1	-98,5	-48,3	-57,9	-64,5	-69,7	-100,4
	245	250	265	-18,6	-29,6	-37,0	-43,7	-44,4	-51,8	-59,2	-66,6	-74,0	-81,4	-88,8	-95,8	-101,4	-49,7	-59,6	-66,5	-71,8	-103,4
	250	255	270	-19,1	-30,5	-38,1	-45,0	-45,7	-53,3	-60,9	-68,5	-76,2	-83,8	-91,4	-98,6	-104,4	-51,2	-61,4	-68,4	-73,9	-106,5
	255	**260**	275	-19,6	-31,3	-39,1	-46,2	-47,0	-54,8	-62,6	-70,5	-78,3	-86,1	-93,9	-101,3	-107,3	-52,6	-63,1	-70,4	-76,0	-109,5
	260	265	**280**	-20,2	-32,2	-40,2	-47,5	-48,2	-56,3	-64,3	-72,4	-80,4	-88,5	-96,5	-104,1	-110,2	-54,0	-64,9	-72,3	-78,1	-112,6
	265	270	285	-20,7	-33,0	-41,3	-48,7	-49,5	-57,8	-66,0	-74,3	-82,5	-90,8	-99,1	-106,8	-113,1	-55,5	-66,6	-74,3	-80,2	-115,7
	270	275	290	-21,2	-33,9	-42,3	-50,0	-50,8	-59,3	-67,7	-76,2	-84,7	-93,1	-101,6	-109,6	-116,0	-56,9	-68,4	-76,2	-82,3	-118,7
	275	**280**	295	-21,7	-34,7	-43,4	-51,2	-52,1	-60,8	-69,4	-78,1	-86,8	-95,5	-104,2	-112,3	-118,9	-58,3	-70,1	-78,2	-84,4	-121,8
	280	285	**300**	-22,3	-35,6	-44,5	-52,5	-53,4	-62,2	-71,1	-80,0	-88,9	-97,8	-106,7	-115,1	-121,8	-59,7	-71,9	-80,1	-86,5	-124,8
	285	290		-22,8	-36,4	-45,5	-53,7	-54,6	-63,7	-72,8	-81,9	-91,1	-100,2	-109,3	-117,8	-124,8	-61,2	-73,6	-82,0	-88,6	-127,9
	290	295		-23,3	-37,3	-46,6	-55,0	-55,9	-65,2	-74,5	-83,9	-93,2	-102,5	-111,8	-120,6	-127,7	-62,6	-75,3	-84,0	-90,7	-131,0
	295	**300**		-23,9	-38,1	-47,7	-56,3	-57,2	-66,7	-76,2	-85,8	-95,3	-104,8	-114,4	-123,4	-130,6	-64,0	-77,1	-85,9	-92,8	-134,0
	300			-24,4	-39,0	-48,7	-57,5	-58,5	-68,2	-77,9	-87,7	-97,4	-107,2	-116,9	-126,1	-133,5	-65,5	-78,8	-87,9	-94,9	-137,1

Shear force level		concrete cover [mm]			V_{Rd} [kN/element]																
		C30	C35	C50																	
height of connection [mm] good bonding conditions	VS	160-190	160-195	175-210	15,7	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4
		195-300	200-300	215-300	21,0	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9
	V1	160-190	160-195	175-210	27,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9
		195-300	200-300	215-300	37,3	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6
	V2	160-170	160-175	175-190	41,9	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	-	83,8	83,8	83,8	83,8
		175-190	180-195	195-210	41,9	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	87,3	83,8	83,8	83,8	83,8
		195-300	200-300	215-300	55,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	105,9	111,9	111,9	111,9	111,9
	V3	160-190	160-195	175-210	55,9	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	-	-	-	-
		195-300	200-300	215-300	74,6	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	-	-	-	-	-
	V4	175-190	180-195	195-210	-	156,9	156,9	156,9	174,7	174,7	174,7	174,7	174,7	174,7	174,7	174,7	109,2	109,2	109,2	109,2	109,2
		195-300	200-300	215-300	-	210,7	210,7	210,7	211,9	211,9	211,9	211,9	211,9	211,9	211,9	211,9	132,4	132,4	132,4	132,4	132,4
	V6±	160-190	160-195	175-210	+15,7/ -15,7	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+15,7/ -15,7	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4
		195-300	200-300	215-300	+21/ -21	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+21/ -21	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9
	V7±	160-190	160-195	175-210	+31,4/ -23,6	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9	+41,9/ -27,9	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9
		195-300	200-300	215-300	+41,9/ -31,5	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6	+55,9/ -37,3	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6
	V8±	175-190	180-195	195-210	+65,5/ -65,5	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+65,5/ -65,5	+109,2/ -109,2	+109,2/ -109,2	+109,2/ -109,2	+109,2/ -109,2
		195-300	200-300	215-300	+79,4/ -79,4	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+79,4/ -79,4	+132,4/ -132,4	+132,4/ -132,4	+132,4/ -132,4	+132,4/ -132,4

Shear force level VS to V4 also possible with lifting shear force (-15.7 or -21.0 kN/element depending on height of connection/concrete cover) (designation: VS±, V1±, V2±, V3± or V4±)

Reinforcement Egcobox® type MXL

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
length of element [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**	**500**
tensile bars	4 ø 8	4 ø 12	5 ø 12	6 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	11 ø 12	12 ø 12	13 ø 12	14 ø 12	7 ø 12	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of tensile bars [mm]	1130	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1340	1620	1620	1620	2560
compression bearings	2 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	11 ø 12	12 ø 12	6 ø 12	-	-	-	-
compression bars	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of compression bars [mm]															1620	1620	1620	2560
shear force bars VS	2 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6
shear force bars V1	2 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8
shear force bars V2	3 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	4 ø 10	6 ø 8	6 ø 8	6 ø 8	6 ø 8
shear force bars V3	4 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	-	-	-	-	-
shear force bars V4	-	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	5 ø 10	5 ø 10	5 ø 10	5 ø 10	5 ø 10
shear force bars VS±	-	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6
shear force bars V1±	-	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6
shear force bars V2±	-	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	4 ø10 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6
shear force bars V3±	-	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	-	-	-	-	-
shear force bars V4±	-	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6	5 ø 10 / 2 ø 6
shear force bars V6±	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6
shear force bars V7±	4 ø6 / 3 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	3 ø8 / 2 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8
shear force bars V8±	3 ø10 / 3 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	3 ø10 / 3 ø10	5 ø10 / 5 ø10	5 ø10 / 5 ø10	5 ø10 / 5 ø10	5 ø10 / 5 ø10
applicable expansion joint distances [m]	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**17,0**

The Egcobox® is also available as semi-prefab version in variant "FO" (from height 185 mm) or "F" (from height 160 mm): e.g. MXL50-FO-V1-C35-h200

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
	length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**	**500**
	concrete cover [mm]			**banking factor k [1/kNm]**																	
	C30	**C35**	**C50**																		
height of connection [mm] good bonding conditions		**160**	175	1,625	1,137	0,957	0,836	0,789	0,704	0,608	0,535	0,478	0,433	0,395	0,363	0,336	0,672	0,898	0,770	0,674	0,595
	160	165	**180**	1,451	1,013	0,852	0,745	0,703	0,627	0,541	0,477	0,426	0,385	0,352	0,323	0,299	0,599	0,797	0,683	0,598	0,526
	165	170	185	1,304	0,908	0,764	0,668	0,630	0,562	0,485	0,427	0,382	0,345	0,315	0,290	0,268	0,537	0,712	0,610	0,534	0,469
	170	175	190	1,178	0,819	0,689	0,602	0,568	0,506	0,438	0,385	0,344	0,311	0,284	0,261	0,242	0,484	0,640	0,548	0,480	0,420
	175	**180**	195	1,070	0,742	0,624	0,546	0,515	0,459	0,396	0,349	0,312	0,282	0,258	0,237	0,219	0,439	0,578	0,495	0,433	0,379
	180	185	**200**	0,976	0,675	0,568	0,497	0,469	0,418	0,361	0,318	0,284	0,257	0,234	0,216	0,200	0,399	0,525	0,450	0,393	0,343
	185	190	205	0,893	0,617	0,519	0,454	0,429	0,382	0,330	0,291	0,260	0,235	0,214	0,197	0,182	0,365	0,478	0,410	0,359	0,312
	190	195	210	0,821	0,567	0,477	0,417	0,393	0,351	0,303	0,267	0,238	0,216	0,197	0,181	0,167	0,335	0,438	0,375	0,329	0,286
	195	**200**	215	0,757	0,522	0,439	0,384	0,362	0,323	0,279	0,246	0,220	0,198	0,181	0,167	0,154	0,308	0,403	0,345	0,302	0,262
	200	205	**220**	0,700	0,482	0,406	0,355	0,335	0,298	0,258	0,227	0,203	0,183	0,167	0,154	0,143	0,285	0,371	0,318	0,278	0,241
	205	210	225	0,650	0,447	0,376	0,329	0,310	0,276	0,239	0,210	0,188	0,170	0,155	0,143	0,132	0,264	0,343	0,294	0,258	0,223
	210	215	230	0,605	0,415	0,349	0,305	0,288	0,257	0,222	0,195	0,175	0,158	0,144	0,133	0,123	0,245	0,319	0,273	0,239	0,207
	215	**220**	235	0,564	0,387	0,326	0,285	0,269	0,239	0,207	0,182	0,163	0,147	0,134	0,124	0,114	0,229	0,296	0,254	0,222	0,192
	220	225	**240**	0,527	0,361	0,304	0,266	0,251	0,224	0,193	0,170	0,152	0,137	0,125	0,115	0,107	0,214	0,277	0,237	0,207	0,179
	225	230	245	0,494	0,338	0,285	0,249	0,235	0,209	0,181	0,159	0,142	0,129	0,117	0,108	0,100	0,200	0,259	0,222	0,194	0,167
	230	235	250	0,464	0,317	0,267	0,233	0,220	0,196	0,170	0,149	0,134	0,121	0,110	0,101	0,094	0,188	0,242	0,208	0,182	0,157
	235	**240**	255	0,436	0,298	0,251	0,219	0,207	0,185	0,159	0,140	0,125	0,113	0,104	0,095	0,088	0,176	0,227	0,195	0,171	0,147
	240	245	**260**	0,411	0,281	0,236	0,207	0,195	0,174	0,150	0,132	0,118	0,107	0,098	0,090	0,083	0,166	0,214	0,183	0,160	0,138
	245	250	265	0,388	0,265	0,223	0,195	0,184	0,164	0,142	0,125	0,111	0,101	0,092	0,085	0,078	0,157	0,202	0,173	0,151	0,130
	250	255	270	0,367	0,250	0,211	0,184	0,174	0,155	0,134	0,118	0,105	0,095	0,087	0,080	0,074	0,148	0,190	0,163	0,143	0,123
	255	**260**	275	0,347	0,237	0,199	0,174	0,165	0,147	0,127	0,112	0,100	0,090	0,082	0,076	0,070	0,140	0,180	0,154	0,135	0,116
	260	265	**280**	0,329	0,225	0,189	0,165	0,156	0,139	0,120	0,106	0,094	0,085	0,078	0,072	0,066	0,133	0,170	0,146	0,128	0,110
	265	270	285	0,313	0,213	0,179	0,157	0,148	0,132	0,114	0,100	0,090	0,081	0,074	0,068	0,063	0,126	0,162	0,138	0,121	0,104
	270	275	290	0,298	0,203	0,170	0,149	0,141	0,125	0,108	0,095	0,085	0,077	0,070	0,065	0,060	0,120	0,153	0,132	0,115	0,099
	275	**280**	295	0,283	0,193	0,162	0,142	0,134	0,119	0,103	0,091	0,081	0,073	0,067	0,062	0,057	0,114	0,146	0,125	0,109	0,094
	280	285	**300**	0,270	0,184	0,155	0,135	0,128	0,114	0,098	0,086	0,077	0,070	0,064	0,059	0,054	0,109	0,139	0,119	0,104	0,089
	285	290		0,258	0,175	0,147	0,129	0,122	0,108	0,094	0,082	0,074	0,067	0,061	0,056	0,052	0,104	0,132	0,113	0,099	0,085
	290	295		0,246	0,167	0,141	0,123	0,116	0,104	0,089	0,079	0,070	0,064	0,058	0,053	0,049	0,099	0,126	0,108	0,095	0,081
	295	**300**		0,235	0,160	0,135	0,118	0,111	0,099	0,085	0,075	0,067	0,061	0,056	0,051	0,047	0,095	0,121	0,103	0,091	0,077
	300			0,225	0,153	0,129	0,113	0,106	0,095	0,082	0,072	0,064	0,058	0,053	0,049	0,045	0,090	0,115	0,099	0,087	0,074

Rotation spring stiffness Egcobox® type MXL

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500	500
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]																	
	C30	C35	C50																		
height of connection [mm] good bonding conditions		**160**	175	615	879	1045	1196	1267	1421	1645	1868	2090	2312	2533	2754	2975	1488	1113	1299	1484	1681
	160	165	**180**	689	987	1173	1342	1422	1596	1847	2097	2347	2596	2844	3092	3340	1670	1255	1464	1673	1901
	165	170	185	767	1101	1309	1497	1586	1780	2060	2340	2618	2895	3172	3449	3726	1863	1405	1639	1873	2134
	170	175	190	849	1221	1452	1661	1759	1974	2285	2595	2904	3212	3519	3826	4133	2066	1563	1824	2085	2380
	175	**180**	195	935	1348	1602	1833	1942	2179	2522	2864	3204	3544	3883	4222	4561	2280	1731	2019	2307	2640
	180	185	**200**	1025	1481	1760	2013	2133	2393	2771	3146	3520	3893	4266	4638	5010	2505	1906	2224	2542	2914
	185	190	205	1120	1620	1925	2202	2333	2618	3031	3441	3850	4258	4666	5073	5480	2740	2090	2439	2787	3201
	190	195	210	1218	1765	2098	2399	2542	2853	3302	3749	4195	4640	5084	5528	5971	2986	2283	2663	3044	3501
	195	**200**	215	1321	1916	2278	2605	2760	3097	3586	4071	4555	5038	5521	6002	6484	3242	2484	2898	3312	3815
	200	205	**220**	1428	2074	2465	2820	2987	3352	3881	4406	4930	5453	5975	6496	7017	3508	2693	3142	3591	4142
	205	210	225	1539	2238	2660	3042	3223	3617	4187	4754	5320	5884	6447	7009	7571	3786	2911	3397	3882	4483
	210	215	230	1654	2408	2862	3274	3468	3892	4505	5116	5724	6331	6937	7542	8147	4074	3138	3661	4184	4837
	215	**220**	235	1773	2584	3072	3513	3723	4177	4835	5490	6143	6795	7445	8095	8744	4372	3373	3935	4497	5205
	220	225	**240**	1897	2767	3289	3762	3986	4472	5177	5878	6577	7275	7971	8667	9361	4681	3616	4219	4822	5586
	225	230	245	2025	2956	3513	4018	4257	4777	5530	6279	7026	7771	8515	9258	10000	5000	3868	4513	5157	5981
	230	235	250	2157	3151	3745	4283	4538	5093	5895	6694	7490	8284	9077	9869	10660	5330	4129	4817	5505	6389
	235	**240**	255	2293	3352	3984	4557	4828	5418	6272	7121	7968	8813	9657	10499	11341	5671	4397	5130	5863	6810
	240	245	**260**	2433	3559	4231	4839	5127	5753	6660	7562	8461	9359	10255	11149	12043	6022	4675	5454	6233	7246
	245	250	265	2577	3773	4485	5130	5435	6099	7060	8016	8970	9921	10870	11819	12766	6383	4961	5787	6614	7694
	250	255	270	2726	3993	4746	5429	5752	6455	7472	8484	9492	10499	11504	12508	13511	6755	5255	6131	7007	8156
	255	**260**	275	2878	4219	5015	5736	6078	6820	7895	8964	10030	11094	12156	13216	14276	7138	5558	6484	7410	8632
	260	265	**280**	3035	4452	5291	6052	6413	7196	8330	9458	10583	11705	12825	13944	15062	7531	5869	6847	7825	9121
	265	270	285	3196	4690	5575	6377	6756	7582	8776	9965	11150	12332	13513	14692	15870	7935	6189	7220	8252	9623
	270	275	290	3361	4935	5866	6710	7109	7977	9235	10485	11732	12976	14218	15459	16698	8349	6517	7603	8689	10139
	275	**280**	295	3531	5186	6165	7051	7471	8383	9704	11019	12329	13637	14942	16246	17548	8774	6854	7996	9138	10668
	280	285	**300**	3704	5444	6470	7401	7842	8799	10186	11566	12941	14313	15683	17052	18419	9209	7199	8399	9599	11211
	285	290		3882	5707	6784	7759	8221	9225	10679	12126	13568	15006	16443	17877	19311	9655	7553	8812	10070	11767
	290	295		4063	5977	7104	8126	8610	9662	11184	12699	14209	15716	17220	18722	20224	10112	7915	9234	10553	12337
	295	**300**		4249	6253	7433	8502	9008	10108	11701	13285	14865	16441	18015	19587	21158	10579	8286	9667	11048	12920
	300			4440	6535	7768	8885	9414	10564	12229	13885	15536	17184	18828	20471	22113	11056	8665	10109	11553	13517

On-site reinforcement Egcobox® type MXL - C20/25

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80	MXL80-K	MXL110-K	MXL120-K	MXL130-K	MXL150-K
length of element [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**	**500**
Egcobox ø rebar [mm]	ø 8	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 16
Egcobox l_0 rebar [mm]	475	580	580	580	580	580	580	580	580	580	580	580	580	580	720	720	720	1190
item ① - lapping reinforcement / element																		
≥ a_s [cm²] B500	2,43	3,91	4,89	5,78	5,87	6,85	7,83	8,81	9,79	10,76	11,74	12,67	13,41	6,57	8,02	8,94	9,66	14,07
suggested on-site reinforcement [mm]	ø 10	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 16
item ② - suspension reinforcement shear force / element																		
shear force level VS ≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	0,96	0,96	0,96	0,96	0,96
shear force level V1 ≥ a_s [cm²] B500	0,86	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72
shear force level V2 ≥ a_s [cm²] B500	1,29	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,44	2,57	2,57	2,57	2,57
shear force level V3 ≥ a_s [cm²] B500	1,72	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	-	-	-	-	-
shear force level V4 ≥ a_s [cm²] B500	-	4,85	4,85	4,85	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	3,05	3,05	3,05	3,05	3,05
shear force level VS± ≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	0,96	0,96	0,96	0,96	0,96
shear force level V1± ≥ a_s [cm²] B500	-	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72
shear force level V2± ≥ a_s [cm²] B500	-	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,44	2,57	2,57	2,57	2,57
shear force level V3± ≥ a_s [cm²] B500	-	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	-	-	-	-	-
shear force level V4± ≥ a_s [cm²] B500	-	4,85	4,85	4,85	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	5,65	3,05	3,05	3,05	3,05	3,05
shear force level V6± ≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	0,56	0,96	0,96	0,96	0,96
shear force level V7± ≥ a_s [cm²] B500	0,96	1,93	1,93	1,93	1,93	1,93	1,93	2,57	2,57	2,57	2,57	2,57	2,57	1,29	2,57	2,57	2,57	2,57
shear force level V8± ≥ a_s [cm²] B500	1,83	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	1,83	2,63	2,63	2,63	2,63

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

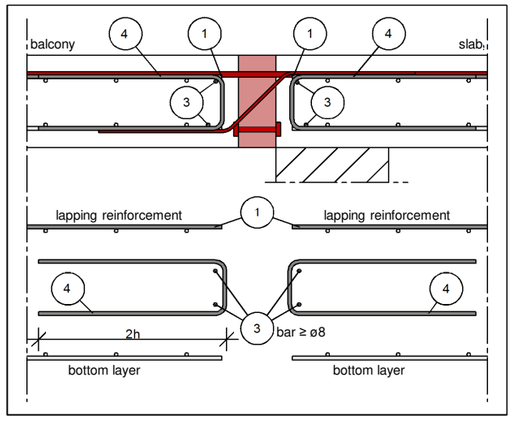
The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox® (height Egcobox® = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

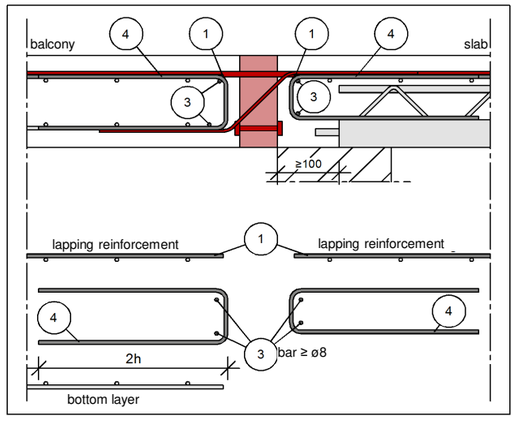
The specifications apply to good bonding conditions.

design proposal

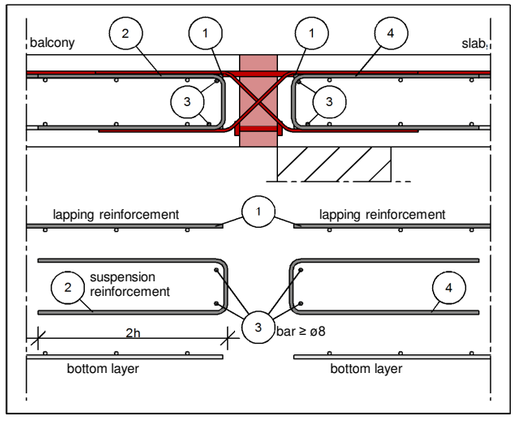
direct support



direct support (semi-prefab slab)



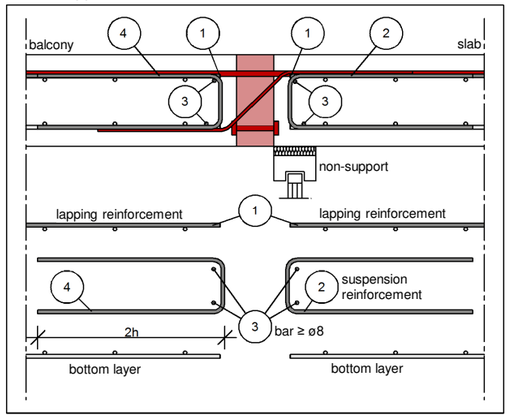
direct support with alternating shear force (V6±, V7±, V8±)



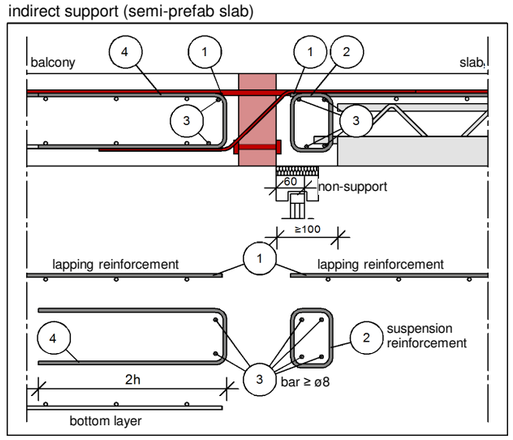
For the Egcobox shear force levels VS± to V4±, a constructive edging on the balcony side is generally sufficient.

design proposal

indirect support



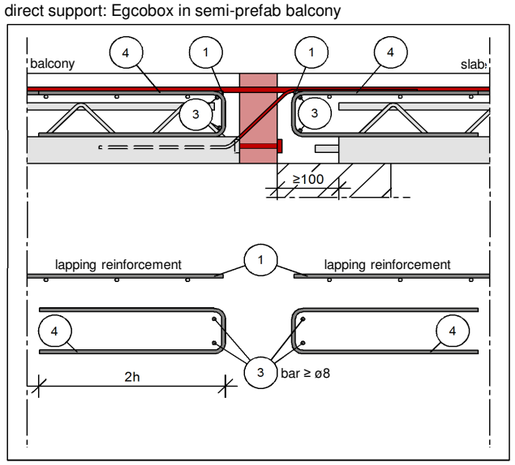
indirect support (semi-prefab slab)



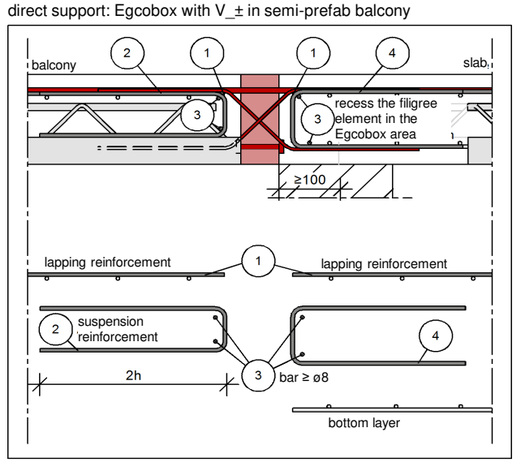
Note indirect support (semi-prefab slab):
The adviced u-bar reinforcement item ② is not replacing the required statical reinforcement of the beam. The reinforcement of the beam has to be calculated by the project engineer in additional.

Semi-prefab balcony

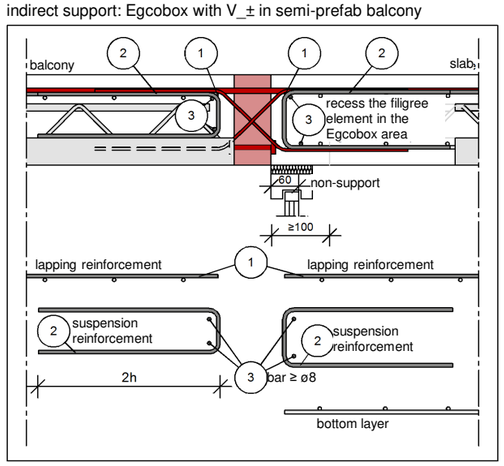
direct support: Egcobox in semi-prefab balcony



direct support: Egcobox with V_± in semi-prefab balcony



indirect support: Egcobox with V_± in semi-prefab balcony

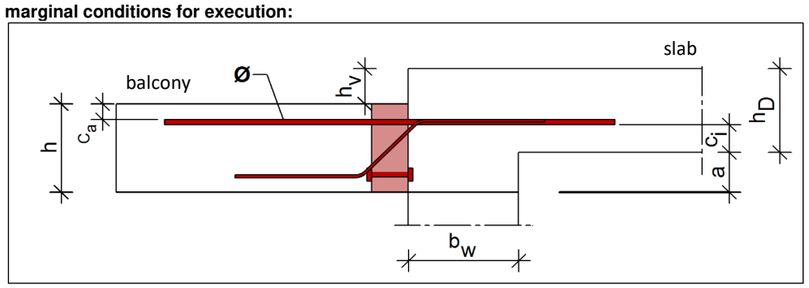


Note Egcobox in semi-prefab balcony:
It is advisable to include the constructive edging on the balcony side (item ④) or the suspension reinforcement (item ②) in the semi-prefab part.
For the Egcobox shear force levels VS± to V4±, a constructive edging on the balcony side is generally sufficient.

On-site reinforcement Egcobox® type MXL - C20/25

for balconies with low offset of height

marginal conditions for execution:



offset of height $h_v < h_D - c_a - d_s - c_i$

If $h_v \leq h_D - c_a - d_s - c_i$, the offset of height balcony can execute with a standard Egcobox®-element MM.

If the marginal conditions do not match, the Egcobox® should be designed with a offset of height MXL-HV.

required minimum width of the joist b_W : 175 mm MXL10-K bis MXL60,
220 mm MXL65 bis MXL80-K

Egcobox type			**MXL10-K**	**MXL20**	**MXL25**	**MXL30**	**MXL35**	**MXL45**	**MXL50**	**MXL55**	**MXL60**	**MXL65**	**MXL70**	**MXL75**	**MXL80**	**MXL80-K**
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist **b_w** [mm]			175	175	175	175	175	175	175	175	175	220	220	220	220	220
Egcobox ø rebar [mm]			ø 8	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12
Egcobox l_0 rebar [mm]			475	580	580	580	580	580	580	580	580	580	580	580	580	580
item ① - lapping reinforcement / element																
≥ as [cm²] B500			2,43	3,91	4,89	5,78	5,87	6,85	7,83	8,81	9,79	10,76	11,74	12,67	13,41	6,57
suggested on-site reinforcement [mm]			ø 10	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12
item ⑤ - link reinforcement slabsides / element at <u>direct support</u> (all shear force level - a_s lapping reinforcement)																
offset height	**a= 50 mm**	≥ a_s [cm²] B500	0,67	1,12	1,35	1,60	1,63	1,90	2,19	2,46	2,74	2,28	2,48	2,69	2,85	1,40
offset height	**a= 100 mm**	≥ a_s [cm²] B500	1,63	2,62	3,28	3,90	3,96	4,62	5,32	5,98	6,65	5,53	6,03	6,54	6,92	3,39
offset height	**a= 200 mm**	≥ a_s [cm²] B500	3,54	5,71	7,13	8,48	8,62	10,06	11,58	13,02	14,47	12,03	13,12	14,23	15,06	7,38
item ⑥ - link reinforcement / element at <u>indirect support</u> (a_s lapping reinforcement + a_s transverse shear force)																
shear force	**a= 50 mm**		1,12+0,48	1,12+0,96	1,35+0,96	1,60+0,96	1,63+0,96	1,90+0,96	2,19+0,96	2,46+0,96	2,74+0,96	2,28+0,96	2,48+0,96	2,69+0,96	2,85+0,96	1,40+0,96
level	**a= 100 mm**	≥ a_s [cm²] B500	1,63+0,48	2,62+0,96	3,28+0,96	3,90+0,96	3,96+0,96	4,62+0,96	5,32+0,96	5,98+0,96	6,65+0,96	5,53+0,96	6,03+0,96	6,54+0,96	6,92+0,96	3,39+0,96
VS / VS±	**a= 200 mm**		3,54+0,48	5,71+0,96	7,13+0,96	8,48+0,96	8,62+0,96	10,06+0,96	11,58+0,96	13,02+0,96	14,47+0,96	12,03+0,96	13,12+0,96	14,23+0,96	15,06+0,96	7,38+0,96
shear force	**a= 50 mm**		1,12+0,86	1,12+1,72	1,35+1,72	1,60+1,72	1,63+1,72	1,90+1,72	2,19+1,72	2,46+1,72	2,74+1,72	2,28+1,72	2,48+1,72	2,69+1,72	2,85+1,72	1,40+1,72
level	**a= 100 mm**	≥ a_s [cm²] B500	1,63+0,86	2,62+1,72	3,28+1,72	3,90+1,72	3,96+1,72	4,62+1,72	5,32+1,72	5,98+1,72	6,65+1,72	5,53+1,72	6,03+1,72	6,54+1,72	6,92+1,72	3,39+1,72
V1 / V1±	**a= 200 mm**		3,54+0,86	5,71+1,72	7,13+1,72	8,48+1,72	8,62+1,72	10,06+1,72	11,58+1,72	13,02+1,72	14,47+1,72	12,03+1,72	13,12+1,72	14,23+1,72	15,06+1,72	7,38+1,72
shear force	**a= 50 mm**		1,12+1,29	1,12+2,57	1,35+2,57	1,60+2,57	1,63+2,57	1,90+2,57	2,19+2,57	2,46+2,57	2,74+2,57	2,28+2,57	2,48+2,57	2,69+2,57	2,85+2,57	1,40+2,44
level	**a= 100 mm**	≥ a_s [cm²] B500	1,63+1,29	2,62+2,57	3,28+2,57	3,90+2,57	3,96+2,57	4,62+2,57	5,32+2,57	5,98+2,57	6,65+2,57	5,53+2,57	6,03+2,57	6,54+2,57	6,92+2,57	3,39+2,44
V2 / V2±	**a= 200 mm**		3,54+1,29	5,71+2,57	7,13+2,57	8,48+2,57	8,62+2,57	10,06+2,57	11,58+2,57	13,02+2,57	14,47+2,57	12,03+2,57	13,12+2,57	14,23+2,57	15,06+2,57	7,38+2,44
shear force	**a= 50 mm**		1,12+1,72	1,12+3,43	1,35+3,43	1,60+3,43	1,63+3,43	1,90+3,43	2,19+3,43	2,46+3,43	2,74+3,43	2,28+3,43	2,48+3,43	2,69+3,43	2,85+3,43	-
level	**a= 100 mm**	≥ a_s [cm²] B500	1,63+1,72	2,62+3,43	3,28+3,43	3,90+3,43	3,96+3,43	4,62+3,43	5,32+3,43	5,98+3,43	6,65+3,43	5,53+3,43	6,03+3,43	6,54+3,43	6,92+3,43	-
V3 / V3±	**a= 200 mm**		3,54+1,72	5,71+3,43	7,13+3,43	8,48+3,43	8,62+3,43	10,06+3,43	11,58+3,43	13,02+3,43	14,47+3,43	12,03+3,43	13,12+3,43	14,23+3,43	15,06+3,43	-
shear force	**a= 50 mm**		-	1,12+4,85	1,35+4,85	1,60+4,85	1,63+4,87	1,90+4,87	2,19+4,87	2,46+4,87	2,74+4,87	2,28+4,87	2,48+4,87	2,69+4,87	2,85+4,87	1,40+2,44
level	**a= 100 mm**	≥ a_s [cm²] B500	-	2,62+4,85	3,28+4,85	3,90+4,85	3,96+4,87	4,62+4,87	5,32+4,87	5,98+4,87	6,65+4,87	5,53+4,87	6,03+4,87	6,54+4,87	6,92+4,87	3,39+2,44
V4 / V4±	**a= 200 mm**		-	5,71+4,85	7,13+4,85	8,48+4,85	8,62+4,87	10,06+4,87	11,58+4,87	13,02+4,87	14,47+4,87	12,03+4,87	13,12+4,87	14,23+4,87	15,06+4,87	7,38+2,44
shear force	**a= 50 mm**		1,12+0,48	1,12+0,96	1,35+0,96	1,60+0,96	1,63+0,96	1,90+0,96	2,19+0,96	2,46+0,96	2,74+0,96	2,28+0,96	2,48+0,96	2,69+0,96	2,85+0,96	1,40+0,48
level	**a= 100 mm**	≥ a_s [cm²] B500	1,63+0,48	2,62+0,96	3,28+0,96	3,90+0,96	3,96+0,96	4,62+0,96	5,32+0,96	5,98+0,96	6,65+0,96	5,53+0,96	6,03+0,96	6,54+0,96	6,92+0,96	3,39+0,48
V6±	**a= 200 mm**		3,54+0,48	5,71+0,96	7,13+0,96	8,48+0,96	8,62+0,96	10,06+0,96	11,58+0,96	13,02+0,96	14,47+0,96	12,03+0,96	13,12+0,96	14,23+0,96	15,06+0,96	7,38+0,48
shear force	**a= 50 mm**		1,12+0,96	1,12+1,93	1,35+1,93	1,60+1,93	1,63+1,93	1,90+1,93	2,19+1,93	2,46+2,57	2,74+2,57	2,28+2,57	2,48+2,57	2,69+2,57	2,85+2,57	1,40+1,29
level	**a= 100 mm**	≥ a_s [cm²] B500	1,63+0,96	2,62+1,93	3,28+1,93	3,90+1,93	3,96+1,93	4,62+1,93	5,32+1,93	5,98+2,57	6,65+2,57	5,53+2,57	6,03+2,57	6,54+2,57	6,92+2,57	3,39+1,29
V7±	**a= 200 mm**		3,54+0,96	5,71+1,93	7,13+1,93	8,48+1,93	8,62+1,93	10,06+1,93	11,58+1,93	13,02+2,57	14,47+2,57	12,03+2,57	13,12+2,57	14,23+2,57	15,06+2,57	7,38+1,29
shear force	**a= 50 mm**		1,12+1,83	1,12+3,65	1,35+3,65	1,60+3,65	1,63+3,65	1,90+3,65	2,19+3,65	2,46+3,65	2,74+3,65	2,28+3,65	2,48+3,65	2,69+3,65	2,85+3,65	1,40+2,01
level	**a= 100 mm**	≥ a_s [cm²] B500	1,63+1,83	2,62+3,65	3,28+3,65	3,90+3,65	3,96+3,65	4,62+3,65	5,32+3,65	5,98+3,65	6,65+3,65	5,53+3,65	6,03+3,65	6,54+3,65	6,92+3,65	3,39+2,01
V8±	**a= 200 mm**		3,54+1,83	5,71+3,65	7,13+3,65	8,48+3,65	8,62+3,65	10,06+3,65	11,58+3,65	13,02+3,65	14,47+3,65	12,03+3,65	13,12+3,65	14,23+3,65	15,06+3,65	7,38+2,01

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox^{ov} (height Egcobox^{ov} = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox^{ov}. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ or item ⑥ applies to the specified required minimum widths of the joist (b_w) and the height of the offset (a= 50 mm; a=100 mm; a= 200 mm). For larger beam widths, a reduction of the required reinforcement is possible.
For balcony offset dimensions between 20 mm < a ≤ 230 mm, interpolation is possible; recommended minimum reinforcement ø6/250 mm.
For offset dimensions < 20 mm, item ⑤ or ⑥ can be reduced to a structural edge reinforcement (direct bearing - item ④) or suspension reinforcement (indirect bearing - item ②).

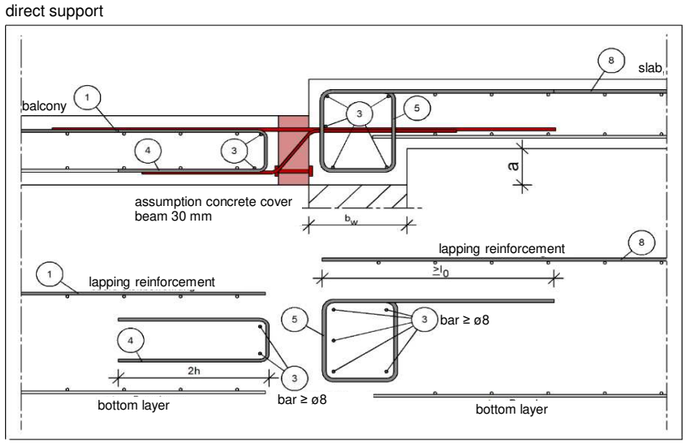
The specified connection reinforcement is to be used exclusively for The force transmission into the slab and the reinforcement required for this (item ⑧) must be verified by the structural engineer.

The specifications apply to good bonding conditions.

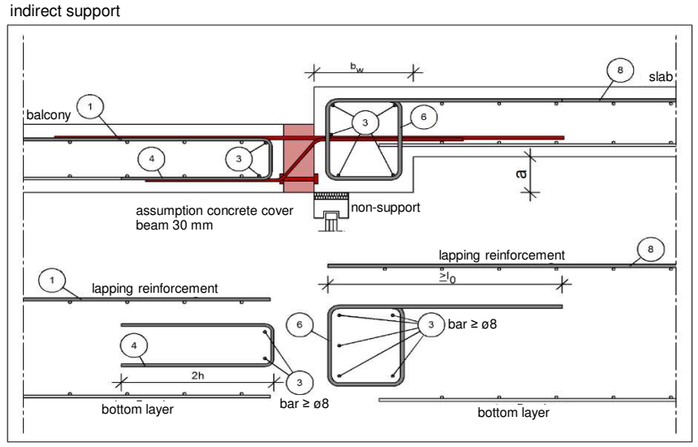
The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox^{ov} reinforcement and the required minimum beam widths must be observed. In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the beam width.

design proposal

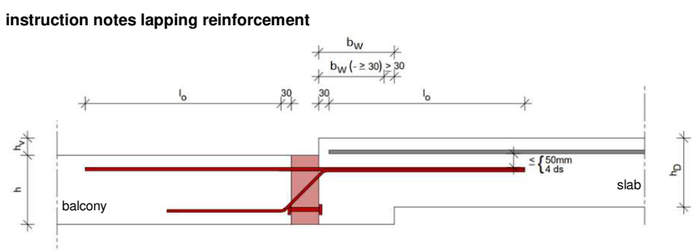
direct support

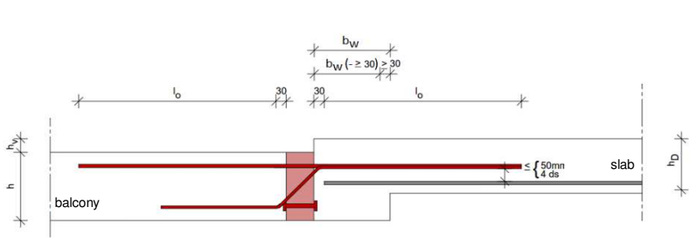


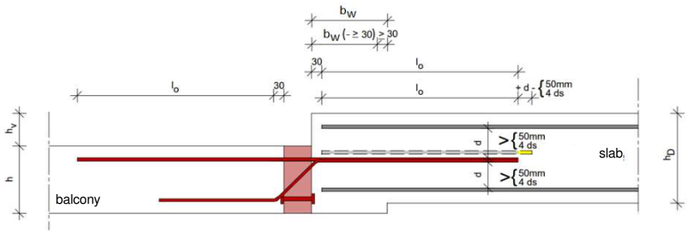
indirect support



instruction notes lapping reinforcement







Design table Egcobox® type MXL-CO - C20/25

for cantilever slabs for transmission of moment and shear force in corner situation, insulation 120 mm

	Egcobox type			MXL10-CO-L or MXL10-CO-R		MXL20-CO-L or MXL20-CO-R		MXL30-CO-L or MXL30-CO-R	
	length of element [mm]			500	620	500	620	600	720
				consists of subcomponents:		consists of subcomponents:		consists of subcomponents:	
	concrete cover [mm] 1. layer (2. layer)			MXL10-CO-S1L or MXL10-CO-S1R 1. layer	MXL10-CO-S2R or MXL10-CO-S2L 2. layer	MXL20-CO-S1L or MXL20-CO-S1R 1. layer	MXL20-CO-S2R or MXL20-CO-S2L 2. layer	MXL30-CO-S1L or MXL30-CO-S1R 1. layer	MXL30-CO-S2R or MXL30-CO-S2L 2. layer
	C30 (C45)	C35 (C50)	C50 (C65)	M_{Rd} [kNm/element]					
height of connection [mm] good bonding conditions		**160**	175	-	-	-	-	-	-
	160	165	**180**	-	-	-	-	-	-
	165	170	185	-	-	-	-	-	-
	170	175	190	-16,8	-14,3	-24,8	-23,0	-30,5	-27,8
	175	**180**	195	-17,7	-15,1	-26,2	-24,4	-32,2	-29,5
	180	185	**200**	-18,6	-16,0	-27,6	-25,8	-33,8	-31,2
	185	190	205	-19,4	-16,8	-29,0	-27,2	-35,5	-32,9
	190	195	210	-20,3	-17,7	-30,4	-28,6	-37,2	-34,6
	195	**200**	215	-21,1	-18,6	-31,8	-30,0	-38,9	-36,3
	200	205	**220**	-22,0	-19,4	-33,2	-31,5	-40,6	-38,0
	205	210	225	-22,8	-20,3	-34,6	-32,9	-42,3	-39,7
	210	215	230	-23,7	-21,1	-36,0	-34,3	-44,0	-41,4
	215	**220**	235	-24,5	-22,0	-37,4	-35,7	-45,7	-43,1
	220	225	**240**	-25,4	-22,8	-38,8	-37,1	-47,4	-44,8
	225	230	245	-26,2	-23,7	-40,2	-38,5	-49,1	-46,5
	230	235	250	-27,1	-24,5	-41,6	-39,9	-50,8	-48,2
	235	**240**	255	-27,9	-25,4	-43,0	-41,3	-52,5	-49,9
	240	245	**260**	-28,8	-26,2	-44,4	-42,7	-54,2	-51,6
	245	250	265	-29,6	-27,1	-45,9	-44,1	-55,9	-53,3
	250	255	270	-30,5	-27,9	-47,3	-45,5	-57,6	-55,0
	255	**260**	275	-31,3	-28,8	-48,7	-46,9	-59,3	-56,7
	260	265	**280**	-32,2	-29,6	-50,1	-48,3	-61,0	-58,4
	265	270	285	-33,0	-30,5	-51,5	-49,7	-62,7	-60,1
	270	275	290	-33,9	-31,3	-52,9	-51,1	-64,4	-61,8
	275	**280**	295	-34,7	-32,2	-54,3	-52,5	-66,1	-63,5
	280	285	**300**	-35,6	-33,0	-55,7	-54,0	-67,8	-65,2
	285	290		-36,4	-33,9	-57,1	-55,4	-69,5	-66,9
	290	295		-37,3	-34,7	-58,5	-56,8	-71,2	-68,6
	295	**300**		-38,1	-35,6	-59,9	-58,2	-72,9	-70,3
	300			-39,0	-36,4	-61,3	-59,6	-74,6	-72,0

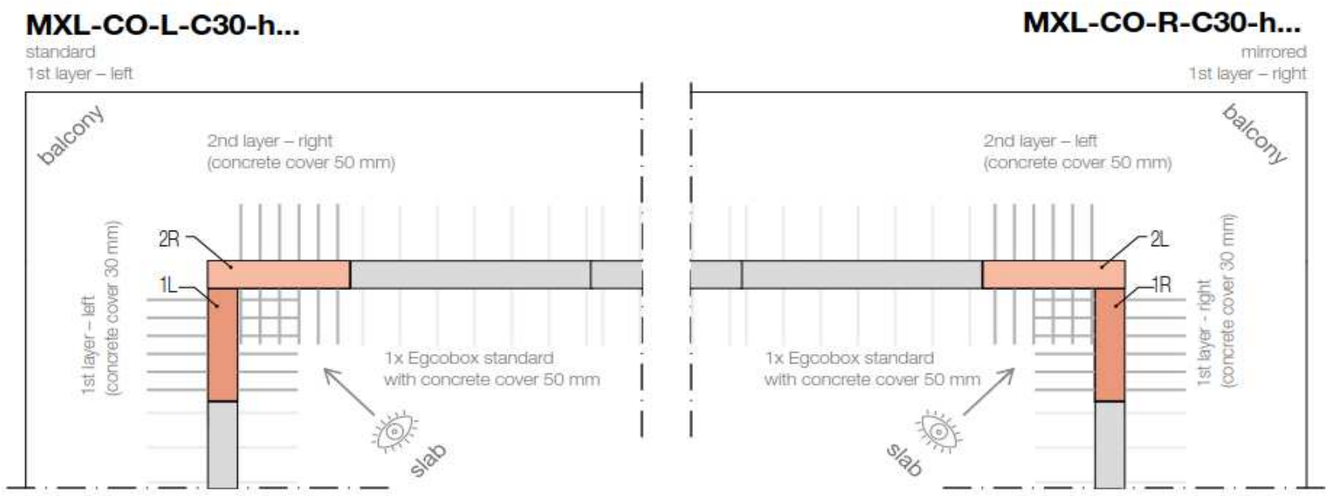
Shear force level		concrete cover [mm] 30 (C45)	35 (C50)	50 (C65)	V_{Rd} [kN/element]					
height of connection [mm] good bonding conditions	VS	170-185	175-190	190-205	41,9	41,9	41,9	41,9	41,9	41,9
		190-205	195-210	210-225	41,9	41,9	41,9	41,9	41,9	41,9
		210-300	215-300	230-300	55,9	55,9	55,9	55,9	55,9	55,9
	V1	170-185	175-190	190-205	82,4	82,4	82,4	82,4	82,4	82,4
		190-205	195-210	210-225	87,3	87,3	87,3	87,3	87,3	87,3
		210-300	215-300	230-300	105,9	105,9	105,9	105,9	105,9	105,9
	V2	170-185	175-190	190-205	-	-	-	-	-	-
		190-205	195-210	210-225	127,9	127,9	127,9	127,9	127,9	127,9
		210-300	215-300	230-300	155,1	155,1	155,1	155,1	155,1	155,1

The choice of the Egcobox® as a complete element, the specification of the concrete cover of the 1st layer is decisive, e.g. MXL20-CO-L-VS-C35-h200, consisting of subcomponents MXL20-CO-S1L-VS-C35-h200, MXL20-CO-S2R-VS-C50-h200; or MXL20-CO-R-VS-C35-h200, consisting of subcomponents MXL20-CO-S1R-VS-C35-h200, MXL20-CO-S2L-VS-C50-h200. "L" and "R" indicate the arrangement of the 1st layer (arrangement of 1st layer left or right of the corner). The Egcobox® corner elements can be planned as a complete element or, for example, as a partial element for centered load requirements.

Reinforcement Egcobox® type MXL-CO

Egcobox type	MXL10-CO-L or MXL10-CO-R		MXL20-CO-L or MXL20-CO-R		MXL30-CO-L or MXL30-CO-R	
length of element [mm]	**500**	**620**	**500**	**620**	**600**	**720**
	consists of subcomponents:		consists of subcomponents:		consists of subcomponents:	
	MXL10-CO-S1L or MXL10-CO-S1R **1. layer**	MXL10-CO-S2R or MXL10-CO-S2L **2. layer**	MXL20-CO-S1L or MXL20-CO-S1R **1. layer**	MXL20-CO-S2R or MXL20-CO-S2L **2. layer**	MXL30-CO-S1L or MXL30-CO-S1R **1. layer**	MXL30-CO-S2R or MXL30-CO-S2L **2. layer**
tensile bars	4 ø 12	4 ø 12	5 ø 14	5 ø 14	6 ø 14	6 ø 14
length of tensile bars [mm]	1340	1340	1620	1620	1620	1620
compression bearings	4 ø 12	4 ø 12	2 ø 12	2 ø 12	3 ø 12	3 ø 12
compression bars	-	-	3 ø 14	3 ø 14	3 ø 14	3 ø 14
length of compression bars [mm]	-	-	1620	1620	1620	1620
shear force bars VS	3 ø 8	3 ø 8	3 ø 8	3 ø 8	3 ø 8	3 ø 8
shear force bars V1	4 ø 10	4 ø 10	4 ø 10	4 ø 10	4 ø 10	4 ø 10
shear force bars V2	6 ø 10	6 ø 10	6 ø 10	6 ø 10	6 ø 10	6 ø 10
applicable expansion joint distances [m]	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**	**19,9 / 2**

Placement



On-site reinforcement Egcobox® type MM-CO - C20/25

Egcobox type	MXL10-CO-L or MXL10-CO-R		MXL20-CO-L or MXL20-CO-R		MXL30-CO-L or MXL30-CO-R	
length of element [mm]	**500**	**620**	**500**	**620**	**600**	**720**
	consists of subcomponents:		consists of subcomponents:		consists of subcomponents:	
	MXL10-CO-S1L or MXL10-CO-S1R **1. layer**	MXL10-CO-S2R or MXL10-CO-S2L **2. layer**	MXL20-CO-S1L or MXL20-CO-S1R **1. layer**	MXL20-CO-S2R or MXL20-CO-S2L **2. layer**	MXL30-CO-S1L or MXL30-CO-S1R **1. layer**	MXL30-CO-S2R or MXL30-CO-S2L **2. layer**
Egcobox ø rebar [mm]	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14
Egcobox l_0 rebar [mm]	580	580	720	720	720	720
item ① - lapping reinforcement / element						
≥ a_s [cm²] B500	4,52	4,52	6,92	6,92	8,16	8,16
suggested on-site reinforcement [mm]	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14
item ② - suspension reinforcement shear force / element						
shear force level VS ≥ a_s [cm²] B500	1,29	1,29	1,29	1,29	1,29	1,29
shear force level V1 ≥ a_s [cm²] B500	2,44	2,44	2,44	2,44	2,44	2,44
shear force level V2 ≥ a_s [cm²] B500	3,57	3,57	3,57	3,57	3,57	3,57

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

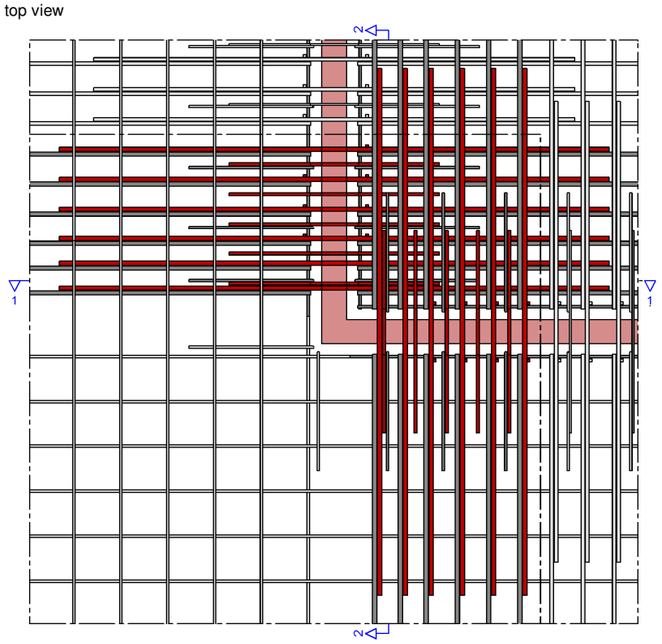
The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox® (height Egcobox® = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

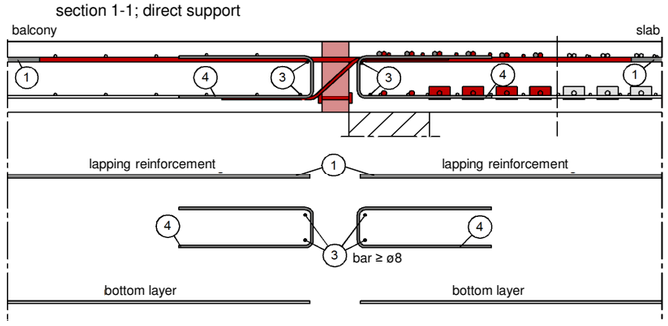
The specifications apply to good bonding conditions.

design proposal

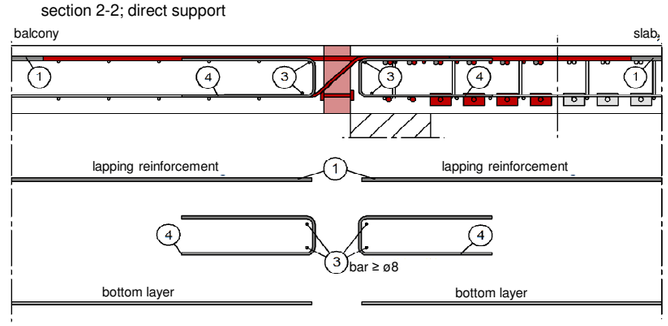
top view



section 1-1; direct support



section 2-2; direct support



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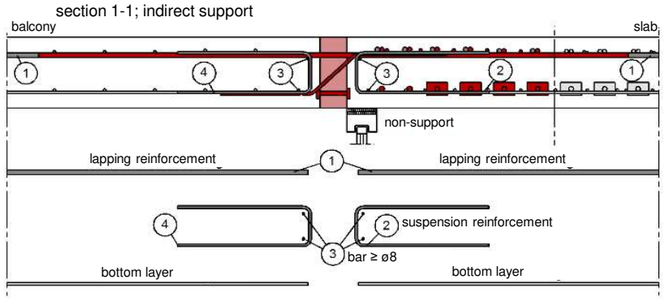

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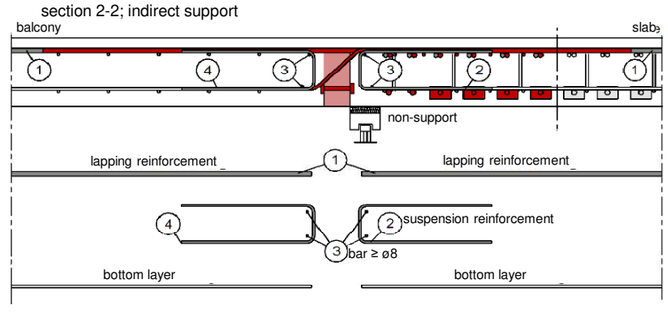
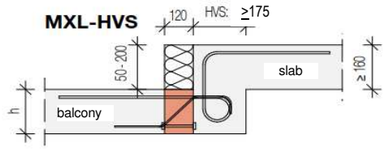
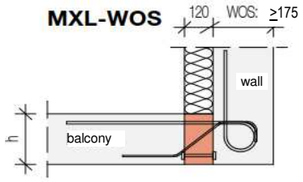


Design table Egcobox® type MXL-HVS / -WOS - C20/25

for cantilever slabs with height offset or wall connection for transmission of moment and shear force, insulation 120 mm

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
				-HVS / -WOS								
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			M_{Rd} [kNm/element]								
	C30	C35	C50									
height of connection [mm] good bonding conditions		**160**	175	-9,1	-13,6	-18,2	-20,4	-22,7	-25,0	-27,2	-31,8	-34,0
	160	165	**180**	-9,6	-14,4	-19,2	-21,6	-24,0	-26,4	-28,8	-33,6	-36,0
	165	170	185	-10,1	-15,2	-20,3	-22,8	-25,3	-27,9	-30,4	-35,5	-38,0
	170	175	190	-10,7	-16,0	-21,3	-24,0	-26,7	-29,3	-32,0	-37,3	-40,0
	175	**180**	195	-11,2	-16,8	-22,4	-25,2	-28,0	-30,8	-33,6	-39,2	-42,0
	180	185	**200**	-11,7	-17,6	-23,4	-26,4	-29,3	-32,2	-35,1	-41,0	-44,0
	185	190	205	-12,2	-18,4	-24,5	-27,5	-30,6	-33,7	-36,7	-42,9	-46,0
	190	195	210	-12,8	-19,2	-25,5	-28,7	-31,9	-35,1	-38,3	-44,7	-48,0
	195	**200**	215	-13,3	-19,9	-26,6	-29,9	-33,2	-36,6	-39,9	-46,5	-50,0
	200	205	**220**	-13,8	-20,7	-27,7	-31,1	-34,6	-38,0	-41,5	-48,4	-52,0
	205	210	225	-14,4	-21,5	-28,7	-32,3	-35,9	-39,5	-43,1	-50,2	-54,0
	210	215	230	-14,9	-22,3	-29,8	-33,5	-37,2	-40,9	-44,6	-52,1	-56,0
	215	**220**	235	-15,4	-23,1	-30,8	-34,7	-38,5	-42,4	-46,2	-53,9	-58,0
	220	225	**240**	-15,9	-23,9	-31,9	-35,9	-39,8	-43,8	-47,8	-55,8	-60,0
	225	230	245	-16,5	-24,7	-32,9	-37,0	-41,2	-45,3	-49,4	-57,6	-62,0
	230	235	250	-17,0	-25,5	-34,0	-38,2	-42,5	-46,7	-51,0	-59,5	-64,0
	235	**240**	255	-17,5	-26,3	-35,0	-39,4	-43,8	-48,2	-52,6	-61,3	-66,0
	240	245	**260**	-18,0	-27,1	-36,1	-40,6	-45,1	-49,6	-54,1	-63,2	-68,0
	245	250	265	-18,6	-27,9	-37,2	-41,8	-46,4	-51,1	-55,7	-65,0	-70,0
	250	255	270	-19,1	-28,7	-38,2	-43,0	-47,8	-52,5	-57,3	-66,9	-72,0
	255	**260**	275	-19,6	-29,4	-39,3	-44,2	-49,1	-54,0	-58,9	-68,7	-74,0
	260	265	**280**	-20,2	-30,2	-40,3	-45,4	-50,4	-55,4	-60,5	-70,6	-76,0
	265	270	285	-20,7	-31,0	-41,4	-46,5	-51,7	-56,9	-62,1	-72,4	-78,0
	270	275	290	-21,2	-31,8	-42,4	-47,7	-53,0	-58,3	-63,6	-74,3	-80,0
	275	**280**	295	-21,7	-32,6	-43,5	-48,9	-54,4	-59,8	-65,2	-76,1	-82,0
	280	285	**300**	-22,3	-33,4	-44,5	-50,1	-55,7	-61,2	-66,8	-78,0	-84,0
	285	290		-22,8	-34,2	-45,6	-51,3	-57,0	-62,7	-68,4	-79,8	-86,0
	290	295		-23,3	-35,0	-46,7	-52,5	-58,3	-64,1	-70,0	-81,6	-88,0
	295	**300**		-23,9	-35,8	-47,7	-53,7	-59,6	-65,6	-71,6	-83,5	-90,0
	300			-24,4	-36,6	-48,8	-54,9	-61,0	-67,1	-73,1	-85,3	-92,0





Shear force level		concrete cover [mm]			V_{Rd} [kN/element]								
		C30	C35	C50									
height of connection [mm] good bonding conditions	VS	160-190	160-195	175-210	15,7	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4
		195-300	200-300	215-300	21,0	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9
	V1	160-190	160-195	175-210	27,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9
		195-300	200-300	215-300	37,3	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6
	V2	160-190	160-195	175-210	41,9	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8
		195-300	200-300	215-300	55,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9
	V3	160-190	160-195	175-210	55,9	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8
		195-300	200-300	215-300	74,6	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2
	V4	175-190	180-195	195-210	-	138,5	138,5	155,9	174,7	174,7	174,7	174,7	174,7
		195-300	200-300	215-300	-	186,0	186,0	209,3	211,9	211,9	211,9	211,9	211,9
	V6±	160-190	160-195	175-210	+15,7/ -15,7	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4
		195-300	200-300	215-300	+21/ -21	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9
	V7±	160-190	160-195	175-210	+31,4/ -23,6	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+83,8/ -55,9	+83,8/ -55,9
		195-300	200-300	215-300	+41,9/ -31,5	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+111,9/ -74,6	+111,9/ -74,6
	V8±	175-190	180-195	195-210	+65,5/ -65,5	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131
		195-300	200-300	215-300	+79,4/ -79,4	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9

Shear force level VS to V4 also possible with lifting shear force (-15.7 or -21.0 kN/element depending on height of connection/concrete cover) (designation: VS±, V1±, V2±, V3± or V4±)

Reinforcement Egcobox® type MXL-HVS / -WOS

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
	-HVS / -WOS								
length of element [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
wall / beam width b_w: -HVS / -WOS [mm]	**≥175**								
tensile bars	4 ø 8	6 ø 8	8 ø 8	9 ø 8	10 ø 8	11 ø 8	12 ø 8	14 ø 8	10 ø 10
length of tensile bars [mm]	depending on bending form								
compression bearings	2 ø 12	4 ø 12	4 ø 12	5 ø 12	7 ø 12	8 ø 12	9 ø 12	12 ø 12	12 ø 12
shear force bars VS	2 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6
shear force bars V1	2 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8
shear force bars V2	3 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8
shear force bars V3	4 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8
shear force bars V4	-	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10
shear force bars VS±	-	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6
shear force bars V1±	-	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6
shear force bars V2±	-	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6
shear force bars V3±	-	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6
shear force bars V4±	-	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6
shear force bars V6±	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6
shear force bars V7±	4 ø6 / 3 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	6 ø8 / 4 ø8	6 ø8 / 4 ø8
shear force bars V8±	3 ø10 / 3 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10
applicable expansion joint distances [m]	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL-HVS / -WOS

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
				-HVS / -WOS								
	length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
	concrete cover [mm]			**banking factor k [1/kNm]**								
	C30	**C35**	**C50**									
height of connection [mm] good bonding conditions		**160**	175	1,625	1,009	0,813	0,702	0,599	0,540	0,492	0,411	0,429
	160	165	**180**	1,451	0,901	0,726	0,627	0,535	0,482	0,439	0,367	0,383
	165	170	185	1,304	0,810	0,652	0,564	0,481	0,433	0,395	0,330	0,343
	170	175	190	1,178	0,731	0,589	0,509	0,434	0,392	0,357	0,298	0,310
	175	**180**	195	1,070	0,664	0,535	0,462	0,394	0,355	0,324	0,271	0,281
	180	185	**200**	0,976	0,606	0,488	0,422	0,359	0,324	0,295	0,247	0,256
	185	190	205	0,893	0,554	0,447	0,386	0,329	0,297	0,270	0,226	0,234
	190	195	210	0,821	0,510	0,410	0,355	0,302	0,273	0,248	0,208	0,215
	195	**200**	215	0,757	0,470	0,379	0,327	0,279	0,252	0,229	0,191	0,198
	200	205	**220**	0,700	0,435	0,350	0,303	0,258	0,233	0,212	0,177	0,183
	205	210	225	0,650	0,403	0,325	0,281	0,239	0,216	0,197	0,164	0,170
	210	215	230	0,605	0,375	0,302	0,261	0,223	0,201	0,183	0,153	0,158
	215	**220**	235	0,564	0,350	0,282	0,244	0,208	0,187	0,171	0,143	0,147
	220	225	**240**	0,527	0,327	0,264	0,228	0,194	0,175	0,160	0,133	0,138
	225	230	245	0,494	0,307	0,247	0,213	0,182	0,164	0,149	0,125	0,129
	230	235	250	0,464	0,288	0,232	0,200	0,171	0,154	0,140	0,117	0,121
	235	**240**	255	0,436	0,271	0,218	0,189	0,161	0,145	0,132	0,110	0,114
	240	245	**260**	0,411	0,255	0,206	0,178	0,151	0,137	0,124	0,104	0,107
	245	250	265	0,388	0,241	0,194	0,168	0,143	0,129	0,117	0,098	0,101
	250	255	270	0,367	0,228	0,183	0,159	0,135	0,122	0,111	0,093	0,096
	255	**260**	275	0,347	0,216	0,174	0,150	0,128	0,115	0,105	0,088	0,091
	260	265	**280**	0,329	0,205	0,165	0,142	0,121	0,109	0,100	0,083	0,086
	265	270	285	0,313	0,194	0,156	0,135	0,115	0,104	0,095	0,079	0,082
	270	275	290	0,298	0,185	0,149	0,129	0,110	0,099	0,090	0,075	0,077
	275	**280**	295	0,283	0,176	0,142	0,122	0,104	0,094	0,086	0,072	0,074
	280	285	**300**	0,270	0,168	0,135	0,117	0,099	0,090	0,082	0,068	0,070
	285	290		0,258	0,160	0,129	0,111	0,095	0,086	0,078	0,065	0,067
	290	295		0,246	0,153	0,123	0,106	0,091	0,082	0,074	0,062	0,064
	295	**300**		0,235	0,146	0,118	0,102	0,087	0,078	0,071	0,060	0,061
	300			0,225	0,140	0,113	0,097	0,083	0,075	0,068	0,057	0,059

Rotation spring stiffness Egcobox® type MXL-HVS / -WOS

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
				-HVS / -WOS								
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]								
	C30	C35	C50									
height of connection [mm] good bonding conditions		**160**	175	615	991	1231	1424	1670	1852	2033	2433	2331
	160	165	**180**	689	1110	1378	1594	1870	2073	2276	2725	2614
	165	170	185	767	1235	1534	1774	2081	2307	2533	3032	2912
	170	175	190	849	1367	1697	1964	2303	2554	2804	3356	3227
	175	**180**	195	935	1506	1870	2163	2537	2813	3088	3697	3557
	180	185	**200**	1025	1652	2050	2372	2782	3085	3387	4054	3904
	185	190	205	1120	1804	2239	2590	3038	3369	3699	4427	4267
	190	195	210	1218	1962	2436	2818	3306	3666	4024	4817	4647
	195	**200**	215	1321	2128	2642	3056	3585	3975	4364	5223	5042
	200	205	**220**	1428	2300	2856	3304	3875	4297	4717	5646	5453
	205	210	225	1539	2479	3078	3561	4176	4631	5084	6085	5881
	210	215	230	1654	2665	3308	3827	4489	4978	5465	6541	6324
	215	**220**	235	1773	2857	3547	4103	4813	5337	5859	7013	6784
	220	225	**240**	1897	3056	3794	4389	5148	5709	6267	7502	7260
	225	230	245	2025	3262	4049	4685	5495	6093	6689	8007	7752
	230	235	250	2157	3474	4313	4990	5853	6490	7125	8528	8260
	235	**240**	255	2293	3694	4585	5305	6222	6899	7574	9066	8785
	240	245	**260**	2433	3920	4866	5629	6602	7321	8037	9621	9325
	245	250	265	2577	4152	5154	5963	6994	7756	8514	10191	9882
	250	255	270	2726	4391	5451	6307	7397	8203	9005	10779	10455
	255	**260**	275	2878	4637	5757	6660	7811	8662	9509	11382	11044
	260	265	**280**	3035	4890	6070	7023	8237	9134	10028	12003	11649
	265	270	285	3196	5149	6392	7395	8674	9619	10559	12639	12270
	270	275	290	3361	5415	6723	7777	9122	10116	11105	13292	12907
	275	**280**	295	3531	5688	7061	8169	9582	10625	11664	13962	13560
	280	285	**300**	3704	5968	7408	8571	10052	11147	12237	14648	14230
	285	290		3882	6254	7763	8982	10535	11682	12824	15350	14916
	290	295		4063	6547	8127	9402	11028	12229	13425	16069	15617
	295	**300**		4249	6846	8499	9832	11533	12788	14039	16805	16335
	300			4440	7153	8879	10272	12048	13360	14667	17556	17069

On-site reinforcement Egcobox® type MXL-HVS - C20/25

for balconies with offset of height

Egcobox type HVS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist b_w [mm]			175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612
item ① - lapping reinforcement / element											
≥ as [cm²] B500			2,43	3,64	4,86	5,46	6,07	6,68	7,28	8,50	9,20
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12
item ② - balcony-side suspension reinforcement shear force / element											
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,28	4,28	4,81	4,87	4,87	4,87	4,87	4,87
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	0,96	1,93	1,93	1,93	1,93	1,93	1,93	2,57	2,57
shear force level	V8±	≥ a_s [cm²] B500	1,83	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65

MXL-HVS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43	2,15	2,87	3,25	3,61	3,97	4,37	5,09	5,52
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	2,58	3,87	5,17	5,85	6,50	7,15	7,86	9,17	9,93
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	4,69	7,03	9,37	10,62	11,80	12,98	14,26	16,64	18,02
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43+0,48	2,15+0,96	2,87+0,96	3,25+0,96	3,61+0,96	3,97+0,96	4,37+0,96	5,09+0,96	5,52+0,96
	a= 150 mm		2,58+0,48	3,87+0,96	5,17+0,96	5,85+0,96	6,50+0,96	7,15+0,96	7,86+0,96	9,17+0,96	9,93+0,96
	a= 260 mm		4,69+0,48	7,03+0,96	9,37+0,96	10,62+0,96	11,80+0,96	12,98+0,96	14,26+0,96	16,64+0,96	18,02+0,96
shear force level V1 / V1±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43+0,86	2,15+1,72	2,87+1,72	3,25+1,72	3,61+1,72	3,97+1,72	4,37+1,72	5,09+1,72	5,52+1,72
	a= 150 mm		2,58+0,86	3,87+1,72	5,17+1,72	5,85+1,72	6,50+1,72	7,15+1,72	7,86+1,72	9,17+1,72	9,93+1,72
	a= 260 mm		4,69+0,86	7,03+1,72	9,37+1,72	10,62+1,72	11,80+1,72	12,98+1,72	14,26+1,72	16,64+1,72	18,02+1,72
shear force level V2 / V2±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43+1,29	2,15+2,57	2,87+2,57	3,25+2,57	3,61+2,57	3,97+2,57	4,37+2,57	5,09+2,57	5,52+2,57
	a= 150 mm		2,58+1,29	3,87+2,57	5,17+2,57	5,85+2,57	6,50+2,57	7,15+2,57	7,86+2,57	9,17+2,57	9,93+2,57
	a= 260 mm		4,69+1,29	7,03+2,57	9,37+2,57	10,62+2,57	11,80+2,57	12,98+2,57	14,26+2,57	16,64+2,57	18,02+2,57
shear force level V3 / V3±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43+1,72	2,15+3,43	2,87+3,43	3,25+3,43	3,61+3,43	3,97+3,43	4,37+3,43	5,09+3,43	5,52+3,43
	a= 150 mm		2,58+1,72	3,87+3,43	5,17+3,43	5,85+3,43	6,50+3,43	7,15+3,43	7,86+3,43	9,17+3,43	9,93+3,43
	a= 260 mm		4,69+1,72	7,03+3,43	9,37+3,43	10,62+3,43	11,80+3,43	12,98+3,43	14,26+3,43	16,64+3,43	18,02+3,43
shear force level V4 / V4±	**a≤ 90 mm**	≥ a_s [cm²] B500	-	2,15+4,28	2,87+4,28	3,25+4,81	3,61+4,87	3,97+4,87	4,37+4,87	5,09+4,87	5,52+4,87
	a= 150 mm		-	3,87+4,28	5,17+4,28	5,85+4,81	6,50+4,87	7,15+4,87	7,86+4,87	9,17+4,87	9,93+4,87
	a= 260 mm		-	7,03+4,28	9,37+4,28	10,62+4,81	11,80+4,87	12,98+4,87	14,26+4,87	16,64+4,87	18,02+4,87
shear force level V6±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43+0,48	2,15+0,96	2,87+0,96	3,25+0,96	3,61+0,96	3,97+0,96	4,37+0,96	5,09+0,96	5,52+0,96
	a= 150 mm		2,58+0,48	3,87+0,96	5,17+0,96	5,85+0,96	6,50+0,96	7,15+0,96	7,86+0,96	9,17+0,96	9,93+0,96
	a= 260 mm		4,69+0,48	7,03+0,96	9,37+0,96	10,62+0,96	11,80+0,96	12,98+0,96	14,26+0,96	16,64+0,96	18,02+0,96
shear force level V7±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43+0,96	2,15+1,93	2,87+1,93	3,25+1,93	3,61+1,93	3,97+1,93	4,37+1,93	5,09+2,57	5,52+2,57
	a= 150 mm		2,58+0,96	3,87+1,93	5,17+1,93	5,85+1,93	6,50+1,93	7,15+1,93	7,86+1,93	9,17+2,57	9,93+2,57
	a= 260 mm		4,69+0,96	7,03+1,93	9,37+1,93	10,62+1,93	11,80+1,93	12,98+1,93	14,26+1,93	16,64+2,57	18,02+2,57
shear force level V8±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,43+1,83	2,15+3,65	2,87+3,65	3,25+3,65	3,61+3,65	3,97+3,65	4,37+3,65	5,09+3,65	5,52+3,65
	a= 150 mm		2,58+1,83	3,87+3,65	5,17+3,65	5,85+3,65	6,50+3,65	7,15+3,65	7,86+3,65	9,17+3,65	9,93+3,65
	a= 260 mm		4,69+1,83	7,03+3,65	9,37+3,65	10,62+3,65	11,80+3,65	12,98+3,65	14,26+3,65	16,64+3,65	18,02+3,65

Egcobox type HVS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000

MXL-HVS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	1,22	1,83	2,44	2,76	3,07	3,37	3,70	4,32	4,67
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	2,19	3,29	4,39	4,97	5,52	6,07	6,66	7,77	8,41
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,98	5,97	7,96	9,01	10,01	11,01	12,09	14,10	15,27
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**a≤ 90 mm**		1,22+0,48	1,83+0,96	2,44+0,96	2,76+0,96	3,07+0,96	3,37+0,96	3,70+0,96	4,32+0,96	4,67+0,96
	a= 150 mm	≥ a_s [cm²] B500	2,19+0,48	3,29+0,96	4,39+0,96	4,97+0,96	5,52+0,96	6,07+0,96	6,66+0,96	7,77+0,96	8,41+0,96
	a= 260 mm		3,98+0,48	5,97+0,96	7,96+0,96	9,01+0,96	10,01+0,96	11,01+0,96	12,09+0,96	14,10+0,96	15,27+0,96
shear force level V1 / V1±	**a≤ 90 mm**		1,22+0,86	1,83+1,72	2,44+1,72	2,76+1,72	3,07+1,72	3,37+1,72	3,70+1,72	4,32+1,72	4,67+1,72
	a= 150 mm	≥ a_s [cm²] B500	2,19+0,86	3,29+1,72	4,39+1,72	4,97+1,72	5,52+1,72	6,07+1,72	6,66+1,72	7,77+1,72	8,41+1,72
	a= 260 mm		3,98+0,86	5,97+1,72	7,96+1,72	9,01+1,72	10,01+1,72	11,01+1,72	12,09+1,72	14,10+1,72	15,27+1,72
shear force level V2 / V2±	**a≤ 90 mm**		1,22+1,29	1,83+2,57	2,44+2,57	2,76+2,57	3,07+2,57	3,37+2,57	3,70+2,57	4,32+2,57	4,67+2,57
	a= 150 mm	≥ a_s [cm²] B500	2,19+1,29	3,29+2,57	4,39+2,57	4,97+2,57	5,52+2,57	6,07+2,57	6,66+2,57	7,77+2,57	8,41+2,57
	a= 260 mm		3,98+1,29	5,97+2,57	7,96+2,57	9,01+2,57	10,01+2,57	11,01+2,57	12,09+2,57	14,10+2,57	15,27+2,57
shear force level V3 / V3±	**a≤ 90 mm**		1,22+1,72	1,83+3,43	2,44+3,43	2,76+3,43	3,07+3,43	3,37+3,43	3,70+3,43	4,32+3,43	4,67+3,43
	a= 150 mm	≥ a_s [cm²] B500	2,19+1,72	3,29+3,43	4,39+3,43	4,97+3,43	5,52+3,43	6,07+3,43	6,66+3,43	7,77+3,43	8,41+3,43
	a= 260 mm		3,98+1,72	5,97+3,43	7,96+3,43	9,01+3,43	10,01+3,43	11,01+3,43	12,09+3,43	14,10+3,43	15,27+3,43
shear force level V4 / V4±	**a≤ 90 mm**		-	1,83+4,28	2,44+4,28	2,76+4,81	3,07+4,87	3,37+4,87	3,70+4,87	4,32+4,87	4,67+4,87
	a= 150 mm	≥ a_s [cm²] B500	-	3,29+4,28	4,39+4,28	4,97+4,81	5,52+4,87	6,07+4,87	6,66+4,87	7,77+4,87	8,41+4,87
	a= 260 mm		-	5,97+4,28	7,96+4,28	9,01+4,81	10,01+4,87	11,01+4,87	12,09+4,87	14,10+4,87	15,27+4,87
shear force level V6±	**a≤ 90 mm**		1,22+0,48	1,83+0,96	2,44+0,96	2,76+0,96	3,07+0,96	3,37+0,96	3,70+0,96	4,32+0,96	4,67+0,96
	a= 150 mm	≥ a_s [cm²] B500	2,19+0,48	3,29+0,96	4,39+0,96	4,97+0,96	5,52+0,96	6,07+0,96	6,66+0,96	7,77+0,96	8,41+0,96
	a= 260 mm		3,98+0,48	5,97+0,96	7,96+0,96	9,01+0,96	10,01+0,96	11,01+0,96	12,09+0,96	14,10+0,96	15,27+0,96
shear force level V7±	**a≤ 90 mm**		1,22+0,96	1,83+1,93	2,44+1,93	2,76+1,93	3,07+1,93	3,37+1,93	3,70+1,93	4,32+2,57	4,67+2,57
	a= 150 mm	≥ a_s [cm²] B500	2,19+0,96	3,29+1,93	4,39+1,93	4,97+1,93	5,52+1,93	6,07+1,93	6,66+1,93	7,77+2,57	8,41+2,57
	a= 260 mm		3,98+0,96	5,97+1,93	7,96+1,93	9,01+1,93	10,01+1,93	11,01+1,93	12,09+1,93	14,10+2,57	15,27+2,57
shear force level V8±	**a≤ 90 mm**		1,22+1,83	1,83+3,65	2,44+3,65	2,76+3,65	3,07+3,65	3,37+3,65	3,70+3,65	4,32+3,65	4,67+3,65
	a= 150 mm	≥ a_s [cm²] B500	2,19+1,83	3,29+3,65	4,39+3,65	4,97+3,65	5,52+3,65	6,07+3,65	6,66+3,65	7,77+3,65	8,41+3,65
	a= 260 mm		3,98+1,83	5,97+3,65	7,96+3,65	9,01+3,65	10,01+3,65	11,01+3,65	12,09+3,65	14,10+3,65	15,27+3,65

MXL-HVS: minimum width of joist b_w 220 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	1,09	1,63	2,18	2,46	2,73	3,01	3,30	3,85	4,17
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	1,96	2,94	3,92	4,43	4,92	5,41	5,94	6,93	7,50
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,55	5,33	7,11	8,04	8,93	9,82	10,78	12,57	13,61
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**a≤ 90 mm**		1,12+0,48	1,63+0,96	2,18+0,96	2,46+0,96	2,73+0,96	3,01+0,96	3,30+0,96	3,85+0,96	4,17+0,96
	a= 150 mm	≥ a_s [cm²] B500	1,96+0,48	2,94+0,96	3,92+0,96	4,43+0,96	4,92+0,96	5,41+0,96	5,94+0,96	6,93+0,96	7,50+0,96
	a= 260 mm		3,55+0,48	5,33+0,96	7,11+0,96	8,04+0,96	8,93+0,96	9,82+0,96	10,78+0,96	12,57+0,96	13,61+0,96
shear force level V1 / V1±	**a≤ 90 mm**		1,12+0,86	1,63+1,72	2,18+1,72	2,46+1,72	2,73+1,72	3,01+1,72	3,30+1,72	3,85+1,72	4,17+1,72
	a= 150 mm	≥ a_s [cm²] B500	1,96+0,86	2,94+1,72	3,92+1,72	4,43+1,72	4,92+1,72	5,41+1,72	5,94+1,72	6,93+1,72	7,50+1,72
	a= 260 mm		3,55+0,86	5,33+1,72	7,11+1,72	8,04+1,72	8,93+1,72	9,82+1,72	10,78+1,72	12,57+1,72	13,61+1,72
shear force level V2 / V2±	**a≤ 90 mm**		1,12+1,29	1,63+2,57	2,18+2,57	2,46+2,57	2,73+2,57	3,01+2,57	3,30+2,57	3,85+2,57	4,17+2,57
	a= 150 mm	≥ a_s [cm²] B500	1,96+1,29	2,94+2,57	3,92+2,57	4,43+2,57	4,92+2,57	5,41+2,57	5,94+2,57	6,93+2,57	7,50+2,57
	a= 260 mm		3,55+1,29	5,33+2,57	7,11+2,57	8,04+2,57	8,93+2,57	9,82+2,57	10,78+2,57	12,57+2,57	13,61+2,57
shear force level V3 / V3±	**a≤ 90 mm**		1,12+1,72	1,63+3,43	2,18+3,43	2,46+3,43	2,73+3,43	3,01+3,43	3,30+3,43	3,85+3,43	4,17+3,43
	a= 150 mm	≥ a_s [cm²] B500	1,96+1,72	2,94+3,43	3,92+3,43	4,43+3,43	4,92+3,43	5,41+3,43	5,94+3,43	6,93+3,43	7,50+3,43
	a= 260 mm		3,55+1,72	5,33+3,43	7,11+3,43	8,04+3,43	8,93+3,43	9,82+3,43	10,78+3,43	12,57+3,43	13,61+3,43
shear force level V4 / V4±	**a≤ 90 mm**		-	1,63+4,28	2,18+4,28	2,46+4,81	2,73+4,87	3,01+4,87	3,30+4,87	3,85+4,87	4,17+4,87
	a= 150 mm	≥ a_s [cm²] B500	-	2,94+4,28	3,92+4,28	4,43+4,81	4,92+4,87	5,41+4,87	5,94+4,87	6,93+4,87	7,50+4,87
	a= 260 mm		-	5,33+4,28	7,11+4,28	8,04+4,81	8,93+4,87	9,82+4,87	10,78+4,87	12,57+4,87	13,61+4,87
shear force level V6±	**a≤ 90 mm**		1,12+0,48	1,63+0,96	2,18+0,96	2,46+0,96	2,73+0,96	3,01+0,96	3,30+0,96	3,85+0,96	4,17+0,96
	a= 150 mm	≥ a_s [cm²] B500	1,96+0,48	2,94+0,96	3,92+0,96	4,43+0,96	4,92+0,96	5,41+0,96	5,94+0,96	6,93+0,96	7,50+0,96
	a= 260 mm		3,55+0,48	5,33+0,96	7,11+0,96	8,04+0,96	8,93+0,96	9,82+0,96	10,78+0,96	12,57+0,96	13,61+0,96
shear force level V7±	**a≤ 90 mm**		1,12+0,96	1,63+1,93	2,18+1,93	2,46+1,93	2,73+1,93	3,01+1,93	3,30+1,93	3,85+2,57	4,17+2,57
	a= 150 mm	≥ a_s [cm²] B500	1,96+0,96	2,94+1,93	3,92+1,93	4,43+1,93	4,92+1,93	5,41+1,93	5,94+1,93	6,93+2,57	7,50+2,57
	a= 260 mm		3,55+0,96	5,33+1,93	7,11+1,93	8,04+1,93	8,93+1,93	9,82+1,93	10,78+1,93	12,57+2,57	13,61+2,57
shear force level V8±	**a≤ 90 mm**		1,12+1,83	1,63+3,65	2,18+3,65	2,46+3,65	2,73+3,65	3,01+3,65	3,30+3,65	3,85+3,65	4,17+3,65
	a= 150 mm	≥ a_s [cm²] B500	1,96+1,83	2,94+3,65	3,92+3,65	4,43+3,65	4,92+3,65	5,41+3,65	5,94+3,65	6,93+3,65	7,50+3,65
	a= 260 mm		3,55+1,83	5,33+3,65	7,11+3,65	8,04+3,65	8,93+3,65	9,82+3,65	10,78+3,65	12,57+3,65	13,61+3,65

Egcobox type HVS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000

MXL-HVS: minimum width of joist b_w 250 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)											
offset balcony	**a≤ 90 mm**	≥ a_s [cm²] B500	0,94	1,40	1,87	2,12	2,35	2,59	2,84	3,31	3,58
offset balcony	**a= 150 mm**	≥ a_s [cm²] B500	1,69	2,53	3,37	3,81	4,23	4,66	5,10	5,96	6,45
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,06	4,59	6,12	6,92	7,68	8,45	9,26	10,81	11,70
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level V5 / V5±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+0,48	1,40+0,96	1,87+0,96	2,12+0,96	2,35+0,96	2,59+0,96	2,84+0,96	3,31+0,96	3,58+0,96
	a= 150 mm		1,69+0,48	2,53+0,96	3,37+0,96	3,81+0,96	4,23+0,96	4,66+0,96	5,10+0,96	5,96+0,96	6,45+0,96
	a= 260 mm		3,06+0,48	4,59+0,96	6,12+0,96	6,92+0,96	7,68+0,96	8,45+0,96	9,26+0,96	10,81+0,96	11,70+0,96
shear force level V1 / V1±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+0,86	1,40+1,72	1,87+1,72	2,12+1,72	2,35+1,72	2,59+1,72	2,84+1,72	3,31+1,72	3,58+1,72
	a= 150 mm		1,69+0,86	2,53+1,72	3,37+1,72	3,81+1,72	4,23+1,72	4,66+1,72	5,10+1,72	5,96+1,72	6,45+1,72
	a= 260 mm		3,06+0,86	4,59+1,72	6,12+1,72	6,92+1,72	7,68+1,72	8,45+1,72	9,26+1,72	10,81+1,72	11,70+1,72
shear force level V2 / V2±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+1,29	1,40+2,57	1,87+2,57	2,12+2,57	2,35+2,57	2,59+2,57	2,84+2,57	3,31+2,57	3,58+2,57
	a= 150 mm		1,69+1,29	2,53+2,57	3,37+2,57	3,81+2,57	4,23+2,57	4,66+2,57	5,10+2,57	5,96+2,57	6,45+2,57
	a= 260 mm		3,06+1,29	4,59+2,57	6,12+2,57	6,92+2,57	7,68+2,57	8,45+2,57	9,26+2,57	10,81+2,57	11,70+2,57
shear force level V3 / V3±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+1,72	1,40+3,43	1,87+3,43	2,12+3,43	2,35+3,43	2,59+3,43	2,84+3,43	3,31+3,43	3,58+3,43
	a= 150 mm		1,69+1,72	2,53+3,43	3,37+3,43	3,81+3,43	4,23+3,43	4,66+3,43	5,10+3,43	5,96+3,43	6,45+3,43
	a= 260 mm		3,06+1,72	4,59+3,43	6,12+3,43	6,92+3,43	7,68+3,43	8,45+3,43	9,26+3,43	10,81+3,43	11,70+3,43
shear force level V4 / V4±	**a≤ 90 mm**	≥ a_s [cm²] B500	-	1,40+4,28	1,87+4,28	2,12+4,81	2,35+4,87	2,59+4,87	2,84+4,87	3,31+4,87	3,58+4,87
	a= 150 mm		-	2,53+4,28	3,37+4,28	3,81+4,81	4,23+4,87	4,66+4,87	5,10+4,87	5,96+4,87	6,45+4,87
	a= 260 mm		-	4,59+4,28	6,12+4,28	6,92+4,81	7,68+4,87	8,45+4,87	9,26+4,87	10,81+4,87	11,70+4,87
shear force level V6±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+0,48	1,40+0,96	1,87+0,96	2,12+0,96	2,35+0,96	2,59+0,96	2,84+0,96	3,31+0,96	3,58+0,96
	a= 150 mm		1,69+0,48	2,53+0,96	3,37+0,96	3,81+0,96	4,23+0,96	4,66+0,96	5,10+0,96	5,96+0,96	6,45+0,96
	a= 260 mm		3,06+0,48	4,59+0,96	6,12+0,96	6,92+0,96	7,68+0,96	8,45+0,96	9,26+0,96	10,81+0,96	11,70+0,96
shear force level V7±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+0,96	1,40+1,93	1,87+1,93	2,12+1,93	2,35+1,93	2,59+1,93	2,84+1,93	3,31+2,57	3,58+2,57
	a= 150 mm		1,69+0,96	2,53+1,93	3,37+1,93	3,81+1,93	4,23+1,93	4,66+1,93	5,10+1,93	5,96+2,57	6,45+2,57
	a= 260 mm		3,06+0,96	4,59+1,93	6,12+1,93	6,92+1,93	7,68+1,93	8,45+1,93	9,26+1,93	10,81+2,57	11,70+2,57
shear force level V8±	**a≤ 90 mm**	≥ a_s [cm²] B500	1,12+1,83	1,40+3,65	1,87+3,65	2,12+3,65	2,35+3,65	2,59+3,65	2,84+3,65	3,31+3,65	3,58+3,65
	a= 150 mm		1,69+1,83	2,53+3,65	3,37+3,65	3,81+3,65	4,23+3,65	4,66+3,65	5,10+3,65	5,96+3,65	6,45+3,65
	a= 260 mm		3,06+1,83	4,59+3,65	6,12+3,65	6,92+3,65	7,68+3,65	8,45+3,65	9,26+3,65	10,81+3,65	11,70+3,65

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The dimension of the balcony offset HV [mm] must be specified in the element name, e.g. MXL20-HVS120-C35-h200.

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox^{cv} (height Egcobox^{cv} = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}. The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox^{cv}. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

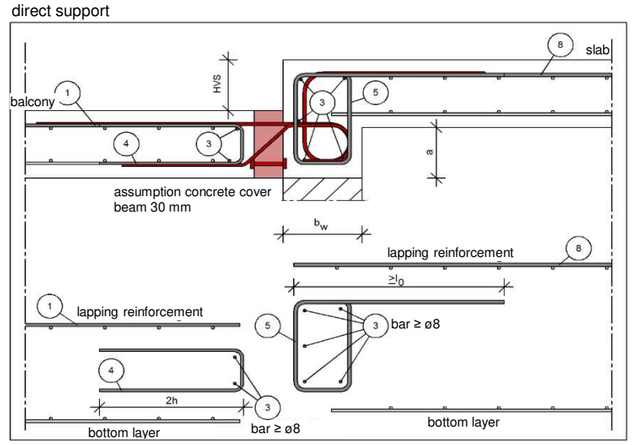
Item ⑤ or item ⑥ applies to the specified required minimum widths of the joist (b_w) and the height of the offset (a= 50 mm; a=100 mm; a= 200 mm). For larger joist widths, a reduction of the required reinforcement is possible.
In between, interpolation is possible; recommended minimum reinforcement ø6/250 mm.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.
For low offset heights ≤90 mm (connection height Egcobox from 160 mm) to 230 mm (connection height 300 mm), the use of Egcobox® standard elements without height offset is recommended as an alternative.

Item ⑧ must be verified and planned by the structural engineer (corresponds to item ① for slab thickness = balcony slab thickness;
for slab thickness ≠ balcony slab thickness, an allowance is required or reduction is possible). The load transmission into the slab must be verified by the structural engineer.

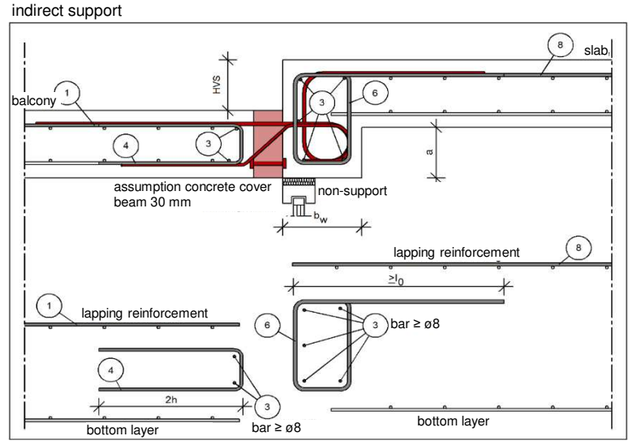
The specifications apply to good bonding conditions.

The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox$^{®}$ reinforcement and the required minimum beam widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the beam width.

design proposal
direct support



indirect support



On-site reinforcement Egcobox® type MXL-WOS - C20/25

for balconies with overlap in wall upwards

Egcobox type WOS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist b_w [mm]			175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612
item ① - lapping reinforcement / element											
≥ as [cm²] B500			2,43	3,64	4,86	5,46	6,07	6,68	7,28	8,50	9,20
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12
item ② - balcony-side suspension reinforcement shear force / element											
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,28	4,28	4,81	4,87	4,87	4,87	4,87	4,87
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	0,96	1,93	1,93	1,93	1,93	1,93	1,93	2,57	2,57
shear force level	V8±	≥ a_s [cm²] B500	1,83	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65

MXL-WOS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)											
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,72	2,58	3,44	3,90	4,34	4,77	5,24	6,11	6,62
height	**h= 250 mm**	≥ a_s [cm²] B500	3,44	5,17	6,89	7,80	8,67	9,54	10,48	12,23	13,24
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**h= 160 mm**	≥ a_s [cm²] B500	1,72+0,48	2,58+0,96	3,44+0,96	3,90+0,96	4,34+0,96	4,77+0,96	5,24+0,96	6,11+0,96	6,62+0,96
	h= 250 mm		3,44+0,48	5,17+0,96	6,89+0,96	7,80+0,96	8,67+0,96	9,54+0,96	10,48+0,96	12,23+0,96	13,24+0,96
shear force level V1 / V1±	**h= 160 mm**	≥ a_s [cm²] B500	1,72+0,86	2,58+1,72	3,44+1,72	3,90+1,72	4,34+1,72	4,77+1,72	5,24+1,72	6,11+1,72	6,62+1,72
	h= 250 mm		3,44+0,86	5,17+1,72	6,89+1,72	7,80+1,72	8,67+1,72	9,54+1,72	10,48+1,72	12,23+1,72	13,24+1,72
shear force level V2 / V2±	**h= 160 mm**	≥ a_s [cm²] B500	1,72+1,29	2,58+2,57	3,44+2,57	3,90+2,57	4,34+2,57	4,77+2,57	5,24+2,57	6,11+2,57	6,62+2,57
	h= 250 mm		3,44+1,29	5,17+2,57	6,89+2,57	7,80+2,57	8,67+2,57	9,54+2,57	10,48+2,57	12,23+2,57	13,24+2,57
shear force level V3 / V3±	**h= 160 mm**	≥ a_s [cm²] B500	1,72+1,72	2,58+3,43	3,44+3,43	3,90+3,43	4,34+3,43	4,77+3,43	5,24+3,43	6,11+3,43	6,62+3,43
	h= 250 mm		3,44+1,72	5,17+3,43	6,89+3,43	7,80+3,43	8,67+3,43	9,54+3,43	10,48+3,43	12,23+3,43	13,24+3,43
shear force level V4 / V4±	**h= 160 mm**	≥ a_s [cm²] B500	-	2,58+4,28	3,44+4,28	3,90+4,81	4,34+4,87	4,77+4,87	5,24+4,87	6,11+4,87	6,62+4,87
	h= 250 mm		-	5,17+4,28	6,89+4,28	7,80+4,81	8,67+4,87	9,54+4,87	10,48+4,87	12,23+4,87	13,24+4,87
shear force level V6±	**h= 160 mm**	≥ a_s [cm²] B500	1,72+0,48	2,58+0,96	3,44+0,96	3,90+0,96	4,34+0,96	4,77+0,96	5,24+0,96	6,11+0,96	6,62+0,96
	h= 250 mm		3,44+0,48	5,17+0,96	6,89+0,96	7,80+0,96	8,67+0,96	9,54+0,96	10,48+0,96	12,23+0,96	13,24+0,96
shear force level V7±	**h= 160 mm**	≥ a_s [cm²] B500	1,72+0,96	2,58+1,93	3,44+1,93	3,90+1,93	4,34+1,93	4,77+1,93	5,24+1,93	6,11+2,57	6,62+2,57
	h= 250 mm		3,44+0,96	5,17+1,93	6,89+1,93	7,80+1,93	8,67+1,93	9,54+1,93	10,48+1,93	12,23+2,57	13,24+2,57
shear force level V8±	**h= 160 mm**	≥ a_s [cm²] B500	1,72+1,83	2,58+3,65	3,44+3,65	3,90+3,65	4,34+3,65	4,77+3,65	5,24+3,65	6,11+3,65	6,62+3,65
	h= 250 mm		3,44+1,83	5,17+3,65	6,89+3,65	7,80+3,65	8,67+3,65	9,54+3,65	10,48+3,65	12,23+3,65	13,24+3,65

MXL-WOS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)											
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,46	2,19	2,92	3,31	3,68	4,05	4,44	5,18	5,61
height	**h= 250 mm**	≥ a_s [cm²] B500	2,92	4,39	5,85	6,62	7,36	8,09	8,88	10,36	11,22
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)											
shear force level VS / VS±	**h= 160 mm**	≥ a_s [cm²] B500	1,46+0,48	2,19+0,96	2,92+0,96	3,31+0,96	3,68+0,96	4,05+0,96	4,44+0,96	5,18+0,96	5,61+0,96
	h= 250 mm		2,92+0,48	4,39+0,96	5,85+0,96	6,62+0,96	7,36+0,96	8,09+0,96	8,88+0,96	10,36+0,96	11,22+0,96
shear force level V1 / V1±	**h= 160 mm**	≥ a_s [cm²] B500	1,46+0,86	2,19+1,72	2,92+1,72	3,31+1,72	3,68+1,72	4,05+1,72	4,44+1,72	5,18+1,72	5,61+1,72
	h= 250 mm		2,92+0,86	4,39+1,72	5,85+1,72	6,62+1,72	7,36+1,72	8,09+1,72	8,88+1,72	10,36+1,72	11,22+1,72
shear force level V2 / V2±	**h= 160 mm**	≥ a_s [cm²] B500	1,46+1,29	2,19+2,57	2,92+2,57	3,31+2,57	3,68+2,57	4,05+2,57	4,44+2,57	5,18+2,57	5,61+2,57
	h= 250 mm		2,92+1,29	4,39+2,57	5,85+2,57	6,62+2,57	7,36+2,57	8,09+2,57	8,88+2,57	10,36+2,57	11,22+2,57
shear force level V3 / V3±	**h= 160 mm**	≥ a_s [cm²] B500	1,46+1,72	2,19+3,43	2,92+3,43	3,31+3,43	3,68+3,43	4,05+3,43	4,44+3,43	5,18+3,43	5,61+3,43
	h= 250 mm		2,92+1,72	4,39+3,43	5,85+3,43	6,62+3,43	7,36+3,43	8,09+3,43	8,88+3,43	10,36+3,43	11,22+3,43
shear force level V4 / V4±	**h= 160 mm**	≥ a_s [cm²] B500	-	2,19+4,28	2,92+4,28	3,31+4,81	3,68+4,87	4,05+4,87	4,44+4,87	5,18+4,87	5,61+4,87
	h= 250 mm		-	4,39+4,28	5,85+4,28	6,62+4,81	7,36+4,87	8,09+4,87	8,88+4,87	10,36+4,87	11,22+4,87
shear force level V6±	**h= 160 mm**	≥ a_s [cm²] B500	1,46+0,48	2,19+0,96	2,92+0,96	3,31+0,96	3,68+0,96	4,05+0,96	4,44+0,96	5,18+0,96	5,61+0,96
	h= 250 mm		2,92+0,48	4,39+0,96	5,85+0,96	6,62+0,96	7,36+0,96	8,09+0,96	8,88+0,96	10,36+0,96	11,22+0,96
shear force level V7±	**h= 160 mm**	≥ a_s [cm²] B500	1,46+0,96	2,19+1,93	2,92+1,93	3,31+1,93	3,68+1,93	4,05+1,93	4,44+1,93	5,18+2,57	5,61+2,57
	h= 250 mm		2,92+0,96	4,39+1,93	5,85+1,93	6,62+1,93	7,36+1,93	8,09+1,93	8,88+1,93	10,36+2,57	11,22+2,57
shear force level V8±	**h= 160 mm**	≥ a_s [cm²] B500	1,46+1,83	2,19+3,65	2,92+3,65	3,31+3,65	3,68+3,65	4,05+3,65	4,44+3,65	5,18+3,65	5,61+3,65
	h= 250 mm		2,92+1,83	4,39+3,65	5,85+3,65	6,62+3,65	7,36+3,65	8,09+3,65	8,88+3,65	10,36+3,65	11,22+3,65

Egcobox Typ WOS	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60
Elementlänge l [mm]	500	1000	1000	1000	1000	1000	1000	1000	1000

MXL-WOS: minimum width of joist b_w 220 mm (concrete cover 30 mm)

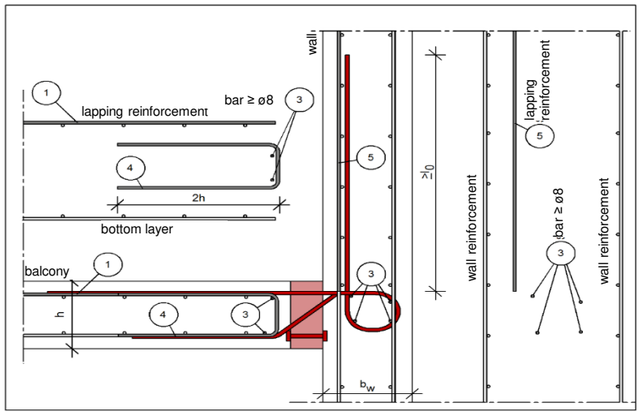
item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)										
connection	h= 160 mm	≥ a_s [cm²] B500	1,31	1,96	2,61	2,95	3,28	3,61	3,96	4,62	5,00
height	h= 250 mm	≥ a_s [cm²] B500	2,61	3,92	5,22	5,91	6,56	7,22	7,92	9,24	10,00
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)										
shear force level VS	h= 160 mm	≥ a_s [cm²] B500	1,31+0,48	1,96+0,96	2,61+0,96	2,95+0,96	3,28+0,96	3,61+0,96	3,96+0,96	4,62+0,96	5,00+0,96
/ VS±	h= 250 mm		2,61+0,48	3,92+0,96	5,22+0,96	5,91+0,96	6,56+0,96	7,22+0,96	7,92+0,96	9,24+0,96	10,00+0,96
shear force level V1	h= 160 mm	≥ a_s [cm²] B500	1,31+0,86	1,96+1,72	2,61+1,72	2,95+1,72	3,28+1,72	3,61+1,72	3,96+1,72	4,62+1,72	5,00+1,72
/ V1±	h= 250 mm		2,61+0,86	3,92+1,72	5,22+1,72	5,91+1,72	6,56+1,72	7,22+1,72	7,92+1,72	9,24+1,72	10,00+1,72
shear force level V2	h= 160 mm	≥ a_s [cm²] B500	1,31+1,29	1,96+2,57	2,61+2,57	2,95+2,57	3,28+2,57	3,61+2,57	3,96+2,57	4,62+2,57	5,00+2,57
/ V2±	h= 250 mm		2,61+1,29	3,92+2,57	5,22+2,57	5,91+2,57	6,56+2,57	7,22+2,57	7,92+2,57	9,24+2,57	10,00+2,57
shear force level V3	h= 160 mm	≥ a_s [cm²] B500	1,31+1,72	1,96+3,43	2,61+3,43	2,95+3,43	3,28+3,43	3,61+3,43	3,96+3,43	4,62+3,43	5,00+3,43
/ V3±	h= 250 mm		2,61+1,72	3,92+3,43	5,22+3,43	5,91+3,43	6,56+3,43	7,22+3,43	7,92+3,43	9,24+3,43	10,00+3,43
shear force level V4	h= 160 mm	≥ a_s [cm²] B500	-	1,96+4,28	2,61+4,28	2,95+4,81	3,28+4,87	3,61+4,87	3,96+4,87	4,62+4,87	5,00+4,87
/ V4±	h= 250 mm		-	3,92+4,28	5,22+4,28	5,91+4,81	6,56+4,87	7,22+4,87	7,92+4,87	9,24+4,87	10,00+4,87
shear force level V6±	h= 160 mm	≥ a_s [cm²] B500	1,31+0,48	1,96+0,96	2,61+0,96	2,95+0,96	3,28+0,96	3,61+0,96	3,96+0,96	4,62+0,96	5,00+0,96
	h= 250 mm		2,61+0,48	3,92+0,96	5,22+0,96	5,91+0,96	6,56+0,96	7,22+0,96	7,92+0,96	9,24+0,96	10,00+0,96
shear force level V7±	h= 160 mm	≥ a_s [cm²] B500	1,31+0,96	1,96+1,93	2,61+1,93	2,95+1,93	3,28+1,93	3,61+1,93	3,96+1,93	4,62+2,57	5,00+2,57
	h= 250 mm		2,61+0,96	3,92+1,93	5,22+1,93	5,91+1,93	6,56+1,93	7,22+1,93	7,92+1,93	9,24+2,57	10,00+2,57
shear force level V8±	h= 160 mm	≥ a_s [cm²] B500	1,31+1,83	1,96+3,65	2,61+3,65	2,95+3,65	3,28+3,65	3,61+3,65	3,96+3,65	4,62+3,65	5,00+3,65
	h= 250 mm		2,61+1,83	3,92+3,65	5,22+3,65	5,91+3,65	6,56+3,65	7,22+3,65	7,92+3,65	9,24+3,65	10,00+3,65

MXL-WOS: minimum width of joist b_w 250 mm (concrete cover 30 mm)

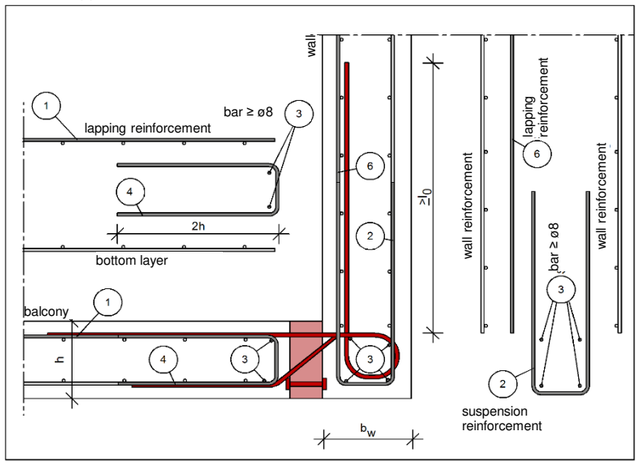
item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)										
connection	h= 160 mm	≥ a_s [cm²] B500	1,12	1,69	2,25	2,54	2,82	3,11	3,40	3,97	4,30
height	h= 250 mm	≥ a_s [cm²] B500	2,25	3,37	4,50	5,08	5,65	6,21	6,81	7,94	8,60
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)										
shear force level VS	h= 160 mm	≥ a_s [cm²] B500	1,12+0,48	1,69+0,96	2,25+0,96	2,54+0,96	2,82+0,96	3,11+0,96	3,40+0,96	3,97+0,96	4,30+0,96
/ VS±	h= 250 mm		2,25+0,48	3,37+0,96	4,50+0,96	5,08+0,96	5,65+0,96	6,21+0,96	6,81+0,96	7,94+0,96	8,60+0,96
shear force level V1	h= 160 mm	≥ a_s [cm²] B500	1,12+0,86	1,69+1,72	2,25+1,72	2,54+1,72	2,82+1,72	3,11+1,72	3,40+1,72	3,97+1,72	4,30+1,72
/ V1±	h= 250 mm		2,25+0,86	3,37+1,72	4,50+1,72	5,08+1,72	5,65+1,72	6,21+1,72	6,81+1,72	7,94+1,72	8,60+1,72
shear force level V2	h= 160 mm	≥ a_s [cm²] B500	1,12+1,29	1,69+2,57	2,25+2,57	2,54+2,57	2,82+2,57	3,11+2,57	3,40+2,57	3,97+2,57	4,30+2,57
/ V2±	h= 250 mm		2,25+1,29	3,37+2,57	4,50+2,57	5,08+2,57	5,65+2,57	6,21+2,57	6,81+2,57	7,94+2,57	8,60+2,57
shear force level V3	h= 160 mm	≥ a_s [cm²] B500	1,12+1,72	1,69+3,43	2,25+3,43	2,54+3,43	2,82+3,43	3,11+3,43	3,40+3,43	3,97+3,43	4,30+3,43
/ V3±	h= 250 mm		2,25+1,72	3,37+3,43	4,50+3,43	5,08+3,43	5,65+3,43	6,21+3,43	6,81+3,43	7,94+3,43	8,60+3,43
shear force level V4	h= 160 mm	≥ a_s [cm²] B500	-	1,69+4,28	2,25+4,28	2,54+4,81	2,82+4,87	3,11+4,87	3,40+4,87	3,97+4,87	4,30+4,87
/ V4±	h= 250 mm		-	3,37+4,28	4,50+4,28	5,08+4,81	5,65+4,87	6,21+4,87	6,81+4,87	7,94+4,87	8,60+4,87
shear force level V6±	h= 160 mm	≥ a_s [cm²] B500	1,12+0,48	1,69+0,96	2,25+0,96	2,54+0,96	2,82+0,96	3,11+0,96	3,40+0,96	3,97+0,96	4,30+0,96
	h= 250 mm		2,25+0,48	3,37+0,96	4,50+0,96	5,08+0,96	5,65+0,96	6,21+0,96	6,81+0,96	7,94+0,96	8,60+0,96
shear force level V7±	h= 160 mm	≥ a_s [cm²] B500	1,12+0,96	1,69+1,93	2,25+1,93	2,54+1,93	2,82+1,93	3,11+1,93	3,40+1,93	3,97+2,57	4,30+2,57
	h= 250 mm		2,25+0,96	3,37+1,93	4,50+1,93	5,08+1,93	5,65+1,93	6,21+1,93	6,81+1,93	7,94+2,57	8,60+2,57
shear force level V8±	h= 160 mm	≥ a_s [cm²] B500	1,12+1,83	1,69+3,65	2,25+3,65	2,54+3,65	2,82+3,65	3,11+3,65	3,40+3,65	3,97+3,65	4,30+3,65
	h= 250 mm		2,25+1,83	3,37+3,65	4,50+3,65	5,08+3,65	5,65+3,65	6,21+3,65	6,81+3,65	7,94+3,65	8,60+3,65

design proposal

direct support



indirect support



item ③+④ - structural reinforcement

In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox^{xy} (height Egcobox^{xy} = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox^{xy}. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ or item ⑥ applies to the specified required minimum widths of the wall (b_w) and the connection height (h) of the Egcobox.
In between, interpolation can be performed. For larger wall widths, a reduction of the required reinforcement is possible.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.

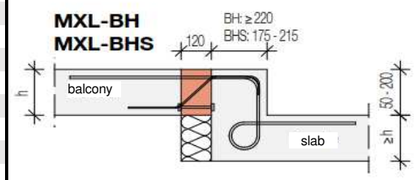
The specifications apply to good bonding conditions.

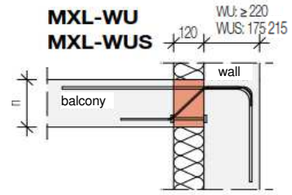
The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox® reinforcement and the required minimum wall widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the wall width.

Design table Egcobox® type MXL -BH / -WU / -BHS / -WUS - C20/25

for cantilever slabs with height offset or wall connection for transmission of moment and shear force, insulation 120 mm

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
									-BH / -WU / -BHS / -WUS							
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			M_{Rd} [kNm/element]												
	C30	C35	C50													
height of connection [mm] good bonding conditions		**160**	175	-9,1	-13,6	-18,2	-20,4	-22,7	-25,0	-27,2	-31,8	-36,1	-39,7	-43,3	-43,3	-47,0
	160	165	**180**	-9,6	-14,4	-19,2	-21,6	-24,0	-26,4	-28,8	-33,6	-38,2	-42,1	-45,9	-45,9	-49,7
	165	170	185	-10,1	-15,2	-20,3	-22,8	-25,3	-27,9	-30,4	-35,5	-40,4	-44,4	-48,4	-48,4	-52,5
	170	175	190	-10,7	-16,0	-21,3	-24,0	-26,7	-29,3	-32,0	-37,3	-42,5	-46,7	-51,0	-51,0	-55,2
	175	**180**	195	-11,2	-16,8	-22,4	-25,2	-28,0	-30,8	-33,6	-39,2	-44,6	-49,1	-53,5	-53,5	-58,0
	180	185	**200**	-11,7	-17,6	-23,4	-26,4	-29,3	-32,2	-35,1	-41,0	-46,7	-51,4	-56,1	-56,1	-60,8
	185	190	205	-12,2	-18,4	-24,5	-27,5	-30,6	-33,7	-36,7	-42,9	-48,9	-53,8	-58,6	-58,6	-63,5
	190	195	210	-12,8	-19,2	-25,5	-28,7	-31,9	-35,1	-38,3	-44,7	-51,0	-56,1	-61,2	-61,2	-66,3
	195	**200**	215	-13,3	-19,9	-26,6	-29,9	-33,2	-36,6	-39,9	-46,5	-53,1	-58,4	-63,7	-63,7	-69,1
	200	205	**220**	-13,8	-20,7	-27,7	-31,1	-34,6	-38,0	-41,5	-48,4	-55,2	-60,8	-66,3	-66,3	-71,8
	205	210	225	-14,4	-21,5	-28,7	-32,3	-35,9	-39,5	-43,1	-50,2	-57,4	-63,1	-68,8	-68,8	-74,6
	210	215	230	-14,9	-22,3	-29,8	-33,5	-37,2	-40,9	-44,6	-52,1	-59,5	-65,4	-71,4	-71,4	-77,3
	215	**220**	235	-15,4	-23,1	-30,8	-34,7	-38,5	-42,4	-46,2	-53,9	-61,6	-67,8	-73,9	-73,9	-80,1
	220	225	**240**	-15,9	-23,9	-31,9	-35,9	-39,8	-43,8	-47,8	-55,8	-63,7	-70,1	-76,5	-76,5	-82,9
	225	230	245	-16,5	-24,7	-32,9	-37,0	-41,2	-45,3	-49,4	-57,6	-65,9	-72,5	-79,0	-79,0	-85,6
	230	235	250	-17,0	-25,5	-34,0	-38,2	-42,5	-46,7	-51,0	-59,5	-68,0	-74,8	-81,6	-81,6	-88,4
	235	**240**	255	-17,5	-26,3	-35,0	-39,4	-43,8	-48,2	-52,6	-61,3	-70,1	-77,1	-84,1	-84,1	-91,2
	240	245	**260**	-18,0	-27,1	-36,1	-40,6	-45,1	-49,6	-54,1	-63,2	-72,2	-79,5	-86,7	-86,7	-93,9
	245	250	265	-18,6	-27,9	-37,2	-41,8	-46,4	-51,1	-55,7	-65,0	-74,4	-81,8	-89,2	-89,2	-96,7
	250	255	270	-19,1	-28,7	-38,2	-43,0	-47,8	-52,5	-57,3	-66,9	-76,5	-84,1	-91,8	-91,8	-99,4
	255	**260**	275	-19,6	-29,4	-39,3	-44,2	-49,1	-54,0	-58,9	-68,7	-78,6	-86,5	-94,3	-94,3	-102,2
	260	265	**280**	-20,2	-30,2	-40,3	-45,4	-50,4	-55,4	-60,5	-70,6	-80,7	-88,8	-96,9	-96,9	-105,0
	265	270	285	-20,7	-31,0	-41,4	-46,5	-51,7	-56,9	-62,1	-72,4	-82,9	-91,2	-99,4	-99,4	-107,7
	270	275	290	-21,2	-31,8	-42,4	-47,7	-53,0	-58,3	-63,6	-74,3	-85,0	-93,5	-102,0	-102,0	-110,5
	275	**280**	295	-21,7	-32,6	-43,5	-48,9	-54,4	-59,8	-65,2	-76,1	-87,1	-95,8	-104,5	-104,5	-113,3
	280	285	**300**	-22,3	-33,4	-44,5	-50,1	-55,7	-61,2	-66,8	-78,0	-89,2	-98,2	-107,1	-107,1	-116,0
	285	290		-22,8	-34,2	-45,6	-51,3	-57,0	-62,7	-68,4	-79,8	-91,4	-100,5	-109,6	-109,6	-118,8
	290	295		-23,3	-35,0	-46,7	-52,5	-58,3	-64,1	-70,0	-81,6	-93,5	-102,8	-112,2	-112,2	-121,5
	295	**300**		-23,9	-35,8	-47,7	-53,7	-59,6	-65,6	-71,6	-83,5	-95,6	-105,2	-114,7	-114,7	-124,3
	300			-24,4	-36,6	-48,8	-54,9	-61,0	-67,1	-73,1	-85,3	-97,7	-107,5	-117,3	-117,3	-127,1





Shear force level		concrete cover [mm]			V_{Rd} [kN/element]												
		C30	C35	C50													
height of connection [mm] good bonding conditions	VS	160-190	160-195	175-210	15,7	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4	31,4
		195-300	200-300	215-300	21,0	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9	41,9
	V1	160-190	160-195	175-210	27,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9	55,9
		195-300	200-300	215-300	37,3	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6	74,6
	V2	160-190	160-195	175-210	41,9	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8	83,8
		195-300	200-300	215-300	55,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9	111,9
	V3	160-190	160-195	175-210	55,9	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8	111,8
		195-300	200-300	215-300	74,6	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2	149,2
	V4	175-190	180-195	195-210	-	156,9	156,9	156,9	174,7	174,7	174,7	174,7	174,7	174,7	174,7	174,7	174,7
		195-300	200-300	215-300	-	210,7	210,7	210,7	211,9	211,9	211,9	211,9	211,9	211,9	211,9	211,9	211,9
	V6±	160-190	160-195	175-210	+15,7/ -15,7	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4	+31,4/ -31,4
		195-300	200-300	215-300	+21/ -21	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9	+41,9/ -41,9
	V7±	160-190	160-195	175-210	+31,4/ -23,6	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+62,9/ -47,2	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9	+83,8/ -55,9
		195-300	200-300	215-300	+41,9/ -31,5	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+83,9/ -62,9	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6	+111,9/ -74,6
	V8±	175-190	180-195	195-210	+65,5/ -65,5	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131	+131/ -131
		195-300	200-300	215-300	+79,4/ -79,4	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9	+158,9/ -158,9

Shear force level VS to V4 also possible with lifting shear force (-15.7 or -21.0 kN/element depending on height of connection/concrete cover) (designation: VS±, V1±, V2±, V3± or V4±)

Reinforcement Egcobox® type MXL -BH / -WU / -BHS / -WUS

Egcobox type	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
	-BH / -WU / -BHS / -WUS												
length of element [mm]	500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
wall / beam width b_w: -HV / - WO / -BH / -WU [mm]	≥ 220												
wall / beam width b_w: -BHS / -WUS [mm]	175 ≤ b_w < 220												
tensile bars	4 ø 8	6 ø 8	8 ø 8	9 ø 8	10 ø 8	11 ø 8	12 ø 8	14 ø 8	10 ø 10	11 ø 10	12 ø 10	12 ø 10	13 ø 10
length of tensile bars [mm]	depending on bending form												
compression bearings	2 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	11 ø 12	12 ø 12
shear force bars VS	2 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6	4 ø 6
shear force bars V1	2 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8	4 ø 8
shear force bars V2	3 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8	6 ø 8
shear force bars V3	4 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8	8 ø 8
shear force bars V4	-	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10	8 ø 10
shear force bars VS±	-	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6	4 ø6 / 2 ø6
shear force bars V1±	-	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6	4 ø8 / 2 ø6
shear force bars V2±	-	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6	6 ø8 / 2 ø6
shear force bars V3±	-	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6	8 ø8 / 2 ø6
shear force bars V4±	-	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6	8 ø10 / 2 ø6
shear force bars V6±	2 ø6 / 2 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6	4 ø6 / 4 ø6
shear force bars V7±	4 ø6 / 3 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	8 ø6 / 6 ø6	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8	6 ø8 / 4 ø8
shear force bars V8±	3 ø10 / 3 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10	6 ø10 / 6 ø10
applicable expansion joint distances [m]	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL -BH / -WU / -BHS / -WUS

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
				-BH / -WU / -BHS / -WUS												
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			banking factor k [1/kNm]												
	C30	**C35**	**C50**													
height of connection [mm] good bonding conditions		**160**	175	1,625	1,009	0,813	0,747	0,650	0,607	0,542	0,464	0,467	0,422	0,385	0,377	0,348
	160	165	**180**	1,451	0,901	0,726	0,667	0,581	0,542	0,484	0,415	0,417	0,377	0,344	0,336	0,310
	165	170	185	1,304	0,810	0,652	0,600	0,522	0,487	0,435	0,373	0,374	0,338	0,309	0,302	0,278
	170	175	190	1,178	0,731	0,589	0,542	0,471	0,440	0,393	0,337	0,338	0,305	0,279	0,272	0,251
	175	**180**	195	1,070	0,664	0,535	0,492	0,428	0,400	0,357	0,306	0,306	0,277	0,253	0,247	0,228
	180	185	**200**	0,976	0,606	0,488	0,449	0,390	0,365	0,325	0,279	0,279	0,252	0,230	0,225	0,208
	185	190	205	0,893	0,554	0,447	0,411	0,357	0,334	0,298	0,255	0,255	0,231	0,211	0,206	0,190
	190	195	210	0,821	0,510	0,410	0,377	0,328	0,307	0,274	0,235	0,234	0,212	0,193	0,189	0,174
	195	**200**	215	0,757	0,470	0,379	0,348	0,303	0,283	0,252	0,216	0,216	0,195	0,178	0,174	0,161
	200	205	**220**	0,700	0,435	0,350	0,322	0,280	0,262	0,233	0,200	0,200	0,181	0,165	0,161	0,149
	205	210	225	0,650	0,403	0,325	0,299	0,260	0,243	0,217	0,186	0,185	0,167	0,153	0,150	0,138
	210	215	230	0,605	0,375	0,302	0,278	0,242	0,226	0,202	0,173	0,172	0,156	0,142	0,139	0,128
	215	**220**	235	0,564	0,350	0,282	0,259	0,226	0,211	0,188	0,161	0,161	0,145	0,132	0,130	0,119
	220	225	**240**	0,527	0,327	0,264	0,242	0,211	0,197	0,176	0,151	0,150	0,136	0,124	0,121	0,112
	225	230	245	0,494	0,307	0,247	0,227	0,198	0,185	0,165	0,141	0,140	0,127	0,116	0,113	0,105
	230	235	250	0,464	0,288	0,232	0,213	0,185	0,173	0,155	0,132	0,132	0,119	0,109	0,106	0,098
	235	**240**	255	0,436	0,271	0,218	0,201	0,174	0,163	0,145	0,125	0,124	0,112	0,102	0,100	0,092
	240	245	**260**	0,411	0,255	0,206	0,189	0,164	0,154	0,137	0,117	0,117	0,106	0,096	0,094	0,087
	245	250	265	0,388	0,241	0,194	0,178	0,155	0,145	0,129	0,111	0,110	0,100	0,091	0,089	0,082
	250	255	270	0,367	0,228	0,183	0,169	0,147	0,137	0,122	0,105	0,104	0,094	0,086	0,084	0,078
	255	**260**	275	0,347	0,216	0,174	0,160	0,139	0,130	0,116	0,099	0,099	0,089	0,081	0,080	0,073
	260	265	**280**	0,329	0,205	0,165	0,151	0,132	0,123	0,110	0,094	0,094	0,085	0,077	0,075	0,070
	265	270	285	0,313	0,194	0,156	0,144	0,125	0,117	0,104	0,089	0,089	0,080	0,073	0,072	0,066
	270	275	290	0,298	0,185	0,149	0,137	0,119	0,111	0,099	0,085	0,084	0,076	0,070	0,068	0,063
	275	**280**	295	0,283	0,176	0,142	0,130	0,113	0,106	0,094	0,081	0,080	0,073	0,066	0,065	0,060
	280	285	**300**	0,270	0,168	0,135	0,124	0,108	0,101	0,090	0,077	0,077	0,069	0,063	0,062	0,057
	285	290		0,258	0,160	0,129	0,118	0,103	0,096	0,086	0,074	0,073	0,066	0,060	0,059	0,054
	290	295		0,246	0,153	0,123	0,113	0,098	0,092	0,082	0,070	0,070	0,063	0,058	0,056	0,052
	295	**300**		0,235	0,146	0,118	0,108	0,094	0,088	0,078	0,067	0,067	0,060	0,055	0,054	0,050
	300			0,225	0,140	0,113	0,104	0,090	0,084	0,075	0,064	0,064	0,058	0,053	0,052	0,047

Rotation spring stiffness Egcobox® type MXL -BH / -WU / -BHS / -WUS

	Egcobox type			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
				-BH / -WU / -BHS / -WUS												
	length of element [mm]			500	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]												
	C30	C35	C50													
height of connection [mm] good bonding conditions		**160**	175	615	991	1231	1338	1538	1647	1846	2154	2140	2367	2594	2651	2877
	160	165	**180**	689	1110	1378	1498	1722	1844	2067	2411	2400	2654	2908	2973	3225
	165	170	185	767	1235	1534	1668	1917	2052	2300	2684	2674	2957	3240	3312	3594
	170	175	190	849	1367	1697	1846	2122	2271	2546	2970	2963	3277	3590	3670	3982
	175	**180**	195	935	1506	1870	2033	2337	2502	2804	3272	3266	3613	3958	4046	4390
	180	185	**200**	1025	1652	2050	2230	2563	2743	3075	3588	3585	3965	4344	4440	4818
	185	190	205	1120	1804	2239	2435	2799	2996	3359	3918	3918	4333	4748	4853	5266
	190	195	210	1218	1962	2436	2649	3045	3260	3654	4263	4266	4719	5170	5285	5734
	195	**200**	215	1321	2128	2642	2873	3302	3535	3963	4623	4629	5120	5610	5734	6222
	200	205	**220**	1428	2300	2856	3105	3569	3821	4283	4997	5007	5538	6068	6202	6729
	205	210	225	1539	2479	3078	3347	3847	4118	4616	5386	5399	5972	6543	6688	7257
	210	215	230	1654	2665	3308	3598	4135	4427	4962	5789	5807	6422	7037	7193	7804
	215	**220**	235	1773	2857	3547	3857	4434	4746	5320	6207	6229	6889	7549	7716	8372
	220	225	**240**	1897	3056	3794	4126	4742	5077	5691	6639	6666	7373	8078	8257	8959
	225	230	245	2025	3262	4049	4404	5062	5418	6074	7086	7118	7872	8626	8817	9566
	230	235	250	2157	3474	4313	4691	5391	5771	6470	7548	7584	8388	9191	9395	10193
	235	**240**	255	2293	3694	4585	4986	5732	6135	6878	8024	8066	8921	9775	9991	10840
	240	245	**260**	2433	3920	4866	5291	6082	6511	7298	8515	8562	9470	10376	10606	11507
	245	250	265	2577	4152	5154	5605	6443	6897	7731	9020	9073	10035	10996	11239	12194
	250	255	270	2726	4391	5451	5928	6814	7294	8177	9540	9599	10617	11633	11890	12901
	255	**260**	275	2878	4637	5757	6260	7196	7703	8635	10074	10140	11215	12288	12560	13628
	260	265	**280**	3035	4890	6070	6601	7588	8123	9105	10623	10695	11829	12961	13248	14374
	265	270	285	3196	5149	6392	6952	7990	8553	9588	11186	11265	12460	13652	13955	15141
	270	275	290	3361	5415	6723	7311	8403	8995	10084	11764	11850	13107	14362	14679	15927
	275	**280**	295	3531	5688	7061	7679	8826	9448	10592	12357	12450	13771	15089	15422	16733
	280	285	**300**	3704	5968	7408	8056	9260	9913	11112	12964	13065	14450	15834	16184	17560
	285	290		3882	6254	7763	8443	9704	10388	11645	13586	13695	15147	16597	16964	18406
	290	295		4063	6547	8127	8838	10159	10875	12190	14222	14339	15859	17377	17762	19272
	295	**300**		4249	6846	8499	9242	10624	11372	12748	14873	14998	16589	18176	18578	20158
	300			4440	7153	8879	9656	11099	11881	13319	15538	15672	17334	18993	19413	21064

On-site reinforcement Egcobox® type MXL-BH / BHS - C20/25

for balconies with balcony offset

Egcobox type BH / BHS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL76	MXL80
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist b_w [mm]			175	175	175	175	175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10	ø 10	ø 10	ø 10	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612	612	612	612	612
item ① - lapping reinforcement / element															
≥ as [cm²] B500			2,43	3,64	4,86	5,46	6,07	6,68	7,28	8,50	9,77	10,75	11,73	11,73	11,73
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12	ø 10	ø 10	ø 10	ø 12
item ② - balcony-side suspension reinforcement shear force / element															
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,85	4,85	4,85	4,87	4,87	4,87	4,87	4,87	4,87	4,87	4,87	4,87
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	0,96	1,93	1,93	1,93	1,93	1,93	1,93	2,57	2,57	2,57	2,57	2,57	2,57
shear force level	V8±	≥ a_s [cm²] B500	1,83	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65

MXL-BHS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)															
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91	2,87	3,83	4,34	4,82	5,30	5,82	6,79	7,81	8,53	9,38	9,38	9,38
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	4,30	6,46	8,61	9,75	10,84	11,92	13,10	15,28	17,58	19,20	21,10	21,10	21,10
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)															
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91+0,48	2,87+0,96	3,83+0,96	4,34+0,96	4,82+0,96	5,30+0,96	5,82+0,96	6,79+0,96	7,81+0,96	8,53+0,96	9,38+0,96	9,38+0,96	10,16+0,96
VS / VS±	**a= 260 mm**		4,30+0,48	6,46+0,96	8,61+0,96	9,75+0,96	10,84+0,96	11,92+0,96	13,10+0,96	15,28+0,96	17,58+0,96	19,20+0,96	21,10+0,96	21,10+0,96	22,85+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91+0,86	2,87+1,72	3,83+1,72	4,34+1,72	4,82+1,72	5,30+1,72	5,82+1,72	6,79+1,72	7,81+1,72	8,53+1,72	9,38+1,72	9,38+1,72	10,16+1,72
V1 / V1±	**a= 260 mm**		4,30+0,86	6,46+1,72	8,61+1,72	9,75+1,72	10,84+1,72	11,92+1,72	13,10+1,72	15,28+1,72	17,58+1,72	19,20+1,72	21,10+1,72	21,10+1,72	22,85+1,72
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91+1,29	2,87+2,57	3,83+2,57	4,34+2,57	4,82+2,57	5,30+2,57	5,82+2,57	6,79+2,57	7,81+2,57	8,53+2,57	9,38+2,57	9,38+2,57	10,16+2,57
V2 / V2±	**a= 260 mm**		4,30+1,29	6,46+2,57	8,61+2,57	9,75+2,57	10,84+2,57	11,92+2,57	13,10+2,57	15,28+2,57	17,58+2,57	19,20+2,57	21,10+2,57	21,10+2,57	22,85+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91+1,72	2,87+3,43	3,83+3,43	4,34+3,43	4,82+3,43	5,30+3,43	5,82+3,43	6,79+3,43	7,81+3,43	8,53+3,43	9,38+3,43	9,38+3,43	10,16+3,43
V3 / V3±	**a= 260 mm**		4,30+1,72	6,46+3,43	8,61+3,43	9,75+3,43	10,84+3,43	11,92+3,43	13,10+3,43	15,28+3,43	17,58+3,43	19,20+3,43	21,10+3,43	21,10+3,43	22,85+3,43
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	2,87+4,85	3,83+4,85	4,34+4,85	4,82+4,87	5,30+4,87	5,82+4,87	6,79+4,87	7,81+4,87	8,53+4,87	9,38+4,87	9,38+4,87	10,16+4,87
V4 / V4±	**a= 260 mm**		-	6,46+4,85	8,61+4,85	9,75+4,85	10,84+4,87	11,92+4,87	13,10+4,87	15,28+4,87	17,58+4,87	19,20+4,87	21,10+4,87	21,10+4,87	22,85+4,87
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91+0,48	2,87+0,96	3,83+0,96	4,34+0,96	4,82+0,96	5,30+0,96	5,82+0,96	6,79+0,96	7,81+0,96	8,53+0,96	9,38+0,96	9,38+0,96	10,16+0,96
V6±	**a= 260 mm**		4,30+0,48	6,46+0,96	8,61+0,96	9,75+0,96	10,84+0,96	11,92+0,96	13,10+0,96	15,28+0,96	17,58+0,96	19,20+0,96	21,10+0,96	21,10+0,96	22,85+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91+0,96	2,87+1,93	3,83+1,93	4,34+1,93	4,82+1,93	5,30+1,93	5,82+1,93	6,79+2,57	7,81+2,57	8,53+2,57	9,38+2,57	9,38+2,57	10,16+2,57
V7±	**a= 260 mm**		4,30+0,96	6,46+1,93	8,61+1,93	9,75+1,93	10,84+1,93	11,92+1,93	13,10+1,93	15,28+2,57	17,58+2,57	19,20+2,57	21,10+2,57	21,10+2,57	22,85+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,91+1,83	2,87+3,65	3,83+3,65	4,34+3,65	4,82+3,65	5,30+3,65	5,82+3,65	6,79+3,65	7,81+3,65	8,53+3,65	9,38+3,65	9,38+3,65	10,16+3,65
V8±	**a= 260 mm**		4,30+1,83	6,46+3,65	8,61+3,65	9,75+3,65	10,84+3,65	11,92+3,65	13,10+3,65	15,28+3,65	17,58+3,65	19,20+3,65	21,10+3,65	21,10+3,65	22,85+3,65

MXL-BHS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)															
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62	2,44	3,25	3,68	4,09	4,50	4,93	5,76	6,62	7,28	7,95	7,95	8,61
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,66	5,48	7,31	8,28	9,20	10,12	11,10	12,95	14,90	16,39	17,88	17,88	19,37
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)															
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62+0,48	2,44+0,96	3,25+0,96	3,68+0,96	4,09+0,96	4,50+0,96	4,93+0,96	5,76+0,96	6,62+0,96	7,28+0,96	7,95+0,96	7,95+0,96	8,61+0,96
VS / VS±	**a= 260 mm**		3,66+0,48	5,48+0,96	7,31+0,96	8,28+0,96	9,20+0,96	10,12+0,96	11,10+0,96	12,95+0,96	14,90+0,96	16,39+0,96	17,88+0,96	17,88+0,96	19,37+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62+0,86	2,44+1,72	3,25+1,72	3,68+1,72	4,09+1,72	4,50+1,72	4,93+1,72	5,76+1,72	6,62+1,72	7,28+1,72	7,95+1,72	7,95+1,72	8,61+1,72
V1 / V1±	**a= 260 mm**		3,66+0,86	5,48+1,72	7,31+1,72	8,28+1,72	9,20+1,72	10,12+1,72	11,10+1,72	12,95+1,72	14,90+1,72	16,39+1,72	17,88+1,72	17,88+1,72	19,37+1,72
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62+1,29	2,44+2,57	3,25+2,57	3,68+2,57	4,09+2,57	4,50+2,57	4,93+2,57	5,76+2,57	6,62+2,57	7,28+2,57	7,95+2,57	7,95+2,57	8,61+2,57
V2 / V2±	**a= 260 mm**		3,66+1,29	5,48+2,57	7,31+2,57	8,28+2,57	9,20+2,57	10,12+2,57	11,10+2,57	12,95+2,57	14,90+2,57	16,39+2,57	17,88+2,57	17,88+2,57	19,37+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62+1,72	2,44+3,43	3,25+3,43	3,68+3,43	4,09+3,43	4,50+3,43	4,93+3,43	5,76+3,43	6,62+3,43	7,28+3,43	7,95+3,43	7,95+3,43	8,61+3,43
V3 / V3±	**a= 260 mm**		3,66+1,72	5,48+3,43	7,31+3,43	8,28+3,43	9,20+3,43	10,12+3,43	11,10+3,43	12,95+3,43	14,90+3,43	16,39+3,43	17,88+3,43	17,88+3,43	19,37+3,43
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	2,44+4,85	3,25+4,85	3,68+4,85	4,09+4,87	4,50+4,87	4,93+4,87	5,76+4,87	6,62+4,87	7,28+4,87	7,95+4,87	7,95+4,87	8,61+4,87
V4 / V4±	**a= 260 mm**		-	5,48+4,85	7,31+4,85	8,28+4,85	9,20+4,87	10,12+4,87	11,10+4,87	12,95+4,87	14,90+4,87	16,39+4,87	17,88+4,87	17,88+4,87	19,37+4,87
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62+0,48	2,44+0,96	3,25+0,96	3,68+0,96	4,09+0,96	4,50+0,96	4,93+0,96	5,76+0,96	6,62+0,96	7,28+0,96	7,95+0,96	7,95+0,96	8,61+0,96
V6±	**a= 260 mm**		3,66+0,48	5,48+0,96	7,31+0,96	8,28+0,96	9,20+0,96	10,12+0,96	11,10+0,96	12,95+0,96	14,90+0,96	16,39+0,96	17,88+0,96	17,88+0,96	19,37+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62+0,96	2,44+1,93	3,25+1,93	3,68+1,93	4,09+1,93	4,50+1,93	4,93+1,93	5,76+2,57	6,62+2,57	7,28+2,57	7,95+2,57	7,95+2,57	8,61+2,57
V7±	**a= 260 mm**		3,66+0,96	5,48+1,93	7,31+1,93	8,28+1,93	9,20+1,93	10,12+1,93	11,10+1,93	12,95+2,57	14,90+2,57	16,39+2,57	17,88+2,57	17,88+2,57	19,37+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,62+1,83	2,44+3,65	3,25+3,65	3,68+3,65	4,09+3,65	4,50+3,65	4,93+3,65	5,76+3,65	6,62+3,65	7,28+3,65	7,95+3,65	7,95+3,65	8,61+3,65
V8±	**a= 260 mm**		3,66+1,83	5,48+3,65	7,31+3,65	8,28+3,65	9,20+3,65	10,12+3,65	11,10+3,65	12,95+3,65	14,90+3,65	16,39+3,65	17,88+3,65	17,88+3,65	19,37+3,65

Egcobox type BH / BHS	MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL76	MXL80
Elementlänge l [mm]	**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**

MXL-BH: minimum width of joist b_w 220 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)														
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45	2,18	2,90	3,28	3,65	4,01	4,40	5,13	5,90	6,49	7,08	7,08	7,67
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	3,26	4,89	6,53	7,38	8,20	9,02	9,90	11,54	13,28	14,61	15,94	15,94	17,27
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)														
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+0,48	2,18+0,96	2,90+0,96	3,28+0,96	3,65+0,96	4,01+0,96	4,40+0,96	5,13+0,96	5,90+0,96	6,49+0,96	7,08+0,96	7,08+0,96	7,67+0,96
VS / VS±	**a= 260 mm**		3,26+0,48	4,89+0,96	6,53+0,96	7,38+0,96	8,20+0,96	9,02+0,96	9,90+0,96	11,54+0,96	13,28+0,96	14,61+0,96	15,94+0,96	15,94+0,96	17,27+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+0,86	2,18+1,72	2,90+1,72	3,28+1,72	3,65+1,72	4,01+1,72	4,40+1,72	5,13+1,72	5,90+1,72	6,49+1,72	7,08+1,72	7,08+1,72	7,67+1,72
V1 / V1±	**a= 260 mm**		3,26+0,86	4,89+1,72	6,53+1,72	7,38+1,72	8,20+1,72	9,02+1,72	9,90+1,72	11,54+1,72	13,28+1,72	14,61+1,72	15,94+1,72	15,94+1,72	17,27+1,72
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+1,29	2,18+2,57	2,90+2,57	3,28+2,57	3,65+2,57	4,01+2,57	4,40+2,57	5,13+2,57	5,90+2,57	6,49+2,57	7,08+2,57	7,08+2,57	7,67+2,57
V2 / V2±	**a= 260 mm**		3,26+1,29	4,89+2,57	6,53+2,57	7,38+2,57	8,20+2,57	9,02+2,57	9,90+2,57	11,54+2,57	13,28+2,57	14,61+2,57	15,94+2,57	15,94+2,57	17,27+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+1,72	2,18+3,43	2,90+3,43	3,28+3,43	3,65+3,43	4,01+3,43	4,40+3,43	5,13+3,43	5,90+3,43	6,49+3,43	7,08+3,43	7,08+3,43	7,67+3,43
V3 / V3±	**a= 260 mm**		3,26+1,72	4,89+3,43	6,53+3,43	7,38+3,43	8,20+3,43	9,02+3,43	9,90+3,43	11,54+3,43	13,28+3,43	14,61+3,43	15,94+3,43	15,94+3,43	17,27+3,43
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	2,18+4,85	2,90+4,85	3,28+4,85	3,65+4,87	4,01+4,87	4,40+4,87	5,13+4,87	5,90+4,87	6,49+4,87	7,08+4,87	7,08+4,87	7,67+4,87
V4 / V4±	**a= 260 mm**		-	4,89+4,85	6,53+4,85	7,38+4,85	8,20+4,87	9,02+4,87	9,90+4,87	11,54+4,87	13,28+4,87	14,61+4,87	15,94+4,87	15,94+4,87	17,27+4,87
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+0,48	2,18+0,96	2,90+0,96	3,28+0,96	3,65+0,96	4,01+0,96	4,40+0,96	5,13+0,96	5,90+0,96	6,49+0,96	7,08+0,96	7,08+0,96	7,67+0,96
V6±	**a= 260 mm**		3,26+0,48	4,89+0,96	6,53+0,96	7,38+0,96	8,20+0,96	9,02+0,96	9,90+0,96	11,54+0,96	13,28+0,96	14,61+0,96	15,94+0,96	15,94+0,96	17,27+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+0,96	2,18+1,93	2,90+1,93	3,28+1,93	3,65+1,93	4,01+1,93	4,40+1,93	5,13+2,57	5,90+2,57	6,49+2,57	7,08+2,57	7,08+2,57	7,67+2,57
V7±	**a= 260 mm**		3,26+0,96	4,89+1,93	6,53+1,93	7,38+1,93	8,20+1,93	9,02+1,93	9,90+1,93	11,54+2,57	13,28+2,57	14,61+2,57	15,94+2,57	15,94+2,57	17,27+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,45+1,83	2,18+3,65	2,90+3,65	3,28+3,65	3,65+3,65	4,01+3,65	4,40+3,65	5,13+3,65	5,90+3,65	6,49+3,65	7,08+3,65	7,08+3,65	7,67+3,65
V8±	**a= 260 mm**		3,26+1,83	4,89+3,65	6,53+3,65	7,38+3,65	8,20+3,65	9,02+3,65	9,90+3,65	11,54+3,65	13,28+3,65	14,61+3,65	15,94+3,65	15,94+3,65	17,27+3,65

MXL-BH: minimum width of joist b_w 250 mm (concrete cover 30 mm)

item ⑤ - link reinforcement slabsides / element at direct support (all shear force level - a_s lapping reinforcement)														
offset balcony	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25	1,87	2,50	2,82	3,14	3,45	3,78	4,41	5,08	5,58	6,09	6,09	6,60
offset balcony	**a= 260 mm**	≥ a_s [cm²] B500	2,81	4,21	5,62	6,35	7,06	7,76	8,51	9,93	11,42	12,56	13,70	13,70	14,84
item ⑥ - link reinforcement / element at indirect support (a_s lapping reinforcement + a_s transverse shear force)														
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25+0,48	1,87+0,96	2,50+0,96	2,82+0,96	3,14+0,96	3,45+0,96	3,78+0,96	4,41+0,96	5,08+0,96	5,58+0,96	6,09+0,96	6,09+0,96	6,60+0,96
VS / VS±	**a= 260 mm**		2,81+0,48	4,21+0,96	5,62+0,96	6,35+0,96	7,06+0,96	7,76+0,96	8,51+0,96	9,93+0,96	11,42+0,96	12,56+0,96	13,70+0,96	13,70+0,96	14,84+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25+0,86	1,87+1,72	2,50+1,72	2,82+1,72	3,14+1,72	3,45+1,72	3,78+1,72	4,41+1,72	5,08+1,72	5,58+1,72	6,09+1,72	6,09+1,72	6,60+1,72
V1 / V1±	**a= 260 mm**		2,81+0,86	4,21+1,72	5,62+1,72	6,35+1,72	7,06+1,72	7,76+1,72	8,51+1,72	9,93+1,72	11,42+1,72	12,56+1,72	13,70+1,72	13,70+1,72	14,84+1,72
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25+1,29	1,87+2,57	2,50+2,57	2,82+2,57	3,14+2,57	3,45+2,57	3,78+2,57	4,41+2,57	5,08+2,57	5,58+2,57	6,09+2,57	6,09+2,57	6,60+2,57
V2 / V2±	**a= 260 mm**		2,81+1,29	4,21+2,57	5,62+2,57	6,35+2,57	7,06+2,57	7,76+2,57	8,51+2,57	9,93+2,57	11,42+2,57	12,56+2,57	13,70+2,57	13,70+2,57	14,84+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25+1,72	1,87+3,43	2,50+3,43	2,82+3,43	3,14+3,43	3,45+3,43	3,78+3,43	4,41+3,43	5,08+3,43	5,58+3,43	6,09+3,43	6,09+3,43	6,60+3,43
V3 / V3±	**a= 260 mm**		2,81+1,72	4,21+3,43	5,62+3,43	6,35+3,43	7,06+3,43	7,76+3,43	8,51+3,43	9,93+3,43	11,42+3,43	12,56+3,43	13,70+3,43	13,70+3,43	14,84+3,43
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	-	1,87+4,85	2,50+4,85	2,82+4,85	3,14+4,87	3,45+4,87	3,78+4,87	4,41+4,87	5,08+4,87	5,58+4,87	6,09+4,87	6,09+4,87	6,60+4,87
V4 / V4±	**a= 260 mm**		-	4,21+4,85	5,62+4,85	6,35+4,85	7,06+4,87	7,76+4,87	8,51+4,87	9,93+4,87	11,42+4,87	12,56+4,87	13,70+4,87	13,70+4,87	14,84+4,87
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25+0,48	1,87+0,96	2,50+0,96	2,82+0,96	3,14+0,96	3,45+0,96	3,78+0,96	4,41+0,96	5,08+0,96	5,58+0,96	6,09+0,96	6,09+0,96	6,60+0,96
V6±	**a= 260 mm**		2,81+0,48	4,21+0,96	5,62+0,96	6,35+0,96	7,06+0,96	7,76+0,96	8,51+0,96	9,93+0,96	11,42+0,96	12,56+0,96	13,70+0,96	13,70+0,96	14,84+0,96
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25+0,96	1,87+1,93	2,50+1,93	2,82+1,93	3,14+1,93	3,45+1,93	3,78+1,93	4,41+2,57	5,08+2,57	5,58+2,57	6,09+2,57	6,09+2,57	6,60+2,57
V7±	**a= 260 mm**		2,81+0,96	4,21+1,93	5,62+1,93	6,35+1,93	7,06+1,93	7,76+1,93	8,51+1,93	9,93+2,57	11,42+2,57	12,56+2,57	13,70+2,57	13,70+2,57	14,84+2,57
shear force level	**a≤ 135 mm**	≥ a_s [cm²] B500	1,25+1,83	1,87+3,65	2,50+3,65	2,82+3,65	3,14+3,65	3,45+3,65	3,78+3,65	4,41+3,65	5,08+3,65	5,58+3,65	6,09+3,65	6,09+3,65	6,60+3,65
V8±	**a= 260 mm**		2,81+1,83	4,21+3,65	5,62+3,65	6,35+3,65	7,06+3,65	7,76+3,65	8,51+3,65	9,93+3,65	11,42+3,65	12,56+3,65	13,70+3,65	13,70+3,65	14,84+3,65

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The dimension of the balcony offset BH [mm] must be specified in the element name, e.g. MXL20-BHS120-C35-h200.

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox℠ (height Egcobox℠ = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox℠. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ or item ⑥ applies to the specified required minimum widths of the joist (b_w) and the height of the offset (***a*** ≤135 mm; ***a*** = 260 mm). For larger joist widths, a reduction of the required reinforcement is possible.
In between, interpolation can be performed. For larger joist widths, a reduction of the required reinforcement is possible.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.

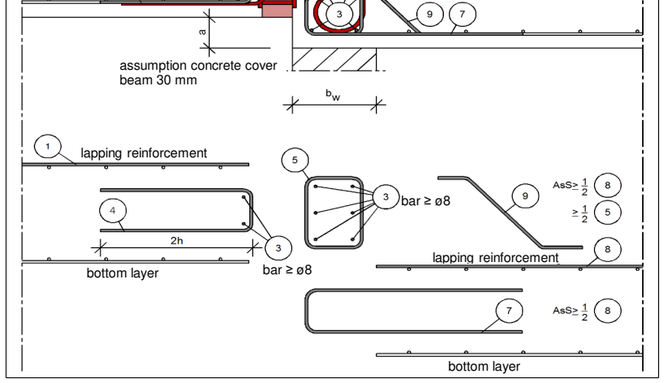
Item ⑧ must be verified and planned by the structural engineer (corresponds to item ① for slab thickness = balcony slab thickness;
for slab thickness ≠ balcony slab thickness, an allowance is required or reduction is possible). The load transmission into the slab must be verified by the structural engineer.
The slab-side stirrups Item ⑦ are structurally recommended at 50 % of the main reinforcement Item ⑧ according to DAfStb Booklet 600.
For reinforcing frame corners, we recommend inclined reinforcement item ⑨ according to DAfStb Booklet 600 with AsS > 50% Pos. ⑧ or > 50% Pos. ⑤ or ⑥.

The specifications apply to good bonding conditions.

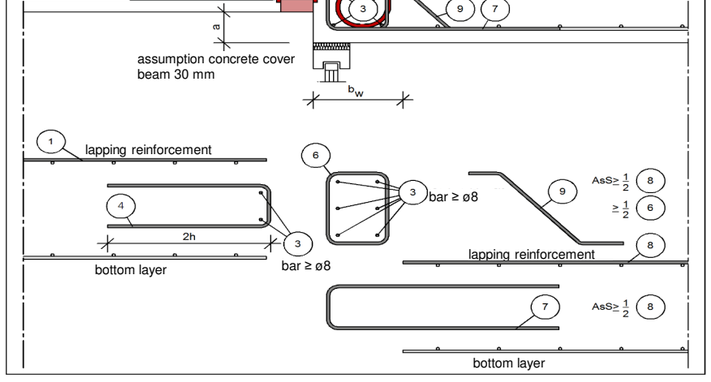
The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox℠ reinforcement and the required minimum beam widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the beam width.

design proposal

direct support



indirect support



On-site reinforcement Egcobox® type MXL-WU / WUS - C20/25

for balconies with overlap in wall downwards

Egcobox type WU / WUS			MXL10-K	MXL20	MXL25	MXL30	MXL35	MXL45	MXL50	MXL55	MXL60	MXL65	MXL70	MXL75	MXL80
length of element [mm]			**500**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
reqired minimum width of joist b_w [mm]			175	175	175	175	175	175	175	175	175	175	175	175	175
Egcobox ø rebar [mm]			ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 8	ø 10	ø 10	ø 10	ø 10	ø 10
Egcobox l_0 rebar [mm]			475	475	475	475	475	475	475	475	612	612	612	612	612
item ① - lapping reinforcement / element															
≥ as [cm²] B500			2,43	3,64	4,86	5,46	6,07	6,68	7,28	8,50	9,77	10,75	11,73	11,73	12,71
suggested on-site reinforcement [mm]			ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 10	ø 12	ø 12	ø 12	ø 12	ø 12
item ② - balcony-side suspension reinforcement shear force / element															
shear force level	VS / VS±	≥ a_s [cm²] B500	-	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V1 / V1±	≥ a_s [cm²] B500	-	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72
shear force level	V2 / V2±	≥ a_s [cm²] B500	-	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57
shear force level	V3 / V3±	≥ a_s [cm²] B500	-	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43
shear force level	V4 / V4±	≥ a_s [cm²] B500	-	4,85	4,85	4,85	4,87	4,87	4,87	4,87	4,87	4,87	4,87	4,87	4,87
shear force level	V6±	≥ a_s [cm²] B500	0,56	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12
shear force level	V7±	≥ a_s [cm²] B500	0,96	1,93	1,93	1,93	1,93	1,93	1,93	2,57	2,57	2,57	2,57	2,57	2,57
shear force level	V8±	≥ a_s [cm²] B500	1,83	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65

MXL-WUS: minimum width of joist b_w 175 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,72	2,58	3,44	3,90	4,34	4,77	5,24	6,11	7,03	7,68	8,44	8,44	9,14
height	**h= 250 mm**	≥ a_s [cm²] B500	3,44	5,17	6,89	7,80	8,67	9,54	10,48	12,23	14,06	15,36	16,88	16,88	18,28

MXL-WUS: minimum width of joist b_w 200 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,46	2,19	2,92	3,31	3,68	4,05	4,44	5,18	5,96	6,52	7,15	7,15	7,75
height	**h= 250 mm**	≥ a_s [cm²] B500	2,92	4,39	5,85	6,62	7,36	8,09	8,88	10,36	11,92	13,03	14,30	14,30	15,50

MXL-WU: minimum width of joist b_w 220 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,31	1,96	2,61	2,95	3,28	3,61	3,96	4,62	5,31	5,81	6,37	6,37	6,91
height	**h= 250 mm**	≥ a_s [cm²] B500	2,61	3,92	5,22	5,91	6,56	7,22	7,92	9,24	10,62	11,62	12,75	12,75	13,81

MXL-WU: minimum width of joist b_w 250 mm (concrete cover 30 mm)

item ⑤ - link reinforcement in wall / element at direct support (all shear force level - a_s lapping reinforcement)															
connection	**h= 160 mm**	≥ a_s [cm²] B500	1,12	1,69	2,25	2,54	2,82	3,11	3,40	3,97	4,57	5,00	5,48	5,48	5,94
height	**h= 250 mm**	≥ a_s [cm²] B500	2,25	3,37	4,50	5,08	5,65	6,21	6,81	7,94	9,14	10,00	10,96	10,96	11,88

item ③+④ - structural reinforcement

In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox^{xy} (height Egcobox^{xy} = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

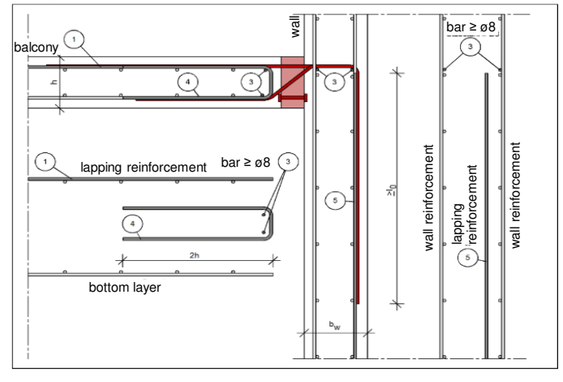
The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox^{xy}. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

Item ⑤ applies to the specified required minimum widths of the wall (b_w) and the connection height (h) of the Egcobox.
In between, interpolation can be performed. For larger wall widths, a reduction of the required reinforcement is possible.
When selecting the reinforcement, the reinforcement rules and the lap lengths must be taken into account. Ø6/250 mm is recommended as the minimum reinforcement.

The specifications apply to good bonding conditions.

The specified connection reinforcement is required exclusively for the static transfer of the cutting forces from the cantilever slab connection.
The statically required beam-reinforcement is not taken into account and shown. This must be additionally dimensioned by the structural engineer.
The specified connection reinforcement is only a suggestion. The structural engineer in charge must check the feasibility of the design.
The distribution of the Egcobox® reinforcement and the required minimum wall widths must be observed.
In the case of alternating shear forces, the embedment length of the shear force bar must be taken into account when selecting the wall width.

design proposal



Design table Egcobox® type MXL± - C20/25

for cantilever plates for transmission of positive and negative moments and shear forces, insulation 120 mm

	Egcobox type			MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
	length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500
	concrete cover [mm]			M_{Rd} [kNm/element]														
	C30	C35	C50															
height of connection [mm] good bonding conditions		**160**	195	±13,9	±17,3	±20,8	±24,3	±27,8	±31,2	±34,7	±33,0	±37,7	±42,4	±47,1	±28,3	±31,5	±34,0	±48,3
	160	165	**200**	±14,7	±18,4	±22,1	±25,8	±29,4	±33,1	±36,8	±35,0	±40,0	±45,0	±50,0	±30,0	±33,4	±36,1	±51,4
	165	170	205	±15,6	±19,4	±23,3	±27,2	±31,1	±35,0	±38,9	±37,0	±42,3	±47,6	±52,9	±31,7	±35,4	±38,2	±54,5
	170	175	210	±16,4	±20,5	±24,6	±28,7	±32,8	±36,9	±41,0	±39,1	±44,6	±50,2	±55,8	±33,5	±37,3	±40,3	±57,5
	175	**180**	215	±17,2	±21,5	±25,8	±30,1	±34,4	±38,8	±43,1	±41,1	±47,0	±52,8	±58,7	±35,2	±39,3	±42,4	±60,6
	180	185	**220**	±18,1	±22,6	±27,1	±31,6	±36,1	±40,6	±45,1	±43,1	±49,3	±55,5	±61,6	±37,0	±41,2	±44,5	±63,6
	185	190	225	±18,9	±23,6	±28,3	±33,1	±37,8	±42,5	±47,2	±45,2	±51,6	±58,1	±64,5	±38,7	±43,2	±46,6	±66,7
	190	195	230	±19,7	±24,7	±29,6	±34,5	±39,5	±44,4	±49,3	±47,2	±54,0	±60,7	±67,4	±40,5	±45,1	±48,7	±69,8
	195	**200**	235	±20,6	±25,7	±30,9	±36,0	±41,1	±46,3	±51,4	±49,2	±56,3	±63,3	±70,3	±42,2	±47,0	±50,8	±72,8
	200	205	**240**	±21,4	±26,8	±32,1	±37,5	±42,8	±48,2	±53,5	±51,3	±58,6	±65,9	±73,3	±44,0	±49,0	±52,9	±75,9
	205	210	245	±22,2	±27,8	±33,4	±38,9	±44,5	±50,0	±55,6	±53,3	±60,9	±68,5	±76,2	±45,7	±50,9	±55,0	±78,9
	210	215	250	±23,1	±28,8	±34,6	±40,4	±46,1	±51,9	±57,7	±55,3	±63,3	±71,2	±79,1	±47,4	±52,9	±57,1	±82,0
	215	**220**	255	±23,9	±29,9	±35,9	±41,8	±47,8	±53,8	±59,8	±57,4	±65,6	±73,8	±82,0	±49,2	±54,8	±59,2	±85,1
	220	225	**260**	±24,7	±30,9	±37,1	±43,3	±49,5	±55,7	±61,9	±59,4	±67,9	±76,4	±84,9	±50,9	±56,8	±61,3	±88,1
	225	230	265	±25,6	±32,0	±38,4	±44,8	±51,2	±57,6	±64,0	±61,5	±70,2	±79,0	±87,8	±52,7	±58,7	±63,4	±91,2
	230	235	270	±26,4	±33,0	±39,6	±46,2	±52,8	±59,4	±66,0	±63,5	±72,6	±81,6	±90,7	±54,4	±60,7	±65,5	±94,2
	235	**240**	275	±27,3	±34,1	±40,9	±47,7	±54,5	±61,3	±68,1	±65,5	±74,9	±84,2	±93,6	±56,2	±62,6	±67,6	±97,3
	240	245	**280**	±28,1	±35,1	±42,1	±49,2	±56,2	±63,2	±70,2	±67,6	±77,2	±86,9	±96,5	±57,9	±64,5	±69,7	±100,4
	245	250	285	±28,9	±36,2	±43,4	±50,6	±57,9	±65,1	±72,3	±69,6	±79,5	±89,5	±99,4	±59,6	±66,5	±71,8	±103,4
	250	255	290	±29,8	±37,2	±44,6	±52,1	±59,5	±67,0	±74,4	±71,6	±81,9	±92,1	±102,3	±61,4	±68,4	±73,9	±106,5
	255	**260**	295	±30,6	±38,2	±45,9	±53,5	±61,2	±68,8	±76,5	±73,7	±84,2	±94,7	±105,2	±63,1	±70,4	±76,0	±109,5
	260	265	**300**	±31,4	±39,3	±47,2	±55,0	±62,9	±70,7	±78,6	±75,7	±86,5	±97,3	±108,1	±64,9	±72,3	±78,1	±112,6
	265	270		±32,3	±40,3	±48,4	±56,5	±64,5	±72,6	±80,7	±77,7	±88,8	±99,9	±111,0	±66,6	±74,3	±80,2	±115,7
	270	275		±33,1	±41,4	±49,7	±57,9	±66,2	±74,5	±82,8	±79,8	±91,2	±102,6	±113,9	±68,4	±76,2	±82,3	±118,7
	275	**280**		±33,9	±42,4	±50,9	±59,4	±67,9	±76,4	±84,9	±81,8	±93,5	±105,2	±116,9	±70,1	±78,2	±84,4	±121,8
	280	285		±34,8	±43,5	±52,2	±60,9	±69,6	±78,3	±86,9	±83,8	±95,8	±107,8	±119,8	±71,9	±80,1	±86,5	±124,8
	285	290		±35,6	±44,5	±53,4	±62,3	±71,2	±80,1	±89,0	±85,9	±98,1	±110,4	±122,7	±73,6	±82,0	±88,6	±127,9
	290	295		±36,5	±45,6	±54,7	±63,8	±72,9	±82,0	±91,1	±87,9	±100,5	±113,0	±125,6	±75,3	±84,0	±90,7	±131,0
	295	**300**		±37,3	±46,6	±55,9	±65,3	±74,6	±83,9	±93,2	±89,9	±102,8	±115,6	±128,5	±77,1	±85,9	±92,8	±134,0
	300			±38,1	±47,7	±57,2	±66,7	±76,2	±85,8	±95,3	±92,0	±105,1	±118,3	±131,4	±78,8	±87,9	±94,9	±137,1

Shear force level		concrete cover [mm]			V_{Rd} [kN/element]													
		C30	C35	C50														
height of connection [mm] good bonding conditions	VS	160-190	160-195	195-230	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5	±36,5
		195-300	200-300	235-300	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7	±48,7
	V1	160-190	160-195	195-230	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9	±64,9
		195-300	200-300	235-300	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5	±86,5
	V2	160-190	160-195	195-230	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3	±97,3
		195-300	200-300	235-300	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8	±129,8
	V3	160-190	160-195	195-230	±104,5	±111,8	±112,8	±113,8	±114,8	±115,8	±116,8	±117,8	±118,8	±119,8	±120,8	-	-	-
		195-300	200-300	235-300	±149,2	±149,2	±149,2	±149,2	±149,2	±149,2	±149,2	±149,2	±149,2	±149,2	±149,2	-	-	-
	V4	175-190	180-195	195-210	-	-	±131,0	±131,0	±131,0	±131,0	±131,0	±131,0	±131,0	±131,0	±131,0	-	-	-
		195-300	200-300	215-300	-	-	±158,9	±158,9	±158,9	±158,9	±158,9	±158,9	±158,9	±158,9	±158,9	-	-	-
	V5	175-190	180-195	195-210	-	-	-	-	±174,7	±174,7	±174,7	±174,7	±174,7	±174,7	±174,7	-	-	-
		195-300	200-300	215-300	-	-	-	-	±211,9	±211,9	±211,9	±211,9	±211,9	±211,9	±211,9	-	-	-

concrete cover:

C30: c_o = 30 mm, c_u = 30 mm

C35: c_o = 35 mm, c_u = 30 mm

C50: c_o = 50 mm, c_u = 50 mm

Reinforcement Egcobox® type MXL±

Egcobox type	MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**
tensile bars	4 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	7 ø 14	8 ø 14	9 ø 14	10 ø 14	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of tensile bars [mm]	1340	1340	1340	1340	1340	1340	1340	1620	1620	1620	1620	1620	1620	1620	2560
compression bars	4 ø 12	5 ø 12	6 ø 12	7 ø 12	8 ø 12	9 ø 12	10 ø 12	7 ø 14	8 ø 14	9 ø 14	10 ø 14	6 ø 14	7 ø 14	8 ø 14	7 ø 16
length of compression bars [mm]	1340	1340	1340	1340	1340	1340	1340	1620	1620	1620	1620	1620	1620	1620	2560
shear force bars VS	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6	2x 4 ø 6
shear force bars V1	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8	2x 4 ø 8
shear force bars V2	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8	2x 6 ø 8
shear force bars V3	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	2x 8 ø 8	-	-	-	-
shear force bars V4	-	-	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	2x 6 ø 10	-	-	-	-
shear force bars V5	-	-	-	-	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	2x 8 ø 10	-	-	-	-
applicable expansion joint distances [m]	**23,0**	**23,0**	**23,0**	**23,0**	**23,0**	**23,0**	**23,0**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**17,0**

concrete cover:
C30: c_o = 30 mm, c_u = 30 mm
C35: c_o = 35 mm, c_u = 30 mm
C50: c_o = 50 mm, c_u = 50 mm

Torsion of the slab in the area of the insulation joint - Egcobox® type MXL±

	Egcobox type	MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
	length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**
	concrete cover [mm]	**banking factor k [1/kNm]**														
	C30 / **C35** / **C50**															
height of connection [mm] good bonding conditions	**160** / 195	1,848	1,479	1,232	1,056	0,924	0,821	0,739	0,770	0,674	0,599	0,539	0,898	0,770	0,674	0,595
	165 / **200**	1,644	1,315	1,096	0,940	0,822	0,731	0,658	0,683	0,598	0,531	0,478	0,797	0,683	0,598	0,526
	170 / 205	1,472	1,178	0,981	0,841	0,736	0,654	0,589	0,610	0,534	0,475	0,427	0,712	0,610	0,534	0,469
	175 / 210	1,326	1,061	0,884	0,758	0,663	0,589	0,530	0,548	0,480	0,426	0,384	0,640	0,548	0,480	0,420
	180 / 215	1,200	0,960	0,800	0,686	0,600	0,533	0,480	0,495	0,433	0,385	0,347	0,578	0,495	0,433	0,379
	185 / **220**	1,092	0,873	0,728	0,624	0,546	0,485	0,437	0,450	0,393	0,350	0,315	0,525	0,450	0,393	0,343
	190 / 225	0,997	0,798	0,665	0,570	0,499	0,443	0,399	0,410	0,359	0,319	0,287	0,478	0,410	0,359	0,312
	195 / 230	0,914	0,732	0,610	0,523	0,457	0,406	0,366	0,375	0,329	0,292	0,263	0,438	0,375	0,329	0,286
	200 / 235	0,842	0,673	0,561	0,481	0,421	0,374	0,337	0,345	0,302	0,268	0,242	0,403	0,345	0,302	0,262
	205 / **240**	0,777	0,622	0,518	0,444	0,389	0,345	0,311	0,318	0,278	0,248	0,223	0,371	0,318	0,278	0,241
	210 / 245	0,720	0,576	0,480	0,411	0,360	0,320	0,288	0,294	0,258	0,229	0,206	0,343	0,294	0,258	0,223
	215 / 250	0,669	0,535	0,446	0,382	0,334	0,297	0,267	0,273	0,239	0,212	0,191	0,319	0,273	0,239	0,207
	220 / 255	0,623	0,498	0,415	0,356	0,311	0,277	0,249	0,254	0,222	0,198	0,178	0,296	0,254	0,222	0,192
	225 / **260**	0,581	0,465	0,388	0,332	0,291	0,258	0,233	0,237	0,207	0,184	0,166	0,277	0,237	0,207	0,179
	230 / 265	0,544	0,435	0,363	0,311	0,272	0,242	0,218	0,222	0,194	0,172	0,155	0,259	0,222	0,194	0,167
	235 / 270	0,510	0,408	0,340	0,291	0,255	0,227	0,204	0,208	0,182	0,161	0,145	0,242	0,208	0,182	0,157
	240 / 275	0,479	0,383	0,319	0,274	0,240	0,213	0,192	0,195	0,171	0,152	0,136	0,227	0,195	0,171	0,147
	245 / **280**	0,451	0,361	0,301	0,258	0,226	0,200	0,180	0,183	0,160	0,143	0,128	0,214	0,183	0,160	0,138
	250 / 285	0,425	0,340	0,284	0,243	0,213	0,189	0,170	0,173	0,151	0,134	0,121	0,202	0,173	0,151	0,130
	255 / 290	0,402	0,321	0,268	0,230	0,201	0,179	0,161	0,163	0,143	0,127	0,114	0,190	0,163	0,143	0,123
	260 / 295	0,380	0,304	0,253	0,217	0,190	0,169	0,152	0,154	0,135	0,120	0,108	0,180	0,154	0,135	0,116
	265 / **300**	0,360	0,288	0,240	0,206	0,180	0,160	0,144	0,146	0,128	0,114	0,102	0,170	0,146	0,128	0,110
	270	0,342	0,273	0,228	0,195	0,171	0,152	0,137	0,138	0,121	0,108	0,097	0,162	0,138	0,121	0,104
	275	0,325	0,260	0,217	0,186	0,162	0,144	0,130	0,132	0,115	0,102	0,092	0,153	0,132	0,115	0,099
	280	0,309	0,247	0,206	0,177	0,154	0,137	0,124	0,125	0,109	0,097	0,088	0,146	0,125	0,109	0,094
	285	0,294	0,235	0,196	0,168	0,147	0,131	0,118	0,119	0,104	0,093	0,083	0,139	0,119	0,104	0,089
	290	0,281	0,225	0,187	0,160	0,140	0,125	0,112	0,113	0,099	0,088	0,079	0,132	0,113	0,099	0,085
	295	0,268	0,214	0,179	0,153	0,134	0,119	0,107	0,108	0,095	0,084	0,076	0,126	0,108	0,095	0,081
	300	0,256	0,205	0,171	0,146	0,128	0,114	0,102	0,103	0,091	0,080	0,072	0,121	0,103	0,091	0,077
		0,245	0,196	0,163	0,140	0,122	0,109	0,098	0,099	0,087	0,077	0,069	0,115	0,099	0,087	0,074

Rotation spring stiffness Egcobox® type MXL±

	Egcobox type			MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
	length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	500	500	500	500
	concrete cover [mm]			Rotation spring stiffness [kNm/rad/Element]														
	C30	C35	C50															
height of connection [mm] good bonding conditions		**160**	195	541	676	812	947	1082	1217	1353	1299	1484	1670	1855	1113	1299	1484	1681
	160	165	**200**	608	760	912	1064	1216	1368	1521	1464	1673	1882	2091	1255	1464	1673	1901
	165	170	205	679	849	1019	1189	1359	1528	1698	1639	1873	2107	2341	1405	1639	1873	2134
	170	175	210	754	943	1131	1320	1509	1697	1886	1824	2085	2345	2606	1563	1824	2085	2380
	175	**180**	215	833	1042	1250	1458	1666	1875	2083	2019	2307	2596	2884	1731	2019	2307	2640
	180	185	**220**	916	1145	1374	1603	1832	2061	2290	2224	2542	2859	3177	1906	2224	2542	2914
	185	190	225	1003	1254	1504	1755	2006	2256	2507	2439	2787	3135	3484	2090	2439	2787	3201
	190	195	230	1094	1367	1640	1914	2187	2461	2734	2663	3044	3424	3805	2283	2663	3044	3501
	195	**200**	235	1188	1485	1782	2079	2376	2674	2971	2898	3312	3726	4140	2484	2898	3312	3815
	200	205	**240**	1287	1608	1930	2252	2574	2895	3217	3142	3591	4040	4489	2693	3142	3591	4142
	205	210	245	1389	1737	2084	2431	2779	3126	3473	3397	3882	4367	4852	2911	3397	3882	4483
	210	215	250	1496	1870	2244	2617	2991	3365	3739	3661	4184	4707	5230	3138	3661	4184	4837
	215	**220**	255	1606	2008	2409	2811	3212	3614	4015	3935	4497	5059	5621	3373	3935	4497	5205
	220	225	**260**	1720	2150	2581	3011	3441	3871	4301	4219	4822	5424	6027	3616	4219	4822	5586
	225	230	265	1839	2298	2758	3217	3677	4137	4596	4513	5157	5802	6447	3868	4513	5157	5981
	230	235	270	1961	2451	2941	3431	3921	4412	4902	4817	5505	6193	6881	4129	4817	5505	6389
	235	**240**	275	2087	2608	3130	3652	4173	4695	5217	5130	5863	6596	7329	4397	5130	5863	6810
	240	245	**280**	2217	2771	3325	3879	4433	4988	5542	5454	6233	7012	7791	4675	5454	6233	7246
	245	250	285	2351	2938	3526	4114	4701	5289	5877	5787	6614	7441	8268	4961	5787	6614	7694
	250	255	290	2488	3111	3733	4355	4977	5599	6221	6131	7007	7882	8758	5255	6131	7007	8156
	255	**260**	295	2630	3288	3945	4603	5260	5918	6576	6484	7410	8337	9263	5558	6484	7410	8632
	260	265	**300**	2776	3470	4164	4858	5552	6246	6940	6847	7825	8804	9782	5869	6847	7825	9121
	265	270		2926	3657	4388	5120	5851	6582	7314	7220	8252	9283	10315	6189	7220	8252	9623
	270	275		3079	3849	4619	5388	6158	6928	7698	7603	8689	9776	10862	6517	7603	8689	10139
	275	**280**		3237	4046	4855	5664	6473	7282	8091	7996	9138	10281	11423	6854	7996	9138	10668
	280	285		3398	4247	5097	5946	6796	7645	8495	8399	9599	10799	11998	7199	8399	9599	11211
	285	290		3563	4454	5345	6236	7127	8017	8908	8812	10070	11329	12588	7553	8812	10070	11767
	290	295		3733	4666	5599	6532	7465	8398	9331	9234	10553	11873	13192	7915	9234	10553	12337
	295	**300**		3906	4882	5859	6835	7811	8788	9764	9667	11048	12429	13809	8286	9667	11048	12920
	300			4083	5104	6124	7145	8166	9186	10207	10109	11553	12997	14441	8665	10109	11553	13517

On-site reinforcement Egcobox® type MXL± - C20/25

Egcobox type	MXL20±	MXL25±	MXL30±	MXL45±	MXL50±	MXL55±	MXL60±	MXL65±	MXL70±	MXL75±	MXL80±	MXL110±-K	MXL120±-K	MXL130±-K	MXL150±-K
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**500**	**500**	**500**	**500**
Egcobox ø rebar [mm]	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 16
Egcobox l_0 rebar [mm]	580	580	580	580	580	580	580	720	720	720	720	720	720	720	1190
item ① - lapping reinforcement / element															
≥ a_s [cm²] B500	3,85	4,81	5,77	6,73	7,69	8,65	9,61	9,36	10,70	12,03	13,37	8,02	8,94	9,66	14,07
suggested on-site reinforcement [mm]	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 12	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 14	ø 16
item ② - suspension reinforcement shear force / element															
shear force level VS ≥ a_s [cm²] B500	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	1,12	0,96	0,96	0,96	0,96
shear force level V1 ≥ a_s [cm²] B500	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72	1,72
shear force level V2 ≥ a_s [cm²] B500	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57	2,57
shear force level V3 ≥ a_s [cm²] B500	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	3,43	-	-	-	-
shear force level V4 ≥ a_s [cm²] B500	-	-	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	3,65	-	-	-	-
shear force level V5 ≥ a_s [cm²] B500	-	-	-	-	4,87	4,87	4,87	4,87	4,87	4,87	4,87	-	-	-	-

item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②).

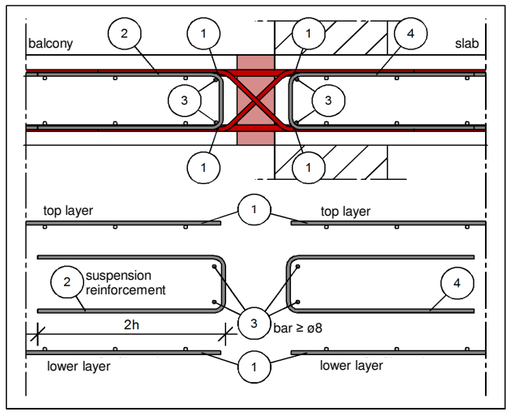
Depending on the moment load (negative or positive moment), the overlap of the bending tension reinforcement (item ①) can only be sufficient in the top or lower layer.
The suggested lapping reinforcement (α_6=1,5) is selected (item ①) to transfer 100% of the M_{Rd} of the Egcobox® (height Egcobox® = height floor). An other reinforcement selection is possible.
In case of an other reinforcement selection shall be approved the lapping reinforcement in accordance with EN 1992. The reinforcement cross section or the lapping length can be derated in reference of utilization proportional M_{Ed} / M_{Rd}.
The lapping reinforcement must be approved by the structural engineer.

The proposed steel cross-section a_s (item ②) covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

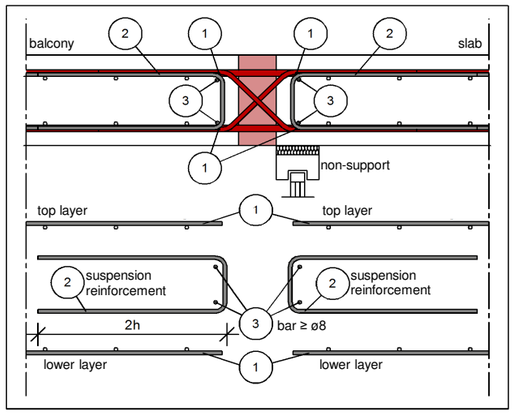
The specifications apply to good bonding conditions.

design proposal

direct support



indirect support



Design table Egcobox® type VXL - C20/25

for supported plates for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL36	VXL45	VXL65	VXL81	VXL97	VXL129	VXL157	VXL194	VXL235	VXL274
length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
concrete cover [mm]			V_{Rd} [kN/element]									
C30	C35	C50										
height of connection [mm] good bonding conditions												
160-170	160-175	175-190	31,4	39,3	55,9	69,9	83,8	111,8	-	-	-	-
175-190	180-195	195-210							139,7	167,7	218,3	256,7
195-300	200-300	215-300	41,9	52,4	74,6	93,2	111,9	149,2	186,4	223,7	264,8	317,8

Reinforcement											
shear force bars			4 ø 6	5 ø 6	4 ø 8	5 ø 8	6 ø 8	8 ø 8	10 ø 8	12 ø 8	10 ø 10	12 ø 10
minimum wall / beam width [mm]			180	180	200	200	200	200	200	200	220	220
compression bearings			4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	6 ø 12	8 ø 12
applicable expansion joint distances [m]			19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

Design table Egcobox® type VXL-K - C20/25

for supported plates for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL18-K	VXL32-K	VXL48-K	VXL65-K	VXL75-K	VXL97-K	VXL113-K	VXL152-K
length of element [mm]			200	250	300	300	400	400	500	510
concrete cover [mm]			V_{Rd} [kN/Element]							
C30	C35	C50								
height of connection [mm] good bonding conditions										
160-170	160-175	175-190	15,7	27,9	41,9	55,9	68,7	-	97,8	-
175-190	180-195	195-210						87,3		131,0
195-300	200-300	215-300	21,0	37,3	55,9	74,6	93,2	105,9	130,5	158,9

Reinforcement									
shear force bars		2 ø 6	2 ø 8	3 ø 8	4 ø 8	5 ø 8	4 ø 10	7 ø 8	6 ø 10
minimum wall / beam width [mm]		180	200	200	200	200	220	200	220
compression bearings		1 ø 12	1 ø 12	2 ø 12	2 ø 12	2 ø 12	3 ø 12	3 ø 12	5 ø 12
applicable expansion joint distances [m]		19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

On-site reinforcement Egcobox® type VXL / VXL-K - C20/25

Egcobox type	VXL36	VXL45	VXL65	VXL81	VXL97	VXL129	VXL157	VXL194	VXL235	VXL274
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
item ② - suspension reinforcement side shear force / element										
≥ a_s [cm²] B500	1,12	1,21	1,72	2,14	2,57	3,43	4,29	5,15	6,09	7,31
x = shear force bar embedment depth (slab) [mm]	155	155	175	175	175	175	175	175	195	195

Egcobox type	VXL18-K	VXL32-K	VXL48-K	VXL65-K	VXL75-K	VXL97-K	VXL113-K	VXL152-K
length of element [mm]	**200**	**250**	**300**	**300**	**400**	**400**	**500**	**510**
item ② - suspension reinforcement side shear force / element								
≥ a_s [cm²] B500	0,48	0,86	1,29	1,72	2,14	2,44	3,00	3,65
x = shear force bar embedment depth (slab) [mm]	155	175	175	175	175	195	175	195

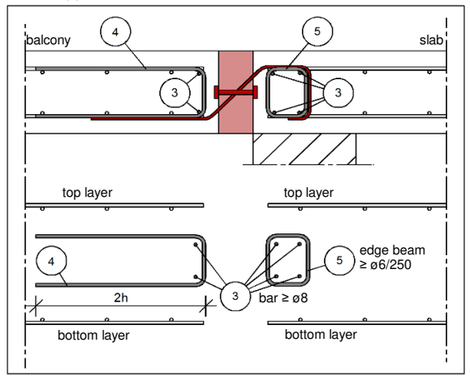
item ③+④+⑤ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②); on the floor side, an edge beam (item ⑤) ≥ ø6/250 is to be provided.

The proposed steel cross-section a_s The proposed steel cross-section as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

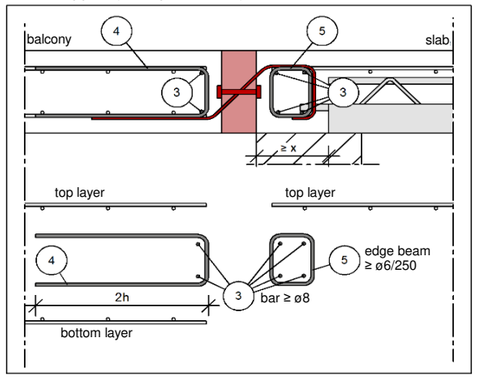
The specifications apply to good bonding conditions.

design proposal

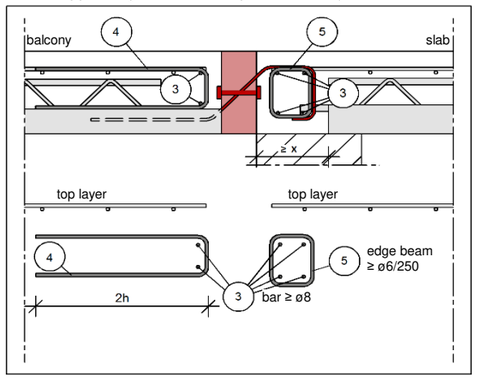
direct support



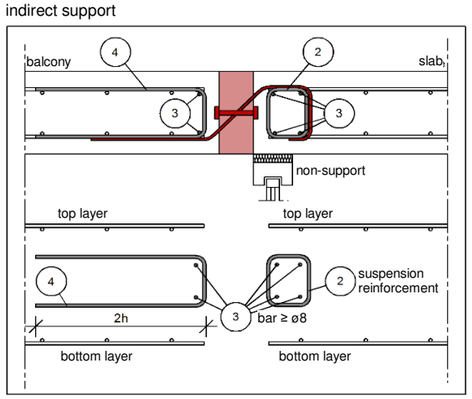
direct support (semi-prefab slab)



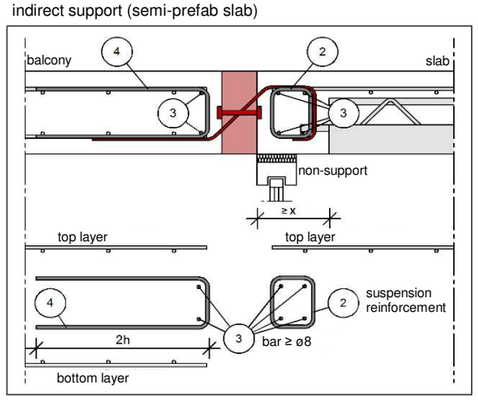
direct support: Egcobox in semi-prefab balcony



indirect support



indirect support (semi-prefab slab)



Note Egcobox in semi-prefab balcony:
It is advisable to include the constructive edging on the balcony side (item ④ vs. item ②) in the semi-prefab part.

Note indirect support (semi-prefab slab):
The information on the minimum required connection reinforcement of the Egcobox of the ceiling-side item ② does not replace the statically selected beam reinforcement of the structural engineer. This has to be considered additionally. The Pos ③ on the ceiling side, however, is only constructive and can be taken into account for the static specifications of the structural engineer.

Design table Egcobox® type VXL± - C20/25

for supported plates for transmission of positive and negative shear forces, insulation 120 mm

Egcobox type			VXL36±	VXL45±	VXL65±	VXL81±	VXL97±	VXL129±	VXL157±	VXL194±	VXL235±	VXL274±
length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
concrete cover [mm]			V_{Rd} [kN/element]									
C30	C35	C50										
height of connection [mm] good bonding conditions												
160-170	160-175	175-190	±31,4	±39,3	±55,9	±69,9	±83,8	±111,8	-	-	-	-
175-190	180-195	195-210							±139,7	±167,7	±218,3	±256,7
195-300	200-300	215-300	±41,9	±52,4	±74,6	±93,2	±111,9	±149,2	±186,4	±223,7	±264,8	±317,8

Reinforcement											
shear force bars			2x 4 ø 6	2x 5 ø 6	2x 4 ø 8	2x 5 ø 8	2x 6 ø 8	2x 8 ø 8	2x 10 ø 8	2x 12 ø 8	2x 10 ø 10	2x 12 ø 10
minimum wall / beam width [mm]			180	180	200	200	200	200	200	200	220	220
compression bearings			4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	4 ø 12	5 ø 12	6 ø 12	8 ø 12
applicable expansion joint distances [m]			19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

Design table Egcobox® type VXL-K± - C20/25

for supported plates for transmission of positive and negative shear forces, insulation 120 mm

Egcobox type			VXL18-K±	VXL32-K±	VXL48-K±	VXL65-K±	VXL75-K±	VXL97-K±	VXL113-K±	VXL152-K±
length of element [mm]			200	250	300	310	400	400	500	530
concrete cover [mm]			V_{Rd} [kN/element]							
C30	C35	C50								
height of connection [mm] good bonding conditions										
160-170	160-175	175-190	±15,7	±27,9	±41,9	±55,9	±68,7	-	±97,8	-
175-190	180-195	195-210						±87,3		±131,0
195-300	200-300	215-300	±21,0	±37,3	±55,9	±74,6	±93,2	±105,9	±130,5	±158,9

Reinforcement									
shear force bars		2x 2 ø 6	2x 2 ø 8	2x 3 ø 8	2x 4 ø 8	2x 5 ø 8	2x 4 ø 10	2x 7 ø 8	2x 6 ø 10
minimum wall / beam width [mm]		180	200	200	200	200	220	200	220
compression bearings		1 ø 12	1 ø 12	2 ø 12	2 ø 12	2 ø 12	3 ø 12	3 ø 12	5 ø 12
applicable expansion joint distances [m]		19,9	19,9	19,9	19,9	19,9	19,9	19,9	19,9

On-site reinforcement Egcobox® type VXL± / VXL-K± - C20/25

Egcobox type	VXL36±	VXL45±	VXL65±	VXL81±	VXL97±	VXL129±	VXL157±	VXL194±	VXL235±	VXL274±
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
item ② - suspension reinforcement side shear force / element										
≥ a_s [cm²] B500	1,12	1,21	1,72	2,14	2,57	3,43	4,29	5,15	6,09	7,31
x = shear force bar embedment depth (slab) [mm]	155	155	175	175	175	175	175	175	195	195

Egcobox type	VXL18-K±	VXL32-K±	VXL48-K±	VXL65-K±	VXL75-K±	VXL97-K±	VXL113-K±	VXL152-K±
length of element [mm]	**200**	**250**	**300**	**310**	**400**	**400**	**500**	**530**
item ② - suspension reinforcement shear force / element								
≥ a_s [cm²] B500	0,48	0,86	1,29	1,72	2,14	2,44	3,00	3,65
x = shear force bar embedment depth (slab) [mm]	155	175	175	175	175	195	175	195

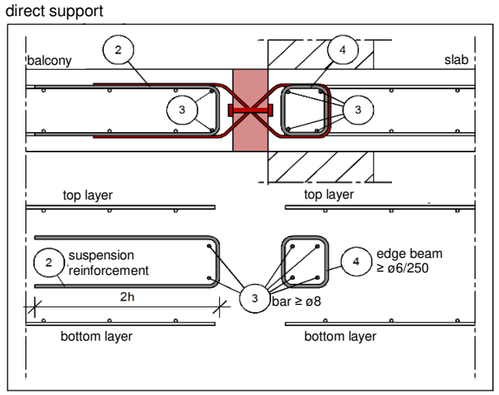
item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②); on the floor side, an edge beam (item ⑤) ≥ ø6/250 is to be provided.

The proposed steel cross-section a_s The proposed steel cross-section as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

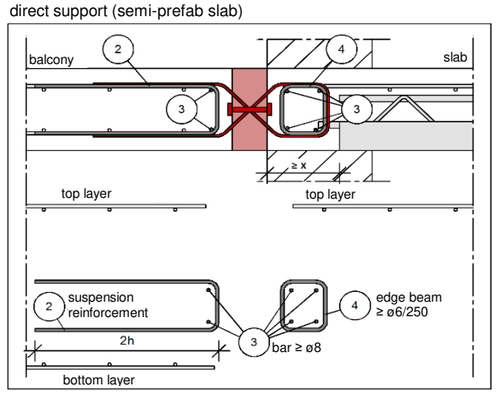
The specifications apply to good bonding conditions.

design proposal

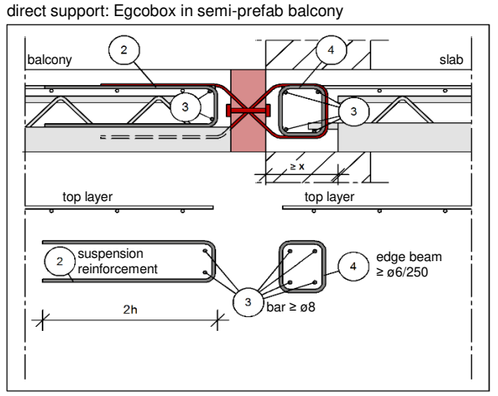
direct support



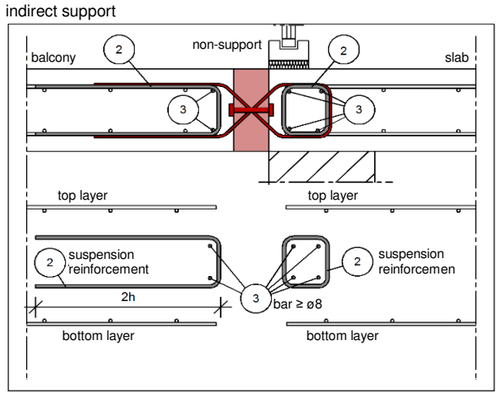
direct support (semi-prefab slab)



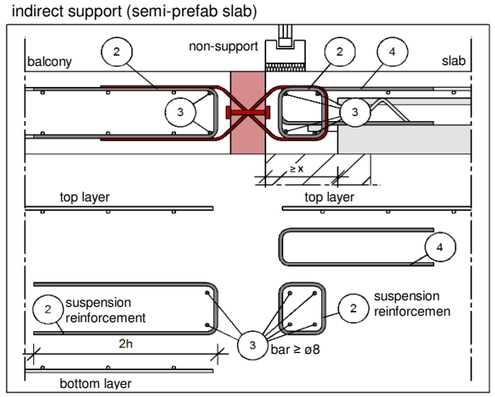
direct support: Egcobox in semi-prefab balcony



indirect support



indirect support (semi-prefab slab)



Note Egcobox in semi-prefab balcony:
It is advisable to include the constructive edging on the balcony side (item ④ vs. item ②) in the semi-prefab part.

Note indirect support (semi-prefab slab):
The information on the minimum required connection reinforcement of the Egcobox of the ceiling-side item ② does not replace the statically selected beam reinforcement of the structural engineer. This has to be considered additionally. The Pos ③ on the ceiling side, however, is only constructive and can be taken into account for the static specifications of the structural engineer.

Design table Egcobox® type VXL Z - C20/25

for zero-stress connection of loggias for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL Z 36	VXL Z 45	VXL Z 65	VXL Z 81	VXL Z 97	VXL Z 129	VXL Z 157	VXL Z 194	VXL Z 235	VXL Z 274
length of element [mm]			**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
concrete cover [mm]												
C30	**C35**	**C50**										
height of connection [mm] good bonding conditions			V_{Rd} [kN/Element]									
160-170	160-175	175-190	31,4	39,3	55,9	69,9	83,8	111,8	-	-	-	-
175-190	180-195	195-210							139,7	167,7	218,3	256,7
195-300	200-300	215-300	41,9	52,4	74,6	93,2	111,9	149,2	186,4	223,7	264,8	317,8

Reinforcement										
shear force bars	4 ø 6	5 ø 6	4 ø 8	5 ø 8	6 ø 8	8 ø 8	10 ø 8	12 ø 8	10 ø 10	12 ø 10
minimum wall / beam width [mm]	180	180	200	200	200	200	200	200	220	220
applicable expansion joint distances [m]	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0
span between elements [m]	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**	**19,9**

Also available as VM Z± version on request.

Design table Egcobox® type VXL Z -K - C20/25

for zero-stress connection of loggias for the transmission of shear forces, insulation 120 mm

Egcobox type			VXL Z 18-K	VXL Z 32-K	VXL Z 48-K	VXL Z 65-K	VXL Z 75-K	VXL Z 97-K	VXL Z 113-K	VXL Z 152-K
length of element [mm]			**200**	**250**	**300**	**300**	**400**	**400**	**500**	**510**
concrete cover [mm]										
C30	**C35**	**C50**								
height of connection [mm] good bonding conditions			V_{Rd} [kN/Element]							
160-170	160-175	175-190	15,7	27,9	41,9	55,9	68,7	-	97,8	-
175-190	180-195	195-210						87,3		131,0
195-300	200-300	215-300	21,0	37,3	55,9	74,6	93,2	105,9	130,5	158,9

Reinforcement								
shear force bars	2 ø 6	2 ø 8	3 ø 8	4 ø 8	5 ø 8	4 ø 10	7 ø 8	6 ø 10
minimum wall / beam width [mm]	180	200	200	200	200	220	200	220
applicable expansion joint distances [m]	23,0	23,0	23,0	23,0	23,0	23,0	23,0	23,0
span between elements [m]	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**	**9,95**

Also available as VXL Z-K± version on request.

The Egcobox VXL Z or VXL Z-K is to be used opposite each other in combination with the Egcobox VXL or VXL-K of the same bearing stage or an opposite bending resistant support.

On-site reinforcement Egcobox® type VXL Z / VXL Z -K - C20/25

Egcobox type	VXL Z 36	VXL Z 45	VXL Z 65	VXL Z 81	VXL Z 97	VXL Z 129	VXL Z 157	VXL Z 194	VXL Z 235	VXL Z 304
length of element [mm]	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**	**1000**
in combination with	VXL36	VXL45	VXL65	VXL81	VXL97	VXL129	VXL157	VXL194	VXL235	VXL274
	oder einem biegesteifem Auflager									
item ② - suspension reinforcement side shear force / element										
≥ a_s [cm²] B500	1,12	1,21	1,72	2,14	2,57	3,43	4,29	5,15	6,09	7,31
x = shear force bar embedment depth (slab) [mm]	155	155	175	175	175	175	175	175	195	195
item ⑤ - tie member (add. reinforcement) in the loggia for transmitting the horizontal tension forces from the Egcobox VM to VM Z										
≥ as [cm²] B500	1,12	1,21	1,72	2,14	2,57	3,43	4,29	5,15	6,09	7,31
item ⑥ - max. required add. reinforcement (tension) in the connection area of the Egcobox VM in case of e.g. asymmetrical loads on the loggia										
≥ a_s [cm²] B500	0,63	0,68	0,97	1,22	1,46	1,95	2,43	2,92	3,45	4,14

Egcobox type	VXL Z 18-K	VXL Z 32-K	VXL Z 48-K	VXL Z 65-K	VXL Z 75-K	VXL Z 97-K	VXL Z 113-K	VXL Z 152-K
length of element [mm]	**200**	**250**	**300**	**300**	**400**	**400**	**500**	**510**
in combination with	VXL18-K	VXL32-K	VXL48-K	VXL65-K	VXL75-K	VXL97-K	VXL113-K	VXL152-K
	oder einem biegesteifem Auflager							
item ② - suspension reinforcement side shear force / element								
≥ a_s [cm²] B500	0,48	0,86	1,29	1,72	2,14	2,44	3,00	3,65
x = shear force bar embedment depth (slab) [mm]	155	175	175	175	175	195	175	195
item ⑤ - tie member (add. reinforcement) in the loggia for transmitting the horizontal tension forces from the Egcobox VM-K to VM Z-K								
≥ as [cm²] B500	0,48	0,86	1,29	1,72	2,14	2,44	3,00	3,65
item ⑥ - max. required add. reinforcement (tension) in the connection area of the Egcobox VM-K in case of e.g. asymmetrical loads on the loggia								
≥ a_s [cm²] B500	0,27	0,49	0,73	0,97	1,22	1,38	1,70	2,07

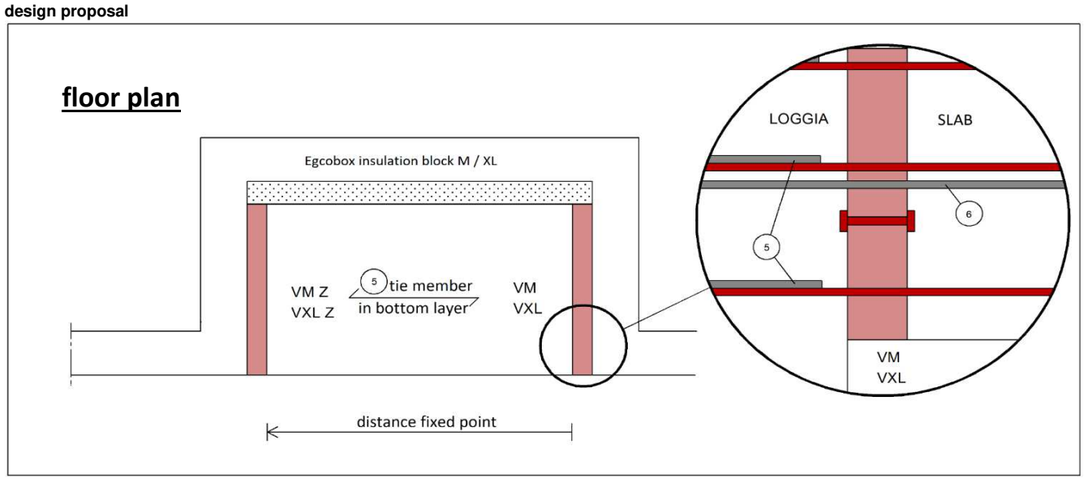
item ③+④ - structural reinforcement
In the slab edge of the u-bar reinforcement is respectively to arrange ≥ ø8 (item ③).
On the balcony side, it is recommended to design the edge reinforcement for the shear force V_{Ed} / f_{yd} ≥ ø6/250 mm according to EN 1992 (item ④ - vs. item ②); on the floor side, an edge beam (item ⑤) ≥ ø6/250 is to be provided.

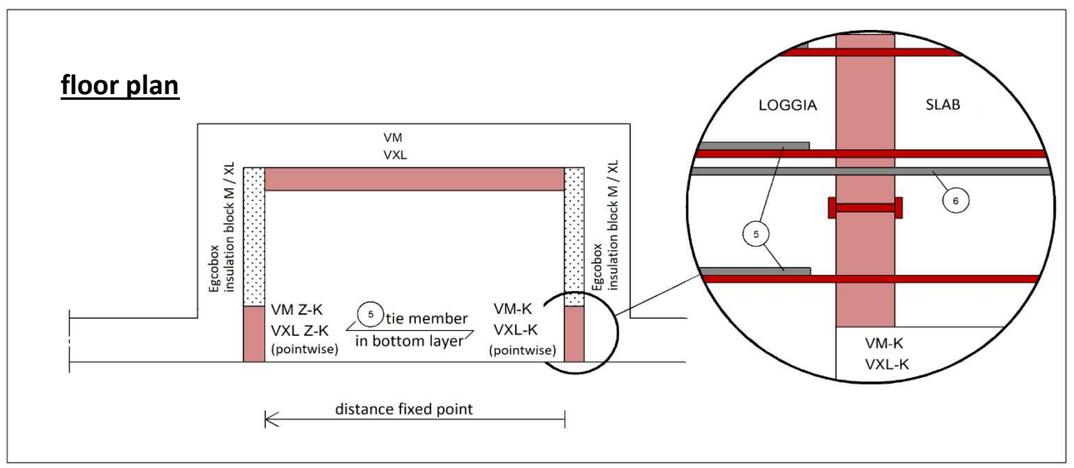
The proposed steel cross-section a_s The proposed steel cross-section as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

item ⑤+⑥ - additional reinforcement
When planning zero-stress elements, care must be taken to ensure that the resulting tensile forces are absorbed in the lower reinforcement layer of the loggia by a tie member (item ⑤).
At maximum design shear force V_{Rd} of Egcobox®, the reinforcement cross-section of the tension member should correspond to the transverse force bars.
In addition, additional tension forces may occur, e.g. due to asymmetrical loading of the balcony plate. These can be absorbed by arranging Egcobox® Short-Elements (modules) or by additional tension rods (V4A) in the Egcobox VXL_ or VXL_-K.
The proposed steel cross-section a_s The proposed steel cross-section (item ⑥) as covers the maximum design transverse force V_{Rd} of the Egcobox®. In case of smaller actions, the edge reinforcement may be determined with V_{Ed} / f_{yd} ≥ ø6/250 mm.

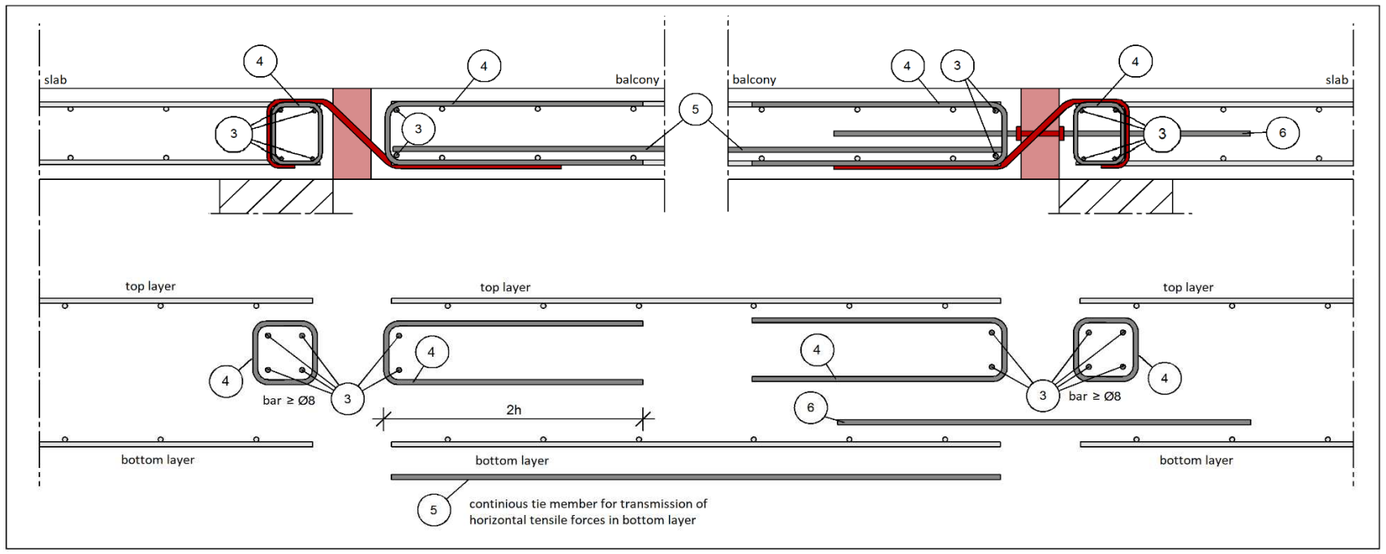
The specifications apply to good bonding conditions.

design proposal

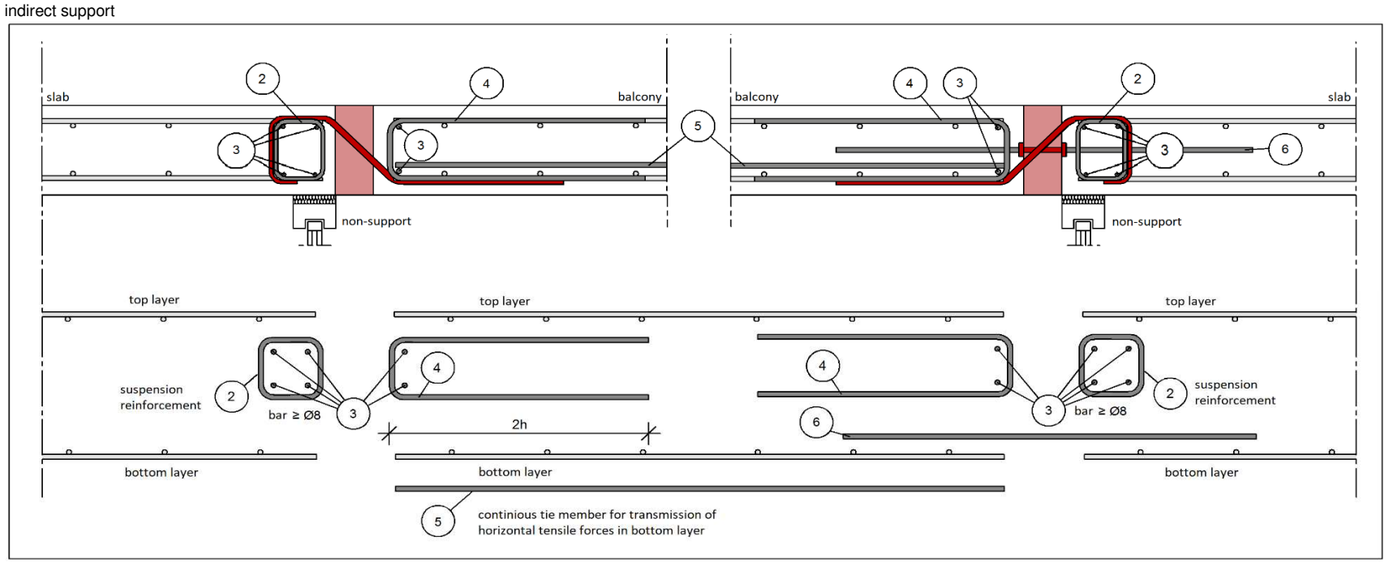




direct support



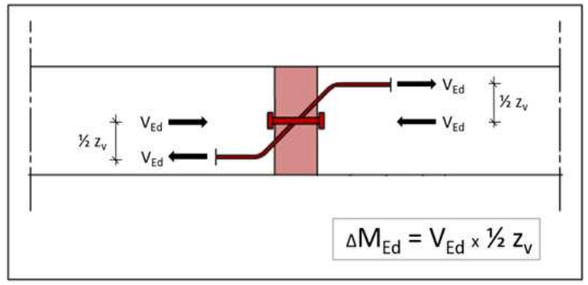
indirect support



Egcobox® type VXL, VXL±, VXL-K, VXL-K± - C20/25

Moments from eccentric connection

When using the Egcobox® V... for the transmission of shear force requirements only, a moment from eccentric connection has to be considered additionally when dimensioning the connection reinforcement.
The moment ΔM_{Ed} is determined under the assumption of a shear force utilisation of 100%.



Egcobox type			VXL36 VXL36±	VXL45 VXL45±	VXL65 VXL65±	VXL81 VXL81±	VXL97 VXL97±	VXL129 VXL129±	VXL157 VXL157±	VXL194 VXL194±	VXL235 VXL235±	VXL274 VXL274±
length of element [mm]			1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
concrete cover [mm]			ΔM_{Ed} [kNm/element] for height of connectionn									
C30	C35	C50										
height of connection [mm] good bonding conditions												
160-170	160-175	175-190	2,1	2,6	3,7	4,6	5,6	7,4	-	-	-	-
175-190	180-195	195-210	2,5	3,2	4,5	5,6	6,7	9,0	11,2	13,5	17,6	20,7
195-225	200-230	215-245	4,0	5,0	7,0	8,8	10,6	14,1	17,6	21,1	25,0	30,0
230-260	235-265	250-280	5,0	6,2	8,9	11,1	13,3	17,7	22,2	26,6	31,5	37,8
265-300	270-300	285-300	7,0	8,8	12,5	15,7	18,8	25,1	31,3	37,6	44,5	53,4

Egcobox type			VXL18-K VXL18-K±	VXL32-K VXL32-K±	VXL48-K VXL48-K±	VXL65-K VXL65-K±	VXL75-K VXL75-K±	VXL97-K VXL97-K±	VXL113-K VXL113-K±	VXL152-K VXL152-K±
length of element [mm]			200	250	300	300 310	400	400	500	510 530
concrete cover [mm]			ΔM_{Ed} [kNm/element] for height of connection							
C30	C35	C50								
height of connection [mm] good bonding conditions										
160-170	160-175	175-190	1,0	1,9	2,8	3,7	4,6	-	6,5	-
175-190	180-195	195-210	1,3	2,2	3,4	4,5	5,5	7,0	7,9	10,5
195-225	200-230	215-245	2,0	3,5	5,3	7,0	8,8	10,0	12,3	15,0
230-260	235-265	250-280	2,5	4,4	6,7	8,9	11,1	12,6	15,5	18,9
265-300	270-300	285-300	3,5	6,3	9,4	12,5	15,7	17,8	21,9	26,7

Design table Egcobox® type AXL

for parapet wall, insulation 120 mm

Egcobox type	AXL10-140	AXL10-150	AXL10-200	AXL20-140	AXL20-150	AXL20-200	AXL30-140	AXL30-150	AXL30-200
length of element [mm]	250			250			250		
height of element [mm]	140 - 250			140 - 250			140 - 250		
width of parapet wall [mm]	140	150 - 190	200 - 250	140	150 - 190	200 - 250	140	150 - 190	200 - 250

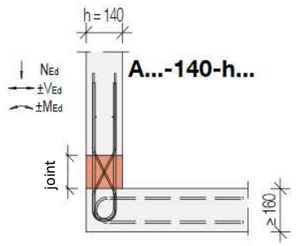
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]																	
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C20/25 parapet wall C20/25 slab C20/25	0,0	± 2,39	0,0	± 2,69	0,0	± 3,05	0,0	± 3,83	0,0	± 4,70	0,0	± 6,50	0,0	± 3,83	0,0	± 4,70	0,0	± 6,50
	10,0	± 1,99	10,0	± 2,24	10,0	± 2,43	10,0	± 3,43	10,0	± 4,25	10,0	± 5,85	10,0	± 3,43	10,0	± 4,25	10,0	± 5,85
	20,0	± 1,59	20,0	± 1,79	20,0	± 1,82	20,0	± 3,03	20,0	± 3,80	20,0	± 5,20	20,0	± 3,03	20,0	± 3,80	20,0	± 5,20
	30,0	± 1,19	30,0	± 1,34	30,0	± 1,20	30,0	± 2,63	30,0	± 3,35	30,0	± 4,55	30,0	± 2,63	30,0	± 3,35	30,0	± 4,55
	40,0	± 0,79	40,0	± 0,89	40,0	± 0,59	40,0	± 2,23	40,0	± 2,90	40,0	± 3,90	40,0	± 2,23	40,0	± 2,90	40,0	± 3,90
	50,0	± 0,39	50,0	± 0,44	49,6	± 0,00	50,0	± 1,83	50,0	± 2,45	50,0	± 3,25	50,0	± 1,83	50,0	± 2,45	50,0	± 3,25
	60,0	± 0,00	59,8	± 0,00	-	-	60,0	± 1,43	60,0	± 2,00	60,0	± 2,60	60,0	± 1,43	60,0	± 2,00	60,0	± 2,60
	V_{Rd} [kN/element]																	
	± 4,84		± 5,31		± 6,87		± 5,89		± 6,46		± 8,36		± 11,78		± 12,92		± 16,71	

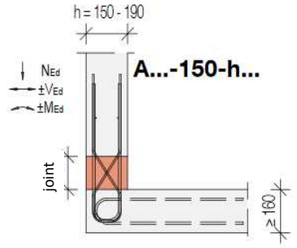
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]																	
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C25/30 parapet wall C25/30 slab ≥C20/25	0,0	± 2,40	0,0	± 3,12	0,0	± 3,18	0,0	± 3,83	0,0	± 4,70	0,0	± 6,91	0,0	± 3,83	0,0	± 4,70	0,0	± 6,91
	10,0	± 2,05	10,0	± 2,67	10,0	± 2,62	10,0	± 3,43	10,0	± 4,25	10,0	± 6,28	10,0	± 3,43	10,0	± 4,25	10,0	± 6,28
	20,0	± 1,71	20,0	± 2,22	20,0	± 2,07	20,0	± 3,03	20,0	± 3,80	20,0	± 5,66	20,0	± 3,03	20,0	± 3,80	20,0	± 5,66
	30,0	± 1,36	30,0	± 1,77	30,0	± 1,52	30,0	± 2,63	30,0	± 3,35	30,0	± 5,04	30,0	± 2,63	30,0	± 3,35	30,0	± 5,04
	40,0	± 1,02	40,0	± 1,32	40,0	± 0,97	40,0	± 2,23	40,0	± 2,90	40,0	± 4,42	40,0	± 2,23	40,0	± 2,90	40,0	± 4,42
	50,0	± 0,67	50,0	± 0,87	50,0	± 0,42	50,0	± 1,83	50,0	± 2,45	50,0	± 3,80	50,0	± 1,83	50,0	± 2,45	50,0	± 3,80
	60,0	± 0,32	59,8	± 0,42	57,5	± 0,00	60,0	± 1,43	60,0	± 2,00	60,0	± 3,18	60,0	± 1,43	60,0	± 2,00	60,0	± 3,18
	V_{Rd} [kN/element]																	
	± 5,62		± 6,16		± 7,97		± 6,22		± 6,93		± 8,82		± 12,42		± 13,85		± 17,61	

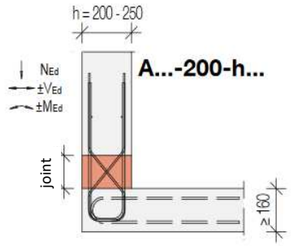
Reinforcement			
tension- / compression bars	2 ø 10	3 ø 10	3 ø 10
shear force bars	2 x 1 ø 6	2 x 1 ø 6	2 x 2 ø 6
u-bars ex works	2 ø 8	4 ø 8	4 ø 10
applicable expansion joint distances [m]	**21,7**	**21,7**	**21,7**

concrete cover parapet wall $c_a \geq 30$ mm; concrete cover slab $25 \geq c_v \geq 35$ mm shear force bars

The u-bars ex works are included in delivery.
The design talbe is also valid for other insulation thicknesses: 60 mm (AS), 80 mm (AM), 100 mm (AL)
The expansion joint distances vary depending on the joint thickness: 60 mm = 7,80 m; 80 mm = 13,0 m; 100 mm = 17,3 m







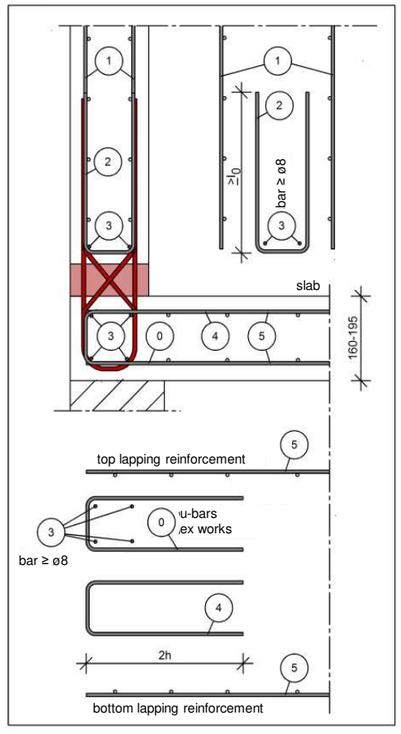
On-site reinforcement Egcobox® type AXL

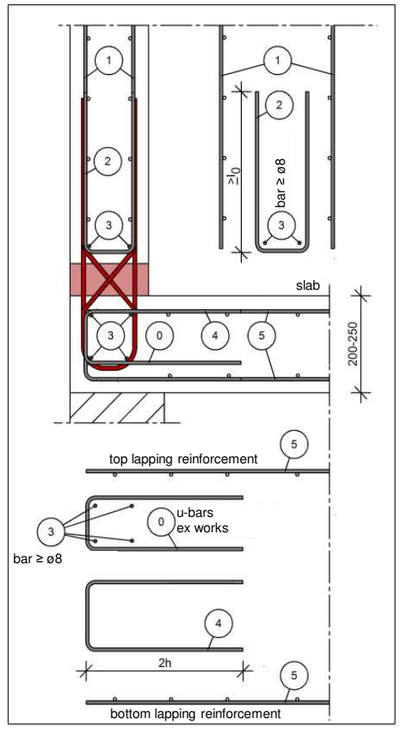
The additional reinforcement is suitable also for Egcobox with insulation thickness 60 mm (AS), 80 mm (AM) and 100 mm (AL).

type Egcobox	AXL10-140	AXL10-150	AXL10-200	AXL20-140	AXL20-150	AXL20-200	AXL30-140	AXL30-150	AXL30-200
length of element [mm]	**250**								
height of element [mm]	**140 - 250**								
item ⓪ - u-bar reinforcement ex works									
rebar	2 ø8	2 ø8	2 ø8	4 ø8	4 ø8	4 ø8	4 ø10	4 ø10	4 ø10
item ① - lapping reinforcement in parapet									
≥ a_s [cm²] B500	1,57	1,57	1,57	2,36	2,36	2,36	2,36	2,36	2,36
rebar	2 ø10	2 ø10	2 ø10	3 ø10	3 ø10	3 ø10	3 ø10	3 ø10	3 ø10
item ② - u-bar reinforcement in parape									
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm
item ③ - rebars									
rebar	ø8	ø8	ø8	ø8	ø8	ø8	ø8	ø8	ø8
item ④ - structural reinforcement in the slab edge for thickness <200 mm									
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm
item ④ - structural reinforcement in the slab edge for thickness >200 mm									
rebar	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm
item ⑤ - lapping reinforcement in slab									
≥ a_s [cm²] B500	1,01	1,01	1,01	2,01	2,01	2,01	2,01	2,01	2,01
rebar	2 ø8	2 ø8	2 ø8	4 ø8	4 ø8	4 ø8	4 ø10	4 ø10	4 ø10

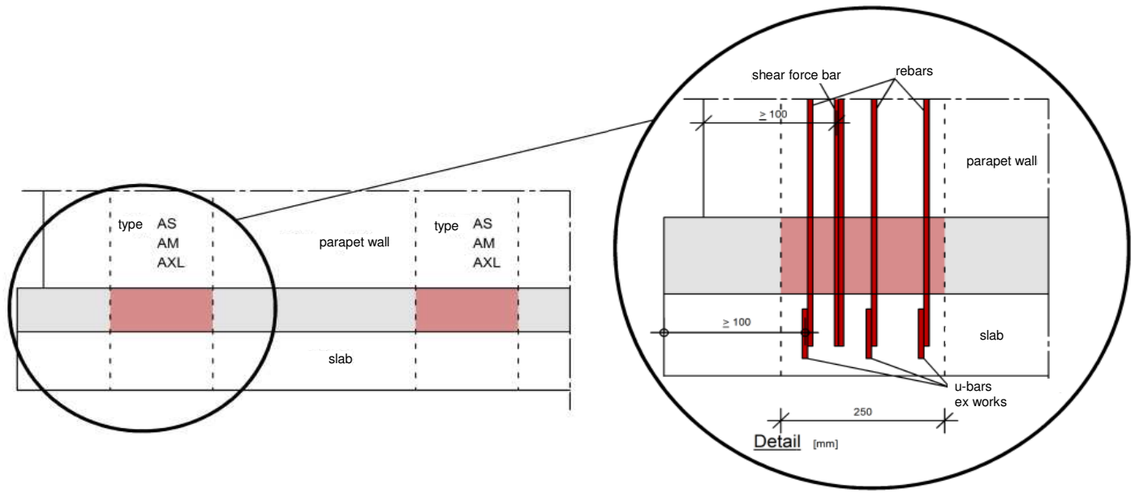
The suggested reinforcement is selected to transfer 100% of the M_{Rd} and V_{Rd} of the Egcobox®. An other reinforcement selection is possible.

design proposal





boundery conditions



Design table Egcobox® type FXL

for console element parapet, insulation 120 mm

Egcobox type	FXL10-160	FXL10-200	FXL20-160	FXL20-200	FXL30-160	FXL30-200
length of element [mm]	250		250		250	
height of element [mm]	160 - 190	200 - 250	160 - 190	200 - 250	160 - 190	200 - 250
width of parapet wall [mm]	≥ 150		≥ 150		≥ 150	

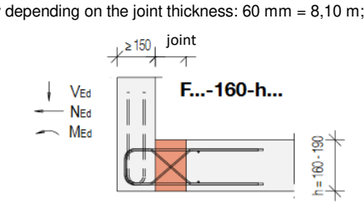
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]											
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C20/25 parapet wall C20/25 slab C20/25	- 28,0	± 0,00	- 28,0	± 0,00	- 42,0	± 0,00	- 42,0	± 0,00	- 56,0	± 0,00	- 56,0	± 0,00
	- 16,7	± 0,52	- 16,7	± 0,74	- 25,1	± 0,78	- 25,1	± 1,11	- 33,5	± 1,04	- 33,5	± 1,49
	- 9,2	± 0,86	- 9,2	± 1,24	- 13,9	± 1,29	- 13,9	± 1,86	- 18,5	± 1,73	- 18,5	± 2,48
	- 0,0	± 1,29	- 0,0	± 1,85	- 0,0	± 1,93	- 0,0	± 2,77	- 0,0	± 2,58	- 0,3	± 3,67
	0,0	± 1,73	0,0	± 2,48	0,0	± 2,59	0,0	± 3,67	0,0	± 3,34	0,0	± 3,67
	2,5	± 1,73	2,5	± 2,48	3,7	± 2,59	4,3	± 3,67	7,4	± 3,34	24,3	± 3,67
	17,5	± 1,04	17,5	± 1,49	26,2	± 1,55	26,2	± 2,23	35,0	± 2,07	35,0	± 2,97
	25,0	± 0,69	25,0	± 0,99	37,5	± 1,04	37,5	± 1,49	50,0	± 1,38	50,0	± 1,98
	32,5	± 0,35	32,5	± 0,50	48,7	± 0,52	48,7	± 0,74	65,0	± 0,69	65,0	± 0,99
	40,0	± 0,00	40,0	± 0,00	60,0	± 0,00	60,0	± 0,00	80,0	± 0,00	80,0	± 0,00
	V_{Rd} [kN/element]											
	± 13,80		± 17,60		± 13,80		± 17,60		± 13,80		± 17,60	

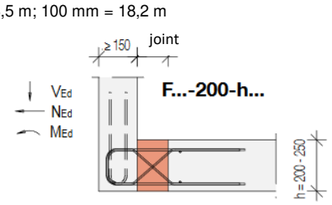
concrete strength	N_{Rd} [kN/element] I M_{Rd} [kNm/element]											
	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$	$N_{R,d}$	$M_{R,d}$
C25/30 parapet wall C25/30 slab ≥C20/25	- 32,5	± 0,00	- 32,5	± 0,00	- 48,7	± 0,00	- 48,7	± 0,00	- 65,0	± 0,00	- 65,0	± 0,00
	- 21,2	± 0,52	- 21,2	± 0,74	- 31,8	± 0,78	- 31,8	± 1,11	- 42,5	± 1,04	- 42,5	± 1,49
	- 13,7	± 0,86	- 13,7	± 1,24	- 20,6	± 1,29	- 20,6	± 1,86	- 27,5	± 1,73	- 27,5	± 2,48
	- 4,5	± 1,29	- 4,5	± 1,85	- 6,7	± 1,93	- 6,7	± 2,77	- 9,0	± 2,58	- 9,0	± 3,70
	0,0	± 1,73	0,0	± 2,48	0,0	± 2,59	0,0	± 3,71	0,0	± 3,45	0,0	± 4,26
	8,9	± 1,73	8,9	± 2,48	13,3	± 2,59	13,3	± 3,71	17,8	± 3,45	28,3	± 4,26
	23,9	± 1,04	23,9	± 1,49	35,9	± 1,55	35,9	± 2,23	47,8	± 2,07	47,8	± 2,97
	31,4	± 0,69	31,4	± 0,99	47,1	± 1,04	47,1	± 1,49	62,8	± 1,38	62,8	± 1,98
	38,9	± 0,35	38,9	± 0,50	58,4	± 0,52	58,4	± 0,74	77,8	± 0,69	77,8	± 0,99
	46,4	± 0,00	46,4	± 0,00	69,6	± 0,00	69,6	± 0,00	92,8	± 0,00	92,8	± 0,00
	V_{Rd} [kN/element]											
	± 13,80		± 17,60		± 13,80		± 17,60		± 13,80		± 17,60	

Reinforcement			
tension- / compression bars	2 ø 8	3 ø 8	4 ø 8
shear force bars	2 x 2 ø 6	2 x 2 ø 6	2 x 2 ø 6
u-bars ex works	3 ø 8	3 ø 8	3 ø 8
applicable expansion joint distances [m]	**23,0**	**23,0**	**23,0**

concrete cover parapet wall c_a ≥ 40 mm; concrete cover slab c_{vo} = 35 mm shear force bars

The u-bars ex works are included in delivery.
The design talbe is also valid for other insulation thicknesses: 60 mm (FS), 80 mm (FM), 100 mm (FL)
The expansion joint distances vary depending on the joint thickness: 60 mm = 8,10 m; 80 mm = 13,5 m; 100 mm = 18,2 m





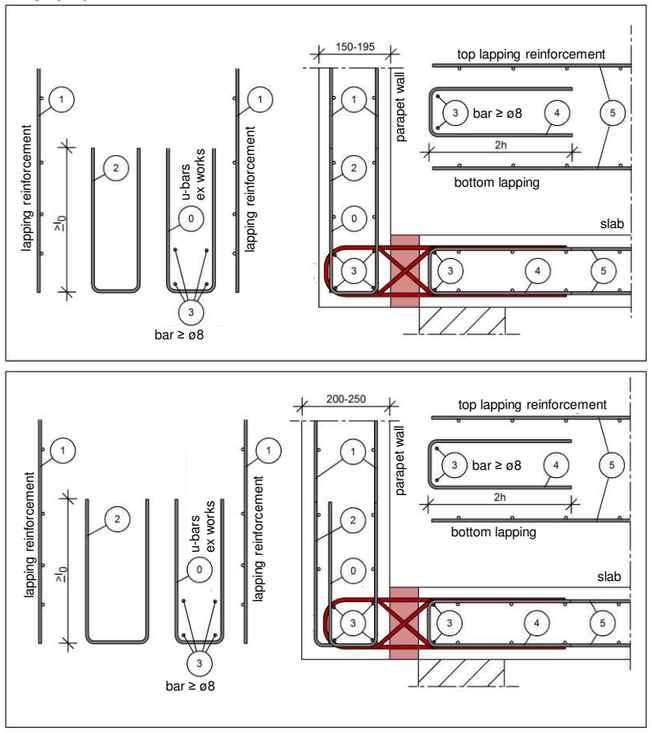
On-site reinforcement Egcobox® type FXL

The additional reinforcement is suitable also for Egcobox with insulation thickness 60 mm (FS), 80 mm (FM) and 100 mm (FL).

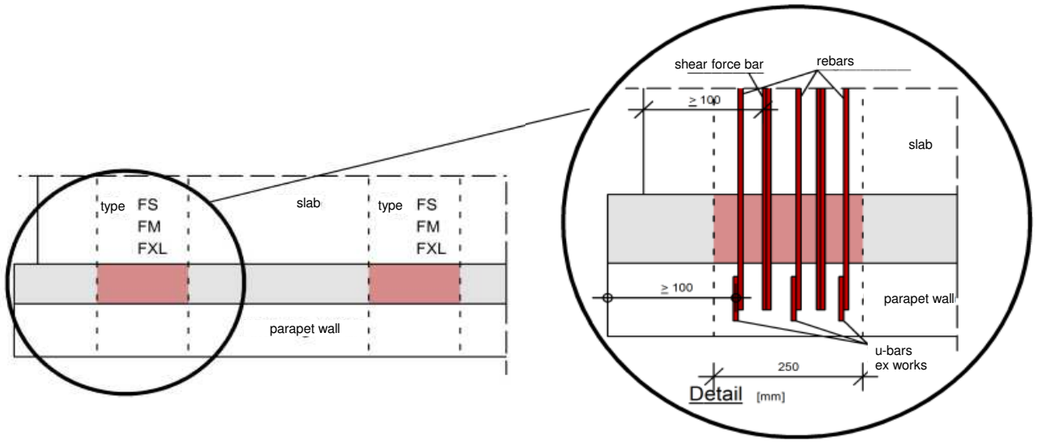
type Egcobox	FXL10-160	FXL10-200	FXL20-160	FXL20-200	FXL30-160	FXL30-200
length of element [mm]	**250**					
height of element [mm]	**160 - 250**					
item ⓪ - u-bar reinforcement ex works						
rebar	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8
item ① - lapping reinforcement in parapet						
≥ a_s [cm²] B500	1,51	1,51	1,51	1,51	1,51	1,51
rebar	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8	3 ø8
item ② - u-bar reinforcement in parapet for thickness <200 mm						
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm
item ② - u-bar reinforcement in parapet for thickness >200 mm						
rebar	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm	ø6 / 150 mm
item ③ - rebars						
rebar	ø8	ø8	ø8	ø8	ø8	ø8
item ④ - design reinforcement in the slab edge						
rebar	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm	ø6 / 250 mm
item ⑤ - lapping reinforcement in slab						
≥ a_s [cm²] B500	1,01	1,01	1,51	1,51	2,01	2,01
rebar	2 ø8	2 ø8	3 ø8	3 ø8	4 ø8	4 ø8

The suggested reinforcement is selected to transfer 100% of the M_{Rd} and V_{Rd} of the Egcobox®. An other reinforcement selection is possible.

design proposal



boundery conditions



Design table Egcobox® type OXL

for corbel elements, insulation 120 mm

Egcobox type	OXL16	OXL20
length of element [mm]	250	
height of element [mm]	180 - 250	
width of corbel element [mm]	160	200

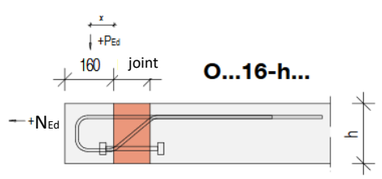
concrete strength	distance x [mm]	N_{Rd} [kN/element]	
	65 - 145	± 15,0	± 20,0
		V_{Rd} [kN/element]	
C20/25	65,0	26,7	29,1
	75,0	25,5	27,8
	85,0	24,4	26,7
	95,0	23,4	25,6
	105,0	22,5	24,6
	115,0	-	23,6
	125,0	-	22,8
	135,0	-	22,0
	145,0	-	21,2

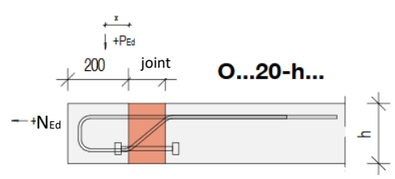
concrete strength	distance x [mm]	N_{Rd} [kN/element]	
	65 - 145	± 15,0	± 20,0
		V_{Rd} [kN/element]	
C25/30	65,0	27,7	30,5
	75,0	27,5	29,2
	85,0	26,3	27,9
	95,0	25,2	26,8
	105,0	24,2	25,7
	115,0	-	24,8
	125,0	-	23,9
	135,0	-	23,0
	145,0	-	22,2

Reinforcement	
tension- / compression bars	3 ø 10
compression bearings	2 ø 12
applicable expansion joint distances [m]	**19,8**

concrete cover corbel element $c_a \geq 30$ mm; concrete cover slab $c_{vo} = 30$ mm

The console must generally be designed with at least concrete strength C25/30.
The design talbe is also valid for other insulation thicknesses: 60 mm (OS), 80 mm (OM), 100 mm (OL)
The expansion joint distances vary depending on the joint thickness: 60 mm = 6,90 m; 80 mm = 11,7 m; 100 mm = 15,7 m





On-site reinforcement Egcobox® type OXL

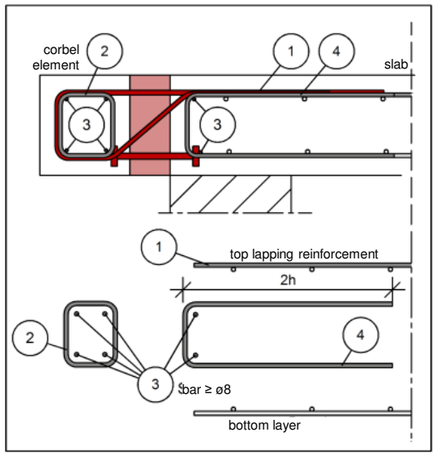
The additional reinforcement is suitable also for Egcobox with insulation thickness 60 mm (OS), 80 mm (OM) and 100 mm (OL).

type Egcobox	OXL16	OXL20
length of element [mm]	**250**	
height of element [mm]	**180 - 250**	
item ① - lapping reinforcement		
≥ a_s [cm²] B500	2,36	2,36
rebar	3 ø10	3 ø10
item ② - suspension reinforcement in corbel [1)]		
≥ a_s [cm²] B500	3,06	3,06
rebar	4 ø10	4 ø10
item ③ - rebars		
rebar	ø8	ø8
item ④ - structural reinforcement in the slab edge		
rebar	ø6 / 250 mm	ø6 / 250 mm

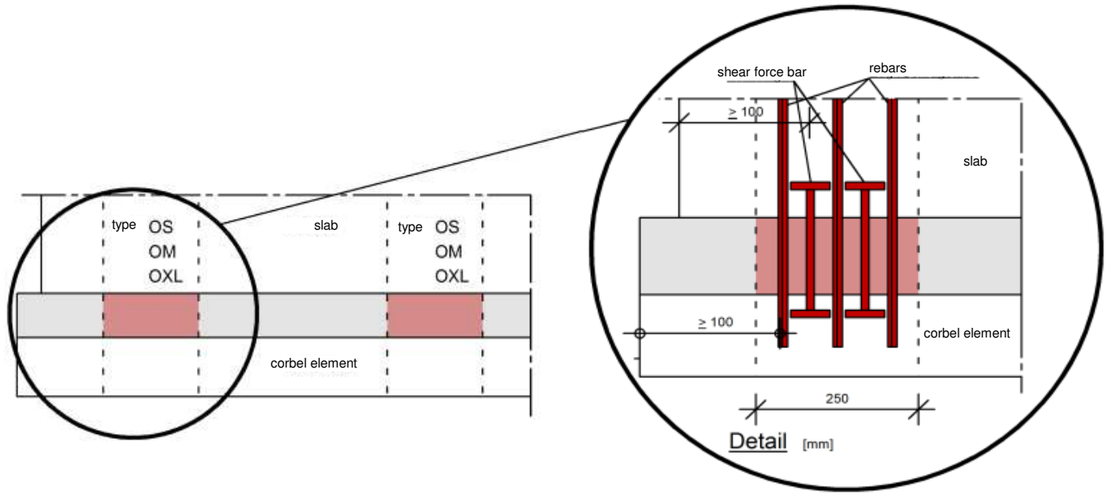
The suggested reinforcement is selected to transfer 100% of the M_{Rd} and V_{Rd} of the Egcobox®. An other reinforcement selection is possible.

[1)] The required reinforcement of the corbel itself has to be calculated by the responsible engineer in additional.

design proposal



boundery conditions



Design table Egcobox® type MXL-Module - C20/25

Supplementary elements for transmission of normal forces and horizontal shear forces, insulation 120 mm

	Egcobox type			MXL-VH10	MXL-NH10	MXL-NH15	MXL-NH20	MXL-VNH10	MXL-VNH15	MXL-VNH20	MXL-VNH-E10	MXL-VNH-E20
	length of element [mm]			150	150	150	150	150	150	150	150	150
	concrete cover [mm]			M_{Rd} [kNm/element]								
	C30	C35	C50									
height of connection [mm]		**160**	175	-	-	-	-	-	-	-	5,2	8,4
	160	165	**180**	-	-	-	-	-	-	-	5,5	8,9
	165	170	185	-	-	-	-	-	-	-	5,8	9,3
	170	175	190	-	-	-	-	-	-	-	6,1	9,8
	175	**180**	195	-	-	-	-	-	-	-	6,4	10,3
	180	185	**200**	-	-	-	-	-	-	-	6,7	10,8
	185	190	205	-	-	-	-	-	-	-	7,0	11,3
	190	195	210	-	-	-	-	-	-	-	7,3	11,8
	195	**200**	215	-	-	-	-	-	-	-	7,6	12,3
	200	205	**220**	-	-	-	-	-	-	-	7,9	12,8
	205	210	225	-	-	-	-	-	-	-	8,2	13,3
	210	215	230	-	-	-	-	-	-	-	8,5	13,8
	215	**220**	235	-	-	-	-	-	-	-	8,8	14,3
	220	225	**240**	-	-	-	-	-	-	-	9,1	14,8
	225	230	245	-	-	-	-	-	-	-	9,4	15,2
	230	235	250	-	-	-	-	-	-	-	9,7	15,7
	235	**240**	255	-	-	-	-	-	-	-	10,0	16,2
	240	245	**260**	-	-	-	-	-	-	-	10,3	16,7
	245	250	265	-	-	-	-	-	-	-	10,6	17,2
	250	255	270	-	-	-	-	-	-	-	10,9	17,7
	255	**260**	275	-	-	-	-	-	-	-	11,2	18,2
	260	265	**280**	-	-	-	-	-	-	-	11,5	18,7
	265	270	285	-	-	-	-	-	-	-	11,8	19,2
	270	275	290	-	-	-	-	-	-	-	12,1	19,7
	275	**280**	295	-	-	-	-	-	-	-	12,4	20,2
	280	285	**300**	-	-	-	-	-	-	-	12,6	20,7
	285	290		-	-	-	-	-	-	-	12,9	21,1
	290	295		-	-	-	-	-	-	-	13,2	21,6
	295	**300**		-	-	-	-	-	-	-	13,5	22,1
	300			-	-	-	-	-	-	-	13,8	22,6

	concrete cover [mm]			V_{Rdy} [kN/element]								
	C30	C35	C50									
connection -height [mm]	160-300	160-300	175-300	±9,1	-	-	-	±9,1	±9,1	±34,1	±15,4	±33,8

	concrete cover [mm]			N_{Rdx} [kN/element]								
	C30	C35	C50									
connection -height [mm]	160-300	160-300	175-300	-	±12,0	±18,2	±48,8	±12,0	±18,2	±48,8	51,7	85,1

Egcobox® MXL-VH and MXL-VNH only to be used in combination with other Egcobox® elements. Prerequisite pressure absorption with D_{Rd} > 10.5 kN resp. > 39,2 kN

Egcobox® MXL-VNH-E for transfer of uplifting moments MRd is to be used only in connection with other Egcobox® elements ≥ MXL20. The concrete cover refers to the adjacent Egcobox® ≥ MXL20. M_{Rd} and N_{Rdx} do not act simultaneously.

Reinforcement Egcobox® type MXL-Module

Egcobox type	MXL-VH10	MXL-NH10	MXL-NH15	MXL-NH20	MXL-VNH10	MXL-VNH15	MXL-VNH20	MXL-VNH-E10	MXL-VNH-E20
length of element [mm]	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**	**150**
tensile bars	-	-	-	-	-	-	-	2 ø 8	2 ø 12
length of tensile bars [mm]	-	-	-	-	-	-	-	1110	1340
tension / compression bars	-	1 ø 10	1 ø 10	1 ø 14	1 ø 10	1 ø 10	1 ø 14	-	-
length of tension / compression bars [mm	-	450	620	1140	450	620	1140	-	-
shear force bars	2x 1 ø 8	-	-	-	2x 1 ø 8	2x 1 ø 8	2x 1 ø 10	2x 1 ø 8	2x 1 ø 10
length of shear force bars l_0 [mm]	200				200	200	520	340	600
applicable expansion joint distances [n	**23,0**	**23,0**	**23,0**	**19,9**	**23,0**	**23,0**	**19,9**	**23,0**	**23,0**