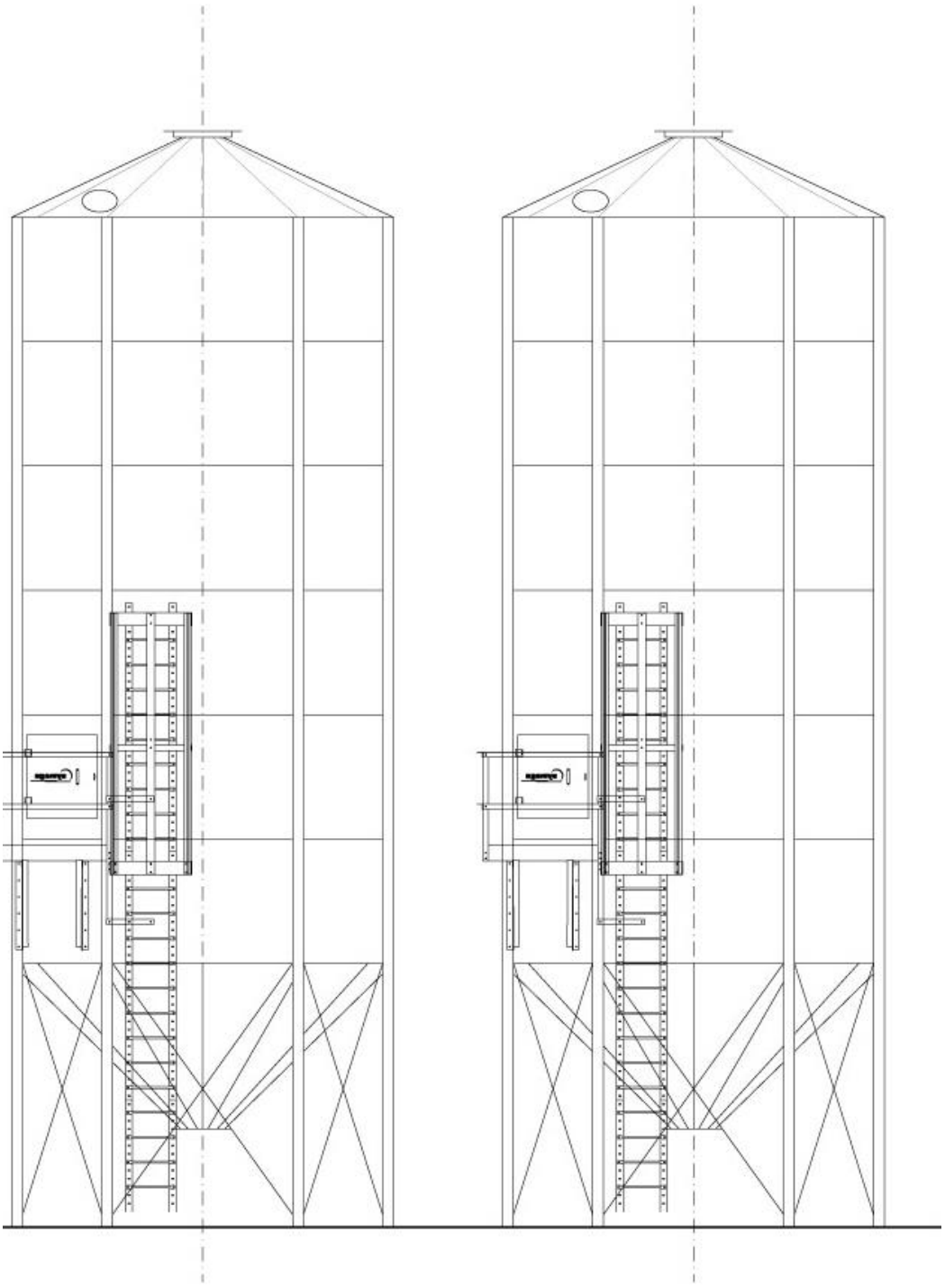
SYMAGA SILOS

SMALL HOPPER SILO

Ø6,10-4 T45 MEPU 6519



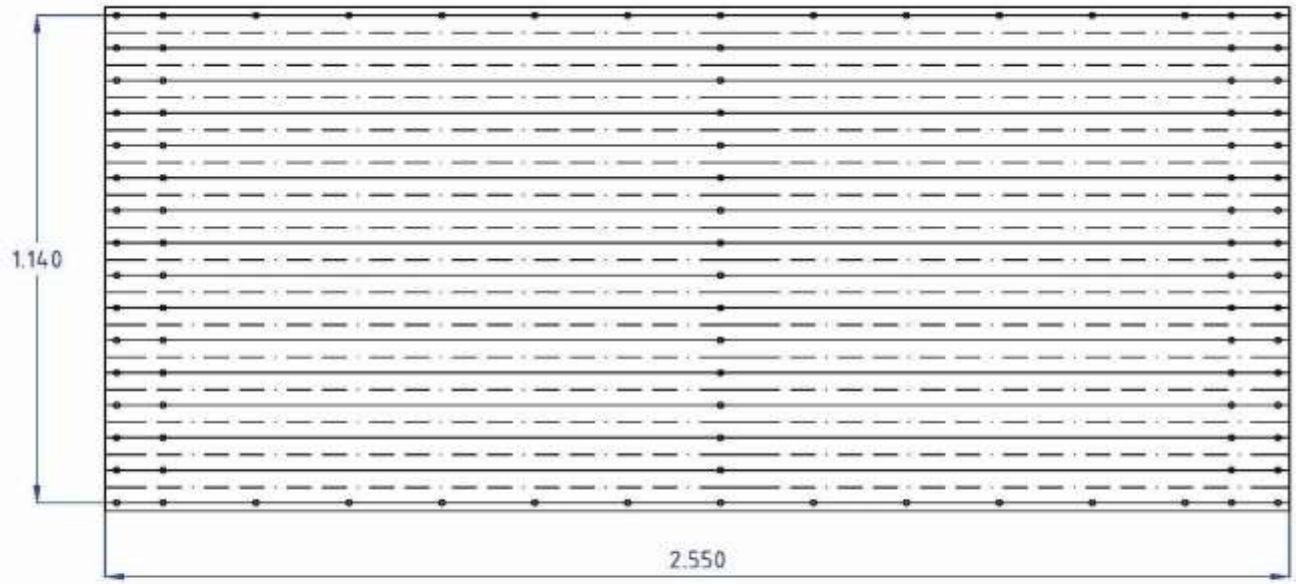
Assembly Instructions

MARK	DESCRIPTION	THICKNESS	QUANTITY
	ROOF		
120498	ROOF SHEET	0,8	18
120535	ROOF SHEET WITH CIRCULAR HOLE	0,8	6
110037	ROOF COLLAR	3	1
120244	ROOF CENTER COLLAR D800mm	5	1
120710	TOP FOR ROOF CENTER COLLAR D800mm FOR PROBE	3	1
120712	SUPPORT FOR PROBE	3	1
120261	REINFORCEMENT FOR TOP FOR ROOF CENTER COLLAR D800mm	3	4
111418	FLASHING FOR ROOF COLLAR R1080mm FOR 2 REINFORCEMENTS	0,8	4
120383	REINFORCEMENT CENTER COLLAR "U" 75x30x456mm	2	8
110038	FLASHING SHEET	0,8	24
110011	SMALL ROOF'S CLIP	2	24
110012A	LARGE ROOF'S CLIP	2	24
120692	ROOF LADDER RUNG L= 418mm	3	10
120691	ROOF LADDER RUNG L= 1100mm	3	6
120715A	RING FOR MANHOLE	2	1
110295	COVER FOR MANHOLE	2	1
120780	"U" HINGE FOR MANHOLE	3	1
120779	"U" FOR HINGE-MANHOLE	3	1
121811	WEATHER STRIP L=1500 mm		1
	BOLT 8 X 30 ISO 4017 GALVANISED C-8.8		380
	BOLT 10 X 25 ISO 4017 GALVANISED C-8.8		110
	NUT M-8 ISO 4032 GALVANISED C-8.8		380
	NUT M-10 ISO 4032 GALVANISED C-8.8		110
	FLAT WASHER M-8 ISO 7091 GALVANISED		270
	FLAT WASHER M-8 ISO 7093 GALVANISED		140
	FLAT WASHER M-10 DISO 7091 GALVANISED		110
	WEATHERSEAL WASHER M-8 GALVANISED		380
	WEATHERSEAL WASHER M-10 GALVANISED		110
	METRE OF PLASTILINE D 6mm		12
	BODYSHEET		
110000A	BODYSHEET 2 STIFFENERS DOUBLE JOINT	0,8	24
122302	BODYSHEET 2 STIFFENERS DOUBLE JOINT WITH LOGO SYMAGA	0,8	1
111091	BODYSHEET (1) WITH MANHOLE 2 STIFFENERS DOUBLE JOINT	1,5	1
110403	BODYSHEET BODY-HOPPER S460-535	1,8	8
	STIFFENERS		
111885	STIFFENER 1 BODYSHEET 75x1140mm	1,5	16
111886	STANDARD STIFFENER 2 BODYSHEETS 75x2280mm	1,5	16
111882	STIFFENER'S SPLICE 67x456mm	1,5	16
	BOLT 10 X 20 ISO 4017 GALVANISED C-8.8		1350
	BOLT 10 X 25 ISO 4017 GALVANISED C-8.8		1050
	NUT M-10 ISO 4032 GALVANISED C-8.8		2350
	WEATHERSEAL WASHER M-10 GALVANISED		1850
	FLAT WASHER M-10 DISO 7091 GALVANISED		1350
	METRE OF PLASTILINE D 6mm		108
	SILICONE TUBE		1
	COLD GALVANIZING SPRAY 985 ZINC		2
	HOPPER T45 WITHOUT RING		
111206	HOPPER CONE T45 D400	3 Y 5 mm	1
111201	HOPPERSHEET T45 D400	3	11
111759	HOPPERSHEET T45 D400 FOR FAN	3	5
110421	CLIP BODY-HOPPERSHEET T45	3	48
110406	LEG-HOPPERSHEET BRACKET T45	3	16
111202	BRACING CLIP	3	32
110229A	LEG BRACING CLIP	3	16
111203	HOPPERSHEET BRACING CLIP	3	16

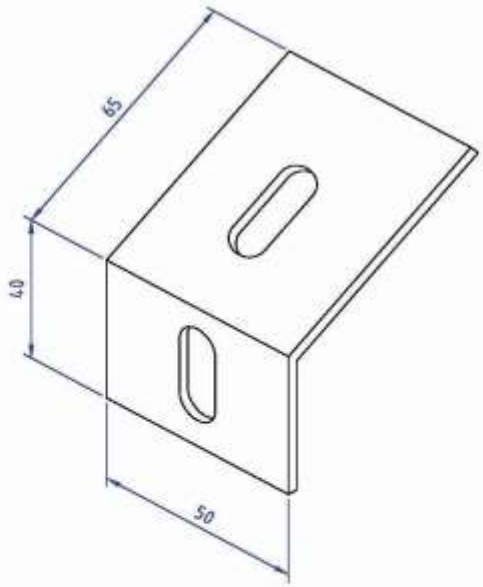
MARK	DESCRIPTION	THICKNESS	QUANTITY
111199	OUTSIDE LEG L= 6004mm	3	16
111200	INSIDE LEG L= 4864mm	3	16
120930	BRACING "U" 30x60x2842mm	3	32
120931	LEG-HOPPER BRACING "U" 30x60x1740mm	3	16
111484	ANCHOR PLATE FOR LEG 240x100x20mm D22	5 y 20 mm	16
	BOLT 10 X 25 ISO 4017 GALVANISED C-8.8		850
	BOLT 10 X 30 ISO 7380 GALVANISED C-8.8		1550
	NUT M-10 ISO 4032 GALVANISED C-8.8		2400
	FLAT WASHER M-10 DISO 7091 GALVANISED		1100
	WEATHERSEAL WASHER M-10 GALVANISED		1950
	METRE OF PLASTILINE D 6mm		100
	SILICONE TUBE		10
ROOF ACCESSORIES			
	INSULATOR FOR EAVE		24
	INSULATOR FOR WAVES OF ROOF SHEETS		24
HANDRAIL FOR ROOF LADDER			
120691	ROOF LADDER RUNG L= 1100mm	3	3
113915	HANDRAIL BRACKET	3	11
110026	GUSSET FOR HANDRAIL BRACKET	3	14
110129A	BANISTER L= 990mm	1,5	4
110059B	BANISTER L=1028mm	1,5	4
110058A	BANISTER L= 1488mm	1,5	6
	BOLT 10 X 20 ISO 4017 GALVANISED C-8.8		110
	NUT M-10 ISO 4032 GALVANISED C-8.8		110
LADDER TO ROOF			
119608	LADDER'S RAIL L= 1138mm	1,5	18
119714	LADDER'S RAIL L= 1326mm	1,5	2
119610	PLASTIC COVER FOR LADDER'S RAIL		4
119611	LADDER SUPPORT	3	10
119612	LADDER SUPPORT ON EAVE-RING-HOPPER	3	14
119613	UPPER SAFETY BAND	2	1
119614	SAFETY BAND	2	9
119616	LADDER RUNG L= 460mm	1,5	41
119617	"U" SAFETY L= 1140mm	2	54
119619	ANGLE TO FLOOR	3	7
119764	HANDRAIL	1,5	2
119620	HANDRAIL BRACKET LEFT TRANSITION	3	1
119622	HANDRAIL BRACKET RIGHT TRANSITION	3	1
	BOLT 8 X 20 ISO 4017 GALVANISED C-8.8		210
	BOLT 8 X 60 ISO 4017 GALVANISED C-8.8		100
	BOLT 10 X 40 ISO 4017GALVANISED C-8.8		10
	NUT M-8 ISO 4032 GALVANISED C-8.8		310
	NUT M-10 ISO 4032 GALVANISED C-8.8		10
	WEATHERSEAL WASHER M-10 GALVANISED		10
	FLAT WASHER M-8 ISO 7091 GALVANISED		310
	FLAT WASHER M-10 DISO 7091 GALVANISED		10
	SLEEVE ANCHOR M10x75		2
AERATION ROOF VENT			
119623	TOP COVER FOR AERATION	2	1
119624	BODY FOR AERATION	2	1
119625	SUPPORT CLIP	2	4
119626	MESH FOR AERATION		1
119627	FLANGE FOR AERATION	2	1
	BOLT 8 X 20 ISO 4017 GALVANISED C-8.8		40
	NUT M-8 ISO 4032 GALVANISED C-8.8		40
	FLAT WASHER M-8 ISO 7091 GALVANISED		40

MARK	DESCRIPTION	THICKNESS	QUANTITY
	WEATHERSEAL WASHER M-8 GALVANISED		40
	METRE OF PLASTILINE D 6mm		3,5
AERATION SYSTEM			
113112	PERFORATED SHEET 160x1064mm	1,5	10
110480	INSIDE STIFFENER FOR FAN	3	20
113113	ROOF FOR FAN DUCT L= 1064mm	3	5
113114A	LATERAL ANGLE FOR FAN DUCT L= 1145mm	3	10
121075	COVER WITH DEFLECTOR	3	5
112872	CONNECTION TO FAN		5
	FAN CMR-1240-2T/N, 5,5CV, 200/380V, 50Hz, LG-270		1
	ASPIRATION CLAMP WITH GRILL B-400/350/ESP		1
	BOLT 8 X 20 DIN 933 BI-CHROMATE C-5.6		400
	NUT M-8 DIN 934 BI-CHROMATE C-5.6		400
	FLAT WASHER M-8 DIN 125 BI-CHROMATE		400
	Mts. POLYETHILENE JOINT 10x3 mm		25
WALL SUPPORT 2U			
117803	WALL SILO ANGLE L= 250mm 101º	3	2
117815	WALL SUPPORT "U" 263x4028mm	3	2
117840	HORIZONTAL BRACING "U" 60x50x1120mm	3	8
117841	BRACING "U" 60x50x1362mm	3	8
117848	OMEGA 273x210x2400mm	3	1
	BOLT 10 X 25 ISO 4017 GALVANISED C-8.8		140
	NUT M-10 ISO 4032 GALVANISED C-8.8		140
	FLAT WASHER M-10 DISO 7091 GALVANISED		280
	WEATHERSEAL WASHER M-10 GALVANISED		60
DOCUMENTATION			
	xxxxx ingles manual 1		1

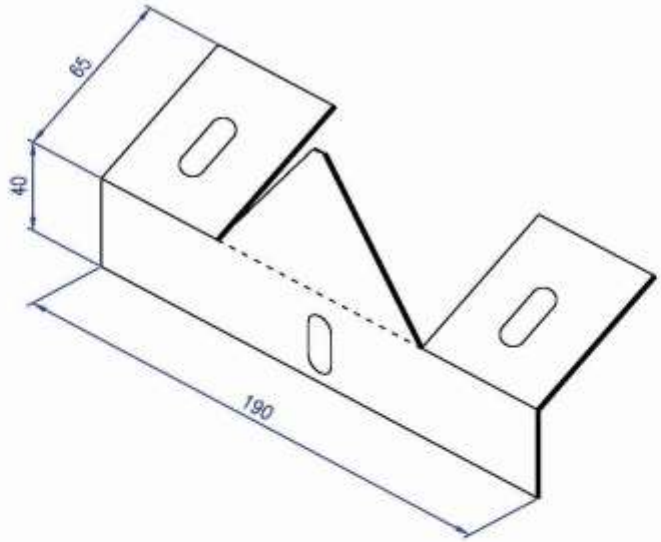
IDENTIFICATION OF MARKS



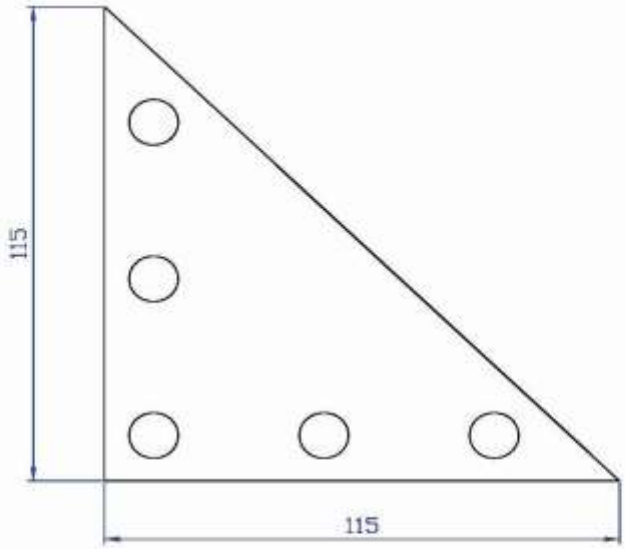
MARCA 110.000A	VIROLA 2 REFUERZOS DOBLE JUNTA
MARK 110.000A	BODYSHEET 2 STIFFENERS DOUBLE JOINT
MARQUE 110.000A	VIROLE 2 MONTANT DOUBLE JOINT



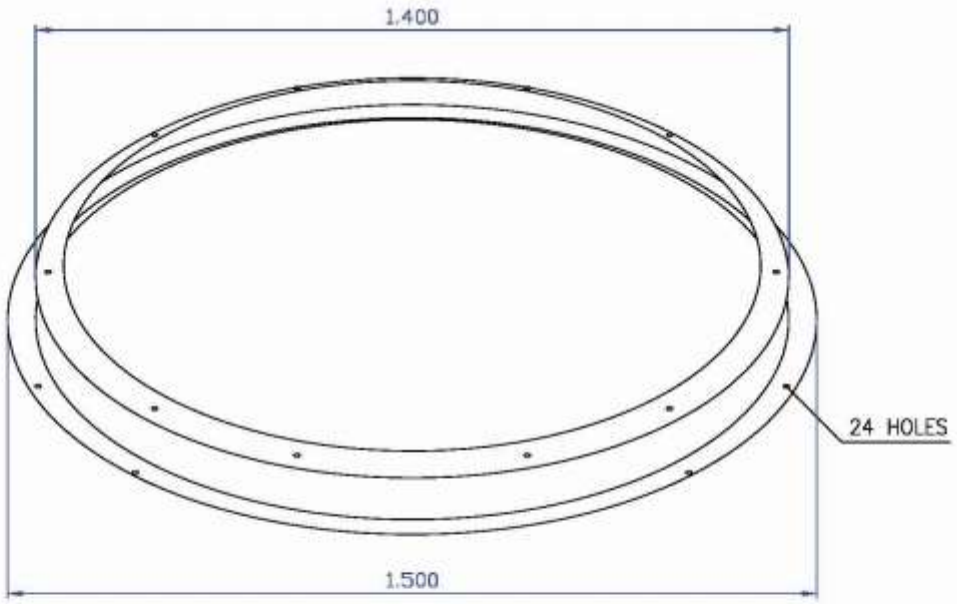
MARCA 110.011	CLIP NORMAL DE TECHO
MARK 110.011	SMALLROOF CLIP
MARQUE 110.011	CLIP PETIT



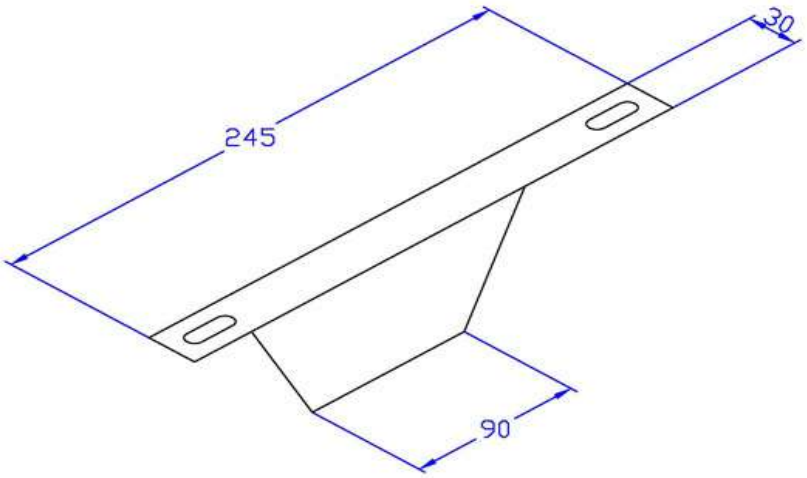
MARCA 110.012A CLIP DOBLE DE TECHO
MARK 110.012A LARGE ROOF CLIP
MARQUE 110.012A CLIP GRAND



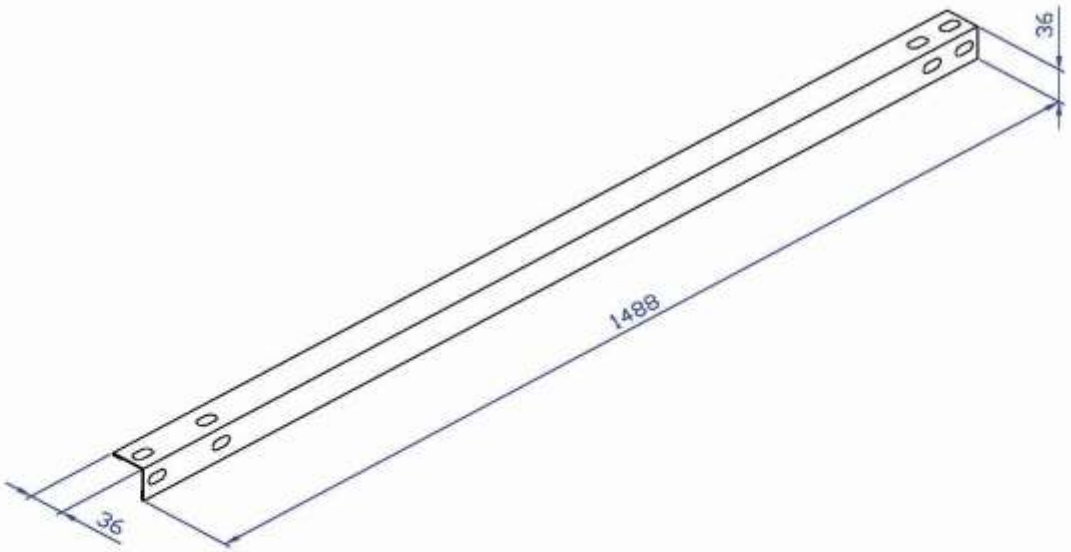
MARCA 110.026 CARTABON EN BARANDILLA TECHO
MARK 110.026 GUSSET
MARQUE 110.026 ECLIPSSE DE RAMBARDE



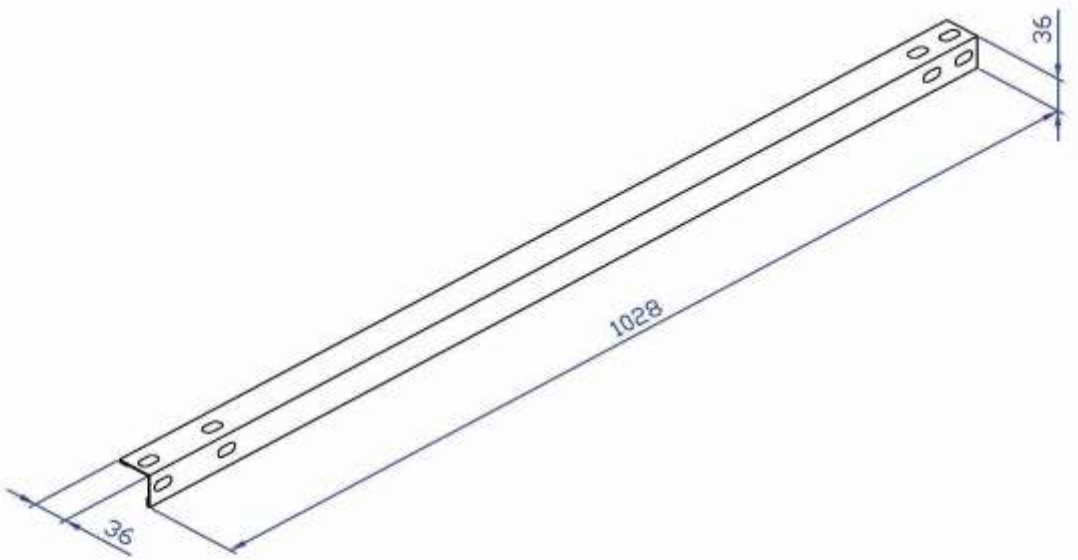
MARCA 110.037 COLLAR TECHO SILO 6,10Ø
MARK 110.037 ROOF COLLAR SILO 6,10Ø
MARQUE 110.037 COLLIER DU TOIT SILO 6,10Ø



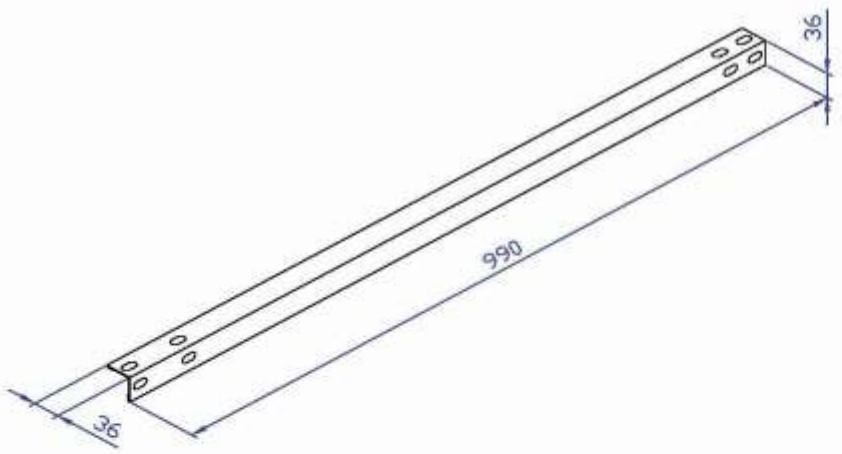
MARCA 110.038 CHAPA CIERRE SILO 6.10
MARK 110.038 CLOSE FLASHING SILO 6,10
MARQUE 110.038 TÔLE DE CLÔTURE SILO 6,10



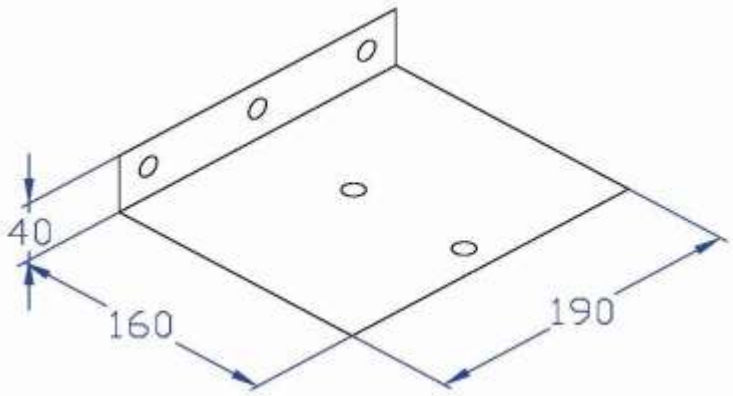
MARCA 110.058A ANGULAR BARANDILLA TECHO
MARK 110.058A HANDRAIL
MARQUE 110.058A ANGLE DE RAMBARDE



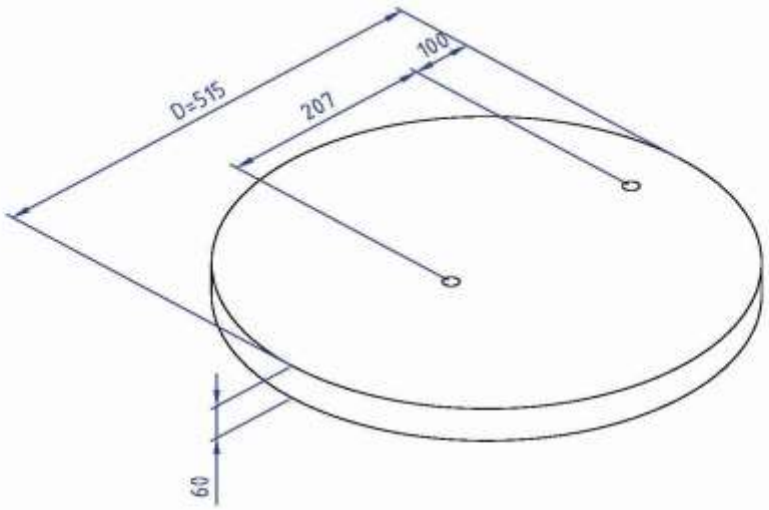
MARCA 110.059B ANGULAR BARANDILLA TECHO
MARK 110.059B HAND RAIL
MARQUE 110.059B ANGLE DE RAMBARDE



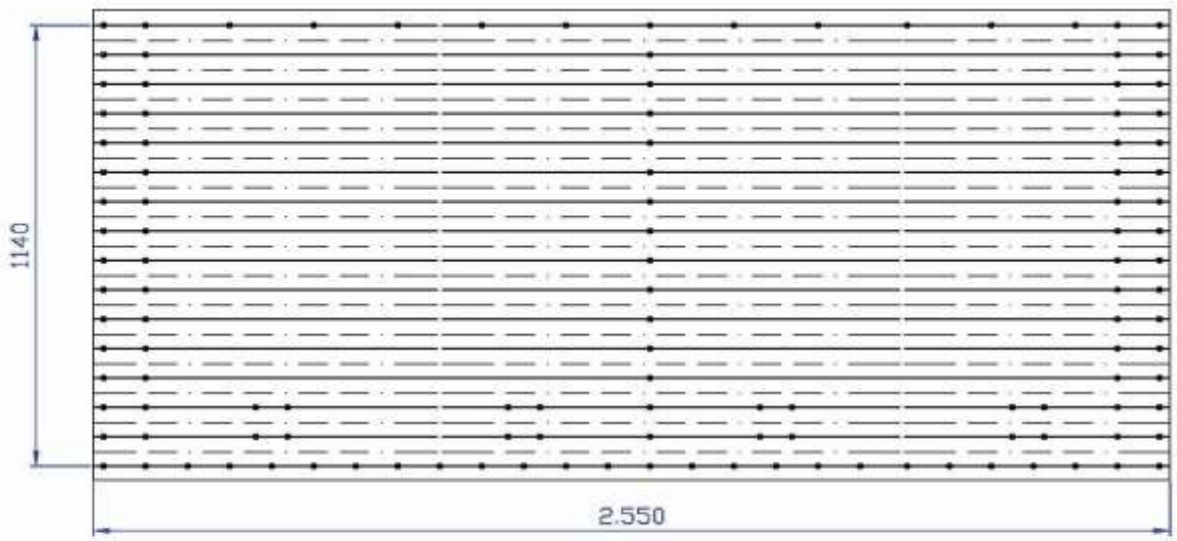
MARCA 110.129A ANGULAR BARANDILLA TECHO
MARK 110.129A HAND RAIL
MARQUE 110.129A ANGLE DE RAMBARDE



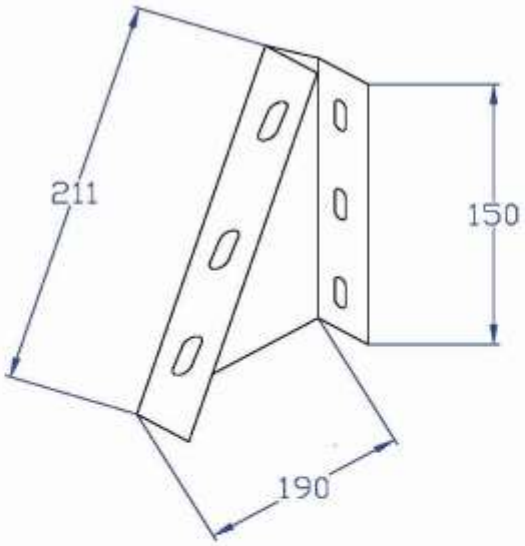
MARCA 110.229A CLIP PATA–UNIÓN TOLVA
MARK 110.229A LEG GUSSET
MARQUE 110.229A CLIP PIED



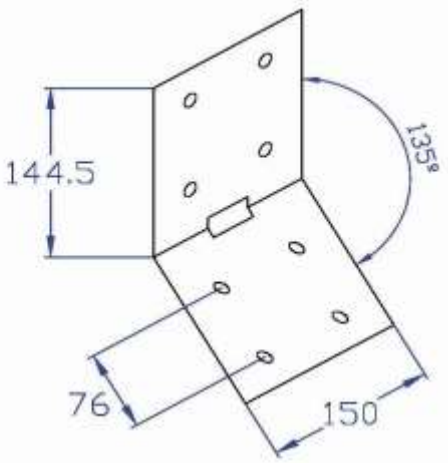
MARCA 110.295 TAPA PUERTA TECHO
MARK 110.295 COVER FOR MANHOLE
MARQUE 110.295 PORTE D'ACCESS



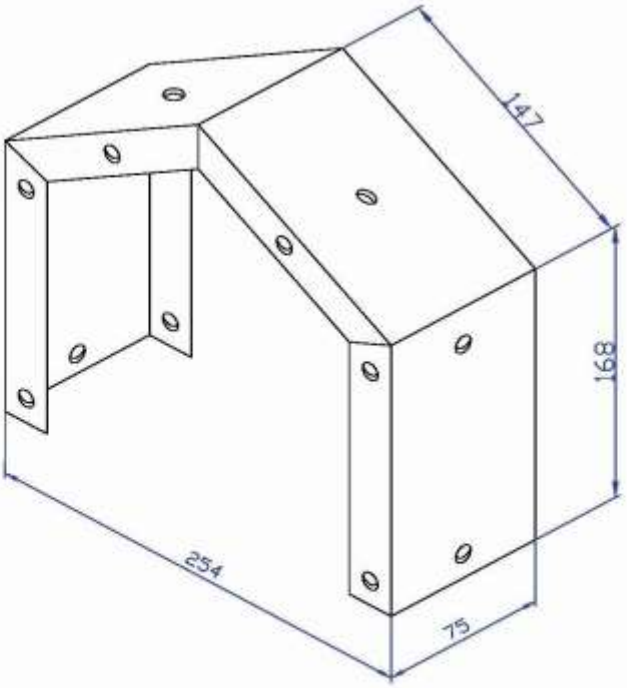
MARCA 110.403 VIROLA ARO–TOLVA
MARK 110.403 BODY–HOPPER BODYSHEET
MARQUE 110.403 VIROLE CORP–TREMIE



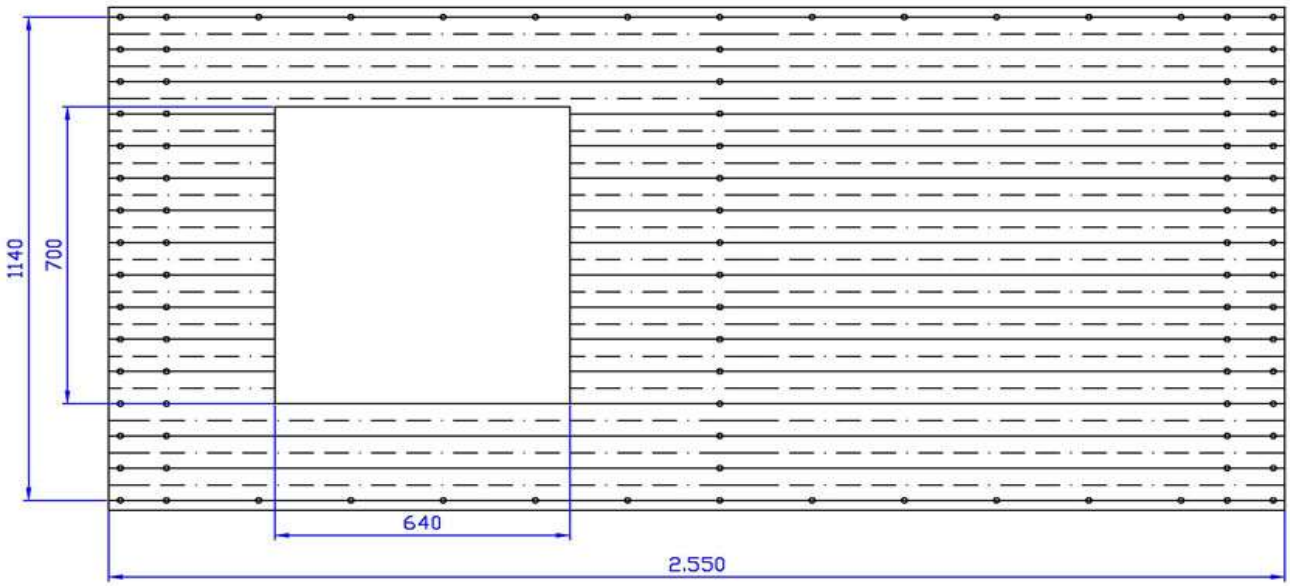
MARCA 110.406 CARTABÓN PATA–TOLVA
MARK 110.406 REINFORT LEG–HOPPER
MARQUE 110.406 EQUERRE TREMIE–PIED



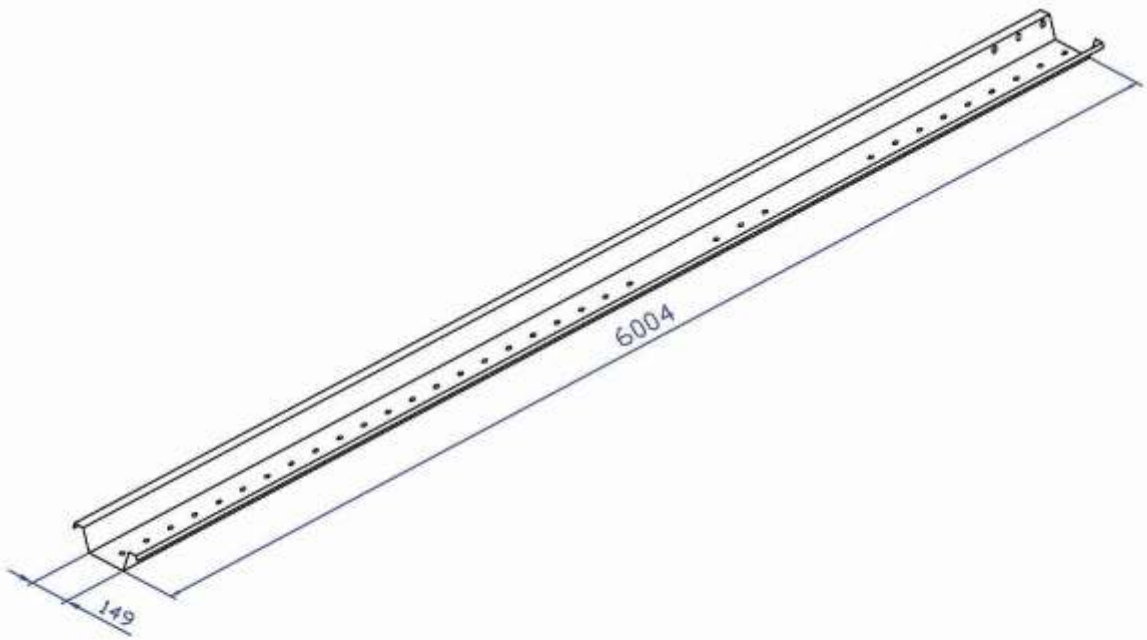
MARCA 110.421 CLIP UNIÓN VIROLA–TOLVA SILO T45
MARK 110.421 CLIP BODYSHEET–HOPPER T45
MARQUE 110.421 CLIP VIROLE–TREMIE SILO T45



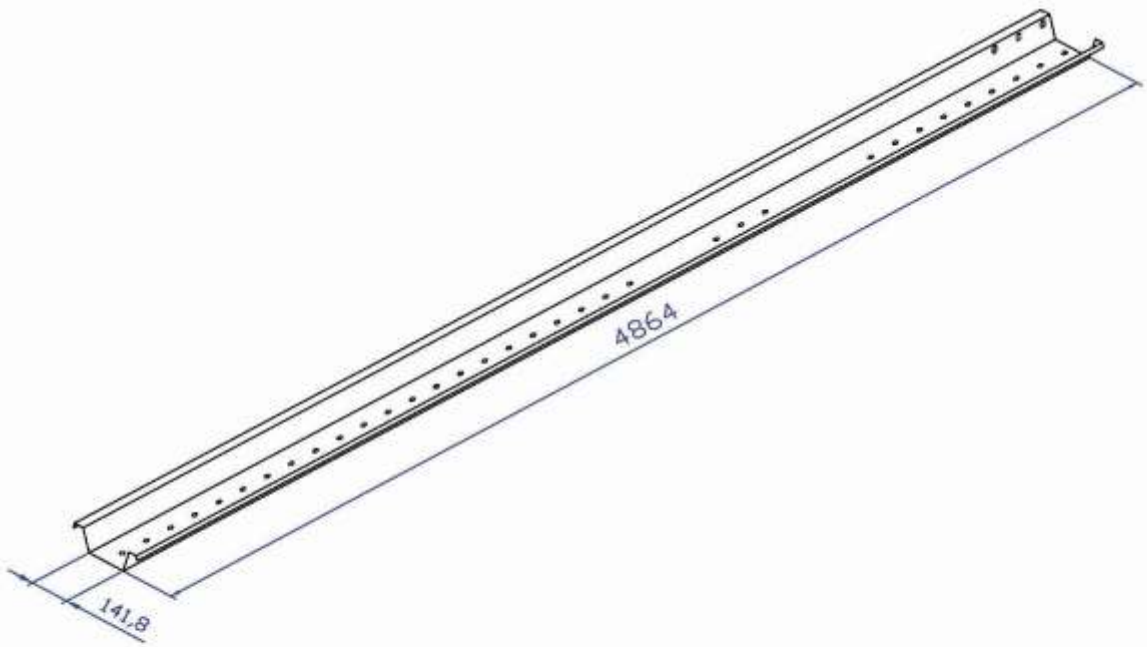
MARCA 110.480 REFUERZO INTERIOR TIPO CASETA
MARK 110.480 INSIDE STIFFENER TYPE HOME
MARQUE 110.480 RENFORT INTERIEUR TIPE MAISON



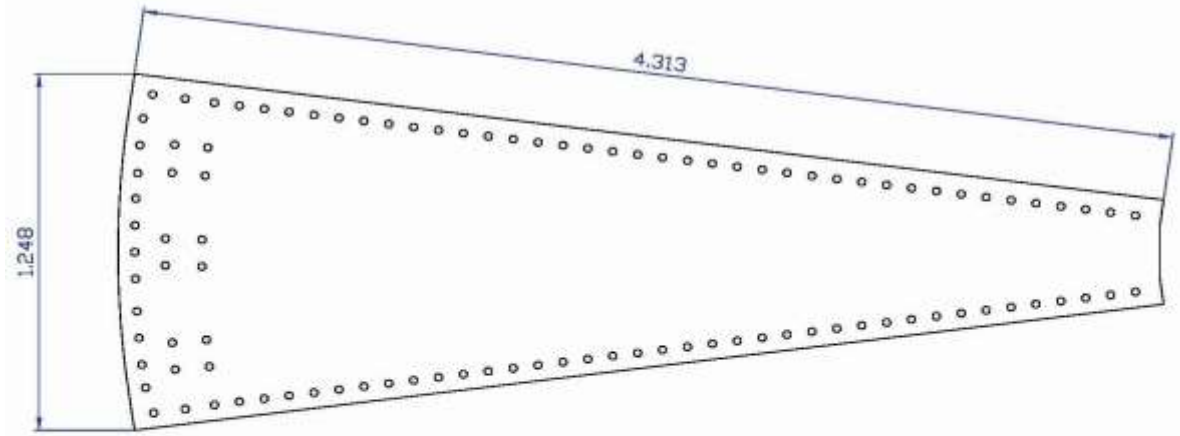
MARCA 111.091 VIROLA CON PUERTA 2 REFUERZOS DOBLE JUNTA
MARK 111.091 ACCESS BODYSHEET 2 STIFFENERS DOUBLE JOINT
MARQUE 111.091 VIROLE AVEC PORTE 2 MONTANT DOUBLE JOINT



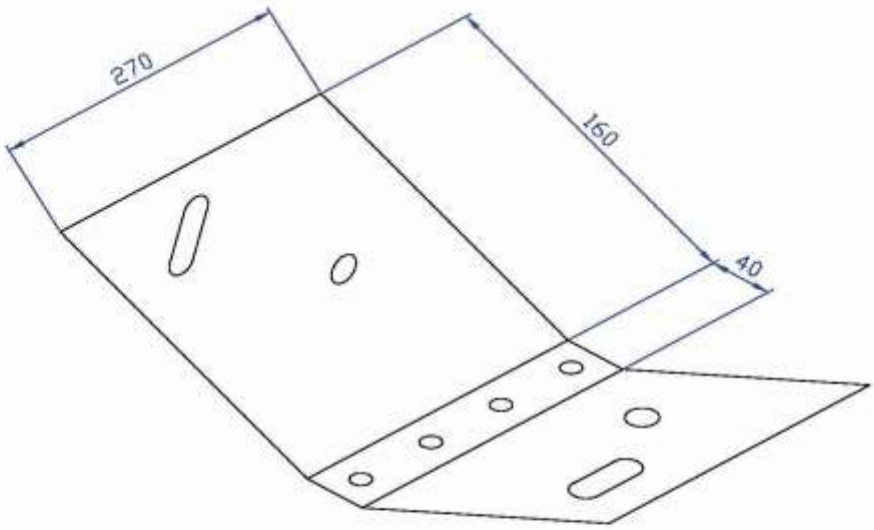
MARCA 111.199 PATA EXTERIOR
MARK 111.199 OUTSIDE LEG
MARQUE 111.199 PIED EXTERIEUR



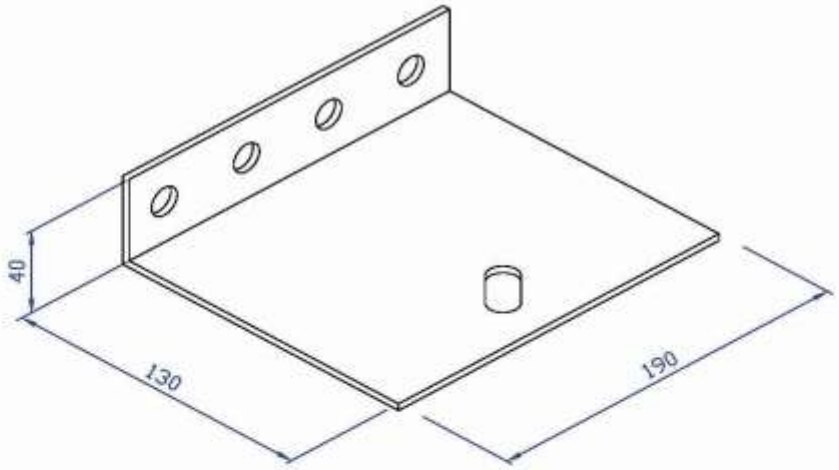
MARCA 111.200 PATA INTERIOR
MARK 111.200 INSIDE LEG
MARQUE 111.200 PIED INTERIEUR



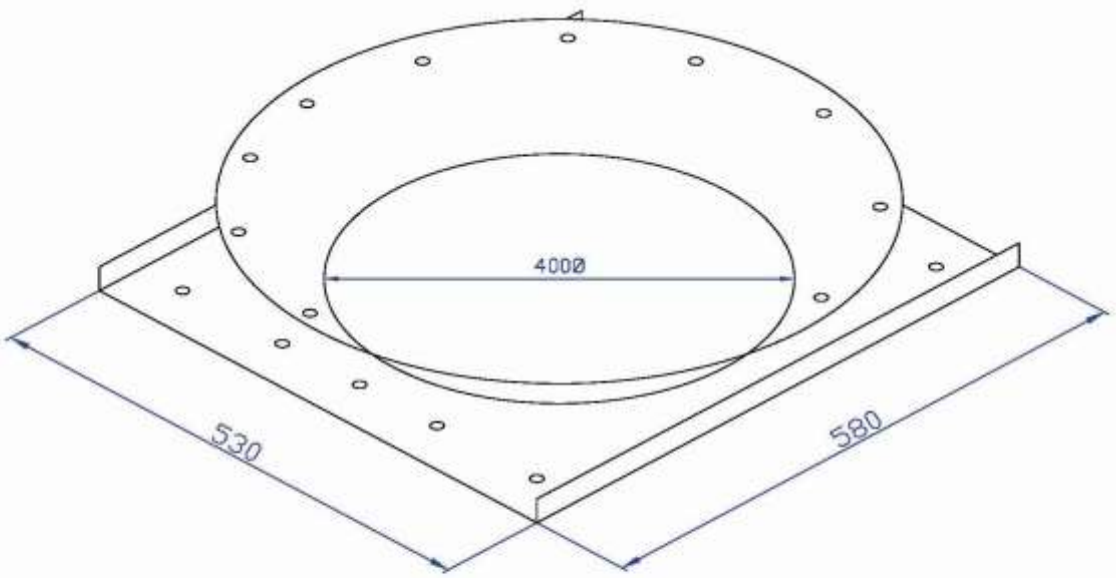
MARCA 111.201 SECTOR TOLVA SILO 610-T45
MARK 111.201 .....
MARQUE 111.201 .....



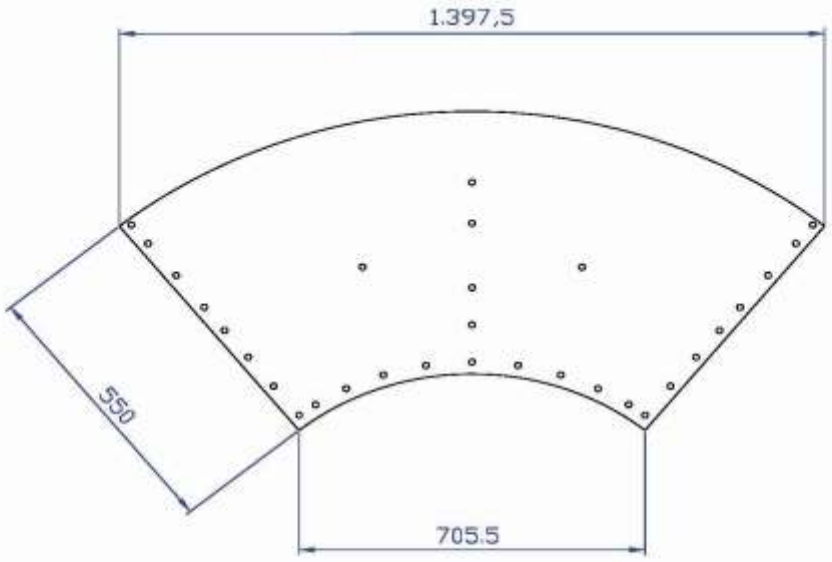
MARCA 111.202 CLIP ARRIOSTRAMIENTO
MARK 111.202 LEG GUSSET
MARQUE 111.202 CLIP



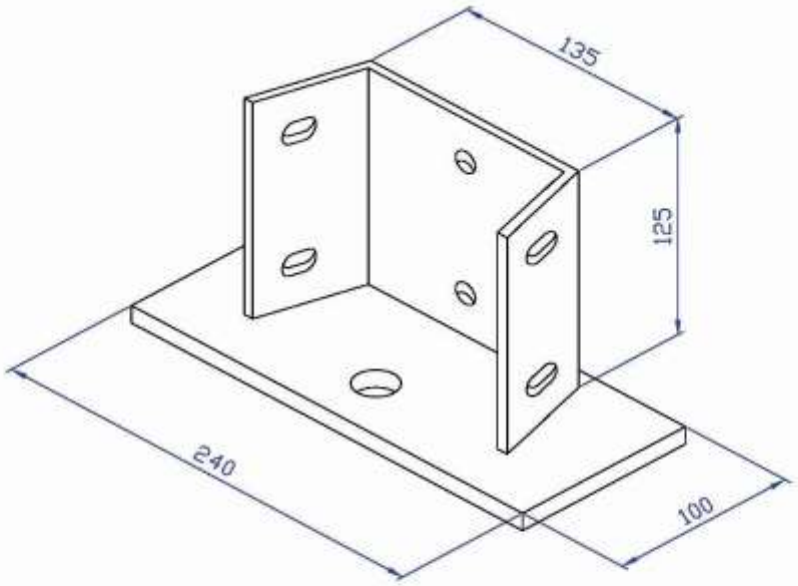
MARCA 111.203 CLIP UNION A TOLVA
MARK 111.203 CLIP FOR HOPPER
MARQUE 111.203 CLIP POUR TREMIE



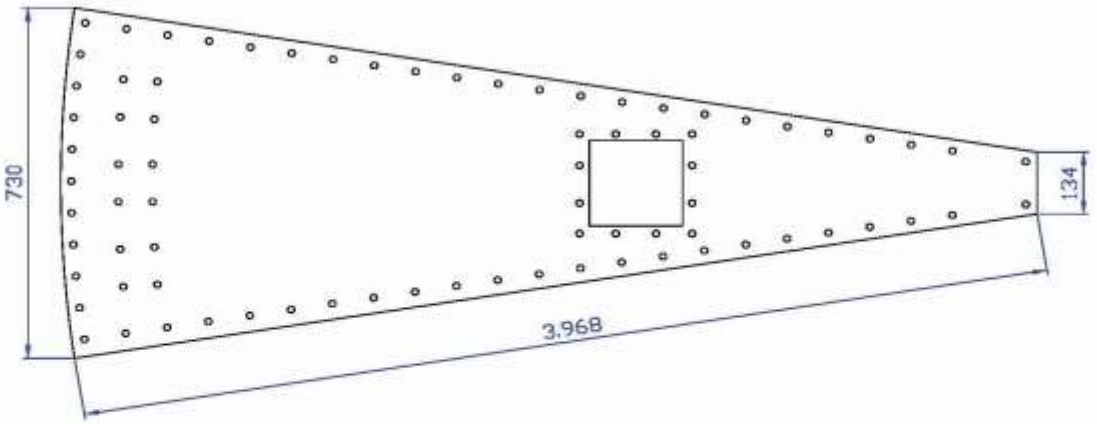
MARCA 111.206 BOCA SALIDA
MARK 111.206 HOPPER CONE
MARQUE 111.206 TREMIE DE SORTIE



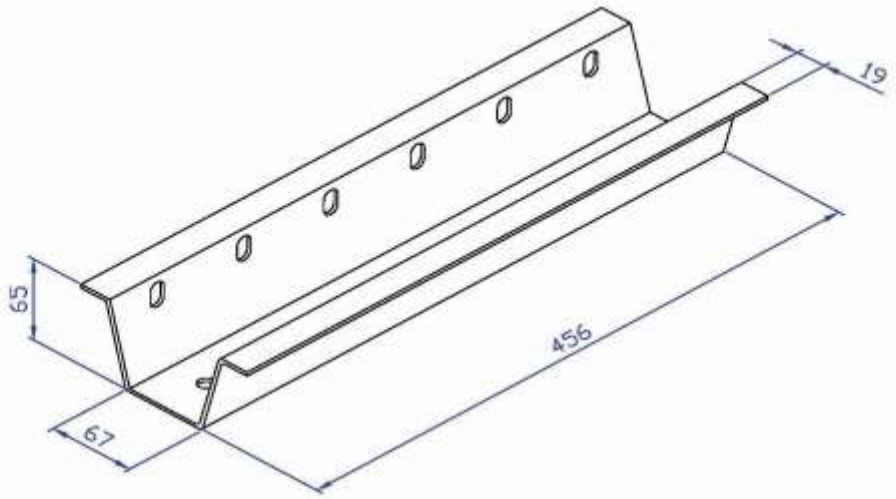
MARCA 111.418 FALDON PARA BOCA DE CARGA
MARK 111.418 FLASHING FOR ROOF CENTER COVER
MARQUE 111.418 BAVECHE POUR BOUCHE CHARGE



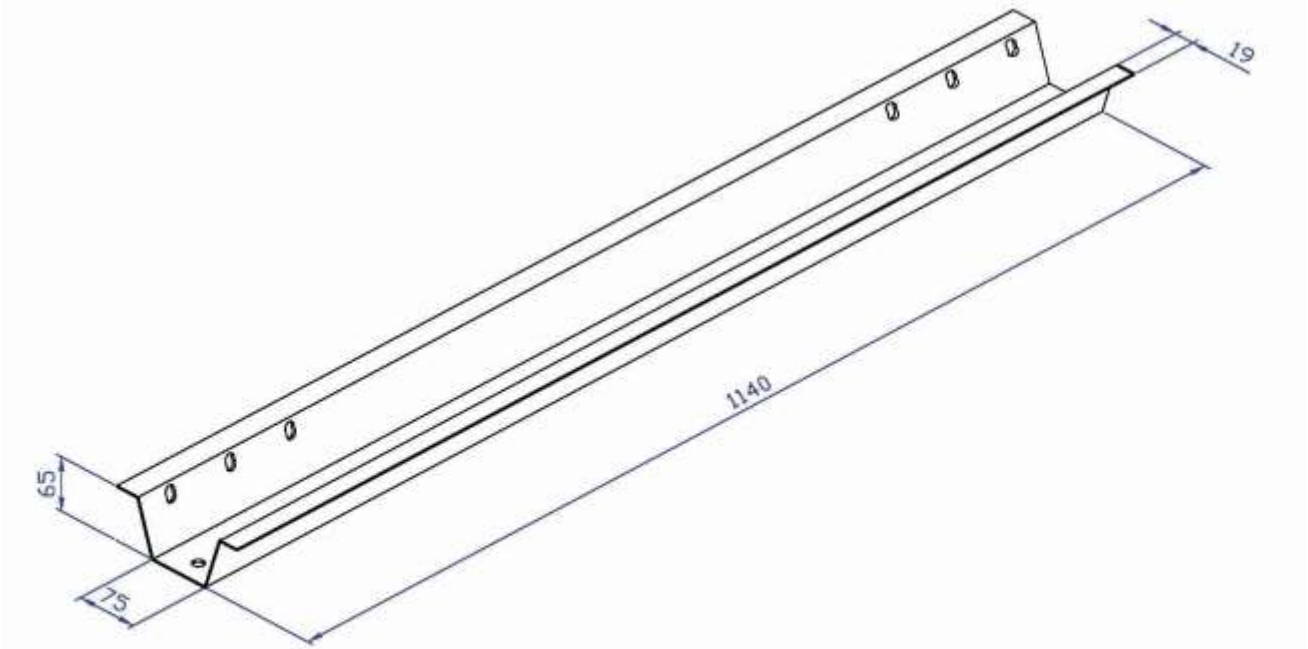
MARCA 111.484 PLACA DE ANCLAJE
MARK 111.484 ANCHOR PLATE
MARQUE 111.484 PLAQUE D'ANCRAGE



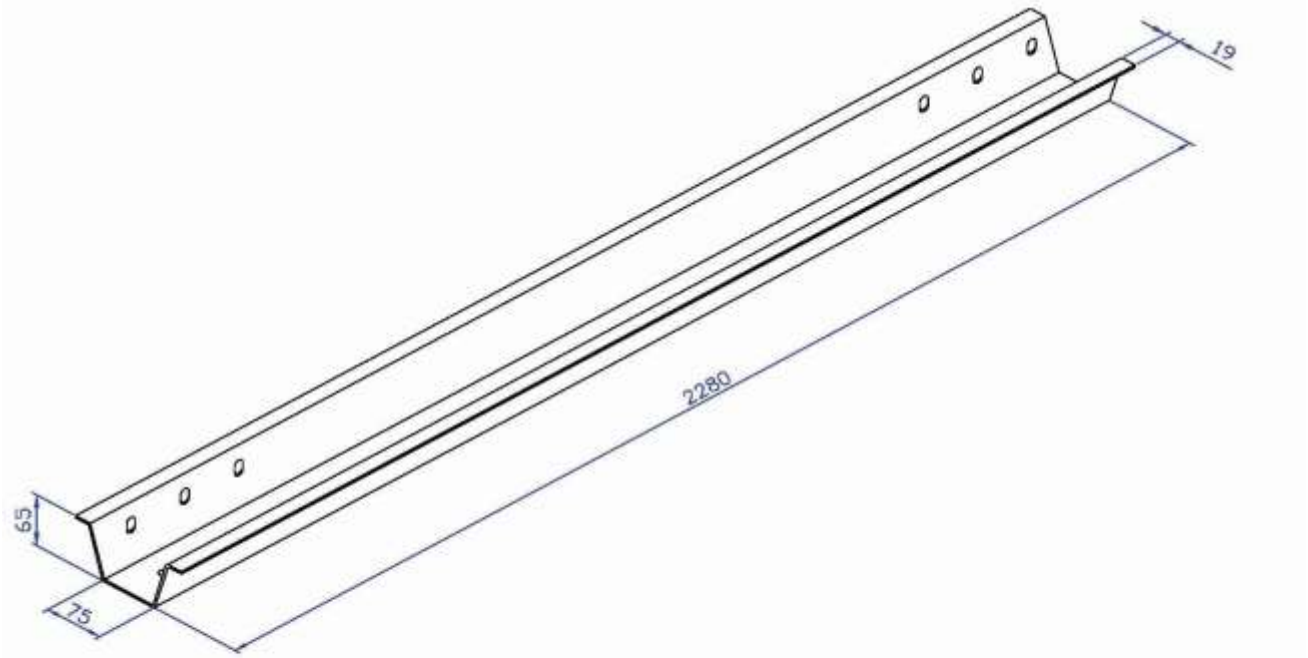
MARCA 111.759 SECTOR INFERIOR TOLVA CON AIREACION SILO 6,10Ø–T45
MARK 111.759 LOWER HOPPER SHEET WITH AERATION SILO 6,10Ø–T45
MARQUE 111.759 SECTEUR INFERIEUR TREMIE AVEC AERATION SILO 6,10Ø–T45



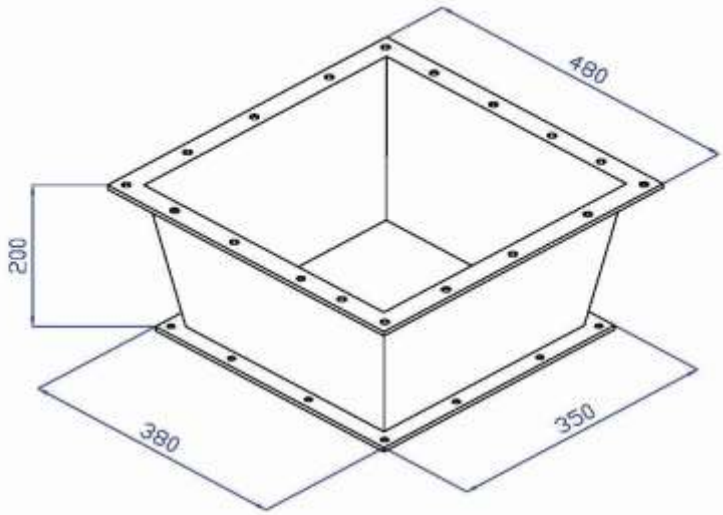
MARCA 111.882 EMPALME REFUERZO
MARK 111.882 SPLICE
MARQUE 111.882 ECLISSE



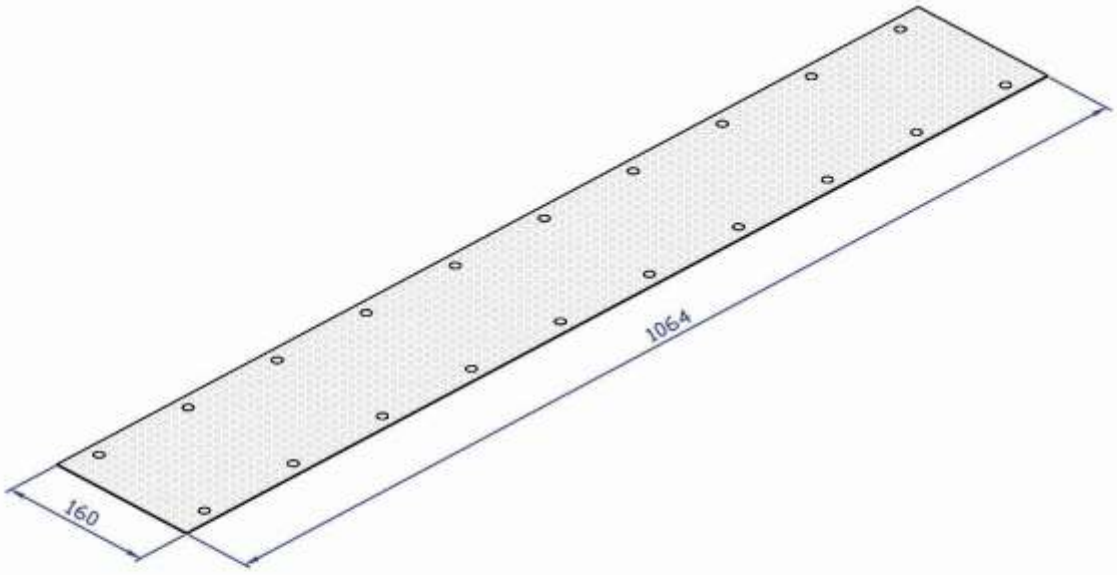
MARCA 111.885 REFUERZO CORTO
MARK 111.885 SHORT STIFFENER
MARQUE 111.885 MONTANT D'UNE VIROLE



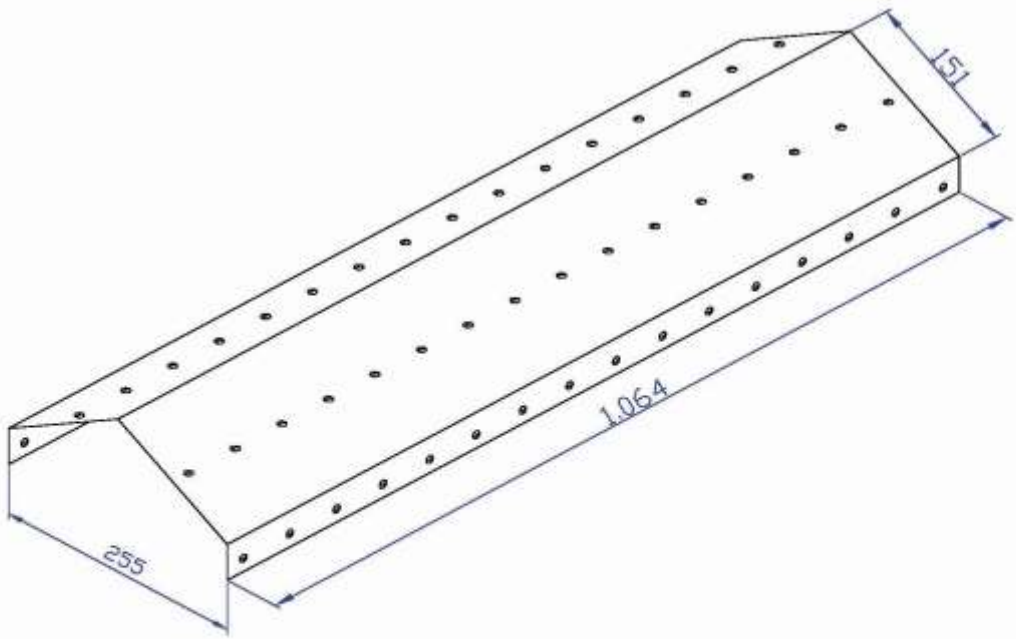
MARCA 111.886 REFUERZO NORMAL
MARK 111.886 STANDARD STIFFENER
MARQUE 111.886 MONTANT STANDARD



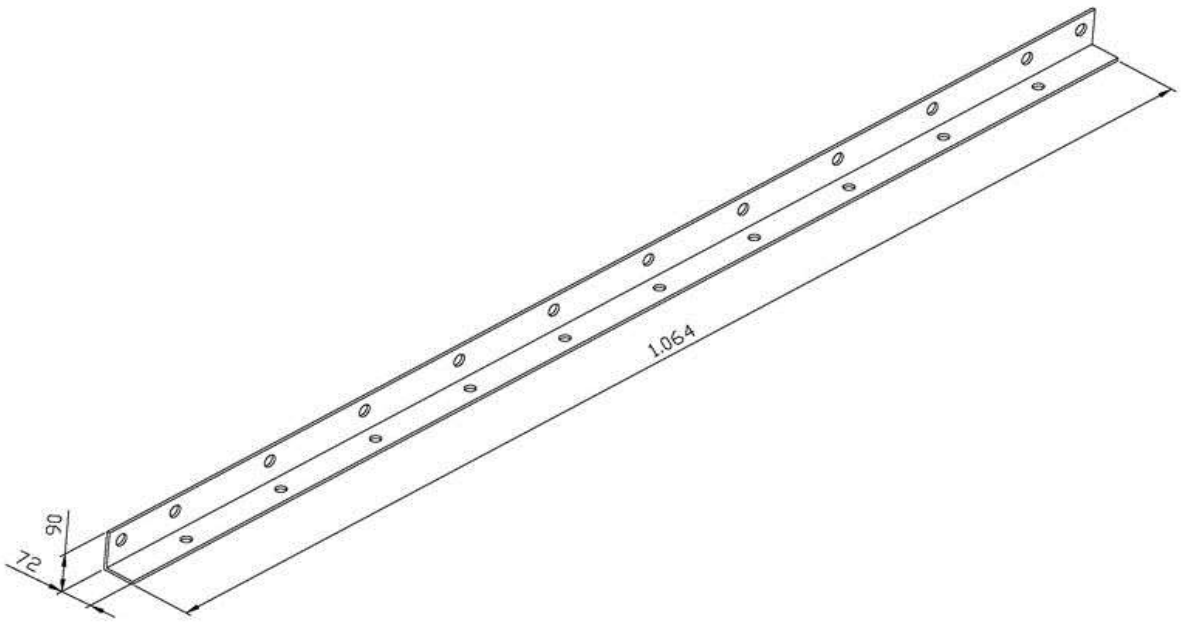
MARCA 112.872 CONEXION A VENTILADOR
MARK 112.872 FAN TRANSITION
MARQUE 112.872 .....



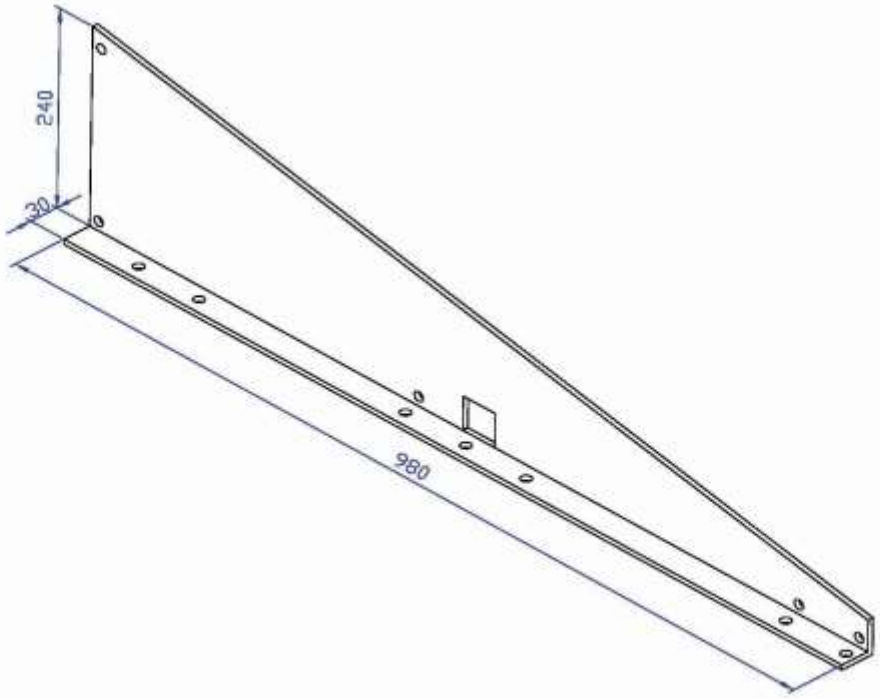
MARCA 113.112 CHAPA PERFORADA PARA CONDUCTO VENTILACION
MARK 113.112 PERFORATED SHEET
MARQUE 113.112 .....



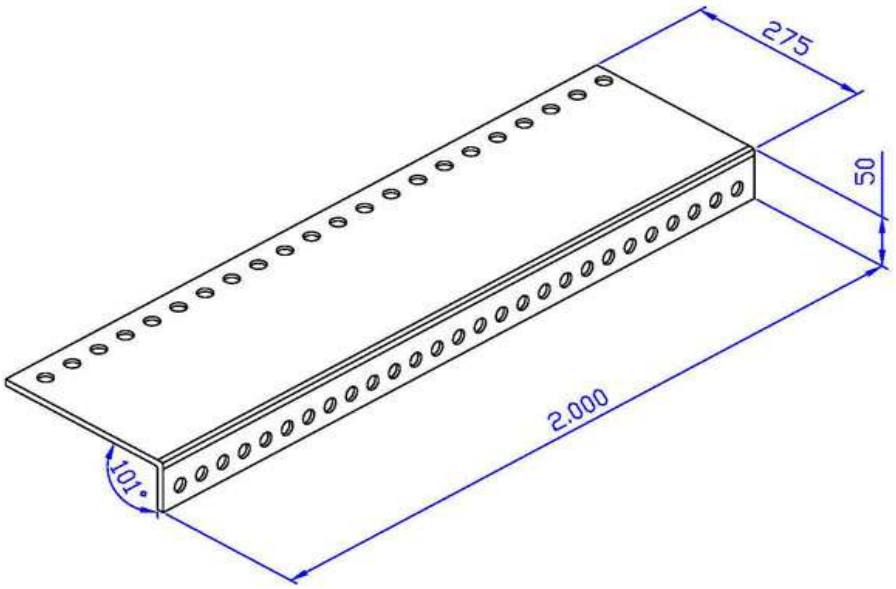
MARCA 113.113 TEJADO CONDUCTO VENTILACION
MARK 113.113 COVER TOP AERATION
MARQUE 113.113 TOIT AERATION



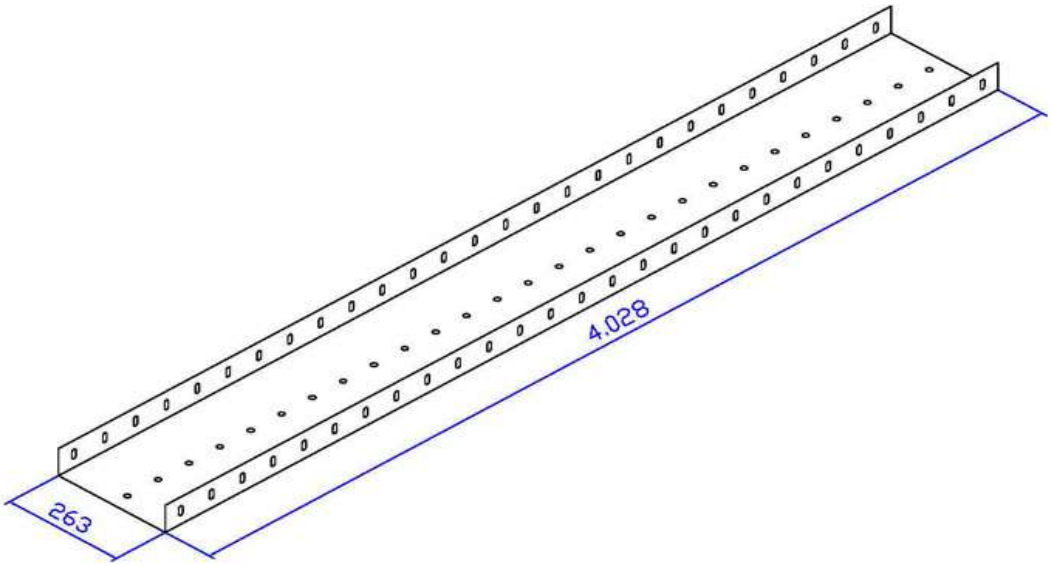
MARCA 113.114 A ANGULO LATERAL CONDUCTO VENTILACION
MARK 113.114 A LATERAL ANGLE
MARQUE 113.114 A LATERAL ANGLE



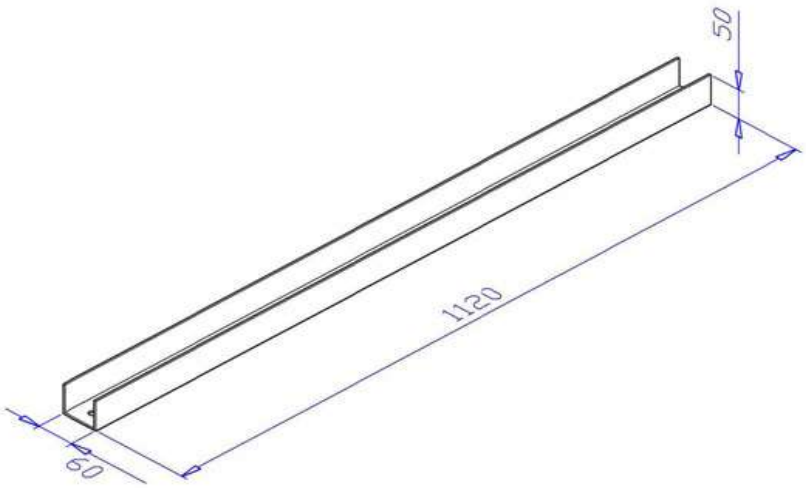
MARCA 113.915 CHAPA BARANDILLA DE TECHO
MARK 113.915 HANDRAIL BRACKET
MARQUE 113.915 POTEAU DE RAMBARDE DU TOIT



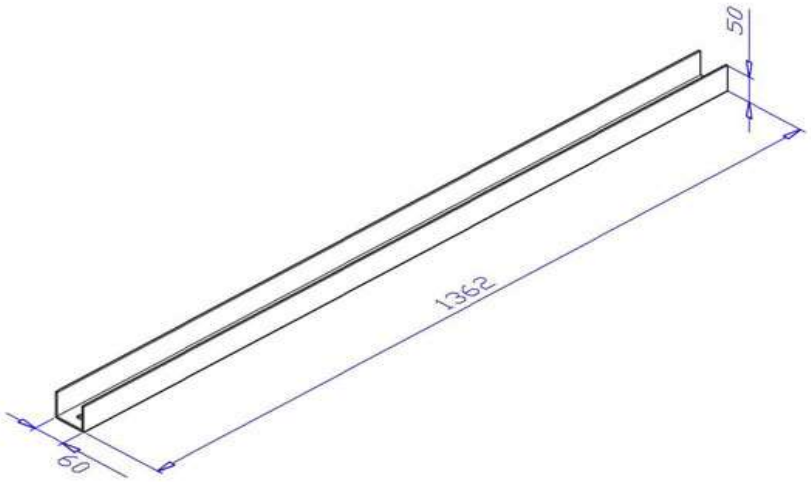
MARCA 117.803 ANGULO AMARRE A SILO ø6,10
MARK 117.803 WALL SILO ANGLE ø6,10
MARQUE 117.803 ANGLE ATTACHE AU PAROI ø6,10



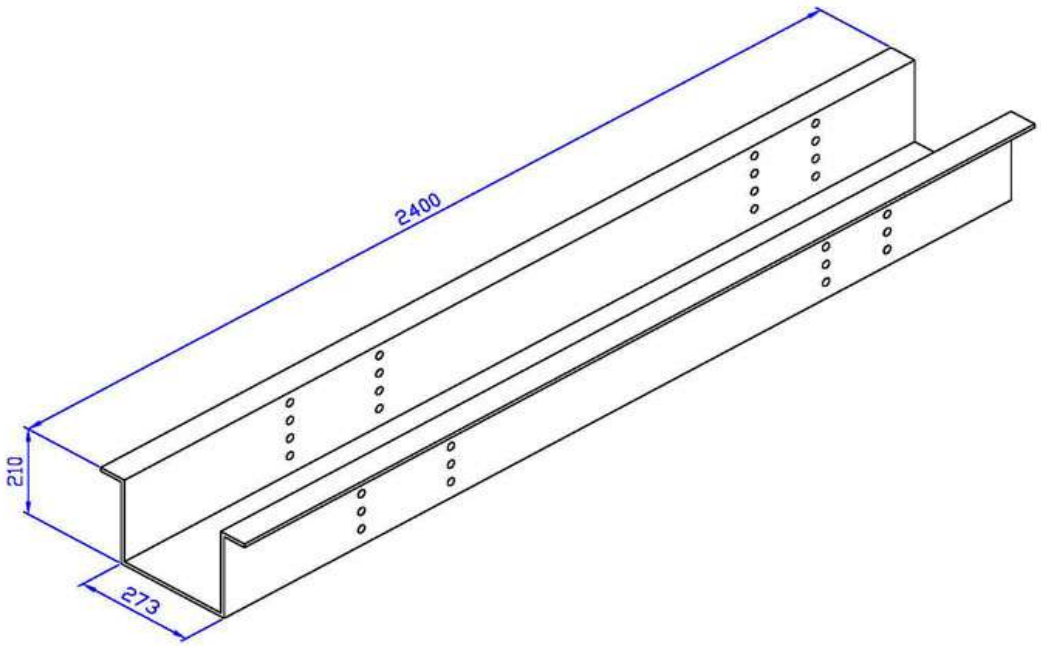
MARCA 117.815	"U" 263x4028 mm
MARK 117.815	"U" 263x4028 mm
MARQUE 117.815	"U" 263x4028 mm



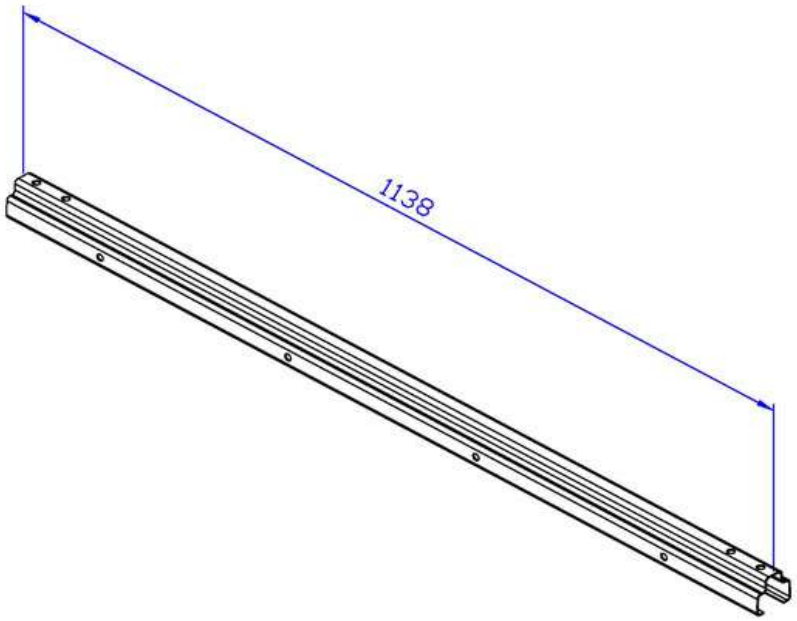
MARCA 117.840	"U" ARRIOSTRAMIENTO 60x50x1.120 mm.
MARK 117.840	"U" BRACING 60x50x1.120 mm.
MARQUE 117.840	"U" CONTREVENTEMENT 60x50x1.120 mm.



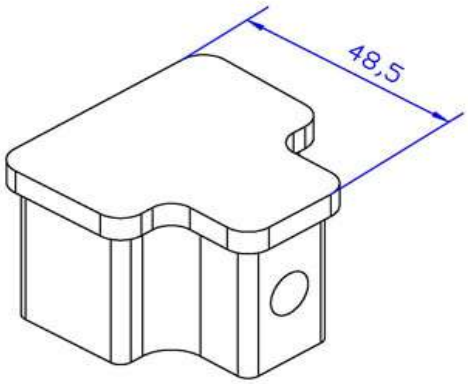
MARCA 117.841	"U" ARRIOSTRAMIENTO 60x50x1.362 mm.
MARK 117.841	"U" BRACING 60x50x1.362 mm.
MARQUE 117.841	"U" CONTREVENTEMENT 60x50x1.362 mm.



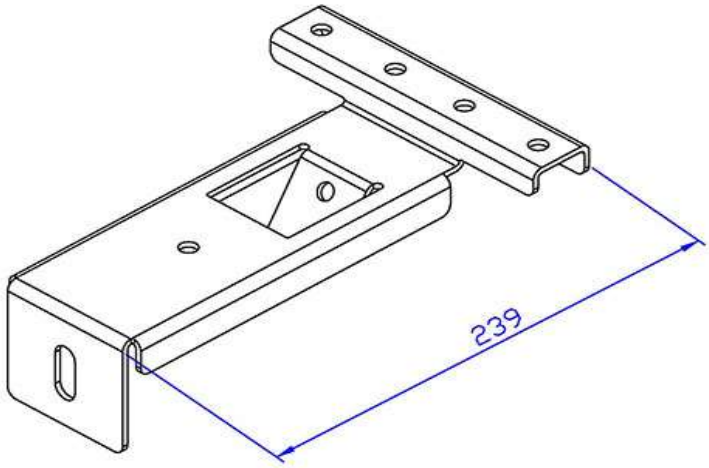
MARCA 117.848	OMEGA 273x210x2400 mm.
MARK 117.848	OMEGA 273x210x2400 mm.
MARQUE 117.848	OMEGA 273x210x2400 mm.



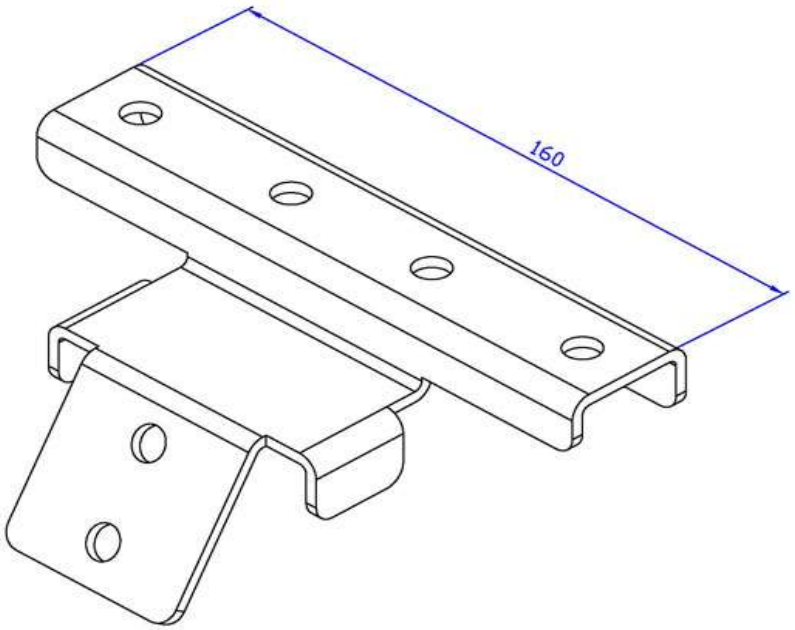
MARCA 119.608	RAIL ESCALERA L=1138 mm
MARK 119.608	LADDER'S RAIL L= 11386mm
MARQUE 119.608	RAIL D'ECHELLE L= 1138mm



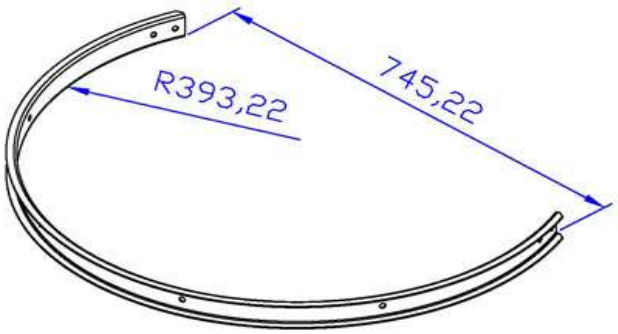
MARCA 119.610	TAPON PLASTICO RAIL ESCALERA
MARK 119.610	PLASTIC COVER FOR LADDER'S RAIL
MARQUE 119.610	COUVERTURE DU PLASTIQUE POUR L'ECHELLE



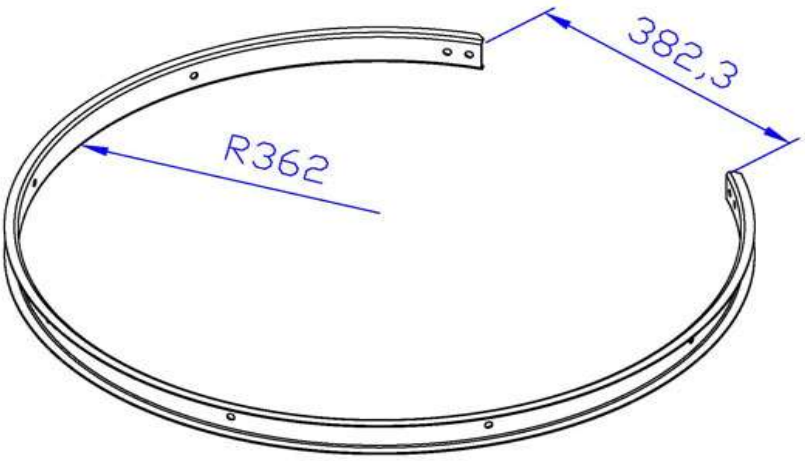
MARCA 119.611 SOPORTE DE RAIL
MARK 119.611 LADDER'S SUPPORT
MARQUE 119.611 SUPPORT D'ECHELLE



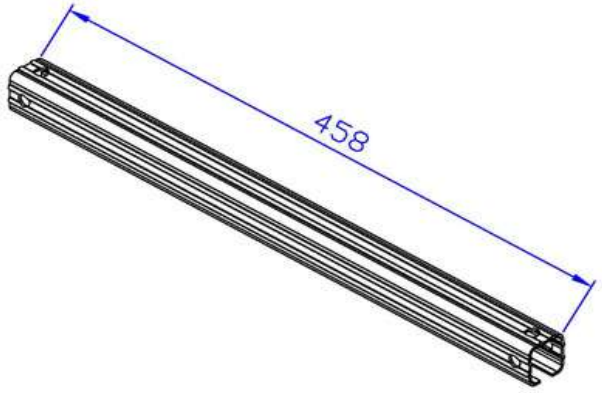
MARCA 119.612 SOPORTE RAIL ESCALERA ZONA ALERO–ANILLO–TOLVA
MARK 119.612 LADDER SUPPORT ON EAVE–RING–HOPPER
MARQUE 119.612 SOUPORT RAIL D'ECHELLE ZONE AUVENT–ANNEOU–TREMIE



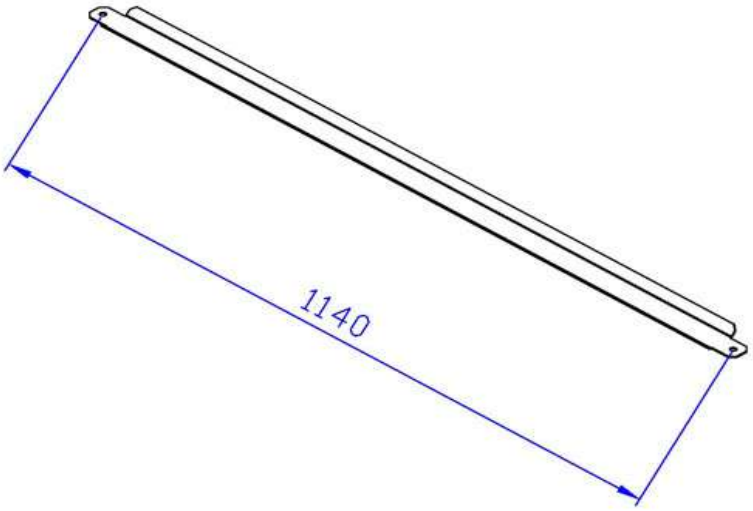
MARCA 119.613	FAJA DEFENSA SUPERIOR
MARK 119.613	UPPER SAFETY BAND
MARQUE 119.613	BANDE DE PROTECTION SUPERIEUR



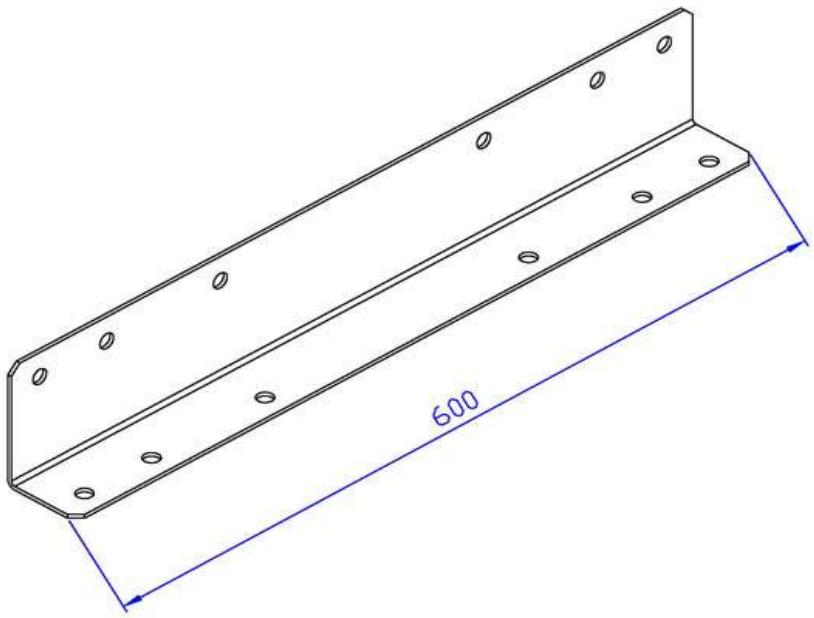
MARCA 119.614	FAJA DE DEFENSA
MARK 119.614	SAFETY BAND
MARQUE 119.614	BANDE DE PROTECTION



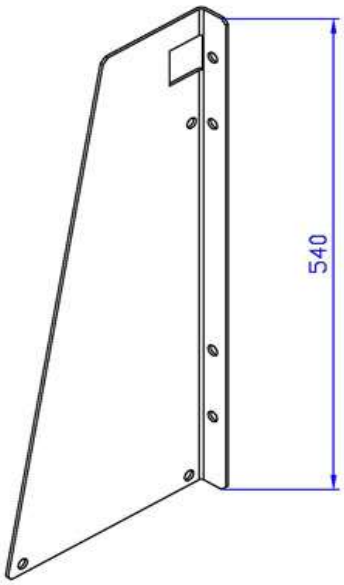
MARCA 119.616 PELDAÑO L= 460mm
MARK 119.616 LADDER RUNG L= 460mm
MARQUE 119.616 MARCHE POUR ECHELLE L= 460mm



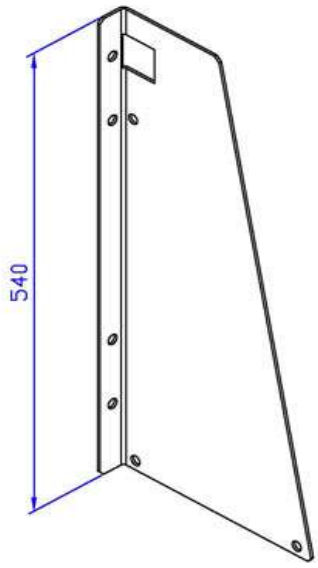
MARCA 119.617 "V" DEFENSA L=1140mm
MARK 119.617 "V" SAFETY L= 1140mm
MARQUE 119.617 "V" PROTECTION L= 1140mm



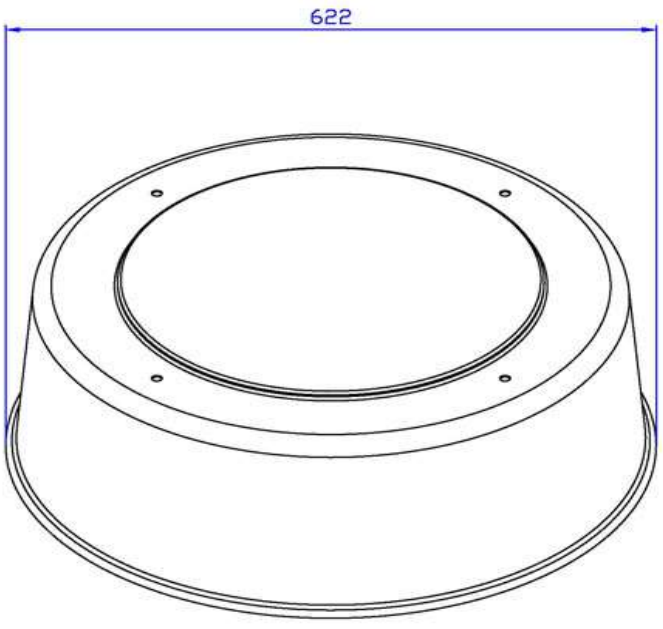
MARCA 119.619 ANGULO SUJECCION ESCALERA A SUELO
MARK 119.619 ANGLE TO FLOOR
MARQUE 119.619 ANGLE AU TERRE



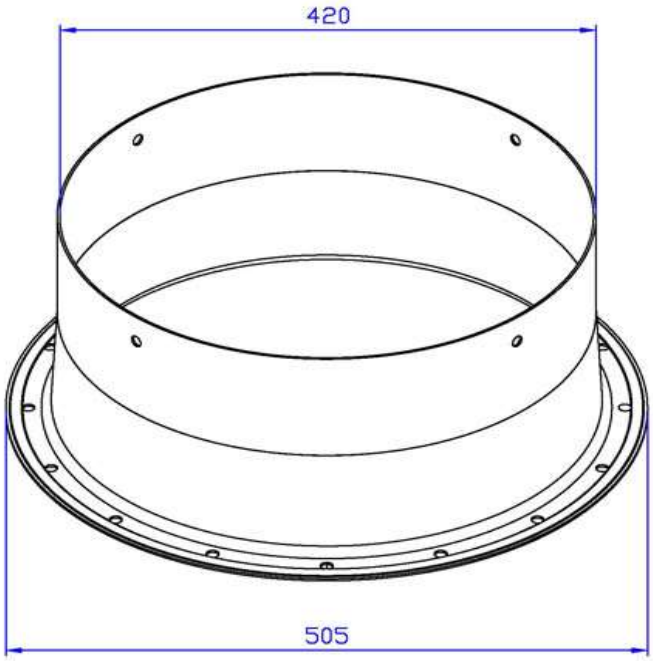
MARCA 119.620 CHAPA BARANDILLA TRANSICION IZQUIERDA
MARK 119.620 HANDRAIL BRACKET LEFT TRANSITION
MARQUE 119.620 POTEAU DE RAMBARDE GAUCHE



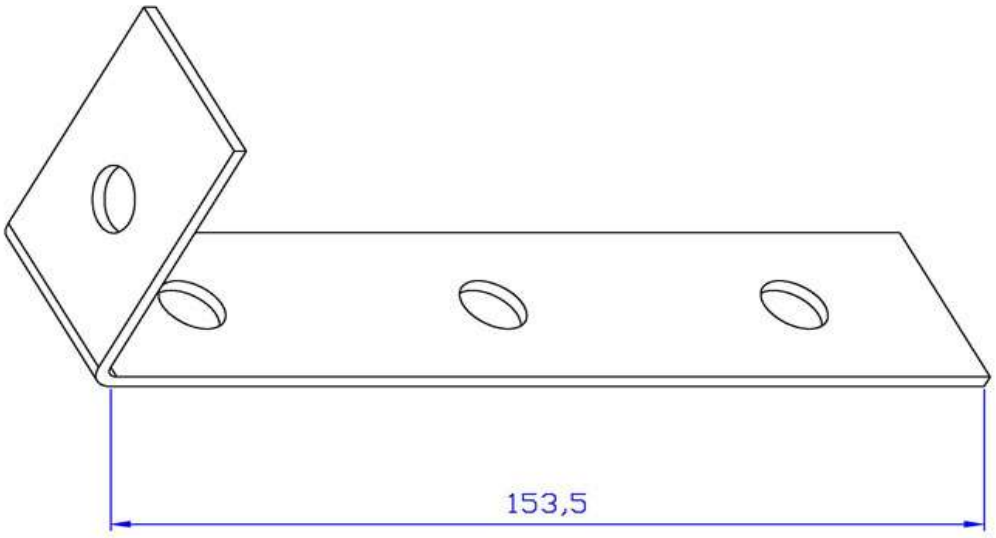
MARCA 119.622 CHAPA BARANDILLA TRANSICION DERECHA
MARK 119.622 HANDRAIL BRACKET RIGHT TRANSITION
MARQUE 119.622 POTEAU DE RAMBARDE DROITE



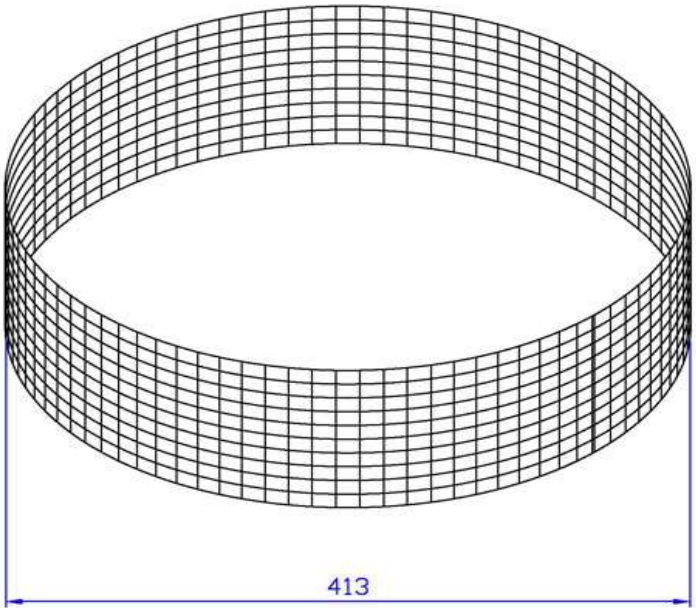
MARCA 119.623 TAPA AIREACIÓN CIRCULAR
MARK 119.623 TOP COVER FOR AERATION
MARQUE 119.623 TOIT DE LA COUVERTURE D'AERATION



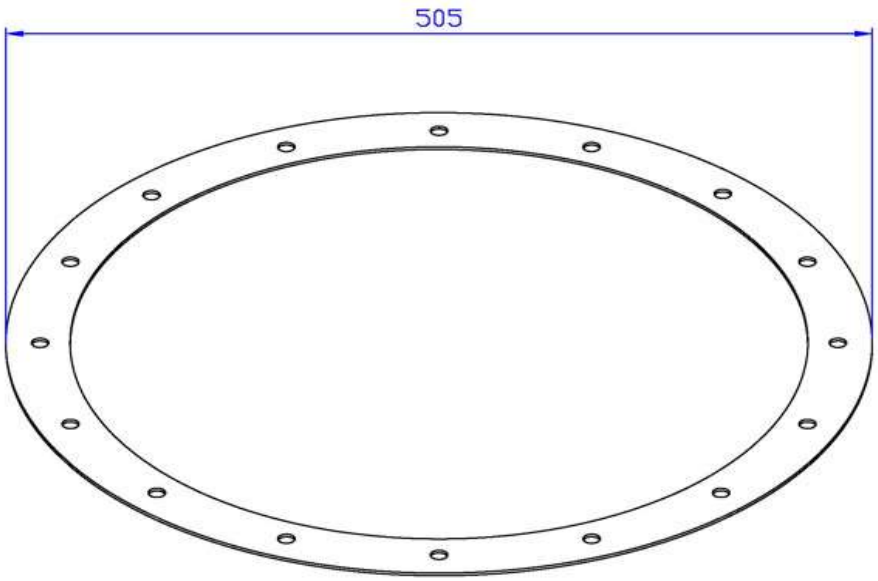
MARCA 119.624 CUERPO AIREACIÓN CIRCULAR
MARK 119.624 TOP COVER FOR AERATION
MARQUE 119.624 TOIT DE LA COUVERTURE D'AERATION



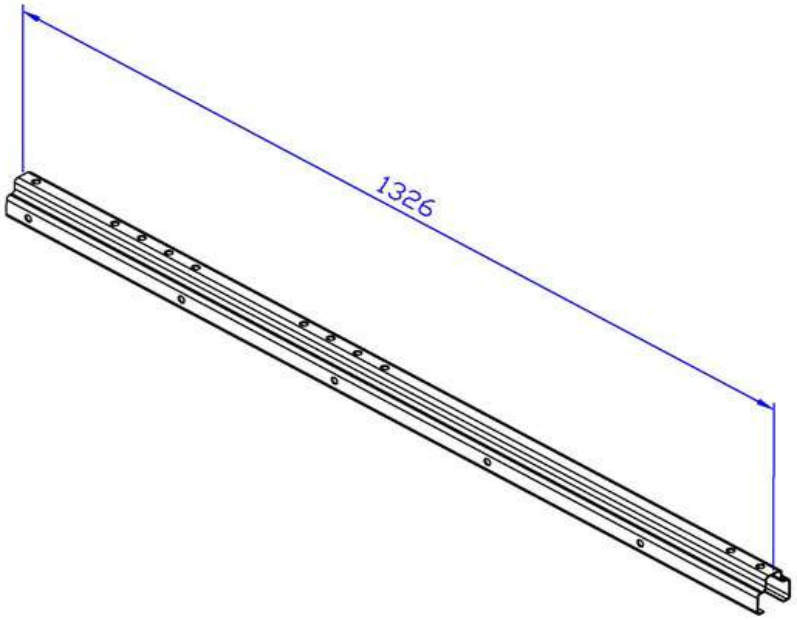
MARCA 119.625 CLIP AIREACIÓN CIRCULAR
MARK 119.625 SUPPORT CLIP
MARQUE 119.625 CLIP SUPPORT



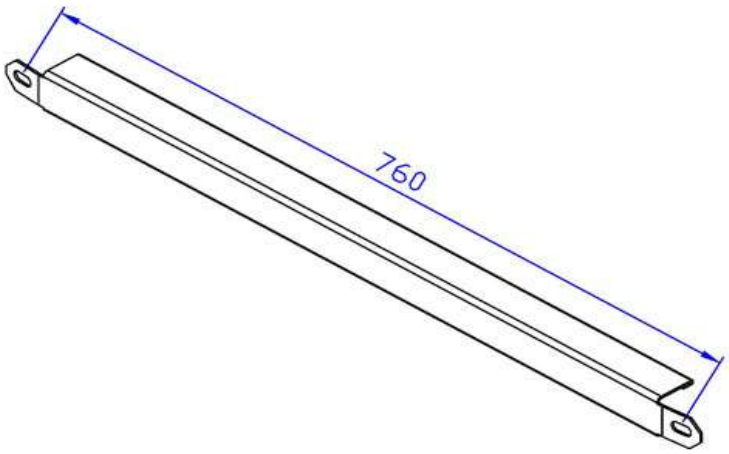
MARCA 119.626 MALLA AIREACIÓN CIRCULAR
MARK 119.626 MESH FOR AERATION
MARQUE 119.626 FILET POUR AERATION



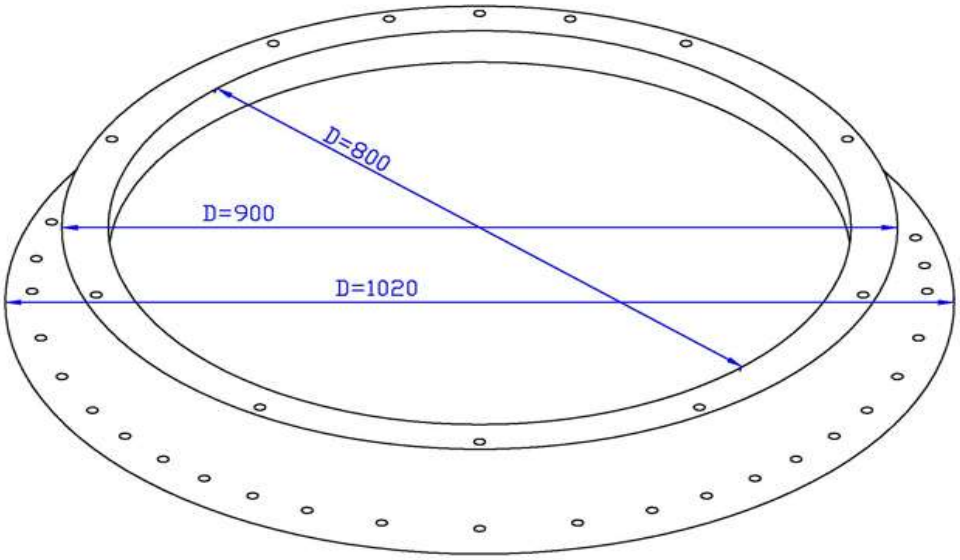
MARCA 119.627 BRIDA AIREACIÓN CIRCULAR
MARK 119.627 FLANGE FOR AERATION
MARQUE 119.627 BRIDE POUR AERATION



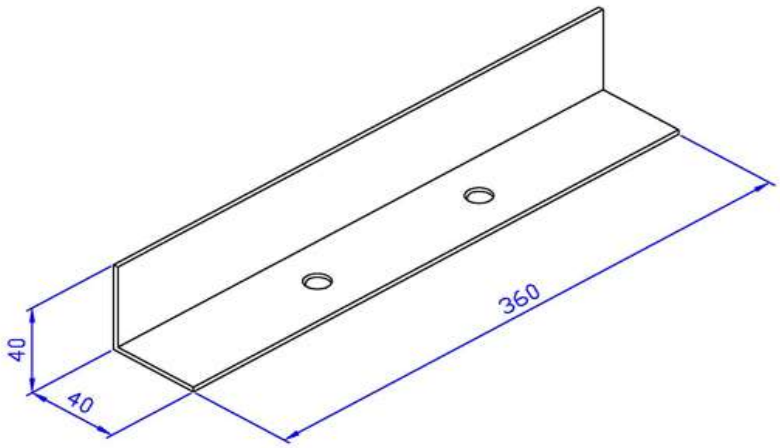
MARCA 119.714	RAIL ESCALERA TERMINAL L=1326 mm
MARK 119.714	LADDER'S TERMINAL RAIL L= 1326mm
MARQUE 119.714	RAIL D'ECHELLE TERMINAL L= 1326mm



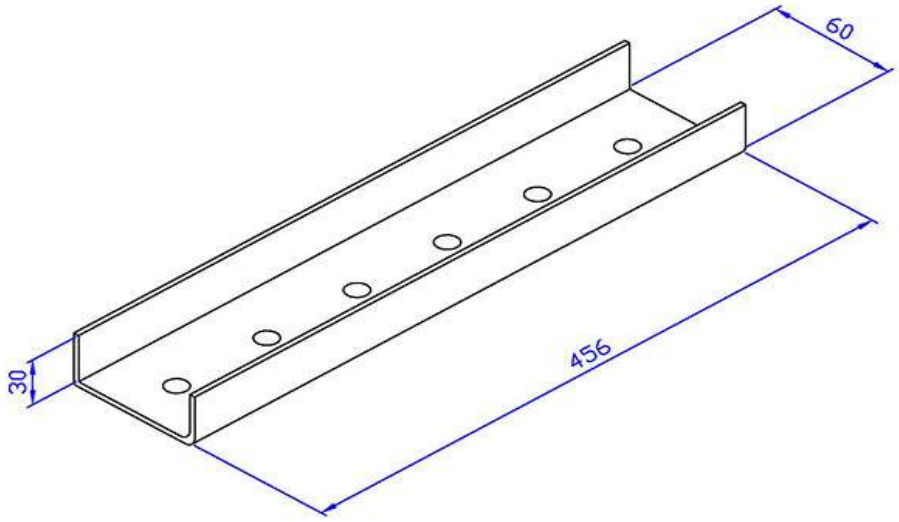
MARCA 119.764	PASAMANOS DE TRANSICIÓN L=760mm
MARK 119.764	HANDRAIL FOR TRANSITION L=760mm
MARQUE 119.764	– L= 760mm



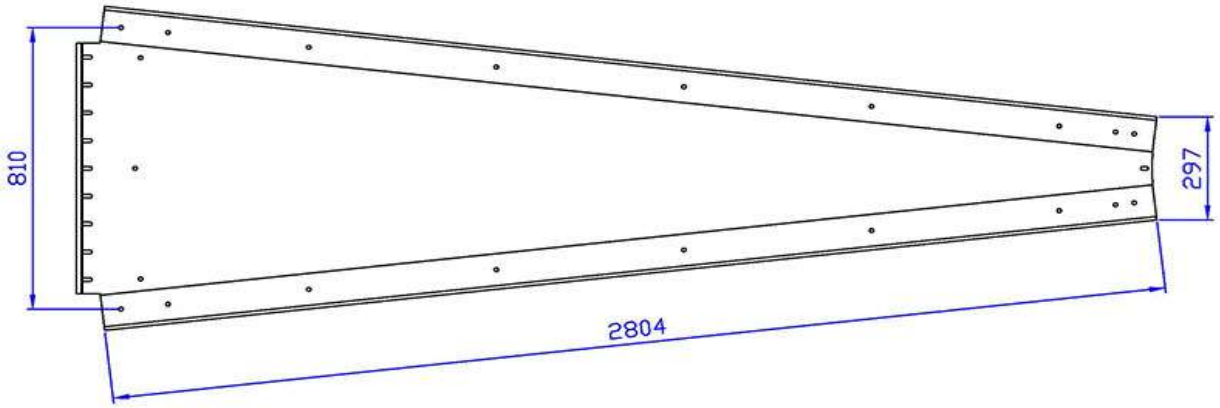
MARCA 120.244 BOCA DE CARGA
MARK 120.244 ROOF CENTER COLLAR
MARQUE 120.244 BOUCHE DE CHARGE



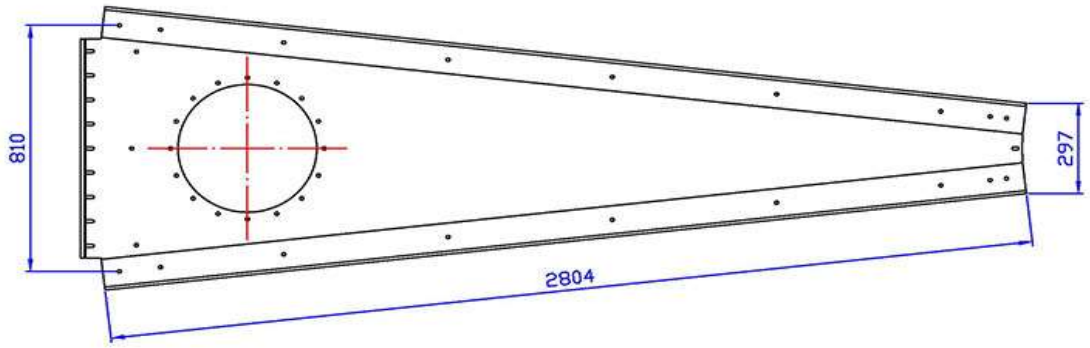
MARCA 120.261 REFUERZO TAPA BOCA DE CARGA
MARK 120.261 REINFORCEMENT FOR TOP FOR ROOF CENTER COLLAR
MARQUE 120.261 RENFORT COUVERTURE BOUCHE DE CHARGE



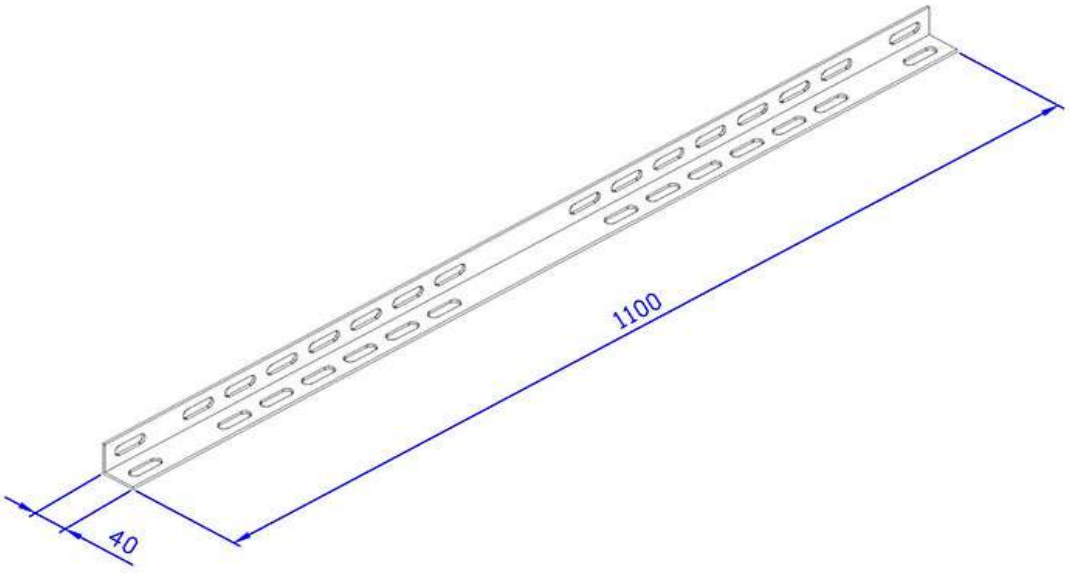
MARCA 120.383 REFUERZO BOCA DE CARGA
MARK 120.383 REINFOR ROOF CENTER COLLAR
MARQUE 120.383 RENFORT BOUCHE CHARGE



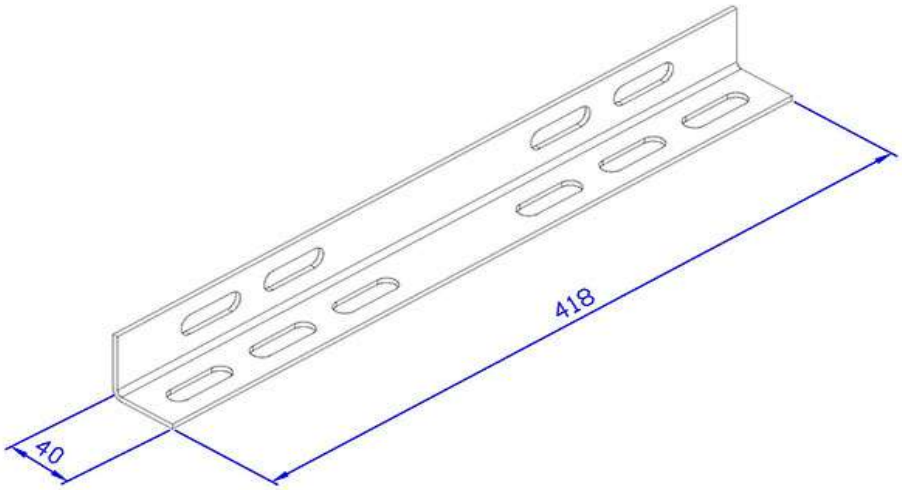
MARCA 120.498 SECTOR TECHO SILO 6,10Ø
MARK 120.498 ROOF SHEET SILO 6,10Ø
MARQUE 120.498 SECTEUR DU TOIT SILO 6,10Ø



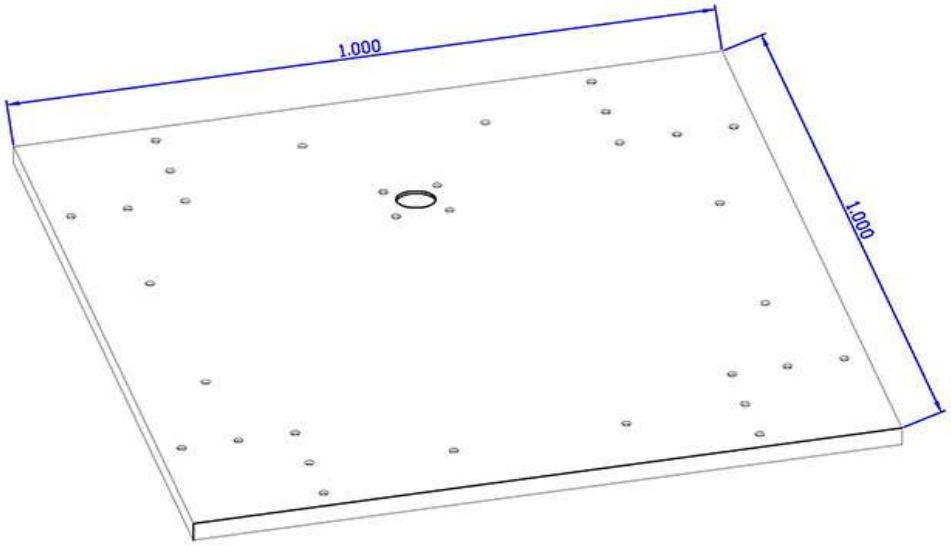
MARCA 120.535	SECTOR TECHO CON ABERTURA CIRCULAR SILO 6,10
MARK 120.535	ROOF SHEET WITH CIRCULAR OPENINING SILO 6,10
MARQUE 120.535	SECTEUR TOIT AVEC OUVERTURE CIRCULAIRE SILO 6,10



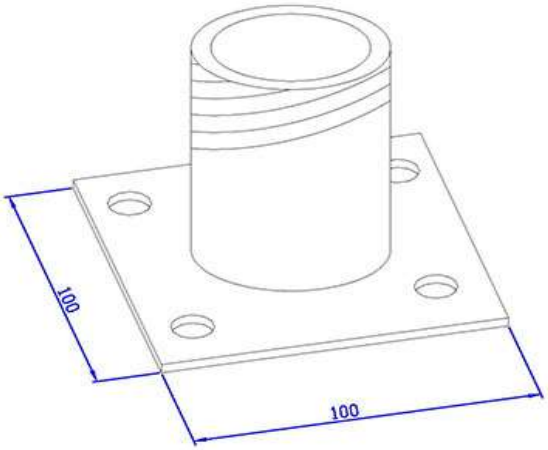
MARCA 120.691	PELDAÑO ESCALERA TECHO L=1100
MARK 120.691	ROOF LADDER RUNG L=1100
MARQUE 120.691	MARCHE DU TOIT L=1100



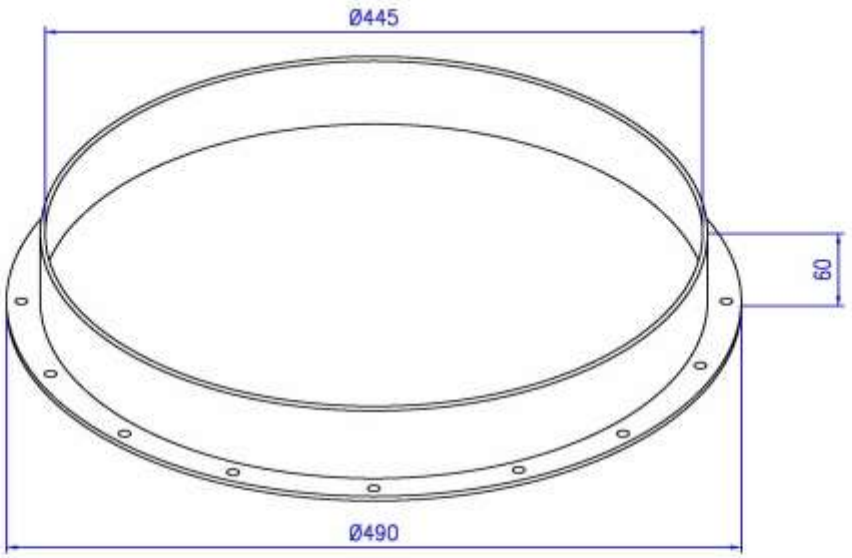
MARCA 120.692 PELDAÑO ESCALERA TECHO L=418
MARK 120.692 ROOF LADDER RUNG L=418
MARQUE 120.692 MARCHE DU TOIT L=418



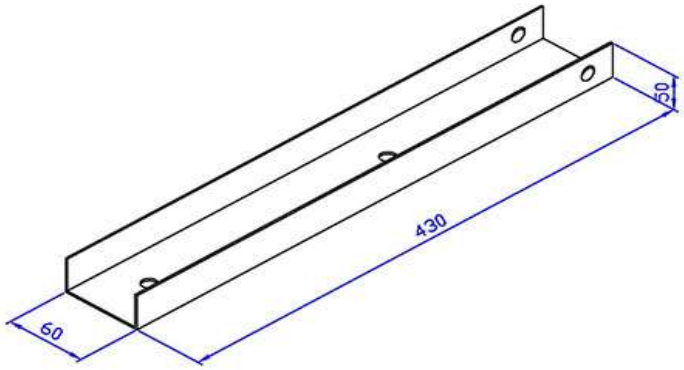
MARCA 120.710 TAPA BOCA DE CARGA D800mm PARA SONDA
MARK 120.710 TOP FOR ROOF CENTER COLLAR D800mm FOR SONDE
MARQUE 120.710 COUVERTURE BOUCHE DE CHARGE D800mm POUR SONDE



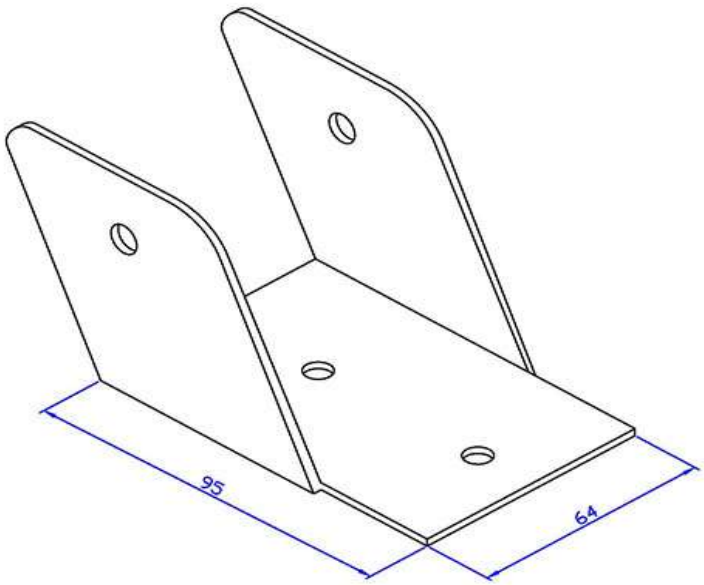
MARCA 120.712 SOPORTE SONDA TAPA 1''
MARK 120.712 TEMPERATURE CABLE SUPPORT COVER 1''
MARQUE 120.712 SONDE SUPPORT COUVERTURE 1''



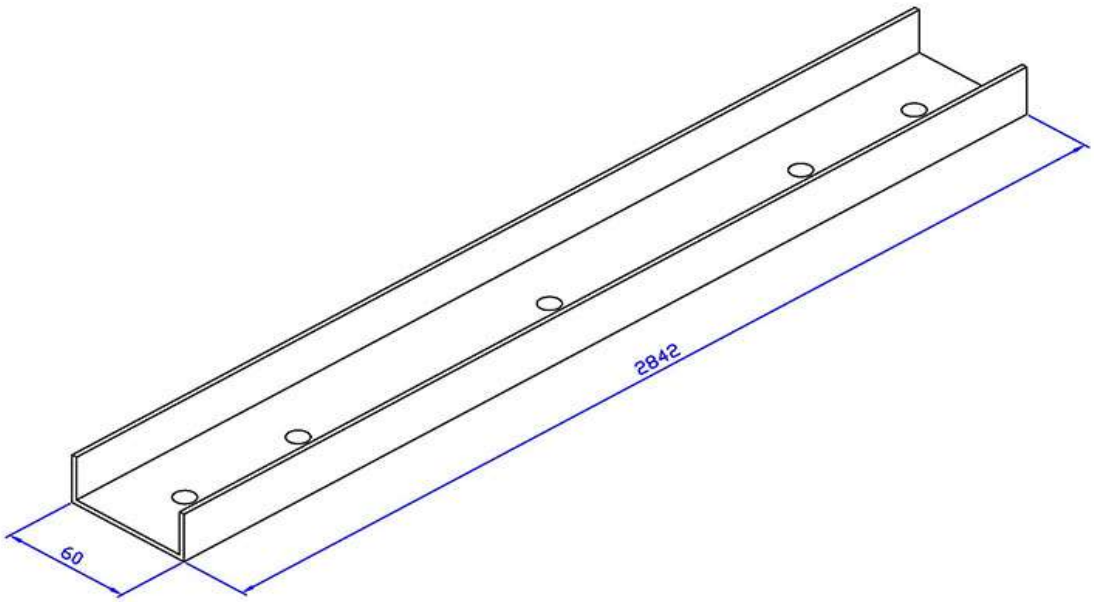
MARCA 120.715 ANILLO PUERTA TECHO
MARK 120.715 RING FOR MANHOLE
MARQUE 120.715 ANNEAU DU PORTE D'ACCESS



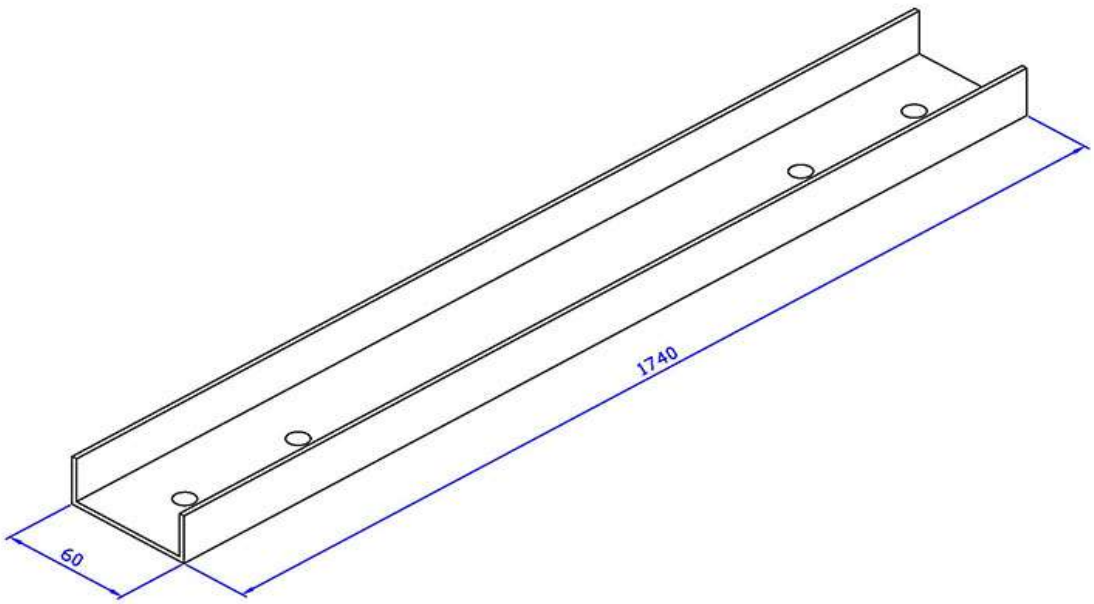
MARCA 120.779	"U" AMARRE BISAGRA
MARK 120.779	"U" FOR HINGE BASE
MARQUE 120.779	"U" ATTACHE POUR CHARNIÈRE



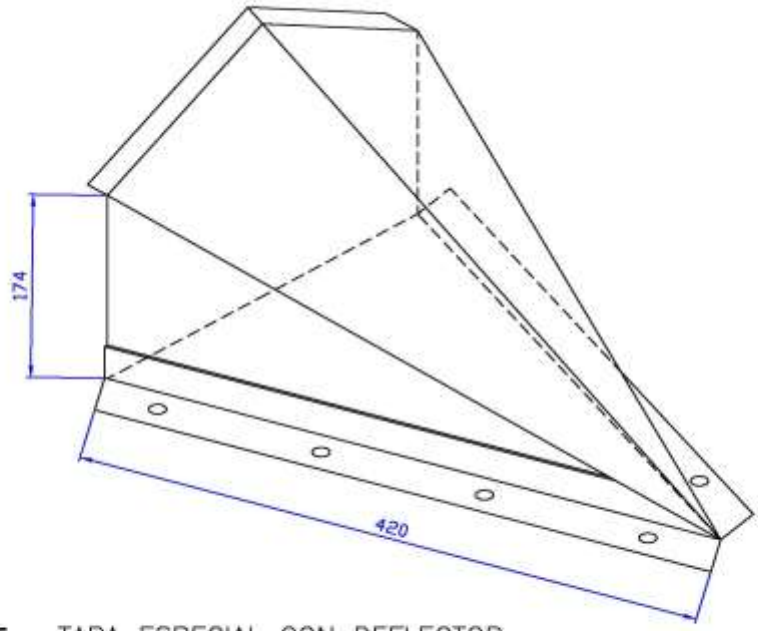
MARCA 120.780	"U" BISAGRA
MARK 120.780	"U" HINGE BASE
MARQUE 120.780	"U" CHARNIERE



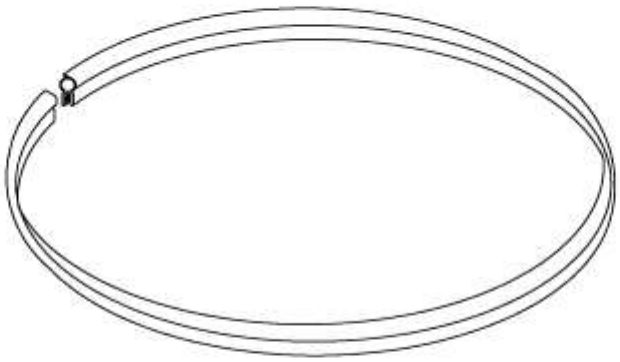
MARCA 120.930 ARRIOSTRAMIENTO L=2.842mm
MARK 120.930 BRACING L=2.842mm
MARQUE 120.930 CONTREVENTEMENT L=2.842mm



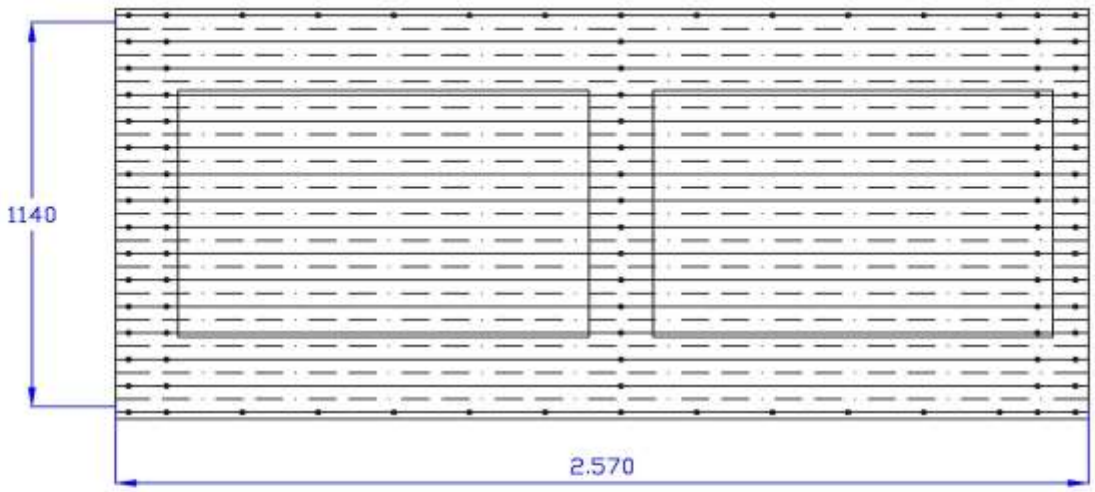
MARCA 120.931 ARRIOSTRAMIENTO HORIZONTAL L=1.740mm
MARK 120.931 HORIZONTAL BRACING L=1.740mm
MARQUE 120.931 CONTREVENTEMENT HORIZONTAL L=1.740mm



MARCA 121.075 TAPA ESPECIAL CON DEFLECTOR
MARK 121.075 END COVER
MARQUE 121.075 COUVERTURE FINALE



MARCA 121.811 JUNTA DE CONTORNO L=1500mm
MARK 121.811 CONTOUR JOINT L=1500mm
MARQUE 121.811 JOINT DE CONTOUR L=1500mm



MARCA 122.302	VIROLA 2 REFUERZOS DOBLE JUNTA CON LOGO
MARK 122.302	BODYSHEET 2 STIFFENERS DOUBLE JOINT WITH LOGO
MARQUE 122.302	VIROLE 2 MONTANT DOUBLE JOINT AVEC LOGO

GENERAL WARRANTY CONDITIONS OF SYMAGA, S.A.

JANUARY 2013

SYMAGA S.A. MANUFACTURES AND SUPPLIES SILOS FOR FREE FLOWING GRAIN STORAGE UNDER MOST MODERN DESIGNS. THE LOAD CALCULATION IN THE SILOS FOLLOWS INTERNATIONAL NORMS LIKE “ANSI-ASAE”, “DIN” OR EUROCODE, ALWAYS ACCORDING TO THE SPECIFIC OFFER OR ORDER CONFIRMATION.

SYMAGA WARRANTS ALL PRODUCTS WHICH IT MANUFACTURES TO BE FREE OF DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USAGE AND CONDITIONS FOR A PERIOD OF 24 MONTHS AFTER DELIVERY, UNLESS OTHERWISE SPECIFICALLY PROVIDED IN WRITING BY SYMAGA PRIOR TO DELIVERY.

IF SYMAGA´S PRODUCTS FAIL TO CONFORM THE ABOVE WARRANTY, AND IF SYMAGA IS INFORMED IN WRITING PRIOR TO THE TO THE END OF THE WARRANTY PERIOD, SYMAGA´S ONLY OBLIGATION SHALL BE TO REPAIR OR REPLACE, AT ITS EXPENSE, PRODUCTS THAT, IN SYMAGA´S SOLE JUDGMENT, CONTAIN A MATERIAL DEFECT DUE TO MATERIALS OR WORKMANSHIP.

OFF-CENTER UNLOADING OF SILOS IS NOT APPROVED AND WILL BE STRUCTURALLY DETRIMENTAL TO A GRAIN SILO. ANY OFF-CENTER DISCHARGE OPENINGS SHOULD BE USED FOR THE SOLE PURPOSE OF CLEAN-OUT THE SILO AFTER CENTER DISCHARGE HAS BEEN COMPLETED TO THE GRAINS ANGLE OF REPOSE. THE USER IS RESPONSIBLE TO GUARANTEE THE PROPER USE OF ANY OFF-CENTER DISCHARGE OPENING. ANY DAMAGES OCCURRED DUE AN OFF-CENTER UNLOADING SHALL NOT BE COVERED BY SYMAGA´S STRUCTURAL WARRANTY.

ALL DELIVERY AND SHIPMENT CHARGES TO AND FROM SYMAGA’S FACTORY WILL BE PURCHASER’S RESPONSIBILITY. EXPENSES INCURRED BY OR ON BEHALF OF THE PURCHASER WITHOUT PRIOR WRITTEN AUTHORIZATION FROM SYMAGA SHALL BE THE SOLE RESPONSIBILITY OF THE PURCHASER.

COMPONENTS MANUFACTURED BY OTHERS, SUCH AS MOTORS, FANS, SWEEP AUGERS, CONTROL SYSTEMS, OR OTHER TRADE ACCESORIES ARE ONLY WARRANTED TO THE EXTENT WARRANTED BY THEIR RESPECTIVE MANUFACTURERS.

SYMAGA DOES NOT WARRANT AGAINST, OR SHALL NOT LIABLE FOR, LOSSES OR DAMAGES ARISING OUT OF CIRCUMSTANCES NOT SUBJECT TO ITS CONTROL, SUCH AS: OCCURENCES DURING SHIPMENT, HANDLING OR STORAGE; IMPROPER INSTALLATION, USE OR MAINTENANCE; ACTS OF THE OWNER; DESIGN, ENGINEERING OR INSTALLATION PROCEDURES NOT APPROVED BY SYMAGA IN WRITING .

SYMAGA SHALL NOT BE LIABLE FOR LOSS OR DAMAGE, INCLUDING WITHOUT LIMITATION DAMAGE TO THE CONTENTS OF A STRUCTURE, LOSS OF USE OF A PRODUCT, DAMAGE TO OTHER PROPERTY. ESPECIALLY SYMAGA SHALL NOT BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOSS OF ANTICIPATED PROFITS OR BENEFITS.

FURTHERMORE FOLLOWING CONDITIONS SHALL APPLY:

LIMITED MATERIAL WARRANTY GALVANIZED COATED SHEET STEEL PROTECTION, 600 GR/M² (Z-600)

GALVANISED COATED SHEET STEEL, PROTECTION Z 600 ACCORDING UNE- EN -36130 , SOLD FOR USE AS STEEL SILO COMPONENTS, WILL NOT RUPTURE, FAIL STRUCTURALLY OR PERFORATE WITHIN A PERIOD OF 18 MONTHS AFTER SHIPMENT FROM OUR FACTORY DUE TO NORMAL ATMOSPHERIC CORROSION. THIS WARRANTY ONLY COVERS THE MATERIAL AND NOT THE INSTALLATION.

THE MANUFACTURER WARRANTS ONLY THAT ITS PRODUCTS ARE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP ON THE DATE OF SHIPMENT FROM ITS PLANT.

THIS WARRANTY DOES NOT APPLY TO SHEETS EXPOSED AT ANY TIME TO CORROSIVE OR AGGRESSIVE ATMOSPHERIC CONDITIONS, INCLUDING BUT NOT LIMITED TO:

A) AREAS SUBJECT TO CONSTANT SPRAYING OF EITHER SALT OR FRESH WATER.
B) AREAS SUBJECT TO FALLOUT OR EXPOSURES TO CORROSIVE CHEMICALS, ASH, FUMES,CEMENT DUST OR ANIMAL WASTE.
C) AREAS SUBJECT TO WATER RUN-OFF FROM LEAD OR COPPER FLASHING OR AREAS IN METALLIC CONTACT WITH LEAD OR COPPER.
D) CONDITIONS OR CIRCUMSTANCES WHERE CORROSIVE FUMES OR CONDESATES ARE GENERATED OR RELEASED INSIDE OF SILOS.
E) TECHNICALLY THE LIFE OF THE GALVANIZATION IS REGULATED BY THE EUROPEAN STANDARDS ISO 9223, 9224 AND 9225

ISO – 9223: CORROSION OF METALS AND ALLOYS – CORROSIVITY OF ATMOSPHERES – CLASSIFICATION

ISO – 9224: CORROSION OF METALS AND ALLOYS – CORROSIVITY OF ATMOSPHERES – GUIDING VALUES FOR THE CORROSIVITY CATEGORIES

ISO – 9225: CORROSION OF METALS AND ALLOYS – CORROSIVITY OF ATMOSPHERES – MEASUREMENT OF POLLUTION.

THIS WARRANTY DOES NOT APPLY IN THE EVENT OF:

A) MECHANICAL, CHEMICAL OR OTHER DAMAGE SUSTAINED DURING THE SHIPMENT,STORAGE, ERECTION, OR AFTER ERECTION.

B) DAMAGE CAUSED BY IMPROPER SCOURING OR CLEANING PROCEDURES.
C) PRESENCE OF CORROSIVE DAMPS OR MATERIALS IN CONTACT WITH OR CLOSE PROXIMITY TO THE SHEETS.
D) DETERIORATION OF SHEETS CAUSED DIRECTLY OR INDIRECTLY BY OVERDRIVING THE BOLTS.
E) FLYING, BLOWN, OR FALLING OBJECTS, EXPLOSION, FIRE, ACTS OF GOD, OR OTHER SIMILAR EXTERNAL FORCES BEYOND SYMAGA REASONABLE CONTROL.
F) IMPROPER ERECTION OR CONSTRUCTION METHODS.
G) THE GALVANIZED MATERIALS LEAVE OUR PLANT IN PRIME CONDITION. DAMAGE CAUSED BY
H) WET OR UNPROPER STORAGE IS NOT COVERED BY THE WARRANTY. STORE MATERIALS IN DRY HIGH GROUND UNDER COVERED AREA, ELEVATED ON WOOD BLOQUING. DO NOT COVER WITH PLASTIC OR TARPAULINS SO AS TO PREVENT FREE AIR CIRCULATION. INSPECT BUNDLES DAILY FOR MOISTURE. IF BUNDLES CONTAINS MOISTURE, IT SHALL BE IMMEDIATELY OPENED AND DRIED.

THIS WARRANTY SHALL BE SUBJECT TO THE STIPULATIONS, LIMITATIONS AND CONDITIONS HEREIN AFTER SET FORTH:

A) SYMAGA'S LIABILITY FOR BREACH OF THIS WARRANTY SHALL BE LIMITED EXCLUSIVELY TO REPAIRING DEFECTIVE SHEETS OR AT SYMAGA'S SOLE OPTION, OF FURNISHING F.O.B. SYMAGA'S PLANT SUFFICIENT REPLACEMENT SHEETS FOR THE DEFECTIVE PIECES.

B) SYMAGA SHALL NOT IN ANY EVENT BE LIABLE FOR THE COST OF LABOUR TO REPLACE AND DEFECTIVE SHEET OR FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES TO ANYONE BY REASON OF THE FACT THAT SUCH SHEETS SHALL HAVE BEEN DEFECTIVE.

C) TITLE TO ANY REPLACED MATERIAL SHALL PASS TO SYMAGA.

D) CLAIMS MUST BE PROMPTLY REPORTED IN WRITING TO SYMAGA, AND SYMAGA SHALL BE GIVEN A REASONABLE OPPORTUNITY TO INSPECT THE SHEETS CLAIMED TO BE DEFECTIVE. ADEQUATE IDENTIFICATION OF THE MATERIAL INVOLVED IN THE CLAIM, INCLUDING DATE OF INSTALLATION, INVOICE NUMBER AND DATE OF SHIPMENT MUST BE ESTABLISHED BY THE BUYER.

E) SYMAGA DOES NOT WARRANT ANY PART, PRODUCT OR MATERIAL TO MEET LOCAL, MUNICIPAL OR STATE ORDINANCES, CODES LAWS OR REGULATIONS.

F) THE BUYER SHALL EXERCISE DILIGENCE IN INSPECTION OF SHEETS AS RECEIVED FROM SYMAGA SO AS TO MITIGATE REPAIR OR REPLACEMENT.

G) THIS WARRANTY SHALL EXTEND ONLY TO THE NAMED OWNER, SUCH NAMED OWNER WITHOUT THE WRITTEN CONSENT OF SYMAGA MAY NOT MAKE THIS WARRANTY SUBJECT TO ANY ASSIGNMENT OR TRANSFER.

H) SYMAGA RESERVES THE RIGHT TO TERMINATE THIS WARRANTY AT ANY TIME, (EXCEPT AS TO ORDERS ALREADY ACCEPTED) UPON THE GIVING OF WRITING NOTICE THERE OF.

I) WARRANTY DOES NOT COVER DAMAGE OR LOSS DURING SHIPMENT OF THE SYMAGA MATERIAL.

J) THE OBLIGATION OF SYMAGA UNDER THIS WARRANTY SHALL NOT ARISE UNLESS SYMAGA IS NOTIFIED AND THE WARRANTY IS PRESENTED TOGETHER WITH A WRITING STATEMENT SPECIFYING THE CLAIM OR FAILURE WITHIN THIRTY (30) DAYS AFTER A FAILURE IS FIRST CALLED TO THE ATTENTION OF THE OWNER AND NOT LATER THAN THE EXPIRATION OF THE APPLICABLE WARRANTY PERIOD.

K) SYMAGA'S LIABILITY FOR MISSING PARTS IS 15 DAYS. MATERIALS AND BUNDLES MUST BE CHECKED INMEDIATLY ON ARRIVAL TO INSTALLATION SITE BY PURCHASER ALONG WITH THE PACKING LIST PROVIDED BY SYMAGA.

RUST DAMAGE DUE TO IMPROPER STORAGE ISN'T COVERED BY SYMAGA'S WARRANTY

PROPER STORAGE OF GRAIN SILOS

MATERIALS PRIOR TO CONSTRUCTION TO PREVENT WET STORAGE STAIN:

WET STORAGE STAIN (RUST) WILL DEVELOP WHEN CLOSELY PACKED BUNDLES OF GALVANIZED MATERIAL SUCH AS SIDEWALL, ROOF AND HOPPER SHEETS AND HOPPER SILO LEGS HAVE MOISTURE PRESENT FROM ANY SOURCE. ROOF AND SIDEWALL BUNDLES SHOULD BE INSPECTED ON ARRIVAL FOR THE PRESENCE OF MOISTURE. IF MOISTURE IS PRESENT, MOISTURE MUST NOT BE PERMITTED TO REMAIN BETWEEN THE SHEETS. IN THE CASE OF MOISTURE PRESENCE, SHEETS OR PANELS SHOULD BE SEPARATED IMMEDIATELY, WIPED DOWN, DRIED AND SPRAYED WITH A LIGHT OIL OR DIESEL FUEL.

WHERE POSSIBLE, SIDEWALL BUNDLES, ROOF SHEETS AND OTHER CLOSELY PACKED MATERIALS (E.G. HOPPER SHEETS AND HOPPER SILO LEGS) SHOULD BE STORED IN A DRY, CLIMATE CONTROLLED BUILDING. STORAGE INSIDE A DRY BUILDING SHOULD BE DONE IF AT ALL POSSIBLE. WHERE OUTDOOR STORAGE IS UNAVOIDABLE, THE MATERIALS SHOULD BE RAISED OUT OF CONTACT FROM THE GROUND OR VEGETATION. STACKING AND SPACING MATERIALS SHOULD NOT BE CORROSIVE OR WET. MATERIALS MUST BE PROTECTED FROM THE WEATHER. WEATHER PROTECTION THAT PERMITS MORE AIR MOVEMENT AROUND THE BUNDLES IS BEST.

THE STORAGE METHOD OF THE ROOF BUNDLES AND SIDEWALL SHEETS MAY ALSO HELP MINIMIZE MOISTURE PRESENCE. ROOF BUNDLES SHOULD BE STORED INCLINED. THE BUNDLES SHOULD BE STORED AND SECURED IN A SAFE & STABLE MANNER. TURNING THE BUNDLES OVER AND STORING WITH THE CENTER OF THE DOME "UP" LIKE AN ARCH IS AN OPTION. SIDEWALL BUNDLES MAY BE STORED ON EDGE, HOWEVER THESE BUNDLES SHOULD BE SECURED IN SUCH AS WAY AS THEY CANNOT FALL OVER AND CAUSE INJURY.

SHOULD "WHITE RUST" OR "WET STORAGE STAIN" OCCUR, CONTACT THE MANUFACTURER IMMEDIATELY CONCERNING METHODS TO MINIMIZE THE ADVERSE EFFECT UPON THE GALVANIZED COATING.

PLASTILINE / SEALANT FOR SILO JOINTS HAS TO BE STORED UNDER DRY CONDITIONS BETWEEN + 5º AND +20 ºC.

GENERAL SAFETY STATEMENT

Our principal concern is your safety and the safety of others associated with grain handling equipment. This manual is to help you understand safe operating procedures and some problems which may be encountered by the operator and other personnel.

As owner and/or operator, it is your responsibility to know what requirements, hazards and precautions exist and inform all personnel associated with the equipment or in the area. Safety precautions may be required from the personnel.

Avoid any alterations to the equipment. Such alterations may produce a very dangerous situation, where serious injury or death may occur.

You should consider the location of the bin site relative to power line locations or electrical transmission equipment. We recommend you contact your local power company to review your installation plan or for information concerning required equipment clearance.

Clearance of portable equipment that may be taken to the bin site should be reviewed and considered as well. Any electrical control equipment in contact with the bin should be properly grounded and installed in accordance with National Electric Code provisions and other local or national codes.

This product is intended for the use of grain storage only. Any other use is a misuse of the product!

This product has sharp edges! These sharp edges may cause serious injury. To avoid injury, handle sharp edges with caution and use proper protective clothing and equipment at all times.

Sidewall bundles or sheets must be stored in a safe manner. The safest method of storing sidewall bundles is laying horizontally with the arch of the sheet upward or over like a dome.

Sidewall sheets stored on edge must be secured in a way that they cannot fall over and cause injury. Care should be taken in the handling and movement of sidewall bundles.

Personnel operating or working around equipment should read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

To avoid anyone becoming caught or trapped by grain, do NOT empty the silo whenever there are people inside it.

Keep hands, feet and clothing away from moving parts.

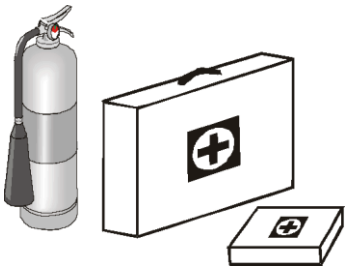
Fall from grain bins at any height can and will cause injury. Make sure all needed safety measures are taken.

PREPARE FOR EMERGENCIES

Be prepared if fire starts

Keep a first aid kit and fire extinguisher handy

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone



Keep emergency Equipment Quickly Accessible

WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Safety glasses should be worn at all times to protect eyes from debris.

Wear gloves to protect your hands from sharp edges on plastic or steel parts.

A respirator may be needed if a hog house has poor ventilation. Waste fumes can be toxic.

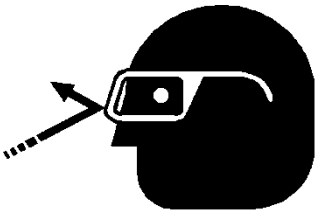
Wear hard hat and steel toe boots to help protect your head and toes from falling debris.

Remove all jewelry.

Tuck in any loose or dangling shoe strings.

Long hair should be tied up and back.

Eye protection



Gloves

Steel Toe Boots

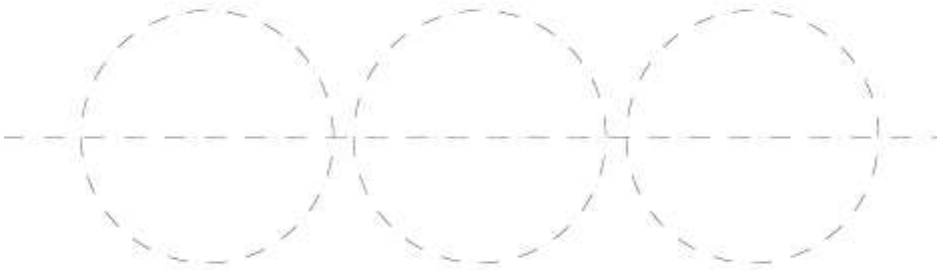
Respirator

Hard hat

PRIOR TO THE ERECTION

Axis tracing:

Trace the axis of the silos (both longitudinal and transverse) on the foundations. Trace as well the circumferences corresponding to the diameters of the silos. This will help to centre the silo properly.



Materials marking:

All the body-sheets, stiffeners and stiffener splices delivered by SYMAGA for the assembly of the silos are marked with a specific code that helps to identify the different body-sheets and stiffeners (according to their thickness and type of joint). These marks are introduced in the tables below:

Body-sheets

E 0.8	E 1	E 1.2	E 1.5	E 1.8	E 2	E 2.2	E 2.5	E 2.8	E 3	E 3.5	E 4	E 5
Body sheets with thickness of **0,8 mm**	Body sheets with thickness of **1,0 mm**	Body sheets with thickness of **1,2 mm**	Body sheets with thickness of **1,5 mm**	Body sheets with thickness of **1,8 mm**	Body sheets with thickness of **2,0 mm**	Body sheets with thickness of **2,2 mm**	Body sheets with thickness of **2,5 mm**	Body sheets with thickness of **2,8 mm**	Body sheets with thickness of **3,0 mm**	Body sheets with thickness of **3,5 mm**	Body sheets with thickness of **4,0 mm**	Body sheets with thickness of **5,0 mm**

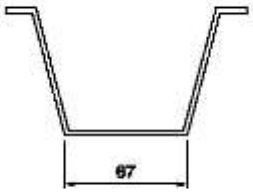
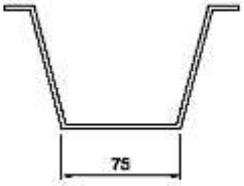
A	Body sheets with **double joint**
B	Body sheets with **triple joint**
C	Body sheets with **quadruple joint**
E	Body sheets with **quintuple joint**
G	Body sheets with **sextuple joint**

The packages of body sheets are also marked with a colour in the edge of the body sheets according to their thickness and based on the following table:

	COLOUR	THICKNESS	RAL
	White	0,80 mm	9016
	Red	1,00 mm	3020
	Yellow	1,20 mm	1016
	Blue	1,50 mm	5015
	Light green	1,80 mm	6032
	Black	2,00 mm	9017
	Gray khaki	2,20 mm	7008
	Orange	2,50 mm	1028
	Dark grey	2,80 mm	9007
	Brown	3,00 mm	8012
	Magenta	3,50 mm	4003
	Pink	4,00 mm	3015

Stiffeners

E 1.5	E 2	E 2.5	E 3	E 3.5	E 4
Stiffeners with thickness of **1,5 mm**	Stiffeners with thickness of **2,0 mm**	Stiffeners with thickness of **2,5 mm**	Stiffeners with thickness of **3,0 mm**	Stiffeners with thickness of **3,5 mm**	Stiffeners with thickness of **4,0 mm**

F	I	N
		

Stiffener splices

E 1.5	E 2	E 3
Splices with thickness of **1,5 mm**	Splices with thickness of **2,0 mm**	Splices with thickness of **3,0 mm**

F	I
	

Torque value

To tighten the bolts SYMAGA suggests different torque values depending on the quality and thread of the bolts provided.

It is very important not to exceed these values because greater values could damage the bolts

TORQUE VALUE (Cs, N x m)		
THREAD	**QUALITY**	
	8.8	**10.9**
M-8	20	28,8
M-10	39,2	57,6
M-12	68	100
M-14	108	160
M-16	168	248

The indicated grip-torques are exclusively for joints without neoprene washers. In joints with neoprene washers it shall be tightened until the neoprene will be expanded.

SILOS OPERATION AND MANAGEMENT

Loading and unloading:

Silos must be loaded through the centre roof cover. Off centre loading can lead to structural damages in the silo. Especially in larger silos it is recommended not to fill it with only one stage. It should be filled with multiple stages to allow proper settlement.

Before loading, make sure all gates are closed and sweep auger (in case it is supplied) is placed over intermediate sumps.

It is necessary to know maximum silo capacity in order not to overfill the silo. Overfilling may cause grain silo failure.

Start unloading through the centre sump until there is not any more grain flowing by gravity. Off centre unloading can cause structural damage.

Do not simultaneous fill and discharge the silo. Simultaneous filling and unloading results in a fluidic behaviour of the grain. This can cause increased sidewall loads. The service life of bins can be drastically reduced and risk of structural failure, economic loss, and personnel injury will increase by simultaneously loading and unloading.

Storing material:

Silos are designed to store dry and cool grain. It is not recommended to fill grain over 16% moisture in a storage bin.

Do not fill grain to top. Maximum fill height is 3 cm below eave.

Avoid increased pressures inside the silo. For this purpose, let the air leave the silo through roof vents or manhole (make sure they are not blocked by grain).

In case temperature cables are supplied, it is advisable to attach the temperature cables among them, in order to avoid the natural displacement to the outer regions of the silo.

ASSEMBLY INSTRUCTIONS FOR GRAIN SILOS

SMALL HOPPER SILOS

The fastest and most economical way to erect the grain silos is from the top to the bottom using lifting jacks. It is strongly recommended to use a crane in order to lift the silo when installing the legs.

The suggested assembly procedure is listed below.

1- Assemble the top ring of body-sheets on the finished foundation bolting the vertical joint line free of stiffener with M10x20 bolts, and doing it in the clockwise direction; in other words, placing the one on the left over the one on the right, as it is shown in the drawing. (See figure 1)

Caulk with sealant the vertical joint. The vertical lines for the holes stiffeners must be aligned with the anchor bolts in the foundation. Check to be sure that the body-sheets are positioned correctly.

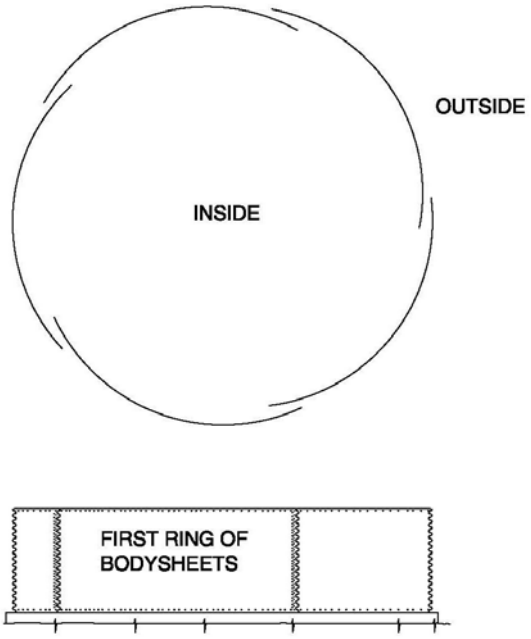


Figure 1

2- Place the central collar support in the centre of the foundation and adjust to obtain the required height (see detail). Choose the location of the manhole sheet and roof ladder and begin bolting the roof clips to the top of the body-sheets.

Begin the roof assembly installing four sheets at quarter points to stabilize the central collar. (See figure 2)

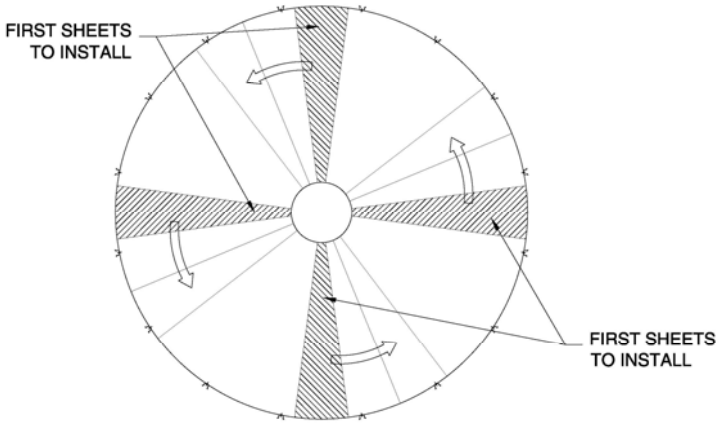


Figure 2

Complete the roof assembly, place the ladder rungs on the sheet right left of the manhole sheet. (See figure 3)

Assemble the manhole according to the detail drawing.

If the roof has any aeration, see the detail drawing to install it.

If the silo has temperature cables, see the detail drawings to install the additional support requirements.

If roof ladder has handrail, see the detail drawing to install it.

Right after the assembly of the roof it is advisable to check the sealing of the roof. For this the roof may be watered with a hose to verify all the points where the water could pass through. In case there is any point where the water can go easily through, they have to be resealed.

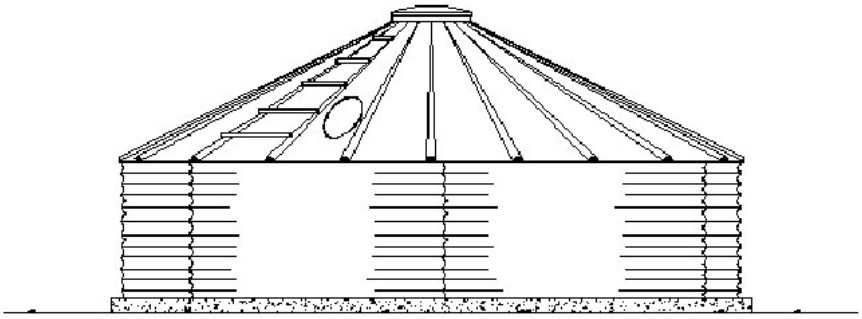


Figure 3

3- Attach the lifting jacks to the stiffeners (or to the holes lines of stiffeners in case they are not installed yet) and raise the silo high enough to let the assembly of the next body-sheets ring. (See figure 4)

Determine the number of required lifting jacks according to the diameter and weight of the silo.

The bolts must be adequate to lift the silo.

The vertical joint of body-sheets must be staggered (as shown in the drawing) to allow all the stiffener holes to be aligned. (See figure 4)

The body-sheets are assembled inside of the previous ring (see drawings).

Caulk with sealant the vertical joint.

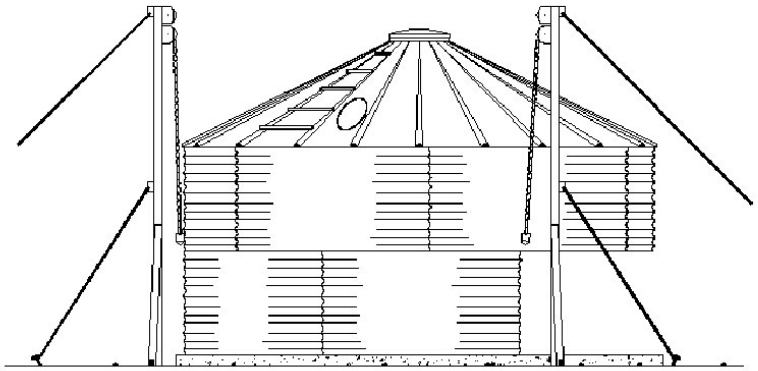


Figure 4

Begin the assembly of stiffeners once one or two body-sheets (depending on the length of stiffeners used) have been installed. Attach the stiffeners to the body-sheets using bolts according to the detail. (See figure 5)

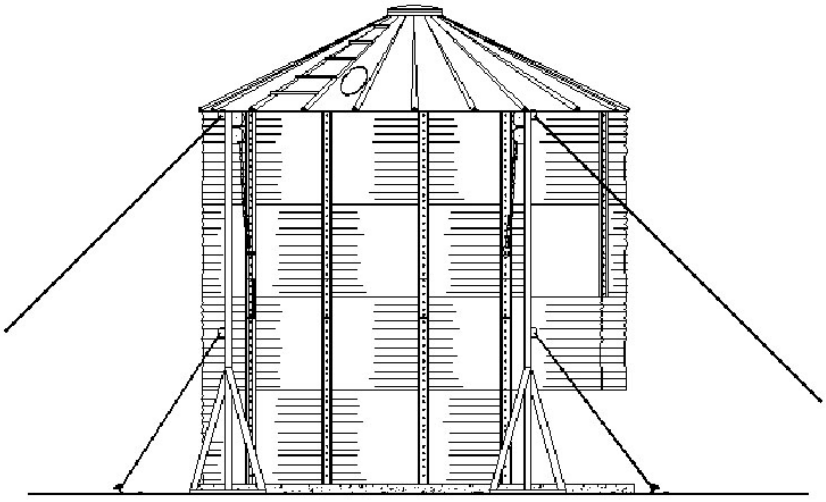


Figure 5

In case the silo has any ladder, attach it to the body-sheets as the silo is raised. See ladder and safety cage details to assemble it.

If wind rings are required, see the detail drawing and assemble it as the silo is lifted.

If the silo has any columns attached to it, install these attachments according to the details included in the Columns Assembly Instructions.

While the silo is being erected the watering test should be done as well in order to check the sealing at every point.

4- Repeat step 3 as additional body-sheets are added.

Install the access body-sheet. See the drawing for its position.

5- After completing the bottom ring, lift the silo high enough to be able to assemble the legs.

6- In case a crane is used for the assembly of the legs, at this point cables must be attached (two per sidewall) to the holes of the clips “body-sheet-hopper” and to the crane hook (put inside the silo through the centre cover). The use of cables at this point in order to keep the silo straight is recommended.

7- Assemble the legs.

8- Assemble the hopper sheets.

9- Attach the hopper collar to bottom hopper.

10- If silo is for structure, lift it with a crane and put it on the structure welding the base plate to the structure beams.

CAUTION

1- DO NOT LIFT THE SILO UNDER WINDY CONDITIONS. THIS COULD RESULT IN SILO DAMAGE. CONLLEVAR DAÑOS EN EL SILO.

If the wind blows during the installation so that the silo wobbles and it is unstable, proceed as follows:

1.1.-Rest the silo on the floor. Let the chain hoists tying the silo, tensed but not working.

1.2.-Fix anchor plates and tie them to the foundation by elements that can be released easily (as cables for example).

1.3.-Once that the wind stops, the anchor plates will be dismantled, and we will proceed with the assembly.

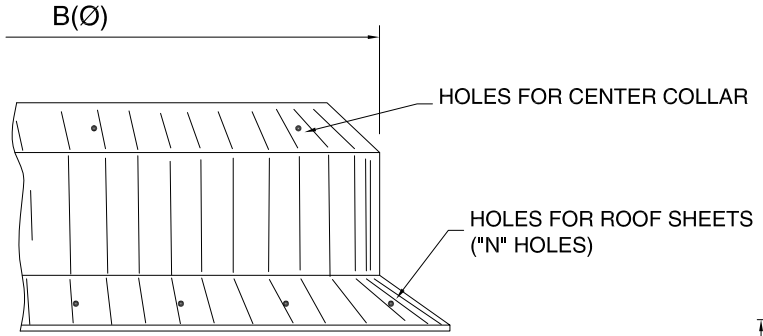
2- WHEN ASSEMBLING, RAISE THE SILO JUST ENOUGH TO ADD ONE BODY-SHEETS RING.

3- START ASSEMBLING EVERY NEW RING OF BODY-SHEETS BY THE WINDWARD SIDE OF THE TANK.

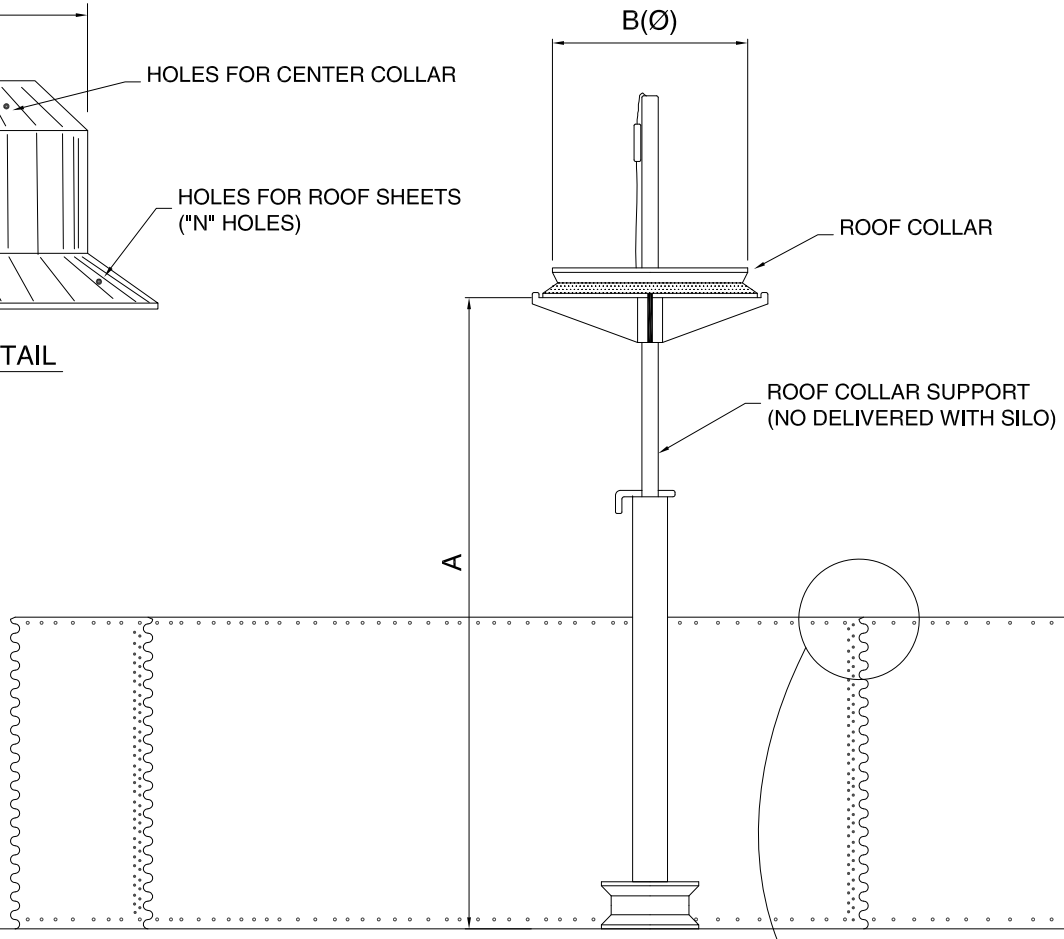
4- WHEN ASSEMBLING A NEW RING LEAVE THE BOLTS LOOSE UNTIL ALL THE BODY-SHEETS ARE ATTACHED.

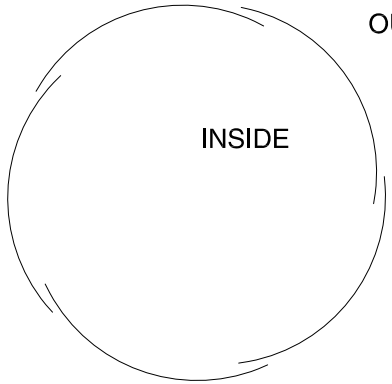
5- LOWER THE SILO AND SECURE IT TO THE FOUNDATION BEFORE LEAVING THE JOBSITE.

6- CHECK THE THICKNESS OF THE BODY-SHEETS AND STIFFENERS AND INSTALL THEM IN THE PROPER POSITION ACCORDING TO THE DRAWING.



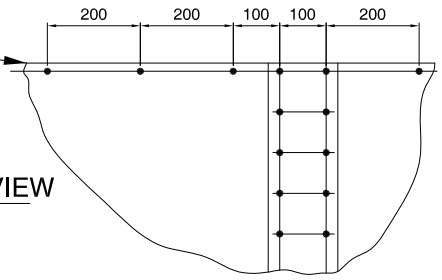
ROOF COLLAR DETAIL





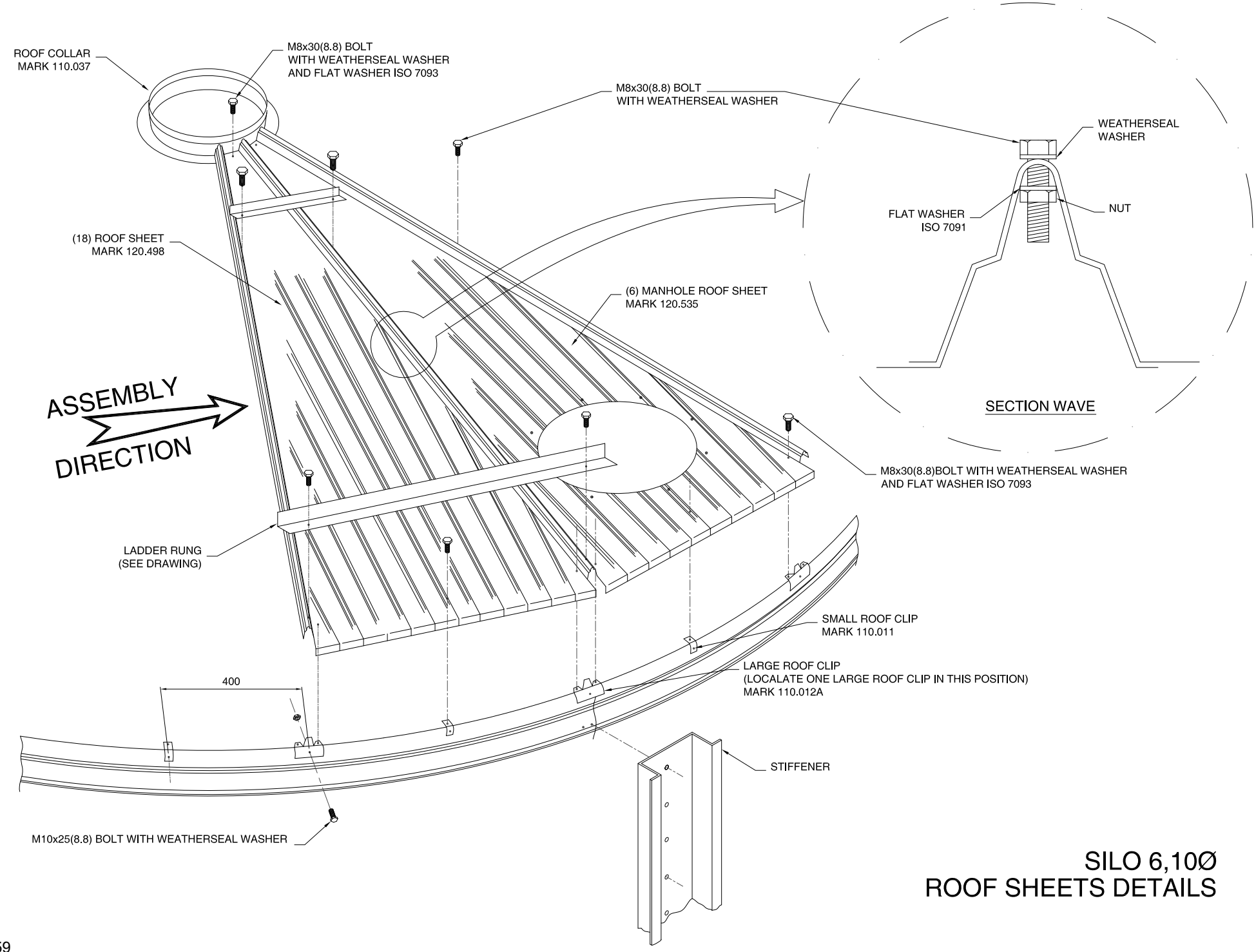
BODY SHEETS INSTALLATION

SILO	(A) mm	(B) mm	N	MARK
4.60	2.070	1.400	18	110.079
5.35	2.290	1.400	21	110.135
6.10	2.510	1.400	24	110.037
6.87	2.730	1.400	27	110.110
7.60	2.950	1.400	30	110.088
8.40	3.170	1.400	33	110.008
8.42	3.170	1.400	27	110.110
9.20	3.390	1.400	36	110.144
9.93	3.460	1.930	39	110.155
10.70	3.680	1.930	42	110.044
11.45	3.900	1.930	45	116.719
12.23	4.120	1.930	48	110.098

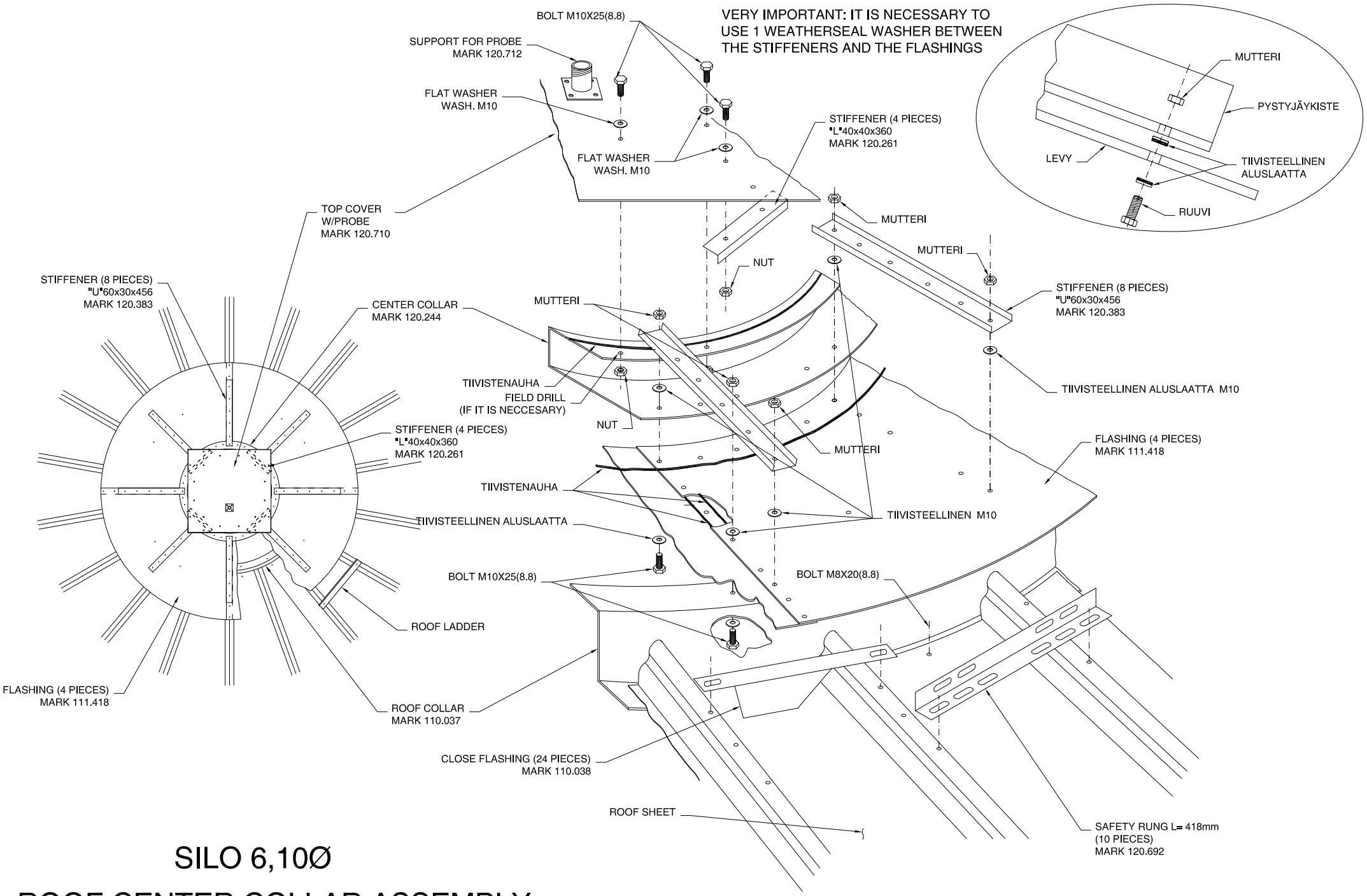


OUTSIDE VIEW

ROOF ASSEMBLY INSTRUCTIONS



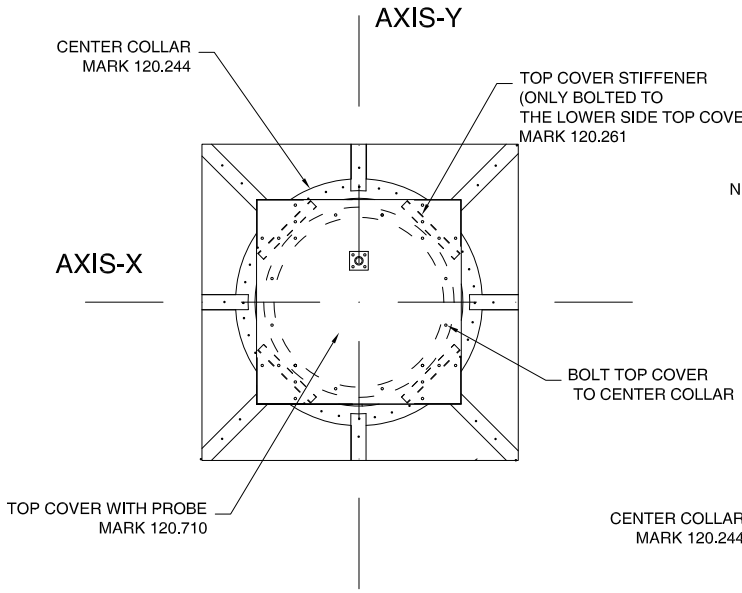
SILO 6,10Ø
ROOF SHEETS DETAILS

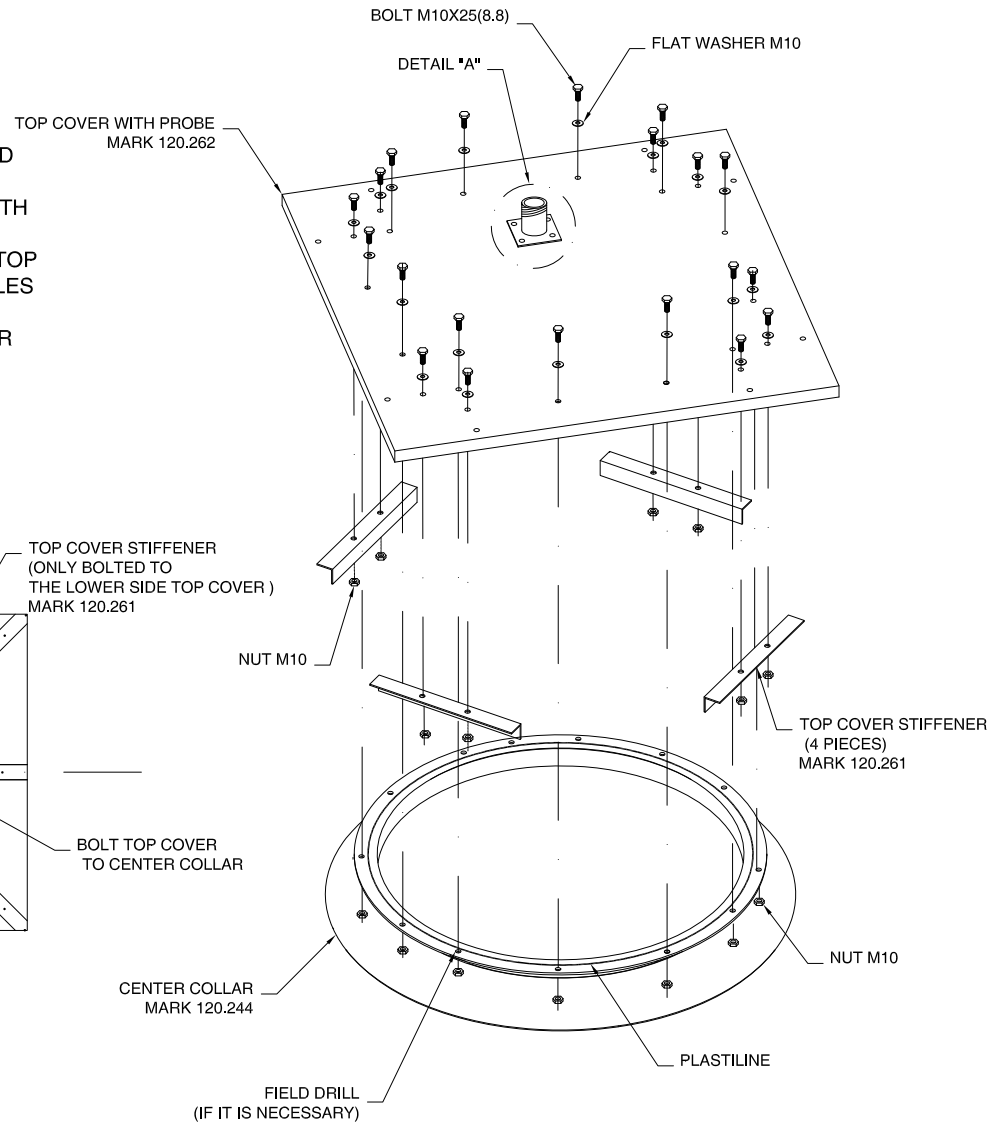


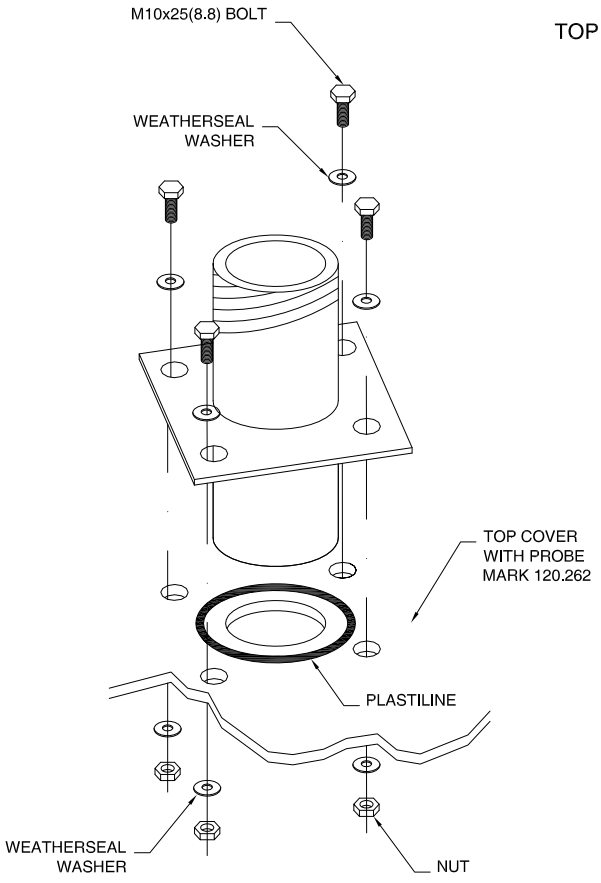
SILO 6,10Ø

ROOF CENTER COLLAR ASSEMBLY

NOTE:
- AXIS X IS THE AXIS OF THE SILO LINE.
-AXIS Y IS PERPENDICULAR TO AXIS X AND CROSSES THE SILO CENTER.
-THE TOP COVER MUST BE INSTALLED WITH THIS ORIENTATION.
-JUST IN CASE THE BOLT HOLES OF THE TOP COVER DO NOT MATCH TO THE BOLT HOLES OF THE ROOF COLLAR, DRILL THE ROOF COLLAR IN THE POSITION THE TOP COVER BOLT HOLES.
-USE M10x25(8.8) BOLTS, NUT AND FLAT WASHER FOR EVERY JOINTS

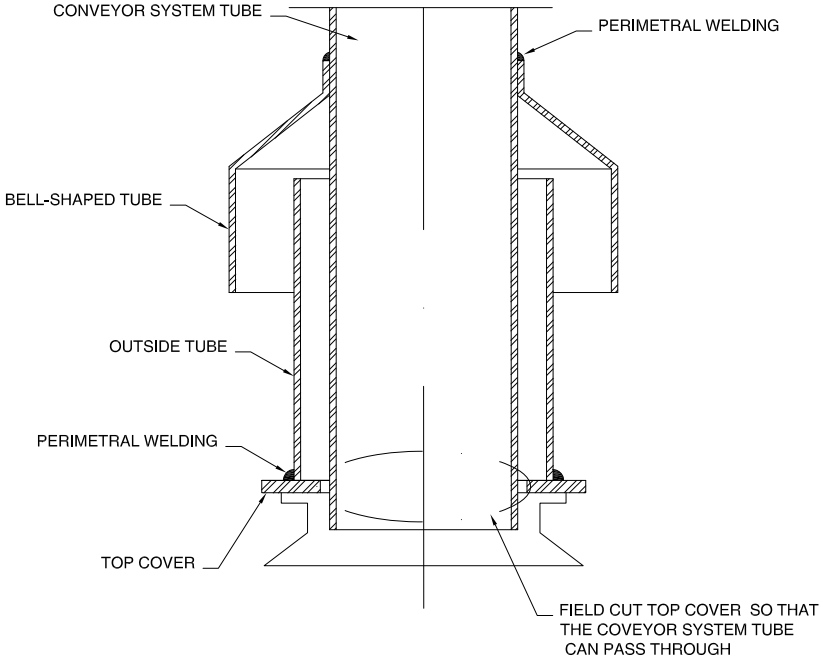






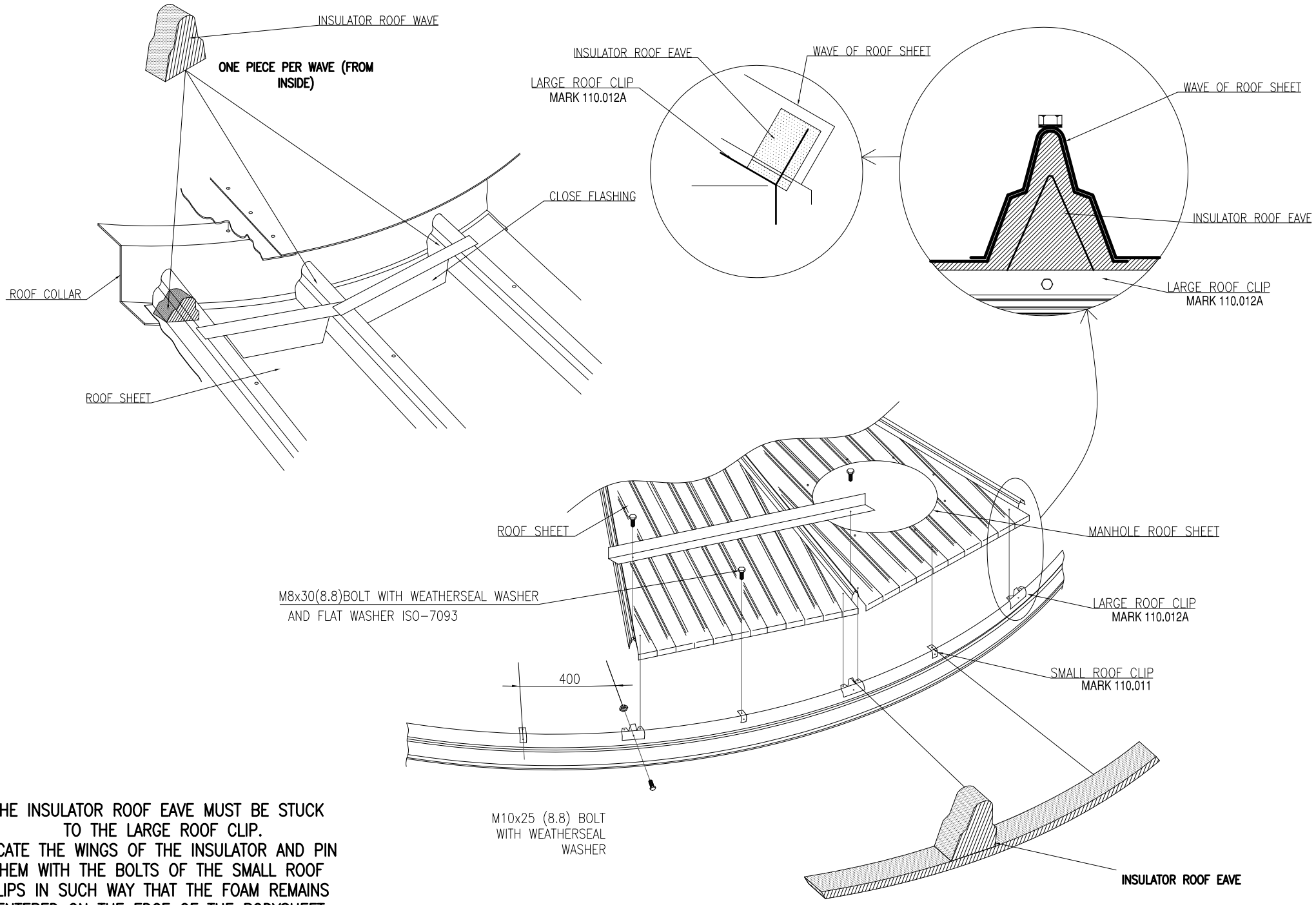
DETAIL "A"

TOP COVER-CENTER COLLAR UNION DETAIL



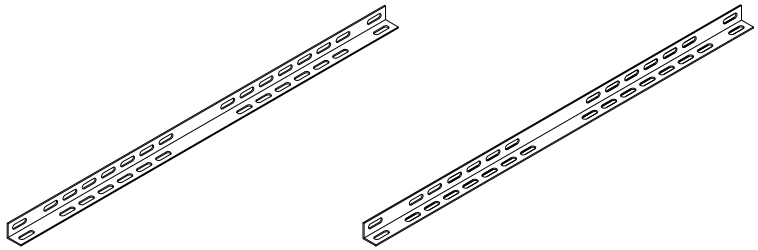
RECOMMENDED CONVEYOR SYSTEM-TOP COVER UNION

ASSEMBLY TOP COVER DETAIL



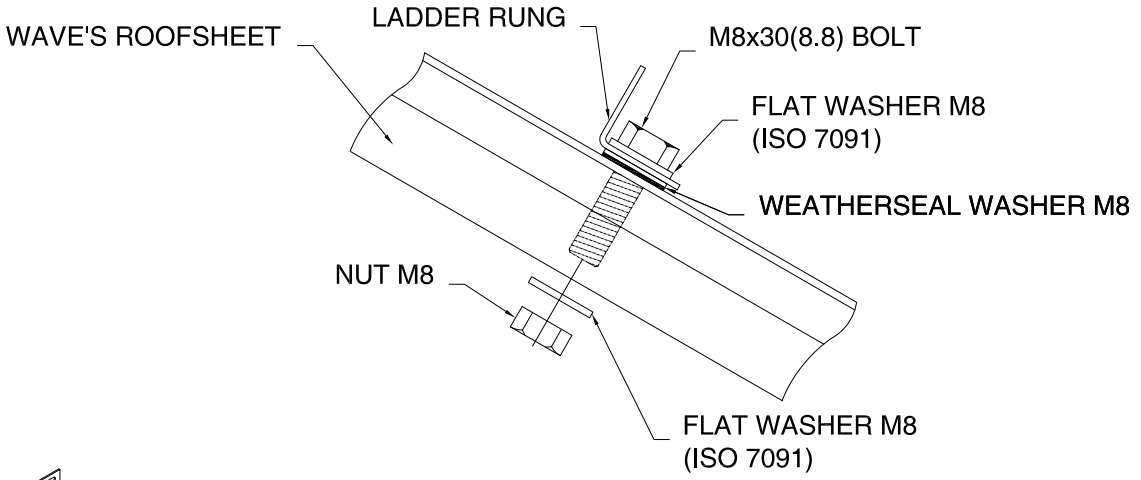
THE INSULATOR ROOF EAVE MUST BE STUCK TO THE LARGE ROOF CLIP.
LOCATE THE WINGS OF THE INSULATOR AND PIN THEM WITH THE BOLTS OF THE SMALL ROOF CLIPS IN SUCH WAY THAT THE FOAM REMAINS CENTERED ON THE EDGE OF THE BODYSHEET.

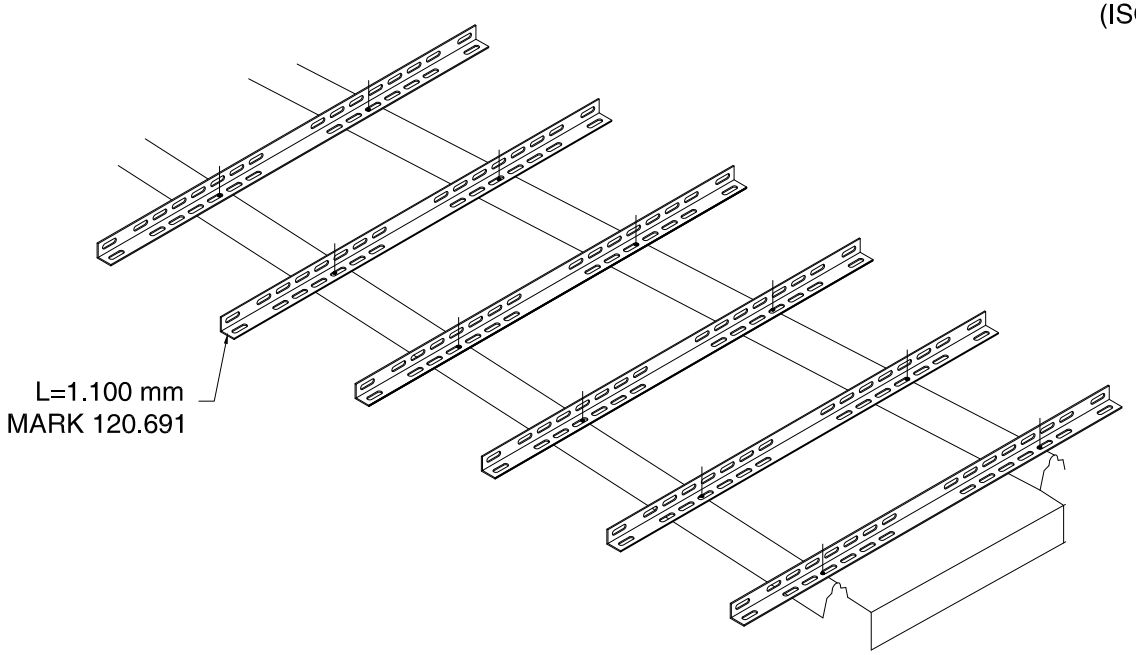
SEALING DETAIL OF ROOF SHEETS WAVES



POSITION "A" POSITION "B"

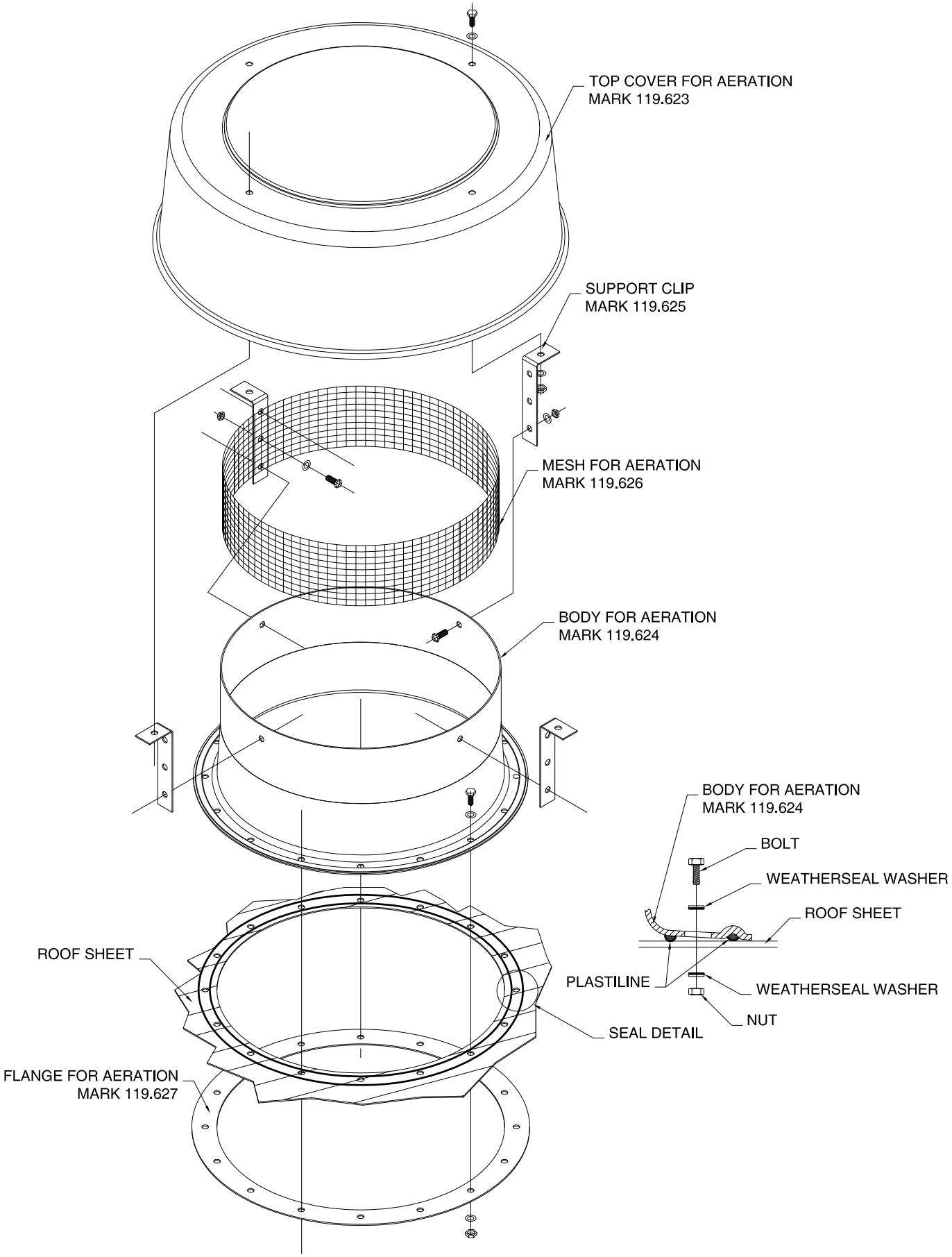
NOTE:
-INSTALL THE RUNGS IN THE POSITION WHERE THE LONG HOLES FIT BETTER WITH THE BOLT HOLE OF ROOF SHEETS.
-TAKE INTO ACCOUNT THE RUNGS ARE SEPARATED 500 mm AMONG THEM



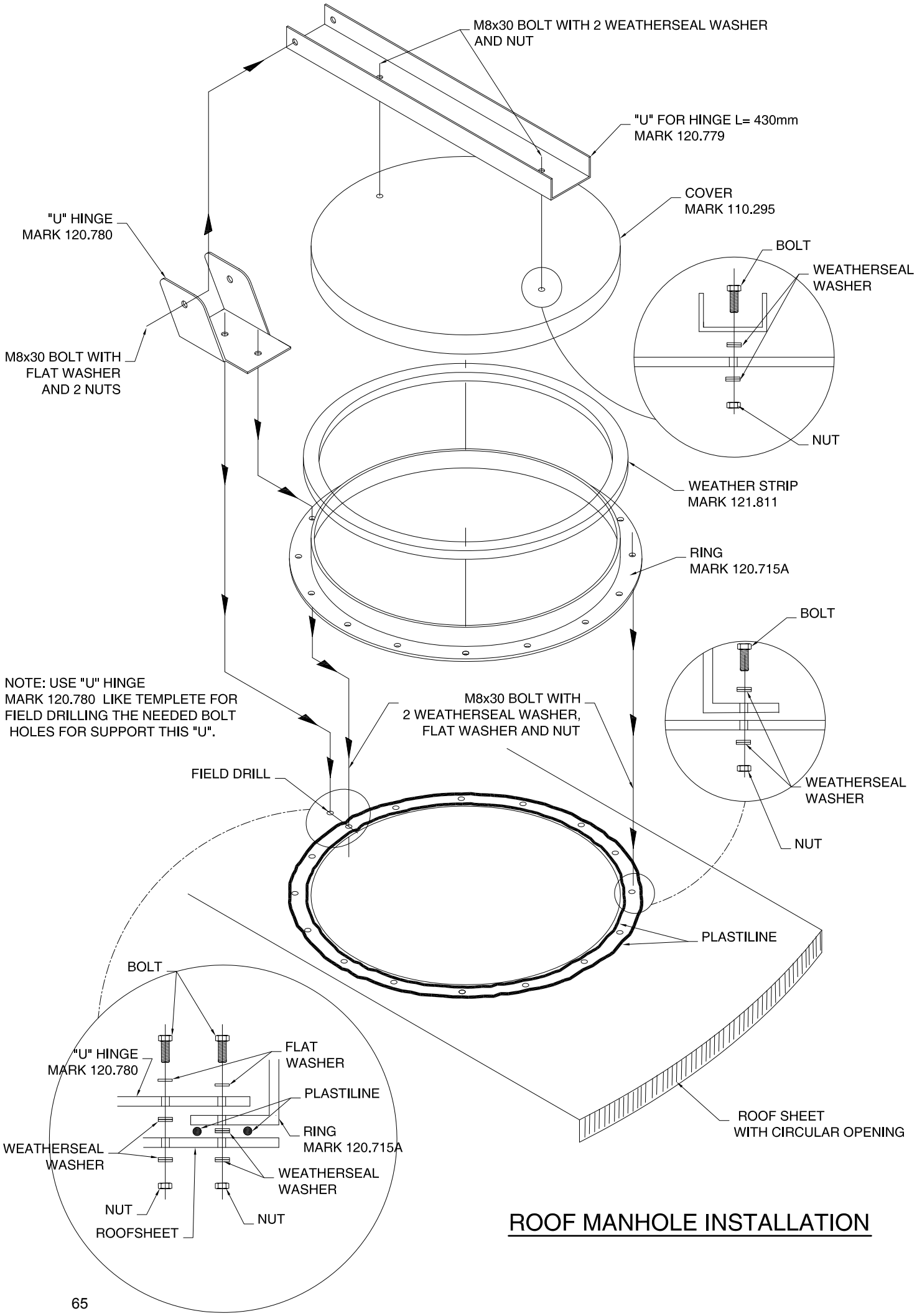


LADDER RUNG ROOF ASSEMBLY SILO 6,10Ø

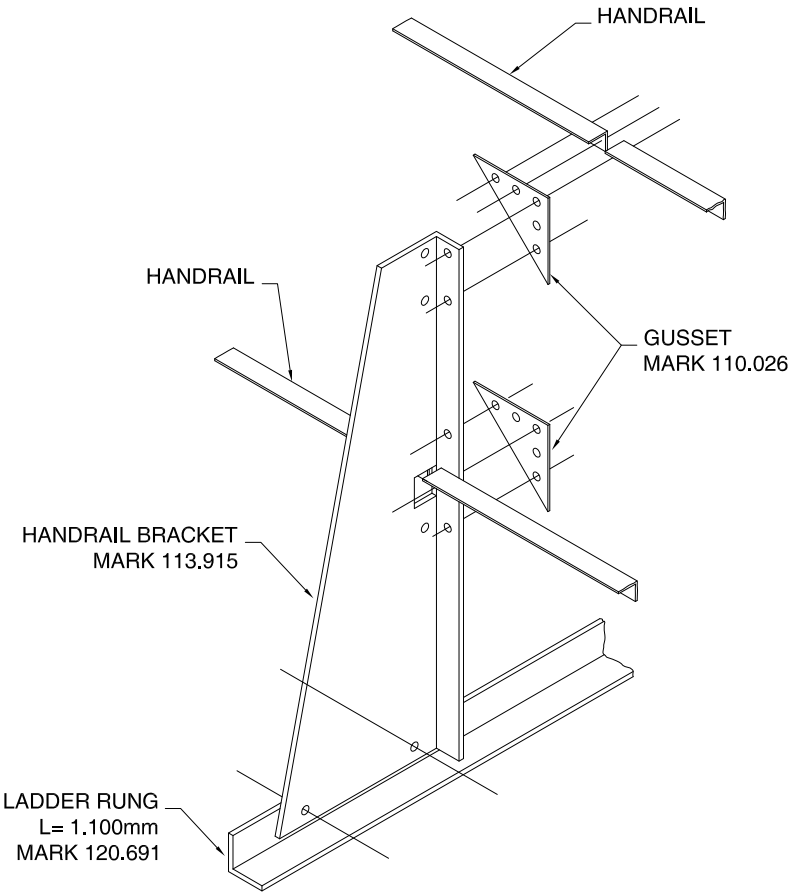
- IT IS VERY IMPORTANT TO SEAL CORRECTLY ALL JOINTS BETWEEN PARTS WITH PLASTILINE
- USE BOLTS M8x20 (8.8) WITH HEAD OUTSIDE, WEATHERSEAL WASHER OUTSIDE, FLAT WASHER AND NUT INSIDE
- THE DISTRIBUTION OF ROOF AERATION MUST BE UNIFORM AROUND THE SILO ROOF



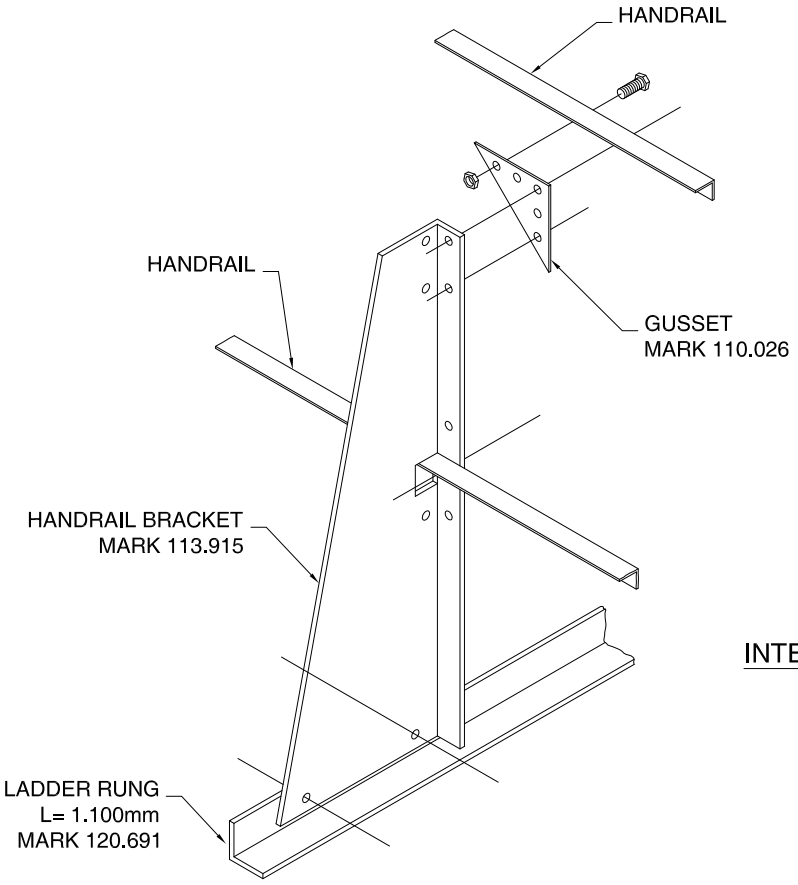
INSTALLATION OF ROOF AERATION



ROOF MANHOLE INSTALLATION



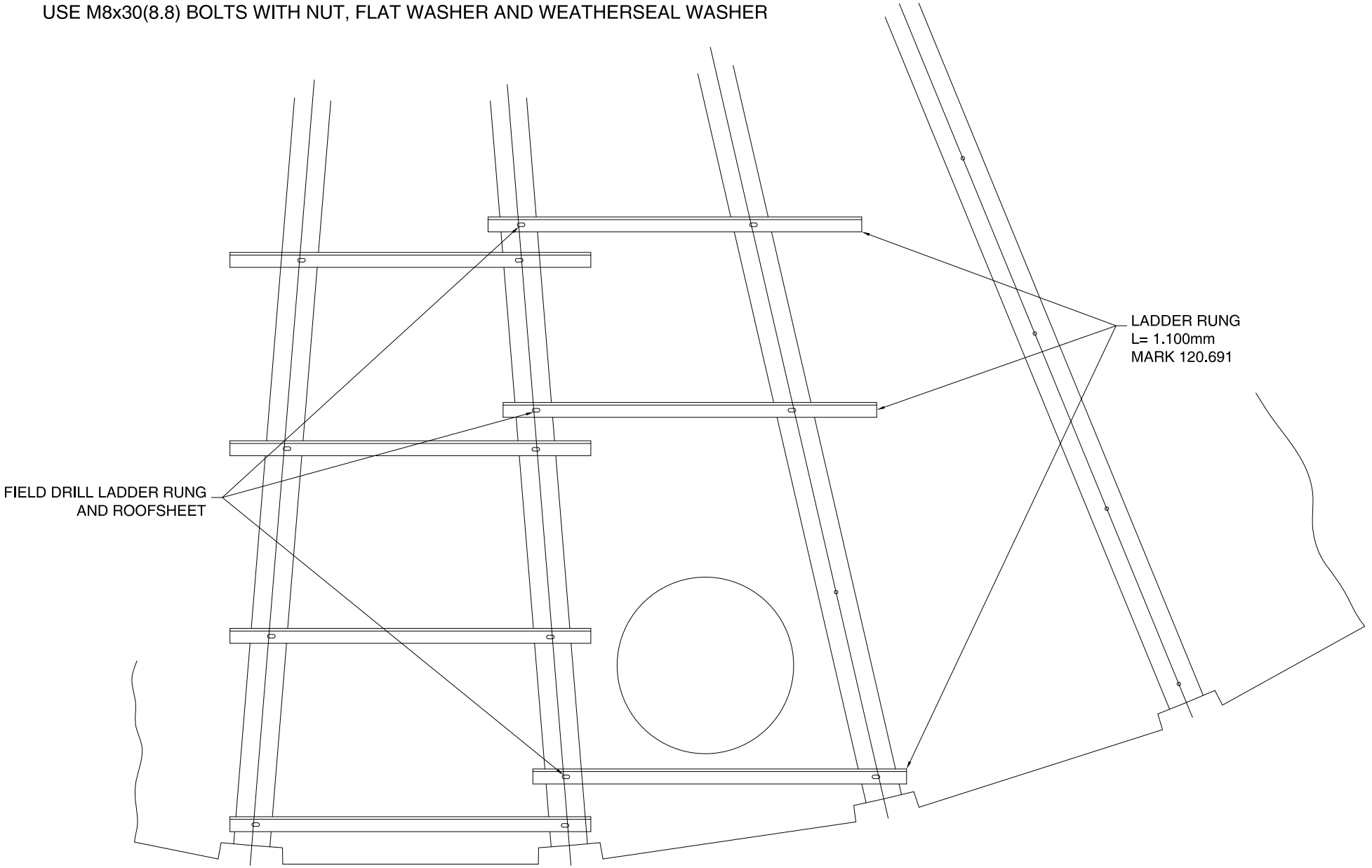
SPLICE DETAIL



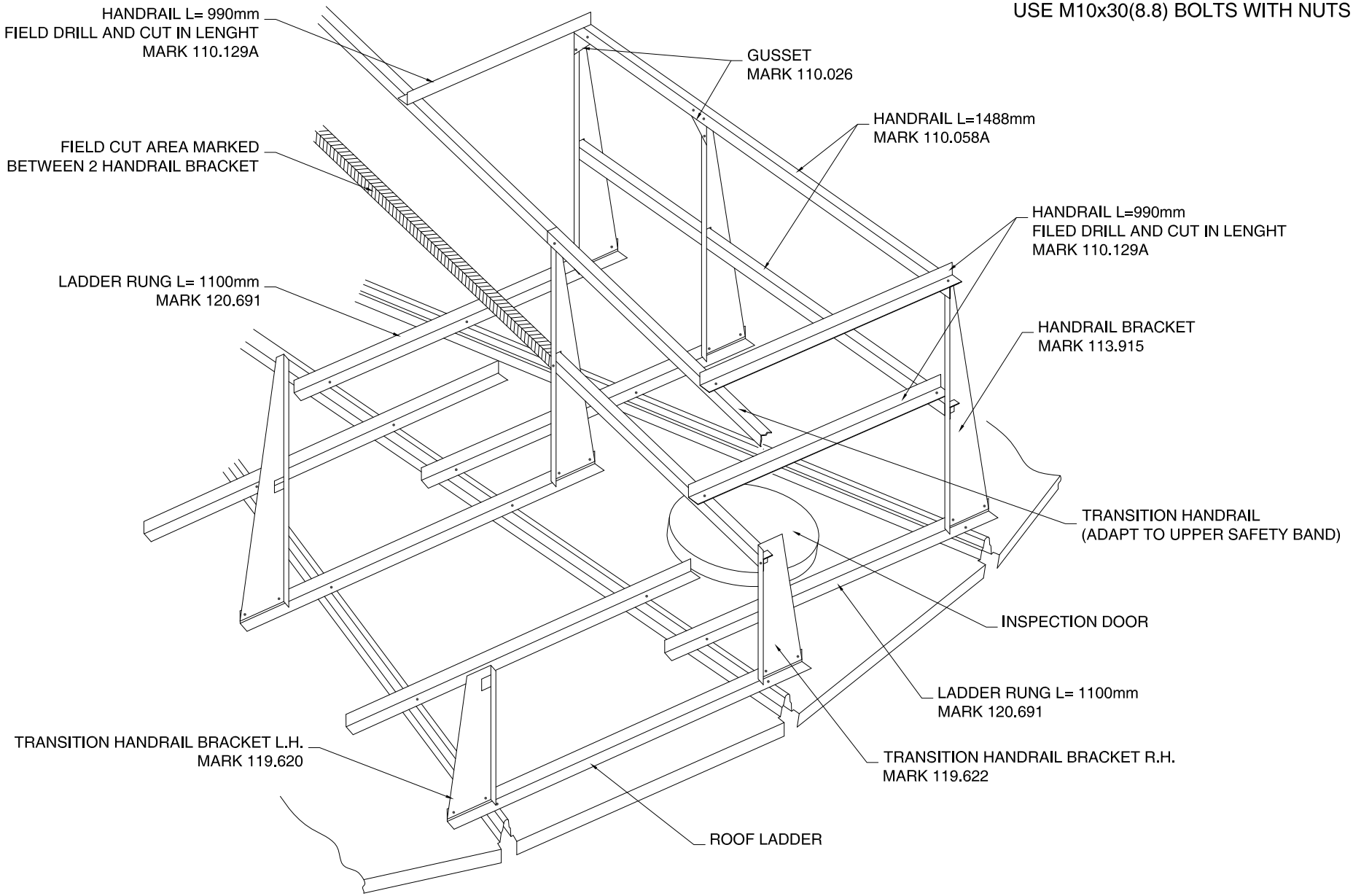
INTERMEDIATE DETAIL

ROOF HANDRAIL DETAILS

USE M8x30(8.8) BOLTS WITH NUT, FLAT WASHER AND WEATHERSEAL WASHER



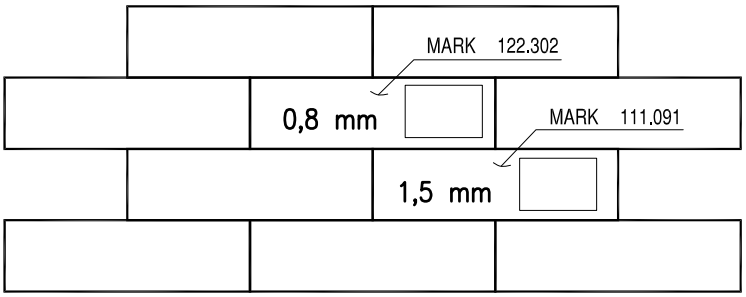
INSTALLATION OF LADDER RUNG FOR PROTECTION ROOF DOOR



PROTECTION OF INSPECTION DOOR

VERY IMPORTANT:
THE FOREMAN IN CHARGED MUST CHECK THAT THERE ARE ENOUGH BODYSHEETS WITH THEIR CORRESPONDING THICKNESS TO INSTALL EVERY SILOS.

SILO 6,10/4 -T45°



BODY SHEETS

QUANT.	THICKNESS (mm)	MARK
8	0,8	110.000A
7	0,8	110.000A
7	0,8	110.000A
8	1,8	110.403

BODY SHEET/BODY SHEET SEAM

USE M10x20(8.8) BOLTS WITH HEAD OUTSIDE, WEATHERSEAL WASHER OUTSIDE, FLAT WASHER INSIDE AND NUT INSIDE.

BODY SHEET/STIFFENERS SEAM AND LEGS SEAM

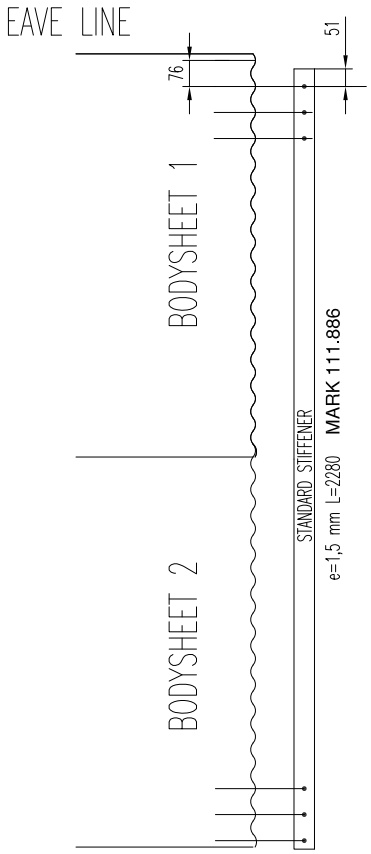
USE M10x25(8.8) BOLTS WITH HEAD INSIDE, WEATHERSEAL WASHER INSIDE AND NUT OUTSIDE.

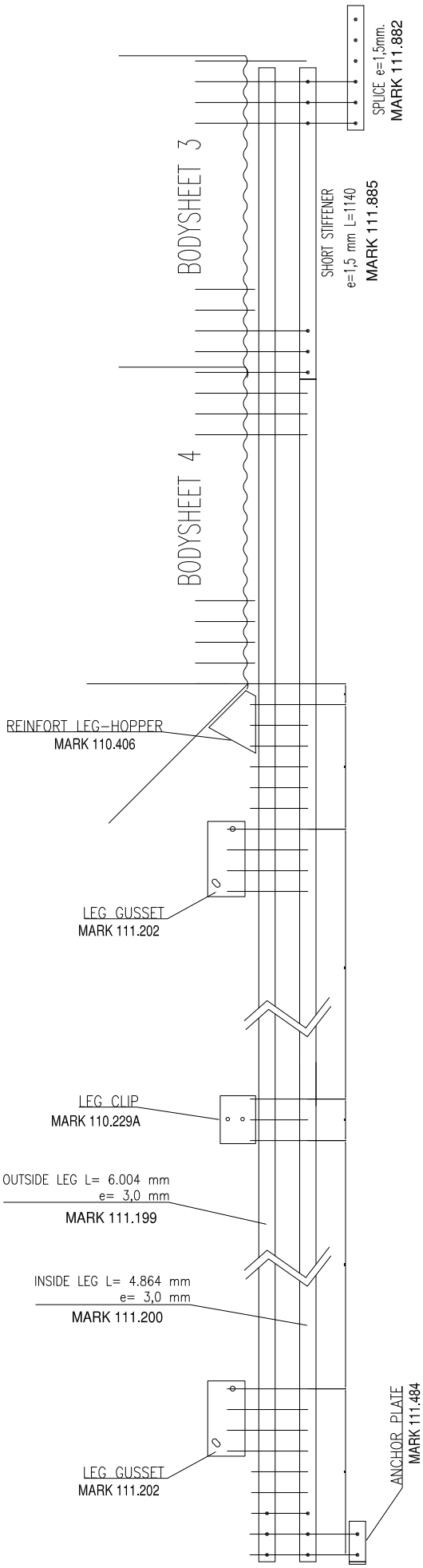
STIFFENER/STIFFENER SPLICE

USE M10x20(8.8) BOLTS WITH NUT AND 2 FLAT WASHERS.

BODY SHEETS COMPOSITION

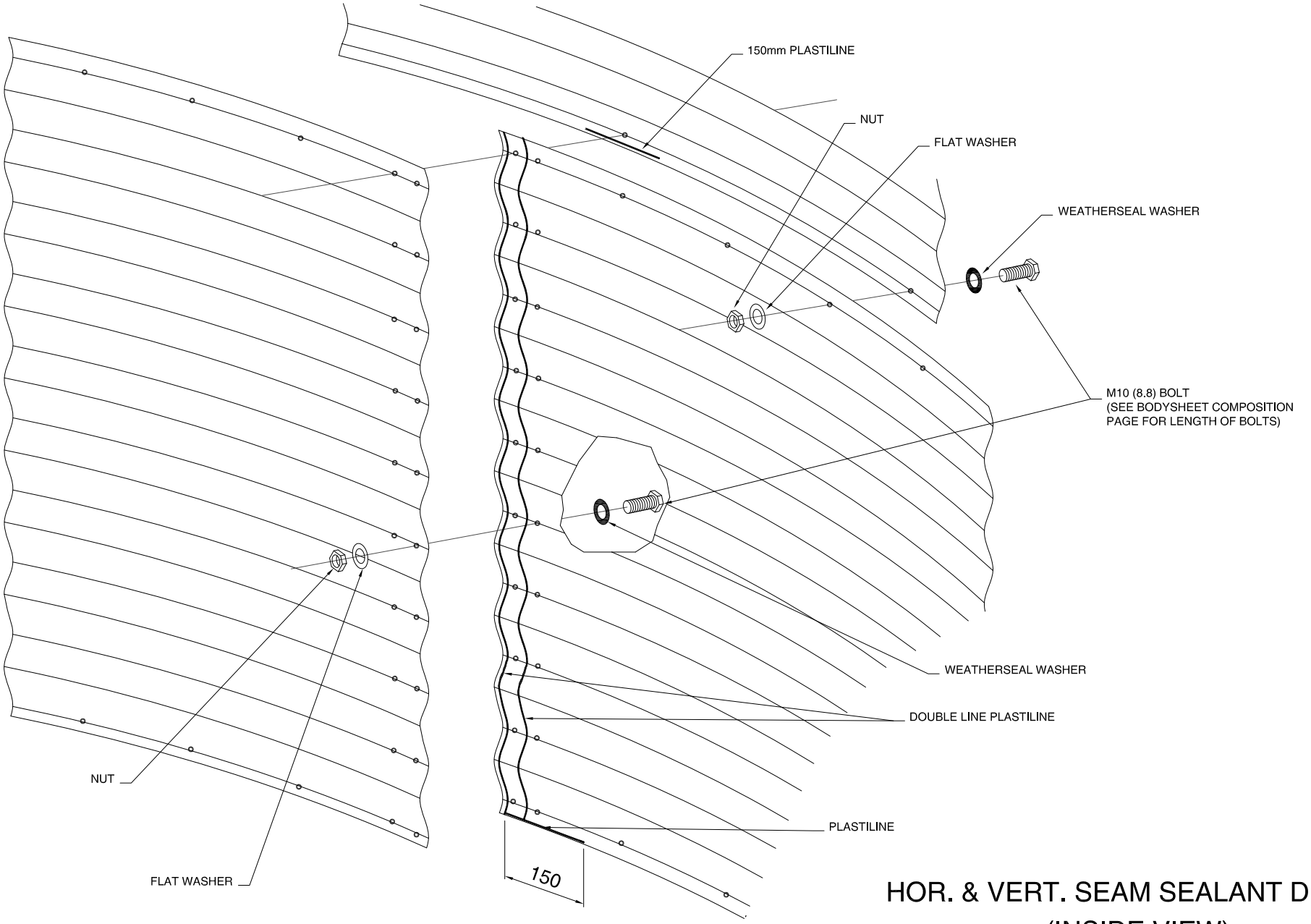
VERY IMPORTANT:
THE FOREMAN IN CHARGED MUST CHECK THAT
THERE ARE ENOUGH STIFFFENERS
WITH THEIR CORRESPONDING THICKNESS
TO INSTALL EVERY SILOS.



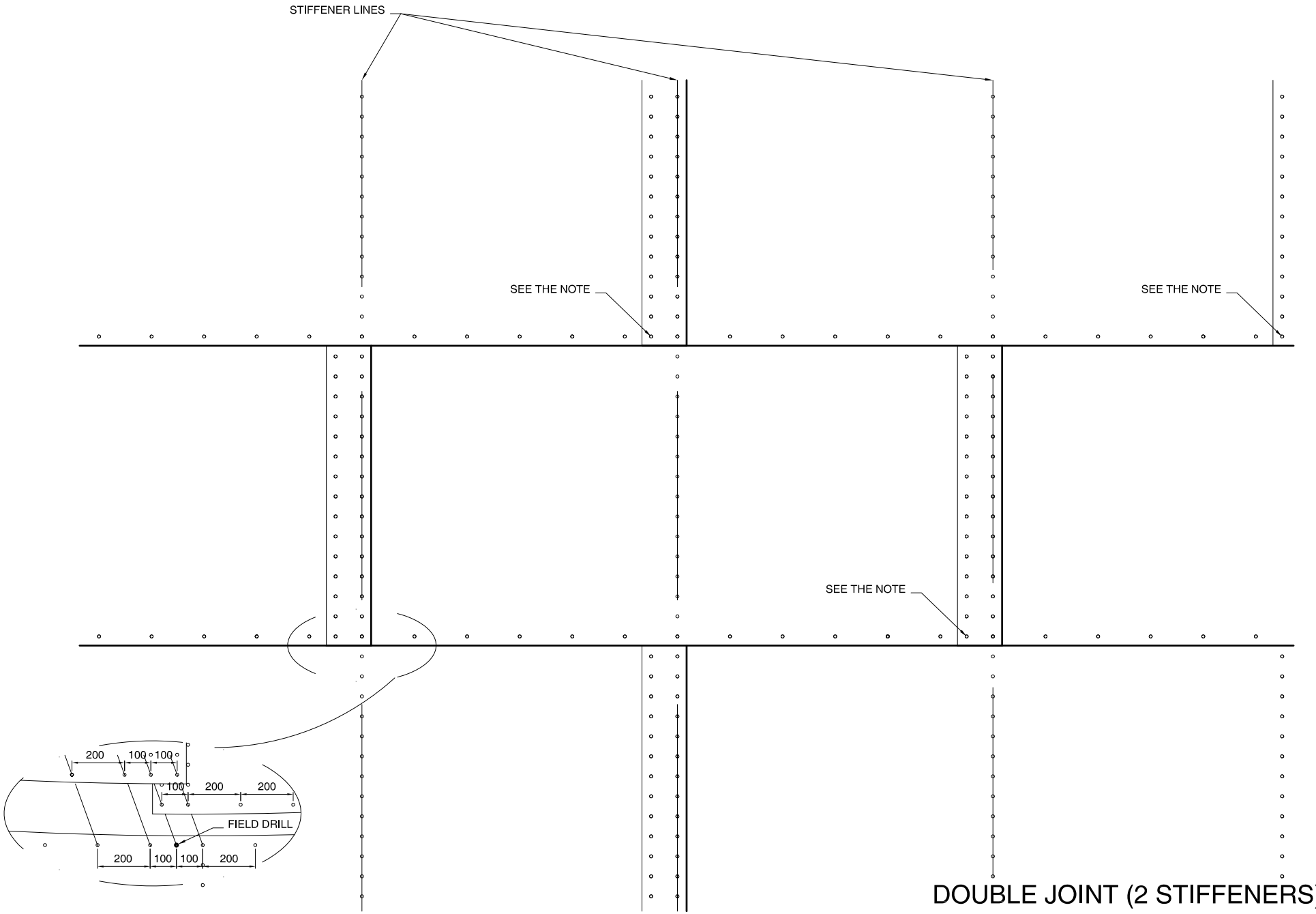


SILO 6,10/ 4-T45°

STIFFENERS AND LEGS INSTALLATION

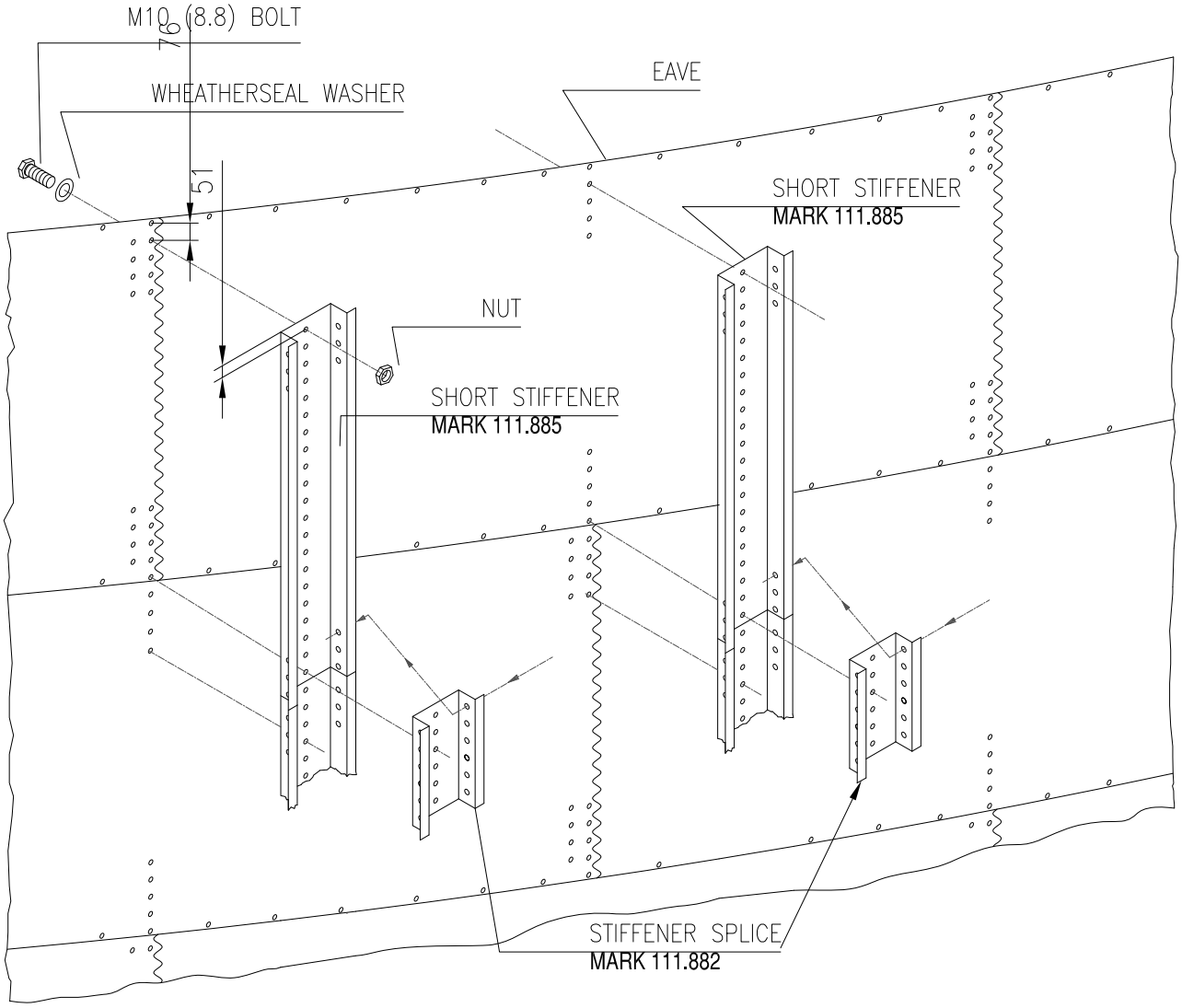


HOR. & VERT. SEAM SEALANT DETAIL (INSIDE VIEW)



DOUBLE JOINT (2 STIFFENERS)
BODYSHEETS AND STIFFENERS INSTALLATION (OUTSIDE VIEW)

NOTE:
IT IS NOT NECESSARY FIELD DRILL HOLES IN THE BODYSHEETS BECAUSE SILO WAS CALCULATED WITHOUT THE CONTRIBUTION OF THESE ADDITIONAL BOLTS, IT IS ONLY AN ESTHETIC ISSUE.



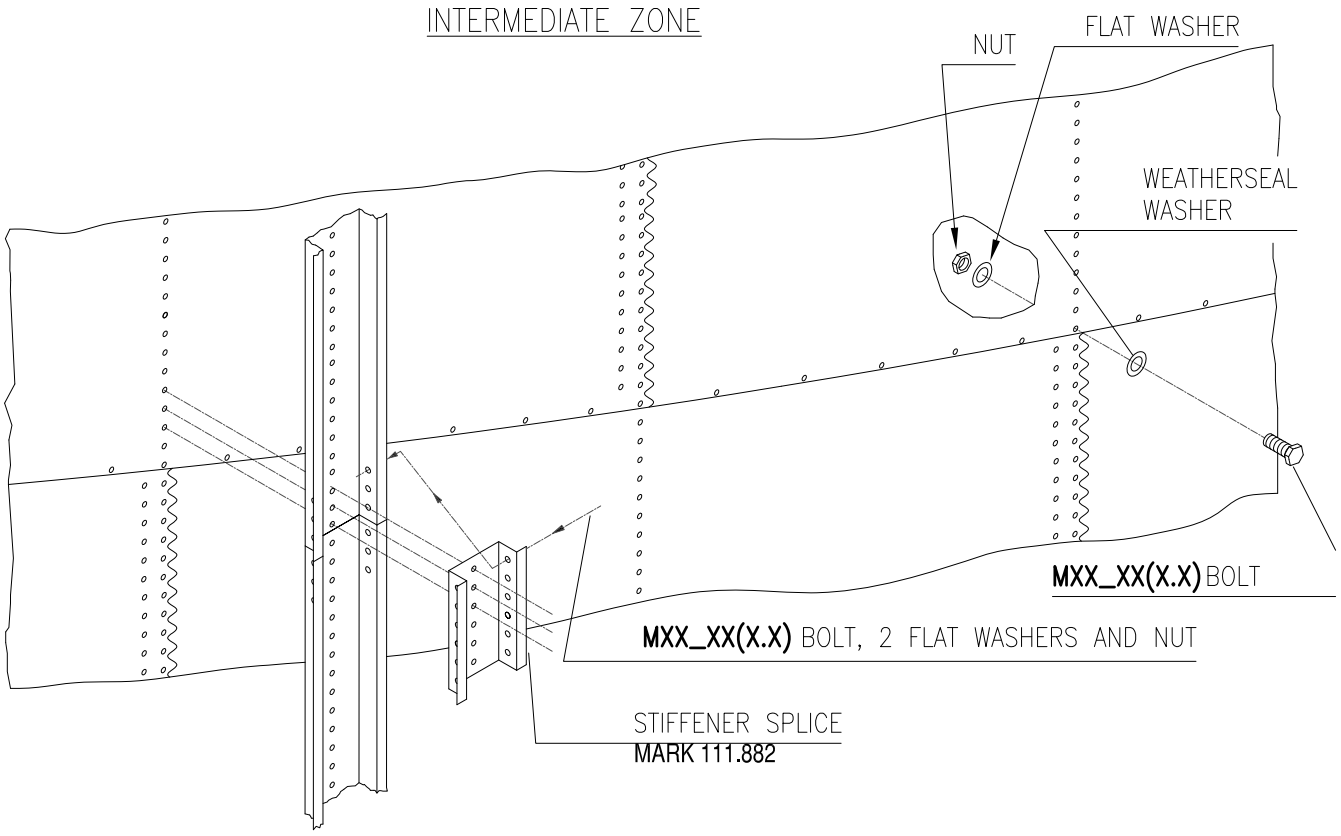
* SEE BODYSHEET COMPOSITION PAGE FOR LENGTH OF BOLTS

NOTE:

WHEN INSTALL STIFFENERS, IT IS VERY IMPORTANT NOT TO ALLOW STIFFENERS TO SLIP DOWNWARD WHEN TIGHTENING. STIFFENERS MUST BE IN CONTACT.

BODYSHEETS AND STIFFENERS DETAILS

(OUTSIDE VIEW)



NOTE:

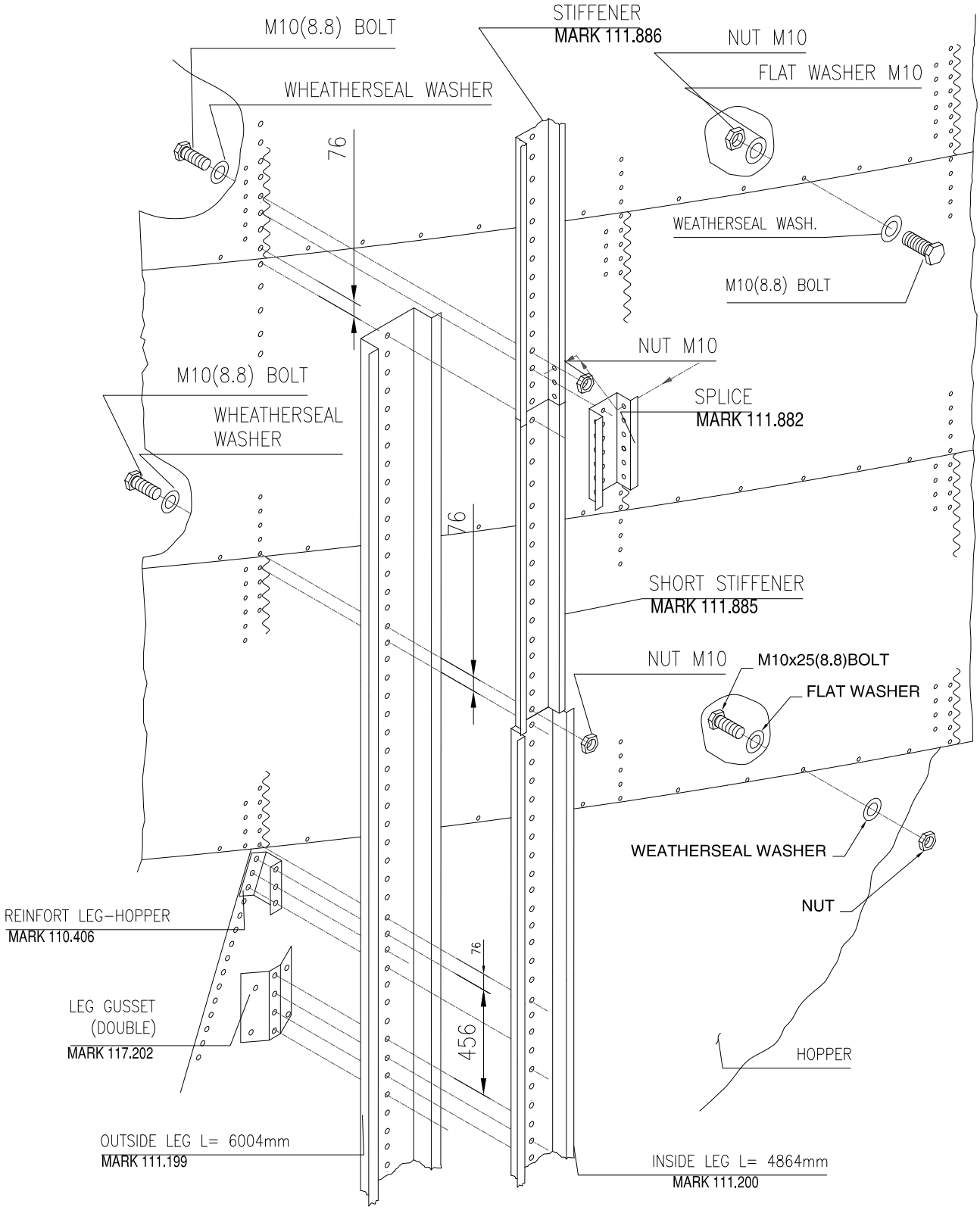
WHEN INSTALL STIFFENERS, IT IS VERY IMPORTANT NOT TO ALLOW STIFFENERS TO SLIP DOWNWARD WHEN TIGHTENING.

STIFFENERS MUST BE IN CONTACT.

* SEE BODYSHEET COMPOSITION PAGE FOR LENGTH OF BOLTS

BODYSHEETS AND STIFFENERS DETAILS

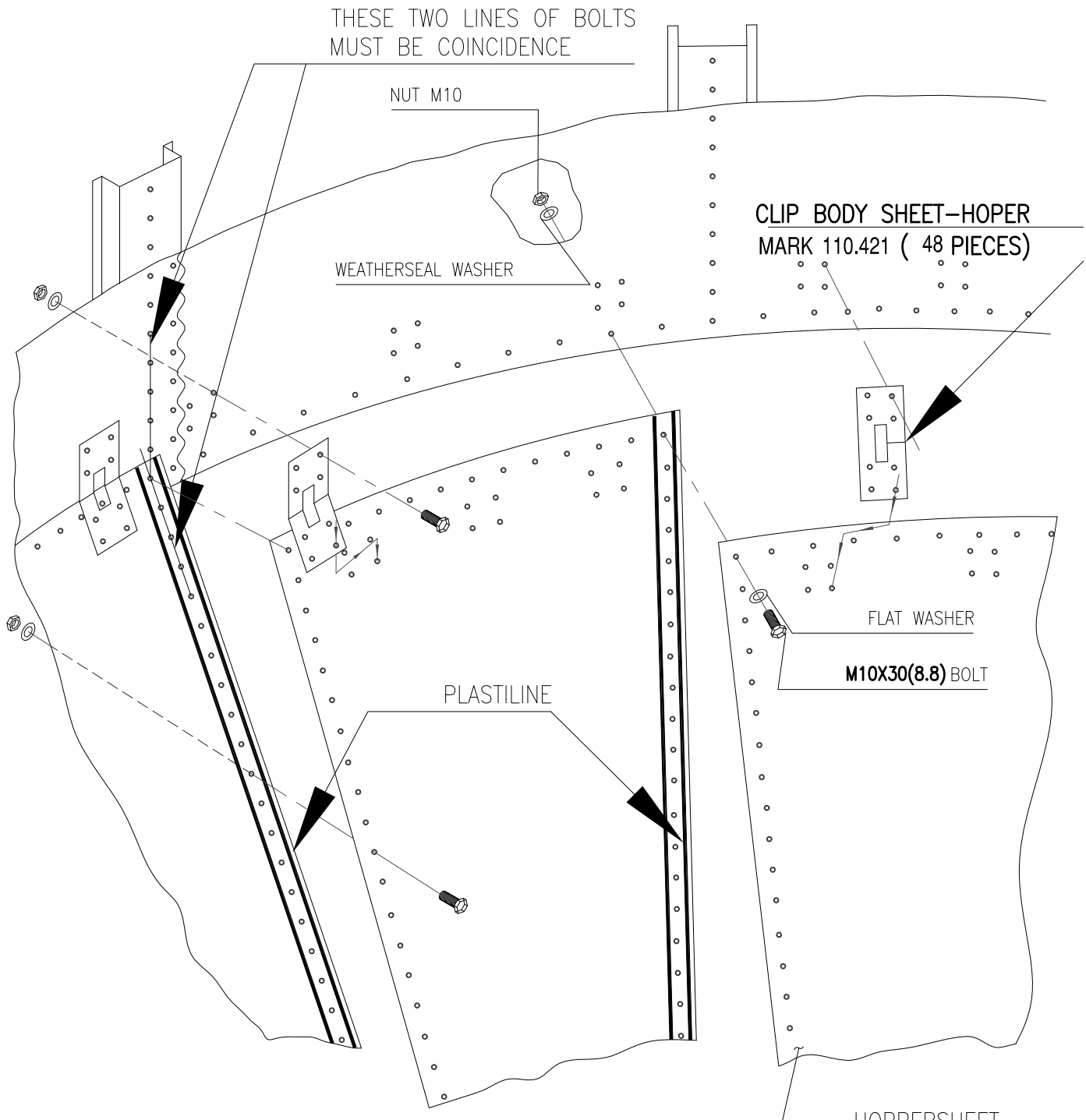
(OUTSIDE VIEW)



SILO 6,10Ø/T45°

BODYSHEETS, STIFFENERS AND LEGS DETAIL

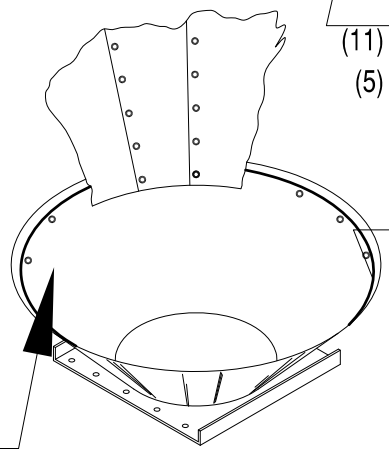
(OUTSIDE VIEW)



BODYSHEET–HOPPERSHEET: USE M10x30(8.8) BOLT WITH HEAD AND FLAT WASHER INSIDE, WEATHERSEAL OUTSIDE AND NUT OUTSIDE.

HOPPERSHEET–HOPPERSHEET: USE M10x25(8.8) BOLT WITH HEAD INSIDE,WEATHERSEAL OUTSIDE AND NUT OUTSIDE

HOPPERSHEET–HOPPER CONE: USE M10x40(8.8) BOLT WITH HEAD INSIDE, FLAT WASHER INSIDE, WEATHERSEAL OUTSIDE AND NUT OUTSIDE



HOPPERSHEET
(11) MARK 111.201
(5) MARK 111.759

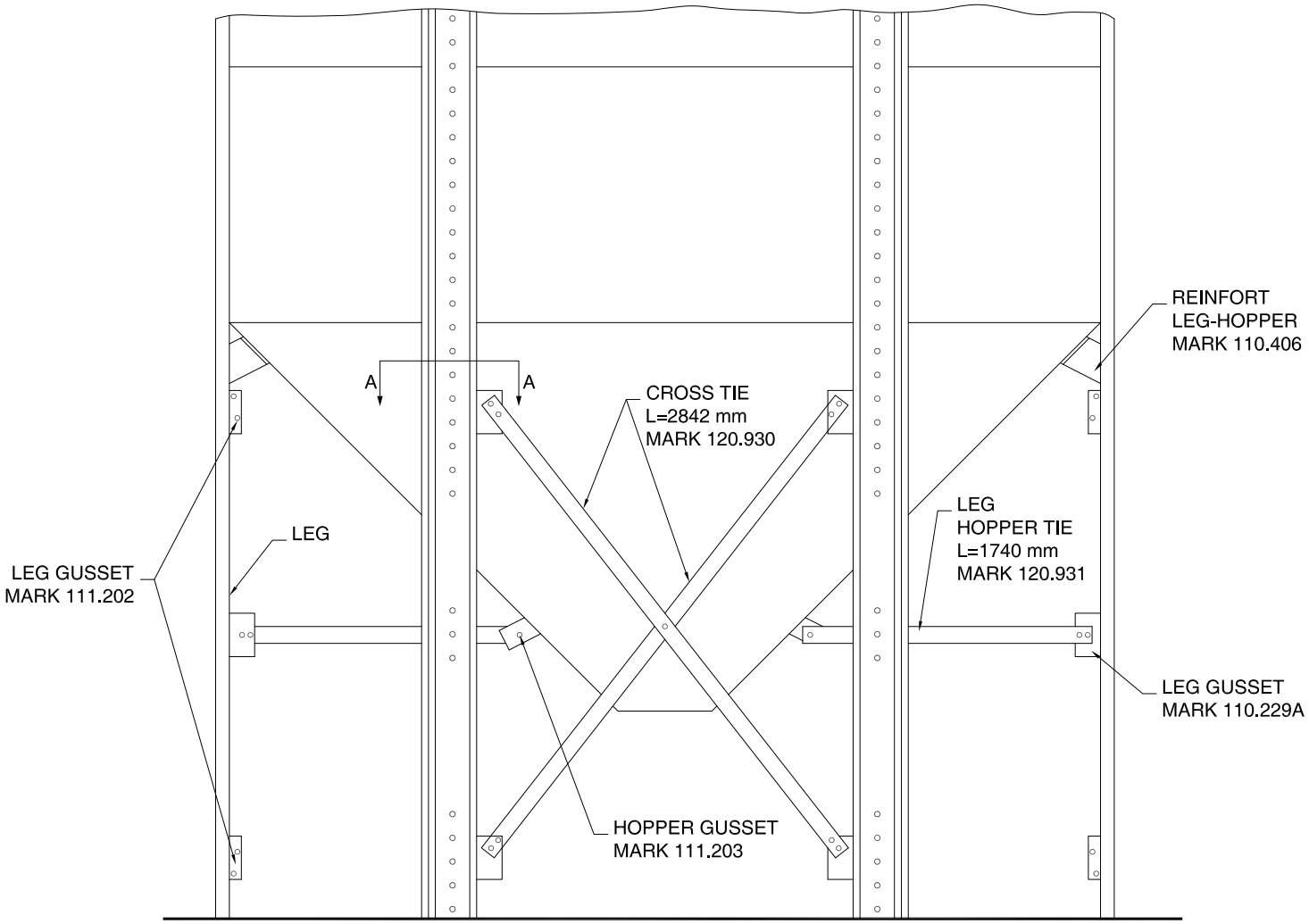
CAULK WITH PLASTILINE

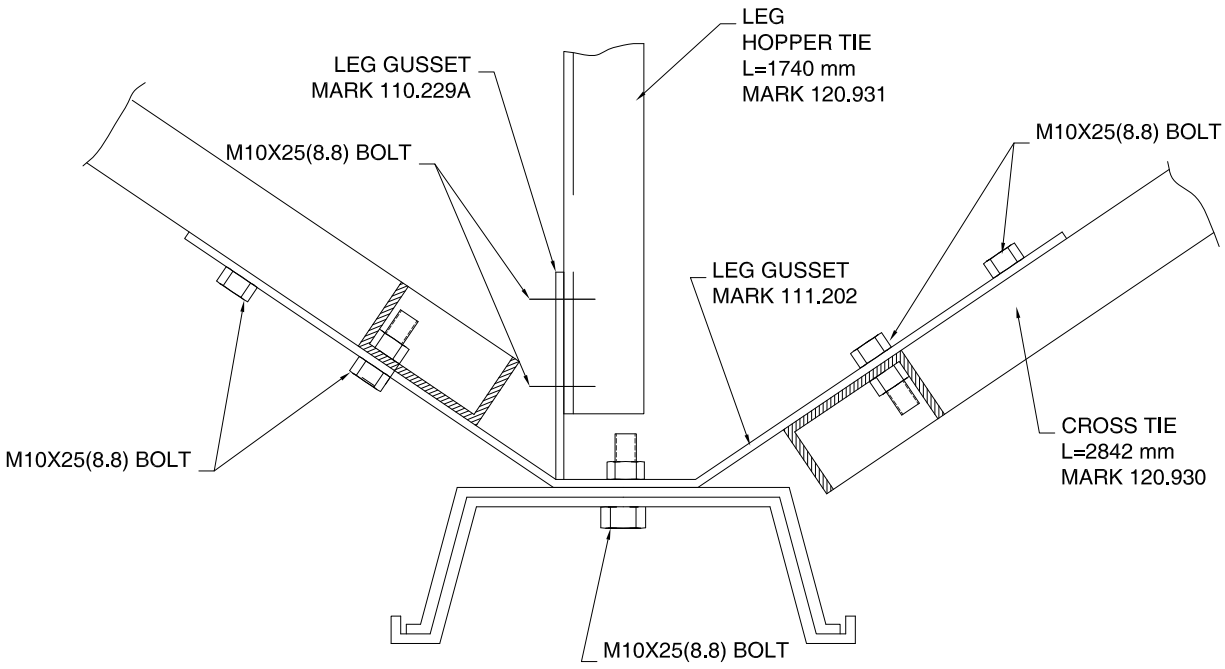
HOPPER COLLAR
MARK 111.206

SILO 6,10Ø/T45°

HOPPER ERECTION

USE BOLTS M10x25(8.8) WITH FLAT WASHER AND NUT FOR CONNECTIONS EXCEPT INDICATED

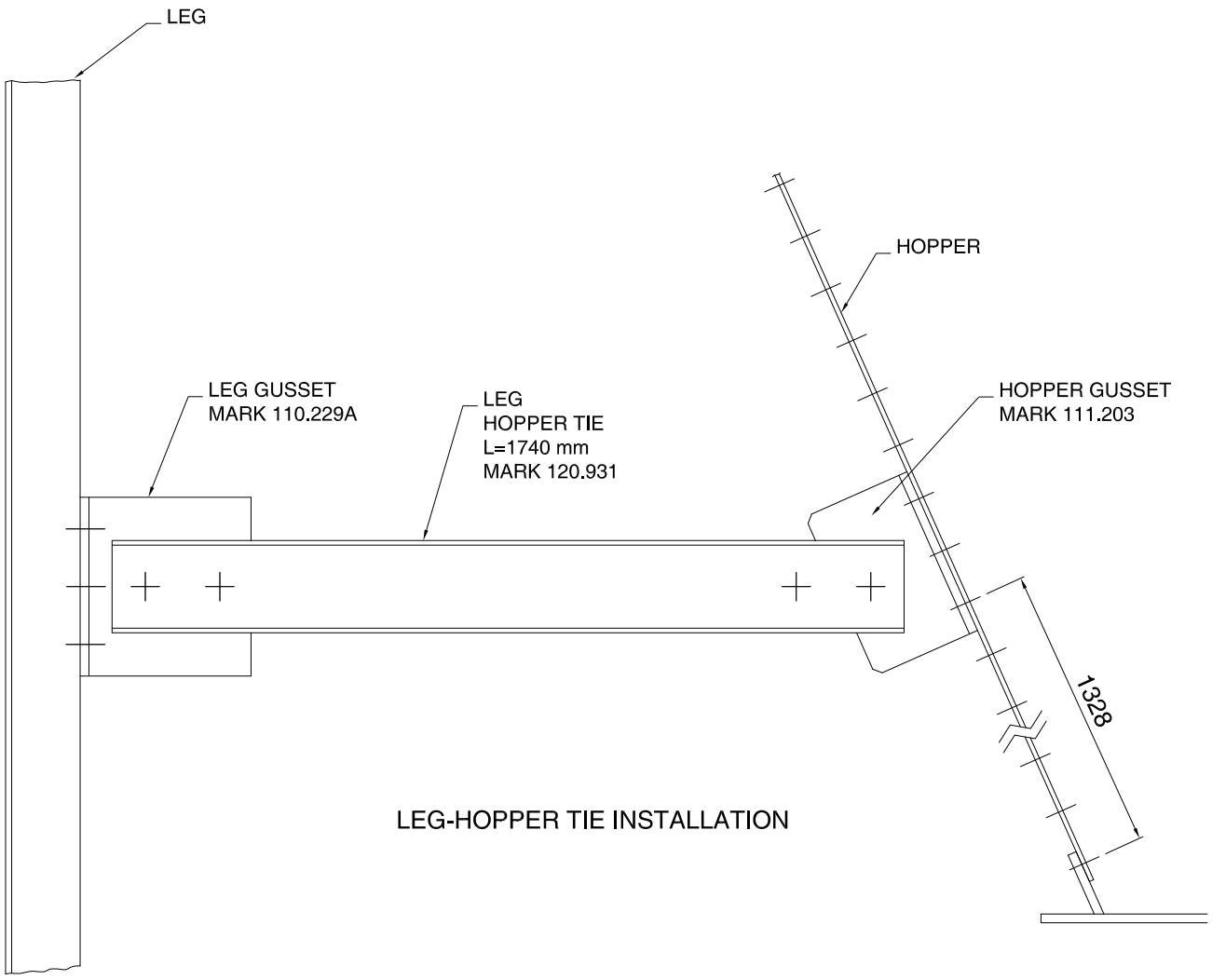




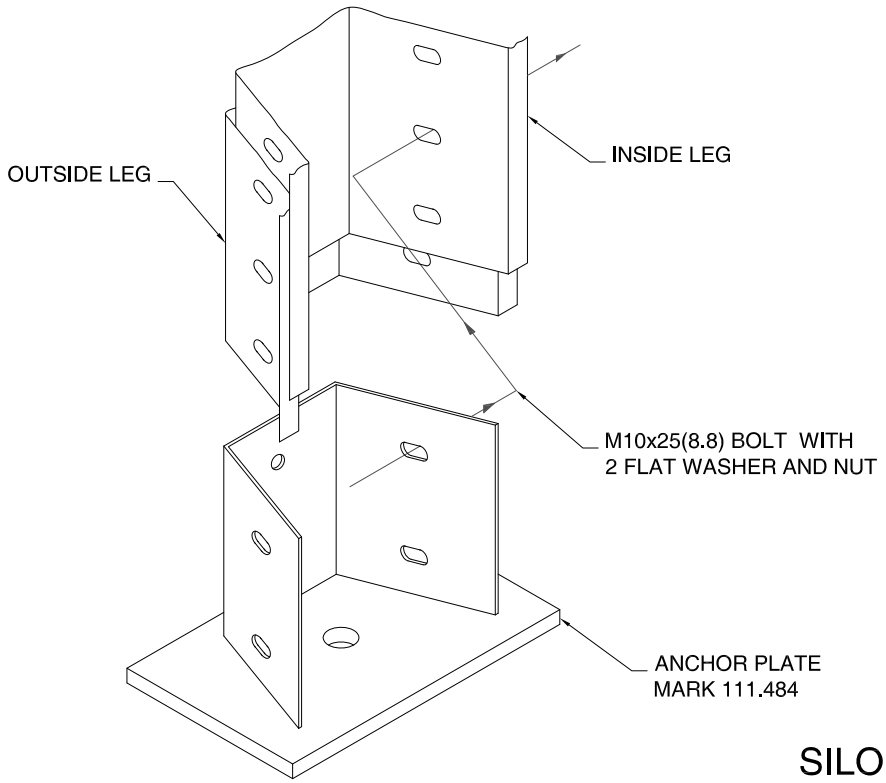
SECTION A-A

SILO 6,10Ø/T45°

BRACING DETAILS



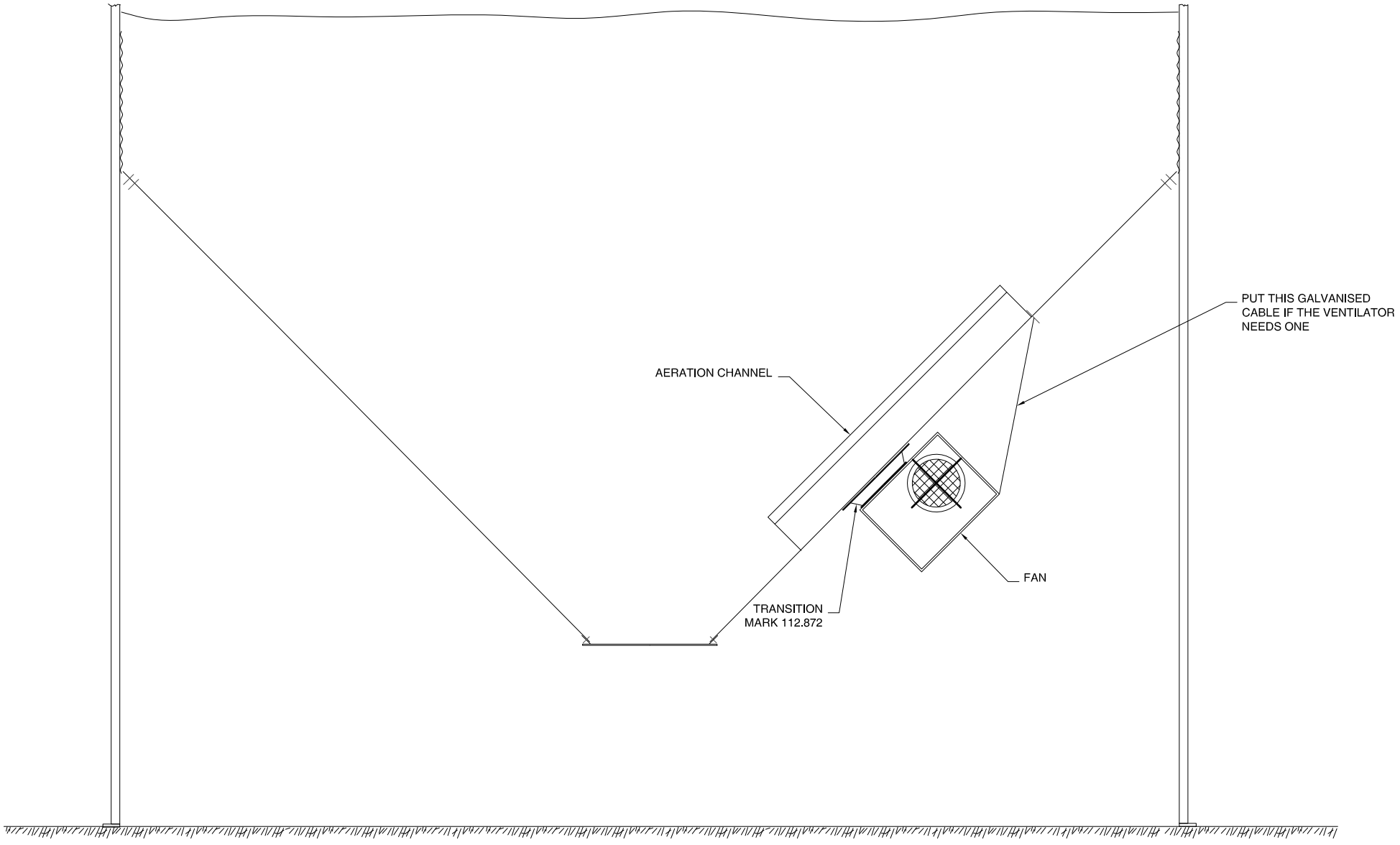
LEG-HOPPER TIE INSTALLATION



BASE PLATE DETAIL

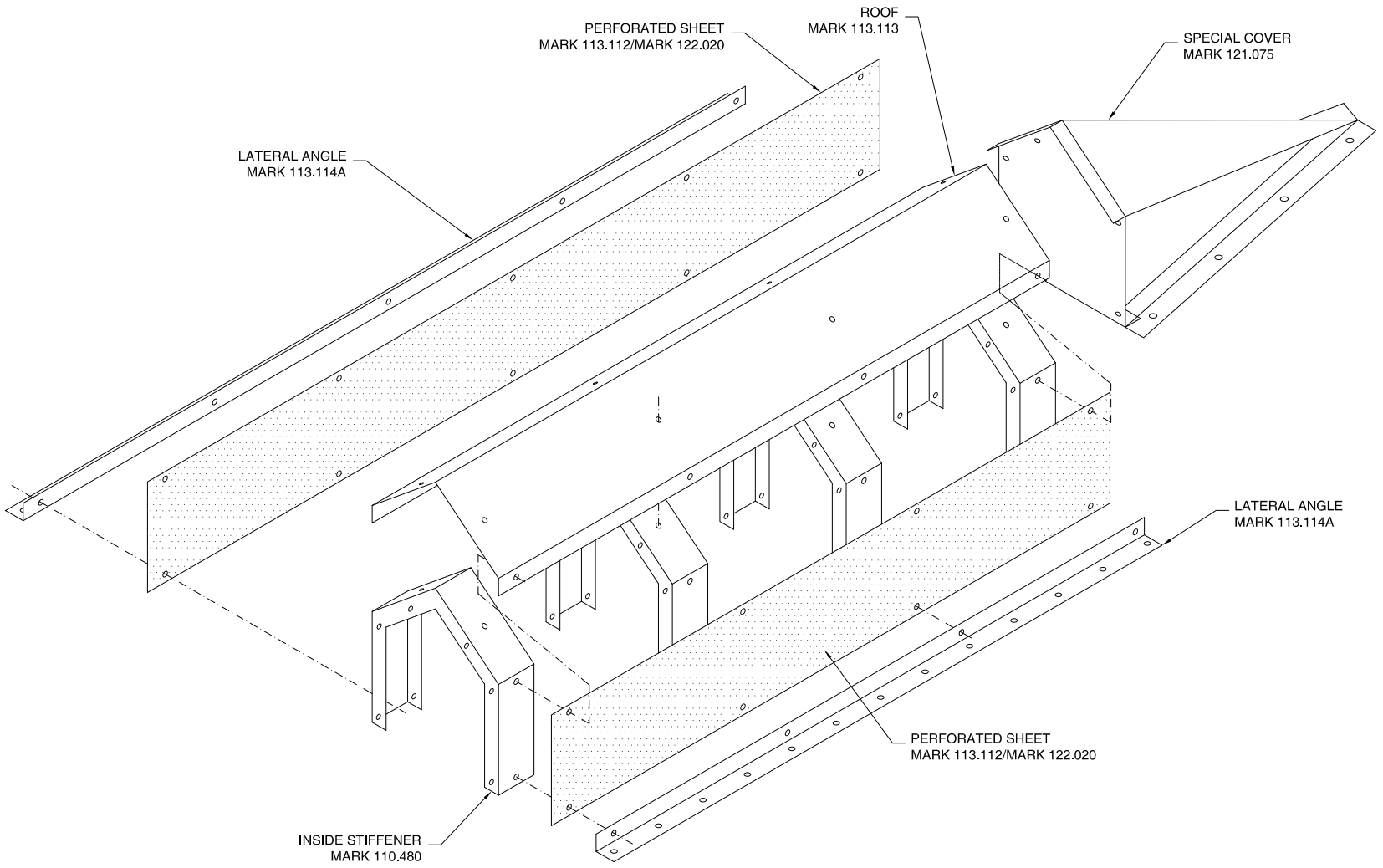
SILO 6,10Ø/T45°

BRACING DETAILS

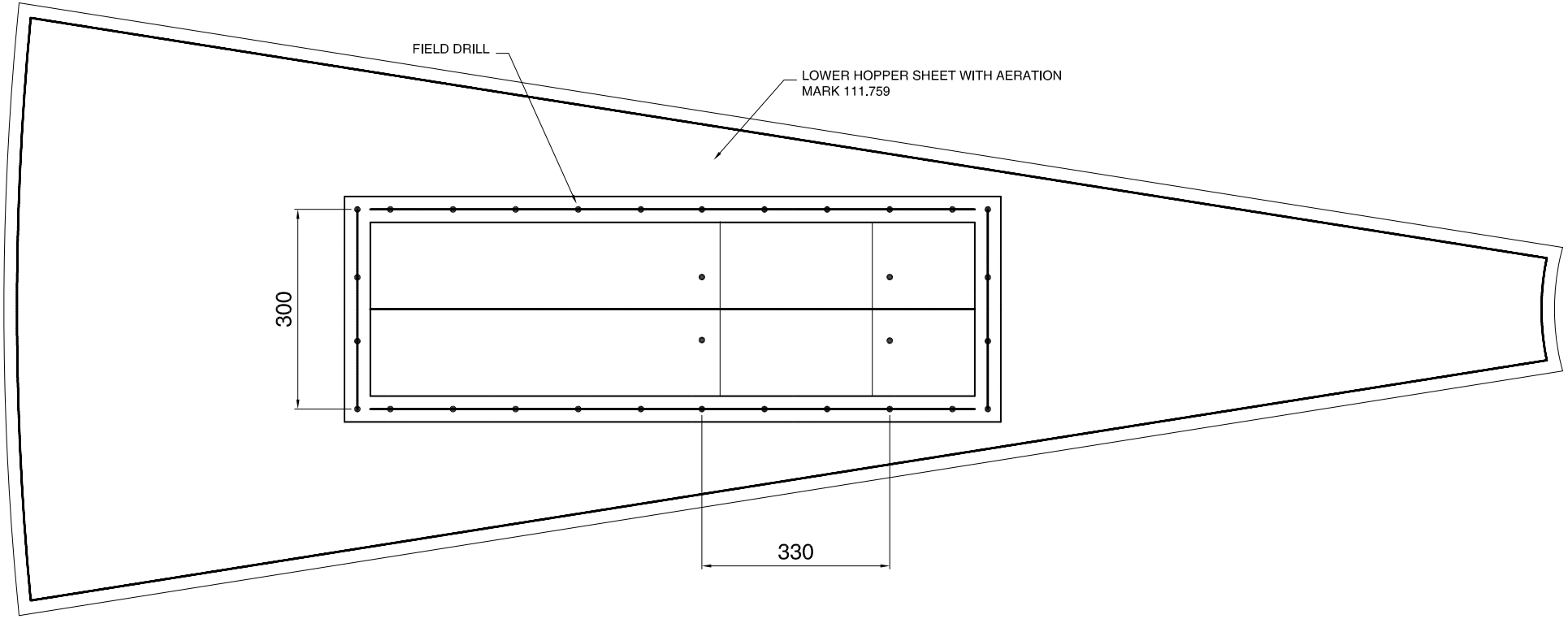


FAN INSTALLATION

USE M8x20(8.8) BOLTS WITH FLAT WASHER AND NUT

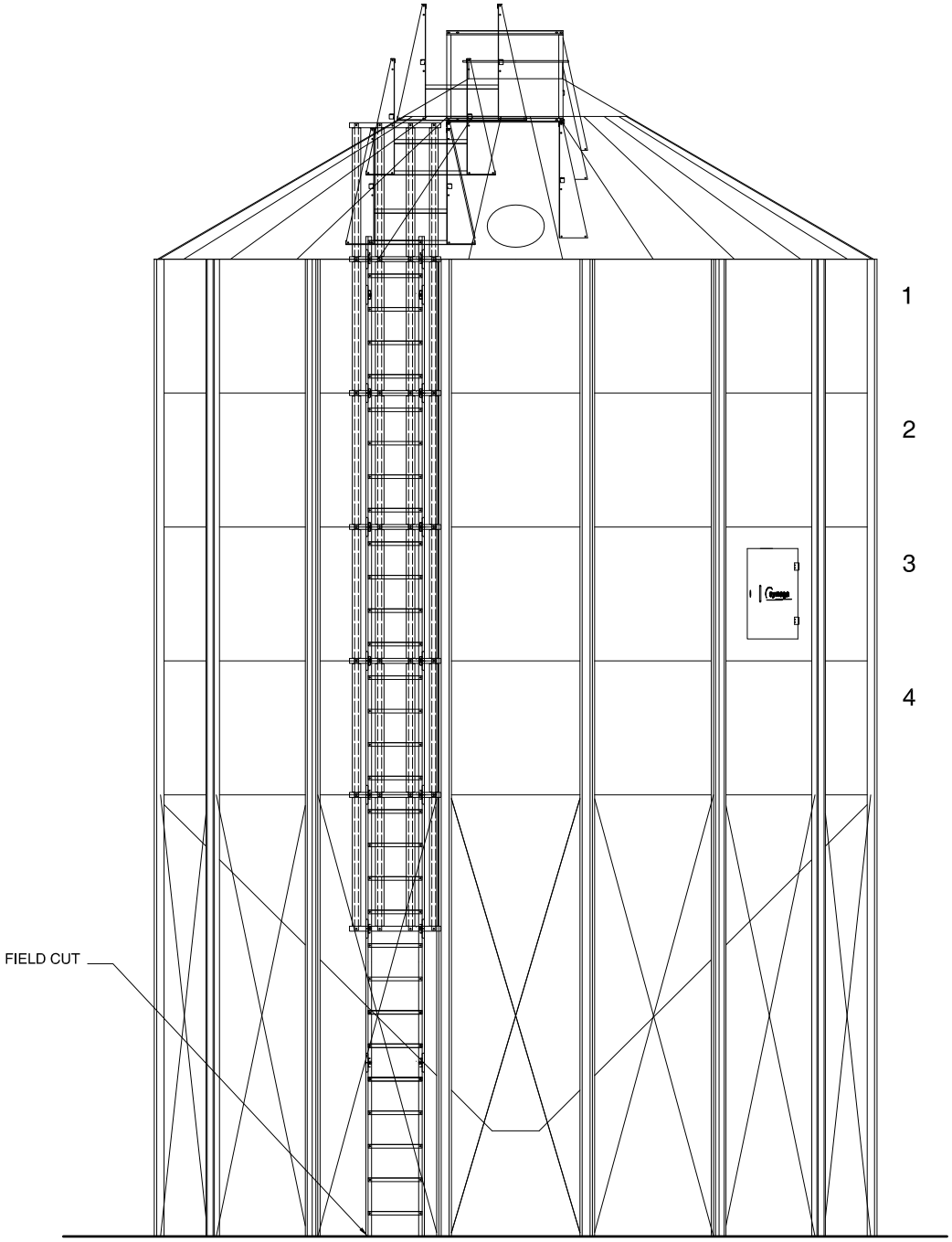


AERATION CHANNEL



- USE M8x20(8.8) BOLTS WITH FLAT WASHER, WEATHERSEAL WASHER AND NUT.
- PLACE FOAM 10x3 BETWEEN THE CONDUIT AND HOPPERSHEET
- SEE ENCLOSED SHEET FOR ASSEMBLY OF THE CONDUIT
- FIELD DRILL IN THE HOPPER SHEET ALL THE HOLES OF THE AERATION CHANNEL.

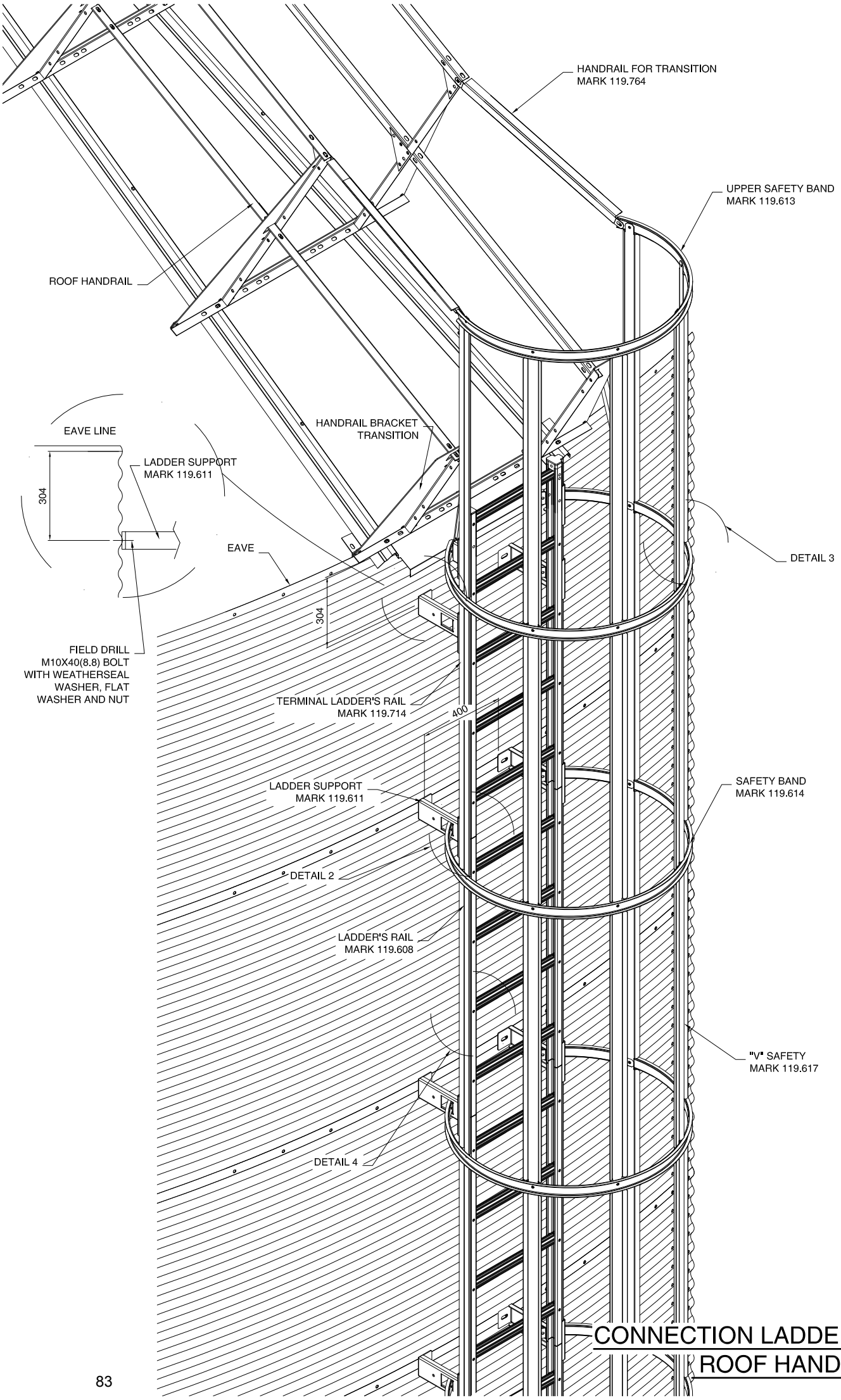
HOPPER SHEET FOR AERATION
SILO T45°



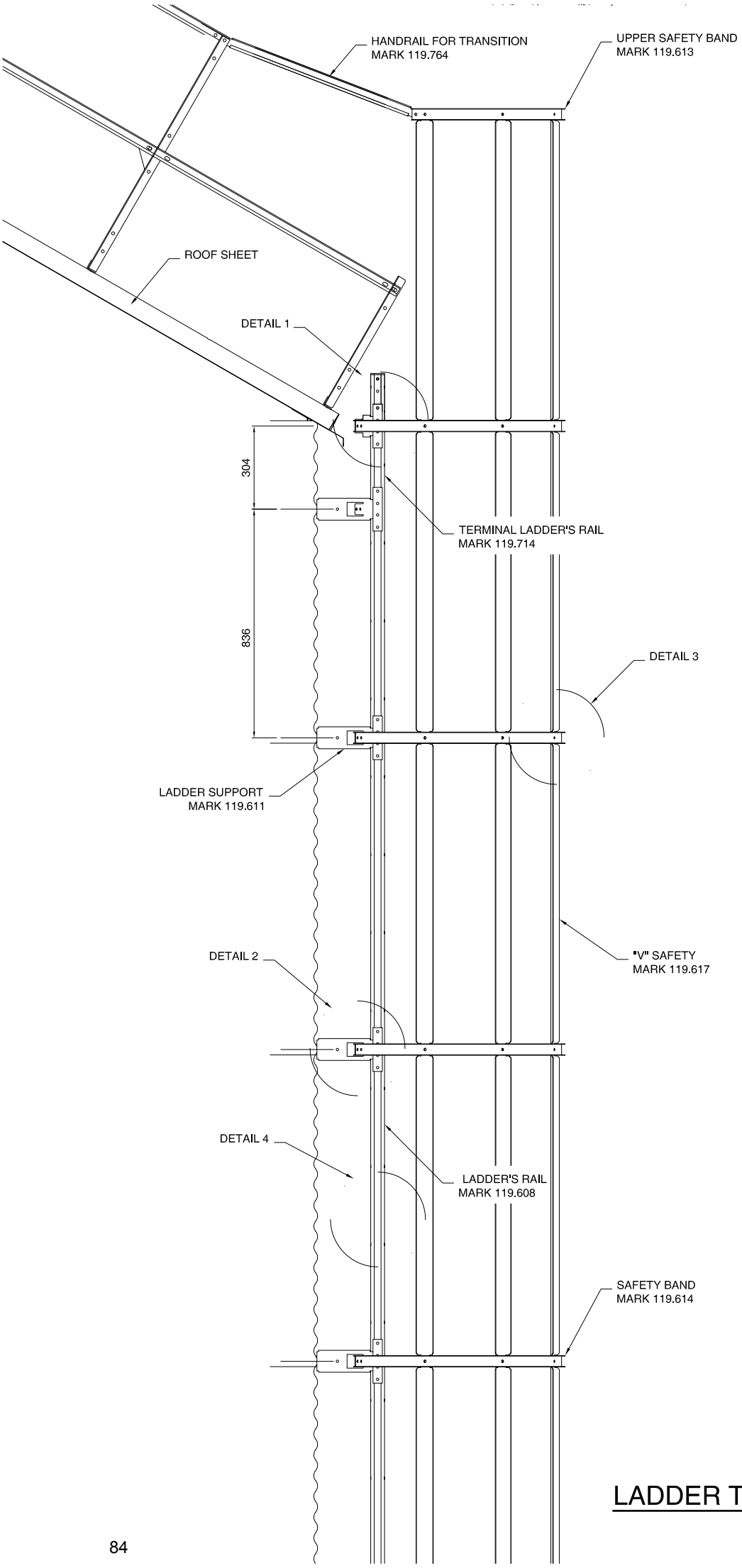
FOR 1 SILO

SILO 4 RINGS

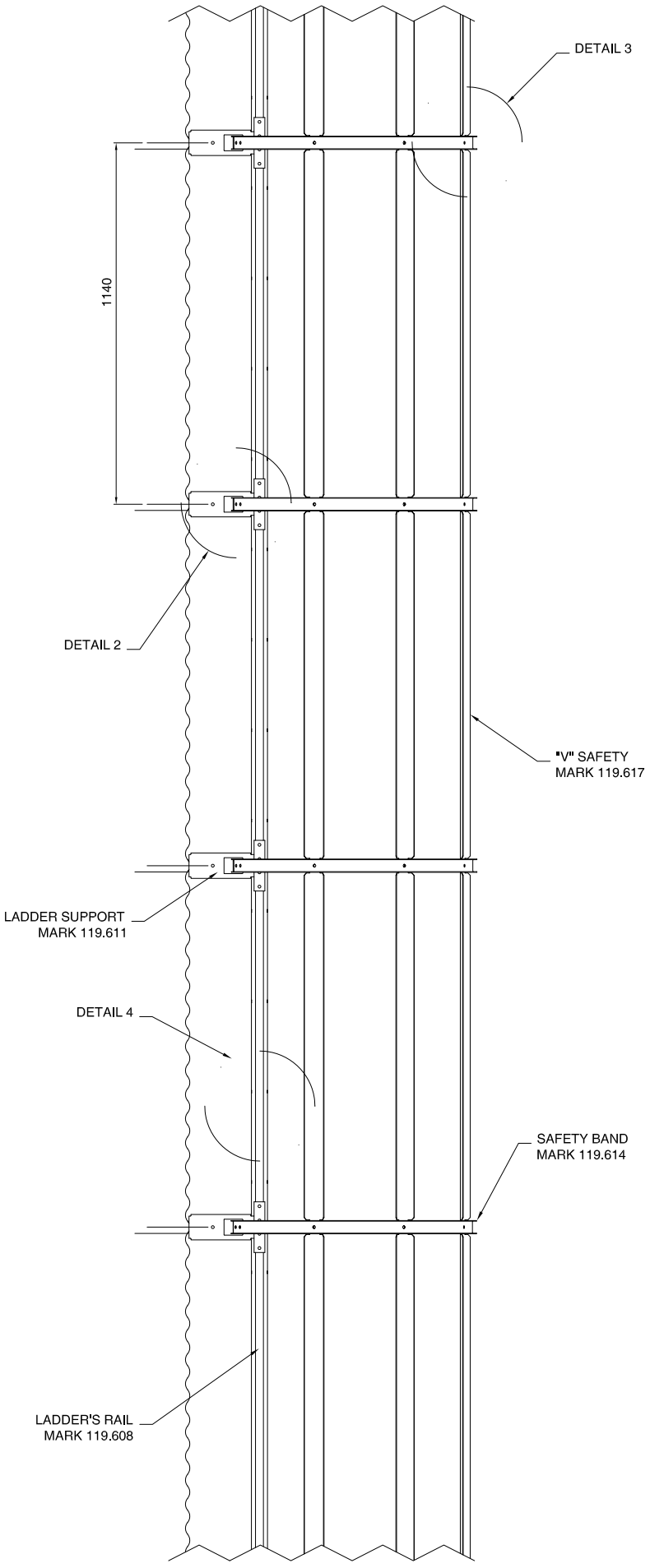
LADDER TO ROOF INSTRUCTIONS



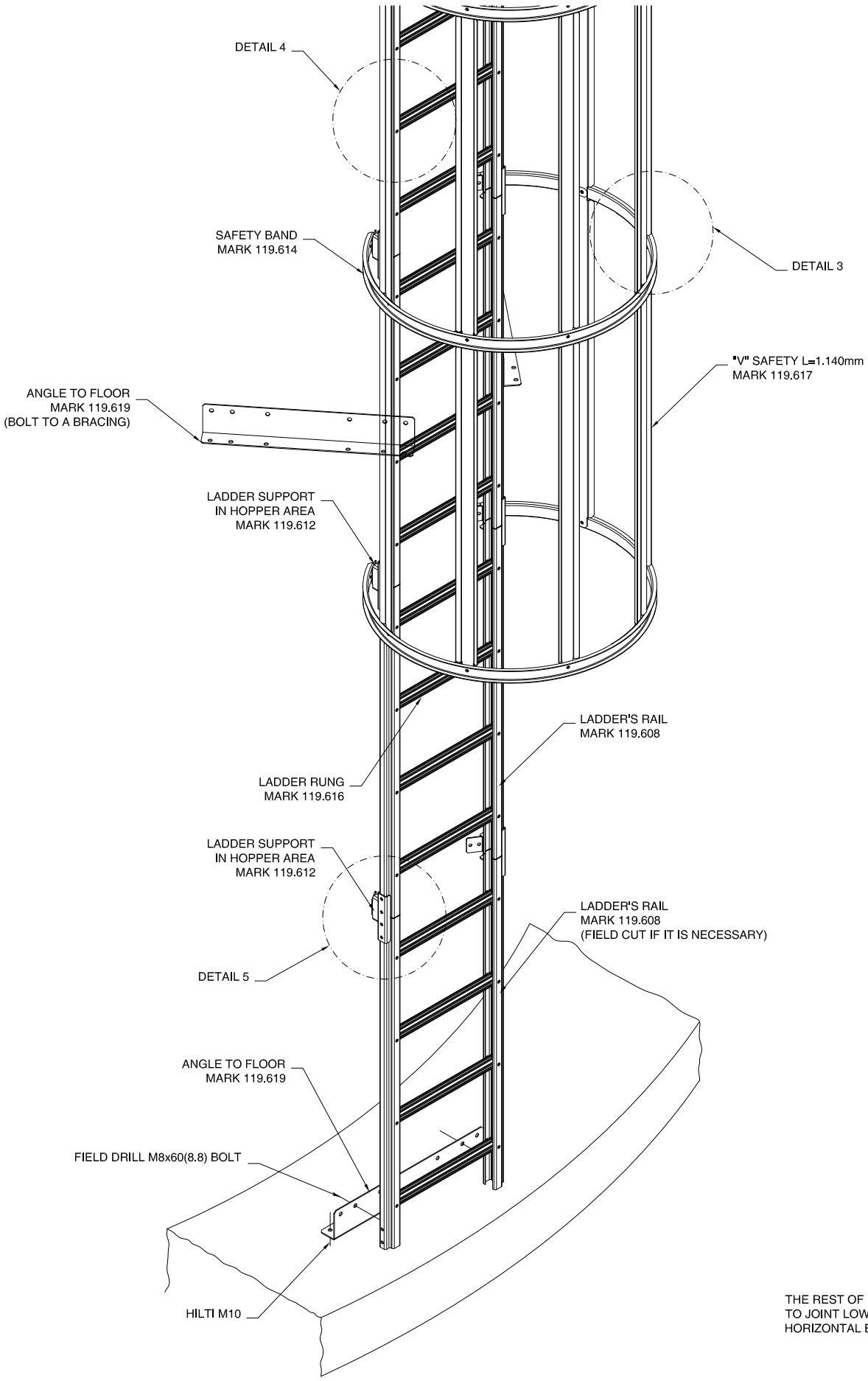
CONNECTION LADDER TO ROOF HANDRAIL



LADDER TO ROOF (UPPER PART)

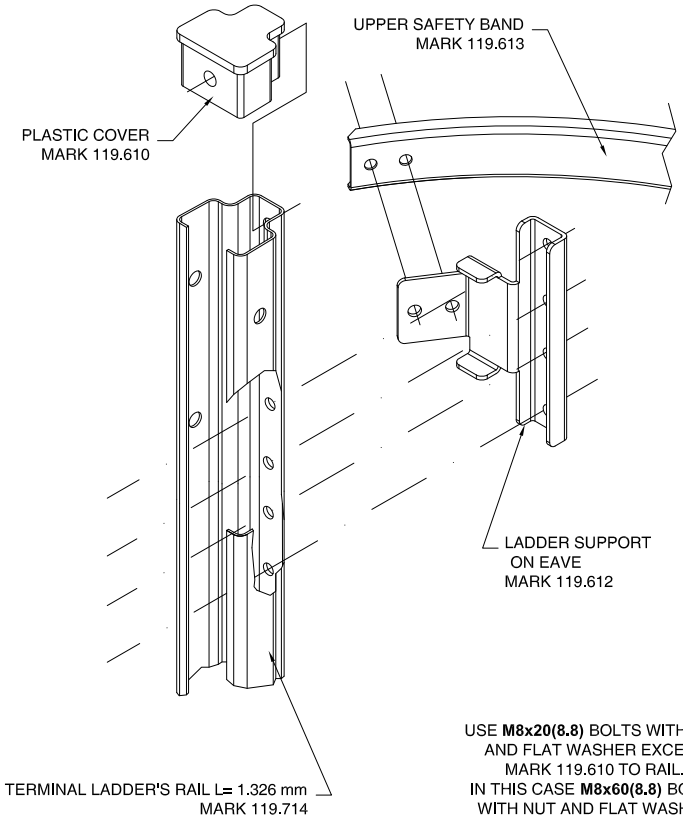


LADDER TO ROOF
(INTERMEDIATE PART)



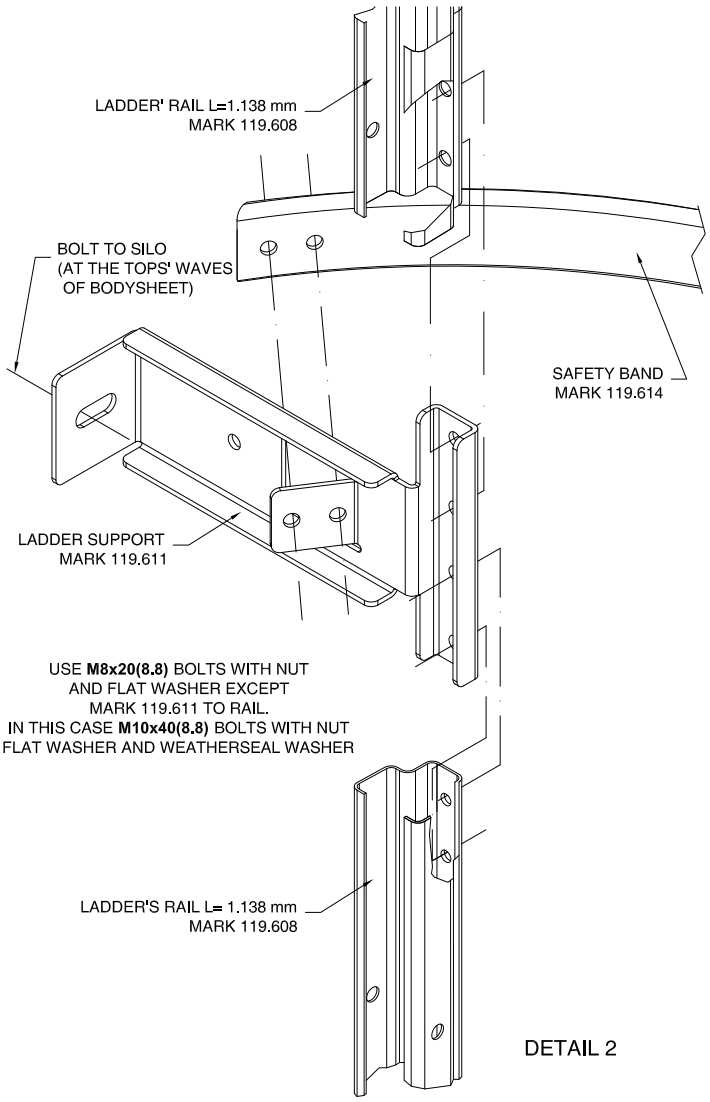
THE REST OF MARKS 119.619 ARE USED TO JOINT LOWER PART OF LADDER TO HORIZONTAL BRACINGS OF HOPPER.

LADDER TO ROOF (LOWER PART)



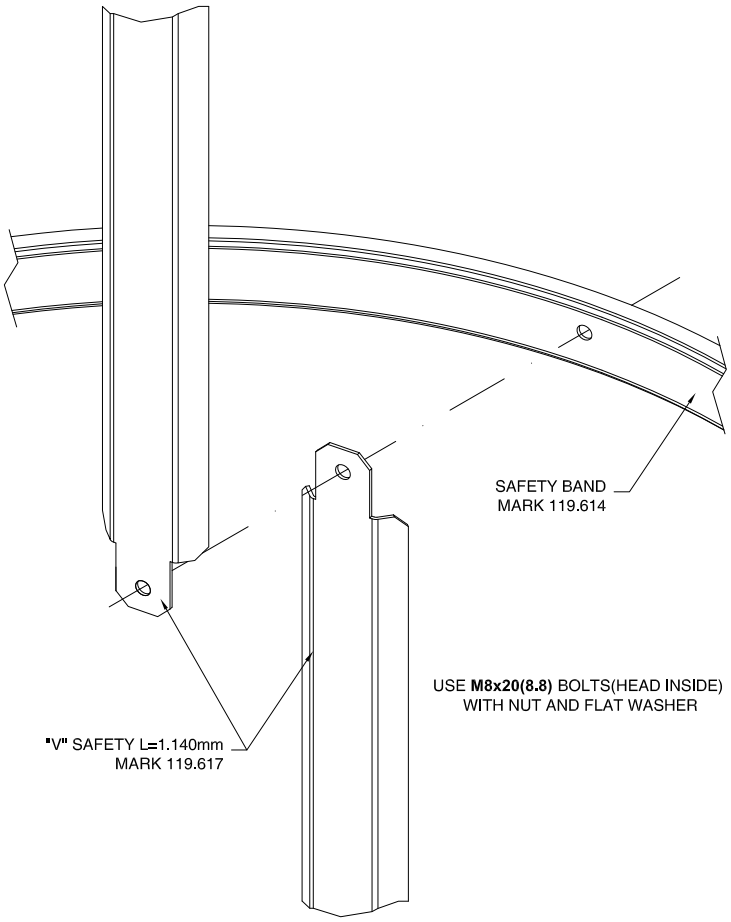
USE **M8x20(8.8)** BOLTS WITH NUT
AND FLAT WASHER EXCEPT
MARK 119.610 TO RAIL.
IN THIS CASE **M8x60(8.8)** BOLTS
WITH NUT AND FLAT WASHER

DETAIL 1



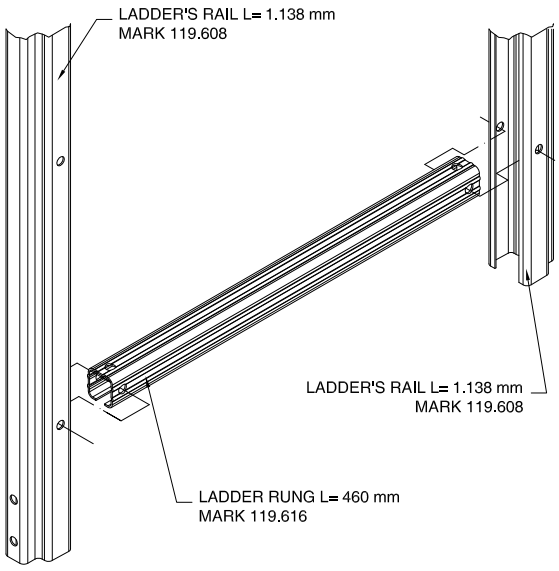
USE **M8x20(8.8)** BOLTS WITH NUT
AND FLAT WASHER EXCEPT
MARK 119.611 TO RAIL.
IN THIS CASE **M10x40(8.8)** BOLTS WITH NUT
FLAT WASHER AND WEATHERSEAL WASHER

DETAIL 2



USE **M8x20(8.8)** BOLTS(HEAD INSIDE)
WITH NUT AND FLAT WASHER

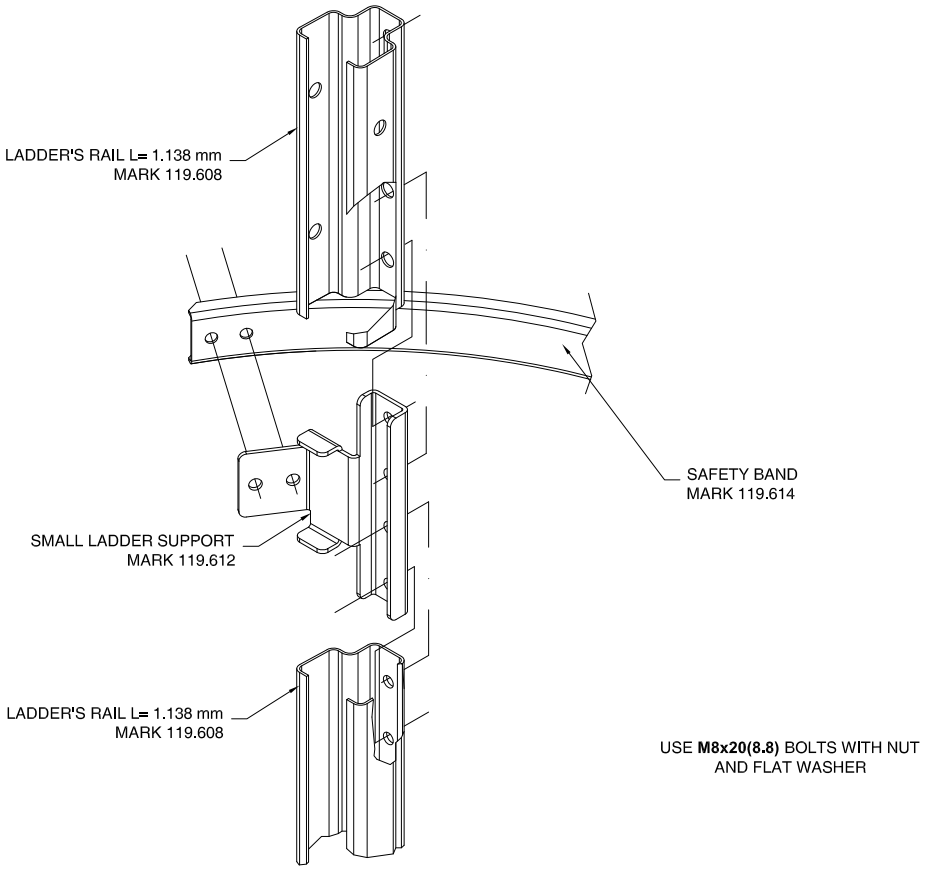
DETAIL 3



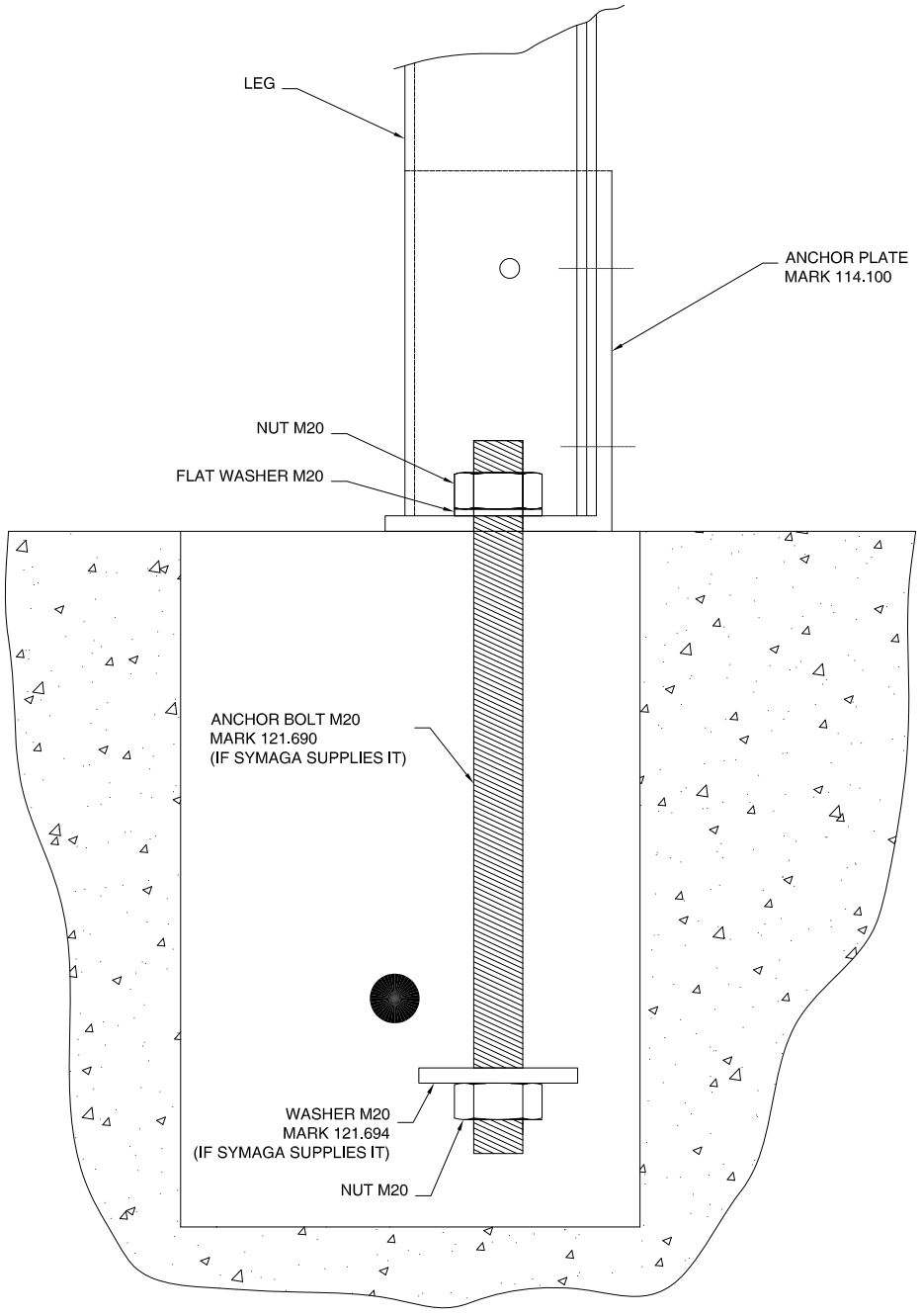
USE **M8x60(8.8)** BOLTS WITH NUT
AND FLAT WASHER

DETAIL 4

LADDER DETAILS

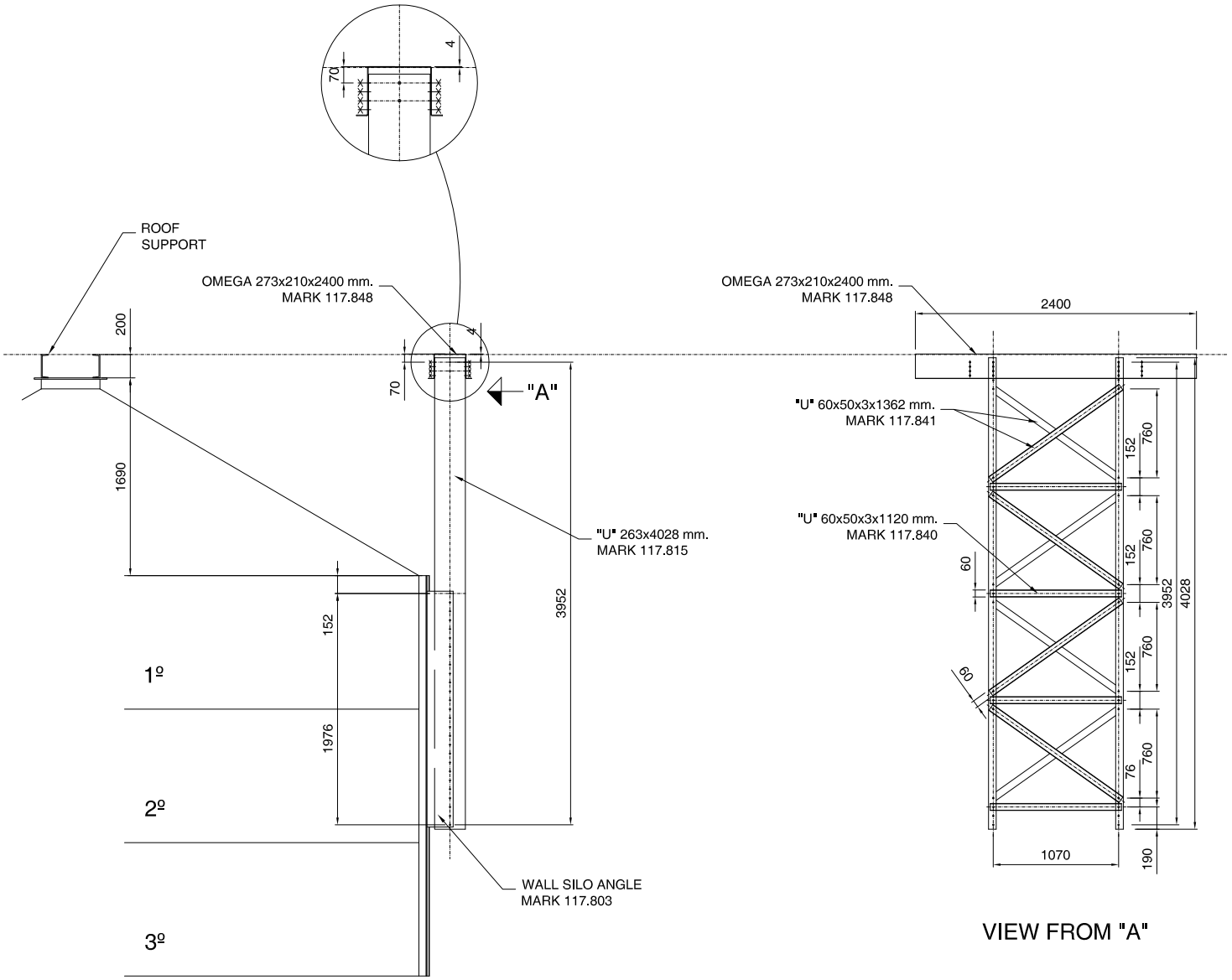

LADDER'S RAIL L= 1.138 mm
MARK 119.608
SAFETY BAND
MARK 119.614
SMALL LADDER SUPPORT
MARK 119.612
LADDER'S RAIL L= 1.138 mm
MARK 119.608
USE **M8x20(8.8)** BOLTS WITH NUT
AND FLAT WASHER

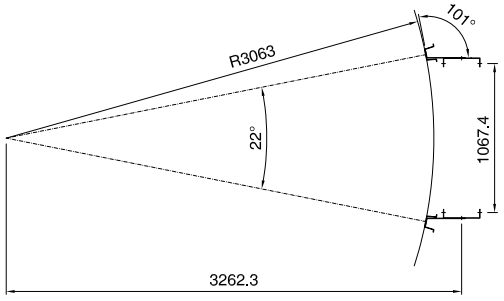
DETAIL 5



AFTER ERECT THE SILO:
1.-CLEAN THE ANCHOR HOLES.
2.-AFTER SUPPORTING THE TANK ON FOUNDATION FILL ANCHOR HOLES WITH CONCRETE FAST SETTING AND EXPANSIVE ADD.

ANCHORAGE SYSTEM





- USE M10x25 (8.8) BOLT WITH WEATHERSEAL WASHER, FLAT WASHER AND NUT FOR JOINING MARK 117.803 TO SILO.
- USE M10x25 (8.8) BOLT WITH FLAT WASHER AND NUT FOR JOINING OTHERS MARKS.

SUPPORT ON SILO WALL

SILO 6,10Ø