Information about piling

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.

Piling

Venice is built on stilts – it is, thus, a proven foundation reinforcement method!

Underpinning by piling is achieved using piles of wood, iron or concrete which are driven down by a piling plant into the ground. In this respect you get a stable subgrade for foundation construction. The piles can be driven down to rock, this is called support piling. When the bedrock lies deep, friction piling can be performed instead, the weight being then taken up by the forces of friction against the soil layers.

The work is usually performed during the construction by specialist companies. It is important for the client during the planning / procurement phase of the piling process, to reflect upon *how the current conditions affect the piling work and what requirements should be imposed.*

Pile types

Concrete piles are common in areas with clay soil.
Steel pipe piling is appropriate when other piles cannot penetrate the ground because of the nature of the substrata; stones, old filling, etc.
Wooden poles for temporary jobs or where there are existing piles of wood shall be supplemented as required. Bored piles and injection piles can be used when quiet piling is required.

Pre-conditions 2(4)

Safety — Risk assessment

Work activity & Problem	P	C	Risk= P*C	Action
Crane work with piles/crushing injuries	30	5	150	Education in crane directing/strapping. See page 4
Falling material/crushing injuries	10	15	150	Helmet compulsory
Cluttered workplace =Twisting or fall injuries	10	15	150	Regular tidying

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

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

Personal Protective Equipment § 71
Safety helmet and safety shoes shall be used unless it 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.

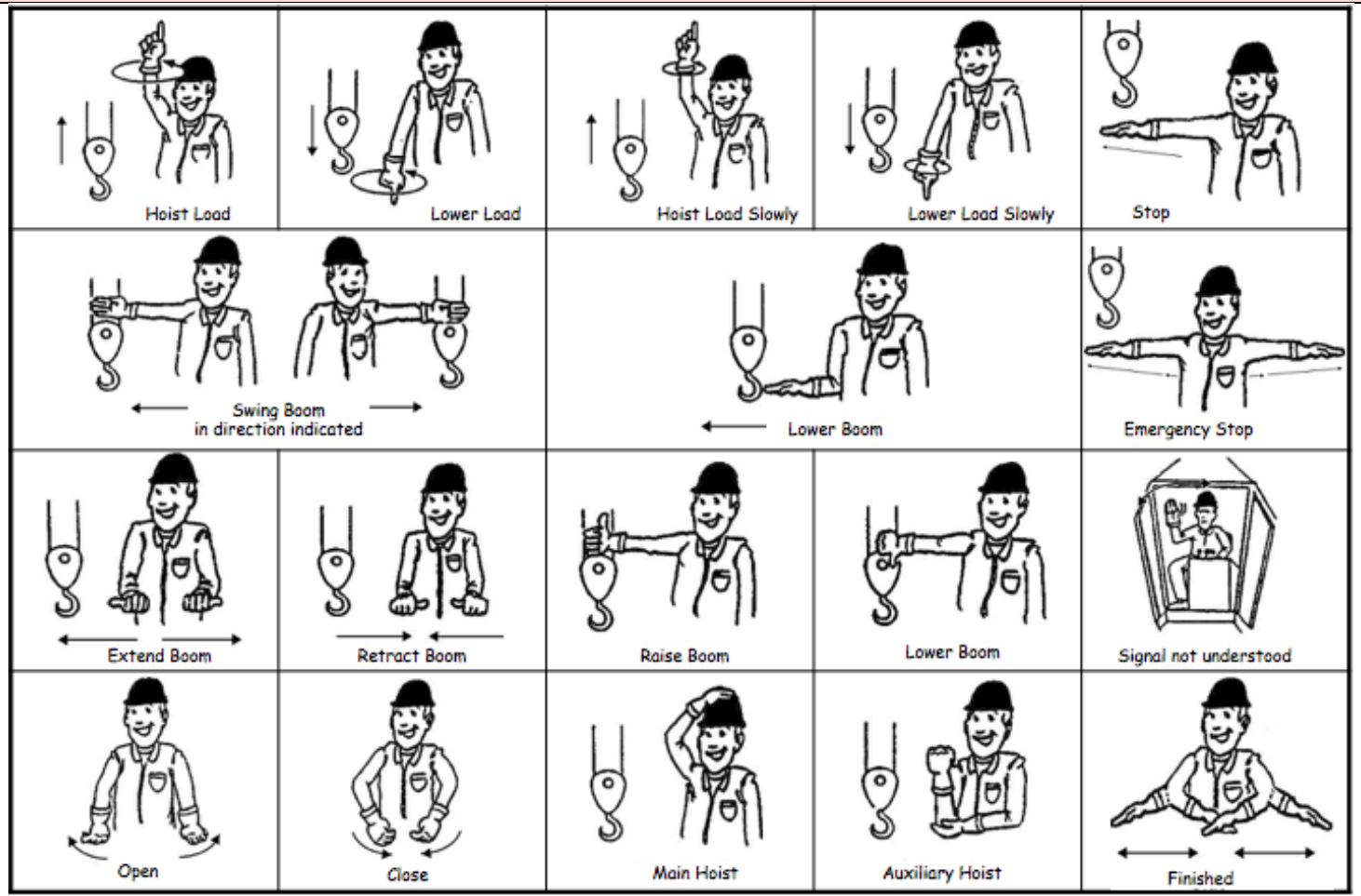
Regulations related to First Aid are presented in AFS 1999:7 "First Aid and Emergency Support".

Watch out for falling objects § 67
Areas where there is a risk of falling objects should be cordoned off and marked in an appropriate way. If such areas must be entered, then a canopy, covered walkways or similar should be organized.

Pre-conditions 4(4)

Crane directing

(See also AFS 2008:13, Appendix 3)



Equipment and machinery

- ❑ Pile crane
- ❑ Dyna
- ❑ Laser for setting out
- ❑ Cutting equipment, saw

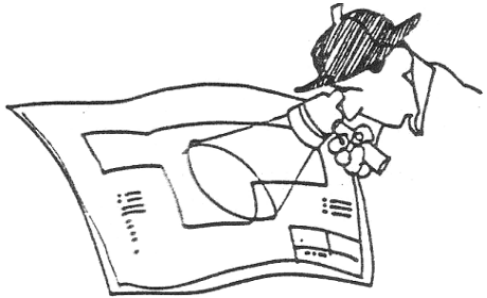
Material

- ❑ Piles - takes up much space
- ❑ Ground mats for excavator

No	Check	Method or equipment	Frequency	Result	Date Signature	Deviation/Remedy Approval/Non-A
1						
2						
3						
4						
5						
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

- The piles should be embedded at least 100 mm into the concrete structure
- For short piles a **vout** shall be cast on or be created in the slab
- Piles must have rock shoes with studs
- The piles shall be fitted with a 'crack ring' of steel
- Piles of less than 12 m may not be spliced.

Piling frame has arrived

How will it get down

into the foundation?

Piling before excavation

Here the piling is performed prior to excavation through the asphalt. Restocking marked on the asphalt and the work can be performed dry.

Piling before excavation

Here we have for unknown reasons removed the soil surface so that the crane can be drive on excavator mats. After a rainfall it did not look so good.

Pile driving

The piles are driven until it stops or until the prescribed depth has been reached. Stop driving is done according to specified requirements.

Pile cutting

The piles should be cut perpendicular to the longitudinal direction and the surface should be even. First the setting out of heights is performed.

Waste

Cut parts of piles can generate large volumes.

Wooden piles

Cables are mounted on the wooden piles to the left whilst the bridge was renovated.
The picture to the right shows a temporary bridge for heavy construction transport.