# Tata Steel Technische Standaard

# S3 29 80 01 Straight steel staircases, ladders, platforms and hand railing

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# Objective

In this Tata Steel Standard, the functional requirements that stairs, ladders with safety cages, platforms and hand railing have to meet have been defined. These requirements have been extended to include Tata Steel safety requirements. The physical implementation has been left partially empty so that competitive tendering is possible.

# 1 General Information

APPLICABILITY:

This Tata Steel Standard applies only to:

Staircases, fixed ladders, ladders with safety cages, platforms/catwalks and hand railing in architectural and mechanical engineering constructions inside as well as outside, primarily for use by people.

This standard is not suitable for locations where it is likely that visitors (minors in particular) will go onto the construction without having received safety instructions. This could, for example, be an excursion route or similar. In that case, because they might be climbed on, one should consider changing the railing construction in accordance with the applicable description established in Dutch National Building regulations (Bouwbesluit 2012).

IMPORTANT:

The user of these regulations should ensure himself that he is using the most recent version of the standard.

The most recent version can be retrieved via the Tata Steel Intranet (Projectnet) and on Internet www.tatasteeleurope.com/health-and-safety/access-and-safety-ijmuiden/regulations

COMMENTS:

Within these regulations, the actual constructions are the responsibility of the supplier. However, the terms and conditions (of supply) mean that they are still subject to approval by the party placing the order.

When extending a construction, the elements already in place must be taken into account.

For examples of the staircases, ladders with safety cages, catwalks and hand railing and details to be used, see drawing A33910.

For preservation and the colours to be used: see the most recent version of
Tata Steel Standard S3 10 56 01.

The most recent version can be retrieved via the Tata Steel Intranet (Projectnet) and on Internet www.tatasteeleurope.com/health-and-safety/access-and-safety-ijmuiden/regulations

For joints by welding: see the most recent version of Tata Steel Standard S1 45 04 01. The most recent version can be retrieved via the Tata Steel Intranet (Projectnet) and on Internet www.tatasteeleurope.com/health-and-safety/access-and-safety-ijmuiden/regulations

If safety colours are applied entirely or in part to staircases, ladders with safety cages, platforms and/or hand railings, the stipulations in the most recent version of Tata Steel Standard S1 91 73 01 are applicable.
The most recent version can be retrieved via the Tata Steel Intranet (Projectnet) and on Internet www.tatasteeleurope.com/health-and-safety/access-and-safety-ijmuiden/regulations

# 2 Calculations

## 2.1 General

The following norms and guidelines have to be used as the basis for the static calculations:

| | |
|---|---|
| – NEN-EN 1990 | Eurocode 0: Basis of structural design |
| – NEN-EN 1991 | Eurocode 1: Actions on structures |
| – NEN-EN 1993 | Eurocode 3: Design of steel structures |
| – R3 35 00 02 | Technical Guidelines, Technical Specificatioons 2000, chapter 25 |

## 2.2 Material quality

For the choice of material quality to be used, see the NEN-EN 1993 for example. It is however possible to use other materials, when discussed with the author.

## 2.3 Live load

NEN-EN 1991 should be used for the live load of staircases and platforms.

## 2.4 Wind load

Wind load values according to NEN-EN 1991-4 should be adopted for outdoor constructions.

## 2.5 Dust load

The effects of dust load are not applicable for platforms with grates, unless instructed otherwise by the client. For platforms with a flat plate or a diamond plate the dust load should be taken into account depending on the location on the terrain. The volume of dust load will be supplied by the client.

## 2.6 Temperature effects

Where constructions are subject to temperature influences, appropriate allowances must be made. The temperature are to be considered per project. This in compliance with the client.

## 2.7 Stress calculations

For this standard the regulations as given in NEN-EN 1993 are applicable here.

## 2.8 Deformations

Deflection in the various construction elements and the total horizontal deflection of the railing as a result of the total load is not allowed.

As result of the total load on a platform the deflection may not be greater than 1/200 mm of the span and, during the load the divergence in height between de loaded- end unloaded construction element may not be greater than 4mm.

As result of the total load on a tread the deflection may not be greater than 1/300 mm of the span and/or may not be greater than 6mm. Whichever occurs first.

## 2.9 Stability

The regulations as given in NEN-EN 1993 are applicable here.

*Note:*

Staircase with grating treads that spans a height of more than 4 metres (incl. the intermediate platforms) should be stiffened at the lower flange of the staircase sides (think of stability bracings).

## 2.10 Fitting / anchoring

Nuts and bolts:

At least M12, quality 8.8, hot-dip galvanized, isometric fit.
The nuts and bolts used must have appropriate washers.

When fixing the construction to sloping surfaces (e.g. INP and/or UNP profiles), use appropriate sloping bearing plates.

After the joint has been made, outdoor constructions must be treated using the same preservation system as was applied to the steel construction as per S3.10.56.01.

## 2.11 Loads

The following must be used in the calculation:

- The construction's dead load
- The live load, as per NEN-EN 1991 (see also paragraph 3.3).

## 2.12 Loads combinations

As per NEN-EN 1991 .

## 2.13 Stair tread loads

In addition to NEN-EN 1991, individual treads should be dimensioned for a concentrated load of 1,5 kN in the middle of the tread, acting on a 100 x 100 mm area.

## 2.14 Grating loads

As per NEN-EN 1991.

## 2.15 Railing loads

As per NEN-EN 1991.

# 3 Straight Staircases

## 3.1 General

The applicability of this standard is restricted to straight staircases in factory buildings and offices.When bridging a difference of height of more than 210 mm, a fixed staircase or a fixed set-up ladder is required.

**IN GENERAL TATA STEEL STATES THAT NO OBJECTS ARE ALLOWED TO BE BE HANGING FROM THE STAIRCASE, LADDER, LADDER WITH SAFETY CAGES OR HAND RAILING.**

## 3.2 Staircase width

Dutch National Building regulations specify a minimum width of 800. (Bouwbesluit 2012, chapter 2, paragraph 2.33, table 2.33)

Tata Steel regulations specify a minimum staircase width of 900 mm.

## 3.3 Staircase inclination

The allowable angles of rise for staircases are 30° to 45°. An inclination of 42° is preferred.

## 3.4 Riser and tread

On the first tread (on platform level), a kick plate is required. See for detail drawing A33910, page 4.

Dimensions for the riser and tread are enlisted in the Dutch National Building regulations (Bouwbesluit 2012, chapter 2, paragraph 2.5). Additional information available in NEN 3509.

The maximum height of the riser (h) should be 210mm or less as the height difference to be bridged necessitates.

The tread (g) should always be more than 185mm in depth.

The relationship between the riser (h) and the tread (g) must comply with the formula:

570mm< 2x(h)+1x(g) < 630mm (Dutch staircase formula).

The minimum dimension for the riser (h) is 170 mm. This in reference to the accessibility.

Up to a height of four meter there, one stair without a platform can be used. To bridge a greater height, multiple stairs can be used with a maximum height of three meter, interrupted with a platform of multiple platforms.

## 3.5 Clear height

The clear height h1 (see figures 1 and 2) is the height of the imaginary vertical plane above the front edge of the treads. This must be at least 2300mm.

On existing situations a different dimension of 1900 mm is acceptable. (according to Bouwbesluit 2012, chapter 2, paragraph 2.39, table 2.39)

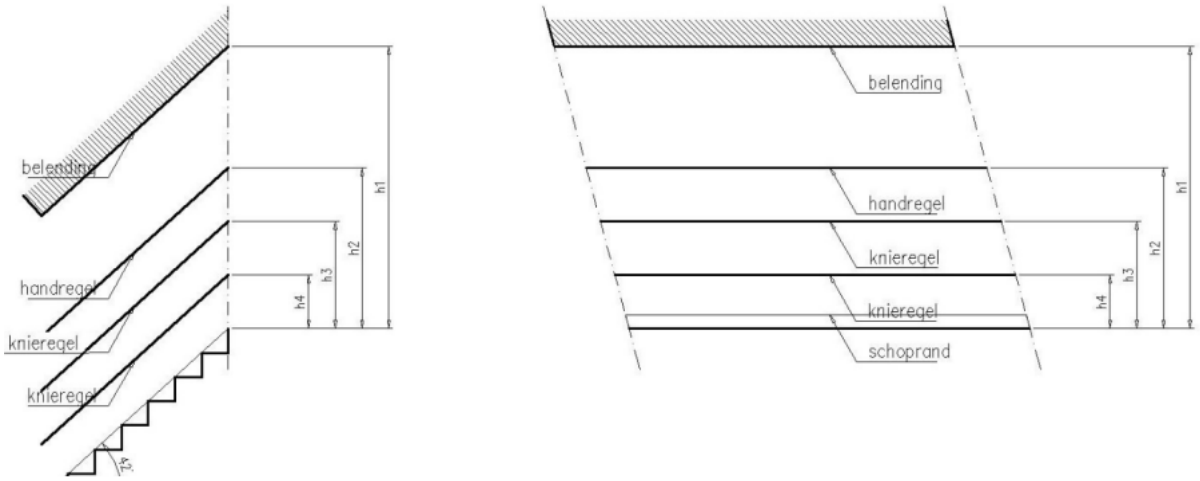



Figure 1, (height of fall > 13m, handrails on stairs and landings with double knee rail)

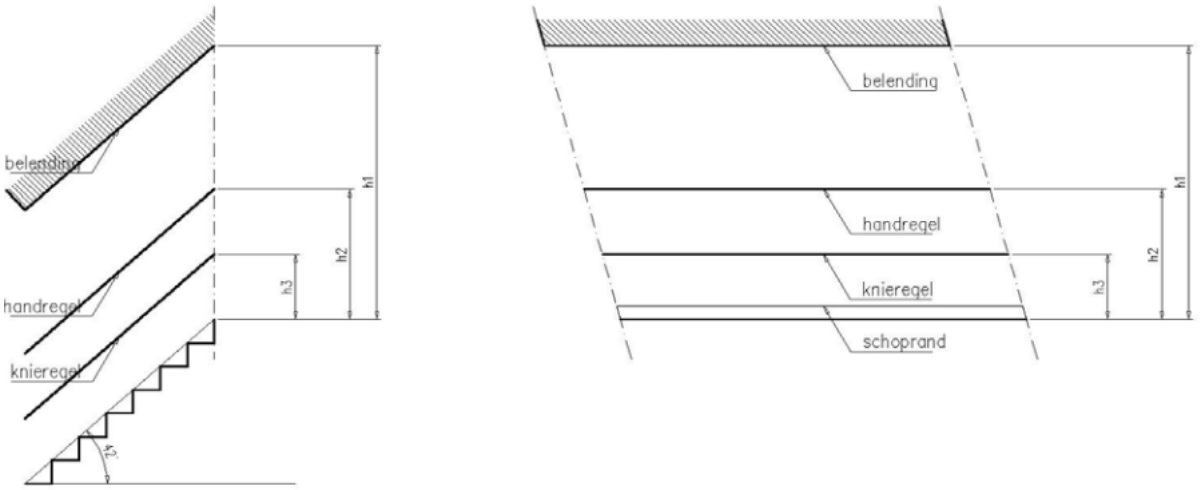



Figure 2, (height of fall < 13, handrails on stairs and landings with single knee rail)

# 4 Straight Treads

## 4.1 General

Stairs with pressed grating treads must be provided with an anti-slip edge.(see figure 3) This also applies to platforms which are fitted with press grating and which are part of a stairwell or step (such as with a cage ladder)

Apply double anti-slip (see figure 4) edge in oil cellars, hydraulic rooms and outdoor installations.

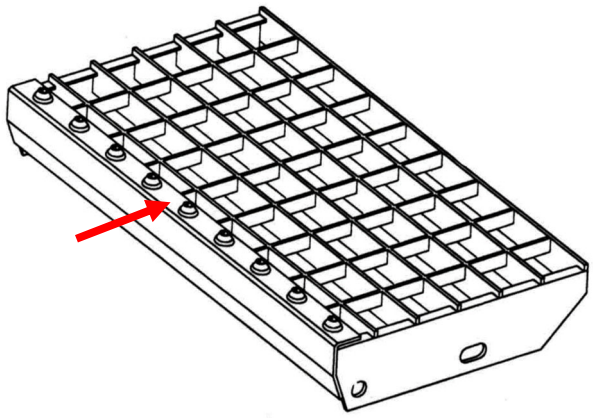


Figure 1, trede met antislip rand

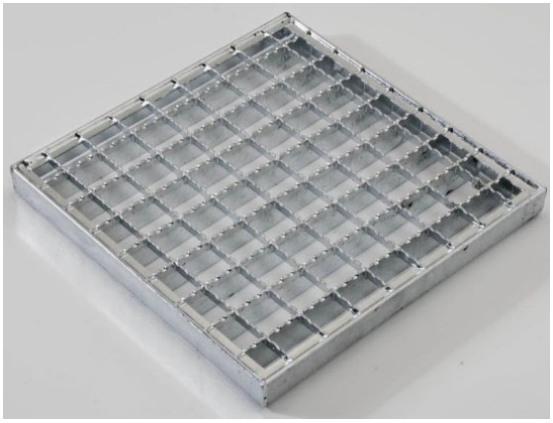


Figure 2, grating with double anti-slip

## 4.2 Trating Treads

Pressed grating treads should be composed of crossbars and bearing bars, placed between standardised gusset plates.

Pressed grating dimensions:

| | |
|---|---|
| Bearing bars at least | : 30 x 3mm |
| Crossbars at least | : 10 x 2mm |
| Bearing bar separation centre to centre | : 33.3 mm |

## 4.3 Surface treatment

Grating stair treads must be hot-dip galvanized in accordance with NEN-EN-ISO 1461.

The first and last step of a staircase must be provided with the yellow safety color in accordance with Tata Standard S1 91 73 01. See also attachment A33910 sheet 01

# 5 Platform Gratings

## 5.1 General

Only pressed gratings may be used for platform floors.
Refer to paragraph **Fout! Verwijzingsbron niet gevonden.** for the types and the anchoring of the gratings.

When used in oil reservoirs, hydraulic rooms or in outdoor installation, the gratings must be made of an anti-slip version.

## 5.2 Gratings

Pressed gratings must consist of crossbars and bearing bars.

Dimensions:

- bearing bars at least : 30 x 3mm
- crossbars at least : 10 x 2mm with centre to centre distance 33.3 mm
- bearing bar separation centre to centre : 33.3mm

Additionally, the design should allow for the standard commercially available dimensions of the gratings.

Where there are recesses in the gratings, the allowable loads are adversely affected. Supports should be added at the recesses, when necessary. On the ledge of the recess a kick plate should be placed (height up to 100mm above the grating) (also see figure 5).

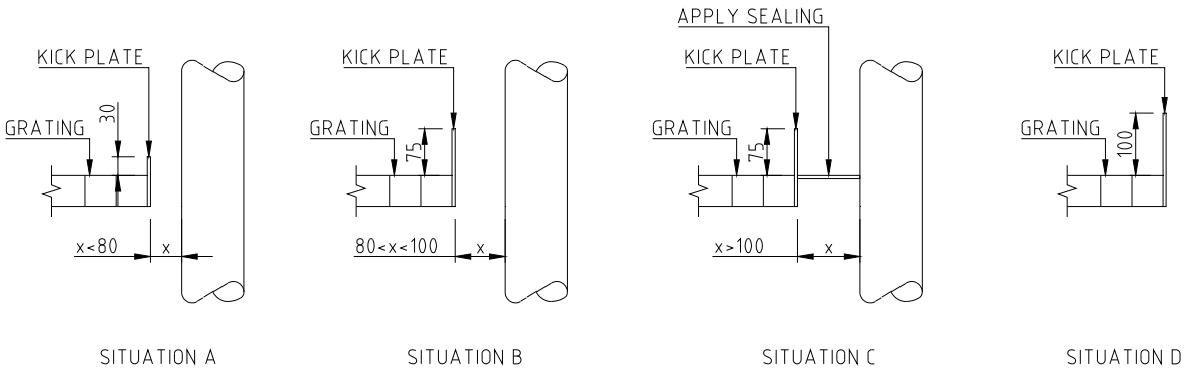


figure 5 recesses and termination at floors / grating with kick plate

The maximum deflection of the bearing bars cannot differ more than 1/200 of the span length of support of what is mentioned in paragraph 3.8.

## 5.3 Attachment

Pressed gratings should be fixed using standard anchoring elements.
The bearing bar should be supported on both sides, with an overlap of at least 30mm. Gratings that cannot be supported at a recess must be replaced by a standard connecting set (top fixings and connecting strip). Stud welds should **not** be applied.

## 5.4 Holding in place

Gratings must be held in place to prevent them from shifting in either direction.
In some cases, kick plates and stair treads may serve for this purpose.
Stud welds may **not** be used.

## 5.5 Surface treatment

Steel gratings must be hot-dip galvanized in line with NEN-EN-ISO 1461.

## 5.6 Request / order details

In the request for quotation this Tata Steel Standard, S3 29 80 01,must be declared applicable to the request.

The most recent version can be retrieved via the Tata Steel Intranet (Projectnet) and on Internet

www.tatasteeleurope.com/health-and-safety/access-and-safety-ijmuiden/regulations

Where appropriate, the following information must be included in the request or the order:

- drawing(s) and/or the dimensions of the gratings
- the span
- the direction of the bearing bars
- recesses
- the load
- environmental variables, such as whether for indoor or outdoor use, greasy or oily surroundings, prevalent temperature, etc.

N.B.:
When giving grating dimensions, the number noted first indicates the length of the bearing bars; this number should be underlined on the drawing or the parts list.
The bearing bars are generally the ones with the smallest space to span.

For instance,
for a grating measuring:
800 x 1000, the bearing bars are 800mm long
1000 x 800, the bearing bars are 1000mm long

## 5.7 Platform dimensions for doors

The dimensions of the platforms near doors must be sufficient to safely enter and pass through the doors.

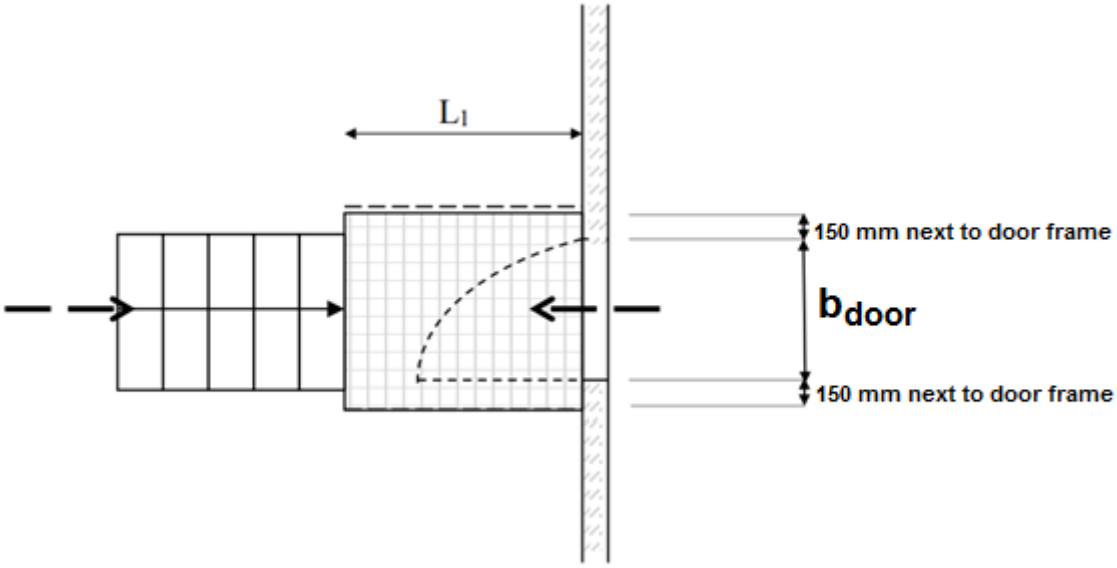



Figure 6, dimensions of the platform and railing at a door that opens over the platform

For dimension $L_1$ use:

$$L_1 = b_{door} \text{ ( door width)} + 500 \text{ mm}$$

Different situations can be discussed.

Minimal “extra” dimension of 300 mm is used. ($L_1 = b_{door} + 300$ mm)

A door that’s swinging outside must be opening at a minimum angle of 90 degrees.

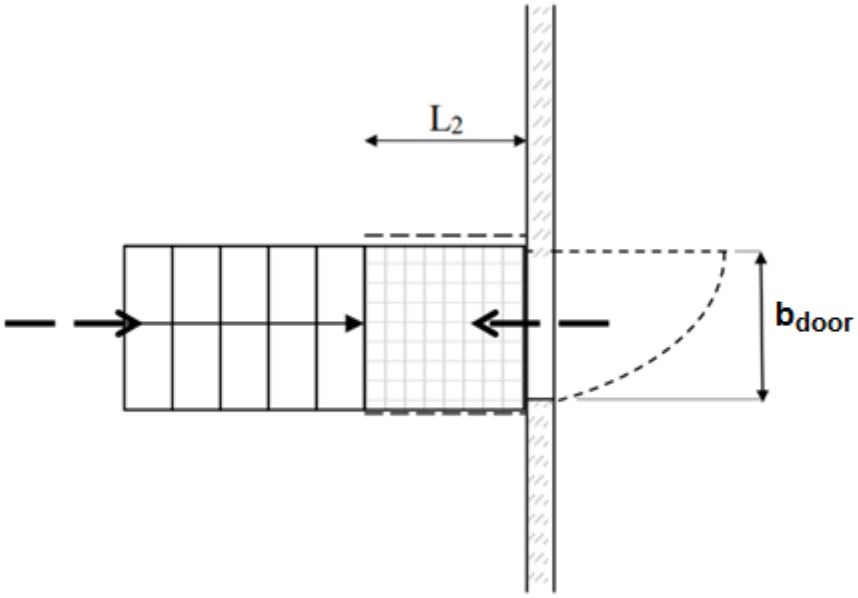



Figure 7, dimensions of the platform and railing at a door that opens from the platform

For dimension $L_2$ use:

## $L_2$ = door width

A platform has a minimum length of 800mm. The Width is at least equal to the width of the stairs.

# 6 Hand railing

## 6.1 General

The hand railing construction prescribed in this standard is derived from NEN-EN-ISO 14122-3. The heights must comply with Dutch National Building regulations (*Bouwbesluit 2012*).

In the case of a floor intended for persons, the floor has a non-movable partition at an edge if that floor is more than 1 m higher than a connecting floor, the adjacent site or the adjacent water.

When bridging a height similar or higher than 1000 mm, hand railings on both sides must be placed.

## 6.2 Space

The clearance (A) between the handrail in the well of the staircase must be at least 150mm.
The clearance (B) between handrail and fixed objects must be at least 75mm (see figure 8).
Apply a through hand- and knee rule (C).

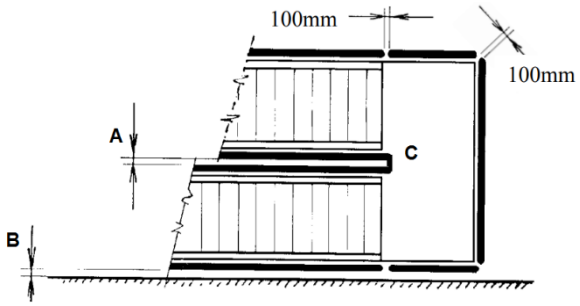



Figure 3, top view stairwell

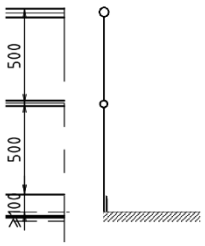



Figure 4,

At fall height < 13 m

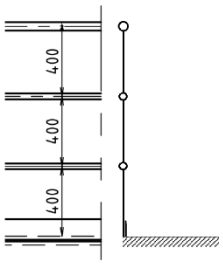



Figure 5,

At fall height ≥ 13 m

## 6.3 Handrails height

For platforms:
Where the drop to ground level / floor is up to 13 metres, the height of the handrail on platforms must be 1100mm, measured from the top of the surface that you can walk on, there must be a knee rail at 500mm (see drawing A33910- page 01 and figure 9).

Where the drop to ground level / floor is 13 metres or more, the height of the hand railing on platforms must be 1200mm, measured from the top of the surface that you can walk on, there must be two knee rails at 400mm and 800mm (see drawing A33910-page 01 and figure 10).

For staircases:
The height of the hand railing for staircases must be **1000mm**. Stair hand railing where the drop is up to 13 metres must have one knee rail at 500mm.

*Measurement method for hand railing:*
Measured vertically in the imaginary plane through the front edge of the treads up to the centre of the knee rail (see drawing A33910, page 01)
Staircase hand railing where the drop to ground level is 13 metres or more must have two knee rails at divided 2P x 1/3 * h (h= 1000 mm).

*Measurement method for hand railing:*
Measured vertically in the imaginary line through the front edge of the treads up to the centre of the knee rails (see drawing A33910, page 01).

At the **OXY2-plant** all hand railing height should be 1200mm for platforms, even if the drop to ground level is up to 13mtr. There will be placed two knee rails instead of one. The staircase hand railing also must be provided with two knee rails.

## 6.4 Posts

The maximum centre-to-centre distance between posts along the edges of platforms is 1500mm.
The maximum centre-to-centre distance between posts along staircases is 1000mm (horizontally measured).

## 6.5 Railing type

The choice of the type of railing and its construction method is determined by the customer, taking account of the connections to existing hand railing.

Tube diameter for handrails:
- Minimum: 40mm
- Maximum: 50mm
- Minimum material thickness with steel: see drawing A33910 e.g. page 5 (see appendix).

## 6.6 Construction method

Finishing:
Handrails should be finished in such a way that there are no sharp corners, edges or protrusions.

Bends:
Putting together the various railing elements from the tubing is done using butt welding, with the help of a suitably sized piece of tubing placed inside.

## 6.7 Kick plates

Platforms and the first step (at the platform level) of the ascending staircase should be fitted with kick plates. The kick plates should protrude 100mm above the walking surface for platforms, and 50mm for the ascending staircase (see also par. 6.2)
The minimum thickness for the kick plates must be 6mm.
At holes in grating there should be a finishing as pointed out in figure 4 (par. 6.2).

## 6.8 Removable hand raililng

Railing elements must be secured on either side by means of a retaining construction that folds inwards (see figure 11 and drawing A33910, page 09 detail 1).

Removing this type of railing must be done by two people.

Depending on the requirements in the working procedures, the retaining construction should be lockable.

There must be a chain on either side to prevent the removable railing from falling. On one side a chain is needed. This chain must be held in place with a D-connector or a shackle.

Attachment points for fall protection equipment must be present on both sides of the opening.

When removing the section, the maximum load per person must be less than 23kg. Hand railing which are connected together should be checked on this point in particular. The locking arrangement should be open on the underside to prevent dirt from accumulating.

The client has to check the details before released for construction.

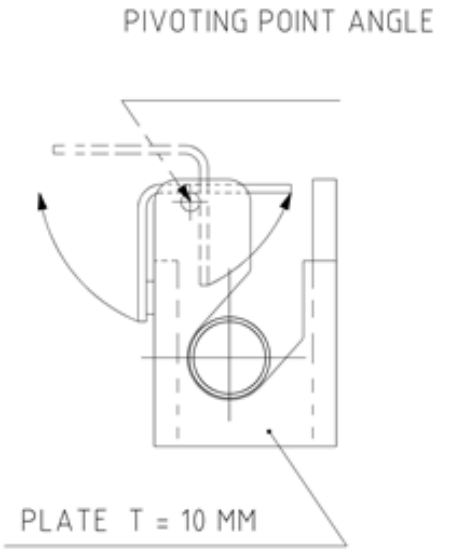



Figure 11

## 6.9 Folding Gate

If it is necessary that the railings must be interrupted to gain access to a safety ladder or cage ladder, a folding gate with a double rule must be used. See drawing A33910 sheet 7

## 6.10 Preservation

Railing elements for outdoor use consisting of tubular profiles must be hot-dip galvanized in accordance with NEN-EN-ISO1461. Holes to allow air to escape must be made in the railing elements (on the underside as far as possible), in accordance with the advisory sheets issued by *Stichting Doelmatig Verzinken* (“Effective Galvanization Foundation”).

After this, the usual coating as per Tata Steel Standard S3 10 56 01 must be applied, with a colour layer as the top coat (for hand railing the signal yellow safety colour accordance Tata Standard S1 91 73 01).

## 6.11 Welded joints

Handrail parts that are welded must comply with a= ½ t with a minimum of a $\geq$ 3 mm.

# 7 Ladders and Ladders with Safety Cages

## 7.1 General

Steel ladders with a drop of 2.5 m or more must be fitted with a safety cage.
Only use caged ladders when there are no objections to doing so from a safety perspective. If a caged ladder serves as an escape route, the top coat should be green (RAL 6024), in line with Tata Steel Standard S1 91 73 01.

Exception
This Tata Steel Standard does not apply to ladders on chimneys, silos, tanks, quay walls and inspection pits.

## 7.2 Beam / rung loads

| | | |
|---|---|---|
| Ladder beams | : | 2 kN per metre height |
| Rungs | : | 2 kN concentrated load in the centre |

## 7.3 Construction

### 7.3.1 Fixed ladders

The beams of a ladder that provides access to a platform or roof surface must protrude at least resp. 1.1 metre of 1.2 metre above the level of the surface to be walked on. The centre of the uppermost, final tread must be level with the walking surface or level with the upper surface of the roof edge. The separation between the rungs must be absolutely even. The distance between the rungs must be 300mm, or as much less as is required to span the height difference required. The thickness of the rungs must be 25 mm (anti-slip with a cross-section of 25 mm or armoured steel with a cross-section of 25 mm). See drawing A33910 page 6.

The rungs must be inserted into the ladder beams and must be welded round the full circumference on the outside. To prevent corrosion, ladders for outdoor use and/or ladders in open factory halls must also be welded on the inner side of the ladder beam. The angle between the ladder and the walking surface must be at minimum of 75° and a maximum of 90°.

### 7.3.2 Safety cages

A safety cage starts 2500mm above the floor or above a platform. There must be no breaks in the safety cages, other than to provide access to platforms. The separation between the hoops must be:

- a maximum of 1500mm centre to centre, when 40 x 20 mm U-profiles are used. (according to European standard 54)
- when strips are used, allowance must be made for a horizontal concentrated load of 1 kN and deflection of 1/200 x 1intermediate distance rings
- the minimum material thickness must be 4 mm.

The lengthwise rods must be attached to the inside of the hoops. There must be 6 of them, equally distributed around the circumference. The finish must be smooth.

If the distance “a” measured horizontally between the rungs of the ladder and the railing of a platform is greater than 1 metre but less than 2 metres, the platform’s railing must be raised by 500 mm up to a distance of 1500 mm from the centre point of the caged ladder. See figure 12.

If this horizontal measured distance is less than 1000 mm in the existing situation (also see figure 12), supplementary measures have to be taken. This depends on the existing situation (for example enlarged railing up to the beginning of the cage).

N.B.:
A safety cage is NOT required if:
– a ladder is built within a construction that can act as a back support, and;
where the back support is never more than 800 mm away from the ladder / rungs.

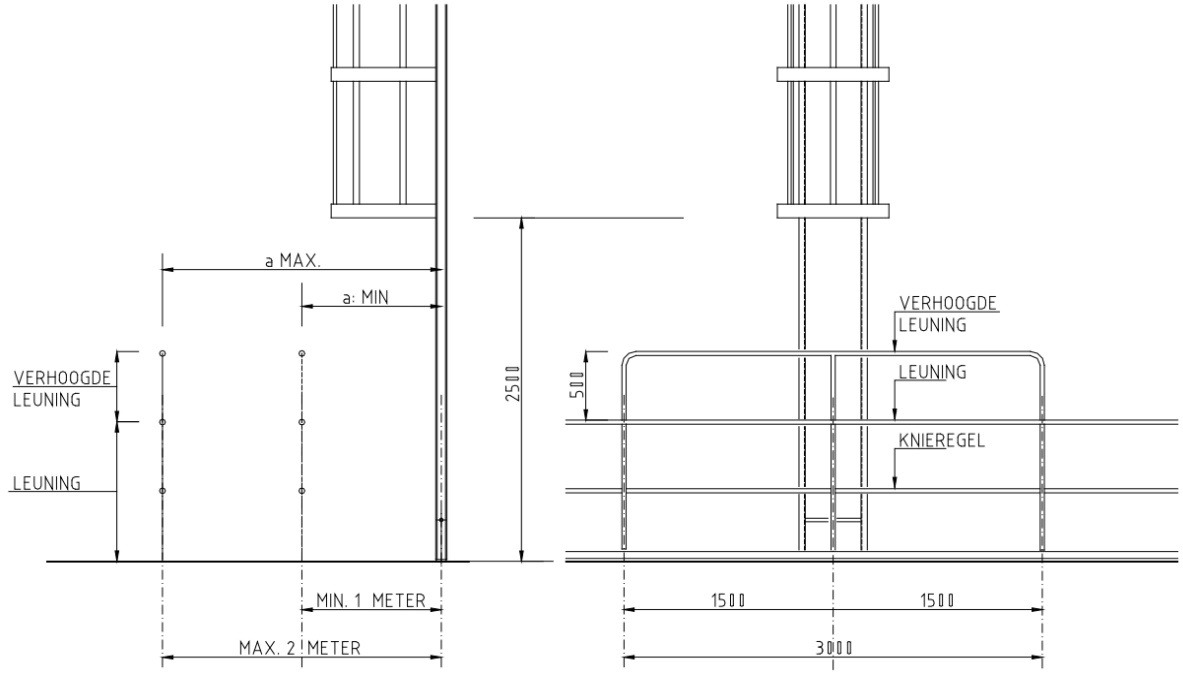



Figure 6

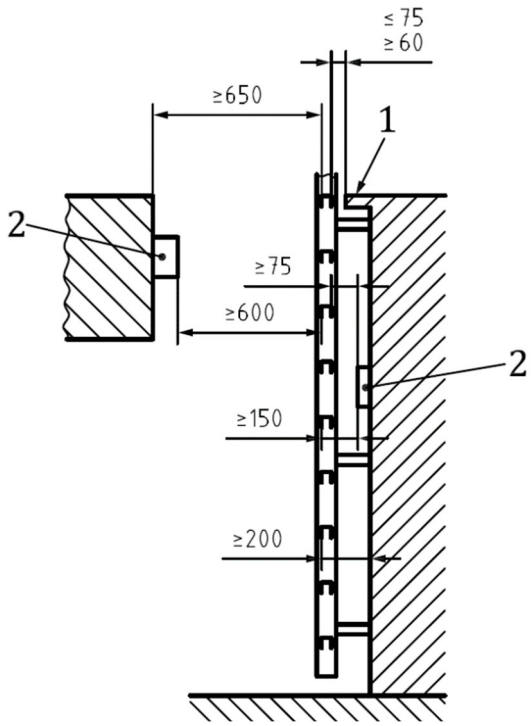



Figure 7

1. connection to floor edge/platform (see als drawing A33910 page no.07)

2. obstaclesuch as a pipe

## 7.4 Attaching cage ladders

Before attaching the cage ladder onto concrete and/or masonry, the contractor should assess if the quality of the existing construction parts are sufficient enough by calculation. This calculation should comply with the applicable standards.

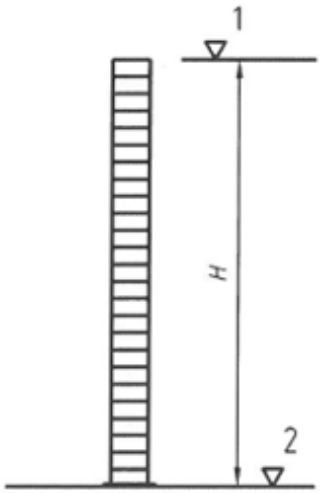
## 7.5 Platforms

### 7.5.1 Resting platforms

A ladder with a climb height H < 10 metres may be built without resting platform. See figure 13.
A ladder with a climb height H ≥ 10 metres in length must have resting platforms. In that case the ladder flights may be max. 6 metres.
Ladders and resting platforms must be placed in such a way that the climbing route is displaced laterally after passing each resting platform. See figure 14 and 15.

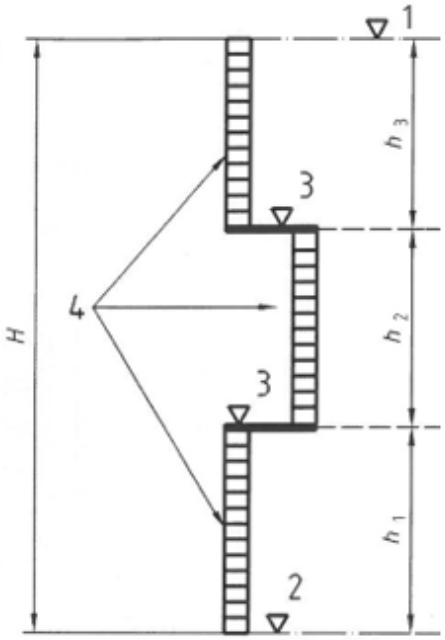
**Position of resting platforms**

**Legend**
1 Arrival
2 Departure
3 Intermediate platform
4 Ladder flight




$H_{max}$ = 10 m.

Ladder without resting platform (single flight)




$h_{max}$ = 6 m.

Ladder with staggered flights

Figure 14

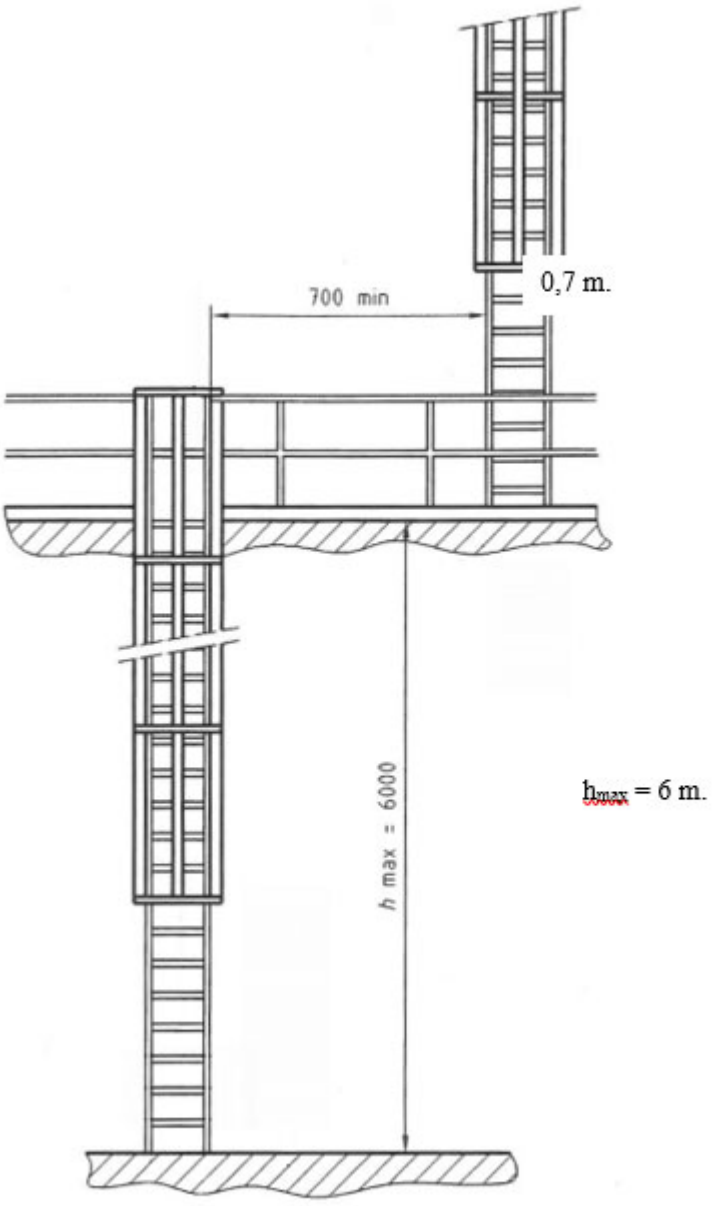



Figure 8, Front view of ladder with safety cage

### 7.5.2 Entry/exit platforms

Getting on or off a ladder from a platform or roof surface must allow for entry/exit by stepping sideways from a platform (see figure 15).

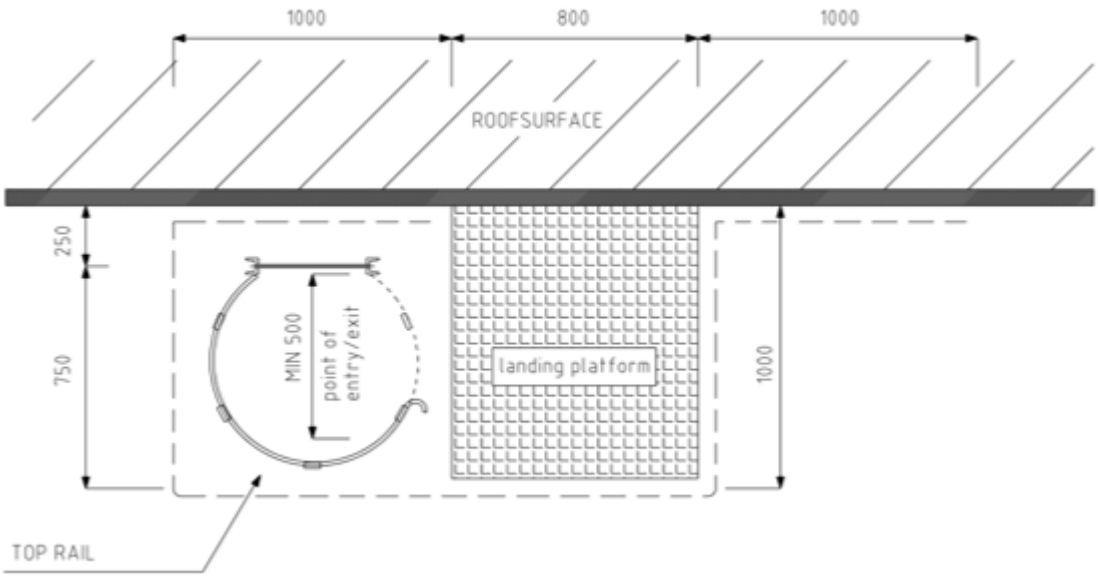



Figure 16

If there is a door for the platform, the width of the platform must be adjusted to allow for the width of the door frame.
The connections to roofs or platforms must be in a single horizontal plane.
If there is no railing along the edge of a roof, a railing must be placed on both sides of the entry/exit platform along the roof edge for a minimum of 4 metres. (For further demands see paragraph 7).

## 7.6 Closing off access

If a caged ladder may not be climbed by unauthorised persons, the access should be closed off in such a way that its ability to act as an escape route is not compromised (information available from CSPY-PTC-MCE-CIV).

# 8 References

This Tata Steel Standard refers to:

**Tata Steel Standard**

| | |
|---|---|
| S1 91 73 01 | Application of safety colours |
| S1 51 80 01 | Free profile on and around electric overhead travelling cranes |
| S3 10 56 01 | Protective coatings |

**Tata Steel Gidelines**

| | |
|---|---|
| R 3 35 00 02 | Technical Stipulations,<br>Technical Guidelines 2000, chapter 25 |

**Standards**

| | |
|---|---|
| EU 54-1980 (1986) | Small hot-rolled steel channels |
| NEN-EN 1990 | Eurocode 0: Basis of structional design |
| NEN-EN 1991 | Eurocode 1: Actions on structures |
| NEN-EN 1993 | Eurocode 3: Design of steel structures |
| NEN-EN-ISO 1461 | Hot dip galvanized coatings on fabricated iron and steel articles<br>- Specifications and test methods |
| NEN-EN-ISO 14122-1 | Safety of machinery - Permanent means of access to machinery<br>- Part 1: Choice of fixed means of access between two levels |
| NEN-EN-ISO 14122-2 | Safety of machinery - Permanent means of access to machinery<br>- Part 2: Working platforms and walkways |
| NEN-EN-ISO 14122-3 | Safety of machinery - Permanent means of access to machinery<br>- Part 3: Stairs, stepladders and guard-rails |
| NEN-EN-ISO 14122-4 | Safety of machinery - Permanent means of access to machinery<br>- Part 4: Fixed ladders |

# 9 Attachment A33910

| | |
|---|---|
| Tata Steel drawing | - A33910 (see appendix) |

# 10 Explanation

**Version: 1.0**
This Hoogovens Standard replaces HO standard 29.00.80.001

**Version: 2.0**
This Hoogovens Standard replaces version 1.0, October 1997

**Version 3.0**
Layout and logos changed. Hoogovens replaced by Tata Steel.
Para. 3.1 reference to Technical Stipulations 2000
Para. 7.2 load changed
Para. 8.2 load changed and condition added
Para. 8.4. first paragraph extended

**Version 4.0**
The whole standard has been revised due to changes in the design standards and to the Bouwbesluit 2012 (Dutch National Building regulations) coming into effect.

**Version 5.0**
Totally revised

**Version 6.0**
Revised in pursuance of comments from Tata Steel.
Among revised subjects are:
Para. 4.4: minimum dimensions added for risers and treads.
Para. 6.7: added text on platform dimensions on with doors / platforms.
Para. 7.2: inserted figure concerning hand railing dimensions (including appendix, drawing A33910).
Para. 8.4: inserted figure 9, safety cages.
Para. 8.5: added text on attaching cage ladders.
Further are there several adjustments on text and figures.

**Version 7.0**
Revised due to the new NEN-EN-standards and the new Dutch National Building regulations (Bouwbesluit 2012).

**Version 8.0**
Revised due to the new NEN-EN-standards.

**Version 9.0**
Color references, Tata Steel Standard S1 91 73 01
Processing to new Tata Steel layout
All Internet links updated
RAL colors replaced by reference to Tata Steel Standard S1 91 73 01
Addition of new pages 40 and 41 in document A33910, Loading platform

| BLAD NR | BENAMING |
|---|---|
| 000 | VOORBLAD |
| 1 | STALEN TRAPPEN MET TUSSENBORDES |
| 2 | STALEN TRAPPEN MET OMLOOPBORDES. |
| 3 | TREDEN VOOR STALEN TRAPPEN |
| 4 | BEVESTIGING STALEN TRAPPEN OP BETONNEN VLOER cq POER |
| 5 | LEUNINGEN VOOR TRAPPEN EN BORDESSEN (BUIS) HOOG 1100MM |
| 6 | STALEN KOOILADDERS VOOR VALHOOGTE≥ 2,5 METER |
| 7 | STALEN LADDERS VOOR EEN VALHOOGTE< 2,5 METER |
| 8 | LEUNINGEN VOOR TRAPPEN EN BORDESSEN (BUIS) HOOG 1200MM |
| 9 | WEGNEEMBAAR VEILIGHEIDSHEK |
| 20 | DEMONTABELE LEUNING OP BETON (B) |
| 21 | DEMONTABELE LEUNING TRANENPLAAT/ROOSTERS (N) |
| 22 | DEMONTABELE LEUNING TRANENPLAAT (N) |
| 23 | DEMONTABELE LEUNING ROOSTER (N) |
| 24 | DEMONTABELE LEUNING OP BETON (N) |
| 25 | DEMONTABELE LEUNING TEGEN BETONVLOER (N) |
| 26 | DEMONTABELE LEUNING OP BETONVLOER (B) |
| 30 | DEMONTABELE LEUNINGEN - DETAILS 1 en 2 |
| 31 | DEMONTABELE LEUNINGEN - DETAILS 3 t/m 7 |
| 32 | DEMONTABELE LEUNINGEN - DETAILS pos nrs 5 t/m 16 |
| 40 | OVERZICHT STANDAARD VERLAADBORDES |
| 41 | STANDAARD VERLAADBORDES - DETAILS |

(B) IN BESTAANDE SITUATIE
(N) IN NIEUWE SITUATIE

## LEGGERTABEL

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 09 | 09 | 09 | 09 | 09 | 09 | 09 | 09 | 09 | 09 |
| 10 | / | / | / | / | / | / | / | / | / | / |
| 20 | 09 | 09 | 09 | 09 | 09 | 09 | 09 | / | / | / |
| 30 | 09 | 09 | 09 | / | / | / | / | / | / | / |
| 40 | 11 | 11 | / | / | / | / | / | / | / | / |
| 50 | / | / | / | / | / | / | / | / | / | / |
| 60 | / | / | / | / | / | / | / | / | / | / |
| 70 | / | / | / | / | / | / | / | / | / | / |
| 80 | / | / | / | / | / | / | / | / | / | / |
| 90 | / | / | / | / | / | / | / | / | / | / |

AANWEZIG

RESERVE

VERVALLEN

NOOT:

DE OP DEZE TEKENING AANGEGEVEN CONSTRUCTIE (DETAILS) VOLDOEN QUA UITVOERING, CONSTRUCTIE, STERKTE EN STIJFHEID AAN DE LAATSTE STANDAARD, S3.29.80.01 VERSIE 7.0 EN MOGEN DERHALVE WORDEN TOEGEPAST VOOR TRAPPEN EN BORDESSEN WAARVAN HET ONDERLINGE HOOGTEVERSCHIL KLEINER IS DAN 13M

DEZE STANDAARD IS VANWEGE DE OPKLIMMOGELIJKHEDEN OP LEUNINGWERKEN IN AFWIJKING OP HET BOUWBESLUIT DERHALVE NIET GESCHIKT VOOR (MINDERJARIGE) BEZOEKERS, (EXCURSIEROUTES).

BEHOORT BIJ S3.29.80.01 REV 8.0

| | OMSCHRIJVING VAN DE WIJZIGINGEN | BUREAU | DATUM | GETEK./GEC./HO-VERANTWOORDELIJKE | OPMERKINGEN | WIJZ. |
|---|---|---|---|---|---|---|
| | BLAD 40-41 TOEGEVOEGD | KH-Eng | mrt '22 | JL/C. BRUENS | 4503489801 | 11 |
| | | | | | | |
| | nwe NEN-EN-normen | EP | mrt '17 | RZW/SCHELLEKENS | | 10 |
| | nwe NEN-EN-normen & Bouwbesl. | EP | mei '13 | PKA/CVB/KRUIJFF | | 09 |
| | BLAD1t/m9+20t/m26+30t/m32 | EP | mei '08 | CVW/CVB/KRUIJFF | | 08 |
| | | TE-ROI | 4/97 | PFAFF/de HULSTER | | 00 |
| ARCHIEF CODE | INSTALLATIEBEHEER: TEL.: | | | | | |

DIVERSE GROEPEN
STANDAARDISATIE
BOUWKUNDE
TRAPPEN EN BORDESSEN
VLGS TATA-STANDAARD S3.298001

CAD

AANTAL BLADEN 41

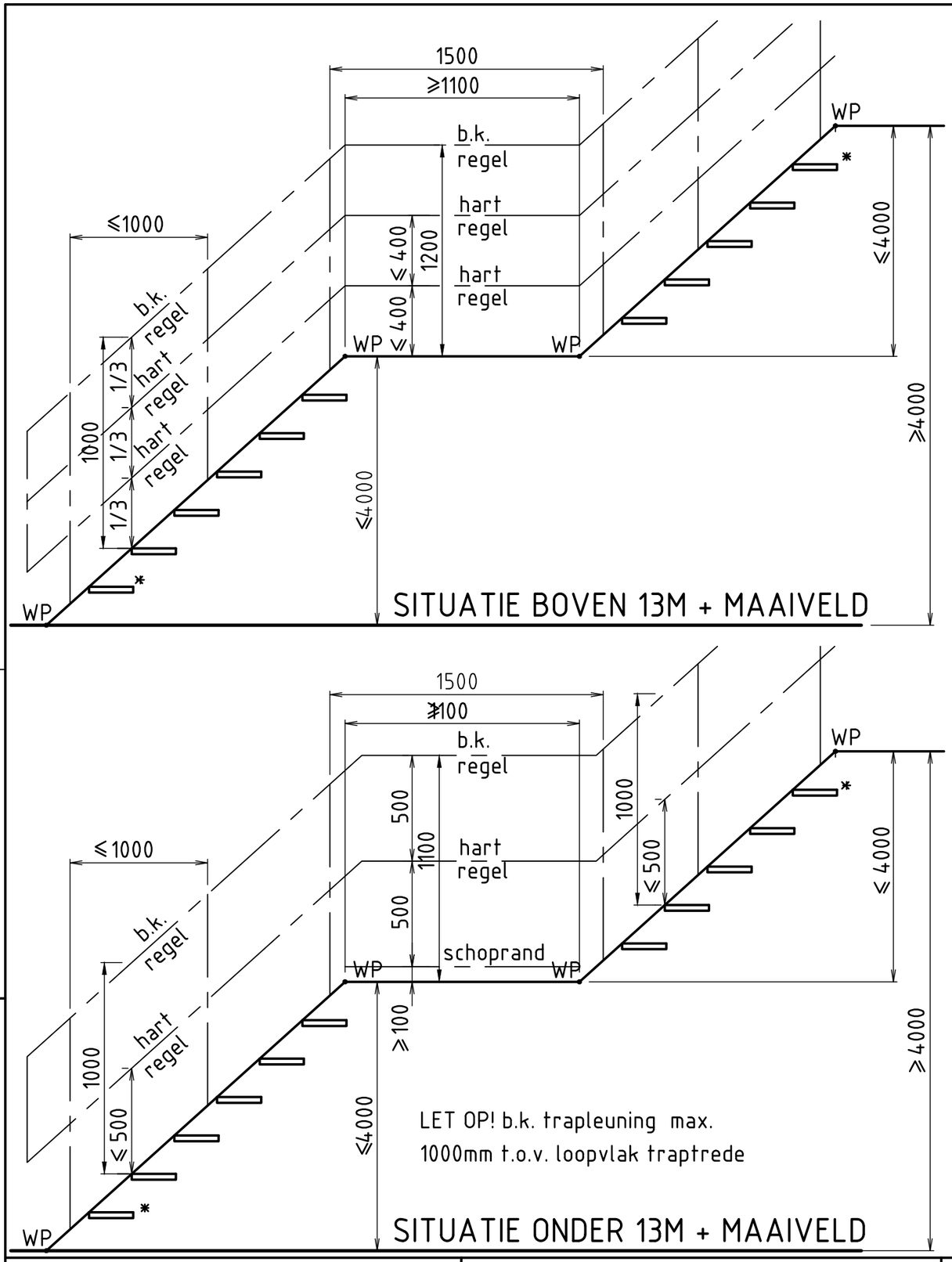
TATA STEEL

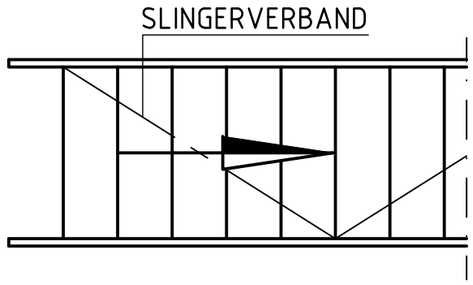
A33910

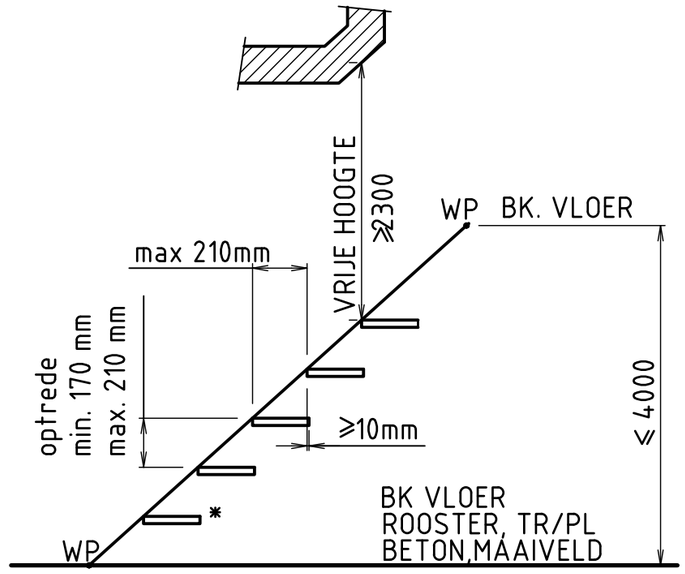
BLAD 000

EP: doss. 12423 - tek. A33910 - 00 - A3

EP: doss. 12423 - tek. A33910 - 08 - A3




* = ONDERSTE EN BOVENSTE TREDE IN GEEL UITVOEREN (RAL 1018)

## OPMERKINGEN

- OPTREDE = max. 210MM
- WP = WERKPUNT

- BIJ AFWIJKENDE TRAPPEN GELDT ALS ONTWERPADVIES:
  . DE OPTREDE MAG VARIEREN TUSSEN 170 MM EN 210 MM
  . DE OPTREDE MOET,PER TRAPPENHUIS,VOLKOMEN GELIJK ZIJN

- BIJ EEN VRIJ OVERSPANNENDE TRAP MET ROOSTERTREDEN, WAAR DE VALHOOGTE MEER IS DAN 4 METER MOET AAN DE ONDERFLENS VAN DE TRAPBOMEN EEN SLINGERVERBAND WORDEN AANGEBRACHT.

- HELLINGSHOEK BIJ VOORKEUR 9/10 (=41,98°)

TATA STEEL

ONDERWERP: STALEN TRAPPEN

CAD

SCHAAL ORIG.

PROJ. METHODE

WIJZ. 09 10

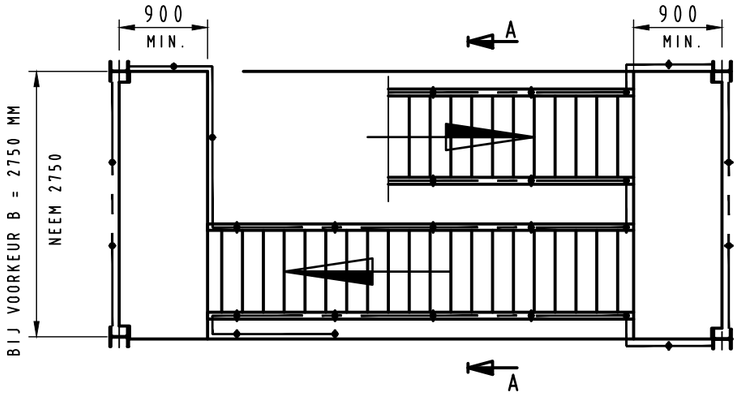
M.F.

TEK.NR. A33910

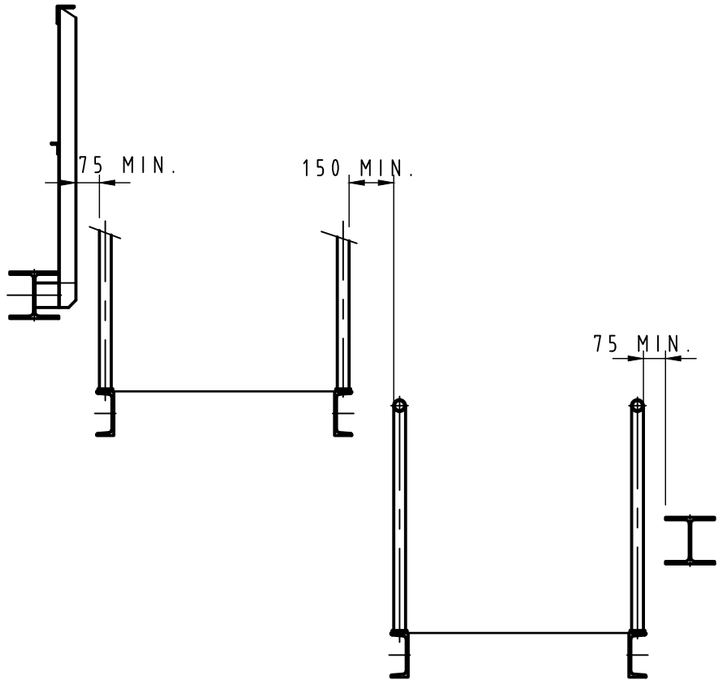
BLAD NR. 01

EP-dossier 12423

5021-(09/2000)




TRAPPENHAL ONTWERP



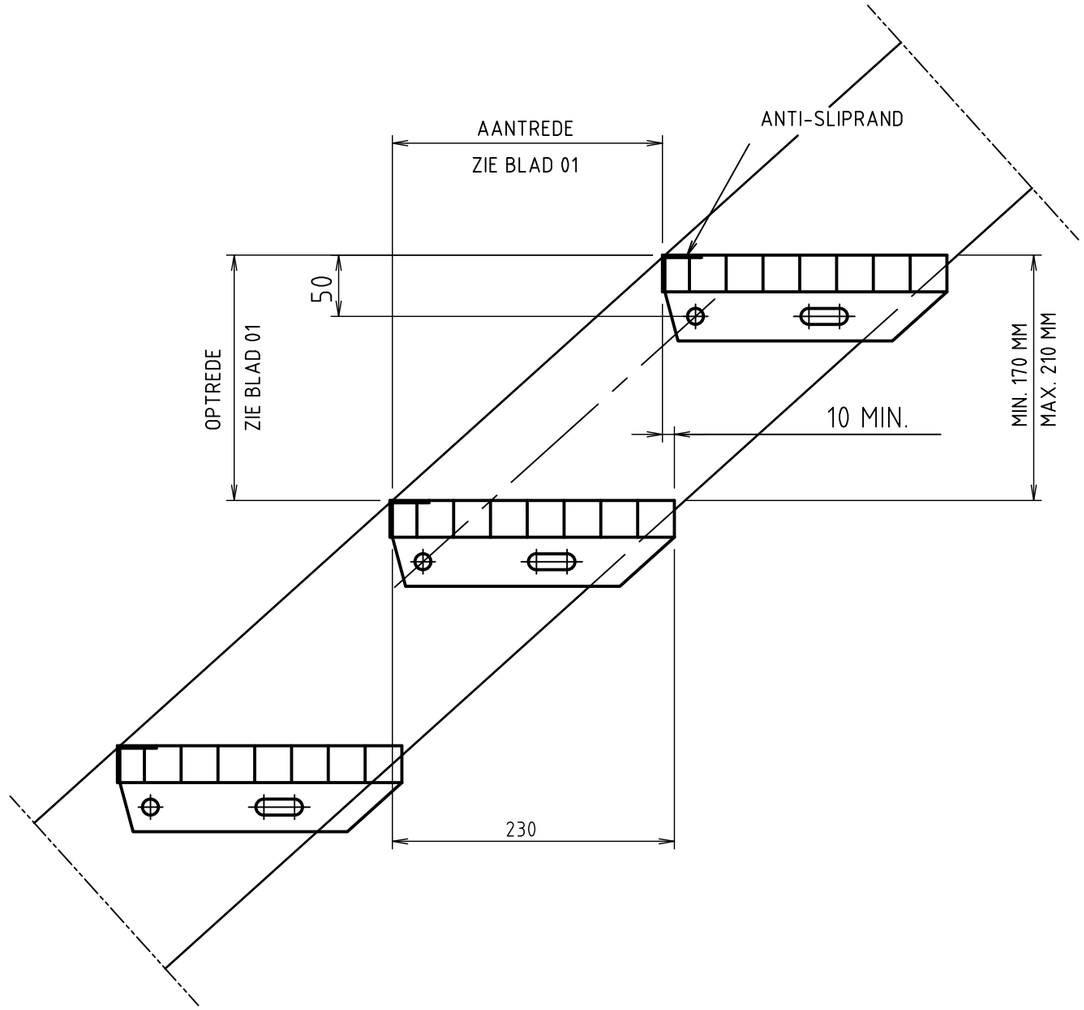

DOORSNEDE A-A

TATA STEEL

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ONDERWERP STALEN TRAPPEN | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. 09 10 / M.F. | TEK.NR. A33910 | BLAD NR. 02 |

EP-dossier 12423

5021-(09/2000)




PERSROOSTERTREDE

| | |
|---|---|
| DRAAGSTAVEN | : MIN. 30x3 MM² |
| VULSTAVEN | : MIN. 10x2 MM² |
| DRAAGSTAAF H.O.H. AFSTAND | : 33,3 MM |

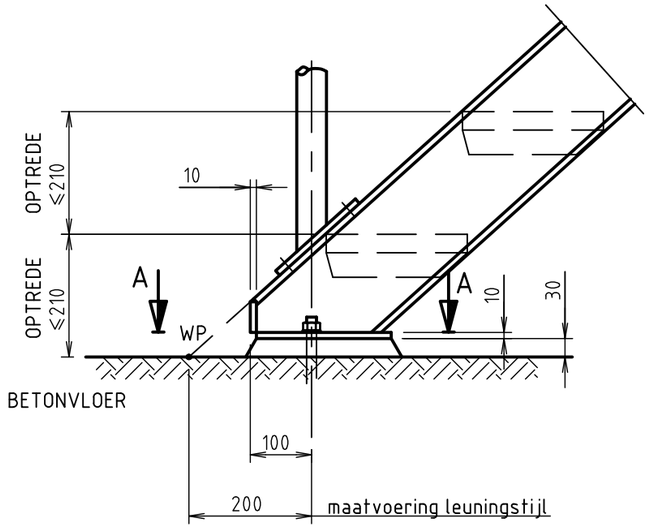
# TRAPTREDEN

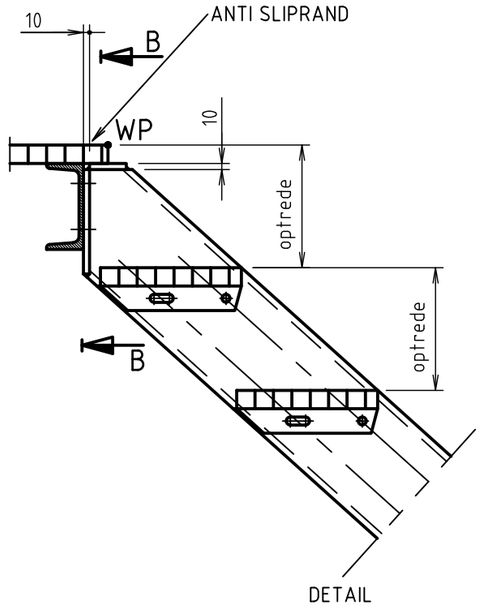
TATA STEEL

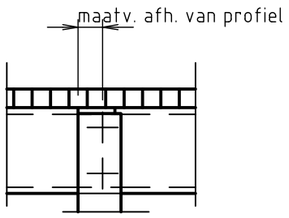
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ONDERWERP: TREDEN VOOR STALEN TRAPPEN | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | 09 10 | TEK.NR. A33910 | BLAD NR. 03 |

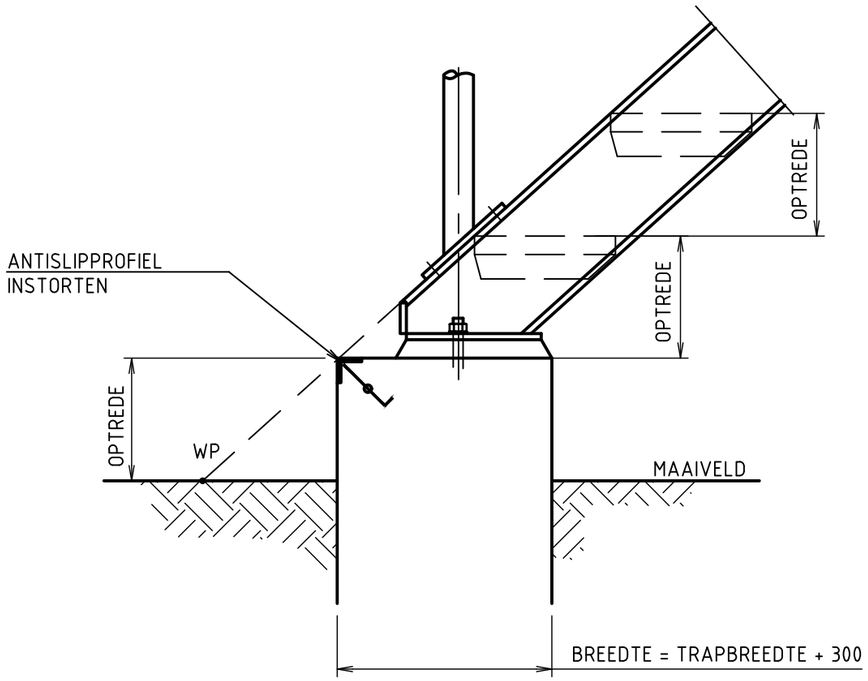
EP-dossier 12423

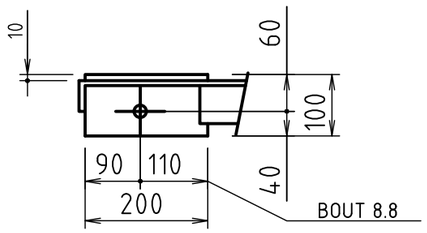
5021-(09/2000)



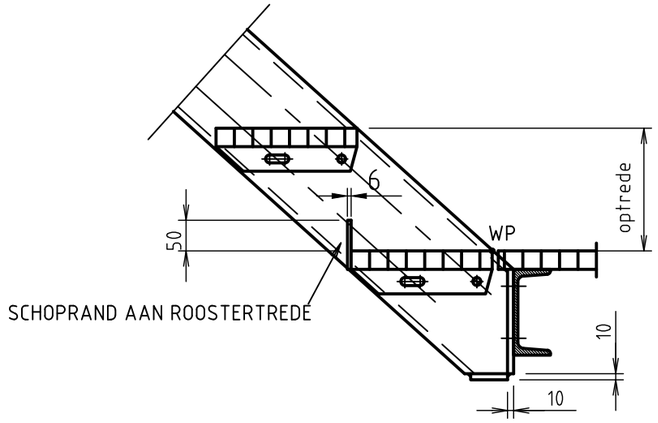




DOORSNEDE A - A




DETAIL

TATA STEEL

ONDERWERP
BEVESTIGING STALEN TRAPPEN
OP BETONNEN VLOER c.q. POER

CAD

SCHAAL ORIG.

PROJ. METHODE

WIJZ. 09 10

M.F.

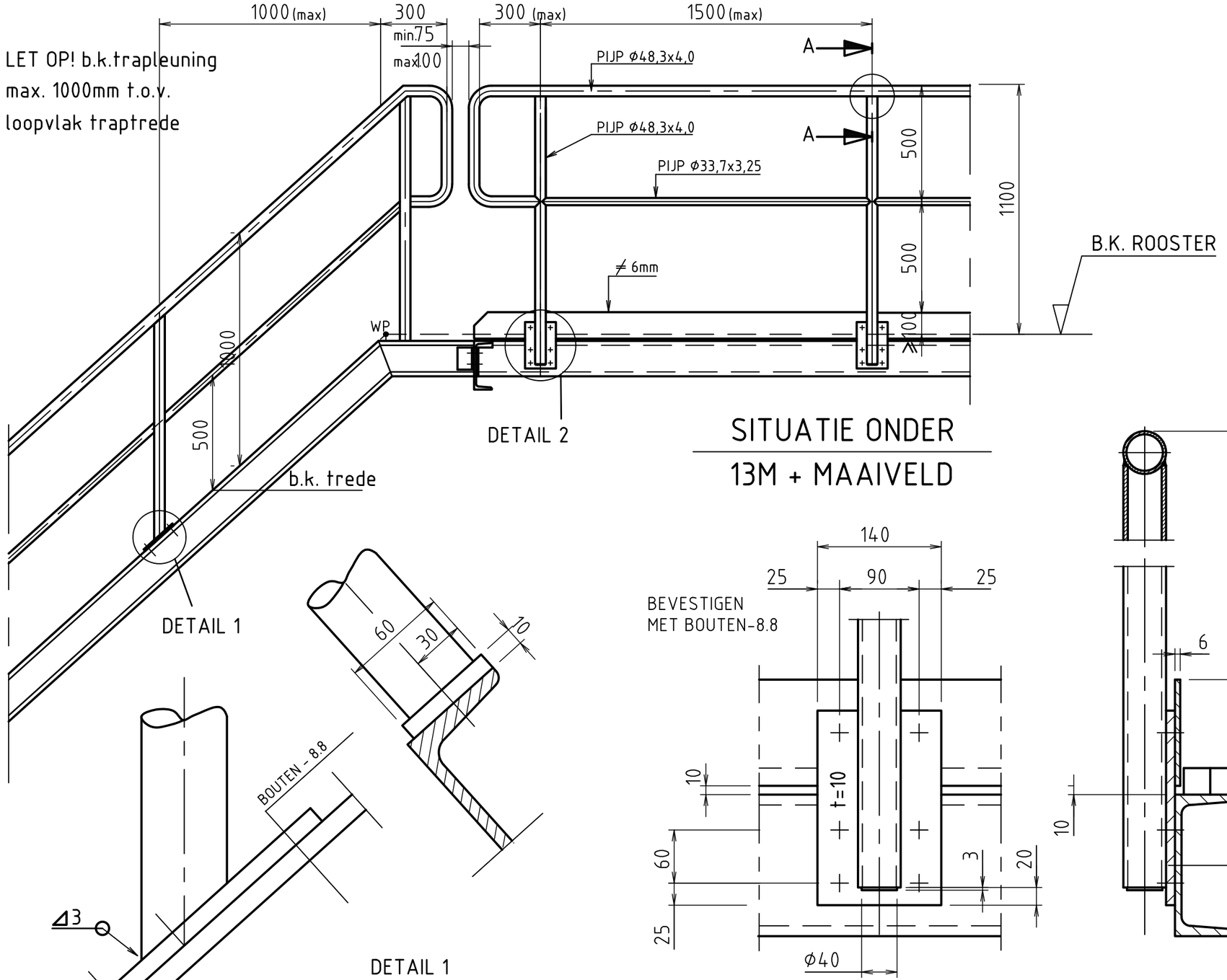
TEK.NR. A33910

BLAD NR. 04

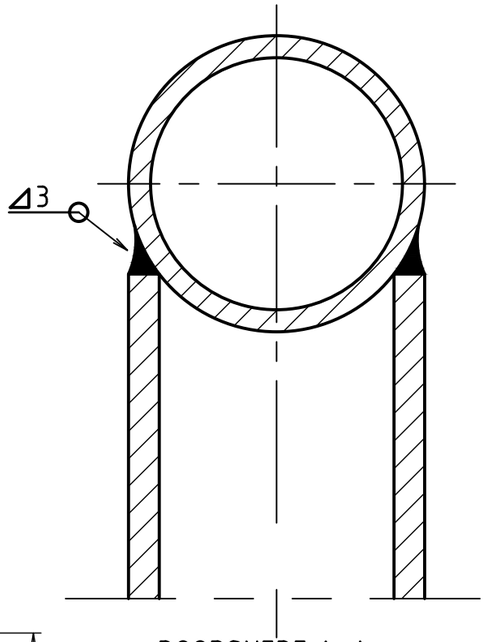
EP-dossier 12423

5021-(09/2000)

LET OP! b.k.trapleuning
max. 1000mm t.o.v.
loopvlak traptrede




# SITUATIE ONDER
# 13M + MAAIVELD



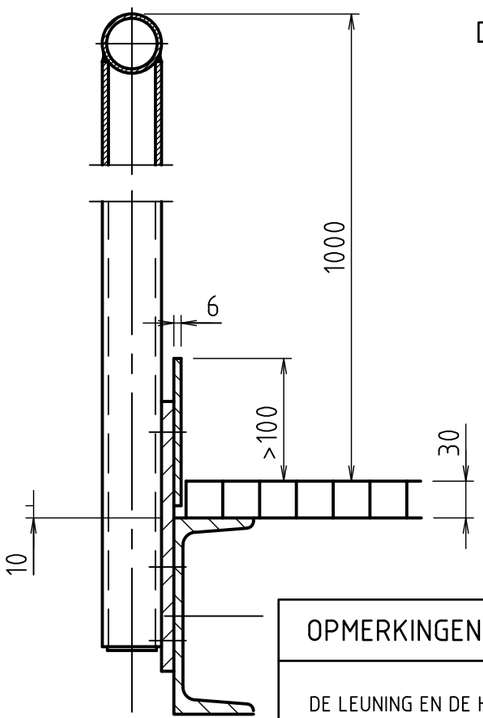

DOORSNEDE A-A
(1:1)




DETAIL 1
(1:2,5)




DETAIL 2 (1:5)




## OPMERKINGEN

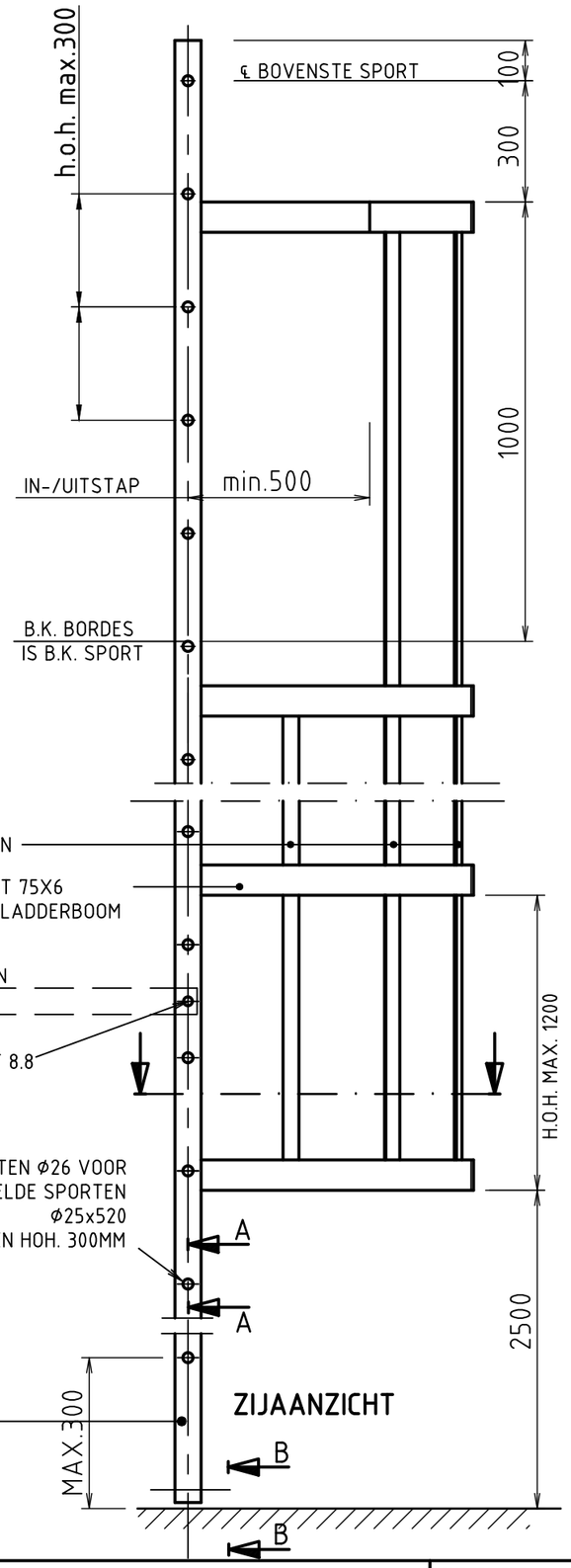
DE LEUNING EN DE HANDREGEL
ZODANIG AFWERKEN DAT GEEN SCHERPE HOEKEN,
RANDEN OF UITSTEEKSELS MERKBAAR ZIJN.
DIT TYPE LEUNING TOEPASSEN TOT 13M
VANAF MAAIVELD.

TATA STEEL

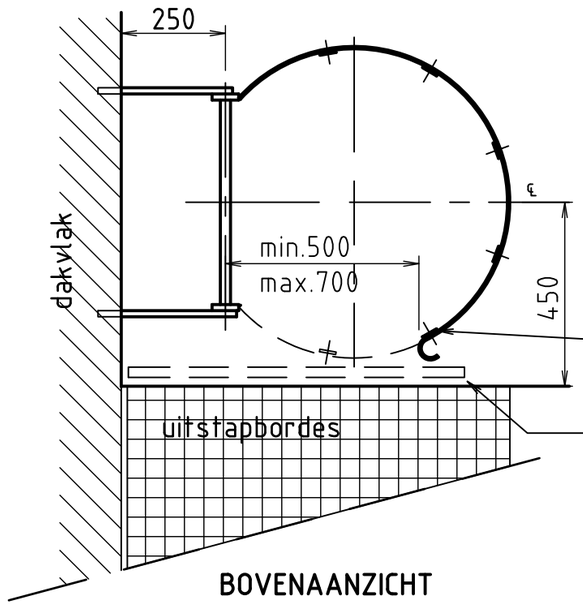
| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| LEUNINGEN VOOR TRAPPEN EN BORDESSEN (BUIS) | CAD | 1:20<br>1:2,5<br>1:1 1:5 | | 08 09 10<br>M.F. | A33910 | 05 |

EP-dossier 12423

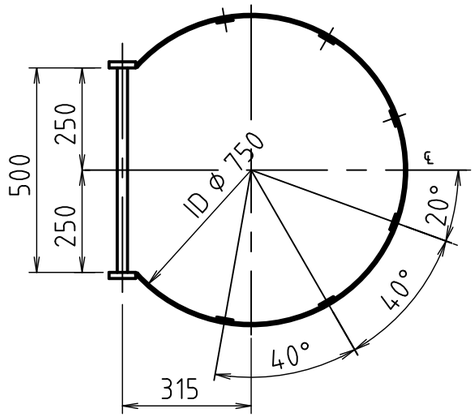
5021-(09/2000)



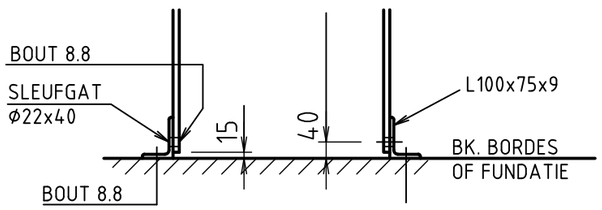

ZIJAANZICHT




BOVENAANZICHT

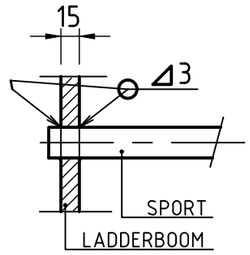



DOORSNEDE



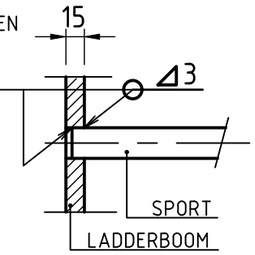

DOORSNEDE B-B

BIJ BUITENOPSTELLING EN OPEN HALLEN KOOILADDER GERIBBELDE SPORTEN INLATEN EN LASSEN AAN BINNEN- EN BUITENZIJDE LADDERBOOM

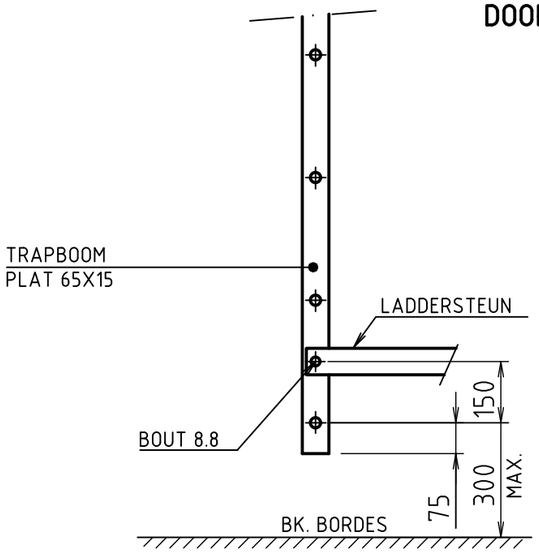



DOORSNEDE A-A
BUITEN

BIJ BINNENOPSTELLING KOOILADDER GERIBBELDE SPORTEN INLATEN EN LASSEN AAN BUITEN- EN BUITENZIJDE LADDERBOOM




DOORSNEDE A-A
BINNEN

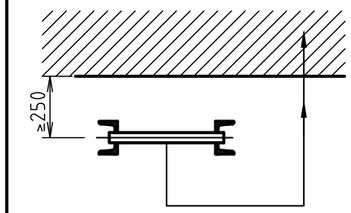



TATA STEEL

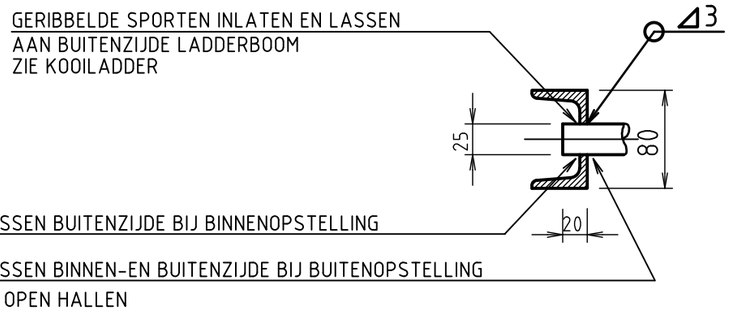
| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | 08 | 09 | 10 | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|---|---|---|
| STALEN KOOILADDERS VOOR VALHOOGTE ⩾2,5 METER | | | | M.F. | | | | A33910 | 06 |

EP-dossier 12423

5021-(09/2000)

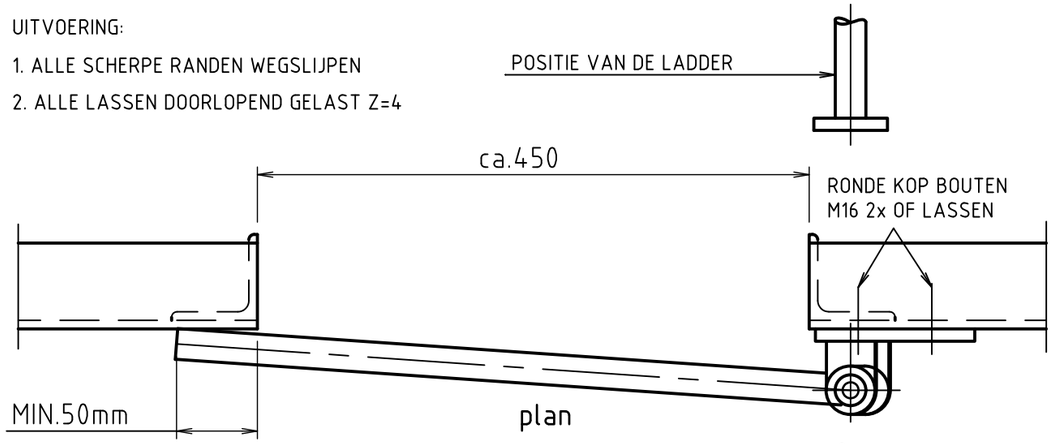


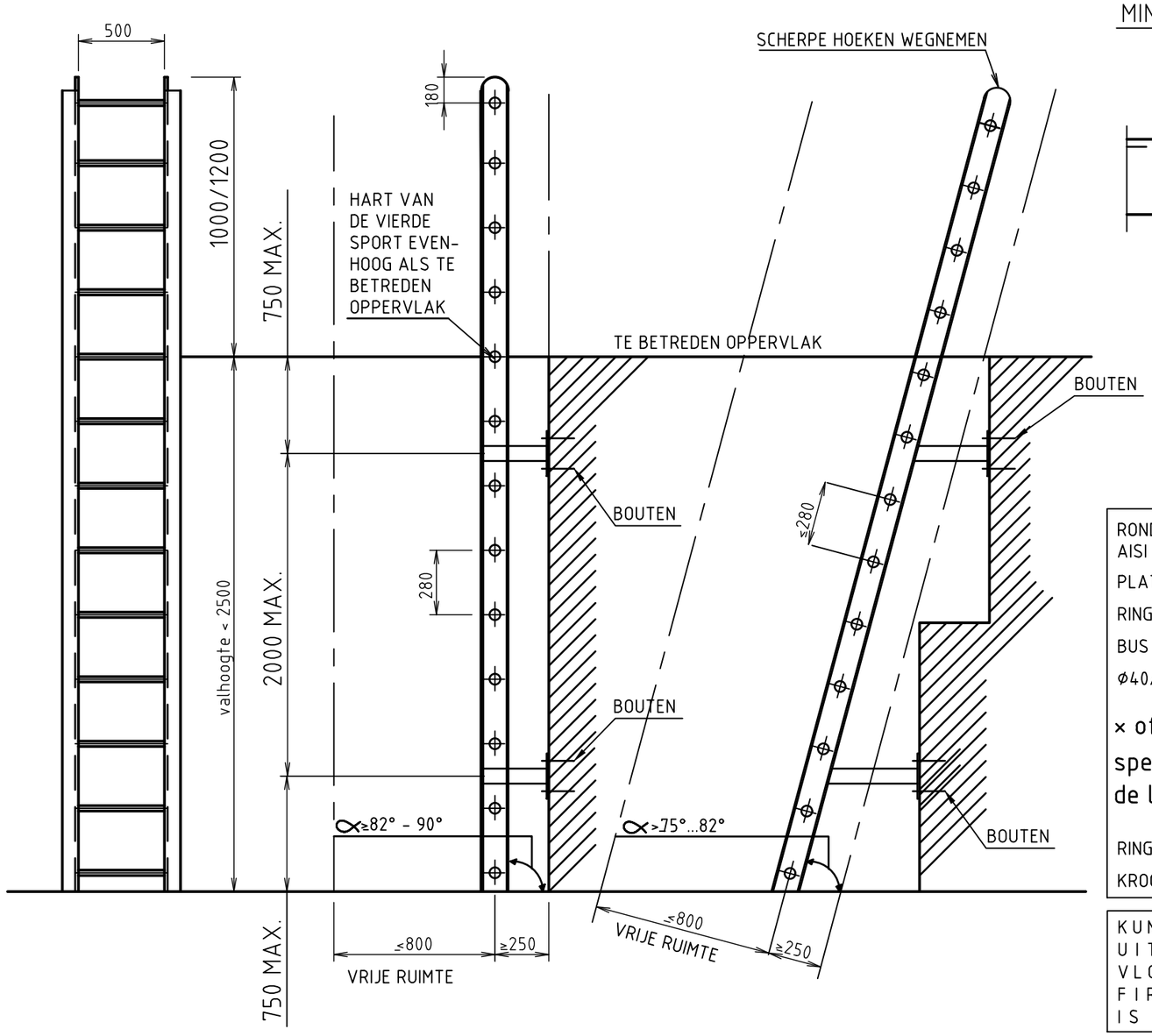

UITSTAP TE BETREDEN OPPERVLAK

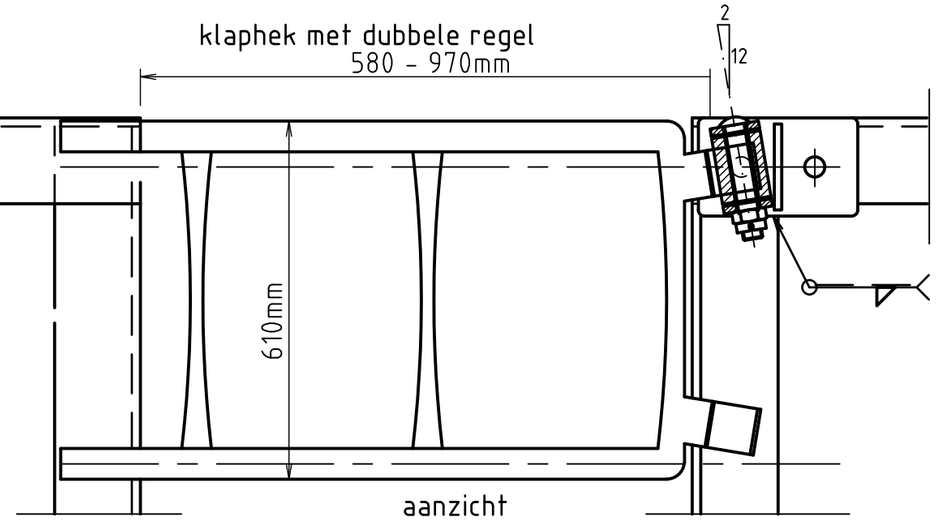



UITVOERING:

1. ALLE SCHERPE RANDEN WEGSLIJPEN
2. ALLE LASSEN DOORLOPEND GELAST Z=4



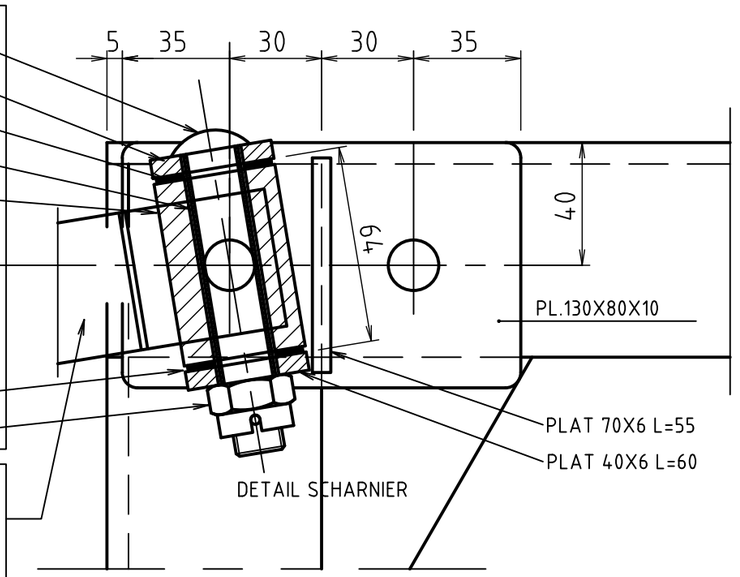




RONDE KOP BOUT M16X100
AISI 316
PLAT 40x6 L=60
RING ϕ38x18x1-PTFE
BUS ϕ18/16 L=60
ϕ40/20 L=60

× of volgens specificaties van de leverancier

RING ϕ38x18x1-PTFE
KROONMOER MET SPLITPEN

KUNSTSTOF UITVOERING, VLGS. LEVERANCIER FIRMA AMERPLASTICS IS TOEGESTAAN




TATA STEEL

ONDERWERP

STALEN LADDERS VOOR EEN VALHOOGTE 2,5 METER

CAD

SCHAAL ORIG

PROJ. METHODE

WIJZ. 09 10

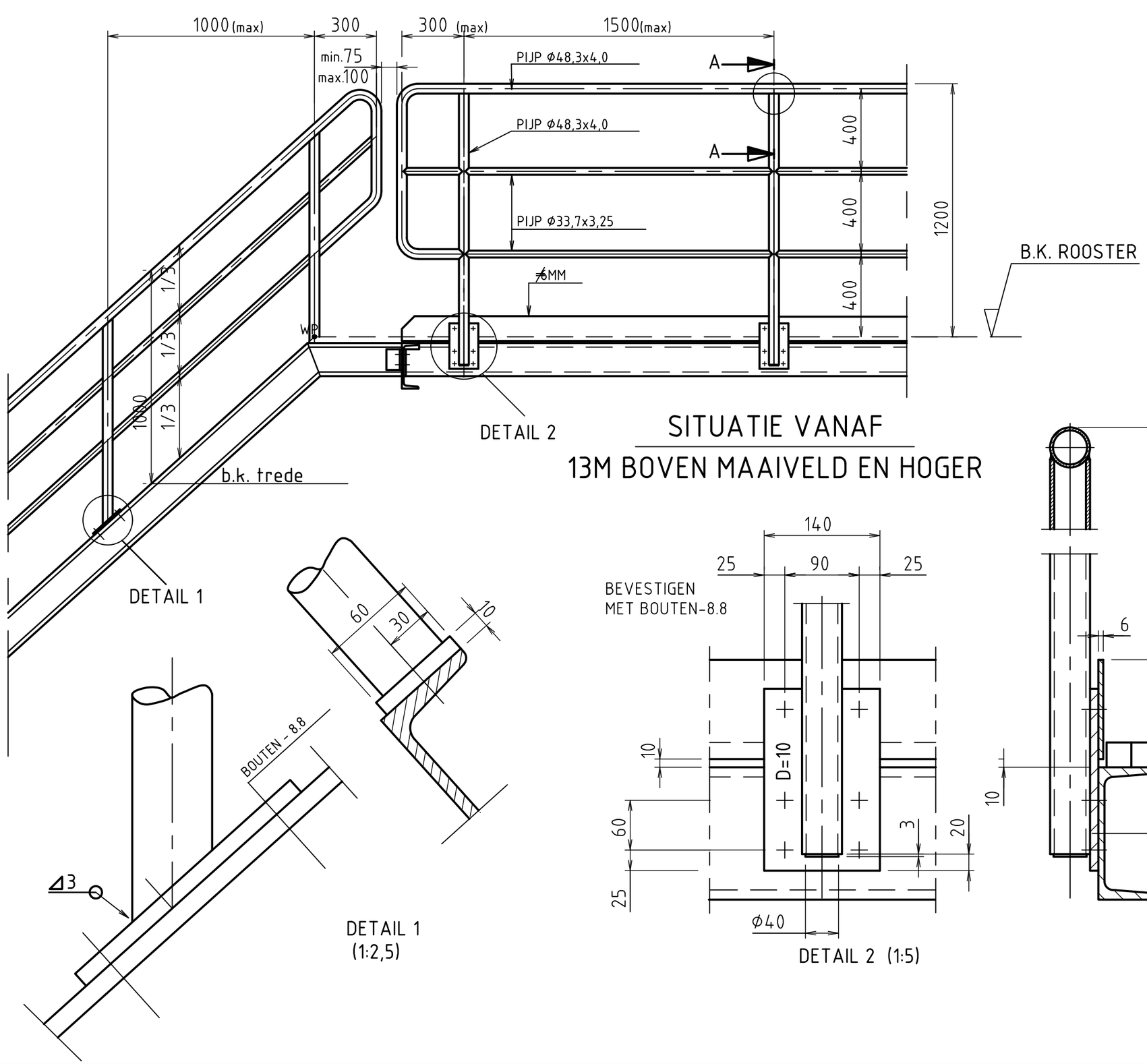
M.F.

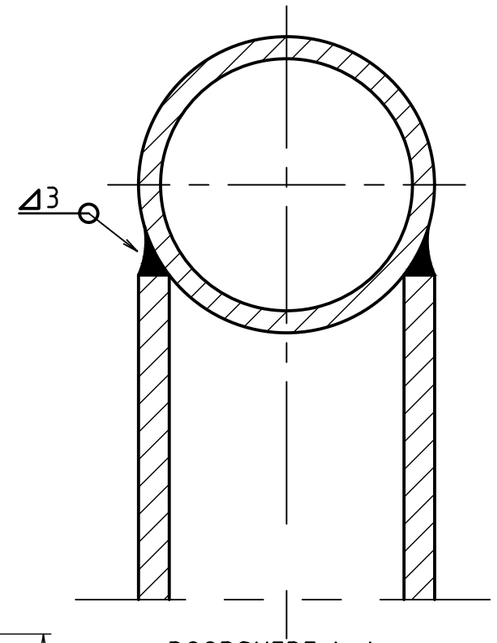
TEK.NR. A33910

BLAD NR. 07

EP-dossier 12423

5021-(09/2000)




# SITUATIE VANAF
# 13M BOVEN MAAIVELD EN HOGER



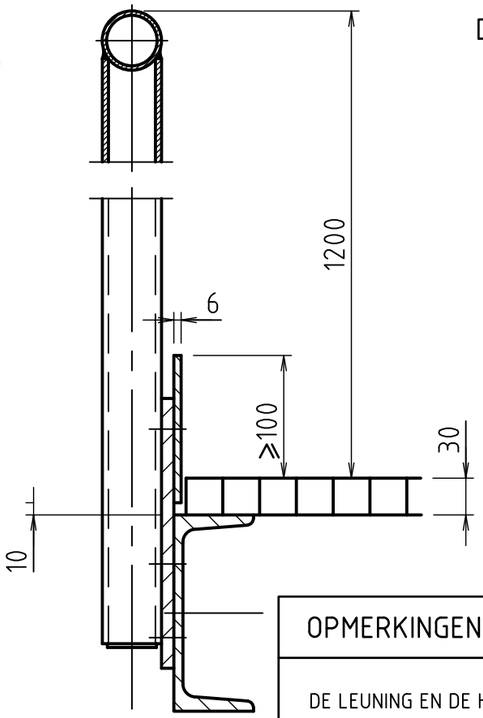













## OPMERKINGEN

DE LEUNING EN DE HANDREGEL
ZODANIG AFWERKEN DAT GEEN SCHERPE HOEKEN,
RANDEN OF UITSTEEKSELS MERKBAAR ZIJN.
DIT TYPE LEUNING TOEPASSEN VANAF
13M BOVEN MAAIVELD EN HOGER.

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| LEUNINGEN VOOR TRAPPEN EN BORDESSEN (BUIS) | CAD | 1:20<br>1:2,5<br>1:1 1:5 | | M.F. 09 10 | A33910 | 08 |

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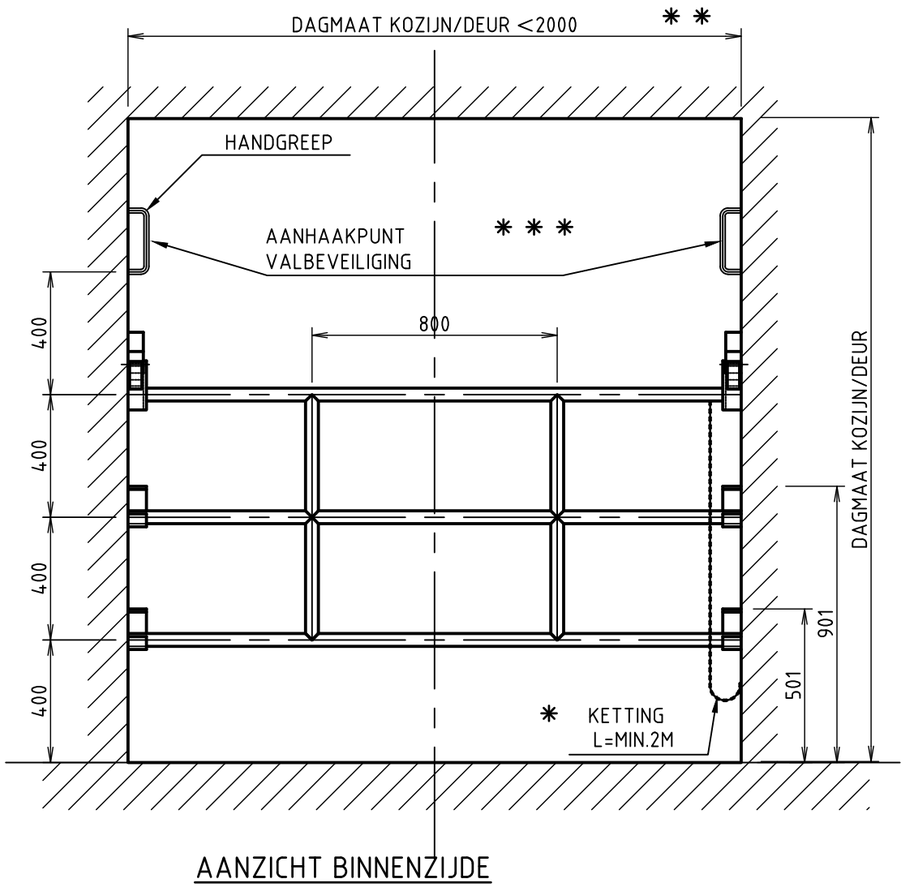
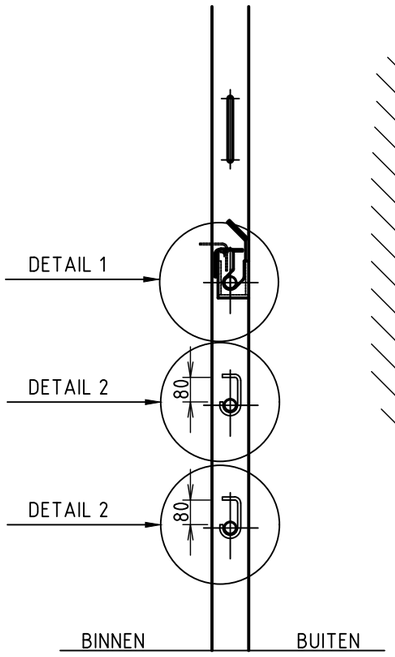
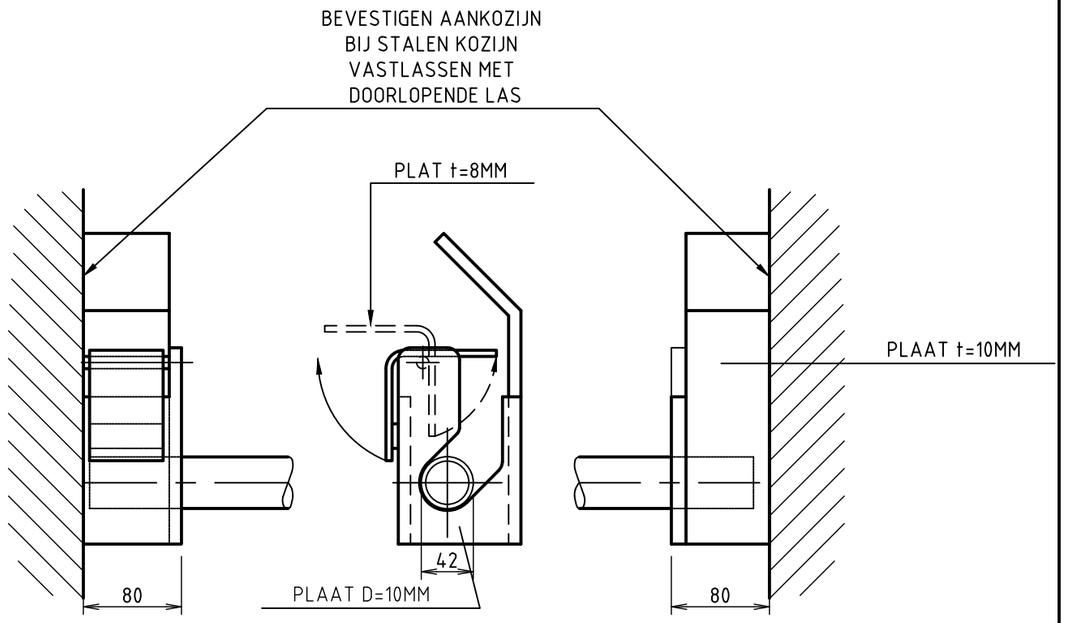
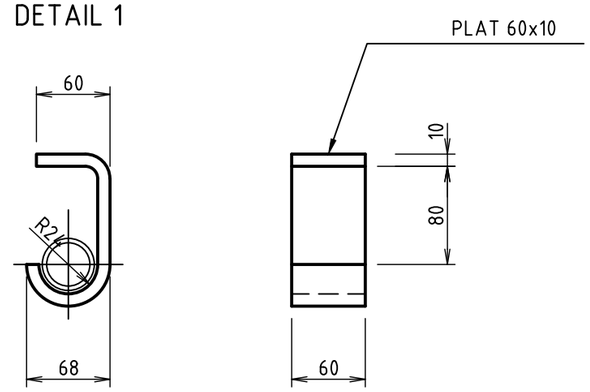



AANZICHT BINNENZIJDE




DETAIL 1




DETAIL 2

* ketting en bevestiging van ketting dienen een vrije last van F=2kN te kunnen dragen

* * bij grotere dagmaten tussenstijlen toepassen

* * * aanhaakpunt valbeveiliging dienen een vrije last van F=2kN te kunnen dragen
Deze dient jaarlijks gekeurd te worden
op deugdelijkheid (voorzien van een jaarsticker)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| VOORBEELD WEGNEEMBAAR VEILIGHEIDSHEK | | | | 06 08 09 10 / M.F. | A33910 | 09 |

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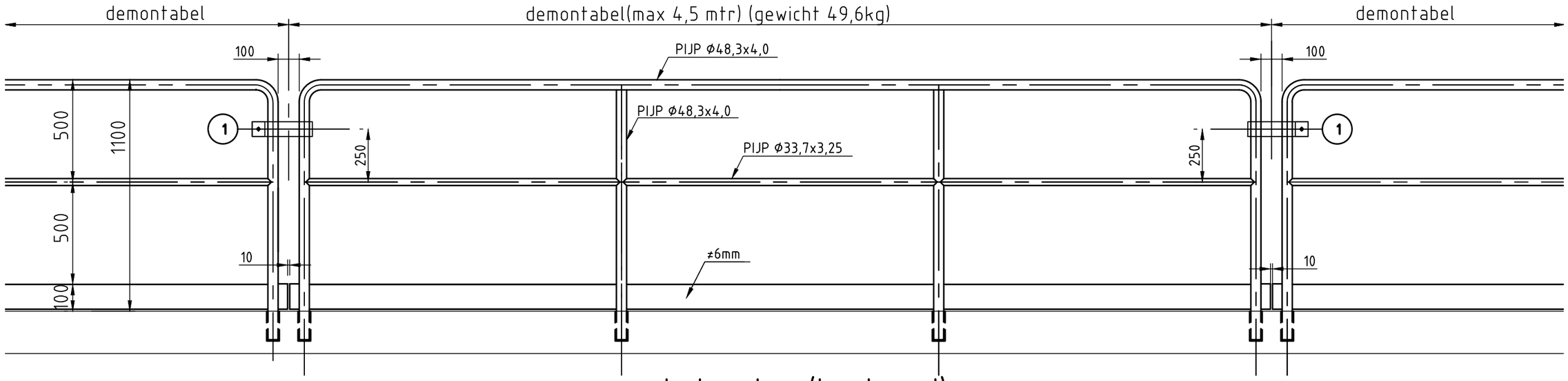
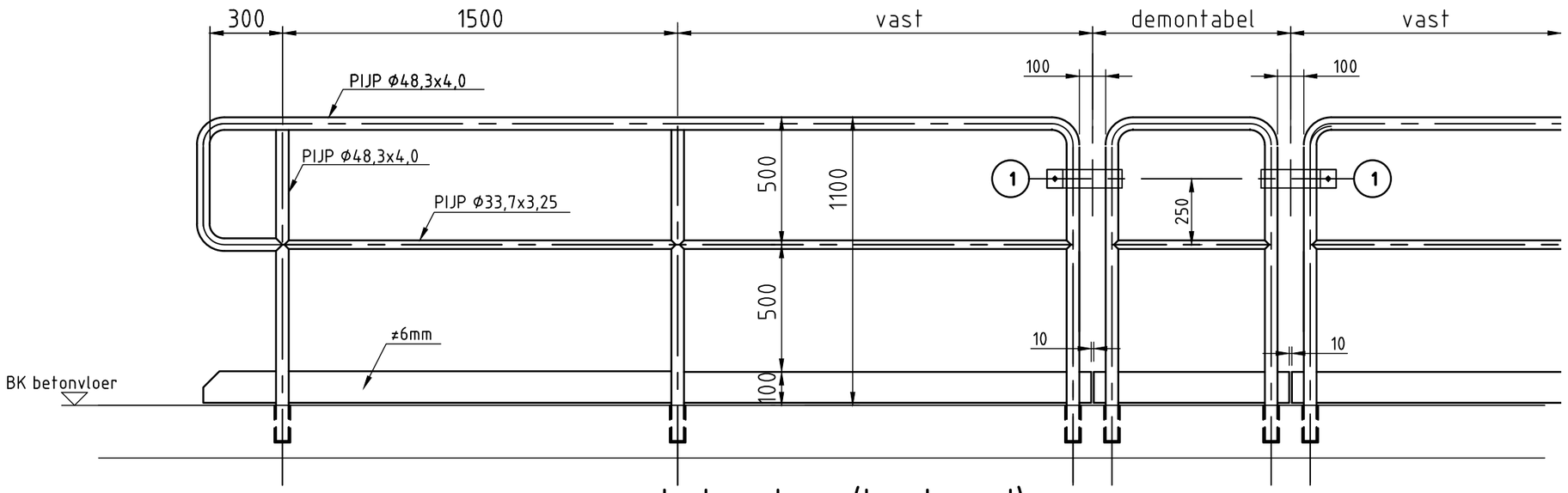



## op betonvloer(bestaand)

bij valhoogte < 13 m.




## op betonvloer (bestaand)

bij valhoogte < 13 m.

Een demontabel hek altijd verwijderen met minimaal twee mensen. Max. 18kg per persoon.

Algemeen:
- lassen : ◣ a= ½ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Voor details zie:
A33910-30, -31 en -32

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING OP BETON - (B) | | 1:20 | | 08 09 10 / M.F. | A33910 | 20 |

5021-(09/2000)



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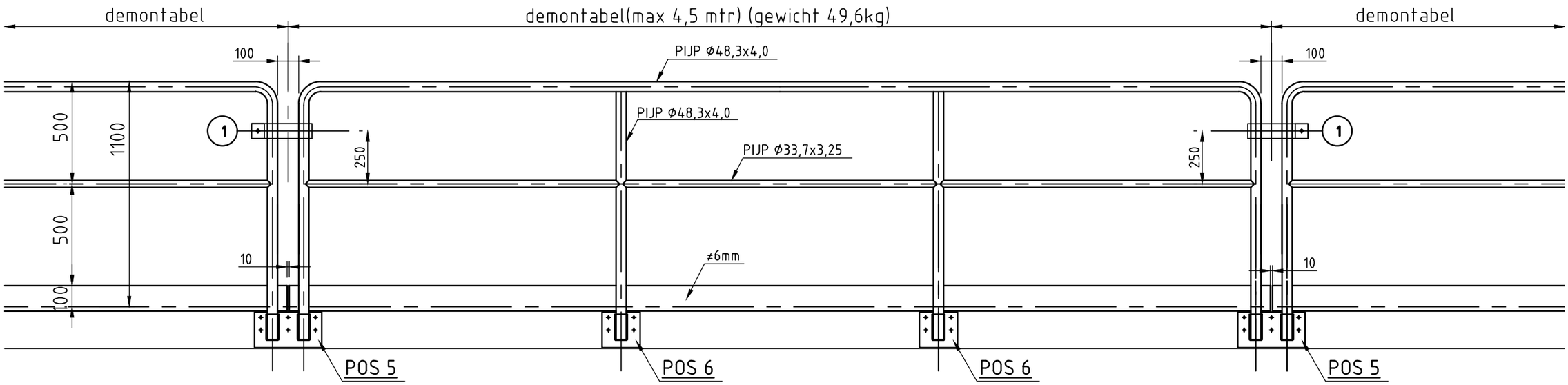
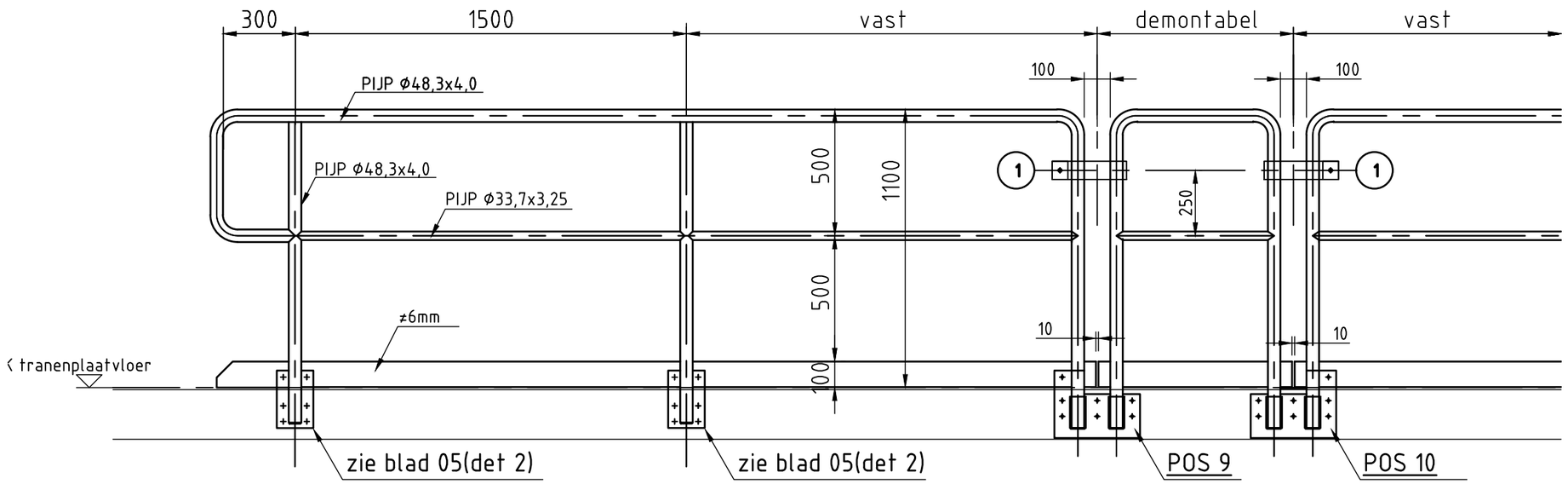



# tranenplaat(nieuw)

bij valhoogte < 13 m.




# tranenplaat(nieuw)

bij valhoogte < 13 m.

Een demontabel hek altijd verwijderen met minimaal twee mensen. Max. 18kg per persoon.

Algemeen:
- lassen : ◣ a= $\frac{1}{2}$ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Voor details zie:
A33910-30, -31 en -32

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING TRANENPLAAT - (N) | | 1:20 | | M.F. 08 09 10 | A33910 | 21 |

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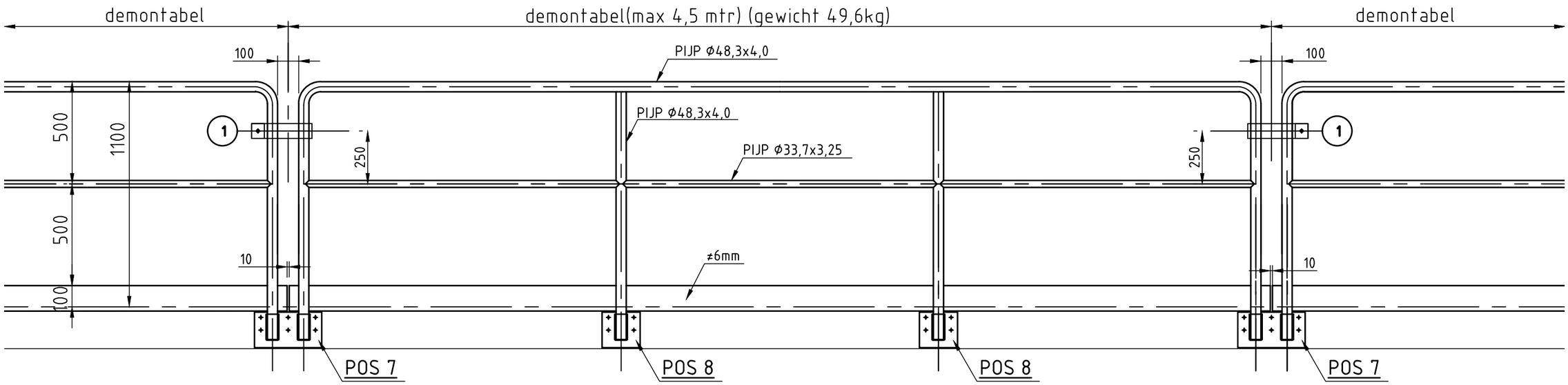
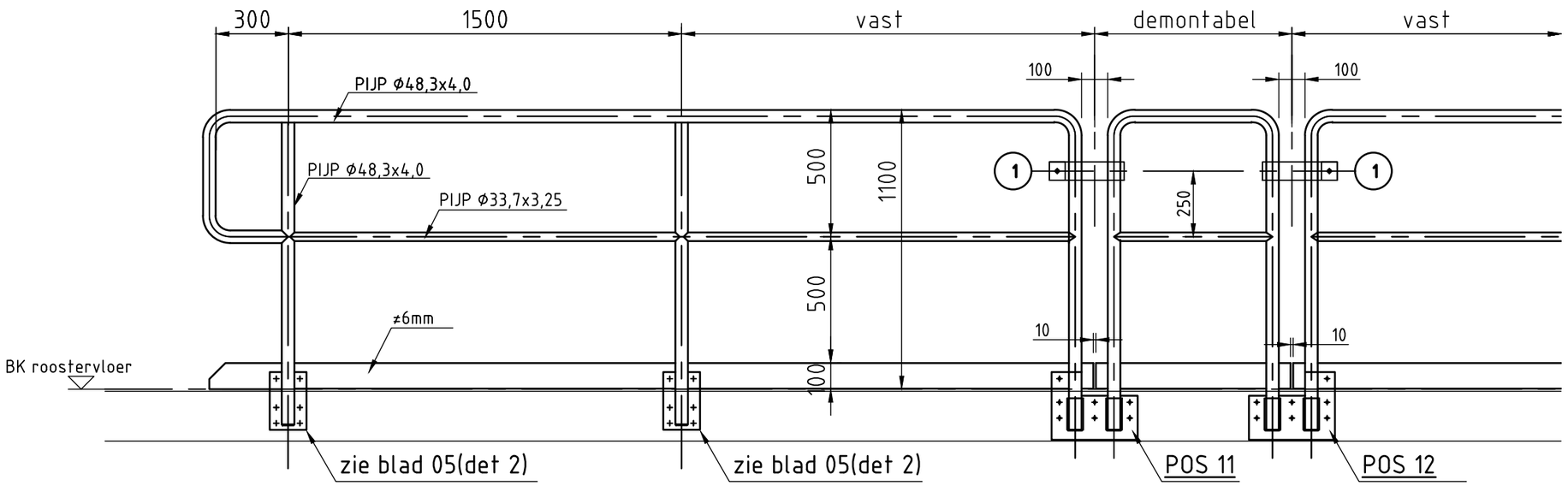
5021-(09/2000)




rooster(nieuw)
bij valhoogte < 13 m.




rooster(nieuw)
bij valhoogte < 13 m.

Een demontabel hek altijd verwijderen met minimaal twee mensen. Max. 18kg per persoon.

Algemeen:
- lassen : ◣ a= $\frac{1}{2}$ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Voor details zie:
A33910-30, -31 en -32

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | | WIJZ. | 08 | 09 | 10 | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING ROOSTERS - (N) | | 1:20 | PROJ. METHODE | M.F. | | | | A33910 | 22 |

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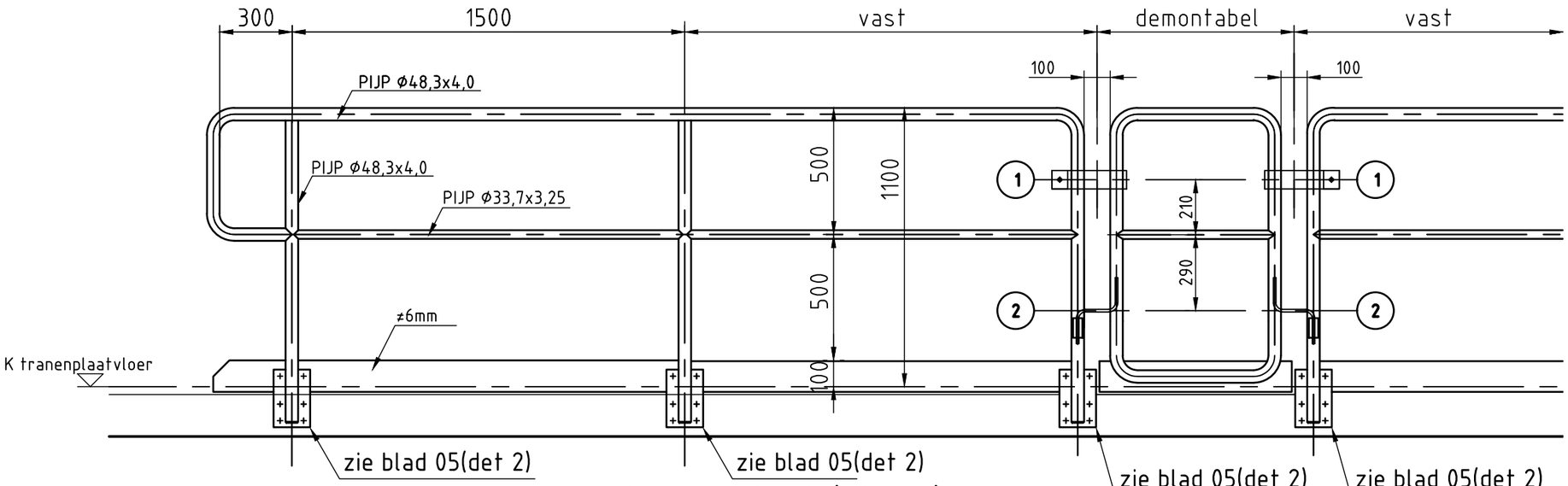
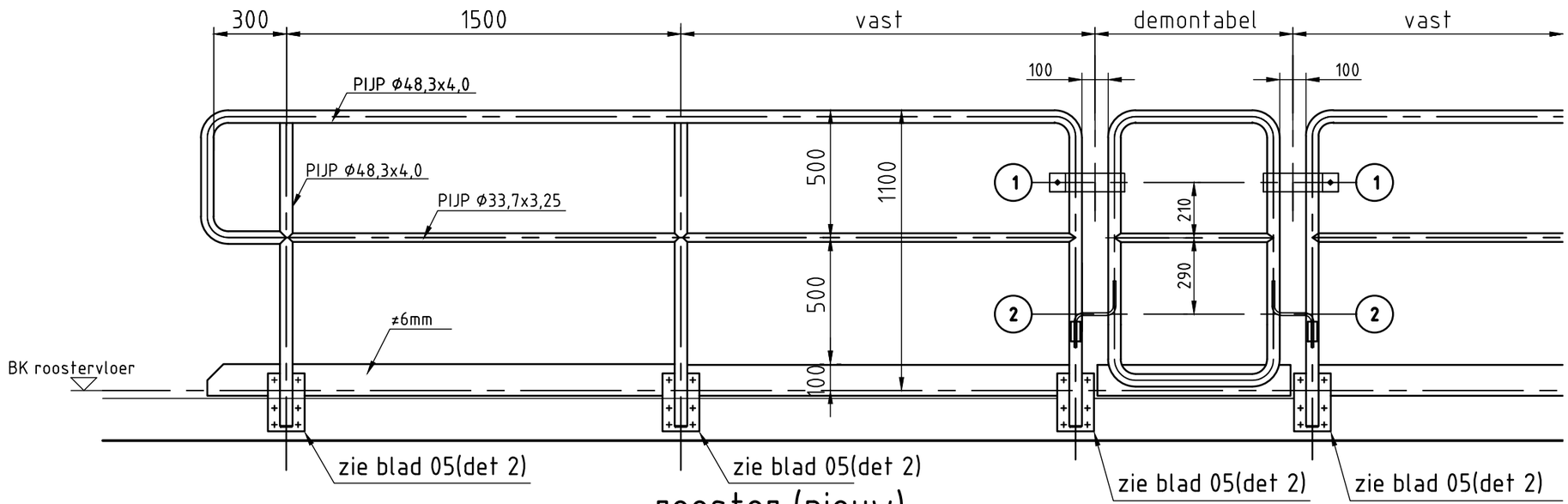



## tranenplaat (nieuw)
bij valhoogte < 13 m.




## rooster (nieuw)
bij valhoogte < 13 m.

Algemeen:
- lassen : ◣ a= $\frac{1}{2}$ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Voor details zie:
A33910-30, -31 en -32

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING TRANENPLAAT & ROOSTERS - (N) | | 1:20 | | 08 09 10 / M.F. | A33910 | 23 |

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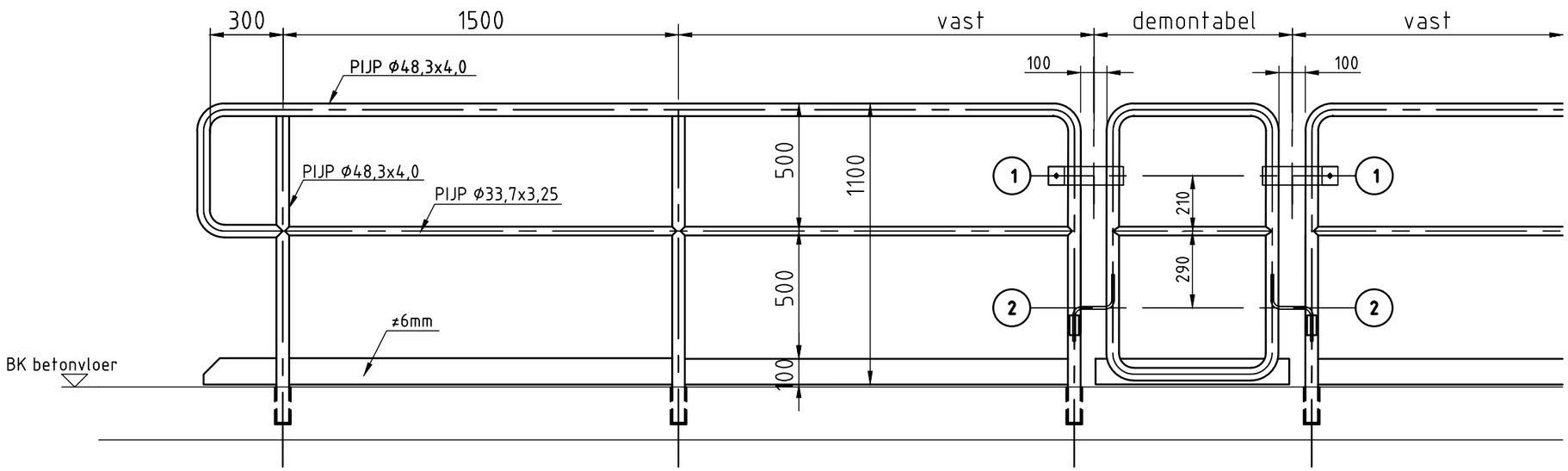


# op betonvloer (nieuw)

bij valhoogte < 13 m.

Algemeen:
- lassen : ◣ a= $\frac{1}{2}$ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Voor details zie:
A33910-30, -31 en -32

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | 08 | 09 | 10 | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING OP BETON - (N) | | 1:20 | | M.F. | | | | A33910 | 24 |

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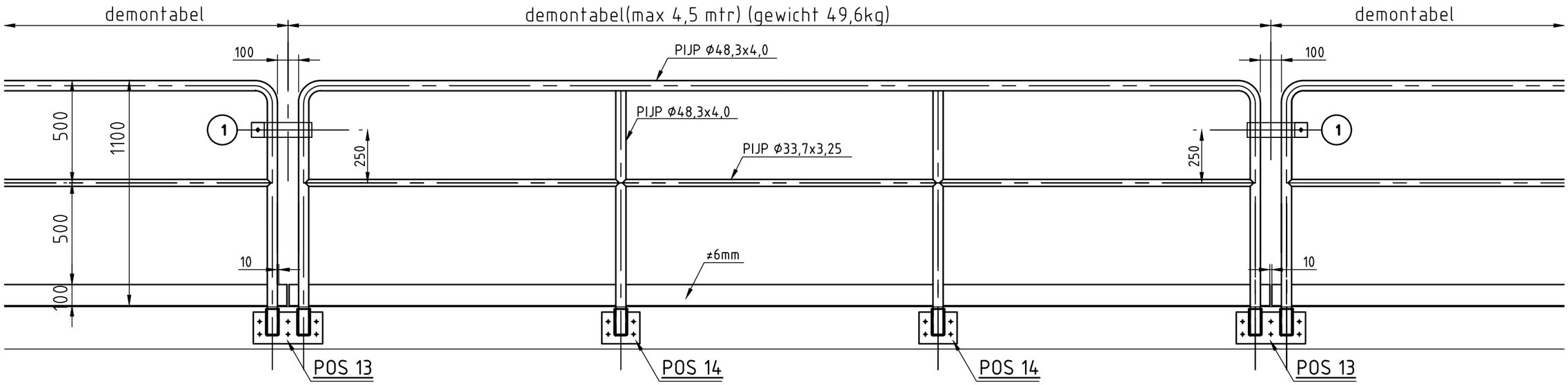
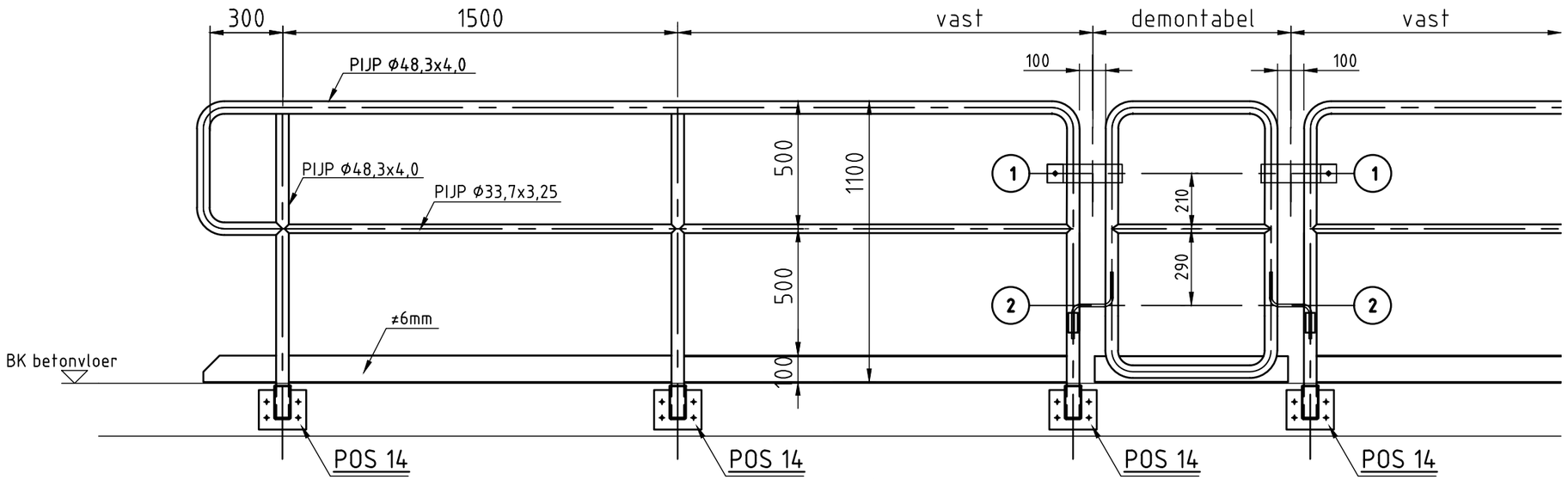
5021-(09/2000)




## tegen betonvloer(nieuw)
bij valhoogte < 13 m.




## tegen betonvloer (nieuw)
bij valhoogte < 13 m.

Een demontabel hek altijd verwijderen met minimaal twee mensen. Max. 18kg per persoon.

Algemeen:
- lassen : ◣ a= $\frac{1}{2}$ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Voor details zie:
A33910-30, -31 en -32

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING TEGEN BETONVLOER - (N) | | 1:20 | | M.F. 08 09 10 | A33910 | 25 |

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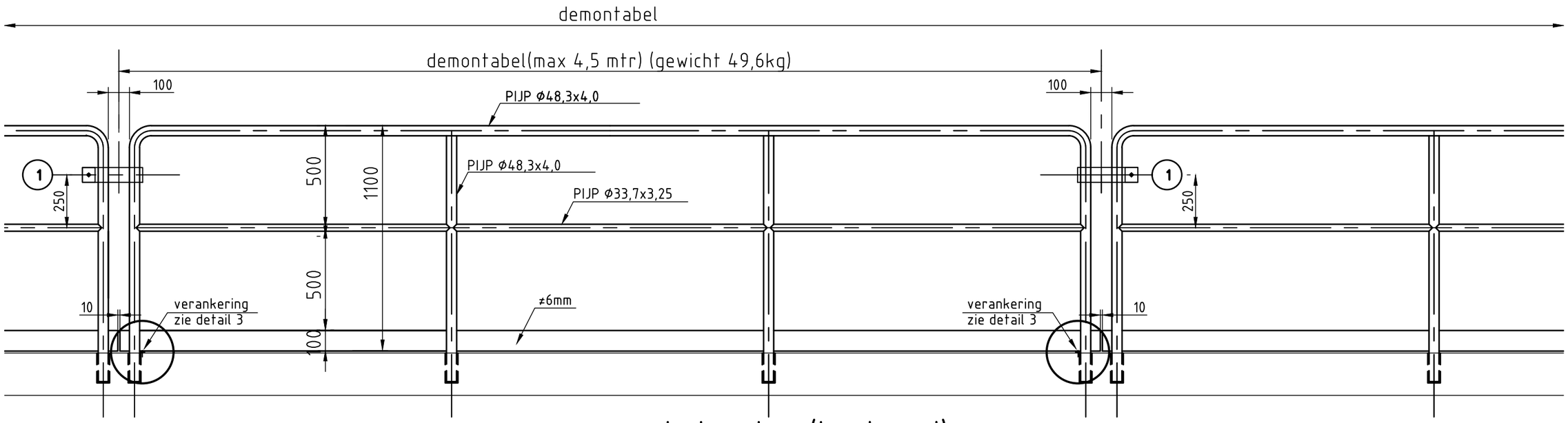


# op betonvloer(bestaand)

bij valhoogte < 13 m.

Een demontabel hek altijd verwijderen met minimaal twee mensen. Max. 18kg per persoon.

Algemeen:
- lassen : ◣ a= $\frac{1}{2}$ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Voor details zie:
A33910-30, -31 en -32

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | 08 | 09 | 10 | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING OP BETON - (B) | | 1:20 | | M.F. | | | | A33910 | 26 |

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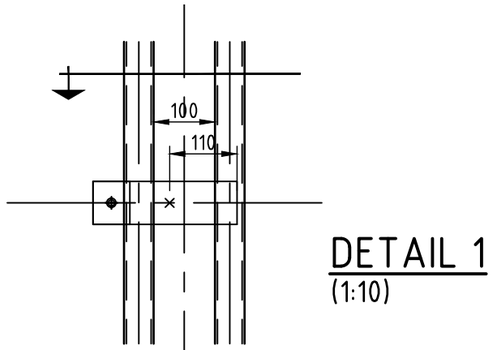
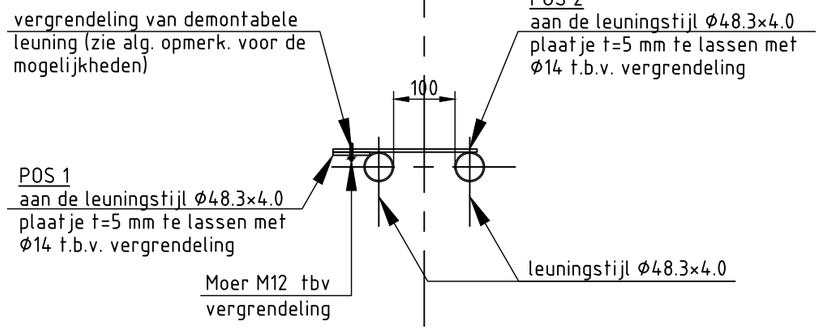
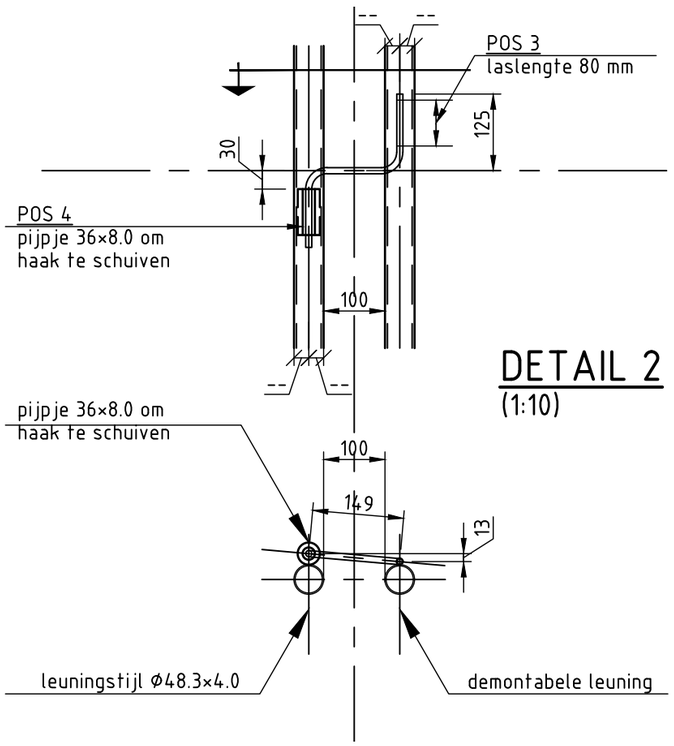
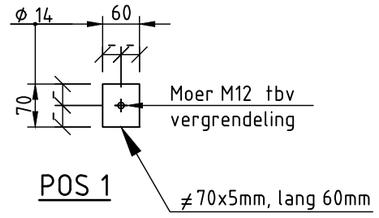



## DETAIL 1
(1:10)

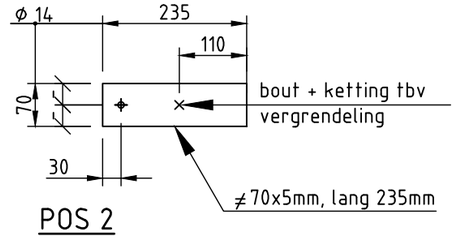


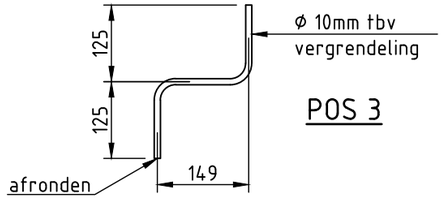

## DETAIL 2
(1:10)




POS 1

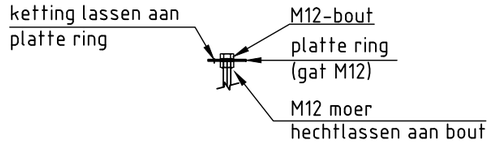



POS 2




POS 3

POS 4 — stalen pijp ϕ36x8mm, lengte 75mm




Voetketting, thermisch verzinkt, DIN5685
met lange rechte schakel. uitw. maat 40×16,
mat. dikte 4 mm, lengte 180mm.
Ook lassen aan POS 2!

**Algemeen:**
- lassen : ◣ a= ½ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

**Vergrendeling:**
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | SCHAAL ORIG. | | WIJZ. | 08 | 09 | 10 | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING DETAILS 1 en 2 | 1:10 | CAD / PROJ. METHODE | M.F. | | | | A33910 | 30 |

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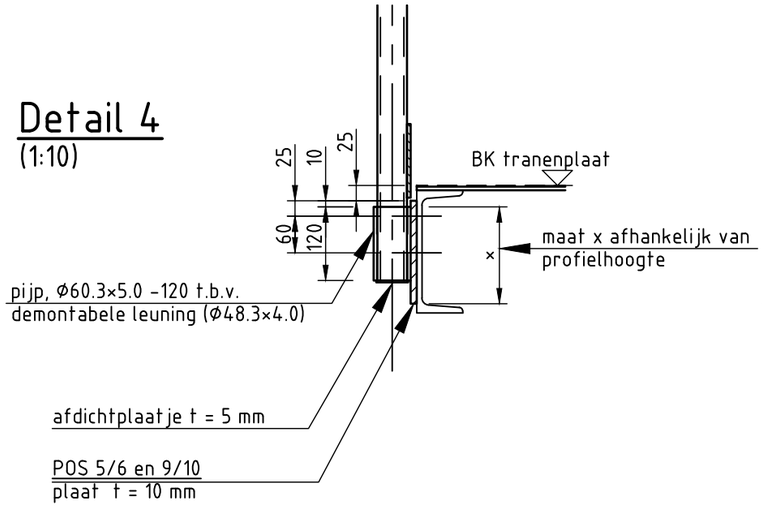
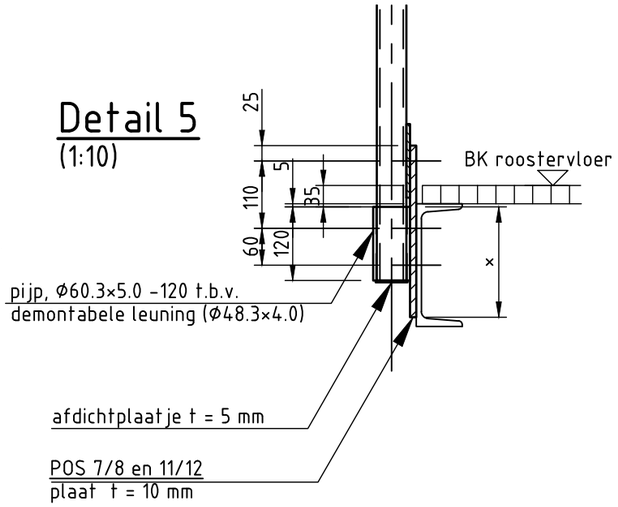
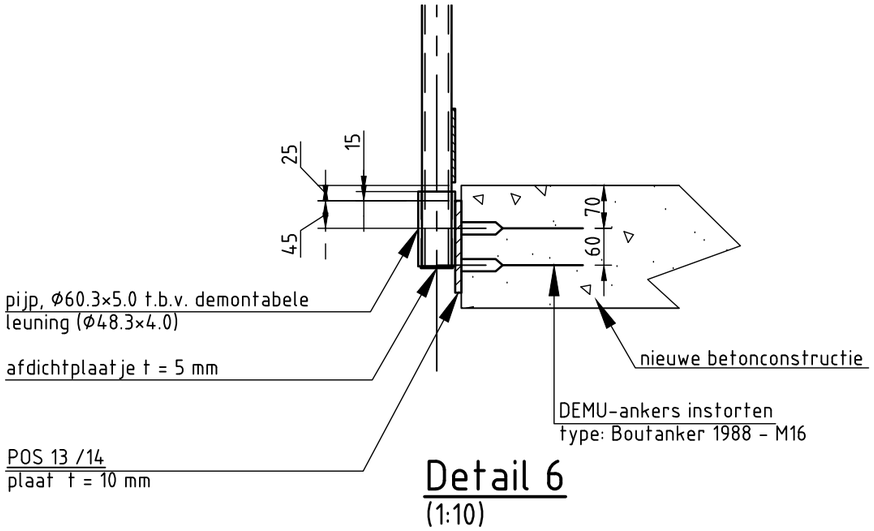
## Detail 4
(1:10)

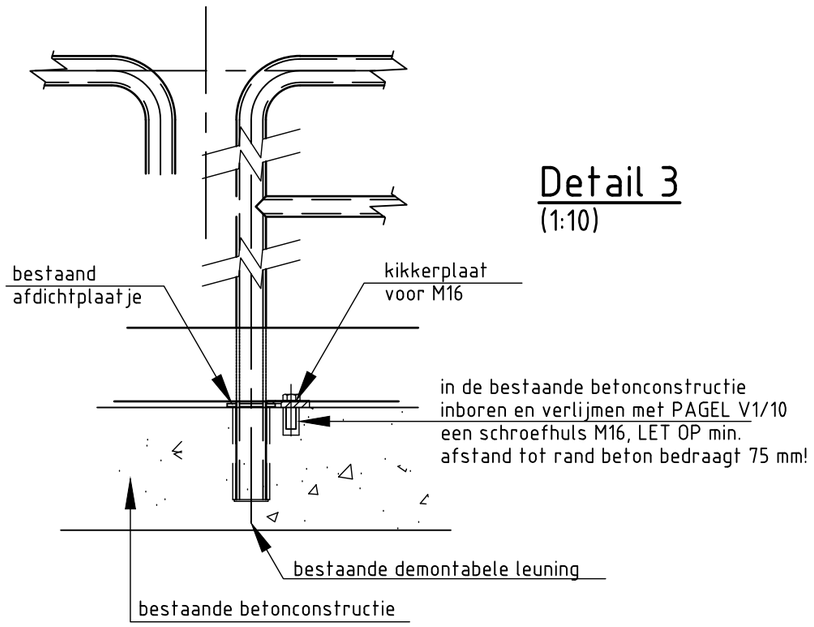



## Detail 5
(1:10)

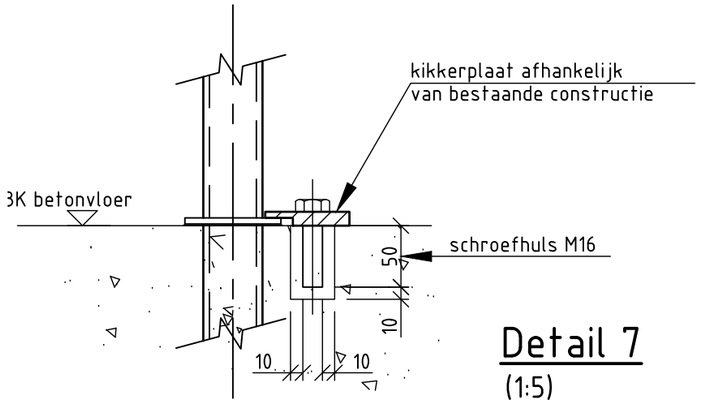



## Detail 6
(1:10)




## Detail 3
(1:10)




## Detail 7
(1:5)

maten x en y zijn afhankelijk van de toe te passen profielhoogte

Algemeen:
- lassen : ◣ a= ½ t
- alle maten bekijken met toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Vergrendeling:
- bout M12 (aan ketting) en moer (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING<br>DETAILS 3 t/m 7 | | 1:10 / 5 | | M.F. 08 09 10 | A33910 | 31 |

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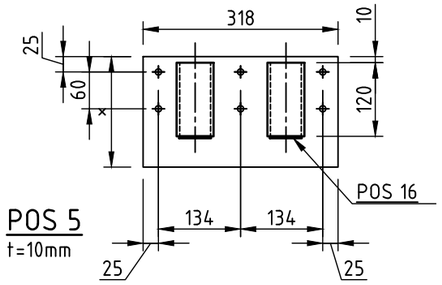
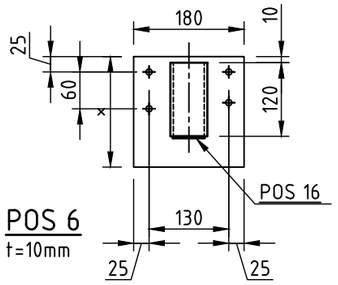
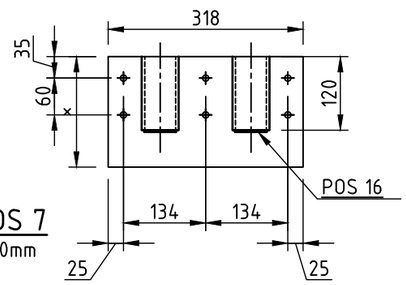
5021-(09/2000)



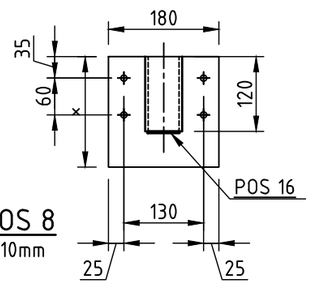

POS 5
t=10mm



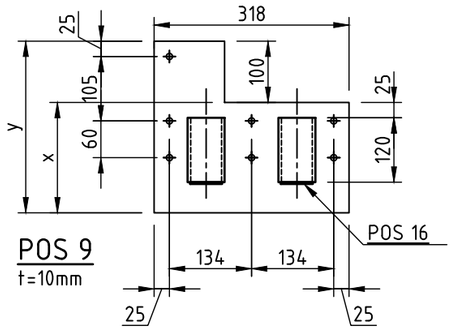

POS 6
t=10mm



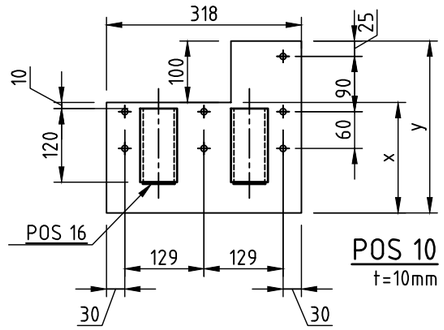

POS 7
t=10mm



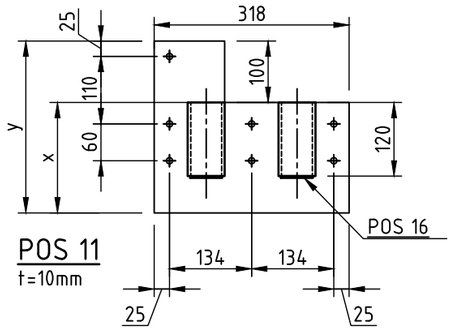

POS 8
t=10mm



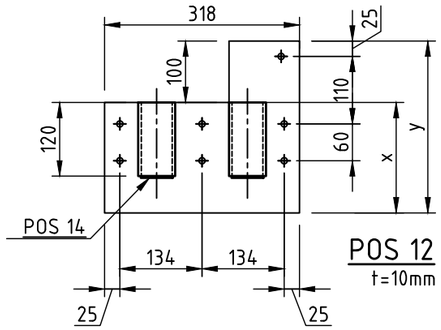

POS 9
t=10mm



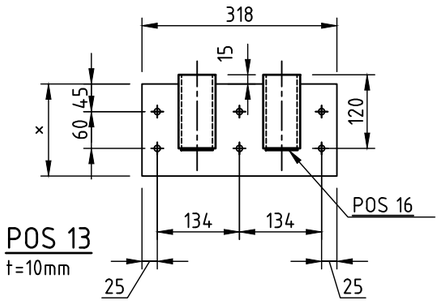

POS 10
t=10mm



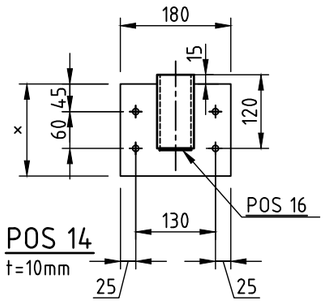

POS 11
t=10mm



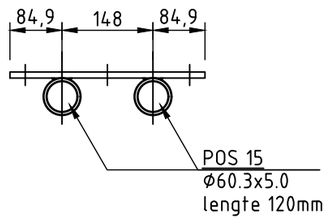

POS 12
t=10mm



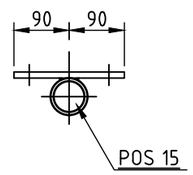

POS 13
t=10mm

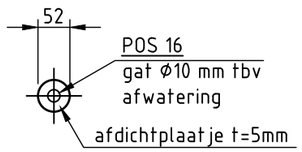



POS 14
t=10mm




POS 15
ϕ60.3x5.0
lengte 120mm




maten x en y zijn afhankelijk van
de toe te passen profielhoogte

Algemeen:
- lassen : ◣ a= ½ t
- alle maten bekijken met
  toegepaste bordesliggers
- bouten en moeren kwaliteit 8.8

Vergrendeling:
- bout M12 (aan ketting) en moer
  (lassen aan plaat)
- hangslot (veiligheidsslot 9 mm)

TATA STEEL

| ONDERWERP | CAD | SCHAAL ORIG. | PROJ. METHODE | WIJZ. | TEK.NR. | BLAD NR. |
|---|---|---|---|---|---|---|
| DEMONTABELE LEUNING<br>DETAILS POS nrs 5 t/m 16 | | 1:10 | | 08 09 10<br>M.F. | A33910 | 32 |

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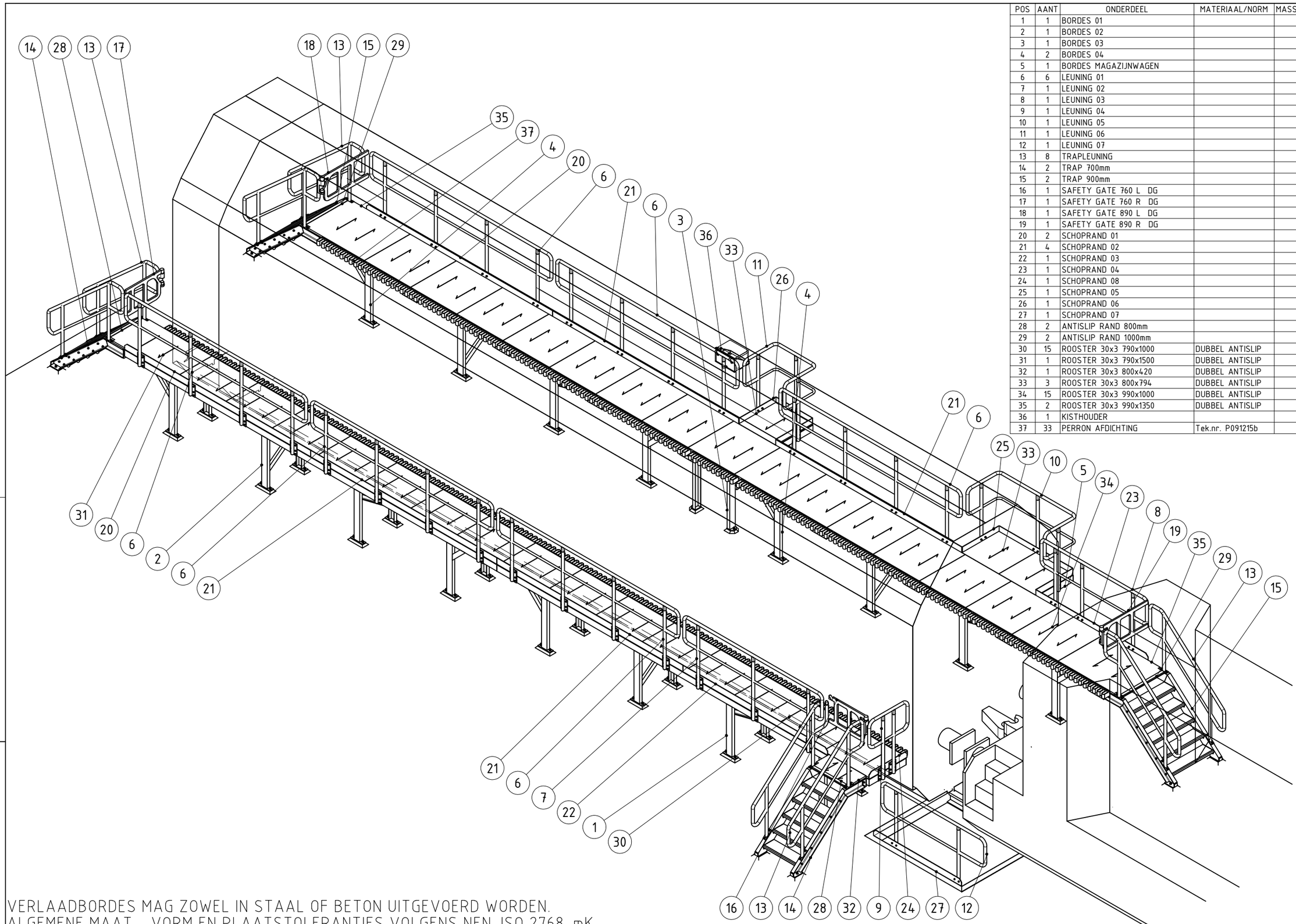


| POS | AANT | ONDERDEEL | MATERIAAL/NORM | MASSA/ST | OPMERKING |
|---|---|---|---|---|---|
| 1 | 1 | BORDES 01 | | | |
| 2 | 1 | BORDES 02 | | | |
| 3 | 1 | BORDES 03 | | | |
| 4 | 2 | BORDES 04 | | | |
| 5 | 1 | BORDES MAGAZIJNWAGEN | | | |
| 6 | 6 | LEUNING 01 | | | |
| 7 | 1 | LEUNING 02 | | | |
| 8 | 1 | LEUNING 03 | | | |
| 9 | 1 | LEUNING 04 | | | |
| 10 | 1 | LEUNING 05 | | | |
| 11 | 1 | LEUNING 06 | | | |
| 12 | 1 | LEUNING 07 | | | |
| 13 | 8 | TRAPLEUNING | | | |
| 14 | 2 | TRAP 700mm | | | |
| 15 | 2 | TRAP 900mm | | | |
| 16 | 1 | SAFETY GATE 760 L DG | | | |
| 17 | 1 | SAFETY GATE 760 R DG | | | |
| 18 | 1 | SAFETY GATE 890 L DG | | | |
| 19 | 1 | SAFETY GATE 890 R DG | | | |
| 20 | 2 | SCHOPRAND 01 | | | |
| 21 | 4 | SCHOPRAND 02 | | | |
| 22 | 1 | SCHOPRAND 03 | | | |
| 23 | 1 | SCHOPRAND 04 | | | |
| 24 | 1 | SCHOPRAND 08 | | | |
| 25 | 1 | SCHOPRAND 05 | | | |
| 26 | 1 | SCHOPRAND 06 | | | |
| 27 | 1 | SCHOPRAND 07 | | | |
| 28 | 2 | ANTISLIP RAND 800mm | | | |
| 29 | 2 | ANTISLIP RAND 1000mm | | | |
| 30 | 15 | ROOSTER 30x3 790x1000 | DUBBEL ANTISLIP | | |
| 31 | 1 | ROOSTER 30x3 790x1500 | DUBBEL ANTISLIP | | |
| 32 | 1 | ROOSTER 30x3 800x420 | DUBBEL ANTISLIP | | |
| 33 | 3 | ROOSTER 30x3 800x794 | DUBBEL ANTISLIP | | |
| 34 | 15 | ROOSTER 30x3 990x1000 | DUBBEL ANTISLIP | | |
| 35 | 2 | ROOSTER 30x3 990x1350 | DUBBEL ANTISLIP | | |
| 36 | 1 | KISTHOUDER | | | |
| 37 | 33 | PERRON AFDICHTING | Tek.nr. P091215b | | ERIKS |

VERLAADBORDES MAG ZOWEL IN STAAL OF BETON UITGEVOERD WORDEN.
ALGEMENE MAAT-, VORM EN PLAATSTOLERANTIES VOLGENS NEN-ISO 2768-mK

TATA STEEL

ONDERWERP
STANDAARD VERLAADBORDES
VLGS.TATA-STANDAARD S3.298001

CAD

SCHAAL ORIG.
1:50

PROJ. METHODE

WIJZ. 11
M.F.

TEK.NR.
A33910

BLAD NR.
40

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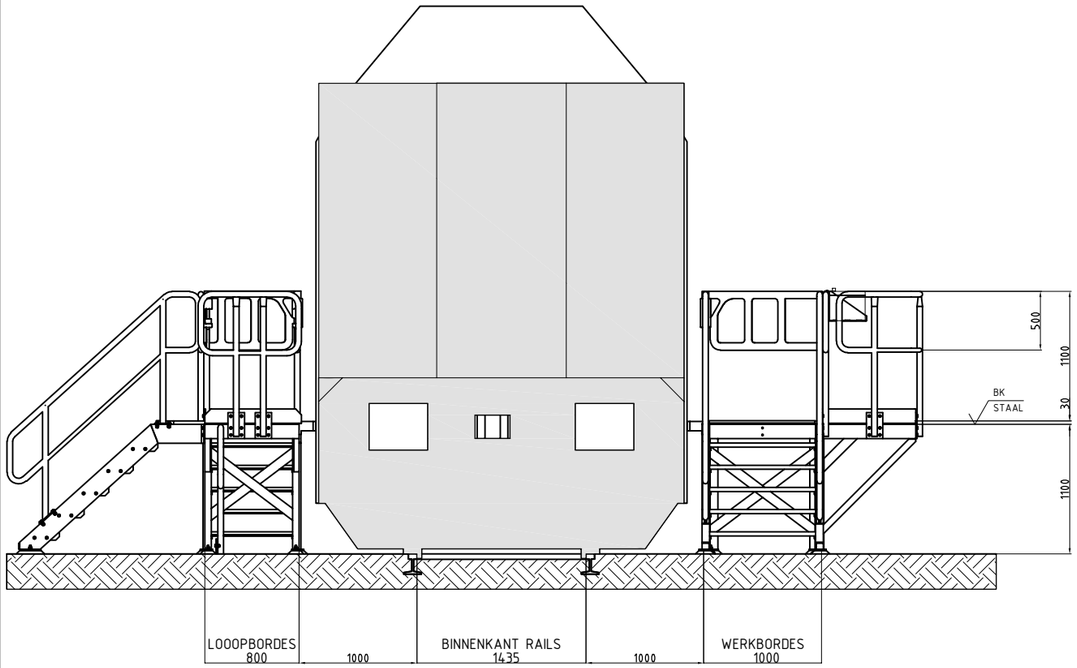
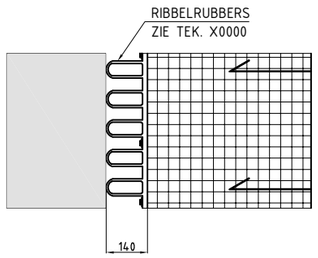
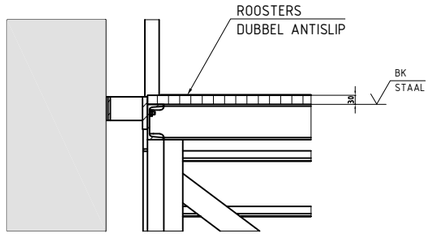
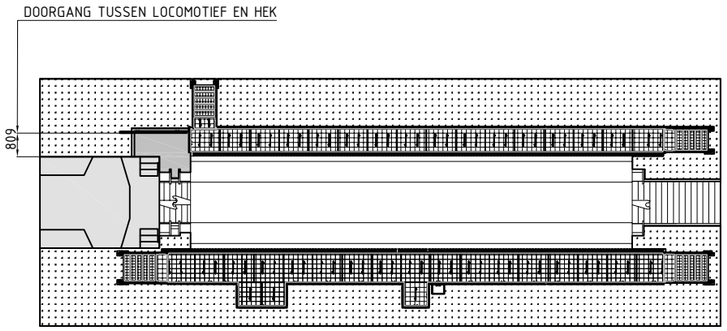


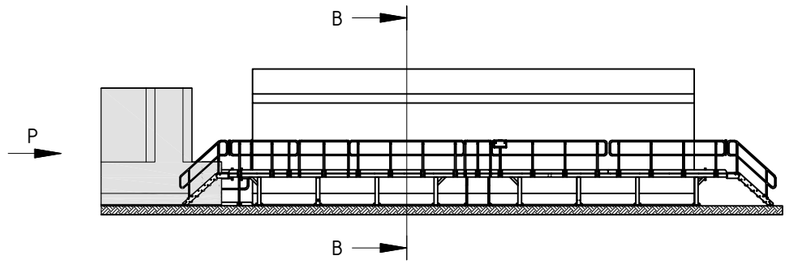

Aanzicht P
Schaal 1 : 25




Doorsnede B-B
Schaal 1 : 10

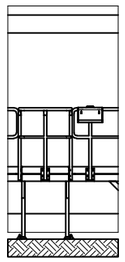


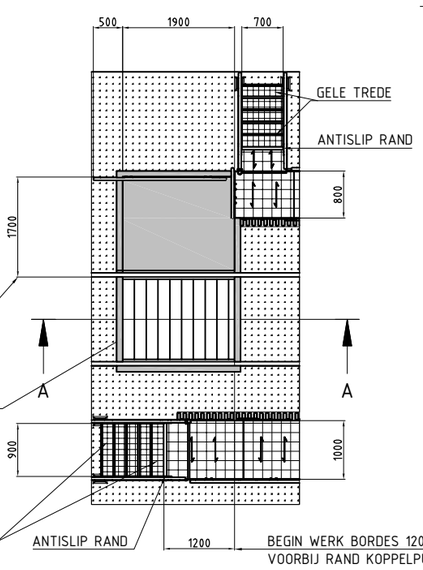


DETAIL OPSTELPLAATS
MAGAZIJNWAGEN
Schaal 1 : 50

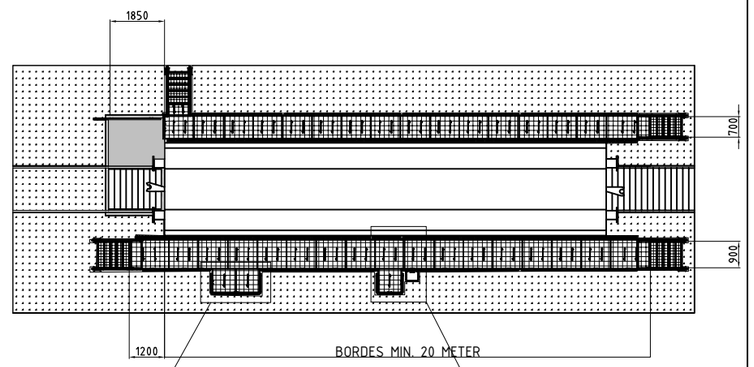


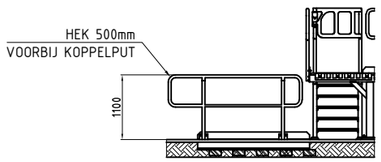



DETAIL UITBOUW
TBV AFVALBAK
Schaal 1 : 50




DETAIL KOPPELPUT
Schaal 1 : 50




Doorsnede A-A
Schaal 1 : 50

VERLAADBORDES MAG ZOWEL IN STAAL OF BETON UITGEVOERD WORDEN.
ALGEMENE MAAT-, VORM EN PLAATSTOLERANTIES VOLGENS NEN-ISO 2768-mK

TATA STEEL

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ONDERWERP STANDAARD VERLAADBORDES VLGS.TATA-STANDAARD S3.298001 | CAD | SCHAAL ORIG. 1:100 | PROJ. METHODE | WIJZ. 11 / M.F. | TEK.NR. A33910 | BLAD NR. 41 |

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