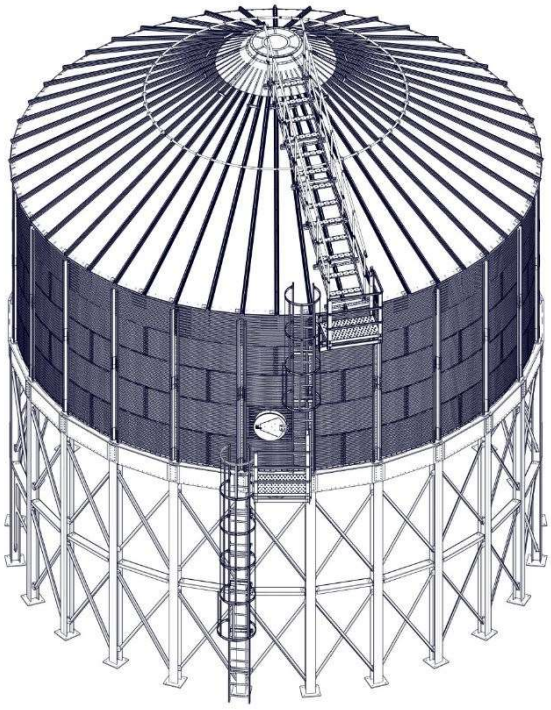
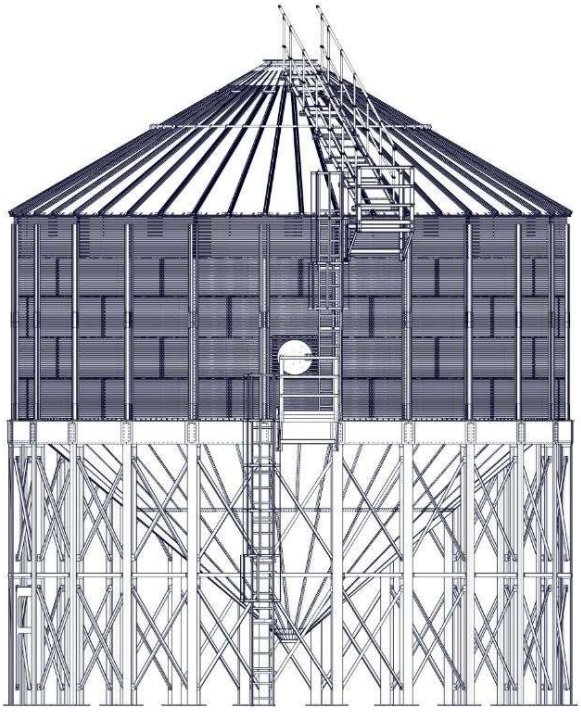
ONE SOURCE. **ONE SOLUTION.**

Lambton

COMMERCIAL HOPPER ASSEMBLY MANUAL

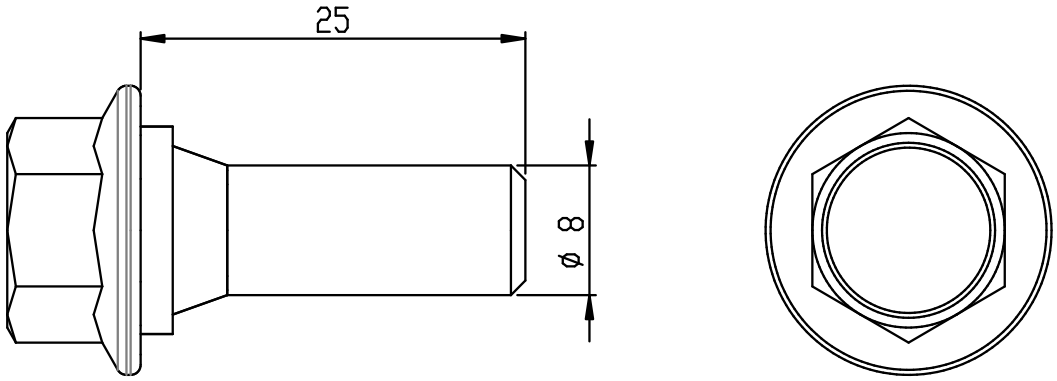




1 – INSTALLATION CONNECTION PARTS GENERAL INFORMATION

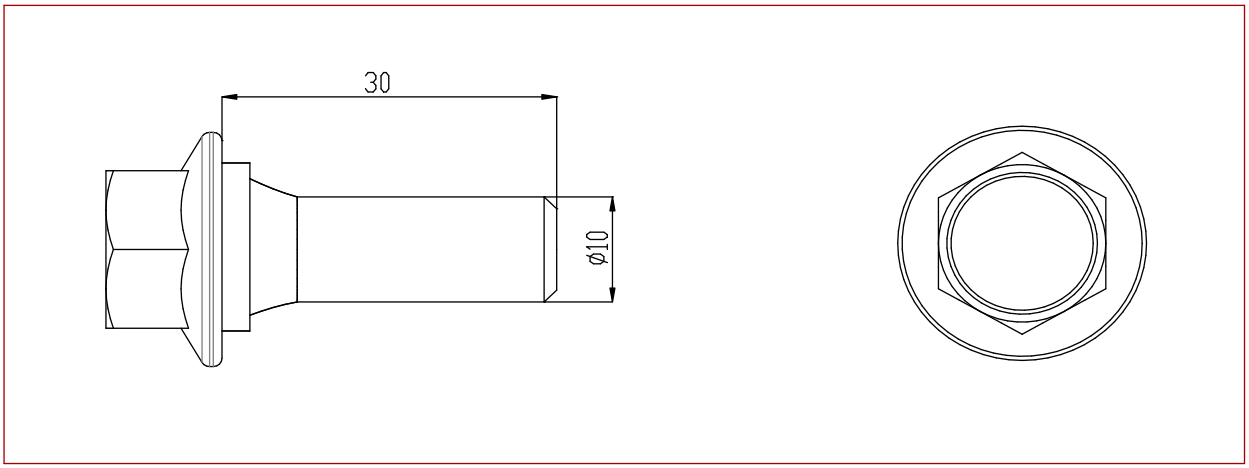
1.1 SILO CONNECTION ELEMENTS

(M8x25) Hexagon Head Bolt (10.9 Grade) - [TM.602.1.8.GEO.25.109.6921.O]

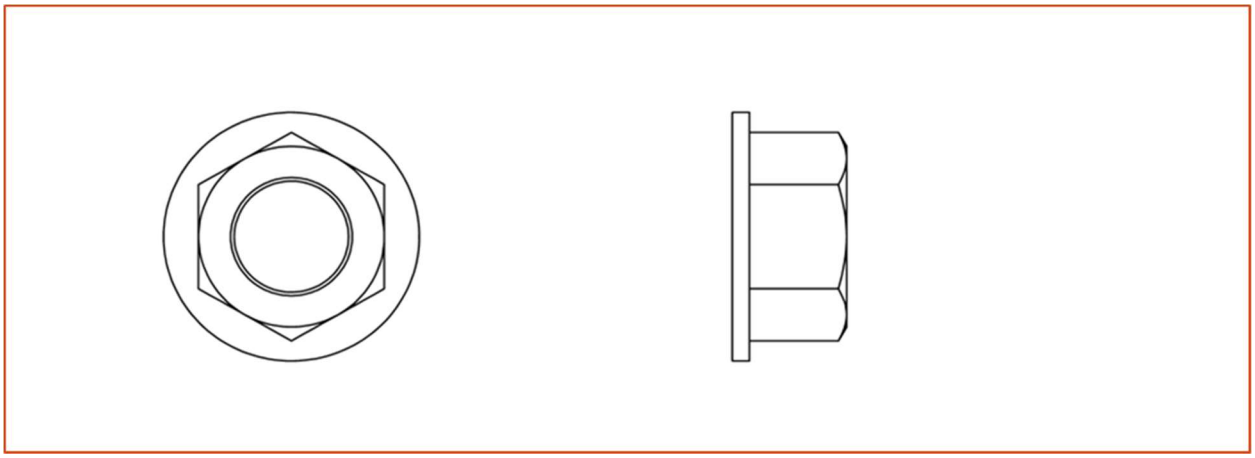


(M8) Somun (10 Kalite)-[TM.602.2.M8.GEO.10.0934]

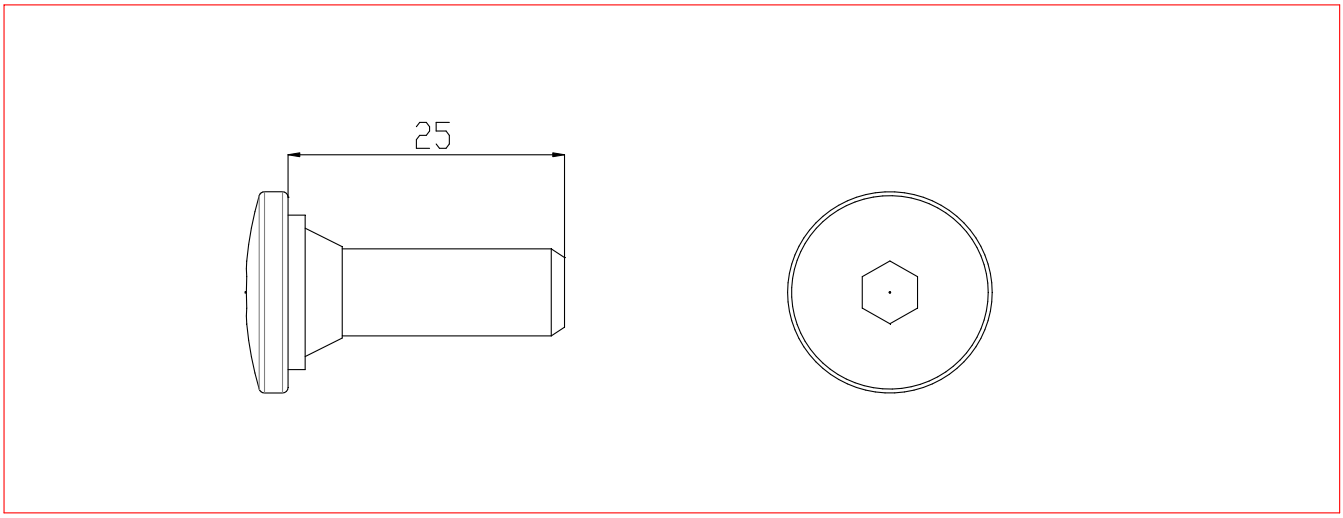
(M10x30) Hexagon Head Bolt (10.9 Grade) - [TM.602.1.10.GEO.30.109.6921.O]



(M10) Nut (10 Quality) - (TM.602.2.M10.GEO.10.0934]



M8x25) Dished Head Imbus (10.9 QualityTM.602.1.8.GEO.25.109.7380.O]



Note: You must use the bolts and nuts that are sent to you in the silo. Use only bolts provided by LAMBTON. Changes made by unauthorized persons, unauthorized and unauthorized bolts replacement from LAMBTON are strictly prohibited and will void the warranty..

BOLT TIGHTENING TORQUE TABLE

BOLT	BOLT TIGHTENING TORQUE			
	Minimum Tork		Maximum Tork	
M8	15 ft.lb	20 Nm	20 ft.lb	27 Nm
M10	35 ft.lb	47 Nm	42 ft.lb	56 Nm
M12	95 ft.lb	128 Nm	105 ft.lb	142 Nm
M18	200 ft.lb	270 Nm	208,7 ft.lb	283 Nm

The data in the table has been created to guide the user considering the normal conditions. For critical applications, the bolt manufacturer and project designer should be contacted and torque values should be obtained.

Table data was created based on the following basic assumptions;

- The bolts are new, not oiled and uncoated.
- Bolt yield strength is predicted as 90%.
- The friction coefficient of the bolts is taken as 0.2..

1.2 SILO SECTIONS

Figure 1.2.1 Silo Parts

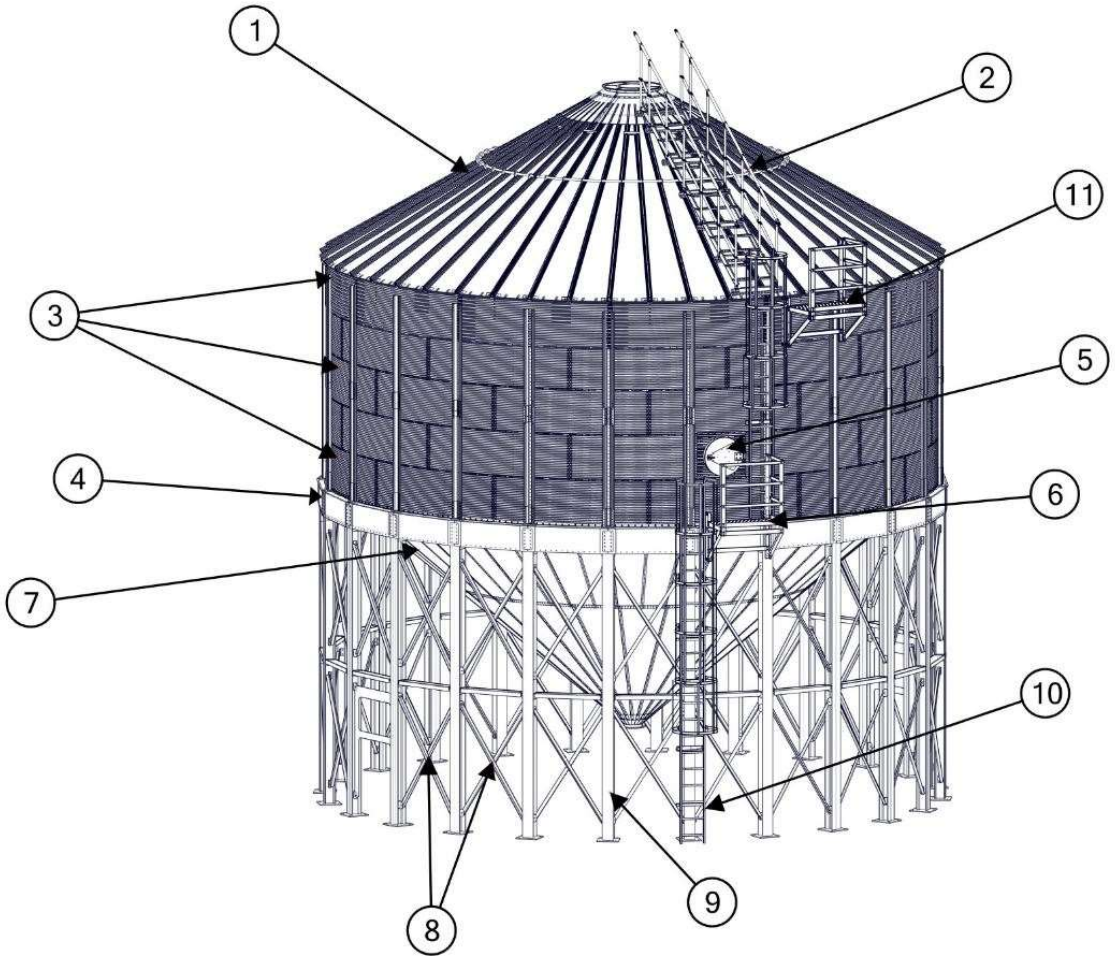


Table 1.2.1 Silo Parts

Ref	Definition
1	Commercial Conical Roof Section
2	Commercial Conical Roof Ladder
3	Commercial Body Rings
4	Commercial Conical Skirt Sheet
5	Commercial Conical Silo Door
6	Commercial Hopper Rest Platform
7	Commercial Hopper Bottom Cone Section
8	Commercial X-Braces
9	Hopper Leg
10	Hopper Ladder
11	Eave Platform

2.1 INTRODUCTION TO COMMERCIAL HOPPER INSTALLATION

FIGURE 2.1.1 Roof Dimensions

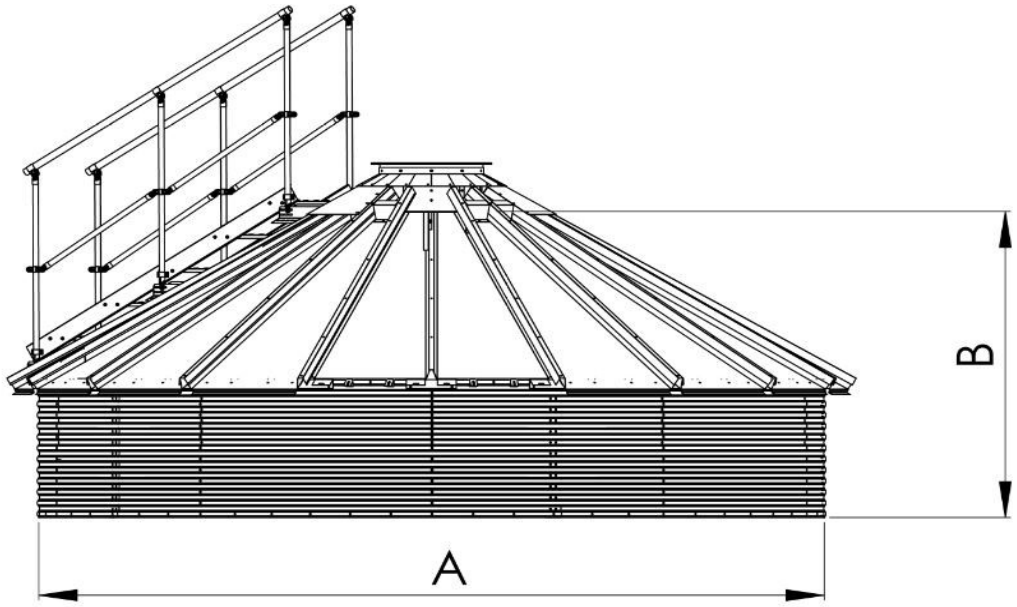


TABLE **2.1.1** Roof Dimensions Table

DIAMETER NUMBER	A (mm)	B (mm)
9	8,210	2,791
10	9,130	3,056
11	10,040	3,315
12	10,950	3,585

COMMERCIAL CONICAL ROOF MOUNTING

- ASSEMBLE FIRST SIDEWALL RING.

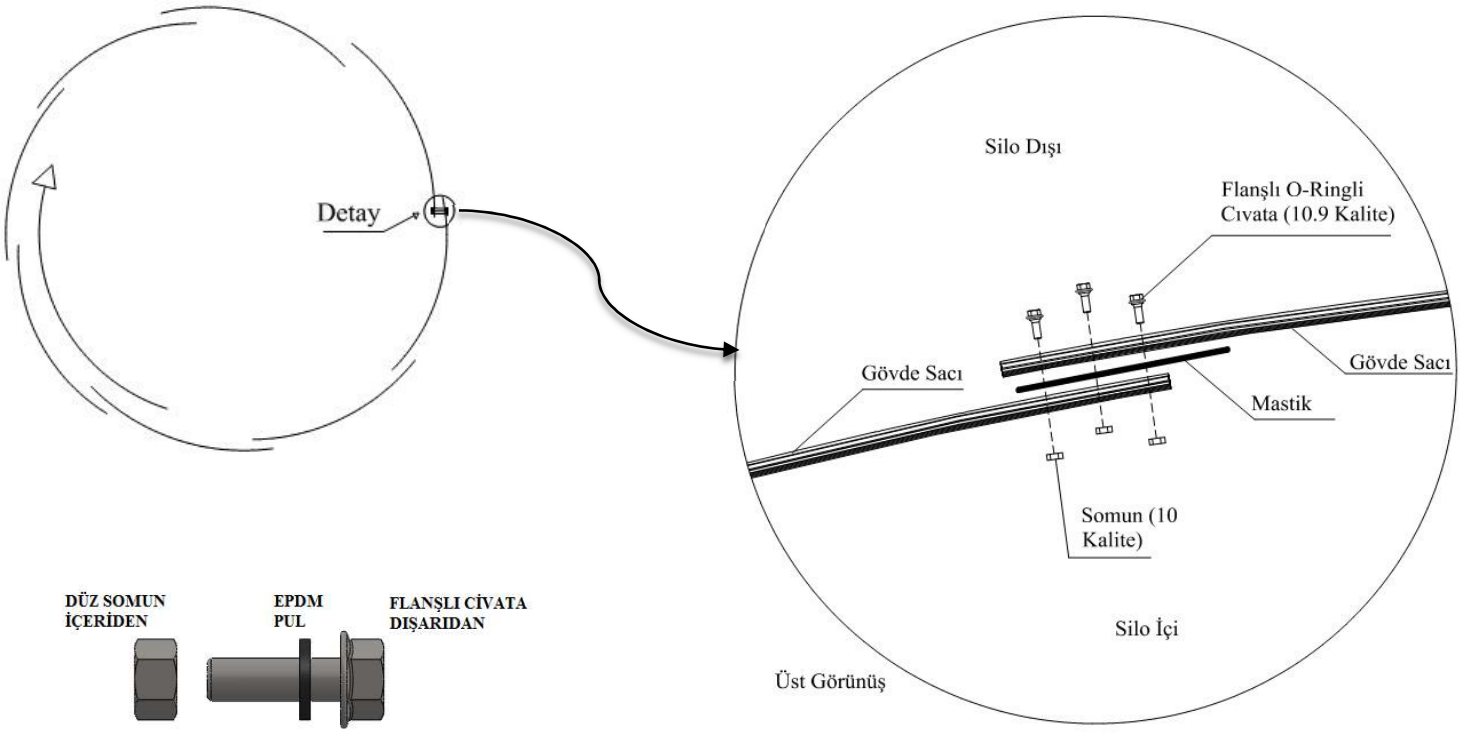
You can find the upper body sheet among the body sheets by looking at the color chart given to you. Color of each ring is different and each ring comes to you in separate packages. The color chart shows which ring is in which package. During assembly, follow the color sequence..

Assemble your top body sheets with the roof connection holes up. This sheet will differ from the others. In addition, there will be 6 more holes in the vertical plane..

Connect the sheets to form a circle through the connecting holes on the ends of the body sheet..

The number of body plates in a circle will change according to your silo model. The dimensions of each body sheet are the same. But its holes and arc angles will change according to the silo models. The pictures here are examples.

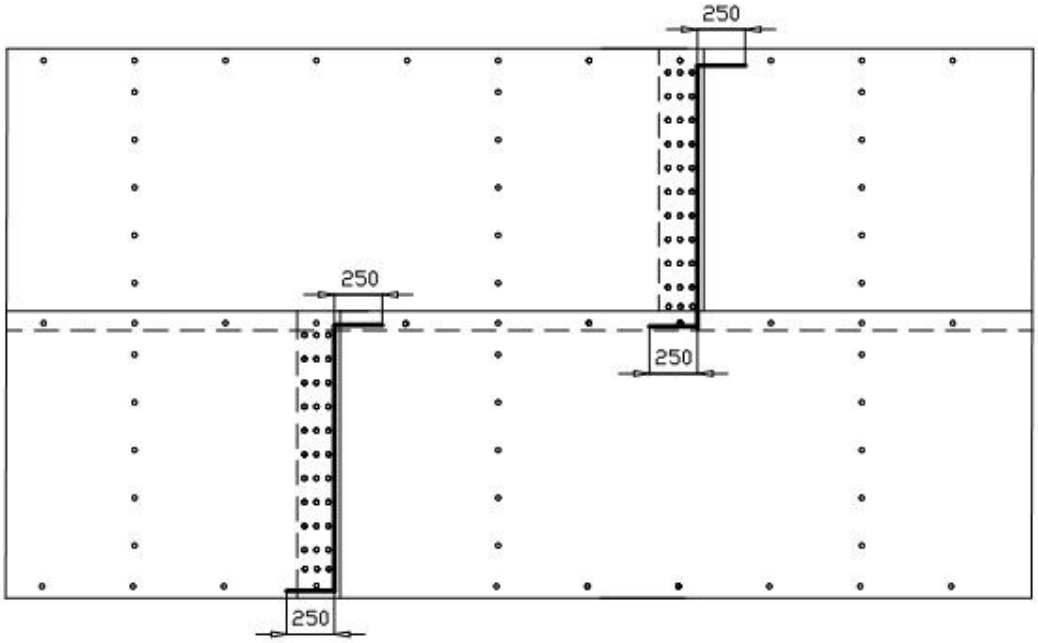
Figure 2.1.2 Top Ring Assembly



Body sheet assembly rotates clockwise as seen in the diagram. Putty should be placed between the joints, including the top body sheet..

M8X25 or M10X25 bolts should be used for body sheet mounting. Which bolt is used in the body direct line list. **The bolt must be mounted on the nut from the outside.**

Figure 2.1.3 Body Putty Application



<u>Do not use putty on the horizontal axis</u>. Use putty only on the vertical axis. As seen in Figure 2.1.3, joints will be used on 250 mm horizontal axis and no other putty application will be made on the horizontal axis. You will be sent enough paste to use only on the vertical axis. It is important to use putty. Otherwise, moisture and other climatic factors will enter the silo and stored grain loss will occur..

In light-roofed silos, a carrier to assist in the installation of the silo, an auxiliary apparatus for carrying the top ring is placed. Top ring carrying apparatus made by the receiver; It also helps with the centering process. Thanks to this apparatus, it will be easier to make a sheet metal arrangement as well as the top ring will be fixed by the support it is seated on. The apparatus made is placed in the middle of the area where the roof will be installed..

Figure 2.1.4 Middle Mast Apparatus

The above-mentioned apparatus is on the side in Figure 2.1.4.
It is shown. While roof mounting of silos,
Do not forget to take and take security measures.
This is the health and life safety of you and your employees
is not an important issue to be neglected for.

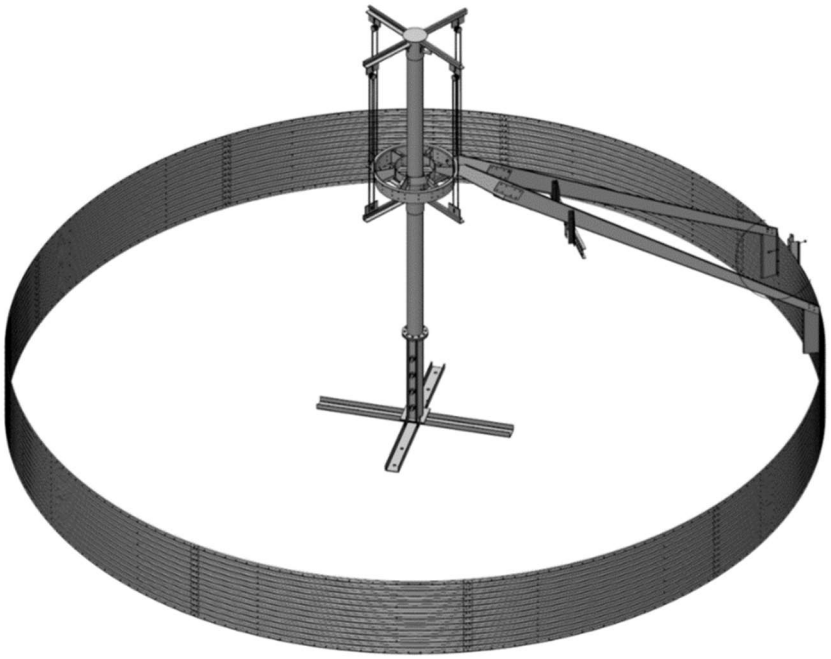
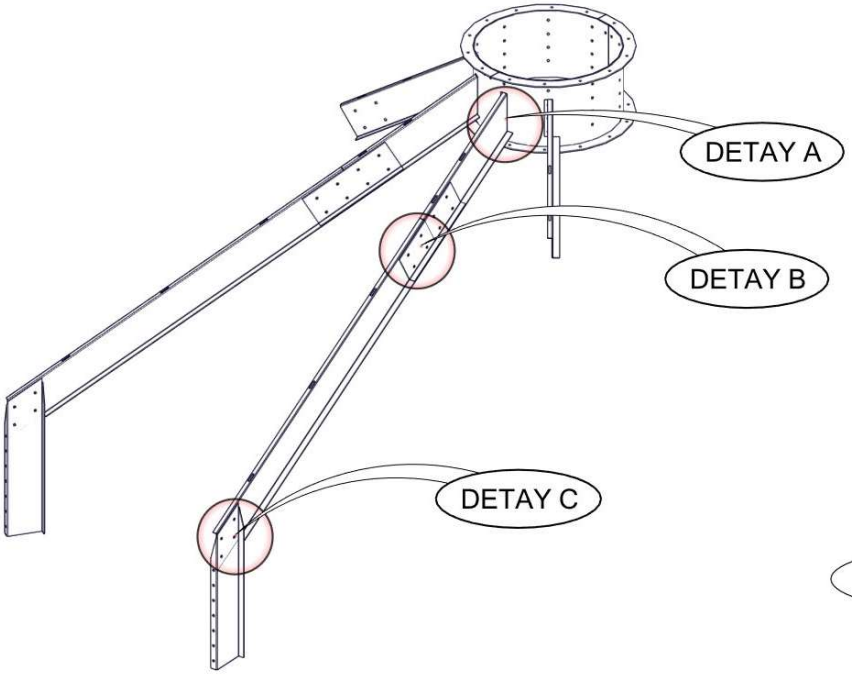
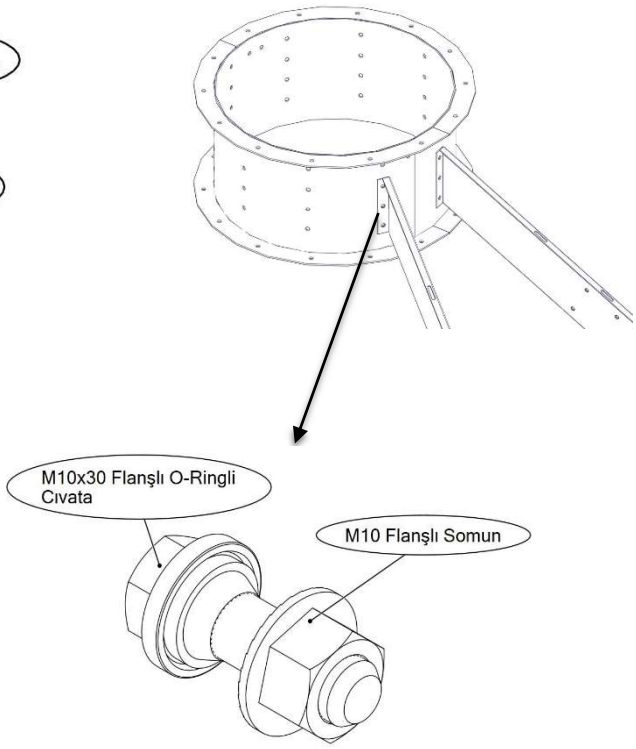


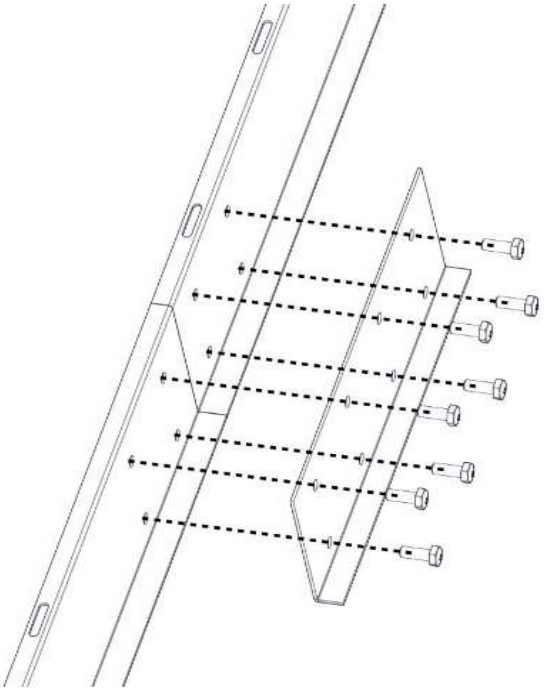
Figure 2.1.5 Peak Ring and Beam Joints



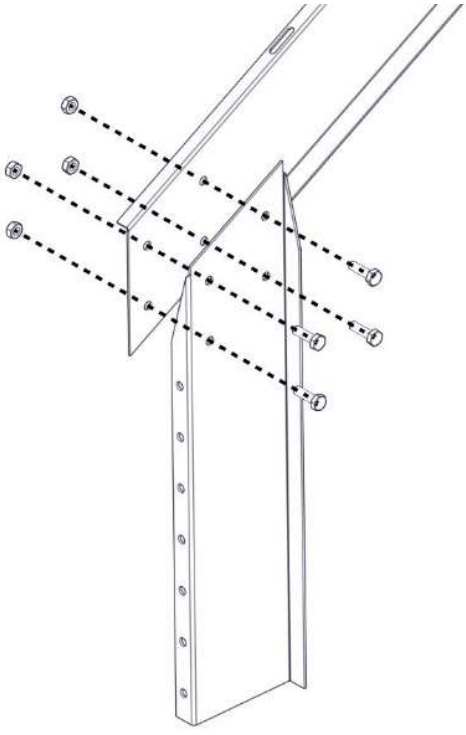
Detay A



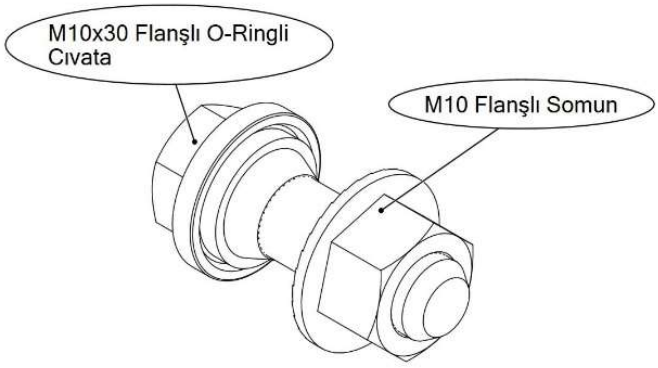
Detay B



Detay C



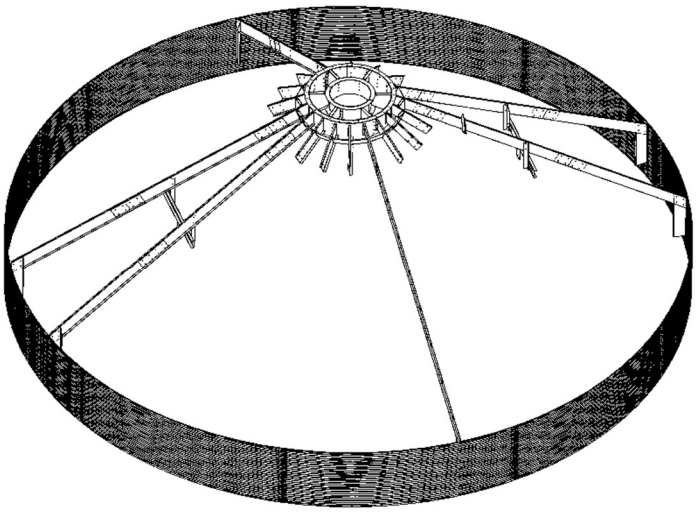
Peak ring and beam joints and details are shown. With the help of a crane or with the apparatus shown in Figure 2.1.4, the top ring will be lifted and the beams will be mounted.. **Attention to work safety is emphasized.**

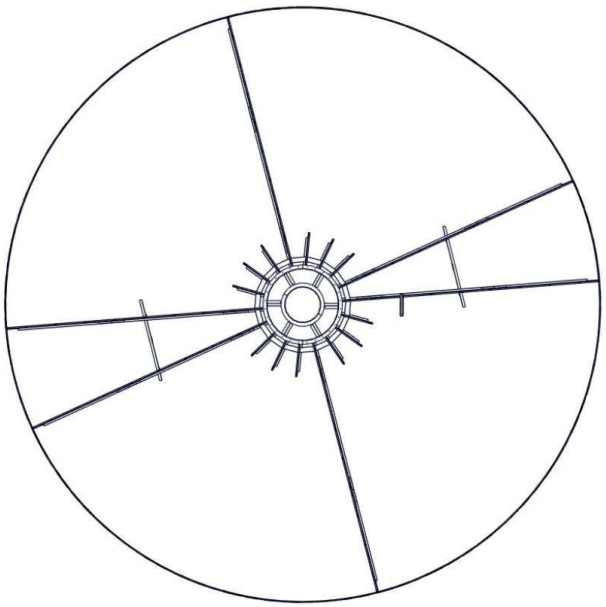


The fasteners to be used are M10x30 “10.9” quality bolts and M10 ”10” quality flanged nuts. Observe the tightening torque values..

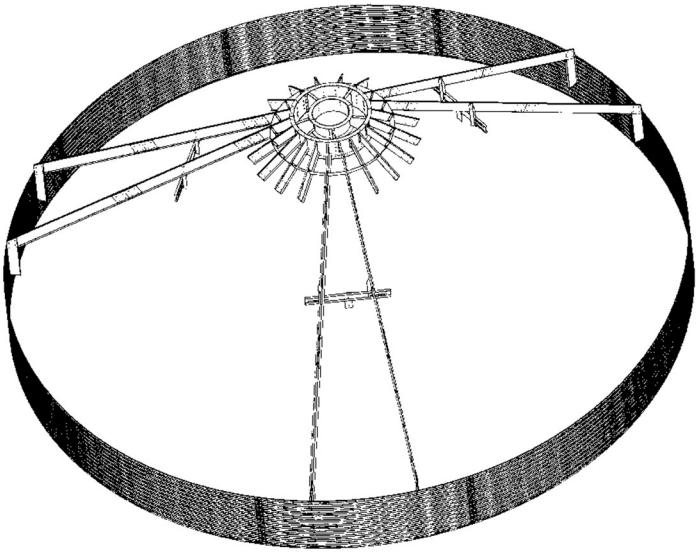
Beam Installation General Views According to Silo Types

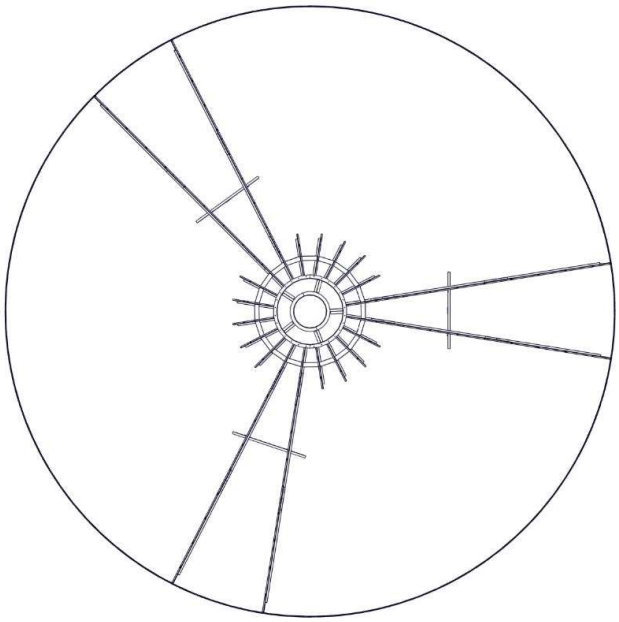
- **Ø8200 mm Silo Roof Beams Views (9 Model Silo)**



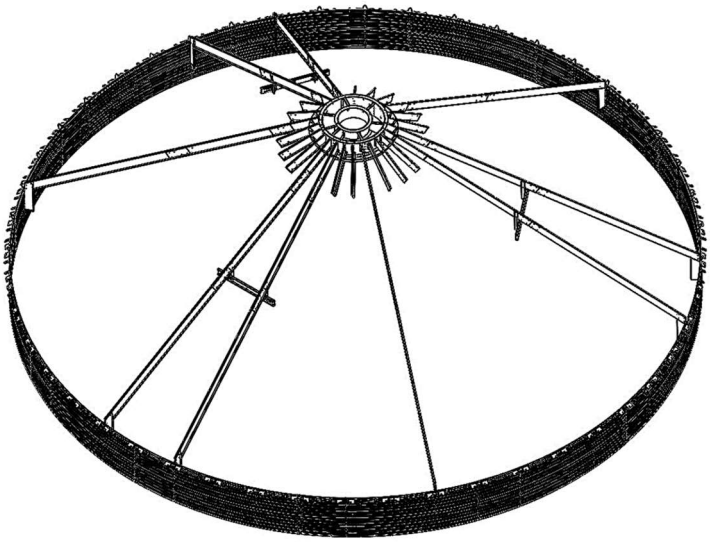


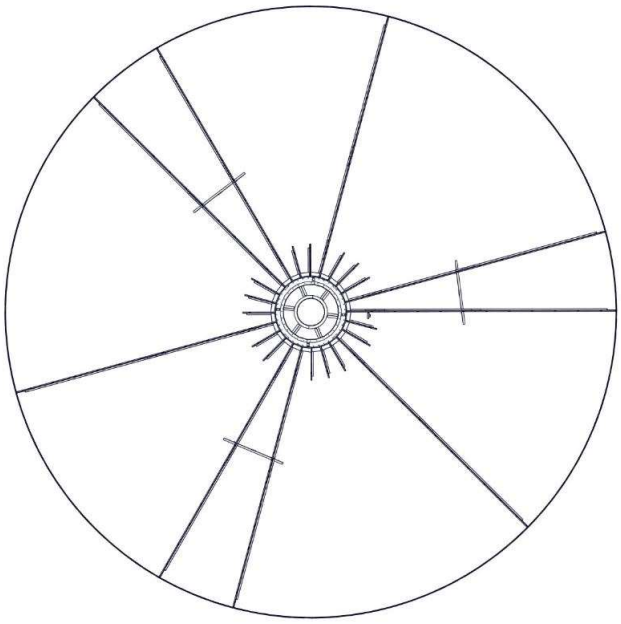
- **Ø9140 mm Silo Roof Beams Views (10 Model Silo)**



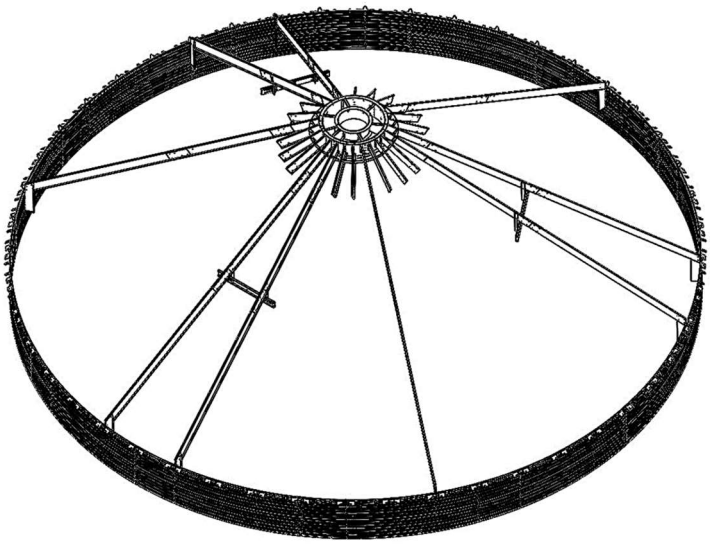


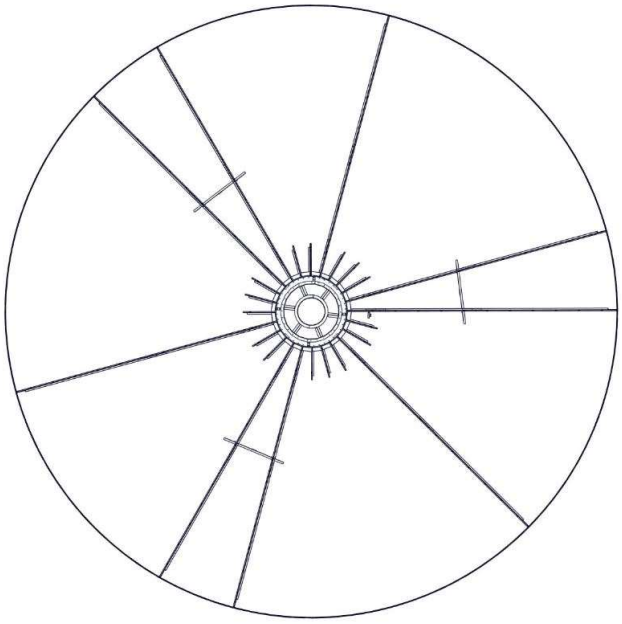
- **Ø10050 mm Silo Roof Beams Views (11 Model Silo)**





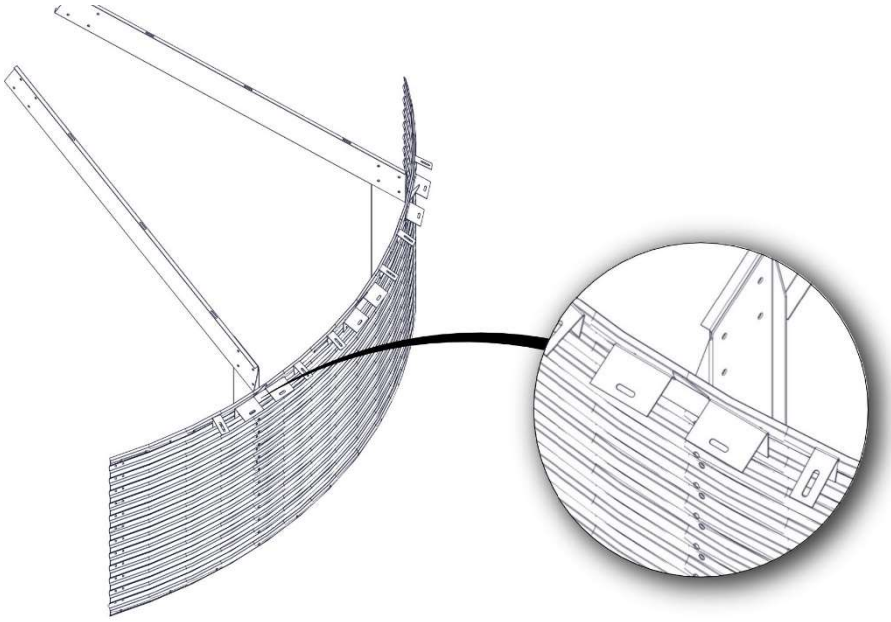
- **Ø10960 mm Silo Roof Beams Views (12 Model Silo)**



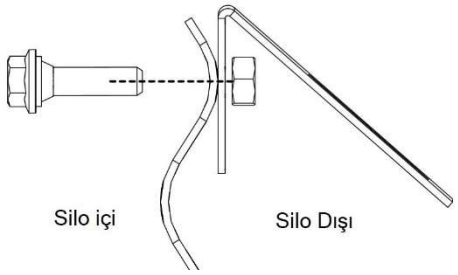


When the assembly of the beams is completed, the above images will be obtained according to the silo type. The length and number of beams varies in every diameter, make sure which type of silo is to be installed and if necessary, contact Lambton. After the upper body sheet is finished, the frame and other parts are assembled..

Figure 2.1.7 Eave And Other Parts



Eave intermediate connector



- After the inner support sheet and the intermediate part spacer assembly are done, we can start assembly the enclosure. A first bolt connection is made by leaving one bolt hole empty after the intermediate part. 3 bolt holes should be left empty between the two ends in the next parting posts. As shown in the detail picture, bolt heads remain in silo frame for nuts and spacers, nuts are tightened from outside.
- Intermediate fittings should be fixed to the middle of these empty bolt holes by using bolt nuts. Continue in this way and complete the entire mid-frame and mid-span assembly in the upper circle..

Figure 2.1.8 Midrange and Intermediate Parts Assembled

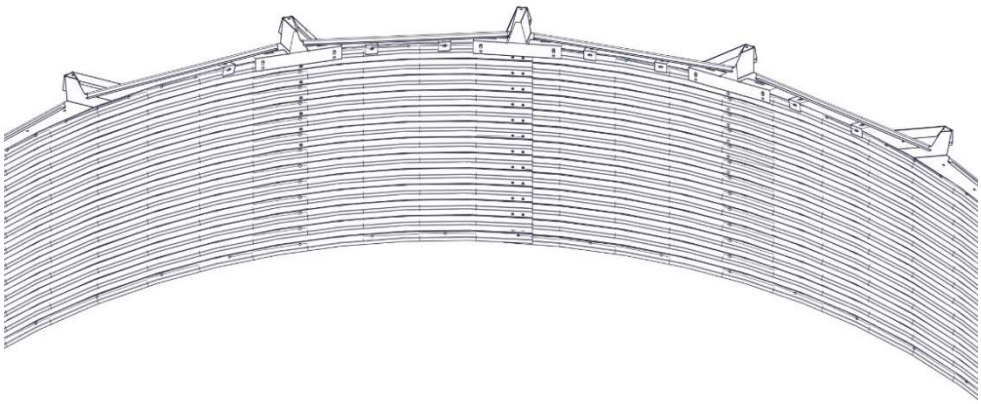


Figure 2.1.7 'as stated
and the assembly of the spacers is complete.
Follow the instructions given to you above.
The hoods are not attached properly or
in the wrong place the bird into the silo and
causing other animals to enter.

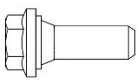
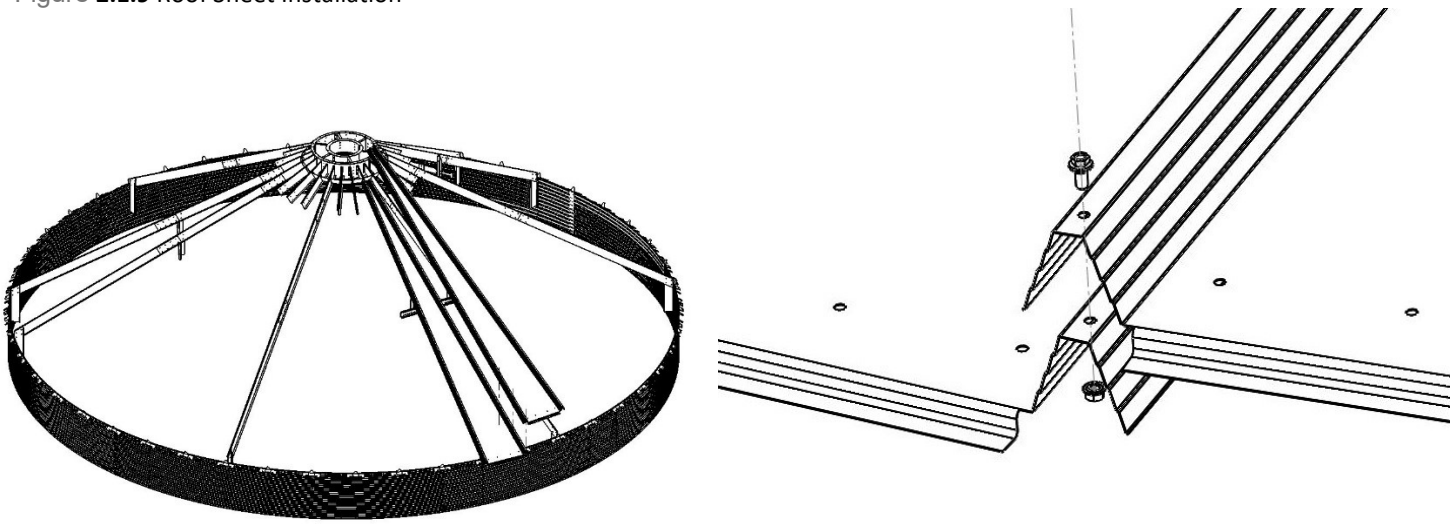
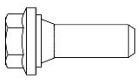
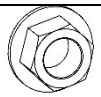
M8x25 Flanged Bolt	
M8 Normal Nut	

Figure **2.1.9** Roof Sheet Installation

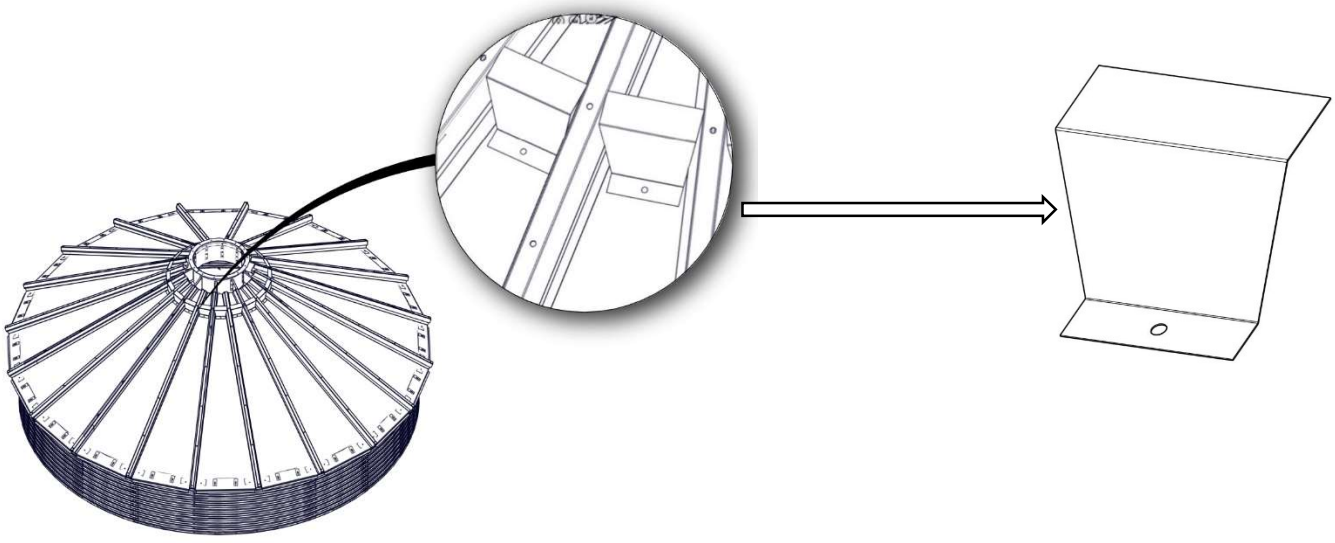


Always install the roof plate counterclockwise. Fasteners are shown in the table on the side..

Combination Detail View

M8x20 Flanged bolt and washer (10.9 kalite)	
M8 Normal Nut 10 kalite	

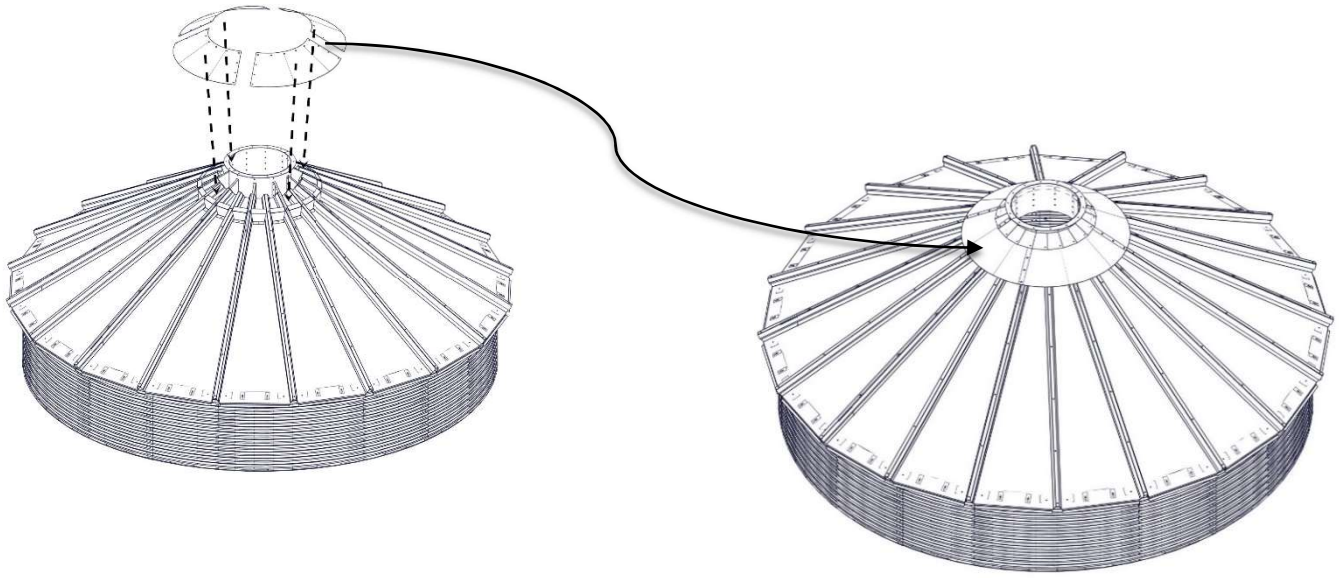
Şekil 2.1.10 Üst Kuşluk Montajı



After the roof sheets are attached to each other and the assembly is completed using the M8 flanged O-ring bolt nut, the upper hoods are mounted before proceeding to the hood assembly. The upper bird areas and the detailed picture are shown in Figure 2.1.10. The roof sheet part of the peak shirt is not drilled and will be drilled in the field. Use the M8 drill bit to drill the veneers. Complete the assembly with the M8x25 flanged O-ring bolt and flanged nut. Then, mount the hood and cover sheet..

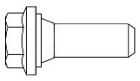
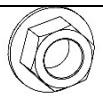
Figure 2.1.11 Peak Flashing Installation

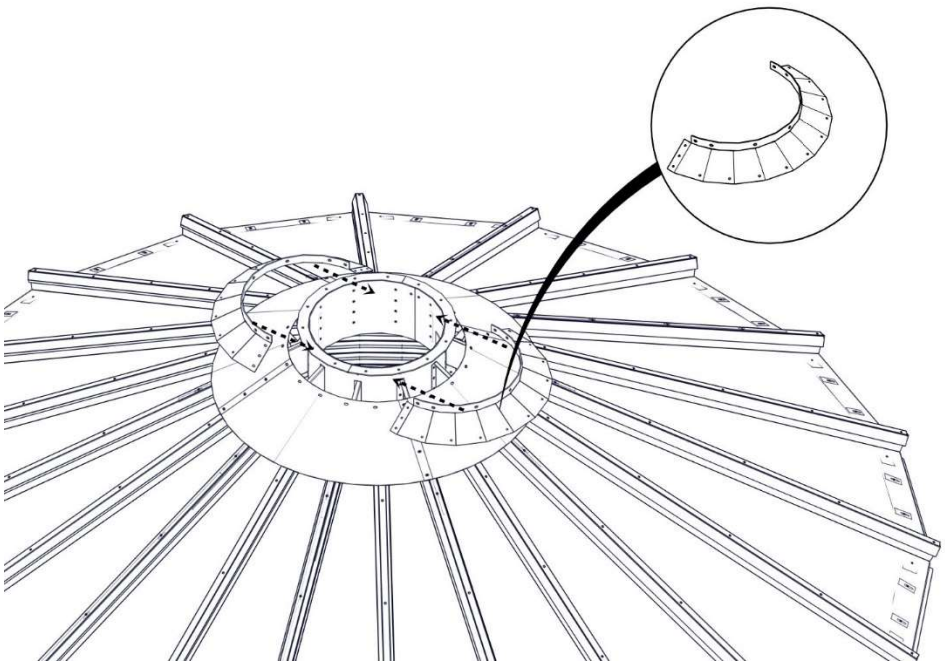
After mounting the upper hood, the hood and its rings are started to be mounted.
First the hood ring is mounted on the upper part as shown in Figure 2.1.11
makes. These rings are attached to the roof sheets with M8 O-ring bolts.
assembled.

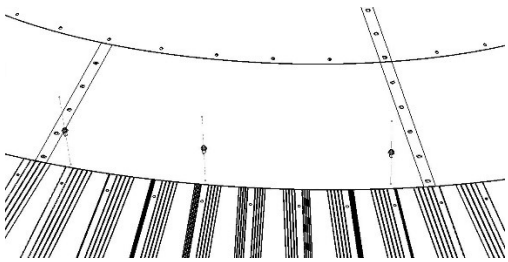


The final shape of the hood ring is on the side.
You see. O-Ring bolts must always be tightened by the nut. Otherwise, the O-ring will be damaged and the sealing will not be fully ensured.
You are kindly requested to pay attention to this important detail..

Figure 2.1.12 Upper Hood Assembly

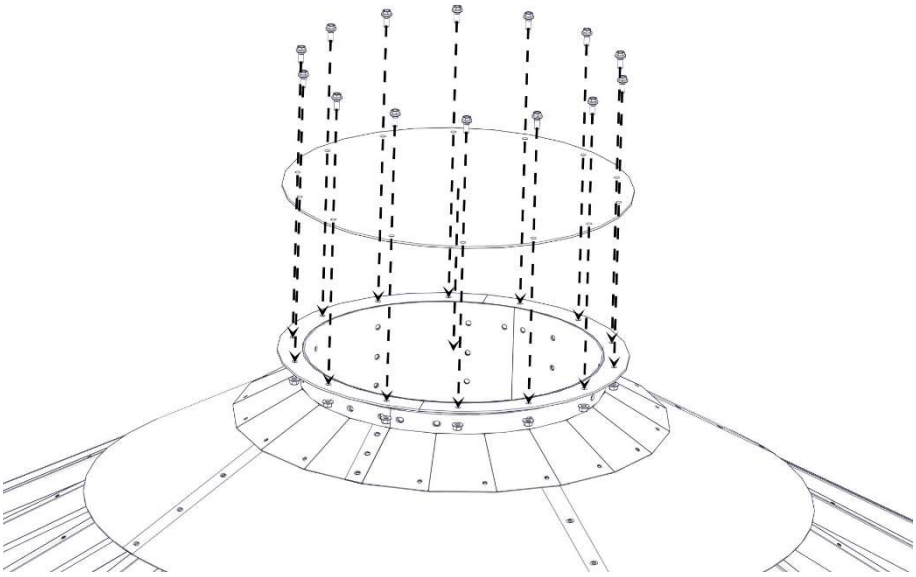
M10x25 Flange bolt and washer (10.9 kalite)	
M10 Flange Nut (10 kalite)	





The upper hood must be mounted as shown in Figure 2.1.12. The hood, the detail of which is shown in the picture, consists of two parts. Two pieces should be added together. Each of these parts is sent to the field in a welded way. Hoods should be fixed to the upper hopper by drilling holes.

Figure 2.1.13 Top Cover Assembly



Top cover assembly is shown in Figure 2.1.13. Caps with M8 flanges and O-Ring bolts and nuts assembled and finished.

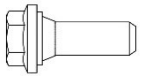
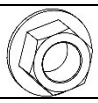
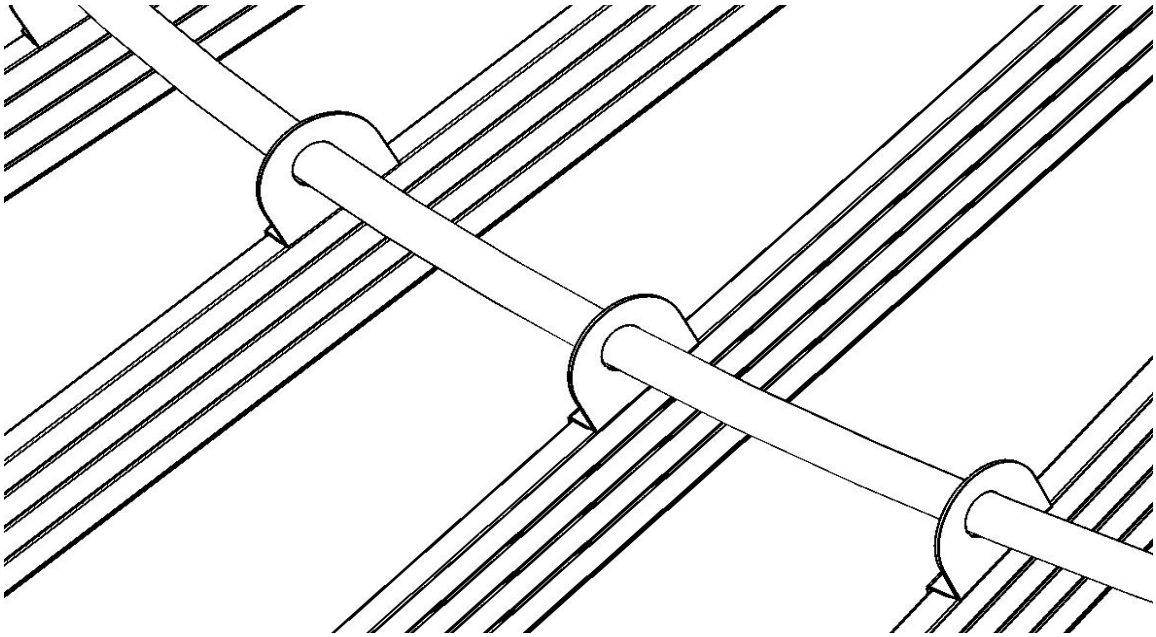
M10x25 Flange bolt (10.9 Kalite)	
M10 Flange nut (10 Kalite)	

Figure 2.1.14 Roof Wind Ring Installation



Roof wind pipes are shown in Figure 2.1.13. These pipes are sent to you in accordance with the diameter of the place to be installed. Pipes are sent in pieces to form the circle. A complete circle is formed by combining with the joining apparatus. Otherwise, the connection can be opened again. The pipes may be a little long and not fully end to end. In such cases, try to reattach the pipe from the end part by cutting enough. When the pipe connections require additional, it must be fixed with the jointing apparatus.. Never leave the ends of the pipes exposed.

Tablo 2.1.2 Wind Ring Roof Position

Model	Diameter	Hole Location
8	7310	4th
9	8210	4th
10	9130	6th
11	10040	6th
12	10950	8th

The holes through which the roof wind ring clamps will be attached are specified in Table 2.1.2. The holes in the table indicate the number of holes to be connected to the roof sheet by starting to count down. The joints are shown in the table below.

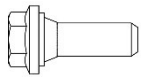
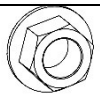
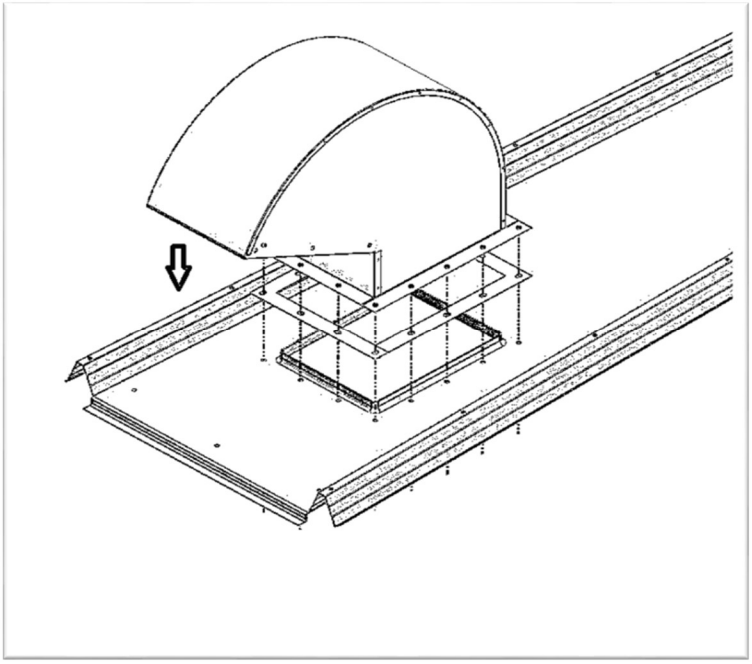
M8x25 Flange bolt with washer (10.9 kalite)	
M8 Flange nut 10 kalite	

Figure 2.1.15 Roof Vent Installation



Roof vents provide natural ventilation of the silo. In addition, while filling the silo, it ensures the dust and air pressure generated in the silo to be released safely. Without a roof vent, your silos can be damaged by air pressure.

In vent assembly, the roof sheet is first cut according to the size of the vent and the sheet metal must be bent outwards with a hammer. this process is an important application to prevent water intake from the vent..

There are 4 vent flanges for each vent, after the roof sheet is drilled according to the vent holes, two are mounted on the roof sheet and the other two are mounted under the roof sheet together with the vent. The fasteners are; M8x25 "10.9" flanged Oring bolt and M8 "10" quality Flanged Nut should be used.

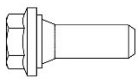
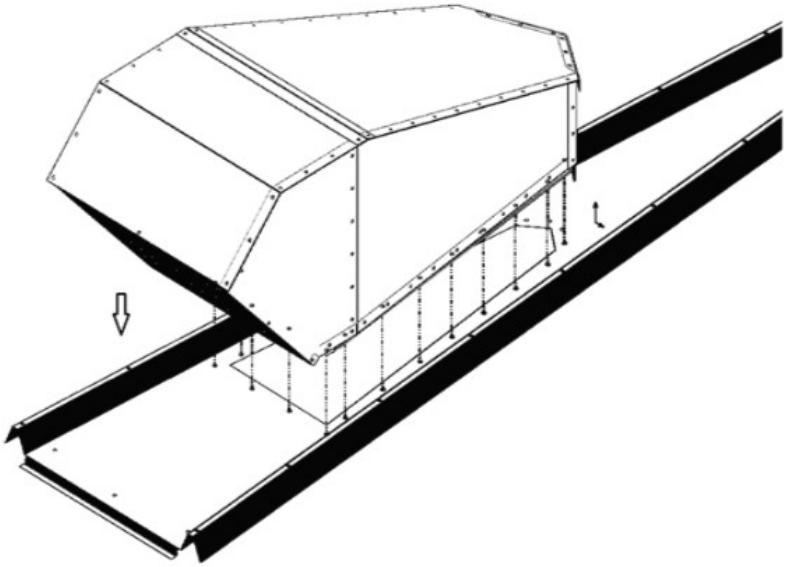
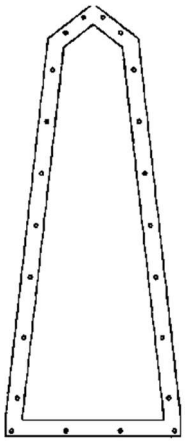
M8x25 Flanged ORing Bolt (10.9 kalite)	
M8 Flanged nut 10 kalite	

Figure **2.1.16** Roof Fan Installation

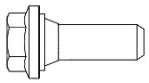
A template is sent to every project with an exhaust fan. Normally, they are drilled in the factory and drilled on the field. In the exhaust fan assembly, the places to be installed are determined by making an equal distribution on the roof according to the number..





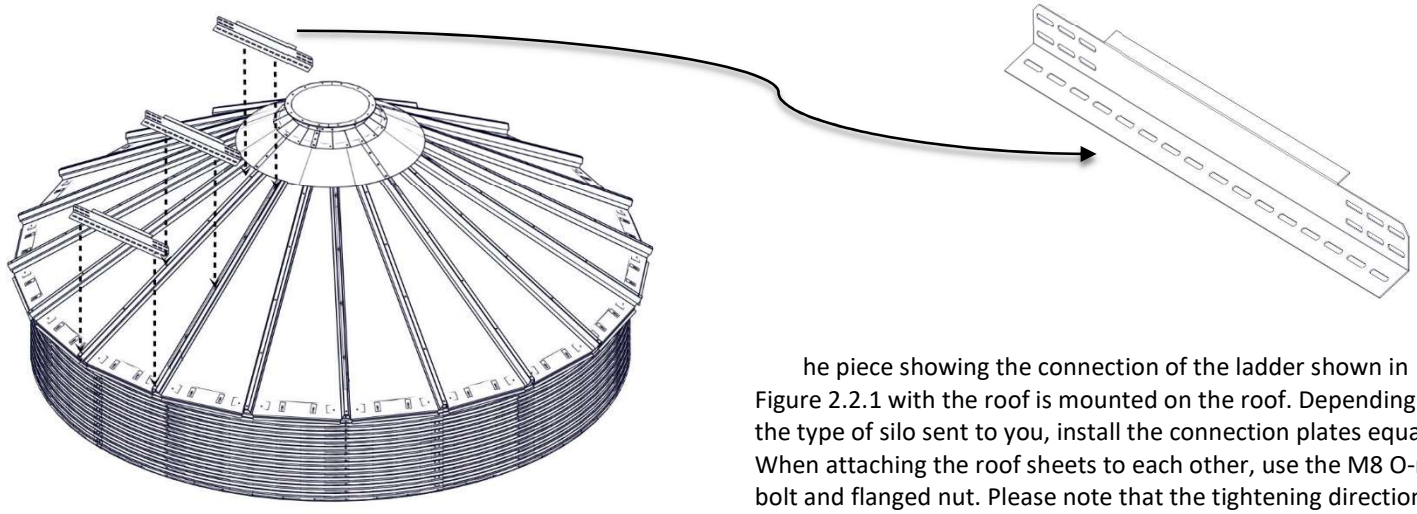
ate

After the holes are drilled, putty is applied to the joint and the roof fan is installed. M8x25 "10.9" quality flanged oring bolts and M8 "10" quality flanged nuts should be used as joints as for roof chimney mounting..

M8x25 Flange ORing Bolt (10.9 kalite)	
M8 Flange Nut 10 kalite	

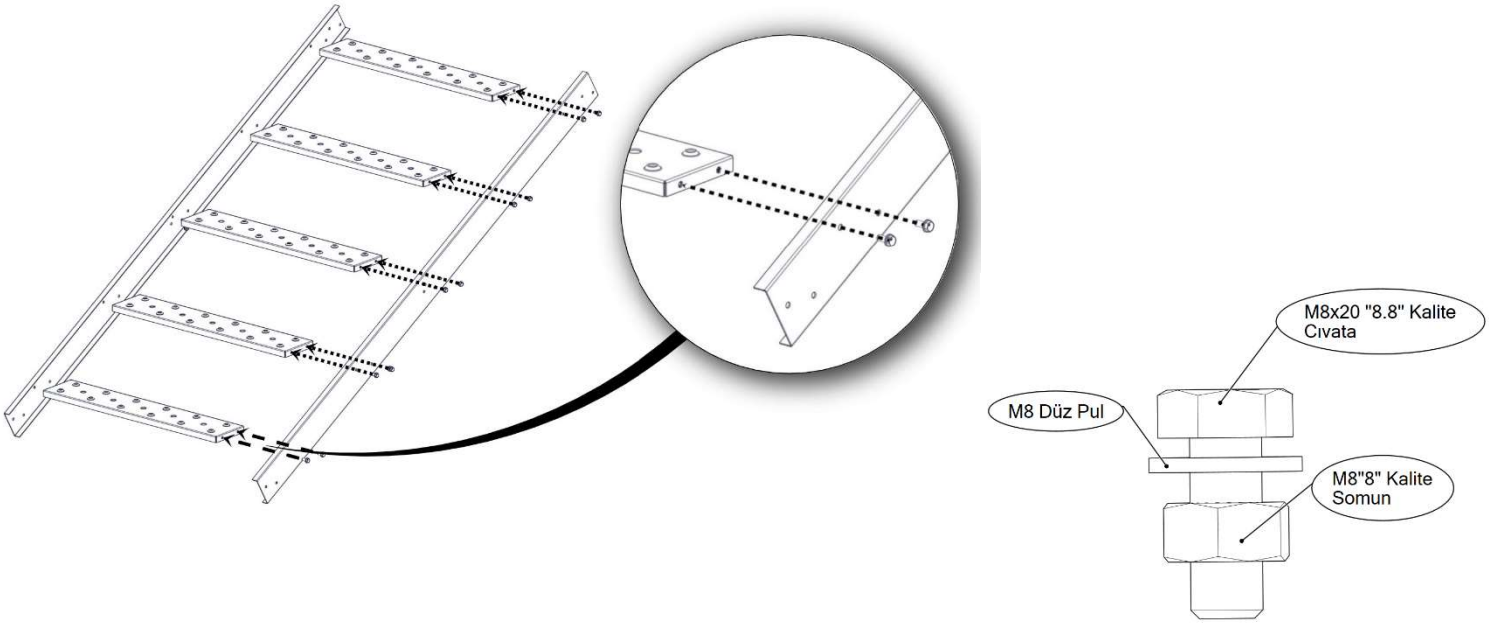
2.2 COMMERCIAL CONICAL ROOF LADDER MOUNTING

Figure 2.2.1 Stair Roof Connection Sheet



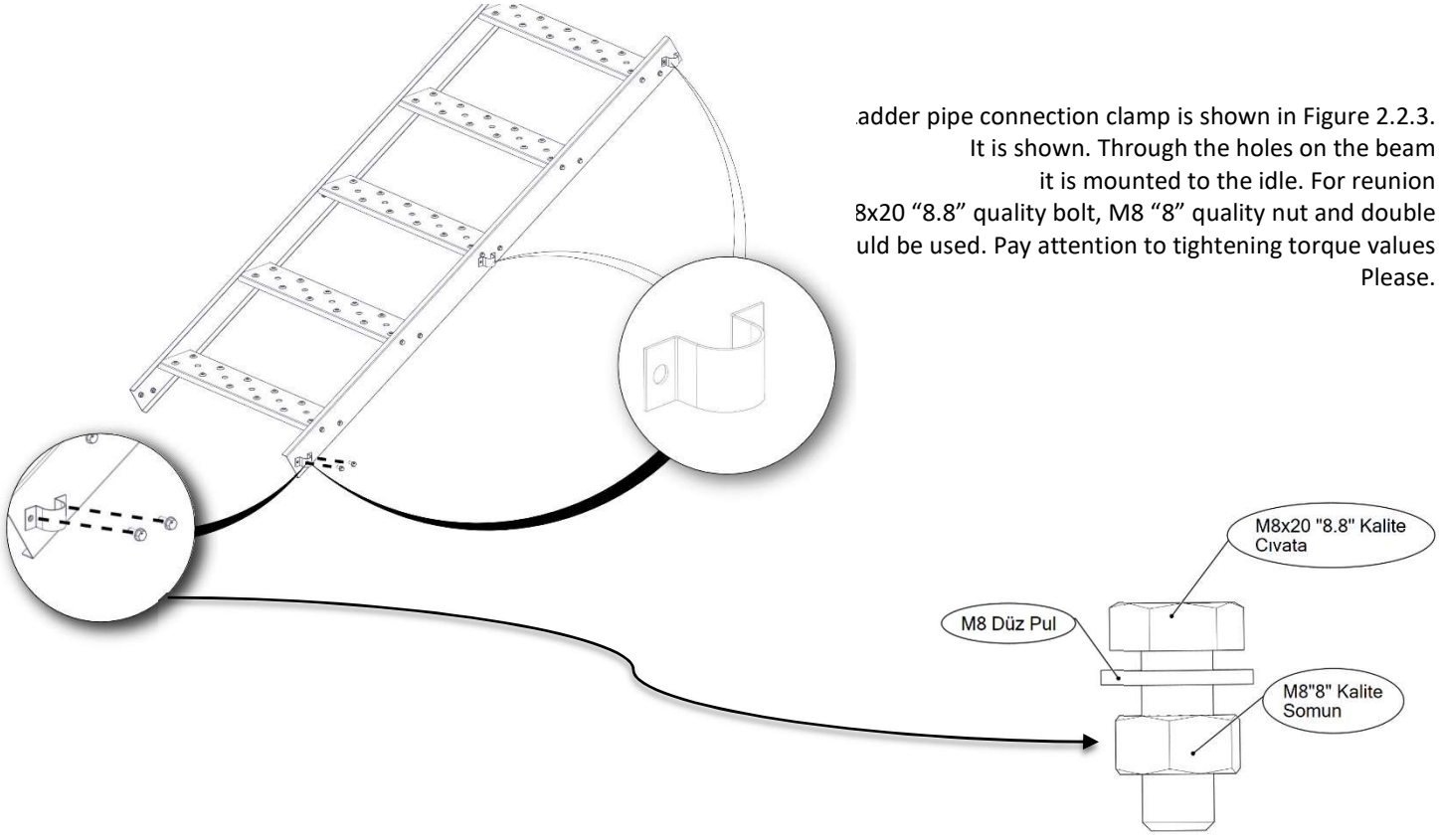
he piece showing the connection of the ladder shown in Figure 2.2.1 with the roof is mounted on the roof. Depending on the type of silo sent to you, install the connection plates equally. When attaching the roof sheets to each other, use the M8 O-ring bolt and flanged nut. Please note that the tightening direction is always in the nut part.

Figure 2.2.2 Stair Mounting



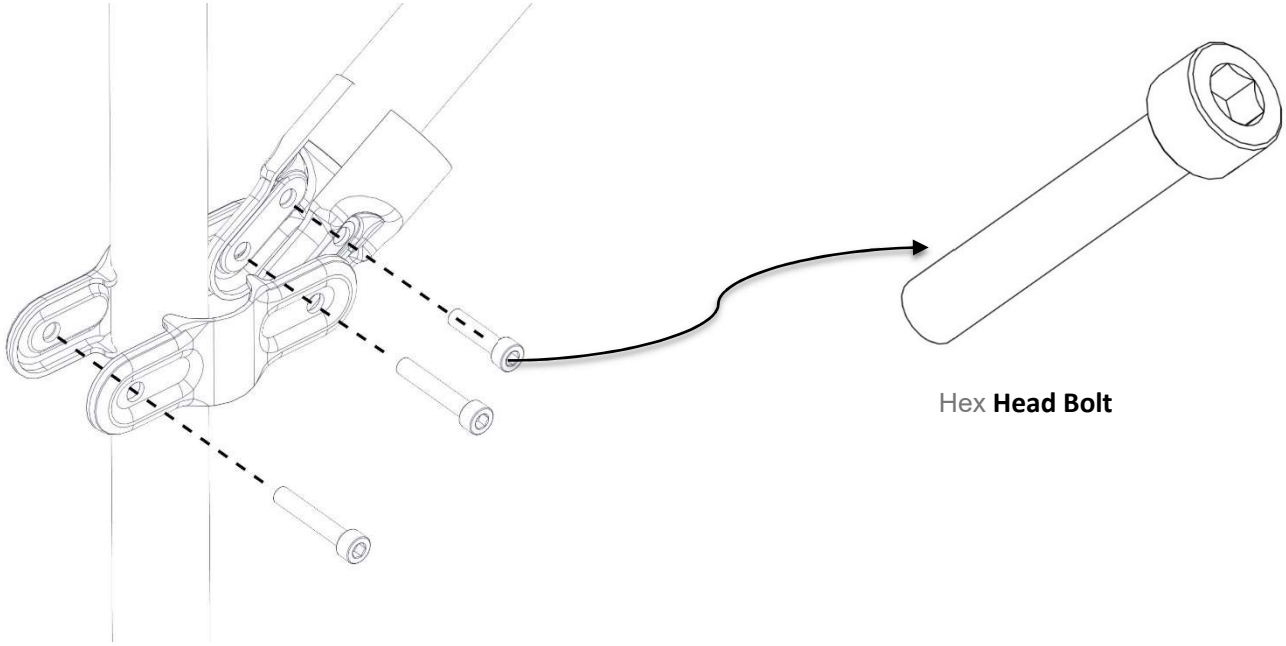
The assembly of the stairs begins with the joining of the steps and beams. The joints are shown in Figure 2.2.2. M8x20 “8.8” quality bolts, M8 “8” quality nuts and double washers should be used for joints. Pay attention to tightening torque values

Figure 2.2.3 Ladder Pipe Connection Clamp



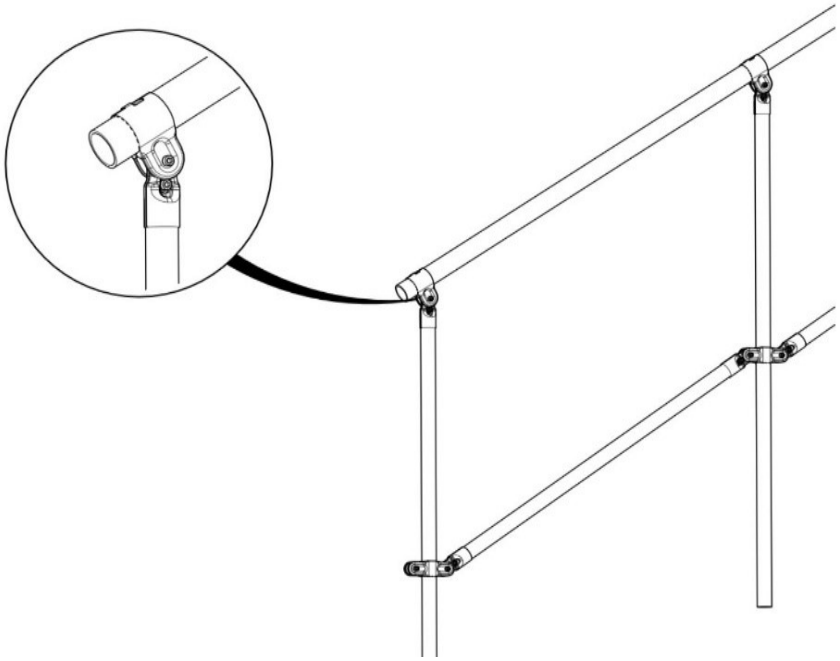
adder pipe connection clamp is shown in Figure 2.2.3.
It is shown. Through the holes on the beam
it is mounted to the idle. For reunion
8x20 “8.8” quality bolt, M8 “8” quality nut and double
uld be used. Pay attention to tightening torque values
Please.

Figure 2.2.4 Middle Clamps and Pipe Installation



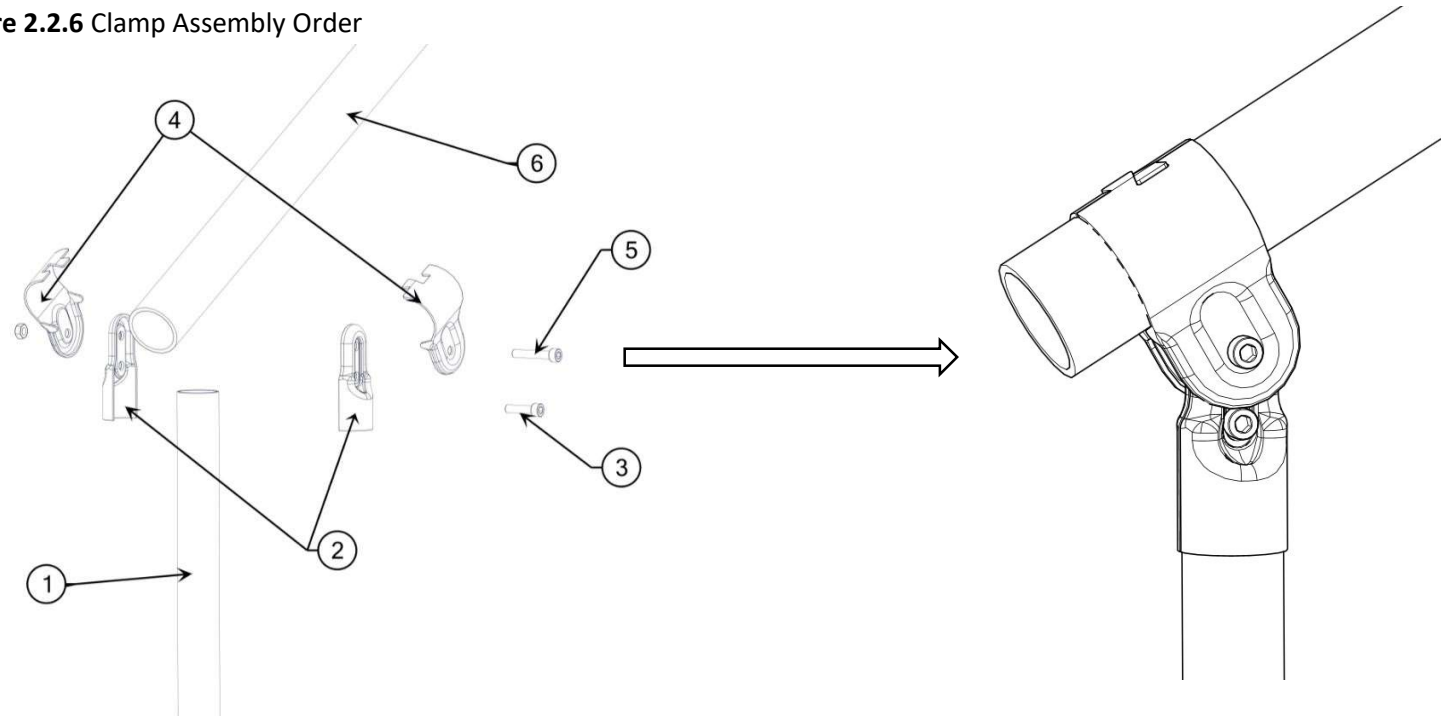
Upon mounting the pipe fixing plate shown in Figure 2.2.3, vertical pipe railings and clamps are started. Figure 2.2.4 shows how to assemble the clamps in the middle. The clamps are connected to each other and other clamps with the Hex head bolt.. **The nut to be used is M6 hex nut.**

Figure 2.2.5 Mounting the Upper Clamps



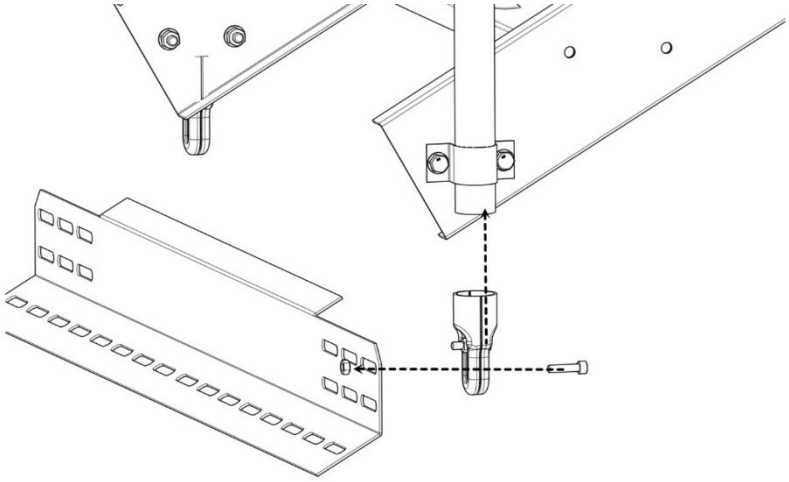
General views of the upper clamps on the side like this. Top clamp generally for Ø42 pipe designed and other pipes Ø32 pipes designed for.

Figure 2.2.6 Clamp Assembly Order



The upper clamp mounting sequence is shown on the side in Figure 2.2.6. The order is as follows:
The lower tube railing is fixed to the lower clamp.
Then the clamps indicated with the number 2 are fixed on the lower pipe.
The hex bolt indicated by the number 3 tightens the clamp and the pipe.
The upper clamps indicated by number 4 are then joined by the imbus bolt indicated by number 5 with the other clamps indicated by number 2. The pipe railing is passed through this clamp and the assembly is completed.

Figure 2.2.7 Stair Roof Fixing



Finally; installation in place as described above the ladder made is taken with the help of a crane and ladder-roof mounted on roof sheets mounting on fixing apparatus as shown in Figure 2.2.7 makes. Shown in the figure before fixing to the roof clamps are mounted on pipe railings. And finally M6x30 Hex bolt and M6 used in other parts assembly is complete with nut.

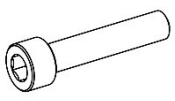
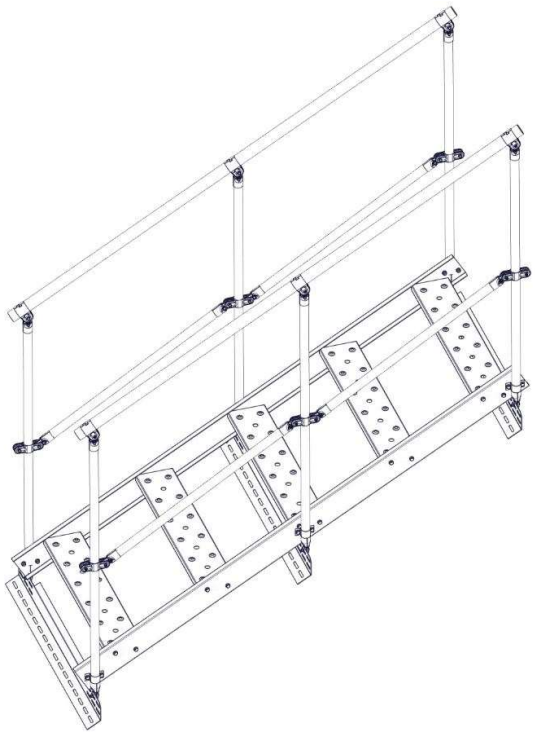
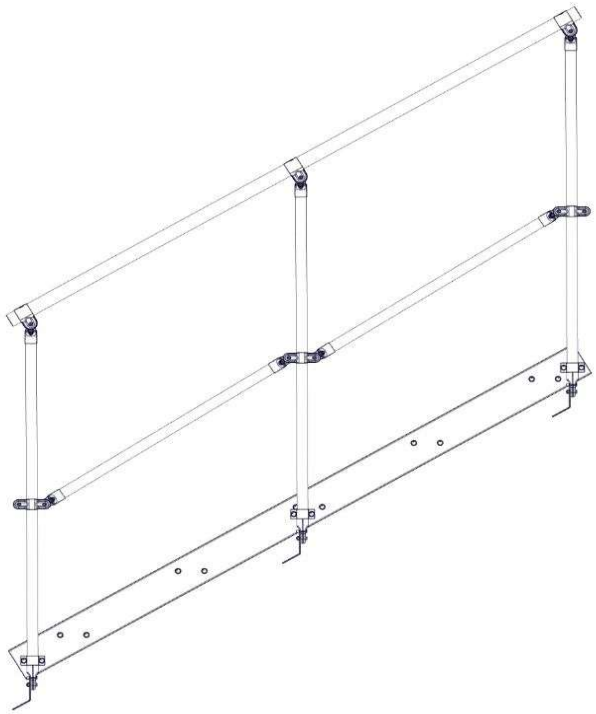
M6x30 Hex Cıvata	
M6 Normal nut	

Figure 2.2.8 Stairs Overview





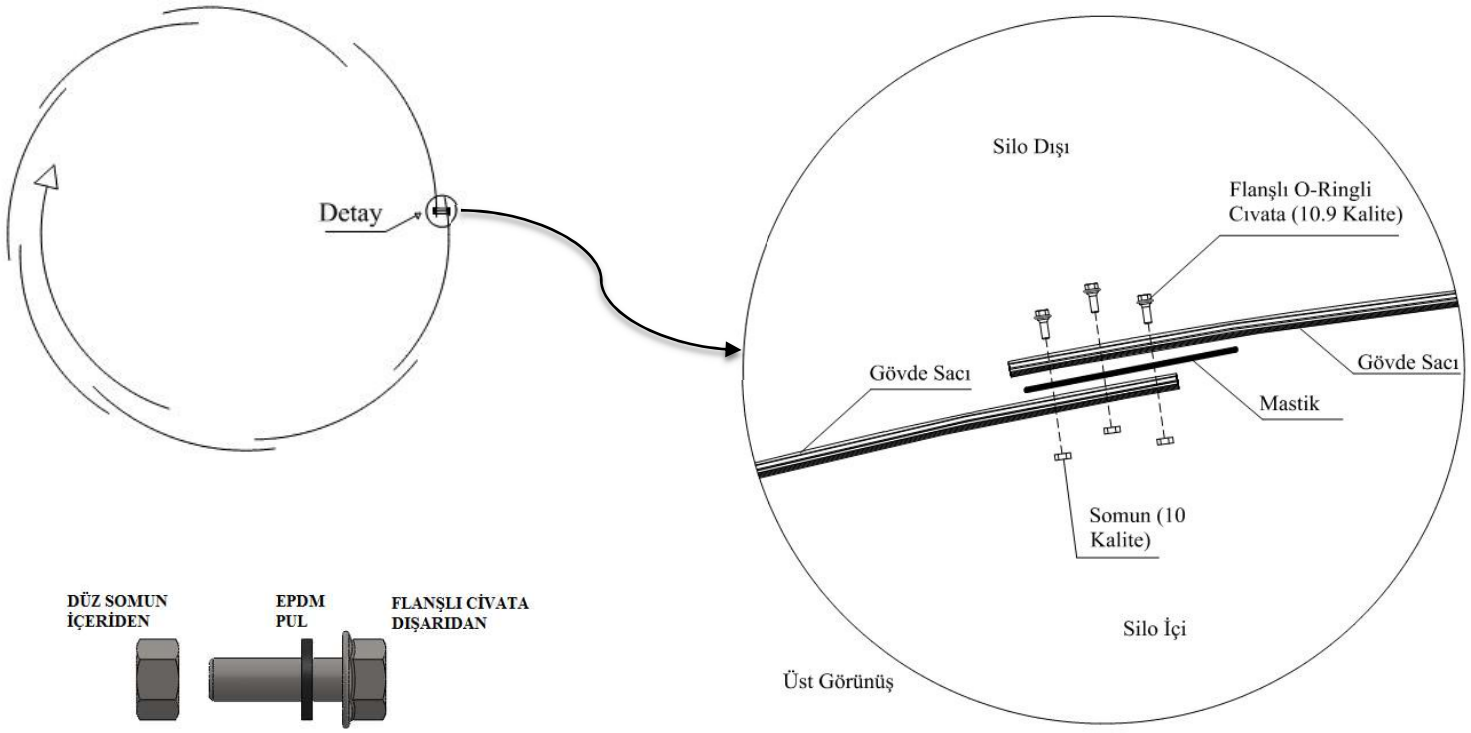
<u>You have completed the assembly of the roof ladder and put it in place with a crane. Since you will work at height, take all necessary precautions for occupational health and safety for you and those working for you..</u>

2.3 COMMERCIAL CONICAL BODY MOUNTING

- Before proceeding with the body assembly, be sure to choose the right thickness sheet. For the color chart, it will be sent to you separately.
- In general, the thinnest body sheet is at the top in the silos and the thickest body sheet is at the bottom.
- Check the silo body sheet thicknesses sent to you in the table below.. **Do not forget; The top body will be assembled first.**

BODY THICKNESS COLOR CHART			
THICKNESS (mm)	**COLOR**	**VIEW**	**RAL CODES**
UPPER	**WHITE**		**RAL 9016**
1	**CYAN**		**RAL 5012**
1.2	**PINK**		**RAL 4003**
1.35	**ORANGE**		**RAL 2009**
1.5	**RED**		**RAL 2002**
1.8	**PURPLE**		**RAL 4007**
2.2	**GREEN**		**RAL 6001**
2.5	**NAVY BLUE**		**RAL 5013**
3	**BLACK + CYAN**		**RAL 8022+RAL 5012**
3.5	**PINK + BLACK**		**RAL 8022+RAL 4003**
3.8	**BLACK + ORANGE**		**RAL 8022+RAL 2009**
4.2	**Black + Red**		**RAL 8022+RAL 2002**
4.5	**Black + Purple**		**RAL 8022+RAL 4007**
5.2	**Black + Greene**		**RAL 8022+RAL 6001**
6.35	**Black + Navy Blue**		**RAL 8022+RAL 5013**

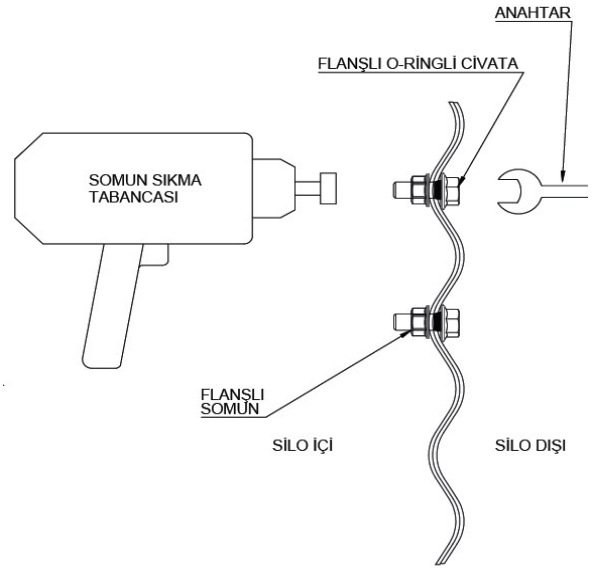
Figure 2.3.1 Introduction to Body Assembly



Body sheet assembly rotates clockwise as seen in the diagram. Putty should be placed between the joints, including the top body sheet..

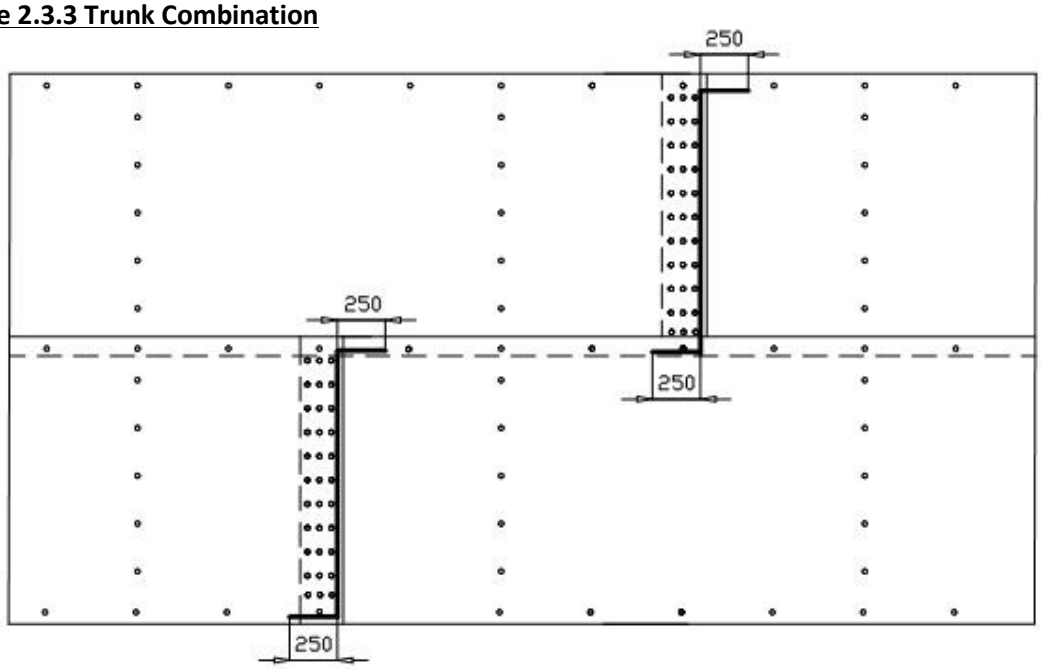
M8X25 or M10X25 bolts should be used for body sheet mounting. Which bolt is used in the body direct line list. **The bolt must be mounted on the nut from the outside.**

Figure 2.3.2 Tightening Type and Bolt Nut Locations



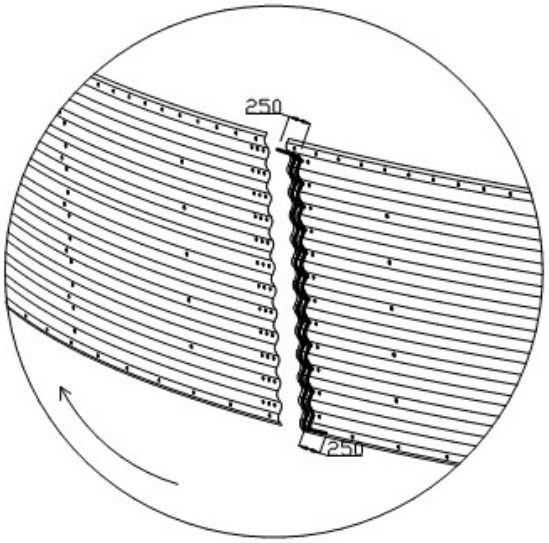
ATTENTION!!! The nut and bolt connection must not be damaged by that ring and
tighten only the nut to ensure tightness. Otherwise, errors that may occur and may occur as a result of wrong assembly,
Lambton cannot be held responsible…

Figure 2.3.3 Trunk Combination



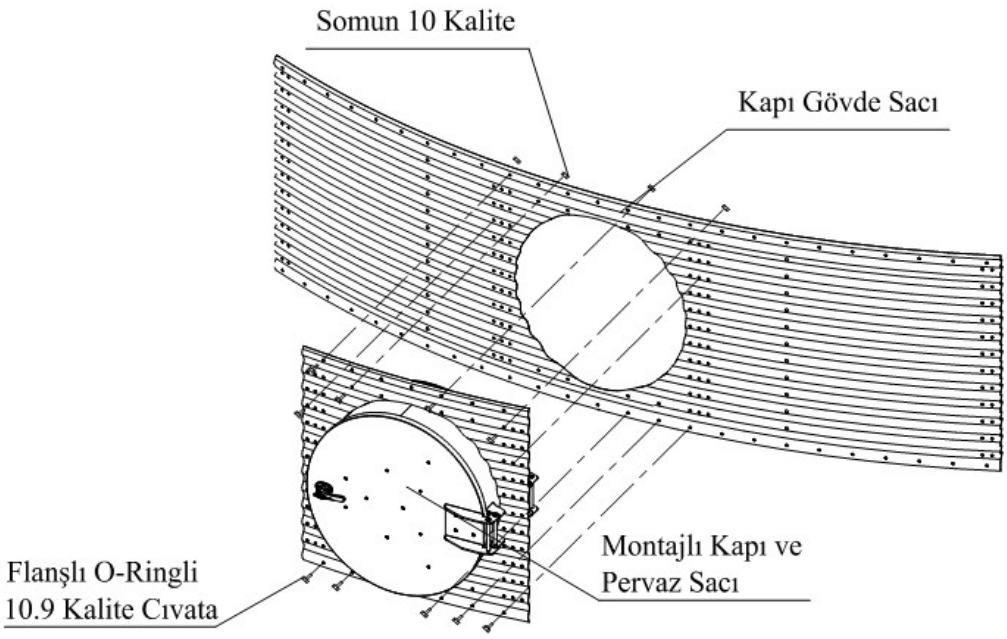
Do not use putty on the horizontal axis. Use putty only on the vertical axis. As seen in Figure 2.3.3, only "250" mm paste should be used on the horizontal axis at the joints.. You will be sent enough paste to use only on the vertical axis.

Figure 2.3.4 Body Sheet Isometric View



You can see the application of sealant on the sheet metal in detail in Figure 2.3.4. It is important to apply sealant in specified dimensions. Thus, moisture, dust and other climatic conditions will not enter the silo from outside and your grain will be protected for a long time. Any improperly putty application does not fully seal. Lambton cannot be held responsible for any problems and damages that may occur..

Figure 2.3.5 Silo Door Installation



In Figure 2.3.5 there is a silo door assembly used in commercial conical silos. The door is mounted on the body above the junction of the lower bodies. The flat door and molding plate are sent to the assembly site as assembled. When installing the door, it is mandatory to apply sealant to the door and body joints. The fasteners to be used are the same as the body fasteners. Tightening direction is from the nut side as usual.

Pay attention to the following points during the body installation of the silo:

After creating the first circle, make sure that your silo is equidistant from the center in all directions.

A silo installed out of center may cause all equipment to be installed incorrectly. This will save you time.

When sewing the body sheet, place the sheets between the anchors and the elevation in the middle of your foundation.
In this area, ensure that the bolts are tightened sufficiently. Tightening too little can cause loosening, too tighting may cause threading or breakage of the bolt.

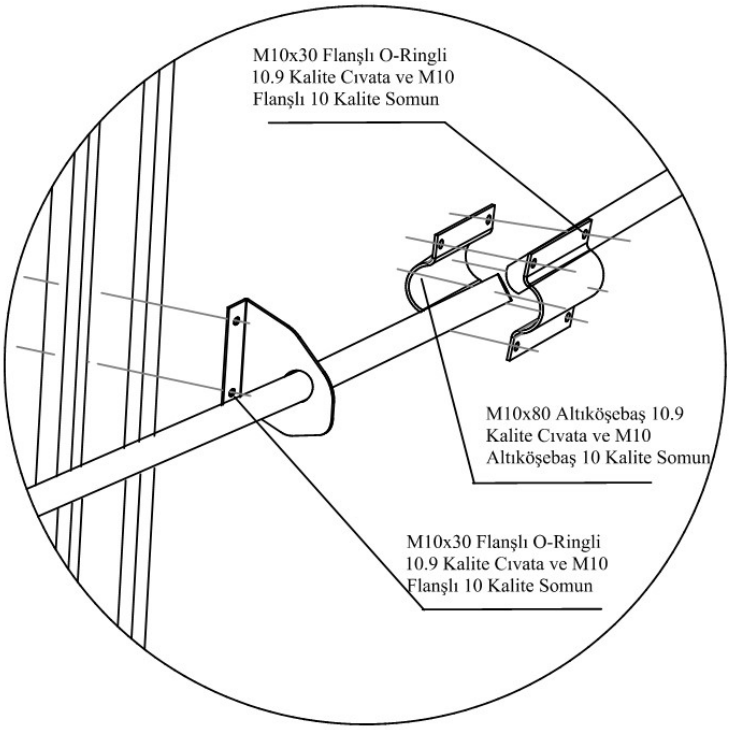
Do not forget to use caulking. If you do not use putty, rainwater will seep into your silo and damage your grain, and the dust in the silo will come out and a large amount of dust will be seen around the silo.

Handle your materials and equipment with care. Because each material loss will cause additional costs and longer installation time for you.

The number of body plates will change according to the silo model. The top body has a different hole structure compared to other bodies. It can be distinguished from others with this feature.

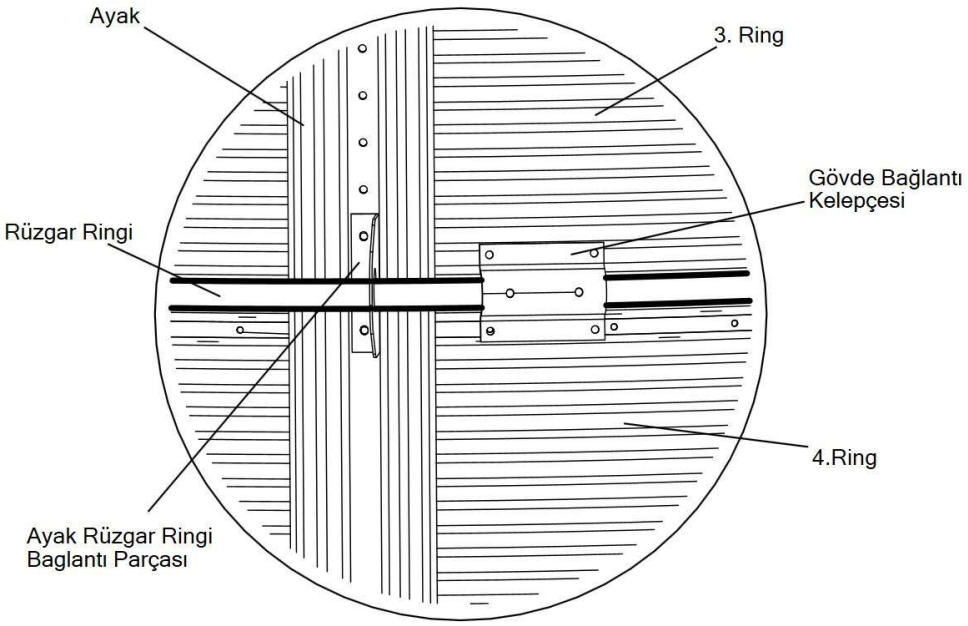
Other body assemblies should be made as described above. Complete the body assemblies by respecting the floor layouts

Figure 2.3.6 Body Wind Ring Installation



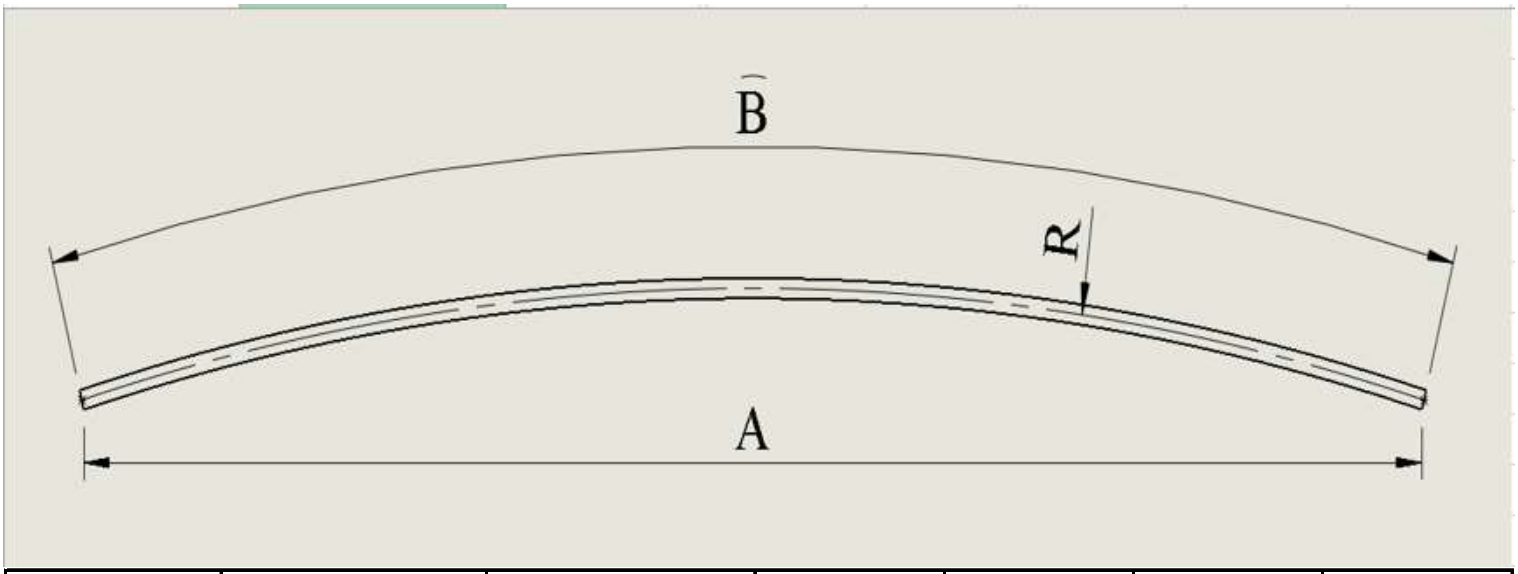
The trunk wind ring connection assembly is shown in Figure 2.3.6 below. Installation should be started on the wind ring from the top of the 3rd and 4th rings. There may be an increase in the number of wind rings depending on where the silo will be installed. The joining elements of the body wind ring are shown in Figure 2.3.6..

You can use the view below for the front view. As seen in the figure, a wind ring is mounted on the joints of the 3rd and 4th bodies from above. Tighten by the nut to avoid sealing problems as usual.



Front view

Table 2.3.1 Body Wind Ring Table



Number of Circles	Silo Diameter mm	WindRing Diameter (R) mm	6M number of pipes	Additional pipe (B) mm	6m pipe curve (A) mm	Additional pipe curve (a)
5	4568	4831	2	3116	4557	2890
6	5481	5744	2	5986	4952	4945
7	6395	6658	3	2836	5205	2736
8	7308	7571	3	5706	5376	5166
9	8222	8485	4	2556	5497	2503
10	9135	9398	4	5426	5586	5115
11	10049	10312	5	2276	5652	2243
12	10963	11226	5	5146	5703	4953

Body wind ring dimensions, how many can it be and the bending dimensions of the additional pipes are specified for all commercial hoppers specified in Table 2.1.2. Check the accuracy of the wind rings sent to you for the silo to be installed by making use of these measurements. In case of wrong shipment, contact the authorized person immediately.

2.5 COMMERCIAL CONICAL STIFFENER COLOR ARRANGEMENTS

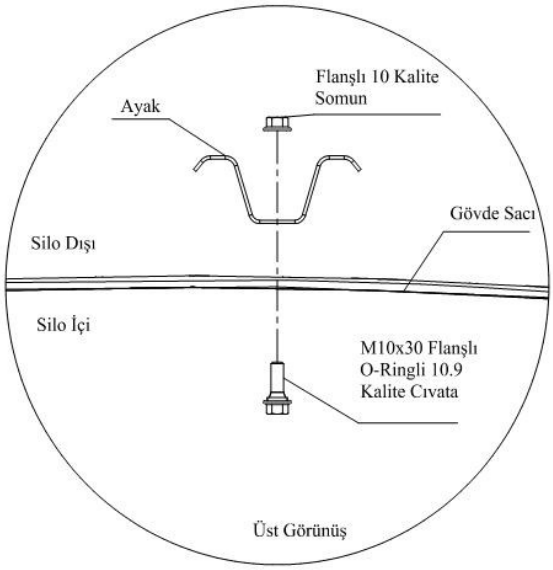
Table 2.5.1 Stiffener Thickness Color Chart

STIFFENER THICKNESS COLOR CHART			
THICKNESS (mm)	**COLOR**	**VIEW**	**RAL CODES**
UPPER	**WHITE**		**RAL 9016**
1,5	**RED**		**RAL 2002**
1,8	**PURPLE**		**RAL 4007**
2,2	**GREEN**		**RAL 6001**
2,5	**NAVY BLUE**		**RAL 5013**
3	**BLACK + LIGHT BLUE**		**RAL 5012+RAL 8022**
3,5	**BLACK + PINK**		**RAL 4003+RAL 8022**
3,8	**BLACK + ORANGE**		**RAL 2009+RAL 8022**
4,2	**BLACK + RED**		**RAL 2002+RAL 8022**
4,5	**BLACK + PURPLE**		**RAL 4007+RAL 8022**
5,2	**BLACK + GREEN**		**RAL 6001+RAL 8022**
6,35	**BLACK + NAVY BLUE**		**RAL 5013+RAL 8022**
8	**RED + ORANGE**		**RAL 2002+RAL 2009**
9	**YELLOW + PURPLE**		**RAL 1021+RAL 4007**
10	**GREEN + NAVY BLUE**		**RAL 6001+RAL 5013**
12	**PINK + LIGHT BLUE**		**RAL 4003+RAL 5012**
JOINER (BROWN) {RAL 8016})			

Table 2.5.1, there is a color table according to the stiffener thickness. In the table, the stiffeners are given from thin to thick, with their color appearances and Ral codes of colors..

Stiffener length table is given according to the type of silo. The thickness of the stiffener varies according to the number of rings of the silo. Regarding all your questions about stiffener length and thickness, you can get information from authorized personnel of Lambton..

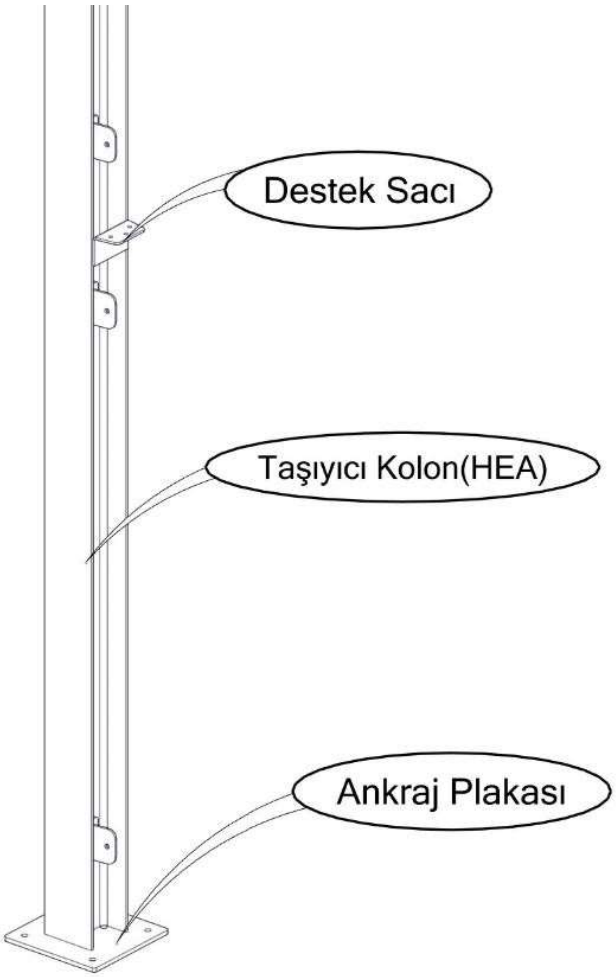
Figure 2.5.1 Stiffener Mount Top Detail View



Stiffener assemblies should be done as shown in Figure 2.5.1. As shown in the figure, the Flanged O-Ring bolt is inside the silo and mounting the flanged nut out of the silo Clamping nut always nut during assembly It should be tightened. So the sealing that the bolt will provide will be preserved. This is important. Tightening torque respect the values.

2.6 Commercial Cone Assembly

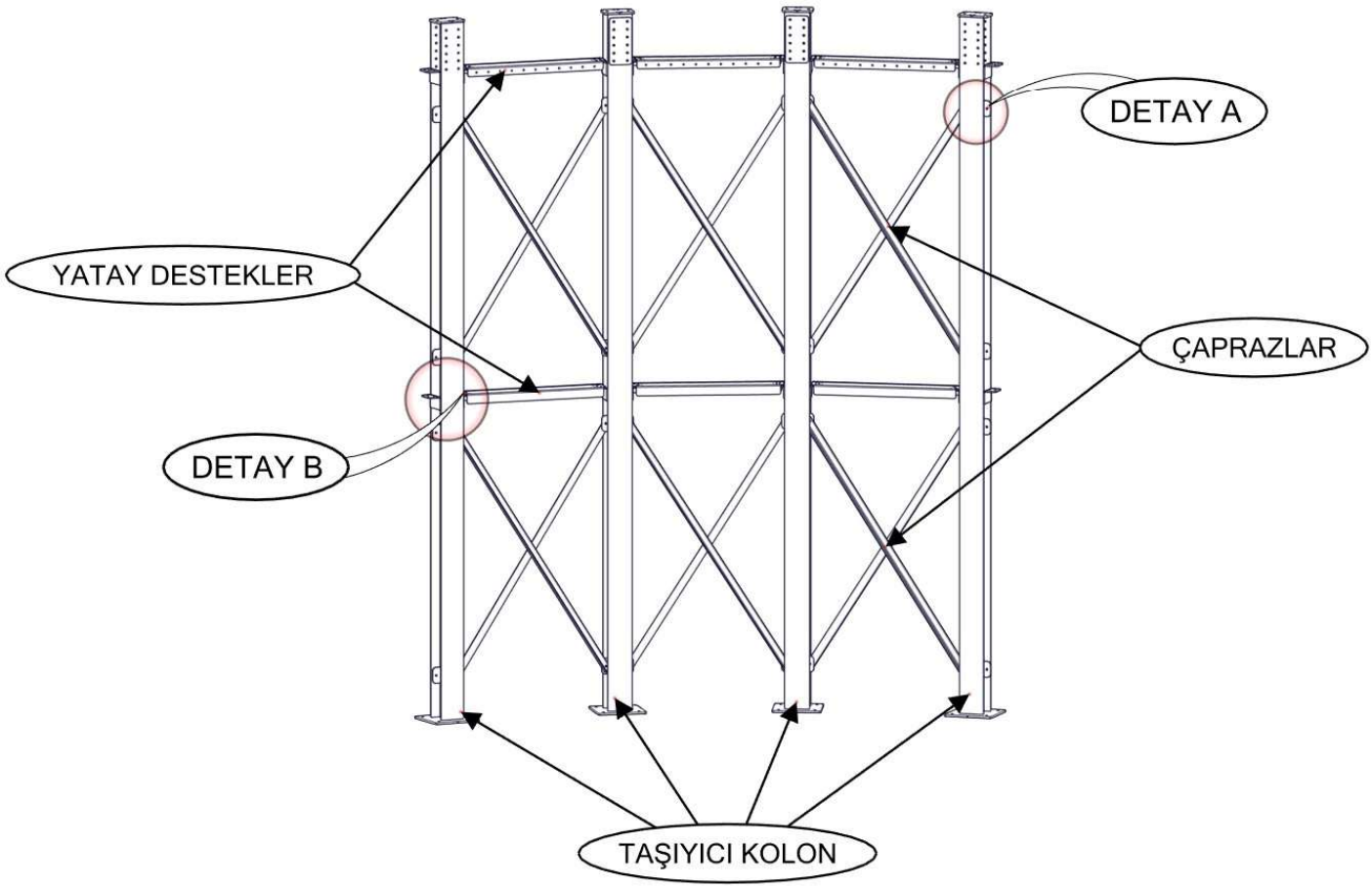
Figure **2.6.1** Legs (HEA)



Before placing the support columns (See Figure 2.6.1) on the anchor bolts, concrete must be poured properly and in accordance with the norms. To ensure the level of alignment for the support columns, use metal pieces called “TEMPLATE” between the concrete and the baseplate. Once the concrete is leveled, place the support columns over the anchor bolts and do not tighten the nuts and washers too much. The anchor bolt size should be determined by the approval of the basic engineer, but for standard anchor bolt recommendations, please contact Lambton.

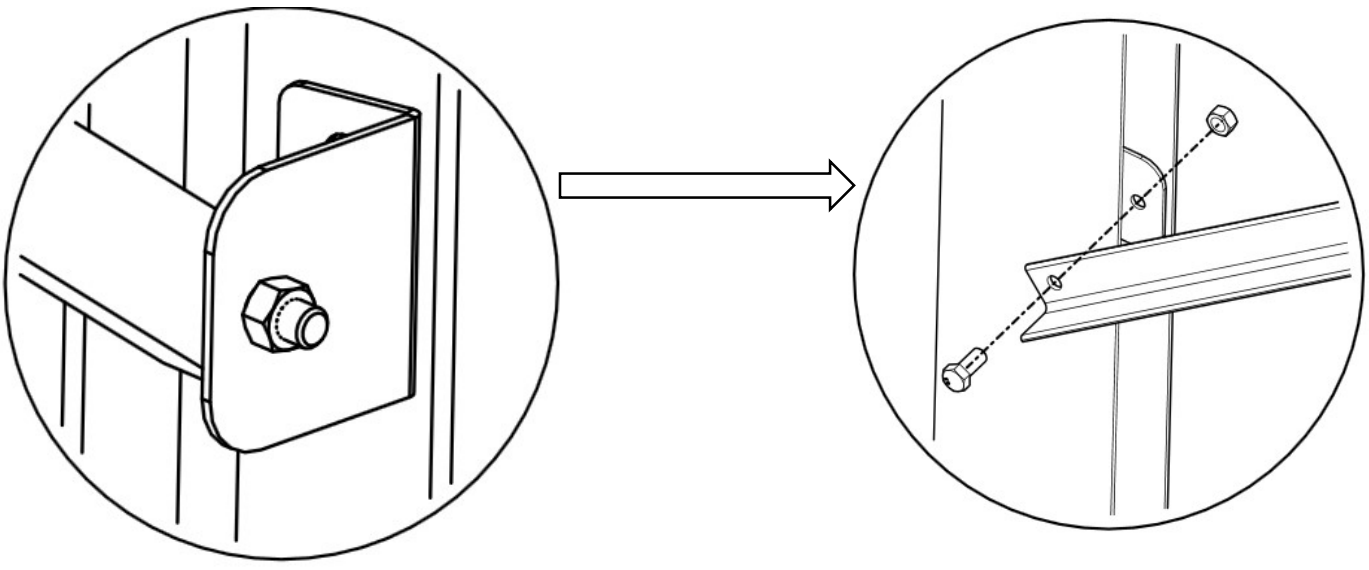
Support columns are strong and very heavy materials in their structure. When working with these columns, follow the instructions given to you for occupational health and safety..

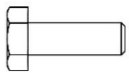
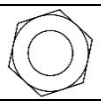
Figure 2.6.2 Conical Support Parts



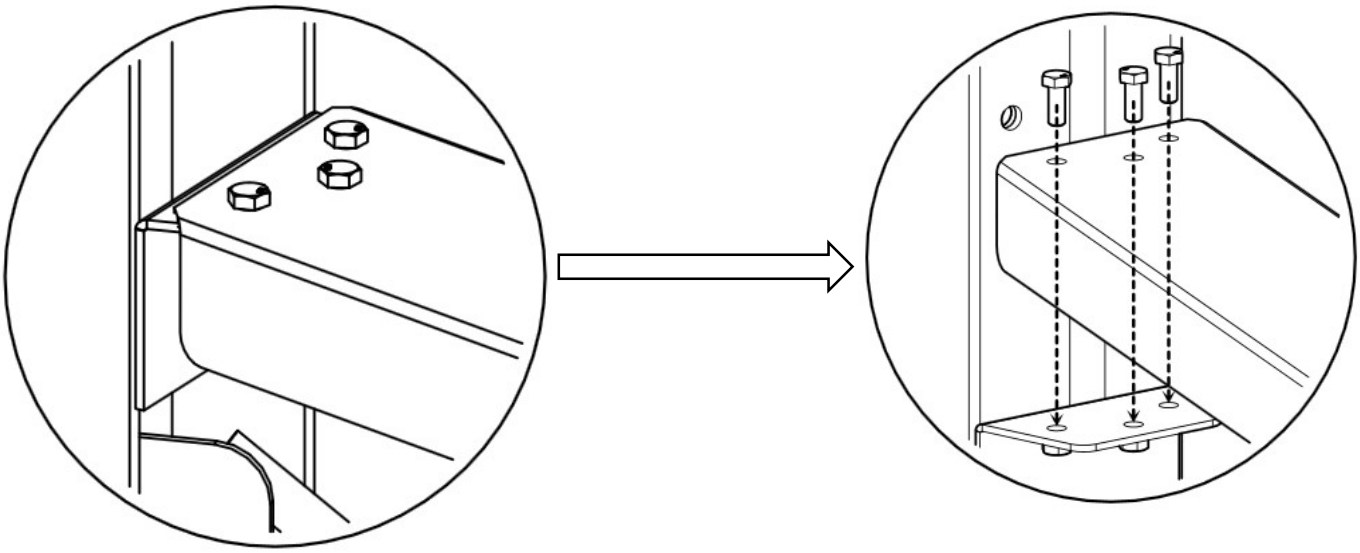
In Figure 2.6.2, you can see the lower connections in the chassis section. Depending on the type of silo, horizontal supports can be 2 or 1 in smaller diameter silos as shown in the figure. The crosses will be 4 in each section regardless of the silo type..

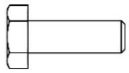
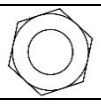
Now you will see how these parts are assembled in Detail A and Detail B.



Hexagon Bolt (10.9 quality Zinc Coated)	
Hexagon Nut (10 quality)	

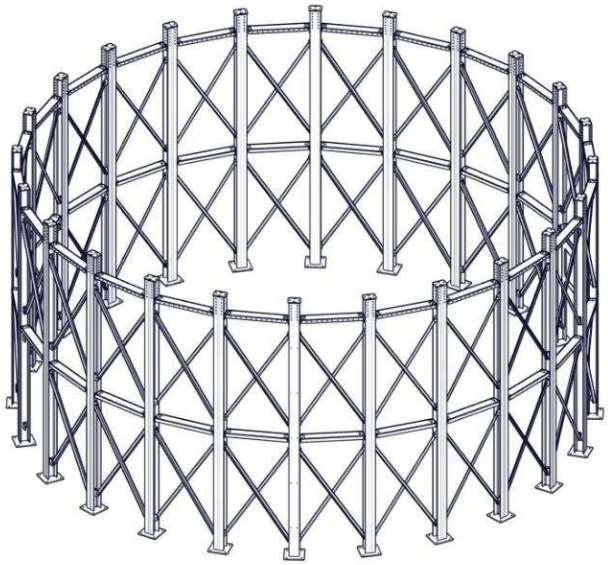
Detail B



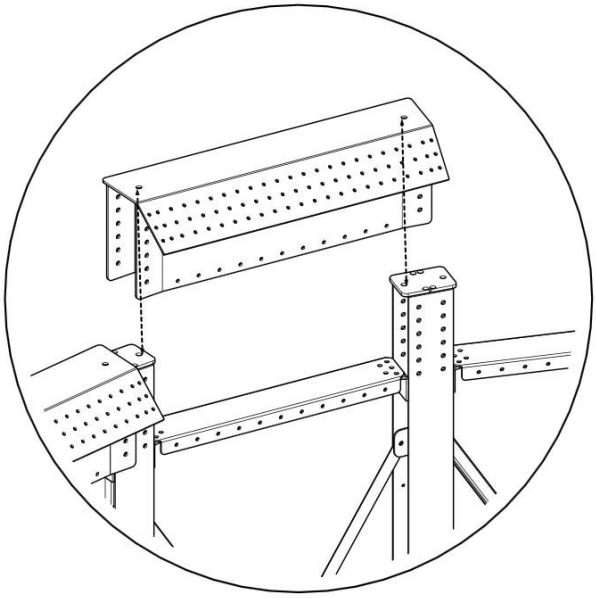
Hexagon Bolt (10.9 quality Zinc Coated)	
Hexagon Nut (10 quality)	

Bolts and nuts can vary depending on the silo type. For detailed information on this subject, please contact the authorized personnel of Lambton..

Figure 2.6.3 Skirt Sheet Installation



After the sections in Figure 2.6.2 are installed, the skirt sheet in Figure 2.6.3 seen on the side is started to be mounted. The part called skirt sheet is welded at the factory and sent to the field as assembled. Skirt sheet is put on all carrier legs. The skirt plate is not bolted immediately, just put in place and bolted together with the part in Figure 2.6.4.



Hexagon Bolt (10.9 quality Zinc Coated)	
Hexagon Nut (10 quality)	

Figure **2.6.4** Cover Sheet

Closing sheets specified in Figure 2.4.6, used at the joints of the skirt sheets, from inside and outside after the skirt sheets are placed. **Hexagon head "10.9" quality bolt and hexagon "10" quality nut** Combination with is provided. Bolt length varies according to the silo to be installed.

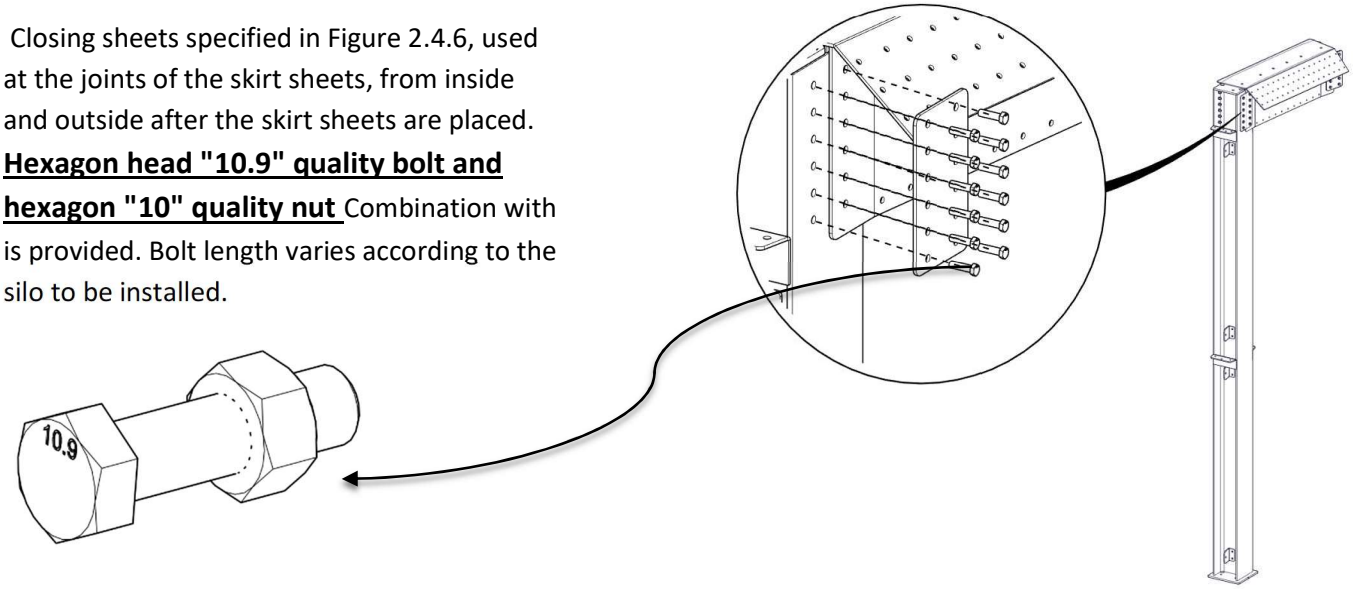
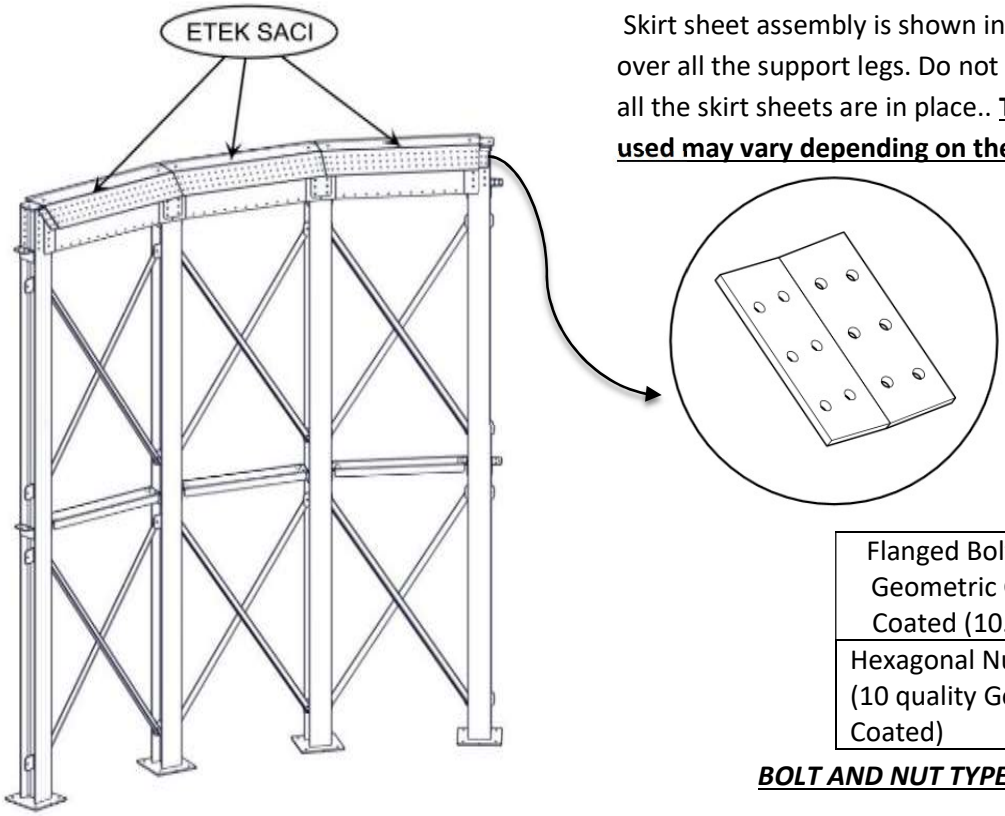
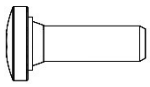


Figure 2.6.5 Skirt Sheet Assembly Spacer



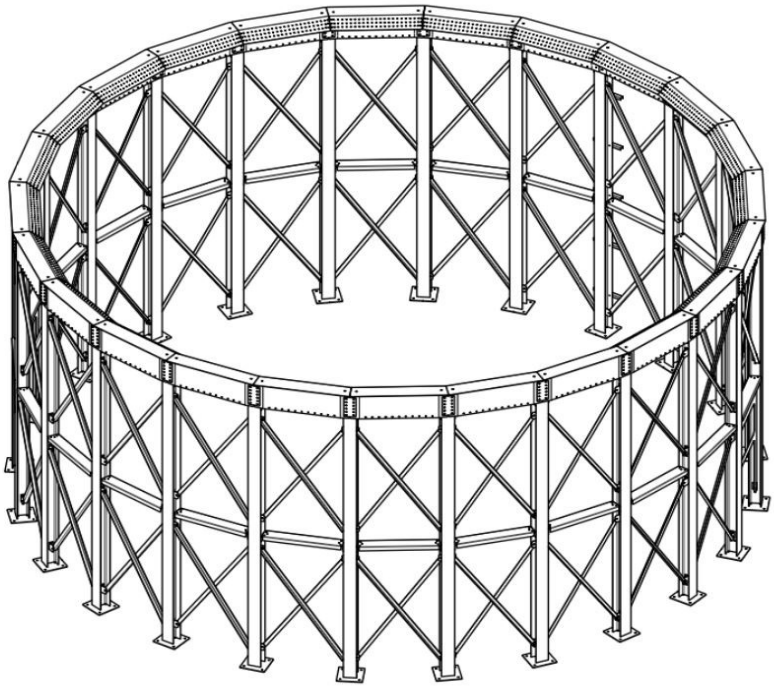
Skirt sheet assembly is shown in Figure 2.6.3. Bolt them circularly over all the support legs. Do not fully tighten unless you are sure all the skirt sheets are in place.. **The type of nut and bolt to be used may vary depending on the silo to be installed..**

The inner support connecting piece shown on the side is used to connect the skirt sheets to each other. This piece reduces the flexibility of the skirt sheet and restricts its movement. Bolted with Bottom Taper.

Flanged Bolt Bolt With Geometric Geometric Coated (10.9 quality)	
Hexagonal Nut (10 quality Geomet Coated)	

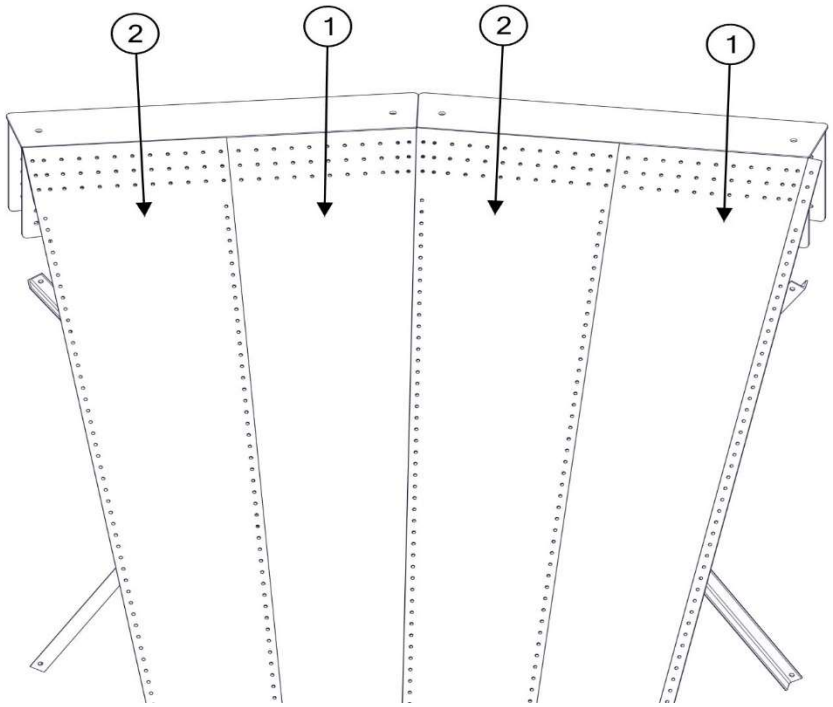
BOLT AND NUT TYPES CAN CHANGE BY SILO TYPE AND GEOGRAPHICAL CONDITIONS.

Figure 2.6.6 Şase Genel Görünüm

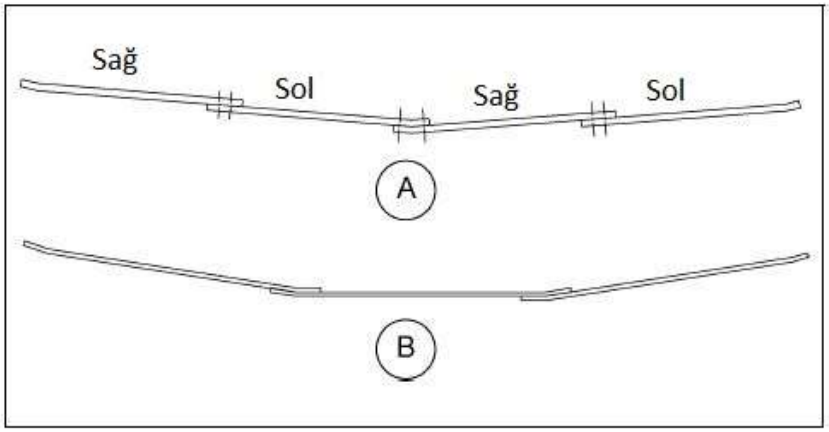


You have obtained the overall view of the chassis, see Figure 2.6.6, shown on the side, in accordance with all the applications and figures described above. The most important thing you will notice during all these applications is to take the necessary precautions regarding OCCUPATIONAL HEALTH AND SAFETY..

Figure 2.6.6 Conical Sheets Installation



Before starting the lower conical assembly, pay attention to the directions of the conical plates. As seen in Figure 2.6.5, the sheets indicated with the number 1 (Sag) are called right, and the sheets with the number 2 are left. Sheet 1, called right, is bolted to the skirt sheet. Then sheet 2 (SOL) is aligned on the first one and putty is applied between them horizontally and vertically. While small silos have single-stage bottom conical sheet, large silos are mounted in two stages as conical. For tapered sheets and skirt sheet combinations **Flanged Bolted Bolt Bolt Geometric Coated "10.9" bolt and Hexagon head "10" quality nut** should be used with the bolt heads to the inside of the hopper. **Do not forget about the application of sealing paste.**



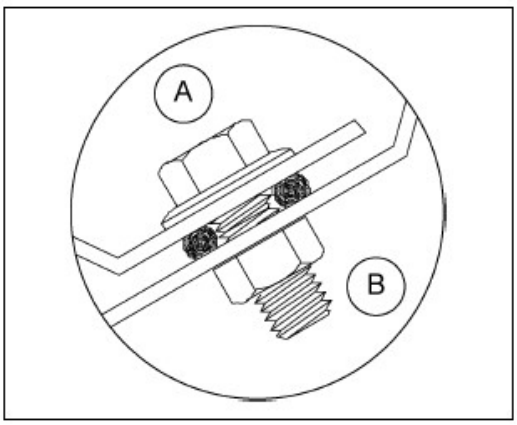


Table 2.6.1 Sheet Arrays

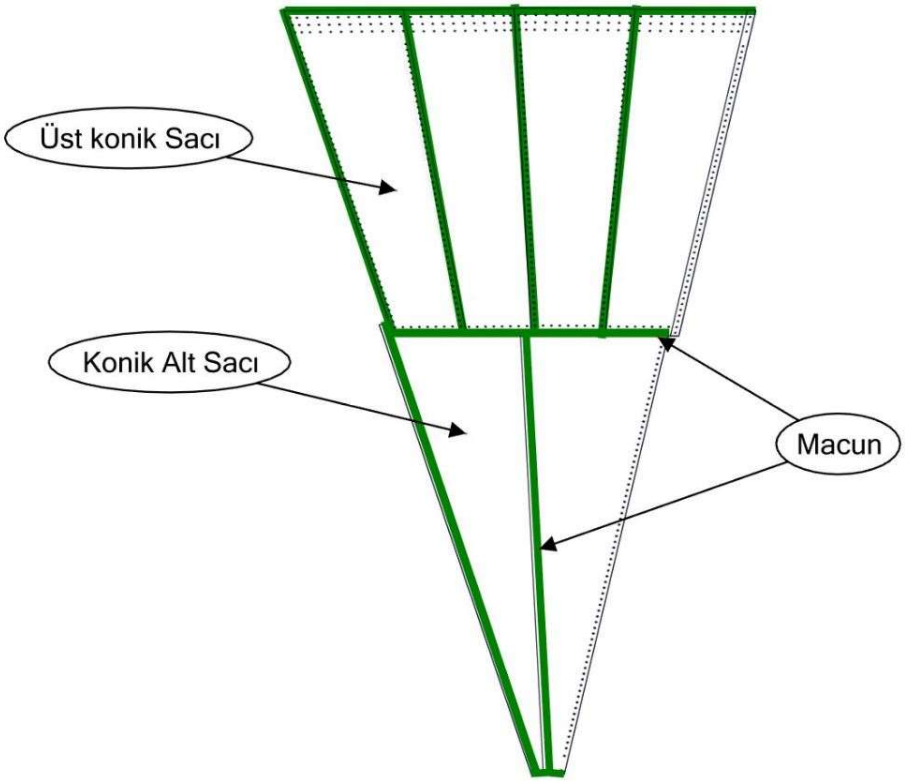
Ref	Description
A	Sheet Arrays
B	Sheet Layout Top View

Table 2.6.2 Bolt Nut Location

Referans	Definition
A	Inside silo
B	Out of Silo

Figure **2.6.6** Tapered Bottom Sheet Assembly and Putty

After completing the conical upper part, assembly of the lower part is started. The point to be considered here is; Bolt heads must be in the silo. The clamping side is from the outside. You will find the details of the putty application in Figure 2.6.6.. **Putty application is an important detail. If it is not done correctly, moisture, rain and other factors will enter the silo, and there will be deterioration in the stored product. Also pay attention to this detail since there will be dust coming out from inside the silo..**



BOLT AND NUT BY SILO TYPE AND GEOGRAPHICAL CONDITIONS

VARIETY CAN BE CHANGED.

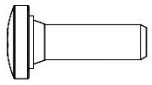
Flanged Bolt Bolt With Geometric Geometric Coated (10.9 quality)	
Hexagonal Nut (10 quality Geomet Coated)	

Figure 2.6.7 Conical Sheet Layout (Representation)

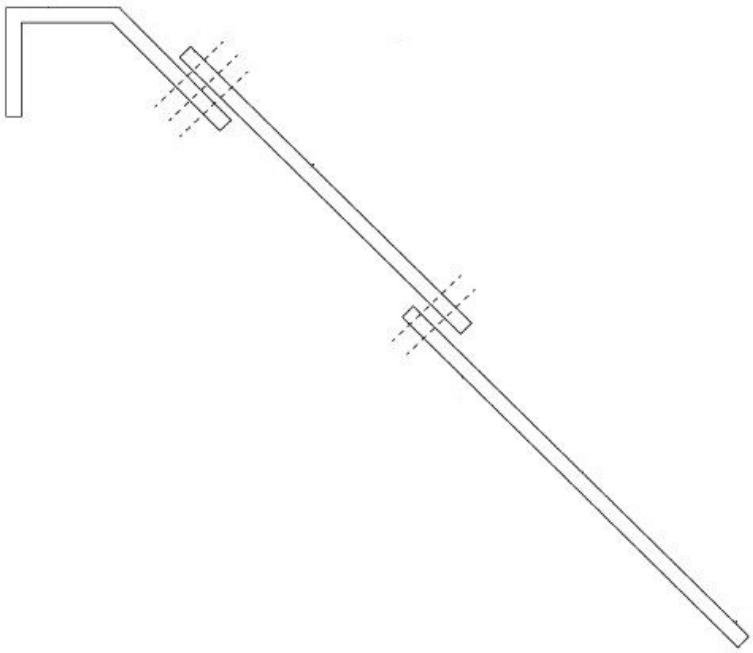
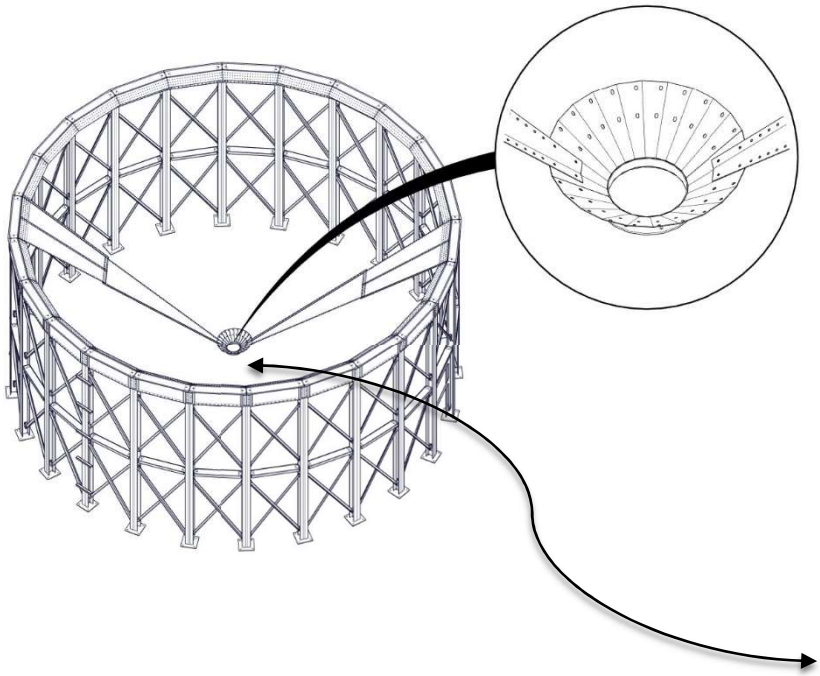
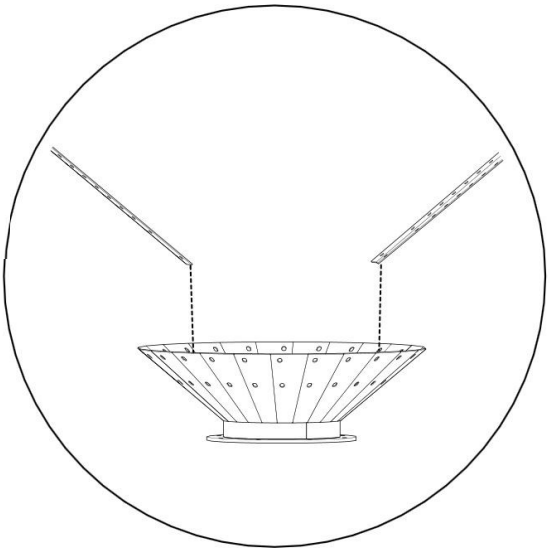


Figure 2.6.8 Installation of Conical Sheets



The assembly of the lower tapered sheets begins as shown in figure 2.6.8. Conical sheets are mounted from both sides as shown in the figure on the side and the top view shown below. Then the lower cone shown in the detail picture is bolted to two assembled plates.



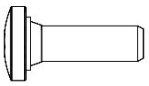
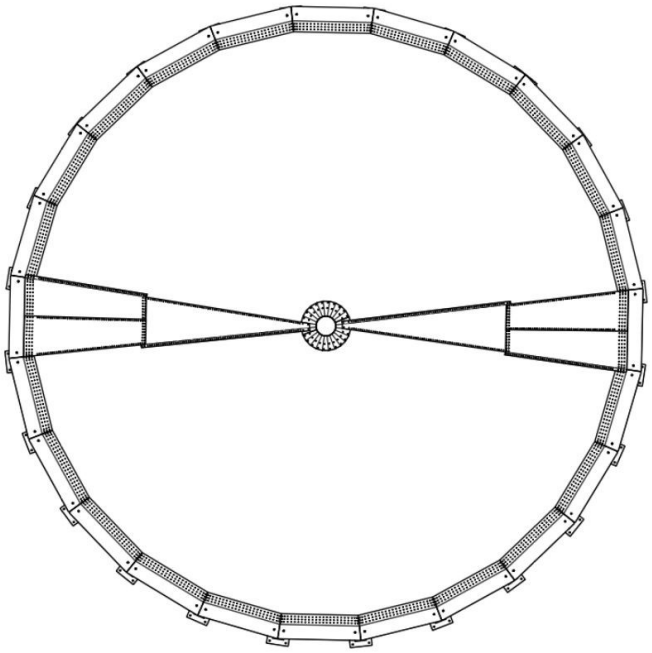
Flanged Bolt Bolt With Geometric Geometric Coated (10.9 quality)	
Hexagonal Nut (10 quality Geomet Coated)	

Figure 2.6.9 Top View

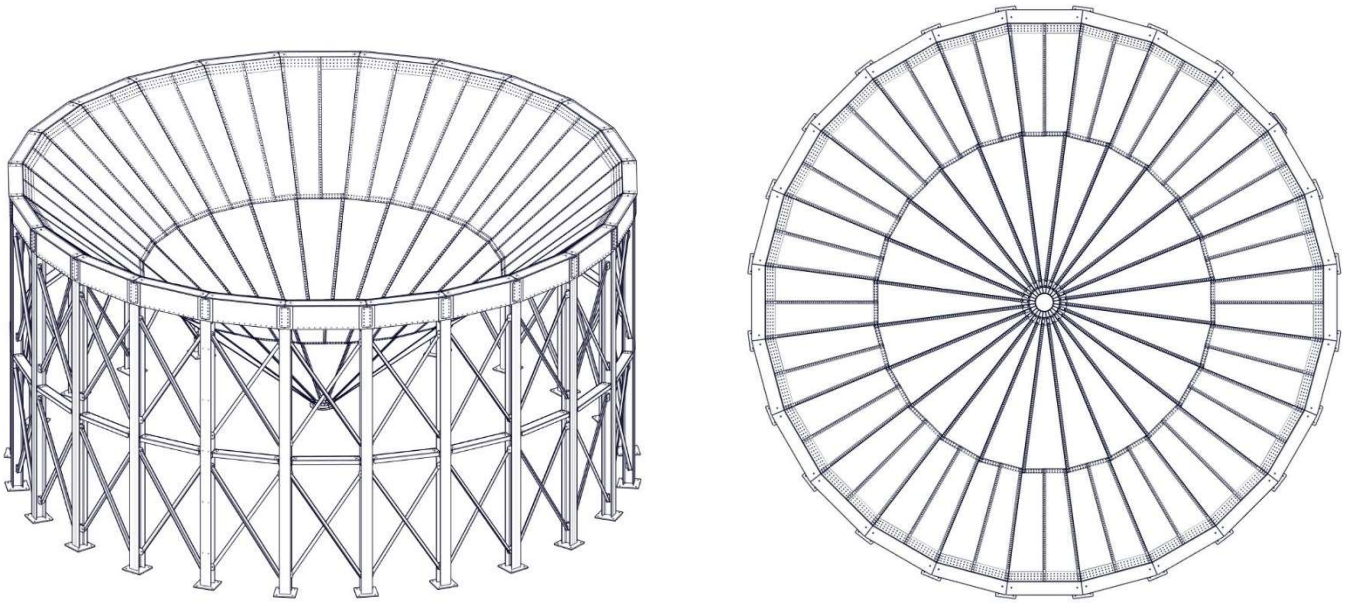


You can see the top view of the conical plate and the bottom cone on the side. The silo bottom taper joints should be started in this way. In order to realize the assembly of the lower tapered ring, first of all, it should be ensured that the holes meet with 2 punches. All holes should be checked and the holes that are close to each other should be aligned using punches..

In order for the lower tapered ring to fit smoothly, all holes must be aligned.

Connection elements should be used with "10.9" quality Geometric Coated Flanged Oring head camber head bolt and hexagon head "10" quality nut..

Figure 2.6.10 Bottom Conic Overview and Top View



After assembling the first sheets, install the other sheets in order. For directions of sheet metal and detailed information on this subject, it is recommended to examine Figure 2.6.6

The final version of the lower taper assembly is as above. (See Figure 2.6.10).

Figure 2.6.11 Commercial Conical Ventilation

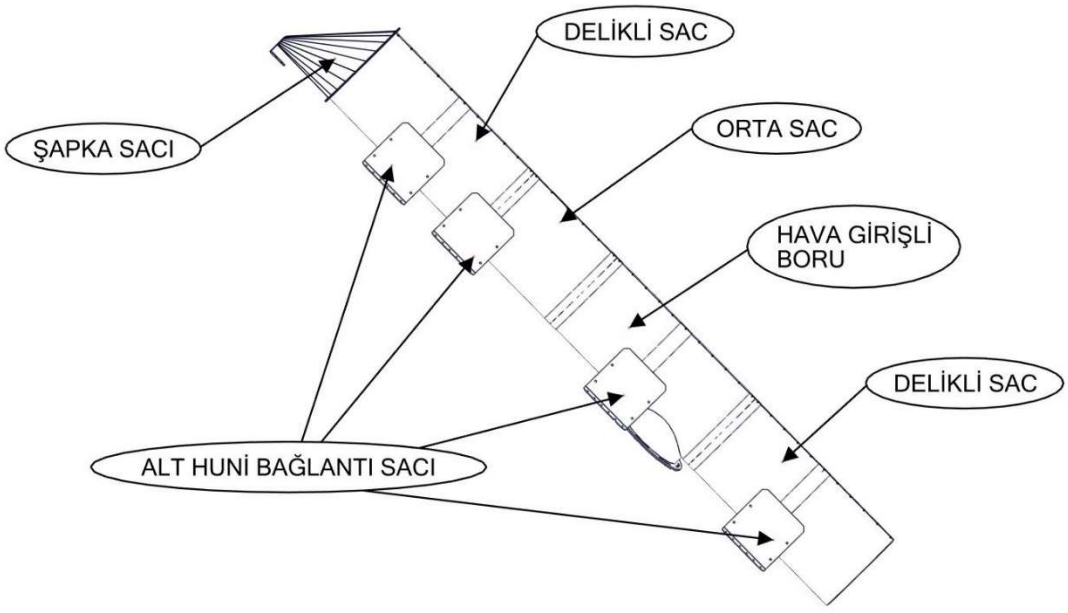
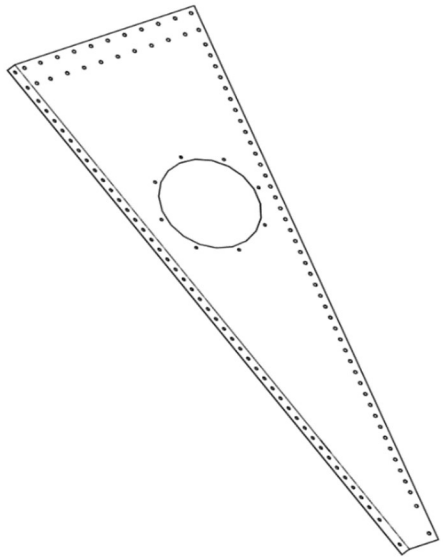


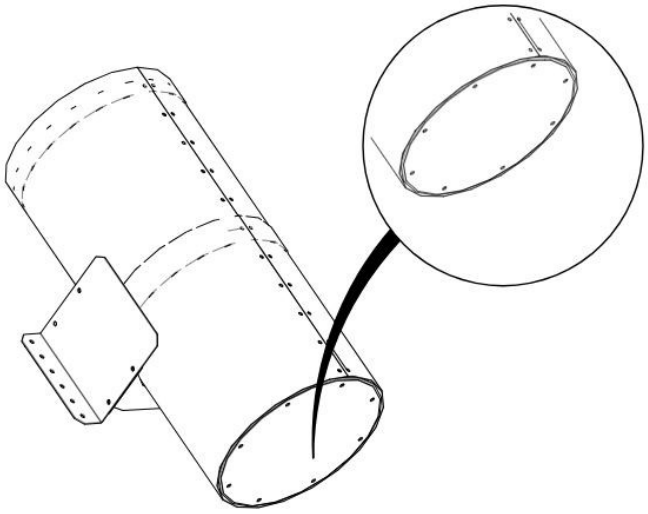
Figure **2.6.12** Bottom Conical Air Inlet Sheet



Economic conical ventilation is in the form of tube ventilation inside the silo. It is shown in Figure 2.6.11. It is sent to the field in parts and assembled on the field. It is mounted on the bottom tapered sheet that is sent to you (See 2.6.12)

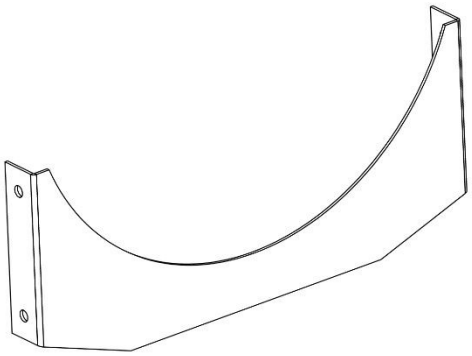
Ventilation will be sent to you in the most suitable size according to the silo you have bought..

Figure 2.6.13 Tube Ventilation Installation



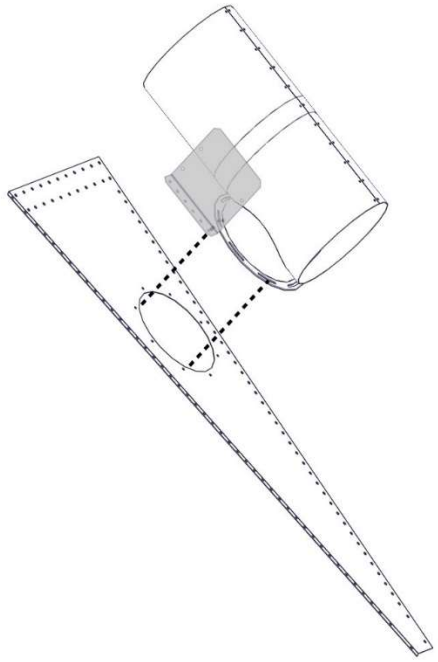
The tube to be shipped to the site is shipped in ventilation modules. The module shown in Figure 2.6.13 is the module to be placed at the bottom. The bottom part is closed as shown in the detail picture. With this feature, you can easily distinguish where to put this module..

Figure 2.6.14 Tube Aeration Funnel Support



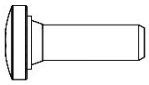
Connection plates to be used to fix the tube to the lower conical part of the ventilation are shown in Figure 2.6.14. The silo lower taper plate is drilled in the field and these parts are fixed to the lower taper plate with bolts and nuts. The fasteners are the same as the bolt and nut used in the lower taper. Bolt heads must remain in the silo.

Figure 2.6.15 Tube Ventilation and Bottom Conical Combination



The tube ventilation air inlet part and the lower taper composition are as follows:

The parts specified in Figure 2.6.15 are shipped to the site as assembled and welded previously. The figure shown is for informational purposes and representation. Joining is done to the lower tapered sheet, which was previously drilled, with the help of flange on the module with the help of bolts and nuts. The dark colored piece shown in the figure is shipped to the field as welded at the factory like others, and the bottom taper is drilled and the connection is made with the bolt and nut..

Flanged Bolt Bolt With Geometric Geometric Coated (10.9 quality)	
Hexagonal Nut (10 quality Geomet Coated)	

BOLT AND NUT TYPES CAN CHANGE BY SILO TYPE AND GEOGRAPHICAL CONDITIONS.

Figure **2.6.16** Ventilation Modules Combinations

In the joints of the ventilation modules, the joint is provided by using the tube ventilation flange specified in detail in Figure 2.6.16. During this combination, half of the flange is in one module and the other half is in the module to be joined. The round sheet seen in the figure, which provides the connection, is fixed to the pipes with a smart screw..

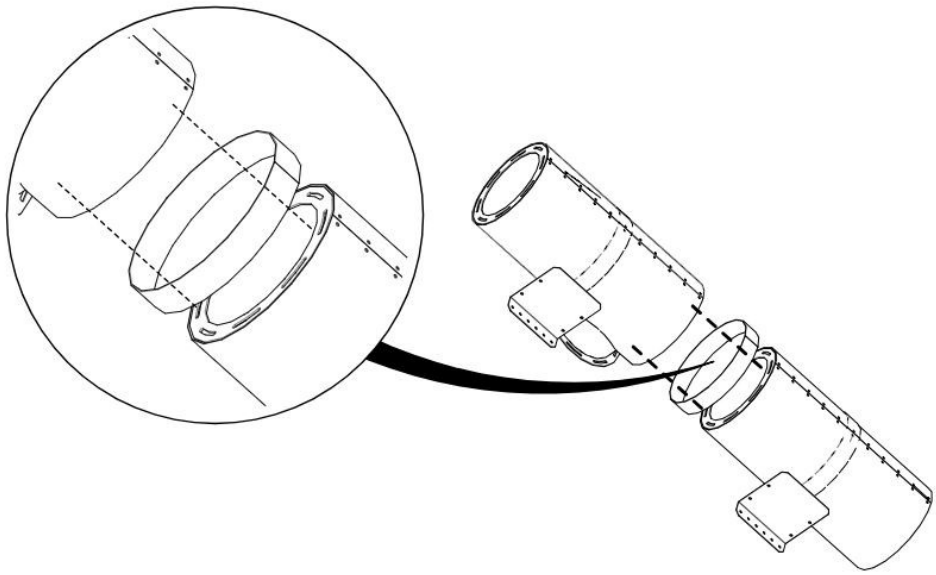
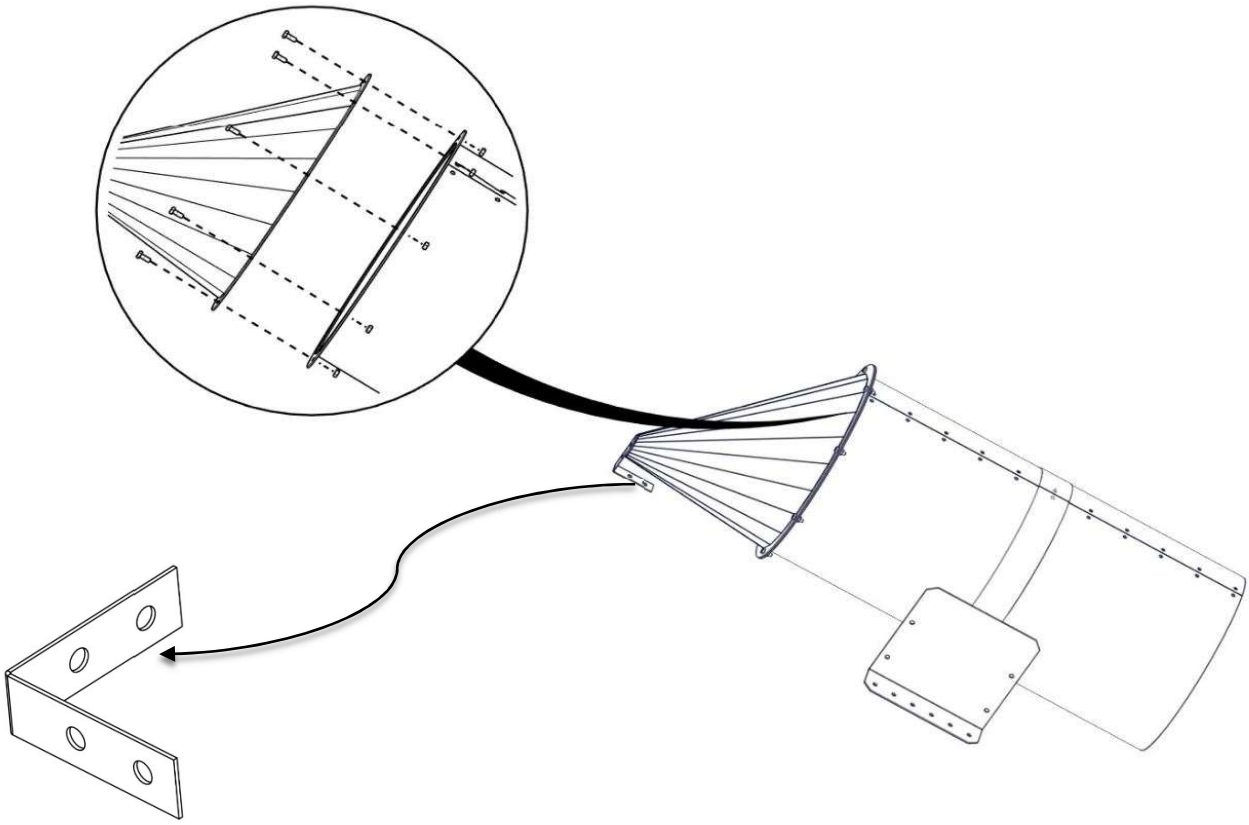
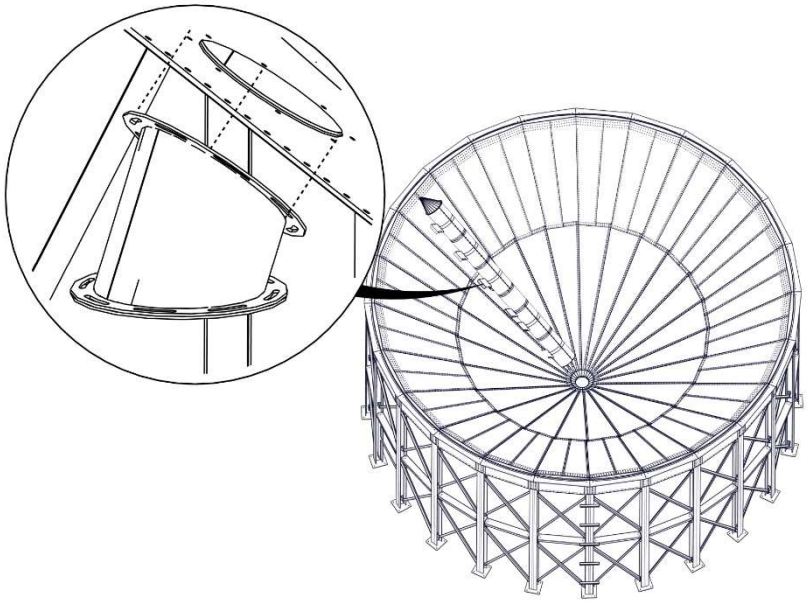


Figure 2.6.17 Tube Ventilation Top Joint



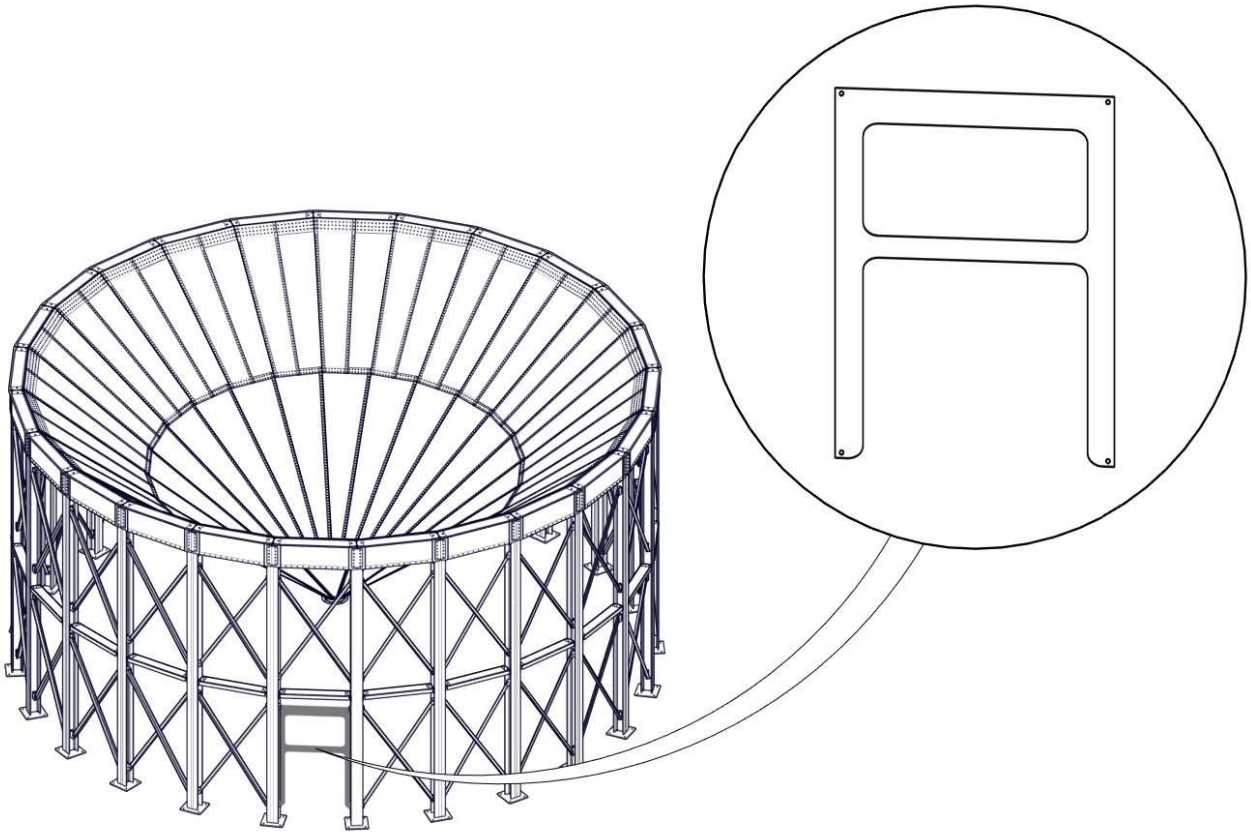
The tube ventilation upper combination is shown in the detail picture in Figure 2.6.17. The flange in the top joint is bolted with the flange in the lower module to make the union. The flanges are sent to the field in a previously welded manner at the factory. Hexagonal bolts are used for the flat plate. Finally, the cover plate is fastened by attaching the lower taper plate by drilling the bolt..

Figure 2.6.18 Tube Vent External Elbow

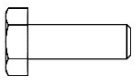
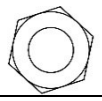


Finally, the elbow, the detail of which is shown from the outside of the silo, is mounted on the previously drilled bottom conical sheet with bolts and nuts. Thus, you have finished the tube ventilation assembly..

Figure 2.6.19 Equipment Slot Assembly

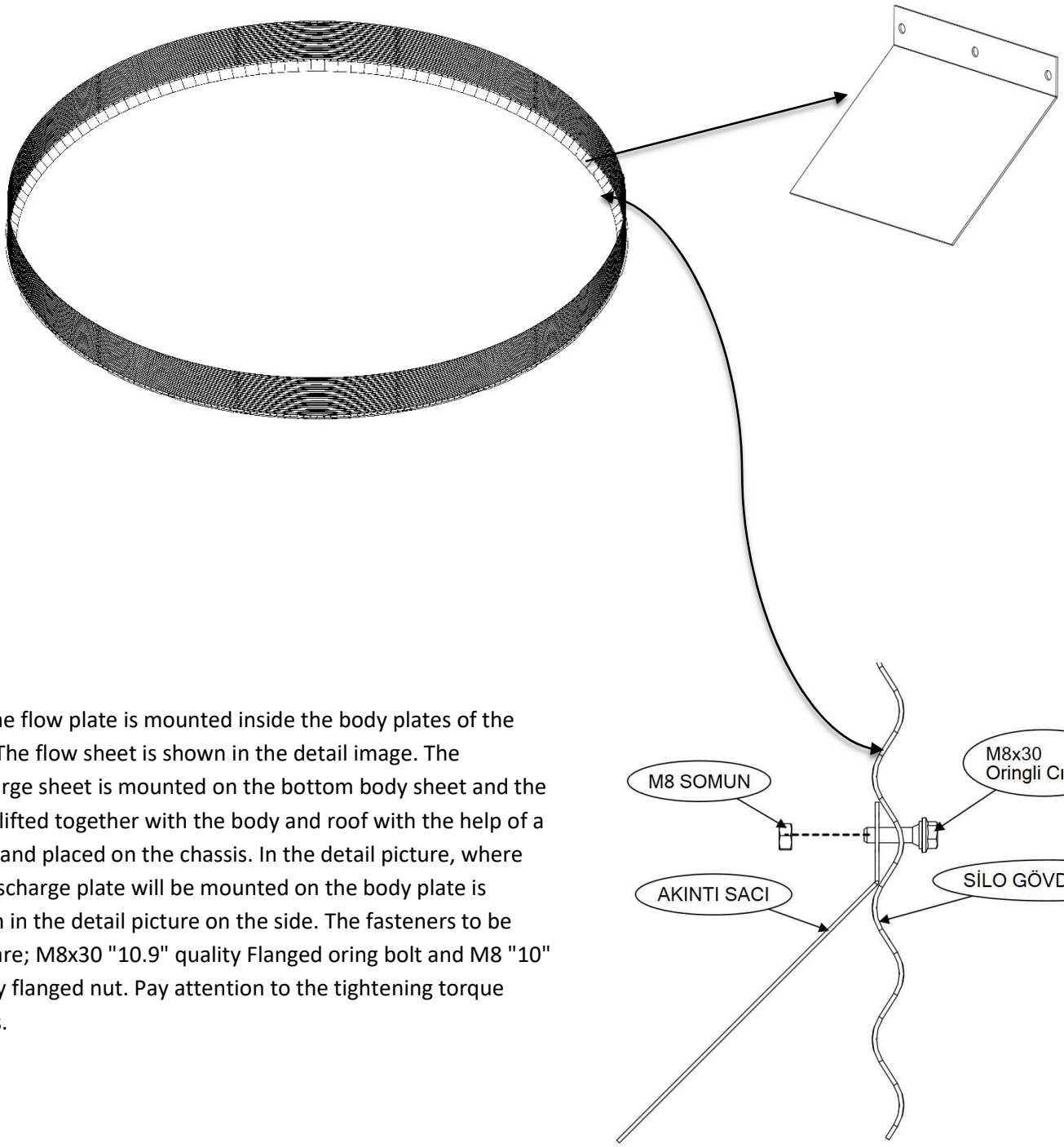


The part of the so-called Equipment Slot, which is represented in dark color in Figure 2.6.19, is put in the transition parts of your discharge equipment located at the bottom of the silo and facilitates the passage of your equipment. Crosses must be removed where the equipment will arrive. And then you can use the same joints used for crosses in the mounting of the equipment slot..

Hexagon Bolt (10.9 quality Zinc Coated)	
Hexagon Nut (10 quality)	

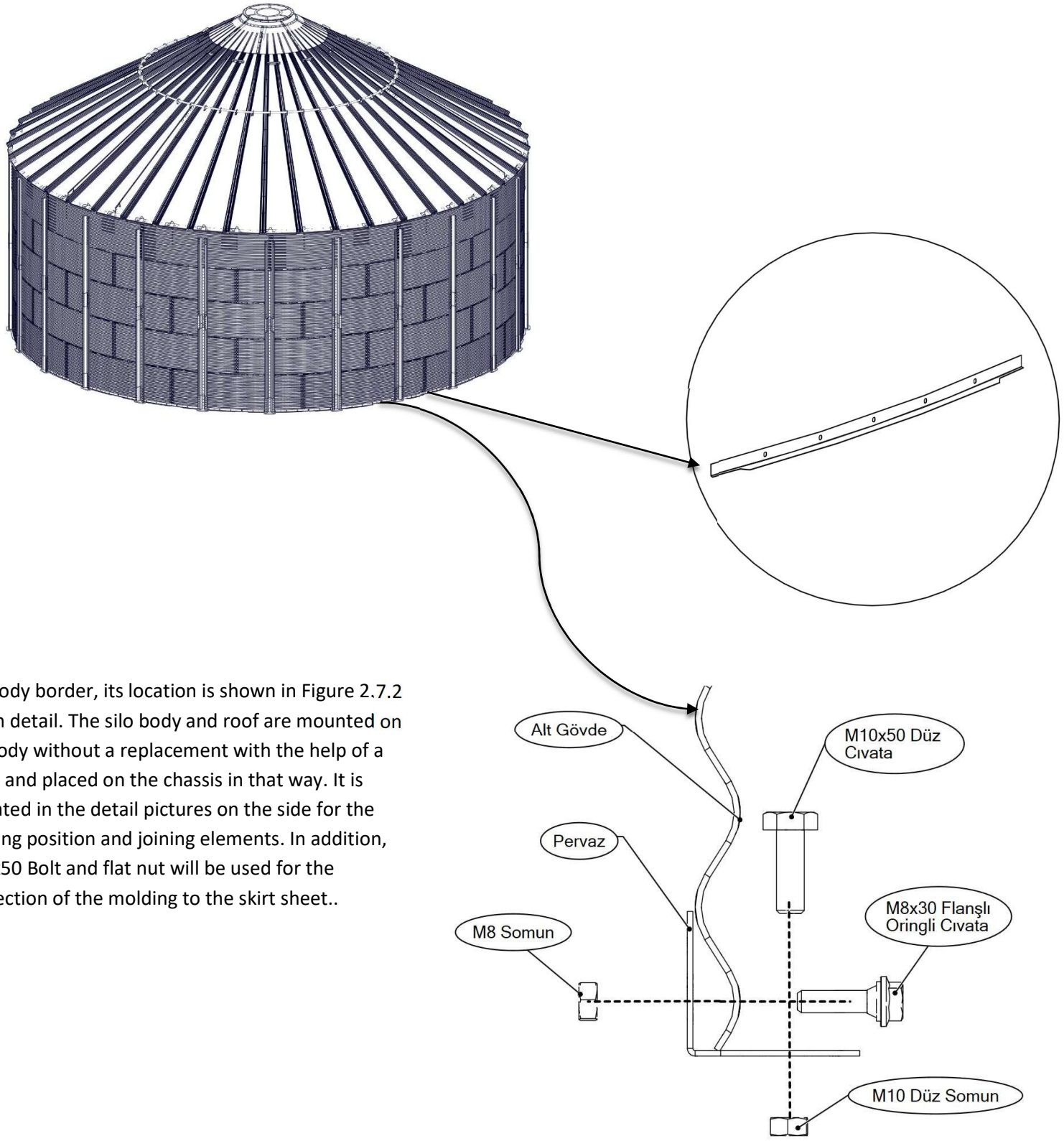
2.7 COMMERCIAL CONIC FLOW SHEET AND PERVASE MOUNTING

Figure 2.7.1 Flow Sheet



The flow plate is mounted inside the body plates of the silos. The flow sheet is shown in the detail image. The discharge sheet is mounted on the bottom body sheet and the silo is lifted together with the body and roof with the help of a crane and placed on the chassis. In the detail picture, where the discharge plate will be mounted on the body plate is shown in the detail picture on the side. The fasteners to be used are; M8x30 "10.9" quality Flanged oring bolt and M8 "10" quality flanged nut. Pay attention to the tightening torque values.

Figure 2.7.2 Body Moldings Installation



Silo body border, its location is shown in Figure 2.7.2 and in detail. The silo body and roof are mounted on the body without a replacement with the help of a crane and placed on the chassis in that way. It is indicated in the detail pictures on the side for the molding position and joining elements. In addition, M10x50 Bolt and flat nut will be used for the connection of the molding to the skirt sheet..

Figure 2.7.3 Short Foot Mount

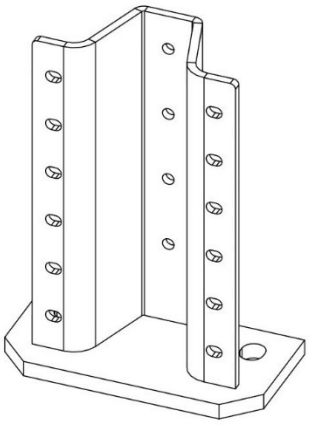
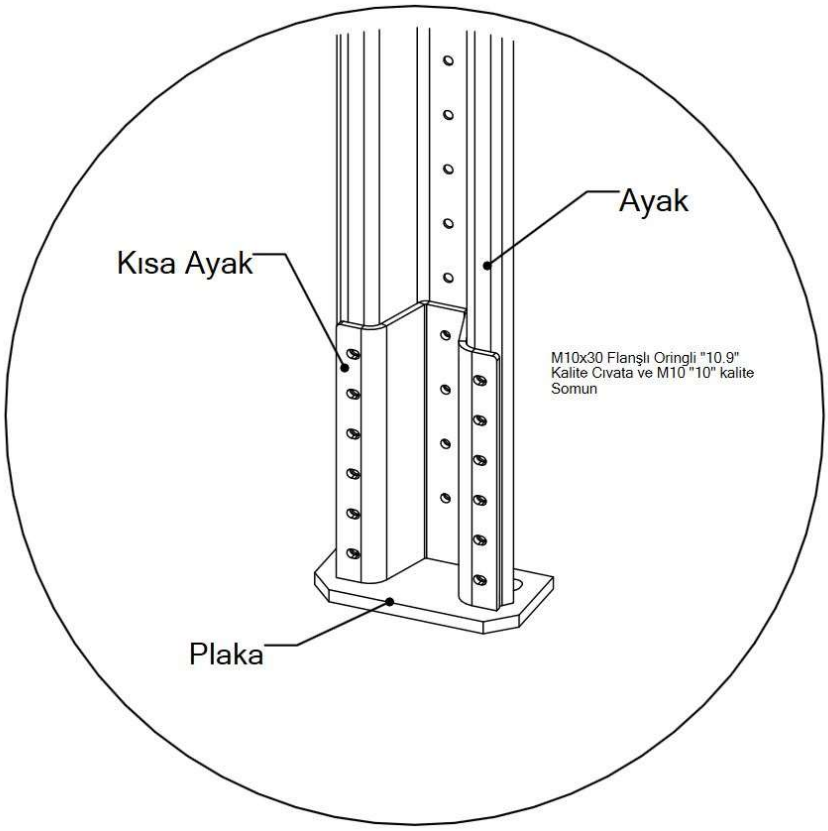


Figure 2.7.3 shows the base short leg and its assembly below. While the thickness of the sole short foot varies according to the thickness of the bottom foot; plate thickness diameter varies according to the model of the silo. Short foot silo feet are made while mounting the bottom body and all this assembly is lifted with a crane and placed on the chassis..



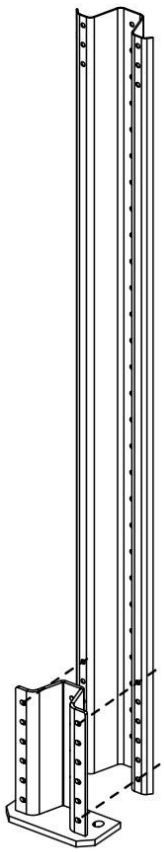
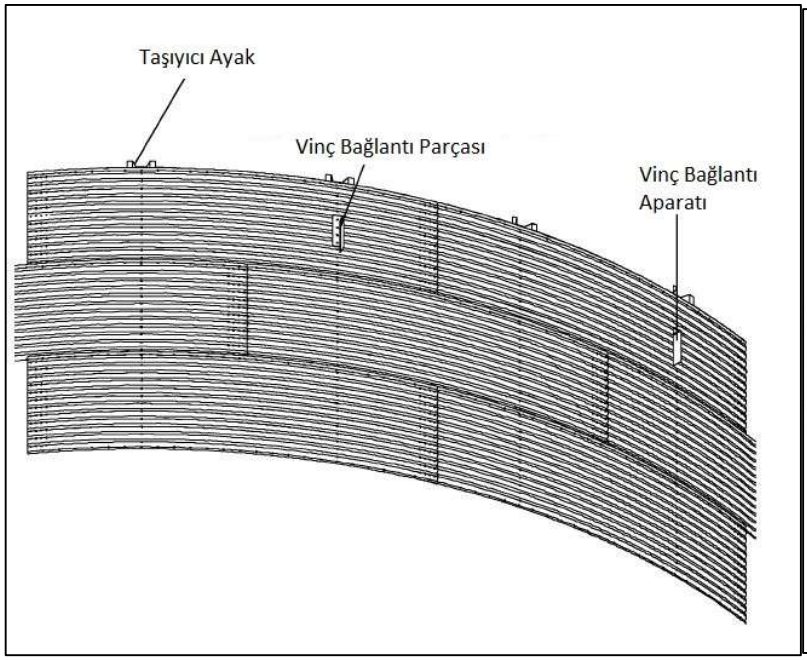
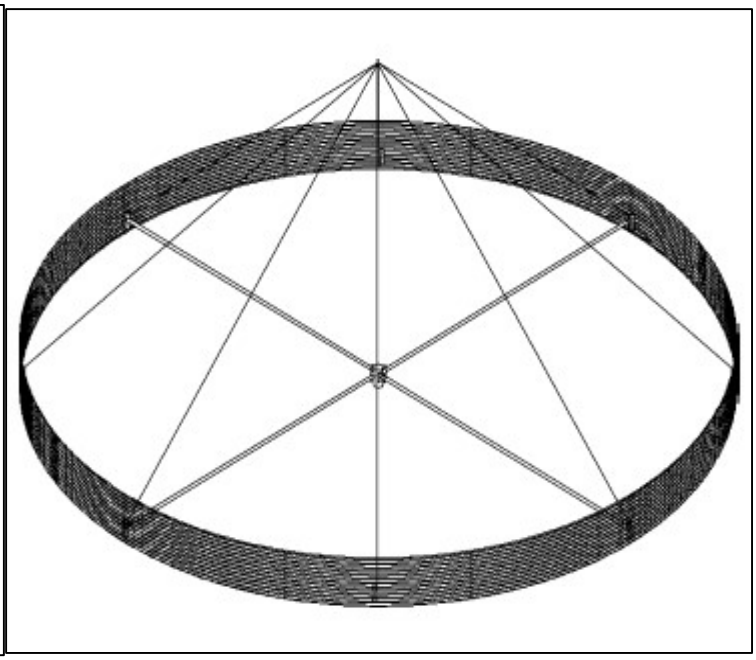


Figure 2.7.4 Body and Chassis Combination



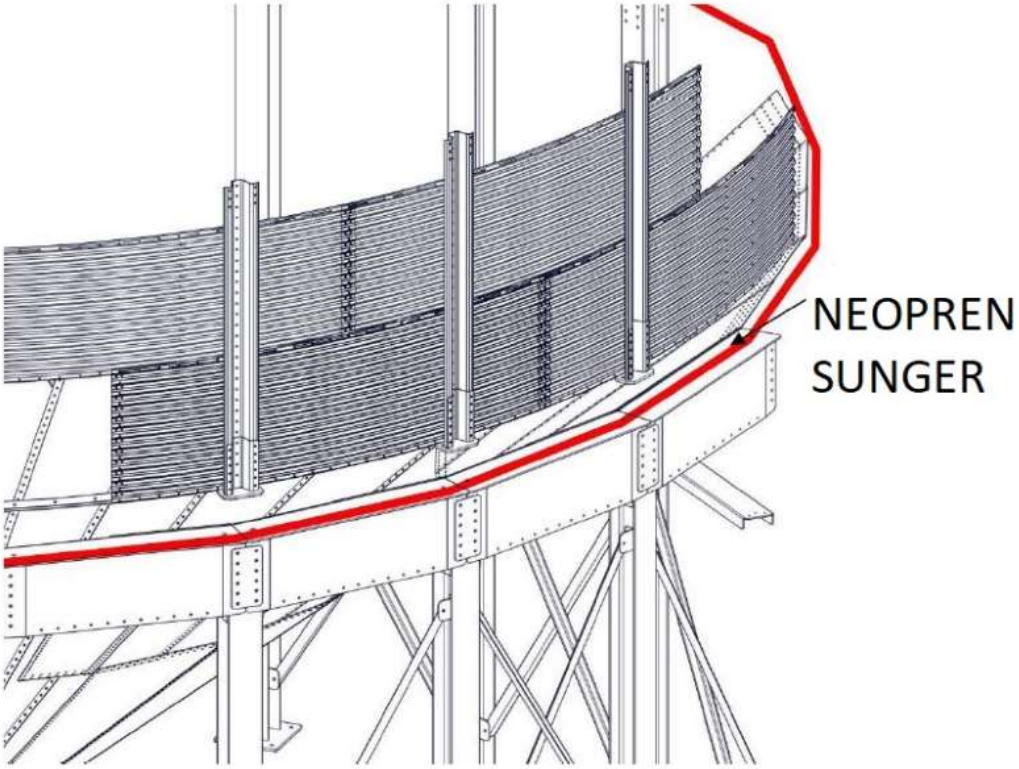


After installing the silo and chassis separately, with the help of a crane, the number of rope binding places shown in Figure 2.7.4 changes according to the type and height of the silo. Crane fittings are always fastened and bolted to the inside of the support leg. The number of connections is generally half of the number of carrier legs. For detailed information on this subject, please contact Lambton..

The removal and replacement of such silos should be followed, taking into account vital factors such as experience, equipment and work safety. Do not forget that occupational health and safety comes first. In this context, the following suggestions are given for information purposes.:

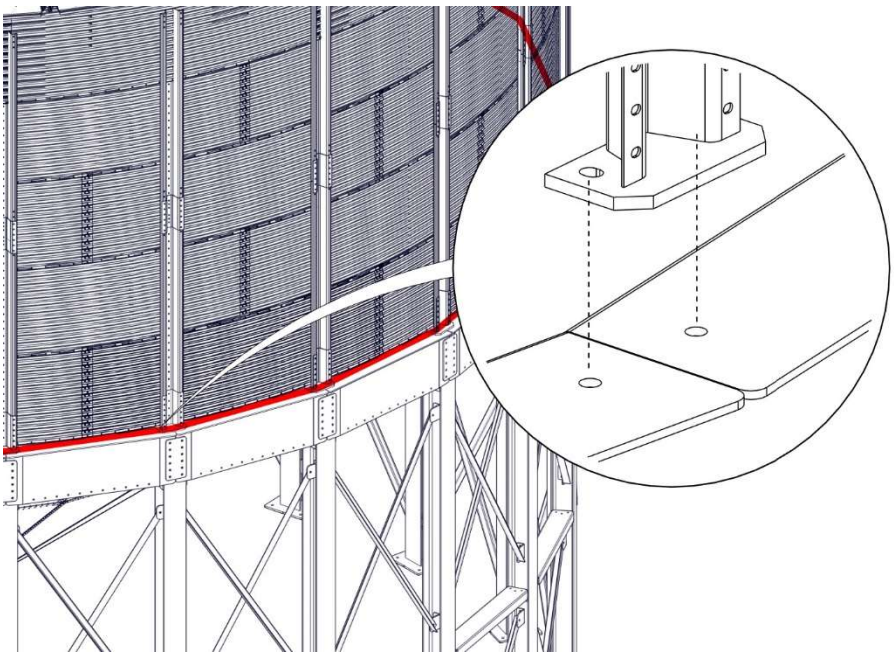
- Make sure the carrier legs are smooth and tightening torque values.
- Make sure the locations of the stairs and the locations of the rest platforms are correct.
- Although lifting the silo requires technical experience, it is also very important to follow the safety rules.
- Lifting devices must be attached to the support legs (See Figure 2.7.4). These attachments are generally connected to the second or third body sheet from the lower body sheet. Fittings should be attached to the support leg with at least 4 bolts.
- Connect the cables of the crane to these apparatus. Suspend the cables from the silo roof entrance and connect the cables in a balanced way. Make sure that the cables will carry the silo you will install. Make sure that the lengths of the cables are the same. The part where the cables exit the silo must be long.
- As shown in Figure 2.7.4, it is important to use a "+" or hexagonal support kit depending on the type of silo to be lifted. This apparatus must consist of reinforced profile pipes. These pipes should be prepared to be easily disassembled at the end.

Figure 2.7.5 Sealing Paste



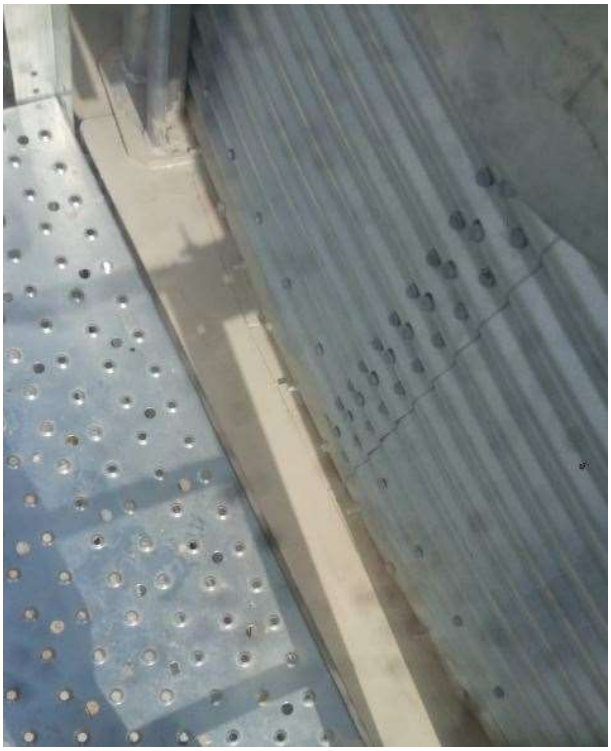
The sealant should be applied over the entire chassis without the replacement of the hoist lifted by the crane, under the moldings. This stage is very important because it prevents moisture and rain and other climatic elements from entering the silo and damaging the grain without sealing..

Figure 2.7.6 Short Feet And Chassis Combination



Finally, the silo is mounted to the chassis from short legs, plates, which have been previously mounted. Use nuts and bolts to be sent to you according to the type of silo. Observe the tightening torque values. Short feet should be tightened at the same size and at the same time.

2.7.1. LIQUID SILICONE APPLICATION



Picture 2.7.1

Picture 2.7.2

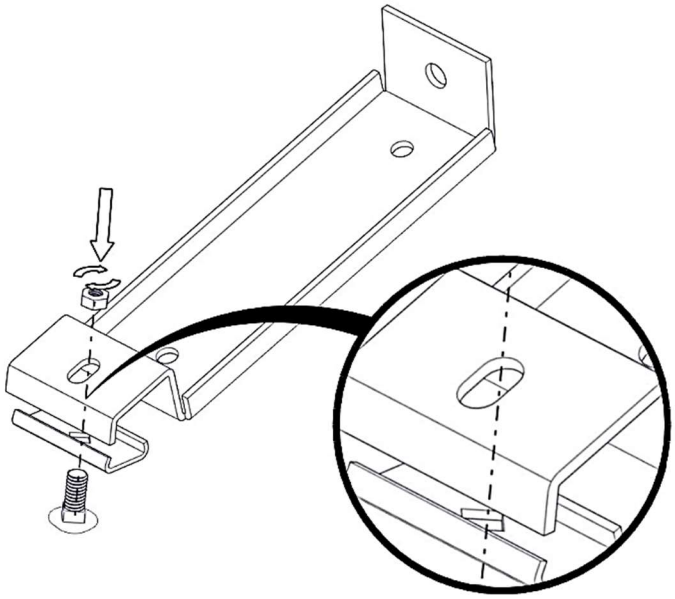
Picture 2.7.3

Liquid silicone application is an application that should be applied after assembly as seen in the above pictures in order to provide an effective seal in commercial conical silos in chassis and silo body combinations. This application is an application that is not undertaken by Lambton, and the company that performs the installation must do it upon the request of the customer..

Do not forget; Liquid silicone application provides you with extra sealing and is made entirely within the needs and demands of the customer, by the company or people who install it, at the request of the customer..

2.8 ECONOMIC TAPER SHIP TYPE LADDER MOUNTING

Figure 2.8.1 Beam Appearance And Installation



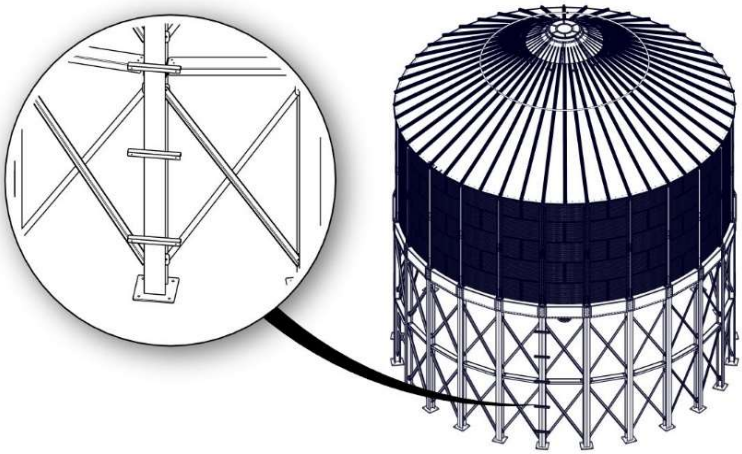
The first apparatus required for staircase assembly after assemblies made up to here within the framework of silo general assembly; **It is the beam connection apparatus of the ladder.** Prior to the assembly, the assembly method should be the assembly of the apparatus and parts, as shown in Figure 2.8.1. All parts as in the picture should be mounted and made ready for mounting on the body.

Table 2.8.1 Beam Fasteners

M8x30 Square Base Bolt Head Bolt	
M8 normal nut	
Ladder Beam Connection Apparatus	
Beam Connection Compression Apparatus	

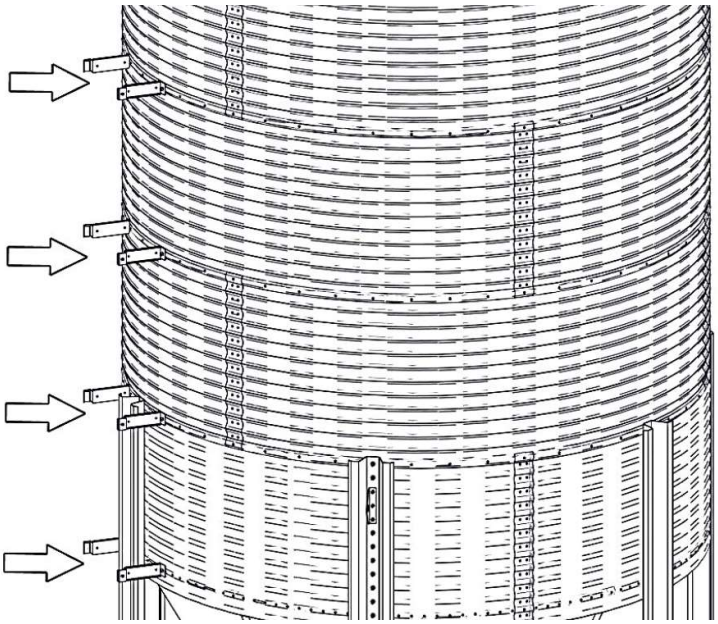
Beam fasteners are specified in Table 2.8.1. Make sure that the bolt to be used is a square-headed dome-head bolt. The installation of the beam connection apparatus, the assembly of which is completed, should be checked before the body layout, the location of the anchorage where the silo will be fixed, and the foot where the maintenance cover will be located must be determined and the foot to which the ladder group will be fixed must be determined in accordance with this mounting situation. At least two feet in the location of the cleaning cover are not suitable for mounting the ladder..

Figure 2.8.2 Ladder Location



REMEMBER The ladder must be easily accessible in every situation and condition. Due to this situation, there should be no settlement that may pose a risk to work and worker safety. In the places where the ladder will be mounted, there are fittings shown in the detail picture. Connection beam shown in Figure 2.8.1 is bolted to this part.

Figure 2.8.3 Installation of Beam Apparatus

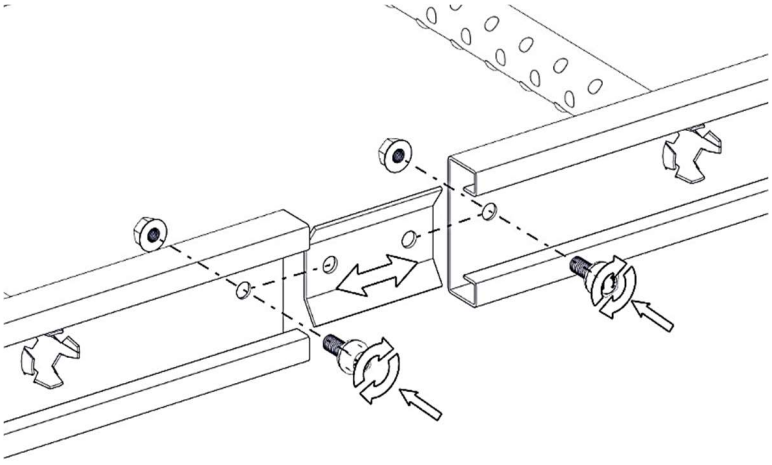


After the layout plan is made, it should be noted that the beam connection apparatuses are in line and aligned in order. Apparatus to be mounted on the body must be fixed in the body combination as corresponding. Figure 2.8.3 shows the plane and the correct method, which must be applied in a representative layout. It should be brought to the body joints on the silo, the bottom conical and the body combination, and the holes in the roof sheet and the body assembly that need to be mounted and make sure that they are aligned in the same direction..

Mounting direction should be fixed to each other according to the shape of the ladder. The bolt must be thrown in from the outside and the nut must be fixed in the silo. Bolts used in body assembly should be used for connection equipment. When doing so, pay attention to sealing.

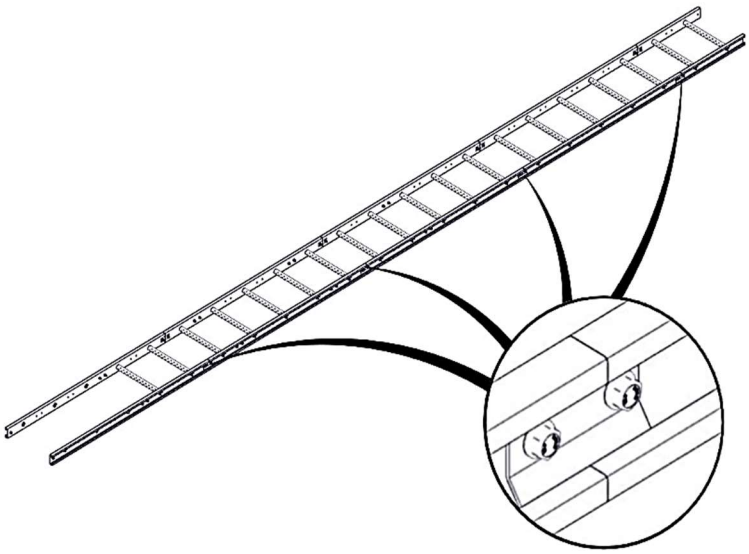
DON'T FORGET bolts should be applied externally and pressing the o-rings as flat as possible. Thus, outside moisture, rain and similar natural formations will stop leaking into the silo. Another point to remember is that the connections of the O-ring bolts are definitely not in terms of bolts! The nut should be tightened or loosened with mechanical or hand tools. So the o-ring will not be damaged.

Figure **2.8.4 Ladder** Join and Fixing



Ladder groups and numbers shipped according to the nature of the project should be integrated and unified by first assembling and fixing each other. The ladders will be shipped to the field, assembled in modules as factory. They are added to each other as shown in Figure 2.8.4..

Figure 2.8.5 Ladder Combination General View



you
are

Provide the combination of the ladder modules sent to according to the nature of the project as shown. Joints shown in Table 2.8.2.:

Table 2.8.2 Module Fasteners

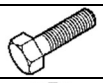
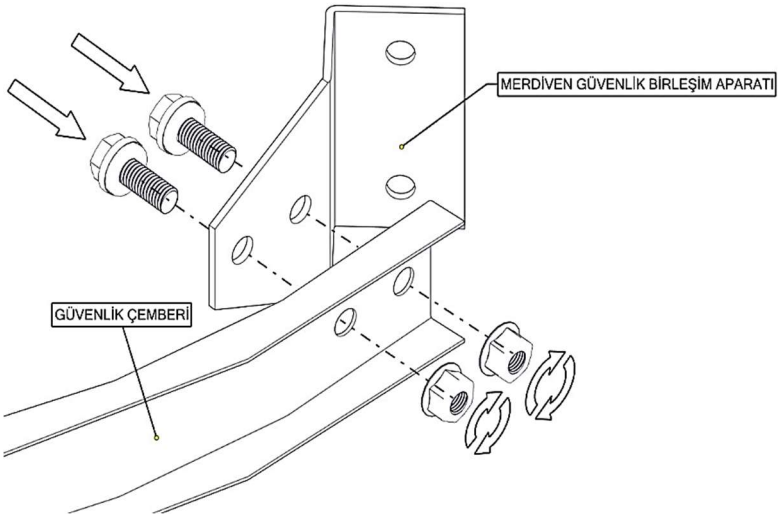
M8x15 Hexagon Head Bolt	
M8 Normal Nut	
Ladder Interconnection Apparatus	
Sailor Type Ladder	

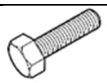
Figure 2.8.6 Safety Cage



In order to perform security cage assembly, all parts, apparatus, connection equipment and tools to be used must be determined and a separate assembly group must be created in a region..

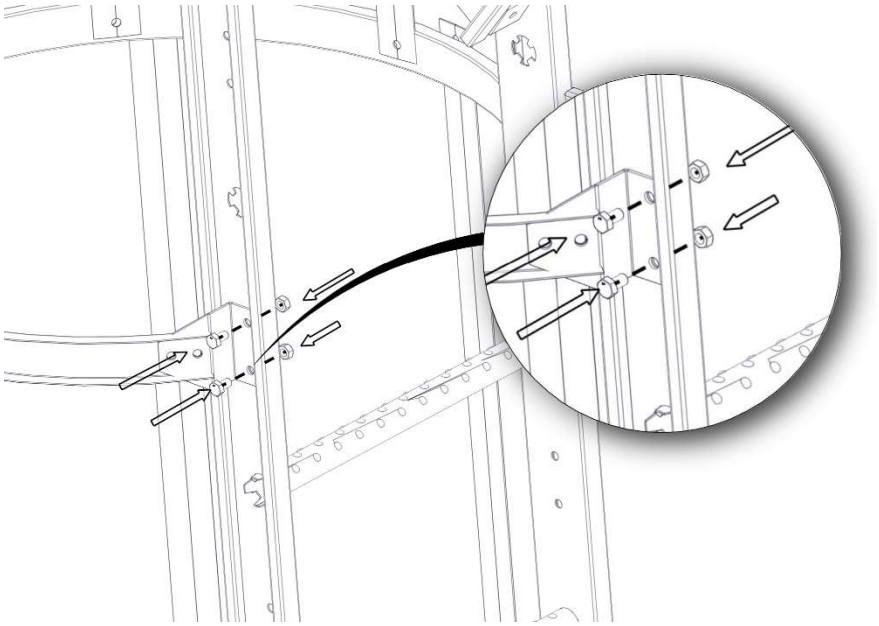
Your priority should be to mount all the safety loops to the hoops, which will be combined with the ladder. Figure 2.8.6 shows how to assemble visually, the fasteners are also shown in Table 2.8.3.

Table 2.8.3 Safety Fasteners

M8x15 Hex Head Bolt	
M8 Normal Nut	
Ladder and Safety Combination Apparatus	
Safety Cage Hoops	

After completing the assembly of all safety rings, the safety ring, which is slightly wider than the other safety rings, is used..

Figure 2.8.7 Security Ring and Ladder Connection



A representative view of the safety ring and the ladder connection is given in Figure 2.8.7. The connection elements to be used are as indicated in Table 2.8.3. Pay attention to the tightening torque values.

Figure 2.8.8 Railing Support Bar

Parts to be used to connect the security circles are marked in bold in Figure 2.8.9 as a representation. All of these parts must be assembled with the connection equipment specified in Table 2.8.3. For the parts to meet the hole axes and for easy connection;

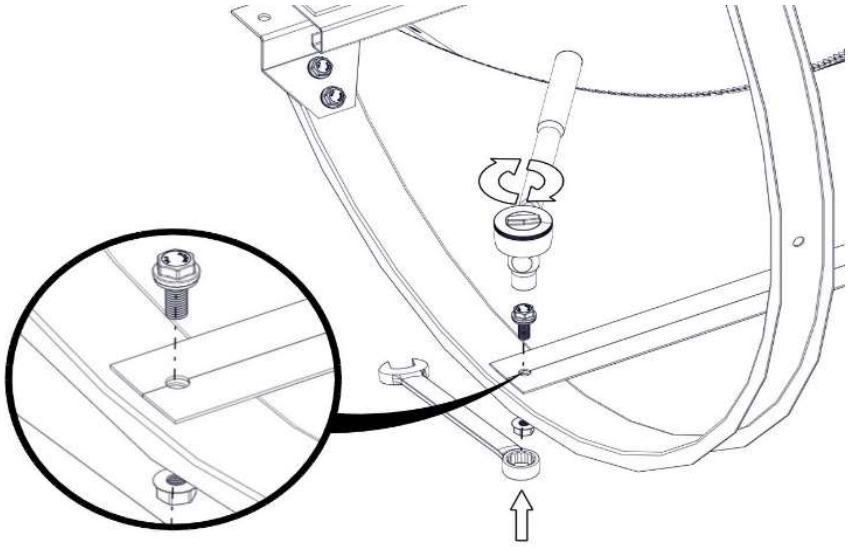
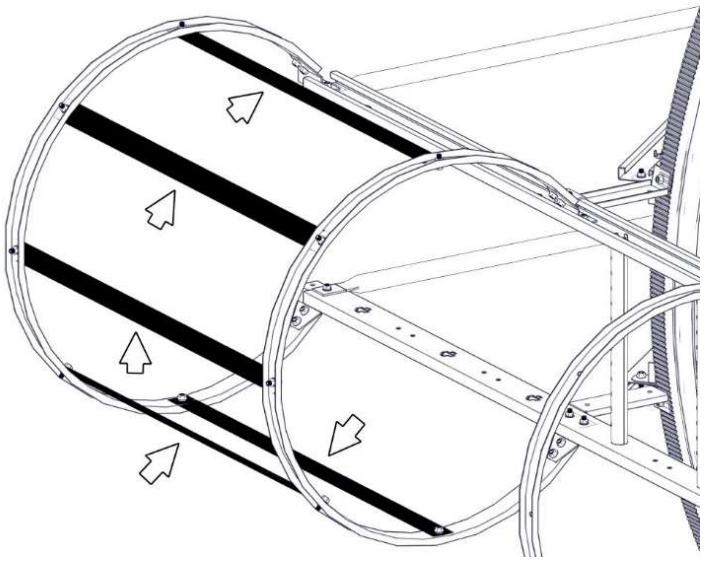


Figure 2.8.9 Guardrail Support Bar Assembly

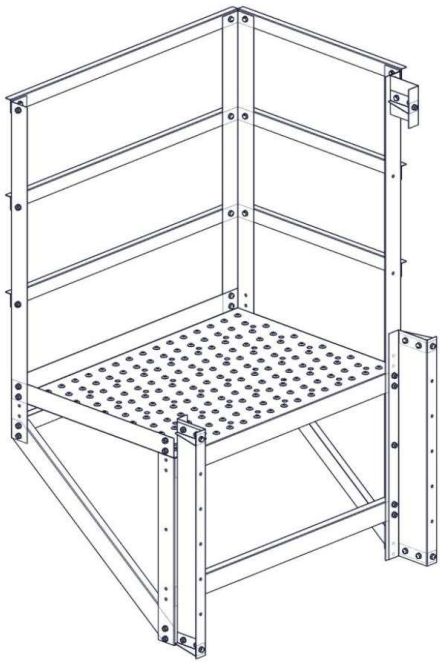


During the connection process of the railing support sheet, it will be a correct mounting system to install using small hand tools and mechanical tools and to remove the bolts from the hoop through the hoop of the nuts.

Connecting the bolts from the inner surface and tightening the nuts from the outside will help minimize bodily injury in the event of a potential hazard..

2.9 COMMERCIAL CONICAL RESTING PLATFORM INSTALLATION

Figure 2.9.1 Rest Platform Overview



Economic conical silos usually have a resting platform just before the roof. It is made of high strength galvanized steel and provides advantages with ease of assembly. Easy access to the resting platform roof provides extra security when climbing up to the silo roof. Resting platforms; provides comfortable and safe landing.

The rest platform should be mounted while the silo body is rising. Because these platforms will be mounted on the silo body sheet, screwing should be done while body assemblies..

Table 2.9.1 Connectors

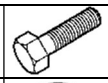
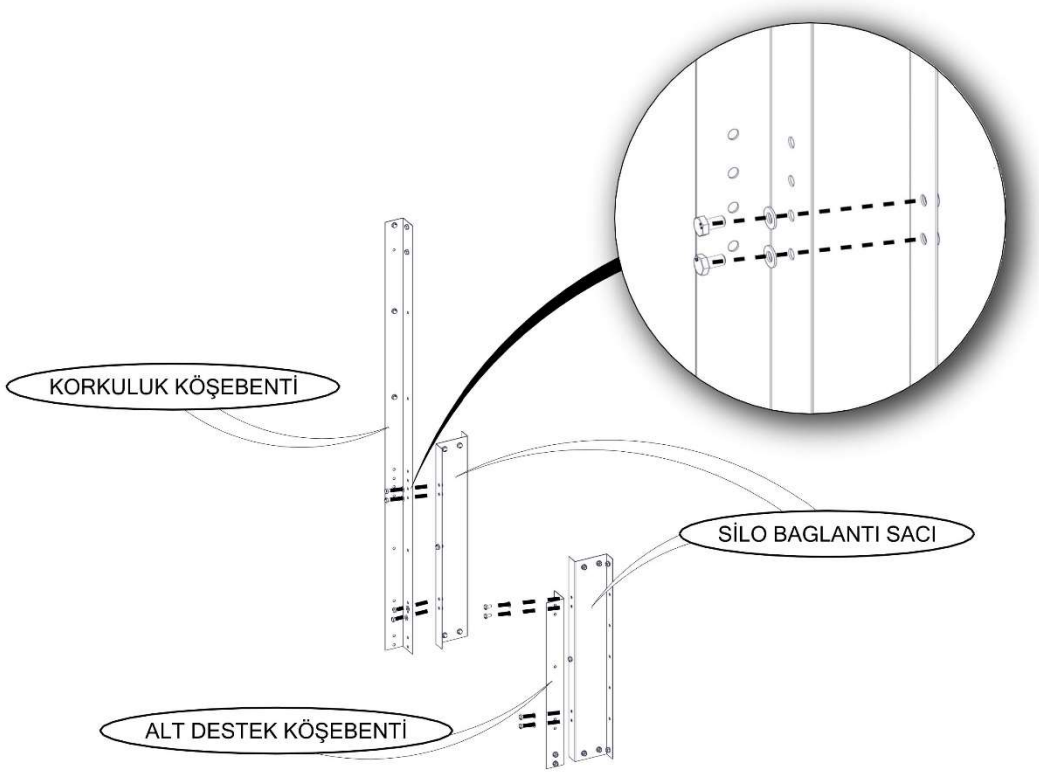
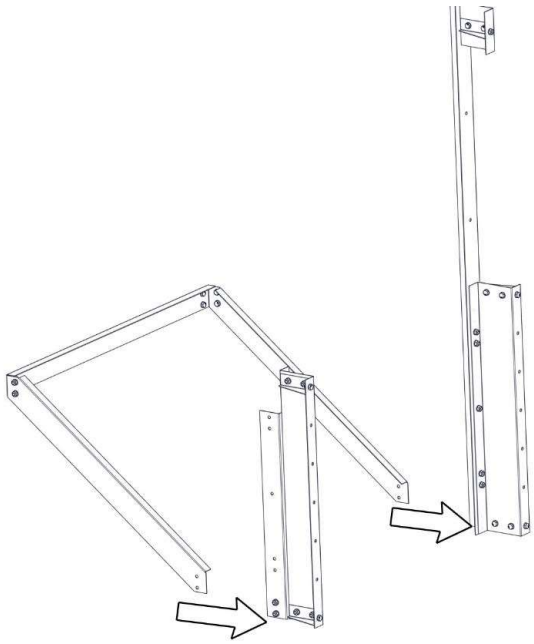
M10x20 Hexagon Head Bolt	
M10 Normal Nut	
M10 Washer (Double Sided)	

Figure 2.9.2 Resting Platform Installation



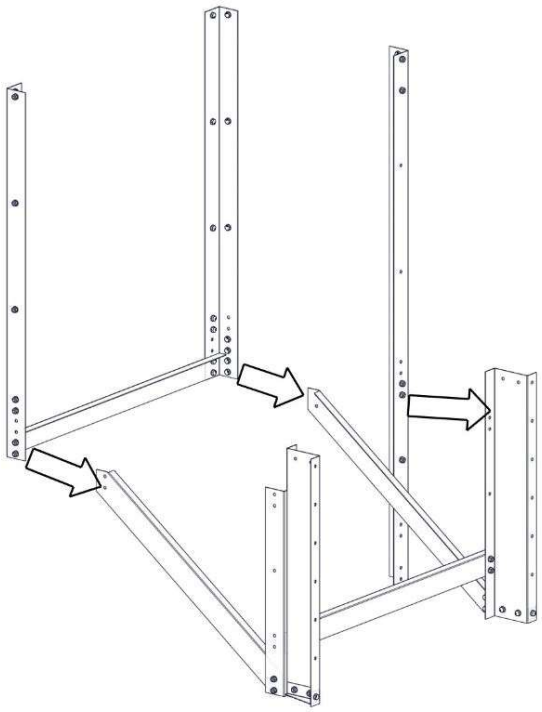
The resting platform begins with the assembly of silo connection plates to the silos as described above. Then, the mounting of the angles shown in 2.9.2 is started. Fasteners are shown in Table 2.9.1..

Figure 2.9.3 Lower Cross Support Plates



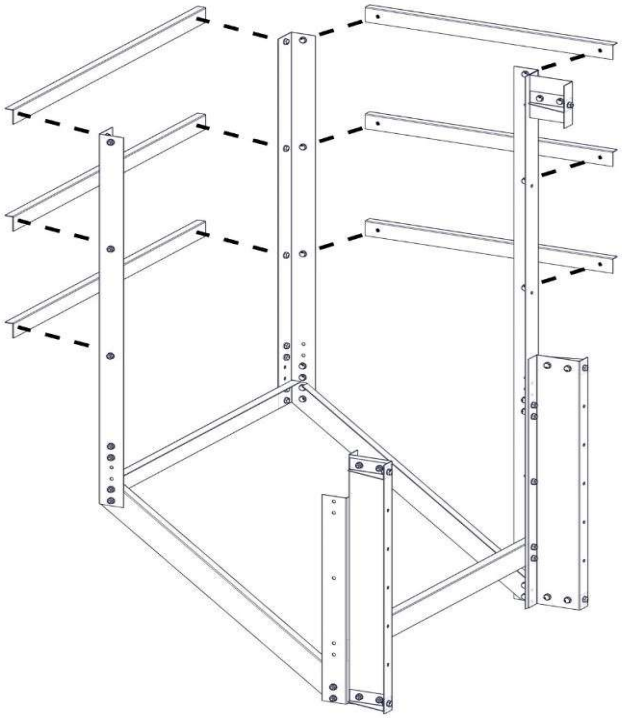
Then, the assembly of the lower support cross sheets shown in Figure 2.9.3 begins. Since these parts will hold the platform, it must be done before the platform and tightened at the required torque value to check its robustness. Do not forget; The health of you and your employees comes first.

Figure 2.9.4 Guardrail Angle Assembly



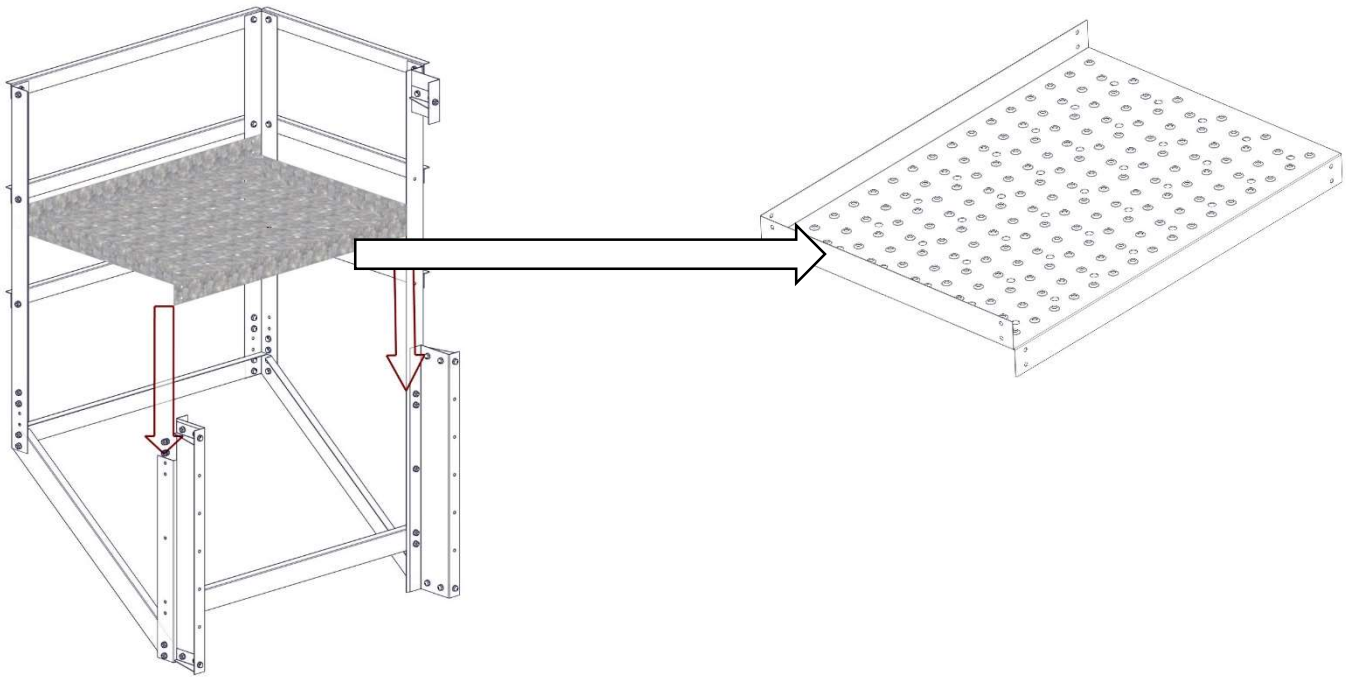
The assemblies of Railing Brackets are shown as a representation in Figure 2.9.4. The railings are mounted to the lower cross-support plates as shown in Figure, thanks to the fasteners shown in Table 2.9.1. Observe the tightening torque values. Make sure the railing angles are strong.

Figure 2.9.5 Horizontal Railing Joints



After assembling the railing angle bar, the process of joining the railing in the horizontal plane is started. As can be seen in Figure 2.9.5, there are generally 3 handrails in horizontal correction. Pay attention to the length of these angles. Connection elements are shown in detail in Table 2.9..

Figure 2.9.6 Platform Installation

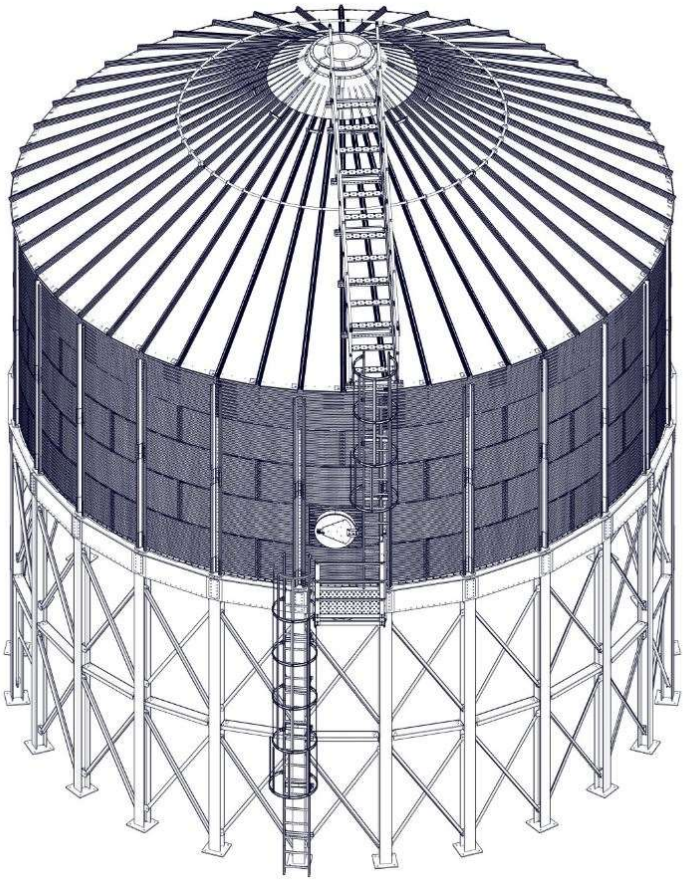


In the assembly of the resting platform, the bottom plate of the platform is finally installed. The bottom plate of the platform, which is indicated in dark color in Figure 2.9.6, is mounted on the rails previously described with a pair of nuts and bolts. Connection elements are detailed in Table 2.9.1..

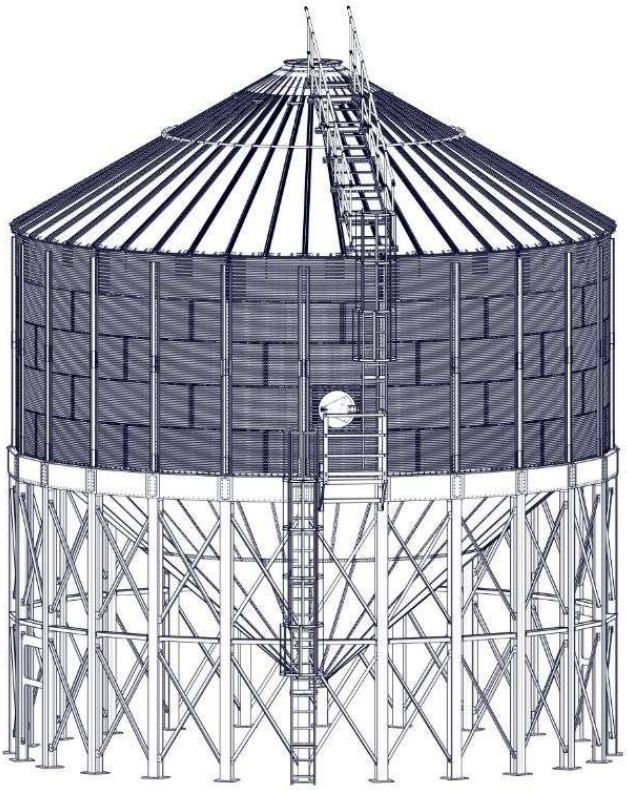
Figure 2.9.7 Wide Security Cages

In a detail you need to know, the type of safety cage you will use in the rest platform and ladder junction parts are shown in Figure 2.9.7. For the joints, the joining elements used in the ladder will be used. (See Table 2.8.3

Figure 2.9.8 Commercial Hopper Overview



You have installed your commercial conical silo following the instructions above. For detailed information of stairs and resting platforms, you can get support from authorized staff of Lambton..



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