

SafeLine *M* H1-W3-cc3

# Tube formed Median Barrier

## Installation manual



05.03.19



**Vik:**  
Elvagata 20  
6893 Vik i Sogn

**Tlf: +47 57 69 86 50**  
[firmapost@vikorsta.no](mailto:firmapost@vikorsta.no)

**Ørsta:**  
Strandgata 59  
6150 Ørsta

**Tlf: +47 70 04 70 00**  
[firmapost@vikorsta.no](mailto:firmapost@vikorsta.no)

Saferoad Sverige AB

**Köping:**  
Volvogatan 2  
731 36 KÖPING

**Tlf: +46 221 297 00**  
[info@saferoad.se](mailto:info@saferoad.se)

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## 1. Important

Proper installation and repair are essential to ensure the systems maximum performance.

## 2. Description

The SafeLine-M is a steel road restraint system that is designed to enhance safety on the roads.

The system has successfully been tested according to classes H1, described in EN 1317-2.

The system is based on C-formed steel posts with post distance of 3 meters and a longitudinal C-formed elliptic steel tubes/profiles, placed on top of the posts.

In a collision, the system is designed to lead the vehicle back on the road.

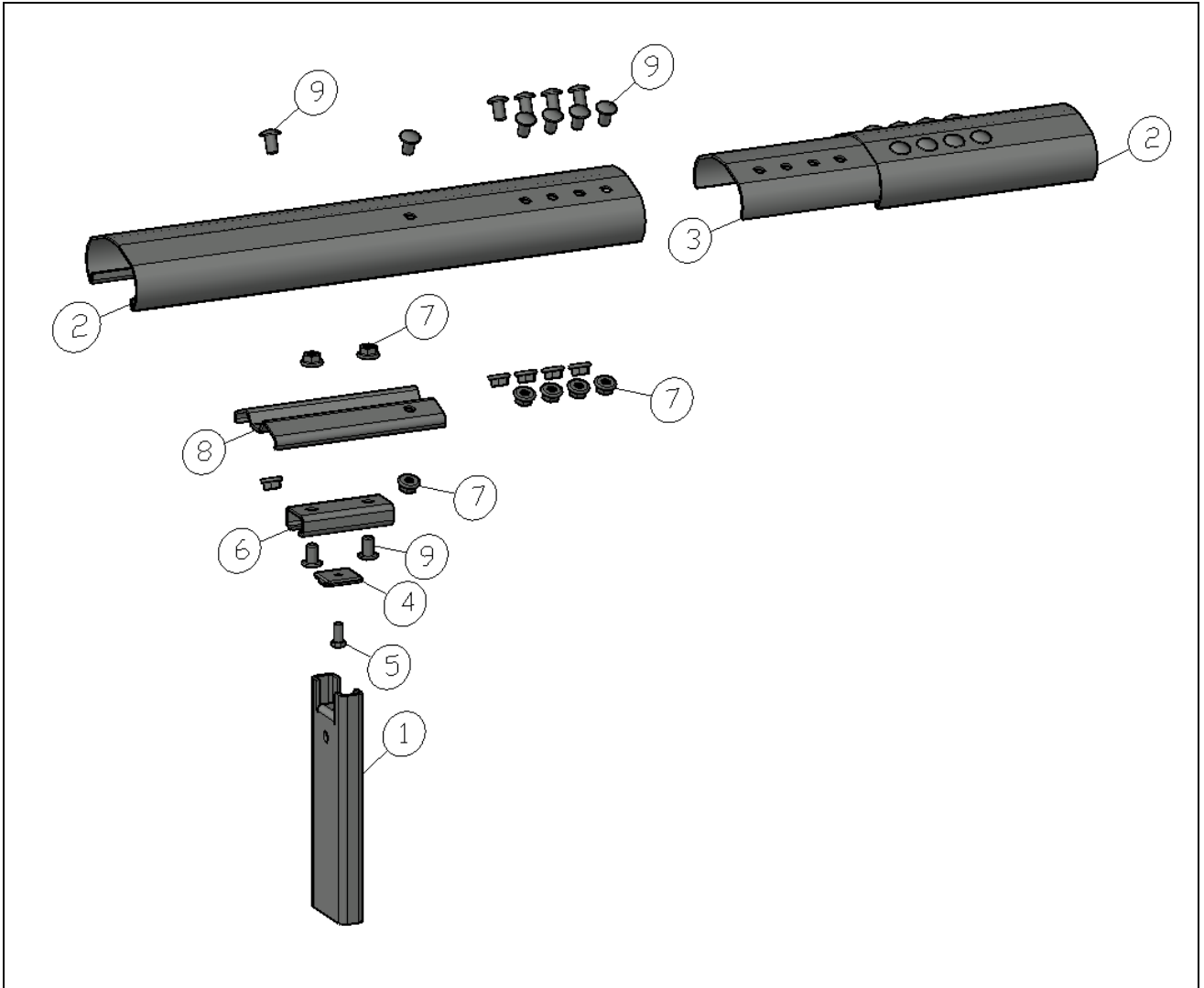
The bolts are an important part of the system function and this manual should be read carefully before installation is started.

## 3. Level of performance

According to EN-1317

Post distance	Containment level	Working width	Dynamic deflection	Impact severity level	System height [mm]
3 m	H1	W3/V16 (1,0/2,0m)	0,7m	A	600

4. Installing



Pos. no.	Description/Item	Quality	Drawing
1	Post C-120 (120x40x25x5), length 1300 mm	S355	CT-010
2	Oval open top profile, length 6000 mm	S420	CT-025
3	Joint plate	S420	CT-014
4	Connector plate, T-washer	S355	CT-013
5	Bolt M12x25 VZN	4.6	
6	Mini C 65	S355	CT-011
7	Flenge nut M16	8	
8	Top plate	S355	CT-012
9	Bolt M16x30 with rounded head	8.8	

#### 4.1 Soil and placement

The soil where the barrier is placed should be of sufficient quality to ensure the guardrails function.

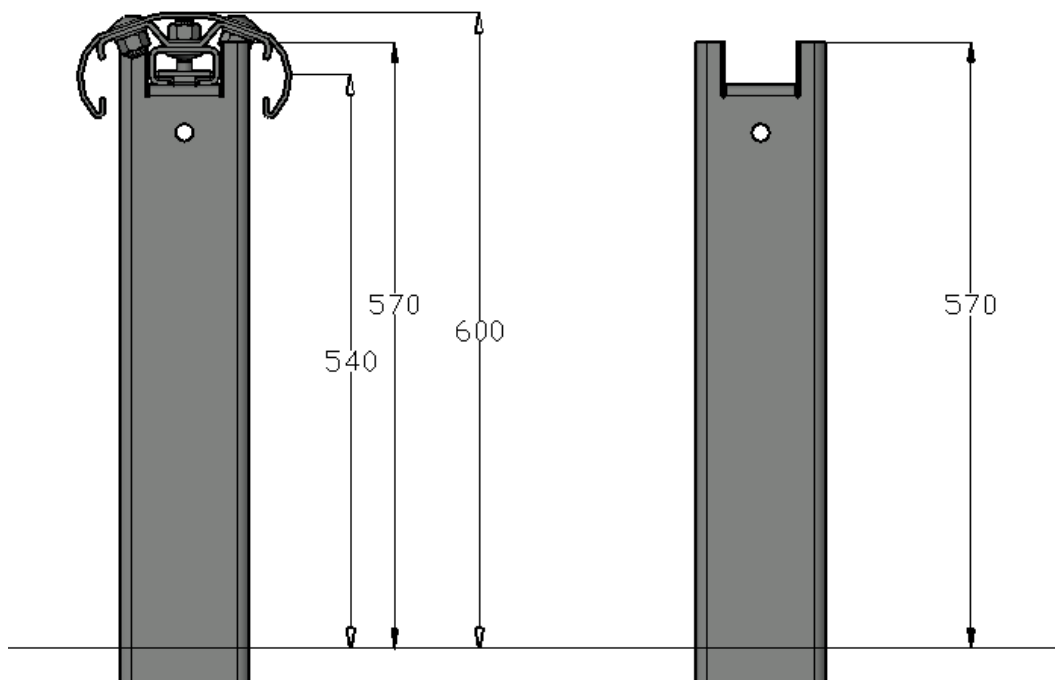
The posts should bend and not break up true the soil or be pulled up when the barrier is hit.

#### 4.2 Installing the posts

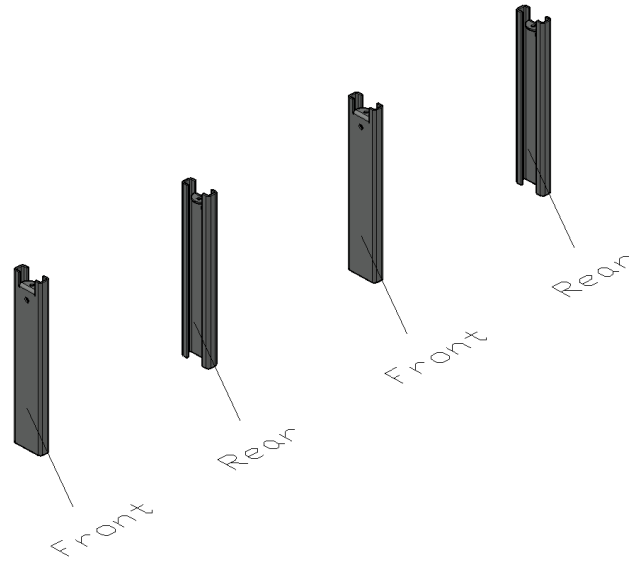
The posts should be installed with a distance of 3 meters. Every second with front / rear, as shown in the figure below.

The holes for the posts should normally be pre-drilled or pre-rammed before installing the post. They should be drilled to the correct level or deeper, to ensure that there is no need to ram the posts after they are placed.

After alignment and height adjustment, parts of the hole around the post should be filled with gravel to lock the post in the correct position.



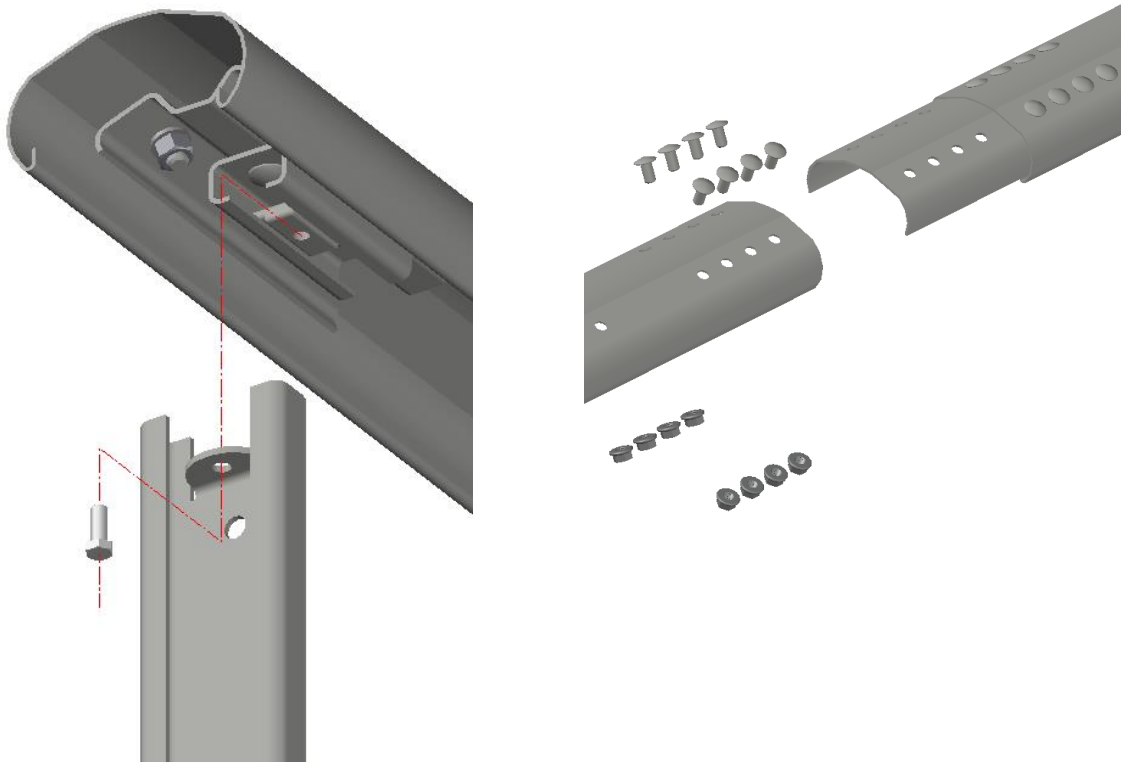
*Hight of the post.*



*Direction for the posts.*

#### **4.3 Installing the profiles/tubes/ longitudinal elements**

For details regarding connection between post to profile and profile to profile, and joining of longitudinal profile, see chapter 8. Drawings.



#### 4.4 After installation

When the guardrail is installed and adjusted, the holes around the post should be fully refilled.

### 5. Maintenance

There are no general inspections intervals for this guardrail itself. Inspections intervals have to be determined based on local factors such as volume of traffic, risk of damage, climate etc.

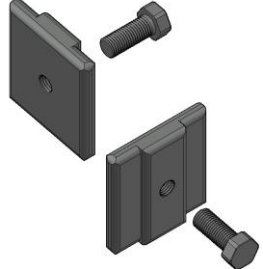

The guard rail should be inspected regularly and if displaced or damaged, it should be adjusted and repaired.

All damaged profiles should be replaced with new when repaired.

#### 5.1 Cleaning

Cleaning can be done with water and any type of Ph neutral detergent.

### 6. Bolts and fasteners

Art. no.	Description	Amount	Illustration
	<b>Fastening bolt M12x25 mm 4.6 (hot dip galvanized)</b>		
xxxxx	Bolt M12x25, DIN933	1	
xxxxx	Washer M12, 60x55x12mm	1	
	Tightening torque: Tighten down firmly 4.6: max. 35 Nm 8.8: max. 85 Nm		
xxxxx	<b>Connecting bolt M16x30 mm 8.8 (hot dip galvanized)</b>		
xxxxx	Bolt M16x30	1	
692316000	Flange nut M 16	1	
	Tightening torque: Tighten down firmly max. 215 Nm		

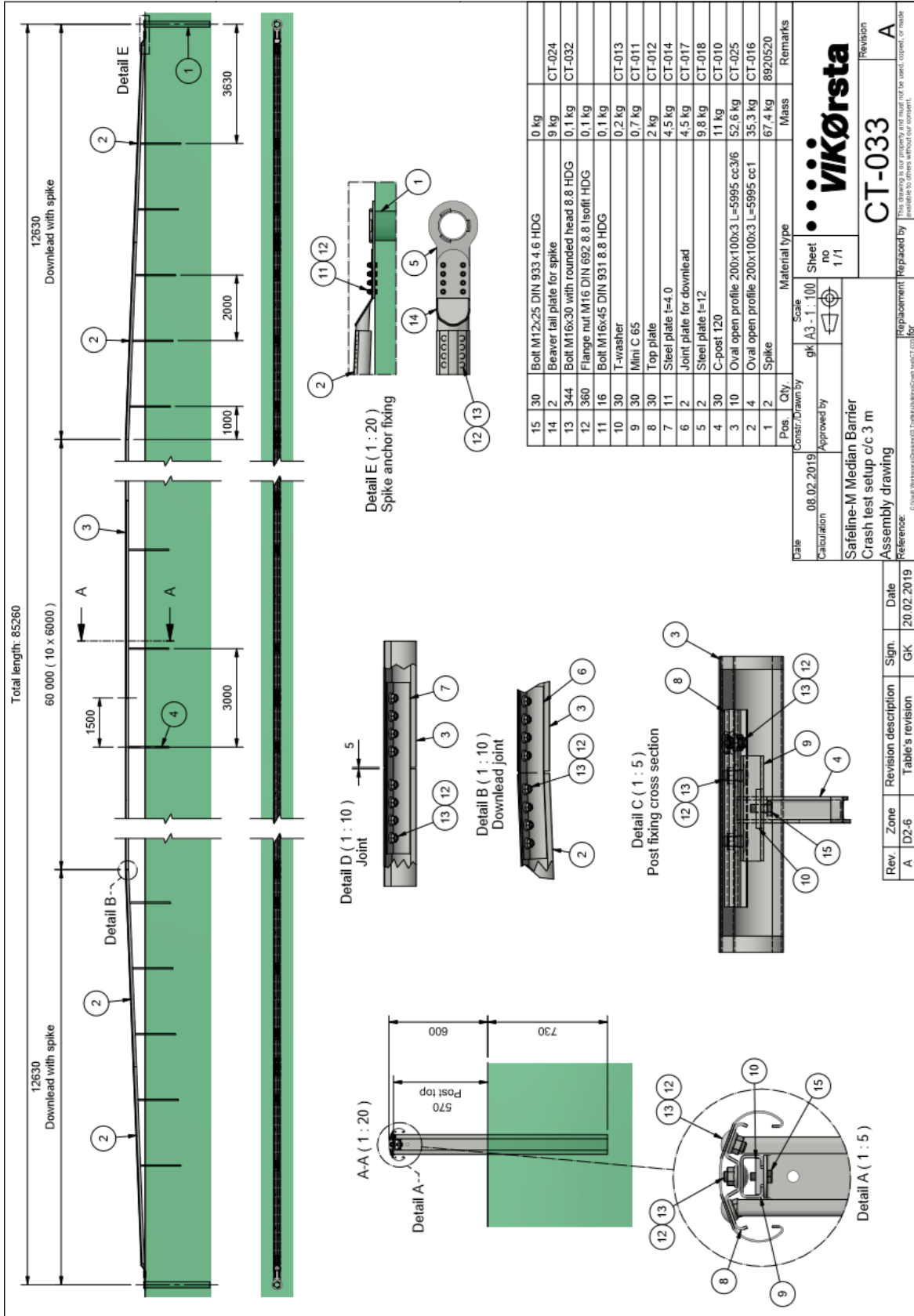
**Note:** Please check that all bolts/fasteners are placed correct and all bolts-washer-nuts-connections are normally/proper fastened/tighten.

### 7. Marking

If everything is done and installed according to this installation manual, the guardrail can be marked with the CE-mark. This mark shall be placed at the end (the starting end) of the installed guardrail.

8. Drawings

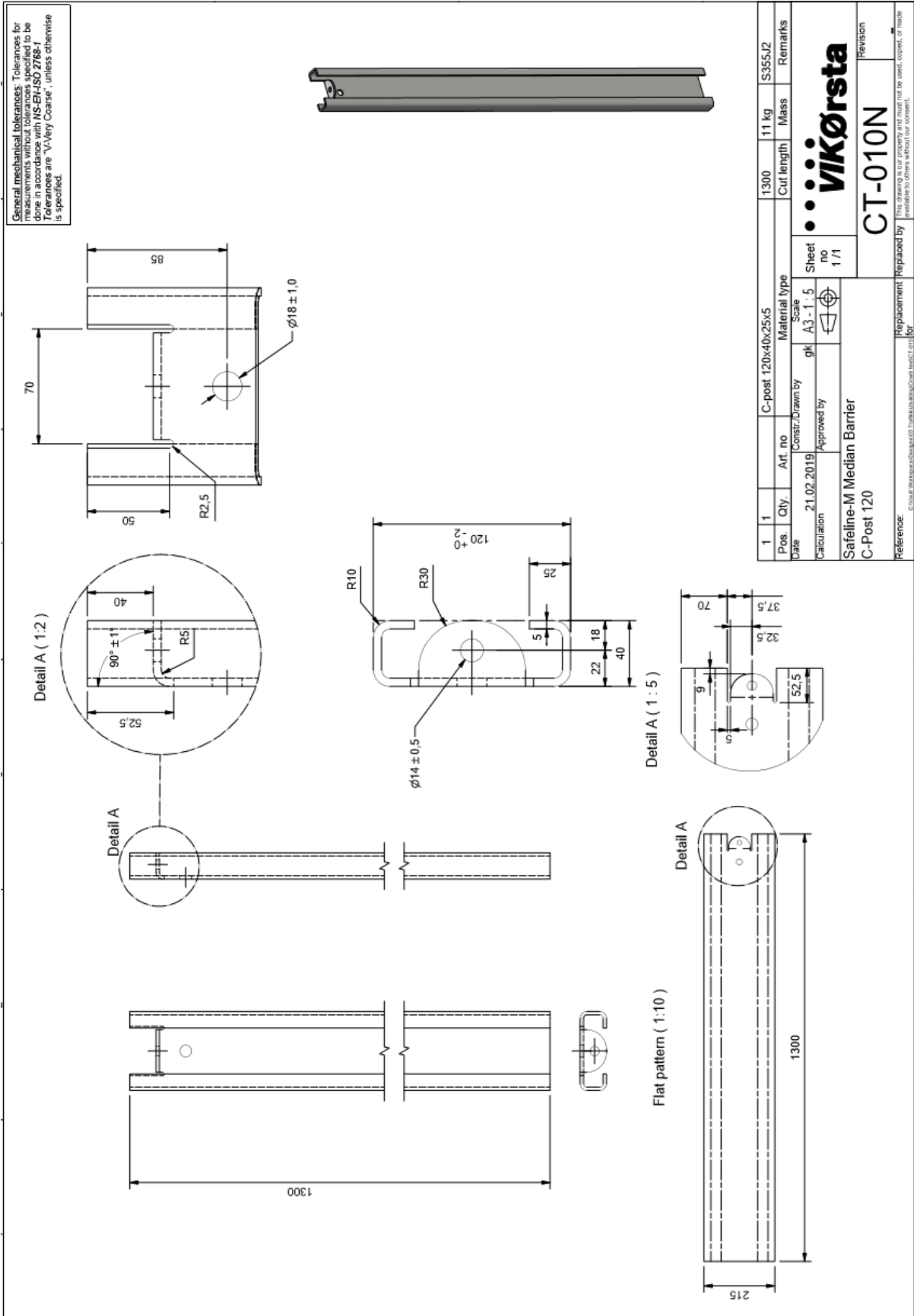
8.1 SafeLine-M H1-W3-cc3m



*Toralf Hystad*

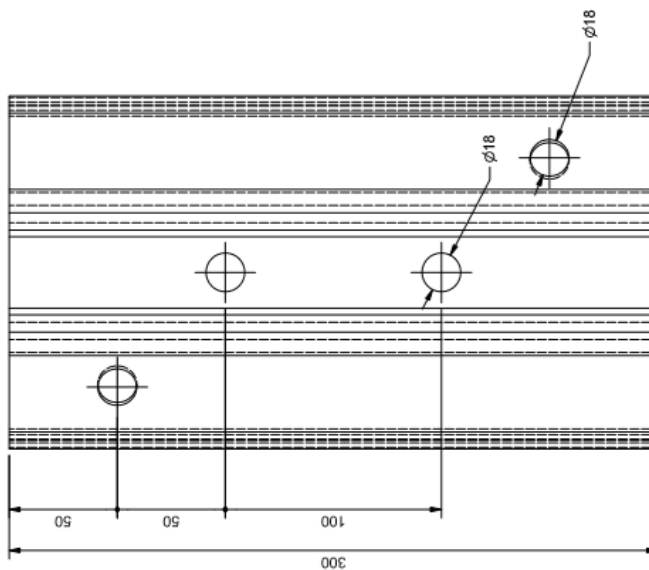
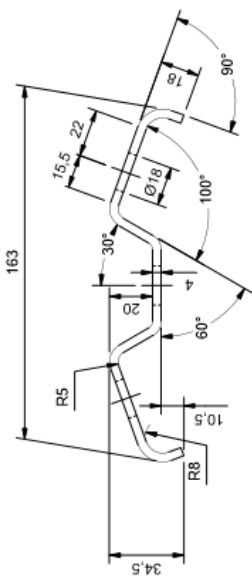
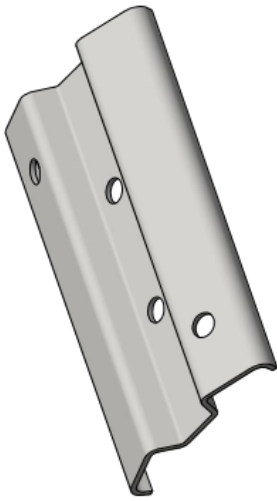


8.2 post

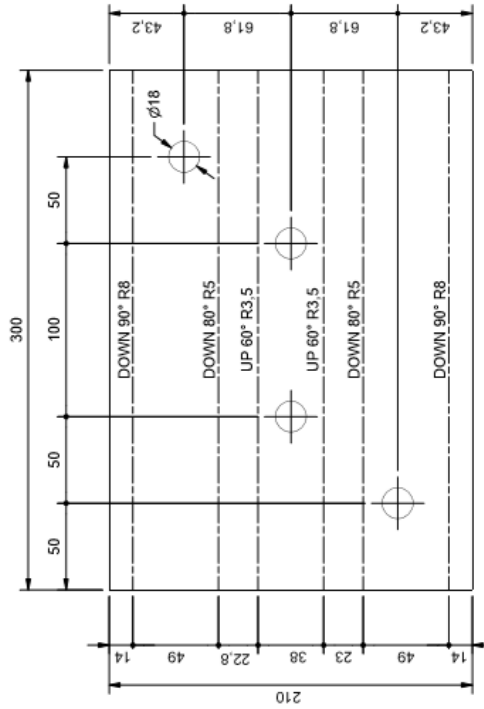




**General mechanical tolerances:** Tolerances for measurements without tolerances specified to be done in accordance with EN ISO 2768-F. Features are V-Very Coarse, unless otherwise is specified.

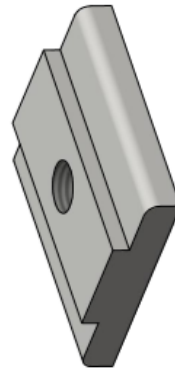
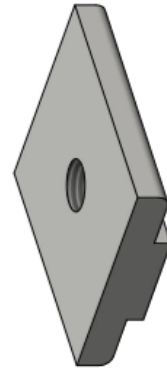
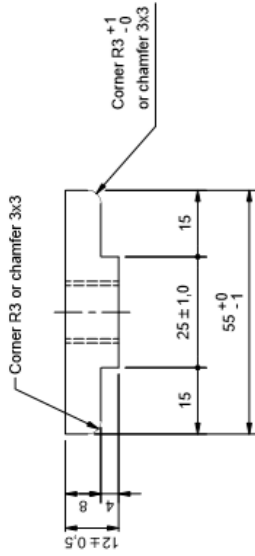
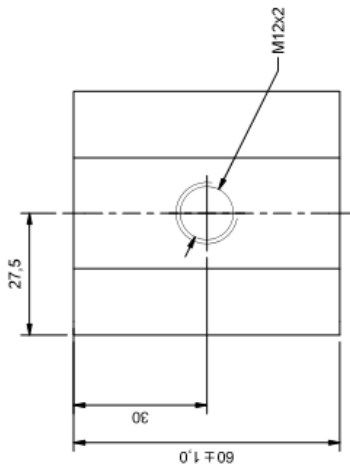



Flat pattern ( 1 : 2.5 )



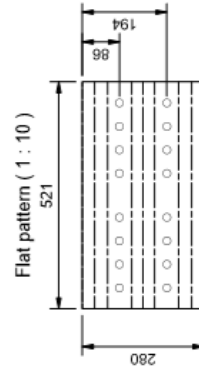
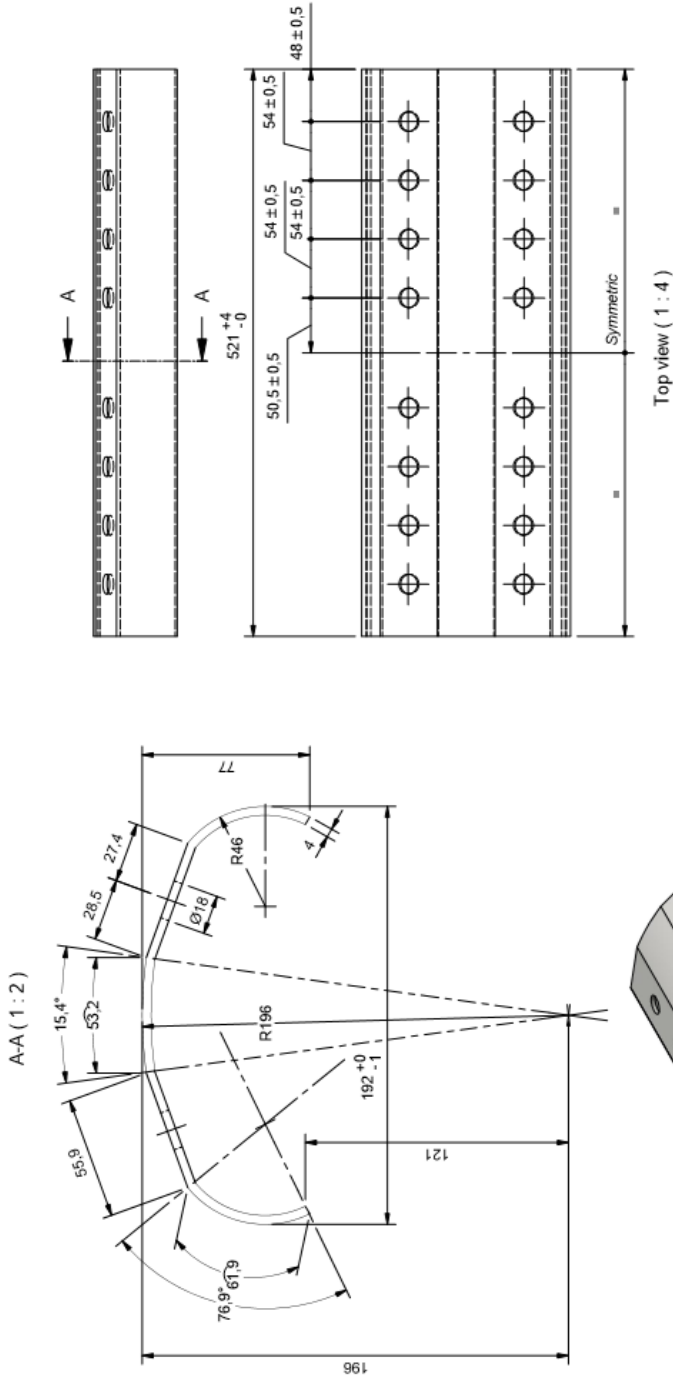
1	1			Steel plate t=4 mm		2 kg	S355 J2	
Pos.	Qty.	Art. no	Constr./Drawn by	Material type	Cut length	Mass	Remarks	
Date	21.02.2019	Approved by	gk	A3-1; 2	Sheet no	1/1		
Calculation				<b>VIKØRSTA</b>				
Safeline-M Median Barrier				<b>CT-012N</b>		Revision		
Top plate				Replacement		Replaced by		
Reference:				This drawing is our property and must not be used, copied, or made public to others without our consent.				

General mechanical tolerances: Tolerances for measurements without tolerances specified to be followed are given in EN ISO 2768. Tolerances are 'Very Coarse', unless otherwise specified.



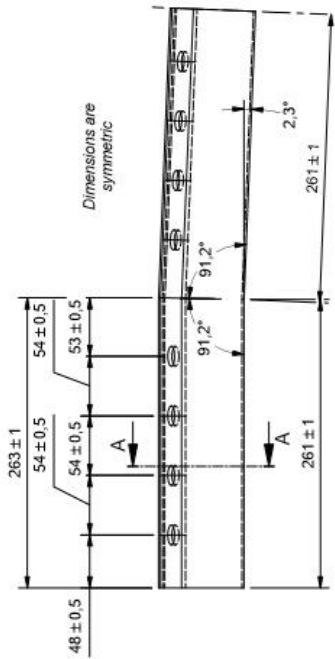
1	1	Steel plate t=12 mm	0,2 kg	S355	Remarks
Pos.	Qty.	Art. no	Cut length	Mass	
Date	21.02.2019	Constr./Drawn by	Material type	Sheet no	Revision
Calculation	21.02.2019	Approved by	Scale	1 / 1	
Safeline-M Median Barrier Connector T-plate / T-washer			A3 - 1 : 1		
Reference: C:\out\Workshop\Design\2019\Tusks\SafeLine\G004\Tusks.ctb			Replaced by	CT-013N	

General mechanical tolerances: Tolerances for dimensions without a tolerance symbol are to be determined with EN ISO 2768. Tolerances are 'Very Coarse', unless otherwise specified.

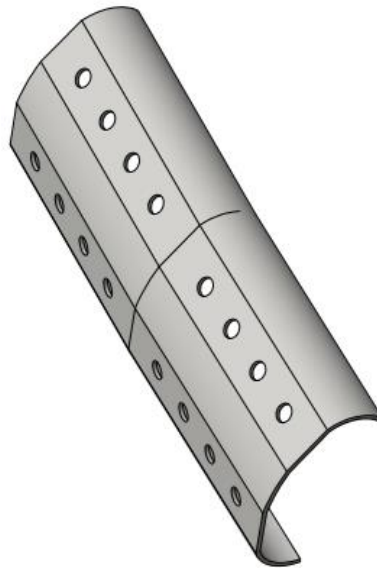
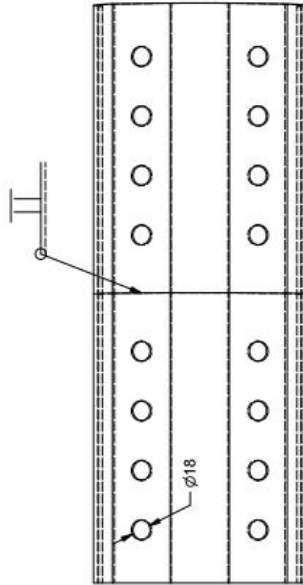
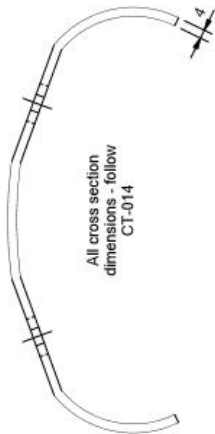


1	1	Steel plate t=4.0	Material type	Scale	4.5 kg	Mass	S420 acc. to EN10025	Remarks
Pos. / Date	Qty. / Art. no.	Constr./Drawn by	gk	A3 - 1:4	Cut length	Sheet no	Revision	
21.02.2019		Approved by				1/1	vikørsta	
Safeline-M Median Barrier Joint plate			CT-014N			This drawing is our property and must not be used, copied, or made imitable to others without our consent.		

General mechanical tolerances: Tolerances for dimensions are given in millimeters and should be given in accordance with EN ISO 2768-1. Tolerances are "Average Coarse", unless otherwise is specified.



A-A (1:2)

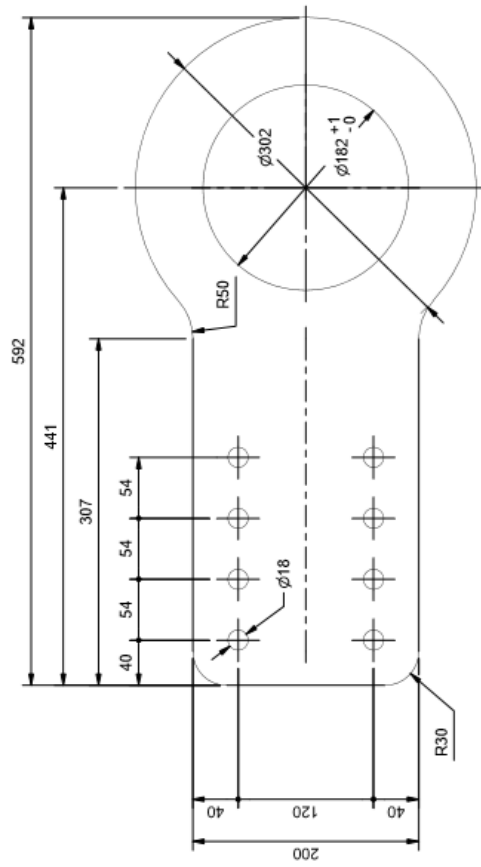


Pos	1	Steel plate t=4 mm	4,5 kg	S420 acc. to EN10025	Remarks
Qty	1	Art. no	Cut length	Mass	
Date	21.02.2019	Constr./Drawn by	Scale		
Calculation	Approved by	gk	A3 - 1 : 4	Sheet no	1/1
SafeLine-M Median barrier			Revision		
Joint plate for 12 m download			CT-017N		
Reference:			Replacement		
E:\Vik\Ørsta\CT-017N\SafeLine-M\SafeLine-M\CT-017N			This drawing is our property and must not be used, copied, or made available to others without our consent.		

General mechanical tolerances: Tolerances for dimensions are given in accordance with EN/ISO 2768-1. Tolerances are "Average Coarse", unless otherwise is specified.



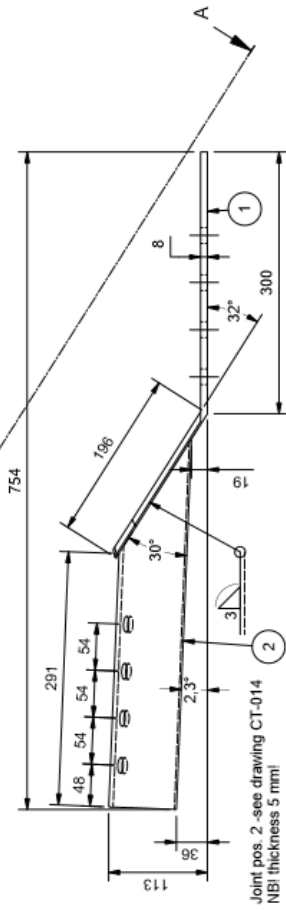
Top view ( 1 : 4 )



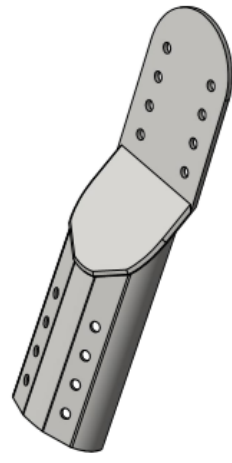
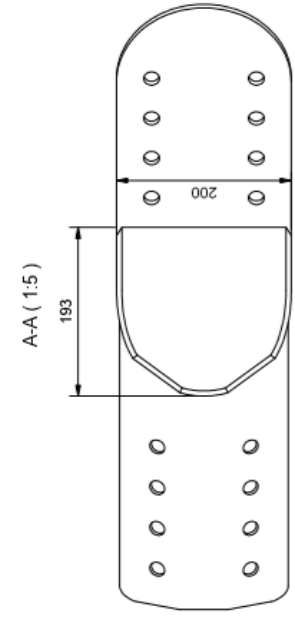
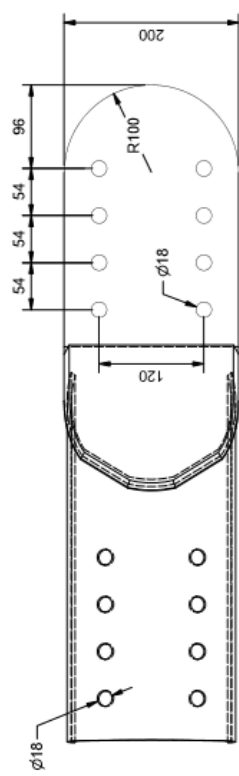
1	1	Steel plate t=12	Material type	S355 J2	9.8 kg	Mass	Remarks
Pos	Qty.	Art. no	Material type		Cut length		
Date	21.02.2019	Constr./Drawn by	Scale				
Calculation		Approved by	A3 - 1. 4	Sheet no			
Safeline-M Median Barrier				1 / 1			
Anchor spike fixing plate							
Reference:			Replacement	Replaced by			
			CT-018N	Revision			

This drawing is our property and must not be used, copied, or made available to others without our consent.

General mechanical tolerances: Tolerances for dimensions are given in millimeters and shall be done in accordance with EN/ISO 2768-M. Tolerances are 'Very Coarse', unless otherwise is specified.

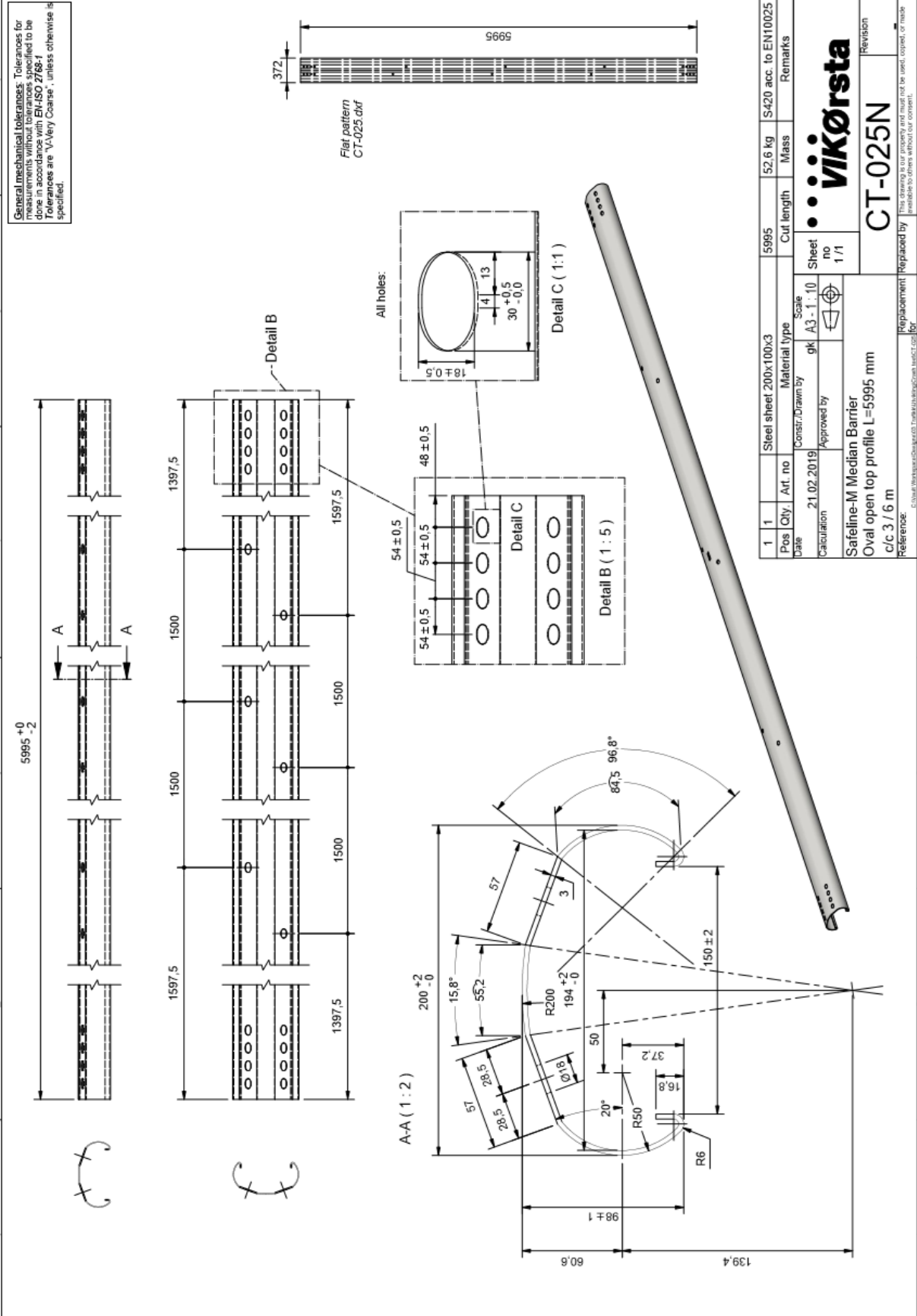


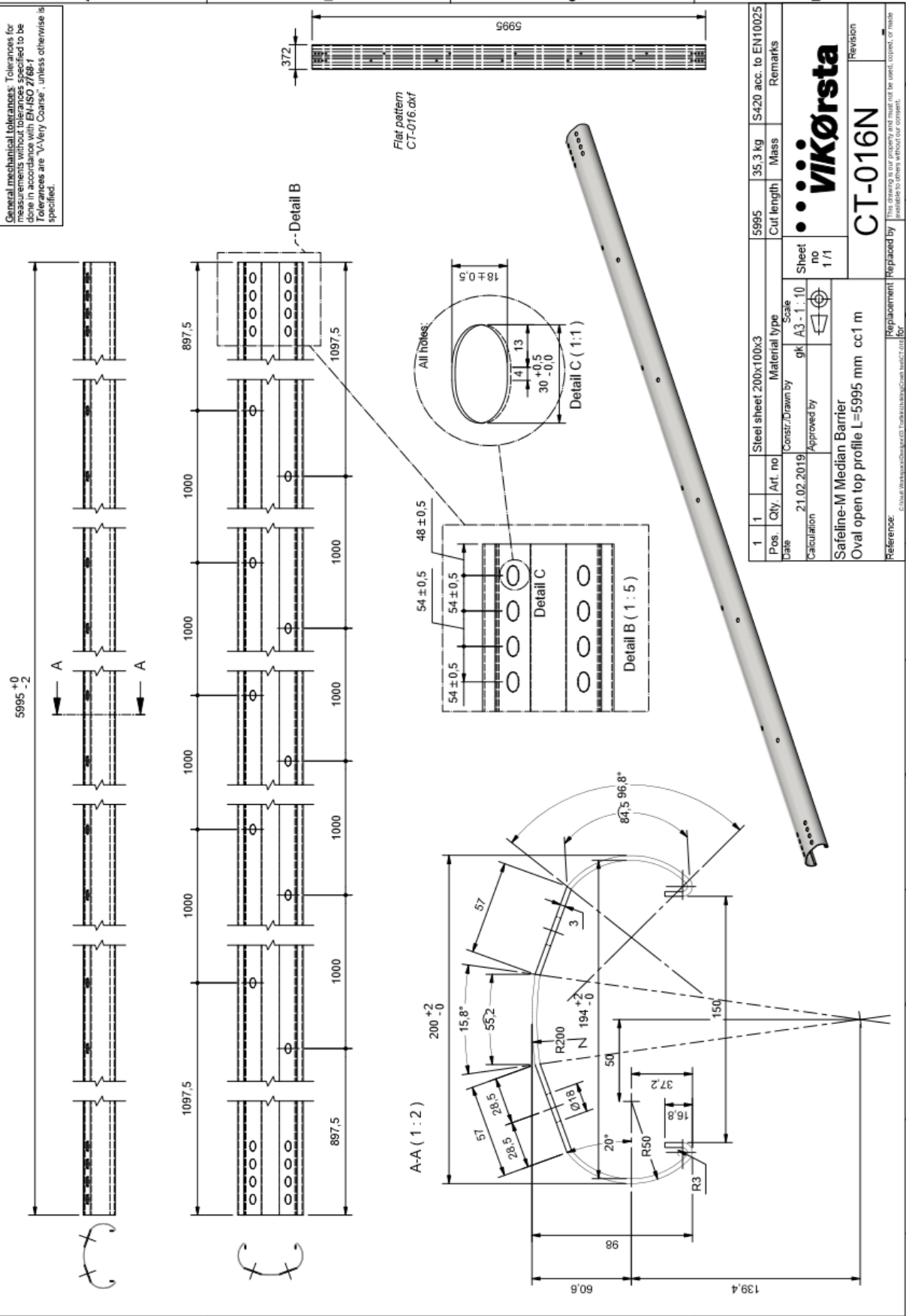
Joint pos. 2 - see drawing CT-014  
NB! thickness 5 mm!



2	1	Joint plate l=5mm		3,6 kg	S355 J2	
1	1	Steel plate l=8mm		5,4 kg	S355 J2	
Pos	Qty.	Art. no	Material type	Mass	Remarks	
Date	21.02.2019	Constr./Drawn by	Scale	Sheet		
Calculation		Approved by	A3 - 1:5	no		
				1 / 1		
SafeLine-M Median Barrier			VIKØRSTA		Revision	
Beaver tail plate for anchor spike			CT-024N		Revision	
Reference: <a href="http://www.vikorsta.no">www.vikorsta.no</a>			Replacement		Replaced by	

8.4 Longitudinal beams

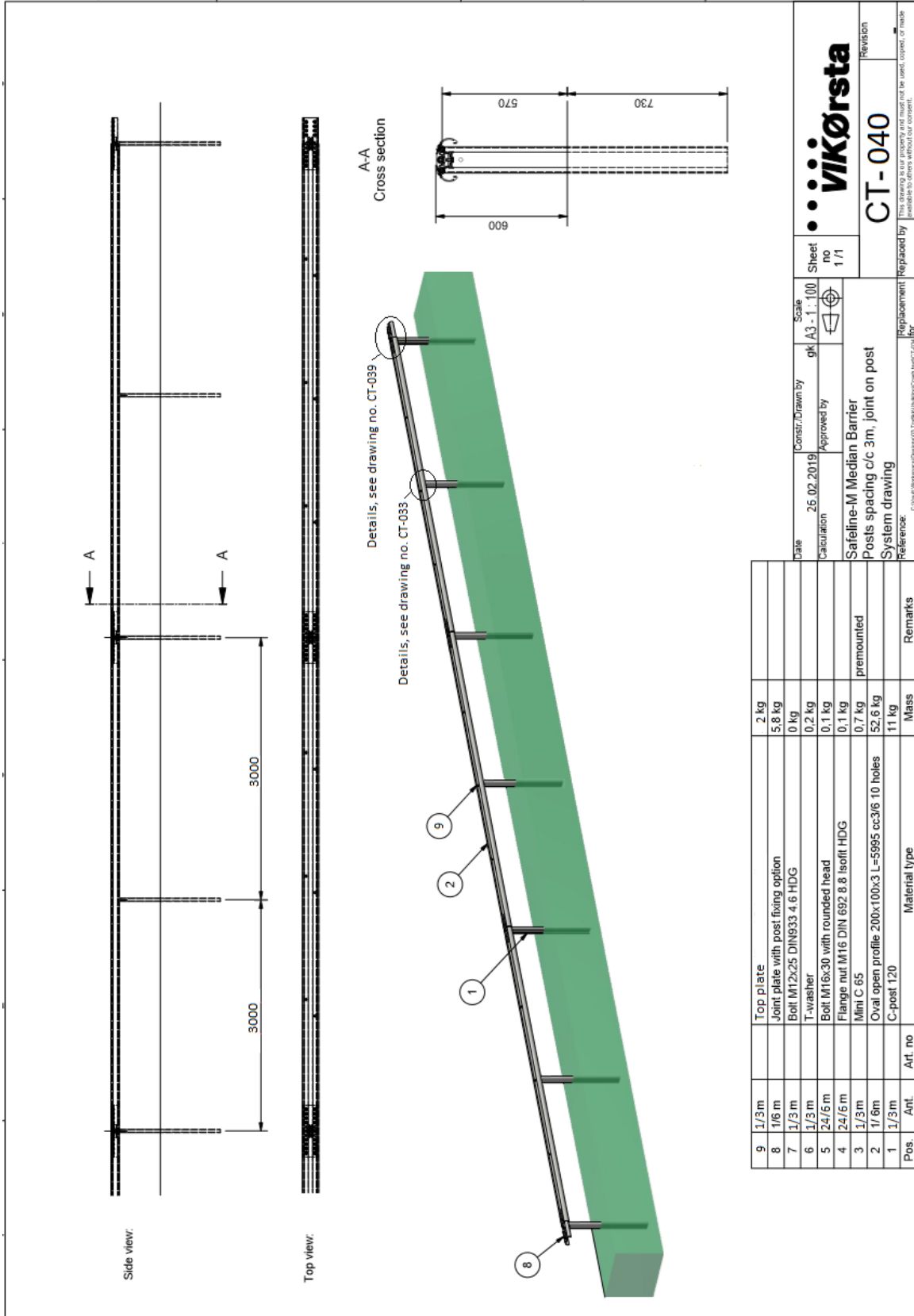




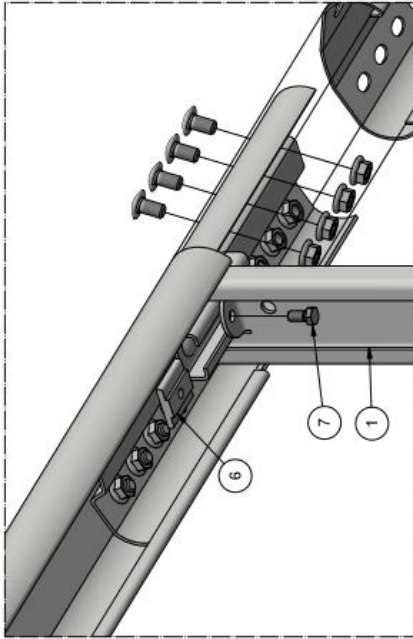
1	1	Steel sheet 200x100x3	Material type	S420 acc. to EN10025	Cut length	Mass	Remarks
Pos. Qty. / Art. no.		Constr./Drawn by		5995		35,3 kg	
Date		Approved by		Sheet no		Revision	
21.02.2019				1 / 1			
Calculation		Scale		gk A3 - 1 : 10		CT-016N	
		Safeline-M Median Barrier		Oval open top profile L=5995 mm cc 1 m			
Reference:		Replacement		Replaced by			
016n-200x100x3.ctb		016n-200x100x3.ctb					



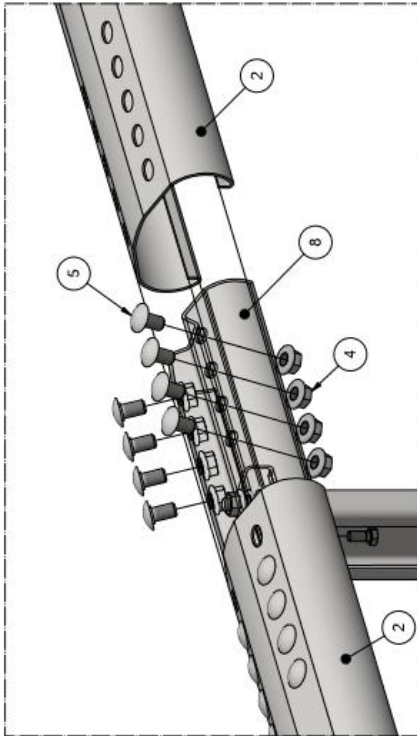
8.5 Alternative post placement/-fixing (c/c 3m)



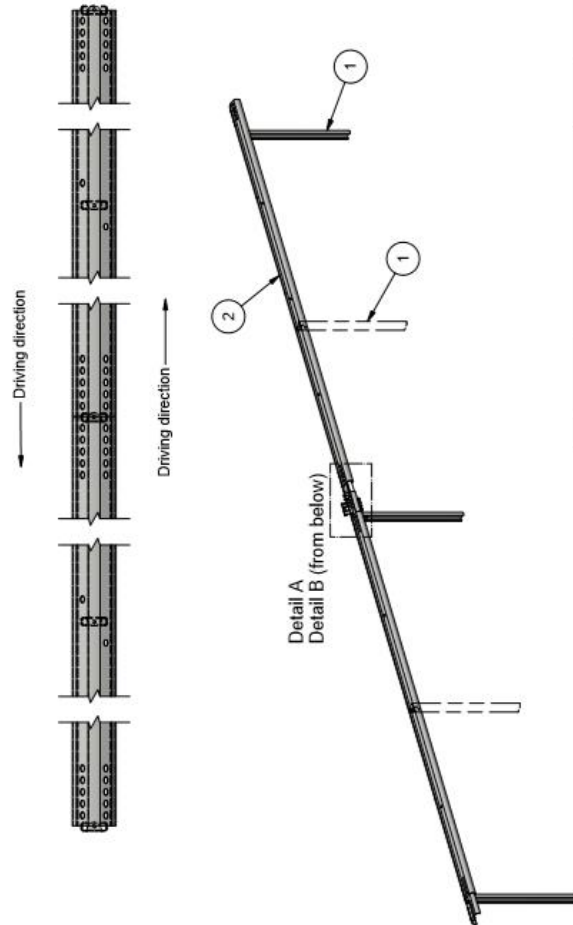
Detail B (1 : 5)



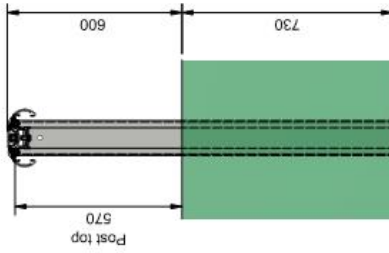
Detail A (1 : 5)



Post's direction is alternated:



Cross section (1 : 15)



Pos	Materialtype	Vekt
8	Joint plate with post fixing option	5,8 kg
7	Bolt M12x25 4.6 HDG	0,2 kg
6	T-washer	0,2 kg
5	Bolt M16x30 with rounded head	0,1 kg
4	Flange nut DIN 692 M16 8.8 Isofltt HDG	0,1 kg
3	Mini C 65	0,7 kg
2	Oval open profile 200x100x3 L=5995 cc3/6 with 10 holes	52,6 kg
1	C-post 120	11 kg

Date	21.02.2019	Scale	A3 - 1 : 50
Calculation	gk	Sheet no	1 / 1
Constr./Drawn by	gk	Approved by	
Safeline-M Median Barrier			
Assembly drawing (universal c/c 3 and 6 m)			
Alternative post placement			
Reference:	C:\Users\Wassenaar\Documents\Teknische\SafeLine\SafeLine.ctb		

Rev.	Zone	Revision description	Sign.	Date
A	C-D1-3	C/C 3 m added	GK	04.03.2019

Replacement		Replaced by	Revision
CT-039			A