

IPHA TECHNICAL SEMINAR 2017

October 25–26. Tallinn, Estonia

Lifting and storage of slabs

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Gruppo Centro Nord | Italy



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LIFTING AND STORAGE OF SLABS

Bruno Della Bella –Gruppo Centro Nord

IPHA TECHNICAL SEMINAR 2017

*“Hollowcore Slab and Floor Design
background and examples”*

Tallinn, Estonia October 25-26, 2017

REFERENCE TO *fib* H.C. RECOMMENDATIONS



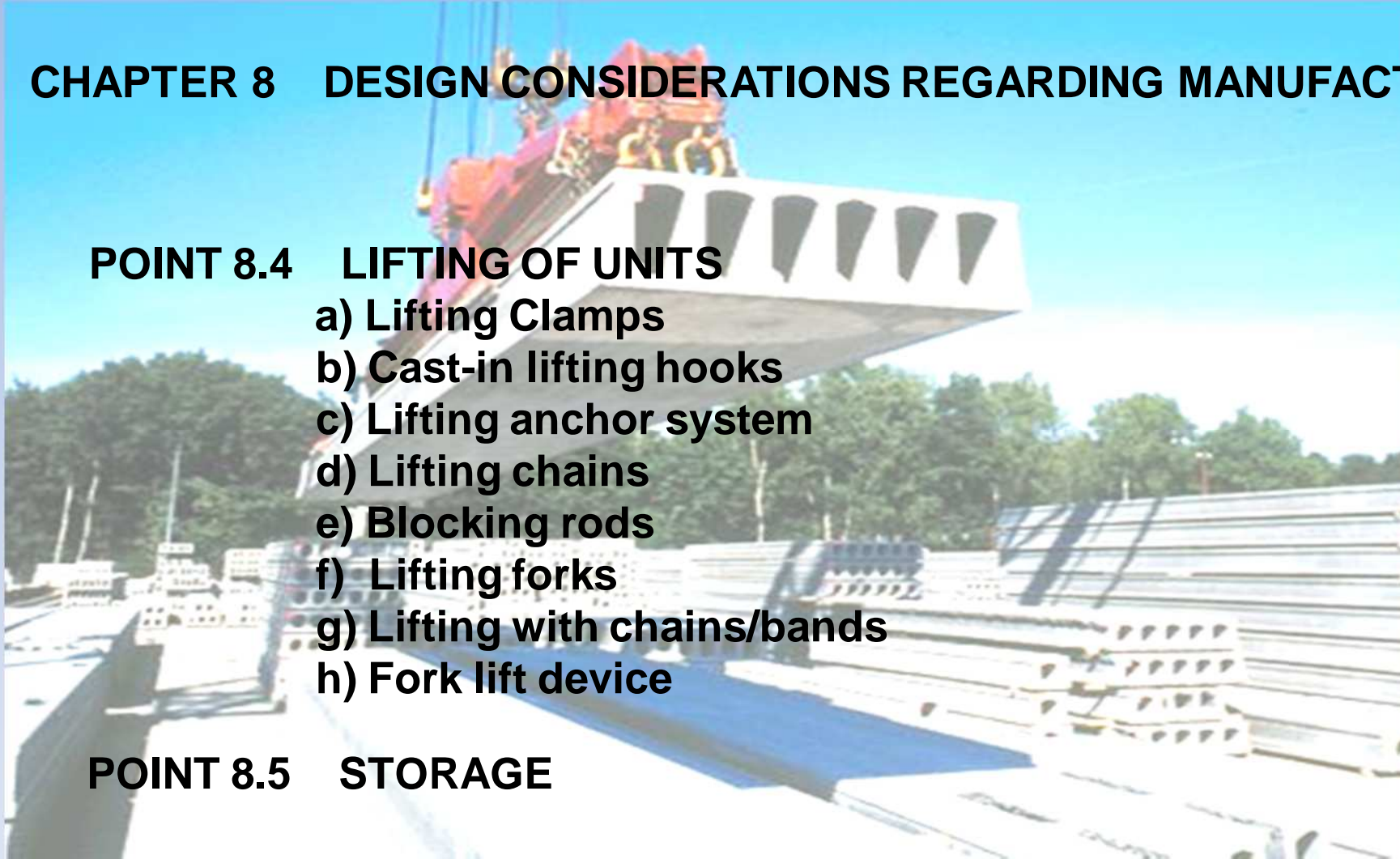
REFERENCE TO *fib* H.C. RECOMMENDATIONS

CHAPTER 8 DESIGN CONSIDERATIONS REGARDING MANUFACTURE

POINT 8.4 LIFTING OF UNITS

- a) Lifting Clamps
- b) Cast-in lifting hooks
- c) Lifting anchor system
- d) Lifting chains
- e) Blocking rods
- f) Lifting forks
- g) Lifting with chains/bands
- h) Fork lift device

POINT 8.5 STORAGE



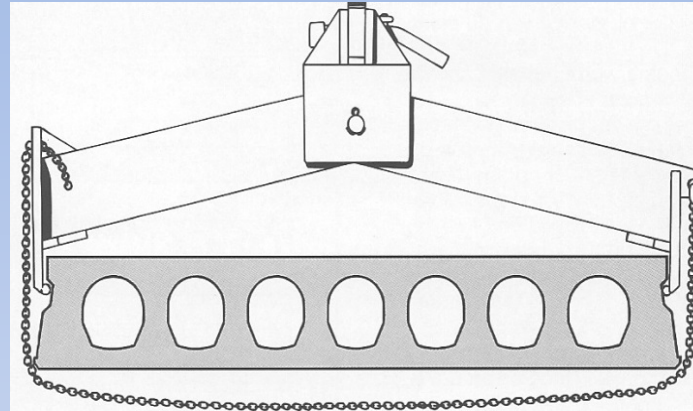
GENERAL DESIGN CONSIDERATIONS

- 1 – Special attention is required in the design with respect to handling, due to absence of transversal reinforcement.
- 2 – In case of insert, details and cut-out do it (preferably) when concrete is still fresh.
- 3 – It has to be considered the influence of cut-out on the design for handling, lifting and transportation

It is the most classical way of handling H.C.



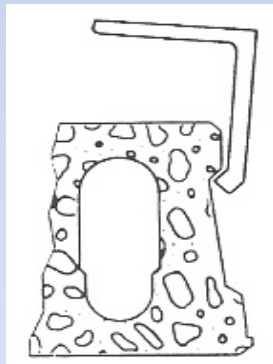
Safety chain to be always used



N.B.: Speed erection

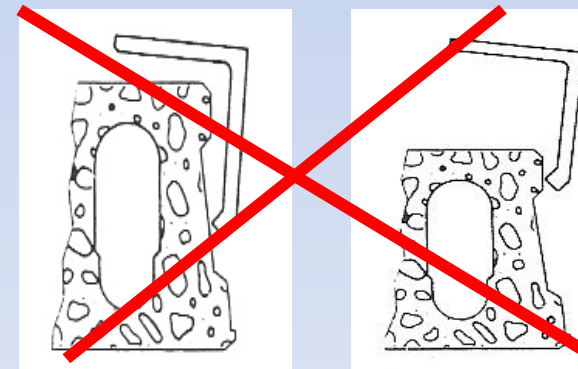
Only for standard H.C. slabs (1200 mm)

Attention to the correct clamp positioning



YES

Correct clamp positioning



NO

Wrong clamp positioning

Lifting hooks to be inserted and concreted in fresh concrete



N.B.: Safe handling and speed erection.

Valid for standard and narrow slabs (< 1200 mm)

To be cut after installation in case of no topping

Different types available

Elematic “Loopmaster”

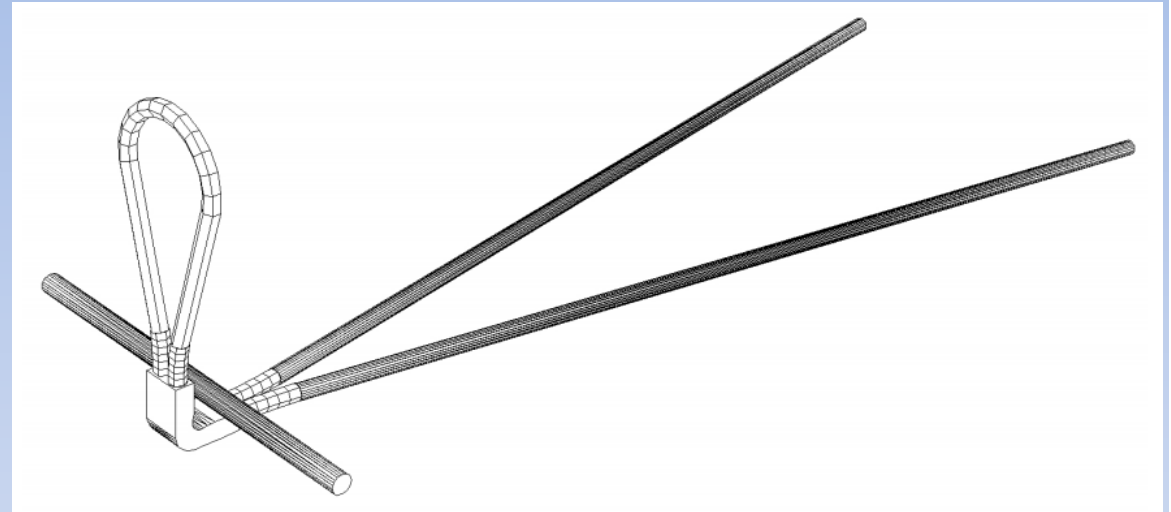


Lifting loop



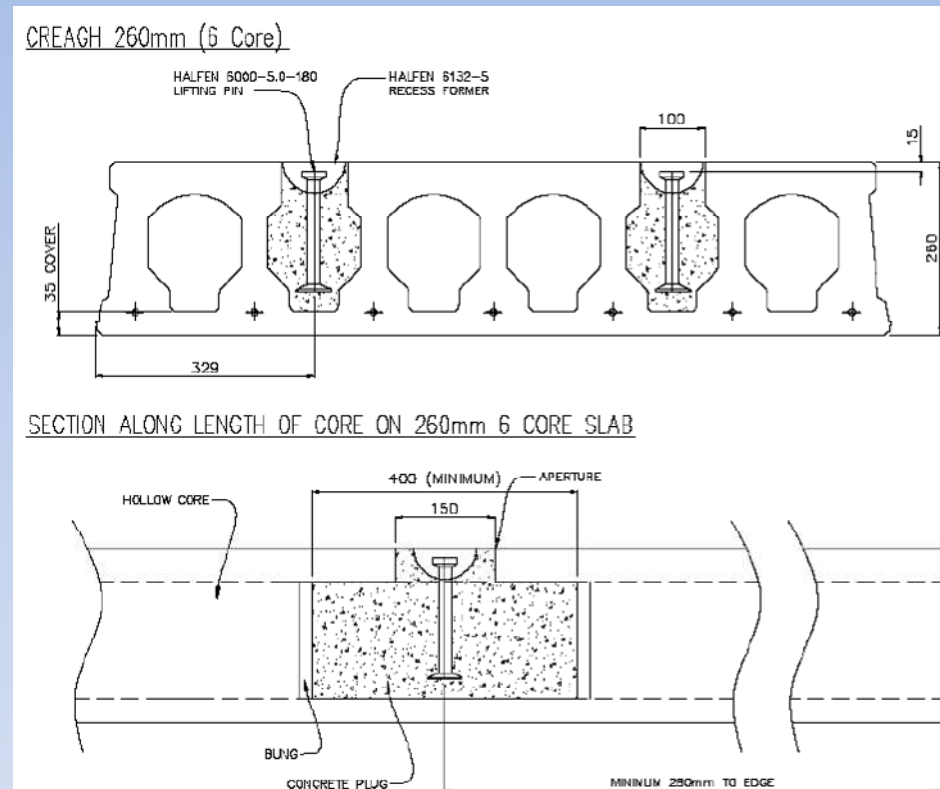
**N.B.: Safe handling and speed erection.
Valid for standard and narrow slabs (< 1200 mm)
Device within the depth of H.C. slab**

Lifting Loop Echo



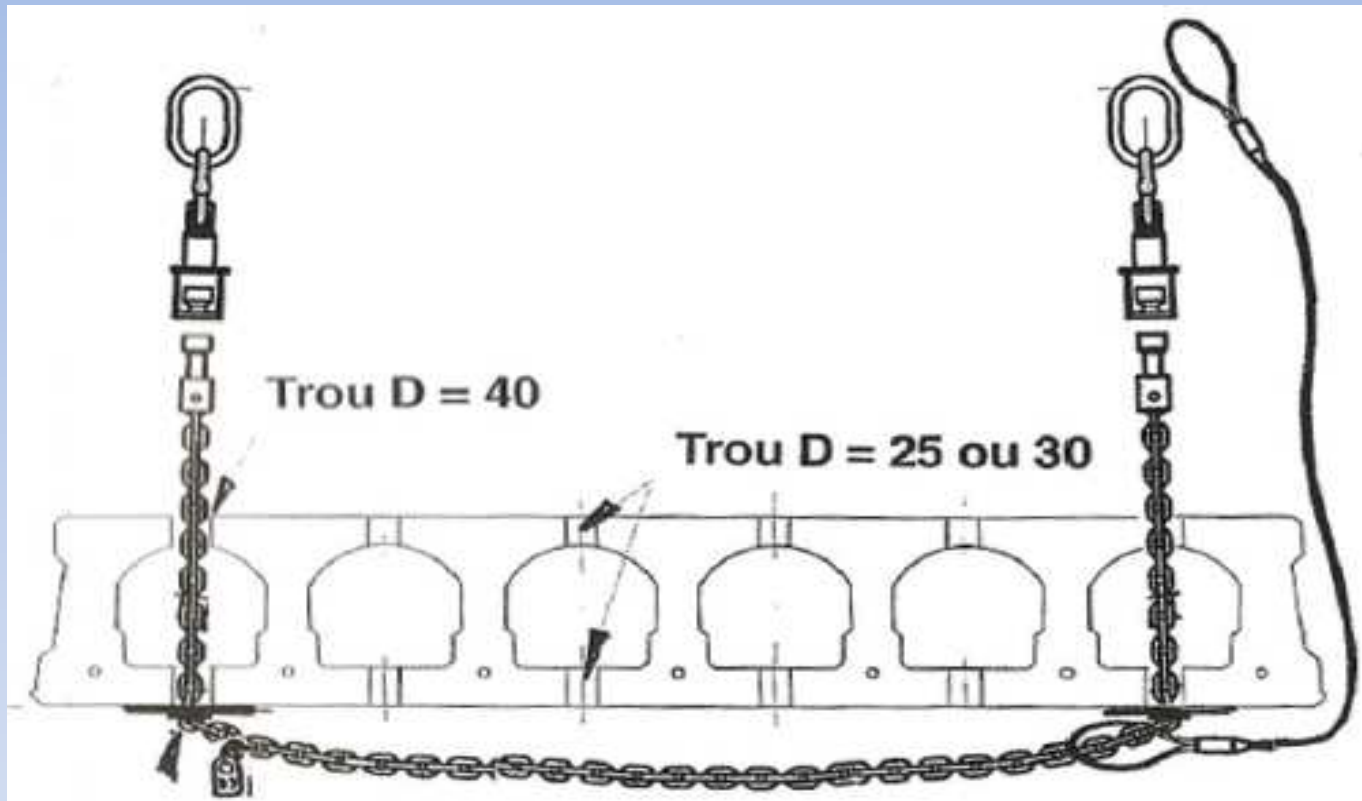
**N.B.: Safe handling and speed erection.
Valid for standard slabs (1200 mm)
Device within the width of H.C. slab**

DEHA System



**N.B.: Safe handling and speed erection.
within the depth of H.C. slab
Valid for standard and narrow slabs (< 1200 mm)**

Ermib system (with vertical holes ϕ 40 mm)



N.B.: Safe handling and speed erection.

Valid for standard and narrow slabs (< 1200 mm)

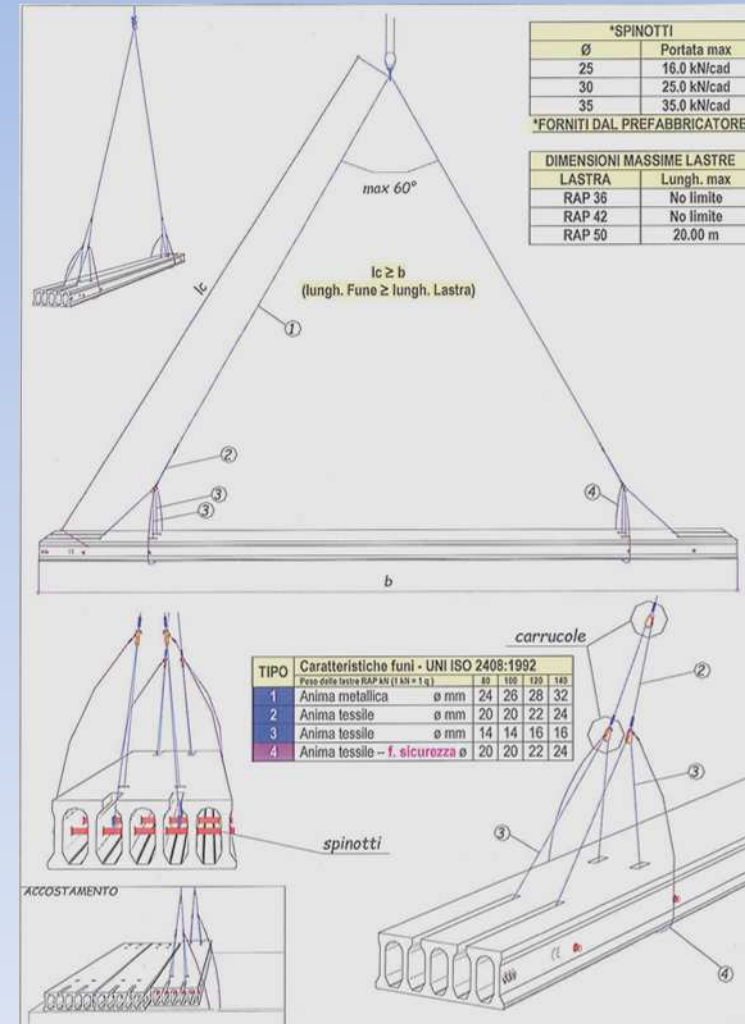
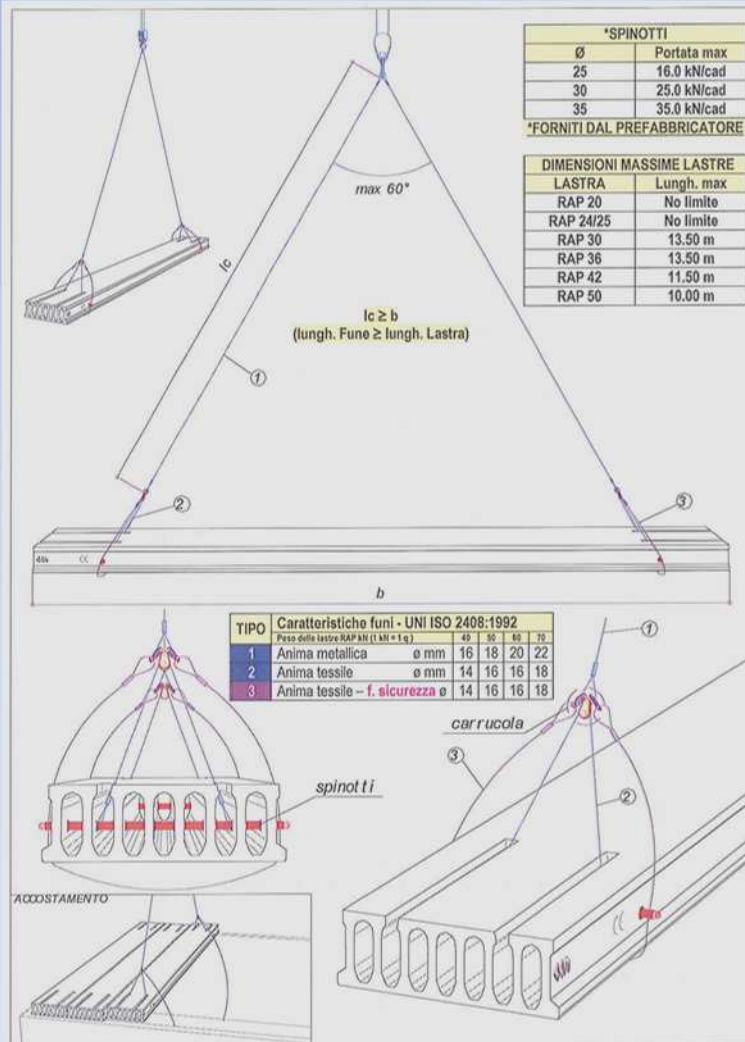
Intradox hole to be repaired after erection when soffit is at sight

- Transversal holes by pushing/drilling steel bar ($\phi 25-35$ mm), immediately after casting. Valid for standard and narrow slabs
- Safety chain to be always used. HC depth ≥ 200 mm

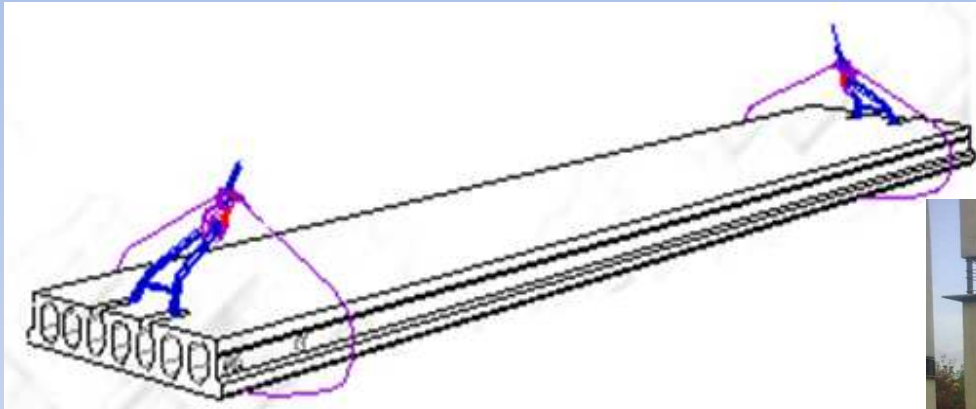


**N.B.: Safe handling and speed erection.
Valid for standard and narrow slabs (< 1200 mm)**

Hollow core slab up to 7.0 Ton (1+1 rods) Over 7.0 Ton (2+2 rods)

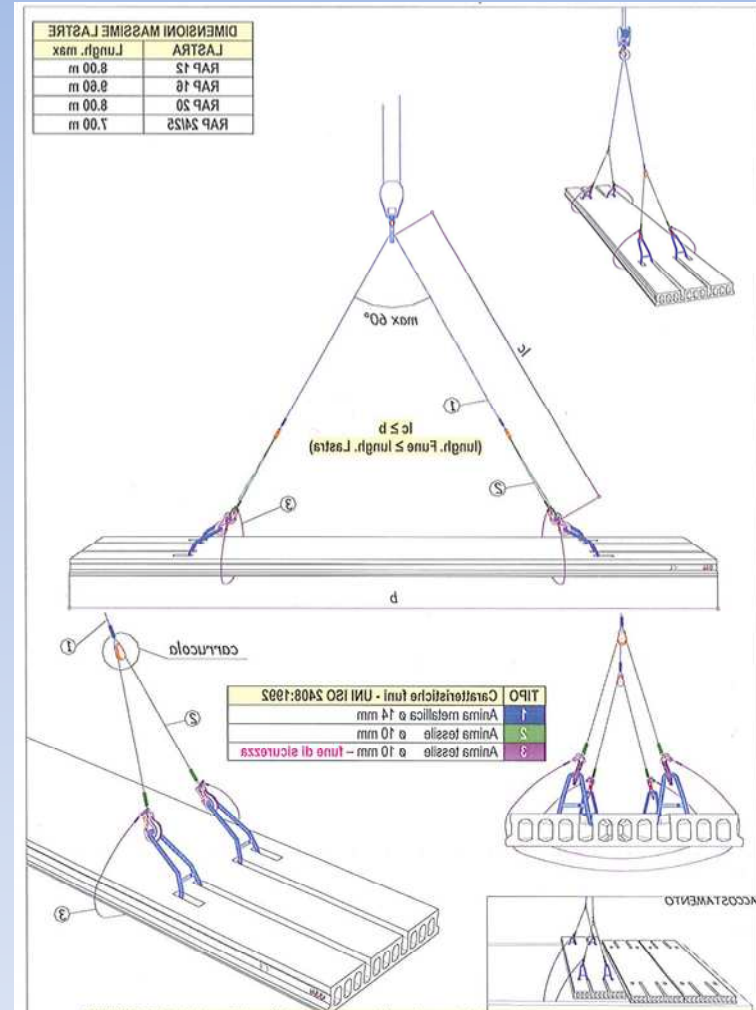
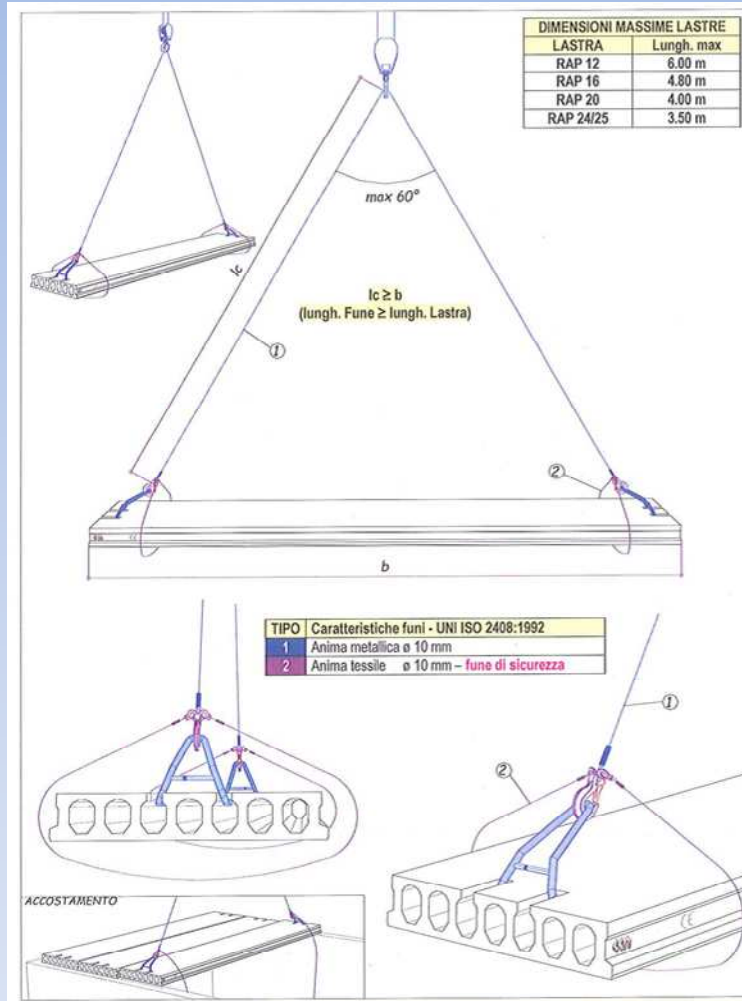


- Taken at slab end or better inside.
- Safety chain to be always used. H.C. depth ≤ 300 mm and weight ≤ 14 Ton



**N.B.: Very speed erection, recommended for light/small slabs
Valid for standard and narrow slabs (< 1200 mm)**

Hollow core slab up to 7 Ton (1+1 forks) Over 7.0 Ton (2+2 forks)



BLOCKING RODS AND FORKS TESTING

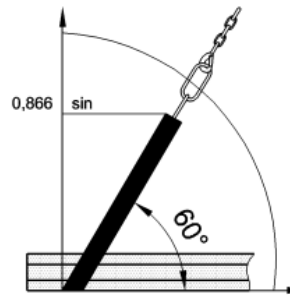
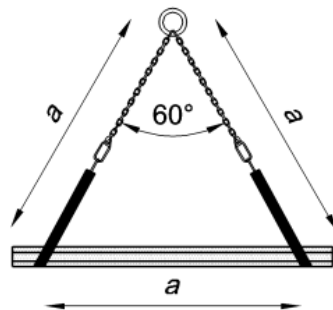
Testing of max lifting capacity with blocking rods and forks is recommended in order to state weight limits according to flange and webs thickness



LIFTING WITH CHAINS/BANDS



1-Vérifier la capacité de charge des sangles



Capacité de charge par sangle

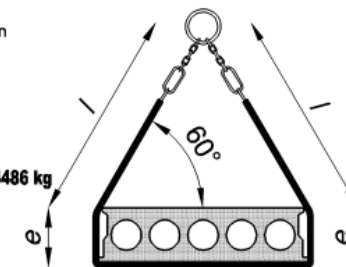
CMU	x0,866	x1,7
charge	sin	coef
maxi	60°	utilisation
utilisation sangle		

Ex: CMU sangle 3000 kg

- poids de la dalle 6200 kg
- Capacité de levage 1 sangle
- **3000kg x 0,866 x 1,7 = 4486 kg**
- Capacité des 2 sangles
- 4486kg x 2 = 8972 kg
- (supérieur au poids de la dalle 6200 kg)

Longueur minimale de l'élingue plate

$$L = (3l + 2e)$$



N.B.: Attention to sliding of the chains/bands.
Valid for standard and in particular for narrow slabs
Some difficulty to place erecting slab adjacent to the previous one

Special device very useful for long/heavy slabs and large erection work

Safety chain to be always used



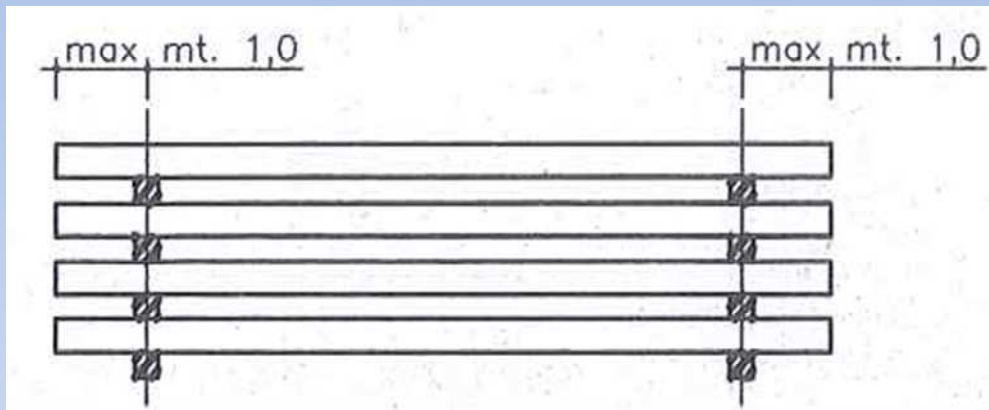
Photos of H.C. slabs erection (H 420 and L>15 mt).

Three-story building (100.000 m² tot) for Amazon logistic center

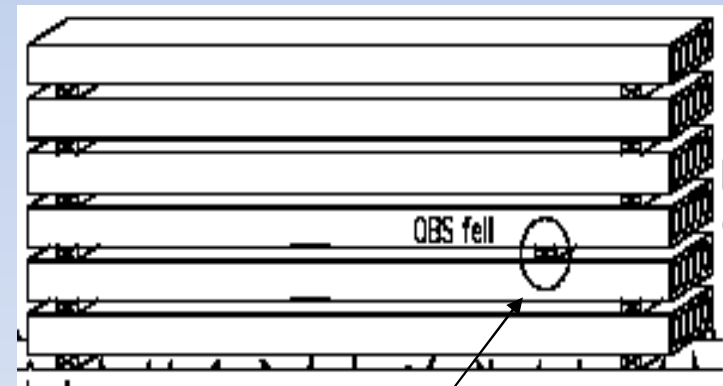
- Safe handling and speed erection but attention to sliding of forks
- Valid for standard and narrow slabs (< 1200 mm)

STORAGE

- Slabs to be supported on two stable support
- Timber spacer in between, in line vertically



YES



wrong

NO

