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Authorised and notified according to
Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of 9
March 2011

MEMBER OF EOTA

European Technical Assessment ETA-13/1063 of 2014/01/16

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:

Gutzeit Post bases

Product family to which the above construction product belongs:

EC PAC 13: Three-dimensional nailing plate (Post bases for the support of timber columns and posts as load-bearing elements)

Manufacturer:

Gutzeit Verbindungssysteme GmbH & Co.
Rudolf-Diesel-Strasse 1
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Manufacturing plant:

Gutzeit Verbindungssysteme GmbH & Co.
Rudolf-Diesel-Strasse 1
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This European Technical Assessment contains:

41 pages including 2 annexes which form an integral part of the document

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:

Guideline for European Technical Approval (ETAG) No. 015 Three Dimensional Nailing Plates, April 2013, used as European Assessment Document (EAD).

This version replaces:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product and intended use

Technical description of the product

The post bases are made from 4.0 mm to 8.0 mm thick steel plates in combination with reinforcing bars, threaded rods or steel tubes. The post bases are produced from steel grade S235JR according to EN 10025-2:2005 with minimum characteristic yield strength of $R_e = 235 \text{ N/mm}^2$ and minimum characteristic tensile strength of $R_m = 360 \text{ N/mm}^2$. The reinforcing bars are produced from steel grade B500A according to EN 10080:2005 with minimum characteristic yield strength of $R_{eH} = 500 \text{ N/mm}^2$.

For the connections with metal fasteners nails $\phi 4,0 \times 40$ according to EN 14592, dowels and bolts $\phi 10$, $\phi 12$ mm (S235) and coach screws $\phi 8,0$, $\phi 10,0$ and $\phi 12,0$ mm according to EN 14592 (DIN 571 and thread according to DIN 7998) are used.

Dimensions are shown in Annex A and B.

2 Specification of the intended use in accordance with the applicable EAD

The intended use of the post bases is the support of timber columns and posts as load-bearing elements, where requirements for mechanical resistance and stability and safety in use in the sense of the Basic Works Requirements 1 and 4 of Regulation (EU) 305/2011 shall be fulfilled.

The static and kinematical behaviour of the timber members or the supports shall be as described in Annex B.

The timber posts may be of solid timber of strength class C24 or better according to EN 338:2009. Minimum dimensions for the post have to be considered (Annex A).

The post base shall be installed as pictured in the drawings. The cross-section of the timber column shall be positioned centrally and with the end grain plane on the base plate. Post bases type H may have a clearance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (maximum 10 mm).

The maximum distance between the foundation and the base plate of the post base is given in Annex A, table A.1.

Annex B states the load-carrying capacities of the post bases for solid timber of strength class C24 according to EN 338:2009. The design of the connections shall be in accordance with Eurocode 3 and Eurocode 5 or a similar national code. The anchorage of the post base in the foundation and imperfections exceeding the assumptions in Eurocode 5, 5.4.4 are not part of this ETA.

The post bases are for use in timber structures subject to the service classes 1, 2 and 3 of Eurocode 5 and for connections subject to static or quasi-static loading. The corrosion protection is given by hot-dip zinc coating with a minimum thickness of 55 μm according to EN 1461 or zinc coating Fe/Zn 25c according to EN ISO 2081. The metal fasteners must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081).

The scope of the post bases regarding resistance to corrosion shall be defined according to national provisions that apply at the installation site considering environmental conditions.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the post bases of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

Characteristic	Assessment of characteristic
3.1 Mechanical resistance and stability*) (BR1)	
Characteristic load-carrying capacity	See Annex B
Stiffness	No performance determined
Ductility in cyclic testing	No performance determined
3.2 Safety in case of fire (BR2)	
Reaction to fire	The hold downs are made from steel classified as Euroclass A1 in accordance with EN 1350-1 and EC decision 96/603/EC, amended by EC Decision 2000/605/EC
3.3 Hygiene, health and the environment (BR3)	
Influence on air quality	No dangerous materials
3.7 Sustainable use of natural resources (BR7)	
	No Performance Determined
3.8 General aspects related to the performance of the product	
	The post bases have been assessed as having satisfactory durability and serviceability when used in timber structures using the timber species described in Eurocode 5 and subject to the conditions defined by service class 1 and 2
Identification	See Annex A

*) See additional information in section 3.8 – 3.9.

In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

3.9 Methods of verification

Safety principles and partial factors

The characteristic load-carrying capacities are based on the characteristic values of the connections with metal fasteners, the steel plates and the timber post.

In the case of timber failure or failure of the metal fasteners, the design values shall be calculated according to EN 1995-1-1 by dividing the characteristic values of the load-carrying capacities by different partial factors for the strength properties, and in addition multiplied with the coefficient k_{mod} .

In the case of steel failure, the design value shall be calculated according to EN 1993-1-1 by reducing the characteristic values of the load-carrying capacity with different partial factors.

The design value of the load-carrying capacity is the smaller value of all load-carrying capacities:

$$F_{Rd} = \min \left\{ \frac{k_{mod} \cdot F_{Rk,T}}{\gamma_{M,T}}; \frac{F_{Rk,S}}{\gamma_{Mi,S}} \right\}$$

Therefore, for timber failure or failure of the metal fasteners the load duration class and the service class are included. The different partial factors γ_M for steel or timber failure, respectively, are also correctly taken into account.

3.10 Mechanical resistance and stability

See Annex B for the characteristic load-carrying capacity in the different directions F_1 to F_5 for solid timber of strength class C24 according to EN 338:2009. Using the load-carrying capacities of the post bases, the specifications in Annex A must be fulfilled. The end grain of the timber post must in general be plane on the base plate of the post base. Post bases type H may have a clearance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (maximum 10 mm).

The characteristic capacities of the post bases are determined by calculation according to Eurocode 3 and Eurocode 5. They should be used for designs in accordance with Eurocode 3 and Eurocode 5 or a similar national code.

No performance has been determined in relation to ductility of a joint under cyclic testing. The contribution to the performance of structures in seismic zones, therefore, has not been assessed.

No performance has been determined in relation to the joint's stiffness properties - to be used for the analysis of the serviceability limit state.

No performance has been determined in relation to the anchorage of the post bases in the foundation. It must be checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly. Therefore the specifications for the lever arms $e_{F2/F3}$ (for load case F_2 / F_3) and $e_{F4/F5}$ (for load case F_4 / F_5) in annex A have to be considered. The lever arm is the distance between the top edge of the foundation and the load.

3.11 Aspects related to the performance of the product

3.11.1 Corrosion protection in service class 1, 2 and 3.

The post bases are produced from steel grade S235JR according to EN 10025-2:2005 with minimum characteristic yield strength of $R_e = 235 \text{ N/mm}^2$ and minimum characteristic tensile strength of $R_m = 360 \text{ N/mm}^2$. The reinforcing bars are produced from steel grade B500A according to EN 10080:2005 with minimum characteristic yield strength of $R_{eH} = 500 \text{ N/mm}^2$

The corrosion protection is given by hot-dip zinc coating with a minimum thickness of 55 μm according to EN 1461 or zinc coating Fe/Zn 25c according to EN ISO 2081. The metal fasteners must also have a zinc coating for the intended use in service class 3 of EN 1995-1-1 (zinc coating Fe/Zn 25c according to EN ISO 2081).

3.12 General aspects related to the fitness for use of the product

The hold downs are manufactured in accordance with the provisions of this European Technical Assessment using the manufacturing processes as identified in the inspection of the plant by the notified inspection body and laid down in the technical documentation

The nailing pattern used shall be either the maximum or the minimum pattern as defined in Annex A.

The following provisions apply:

The timber post

- shall be restrained against rotation, and supported at the lower and upper end
- shall be strength class C24 according to EN 338:2009 or better, see section 3 of this evaluation report
- shall be free from wane in the post base

- must fulfil the requirements regarding minimum dimensions (see Annex A)
- end grain must in general be plane on the base plate of the post base; post bases type H may have a distance between the end grain of the timber post and the base plate of the post base due to constructive wood preservation (maximum 10 mm)

The post base shall be installed centrally in the cross-section of the timber column.

The actual end bearing capacity of the timber member to be used in conjunction with the post base is checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly.

There are no specific requirements relating to preparation of the timber members.

The anchorage of the post base in the foundation is not part of this ETA. It must be checked by the designer of the structure to ensure it is not less than the post base capacity and, if necessary, the post base capacity reduced accordingly. Therefore the specifications for the lever arms $e_{F2/F3}$ (for load case F2 / F3) and $e_{F4/F5}$ (for load case F4 / F5) in Annex A have to be considered. The lever arm is the distance between the top edge of the foundation and the load.

4 Attestation and verification of constancy of performance (AVCP)

4.1 AVCP system

According to the decision 97/638/EC of the European Commission¹, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) is 2+.

5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

5.1 Tasks of the manufacturer

5.1.1 Factory production control

The manufacturer has a factory production control system in the plant and exercises permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer are documented in a systematic manner in the form of written policies and procedures. This production control system ensures that the product is in conformity with the European Technical Assessment.

The manufacturer shall only use raw materials supplied with the relevant inspection documents as laid down in the control plan¹. The incoming raw materials shall be subject to controls and tests by the manufacturer before acceptance. Check of materials, such as sheet metal, shall include control of the inspection documents presented by suppliers (comparison with nominal values) by verifying dimension and determining material properties, e.g. chemical composition, mechanical properties.

The manufactured components are checked visually and for dimensions.

The control plan, which is part of the technical documentation of this European Technical Assessment, includes details of the extent, nature and frequency of testing and controls to be performed within the factory production control and has been agreed between the assessment holder and ETA-Danmark.

The results of factory production control are recorded and evaluated. The records include at least the following information:

- Designation of the product, basic material and components;

- Type of control or testing;
- Date of manufacture of the product and date of testing of the product or basic material and components;
- Result of control and testing and, if appropriate, comparison with requirements;
- Signature of person responsible for factory production control.

The records shall be presented to ETA Danmark on request.

5.1.2 Initial type testing of the product

For initial type-testing the results of the tests performed as part of the assessment for the European Technical Assessment shall be used unless there are changes in the production line or plant. In such cases the necessary initial type testing has to be agreed between ETA-Danmark and the notified body.

5.2. Tasks of notified bodies

5.2.1 Initial inspection of factory and of factory production control

The Notified body shall ascertain that, in accordance with the control plan, the factory and the factory production control are suitable to ensure continuous and orderly manufacturing of the anchor according to the specifications mentioned in 2.1 as well as to the Annexes to the European Technical Assessment.

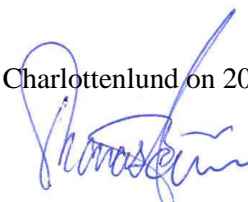
5.2.2 Continuous surveillance

The Notified body shall visit the factory at least once a year for regular inspection. It has to be verified that the system of factory production control and the specified automated manufacturing process are maintained taking account of the control plan.

Continuous surveillance and assessment of factory production control have to be performed according to the control plan.

The results of product certification and continuous surveillance shall be made available on demand by the certification body or inspection body, respectively, to ETA-Danmark. In cases where the provisions of the European Technical Assessment and the control plan are no longer fulfilled the conformity certificate shall be withdrawn.

Issued in Charlottenlund on 2014-01-16



Thomas Bruun
Managing Director, ETA-Danmark

¹ The control plan has been deposited at ETA-Danmark and is only made available to the approved bodies involved in the AVCP procedure.

Annex A
Product details and definitions

Table A.1 Specifications of the post bases

Post base		Metal Fasteners			Post [mm]		Distances [mm]		
Type	Article No.	Screw (Nail)	Bolt	Dowel	min. b	min. h	max.a	e _{F2/F3}	e _{F4/F5}
Type H	89900	-	2 x Ø 10,0	-	71	100	50	195	50
	89901	-	2 x Ø 10,0	-	81	100	50	195	50
	89902	-	2 x Ø 10,0	-	91	100	50	195	50
	89903	-	2 x Ø 10,0	-	101	100	50	195	50
	89904	-	2 x Ø 10,0	-	121	100	50	195	50
	89905	-	2 x Ø 10,0	-	141	100	50	195	50
Type U	891051	8 Nails Ø 4,0	1 x Ø 12,0	-	80	110	185	-	-
	891150	8 x Ø 8,0	1 x Ø 12,0	-	80	110	155	-	-
	89940	8 x Ø 8,0	1 x Ø 12,0	-	80	110	150	-	-
	89820	4 x Ø 10,0	1 x Ø 10,0	-	71	120	50	135	60
	89821	4 x Ø 10,0	1 x Ø 10,0	-	81	120	50	135	60
	89822	4 x Ø 10,0	1 x Ø 10,0	-	91	120	50	135	60
	89823	4 x Ø 10,0	1 x Ø 10,0	-	101	120	50	135	60
	89824	4 x Ø 10,0	1 x Ø 10,0	-	121	120	50	135	60
Type I	891053	-	-	1 x Ø 10,0	80	80	185	285	-
	891127	-	-	1 x Ø 10,0	100	100	195	295	-
	891128	-	-	1 x Ø 10,0	100	100	245	345	-
	891129	-	-	1 x Ø 10,0	100	100	295	395	-
	891130	-	-	1 x Ø 10,0	100	100	345	445	-
	891109	-	-	1 x Ø 10,0	100	100	315	415	-
	891131	-	-	1 x Ø 10,0	100	100	100	200	-
	891132	-	-	1 x Ø 10,0	100	100	150	250	-
	891125	-	-	1 x Ø 10,0	100	100	200	300	-
	891152	-	-	1 x Ø 10,0	100	100	200	300	-
	891153	-	-	1 x Ø 10,0	100	100	100	200	-
	891126	-	-	1 x Ø 10,0	100	100	100	200	-
	891198	-	-	1 x Ø 10,0	100	100	190	-	-
Type T	891052	-	-	4 x Ø 10,0	130	100	190	290	210
	89920	-	-	4 x Ø 10,0	120	100	155	245	175
	89832	-	-	4 x Ø 10,0	130	100	150	255	170
	89810	-	-	4 x Ø 10,0	80	120	100	190	130
	89840	-	-	4 x Ø 10,0	130	100	150	240	185
	89841	-	-	4 x Ø 10,0	130	100	200	290	235

Continuation of Table A.1 Specifications of the post bases

Post base		Metal Fasteners			Post [mm]		Distances [mm]		
Type	Article No.	Screw	Bolt	Dowel	min. b	min. h	max a	e _{F2/F3}	e _{F4/F5}
Type P	891050	4 x Ø 12,0	-	-	80	80	185	-	-
	89850	4 x Ø 12,0	-	-	100	100	100	-	-
	89851	4 x Ø 12,0	-	-	100	100	150	-	-
Universal	89852	2 x Ø 10,0	-	-	100	100	300	-	-

Table A.2 Specifications of the metal fasteners according to EN 14592

Fastener type	Size			Material	Finish
	Diameter	Length	Threaded length		
Nails	4,0 mm	min 40 mm	-	$f_{u,k} \geq 600 \text{ N/mm}^2$	Galvanic zinc coating
Screws	8,0 mm	min 40 mm	min 24 mm	$f_{u,k} \geq 360 \text{ N/mm}^2$	Galvanic zinc coating
Screws	10,0 mm 12,0 mm	min 60 mm	min 40 mm	$f_{u,k} \geq 360 \text{ N/mm}^2$	Galvanic zinc coating
Bolts	10,0 mm 12,0 mm			$f_{u,k} \geq 360 \text{ N/mm}^2$	Galvanic zinc coating
Dowels	10,0 mm 12,0 mm			$f_{u,k} \geq 360 \text{ N/mm}^2$	Galvanic zinc coating

The load-carrying-capacities of the metal fasteners were calculated according to Eurocode 5 for lateral loads. The contribution to the load-carrying capacity due to the rope effect was considered according to Eurocode 5.

Annex B
Characteristic load-carrying capacities

Table B.1 Characteristic load-carrying capacities for post bases [kN]

Post base	F ₁ (Compression)				F ₁ (Tension)			F ₂ /F ₃				F ₄ /F ₅		
	Timber	Steel			Timber	Steel		Timber	Steel			Timber	Steel	
Type H														
89900	25,3	112	183		25,3	-	183	6,53	22,0	12,4	-	6,53	4,88	-
89901	25,3	112	183		25,3	-	183	7,45	22,7	12,4	-	7,27	4,88	-
89902	25,3	112	183		25,3	-	183	8,37	22,8	12,4	-	7,27	4,88	-
89903	25,3	112	183		25,3	-	183	9,29	22,8	12,4	-	7,27	4,88	-
89904	25,3	112	183		25,3	-	183	11,1	22,8	12,4	-	7,27	4,88	-
89905	25,3	112	183		25,3	-	183	13,0	22,8	12,4	-	7,27	4,88	-
	$\gamma_{M,C}$	$\gamma_{M,1}$	$\gamma_{M,2}$		$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,2}$
Type U														
891051	40,4	9,05	-		5,52	1,35	-	-	-	-	-	-	-	-
891150	30,6	19,8	-		11,3	1,35	-	-	-	-	-	-	-	-
89940	30,6	6,17	-		11,3	1,35	-	-	-	-	-	-	-	-
89820	68,4	42,1	-		8,91	5,07	-	-	5,94	1,78	3,42	5,86	6,35	-
89821	75,7	42,1	-		8,91	4,17	-	-	5,94	1,42	3,42	5,86	6,35	-
89822	83,1	42,1	-		8,91	3,55	-	-	5,94	1,18	3,42	5,86	6,35	-
89823	90,4	42,1	-		8,91	3,08	-	-	5,94	1,16	3,42	5,86	6,35	-
89824	105	42,1	-		8,91	2,44	-	-	5,94	1,16	3,42	5,86	6,35	-
89825	120	42,1	-		8,91	2,02	-	-	5,94	1,16	3,42	5,86	6,35	-
	$\gamma_{M,T}$	$\gamma_{M,1}$	$\gamma_{M,2}$		$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,2}$
Type I														
891053	98,5	44,8	29,0		4,98	5,79	-	-	3,90	0,66	1,07	-	-	-
891127	167	85,9	50,5		5,58	6,46	-	-	4,19	1,07	-	-	-	-
891128	167	85,9	40,1		5,58	6,46	-	-	4,19	0,96	-	-	-	-
891129	167	85,9	31,8		5,58	6,46	-	-	4,19	0,84	-	-	-	-
891130	167	85,9	25,4		5,58	6,46	-	-	4,19	0,74	-	-	-	-
891109	167	85,9	29,0		5,58	6,46	-	-	4,19	1,64	-	-	-	-
891131	181	108	108		5,58	10,2	-	-	4,19	1,68	-	-	-	-
891132	181	108	108		5,58	10,2	-	-	4,19	1,33	-	-	-	-
891125	95,0	69,1	56,8	58,8	5,58	-	58,8	-	4,19	1,01	-	-	-	-
891152	97,8	75,9	-	58,8	5,58	-	58,8	-	4,19	1,75	-	-	-	-
891153	97,8	75,9	-	58,8	5,58	-	58,8	-	4,19	2,60	-	-	-	-
891126	181	108	108		5,58	65,8	-	-	4,19	5,10	8,00	-	-	-
891198	167	71,2	52,5		-	-	-	-	-	-	-	-	-	-
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	$\gamma_{M,2}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,2}$

Continuation of Table B.1 Characteristic load-carrying capacities for post bases [kN]

Post base	F ₁ (Compression)			F ₁ (Tension)			F ₂ /F ₃				F ₄ /F ₅			
	Timber	Steel		Timber	Steel		Timber		Steel		Timber	Steel		
Type T														
891052	77,7	54,2	30,58	25,1	5,79	-	18,3	13,1	0,67	1,49	2,19	0,94	-	
89920	109	74,1	48,6	25,1	14,0	-	11,6	18,1	1,13	3,14	1,86	1,76	-	
89832	92,0	99,8	108	25,1	10,2	-	13,1	18,3	1,31	-	2,43	2,48	-	
89810	127	75,1	109	21,8	-	65,3	17,4	16,5	3,06	4,32	1,79	4,47	-	
89840	107,0	105	108	25,1	-	33,8	13,1	18,3	6,57	-	2,85	-	2,48	
89841	107	105	108	25,1	-	33,8	13,1	18,3	5,42	-	2,83		2,55	
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,2}$	
Type P														
891050	71,9	59,2	34,5	-	-	-	-	-	-	-	-	-	-	
89850	111	100	108	-	-	-	-	-	-	-	-	-	-	
89851	111	100	108	-	-	-	-	-	-	-	-	-	-	
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,2}$	
Universal														
89852	132	116	34,3	-	-	-	-	-	-	-	-	-	-	
	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,1}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,C}$	$\gamma_{M,0}$	$\gamma_{M,2}$	$\gamma_{M,T}$	$\gamma_{M,0}$	$\gamma_{M,2}$	

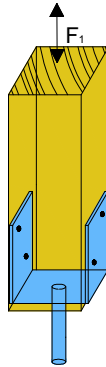
$\gamma_{M,T}$ = partial factor for solid timber according to EN 1995-1-1 and national annex

$\gamma_{M,C}$ = partial factor for connections according to EN 1995-1-1 and national annex

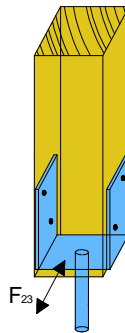
$\gamma_{M,0}$; $\gamma_{M,1}$; $\gamma_{M,2}$ = partial factor according to EN 1993-1-1 and national annex

Definitions of forces, their directions and eccentricity

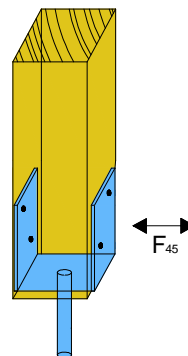
- Force F_1 : tensile or compression load



- Force F_2 / F_3 : horizontal load parallel to the side plates of the post base and perpendicular to the fasteners



- Force F_4 / F_5 : horizontal load perpendicular to the side plates of the post base and parallel to the fasteners



Acting forces

F_1	axial force (tension or compression) acting along the central axis of the joint
F_2 and F_3	horizontal force parallel to the side plates of the post base acting with the lever arm $e_{F2/F3}$ above the foundation
F_4 and F_5	horizontal force perpendicular to the side plates of the post base acting with the lever arm $e_{F4/F5}$ above the foundation

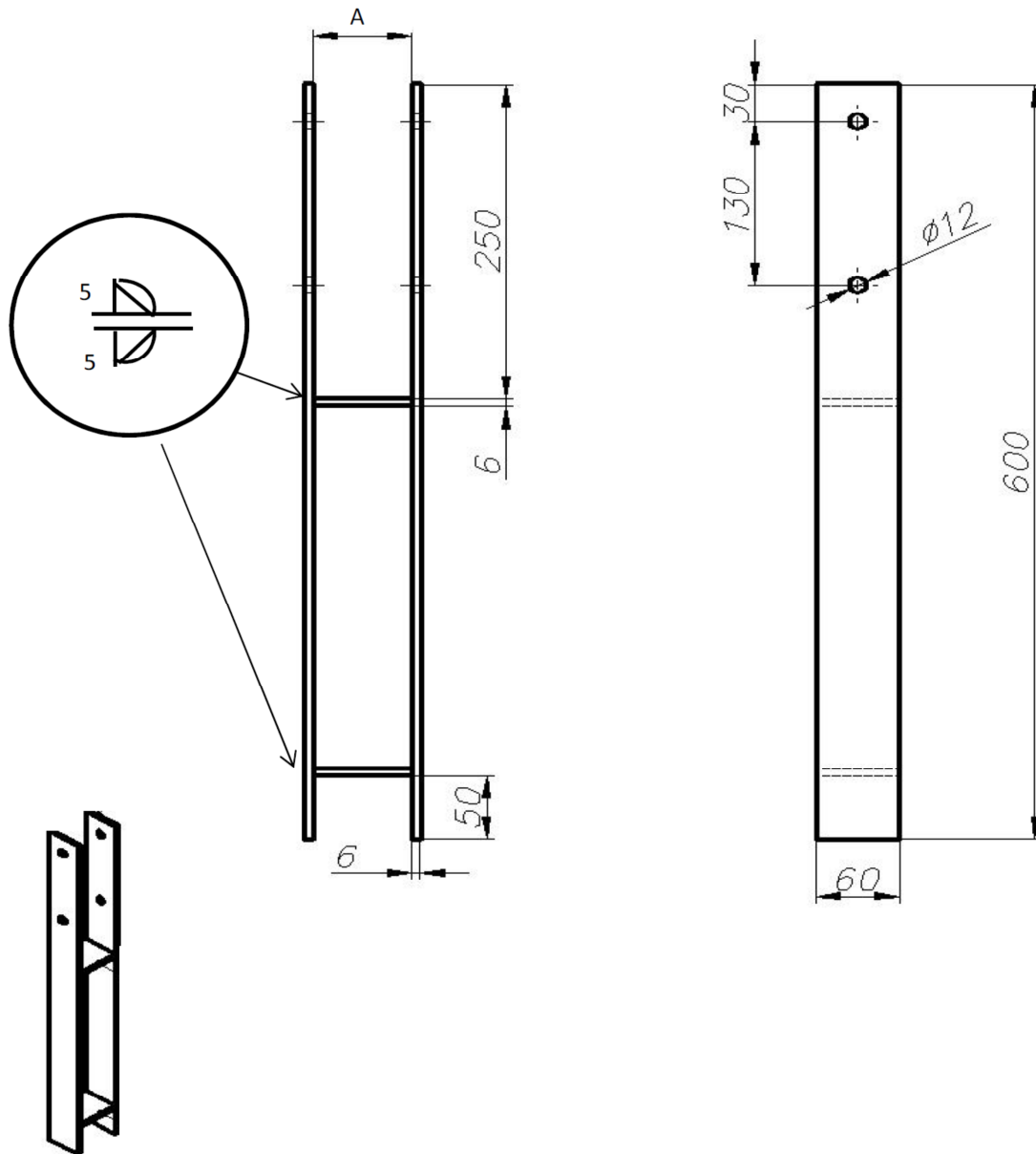
Combined forces

If the forces F_1 and F_2/F_3 or F_4/F_5 act at the same time, the following inequality shall be fulfilled:

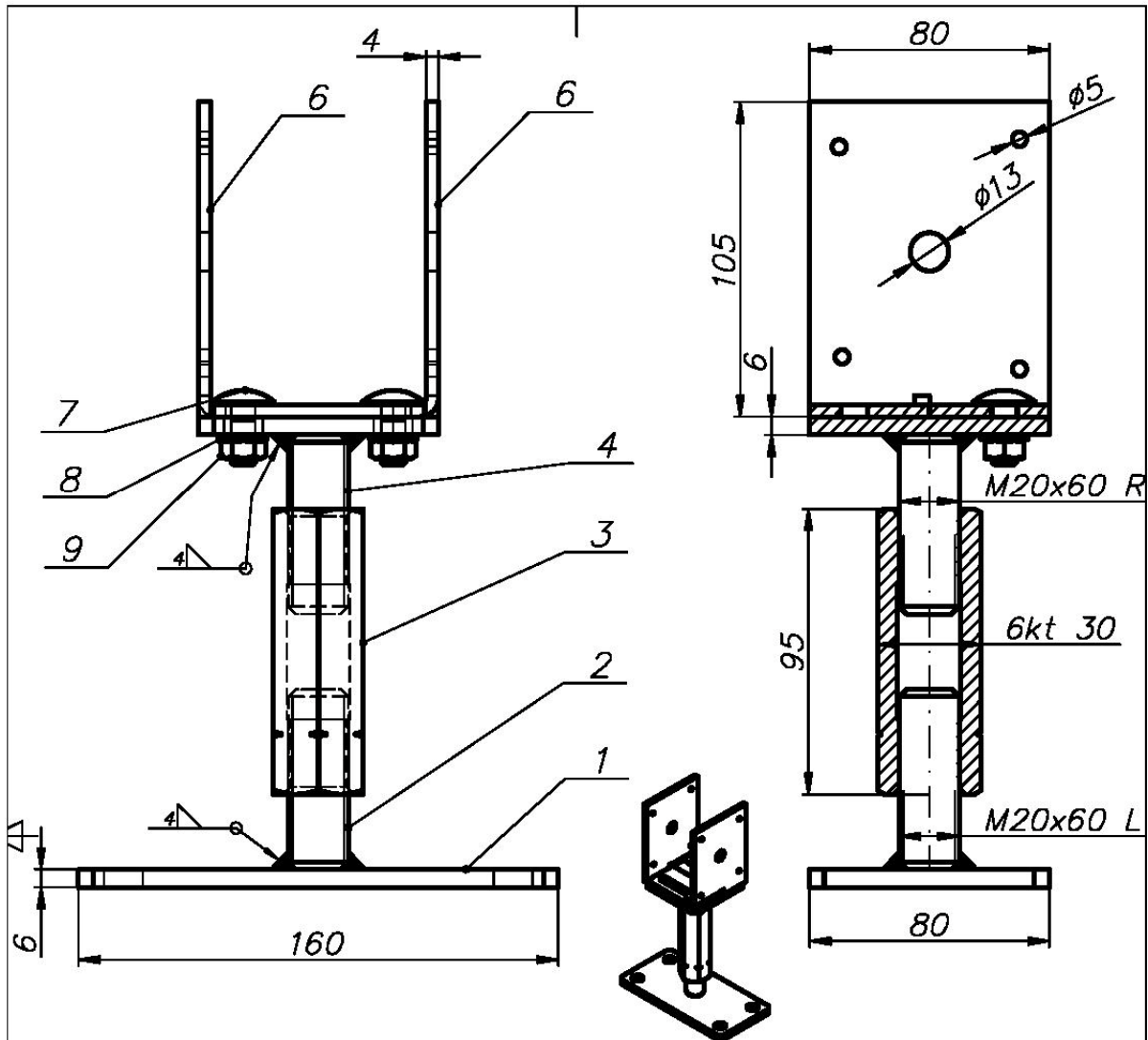
$$\sum \frac{F_{i,d}}{R_{i,d}} \leq 1$$

The forces F_2 and F_3 or F_4 and F_5 are forces with opposite direction. Therefore only one force F_2 or F_3 , and F_4 or F_5 , respectively, is able to act simultaneously with F_1 .

Zeichnung Pfostenträger Typ:H

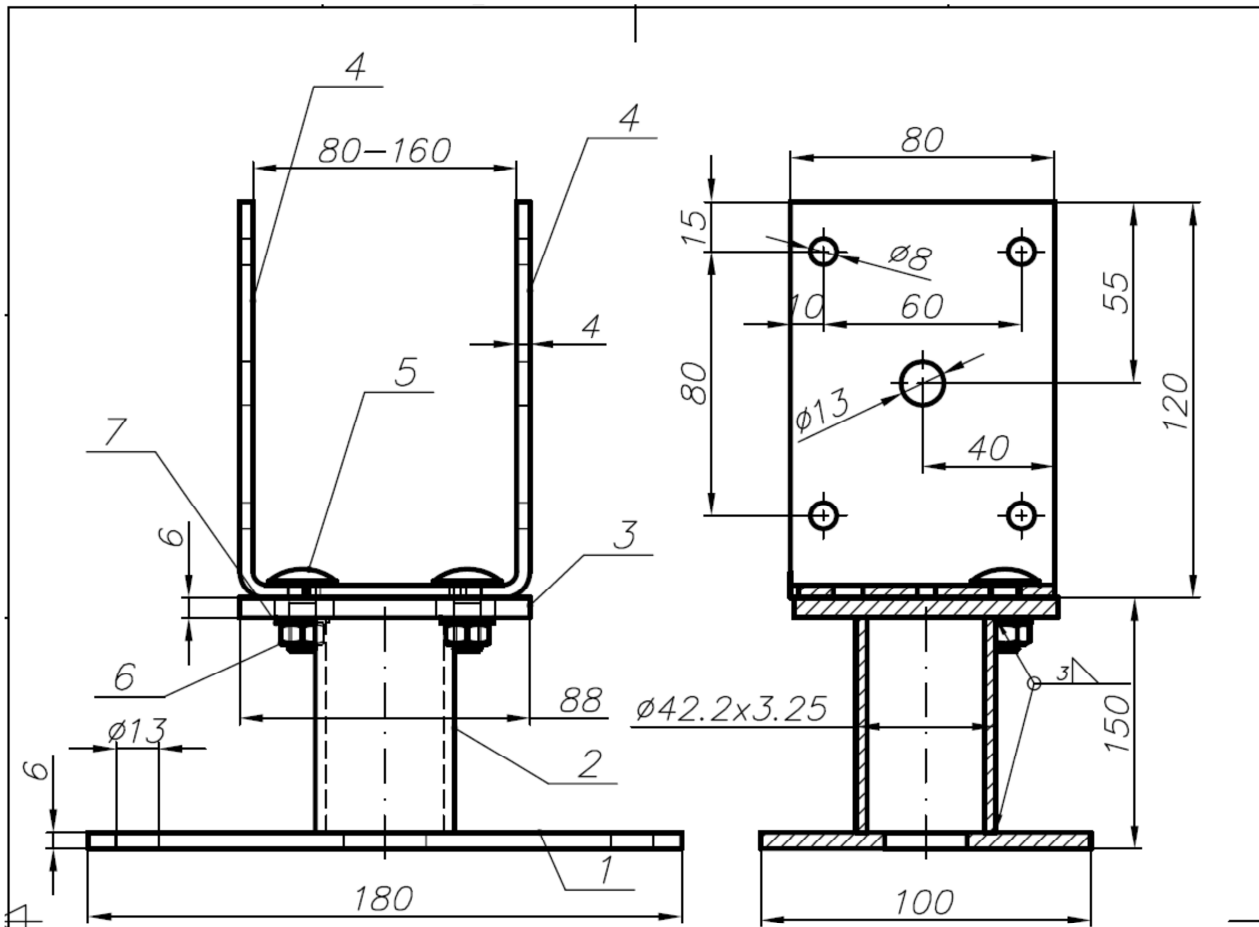


Gutzeit Verbindungssysteme GmbH & Co.		Zeichnungsnummer: 89900-89905	
Rudolf Diesel Str.1		Material: S235JR / EN10025: 2004	
58730 Fröndenberg		Korrosionsschutz: 55µm gemäß DIN EN1461	
Tele: 02373-979265		Bearbeiter: Hr.Tewes	Datum: 14.06.2013
	89900	A =	71 mm
	89901	A =	81 mm
	89902	A =	91 mm
	89903	A =	101 mm
	89904	A =	121 mm
	89905	A =	141 mm



9	2	DIN 555-5	Mutter M8		
8	2	ISO 7093	Schraube A8,4		
7	2	DIN 603	Schraube M8x20		
6	2	891051 / 6	Winkel 105x75x4	S235JR	
5	1	891050 / 5	Trageplatte 6x80x80	S235JR	
4	1	DIN 976	Gewindebolzen M20x60-R	S235JR+P+Mo+AR	
3	1	891050 / 3	Gewindehuse M20x95	S235JR	
2	1	DIN 976	Gewindebolzen M20x60-L	S235JR+P+Mo+AR	
1	1	891050 / 1	Grundplatte 6x80x160	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
Lista elementow					

Poz.	Ilość: 1	Materiał:	Ciężar:		
Projektował M. Mielcarek	Zmienił	Zatwierdził - data	Plik GUTZEIT	Data 31/07/2013	Skala
Lakfam			891051 - PF-TU		
			891051	Edycja 0	Arkusz 1/1

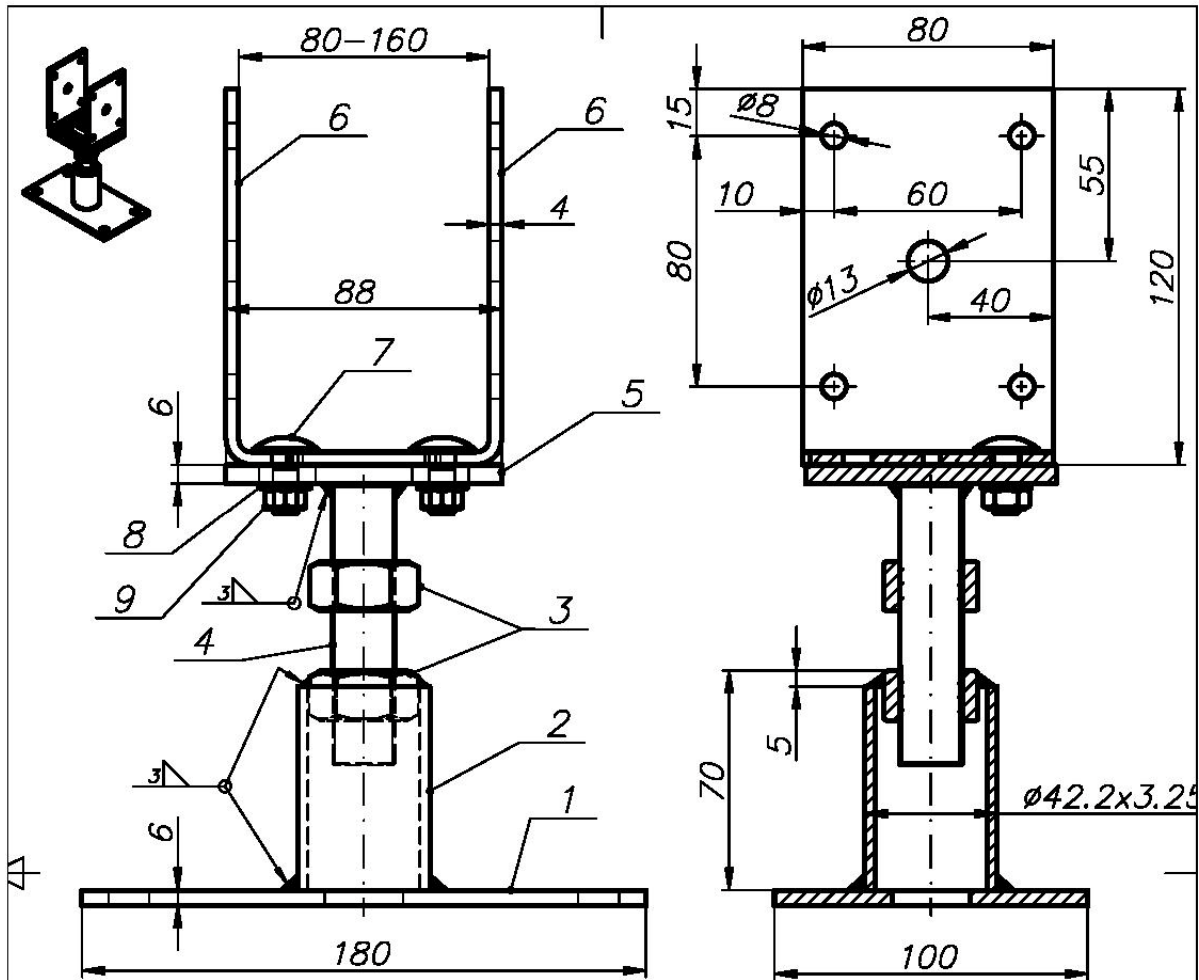


6	2	DIN 555-5	Mutter M8		
7	2	DIN 125	Scheibe A8,4		
5	2	DIN 603	Schraube M8x20		
4	2	89940 / 6	Winkel 120x67x4	S235JR	
3	1	89940 / 5	Trageplatte 6x80x8	S235JR	
2	1	891150 / 2	Rohr 42,2x3,25 L=139	S235JR	
1	1	89940 / 1	Grundplatte 6x100x180	S235JR	

Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
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Lista elementow

Poz.	Ilość: 1	Materiał:			Ciężar:	
Projektował M. Mielcarek	Zmienił	Zatwierdził - data	Plik Gutzeit	Data 31/07/2013	Skala	
Lakfam			891150			
			891150	Edycja 0	Arkusz 1/1	

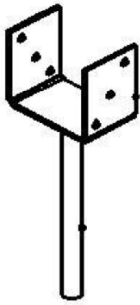
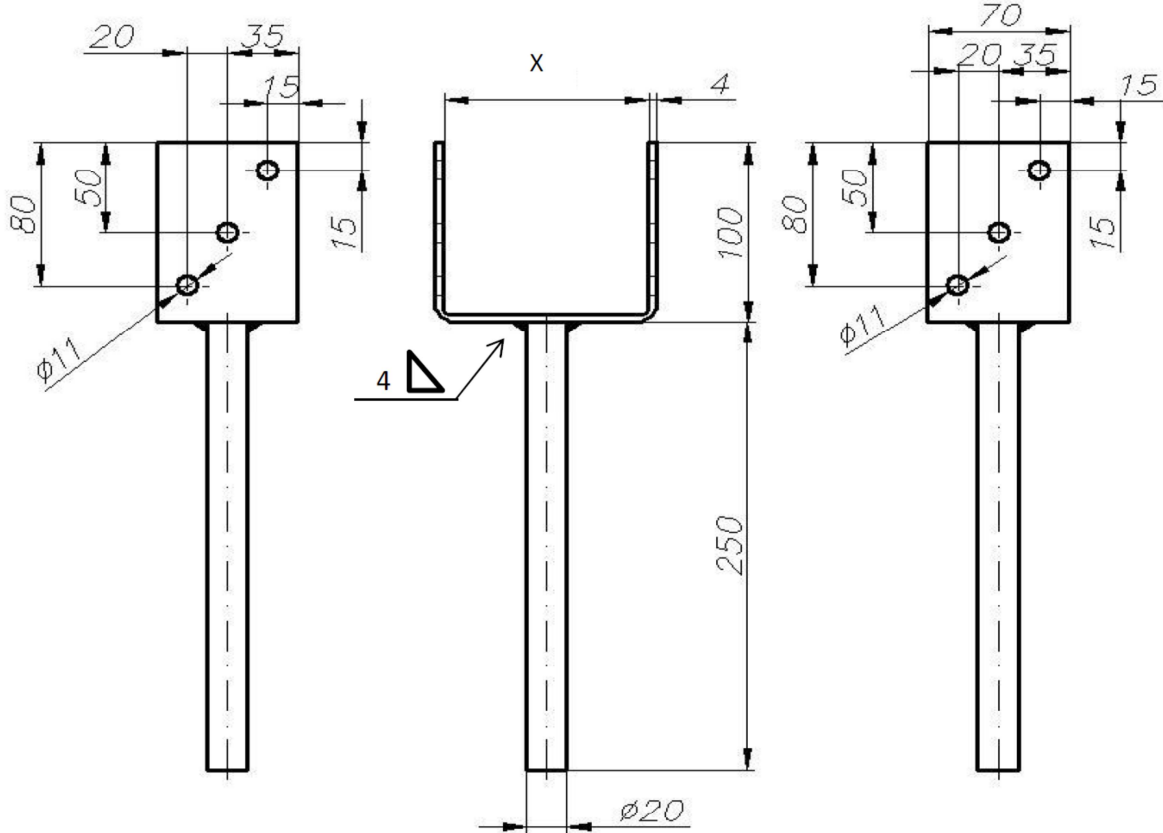


9	2	DIN 555-5	Mutter M8		
8	2	DIN 125	Schelbe A8,4		
7	2	DIN 603	Schraube M8x20		
6	2	89940 / 6	Winkel 120x67x4	S235JR	
5	1	89940 / 5	Trageplatte 6x80x88	S235JR	
4	1	DIN 976	Gewindebolzen M20x90	S235JR+P+Mo+AR	
3	2	DIN 555-5	Mutter M20		
2	1	89940 / 2	Rohr 42,2x3,25 L=65	S235JR	
1	1	89940 / 1	Grundplatte 6x100x180	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi

Lista elementow

Poz.	Ilość: 1	Materiał:	Ciężar:		
Projektował M. Mielcarek	Zmienił	Zatwierdził - data	Plik GUTZEIT	Data 31/07/2013	Skala
Lakfam			89940		
			89940	Edycja 0	Arkusz 1/1

Zeichnung Pfostenträger Typ:U



Gutzeit Verbindungssysteme GmbH & Co.

Rudolf Diesel Str.1

58730 Fröndenberg

Tele: 02373-979265

Zeichnungsnummer:

89820-89825

Material:

S235JR / EN10025: 2004

Korrosionsschutz: 55µm gemäß DIN EN1461

Bearbeiter: Hr.Tewes

Datum: 14.06.2013

89820

X =

71 mm

89821

X =

81 mm

89822

X =

91 mm

89823

X =

101 mm

89824

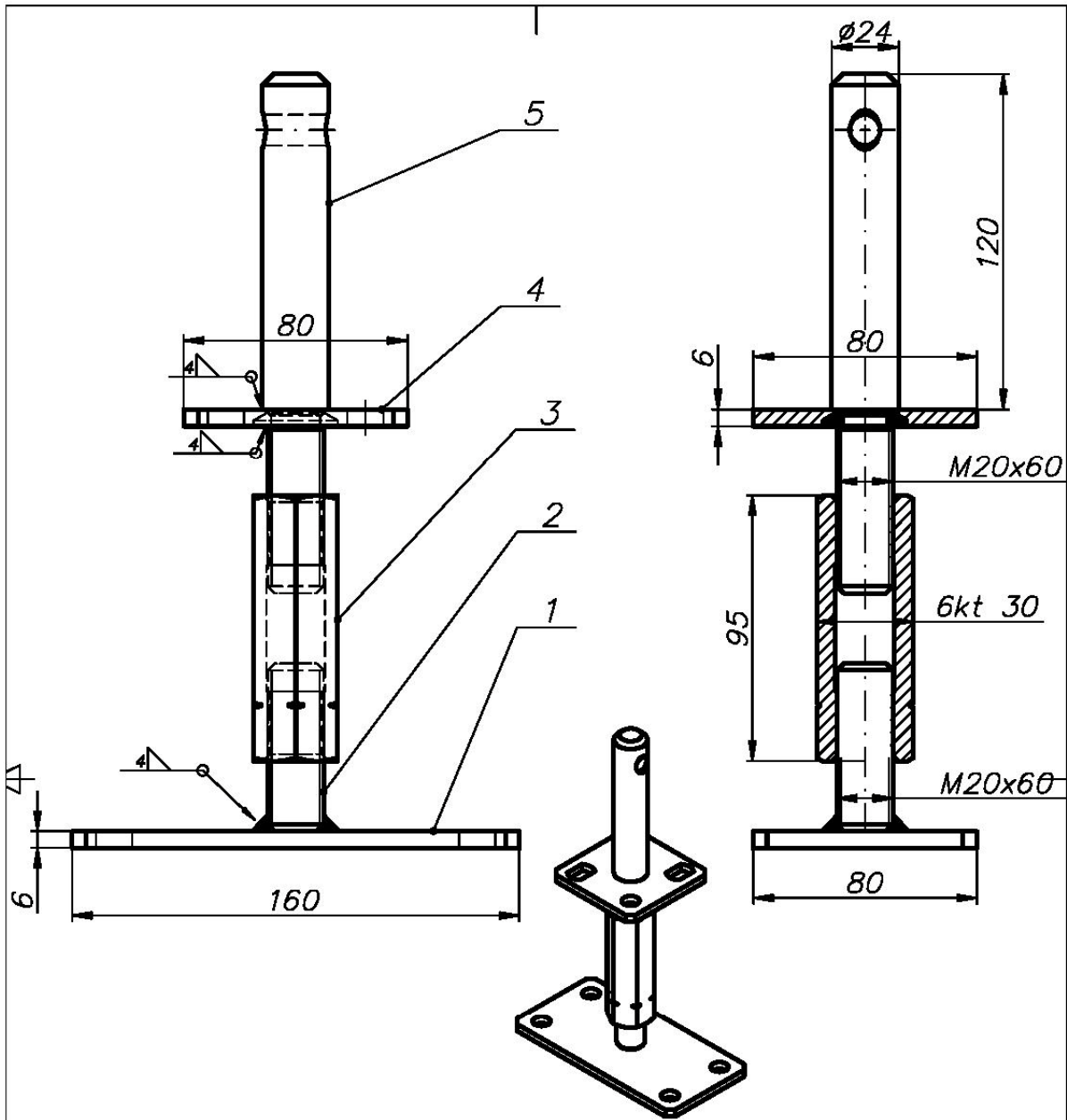
X =

121 mm

89825

X =

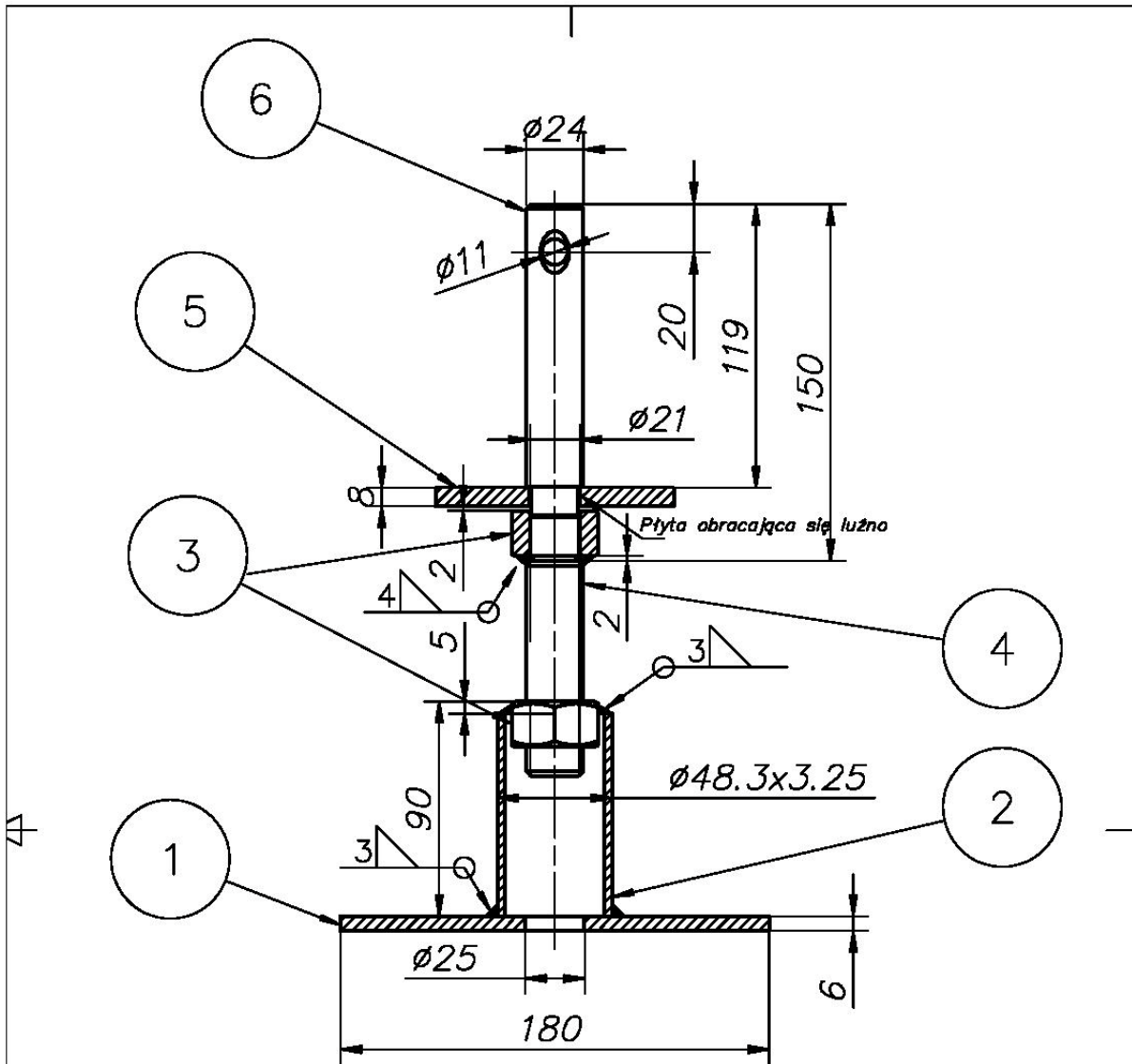
141 mm



5	1	891053 / 5	Bolzen 24x186	S235JR	
4	1	891053 / 4	Trägerplatte 6x80x80	S235JR	
3	1	891050 / 3	Gewindehülse M20x95	S235JR	
2	1	DIN 976	Gewindebolzen M20x60 L	S235JR+P+Mo+AR	
1	1	891050 / 1	Grundplatte 6x80x160	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi

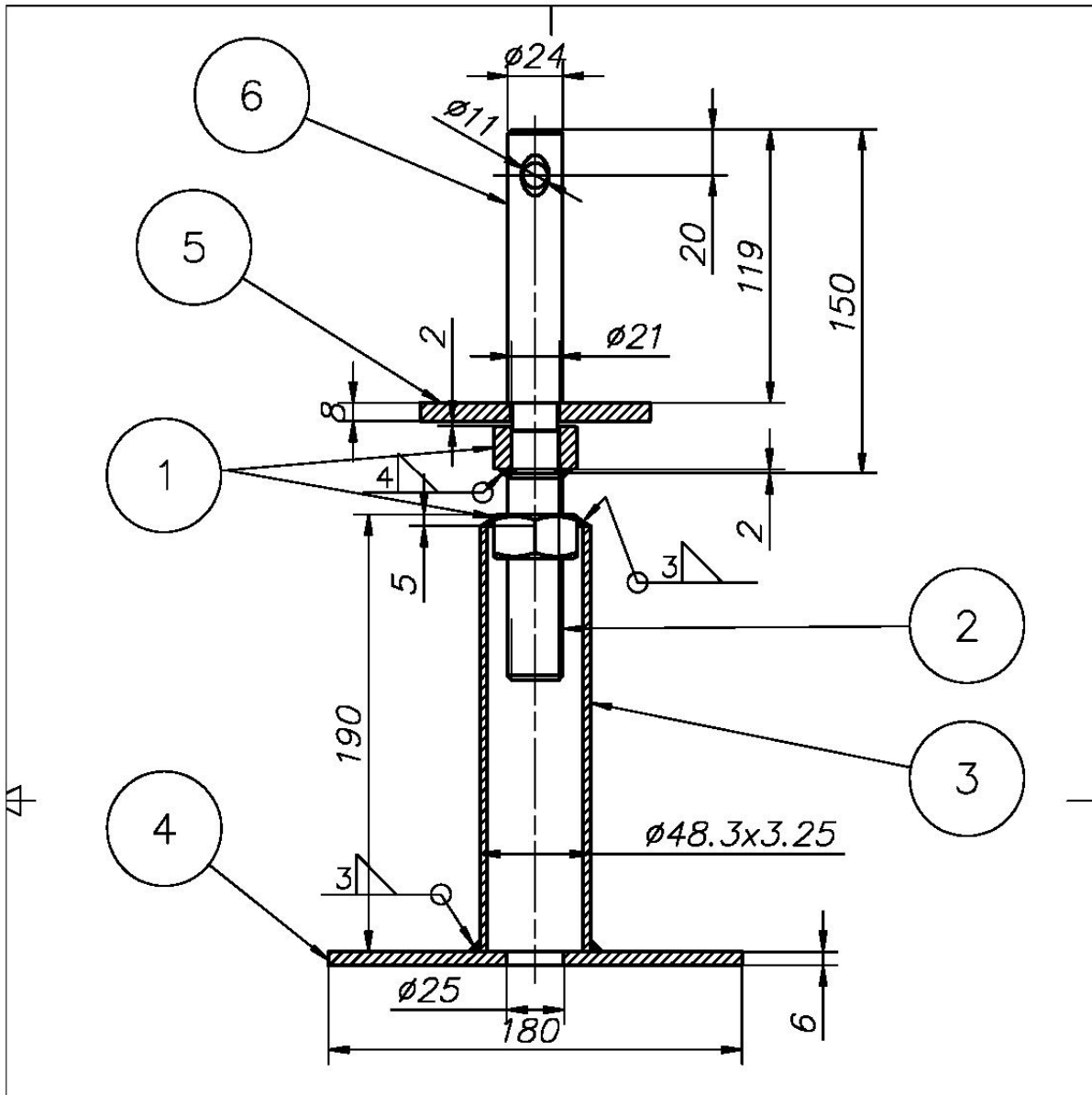
Lista elementów

Poz.	Ilość /	Materiał:	Ciężar:	
Projektował M. Mielcarek	Zmienił	Zatwierdził – data	Plik GUTZEIT	Data 31/07/2013
Lakfam			891053 – PF-TZ	
			891053	Edycja 0
			Arkusz 1/1	



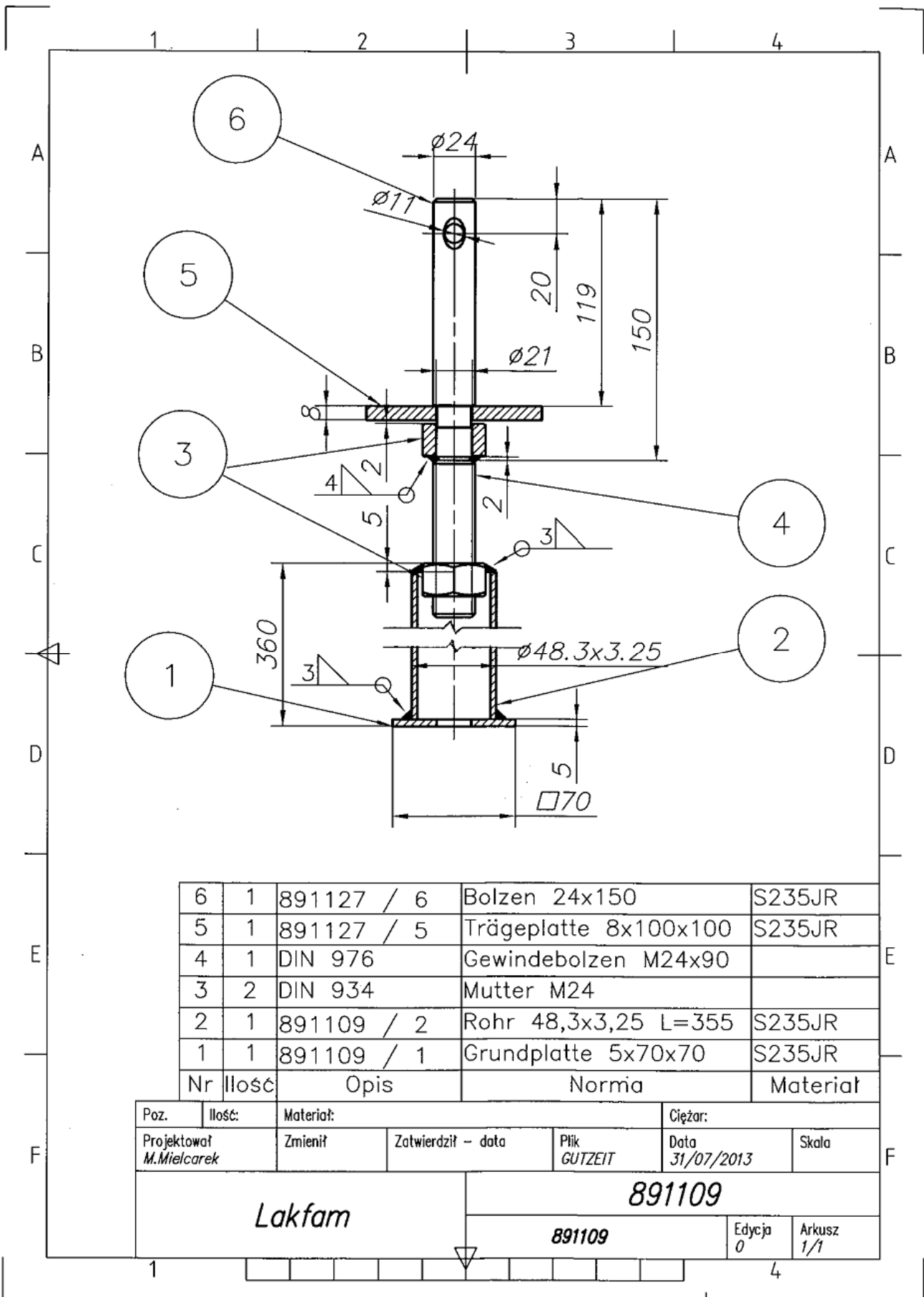
6	1	891127 / 6	Bolzen 24x150	S235JR
5	1	891127 / 5	Trägeplatte 8x100x100	S235JR
4	1	DIN 976	Gewindebolzen M24x90	S235JR+P+Mo+AR
3	2	DIN 934	Mutter M24	
2	1	891127 / 2	Rohr 48,3x3,25 L=85	S235JR
1	1	891127 / 1	Grundplatte 6x100x180	S235JR
Nr	Ilość	Opis	Norma	Materiał

Poz.	Ilość:	Materiał:	Ciężar:	
Projektował <i>M. Mielcarek</i>	Zmienił	Zatwierdził – data	Plik <i>Gutzeit</i>	Data <i>31/07/2013</i>
Lakfam			891127	
			891127	Edycja <i>0</i>
			Arkusz <i>1/1</i>	



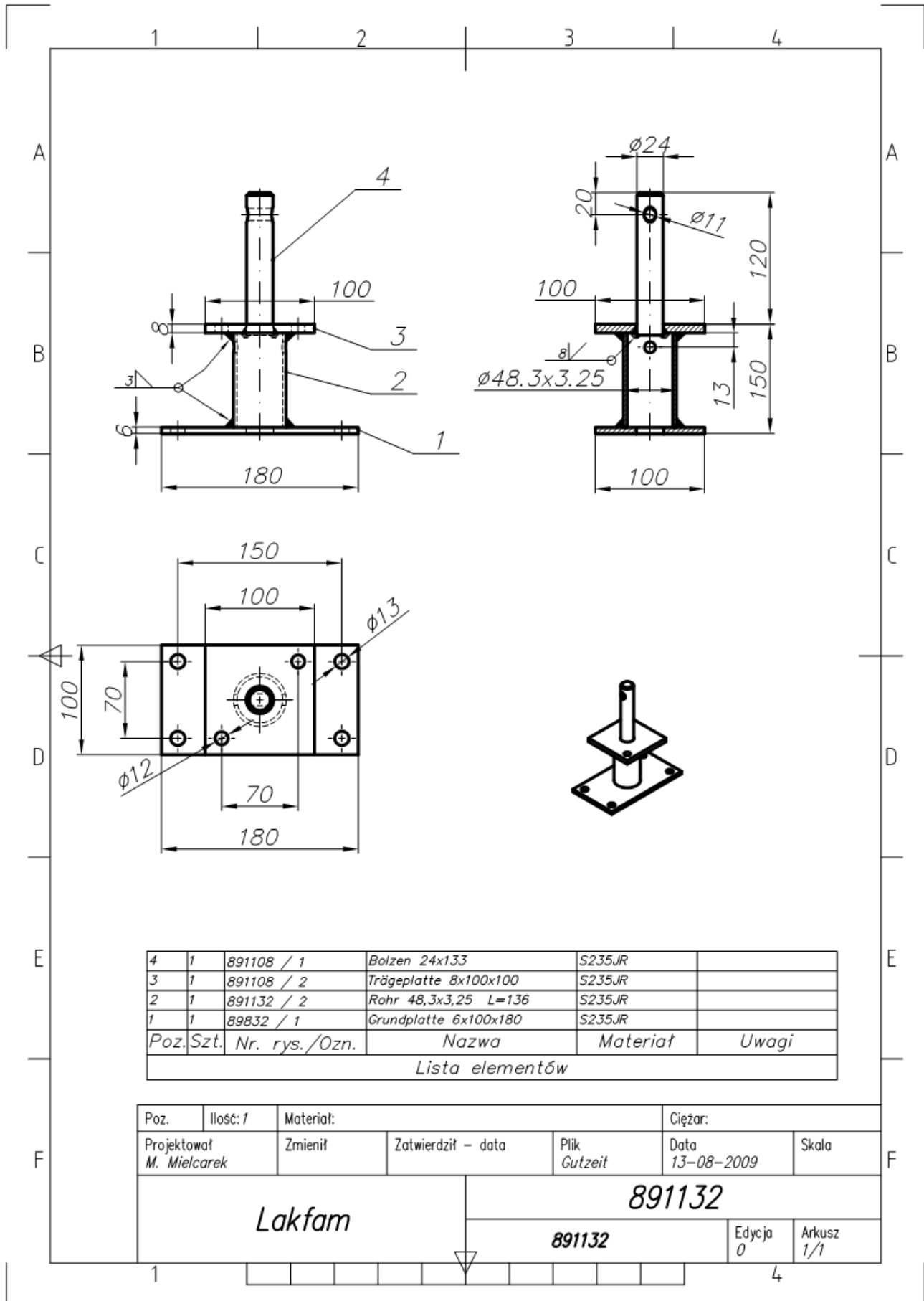
6	1	891127 / 6	Bolzen 24x150	S235JR
5	1	891127 / 5	Trägerplatte 8x100x100	S235JR
4	1	DIN 976	Gewindebolzen M24x90	S235JR+P+Mo+AR
3	1	DIN 934	Mutter M24	
2	1	891129 / 2	Rohr 48,3x3,25 L=185	S235JR
1	2	891127 / 1	Grundplatte 6x100x180	S235JR
Nr	Ilość	Opis	Norma	Materiał

Poz.		Ilość:		Materiał:		Ciężar:	
Projektował <i>M. Mielcarek</i>		Zmienił		Zatwierdził – data		Plik <i>GUTZEIT</i>	
				Data <i>31/07/2013</i>		Skala	
Lakfam				891129			
				891129		Edycja <i>0</i>	Arkusz <i>1/1</i>



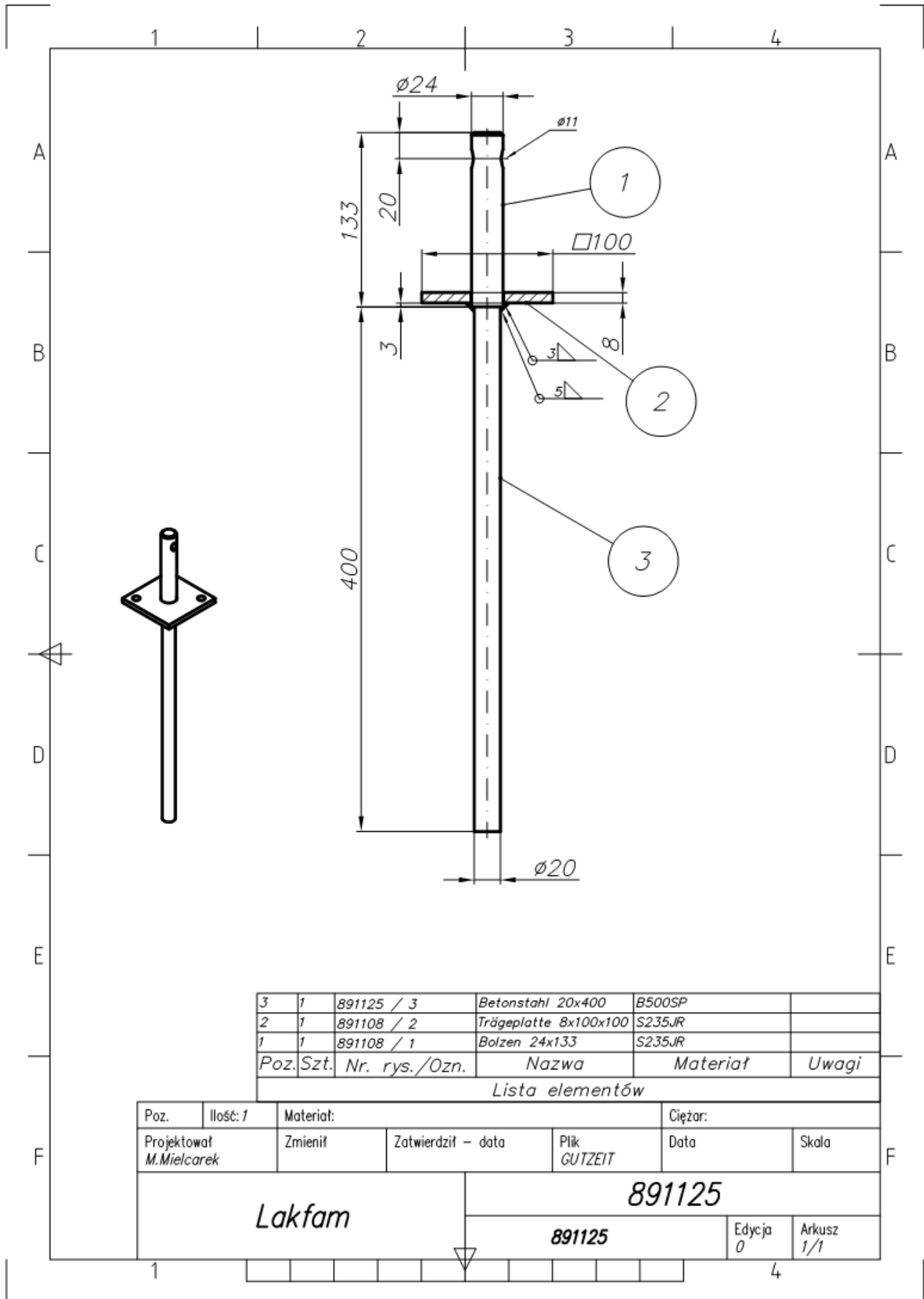
6	1	891127 / 6	Bolzen 24x150	S235JR
5	1	891127 / 5	Trageplatte 8x100x100	S235JR
4	1	DIN 976	Gewindebolzen M24x90	
3	2	DIN 934	Mutter M24	
2	1	891109 / 2	Rohr 48,3x3,25 L=355	S235JR
1	1	891109 / 1	Grundplatte 5x70x70	S235JR
Nr	Ilość	Opis	Normia	Materiał

Poz.	Ilość:	Materiał:	Ciężar:	
Projektował <i>M. Mielcarek</i>	Zmienił	Zatwierdził - data	Plik <i>GUTZEIT</i>	Data <i>31/07/2013</i>
Lakfam		891109		
		891109	Edycja <i>0</i>	Arkusz <i>1/1</i>



4	1	891108 / 1	Bolzen 24x133	S235JR	
3	1	891108 / 2	Trägerplatte 8x100x100	S235JR	
2	1	891132 / 2	Rohr 48,3x3,25 L=136	S235JR	
1	1	89832 / 1	Grundplatte 6x100x180	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
<i>Lista elementów</i>					

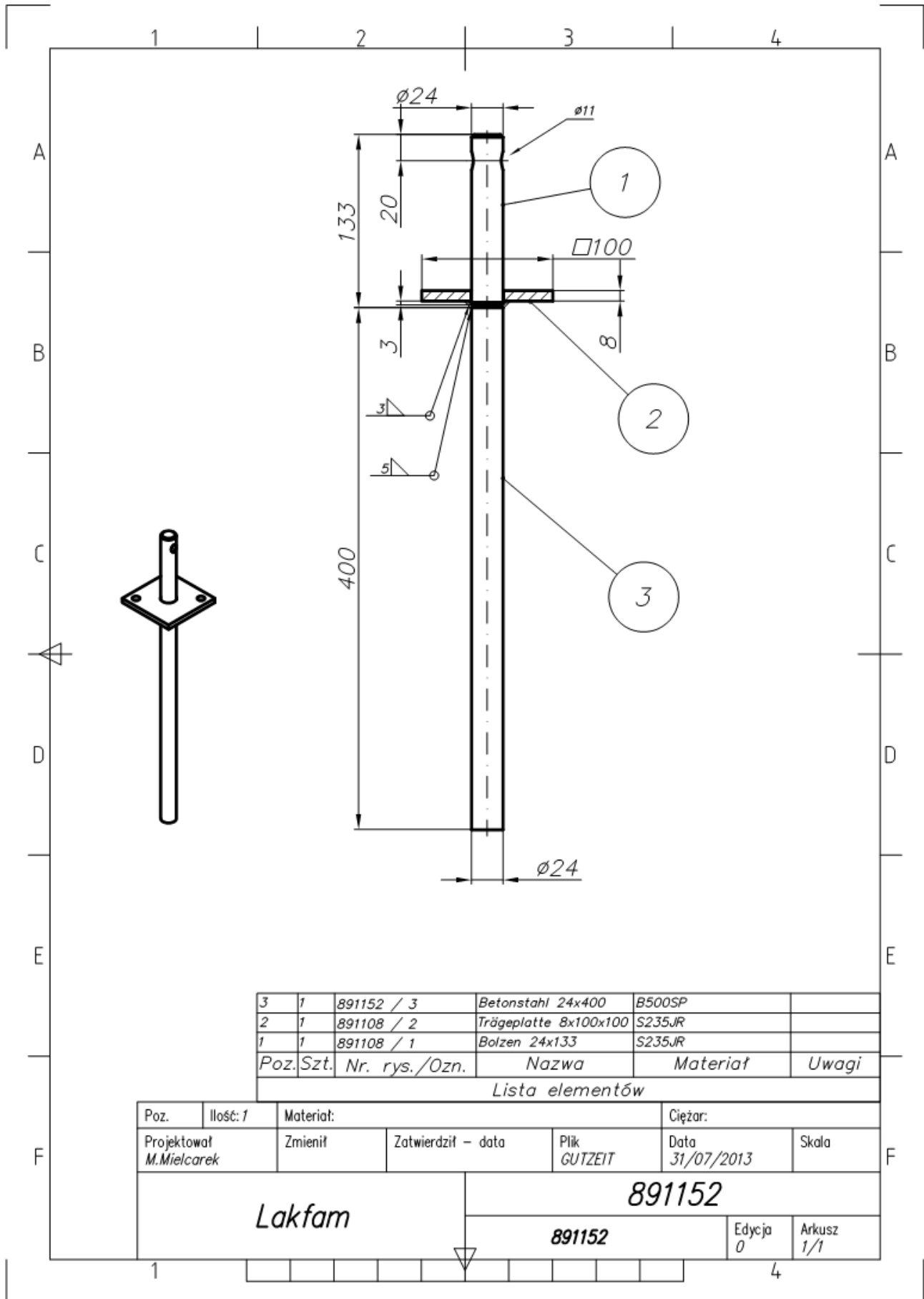
Poz.	Ilość: 1	Materiał:			Ciężar:	
Projektował M. Mielcarek	Zmienił	Zatwierdził - data		Plik Gutzeit	Data 13-08-2009	Skala
Lakfam				891132		
				891132	Edycja 0	Arkusz 1/1



3	1	891125 / 3	Betonstahl 20x400	B500SP	
2	1	891108 / 2	Trägerplatte 8x100x100	S235JR	
1	1	891108 / 1	Bolzen 24x133	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi

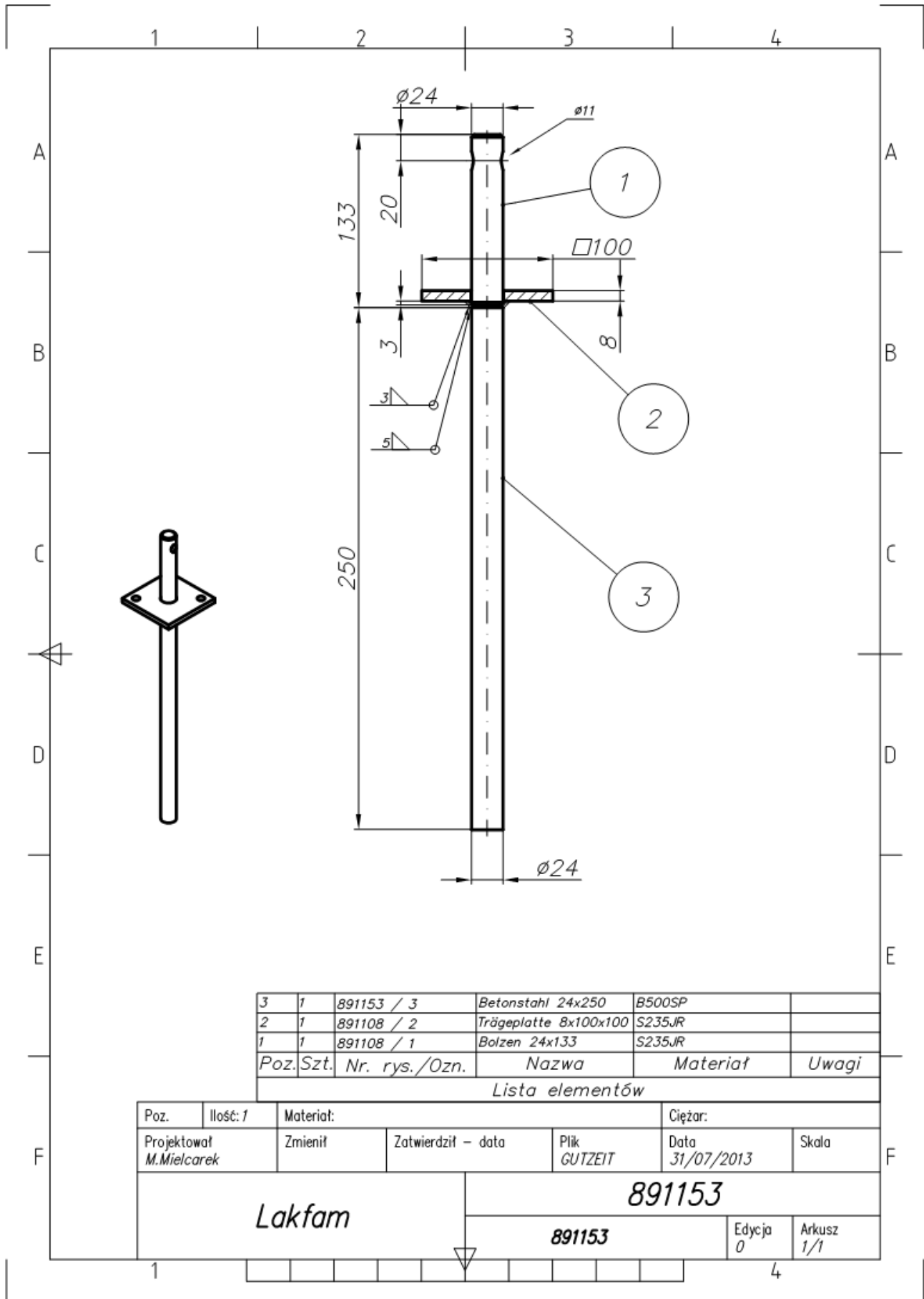
Lista elementów

Poz.	Ilość: 1	Materiał:			Ciężar:	
Projektował M.Mielcarek	Zmienił	Zatwierdził - data		Plik GUTZEIT	Data	Skala
Lakfam				891125		
				891125		Edycja 0



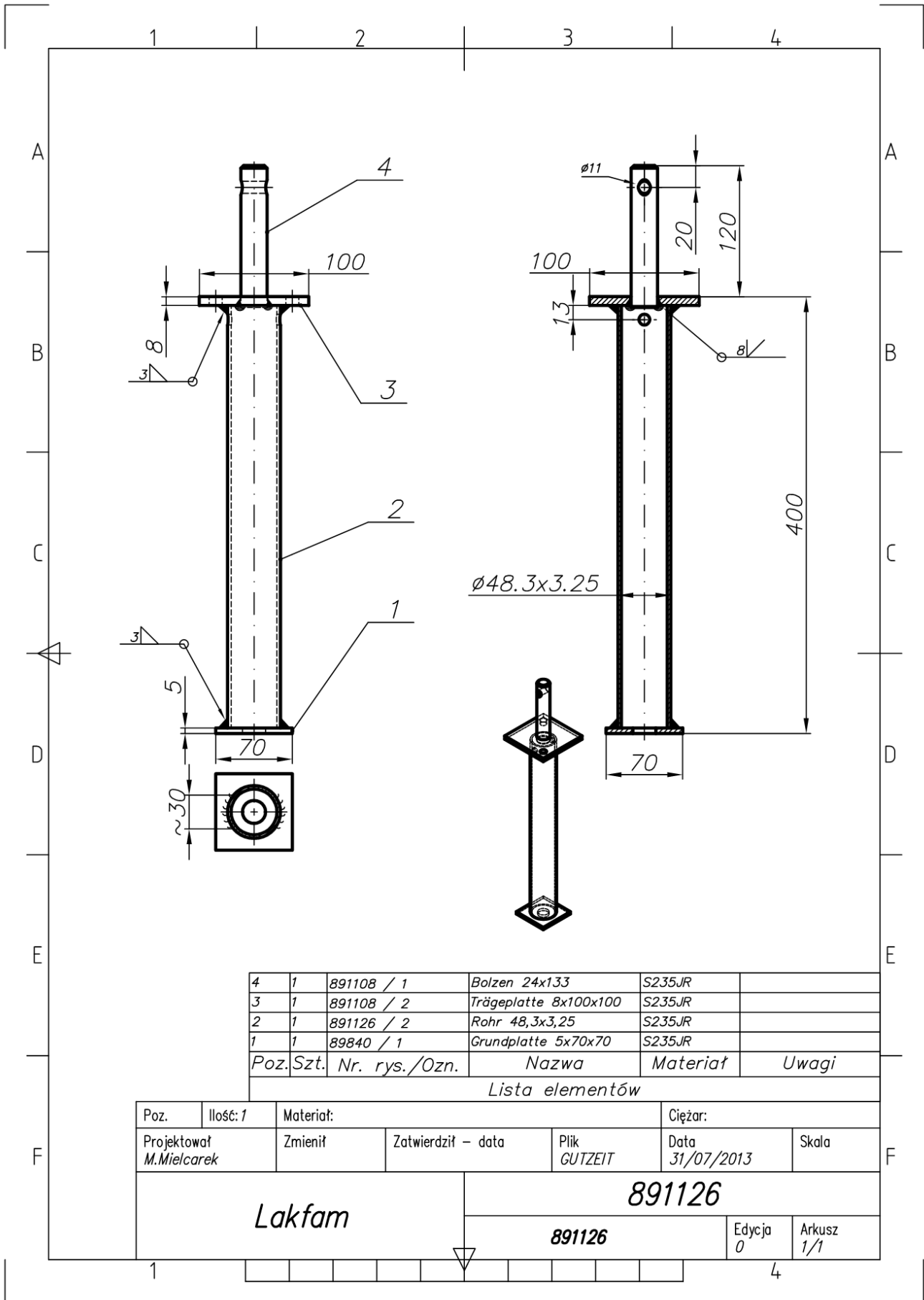
3	1	891152 / 3	Betonstahl 24x400	B500SP	
2	1	891108 / 2	Trageplatte 8x100x100	S235JR	
1	1	891108 / 1	Bolzen 24x133	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
Lista elementow					

Poz.	Ilość: 1	Materiał:			Ciężar:	
Projektował M.Mielcarek	Zmienił	Zatwierdził - data	Plik GUTZEIT	Data 31/07/2013	Skala	
Lakfam			891152			
			891152	Edycja 0	Arkusz 1/1	



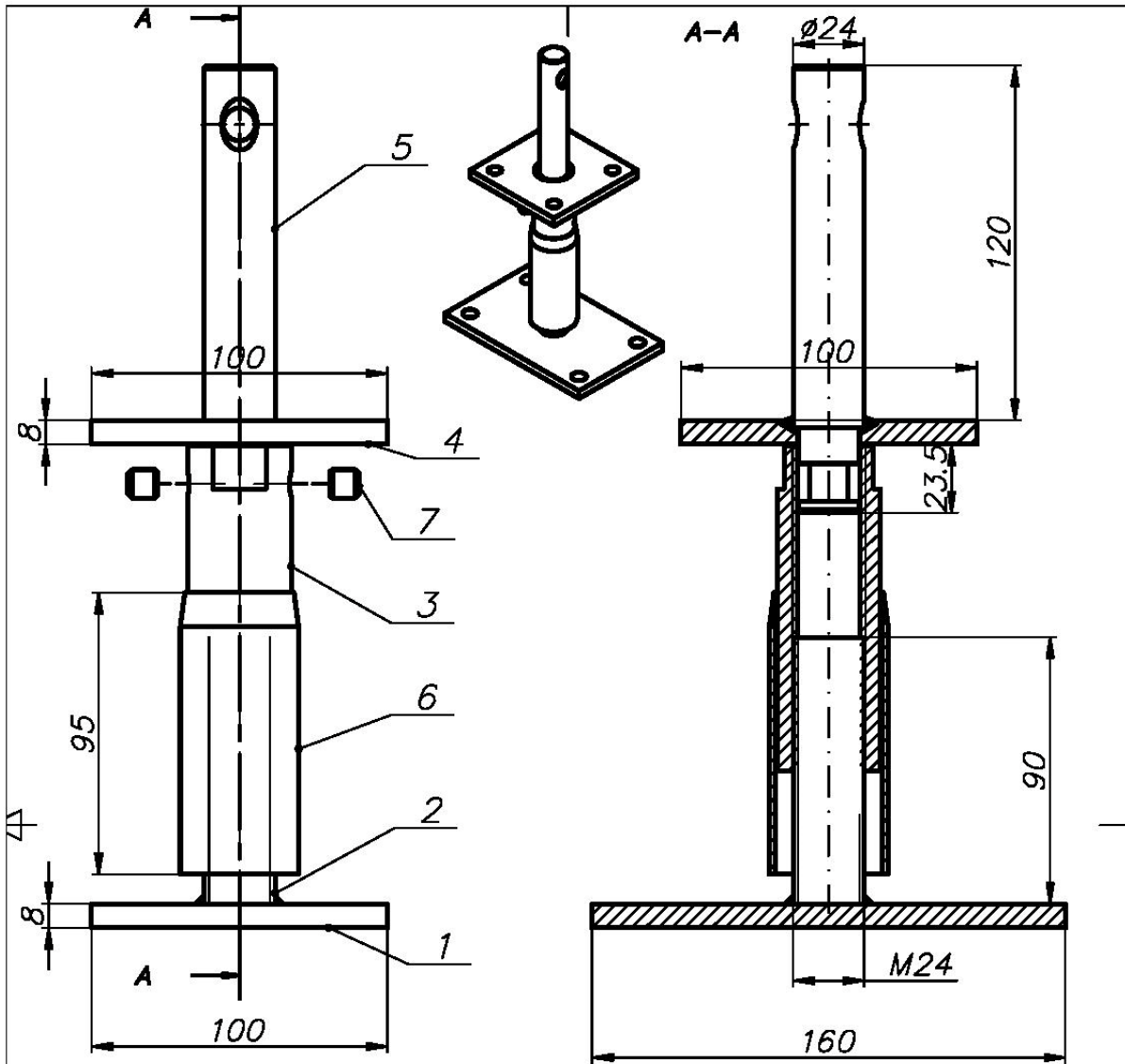
3	1	891153 / 3	Betonstahl 24x250	B500SP	
2	1	891108 / 2	Trägerplatte 8x100x100	S235JR	
1	1	891108 / 1	Bolzen 24x133	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
Lista elementów					

Poz.	Ilość: 1	Materiał:			Ciężar:	
Projektował M.Mielcarek	Zmienił	Zatwierdził - data		Plik GUTZEIT	Data 31/07/2013	Skala
Lakfam				891153		
				891153	Edycja 0	Arkusz 1/1



4	1	891108 / 1	Bolzen 24x133	S235JR	
3	1	891108 / 2	Trageplatte 8x100x100	S235JR	
2	1	891126 / 2	Rohr 48,3x3,25	S235JR	
1	1	89840 / 1	Grundplatte 5x70x70	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
Lista elementow					

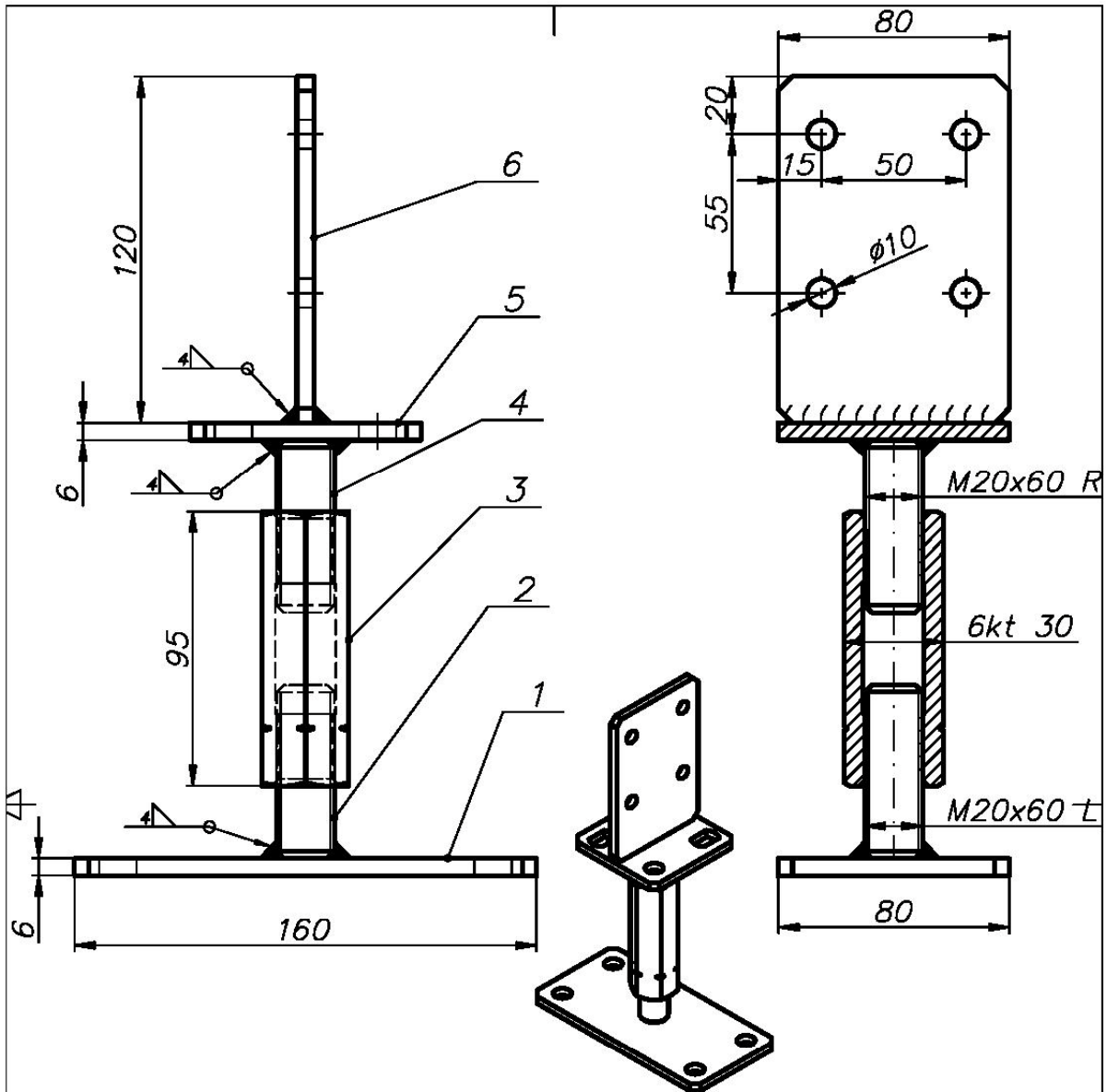
Poz.	Ilość: 1	Materiał:			Ciężar:	
Projektował M. Mielcarek	Zmienił	Zatwierdził - data	Plik GUTZEIT	Data 31/07/2013	Skala	
Lakfam			891126			
891126				Edycja 0	Arkusz 1/1	



7	2	DIN 913	Schraube M10x10		
6	1	891198 / 6	Rohr 40x2 L=95	S235JR	
5	1	891198 / 5	Bolzen 24x152	S235JR	
4	1	891198 / 4	Trägerplatte 8x100x100	S235JR	
3	1	891198 / 3	Gewindehülse 35x110	S235JR	
2	1	DIN 976	Gewindebolzen M24x90	S235JR+C	
1	1	891198 / 1	Grundplatte 8x100x160	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi

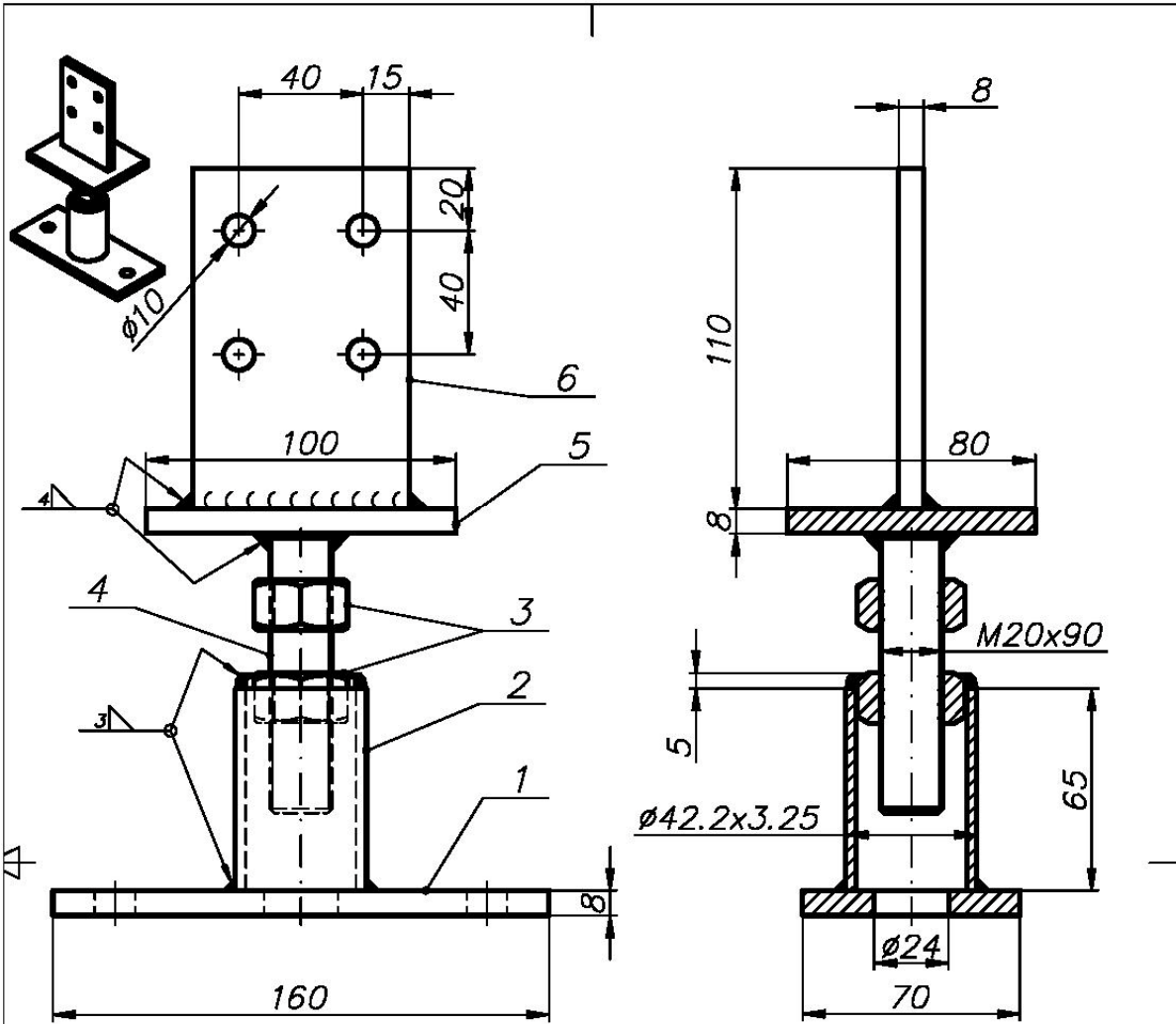
Lista elementów

Poz.	Ilość: /	Materiał:	Ciężar:		
Projektował M. Mielcarek	Zmienił	Zatwierdził – data	Plik GUTZEIT	Data 31/07/2013	Skala
Lakfam			891198, h=140		
			891198	Edycja 0	Arkusz 1/1



6	1	891052 / 6	Steg 6x80x120	S235JR	
5	1	891050 / 5	Trageplatte 6x80x80	S235JR	
4	1	DIN 976	Gewindebolzen M20x60 R	S235JR+P+Mo+AR	
3	1	891050 / 3	Gewindehulse M20x95	S235JR	
2	1	DIN 976	Gewindebolzen M20x60 L	S235JR+P+Mo+AR	
1	1	891050 / 1	Grundplatte 6x80x160	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
Lista elementow					

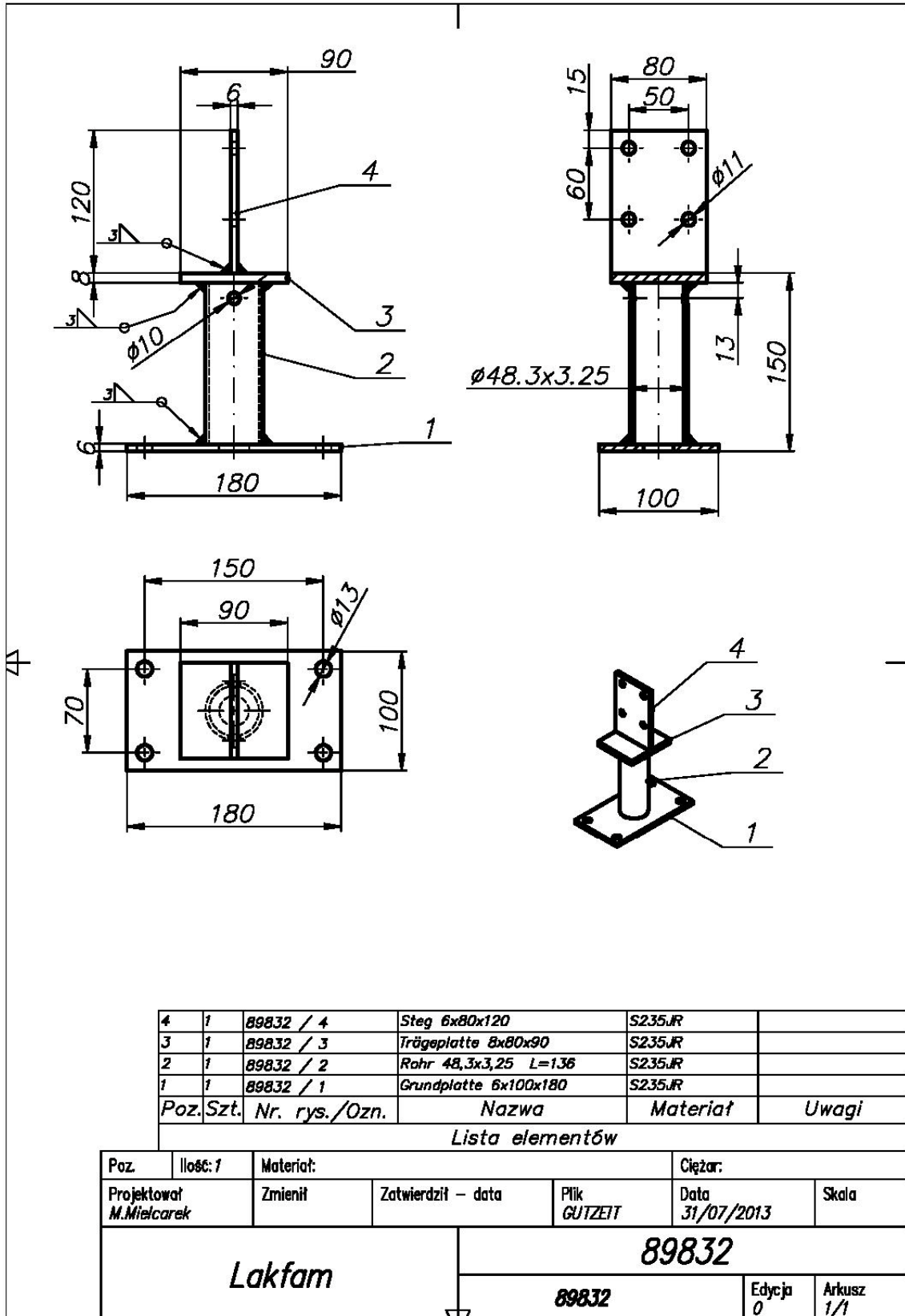
Poz.	Ilość: /	Materiał:	Ciężar:	
Projektował M. Mielcarek	Zmienił	Zatwierdził – data	Plik GUTZEIT	Data 31/07/2013
Lakfam			891052 – PF–TS	
			891052	Edycja 0
			Arkusz 1/1	

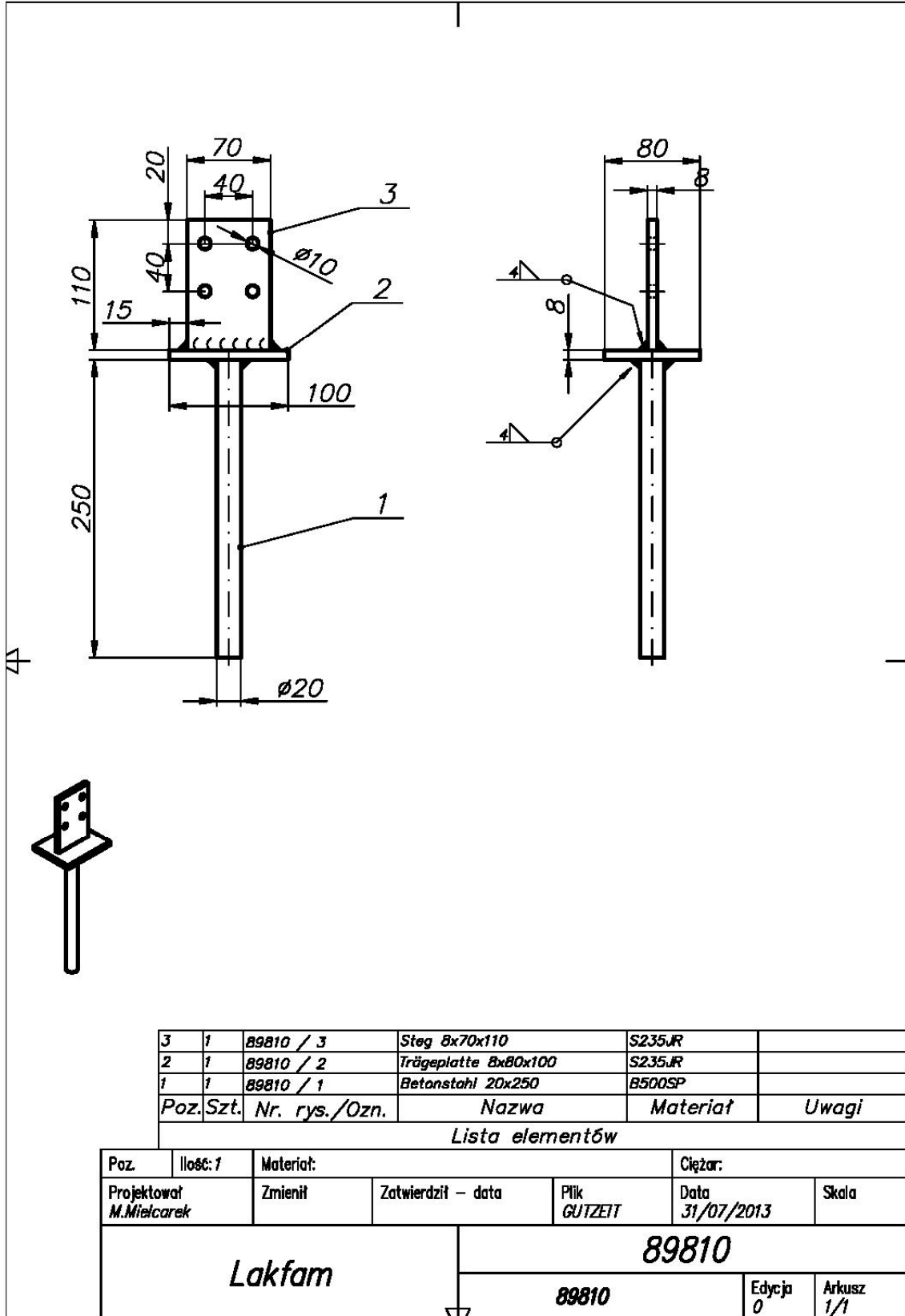


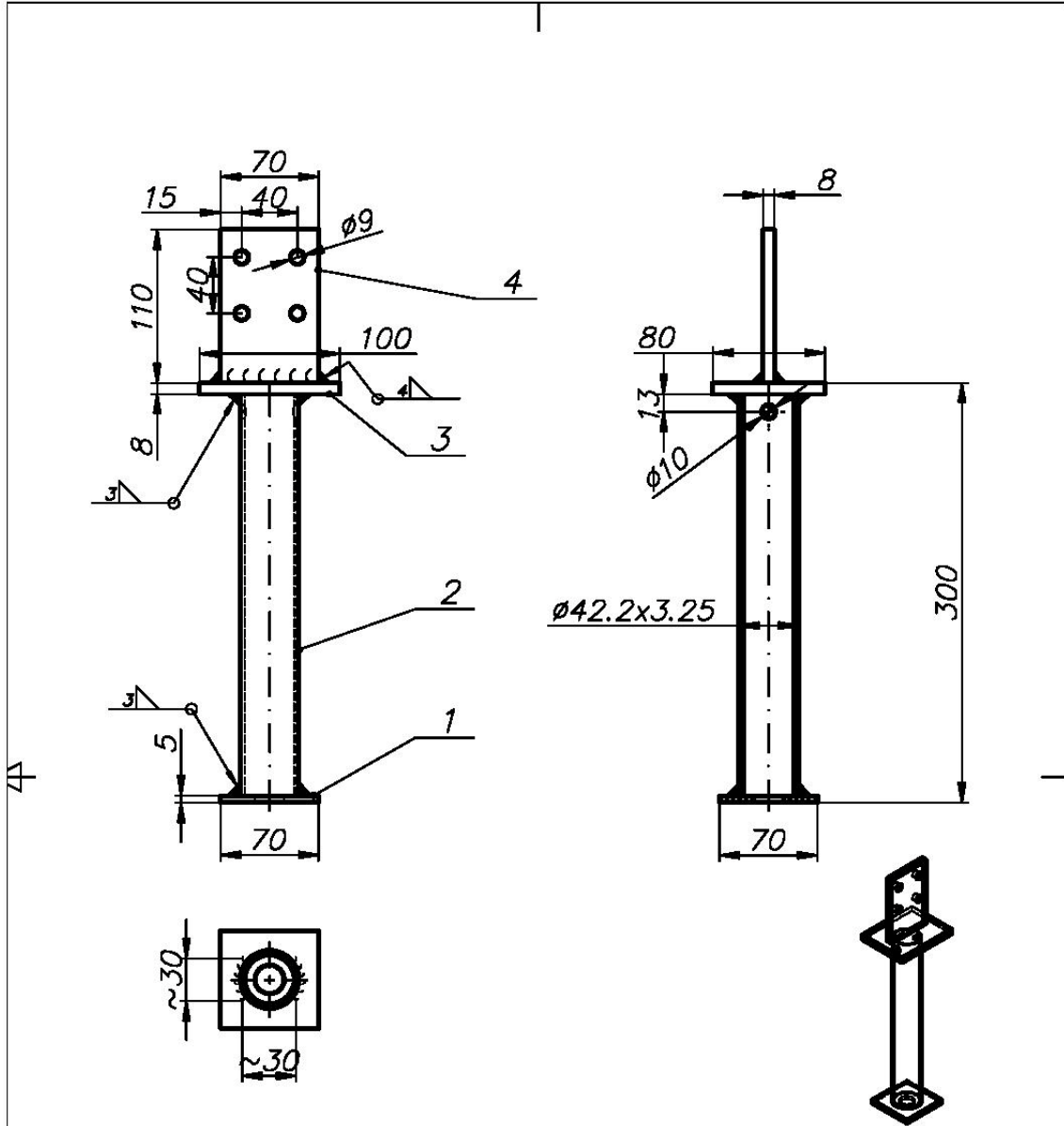
6	1	89920 / 6	Steg 8x70x110	S235JR	
5	1	89920 / 5	Trageplatte 8x80x100	S235JR	
4	1	DIN976	Gewindebolzen M20x90	S235JR+P+Mo+AR	
3	2	DIN 934	Mutter M20		
2	1	89920 / 2	Rohr 42,3x3,25 L=65	S235JR	
1	1	89920 / 1	Grungplatte 8x70x160	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiaf	Uwagi

Lista elementow

Poz.	Ilość: /	Materiaf:	Ciężar:	
Projektował M.Mielcarek	Zmienił	Zatwierdził – data	Plik GUTZEIT	Data 31/07/2013
Lakfam			89920	
			89920	Edycja 0
			Arkusz 1/1	

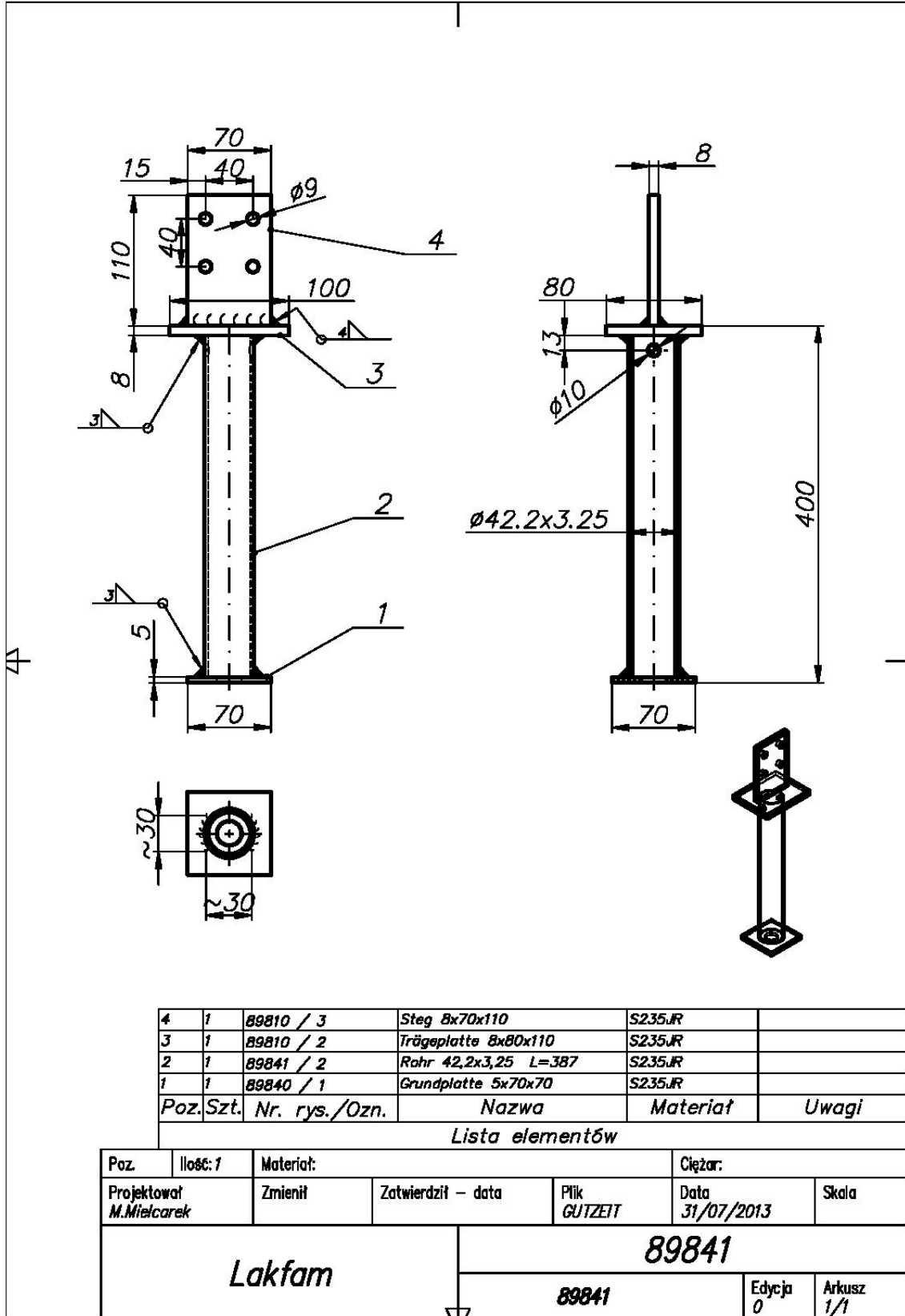


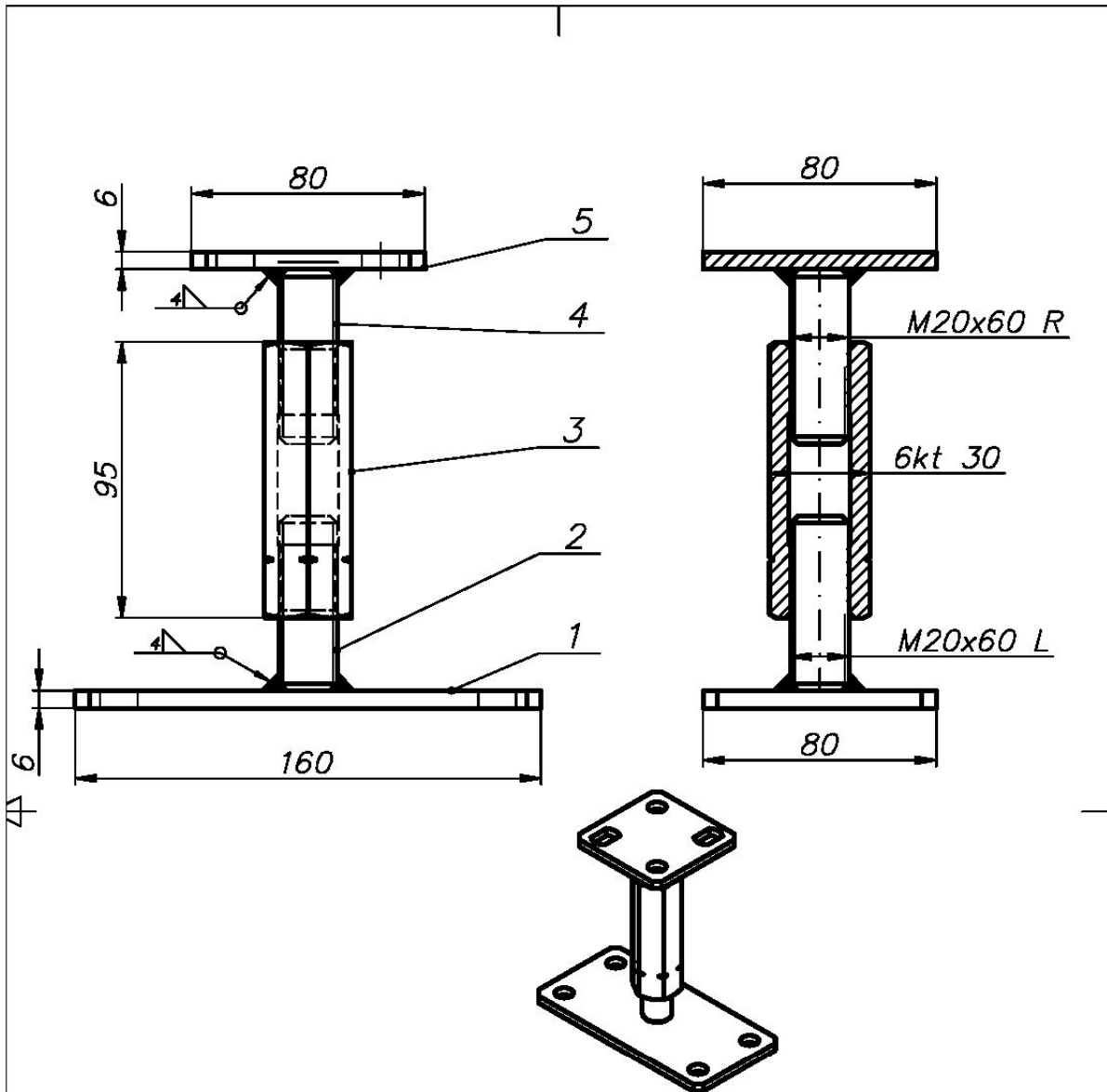




4	1	89810 / 3	Steg 8x70x110	S235JR	
3	1	89810 / 2	Trageplatte 8x80x110	S235JR	
2	1	89840 / 2	Rohr 42,2x3,25 L=287	S235JR	
1	1	89840 / 1	Grundplatte 5x70x70	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi
Lista elementow					

Poz.	ilość: 1	Materiał:			Ciężar:	
Projektował M.Mielcarek	Zmienił	Zatwierdził – data	Plik GUTZEIT	Data 31/07/2013	Skala	
Lakfam			89840			
			89840	Edycja 0	Arkusz 1/1	

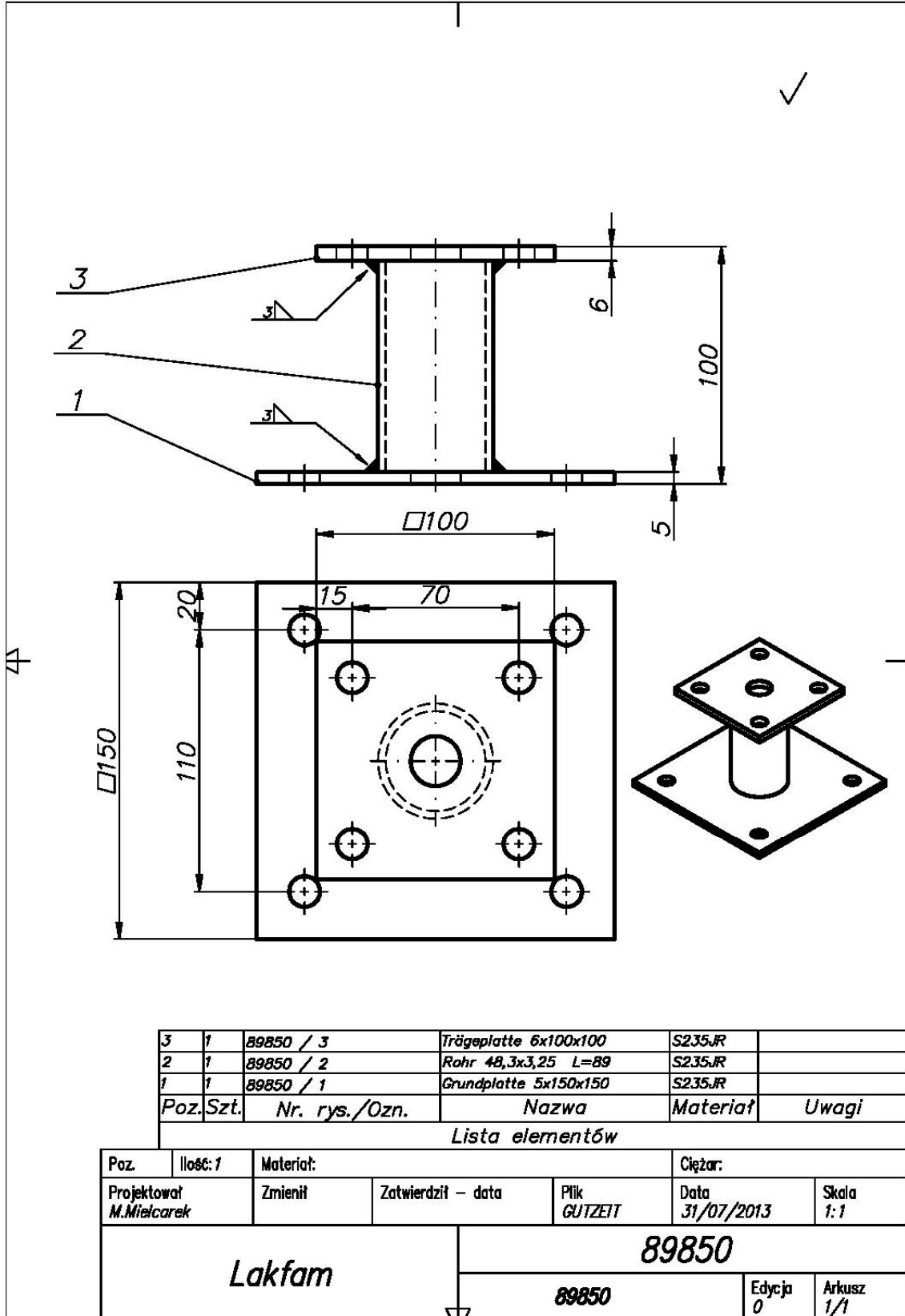




5	1	891050 / 5	Trägerplatte 6x80x80	S235JR	
4	1	DIN 976	Gewindebolzen M20x60-R	S235JR+P+Mo+AR	
3	1	891050 / 3	Gewindehülse M20x95	S235JR	
2	1	DIN 976	Gewindebolzen M20x60-L	S235JR+P+Mo+AR	
1	1	891050 / 1	Grundplatte 6x80x160	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi

Lista elementów

Poz.	Ilość /	Materiał:	Ciężar:		
Projektował M. Mielcarek	Zmienił	Zatwierdził – data	Plik GUTZEIT	Data 21-07-2009	Skala
Lakfam			891050 – PF-TP		
			891050	Edycja 0	Arkusz 1/1



3	1	89850 / 3	Trägerplatte 6x100x100	S235JR	
2	1	89850 / 2	Rohr 48,3x3,25 L=89	S235JR	
1	1	89850 / 1	Grundplatte 5x150x150	S235JR	
Poz.	Szt.	Nr. rys./Ozn.	Nazwa	Materiał	Uwagi

Lista elementów

Poz.	Ilość: 1	Materiał:	Ciężar:		
Projektował M.Mielcarek	Zmienił	Zatwierdził - data	Plik GUTZEIT	Data 31/07/2013	Skala 1:1
Lakfam			89850		
			89850	Edycja 0	Arkusz 1/1

