CONTENTS

Using these installation instructions

This manual deals with fitting the round stock silo with an inner bottom cone, as well as the differences between the silos with 11 or 12 rows with respect to supporting and installing the lifting lugs of the roof.

The ventilated inner cones have air scales in the segment plates.

Operating principle of the silo with ventilated bottom

The grain in the silo can be cooled/vented by airflow during temporary storing of fresh grain after the harvesting. The silo can also be used for cooling or storing the grain. During ventilation of fresh grain, the grain layer should not be more than 5 rows highs, and its moisture content should not exceed 22 %. This ensures that the grain layer's permeability to air is sufficiently high.

The silo shall be filled in the centre the upper way.

The silo shall be emptied from the centre the lower way. A chain conveyor or a screw conveyor shall be used for emptying.

Important to remember - READ FIRST

1. Follow carefully the assembly instructions for the roof. Note! Lifting lugs in the silos, which are 11 or 12 rows high.
2. Use only proper lifting gear that is in good condition for the lifting operations. Do not exceed the maximum allowed loads for the lifting gear. When using a crane, make sure it is suitable and inspected for the assembly work.

Weight and dimensions of the silos

D5,3M	**6 th row**	**7 th row**	**8 th row**	**9 th row**	**10 th row**	**11 th row**	**12 th row**
Weight (kg) (without cone)	2249	2488	2812	3102	3324	3748	3996
Height of wall jacket from foundation cast (mm)	6726	7847	8968	10089	11210	12332	13452
Height of ready-assembled silo from foundation cast (mm)	7968	9089	10210	11331	12452	13574	14694
Volume (with cone)	114	139	164	188	213	237	262
Weight of the cone (kg)	1250						

Foundation

The foundation of the silo with inner cone must be flat-bottomed. The foundation must not be elevated at its centre. **The foundation must be plane and smooth**(The deviation from level must not exceed ±3 mm). The thickness of the foundation grouting is determined by the size of the silo, and the characteristics of the soil at the building site. At a low-lying site, where presence of groundwater is likely to cause problems, we recommend raising the height of foundation by laying a sand bed, and concreting the foundation to as high as possible. The foundation of the silo must always be provided with ground frost insulation and subsoil drainage. For building permission and meeting other official regulations you need to contact your local building authority.

Erecting the stock silo

Check the contents of the delivery and compare it with the packing list immediately after taking delivery, and before starting the assembly. Advise the factory of any missing items.
The factory is responsible for correcting any defective/incomplete delivery, but it is not obliged to compensate any other costs incurred.

Note!
Read the instructions several times before starting the erection in order to memorize the names of the components and the assembly order. To avoid problems, carry out the assembly in stages as described below.

Note!
The conveyors, to be connected to the silo, must be taken into account, when selecting the location for the silo. The location of the silo is determined by the conveyor line. The conveyor line shall go symmetrically between the vertical supports of the silo jacket. *(see drawings on pages 10, 6).*
It pays to install the support console of the cone A77114 in connection with making of the jacket in order to avoid the need to undo the bolts repeatedly *(see drawings on pages 9 and 13)*.
The silo must not be attached to the concrete foundation until the assembly of the cone is completed. Staying in position of the silo, which has not yet been attached to the concrete foundation, should be ensured by tying the jacket down at appropriate intervals to e.g weights of concrete, using load-binding straps.

Pay particular attention to the round shape of the jacket, when assembling the silo jacket. The assembly of the conical part will be more difficult, if the shape of the jacket is oval.

NOTE!
Tighten all the screws firmly to their prescribed tightness. The fastest way to tighten the bolts is to use a pneumatic turn-screw or a cordless drill.

M10 8.8 50 Nm
M10 10.9 65 Nm
M12 8.8 80 Nm

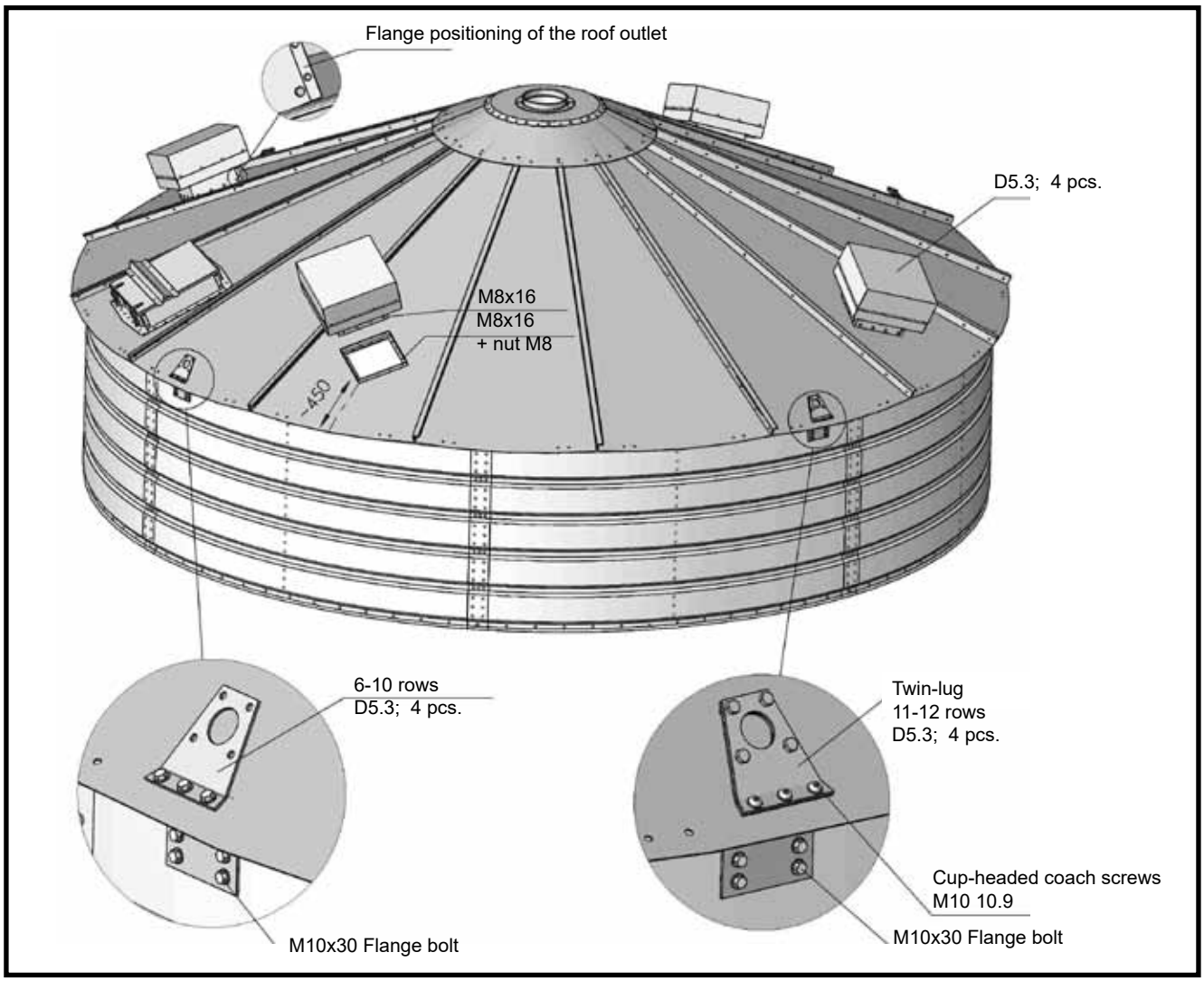
ASSEMBLING THE CONE SILO

Lifting lugs and outlet air joints

The outlet air joints shall be installed as soon as the first row has been assembled and the roof has been installed. The distance of the outlet joint from the edge is about 450 mm. Make a hole in the roof section plate, and drill holes of D9 fort the attachment bolts. Use the lower flange of the outlet air joint as a template. Attach the outlet air joint using M8 bolts and seal the joint with sealing adhesive.
Attach the lifting lugs at the joint of the silo roof and the wall element. You must drill holes for the lugs.

NOTE!
Silos with 11 or 12 rows must be fitted with twin-lugs.

NOTE! Bolts for the lugs: cup-headed coach screws M10 10.9 in 11 and 12 row silos.



Installation of wall-manholes

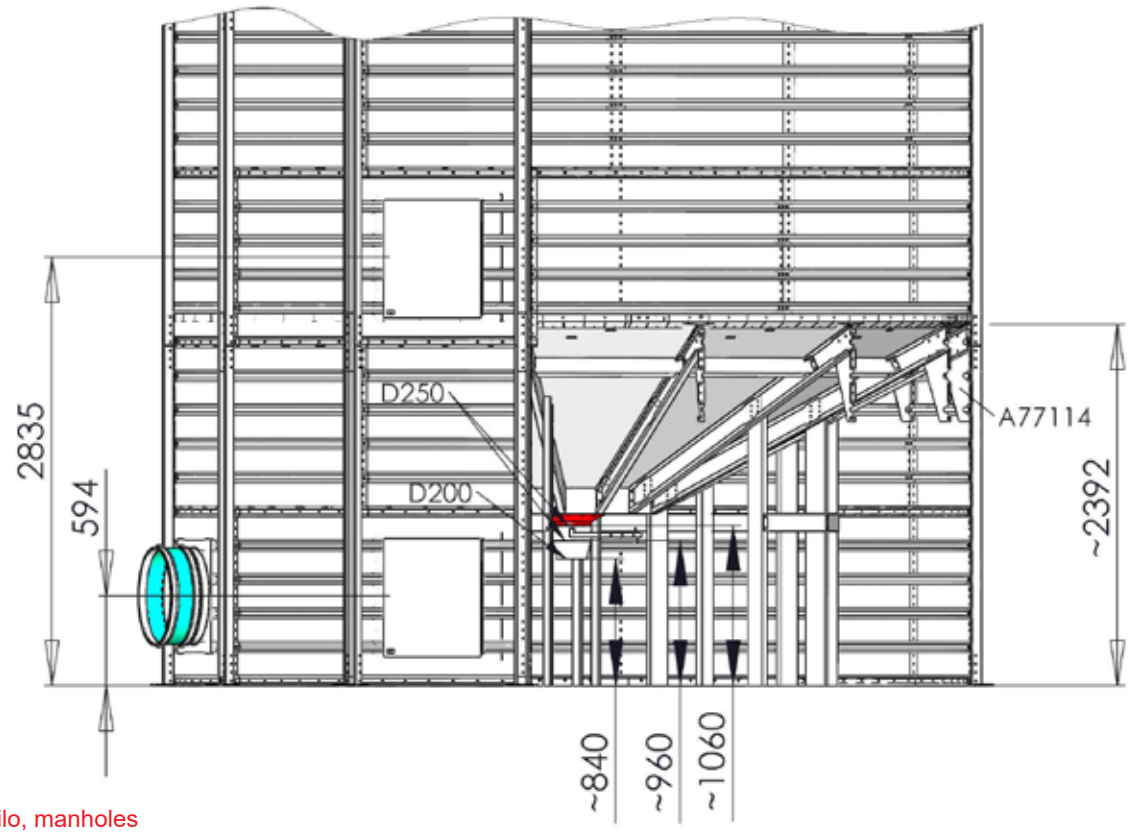
The manhole is attached using M10x25 flange bolts. The joint between the silo jacket and the manhole frame shall be sealed with butyl mass, to be applied between the manhole frame and the silo jacket.

Manhole to be installed in the wall above the cone (Manhole for accessing the grain space)

When planning the work order, note that the inner sealing strip A74960 for the inner cone partly comes between the manhole frame and the silo jacket. If necessary, you can cut off a piece from the upper edge of A74960 to prevent the upper edge from obscuring the manhole bolts. (*see Fig. on page 14*)
The manhole above the cone shall be attached to its final position at the same time with the installation of the sealing strip.

The manhole is mounted on a wall element with a manhole opening.
The material strength of the gaped element is 1.5mm.

Note: The manhole must not be fitted in a wall element that is thinner than 1.5mm.

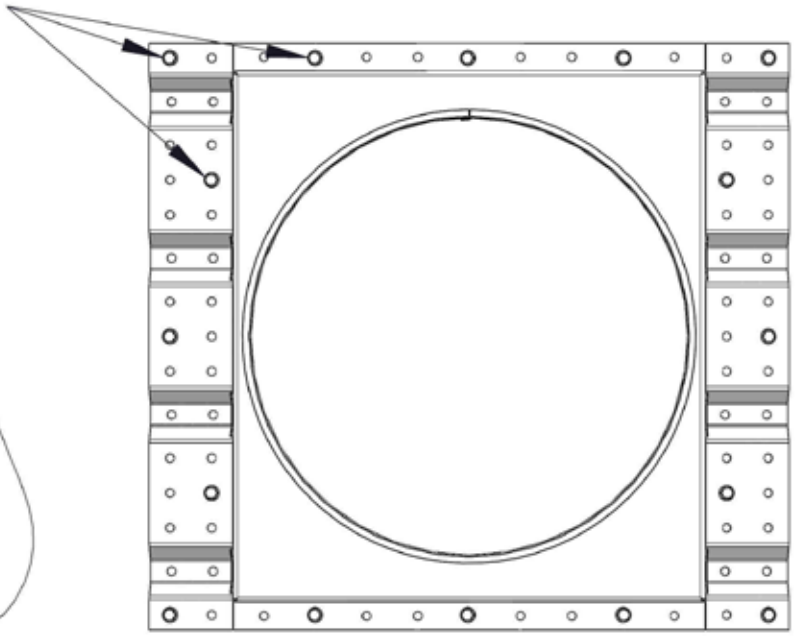


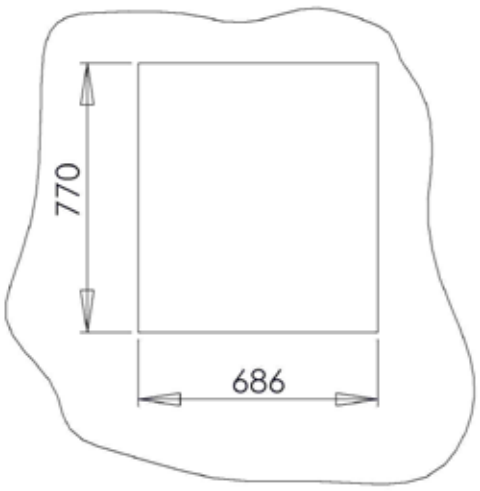
D5.3 silo, manholes

Inlet air joint to be installed under the cone (included only in the setup of ventilated silo)

An opening of 686x770 is made on the wall panel. The air pipe connection is mounted on the inner side of the silo, not forgetting the sealing compound. The manhole is fastened with M10x25 flange screws,16 pcs per frame (see fig.)

The frames, which are located below the cone, shall be fixed using M10x25 flange bolts.
16 pcs./frame.





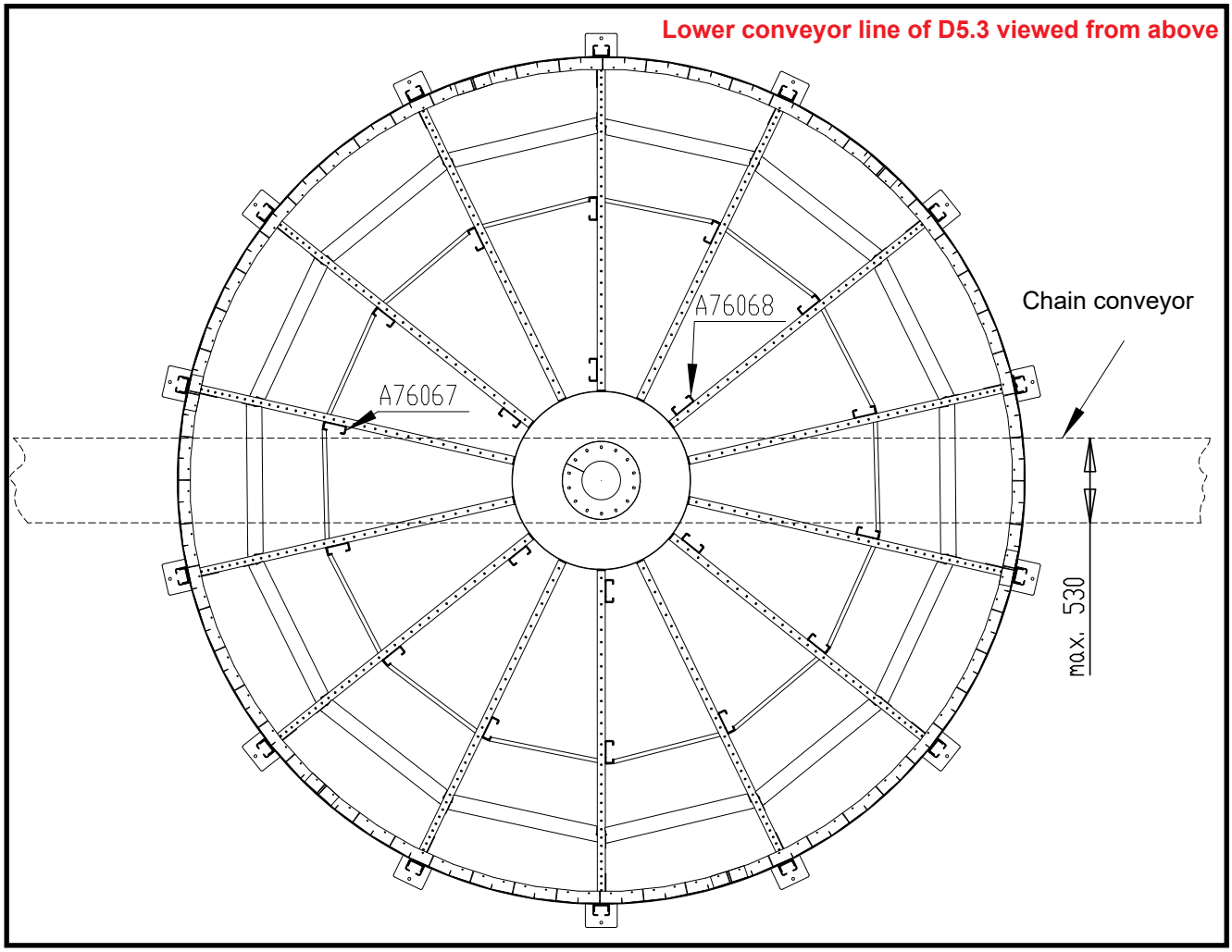
Wall element opening:
Width: 686 mm
Height: 770 mm

NOTE! Important measures to be observed while assembling the cone

Observe the following before completing the assembly of the silo jacket, and attaching it to the foundation:

- leave out one wall panel from the lowermost row to enable the parts to be taken inside the cone.
- if the silo is to be emptied using a chain conveyor or a screw conveyor, the conveyor shall be installed inside the silo at the desired location on the centre-line.Doing so makes it possible to locate the cone legs in a position where they do not interfere with the conveyor. The maximum width of the conveyor's pipe frame in the D5.3 silo is 530 mm.
- Install the cone inside the silo before attaching the silo jacket to the foundation.

- Tie down the jacket to e.g concrete weights, using load-binding straps at appropriate intervals, to ensure that the silo will stay in position, although it has not yet been attached to the concrete foundation.

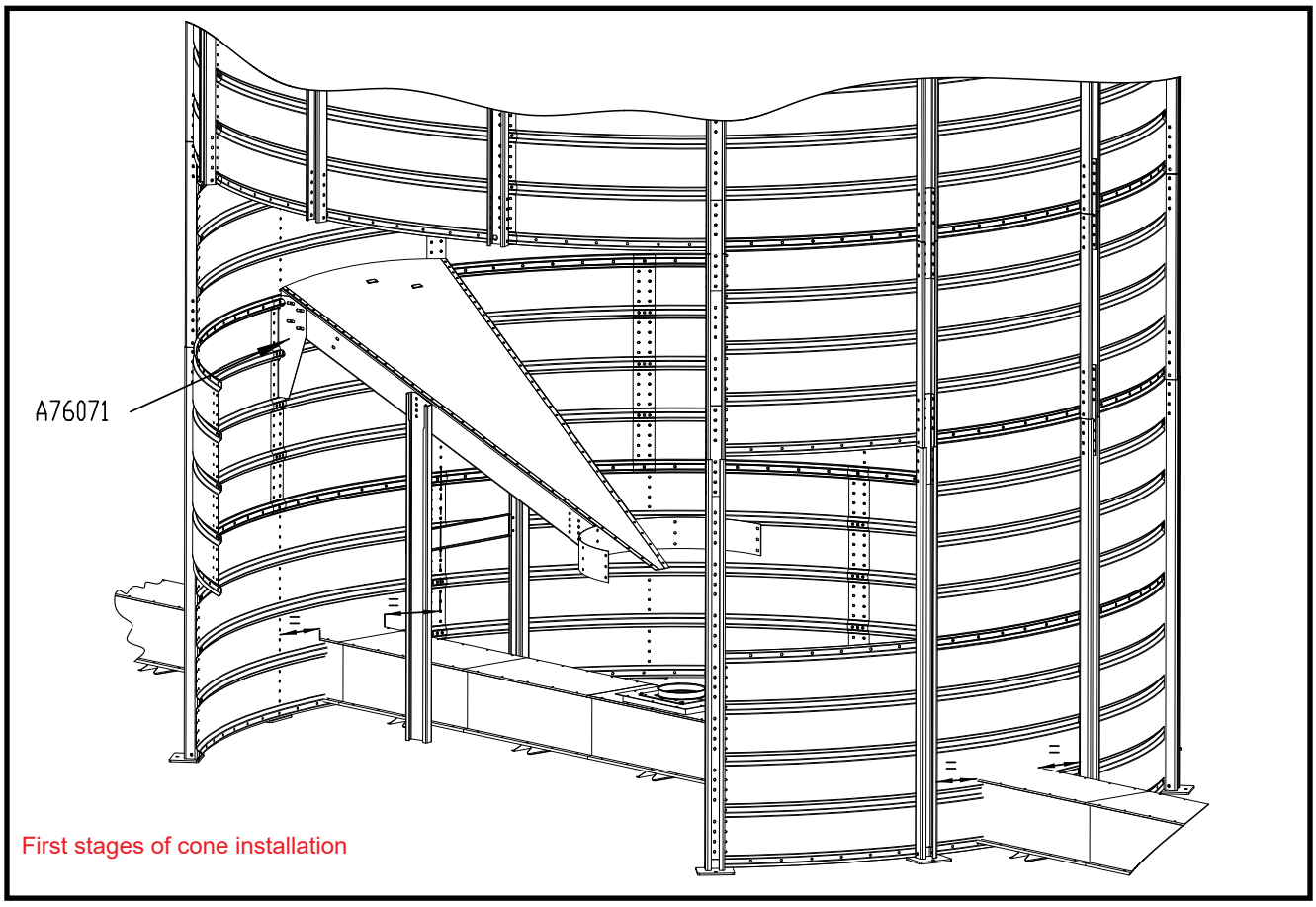


Assembling the cone

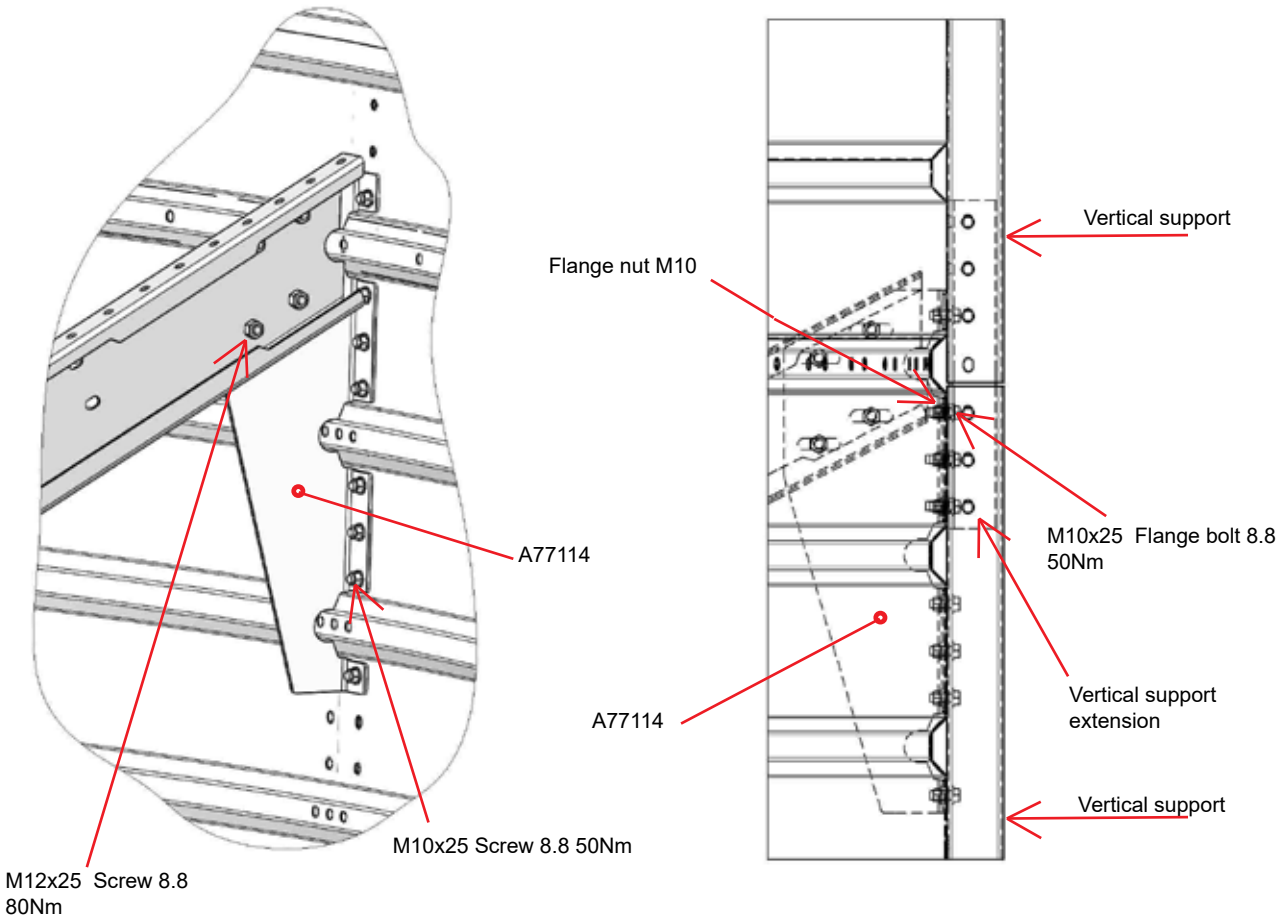
No sealing mastic is required for the assembly.
The support consoles A77114, the sector beam, the legs and the centre attachment shall be installed first.

Install the support console A77114 in the same position with the vertical support for the silo jacket. Determine the correct installation height of the console by checking the distance between the rolls in the drawings. *(See pages 6, 9 and 10).* Attach the support console to the silo jacket using M10x25 flange bolts: 8 pcs/bracket. **Join the support console, silo jacket and the vertical support extension together using bolts**. *(see drawing Attaching the support console to the jacket on page 10)*

Fix the sector beams to the centrepiece and to the legs using M12 bolts. Do not tighten the bolts yet at this stage. Assemble the parts proceeding clockwise. If you are using a grain screw or a chain conveyor, note that the conveyor line must go symmetrically between the vertical supports of the silo jacket to provide sufficient space for the vertical legs of the cone. *(see the drawing First stages of cone installation on page 9)*



First stages of cone installation

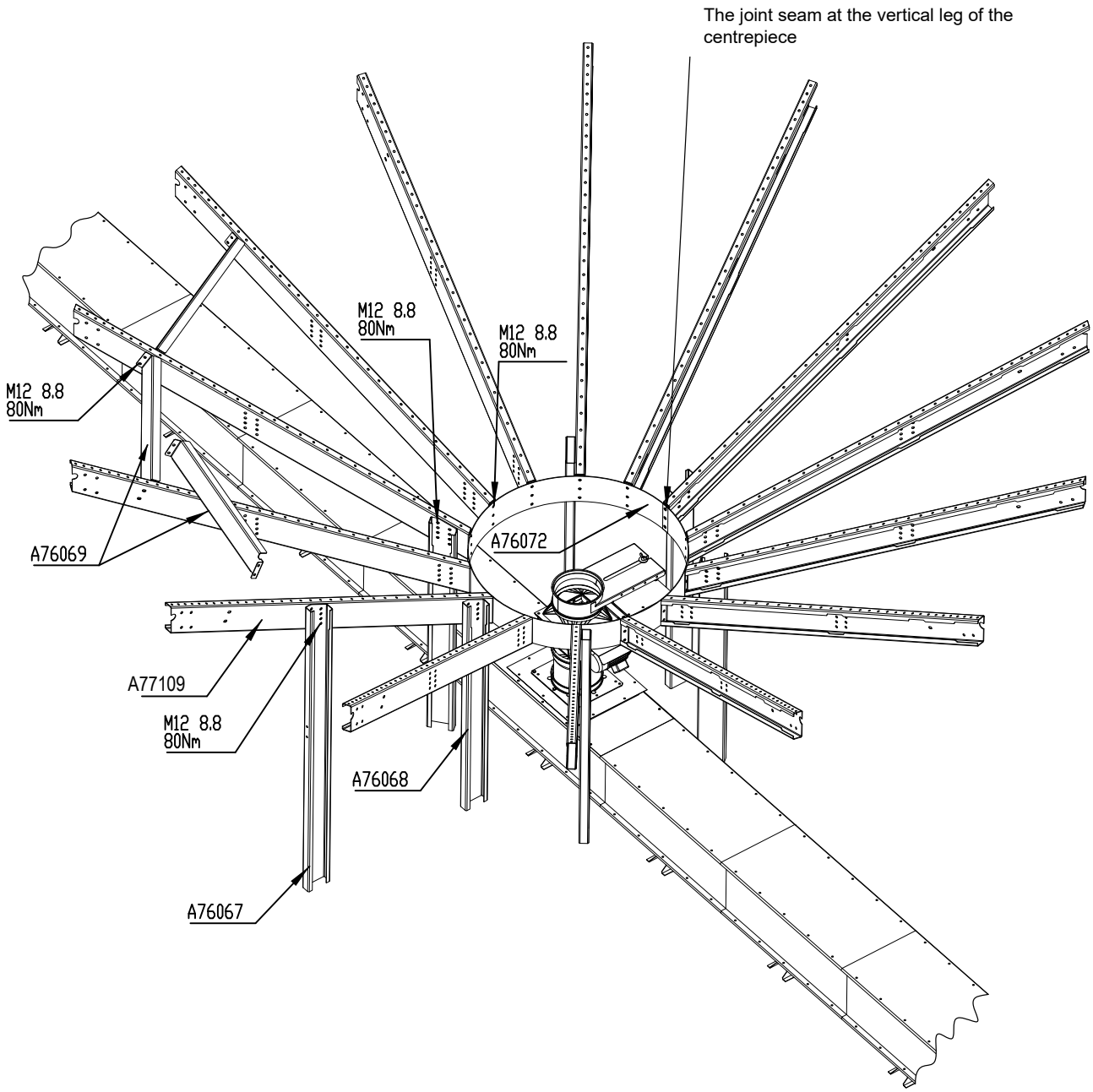


Attaching the support console to the jacket

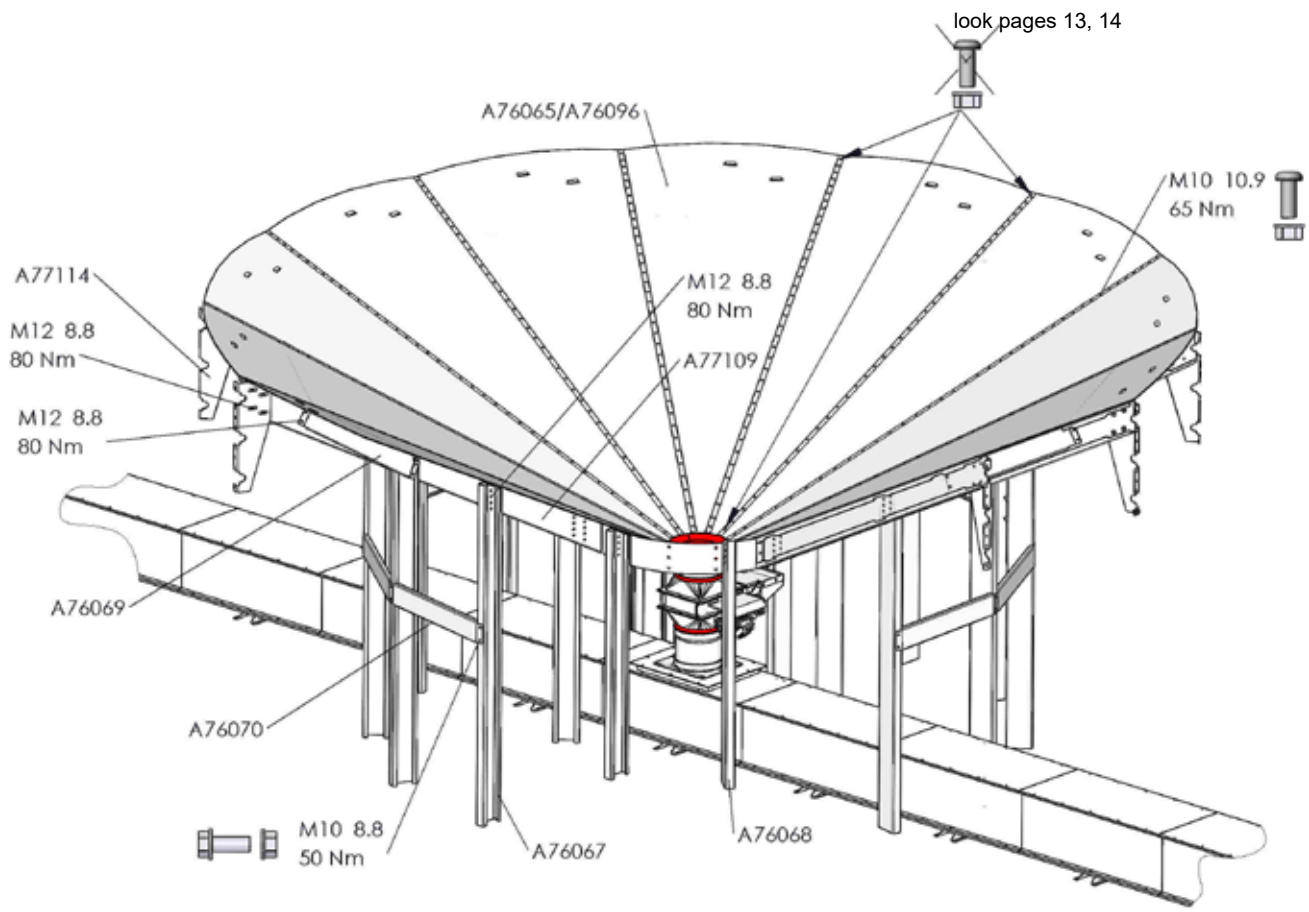
Install the sector plates on top of the sector beams. Do not yet install the uppermost and the lowermost bolts for the sector plates at this stage. Use cup-heades screws for fixing the sector plates. Do not tighten the bolts until all the legs and the sector plates are in place. Before completing the assembly of the cone, lift the remaining parts inside, and install the last wall panel for the silo.

Note!
The manhole shall be installed in the lower part of the silo (below the cone) before installing the last wall panel.
(See drawing on page 6)

D5.3

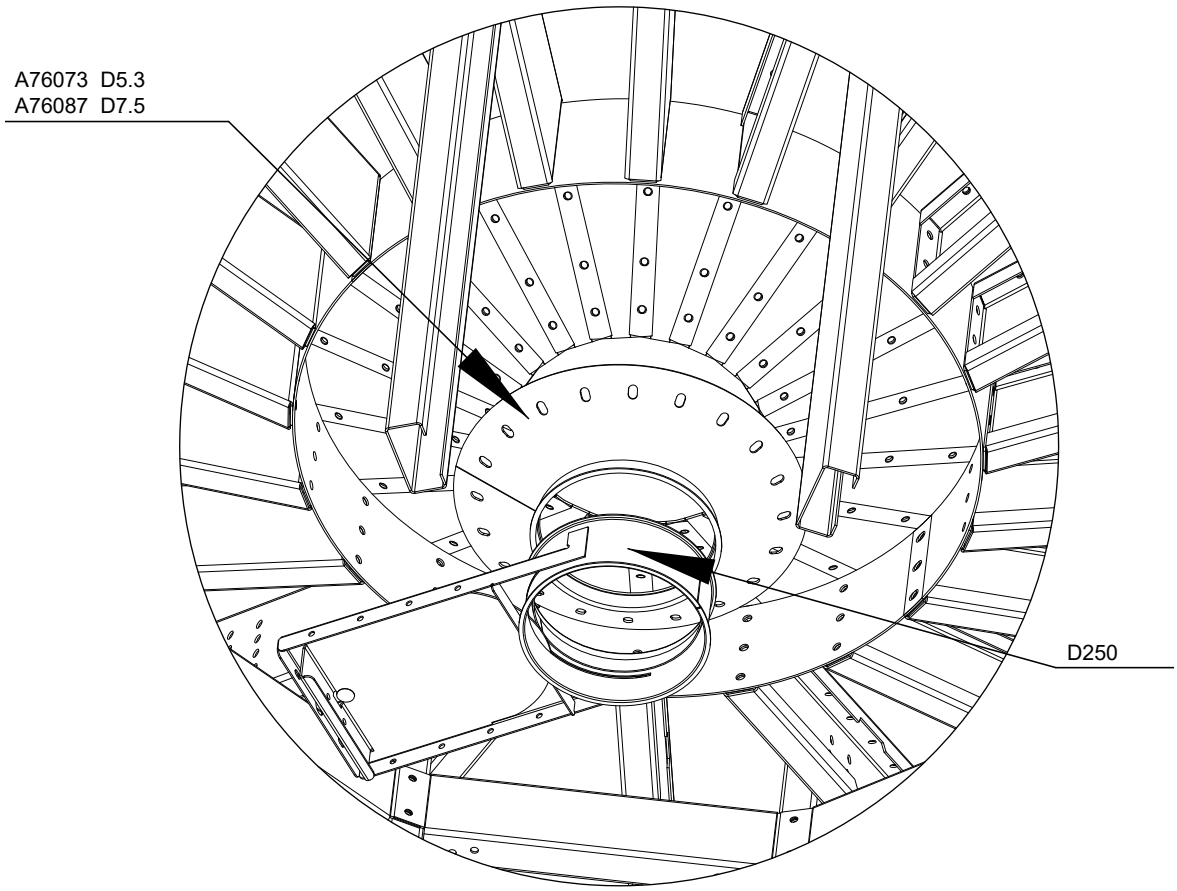

The joint seam at the vertical leg of the centrepiece
M12 8.8
80Nm
M12 8.8
80Nm
M12 8.8
80Nm
A76069
A76072
A77109
M12 8.8
80Nm
A76068
A76067

D5.3



The inner legs (A76068) are installed at intervals, illustrated in the drawing. The inner legs shall be attached to every second horizontal beam (A77109). At the conveyor opening there are two horizontal beams, one after the other, which shall be left without inner vertical leg. The total amount of inner vertical legs (A76068) is 6 pcs. The spacing between the vertical legs shall be the same, no matter whether there will be a conveyor or not. The joint seam of the centrepiece (A76072) must be positioned at one of the vertical legs.

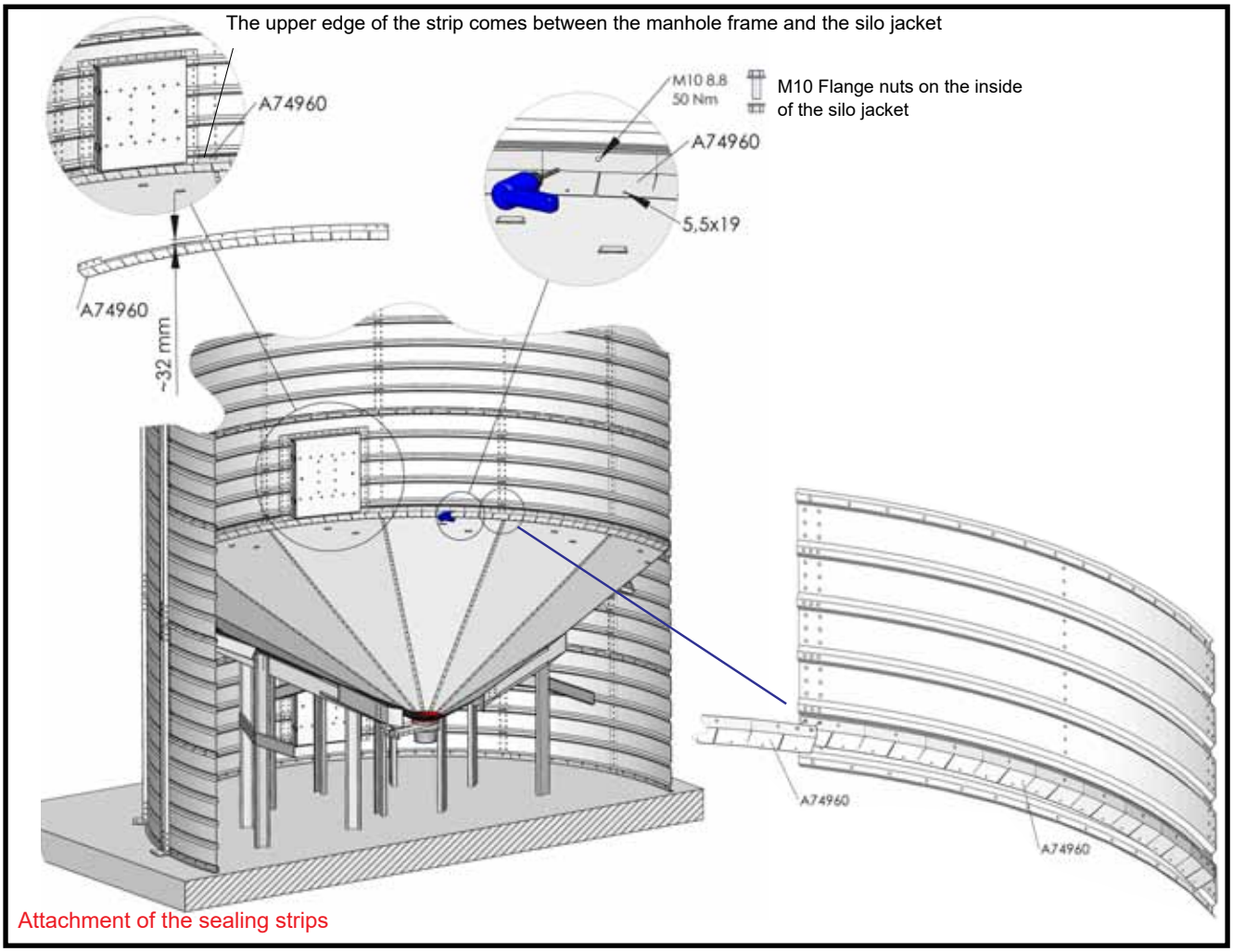
After having tightened the bolts of the cone, install the centre cone using cup-headed screws, and the knife shutter using a grain pipe band.
The delivery of the silo with cone includes a reducer of D200 for connecting the grain screw.



Connecting the centre cone and the knife shutter

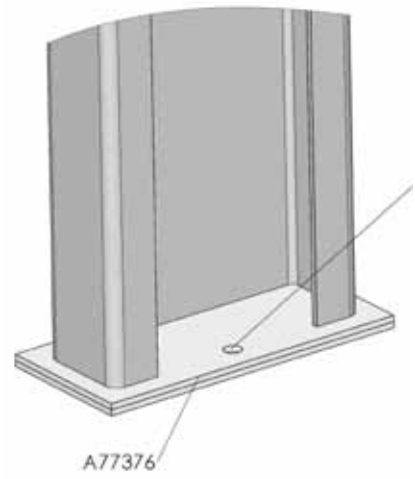
Refer also to the model-specific assembly drawing of the silo and the model-specific standardised structural drawing of the silo bottom.

Note! The deviation from level of the concrete foundation must not exceed +3 mm.



The cone must be sealed against the jacket of the silo using edge framework. Install the edge framework on the cone. The skirt strips proceed in the same sequence as the wall elements. A skirt strip is positioned as shown. The extension overlaps so that the two edge holes overlap. The fixing of the edge framework starts from the edge of the skirt strip. The two edge holes are aligned with the holes already drilled in the silo wall, and the holes in the middle of the skirt strip are drilled in the silo wall. When fixing the edge framwork to the wall panel, it is important to proceed systematically, and tighten the bolts as the drilling of the holes advances. As soon as you have fixed the edge framework to the wall panels, fix the skirt of the framwork to the sector plates using drill screws.

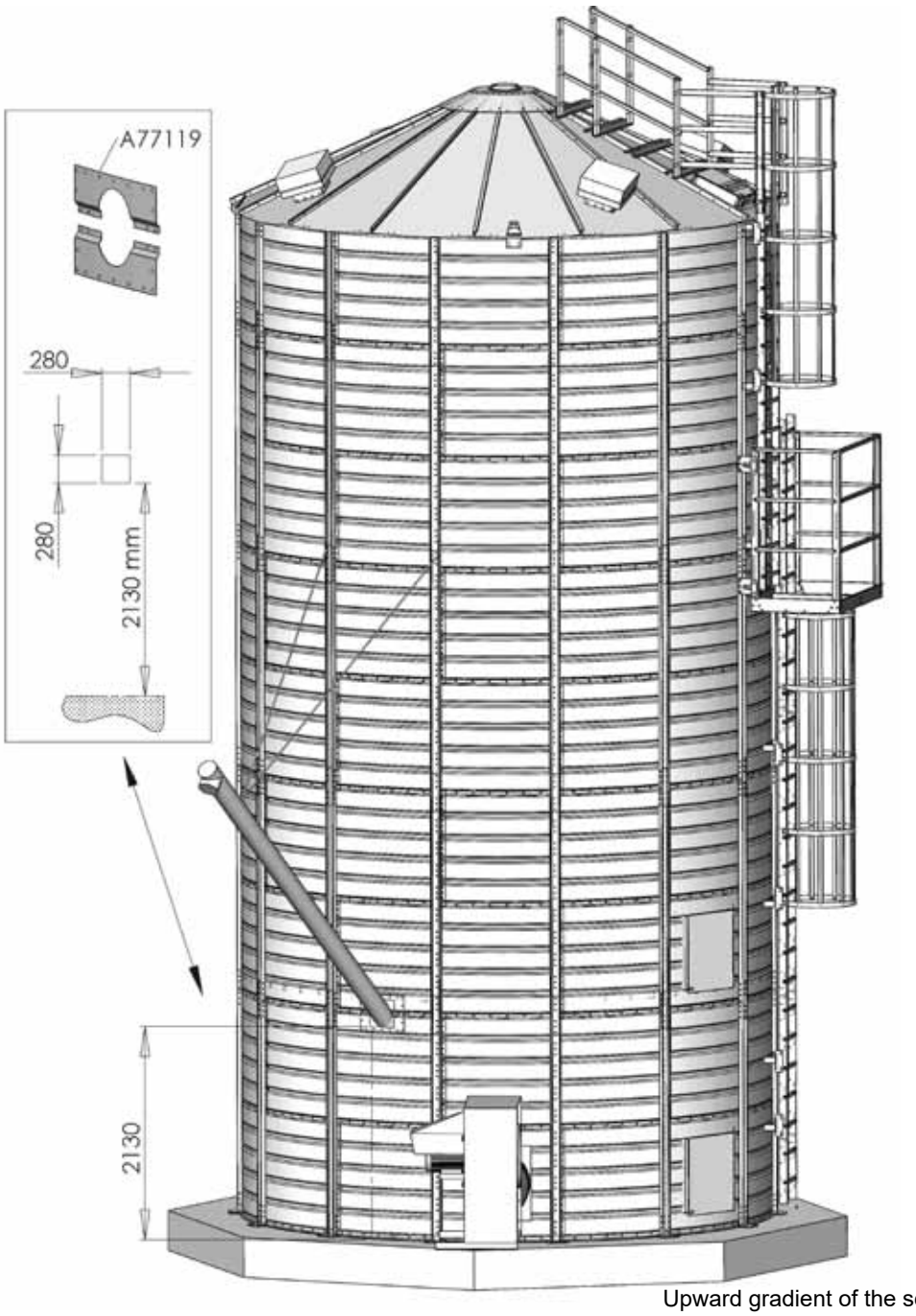
The places for the uppermost holes in the sector plates shall be drilled in the edge framework, and fix the plates using M10 cup-headed screws. Be careful not to press the segment plate of the cone too firmly down at the centre when installing the skirt strip, as the deformation may bounce back during filling of the silo, and damage the attachment of the skirt strip.



Removal of the cone's support leg clearances when attaching the silo (To be done if necessary)

- There must be no clearance (gap) between the support leg of the cone and the concrete foundation
- If necessary, the clearance is removed by placing the required number of shims under the support leg A77376
- The support leg should be supported over its entire surface area (see picture)
- If the supplied number of shims is not sufficient, you will need to purchase an additional quantity of the same type
- To ensure that the shims are held in place, fix them to the concrete slab with wedge anchors or nailing pins (Not included)

Ready-assembled silo with screw conveyor



Ready-assembled silo with screw conveyor

Upward gradient of the screw conveyor:
- Silo D5,3 37,5°

Make a hole in the jacket plate of the silo for the emptying screw, see drawing. Observe the positions of the support legs for the cone. Seal the lead-through using the cover plates A77119. Support the screw conveyor, for example, by means of wire ropes, as illustrated in the drawing.
All the lead-throughs, including the one for the chain conveyor, the screw conveyor, or any other purpose, must be sealed.
Any leaking point will reduce the operating efficiency of the ventilated bottom.