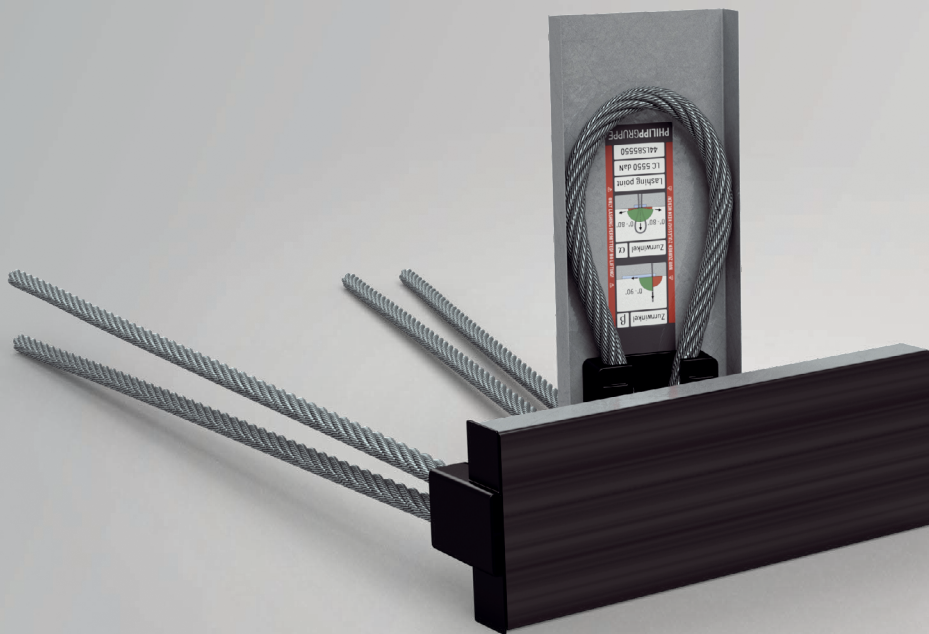


LASI box



Installation and Application Instruction

Our products from the division BUILDING SOLUTIONS

SERVICES

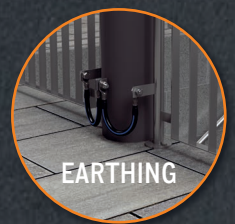
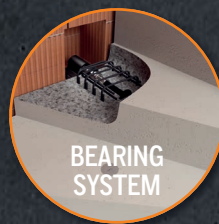
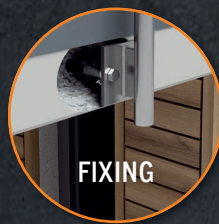
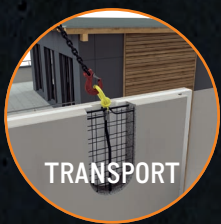
- » On-site tests -> we ensure that your requirements are properly covered by our planning.
- » Test reports -> for your safety and documentation.
- » Trainings -> the knowledge of your employees from planning and production is enhanced by our experts on site, online or via webinar.
- » Planning support -> latest design software, planning documents, CAD data and much more can be downloaded any time from www.philipp-group.de.

HIGH DEMANDS ON PRODUCT SAFETY AND PRACTICALITY

- » Close cooperation with notified bodies and - if necessary - approval of our solutions.

TECHNICAL DEPARTMENT

- » Our expert-team will support you at any time during your planning phase with detailed advice.



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PHILIPP LASI box

PHILIPP LOAD SECURING BOX (LASI BOX)

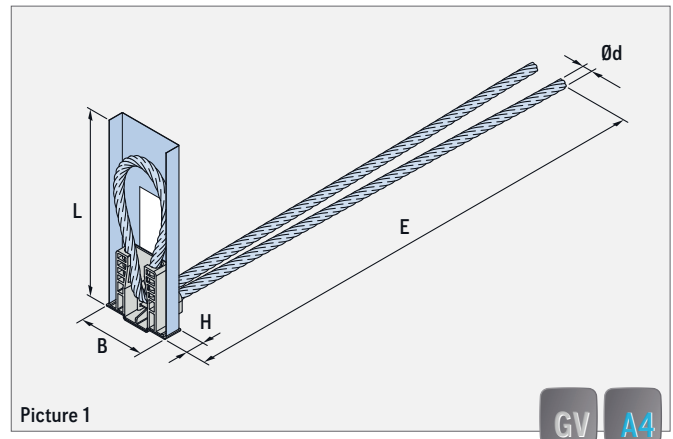
YOUR BENEFITS AT A GLANCE:

- » New solution for load securing of concrete elements acc. to EN 12195 and German VDI 2700
- » Three types available for approx. 1360 resp. 5550 daN lashing force, also as stainless steel version
- » Almost unrestricted securing possible in all directions
- » Easy handling, just unfold the loop and secure
- » Box can be fixed directly to the precast formwork without penetration
- » Wide range of applications thanks to open and flexible end anchorage
- » Usual high quality and safety standard of PHILIPP Building solution parts



LOAD SECURING BOX (LASI BOX)

The LASI box is part of the PHILIPP load securing system and complies with EN 12195 and the German VDI 2700. It is specially designed for load securing of precast concrete elements.



NOTE

The LASI box is used exclusively for securing loads in the diagonal lashing method for road transport (trucks). Lifting a concrete element using the LASI box is not permitted.

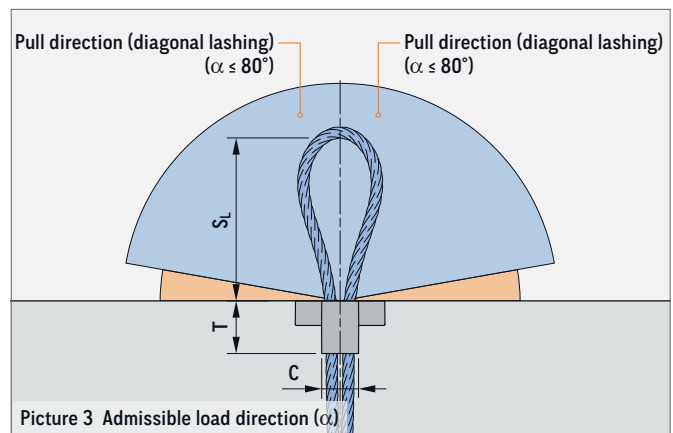
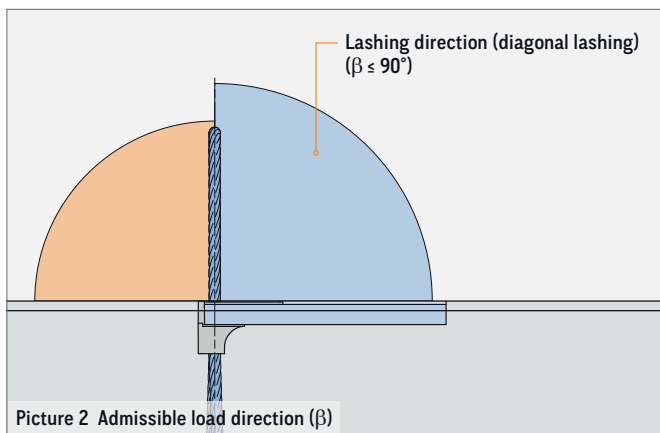


TABLE 1: DIMENSIONS AND LASHING FORCE FOR DIAGONAL LASHING

Ref. no.	Type	Dimensions								Lashing force $\alpha_{\max} 80^\circ / \beta_{\max} 90^\circ$ perm. LC	
		H	B	L	S_L ①	E ②	T	C	$\varnothing d$	$f_{lcc} \geq 35 \text{ N/mm}^2$	$f_{lcc} \geq 45 \text{ N/mm}^2$
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[daN]	[daN]
Version VA (wire rope of stainless steel grade SS316)											
44LSB1360VA	1360	24	50	190	150	370	39	19	6	-	1360
44LSB3830VA	3830	25	90	255	175	590	56	40	9	-	3830
44LSB5450VA	5450	25	90	255	175	650	56	40	12	5450	-
Version GV (wire rope galvanized)											
44LSB1650	1650	24	50	190	150	370	39	19	6	-	1650
44LSB3150	3150	25	90	255	175	590	56	40	9	-	3150
44LSB5550	5550	25	90	255	175	650	56	40	12	5550	-

① Dimensions S_L and E are standard values that may vary.

② Rope diameter $\varnothing d$ is a standard value and may vary depending on the wire rope construction.

GENERAL INFORMATION FOR INSTALLATION AND APPLICATION

MATERIALS

The LASI box consists of a metal recess box and a plastic bracket with a galvanized or stainless steel, angled wire rope loop. This galvanization is aimed at protecting the wire rope temporarily during storage until the final installation in concrete elements.

STORAGE OF THE LASI BOX

PHILIPP LASI boxes shall be stored in a clean, dry and aerated area, without contact to acids, bases or corrosive elements.

LASHING DIRECTIONS

During the transport of concrete elements a diagonal lashing up to $\beta_{\max} 90^\circ$ and up to $\alpha_{\max} 80^\circ$ is permitted! A lashing of the wire rope loops $\alpha > 80^\circ$ is not allowed!



EDGE PROTECTION

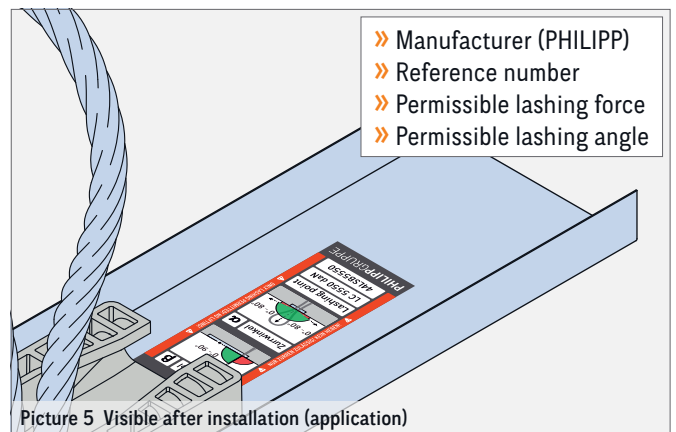
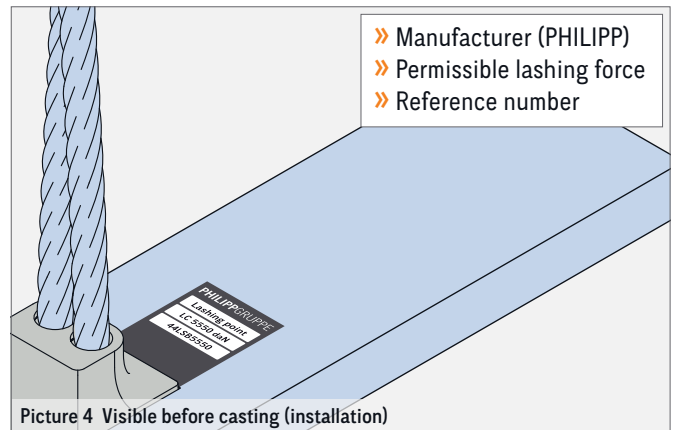
Make sure that the wire rope loop of the LASI box is not damaged by sharp edges of the concrete element! When lashing over sharp edges (e.g. the edges of the box), the wire ropes must be protected against damage by edge protectors or pressure-resistant linings!

CONCRETE COMPRESSIVE STRENGTH

At the time the first loading is applied the concrete must have a minimum compressive strength of 35 N/mm² (cube compression strength).

MARKING

The LASI box is marked with a label both outside and inside (visible even during application). The inner label must be visible even after being cast in concrete.



BOUNDARY CONDITIONS

ELEMENT THICKNESSES, CENTRE AND EDGE DISTANCES

The installation and positioning of the LASI box in precast concrete elements require minimum element thicknesses, centre and

edge distances to ensure a safe load transfer (table 2).

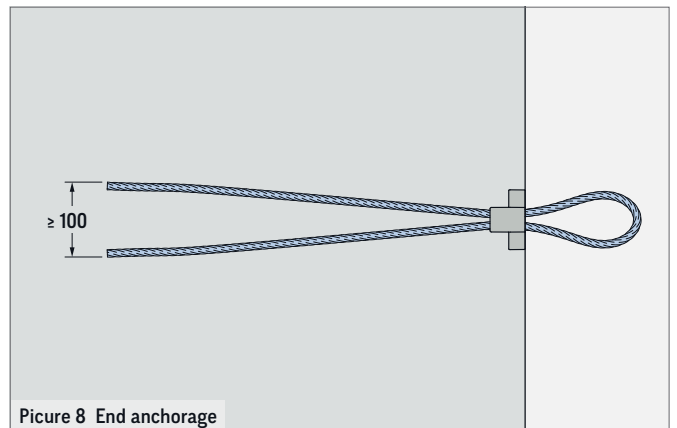
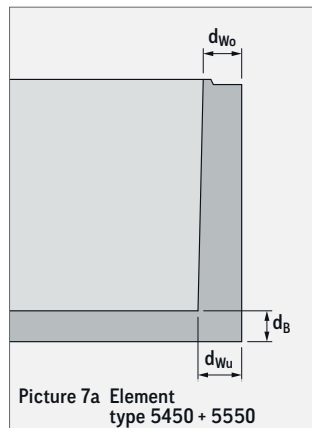
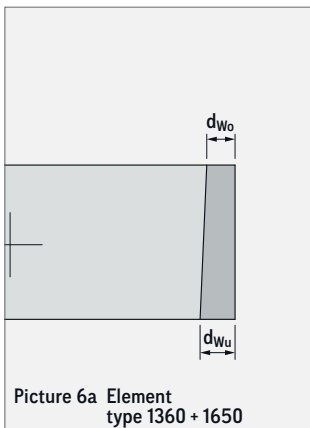
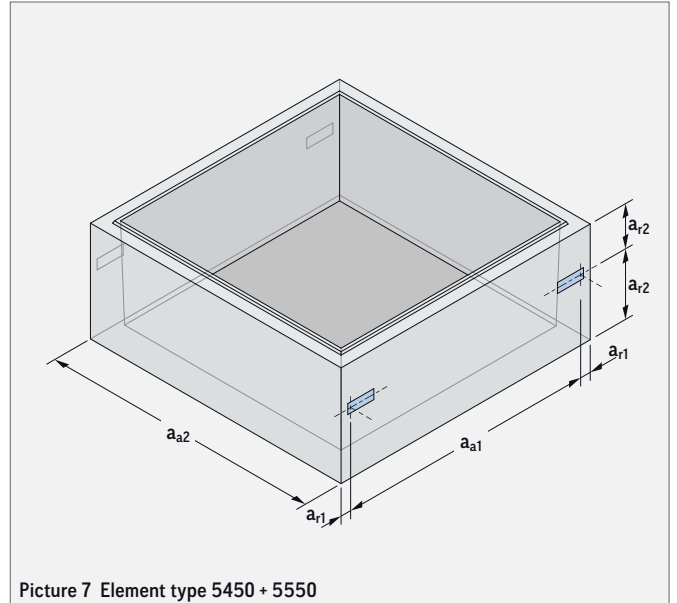
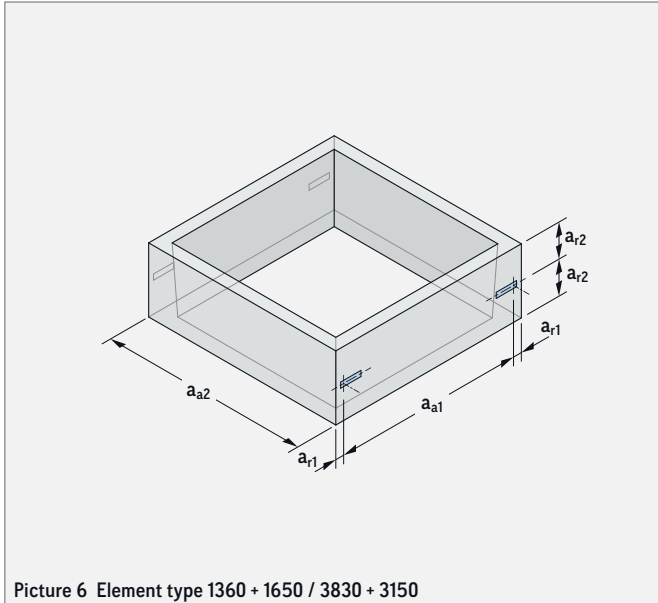


TABLE 2: ELEMENT THICKNESSES, CENTRE AND EDGE DISTANCES

Type	Element thicknesses			Edge and centre distances			
	d_{w0} (mm)	d_{wu} (mm)	d_B (mm)	a_{r1} (mm)	a_{r2} (mm)	a_{a1} (mm)	a_{a2} (mm)
1360 (A4)	≥ 110	≥ 135	-	60	≥ 250	≥ 880	≥ 1000
1650 (GV)							
3830 (A4)	≥ 110	≥ 135	-	60	≥ 250	≥ 880	≥ 1200
3150 (GV)							
5450 (A4)	≥ 150	≥ 170	≥ 150	75	≥ 400	≥ 1000	≥ 1300
5550 (GV)							

REINFORCEMENT

A LASI box requires a minimum reinforcement according to table 3 or 4. This minimum reinforcement guarantees a safe load transfer in concrete elements. The user is personally responsible for further transfer of load into the concrete unit.

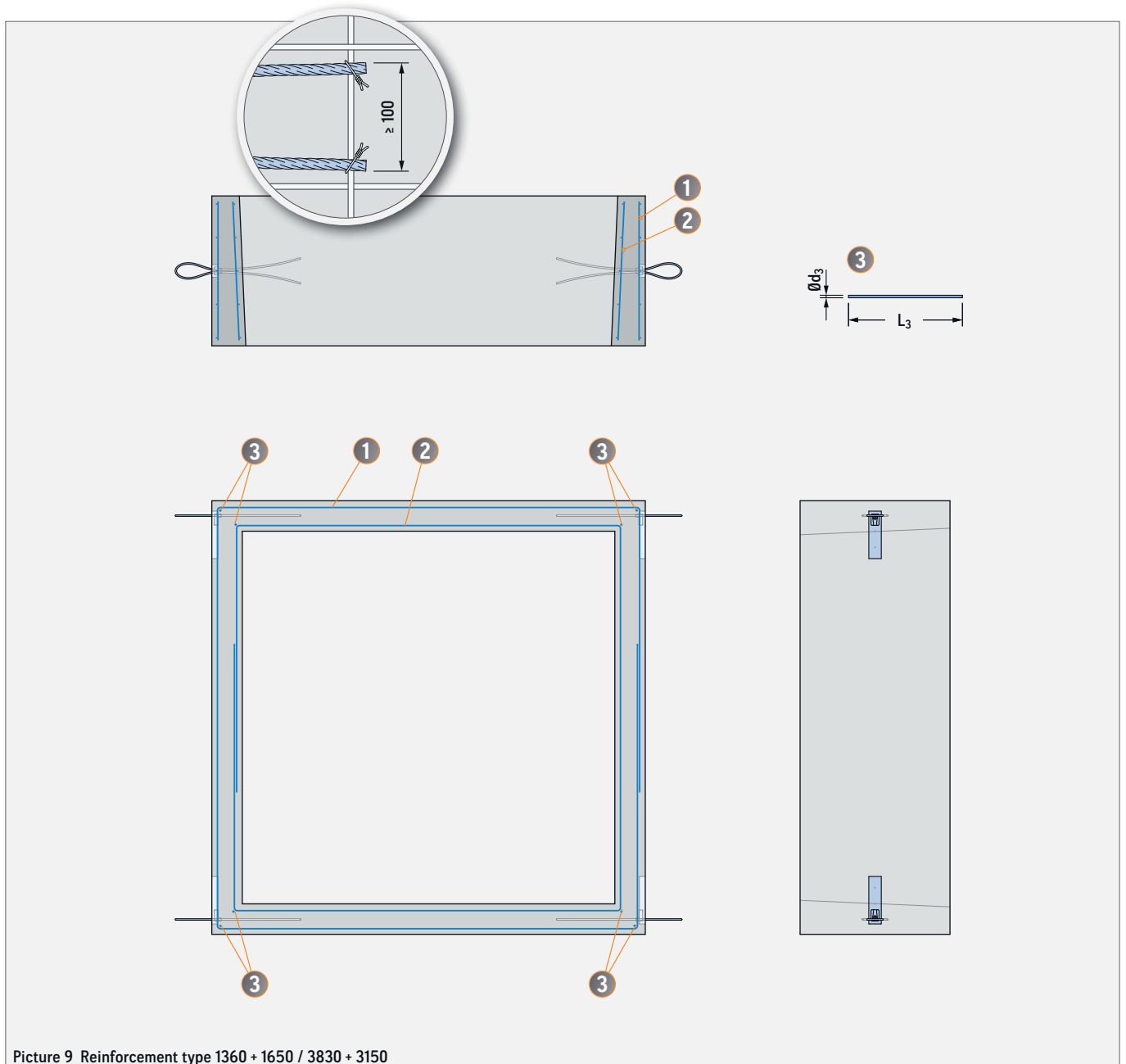
TABLE 3: REINFORCEMENT TYPE 1360 + 1650 / 3830 + 3150

Type	1	2	3	
	Mesh reinforcement bended outside (mm ² /m)	Mesh reinforcement bended inside (mm ² /m)	Corner reinforcement (B500A/B) Ød ₃ (mm)	L ₃ (mm)
1360 (A4)	#188	#188	Ø10	≥ 460
1650 (GV)	#188	#188	Ø10	≥ 460
3830 (A4)	#188	#188	-	-
3150 (GV)	#188	#188	-	-



EXISTING REINFORCEMENT

Existing static or constructive reinforcement can be taken into account for the minimum reinforcement of the respective load case.

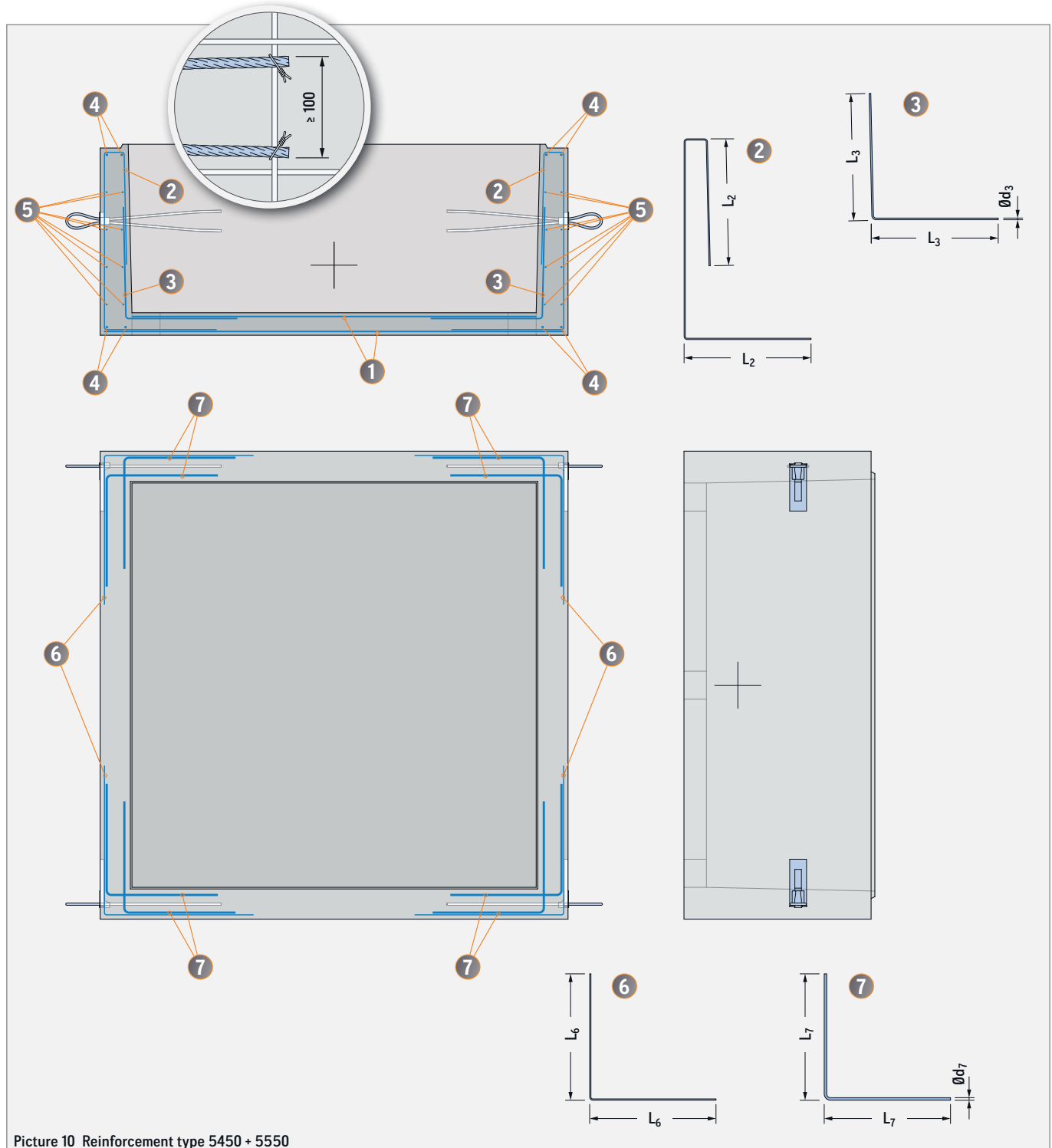


Picture 9 Reinforcement type 1360 + 1650 / 3830 + 3150

REINFORCEMENT

TABLE 4: REINFORCEMENT TYPE 5450 + 5550

Type	①	②		③		④	⑤		⑥		⑦	
	Mesh reinf. [mm ² /m]	Mesh reinf. bended [mm ² /m]	L ₂ (mm)	Ød ₃ / e (mm)	L ₃ (mm)	Edge reinf. (B500A/B) Ød ₄ (mm)	Longitudinal reinf. (B500A/B) Ød ₅ / e (mm)	Mesh reinf. bended [mm ² /m]	L ₆ (mm)	Rebar bended (B500A/B) Ød ₇ / e	L ₇ (mm)	
5450 (A4)	#335	#188	≥ 450	Ø8 / 200	≥ 600	Ø14	Ø10 / 200	#188	≥ 600	Ø12 / 150	≥ 600	
5500 (GV)	#335	#188	≥ 450	Ø8 / 200	≥ 600	Ø14	Ø10 / 200	#188	≥ 600	Ø12 / 150	≥ 600	

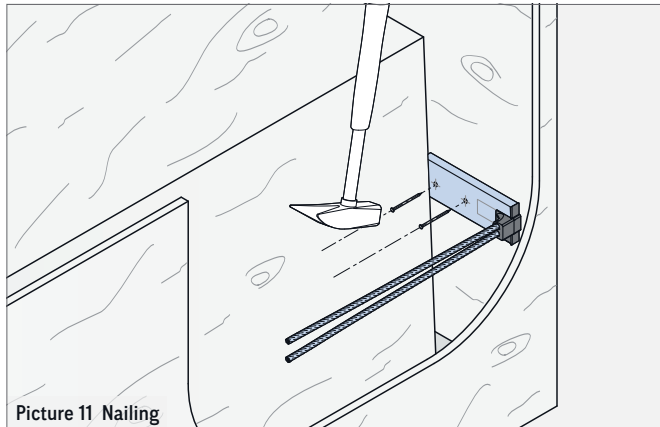


Picture 10 Reinforcement type 5450 + 5550

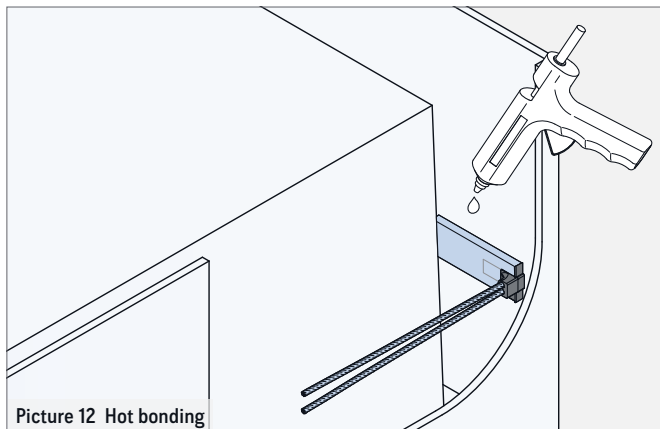
INSTALLATION / LOAD SECURING

INSTALLATION

The LASI box can be fixed to the formwork in the exact position by nailing or hot bonding. If the box is fixed to the formwork using nails, this shall be done at the points recommended in picture 11 in order to avoid damaging the wire rope of the box. The wire rope ends of the box must be fixed to the reinforcement to prevent a change in position during the concreting process. If necessary, more reinforcement can be added to secure the position (picture 9 + 10).



Picture 11 Nailing

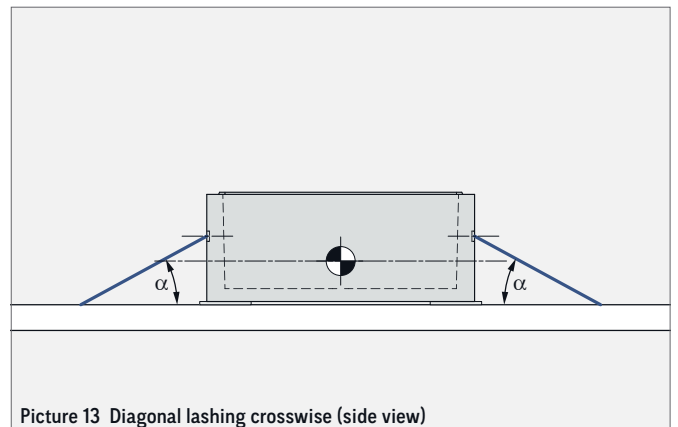


Picture 12 Hot bonding

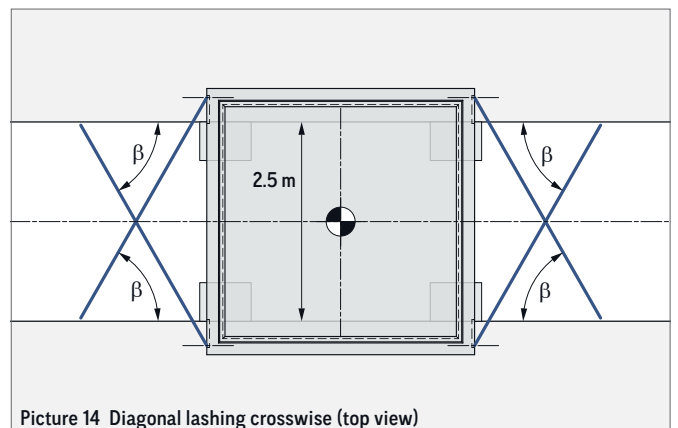
LOAD SECURING

The LASI box shall only be used for securing loads in road transport by diagonal lashing! Securing by lashing down is not permitted! At temperatures between $-20\text{ }^{\circ}\text{C}$ and $70\text{ }^{\circ}\text{C}$ the load securing system shall only be used. Generally, the concrete elements must always be arranged with the centre of gravity in the middle of the loading area. For stability against tipping, the outer points of the support (anti-slip mats) are to be arranged at a distance of at least 2.5 m, depending on the width of the component (picture 14). Here, always anti-slip-materials (anti-slip mats) shall be used. These should have a coefficient of sliding friction of $\mu \geq 0,6$. To ensure an optimum utilisation of the anti-slip mats, the loading area must be free of dirt before installation (swept clean). There must be no contact between the loading area and the precast concrete element.

Always use four identical lashing devices to secure the concrete elements. Here, the specified angles α and β shall be followed.

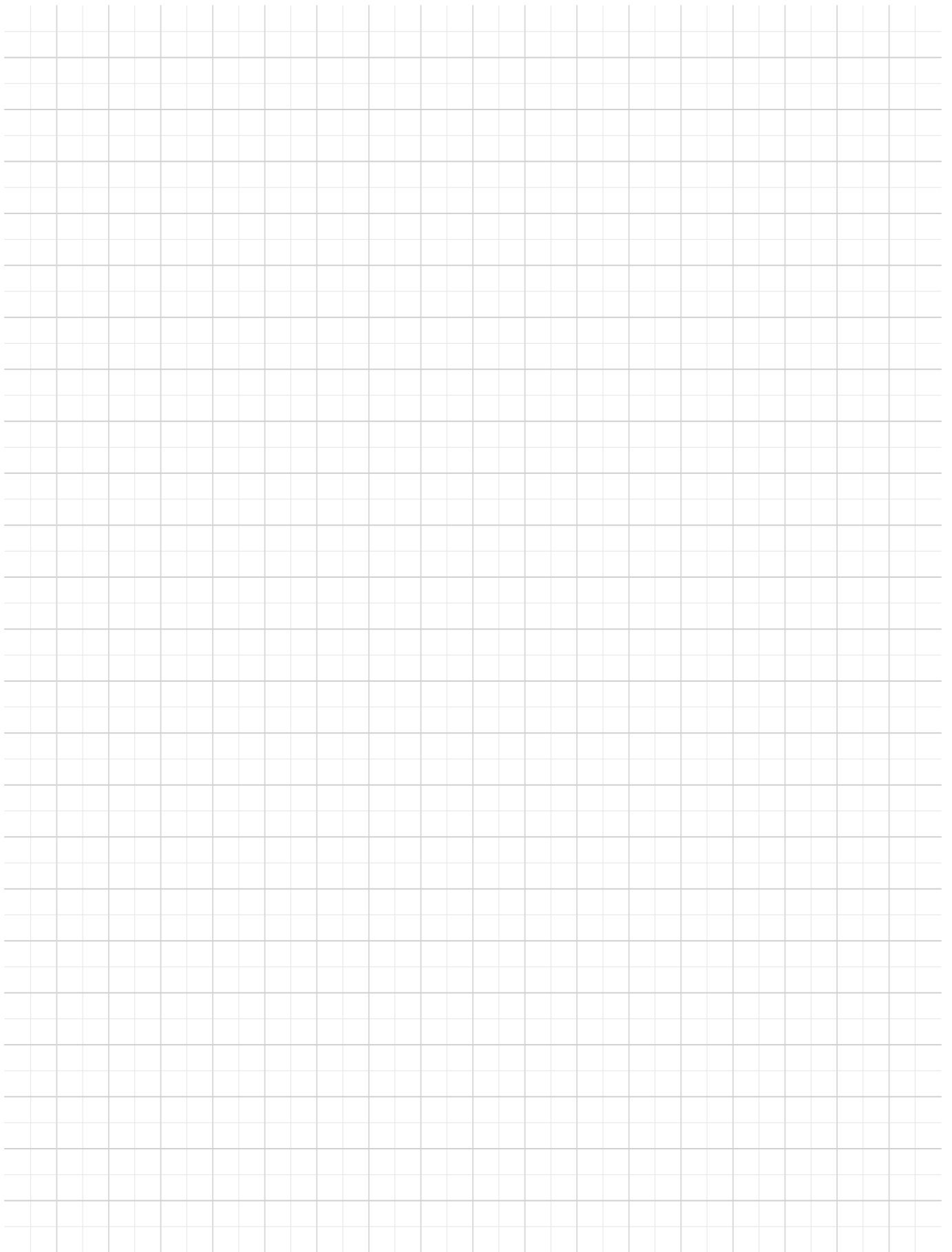


Picture 13 Diagonal lashing crosswise (side view)



Picture 14 Diagonal lashing crosswise (top view)

NOTES



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