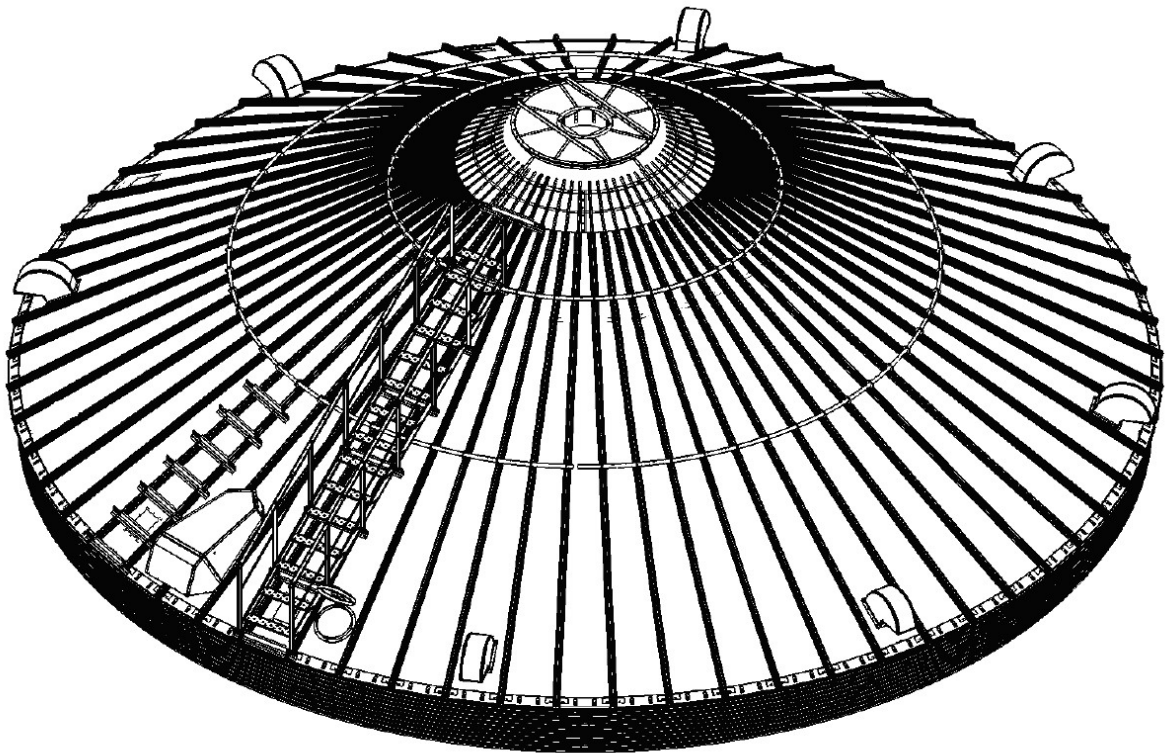


16 Model Silo Roof Installation Manual



26.12.2017

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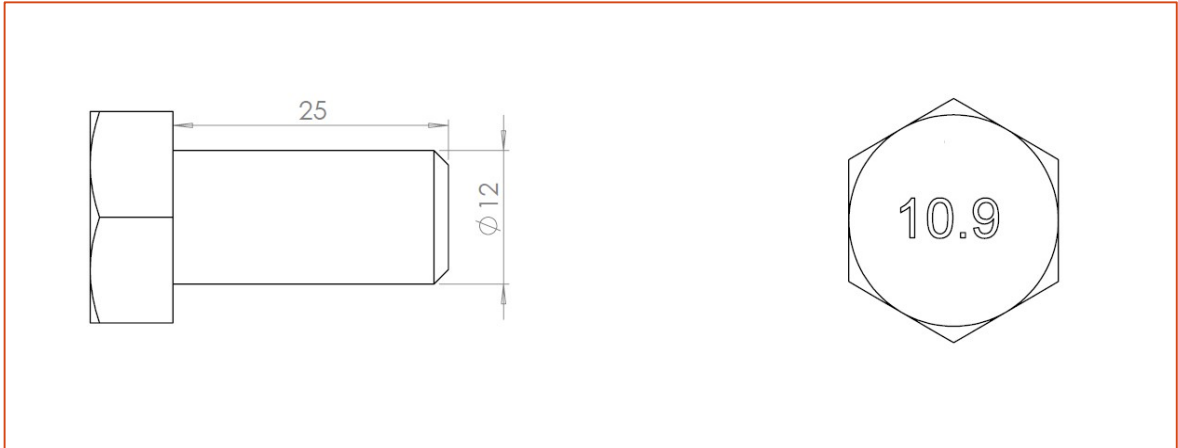
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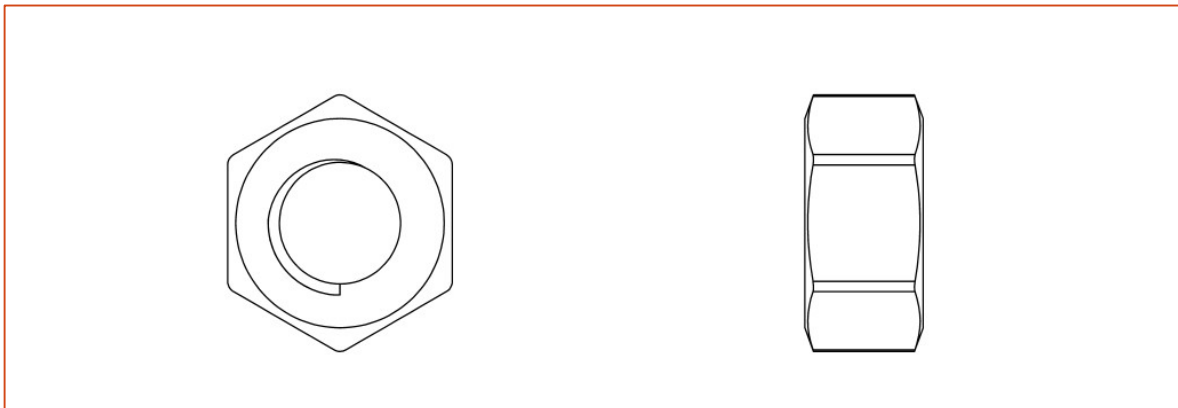
1 - GENERAL INFORMATION ABOUT INSTALLATION

1.1 HEAVY ROOF FITTINGS

(M12x25) Hex Head Bolts (Quality of 10.9) - [TM.602.1.12.GEO.25.109.0933]

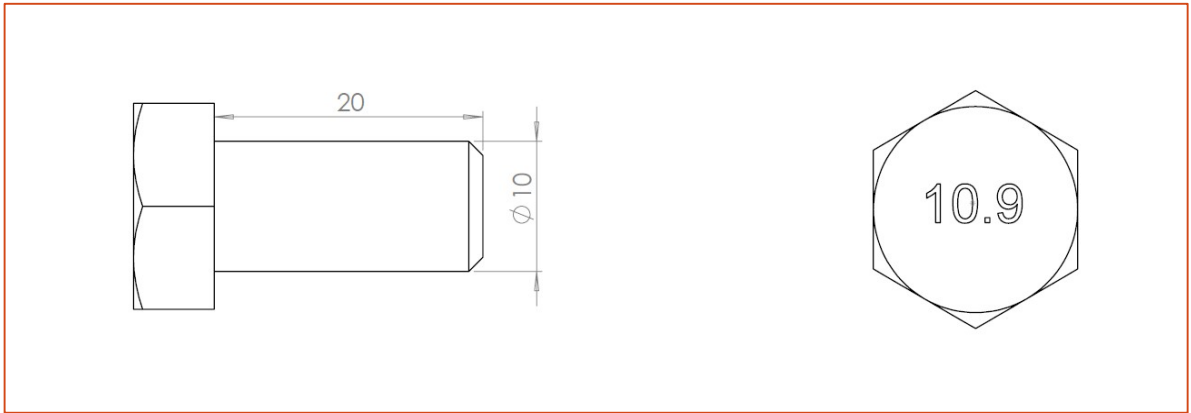


(M12) Nut (10.9 Quality) - [TM.602.2.M12.10.0934]

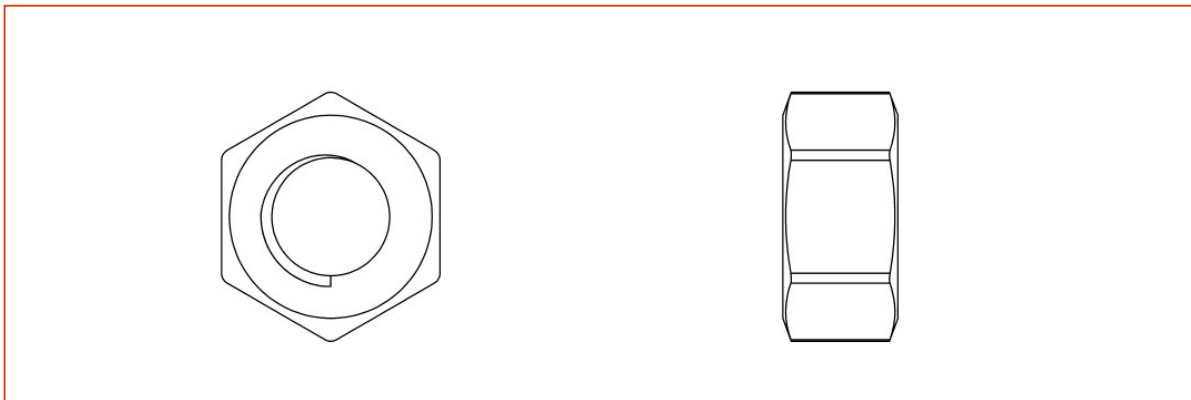


Place of Use: Tepe Ring-Beam

(M10x20) Hexagon Head Bolts (Quality of 10.9) - [TM.602.1.10.GEO.20.109.0933]

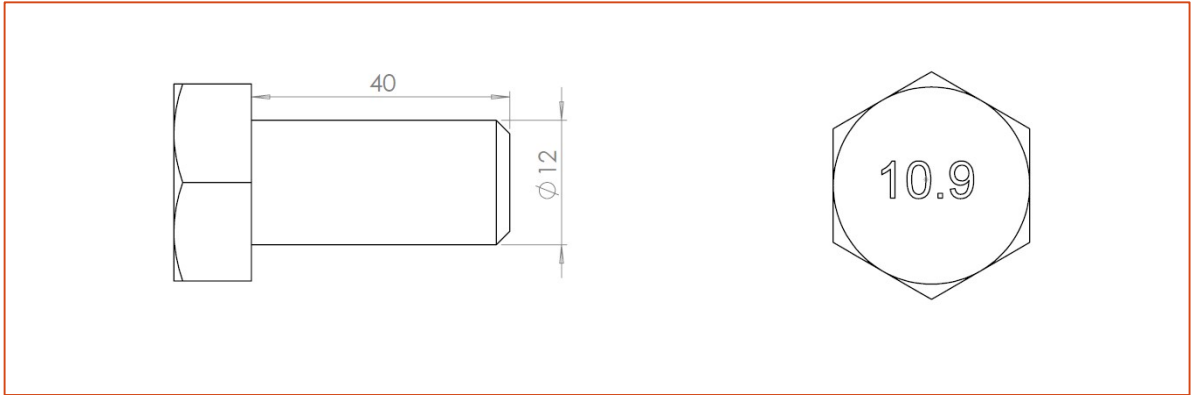


(M10) Nut (10.9 Quality) - [TM.602.2.M10.10.0934]

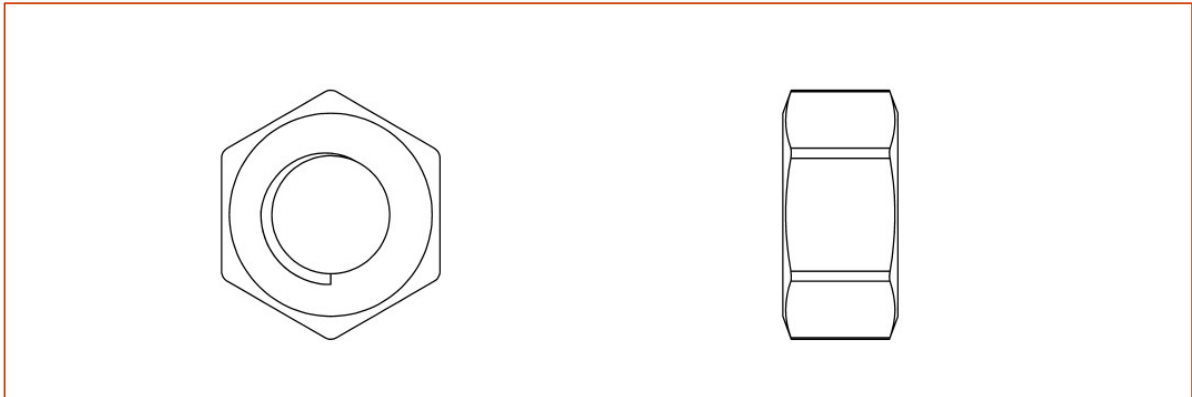


Place of Use: Ring Closure

(M12x40) Hexagon Head Bolts (Quality of 10.9) - [TM.602.1.12.40.109.0933]

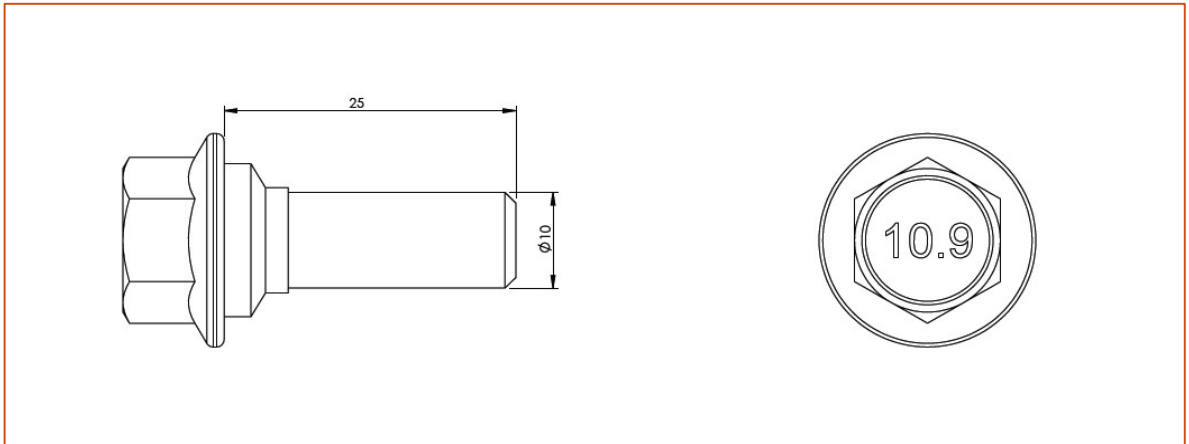


Nut (10.9 Quality) - [TM.602.2.M12.10.0934]

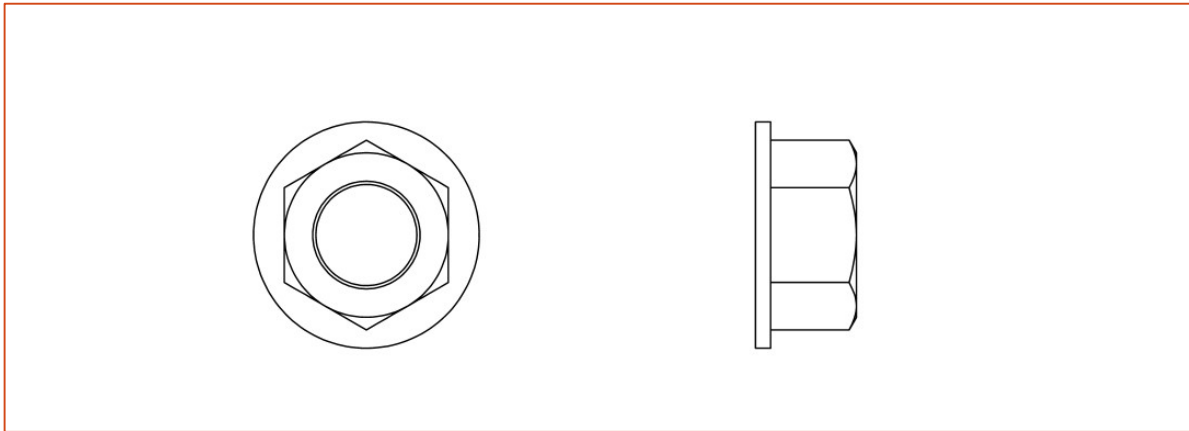


Place Of Use: Beam

(M10x25) Flanged O-Ring Bolt (10.9 Quality) - [TM.602.1.10.GEO.25.109.6921.O]

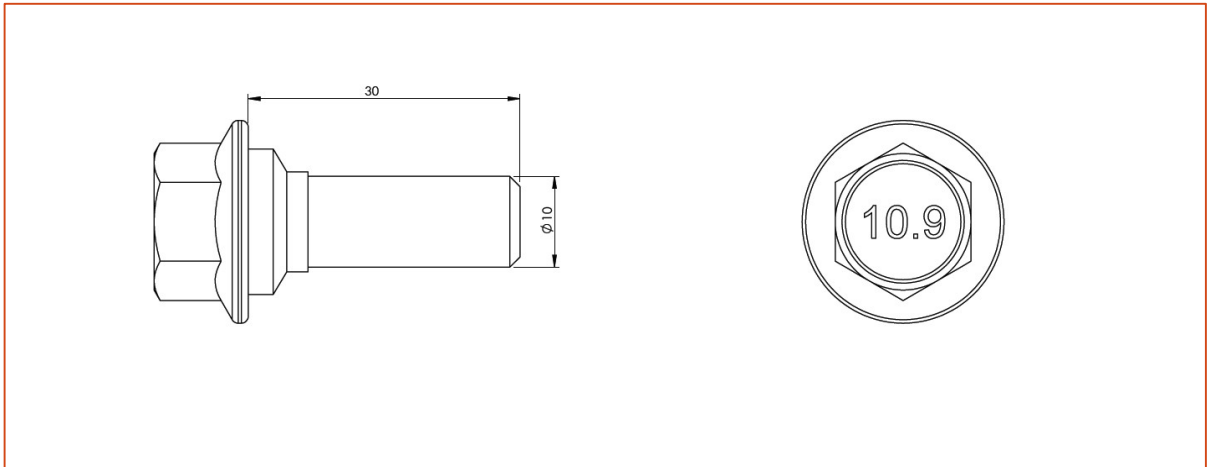


(M10) Flanged Nut (Quality of 10.9) - [TM.602.2.M10.8.6923]

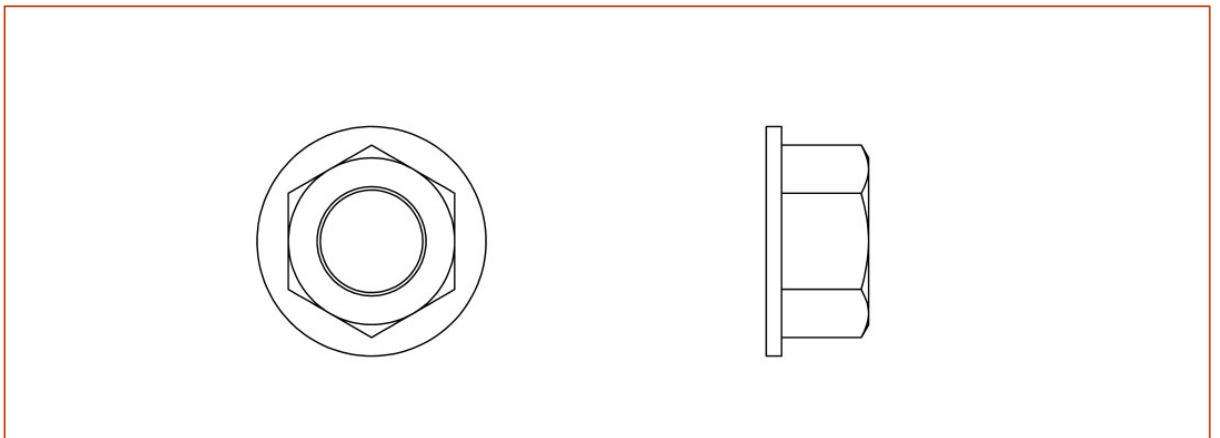


Place Of Use: Hood

(M10x30) Flanged O-Ring Bolt (10.9 Quality) - [TM.602.1.10.GEO.30.109.6921.O]

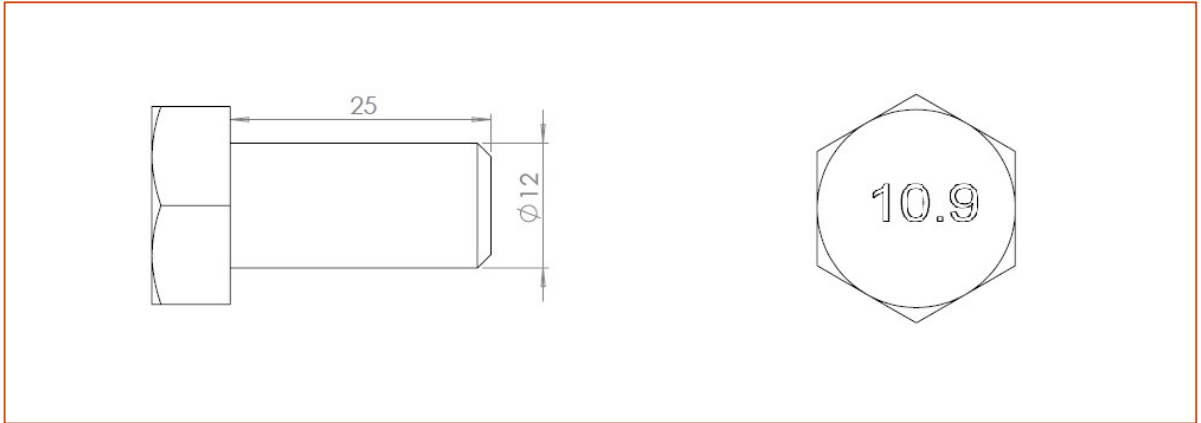


(M10) Flanged Nut (Quality of 10.9) - [TM.602.2.M10.8.6923]

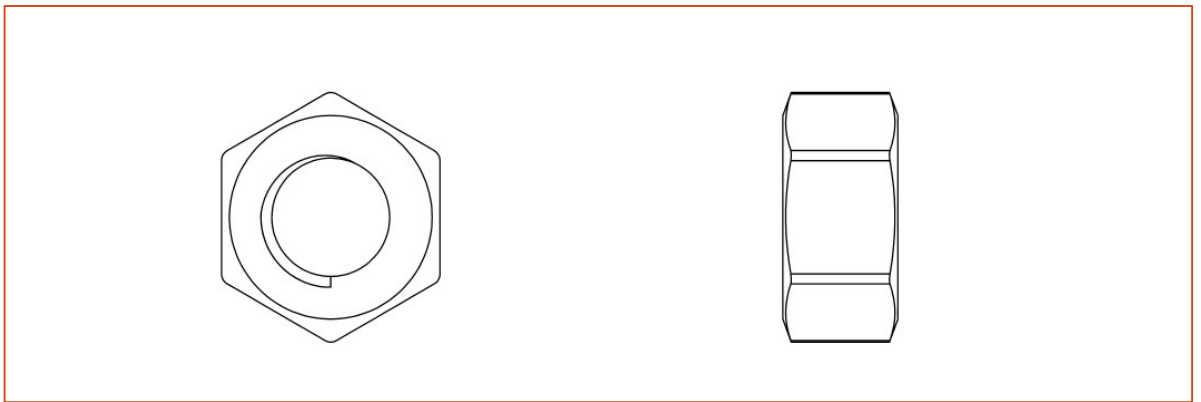


Place of Use: Plate - Inner Pole

(M12x25) Hex Head Bolts (Quality of 10.9) - [TM.602.1.12.25.109.0933]

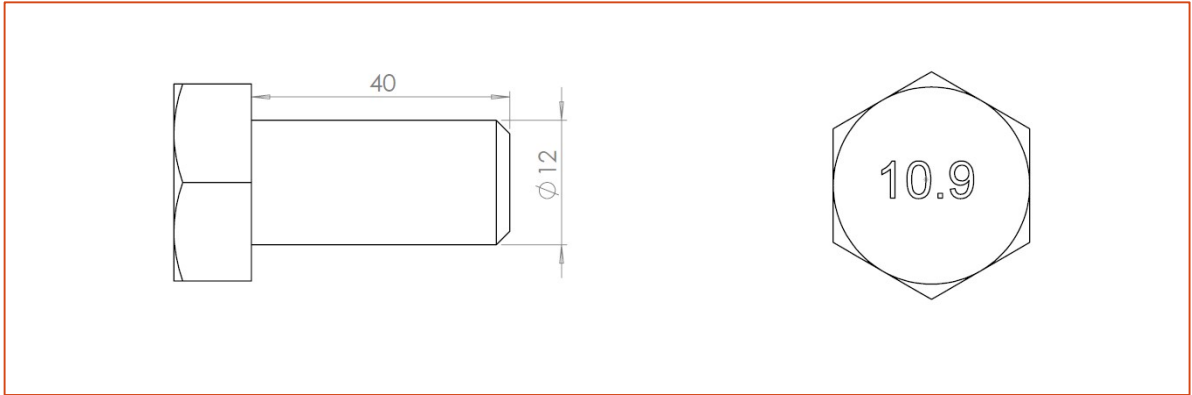


(M12) Nut (10.9 Quality) - [TM.602.2.M12.10.0934]

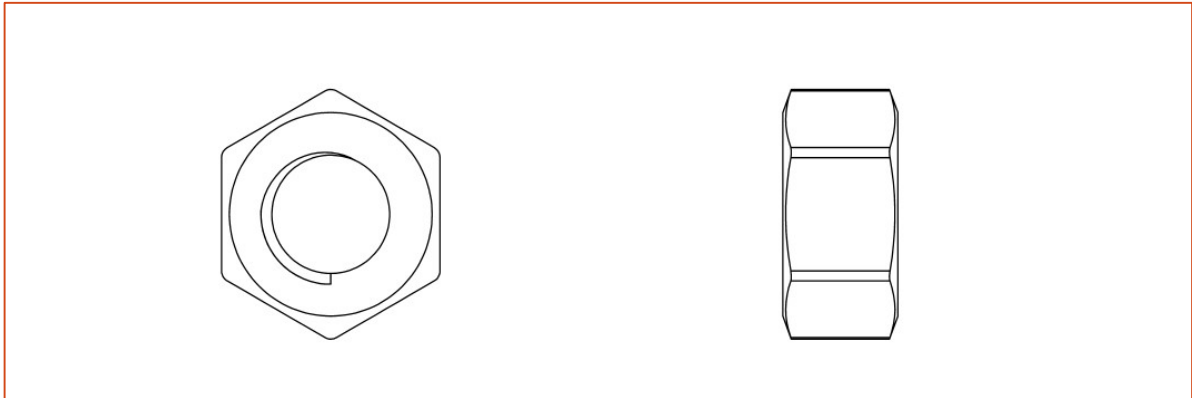


Place Of Use: Temperature Control

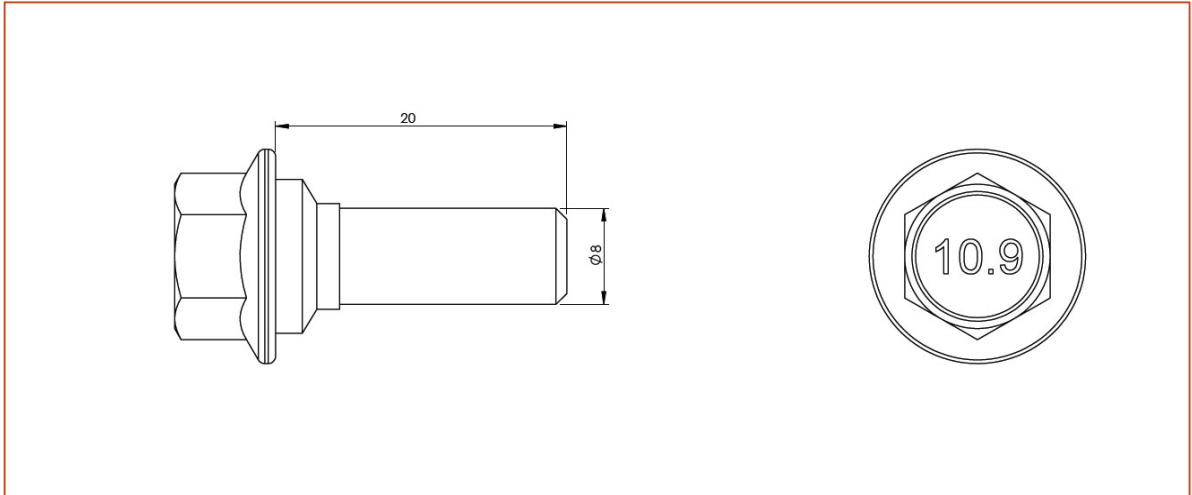
(M12x40) Hex Head Bolts (Quality of 10.9) - [TM.602.1.12.40.109.0933]



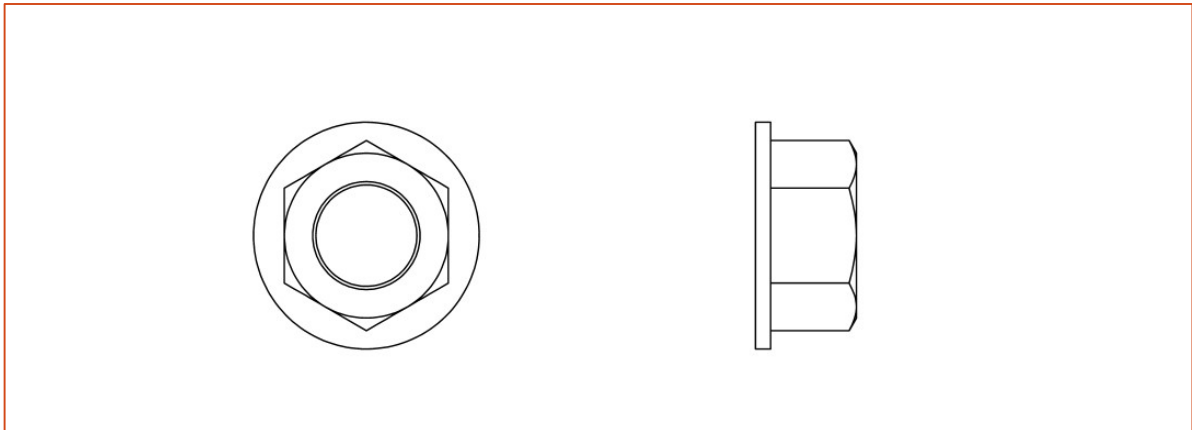
(M12) Nut (10.9 Quality) - [TM.602.2.M12.10.0934]



(M8x20) Flanged O-Ring Bolt (10.9 Quality) - [TM.602.1.8.GEO.20.109.6921.O]

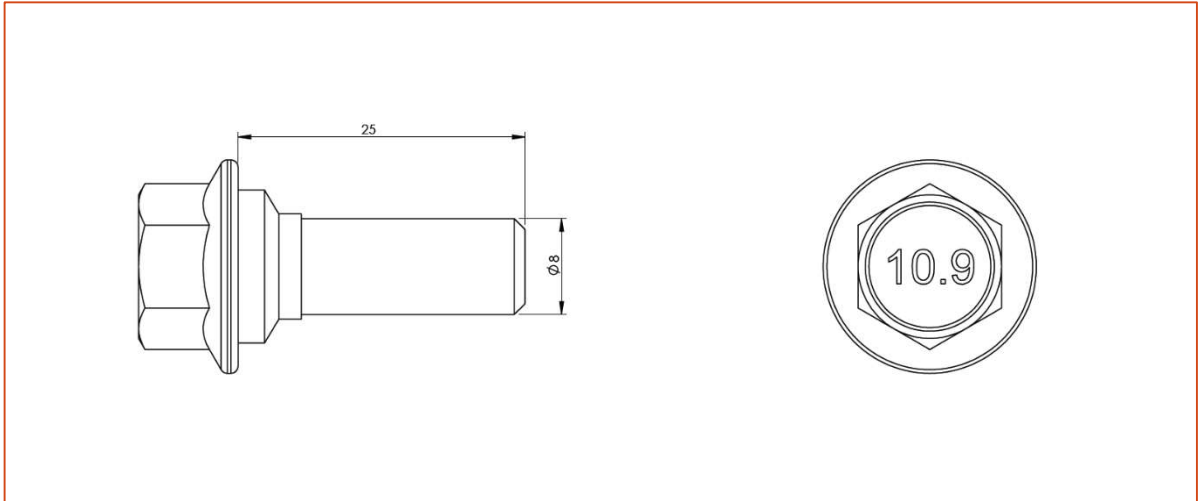


(M8) Flanged Nut (Quality of 10.9) - [TM.602.2.M10.8.6923]

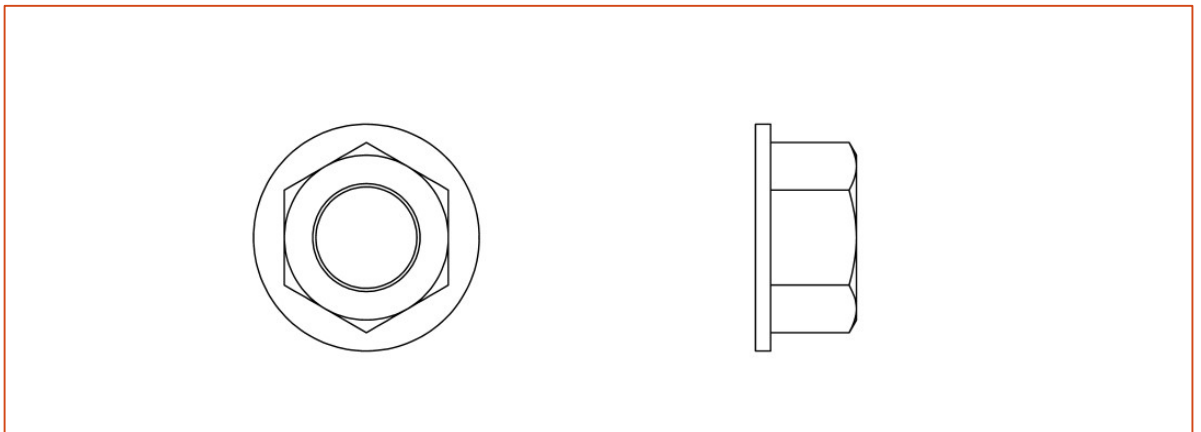


Place Of Use: Roof Sheet

(M8x25) Flanged O-Ring Bolt (10.9 Quality) - [TM.602.1.8.GEO.25.109.6921.O]

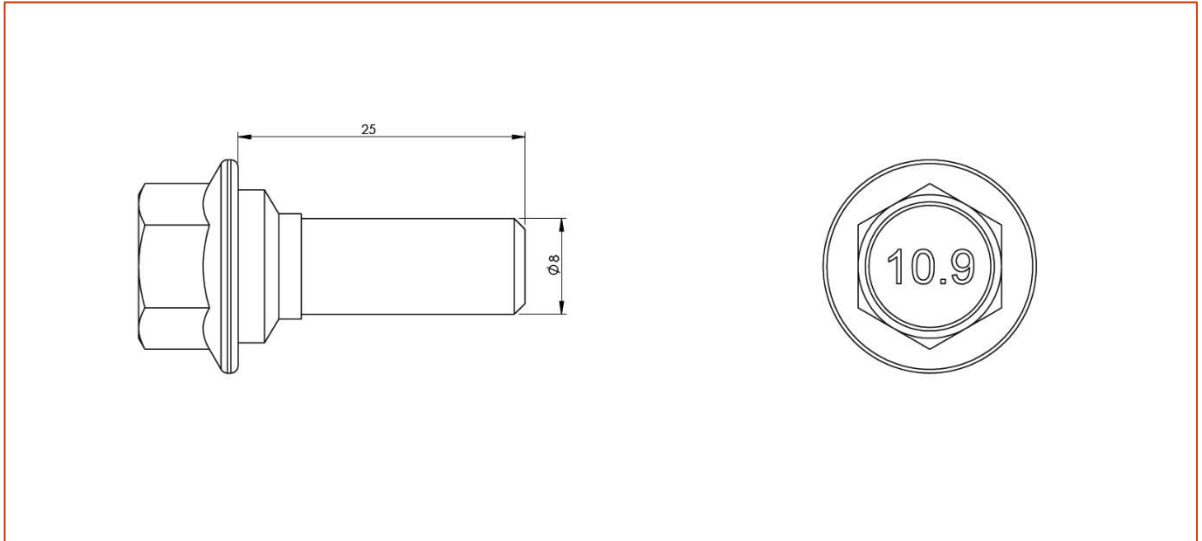


(M8) Flanged Nut (Quality of 10.9) - [TM.602.2.M10.8.6923]

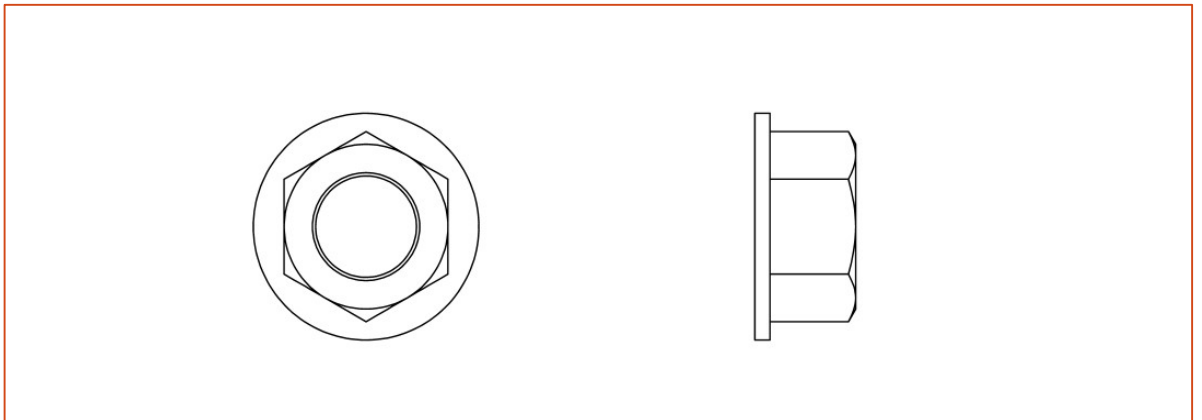


Place of Use: Wind Ring

(M8x25) Flanged O-Ring Bolt (10.9 Quality) - [TM.602.1.8.GEO.25.109.6921.O]



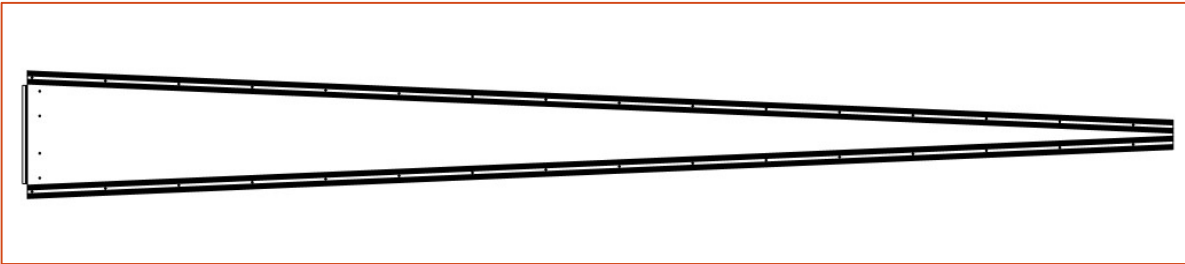
(M8) Flanged Nut (Quality of 10.9) - [TM.602.2.M10.8.6923]



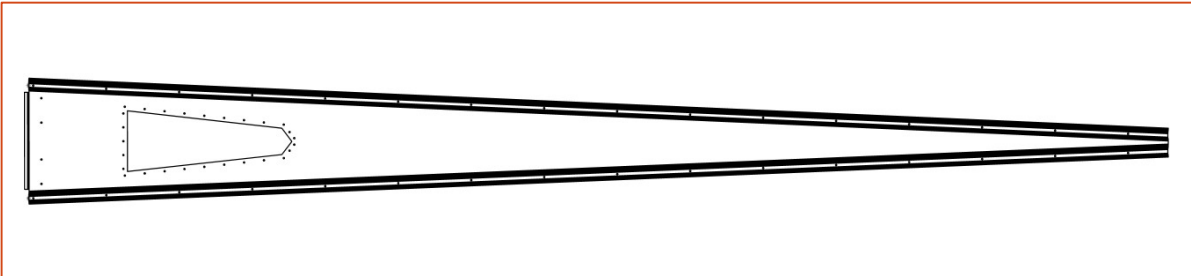
Place Of Use: Vent-Roof Fan

1.2 HEAVY ROOF PARTS

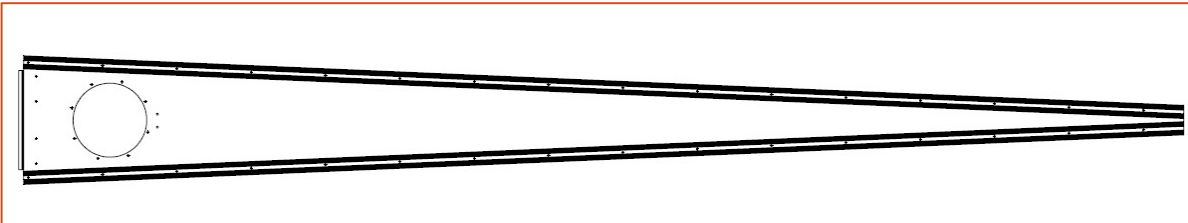
Roof Sheet [YM.ATD16-1204]



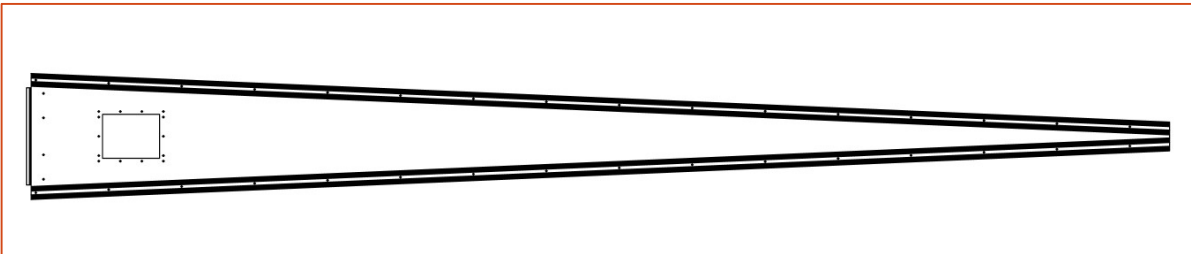
Roof Sheet Exhaust Fan



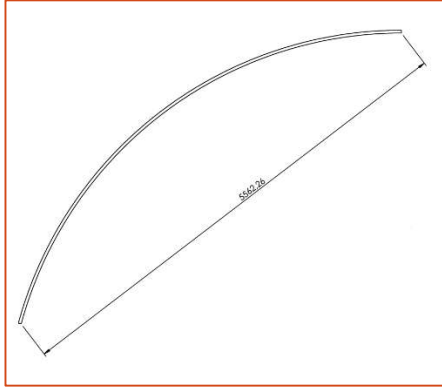
Roof Sheet Manway Door



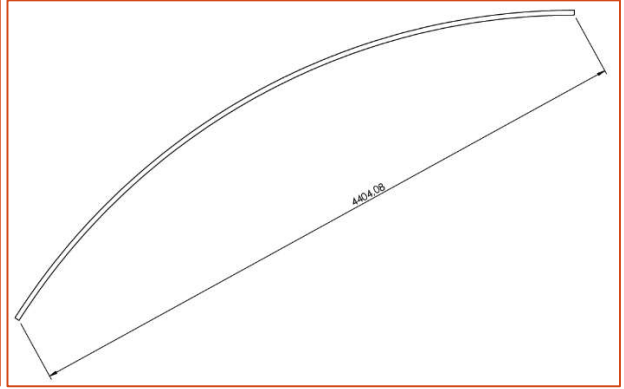
Roof Sheet



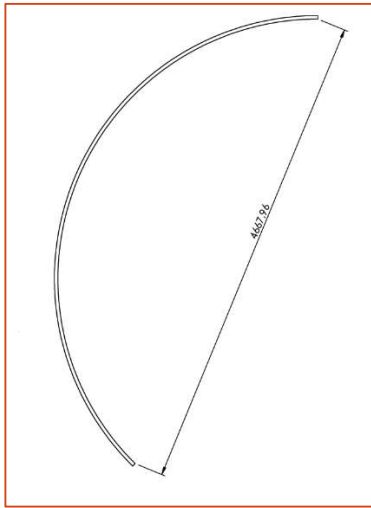
Wind Ring Roof Bottom [YM.ATD16-1208]



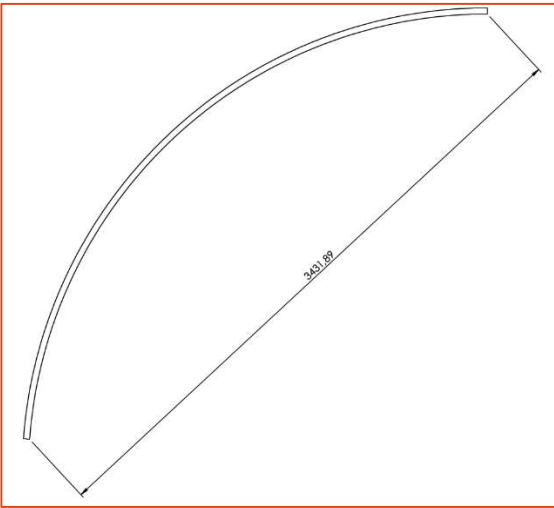
Wind Ring Roof Bottom [YM.ATD16-1208]



Wind Ring Roof Top [YM.ATD16-1209]



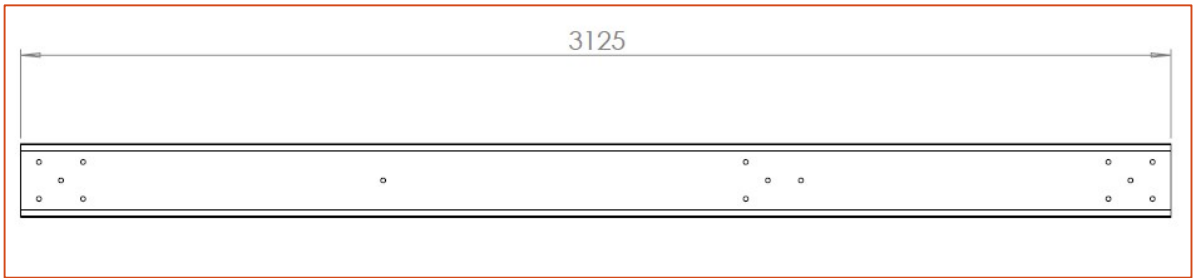
Wind Ring Roof Top [YM.ATD16-1216]



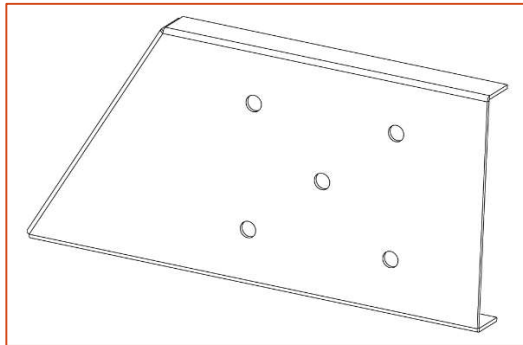
Lower Beam [YM.ATD16-1201]



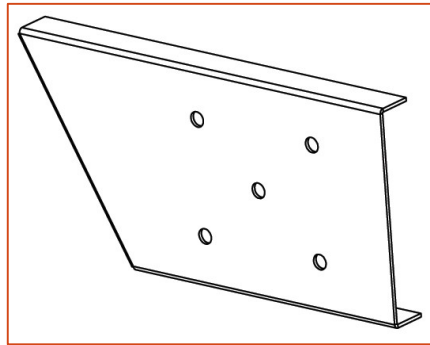
Upper Beam [YM.ATD16-1203]



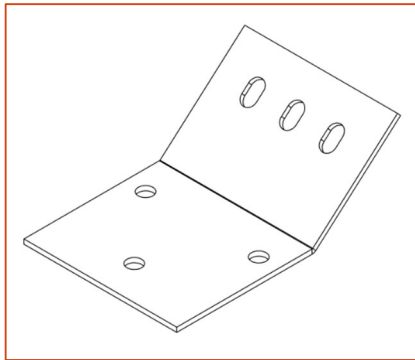
Beam Connection Right [YM.ATDC-03]



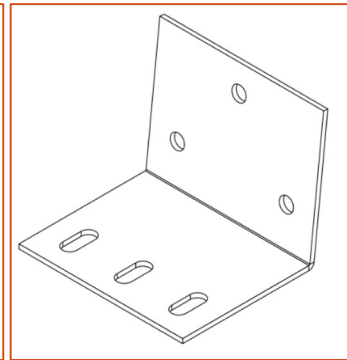
Beam Connection Left [YM.ATDC-04]



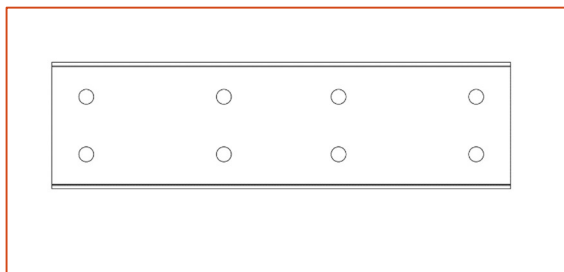
Cross Support Connection [YM.ATDC-05]



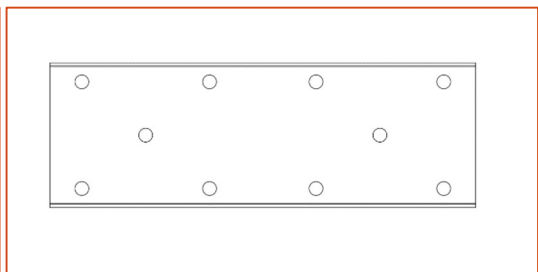
Beam Interconnection [YM.ATDC-06]



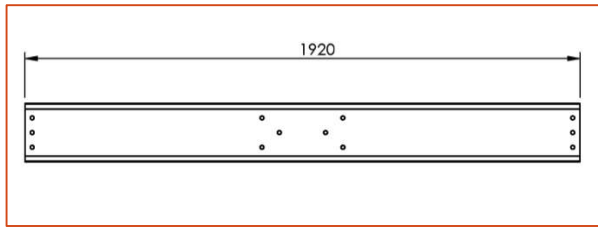
Beam Lower-Upper Connection [YM.ATDC-07]



Beam Interconnection [YM.ATDC-14]



Lower Intermediate Beam [YM.ATDC-14]



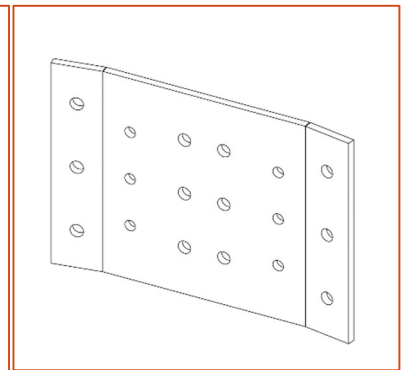
Upper Intermediate Beam [YM.ATDC-57]



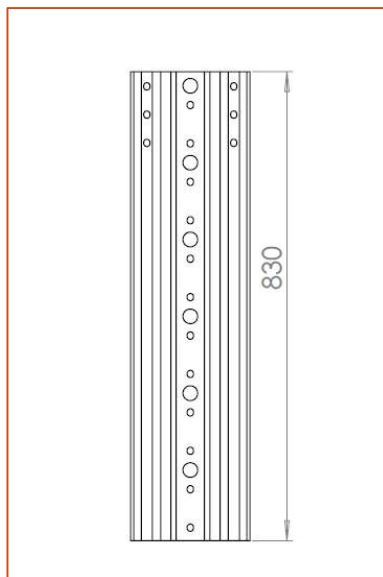
Beam Cross Support [YM.ATDC-10]



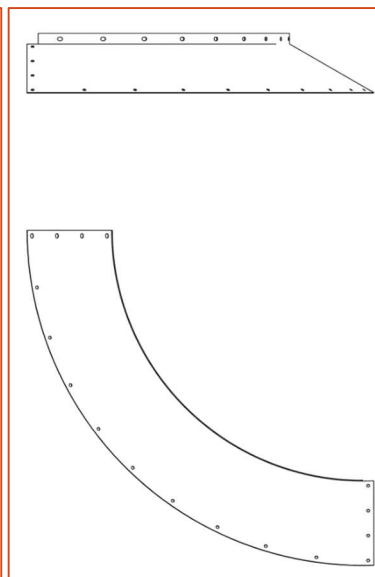
Plate [YM.ATDC-01]



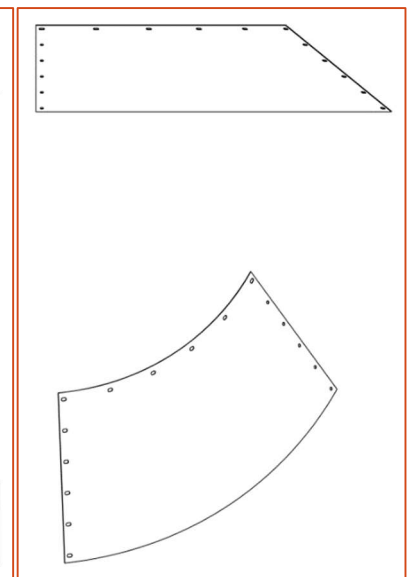
Inner Pole [YM.ATDC-02]



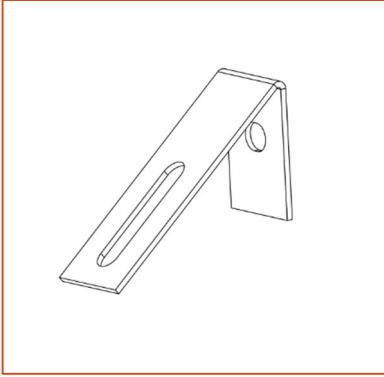
Upper Hood [YM.ATDC-21]



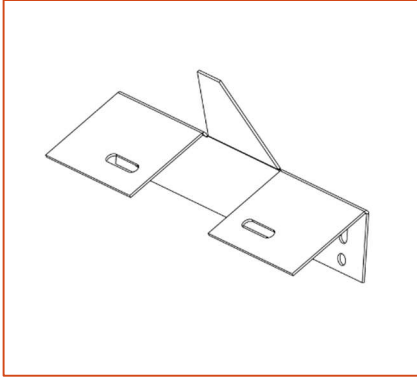
Lower Hood [YM.ATDC-23]



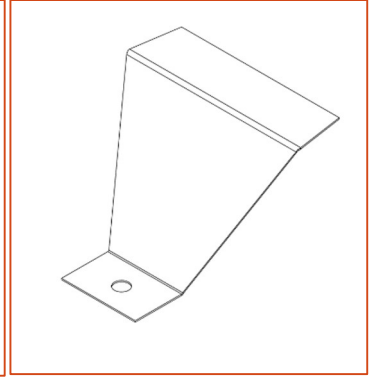
Intermediate [YM.ATDC-13]



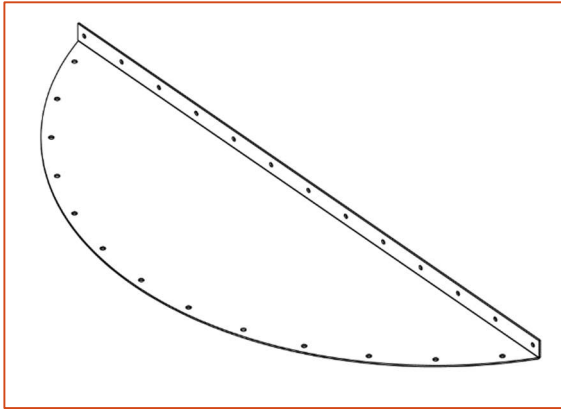
Eave Brkt [YM.ATDC-12]



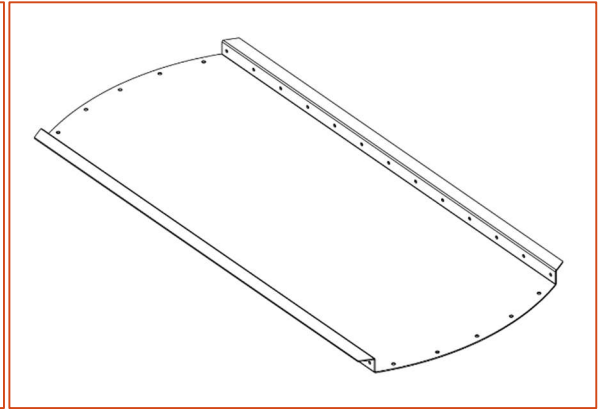
Upper Frame [YM.ATDC-17]



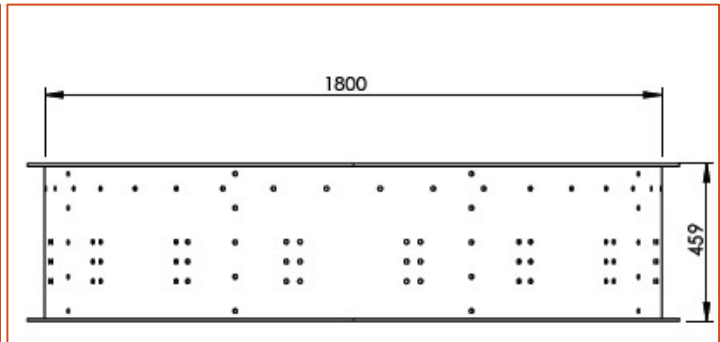
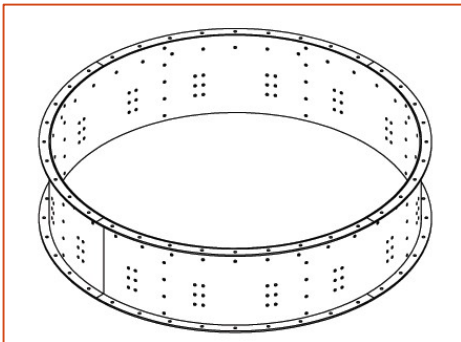
Ring Closing Side (YM.ATDC-24)



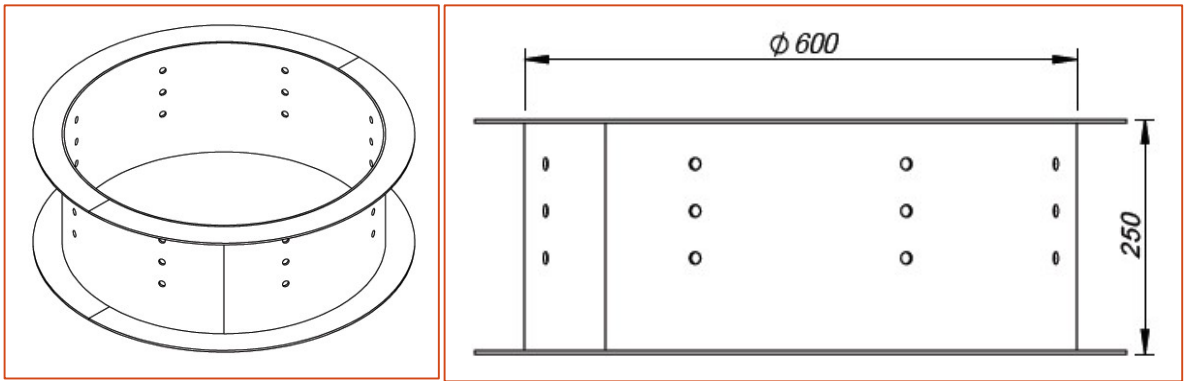
Ring Closing Medium (YM.ATDC-25)



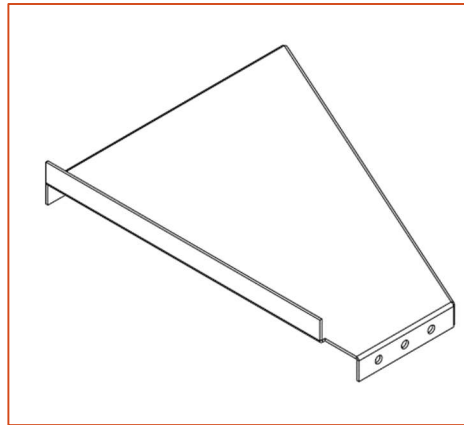
Outer Ring- [YM.ATD16-1110]



Inner Ring- [YM.ATD16-1120]



Ring Amulet [YM.ATDC-15]



2 - 16 MODEL SILO ROOF ASSEMBLY

Tightening Torque Table

CİVATA	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

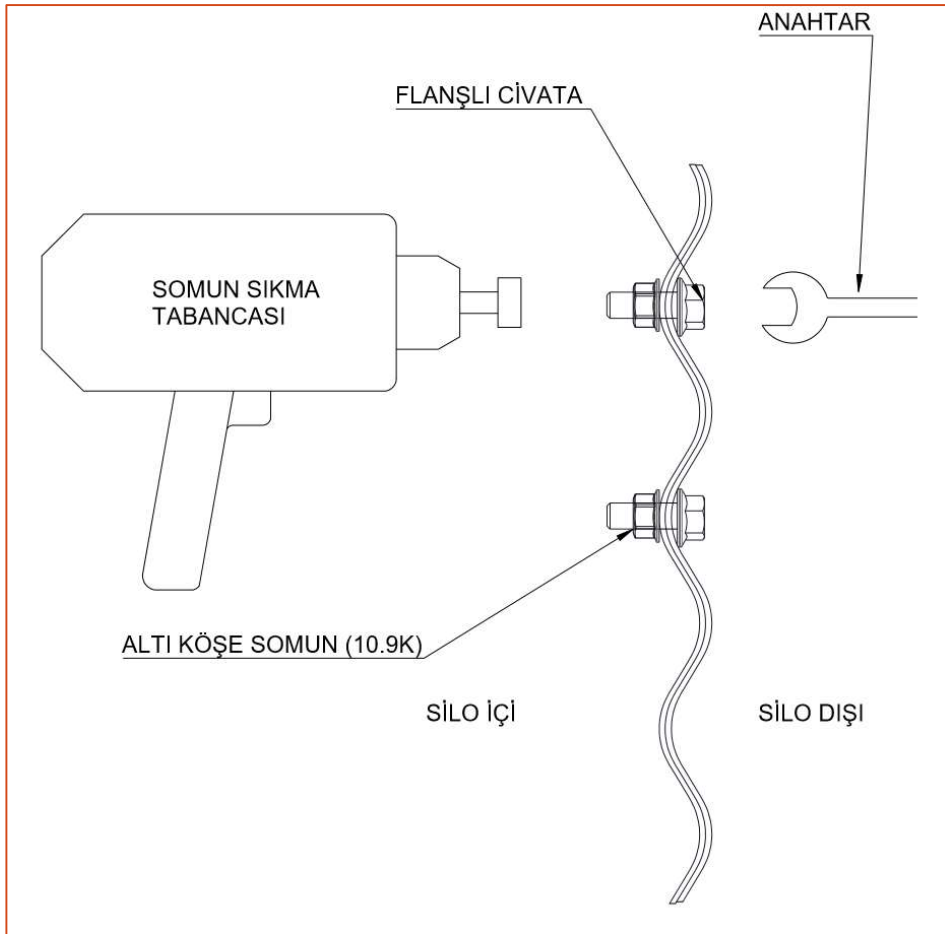


Figure 1 Nut - Bolt Connection Diagram

ATTENTION!!! Tighten the nut bolt connection only with the nut to avoid damaging the o-ring and sealing it

16 Model Çatı Yükleri			
SİLO (Ø)ÇAP	SİLO MODELİ	TEPE YÜKÜ (kg)	KAR YÜKÜ KİRİŞLİ YAPI $\left(\frac{kg}{m^2}\right)$
14,62	16	4536	195

2.1 RING ASSEMBLY

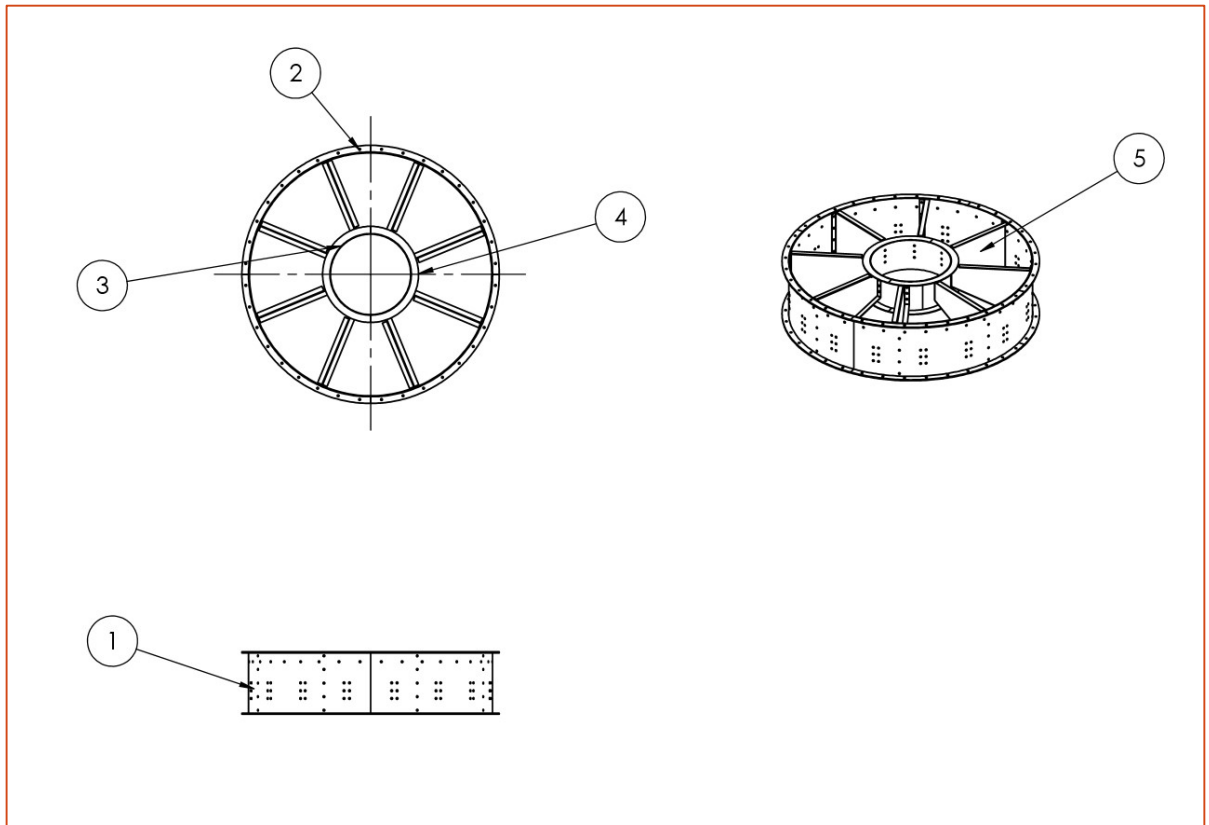


Figure 2 Top Ring

Table 1. Crown Ring Parts list

PART NO	POSITION NO	PART NAME	PIECE
YM.ATD16-1101	1	EXTERNAL RING	1
YM.ATDC-26	2	EXTERNAL RING FLANGE	1
YM.ATD-1102	4	INTERIOR RING	1
YM.ATDC-20	3	INTERNAL RING FLANGE	1
YM.ATDC-15	5	RING MUSLAS	8

2.2 RING HEIGHT

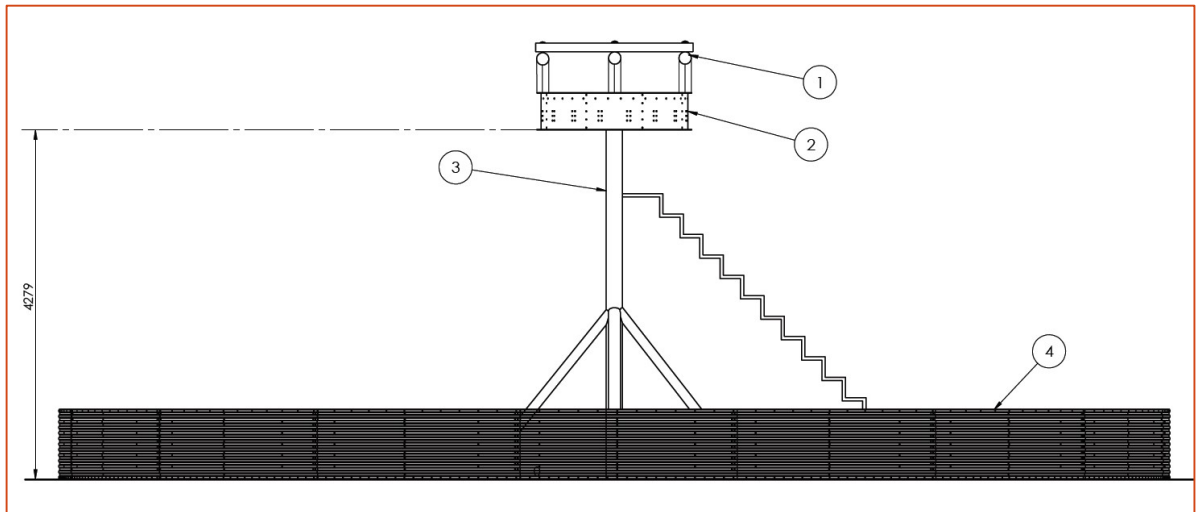


Figure 3 Mounting the Top Ring

IMPORTANT!!! Any deformation, torsion, etc., before mounting the ring and beams. Check whether Do not start the assembly without torsion.

Do not remove hoists until the roof installation is complete.

Do not connect the ring and any part of the ring to the hoist. Do not use any apparatus other than the middle pole in the roof installation process.

Table 2. Top Ring Assembly Parts list

PART NO	PART NAME	PIECE
1	HOISTS	1
2	CREST RING	1
3	CENTER POLE	1
4	BODY SHEET	16

Observe the following points when installing the housing sheets.

Sealant is important for sealing the body sheet. Otherwise, water may get into the silo and cause the product inside the silo to become moist and deteriorate. Apply sealing compound as shown.

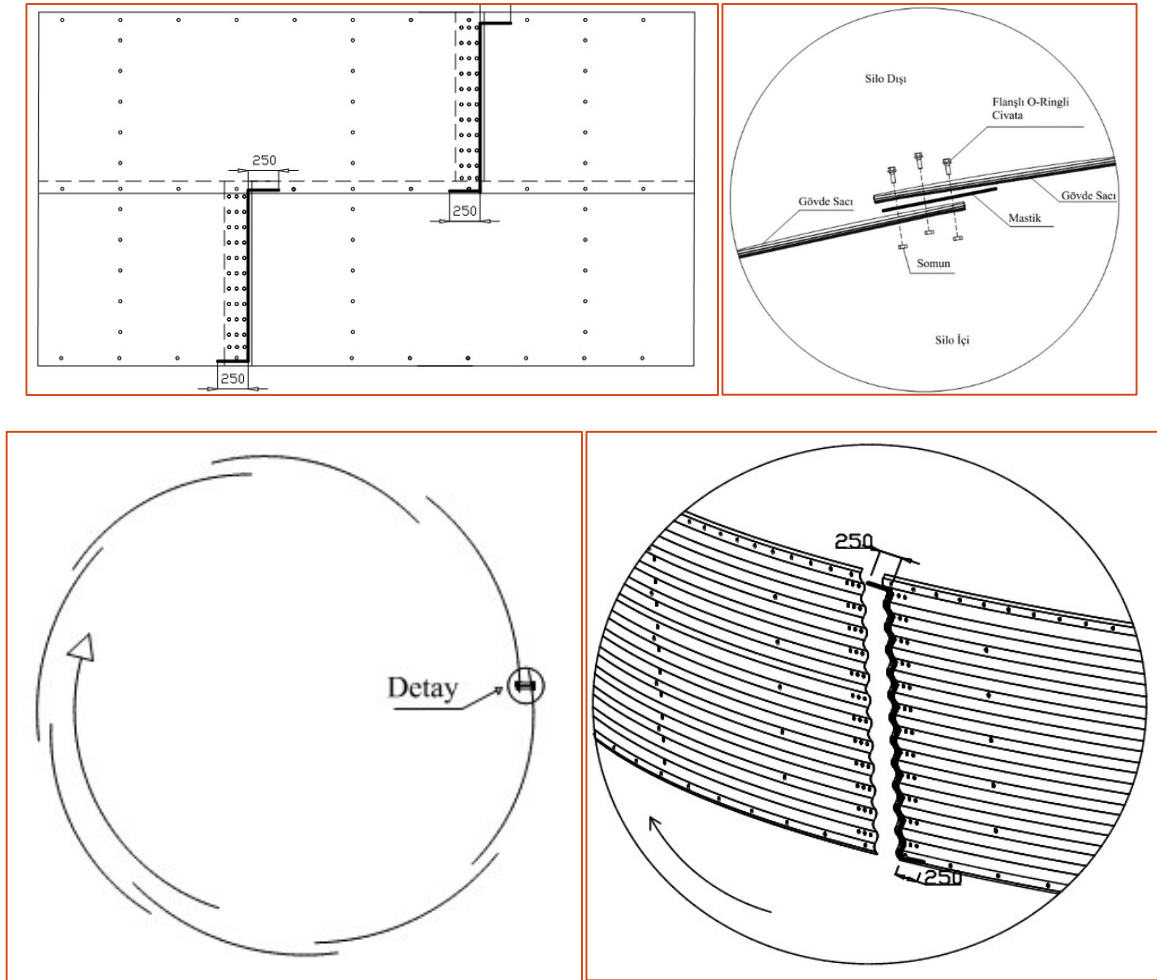


Figure 4 Body Sheet Sealant Application

3 - BEAM ASSEMBLY

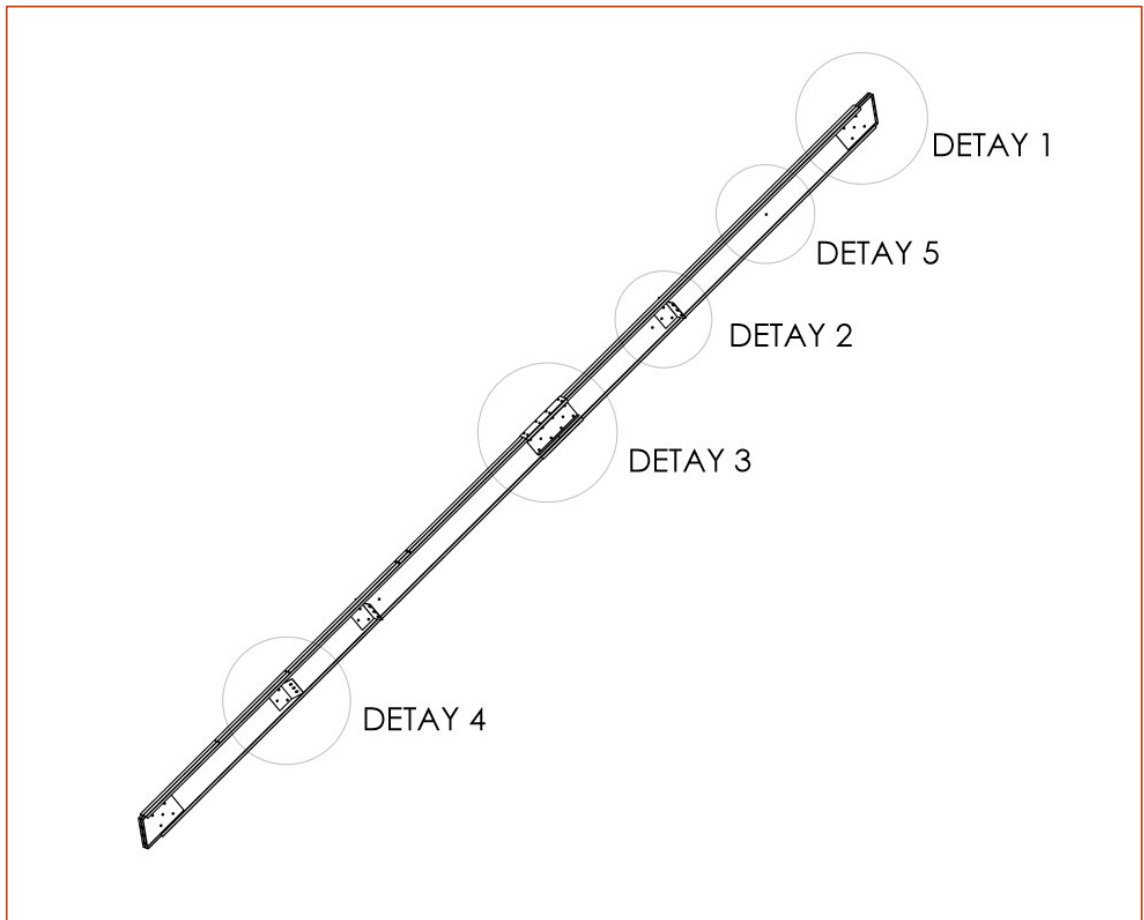
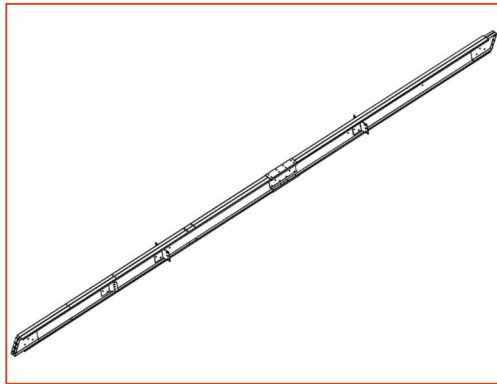
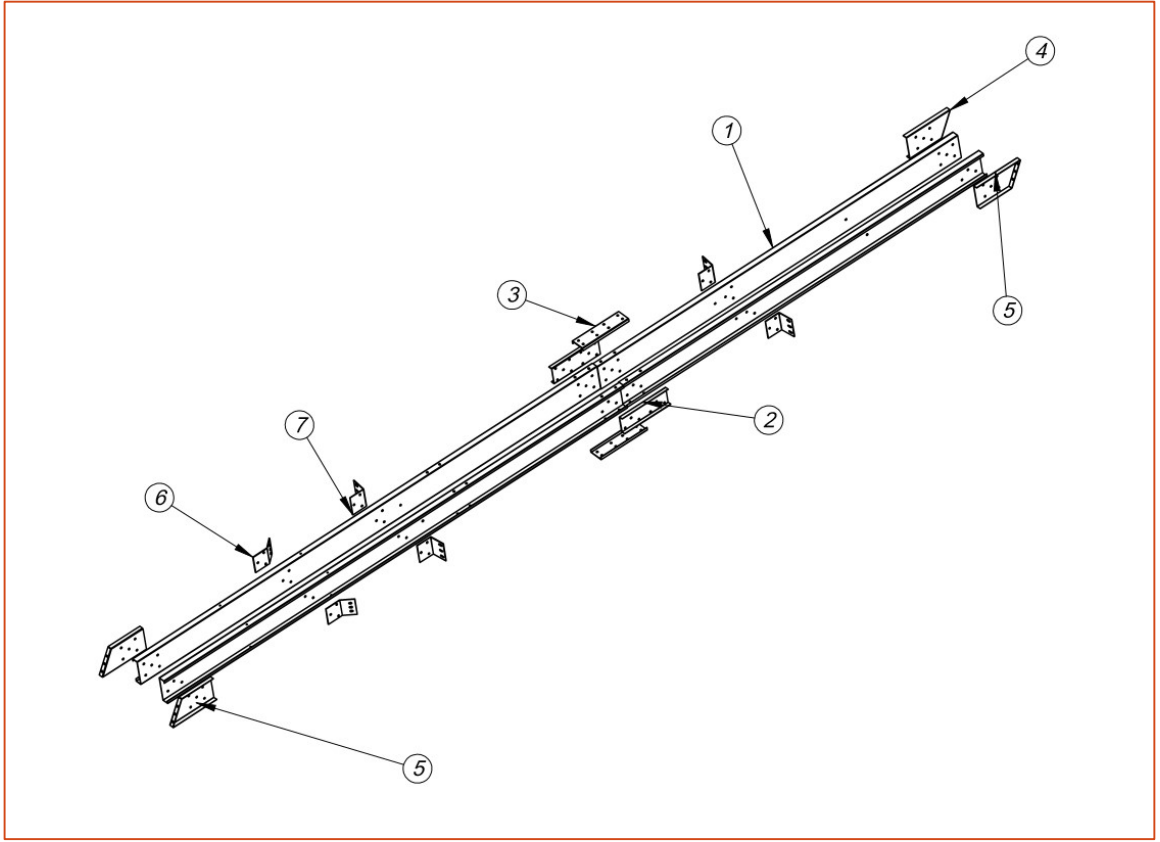


Figure 5 Beam Connection Detail Locations

The detailed images of the named and named links are explained under the following headings. Make the connections in the right places.

3.1 BEAM DESCRIPTION



Tablo 3. Beam Parts List

Part NO	Position NO	DEFINITION	Piece
YM.ATD16-1203	1	Kiriş (Ring)	2
YM.ATDC-14	2	Kiriş Yan Bağlantı	2
YM.ATDC-07	3	Kiriş Alt-Üst Bağlantı	2
YM.ATDC-03	4	Kiriş Bağlantı Sağ	2
YM.ATDC-04	5	Kiriş Bağlantı Sol	2
YM.ATDC-05	6	Çapraz Destek Bağlantı	2
YM.ATDC-06	7	Kiriş Ara bağlantı	4

Figure 6 Beam

Beam-forming parts are shown in the figure.

DETAIL 1

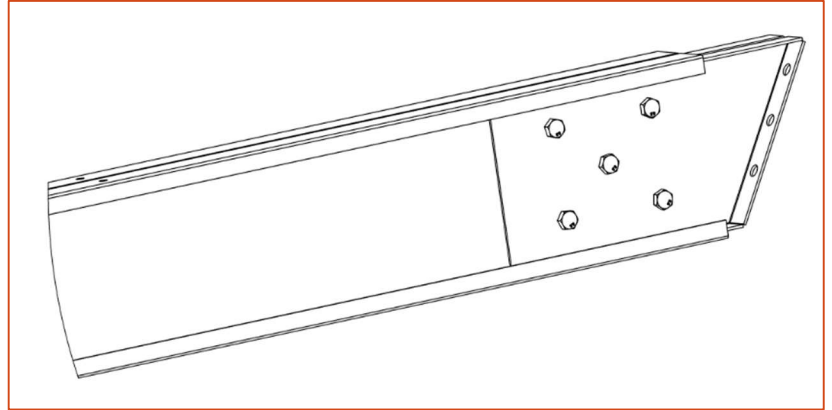
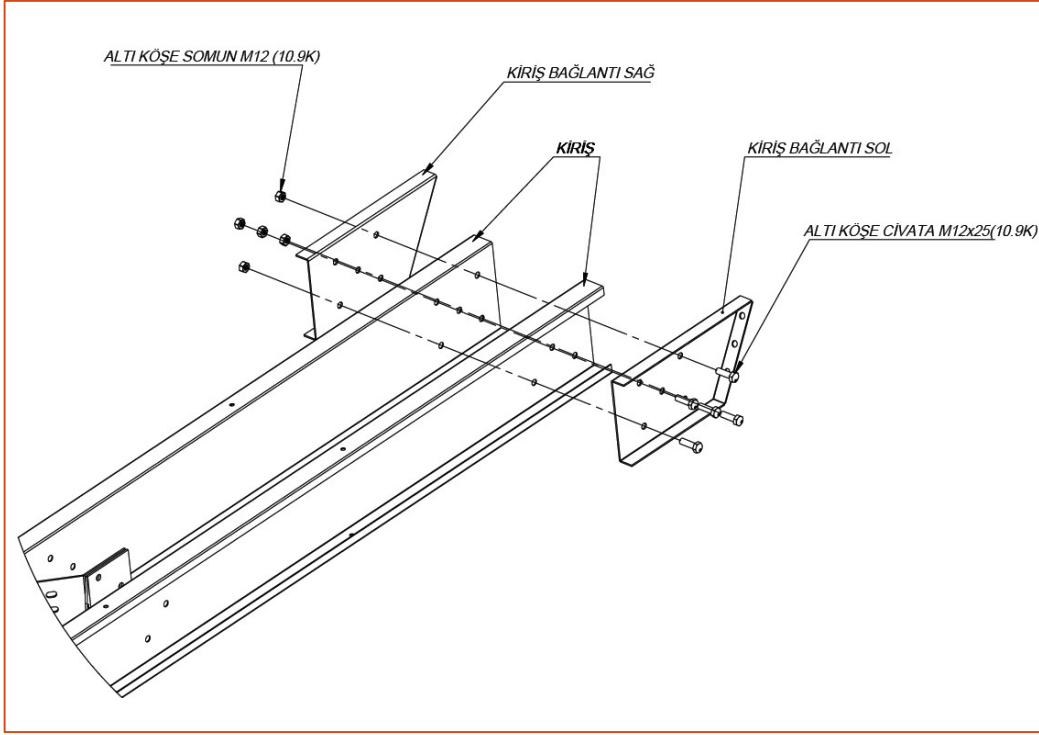


Figure 7 Beam Right - Left Connection Detail

DETAIL 2

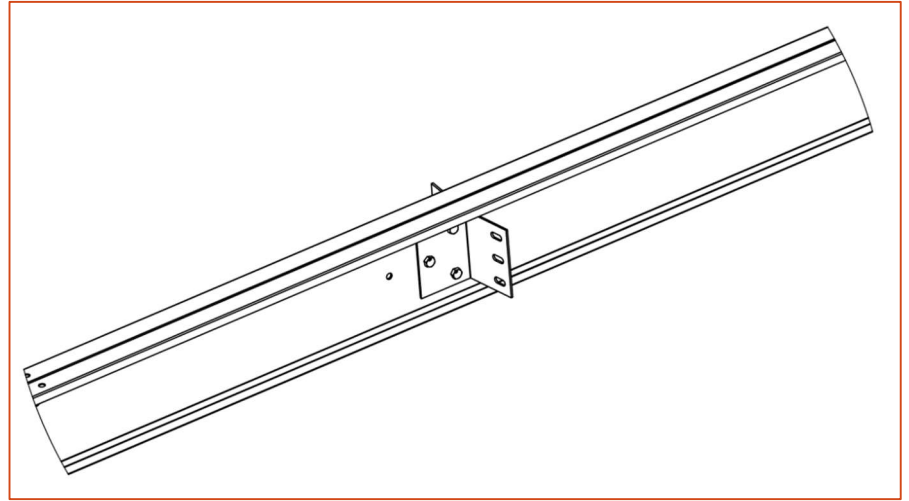
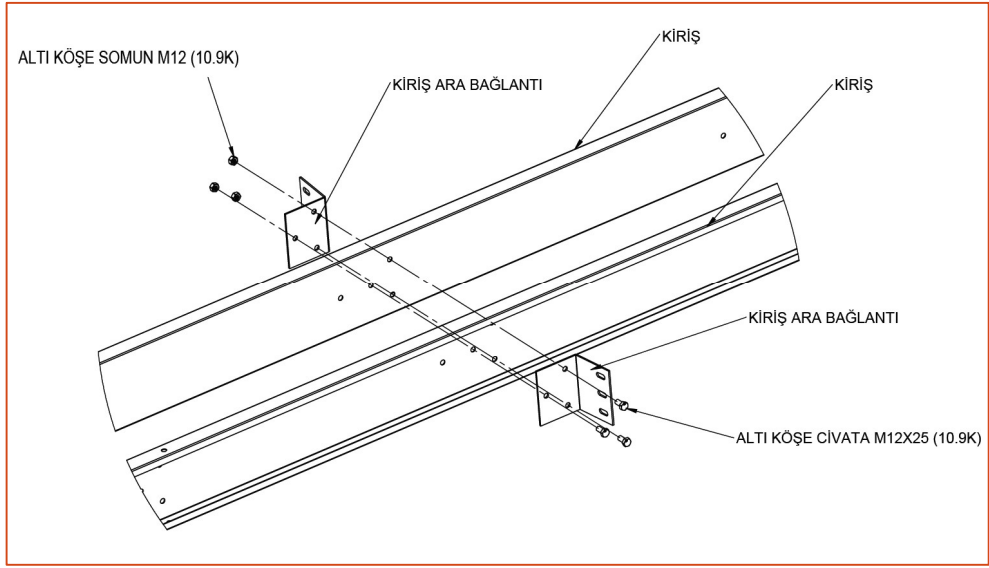


Figure 8 Beam Interconnection

DETAIL 3

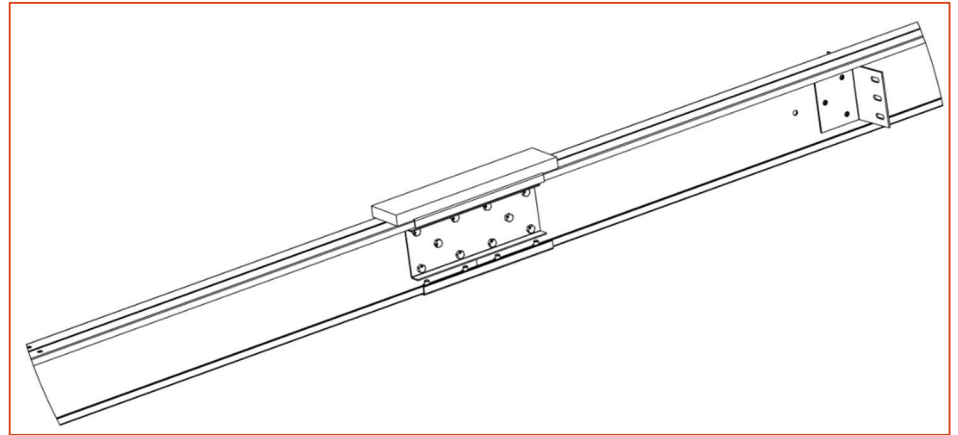
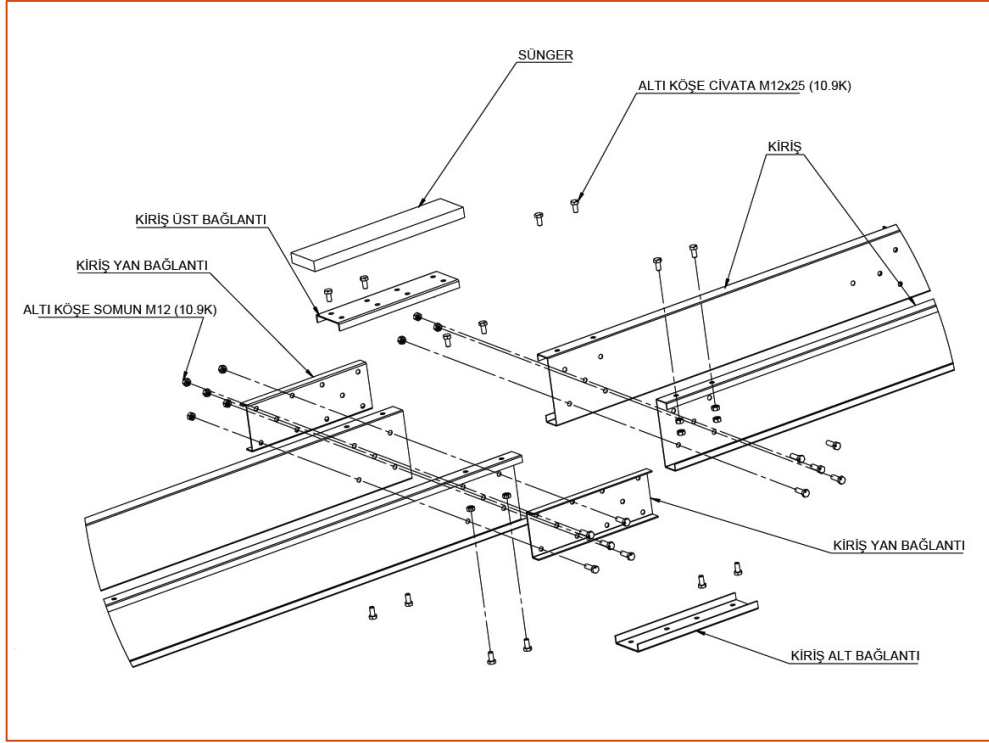


Figure 9 Beam Center Connection

DETAIL 4

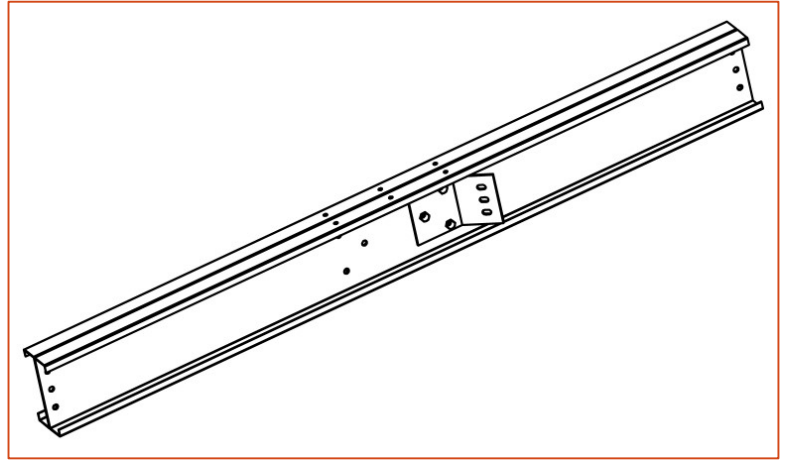
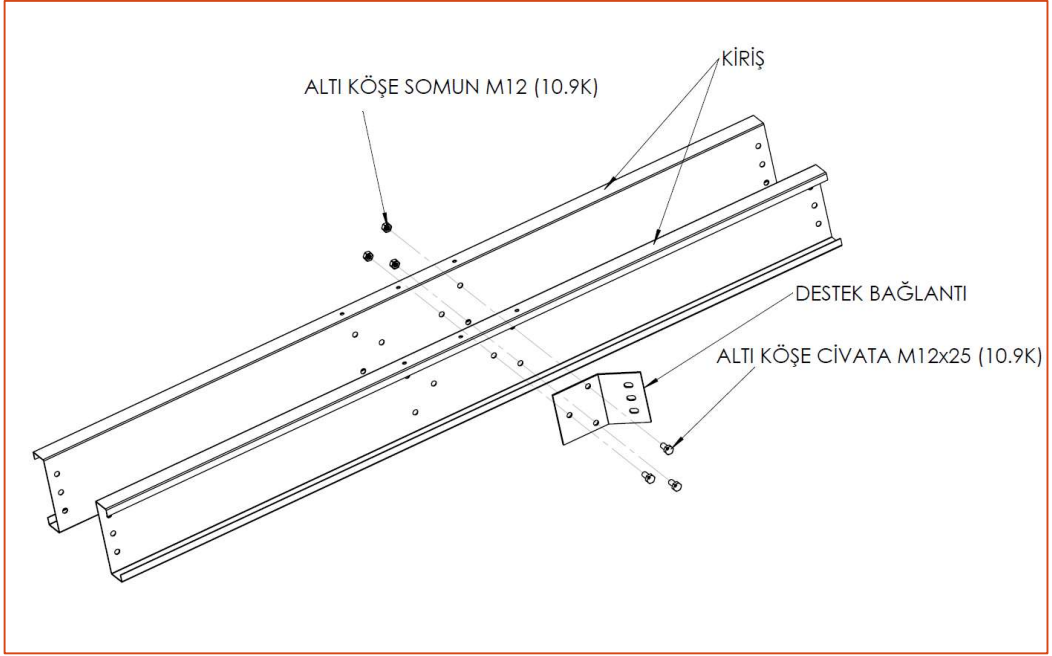


Figure 10 Beam Support Connection

DETAIL 5

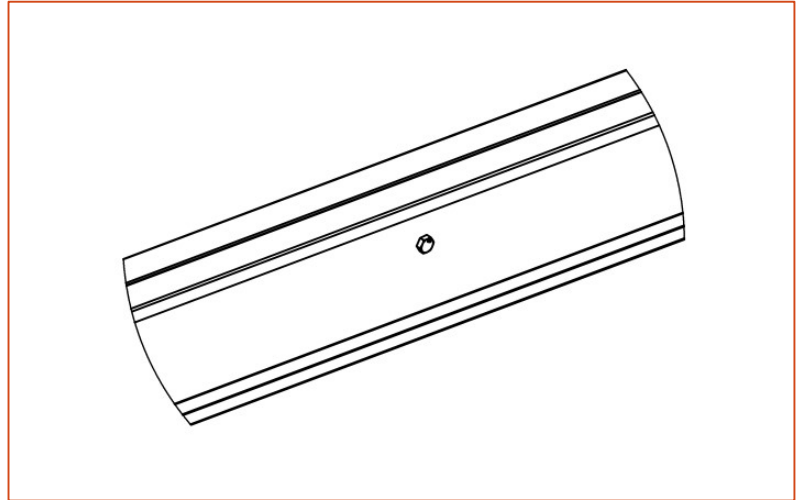
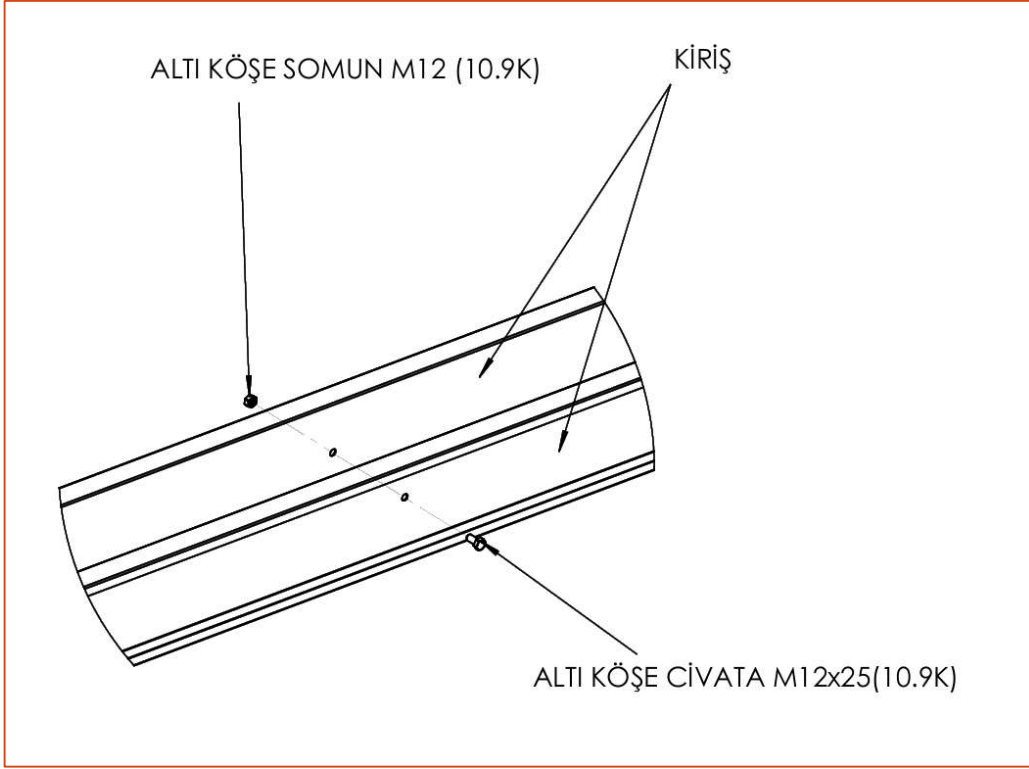


Figure 11 Beam Connection Detail

4 - ROOF ASSEMBLY

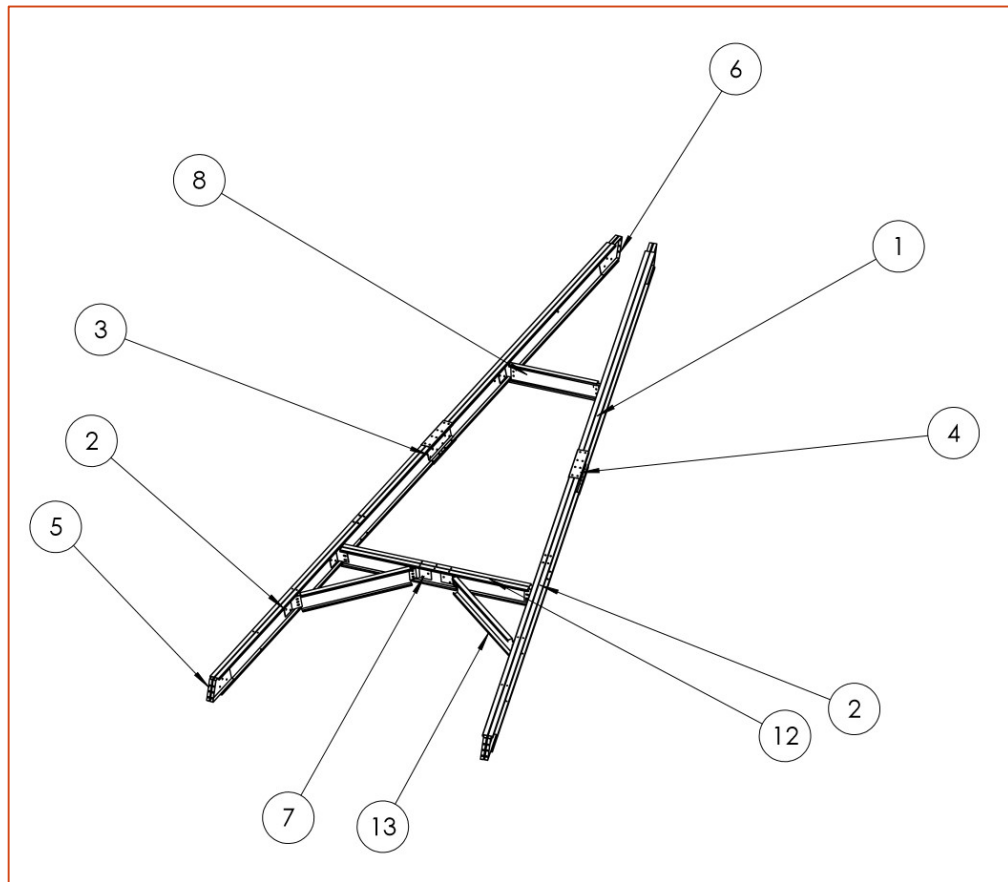


Figure 12 " A Beam "

PART NO	DEFINITION	PIECE
1	Beam	8
2	Beam Support Connection	2
3	Beam Interconnection	4
4	Beam Lower-Upper Connection	4
5	Beam Connection Left	4
6	Beam Connection Right	4
7	Beam Support Connection	2
8	Upper Intermediate Beam	1
12	Lower Intermediate Beam	1

13	Beam Cross Support	2	Tablo 3A Beam Parts Lists
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Assemble beam, support and interconnections to form '.

4.1 A BEAM ASSEMBLY

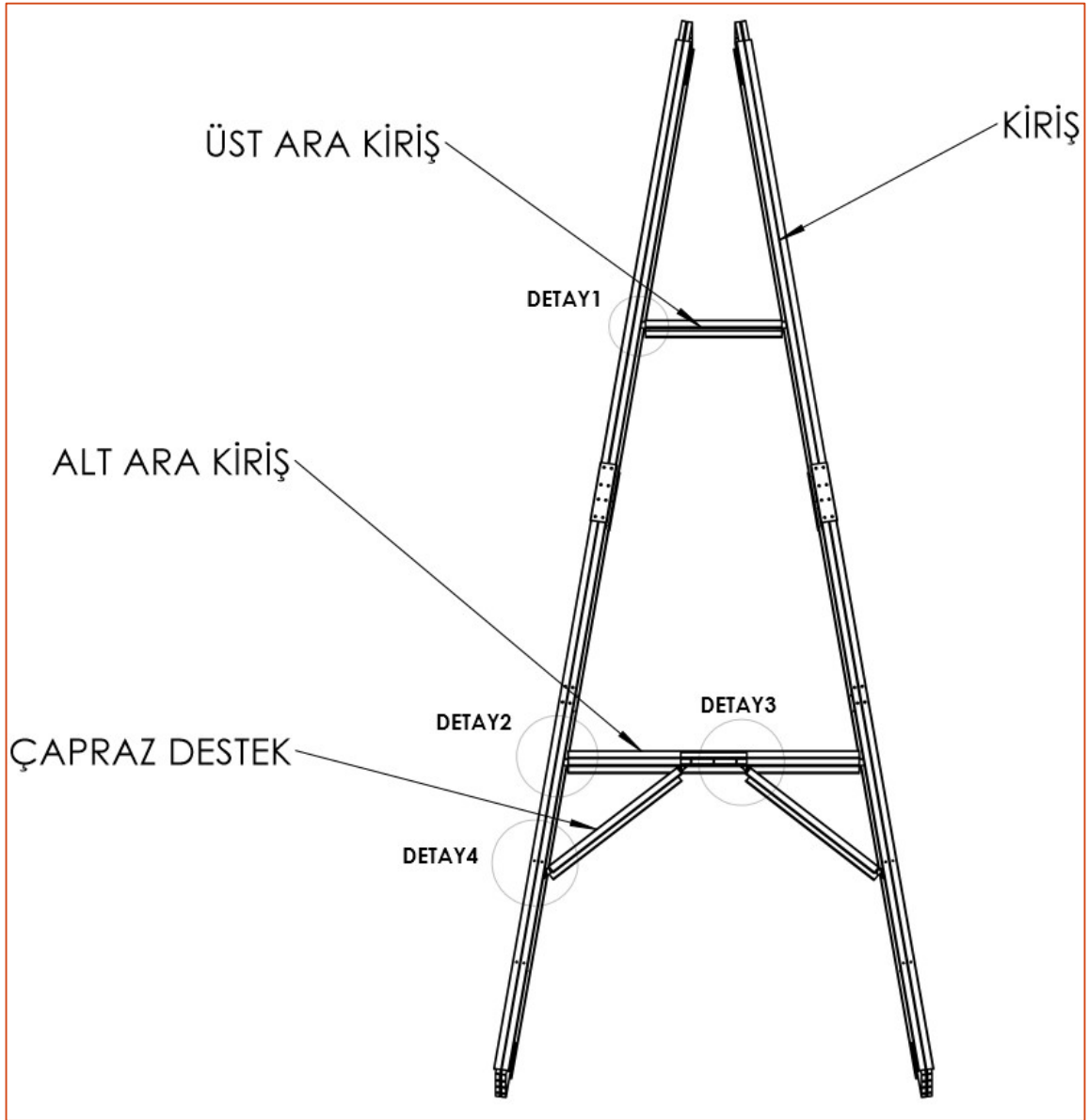


Figure 13 'kir A beam' 'Connection Detail Locations

A beam connection detail locations indicated links are shown below.

DETAIL 1

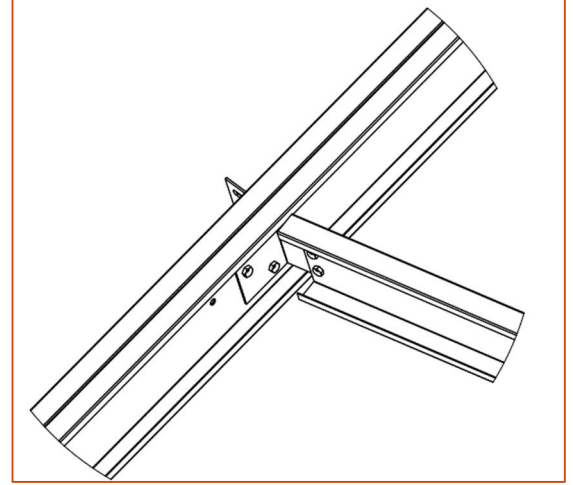
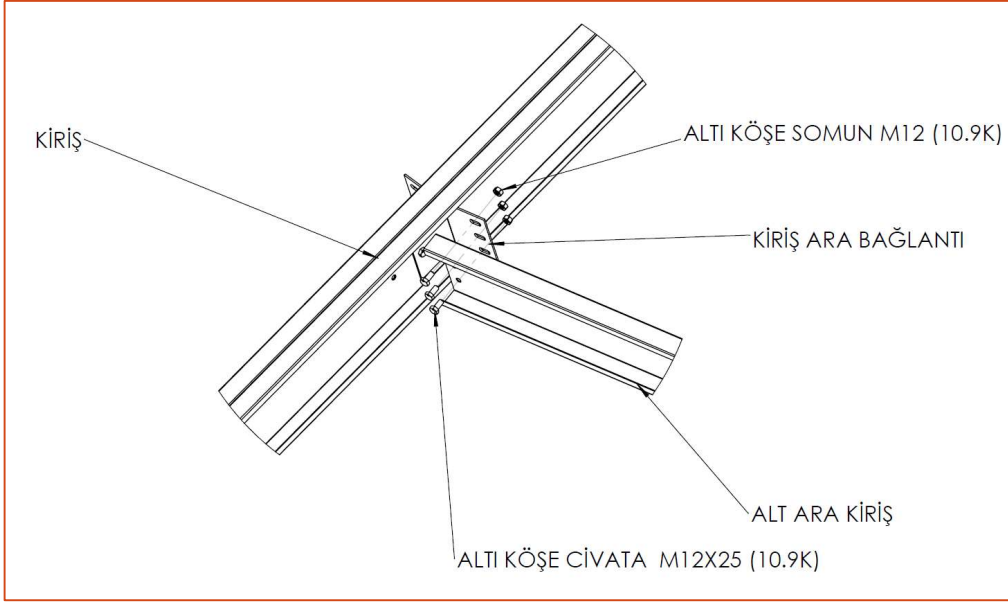


Figure 14 Upper Intermediate Beam Connection Detail

DETAIL 2

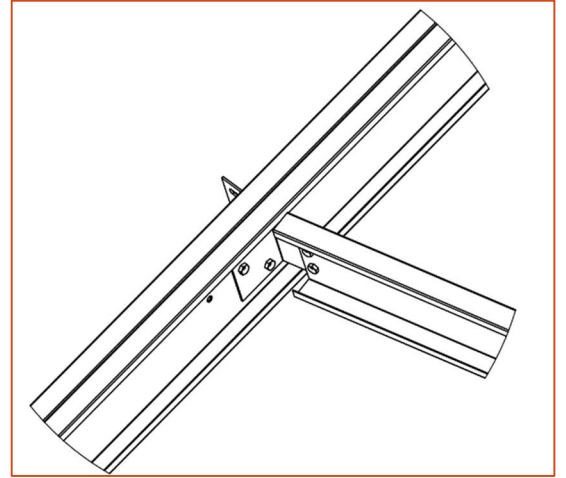
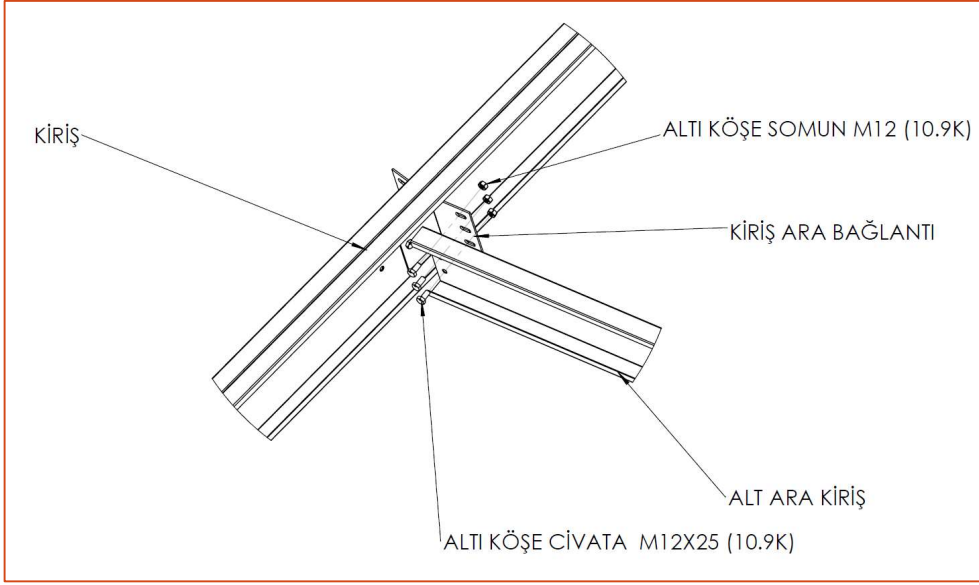


Figure 15 Lower Intermediate Beam Connection Detail

DETAIL 3

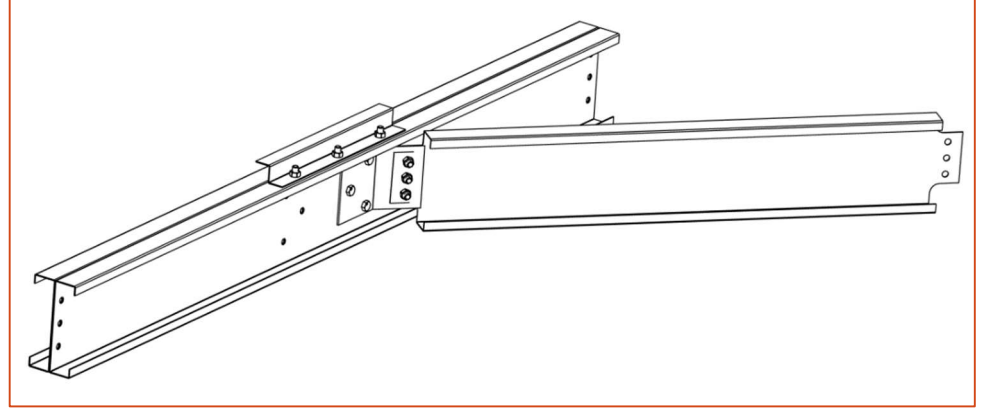
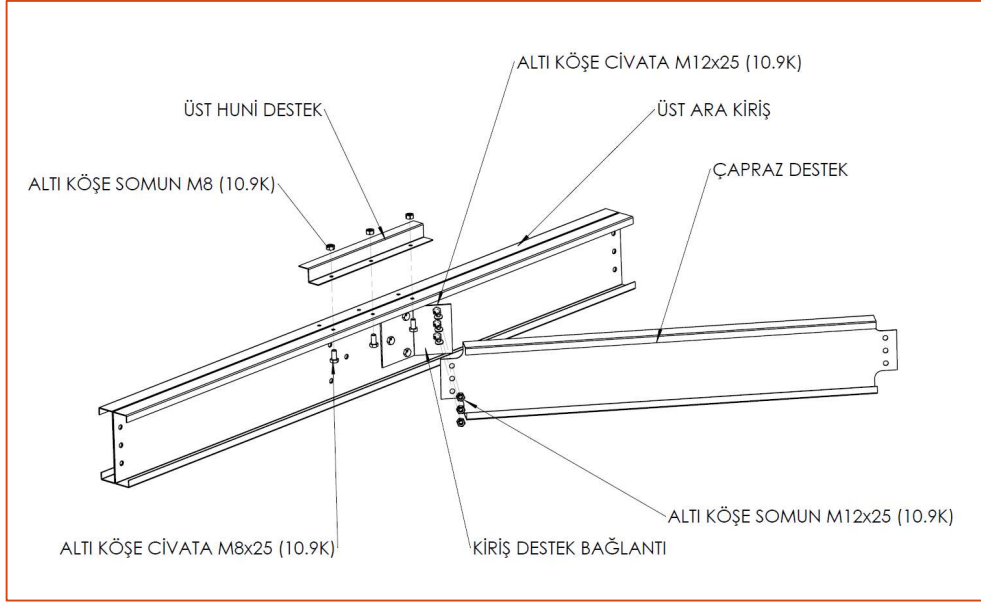


Figure 16 Cross Support Lower Beam Connection Detail

DETAIL 4

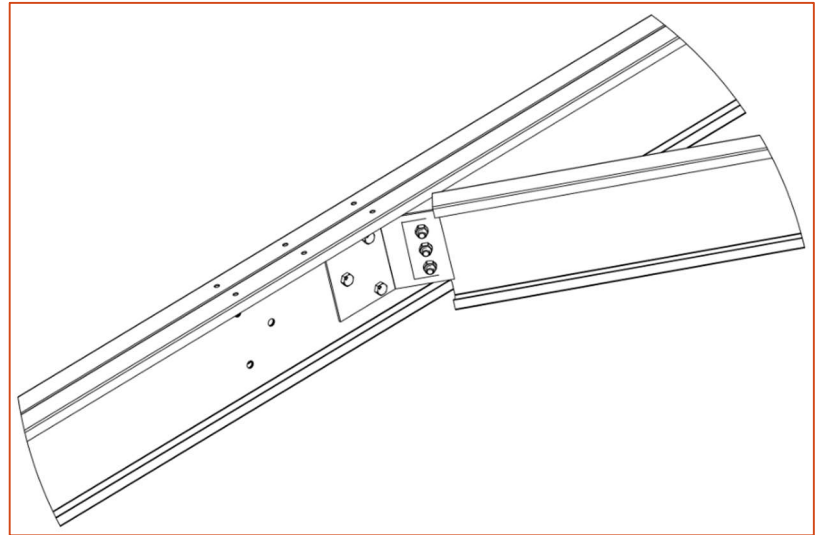
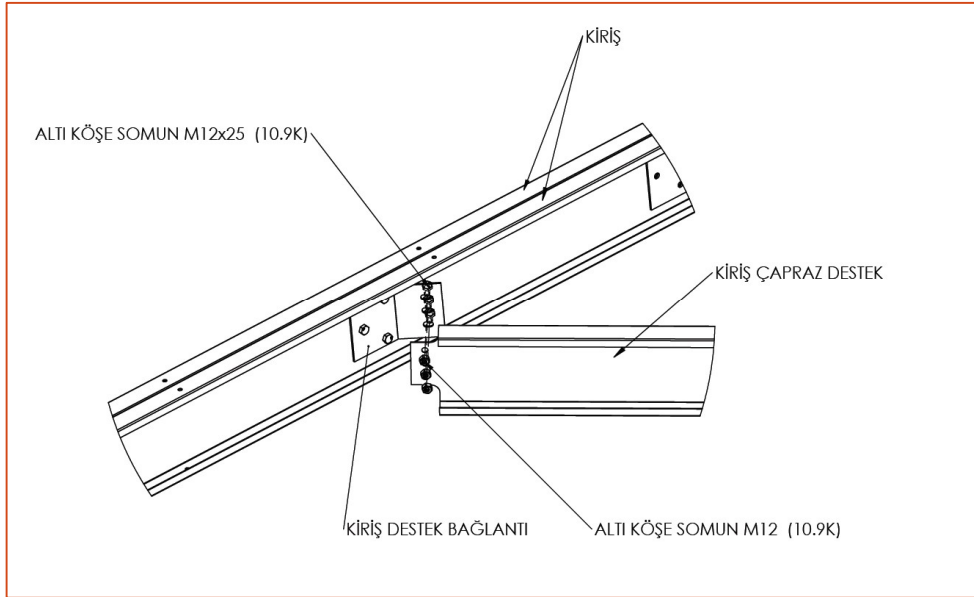
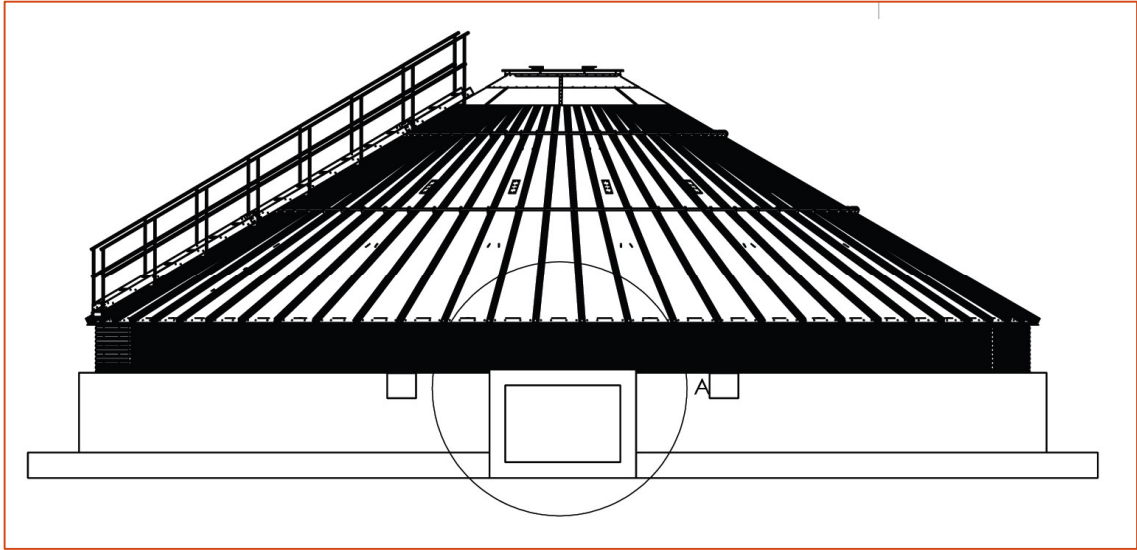


Figure 17 Beam Cross Support Connection Detail

4.2 BEAM - INTERNAL SUPPORT - FOOT ASSEMBLY



(1)

(2)

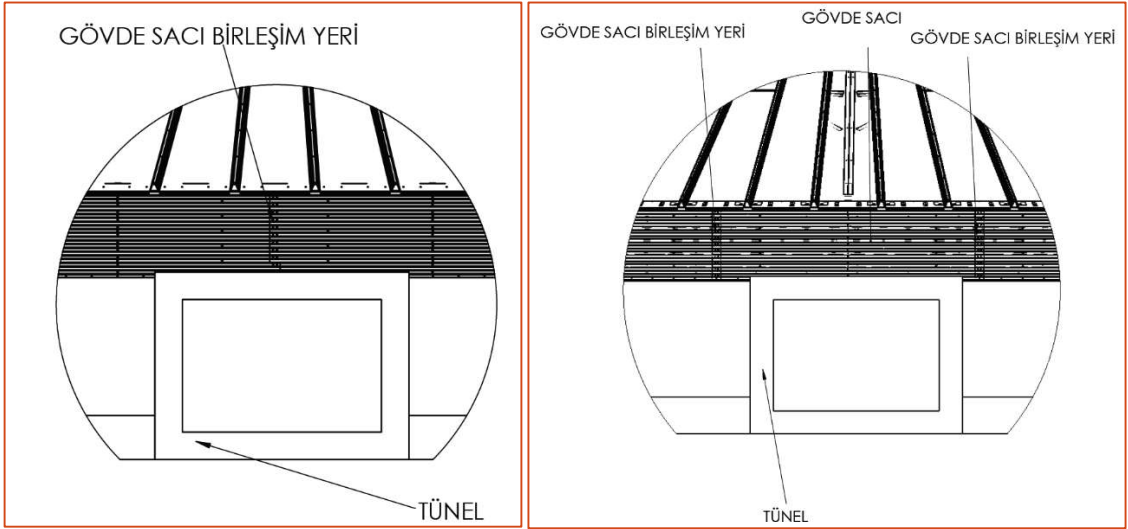


Figure 18 Tunnel and Body Sheet Connection Location Illustration

Double ring numbered If you are installing a silo, install the latest ring body sheets as shown in figure 1. If you are installing a single ring silo, install it as shown in figure 2..

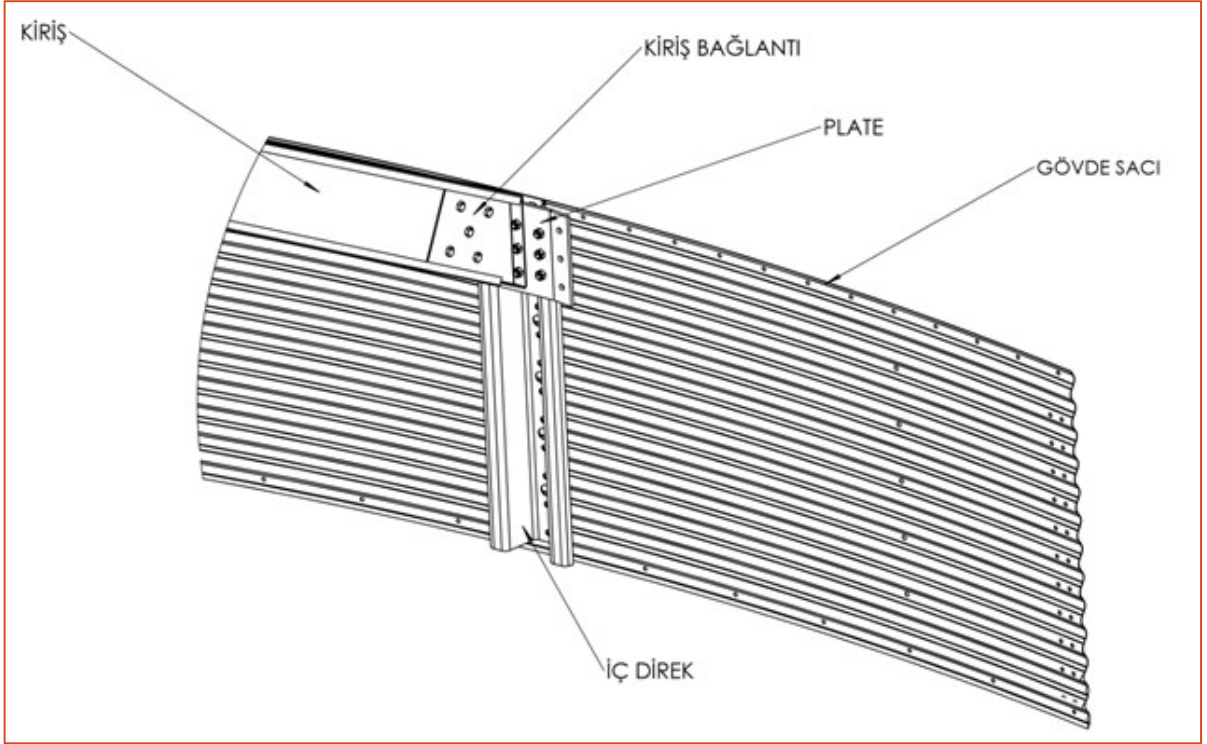


Figure 19 Overview

The details of the assembly given above are given in the subheadings..

4.2.1 INTERIOR POLE - PLATE MOUNTING

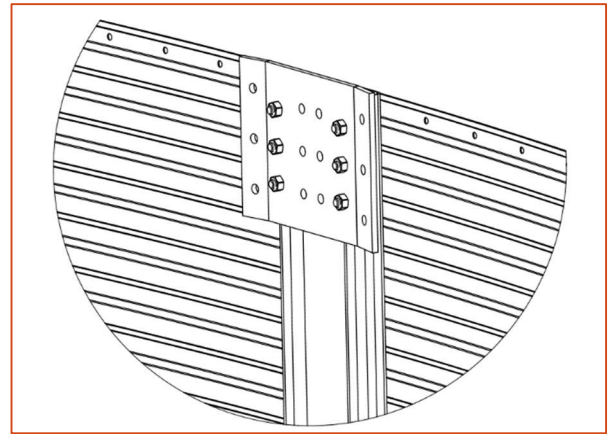
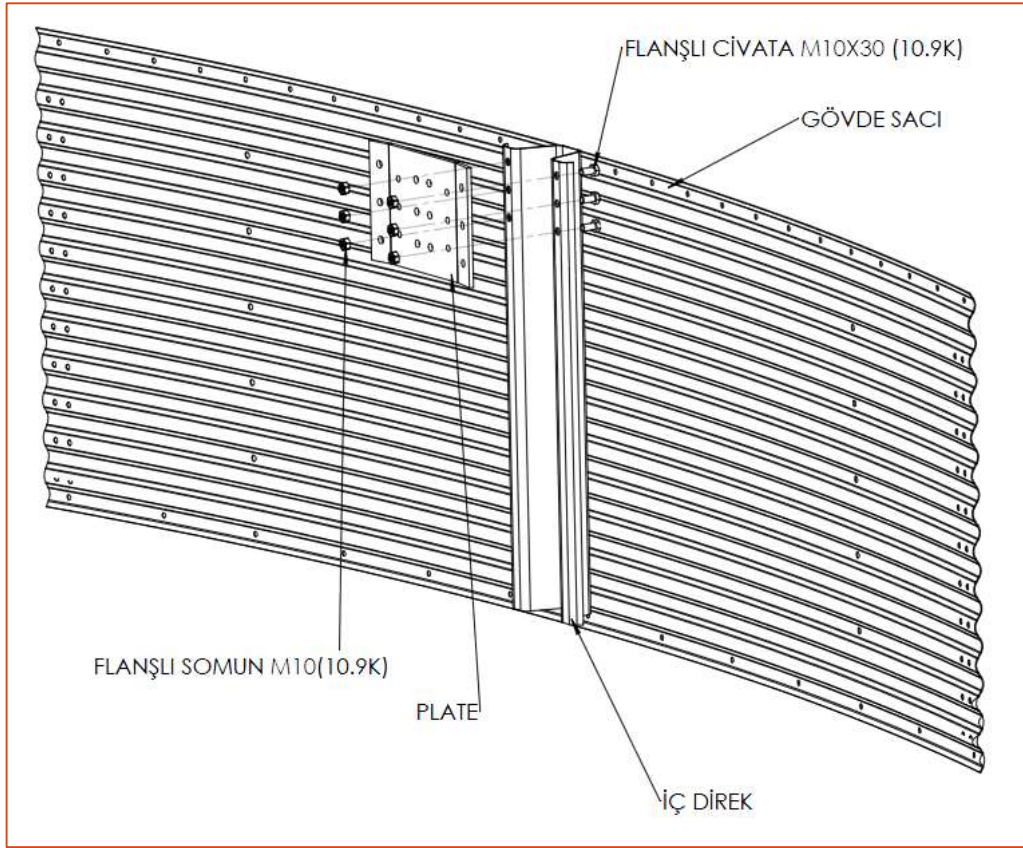


Figure 20 Internal Pole - Plate Connection Detail

Connect the plate to the inner pillar as shown in the figure..

4.2.2 PLATE - INTERNAL TENSION

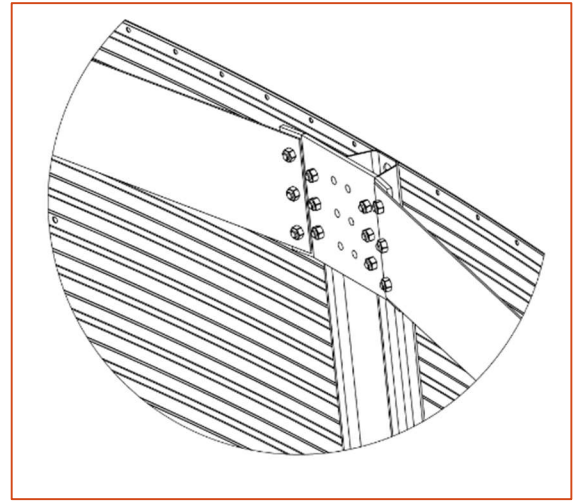
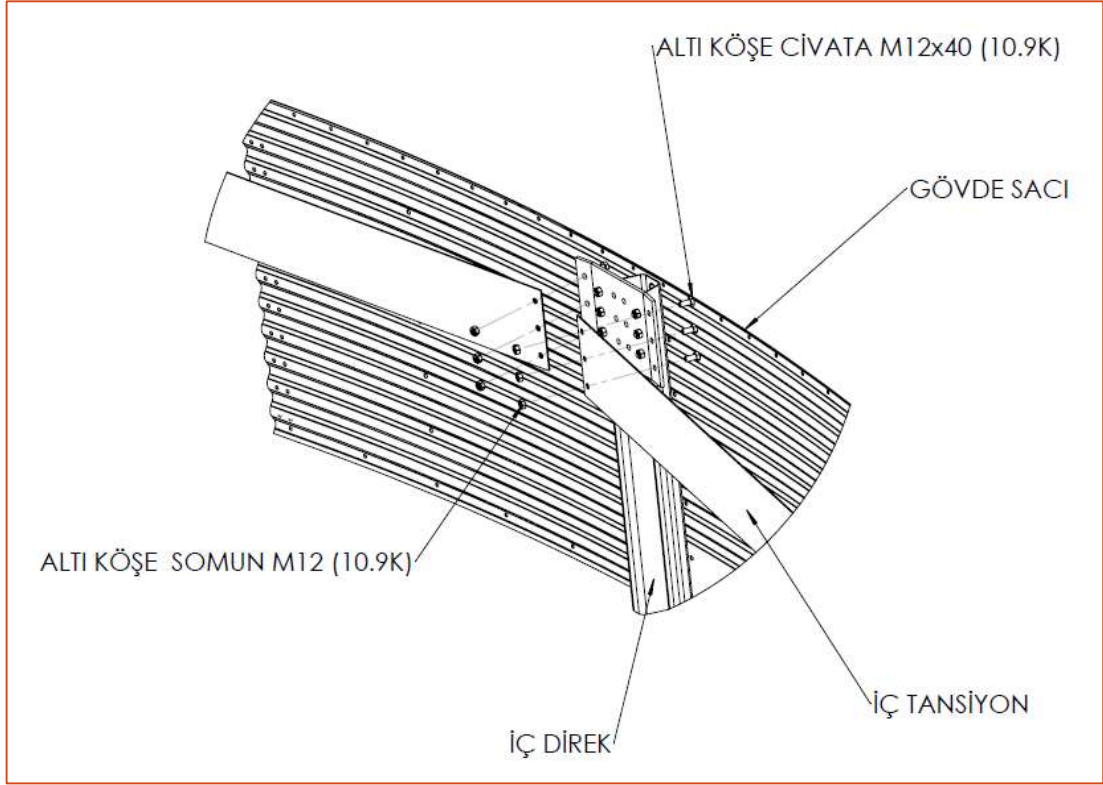


Figure 21 Plate - Internal Blood Pressure Connection Detail

4.2.3 PLATE - BEAM ASSEMBLY

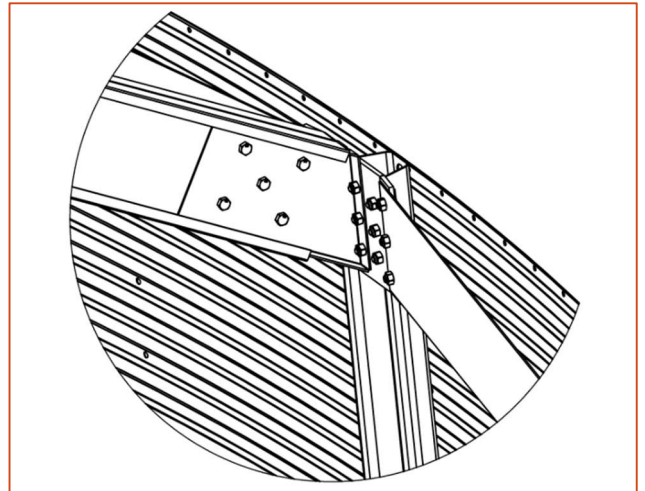
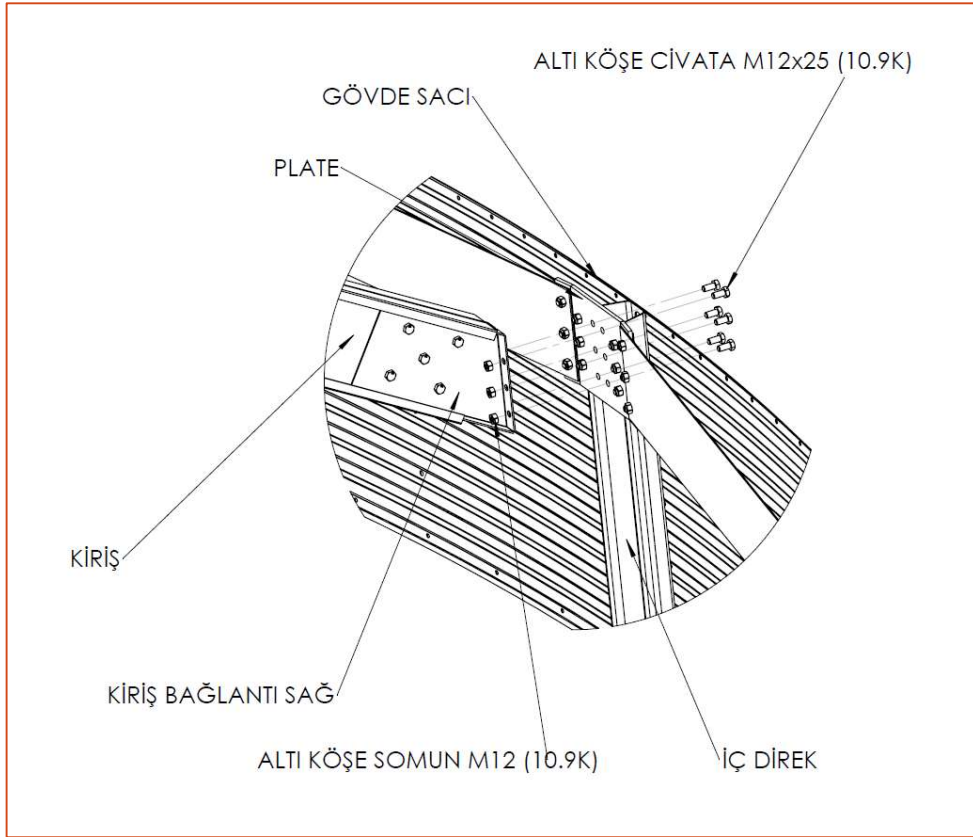
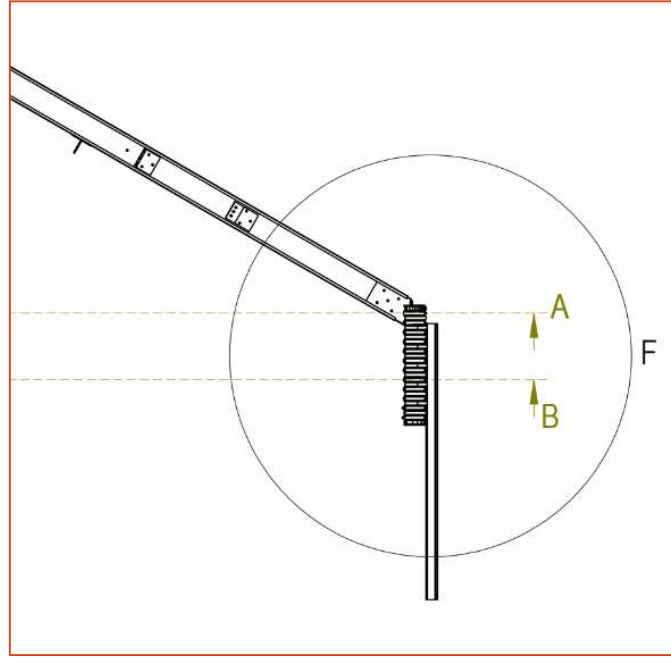


Figure 22 Plate - Beam Connection Detail

IMPORTANT!!! Loosen the internal tension.

4.2.4 INTERNAL PILLAR AND FOOT ASSEMBLY



SECTION A

SECTION B

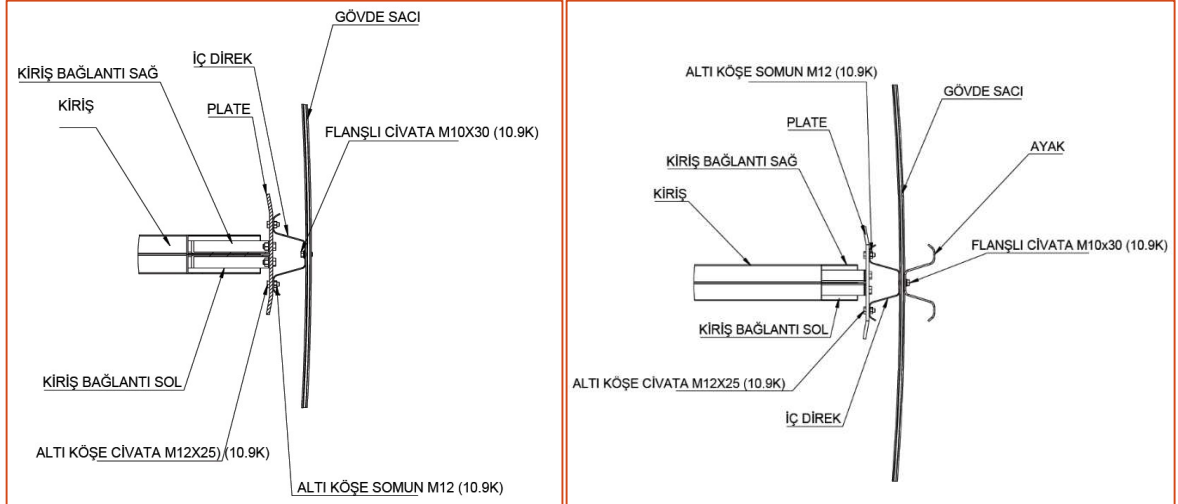


Figure 23 Inner Pole - Leg Connection

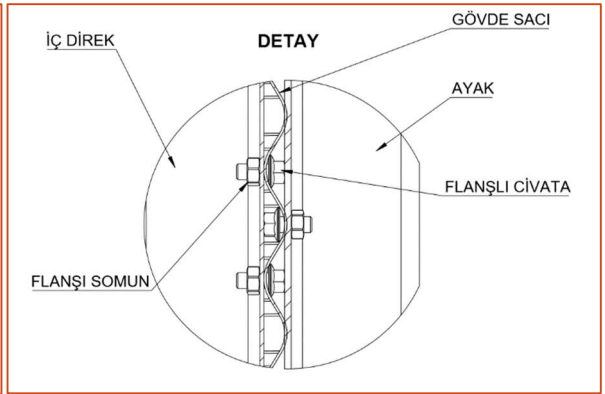
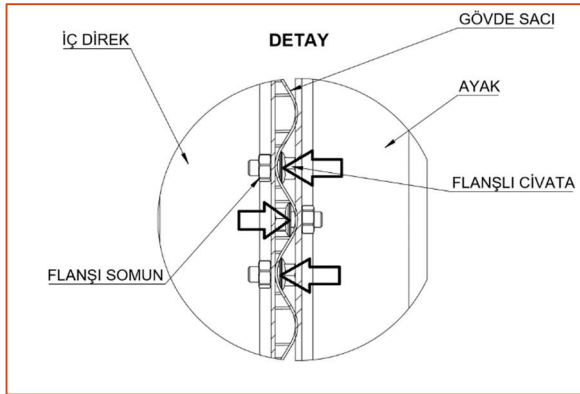
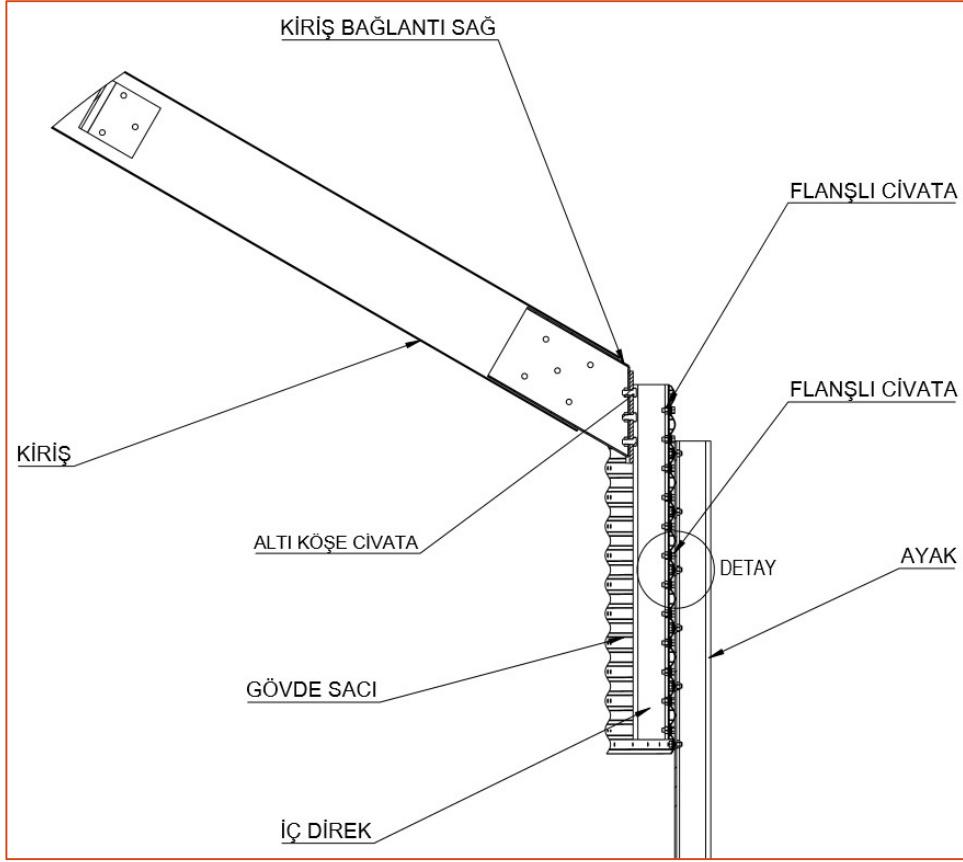


Figure 24 Interior Pole, Body Sheet and Leg Connection Detail

IMPORTANT!!! Check nut bolt connection and direction.

4.3 "A BEAM R' - RING ASSEMBLY

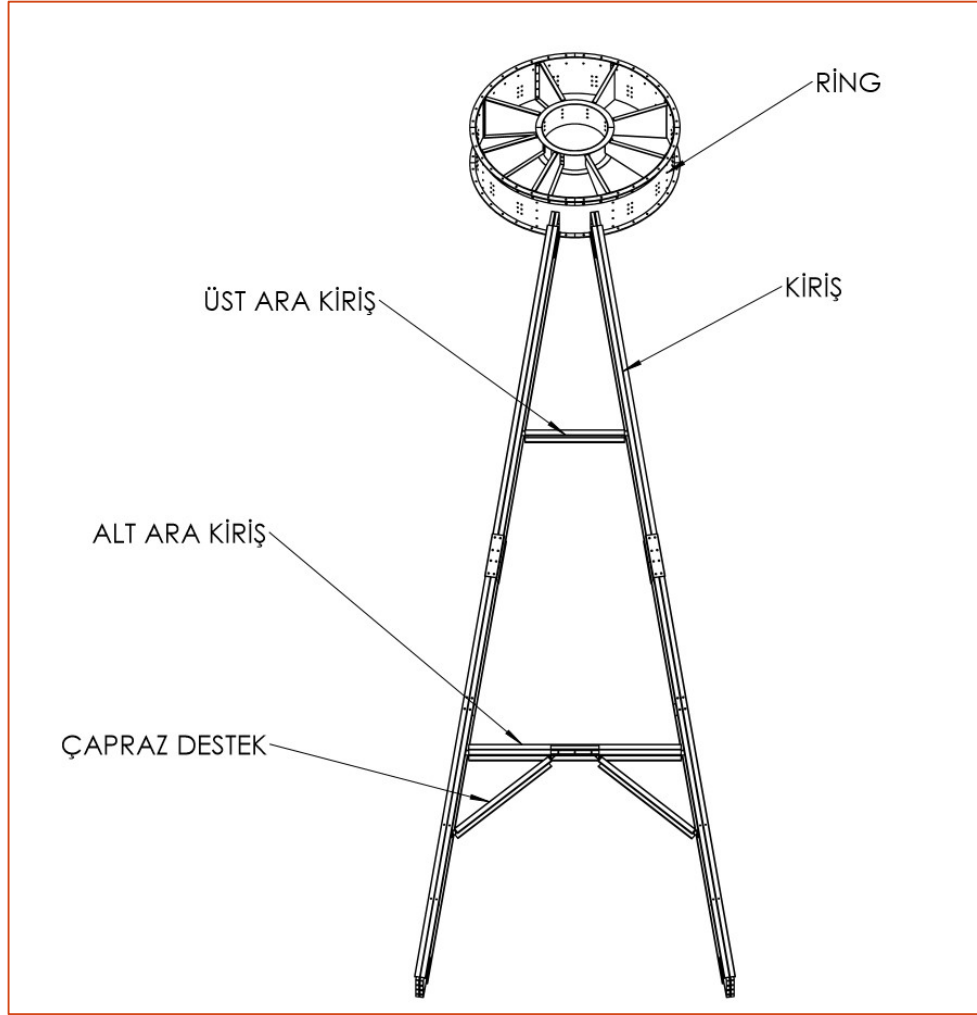


Figure 25 'A Beam' Ring and Ring Installation

4.3.1 BEAM ASSEMBLY STEP 1

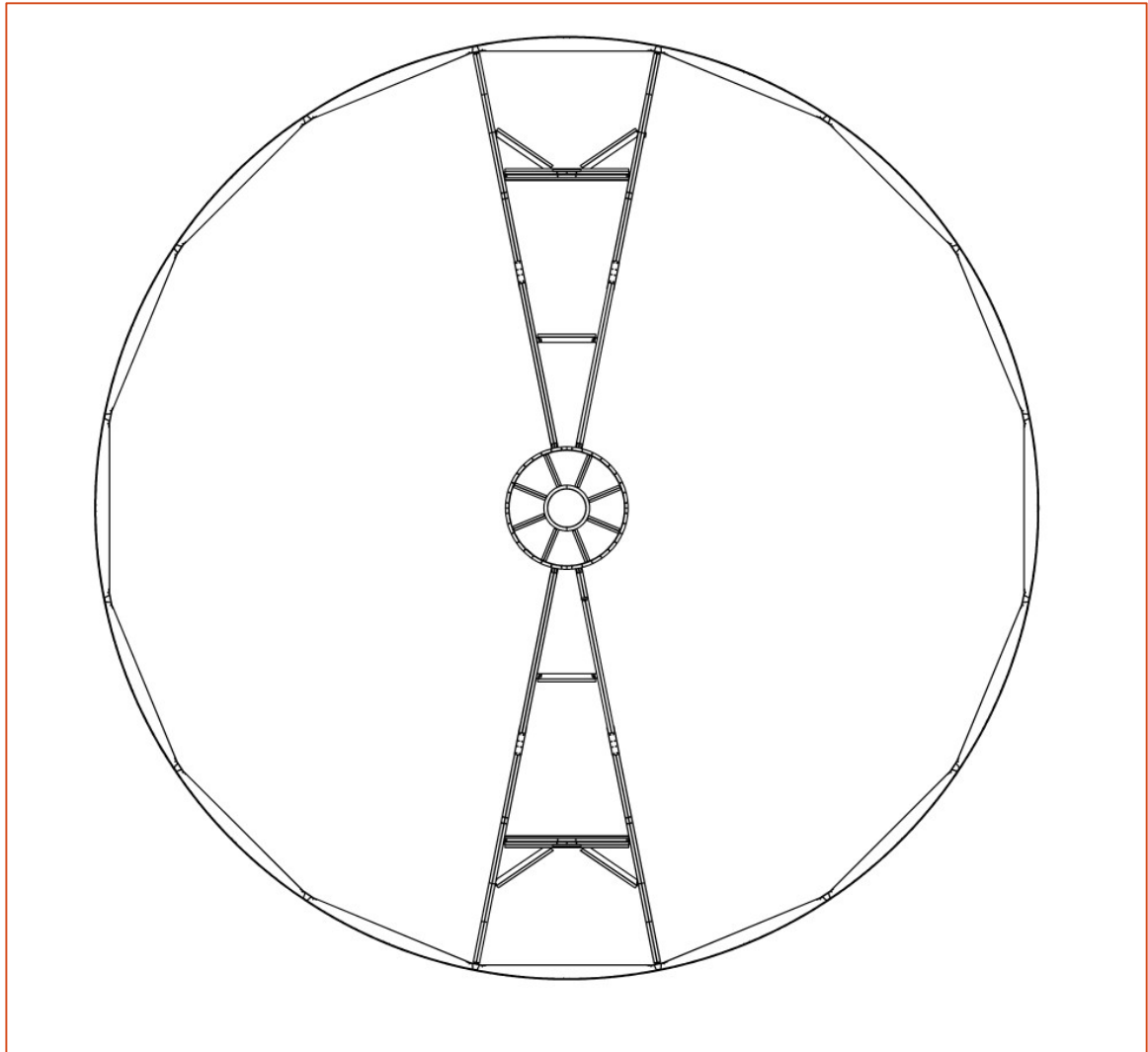


Figure 26 Beam Installation Step 1

After lifting the ring to the extent we have read from the table, connect the A beams you have created to the ring and body sheet. Install the beams mutually as shown in Figure 26

NOTE: When installing the intermediate beams, leave the bolts loose. Loosening the bolts will ensure the most accurate and optimal mounting of the roof sheets.

4.3.2 BEAM ASSEMBLY STEP 2

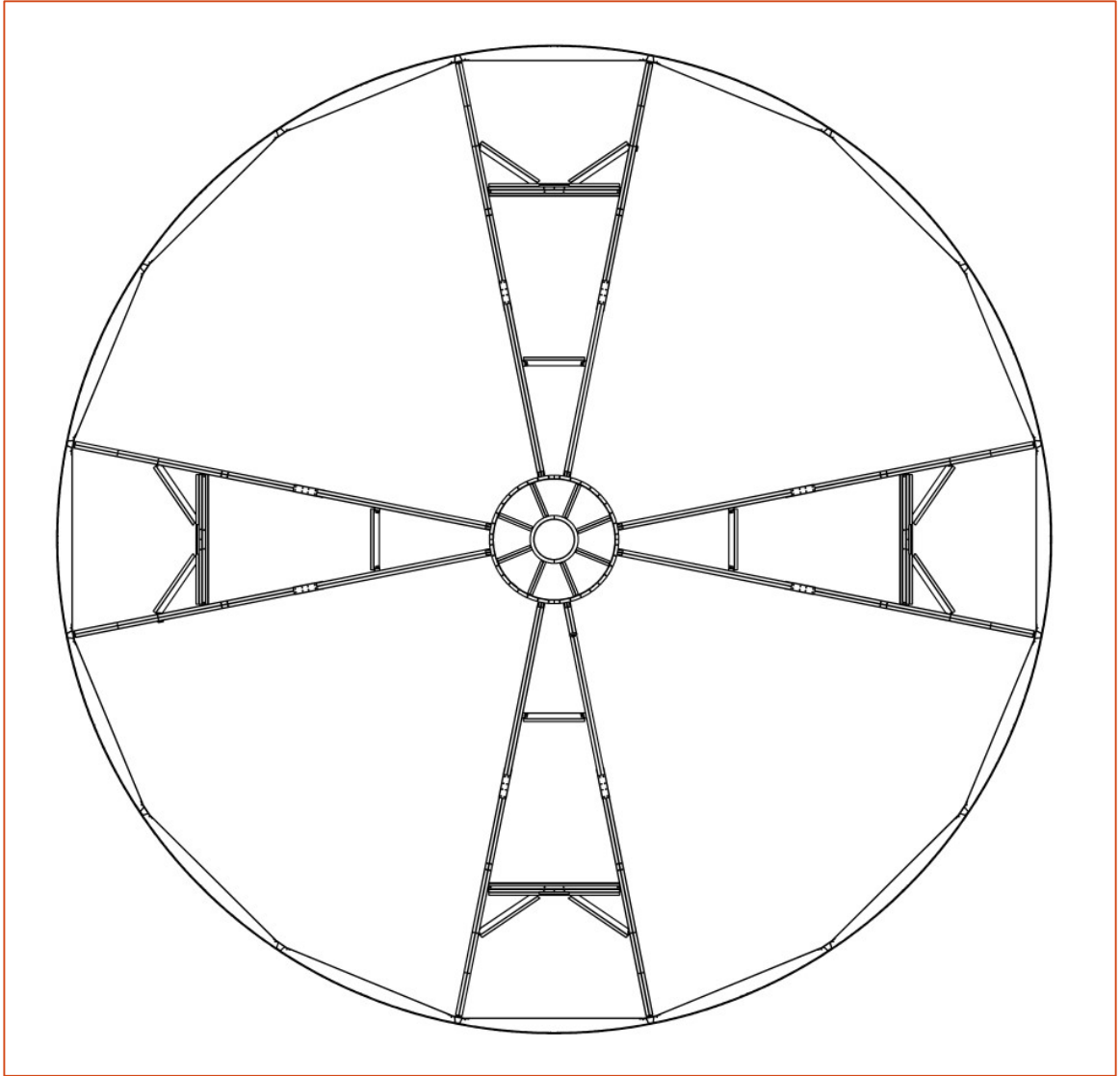


Figure 27 Beam Installation Stage 2

Continue to install A beams mutually as shown in the figure.

4.3.3 BEAM ASSEMBLY STEP 3

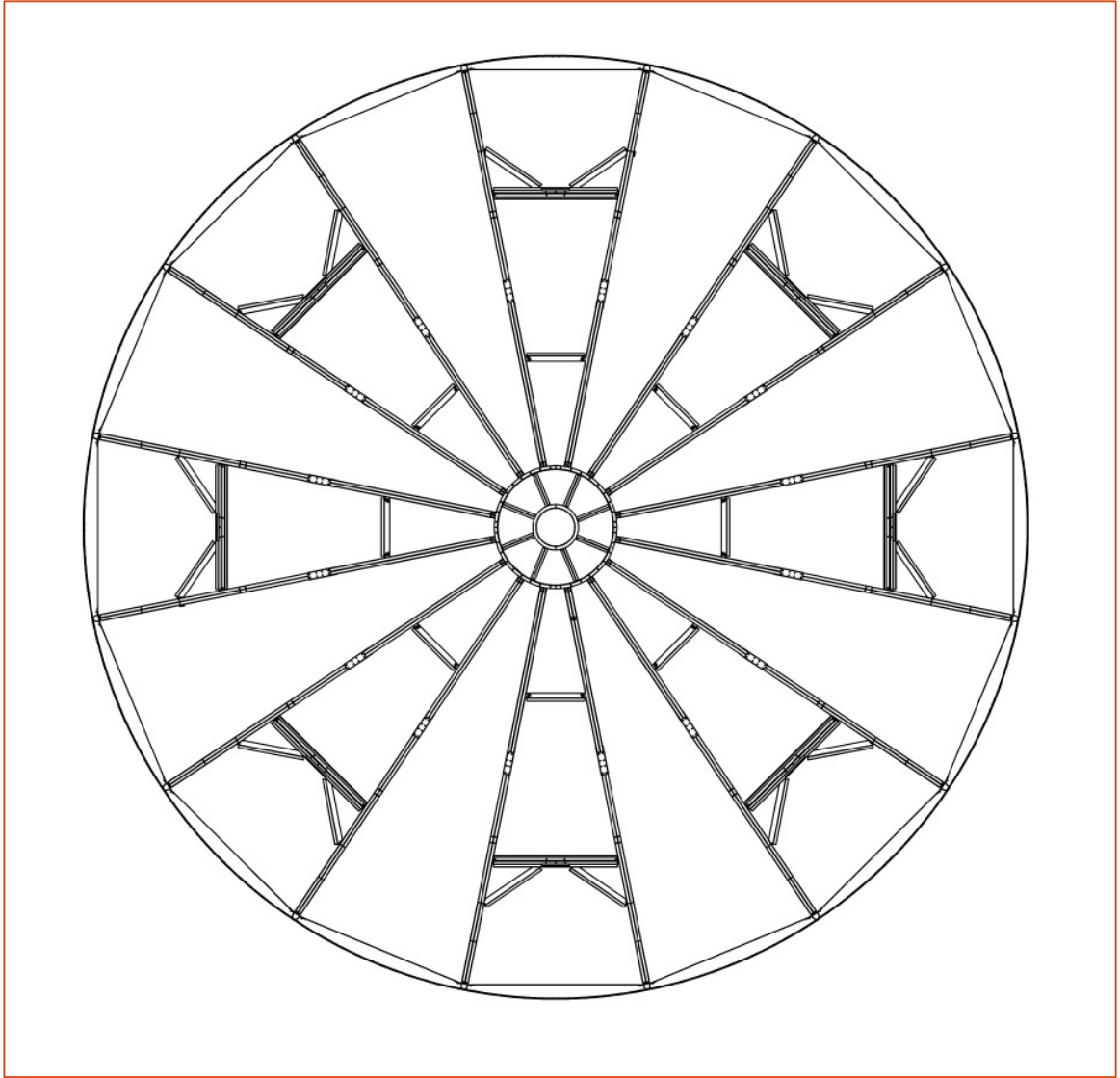


Figure 28 Beam Installation Step 3

Continue mutual installation until installation is complete.

4.3. 4 BEAM ASSEMBLY STEP 4

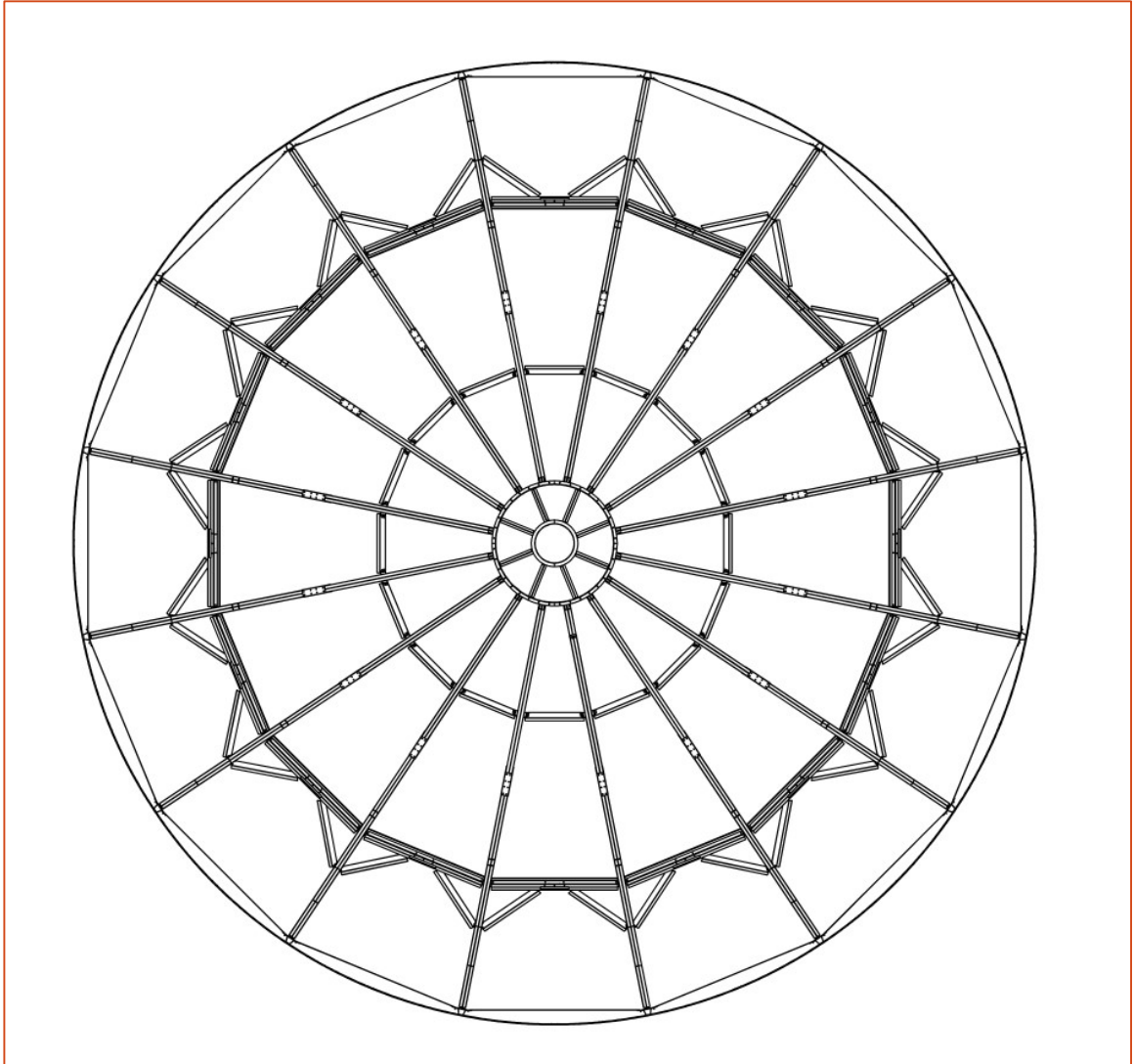


Figure 29 Beam Installation Stage 4

Complete the beam assembly as shown.

4.3.5 BEAM TENSIONING ASSEMBLY

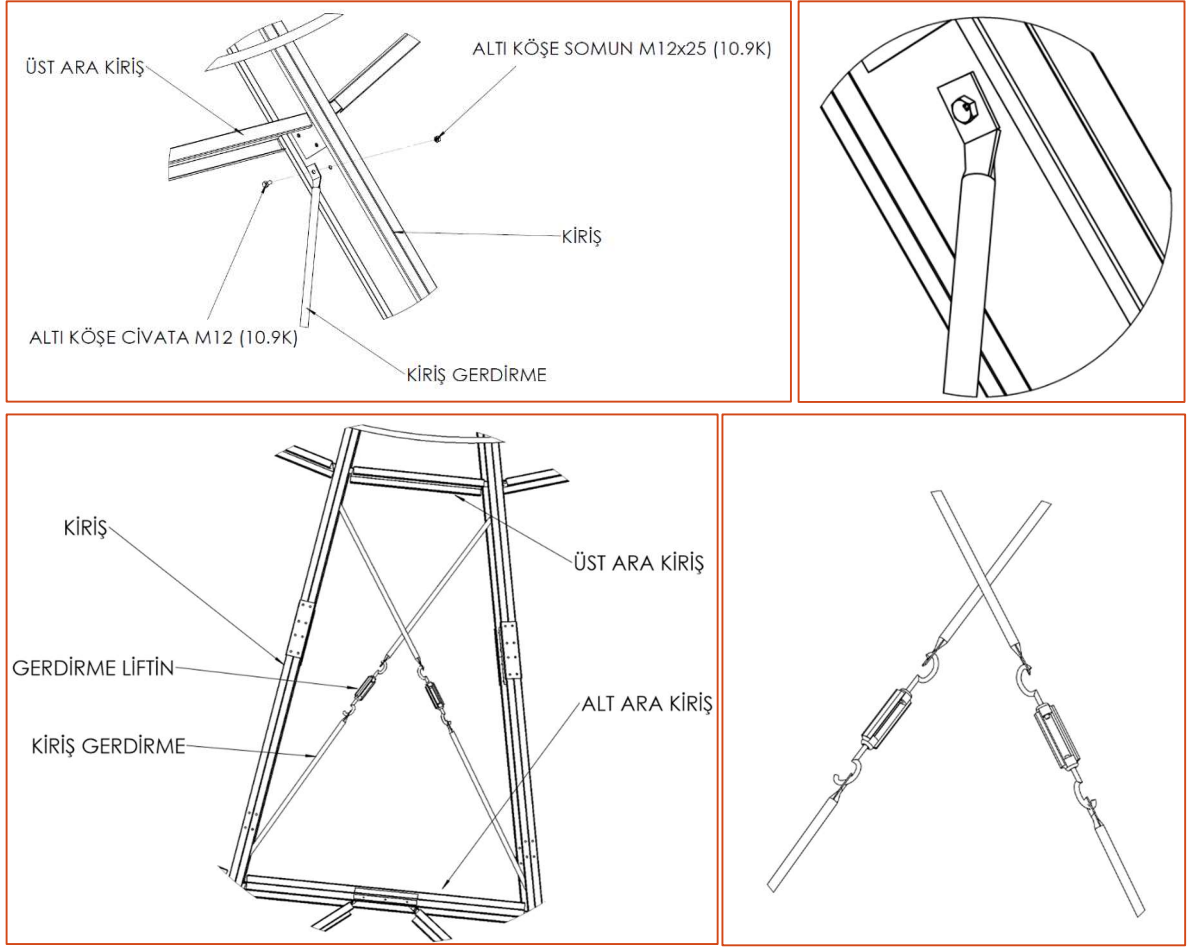


Figure 30 Beam Tension Assembly Detail

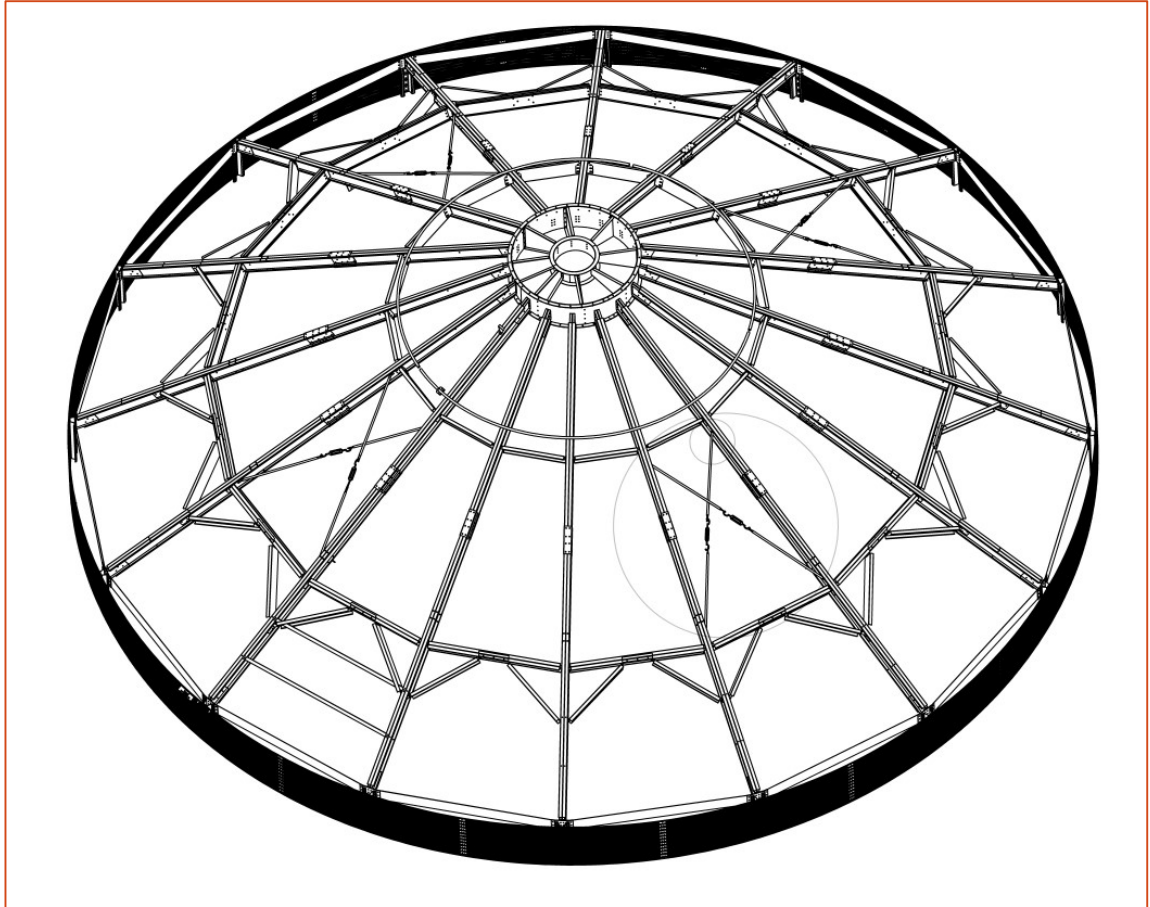


Figure 31 Isometric View of Beam Stretching

NOTE: Number of beam tension varies according to silo model.

4.4 UPPER HUNI INSTALLATION

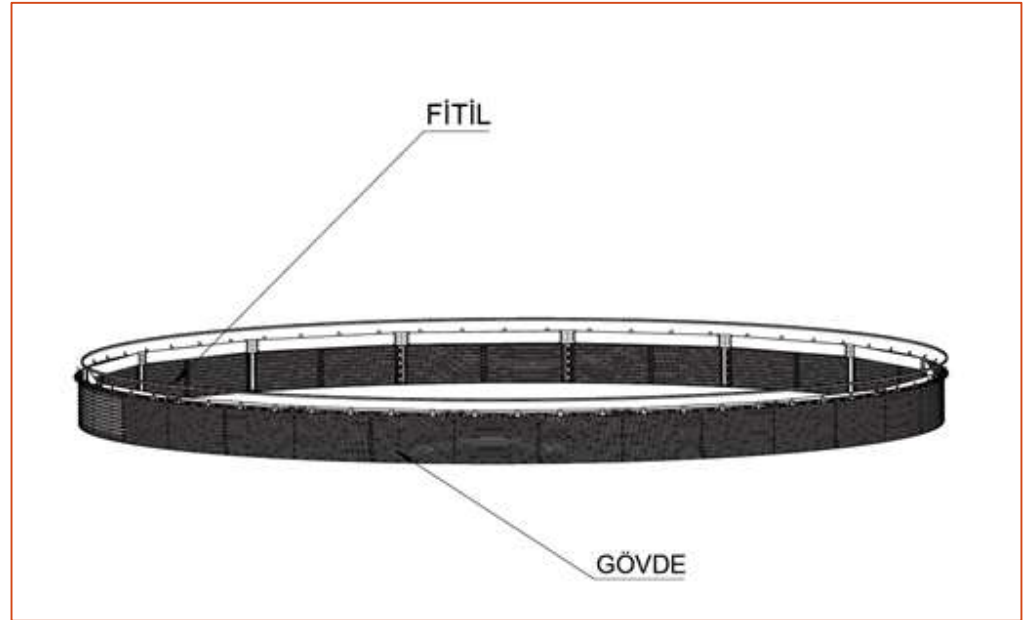
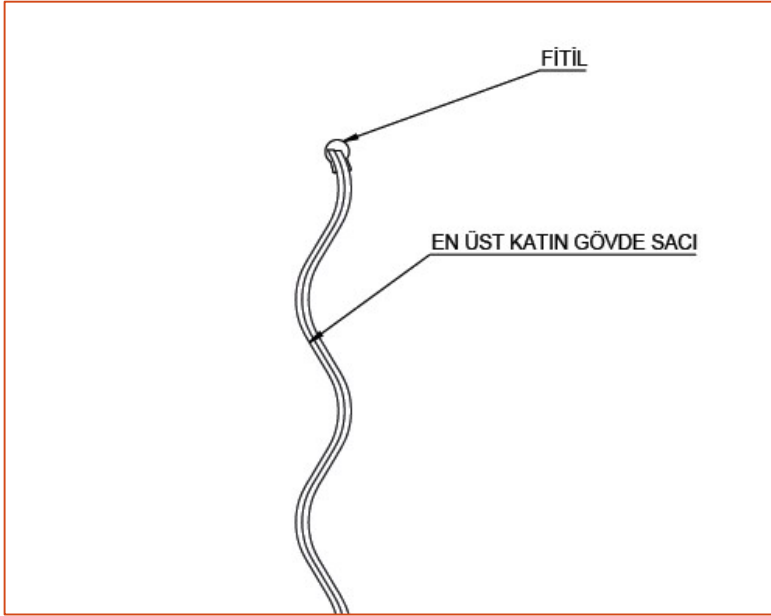


Figure 32 Fuse Assembly Overview

Place the trim as shown above to seal the roof and body.

NOTE!!! Use trim in silos with sealing package.

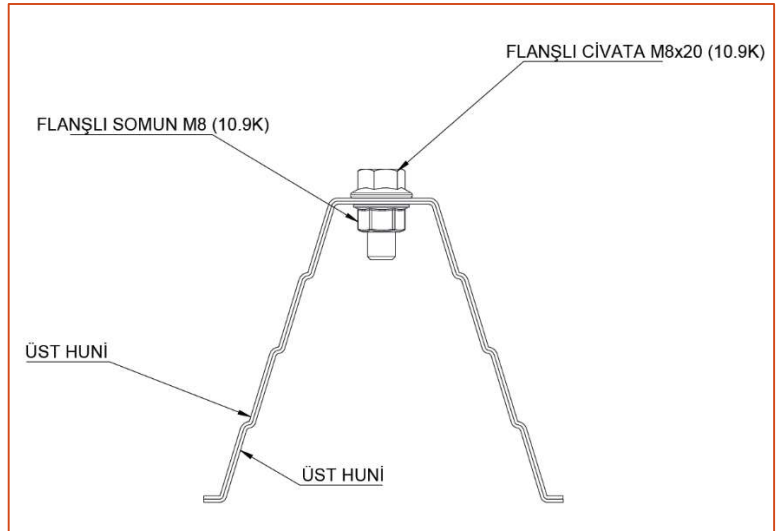
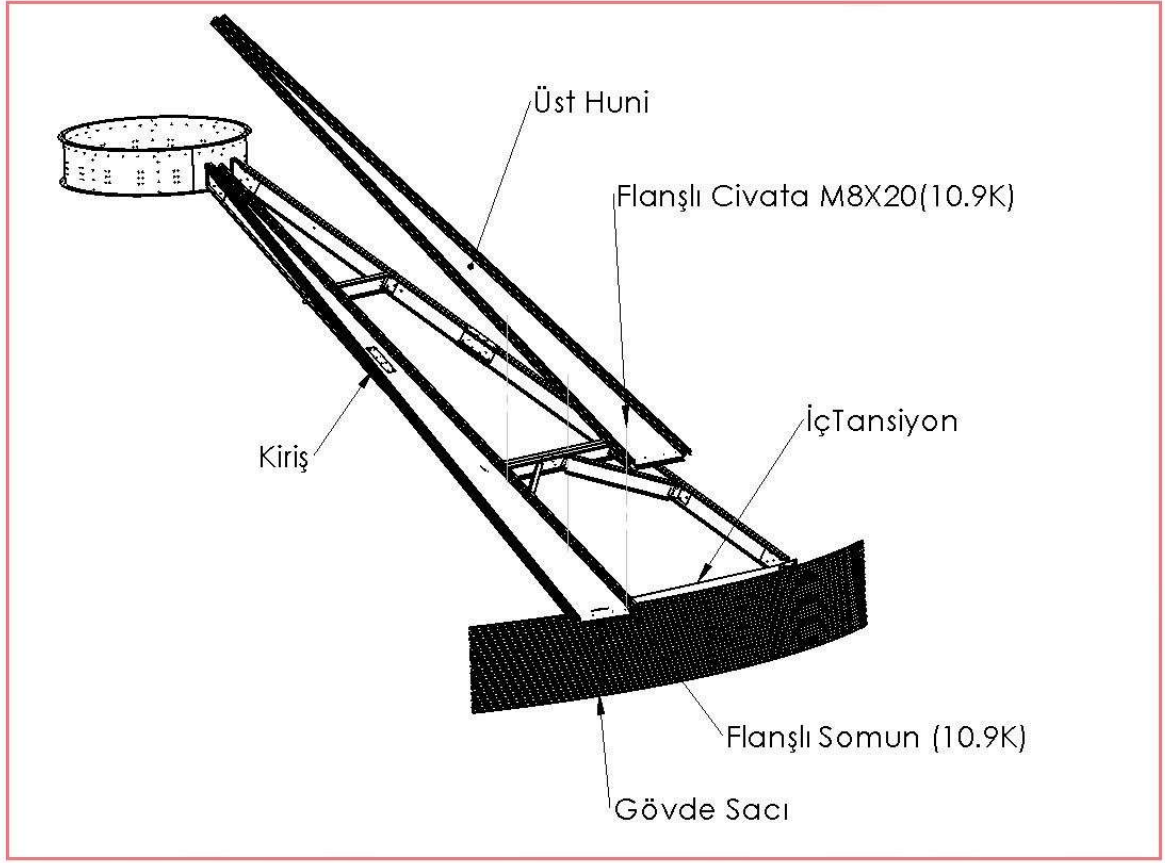


Figure 33 Upper Funnel Connection Detail

NOTE: Install the upper funnel counterclockwise.

Start the installation of the upper funnel from the corresponding funnel on any of the beams..

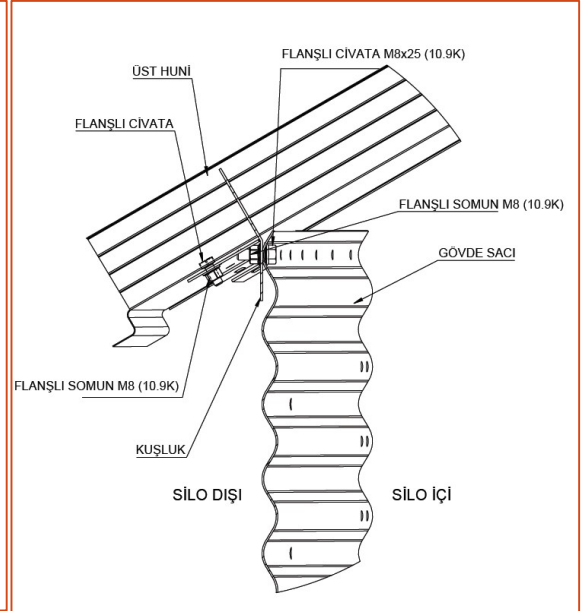
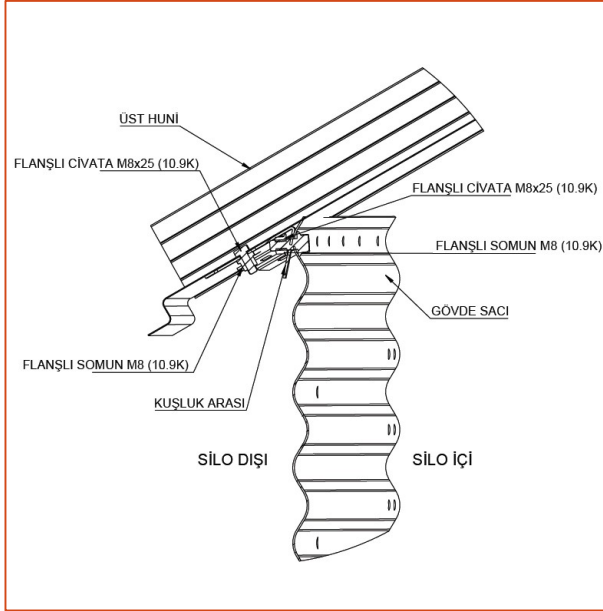
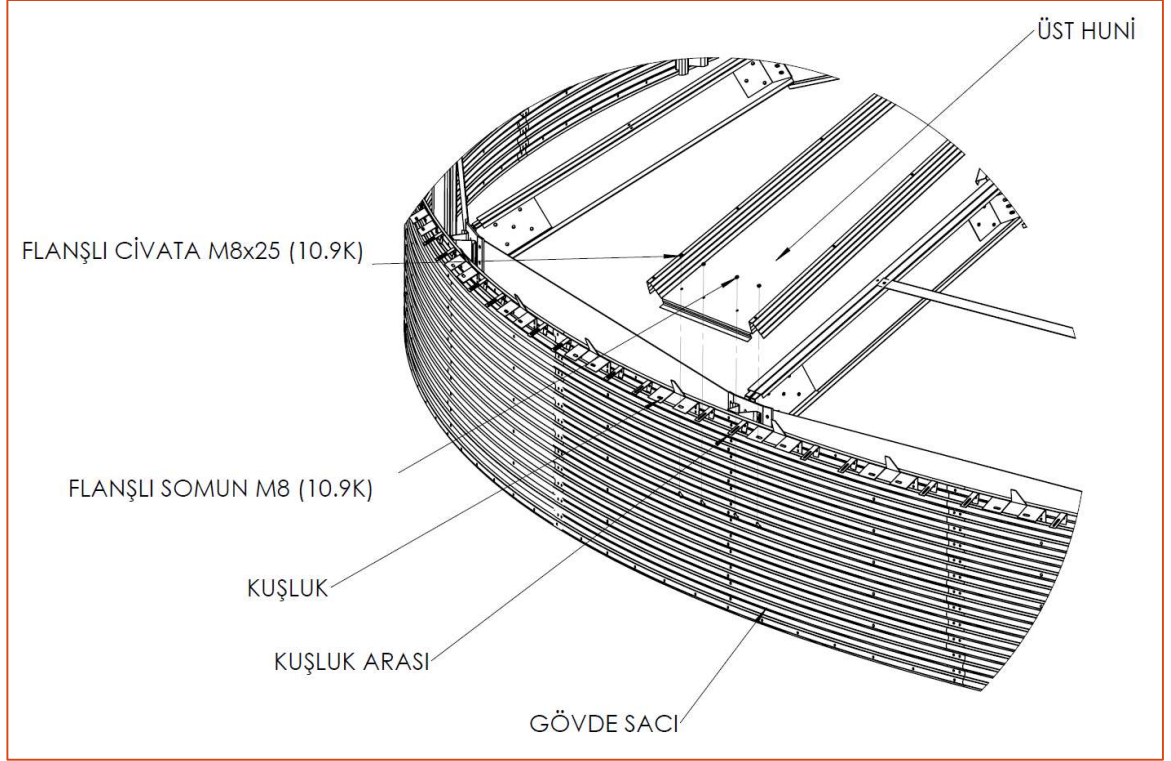


Figure 34 Upper Funnel - Detail

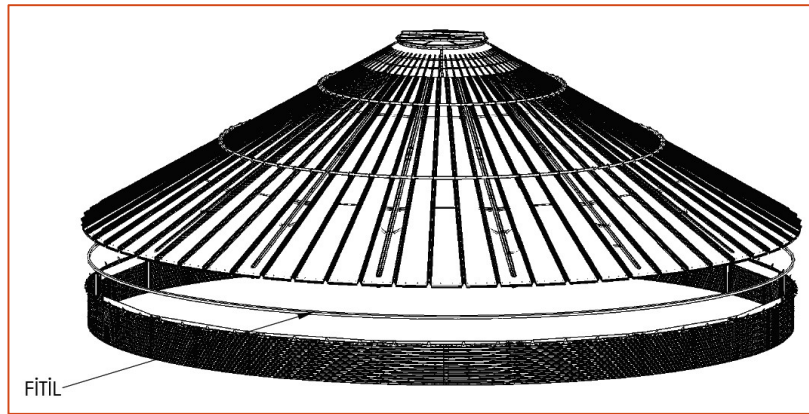
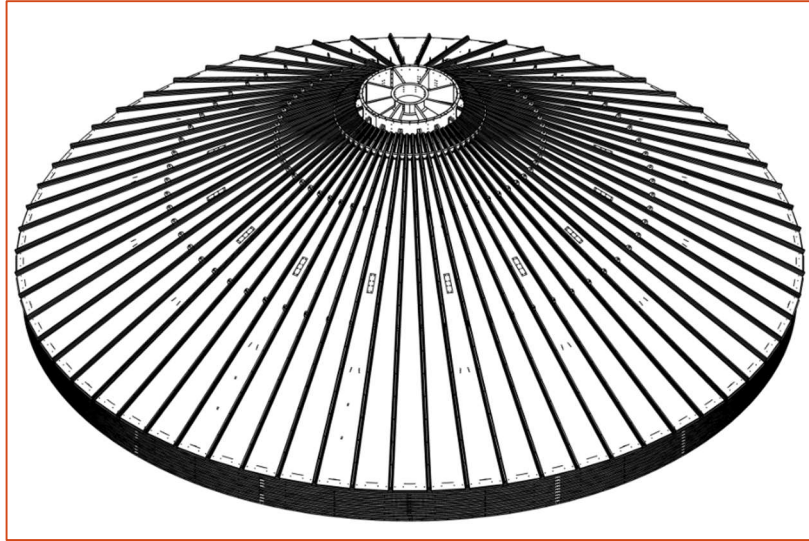


Figure 35 Upper Funnel Finished Form Overview

4.4.1 UPPER ROOF ASSEMBLY

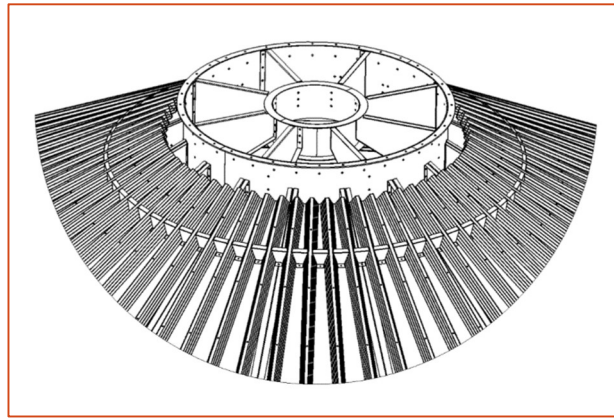
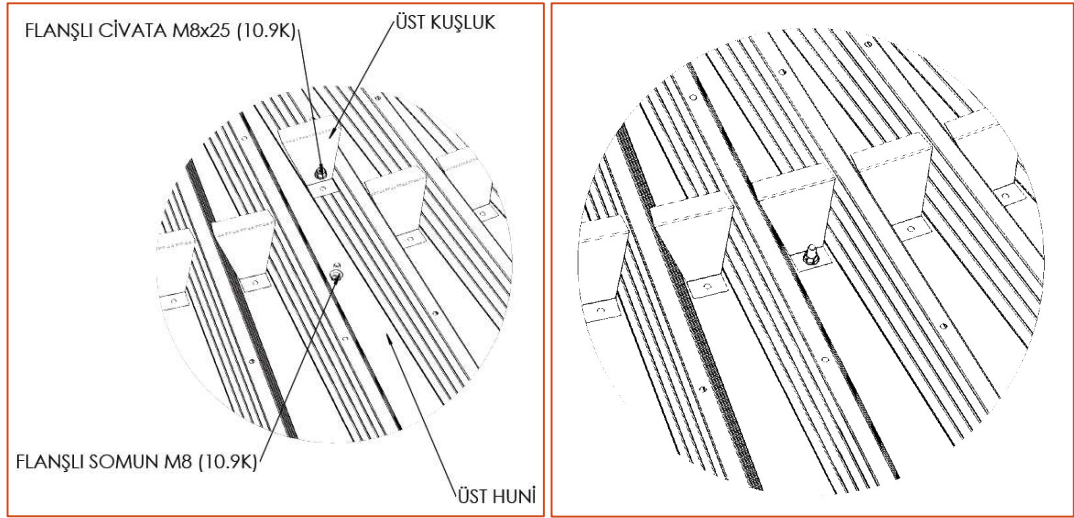
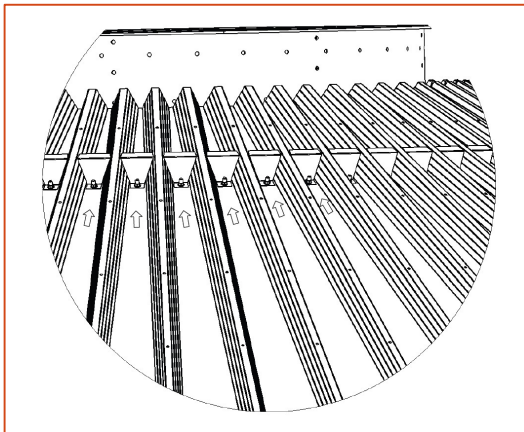


Figure 36 Upper Bracket Mounting Detail

The location of the upper barrel should be determined and connection holes should be drilled into the upper funnel. Make sure that the upper bird is located under the hoods.



Note!!! Attach the upper rails to the highest point that can be

4.4.2 HOOD MOUNTING

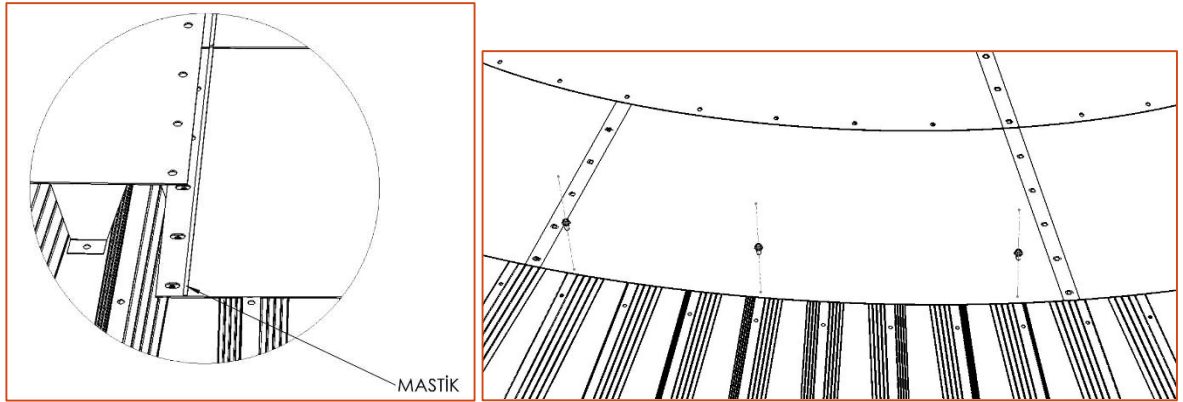
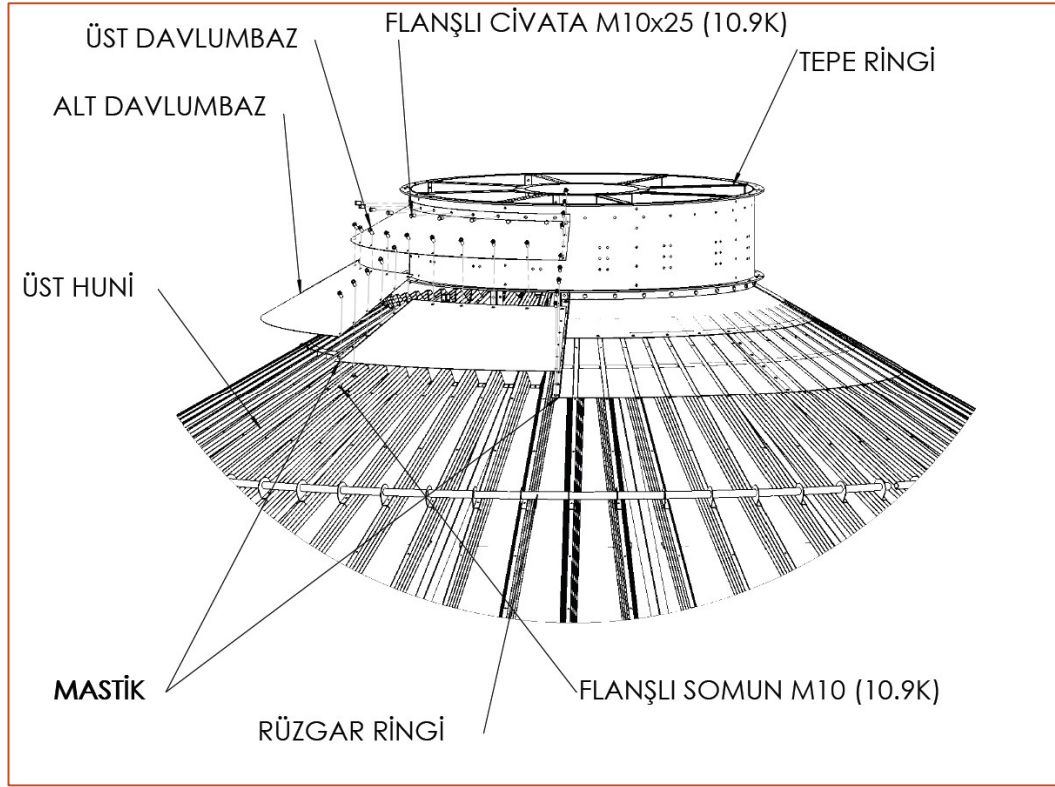


Figure 37 Hood Connection Detail

NOTE: Pull the sealants properly for roof sealing. Hoods should be fixed to the top funnel by drilling holes.

Watch out for sealants!!!

4.4.3 WIND RING ASSEMBLY

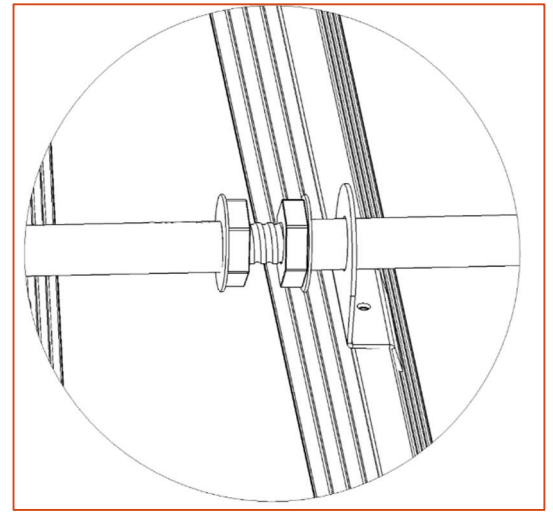
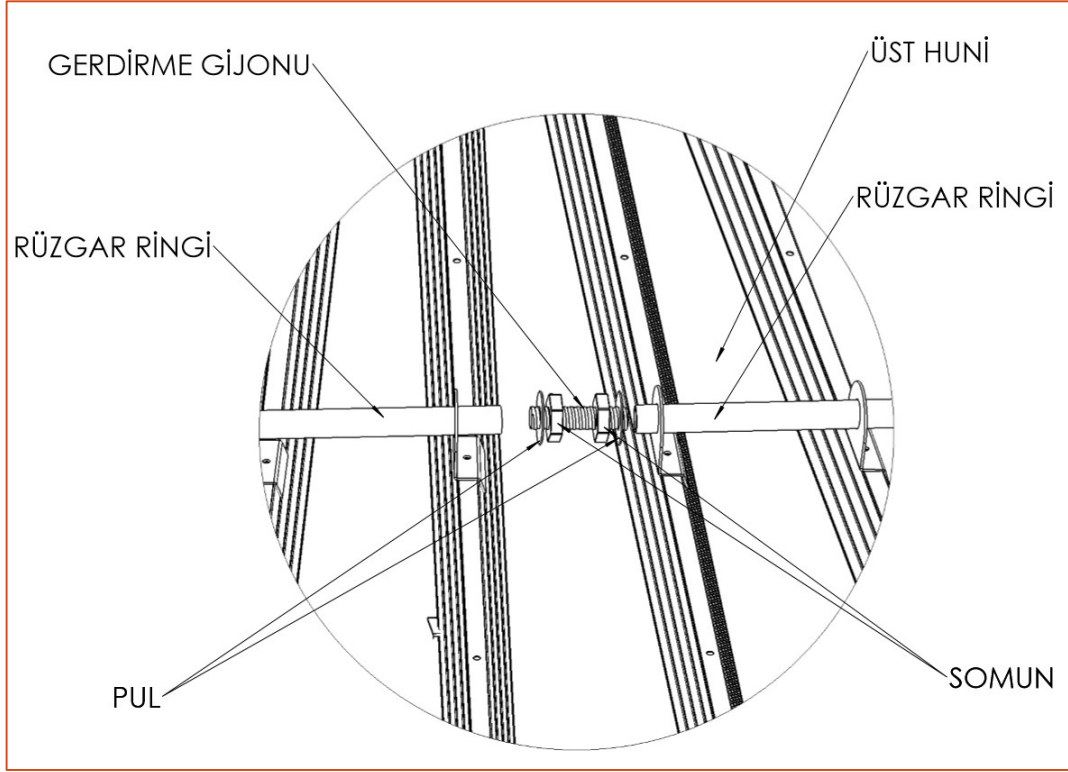


Figure 38 Wind Ring Connection Detail

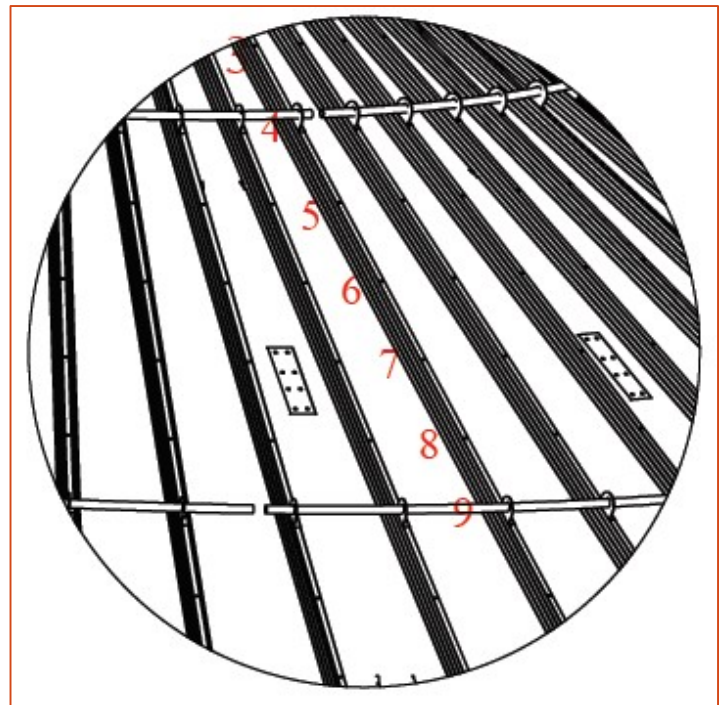
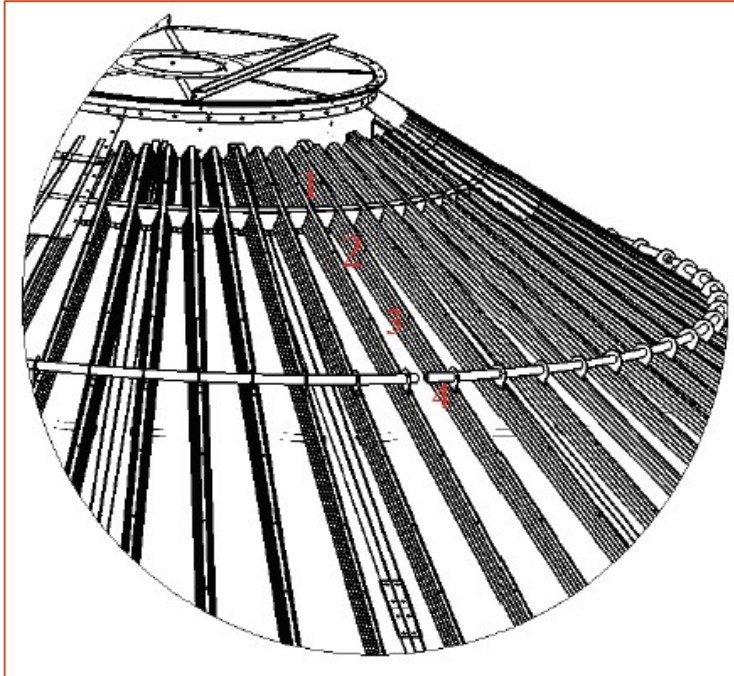


Figure 39 Wind Ring Connection Hole Placement

Note!!! Wind rings will be connected to holes 4 and 9 from the top of the top funnel.

4.4.4 EXHAUST FAN LADDER MOUNTING

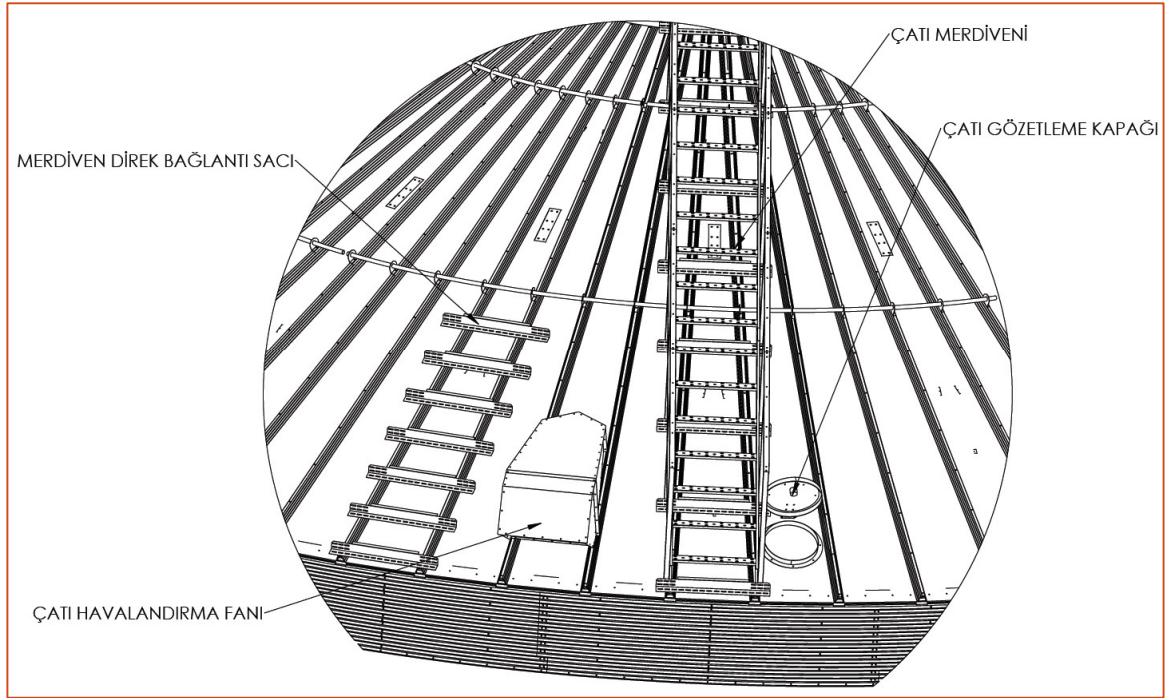


Figure 40 Exhaust Fan Ladder Connection Detail

Place the roof ventilation fan and sight cover on both sides of the ladder as shown in the figure.

The steps required to intervene the ventilation fan shall be arranged and mounted on the roof sheet as shown in the figure..

4.4.5 EXHAUST FAN MOUNTING

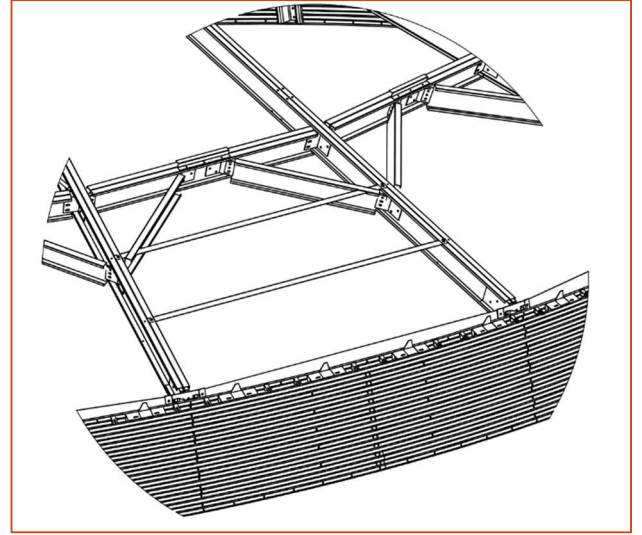
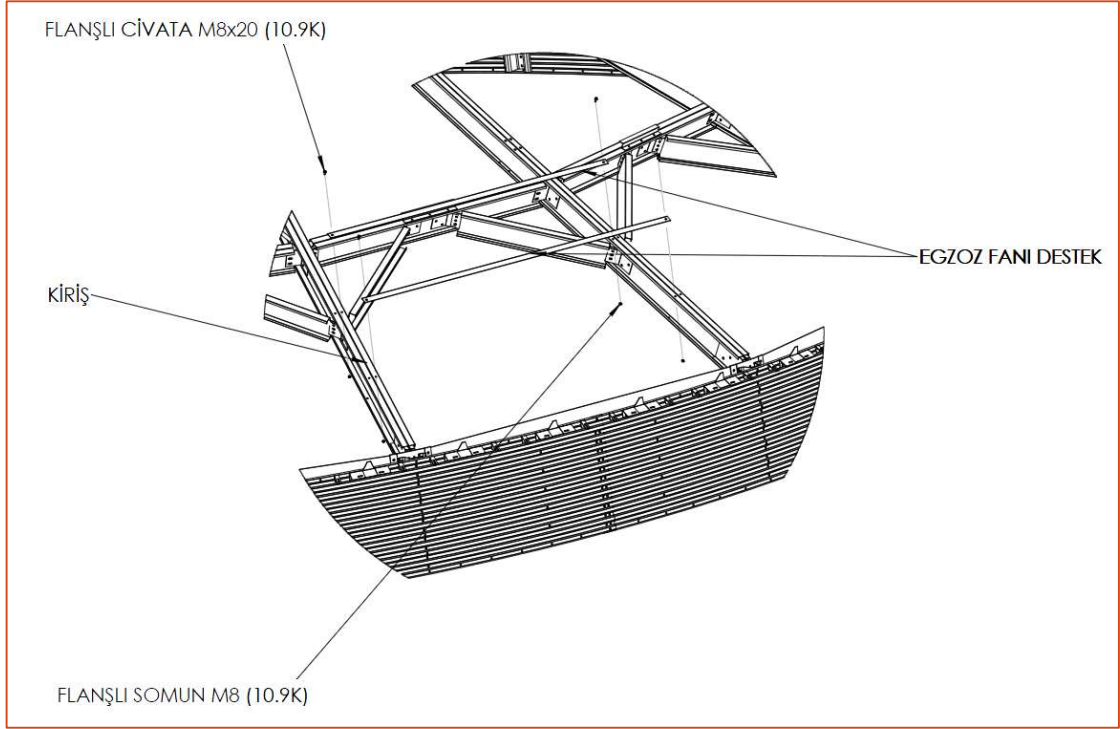


Figure 41 Exhaust Fan Support Connection Detail

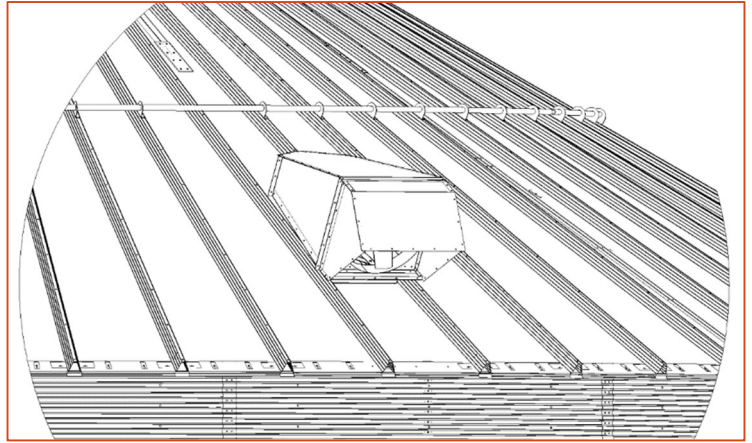
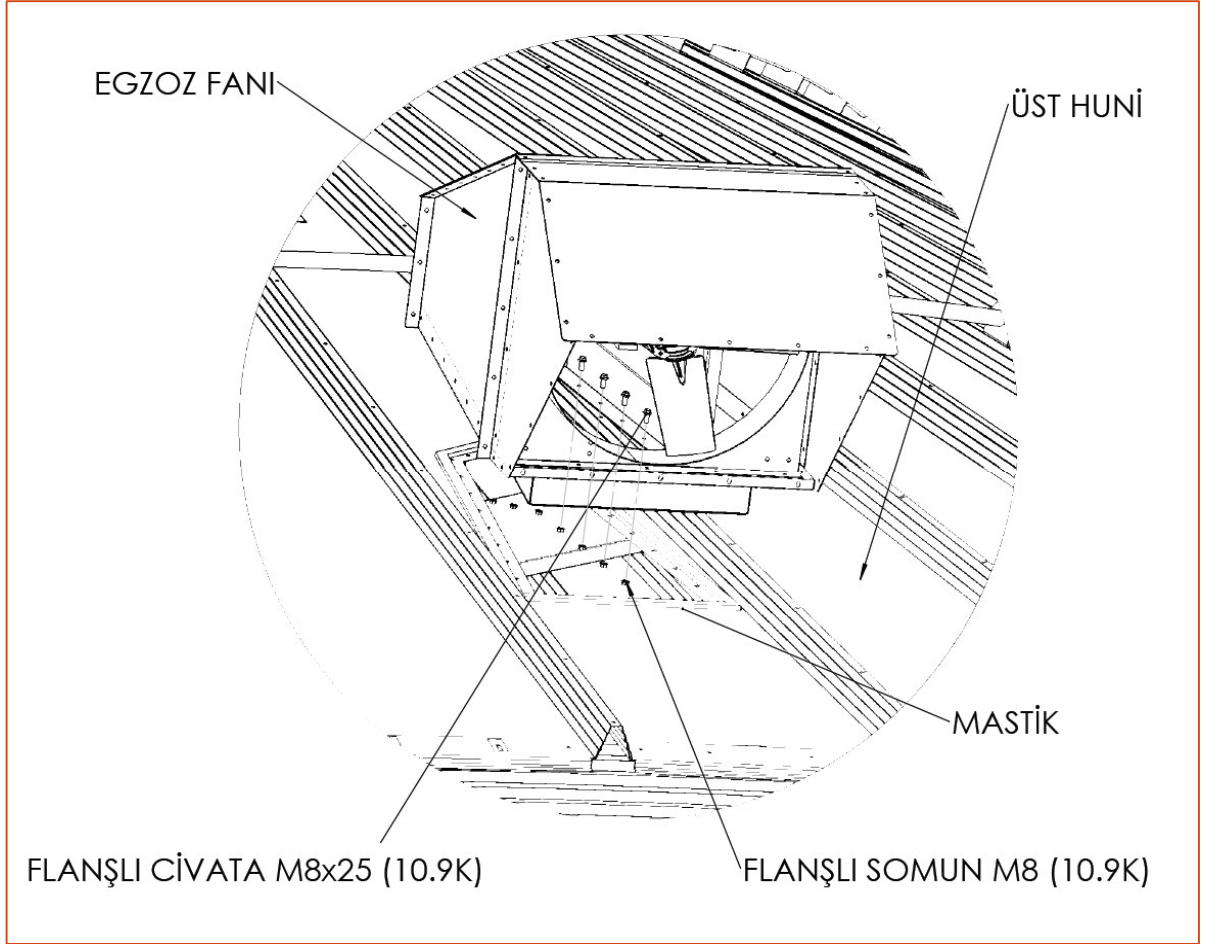
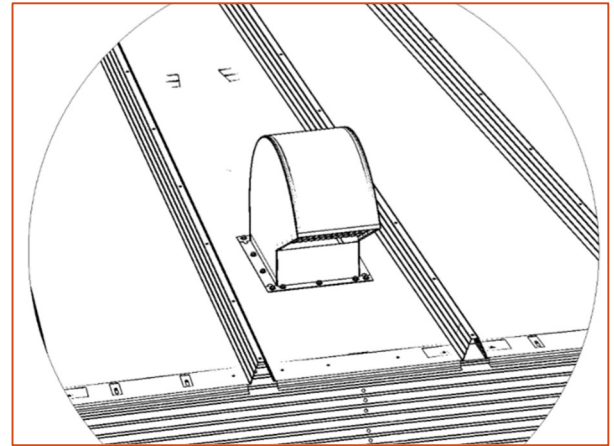
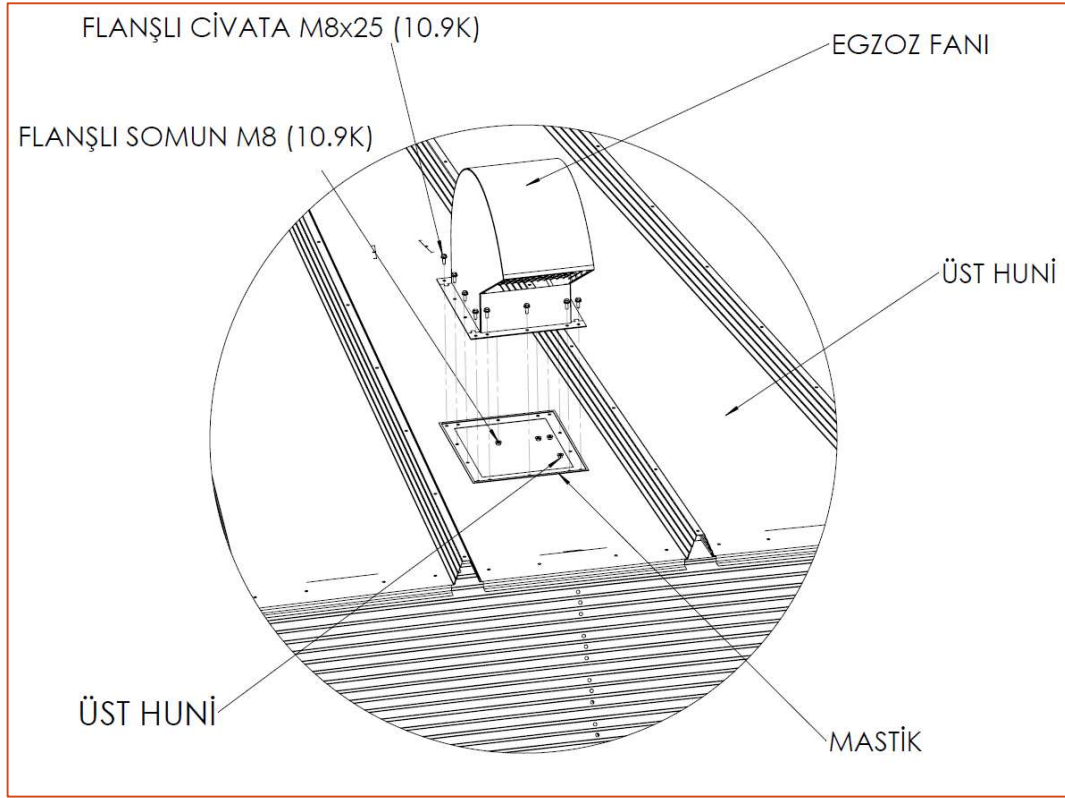


Figure 41 Exhaust Fan Support Connection Detail

Position the fan in the layout.

Roof exhaust fans with sealing package are used with shutter system.

4.4.6 VENTILATION FITTING



Şekil 1 Vent Connection Detail

Place the ventilation shaft by looking at the sheet.

Special system is used in ventilation chimneys with sealing package.

4.4.7 ROOF SURFACE COVER

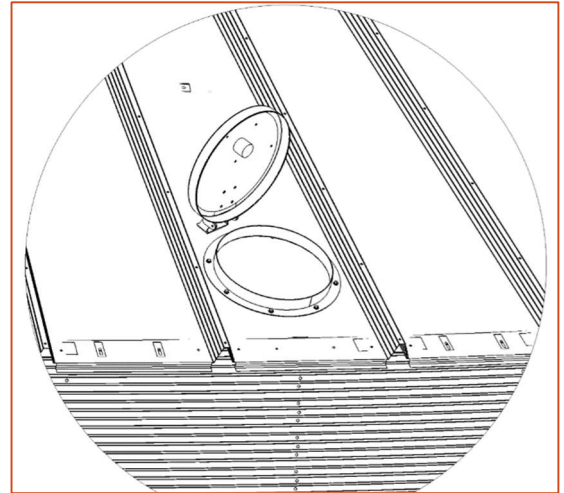
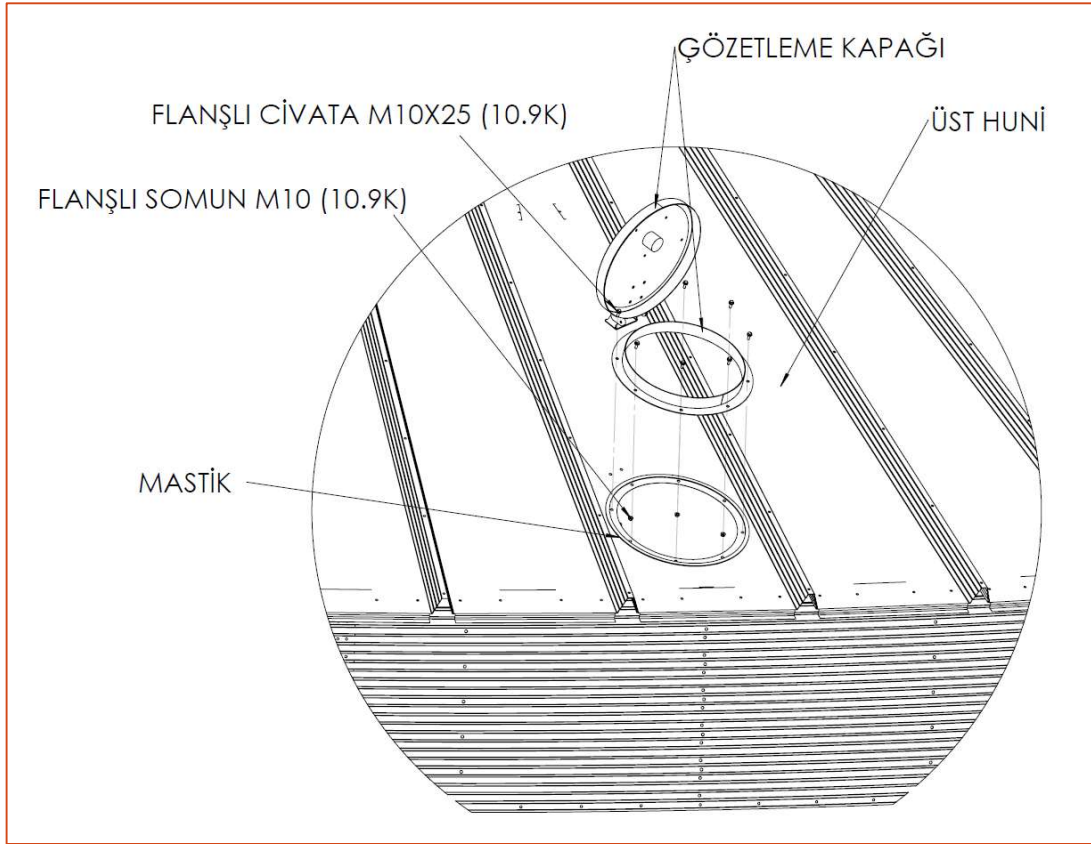


Figure 44 Observation Cover Connection Detail

Adjust the cover to the side of the roof ladder.

4.4.8 HEAVY ROOF RING COVER ASSEMBLY

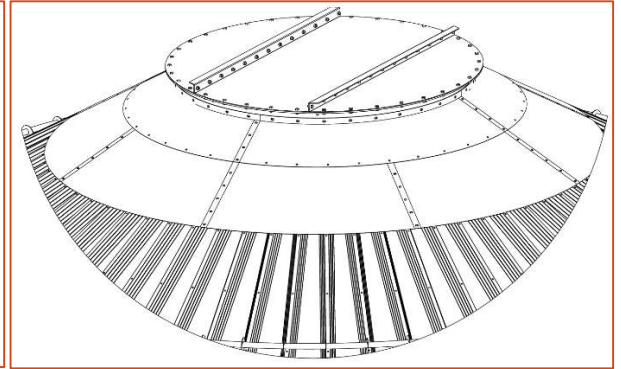
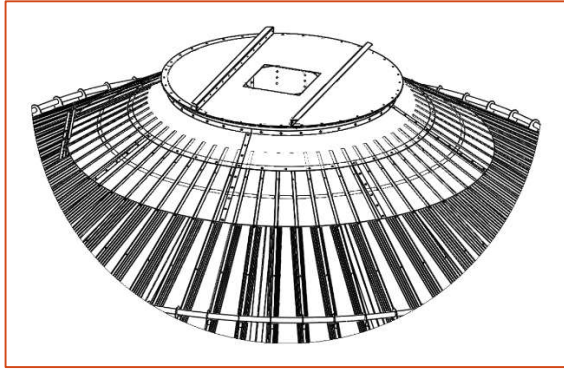
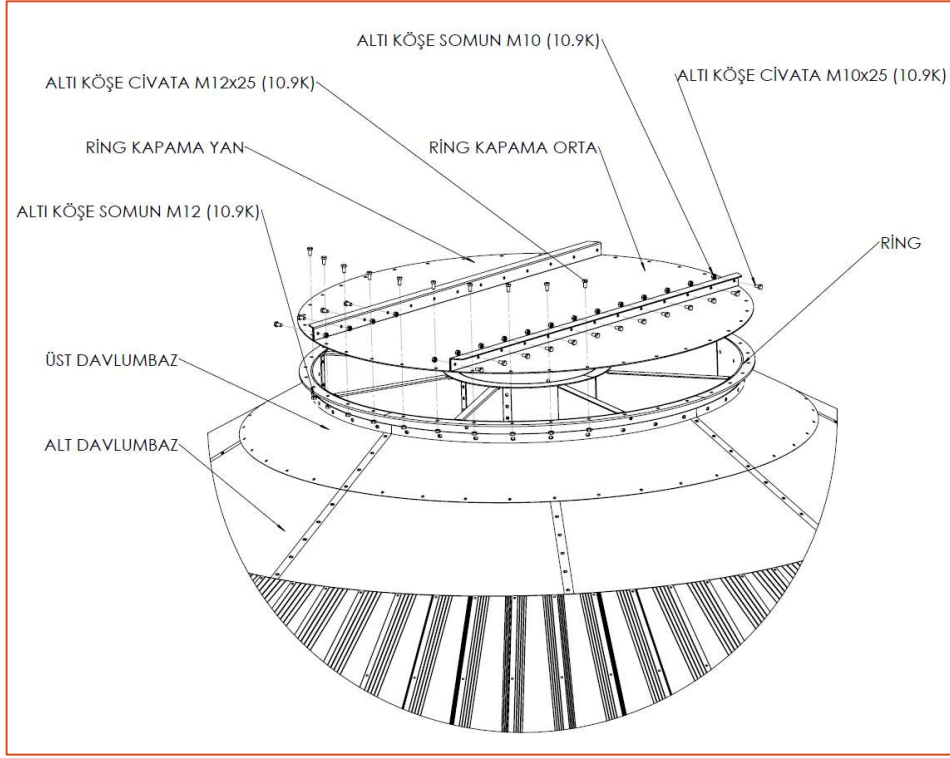


Figure 45 Ring Cover Installation Detail

NOTE: Open the silo inlet properly according to the flow pipe.

4.5 ROOF LADDER ASSEMBLY

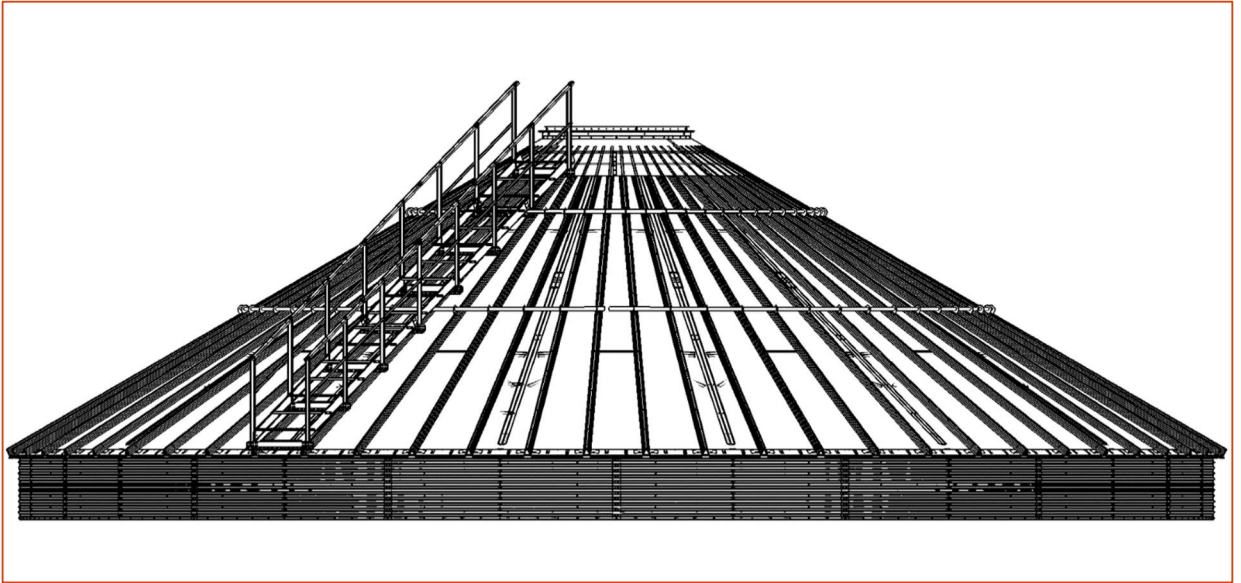
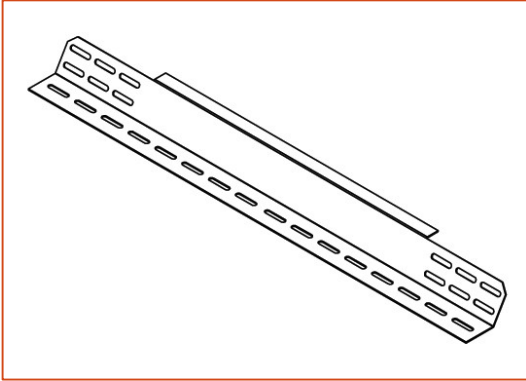


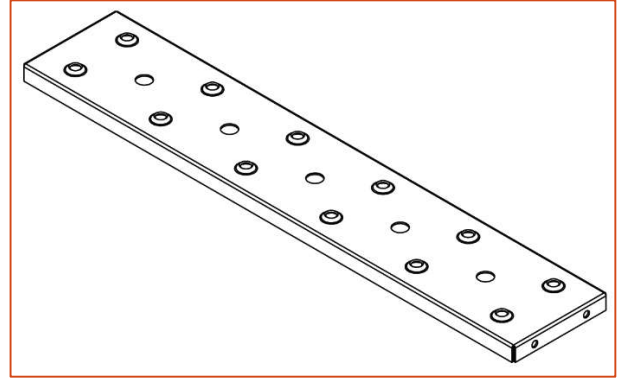
Figure 46 Roof Ladder General View

IMPORTANT!!! Use galvanized bolts and nuts for mounting the roof ladder.

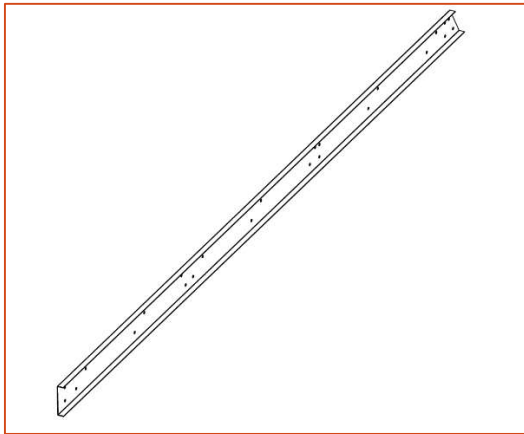
Silo Roof Ladder Direct Connection Plate [YM.SCM.01]



Silo Roof Ladder Direct Connection Plate [YM.SCM.02]



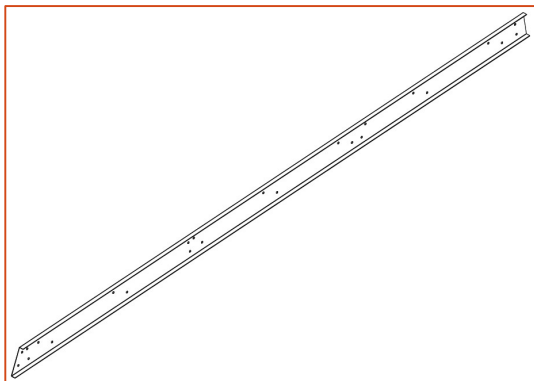
Silo Roof Ladder Direct Connection Plate [YM.SCM.01]



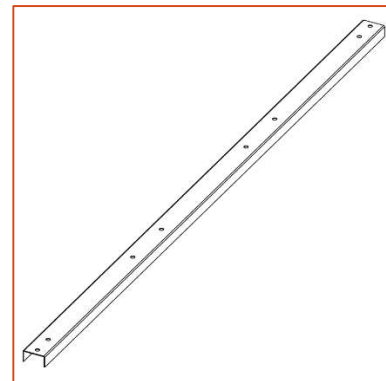
Silo Roof Ladder Guardrail Fence [YM.SCM.06]



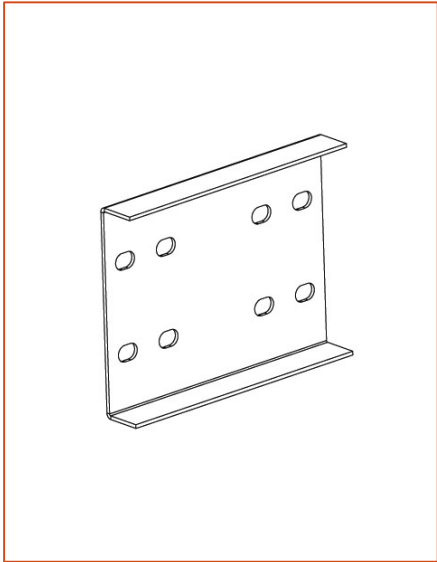
Silo Roof Ladder 3m Side Mast Left [YM.SCM-3m-04]



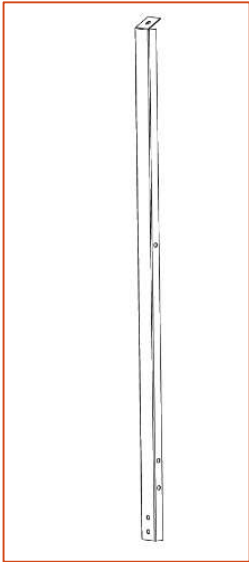
Silo Roof Ladder 3m Balustrade Upper U Plate [YM.SCM-3m-02]



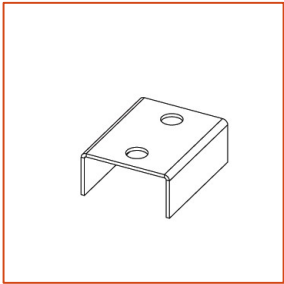
Silo Roof Ladder Module Assembly Sheet [YM.SCM-03]



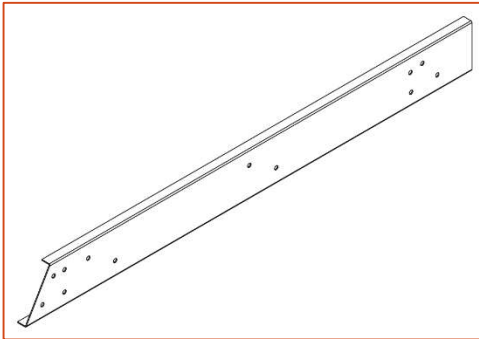
Silo Roof Ladder Railing [YM.SCM-04]



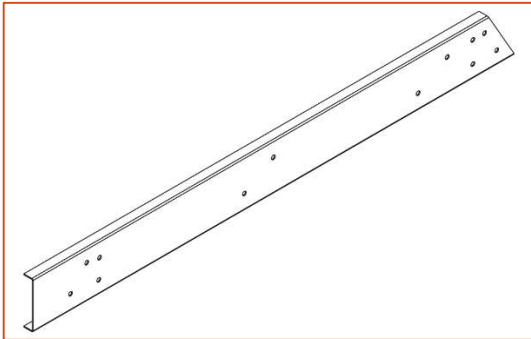
Silo Roof Ladder Upper U Joint Sheet [YM.SCM-05]



Silo Cati Ladder 1m Side Mast Right [YM.SCM-1m-03]



Silo Cati Ladder 1m Side Mast Left- [YM.SCM-1m-04]



4.5.1 ROOF LADDER ASSEMBLY STEP 1

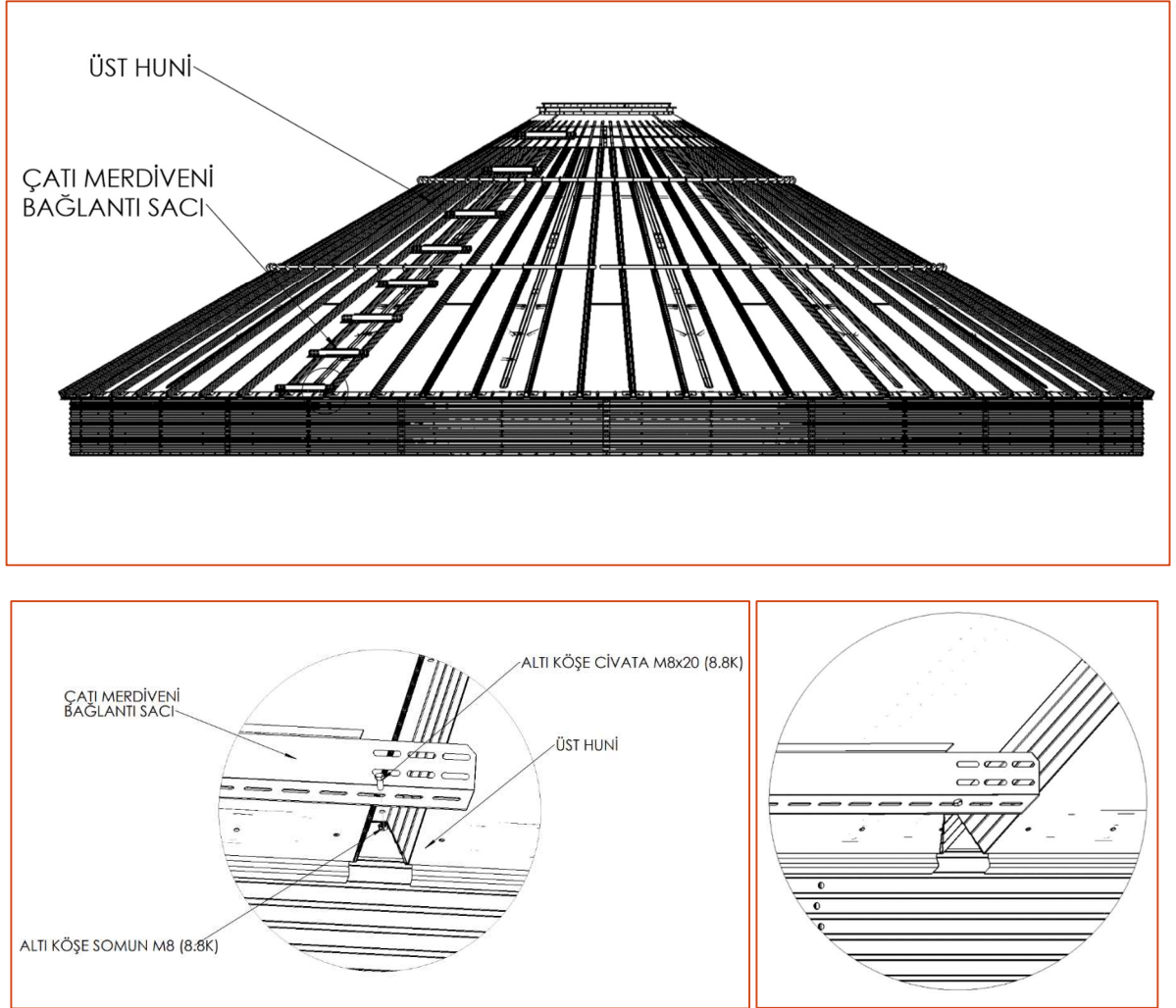


Figure 47 Roof Ladder Connection Sheet Connection Detail

First, connect the roof ladder connection sheets.

4.5.2 ROOF LADDER ASSEMBLY STEP 2

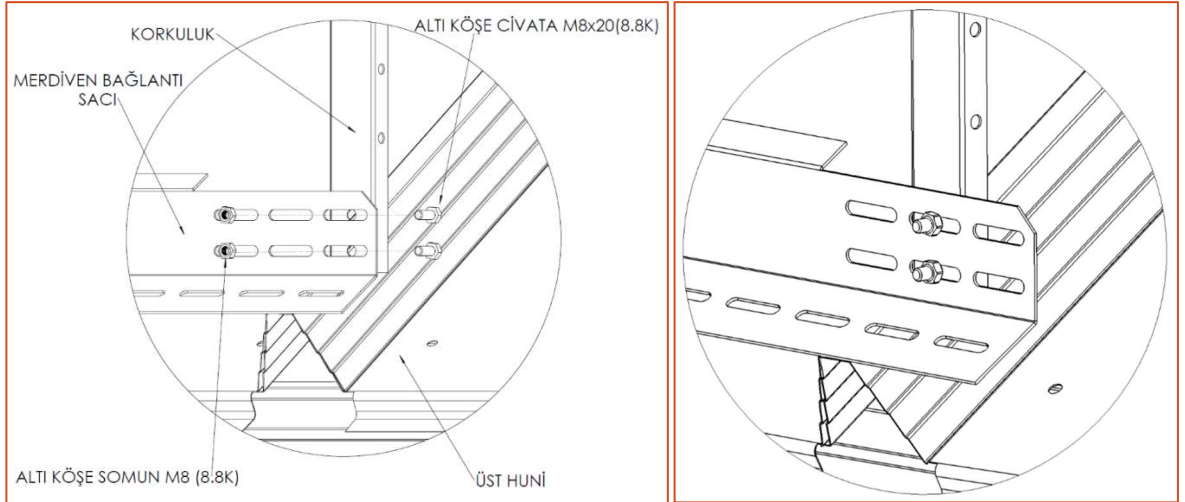
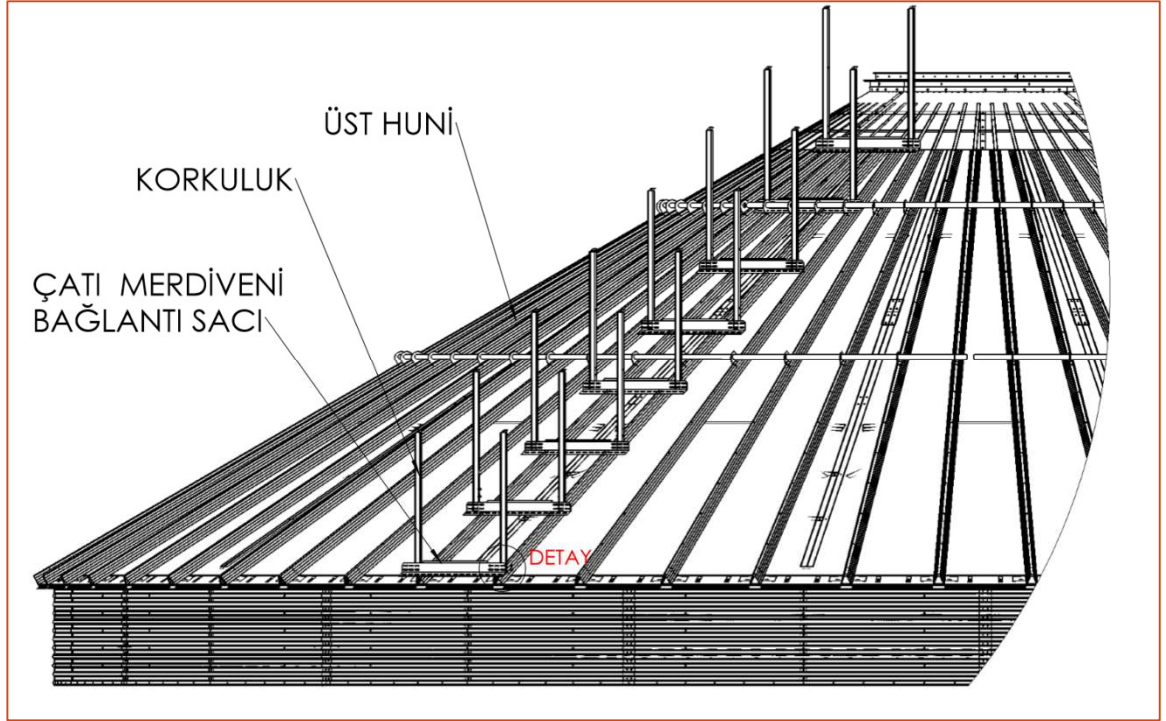


Figure 48 Railing Installation

4.5.3 ROOF LADDER ASSEMBLY STEP 3

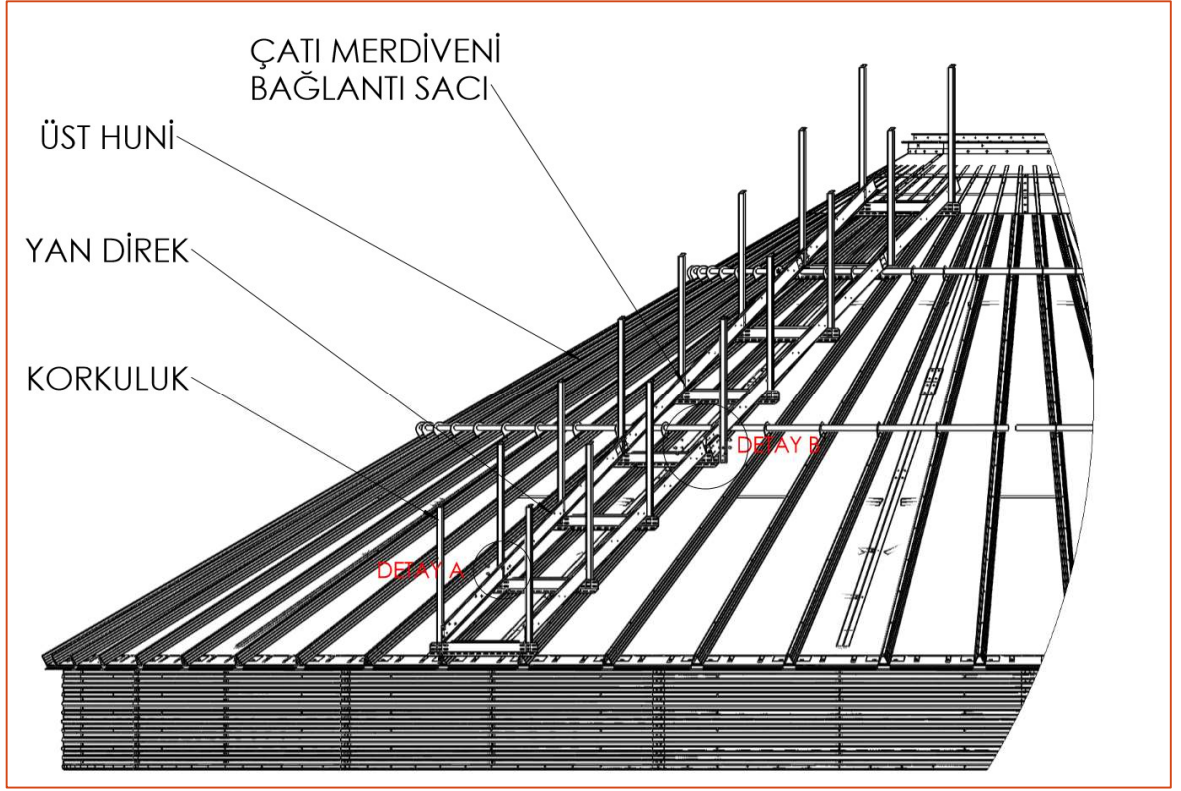
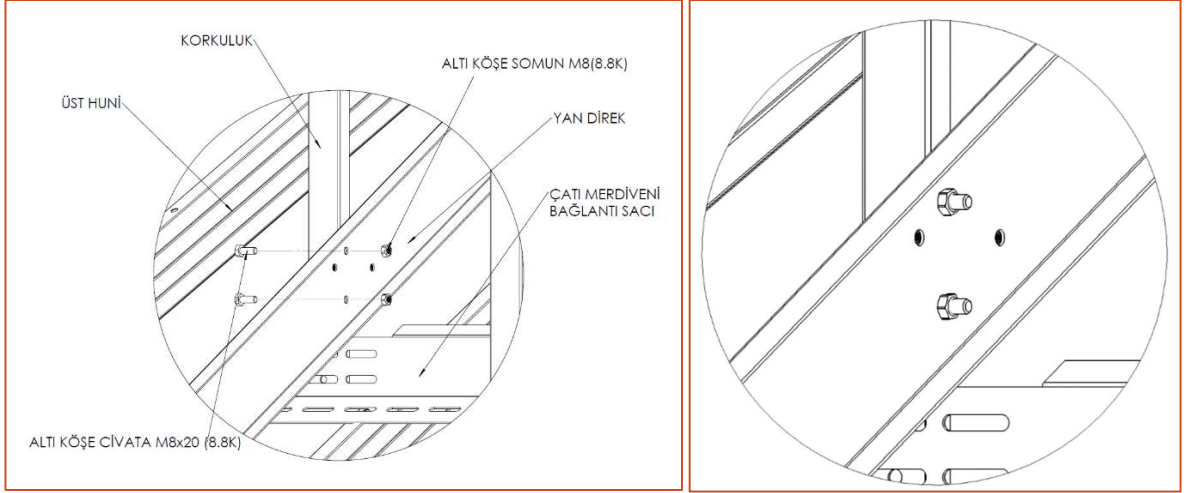


Figure 49 Side Mast Installation Detail Locations

DETAIL A



DETAIL B

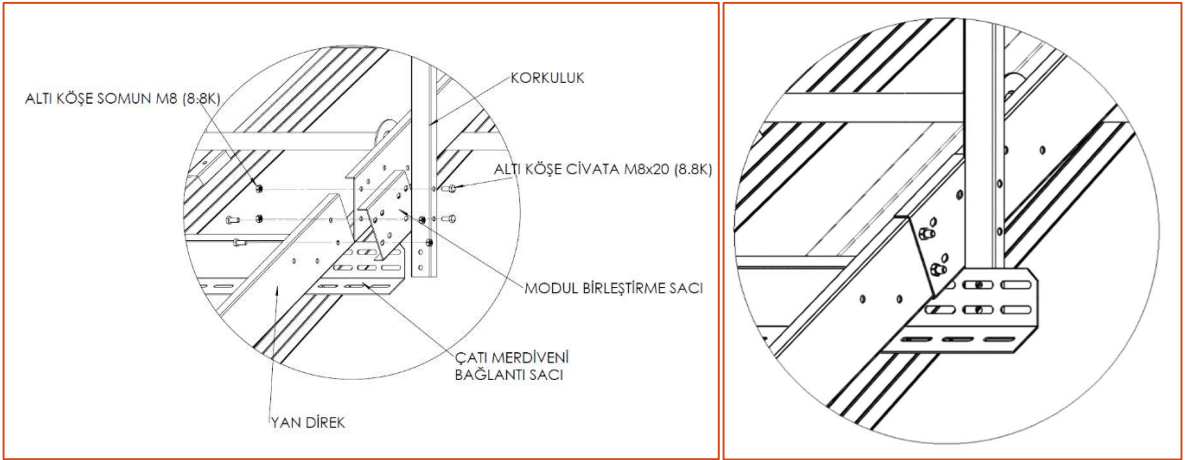


Figure 50 Side Mast Installation Details

4.5.4 ROOF LADDER ASSEMBLY STEP 4

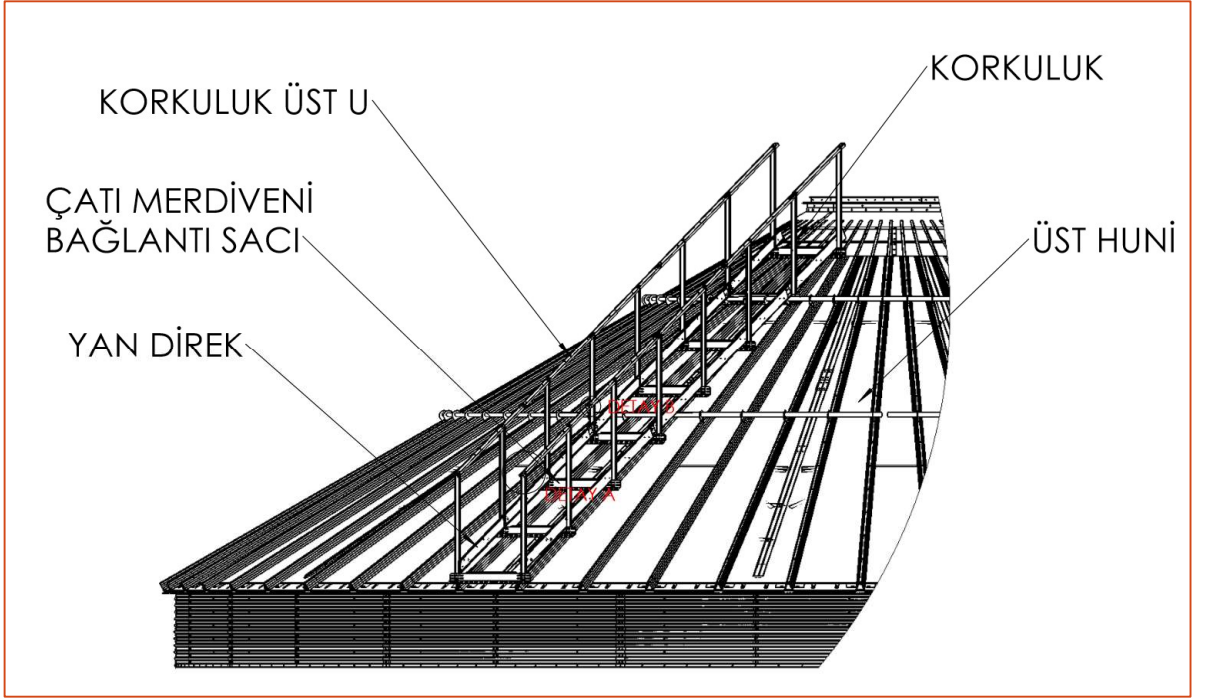
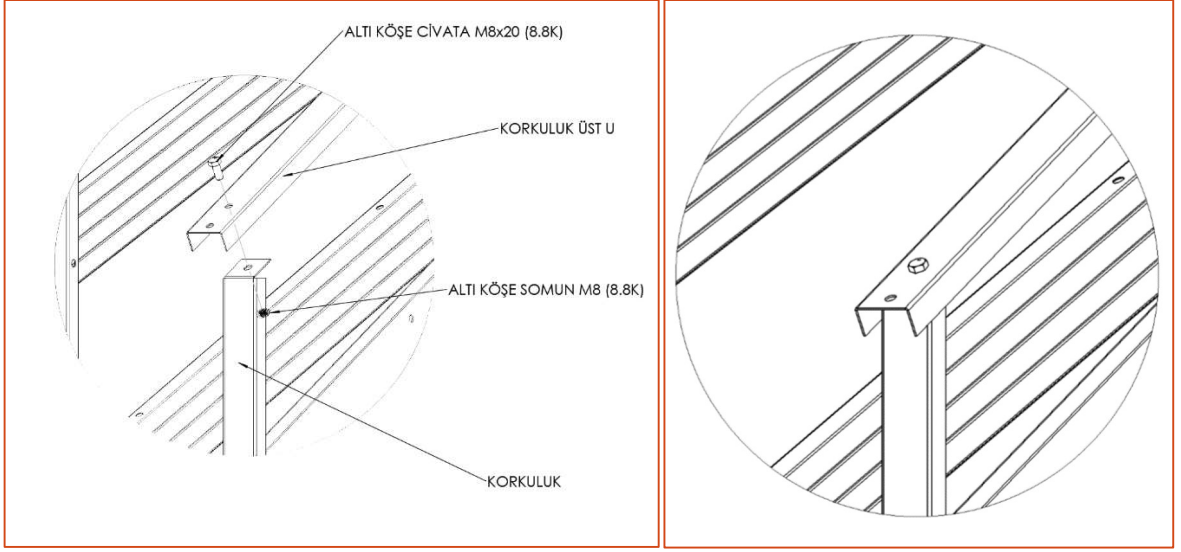


Figure 51 Railing Top U Mounting Detail Locations

DETAIL A



DETAIL B

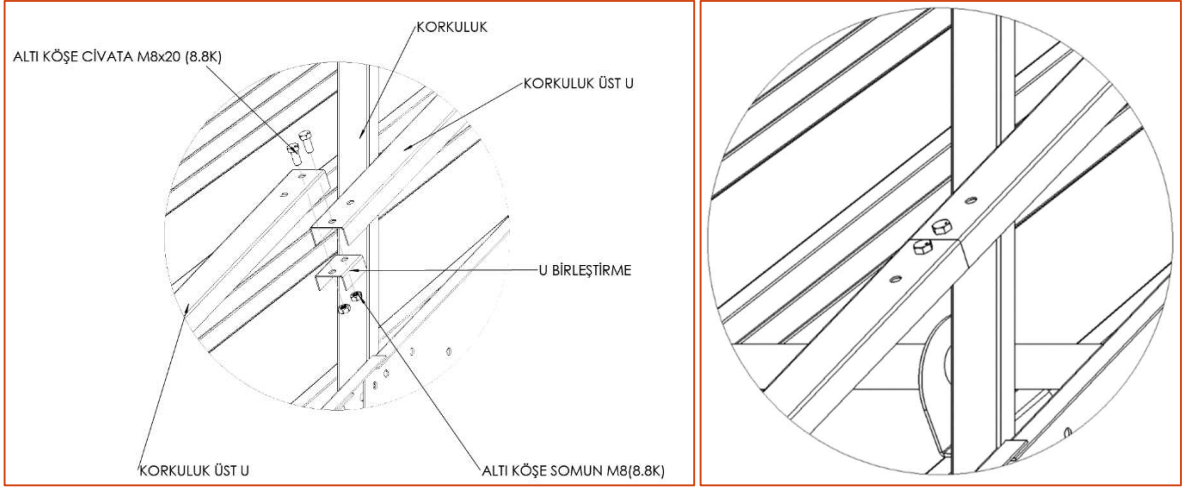


Figure 52 Railing Top U Mounting Details

4.5.5 ROOF LADDER ASSEMBLY STEP 5

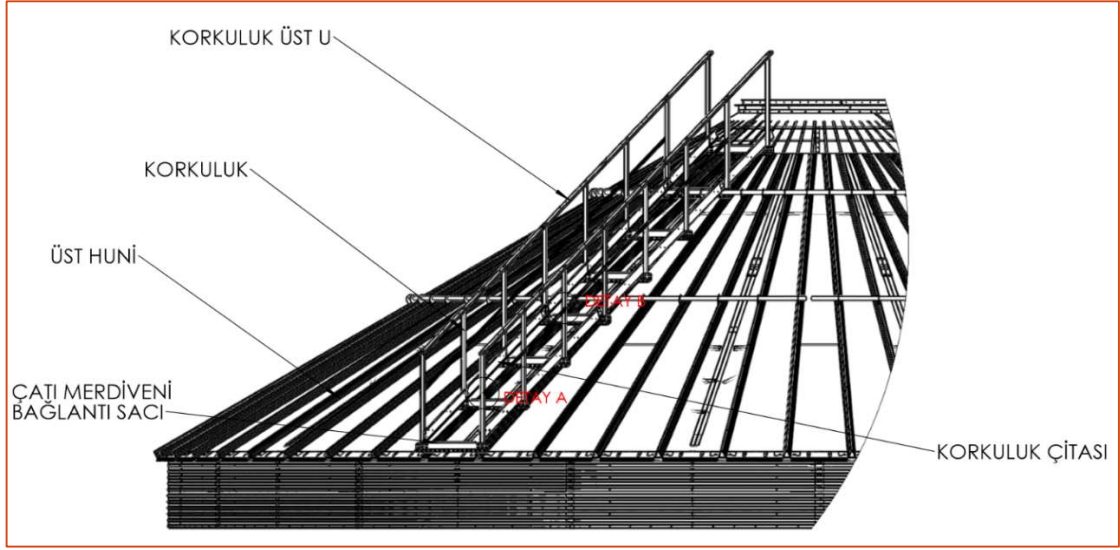
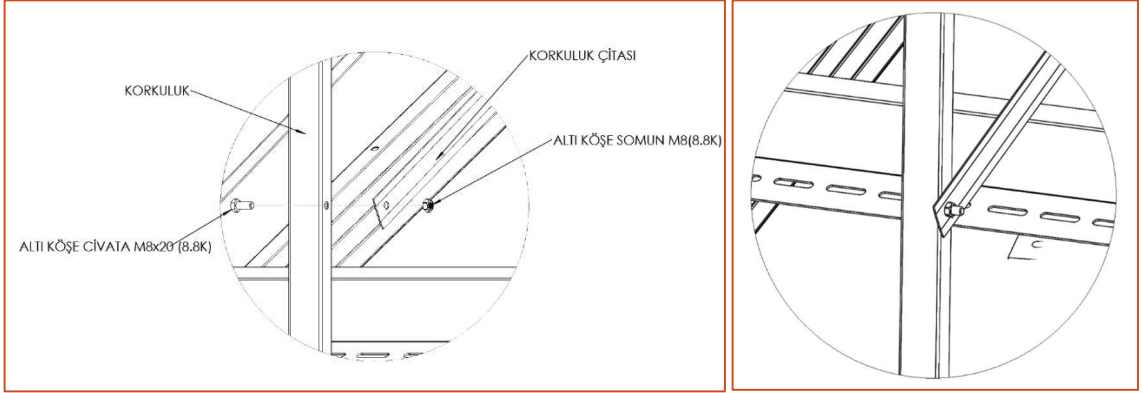


Figure 52. Railing Fence Installation Detail Locations

DETAIL A



DETAIL B

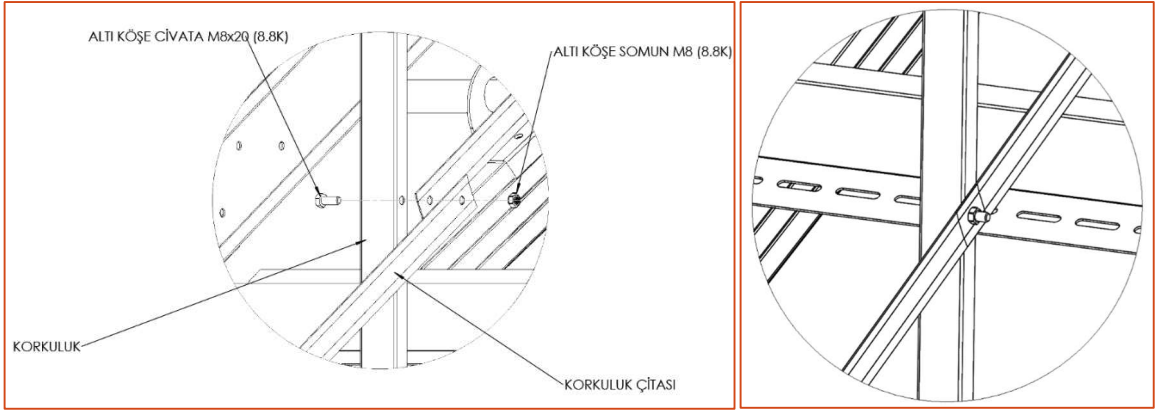


Figure 53 Guardrail Fitting Installation Details

4.5.6 ROOF LADDER ASSEMBLY STEP 6

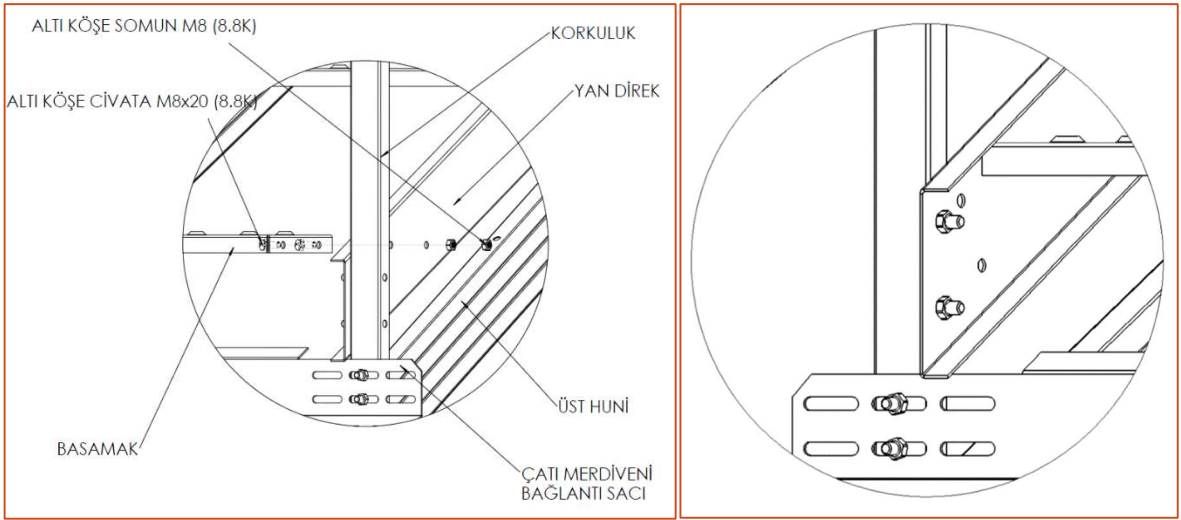
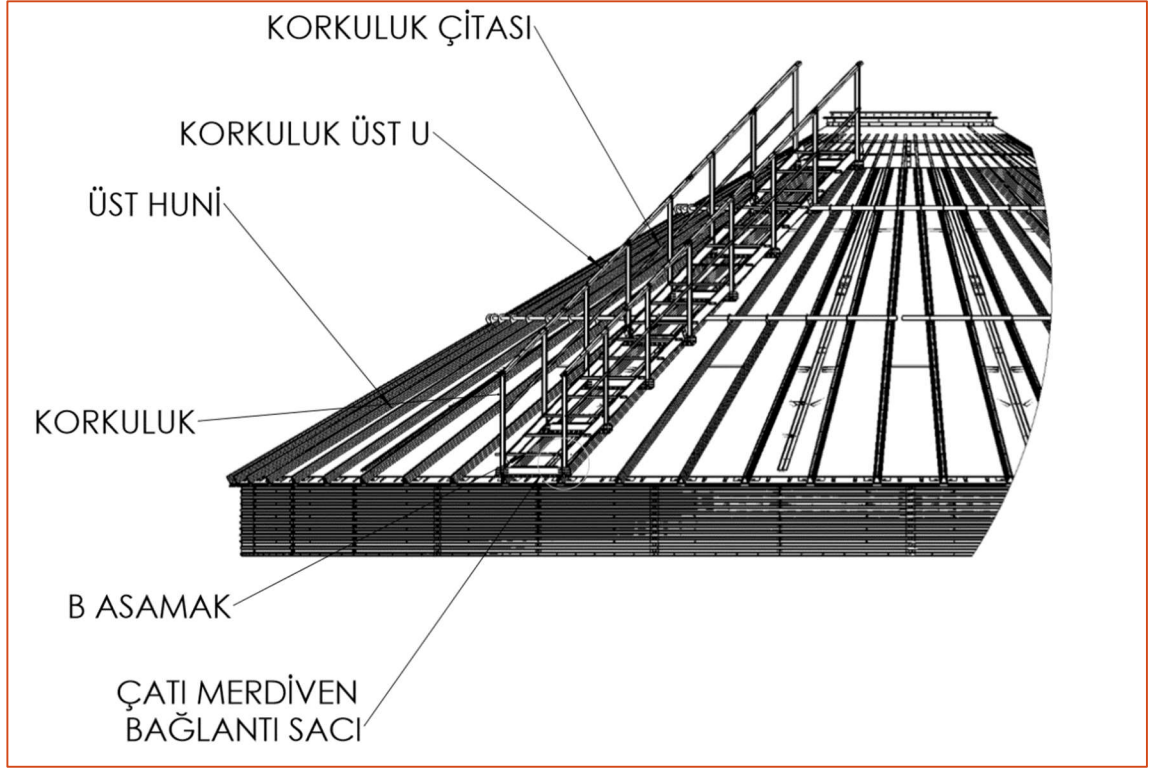


Figure 54 Roof Ladder Step Connection Details

4.6 TEMPERATURE MONITORING

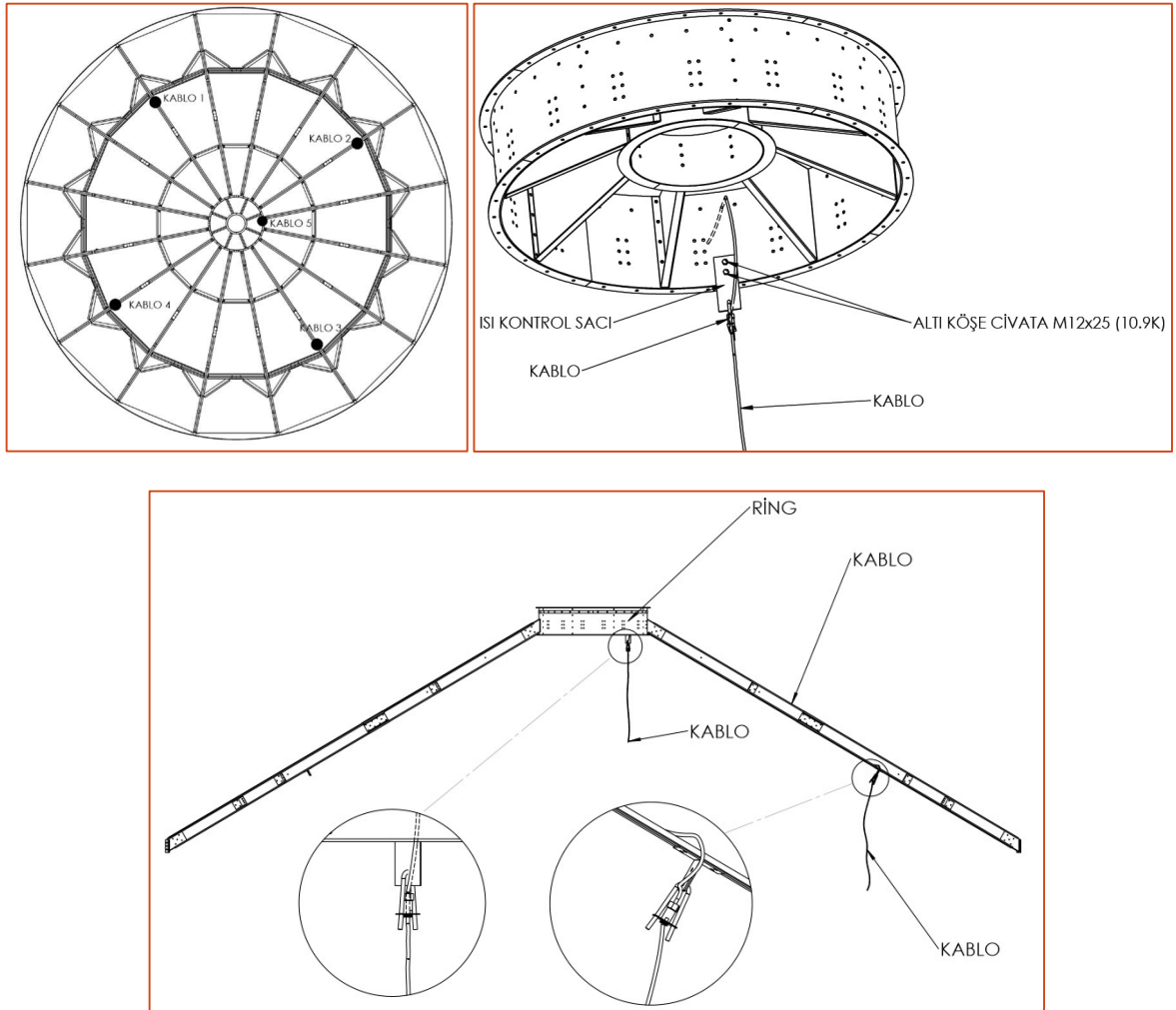


Figure 55 Temperature Monitoring Cable Connections

Place the temperature control plate in the appropriate place. Then drill the holes in the outer ring.

4.6.1 TEMPERATURE MONITORING FITTING

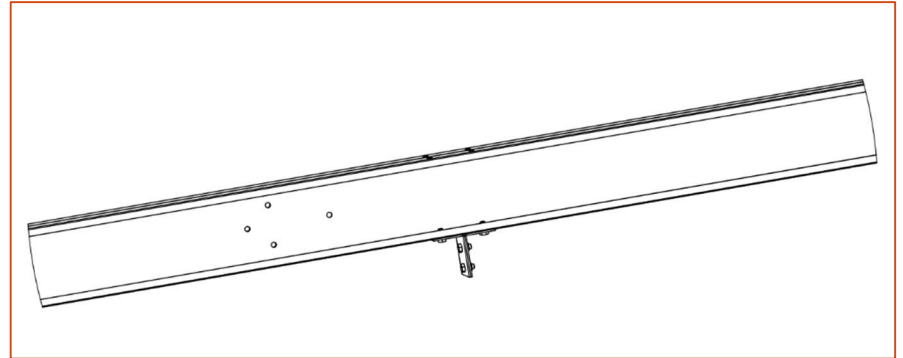
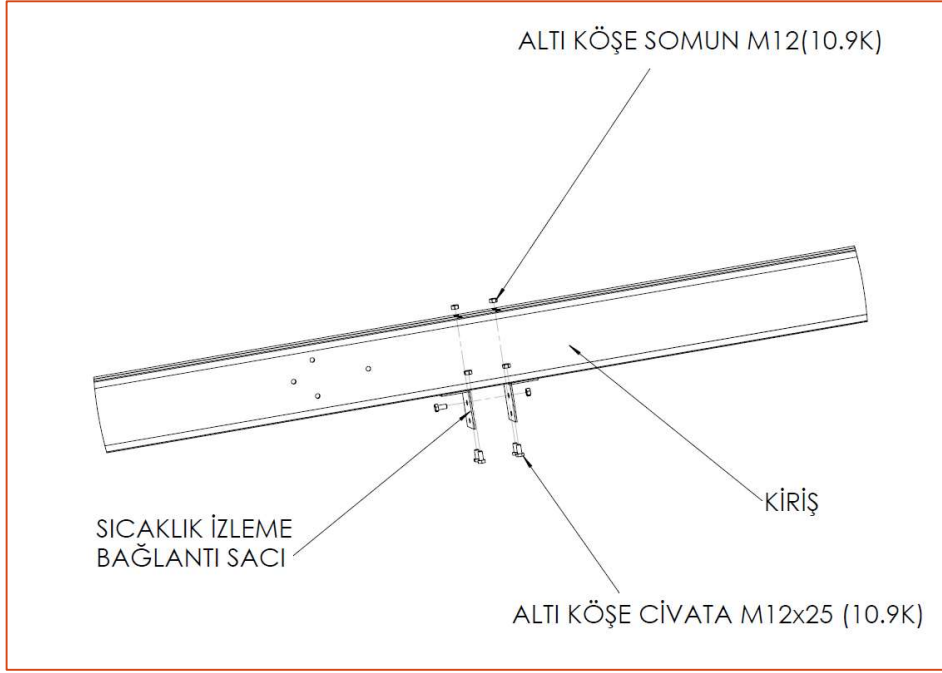


Figure 56 Temperature Monitoring Connection Sheet Connection Detail

4.6.2 TEMPERATURE MONITORING CABLE

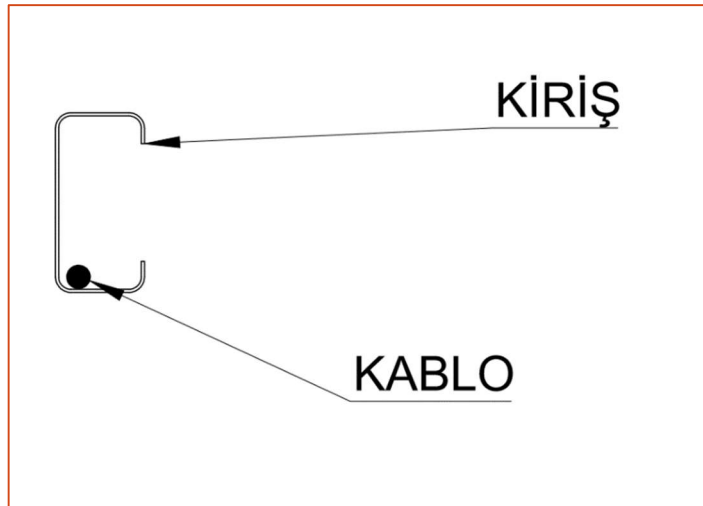
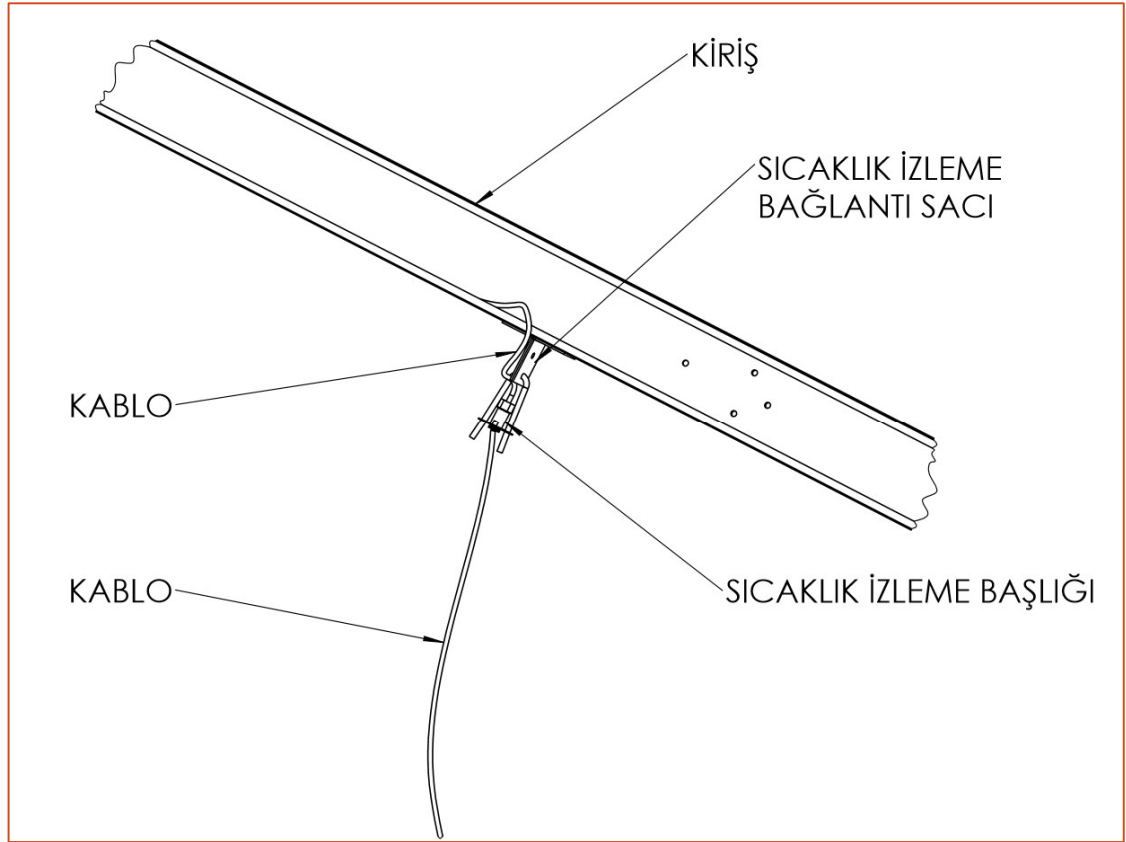


Figure 57 Temperature Monitoring Cable Connection Detail

Route the cable through the beam as shown

4.6.3 TEMPERATURE MONITORING CABLES EXIT FROM CREST RING

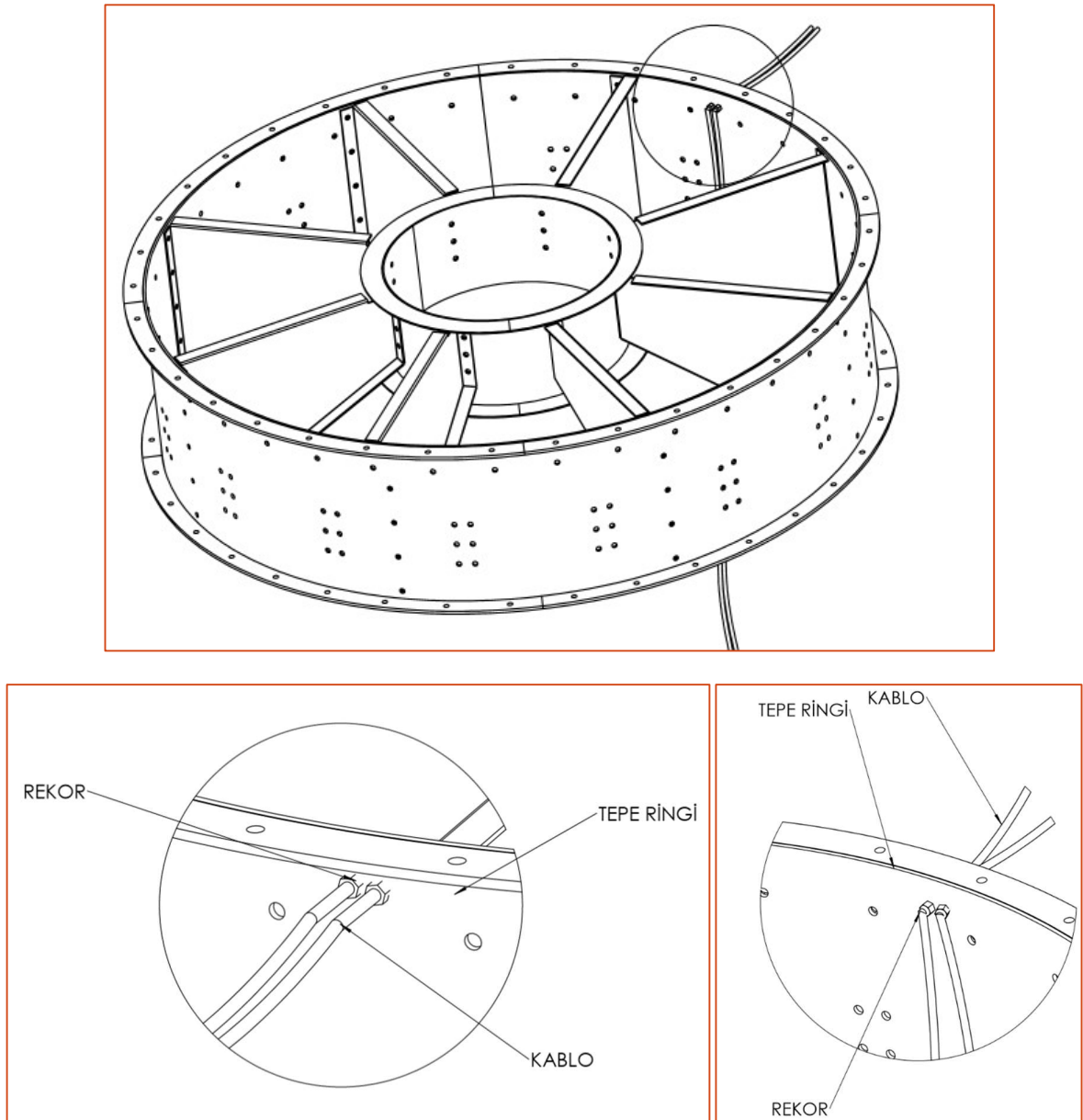


Figure 58 Temperature Monitoring Cables Output from Peak Ring Detail

Drill holes for bushings to a suitable location of the outer ring. Tighten the cables after passing through records.

The number of temperature monitoring sensors varies according to the silo model. A record of 33 is used.

4.7 ASSEMBLY OF SILO FILLING SENSOR

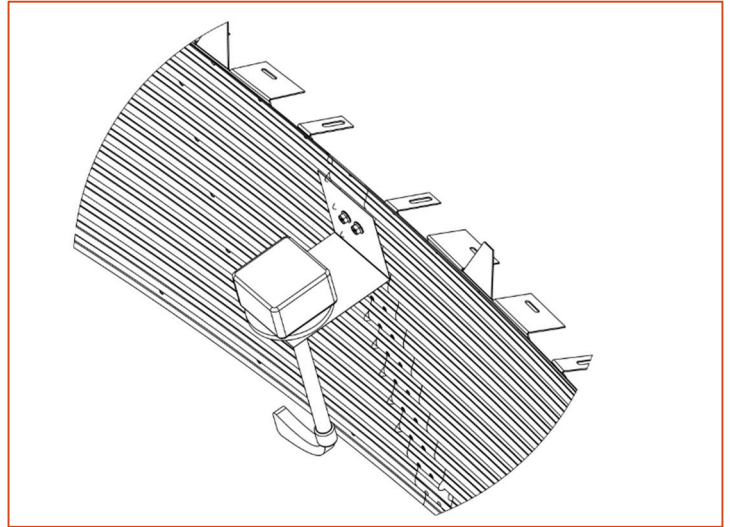
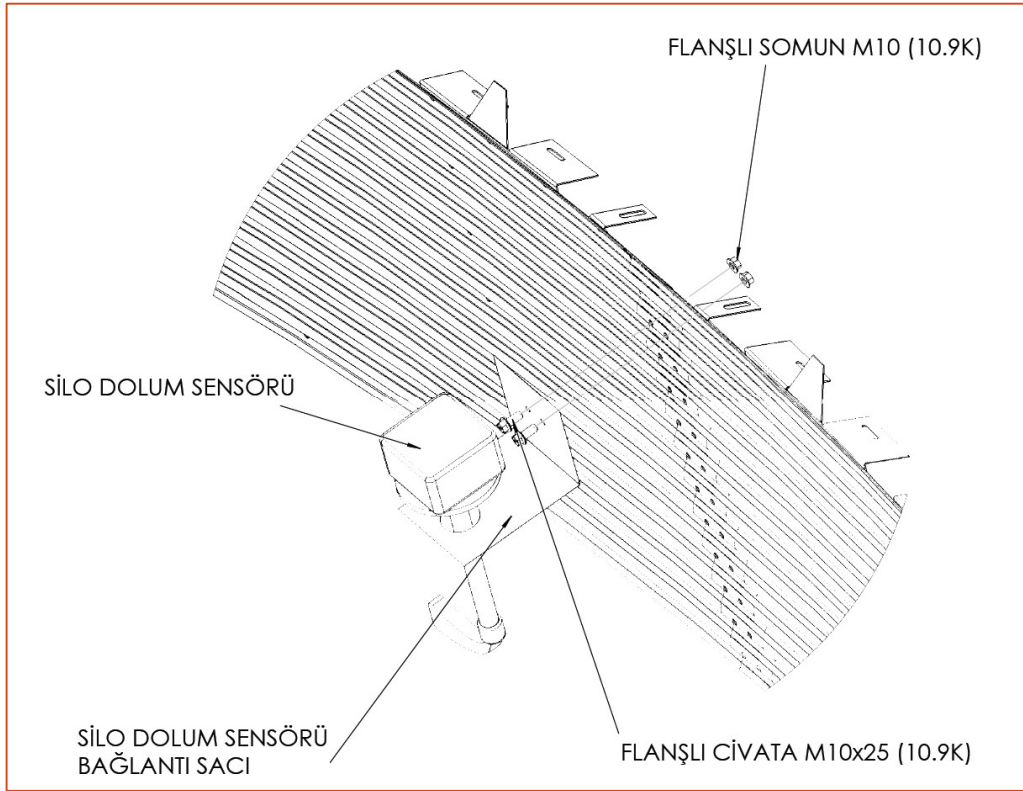


Figure 59 Silo Filling Sensor Connection Detail

