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Designated according to Article 29 of Regulation (EU) No 305/2011

Member of EOTA
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European Technical Assessment

ETA-12/0260
of 02/04/2019

General part

Technical Assessment Body issuing the European Technical Assessment	Österreichisches Institut für Bautechnik (OIB) Austrian Institute of Construction Engineering
Trade name of the construction product	TENSA POLYFLEX® Advanced PU
Product family to which the construction product belongs	Flexible plug expansion joint for nominal movement capacity of 15 mm – 135 mm
Manufacturer	mageba SA Solistrasse 68 CH- 8180 Bülach Switzerland
Manufacturing plant(s)	Comprehensive list of manufacturing plants laid down in technical documentation
This European Technical Assessment contains	30 pages including 20 Annexes which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 120011-01-0107 Flexible plug expansion joints for road bridges with flexible filling based on a synthetic polymer as binder

Specific parts

1 Technical description of the product

The flexible plug expansion joint TENSA POLYFLEX® Advanced PU is an in-situ poured joint comprising a specially formulated flexible polymeric material as joint filling material, which also forms the surfacing, supported over the deck joint gap by a bridging plate. The material used in the flexible joint filling material is based on advanced polyurethane. The subject of this European Technical Assessment is the complete flexible plug expansion joint kit.

The types of the flexible plug expansion joint TENSA POLYFLEX® Advanced PU are defined in Table 1 of this ETA and are depicted in the Annexes A.1 – A.14 of this ETA. A general layout drawing is given in Figure 1.

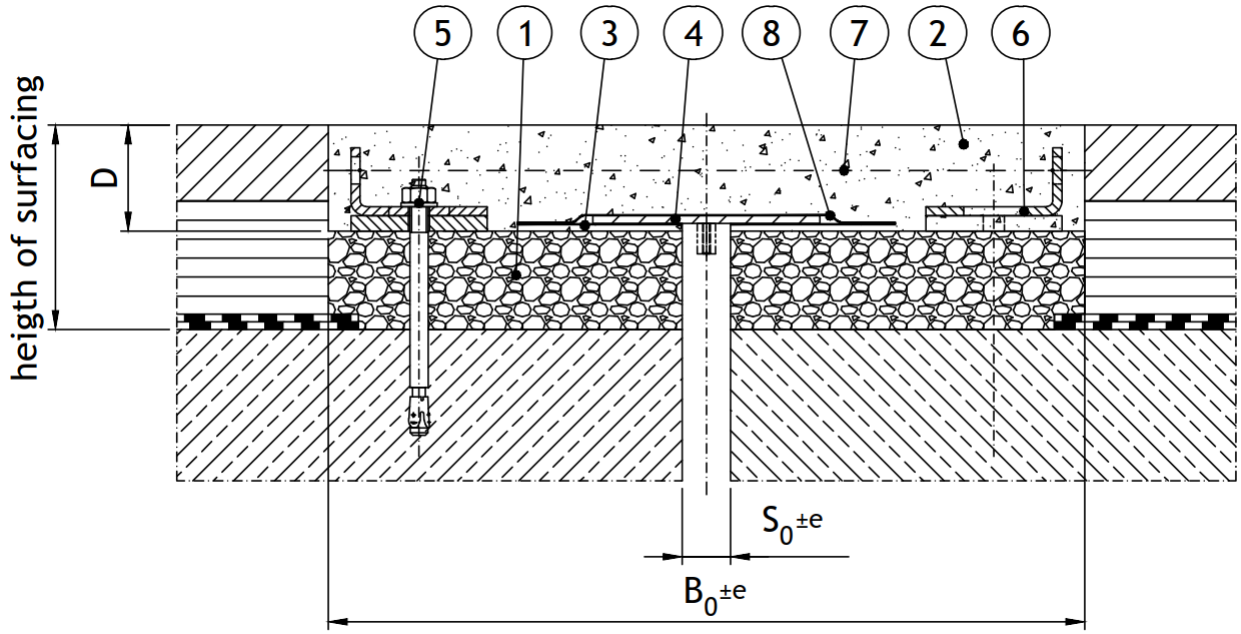


Figure 1: Standard cross section of the flexible plug expansion joint

Key

1	Substructure (not part of kit)
2	Joint filling mixture based on advanced polyurethane
3	Debonding strip (where relevant as installation support *) made of EPDM
4	Bridging plate
5	Fixation kit consisting of bolt kit
6	Steel angle with distance plate
7	Stabilizing element, consisting of structural steel (where relevant)
8	Debonding strip (as installation support *) made of EPDM

- Surface dressing (not shown in Figure 1): Application according to installation instructions
- Primer (not shown in Figure 1): Application on horizontal and vertical surfaces in contact with joint filling material (substructure and adjacent surfacing) in accordance with Installation Instructions

B_0	Joint width in central position
S_0	Bridge gap in central position

*) The application of the debonding strip as component of the expansion joint kit is in order to ensure correct de-boding between the bridging plate and the joint filling material during hardening of the joint filling mixture during and after installation of the expansion joint in the works.

The positioning of the bridging plate (4) to the substructure (1) is granted by centring elements, depicted in Annex A.1 – A.14 of this ETA.

The substructure (1) is not part of the kit.

The substructure (polymer concrete or bridge structure) must provide a minimum compressive strength of 25 N/mm² and a bonding strength of 1,5 N/mm² or higher.

The nominal movement capacity is 15 mm – 135 mm according to the declaration of the manufacturer. The minimum/maximum width in traffic direction is 285/300 mm – 1055/1190 mm according to Table 1. The minim/maximum thickness D according to Figure 1 and Table 1 is 60 mm – 70 mm, whereas this thickness is to be applied over the whole width without any change.

For the selection of appropriate type of expansion joint for the individual work, the concerned tension e^+ and compression e^- for the movement capacity according to Table 1 thereafter shall be considered.

Table 1: Standard geometry of flexible plug expansion joint TENSA POLYFLEX® Advanced PU in respect to its movement capacity

Type	**Total movement [mm]**	**Movement tension [mm]**	**Movement compression [mm]**	**Thickness [mm]**	**Joint width in central position [mm]**
	e	***e⁺***	***e⁻***	***D***	***B₀***
PA15	15	10	-5	60	290 or 330
PA20	20	13	-7	60	290 or 330
PA30	30	20	-10	60	330 or 360
PA40	40	26	-14	60	360 or 390
PA50	50	33	-17	60	430 or 460
PA60	60	40	-20	70	500 or 520
PA75	75	50	-25	70	580
PA80	80	53	-27	70	650
PA90	90	60	-30	70	730
PA100	100	66	-34	70	800
PA110	110	74	-36	70	880
PA120	120	80	-40	70	950
PA130	130	86	-44	70	1030
PA135	135	90	-45	70	1100

The results of the assessment of mechanical resistance of the bridging plate and steel angle at ultimate limit state (ULS) are given in Tables 2a and 2b, whereas a partial factor γ_{Q1} = 1,35 has been taken into account.

Table 2a: Dimensions of the bridging plate for the flexible plug expansion joint TENSA POLYFLEX® Advanced PU, depending on maximum bridge gap and calculated for a minimum thickness of the expansion joint of 60 mm – 70 mm

Maximum bridge gap [mm]	30	40	50	60	70	80	90	100	110	120	130	140
Requested thickness of bridging plate [mm]	5	5	5	5	5	5	5	5	8	8	8	10

Table 2b: Dimensions of the steel angle for the different types of the flexible plug expansion joint TENSA POLYFLEX® Advanced PU

Type	PA 15	PA 20	PA 30	PA 40	PA 50	PA 60	PA 75	PA 80	PA 90	PA 100	PA 110	PA 120	PA 130	PA 135
Dimensioning of steel angle [mm] (long wing /short wing)	70/ 35	70/ 35	70/ 35	70/ 35	70/ 35	90/ 45	90/ 45	90/ 45	90/ 45	90/ 45	90/ 45	90/ 45	90/ 45	90/ 45
Requested thickness of steel angle [mm]	6	6	6	6	6	6	6	6	6	6	6	6	6	6

The complete joint is created on site by placing the fixation kit, the joint filling material and all related ancillaries in the longitudinal axis of the joint.

In its longitudinal axis the flexible plug expansion joint TENSA POLYFLEX® Advanced PU includes the carriageway with/without cyclist areas and with/without footpath, as depicted in Annexes B.1 and B.2 of this ETA. Separate devices for footpath and collision on kerbs are not considered because such elements are not part of the kit.

Note 1: In general, according to the installation manual of the manufacturer it is recommended to install the flexible plug expansion joint TENSA POLYFLEX® Advanced PU in a manner that the adjacent bituminous surfacing areas are equipped with additional transitions strips or support ribs.

Note 2: Optionally, the surface of the joint filling material may be sealed by a colourless flexible coating which is not part of the kit covered by this ETA.

The components and materials which constitute the flexible plug expansion joint TENSA POLYFLEX® Advanced PU are specified in Clause 1.1 and in Annex D.1 in this ETA.

Provisions for proper installation (installation manual) of the flexible plug expansion joint TENSA POLYFLEX® Advanced PU are provided for each delivered kit.

1.1 Technical description of the components

1.1.1 Joint filling mixture

The joint filling material, based on advanced polyurethane, is defined by its compound number Polyflex 60A deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik. The joint filling material according to this ETA does not contain any additional filling material.
Material characteristics of the joint filling material Polyflex 60A, based on advanced polyurethane, are stated in Table D.1 in Annex D.1 of this ETA. For the characterisation of the joint filling mixture Polyflex 60A and applicable mixing ratios the relevant parameters are laid down in the technical documentation according to this ETA. The parameters are confidential[1] and are deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

1.1.2 Bridging plate

General information on the design of the bridging plate is laid down in drawings, depicted in Annex A.1 – A.14 of this ETA. The minimum steel grade is defined as S235JR, whereas for the relevant mechanical properties and chemical composition EN 10025-2 applies.
Regarding the possible use of steel elements for low temperatures EN 1993-1-10, Table 2.1, applies.

[1] The technical documentation of this European Technical Assessment has been deposited at the Technical Assessment Body Österreichisches Institut für Bautechnik and, as far as relevant for the tasks of the notified body involved in the assessment and verification of constancy of performance, is handed over to the notified body.

The bridging plate is hot-galvanized according to EN ISO 1461.

1.1.3 Fixation kit

General information on the design of the fixation kit is laid down in drawings, depicted in Annex A.1 – A.14 of this ETA. The relevant technical specifications are laid down in the technical documentation deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

Regarding the possible use of steel elements for low temperatures EN 1993-1-10, Table 2.1, applies.

The bolts, corrosion-protected by means of electro-galvanisation, to be applied with distances of centre to centre of not more than 250 mm in the fixation kit, are in conformity with the relevant technical specification, deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik, whereas its design shall be at least M10 8.8.

1.1.4 Steel angle

The minimum steel grade for the steel angle and related distance plate is defined as S235JR, whereas for the relevant mechanical properties and chemical composition EN 10025-2 applies.

Regarding the possible use of steel elements for low temperatures EN 1993-1-10, Table 2.1, applies.

For the steel angles separate corrosion protection is not necessary as the joint filling material is acting as complete covering for the elements.

1.1.5 Stabilizing element

Stabilizing elements are used for the product types, defined in Table 1 in this ETA, for nominal movements beyond 50 mm. They consist of a steel tube and steel bar and a plastic covering, depicted in Annex. A.6 – A.14 of this ETA. The tube and bar is made of steel with minimum yield strength of 235 N/mm². The material characteristics are laid down in the technical documentation deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.
For the plastic covering the relevant parameters are laid down in the technical documentation deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

For the steel elements separate corrosion protection is not necessary as the bar is covered completely by the plastic covering and the joint filling material.

1.1.6 Debonding strip

For the debonding strip, sheets made of EPDM are used. The material characteristics are laid down in the technical documentation deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik. The manner of application, depending on the product type, is laid down in the installation manual of the manufacturer.

1.1.7 Primer

The primers, used depending on the type of substructure, are defined by their compound numbers Polyflex 60P, Polyflex 81P and Polyflex 91P and laid down in the technical documentation deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik. Depending on the applied surface, an additional surface dressing, defined and laid down in the technical documentation, may be used.
The primers are defined by the material parameters laid down in the technical documentation deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

1.1.8 Surface dressing

The surface dressing is defined as angular material with size 0,7 mm – 1,2 mm. The relevant parameters are defined and laid down in the technical documentation deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

The flexible plug expansion joint TENSA POLYFLEX® Advanced PU is used for the user categories vehicles, cyclists and pedestrians. The expansion joint system is designated to be applied in new structures and for refurbishment of structures.

The flexible plug expansion joint TENSA POLYFLEX® Advanced PU applies for operating temperatures between –40 °C and +60 °C, whereas for the use of steel elements for low temperatures EN 1993-1-10, Table 2.1, is applied.

The use in moveable bridges is not covered by this ETA.

The use of the flexible plug expansion joint TENSA POLYFLEX® Advanced PU according to this ETA is covering a maximum slope in traffic direction of 4 %.

The minimum angle β between the traffic direction and the longitudinal axis of the flexible plug expansion joint TENSA POLYFLEX® Advanced PU is given as 60° in case of the product Types PA60 – PA135 due to geometric reasons for the positioning of stabilizing elements. The stabilizing elements are always installed parallel to the main direction of movement. Consequently, for the product Types PA15 - PA50 this restriction is not of relevance.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the kit of 15 years. The indications given on the working life cannot be interpreted as a guarantee by the producer or the Technical Assessment Body, but are to be regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.
The indications are also based upon the current state of the art and the available knowledge and experience for the joint filling material.

Note: Working life category 15 years in ETAG 032-1 is referring to N_{obs} = 0,5 million/year (see also EN 1991-2, Table 4.5).

It is likely that the working life of flexible plug expansion joints is influenced by the following:
- Adjacent pavement,
- Traffic behaviour (including stationary, rolling, queuing traffic),
- Temperature,
- Slope of pavement
- Support material

The flexible plug expansion joints TENSA POLYFLEX® Advanced PU (all types according to Table 1 of this ETA) do not contain replaceable components.

If the flexible plug expansion joint TENSA POLYFLEX® Advanced PU will be subject to actions resulting from seismic activity which cause movements to occur outside of the design capability, then the flexible expansion joint would require to be repaired or replaced.

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

3.1 Performance of the product

Table 3: Performance of the flexible plug expansion joint TENSA POLYFLEX® Advanced PU in relation to the essential characteristics

Basic requirements for construction works	Essential characteristics	Method of assessment	Performance
BWR 1	Mechanical resistance	EAD, Clause 2.2.1	Mechanical resistant and stability is given for the products according to the geometries depicted in the Annexes A.1 – A.14 and Tables 2a and 2b in this ETA with the conditions given in Clause 3.1.1 of this ETA. Whereas an adjustment factor α_{Q1} = 1,00 and partial factor γ_{Q1} = 1,35 apply.
	Resistance to fatigue	EAD, Clause 2.2.2	Resistance to fatigue is given for the products according to the geometries depicted in the Annexes A.1 – A.14 in this ETA with the conditions given in Clause 3.1.1 of this ETA. Whereas dynamic amplification factor $\Delta\varphi_{fat}$ = 1,00 applies.
	Movement capacity	EAD, Clause 2.2.3	According to Table 1 in this ETA. Reaction forces and related deformations according to Table 4 in this ETA.
	Resistance to wear	EAD, Clause 2.2.4	No de-bonding and/or cracking and loss of adhesion of the joint filling mixture.
	Water tightness	EAD, Clause 2.2.5	Water tightness is given.
	Bond strength to support	EAD, Clause 2.2.6	1,0 N/mm² (minimum mean value) Mode of failures are detailed in Table D.2 in this ETA.
	Durability aspects - Resistance against chemicals (petrol, diesel, de-icing salt, alkali) - Accelerated ageing by heat - Ageing resulting from ozone - Ageing resulting from freeze/thaw with de-icing salts	EAD, Clause 2.2.7	Joint filling material: Durable
	Durability aspects - Corrosion		Metallic components: Corrosivity category C5 acc. to EN ISO 14713-1 Durability range “high” (H) acc. to EN ISO 14713-1
BWR 2	Reaction to fire	EAD, Clause 2.2.8	E_{fl} according to EN 13501-1 (Joint filling mixture)

Continuation of Table 3 on Page 9

Continuation of Table 3 on Page 8

Basic requirements for construction works	Essential characteristics	Method of assessment	Performance
BWR 4	Level differences in the running surface under unloaded conditions	EAD, Clause 2.2.9	No level differences (including steps) greater than 3 mm are occurring.
	Level differences in the running surface under loaded conditions		Maximum deflection under load: 0,5 mm
	Skid resistance	EAD, Clause 2.2.10	Joint filling mixture including surface dressing for the intended use as: Carriageway: PTV value = 70 Footpath: PTV value = 61
	Wheel tracking for operating temperature +60°C	EAD, Clause 2.2.11	1,6 % (related to a thickness of test piece of 7,5 cm)

3.1.1 Mechanical resistance

The nominal movement capacities of the flexible plug expansion joint TENSA POLYFLEX® Advanced PU for the concerned product types and related maximum tensions and maximum compressions are given in Table 1 in this ETA.

For the design situation ultimate limit state (ULS), the fundamental combinations of action and the combination of actions for fatigue limit state are considered.
For the design situation serviceability limit state (SLS) the characteristic combinations of actions and frequent combinations are considered.

Resulting maximum reaction forces, resulting from slow occurring movements at the minimum operating temperature – 40° C, and maximum vertical deformations are given in Table 4 thereafter. Reaction forces resulting from fast occurring movements due to over rolling traffic are less than those resulting from slow occurring movements.

In comparison to the results given in Table 4 an average decrease of 25 % of the reaction forces for application of TENSA POLYFLEX® Advanced PU for minimum operating temperature not less than -20 °C may be considered.

Table 4: Comprehensive table of reaction forces (at -40 °C) and deformations for product Types PA 15 – PA 135 for the flexible plug expansion joint POLYFLEX® Advanced PU

Type	Maximum assessed deformation: Elevation [mm]	Maximum assessed deformation: Dimple [mm]	Reaction force to be considered in the bridge design [kN/m]
PA15	2,0	- 1,0	12,3
PA20	2,0	- 1,0	28,8
PA30	5,5	- 6,0	26,4
PA40	6,0	- 5,0	29,1
PA50	7,5	- 7,5	20,0
PA60	4,0	- 8,0	32,8

Continuation of Table 4 on Page 10

Continuation of Table 4 on Page 9

Type	Maximum assessed deformation: Elevation [mm]	Maximum assessed deformation: Dimple [mm]	Reaction force to be considered in the bridge design [kN/m]
PA75	6,5	- 8,0	39,2
PA80	8,0	- 5,0	33,4
PA90	8,0	- 8,0	30,7
PA100	8,0	- 7,5	28,2
PA110	8,0	- 7,5	31,0
PA120	7,5	- 8,0	28,2
PA130	7,5	- 7,5	30,4
PA135	8,0	- 8,0	11,6

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

4.1 AVCP system

According to the decision 2001/19/EC[2] of the European Commission, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V of Regulation (EU) No 305/2011) is: 1.

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

Technical details necessary for the implementation of the AVCP system are laid down in in the control plan deposited by the Technical Assessment Body Österreichisches Institut für Bautechnik.

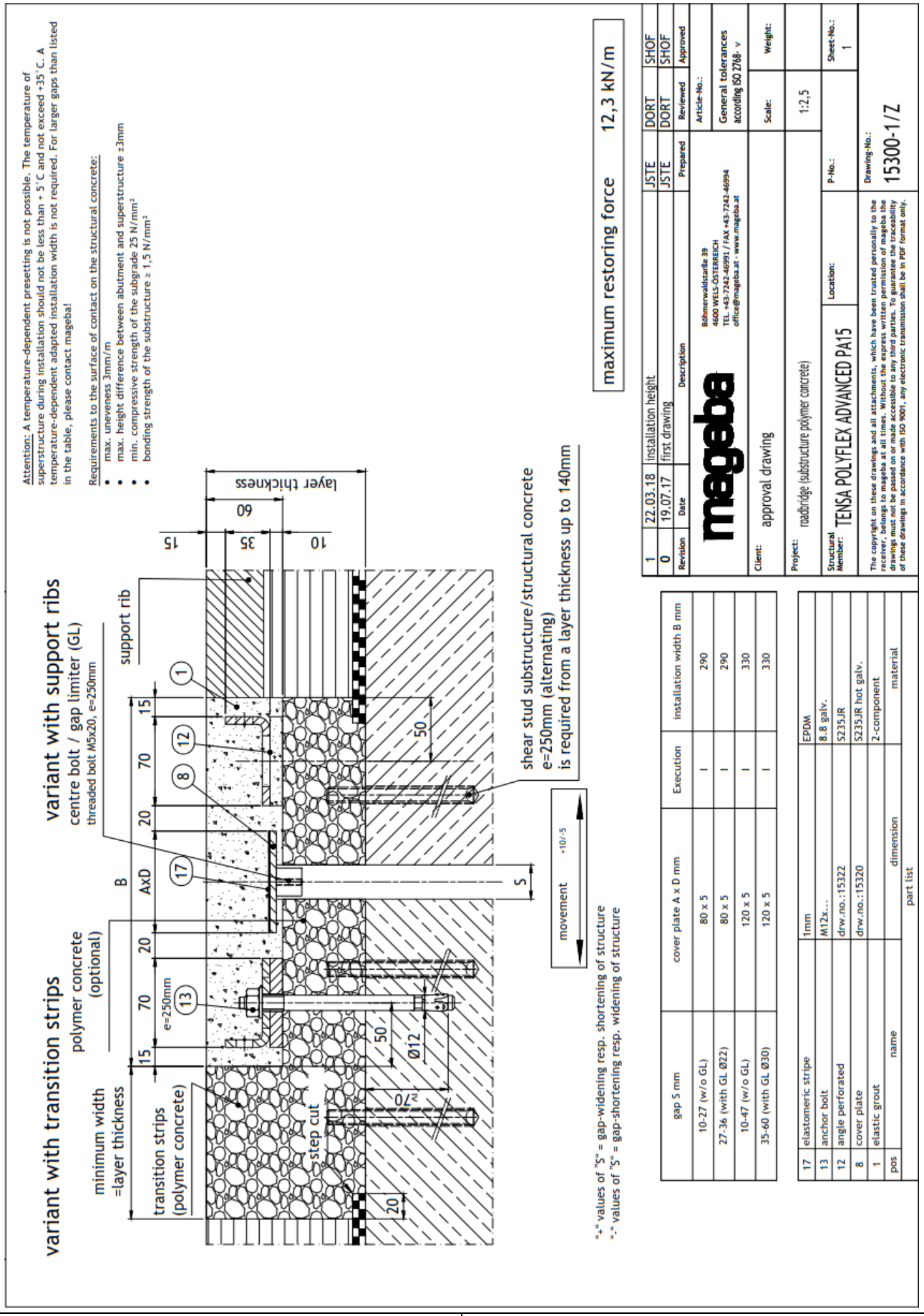
The notified product certification body shall visit the factory at least once a year for surveillance.

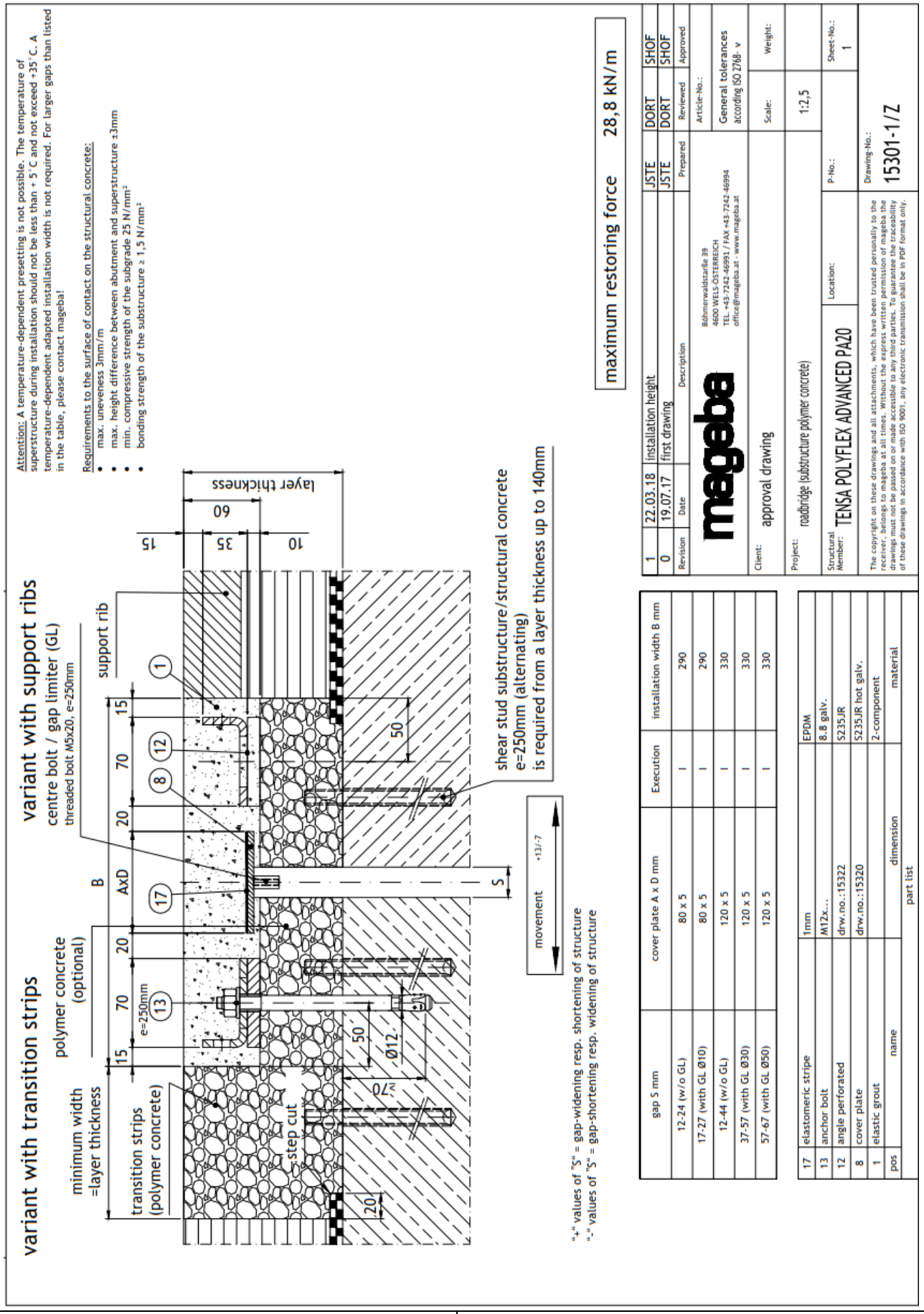
Issued in Vienna on 02.04.2019
by Österreichisches Institut für Bautechnik

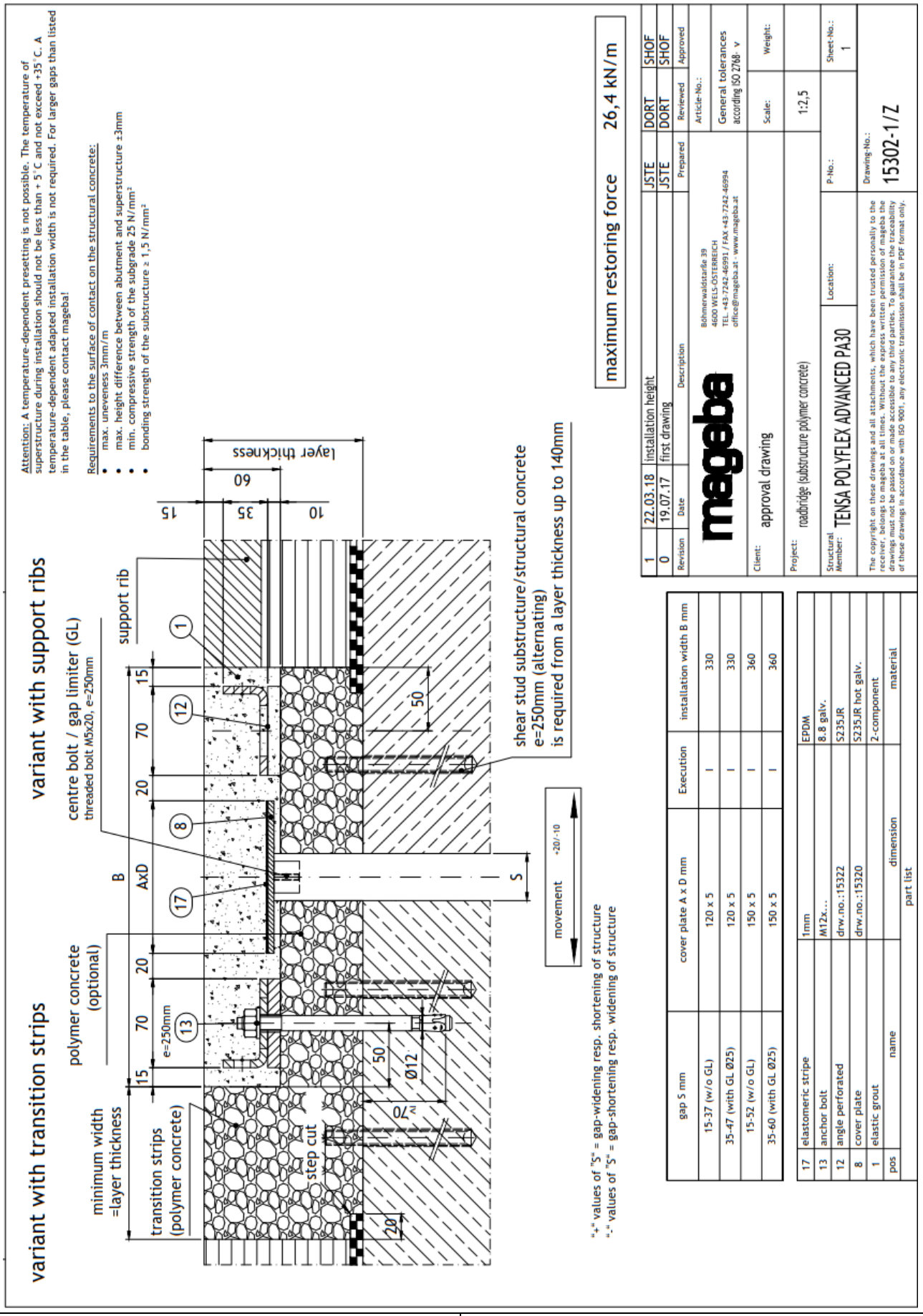
The original document is signed by:

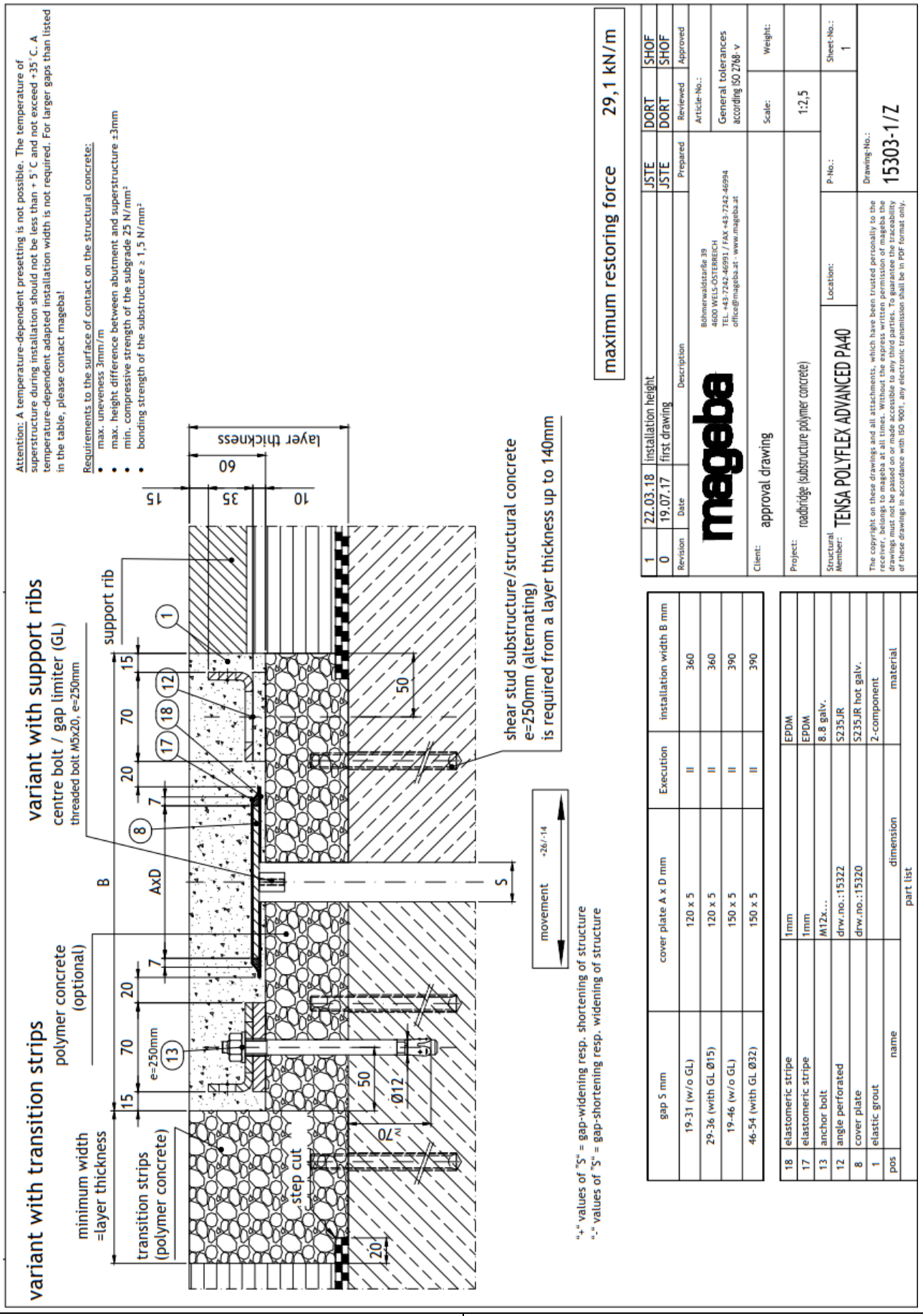
Rainer Mikulits
Managing Director

[2] Official Journal of the European Communities N° L 005, 10.1.2001, p.6-7







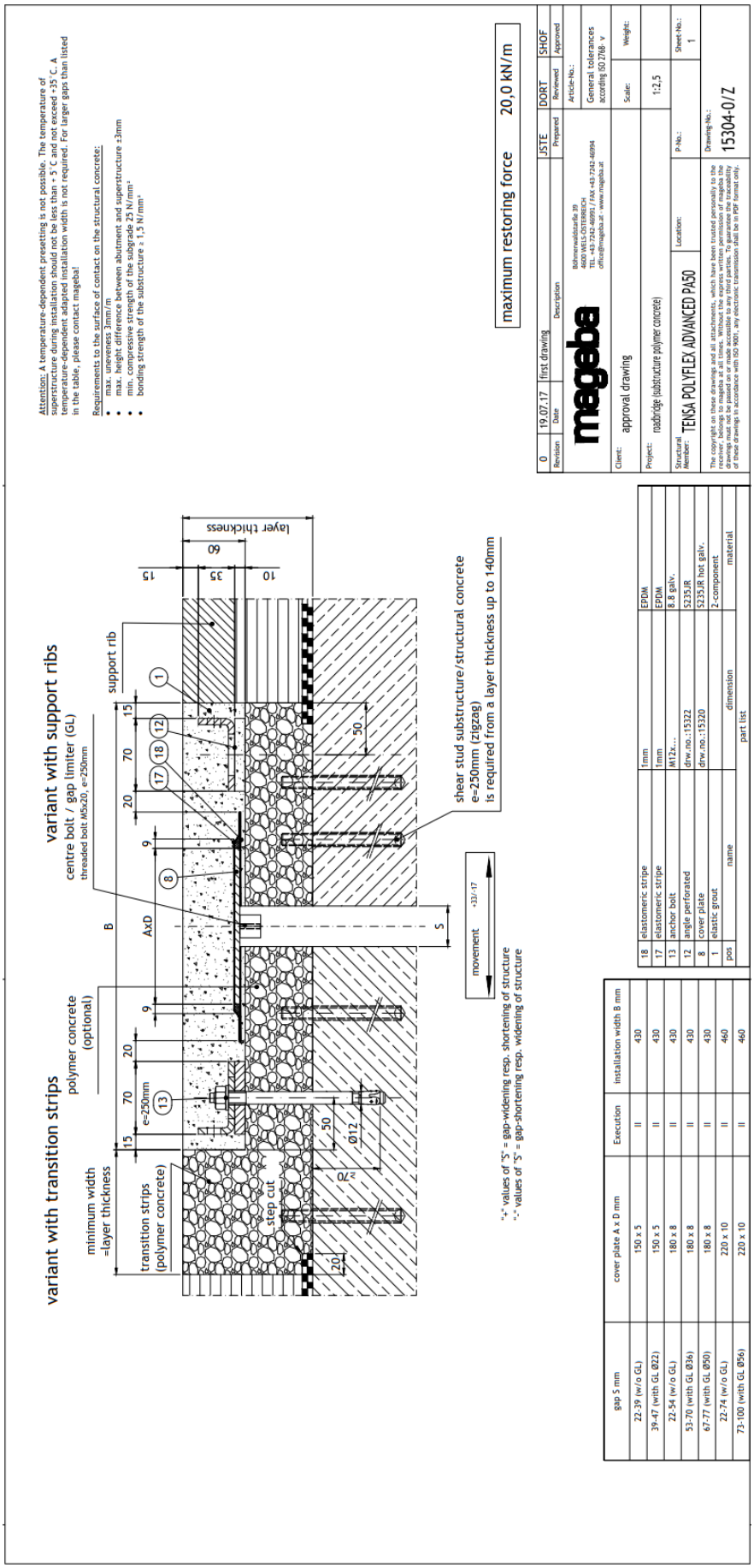


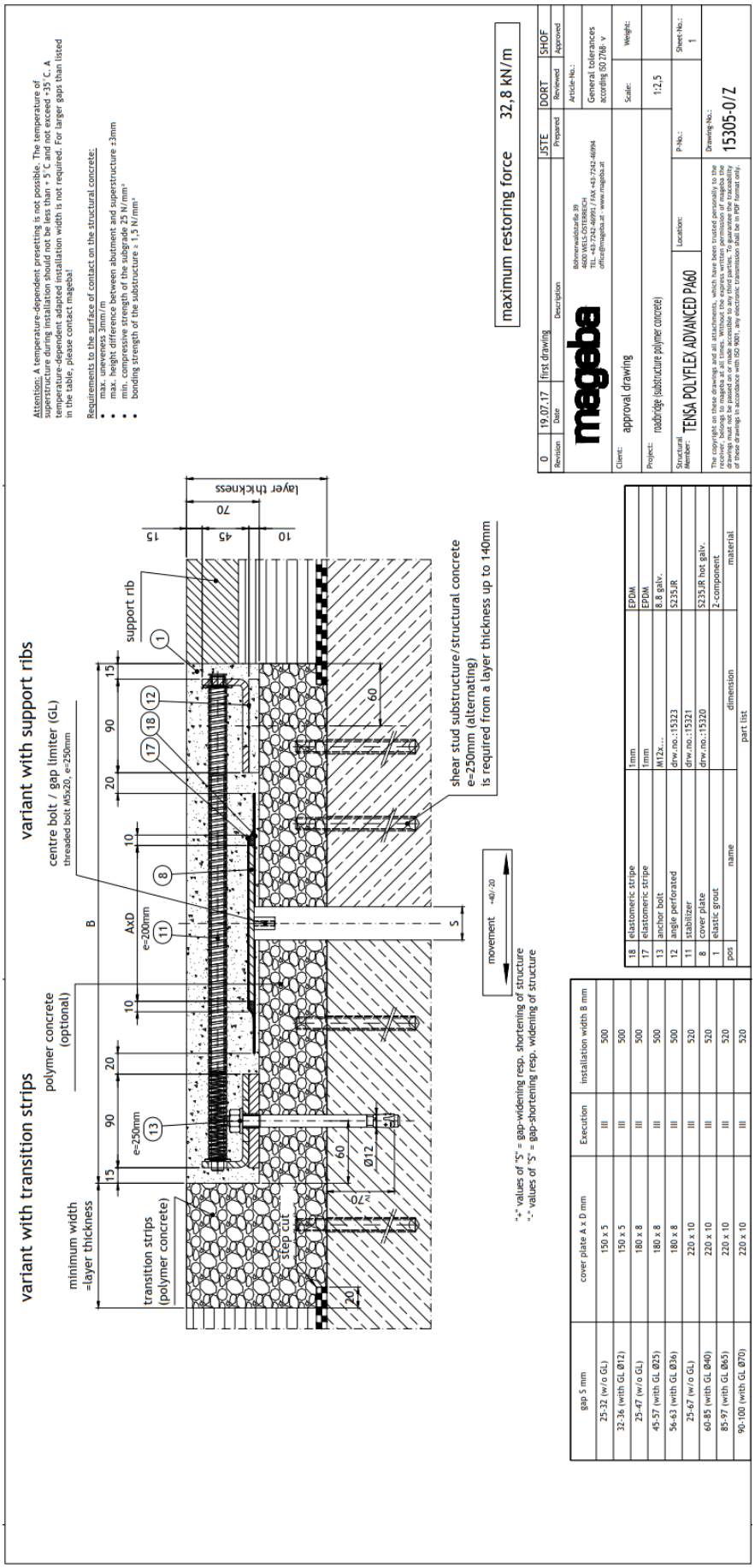
Revision	Date	Description	Prepared	Reviewed	Approved
1	22.03.18	installation height	JSTE	DORT	SHOF
0	19.07.17	first drawing	JSTE	DORT	SHOF

gap S mm	cover plate A x D mm	Execution	installation width B mm
19-31 (w/o GL)	120 x 5	II	360
29-36 (with GL Ø15)	120 x 5	II	360
19-46 (w/o GL)	150 x 5	II	390
46-54 (with GL Ø32)	150 x 5	II	390

pos	name	dimension	material
18	elastomeric stripe	1mm	EPDM
17	elastomeric stripe	1mm	EPDM
13	anchor bolt	M12x...	8.8 galv.
12	angle perforated	drw.no.:15322	S235JR
8	cover plate	drw.no.:15320	S235JR hot galv.
1	elastic grout		2-component

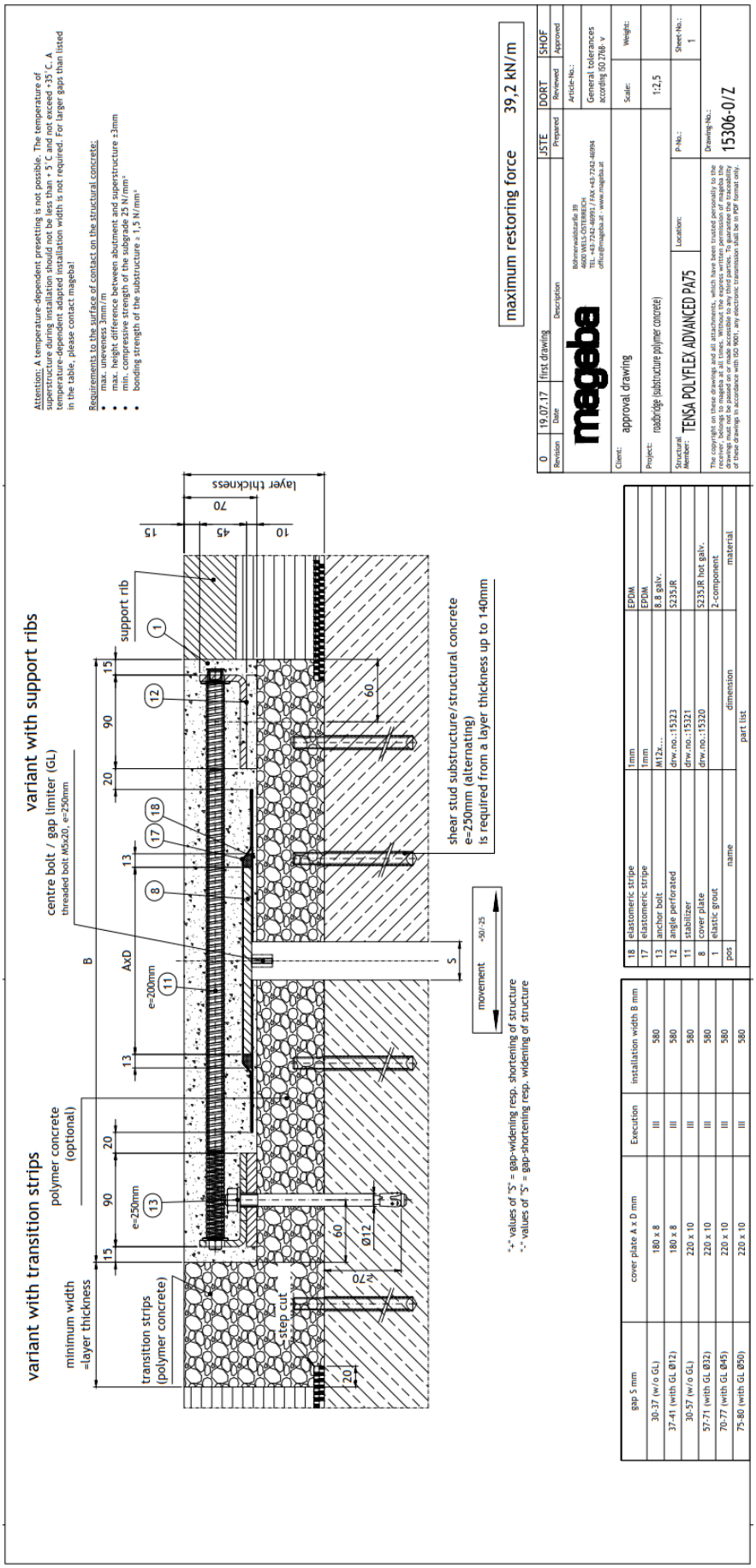
part list



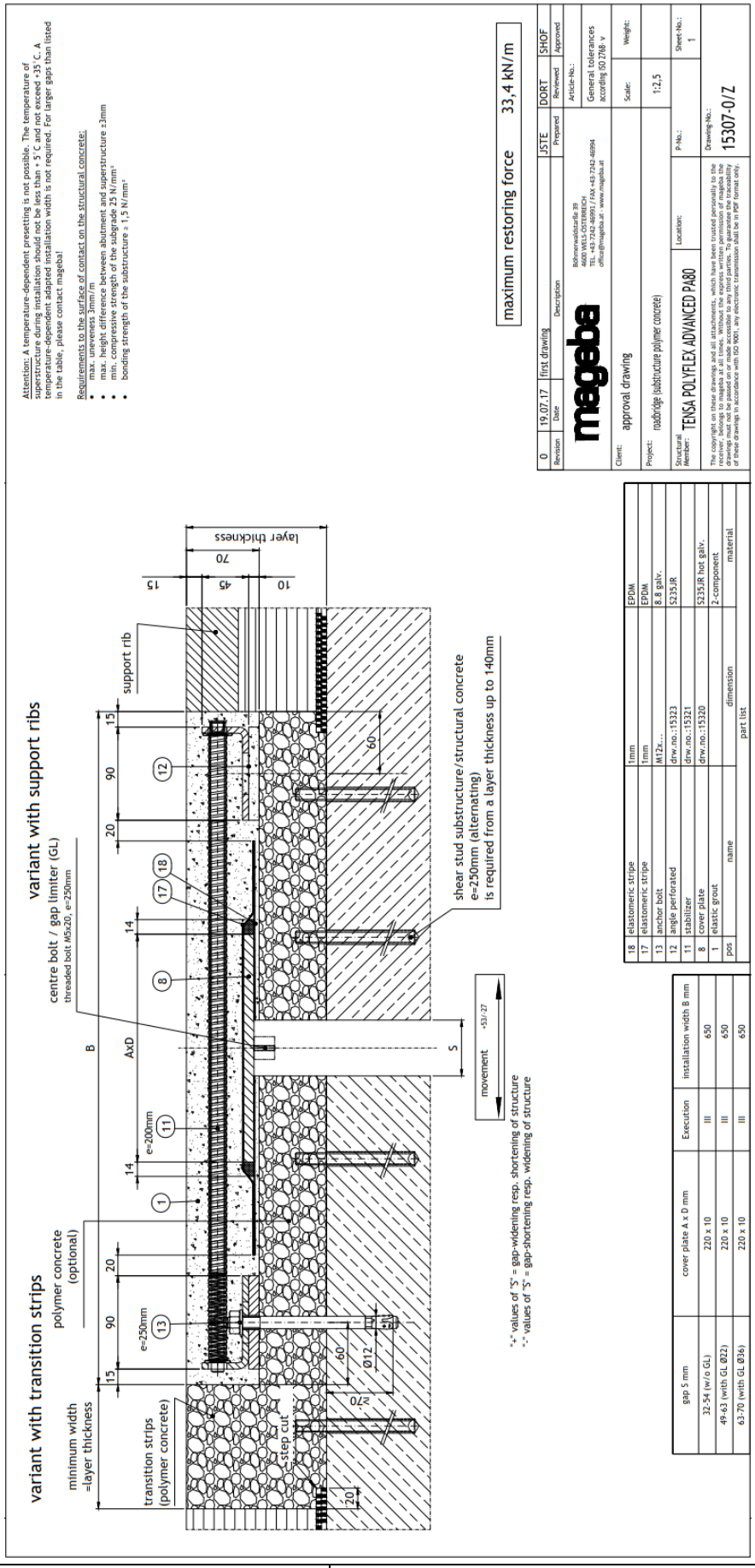


gap S mm	cover plate A x D mm	Execution	installation width B mm
25-32 (w/o GL)	150 x 5	III	500
32-36 (with GL Ø12)	150 x 5	III	500
25-47 (w/o GL)	180 x 8	III	500
45-57 (with GL Ø25)	180 x 8	III	500
56-63 (with GL Ø36)	180 x 8	III	500
25-67 (w/o GL)	220 x 10	III	520
60-85 (with GL Ø40)	220 x 10	III	520
85-97 (with GL Ø65)	220 x 10	III	520
90-100 (with GL Ø70)	220 x 10	III	520

pos	name	dimension	material
part list			
18	elastomeric stripe	1mm	EPDM
17	elastomeric stripe	1mm	EPDM
13	anchor bolt	M12x...	8.8 galv.
12	angle perforated	drw.no.:15323	S235JR
11	stabilizer	drw.no.:15321	
8	cover plate	drw.no.:15320	S235JR hot galv.
1	elastic grout		2-component



TENSA POLYFLEX® Advanced PU	**Annex A.7** of European Technical Assessment
Standard cross-section type PA75	ETA-12/0260



gap S mm	cover plate A x D mm	Execution	installation width B mm
32-54 (w/o GL)	220 x 10	III	650
49-63 (with GL Ø22)	220 x 10	III	650
63-70 (with GL Ø36)	220 x 10	III	650

pos	name	dimension	material
18	elastomeric stripe	1mm	EPDM
17	elastomeric stripe	1mm	EPDM
13	anchor bolt	M12x...	8.8 galv.
12	angle perforated	drw.no.:15323	S235JR
11	stabilizer	drw.no.:15321	
8	cover plate	drw.no.:15320	S235JR hot galv.
1	elastic grout		2-component

part list

Revision	Date	Description	Prepared	Reviewed	Approved
0	19.07.17	first drawing	JSTE	DORT	SHOF

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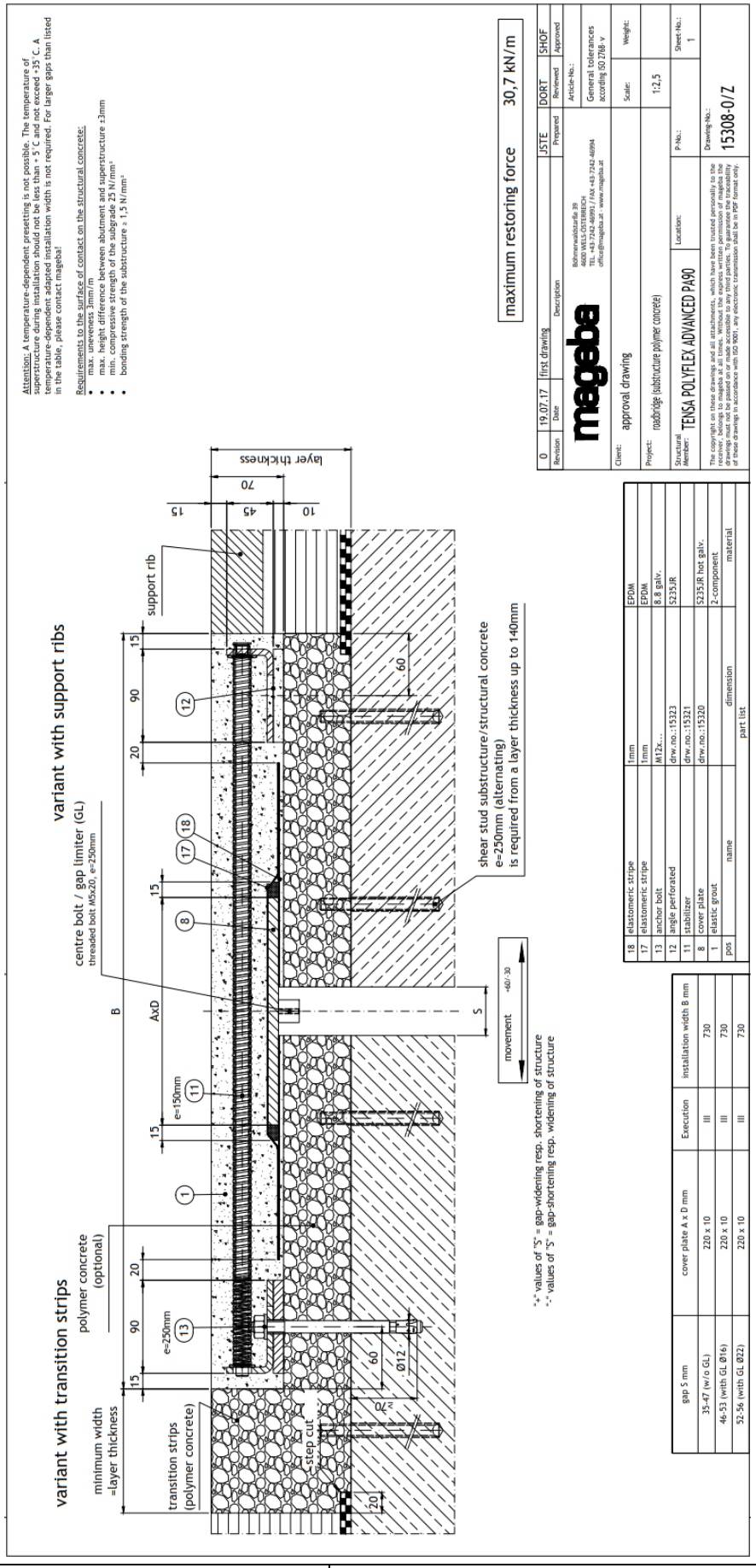
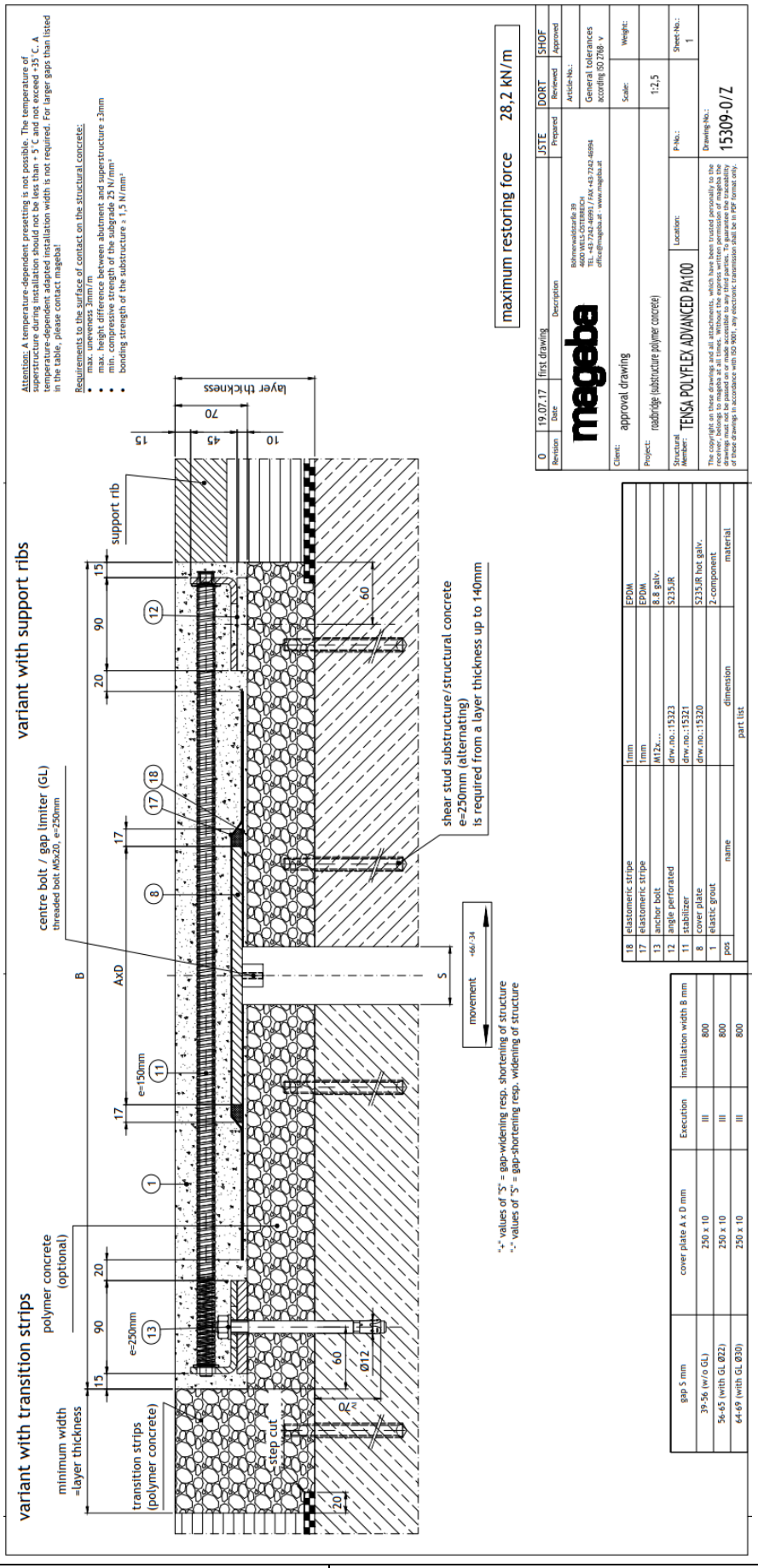
Article-No.:
General tolerances according ISO 2768- v
Scale:
Weight:
1:2,5
P-No.:
Sheet-No.: 1
Drawing-No.:



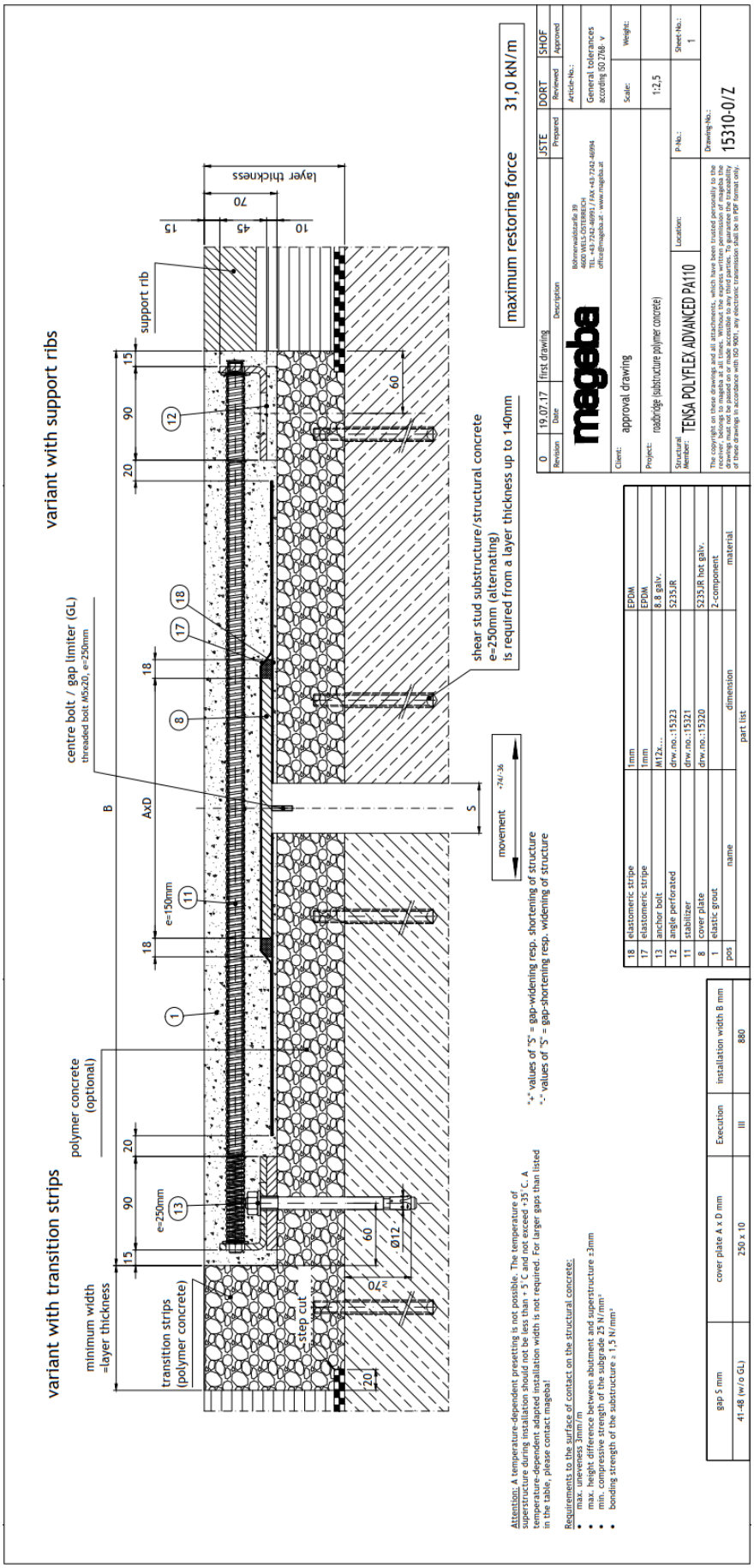
TENSA POLYFLEX® Advanced PU	**Annex A.9** of European Technical Assessment
Standard cross-section type PA90	ETA-12/0260



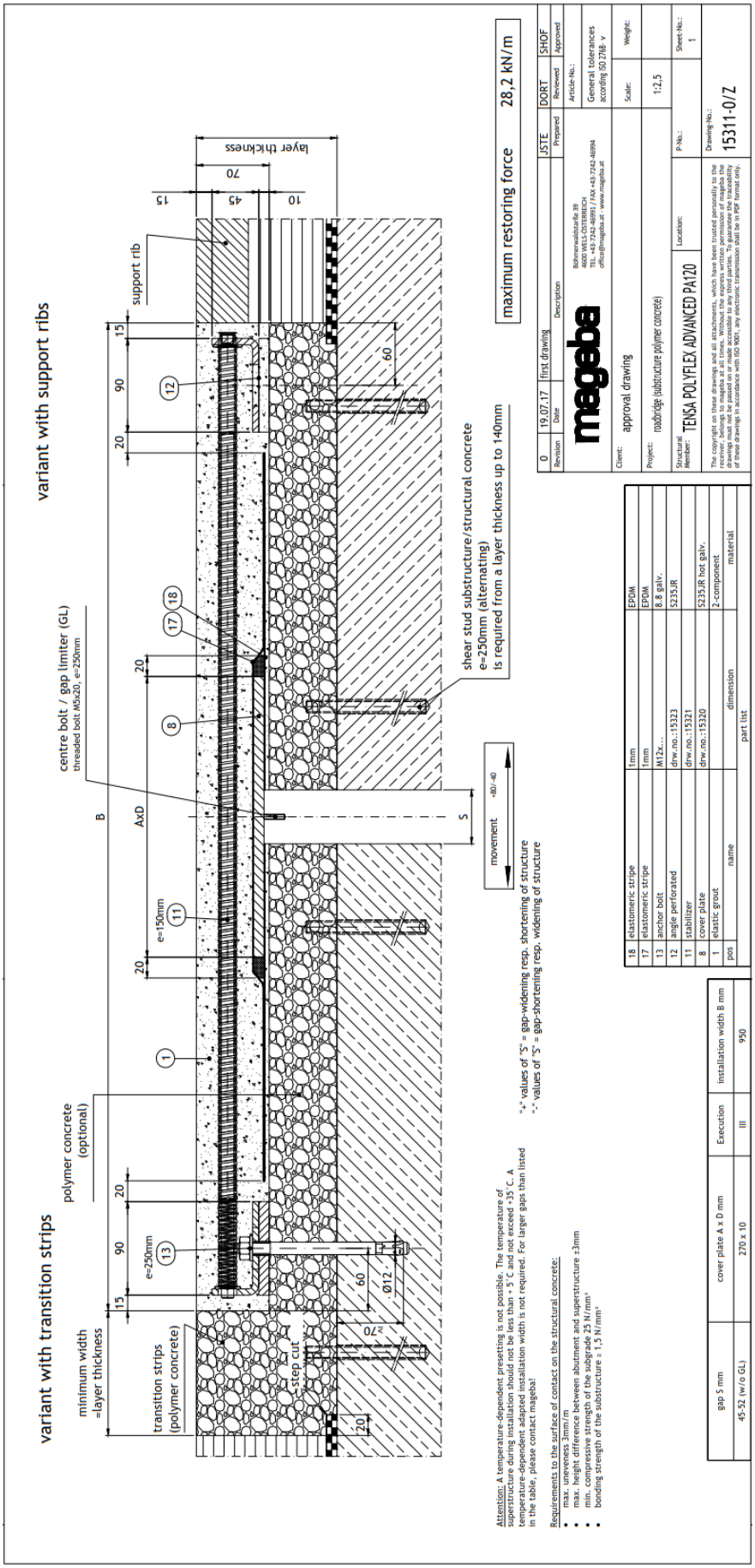
gap S mm	cover plate A x D mm	Execution	installation width B mm
39-56 (w/o GL)	250 x 10	III	800
56-65 (with GL Ø22)	250 x 10	III	800
64-69 (with GL Ø30)	250 x 10	III	800

pos	name	dimension	material
18	elastomeric stripe	1mm	EPDM
17	elastomeric stripe	1mm	EPDM
13	anchor bolt	M12x...	8.8 galv.
12	angle perforated	drw.no.:15323	S235JR
11	stabilizer	drw.no.:15321	
8	cover plate	drw.no.:15320	S235JR hot galv.
1	elastic grout		2-component

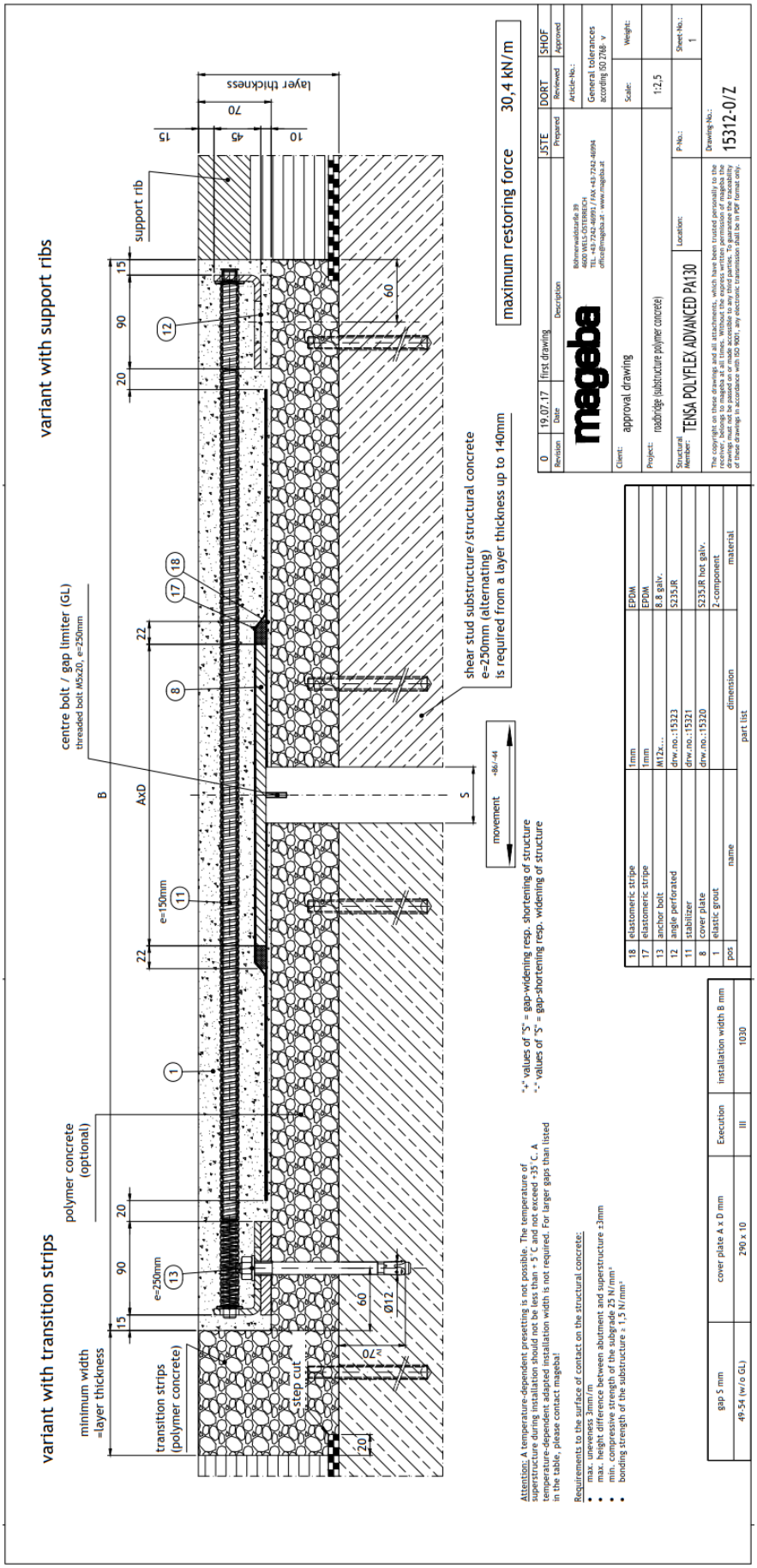
part list

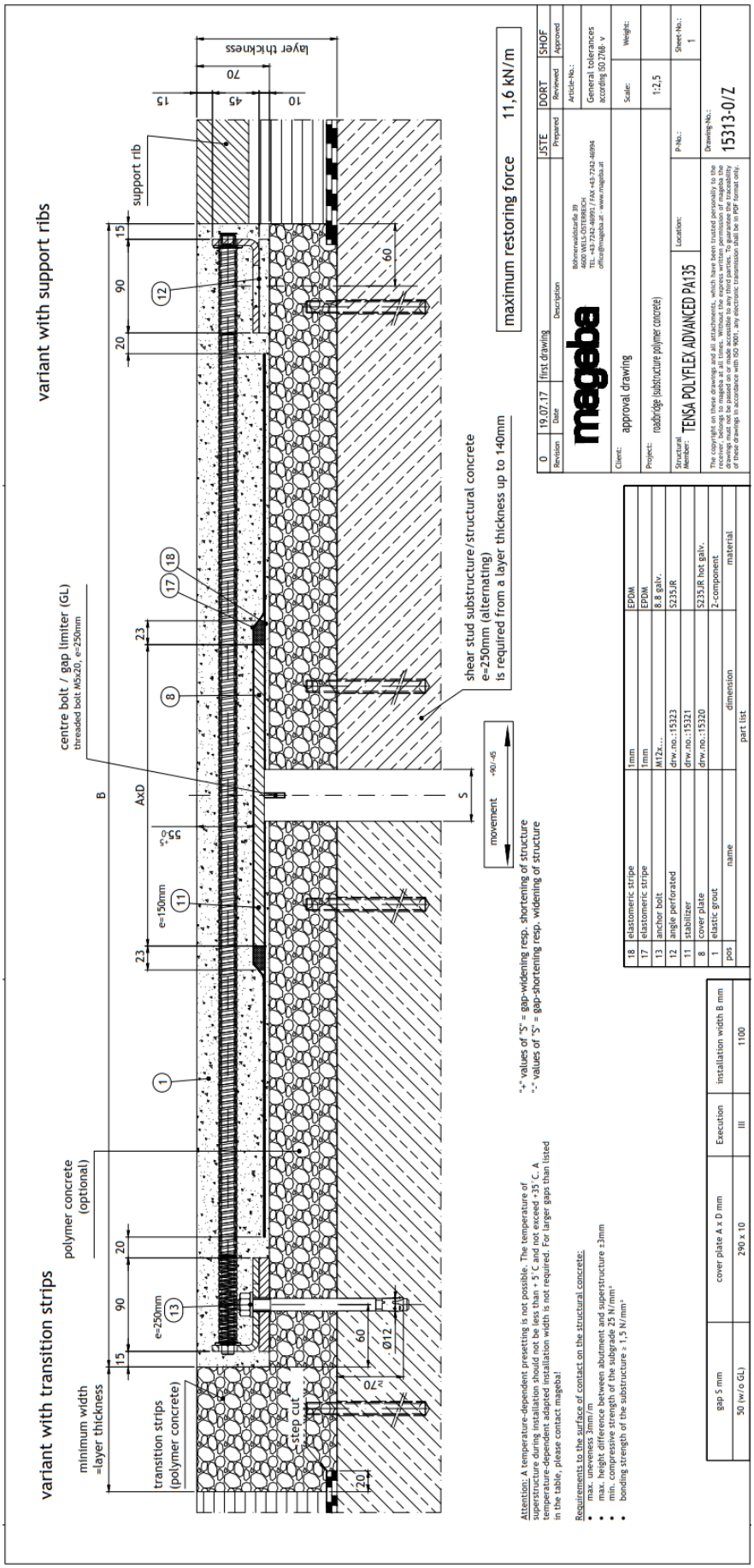


TENSA POLYFLEX® Advanced PU **Standard cross-section type PA110**	**Annex A.11** of European Technical Assessment ETA-12/0260

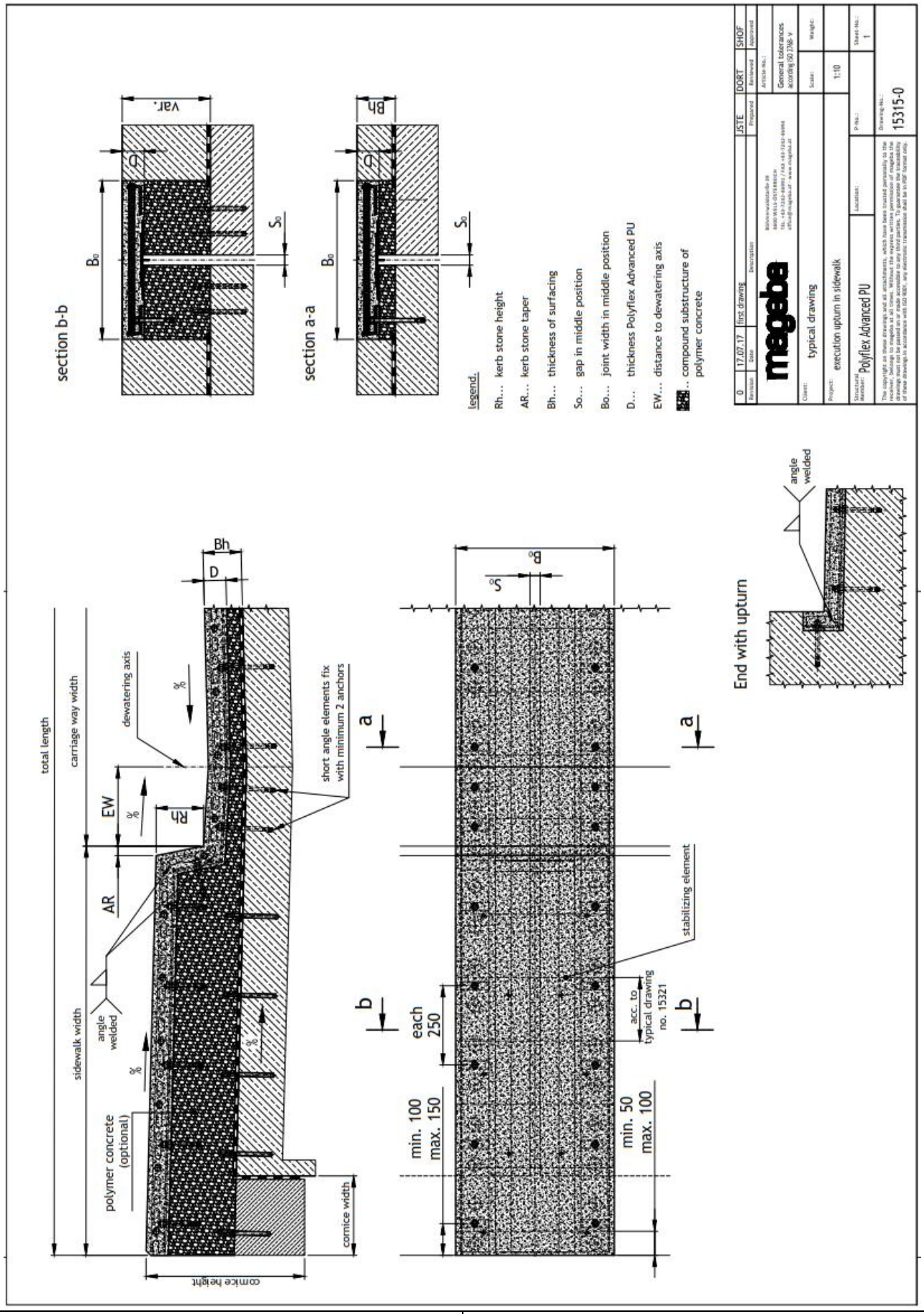


TENSA POLYFLEX® Advanced PU **Standard cross-section type PA120**	**Annex A.12** of European Technical Assessment ETA-12/0260

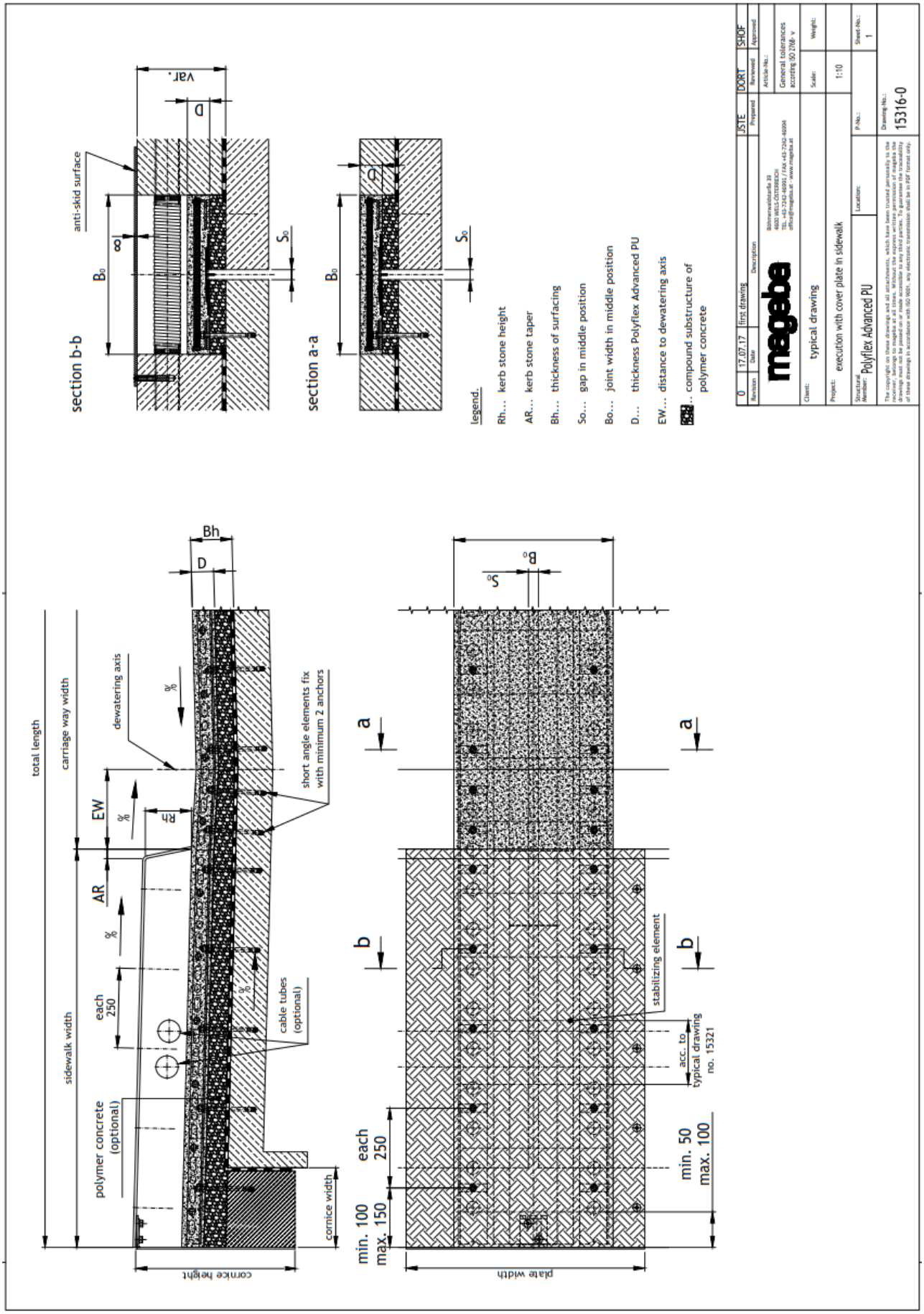




POLYFLEX® Advanced PU	**Annex A.14** of European Technical Assessment
Standard cross-section type PA135	ETA-12/0260

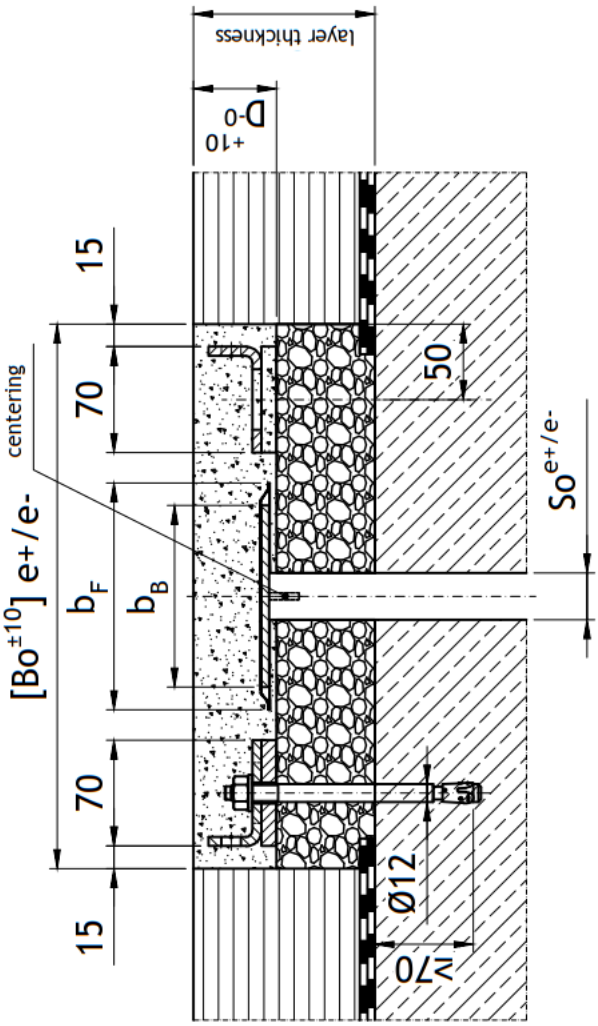


TENSA POLYFLEX® Advanced PU	**Annex B.1** of European Technical Assessment
Execution upturn in sidewalk	ETA-12/0260



TENSA POLYFLEX® Advanced PU	**Annex B.2** of European Technical Assessment
Execution with cover plate in sidewalk	ETA-12/0260

Member of EOTA

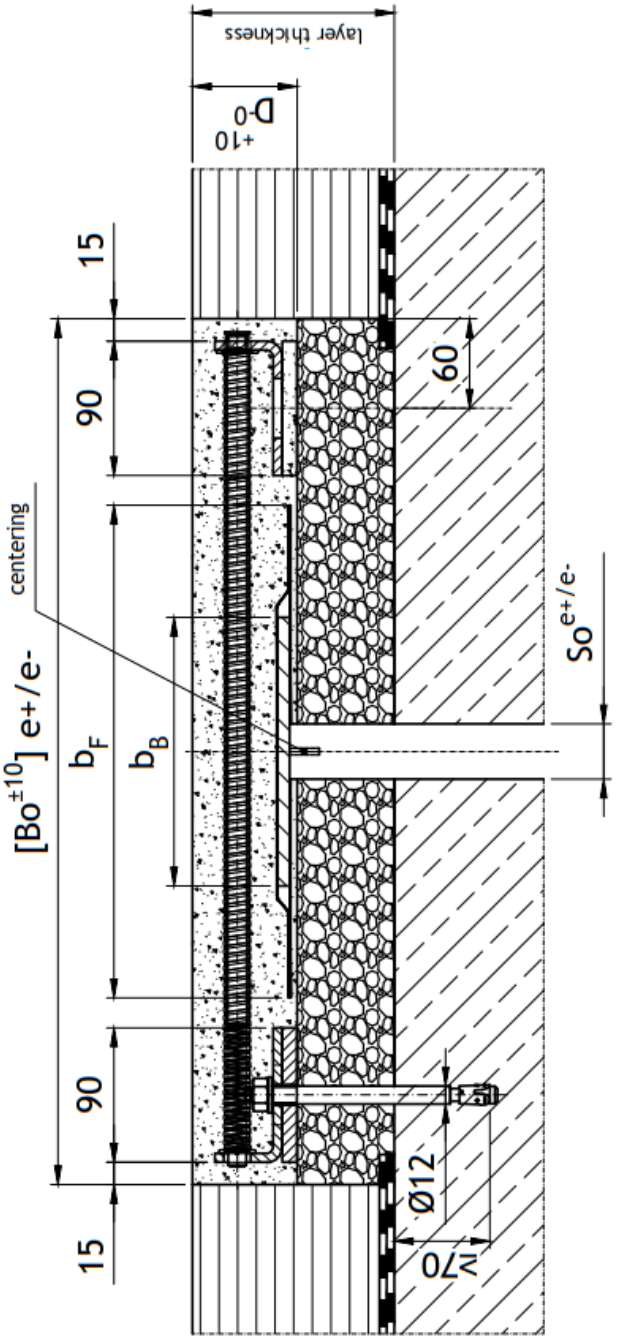


System Types PA15 to PA50
(without stabilizing elements)

	PA15	PA20	PA30	PA40	PA50
Total Movement e	15	20	30	40	50
Movement Tension e+	10	13	20	26	33
Movement Compression e-	5	7	10	14	17
Thickness D	60				
Joint Width in Middle Positon B_0	290 330	290 330	330 360	360 390	430 460
Gap at Middle Position S_0	10-36 10-60	12-27 12-67	15-47 15-60	19-36 19-54	22-47 22-77 22-100
Width cover plate b_B	80 120	80 120	120 150	120 150	150 180 220
Width sliding sheet b_F	80 120	80 120	120 150	150 180	220 250
Steel angle	70x45x6				

TENSA POLYFLEX® Advanced PU	**Annex C.1** of European Technical Assessment
PA15-PA50 restrained bridging plate	ETA-12/0260

Member of EOTA



System Types PA60 to PA135
(with stabilizing elememts)

	PA60 [mm]	PA75 [mm]	PA80 [mm]	PA90 [mm]	PA100 [mm]	PA110 [mm]	PA120 [mm]	PA130 [mm]	PA135 [mm]
Total Movement e	60	75	80	90	100	110	120	130	135
Movement Tension e+	40	50	53	60	66	74	80	86	90
Movement Compression e-	20	25	27	30	34	36	40	44	45
Thickness D	70								
Joint Width in Middle Positon B_0	500	580	650	730	800	880	950	1030	1100
Gap at Middle Position S_0	22-36	30-41	32-70	35-56	39-69	41-48	45-52	49-54	50
Width cover plate b_B	150	180	220	220	250	250	270	290	290
Width sliding sheet b_F	250	330	400	480	550	630	700	780	850
Steel angle	90x55x6								
Stabilizing element distance eS	200				150				

TENSA POLYFLEX® Advanced PU	**Annex C.2** of European Technical Assessment
PA60-PA135 restrained bridging plate	ETA-12/0260

Table D.1: Material characteristics of the joint filling material Polyflex 60A

Performance characteristic	Technical specification	Result
Hardness Shore A of hardened mixture	EN ISO 868 in conjunction with ISO 7619-1/-2	72
Tensile stress of hardened mixture before ageing	EN ISO 527-2	11 N/mm² (Minimum mean value)
Elongation at tensile strength of hardened mixture before ageing	EN ISO 527-2	700 % (Minimum mean value)

Table D.2: Assessment of bond strength to support “concrete” for joint filling material Polyflex 60A without surface dressing

Mode of failure	Failure percentage (%)	Bond strength
Cohesive failure of support	--	1,0 N/mm²
Adhesive failure between support and primer	50	
Adhesive failure between primer and joint filling material	30	
Cohesive failure in joint filling material	--	
Combination of above-mentioned failure modes	20	

Reference documents

EAD 120011-01-0107 “Flexible plug expansion joints for road bridges with flexible filling based on a synthetic polymer as binder”

ETAG 032-1 “Guideline for European technical approval for expansion joints for road bridges - Part 1: General”, edition May 2013, used as European Assessment Document (EAD)

EN 1991-2/AC:2010 “Eurocode 1. Actions on structures – Part 2: Traffic loads on bridges”

EN 1993-1-10/AC:2009 “Eurocode 3: Design of steel structures - Part 1-10: Material toughness and through-thickness properties”

EN 10025-2:2004+AC:2005 “Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels”

EN 13501-1:2007+A1:2009 “Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests”

EN ISO 527-2:2012 “Plastics - Determination of tensile properties - Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:2012)”

EN ISO 1461:2009 “Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461:2009)”

EN ISO 868:2003 “Plastics and ebonite - Determination of indentation hardness by means of a durometer (Shore hardness)”

EN ISO 14713-1: 2017 ”Zinc coatings – Guidelines and recommendations for the protection against corrosion of iron and steel in structures – Part 1: General principles of design and corrosion resistance (ISO 14713-1:2017)”

ISO 7619-1:2010 “Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 1: Durometer method (Shore hardness)”

ISO 7619-2:2010 “Rubber, vulcanized or thermoplastic - Determination of indentation hardness - Part 2: IRHD pocket meter method”