

Reinforcing concrete bridges

*the most time-consuming
work*

Pre-conditions

Preparation

Self-inspection

Execution



This **work instruction** is designed for use in detailed planning and preparation of work on construction projects. With thorough planning high levels of personal safety and optimal work apportionment can be achieved at the same time as the work can be organized efficiently and cost effectively.

Work activity & Problem	P	C	Risk= P*C	Action
Risk of trapping/crushing injury when unloading and receiving reinforcement	3	70	210	Education in crane directing and strapping
Education in crane directing and strapping	10	20	200	Avoid bending posture
Cluttered workplace =Twisting or fall injuries	10	15	150	Regular tidying
Injuries related to falling objects	3	15	45	

Probability = P	P = 0,1	Assessment of probability	C=0,5	Assessment of consequences	
Consequence = C	P = 1	Very unlikely (<1 times/10 years)	C=1	Trifle	
Risk = P * C	P = 3	Unlikely (1 times/10 years)	C=5	Tiny	(1 - 2 days sick leave)
	P = 10	Low probability (1 times/3 years)	C=15	Small	(3 - 7 days sick leave)
	P = 30	Relative probability (1 times/year)	C=70	Tactile	(8 - 29 - " -)
		Probable (1 times/month)	C=500	Severe	(30-299 - " -)
				Very severe	(>300 - " -)

Text from the Working Environment Authority's brochure Safer Construction Work

Personal Protective Equipment § 71

Safety helmet and protective footwear should be used unless this is clearly unnecessary. Other personal protective equipment such as eye protection, hearing protection and gloves should be worn when required.

First Aid § 31

First Aid should be available. Staff who are trained to provide First Aid should always be available. Facilities and First Aid equipment should be marked with signs.

There shall also be signs presenting phone numbers, address and, if necessary, route description of the local emergency services.



















Regulations related to First Aid are presented in AFS 1999:7 "First Aid and Emergency Support".

Access routes § 63

For each location where work is performed there shall be safe means of access such as stairways or gangways.

Ladders are not usually suitable as a means of access.

(See also AFS 2008:13, Appendix 3)

 <p>Hoist Load</p>	 <p>Lower Load</p>	 <p>Hoist Load Slowly</p>	 <p>Lower Load Slowly</p>	 <p>Stop</p>
 <p>Swing Boom in direction indicated</p>		 <p>Lower Boom</p>		 <p>Emergency Stop</p>
 <p>Extend Boom</p>	 <p>Retract Boom</p>	 <p>Raise Boom</p>	 <p>Lower Boom</p>	 <p>Signal not understood</p>
 <p>Open</p>	 <p>Close</p>	 <p>Main Hoist</p>	 <p>Auxiliary Hoist</p>	 <p>Finished</p>

Equipment and machinery

Machinery and equipment:

- Reinforcement specification and reinforcement drawings
 - Reinforcement cutters
 - Electric bolt cutters
 - Tie wire fixers
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- Lift with lifting strap / chain

Materials:

- Reinforcement
- Reinforcement mesh
- Tie wire
- Distance – blocks

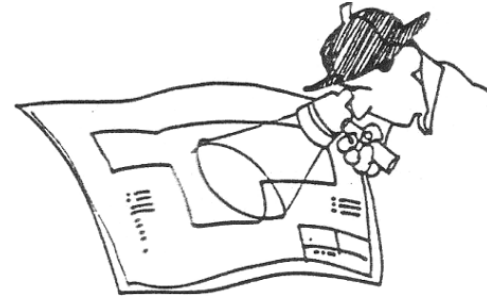


Self-inspection 1(2) Template & instructions

No	Check	Method or equipment	Frequency	Result	Date Signature	Deviation/Remedy Approval/Non-A
1	Fixing + spacing of reinforcement Check max c/c distance pieces	Ocular	Before casting			
2	Requirements regarding location and topcoats	Ocular	Before casting			
3	Reinforcement positioning in relation to perforations	Ocular	Before casting			
4	The straps are not worn or damaged	Ocular	Before lifting			
5	That unprotected reinforcement is bent or provided with end protection	Ocular	Continually			
6						
7						
8						
9						
10						
11						

Quality criteria for the project and the product

- Study Drawings, Specifications and Inspection planning
- Think through the alternative **methods of production** and handling of materials, tools etc. that can meet the requirements



Pay particular attention to

- Prevent galvanic corrosion of bridge parapets by reinforcement which does not have electrical contact with the railing or other steel parts.

Prefabrication - Reinforcement Baskets

Production of uniform structures such as reinforcement cages for column should be performed at the reinforcing the station.



Bottom
reinforcement
is laid out
with spacers



Reinforcing beams

Several reinforcement sections can be prefabricated in the station



The edge
beam is
reinforced



Beginning on the
bridges span
construction



Ready for
casting



Electrical wiring and in-cast fastening fixtures for the railing are visible in the edge beam's formwork

