

<i>Stalprodukt S.A.</i>	Kind of document : <b>Assembly manual</b>	Reference No: <b>IM/MD-70/18</b>		
Title : ASSEMBLY MANUAL OF DOUBLE SIDE BRIDGE SAFETY BARRIER SP-17M/4 according to EN 1317-5:2007+A2:2012			Page:	1
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## Documentation of the producer

According to EN 1317:5 standard point 5.2 Product description

## Equipment and employees

The Contractor should produce evidence that he has the possibility to use special equipment to assemble and transport barriers, which is safe to use. The team performing road works should be under continuous supervision, executed by a properly qualified employee. The Contractor shall equip employees with means of individual protection. Vehicle marking and protection of the working place should be compliant with current legal regulations binding in the place where works are performed.

## Materials

Materials should be compliant with requirements stated in Documentation of the Manufacturer.

Individual barrier elements are packed in bundles with size depending on the weight of elements and the size of the commission. Small barrier elements are delivered in containers or cases.

Each bundle or case shall have a tag including at least the following information:

- name and address of the producer,
- name of the product, together with the name and marking of the element,
- date of production,
- weight of the bundle, container or case,
- number of items in one delivery

Barrier elements should be stored in places and conditions, in which they shall not be exposed to mechanical defects or intensive corrosion.

## Stages of assembly works

Assembly works include the following stages:

- 1) **Preparatory works and measurements** (indication of barrier road with verification of the course of underground installations, determination of posts location, indication of possible passage routes, crossings as well as final and initial barrier sections)
- 2) **Placing posts of the protective barriers system** – placing posts within the distance from the edge of the road stated in Project Documentation. During this stage of works it is essential to verify settlement, height and distance between posts.

### Installation instructions (in case of chemical anchors):

- Drill hole to the required diameter and depth for stud size being used
- Clean the hole with brush and hand pump at least four times each

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- Insert capsule into the hole. Connect stud to drilling machine using appropriate driver system
  - Position the stud into the glass capsule then switch on the drilling machine and drive stud into the capsule. Switch off the drilling machine as soon as the bottom of hole is reached
  - Leave the anchor undisturbed until the curing time elapses
  - Attach fixture and tighten the nut to the required torque.
- 3) **Assembly of protective barriers system** – Assembly of protective barrier elements should be made according to Documentation of the Producer and Project Documentation. When assembling protective barriers system it is forbidden to make any holes or cuts violating the galvanized layer of particular elements. Assembly of protective road barriers includes:
- a) assembly of distancing elements within the protective barriers system with the use of appropriate joining elements,
  - b) assembly of guides for distancing elements with the use of appropriate joining elements. During this stage of works adjoining segments of guides need to be connected according to the direction of vehicle movement, in a way, which in case of accident will enable the vehicle to slide along protective barriers system without touching edges of the guides,
  - c) assembly of initial and final segments of protective barriers system
  - d) regulation of joining element's tightening moment
  - e) checking the continuity of galvanized surface and repair of possible damages
  - f) fixing reflective elements on protective barriers system.
- 4) **Quality control of the works** should include:
- a) verifying the compliance between the assembly of protective barriers system with Project Documentation and Documentation of the Producer, with consideration of possible size deviations,
  - b) test of galvanized layer thickness and its appearance
- 5) **Site arrangement**

#### **Technical specification for bridge restraint system SP – 17M/4:**

Steel quality: S235JR in accordance with EN 10025-2

Hot-dip zinc coating:

- in accordance with EN ISO 1461
- continuous method in accordance with EN 10346

Bolts:

Bolts in accordance with EN ISO 898-1:

- M 10 x 25 according to EN ISO 4017; DBO-1910; property class 5.8
- M 16 x 25 according to drawing DBO-1929; property class 4.6
- M 16 x 40 according to drawing DBO-1935; property class 4.6

Nuts according to EN ISO 4032

Nuts with flange according to ISO 4161; property class 8 – as option

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Washers according to EN ISO 7091

Tightening torque of the bolts:

- M 10 - T =  $40 \pm 10$  [Nm]
- M 16 - T =  $70 \pm 10$  [Nm]

Anchors/Anchorage

- M24 according to the road design

2 posts were detached during test TB42. Weight of each ~6 kg.

#### List of elements SP-17M/4

ID	Part name	No of drawing	Material	Theoretical mass [kg]
1	Sigma bridge post-base plate 25 mm	DBO-0358	S235JR	11.9
2	Guardrail type A(W)	DBO-0633	S235JR	47.4
3	Double side outrigger L-780	DBO-0503	S235JR	7.2
4	Connecting sleeve	DBO-0508	S235JR	0.95
5	Washer M16	DBO-0513	S235JR	0.16

#### Sequence of assembly in accordance with attached drawings:

SP-17M/4 - Assembly drawing bridge safety barrier SP-17M/4

SP-17M/4 - Single section for system SP-17M/4

SP-17M/4 - Double side bridge safety barrier SP-17M/4

SP-17M/4 - Assembly of bolt M16x40 for system SP-17M/4

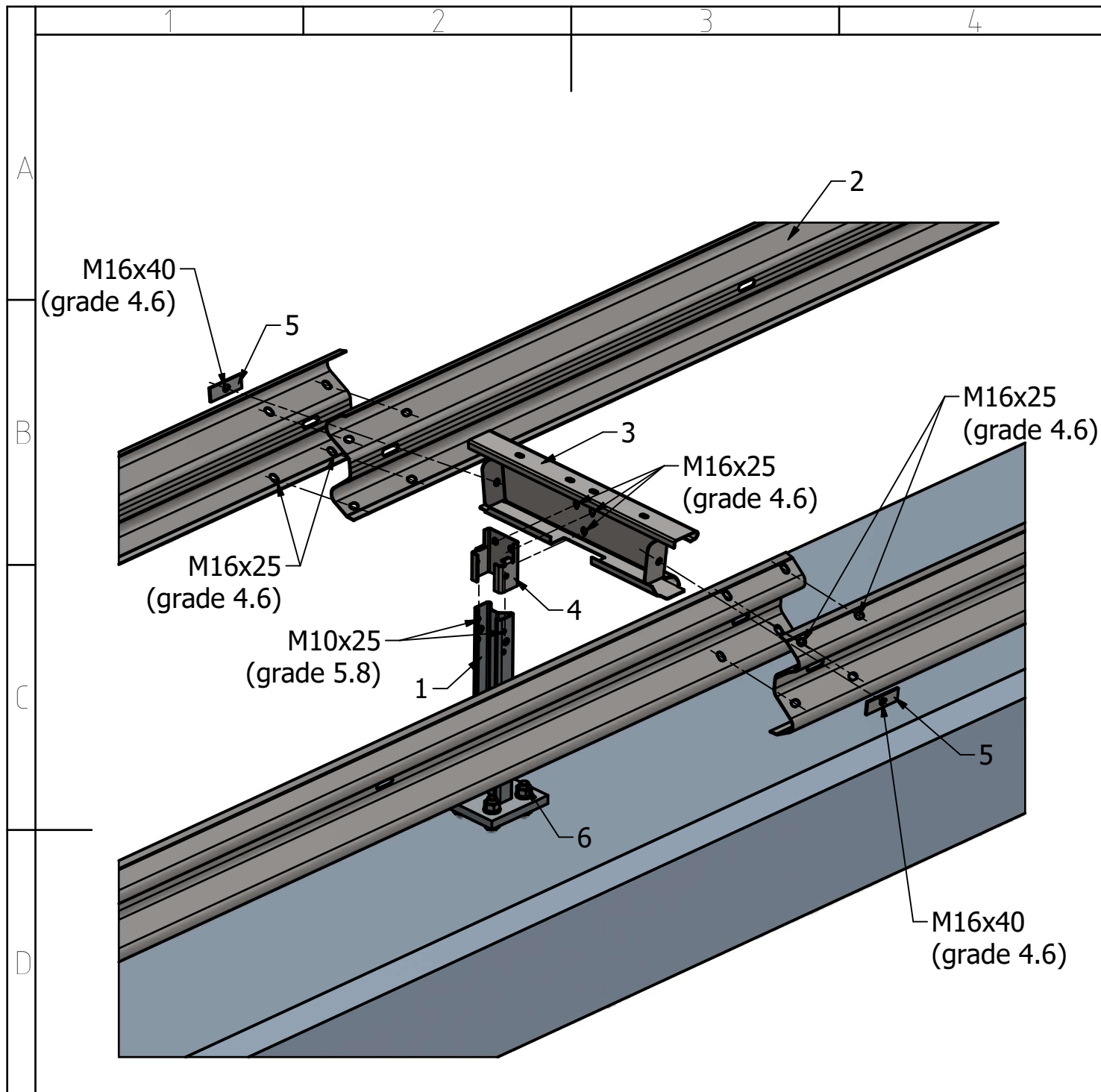
SP-17M/4 - Assembly of bolt M16x25 for system SP-17M/4

SP-17M/4 - Assembly of bolt M16x25 (outrigger-connecting sleeve) for system SP-17M/4

SP-17M/4 - Assembly of bolt M10x25 for system SP-17M/4


The tolerance for height of the top of the system is  $\pm 20$ mm.

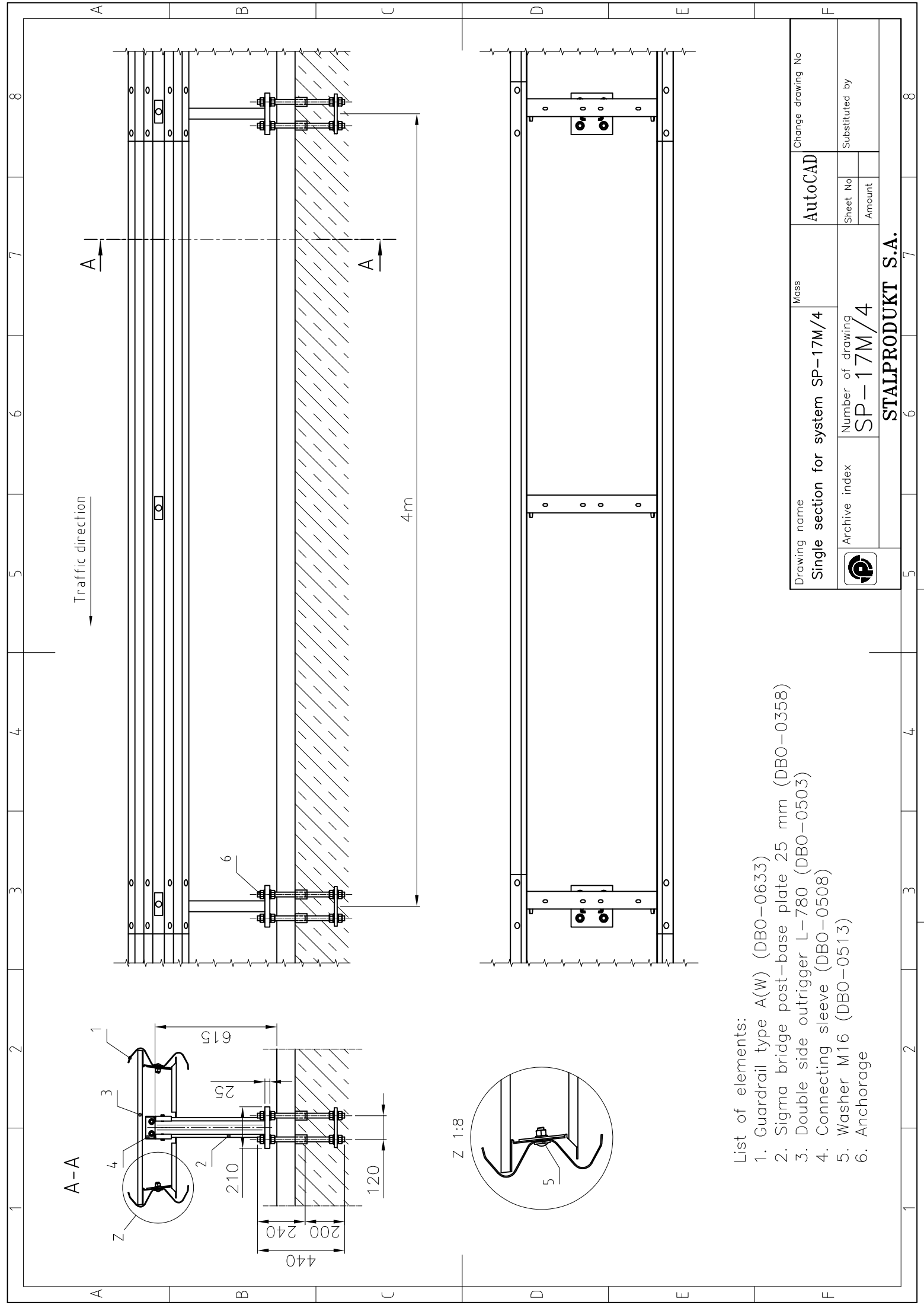
The minimum length of system is 60 m (without terminals).



#### List of elements:


1. Sigma bridge post-base plate 25 mm (DBO-0358)
2. Guardrail type A(W) (DBO-0633)
3. Double side outrigger L-780 (DBO-0503)
4. Connecting sleeve (DBO-0508)
5. Washer M16 (DBO-0513)
6. Anchors M24

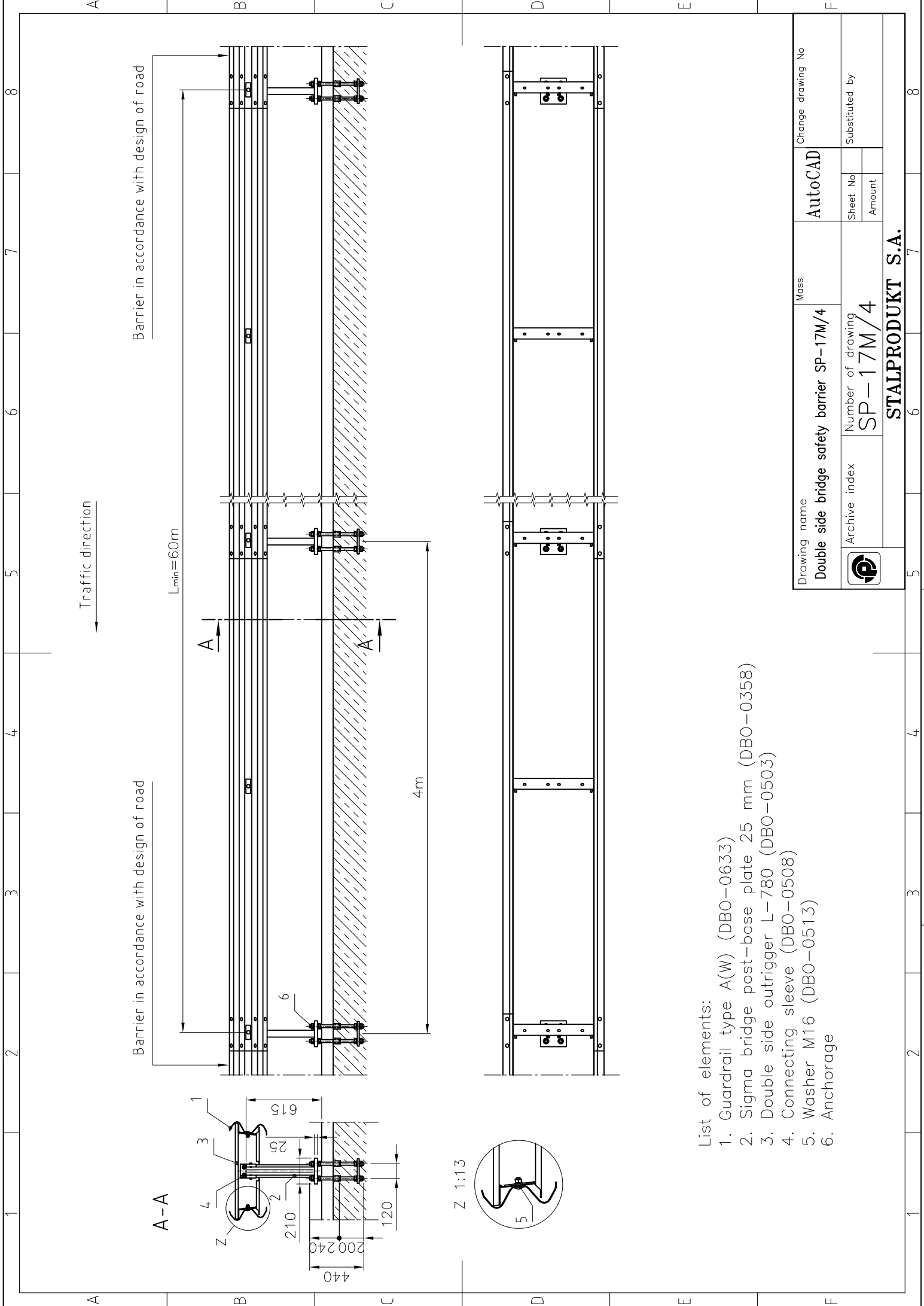
Drawing name Assembly drawing bridge safety barrier SP-17M/4		Mass -	INVENTOR		Change drawing No
	Archive index	Number of drawing SP-17M/4	Sheet No	1	Substituted by
			Amount	1	
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List of elements:

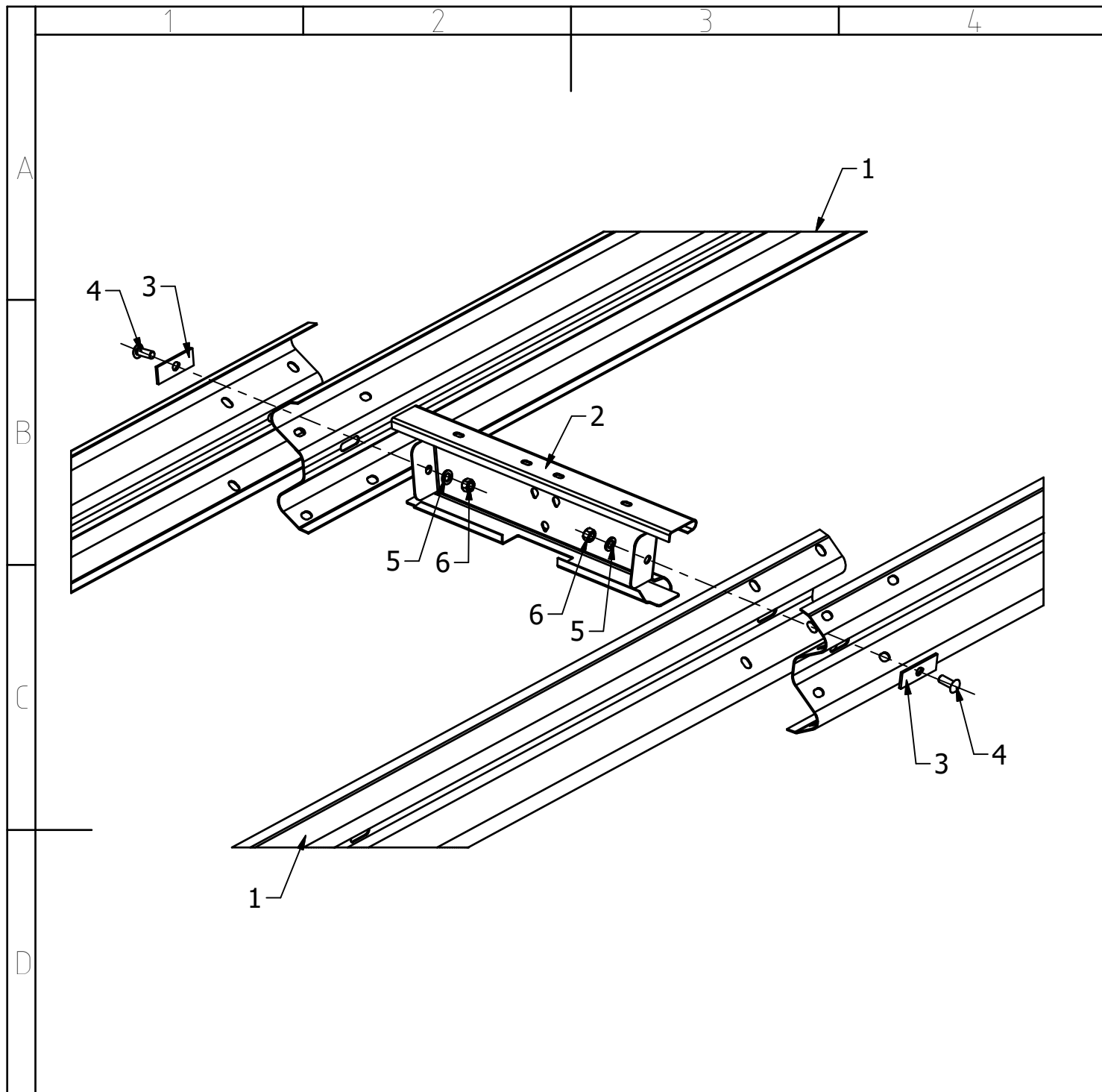
1. Guardrail type A(W) (DBO-0633)
2. Sigma bridge post-base plate 25 mm (DBO-0358)
3. Double side outrigger L-780 (DBO-0503)
4. Connecting sleeve (DBO-0508)
5. Washer M16 (DBO-0513)
6. Anchorage

Drawing name		Mass	AutoCAD		Change drawing No	
Single section for system SP-17M/4						
	Archive index	Number of drawing SP-17M/4	Sheet No		Substituted by	
			Amount			
STALPRODUKT S.A.						
5	6	7	8			




- List of elements:
- 1. Guardrail type A(W) (DBO-0633)
  - 2. Sigma bridge post-base plate 25 mm (DBO-0358)
  - 3. Double side outrigger L-780 (DBO-0503)
  - 4. Connecting sleeve (DBO-0508)
  - 5. Washer M16 (DBO-0513)
  - 6. Anchorage

Drawing name		Mass		Change drawing No	
Double side bridge safety barrier SP-17M/4				AutoCAD	
	Archive index	Number of drawing	Sheet No	Substituted by	
		SP-17M/4	Amount		
STALPRODUKT S.A.					
5		6	7	8	



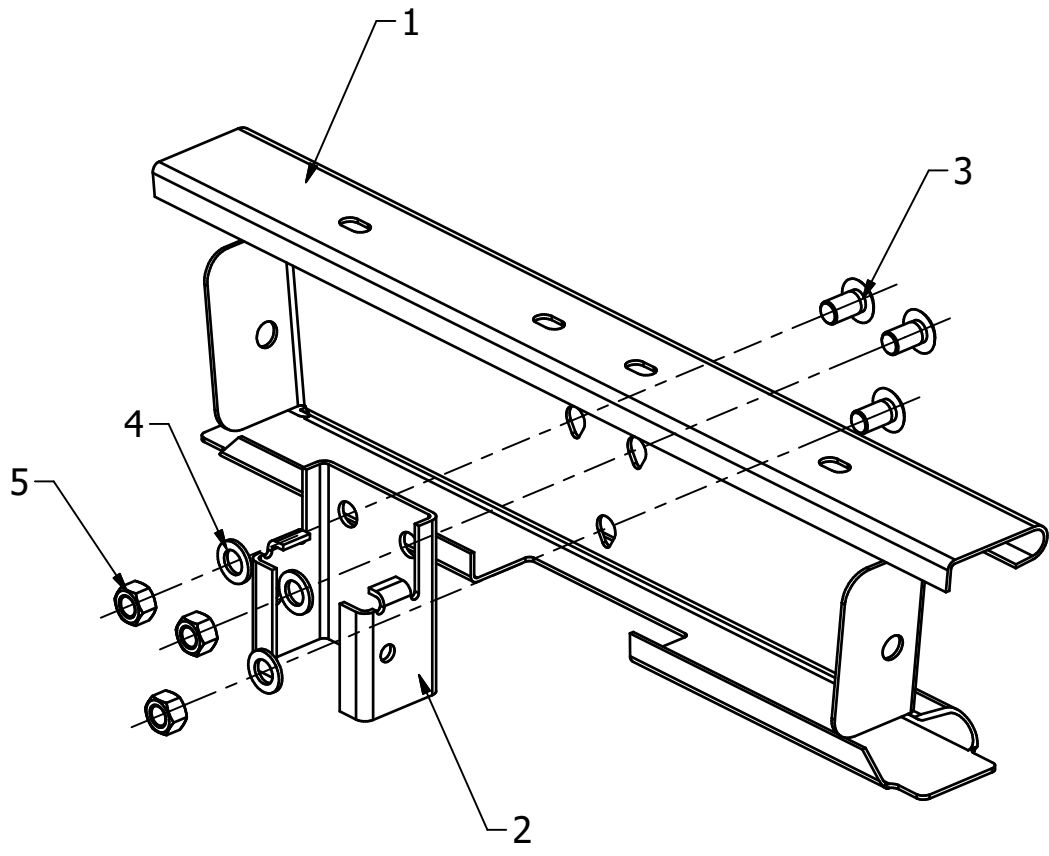
List of elements:

1. Guardrail type A(W) (DBO-0633)
2. Double side outrigger L-780 (DBO-0503)
3. Washer M16 (DBO-0513)
4. Bolt M16x40; grade 4.6 (DBO-1935)
5. Round Washer M16 (DBO-1935)
6. Nut M16 (DBO-1935)

Drawing name Assembly of bolt M16x40 for system SP-17M/4			Mass -		INVENTOR		Change drawing No	
	Archive index		Number of drawing SP-17M/4			Sheet No	1	Substituted by
						Amount	1	
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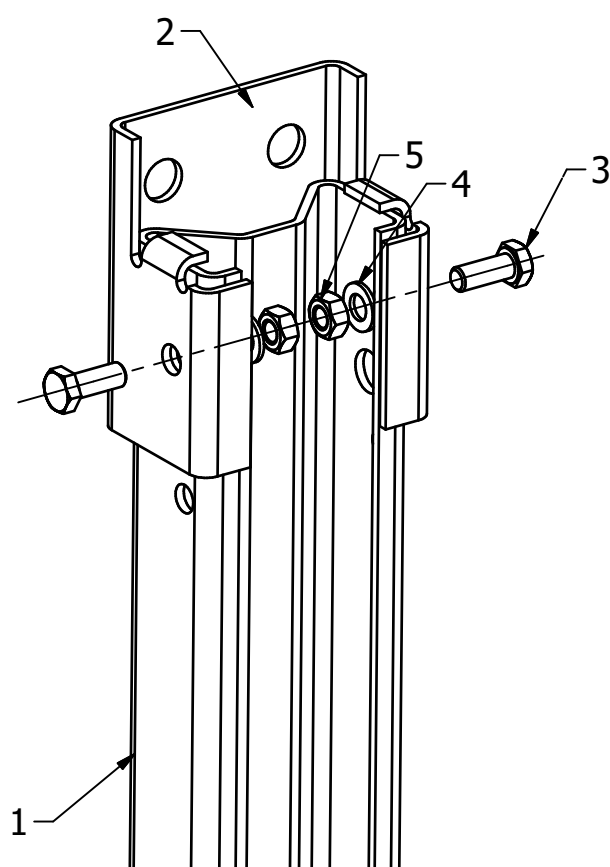




List of elements:


1. Double side outrigger L-780 (DBO-0503)
2. Connecting sleeve (DBO-0508)
3. Bolt M16x25; grade 4.6 (DBO-1929)
4. Round Washer M16 (DBO-1929)
5. Nut M16 (DBO-1929)

Drawing name Assembly of bolt M16x25(Outrigger-Connecting sleeve) for system SP-17M/4		Mass -	INVENTOR		Change drawing No	
	Archive index	Number of drawing SP-17M/4		Sheet No	1	Substituted by
				Amount	1	
	STALPRODUKT S.A. - BOCHNIA					



List of elements:

1. Sigma bridge post-base plate 25 mm (DBO-0358)
2. Connecting sleeve (DBO-0508)
3. Bolt M10x25; grade 5.8 (DBO-1910)
4. Round Washer M10 (DBO-1910)
5. Nut M10 (DBO-1910)

Drawing name Assembly of bolt M10x25 for system SP-17M/4		Mass -	INVENTOR		Change drawing No
	Archive index	Number of drawing SP-17M/4	Sheet No	1	Substituted by
			Amount	1	
	STALPRODUKT S.A. - BOCHNIA				