



U.S. Department
of Transportation
**Federal Highway
Administration**

January 12, 2006

400 Seventh St., S.W.
Washington, D.C. 20590

In Reply Refer To:
HSA-10/B-142

Mr. David A. Hubbell
Managing Member
Composite Structural Design, LLC
P.O. Box 600
Saranac Lake, New York 12983

Dear Mr. Hubbell:

In two e-mailed letters dated February 17 and 23, 2005, to Mr. Richard Powers of my staff, you requested acceptance of an all-steel European roadside barrier called the Max-Rail for use on the National Highway System (NHS) as a test level 5 (TL-5) barrier. To support this request, you also sent copies of test reports (with English text translations) BAST/94 7 D 003/ELL and BAST/94 7 D 004/ELL prepared by the German testing agency BAST. These reports documented EN 1317 tests TB 11 and TB 81, respectively. For test TB 11, a 900-kg passenger car impacted the Max-Rail at a 20-degree angle and a speed of 100 km/h. For test TB 81, a 38,000-kg flatbed tractor-trailer was directed into the rail at a 20-degree angle and a speed of 65 km/h.

The Max-Rail, shown schematically in Enclosure 1, consists of 2.7-m long steel C-125 posts on 1.33-m centers (Enclosure 2), trapezoidal offset blocks (Enclosure 3), and upper and lower C-channel rail elements (Enclosure 4), with a "corrugated" steel beam (Enclosure 5) bolted to the lower C-channel element. The barrier is backed by three 20-mm diameter wire ropes. These ropes and the top beam element are anchored to a 1050-mm by 1050-mm by 800-mm concrete block using specially fabricated mounting hardware. The effective height of the Max-Rail is 1150 mm.

As initially noted, the MAX-Rail was tested and approved under the European EN 1317 testing and evaluation criteria to test level H4b using a small passenger car and a tractor-trailer (flatbed trailer). The small car test is essentially equivalent to the National Cooperative Highway Research Program (NCHRP) Report 350 test 5-10. The tractor-trailer used in TB 81, while different from the comparable Report 350 test truck and for which the ballast center of gravity height and other dimensions could only be estimated, may be considered an acceptable substitute for the NCHRP tractor-trailer in this instance only because the test impact severity was in excess of that recommended in Report 350 for test 5-12, and because a 1070-mm high



rigid barrier has successfully been shown to contain the Report 350 tractor-trailer. When impacting a higher, semi-rigid barrier, the resultant roll angle can be expected to be lower. The tractor-trailer was contained and redirected by the Max-Rail with only a moderate roll angle and with minimal damage to the vehicle itself. The dynamic deflection of the Max-Rail was reported to be 1.65 m.

Please be advised that it is not my intention to set or further any precedent by accepting the European tests in lieu of Report 350 tests and any future requests for “equivalent” tests, if considered at all, will be reviewed on a case-by-case basis. Based on the information you submitted, I agree the MAX-Rail, as tested, may be considered as having met NCHRP Report 350 evaluation criteria and may be used conditionally on the NHS as a test level 5 (TL-5) barrier. Based on reported results of the tests that were conducted by BASt and on the shape of the barrier, I am willing to consider the MAX-Rail as a TL-5 barrier without a pickup truck test and without a 9000-kg single-unit truck test.

Since the MAX-Rail is a steel product and is proprietary, the provisions of Title 23, Code of Federal Regulations Sections 635.410 and 635.411 are applicable. Note that the “Buy America” provisions apply to all steel products that are permanently incorporated into highway projects.

Because the Max-Rail is a European design and drawings in standard U.S. dimensions and nomenclature have not been provided, you must certify to any users that the barrier provided for installation is identical to that which was tested, particularly in regard to its steel components and its concrete anchorage. Detailed shop drawings and materials specifications for all barrier components and connections, described in English, must be provided to any contracting agency prior to advertising a project in which the Max-Rail is proposed. If U.S. steel specifications are provided, each structural element must be shown to be equal or better than its tested European counterpart. An in-service evaluation should be made for the first U.S. installation(s) to establish cost and installation data, and to verify acceptable crash performance over time. My staff will review the evaluation report and consider upgrading the Max-Rail acceptance to fully acceptable at that time.

Please note the following additional qualifications that apply to the FHWA hardware acceptance letters:

- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed or inaccurately reported, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- To prevent misunderstanding by others, this letter of acceptance, designated as acceptance letter B-142, shall not be reproduced except in full. As this letter and the

documentation which supports it become public information, it will be available for inspection at our office by any interested parties.

- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. This acceptance letter pertains only to the crashworthiness characteristics of the barrier, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

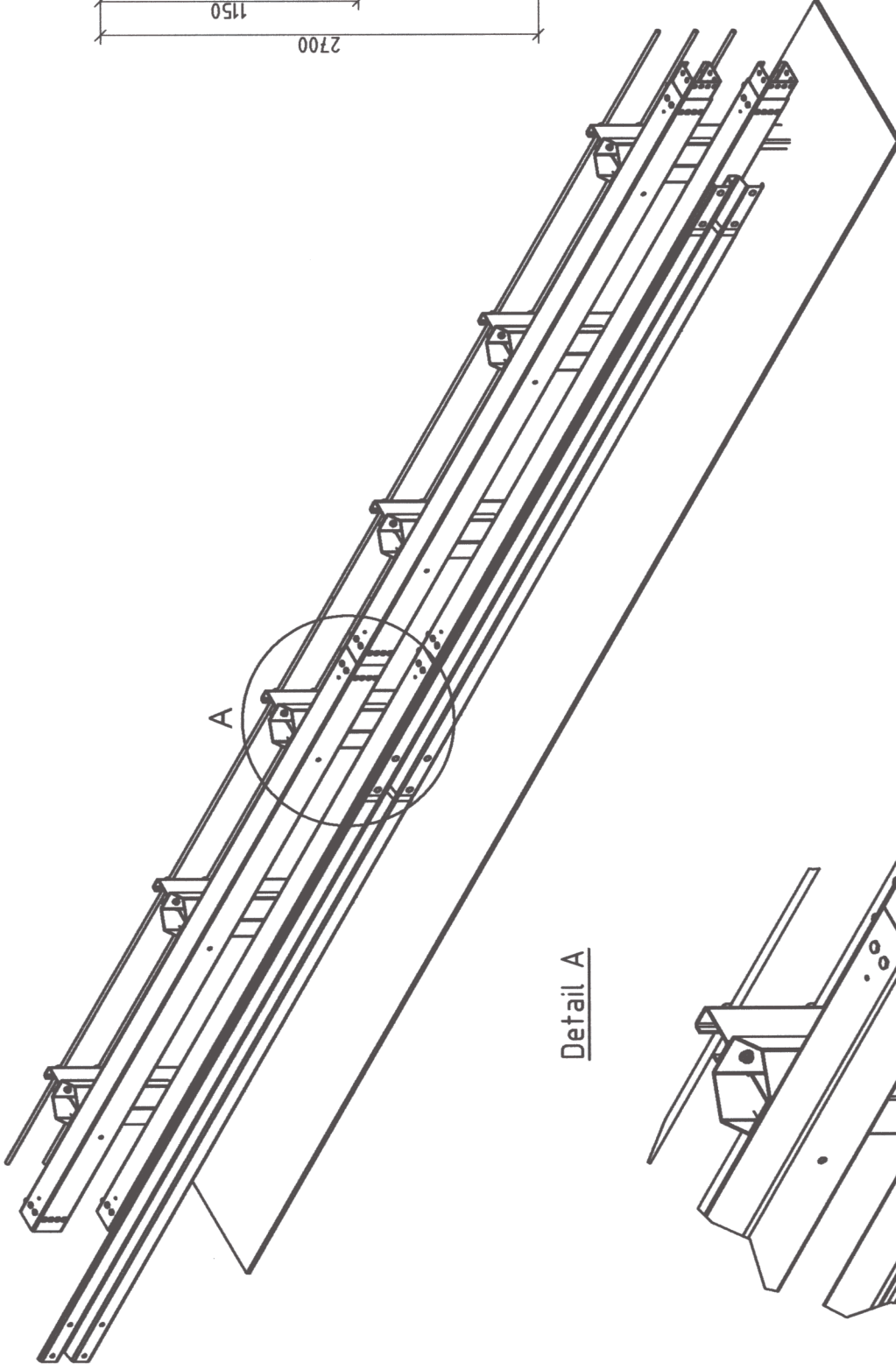
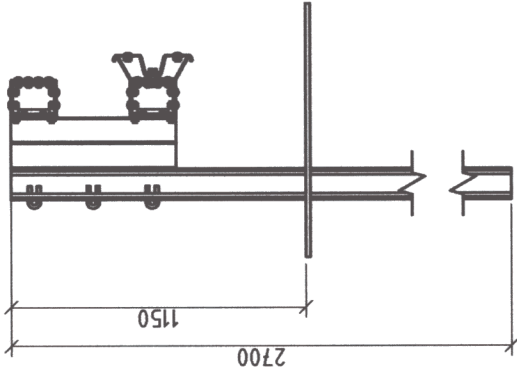
Sincerely yours,

/original signed by/

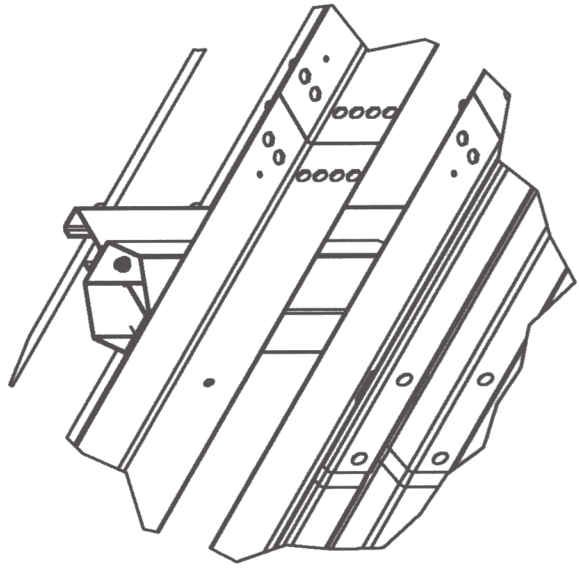
John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

5 Enclosures

Section



Detail A



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Geprüft			
Norm gepr.			
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Geprüft			
Norm gepr.			
Maßstab:	1:20		

SGGT
STRASSENBAU-ANLAGEN
GMBH

Bühnenstraße 35
F.R. 49824008-0
Info Mail: www.sgg.de
E-Mail: info@sgg.de

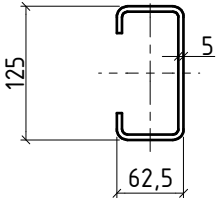
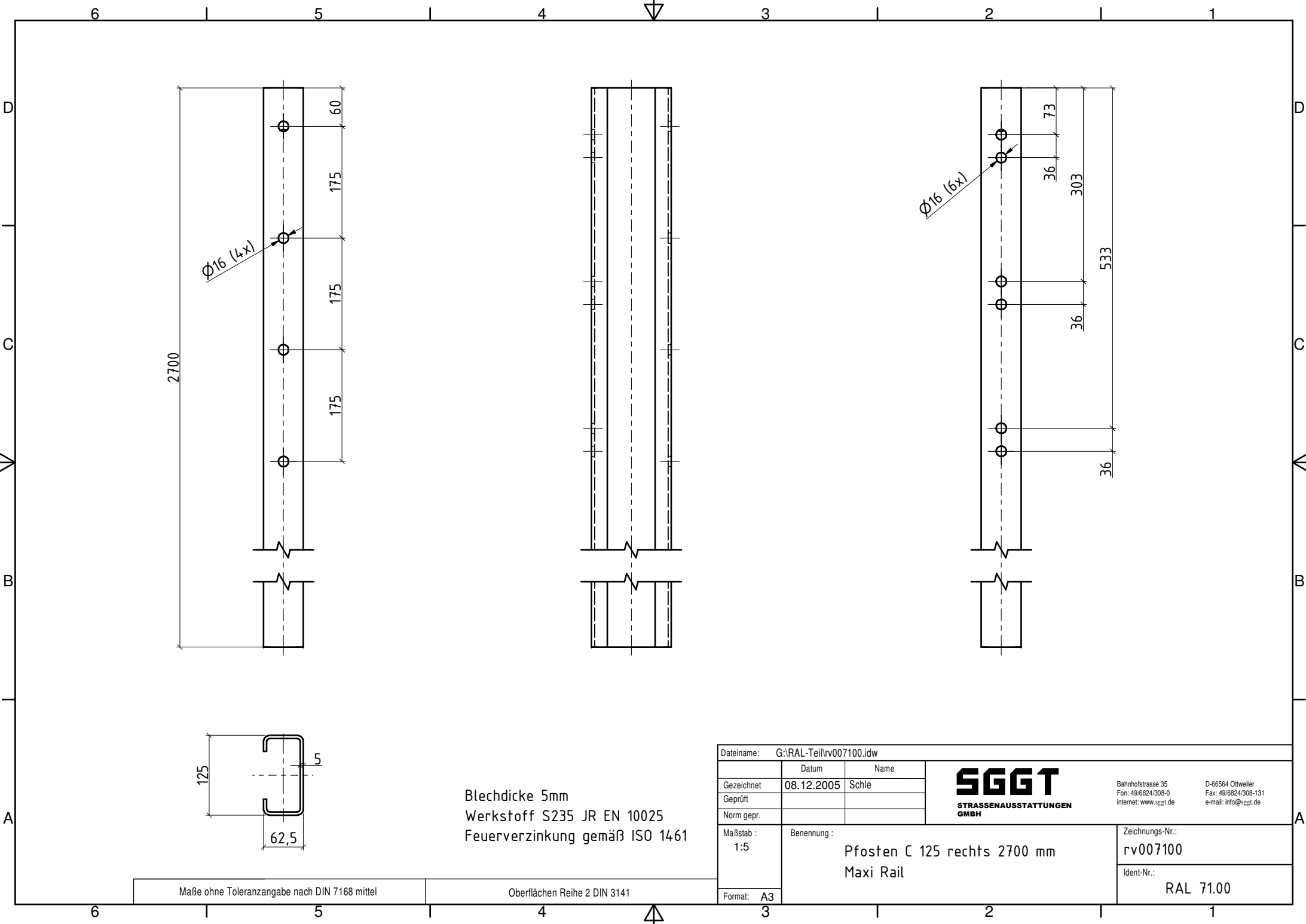
Zeichnungs-Nr.:
131002
Ident-Nr.:

Benennung: **MAXI RAIL**
Containment Level H4b

Format: A3

Oberflächen Reihe 2 DIN 3141

Maße ohne Toleranzangabe nach DIN 7168 mittel

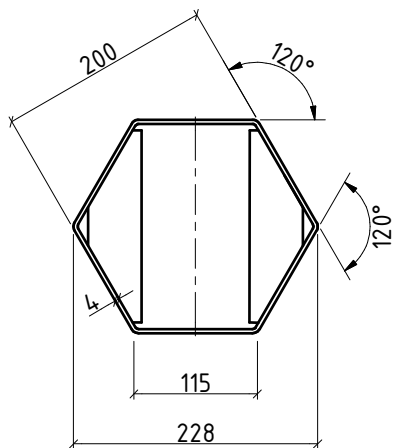
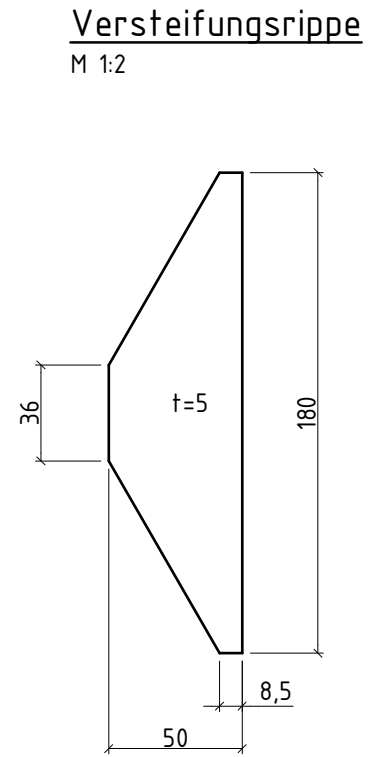
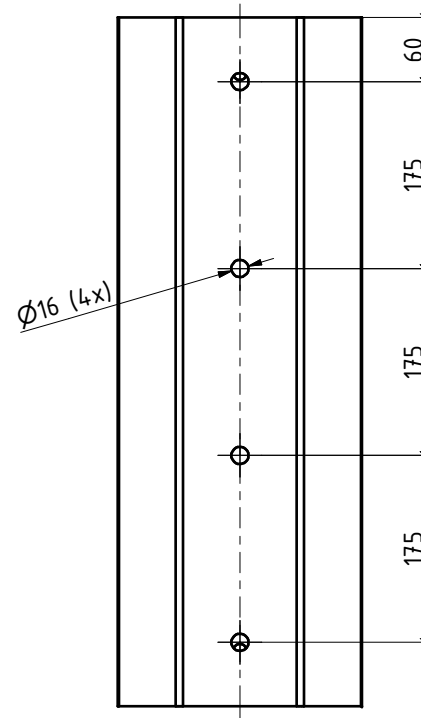
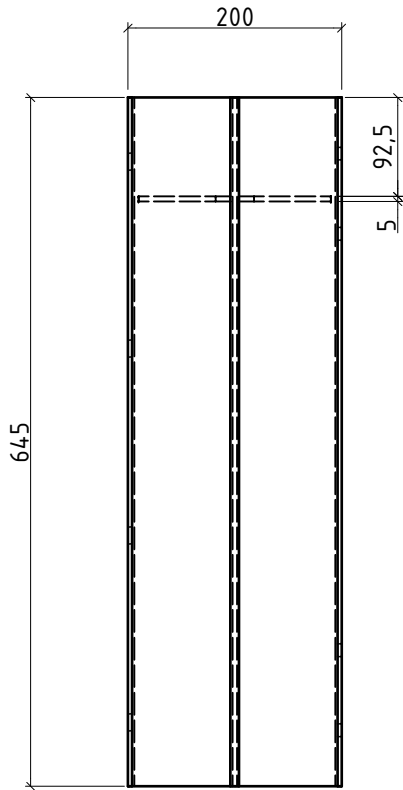
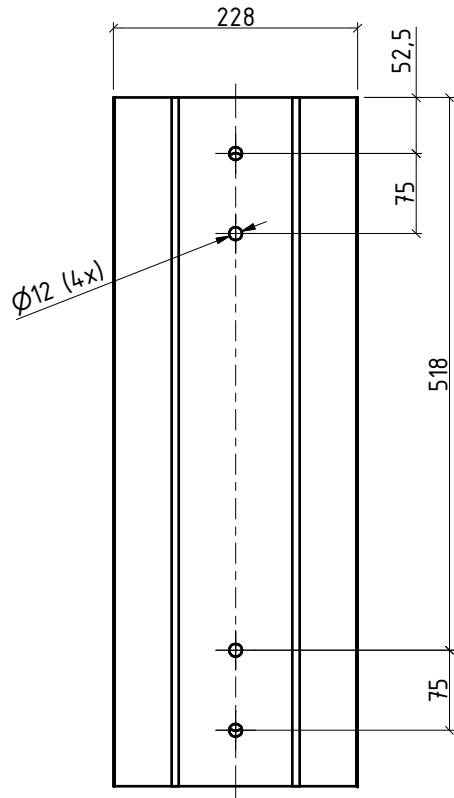


Blechdicke 5mm
 Werkstoff S235 JR EN 10025
 Feuerverzinkung gemäß ISO 1461

Maße ohne Toleranzangabe nach DIN 7168 mittel

Oberflächen Reihe 2 DIN 3141

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Geprüft					Ident-Nr.:		RAL 71.00	
Norm gepr.					Benennung:		Pfosten C 125 rechts 2700 mm Maxi Rail	
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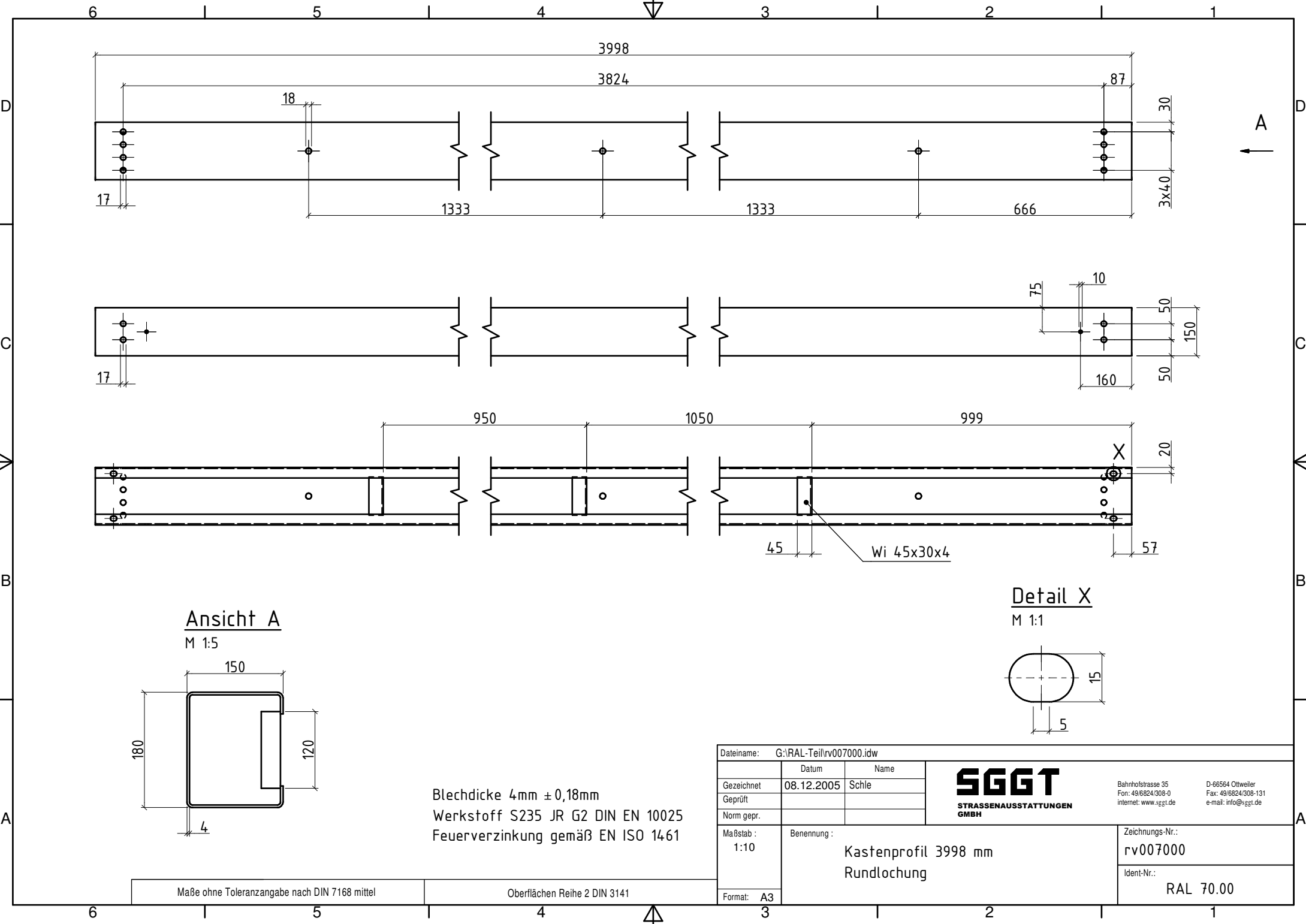


Blechdicke 4mm ± 0,18mm
Werkstoff S235 JR G2 DIN EN 10025
Feuerverzinkung gemäß EN ISO 1461

Maße ohne Toleranzangabe nach DIN 7168 mittel

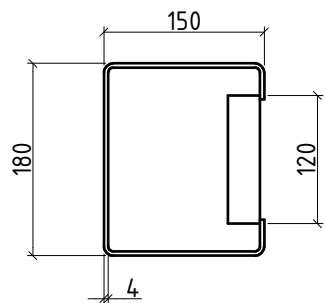
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Geprüft									Zeichnungs-Nr.: rv007010			
Norm gepr.									Ident-Nr.: RAL 70.10			
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Ansicht A

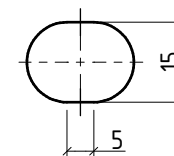
M 1:5




Blechdicke 4mm ± 0,18mm
 Werkstoff S235 JR G2 DIN EN 10025
 Feuerverzinkung gemäß EN ISO 1461

Detail X

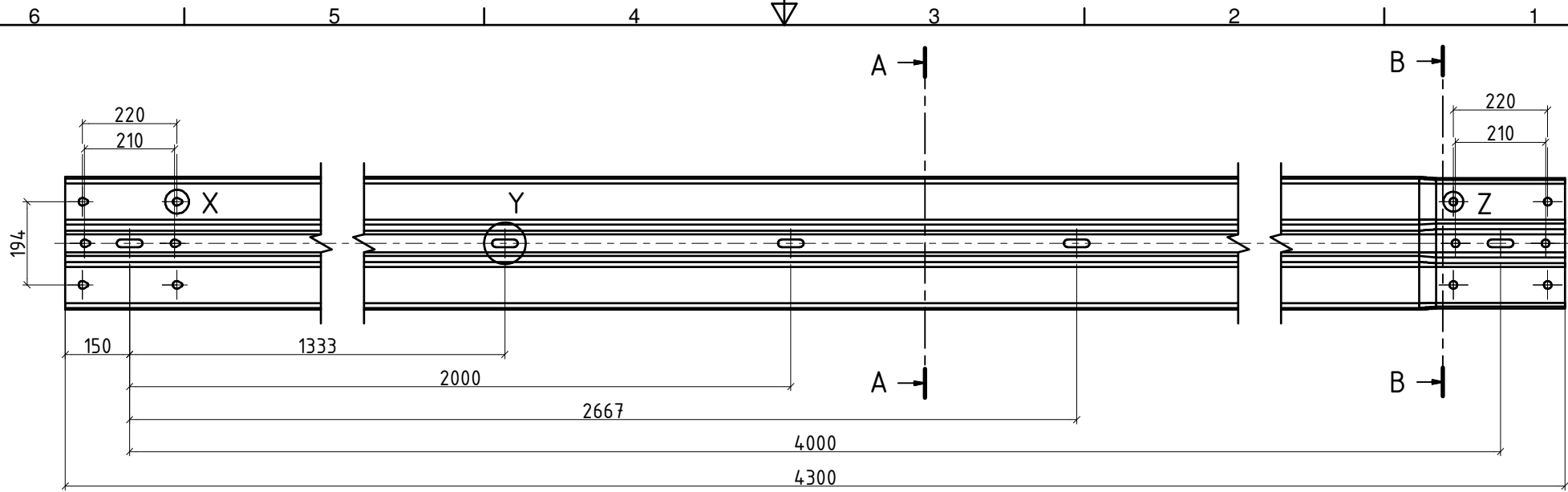
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Geprüft							
Norm gepr.							
Maßstab : 1:10	Benennung : Kastenprofil 3998 mm Rundlochung			Zeichnungs-Nr.: rv007000			
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Maße ohne Toleranzangabe nach DIN 7168 mittel

Oberflächen Reihe 2 DIN 3141



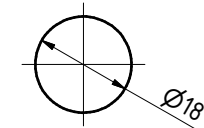
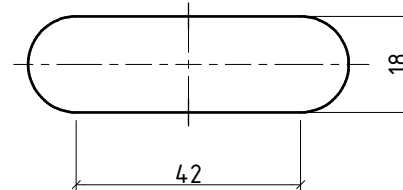
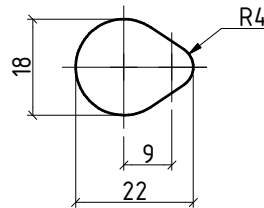
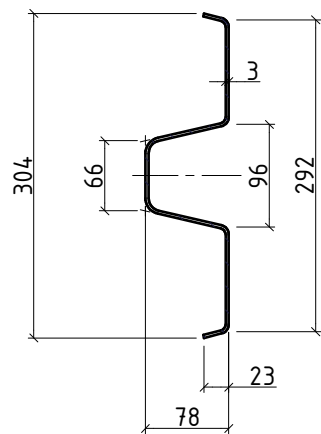
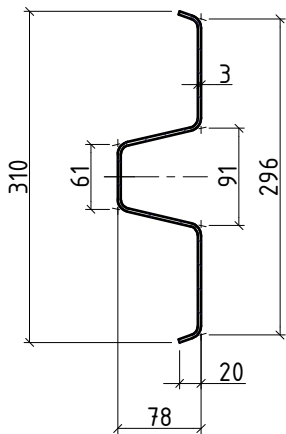
Schnitt A-A
M 1:5

Schnitt B-B
M 1:5

Detail X
M 1:1

Detail Y
M 1:1


Detail Z
M 1:1



Blechdicke 3mm ± 0,17mm
Werkstoff S235 JR G2 DIN EN 10025
Feuerverzinkung gemäß EN ISO 1461

Maße ohne Toleranzangabe nach DIN 7168 mittel

Oberflächen Reihe 2 DIN 3141

Dateiname: G:\RAL-Teilrv000200.idw				Bahnhofstrasse 35 Fon: 49/6824/308-0 internet: www.sgggt.de		D-66564 Ottweiler Fax: 49/6824/308-131 e-mail: info@sggt.de			
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Format: A3				rv000200					
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