

<i>Stalprodukt S.A.</i>	Kind of document : Assembly manual	Reference No: IM/MD-71/18
Title : ASSEMBLY MANUAL OF BRIDGE SAFETY BARRIER STP-11M/2 according to EN 1317-5:2007+A2:2012		Page: 1 Pages: 3
		Issue No: II

	Position	Name	Signature	Date
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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)

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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
- 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 STP-11M/2

Steel quality: S235JR in accordance with EN 10025-2

Steel quality: S275JR in accordance with EN 10025-2

Hot-dip zinc coating:

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

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Bolts:

Bolts in accordance with EN ISO 898-1

- M 16 x 25 according to drawing DBO-1929; property class 4.6
- M 16 x 40 according to EN ISO 4017; DBO-1902; property class 5.8

Nuts according to EN ISO 4032

Washers according to EN ISO 7089 and EN ISO 7091

Tightening torque of the bolts:

- M 16 - T = 70 ± 10 [Nm]

Anchors/Anchorage

- HILTI HAS-E-F M24x210/54 property class 5.8, HVU M24x210

Tightening torque of the anchors:

- HILTI HAS-E-F M24x210/54 property class 5.8, HVU M24x210 $T_{inst,max} = 200$ [Nm]

The usage of Guardrail type A(W) and Guardrail type B is allowed on the base of the report number RSTA-20140806-A.

List of elements STP-11M/2

ID	Part name	No of drawing	Material	Theoretical mass [kg]
1	Bridge Post Sigma StalPro L=510 [mm]	DBO-1333	S275JR/S235JR	12.6
2	Guardrail type B or A(W)	DBO-0143, DBO-1302/ DBO-0621, DBO-0635	S275JR	43.0/47.3
3	Washer M16	DBO-0513	S235JR	0.16

Sequence of assembly in accordance with attached drawings:

STP-11M/2 - Assembly drawing bridge safety barrier STP-11M/2

STP-11M/2 - Single section for system STP-11M/2

STP-11M/2 - Bridge safety barrier STP-11M/2

STP-11M/2 - Assembly of bolt M16x40 for system STP-11M/2

STP-11M/2 - Assembly of bolt M16x25 for system STP-11M/2

The tolerance for height of the Guardrail type B is ± 20 mm.

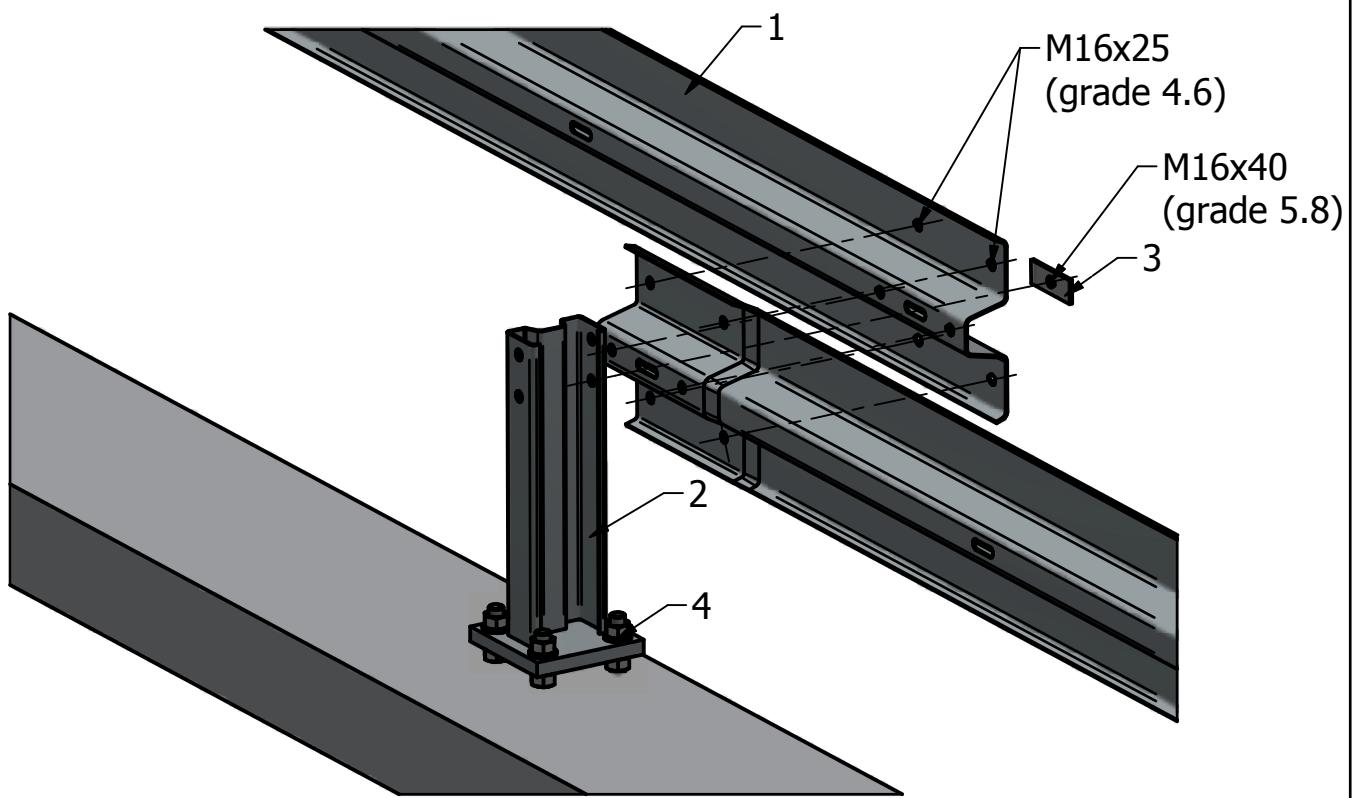
The minimum length of system is 60 m (without terminals).

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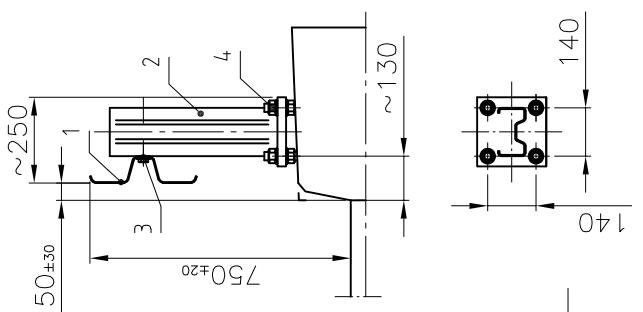
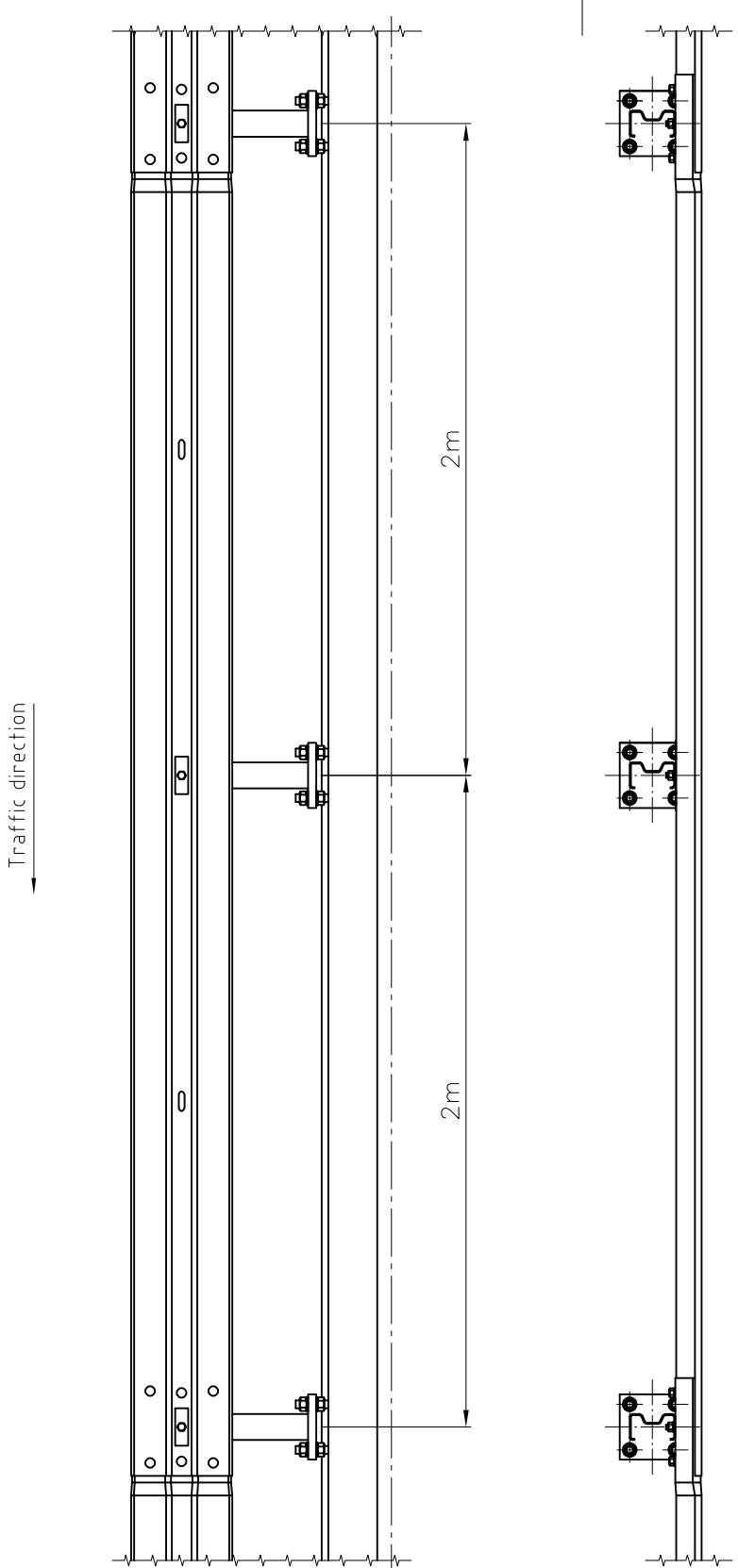
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List of elements:

1. Guardrail type B (DBO-0143, DBO-1302)
2. Bridge Post Sigma StalPro L=510 [mm] (DBO-1333)
3. Washer M16 (DBO-0513)
4. Anchors M24 cl. 5.8

Drawing name Assembly drawing bridge safety barrier STP-11M/2		Mass -	INVENTOR	Change drawing No
	Archive index	Number of drawing STP-11M/2		Substituted by
		Sheet No 1	Amount 1	
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List of elements:

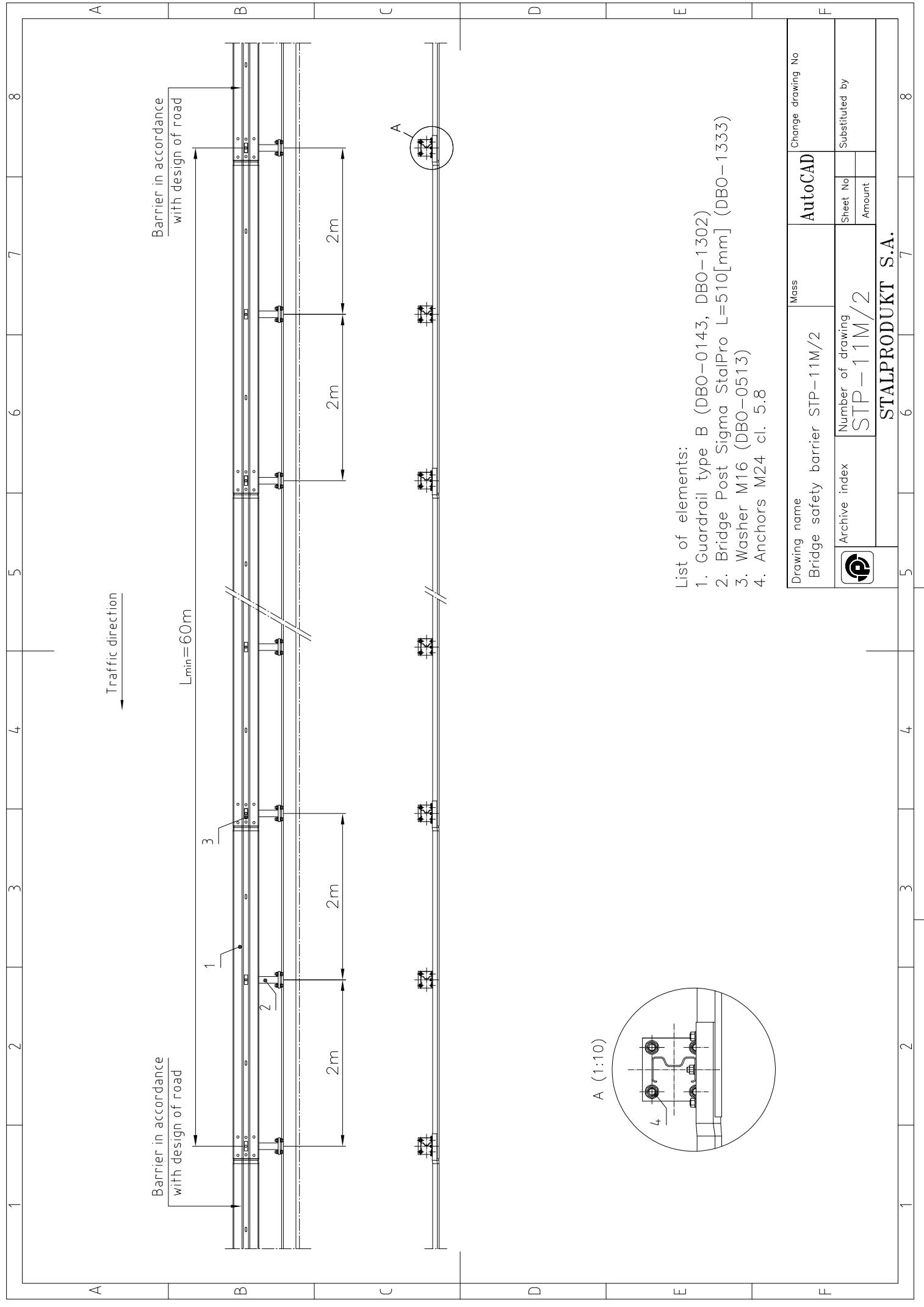
1. Guardrail type B (DBO-0143, DBO-1302)
2. Bridge Post Sigma StalPro L=510 [mm] (DBO-1333)
3. Washer M16 (DBO-0513)
4. Anchors M24 cl. 5.8

Drawing name Single section	Mass	AutoCAD	Change drawing No
Archive index	Number of drawing STP-11M/2	Sheet No	Substituted by
		Amount	
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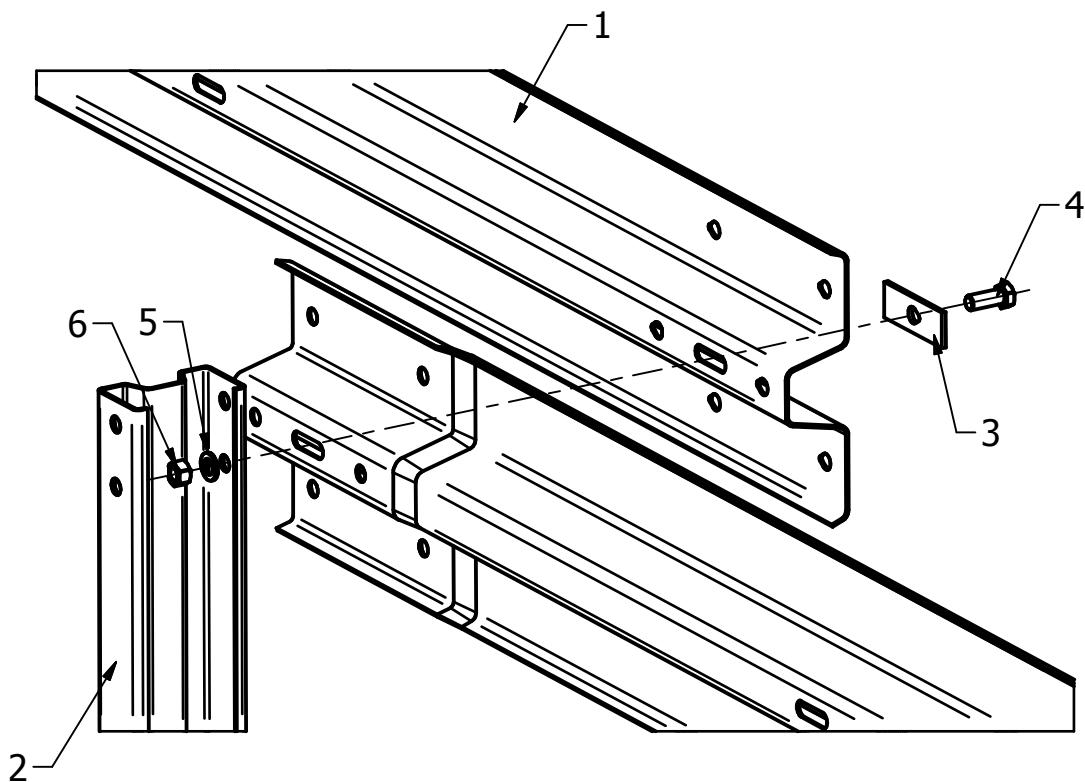
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List of elements:

1. Guardrail type B (DBO-0143, DBO-1302)
2. Bridge Post Sigma StalPro L=510 [mm] (DBO-1333)
3. Washer M16 (DBO-0513)
4. Bolt M16x40; grade 5.8 (DBO-1902)
5. Round washer (DBO-1902)
6. Nut M16 (DBO-1902)

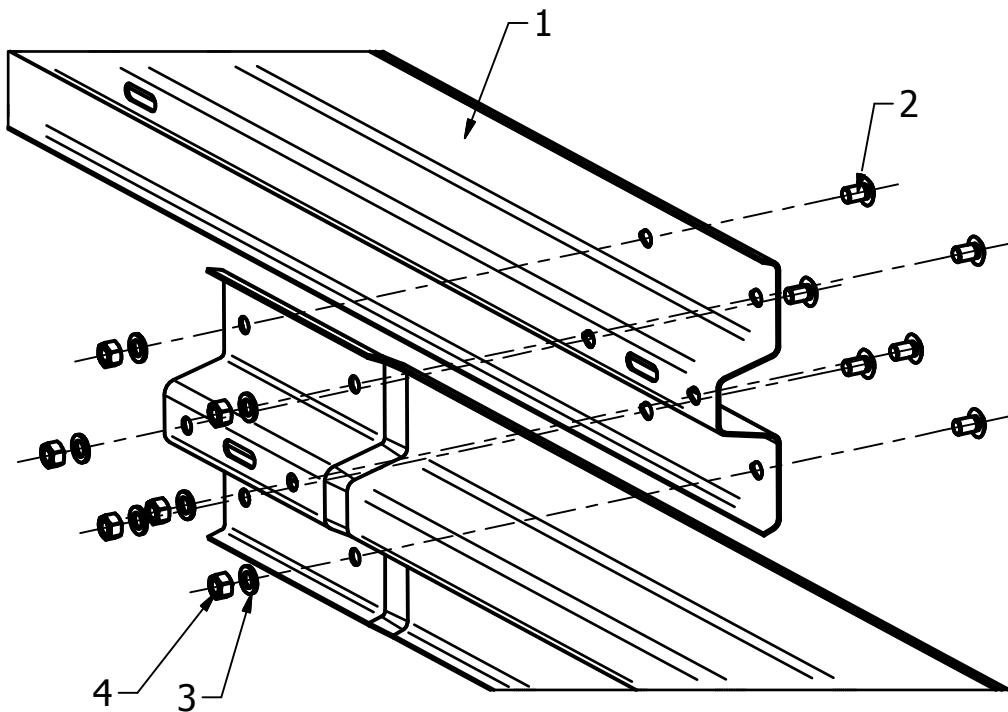
Drawing name Assembly of bolt M16x40 for system STP-11M/2		Mass -	INVENTOR	Change drawing No
	Archive index	Number of drawing STP-11M/2		Substituted by
		Sheet No	1	
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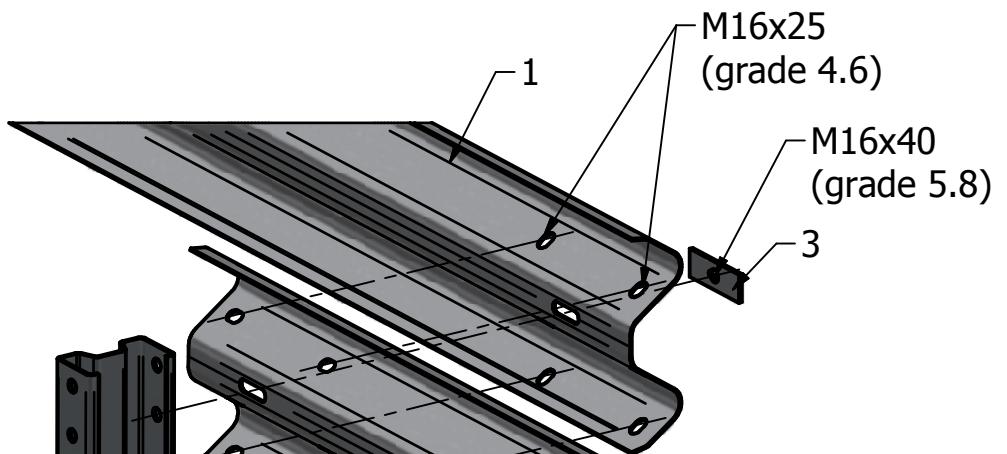


List of elements:

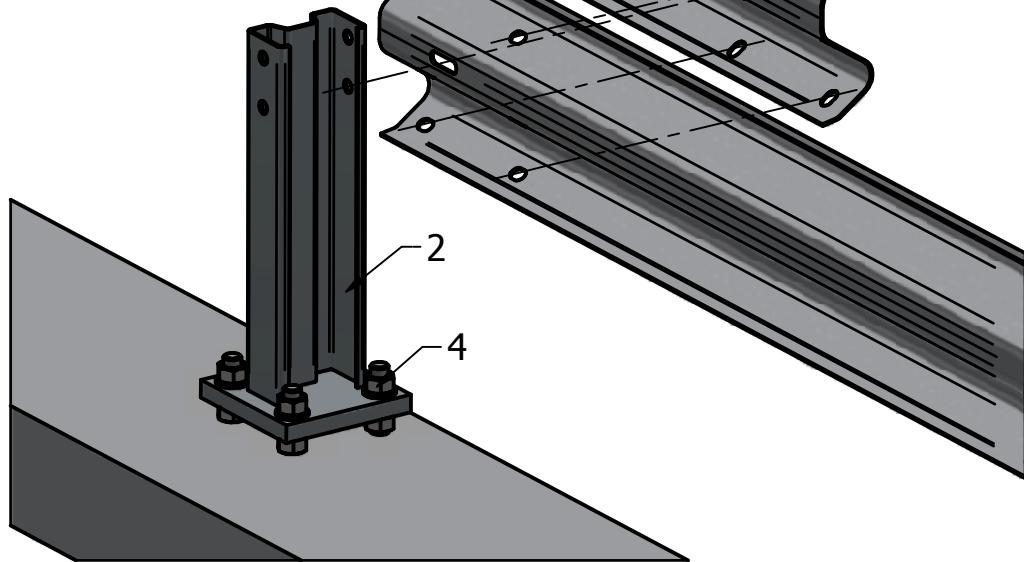
1. Guardrail type B (DBO-0143, DBO-1302)
2. Bolt M16x25; grade 4.6 (DBO-1929)
3. Round washer (DBO-1929)
4. Nut M16 (DBO-1929)

Drawing name Assembly of bolt M16x25 for system STP-11M/2		Mass -	INVENTOR	Change drawing No
	Archive index	Number of drawing STP-11M/2	Sheet No 1 Amount 1	Substituted by
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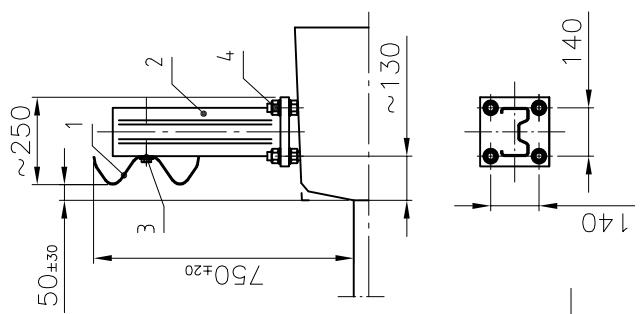
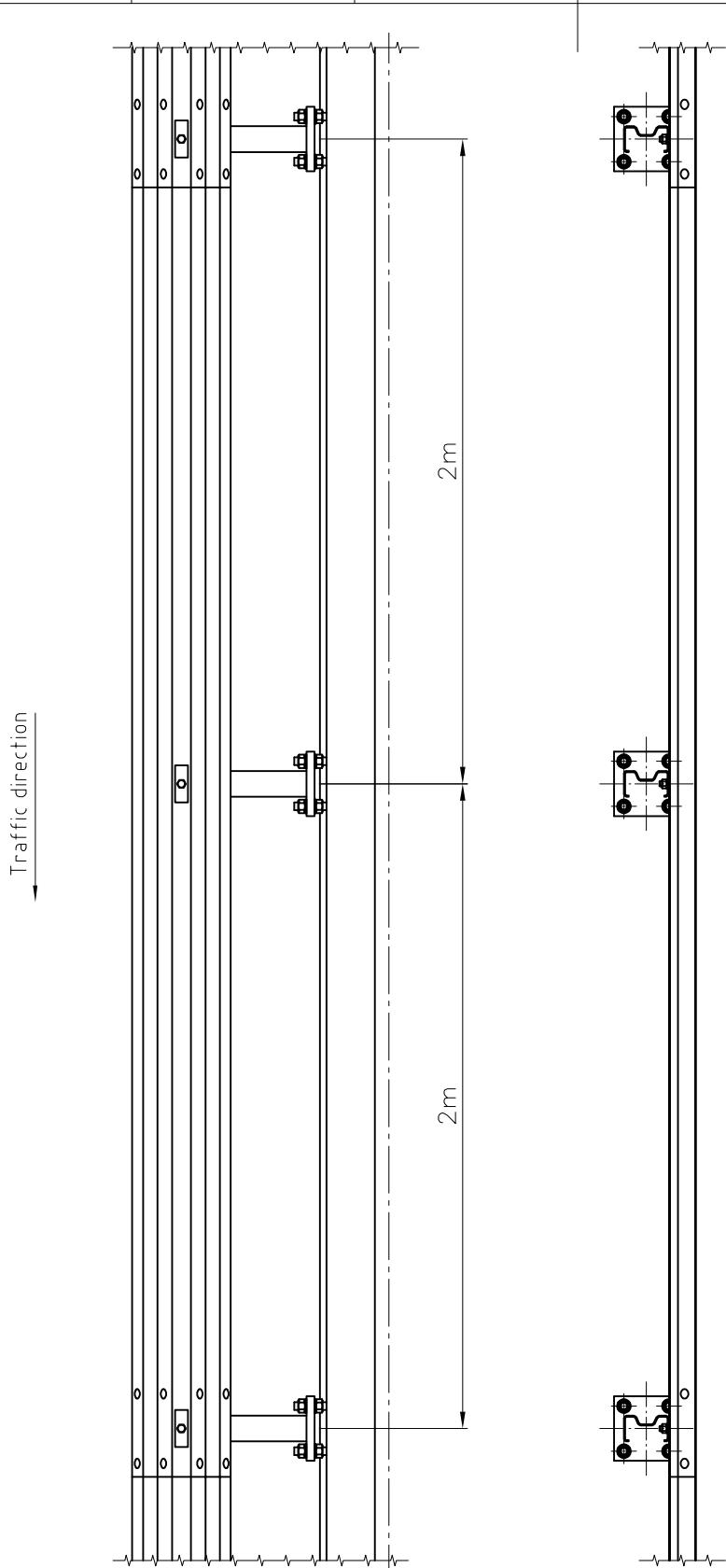
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List of elements:

1. Guardrail type A(W) (DBO-0621, DBO-0635)
2. Bridge Post Sigma StalPro L=510 [mm] (DBO-1333)
3. Washer M16 (DBO-0513)
4. Anchors M24 cl. 5.8

Drawing name Assembly drawing bridge safety barrier STP-11M/2		Mass -	INVENTOR	Change drawing No
	Archive index	Number of drawing STP-11M/2		Substituted by
		Sheet No 1	Amount 1	
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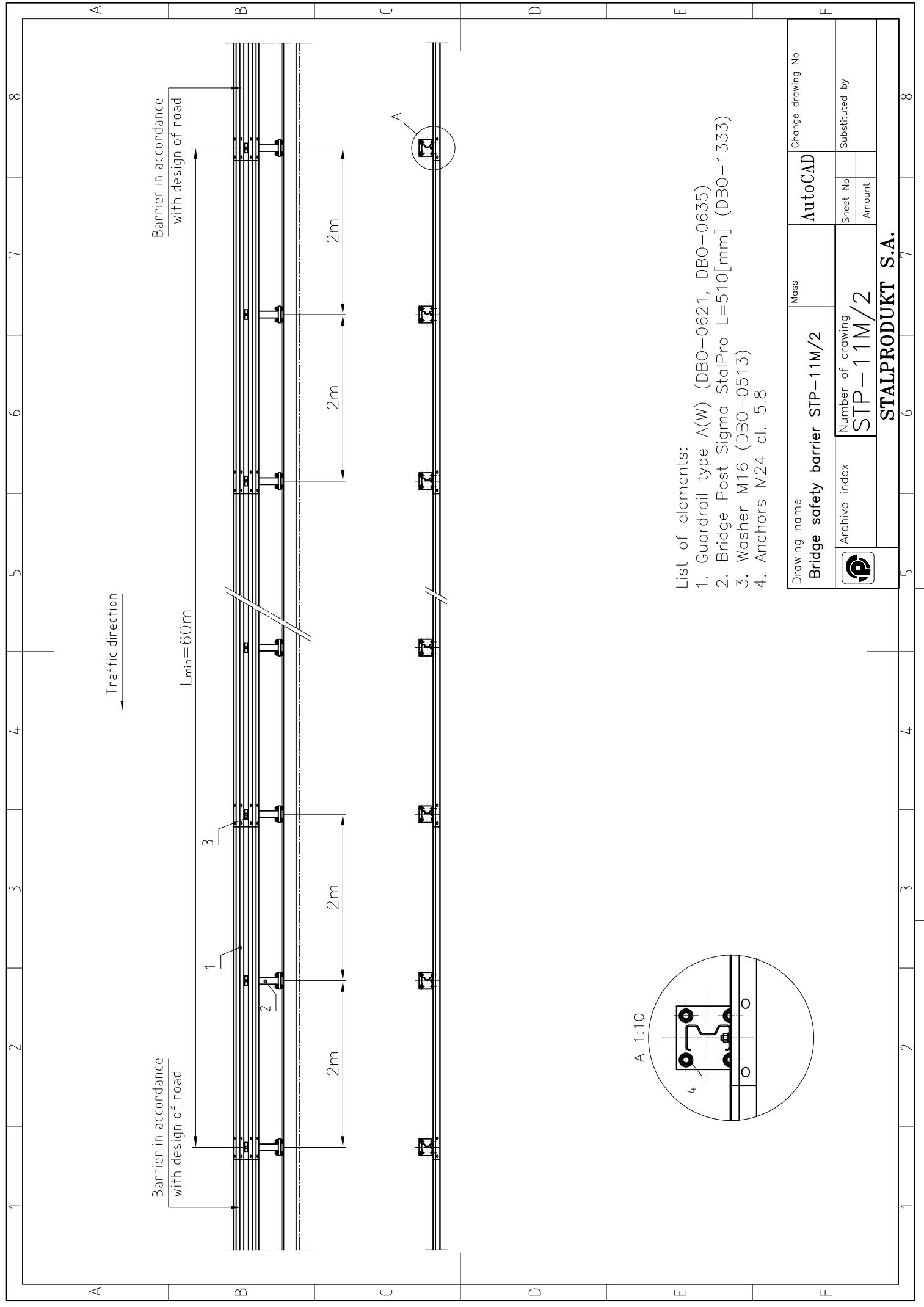


List of elements:

1. Guardrail type A(W) (DBO-0621, DBO-0635)
2. Bridge Post Sigma StaiPro L=510[mm] (DBO-1333)
3. Washer M16 (DBO-0513)
4. Anchors M24 cl. 5.8

Drawing name Single section	Mass	AutoCAD	Change drawing No
Archive index	Number of drawing STP-11M/2	Sheet No	Substituted by
		Amount	

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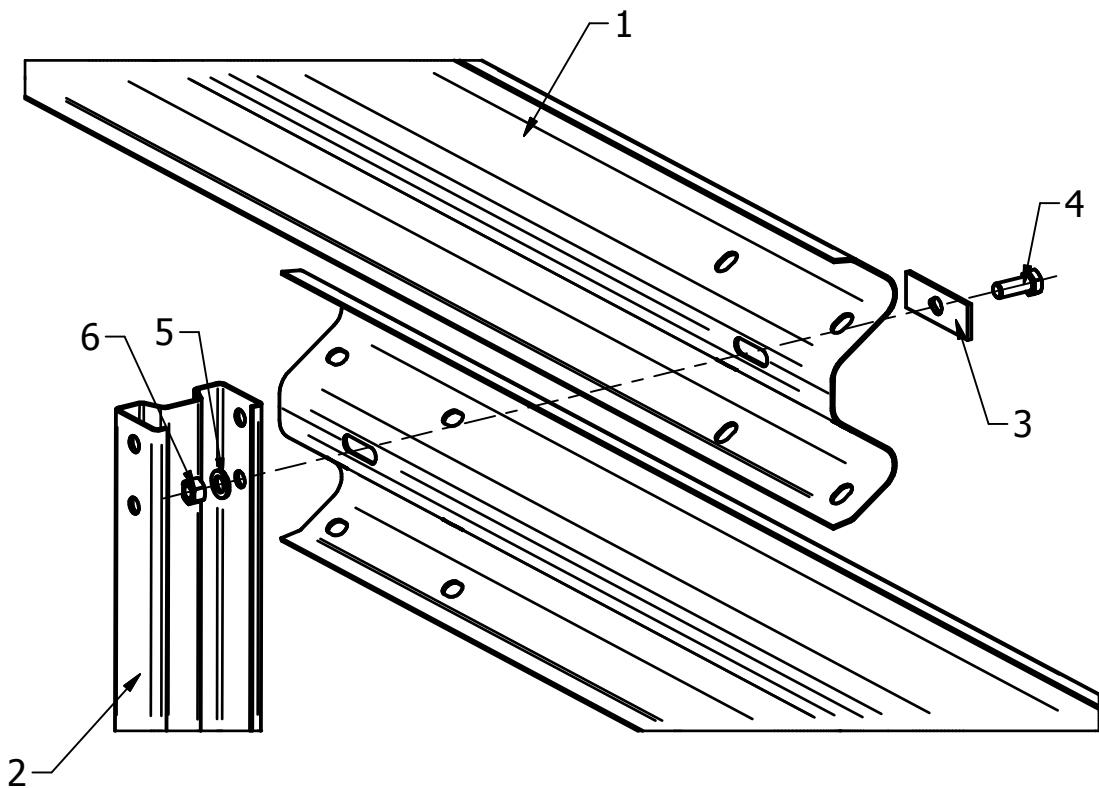


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List of elements:

1. Guardrail type A(W) (DBO-0621, DBO-0635)
2. Bridge Post Sigma StalPro L=510 [mm] (DBO-1333)
3. Washer M16 (DBO-0513)
4. Bolt M16x40; grade 5.8 (DBO-1902)
5. Round washer (DBO-1902)
6. Nut M16 (DBO-1902)

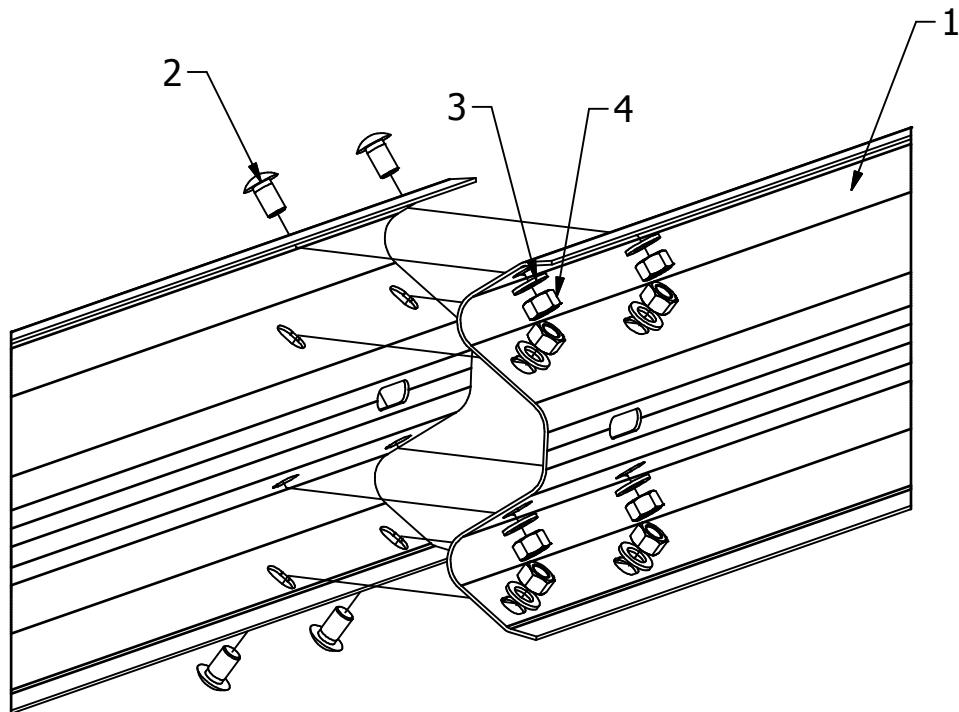
Drawing name Assembly of bolt M16x40 for system STP-11M/2		Mass -	INVENTOR	Change drawing No
	Archive index	Number of drawing STP-11M/2		Substituted by
		Sheet No	1	
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List of elements:

1. Guardrail type A(W) (DBO-0621, DBO-0635)
2. Bolt M16x25; grade 4.6 (DBO-1929)
3. Round Washer M16 (DBO-1929)
4. Nut M16 (DBO-1929)

Drawing name Assembly of bolt M16x25 for system STP-11M/2		Mass -	INVENTOR	Change drawing No
	Archive index	Number of drawing STP-11M/2	Sheet No 1	Substituted by
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