

Andreas H. Rüttschlin

Adelhauserstraße 10
79618 Rheinfelden

andreas@ruetschlin.de

Tel.: 07623-47191

Fax.: 07623-47255

Statische Berechnung

Aluminiumverbundabdeckung

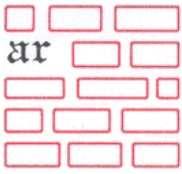
BAUHERR AVA-Innovation
Allmendstraße 7
77948 Friesenheim

PROJEKT Aluminiumverbundabdeckung

AZ 19259_1a

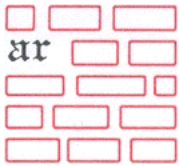
Aluminium Allwetterbelag.

Die Berechnung betrachtet die Aludiele in 1m Breite verlegt.
Berechnet wird das Element als Dachbelag und als Terrassenbelag.



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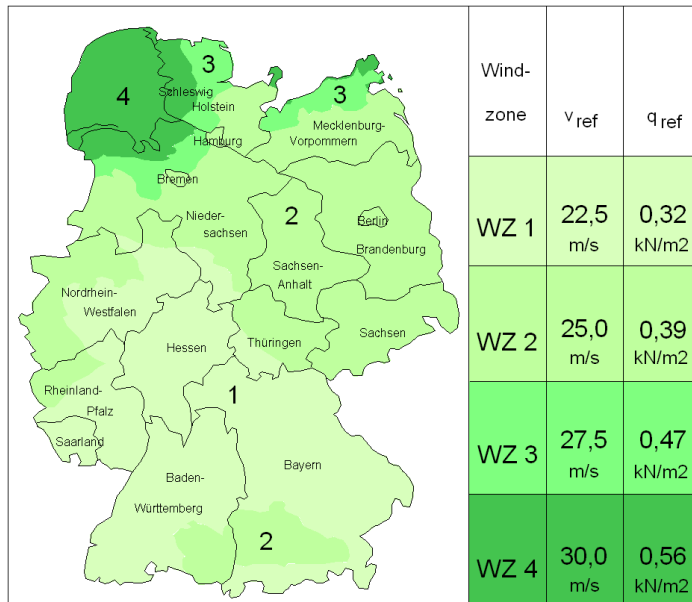
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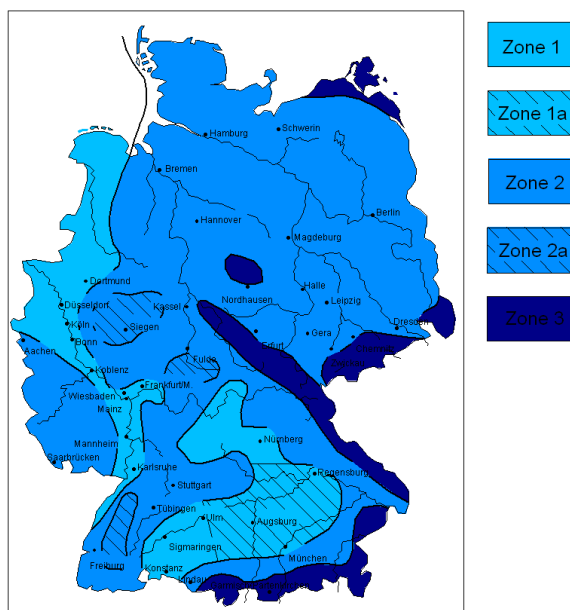
Pos. ALLa01 **Wind- und Schneelastzonen**

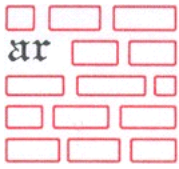
Gebäude				
Gebäudestandort	Postleitzahl	PLZ =	77948	
	Ortsname	Ort =	Friesenheim	
Gemeinde	Gemeindeschlüssel	AGS =	08317031	
	Kreis	Ortenaukreis		
	Bundesland	Baden-Württemberg		
Geodätische Daten	Geogr. Breite	=	48.37388	°
	Geogr. Länge	=	7.88410	°
Geograf. Daten	Geländehöhe ü. NN	H _s =	159.00	m
	Windzone	WZ =	1	
	Schneelastzone	SLZ =	1	
	char. Schneelast	S _k =	0.65	kN/m ²

Übersicht Wind



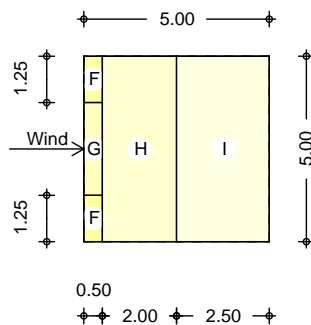
Übersicht Schnee



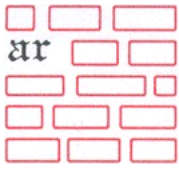


Pos. ALLa02 Flachdach mit Schnee u. Wind für Regelfall

System	Gebäudedaten		
Abmessungen	Gebäudebreite	B =	5.00 m
	Gebäudelänge	L =	5.00 m
	Gebäudehöhe (Höhe Flachdach)	H =	10.00 m
Geograf. Angaben	Geländehöhe über NN	A =	159.00 m
	Windzone	WZ =	1
	Schneelastzone	SLZ =	1
	Standort		Binnenland
Geometrie	Flachdach		
	scharfkantiger Traufbereich		
Wandöffnungen	geschlossene Außenwände		
Einwirkungen	Einwirkungen nach DIN EN 1990:2010-12		
Qk.S	Schnee- und Eislasten für Orte bis NN + 1000 m		
	Schneeeinwirkung		
	Qk.S min/max Werte		
Qk.W	Windlasten		
	Qk.W min/max Werte		
Windlasten	Windlastermittlung nach DIN EN 1991-1-4:2010-12		
	Ermittlung im Regelfall nach NA.B.3.3		
	Anströmrichtung 0° auf Traufe links		
	Basiswindgeschwindigkeit	$v_{b,0}$ =	22.50 m/s
	Basisgeswindigkeitsdruck	$q_{b,0}$ =	0.32 kN/m ²
	Bezugshöhe	z_e =	10.00 m
	Geschwindigkeitsdruck	q_p =	0.54 kN/m ²
	Lasteinflussfläche	A =	10.00 m ²
Qk.W.000	Bereichsgröße	e =	5.00 m
F] W] h] b] [' 1\$š			
M 1:200			



Bereich	d [m]	b [m]	$C_{pe,1}$ [-]	$C_{pe,10}$ [-]	$W_{e,10}$ [kN/m ²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

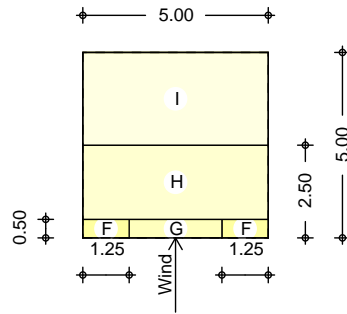


Qk. W. 090
F] WXhi b[1- \$\$

Bereichsgröße

e = 5.00 m

M 1: 200



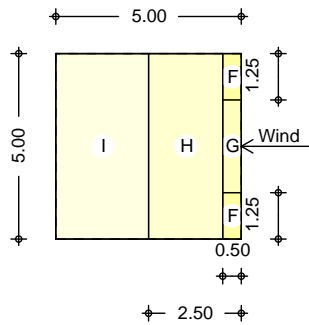
Bereich	d [m]	b [m]	C _{pe, 1} [-]	C _{pe, 10} [-]	We _{e, 10} [kN/m ²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

Qk. W. 180
F] WXhi b[1% \$\$

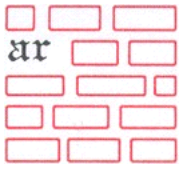
Bereichsgröße

e = 5.00 m

M 1: 200



Bereich	d [m]	b [m]	C _{pe, 1} [-]	C _{pe, 10} [-]	We _{e, 10} [kN/m ²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

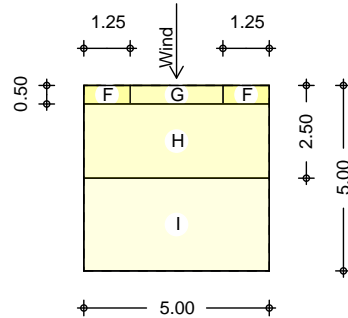


Qk. W. 270
F] W hi b[' 1&+\$\$

Bereichsgröße

e = 5.00 m

M 1: 200



Bereich	d [m]	b [m]	Cpe, 1 [-]	Cpe, 10 [-]	We, 10 [kN/m²]
F	0.50	1.25	-2.50	-1.80	-0.98
G	0.50	2.50	-2.00	-1.20	-0.65
H	2.00	5.00	-1.20	-0.70	-0.38
I -	2.50	5.00	-0.60	-0.60	-0.33
I +	2.50	5.00	0.20	0.20	0.11

Schneelasten

Schneelastermittlung nach DIN EN 1991-1-3: 2010-12

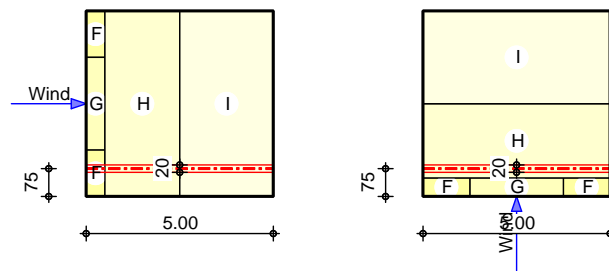
char. Schneelast auf Boden $S_k = 0.65 \text{ kN/m}^2$
 Formbeiwert für Schneelast $\mu = 0.80$
 Schneelast auf dem Dach $S = 0.52 \text{ kN/m}^2$

Dachlage

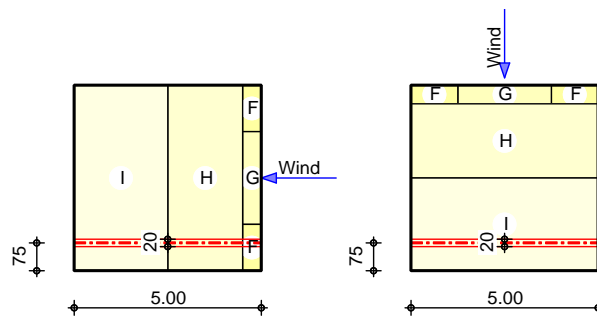
Wind- und Schneelasten für Bauteile in Dachlage

Grafik

M 1: 200

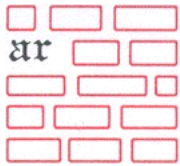


M 1: 200

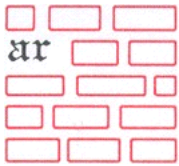


Sparren
Bauteil DD

Bauteile quer zur Traufe
 $x_A = 0.00\text{m}$, $y_A = 0.75\text{m}$, $l = 5.00\text{m}$, $LB_{i1} = 0.10\text{m}$, $LB_{re} = 0.10\text{m}$



	Ri chtung	Berei ch	X _A [m]	X _E [m]	q ₊ [kN/m]	q ₋ [kN/m]
Qk. W. 000	lokal	F	0.00	0.50	-	-0.20
	lokal	H	0.50	2.50	-	-0.08
	lokal	I	2.50	5.00	0.02	-0.07
Qk. W. 090	lokal	H	0.00	5.00	-	-0.08
Qk. W. 180	lokal	F	4.50	5.00	-	-0.20
	lokal	H	2.50	4.50	-	-0.08
Qk. W. 270	lokal	I	0.00	2.50	0.02	-0.07
	lokal	I	0.00	5.00	0.02	-0.07
Qk. S. A	vert.	GF DF	0.00	5.00	0.10	-



Pos. ALLa03 Lastannahmen_4

1) Beschreibung des geplanten Projektes

Es handelt sich um ein Aluminium-Dielenprofil.
Es wird als Dachprofil und als Terrassen und Balkonbelag betrachtet.

2) Lastannahmen

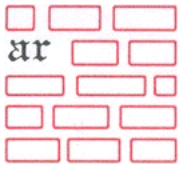
2.1) Lasten Podest

- aus Belag (Allgemein)	=	0,15	kN/m ²
- aus Konstruktion	=	<u>0,10</u>	<u>kN/m²</u>
		<u>0,25</u>	<u>kN/m²</u>

- aus Nutzlasten $q_{k1} = 4,00 \text{ kN/m}^2$

- Mannlast $q_m = 1.0 \text{ kN/m}$

Schneelast, Windlast entsprechend der Ortslast nach La01a

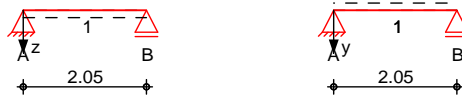


Pos. AL1-4- Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System **Einfeldträger**

M 1:125

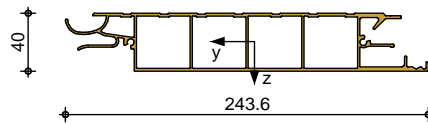


Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	2.05	0.0	frei
	Feld	Material	Profil	
	1	EN-AW 6063, T66, EP	AVADIELE40 40	

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	2.05	fest	frei	fest	frei	fest
	Lager						b [cm]
	A, B						10.0

Grafik **Querschnittsgrafik**

M 1:5



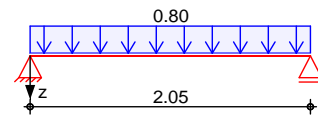
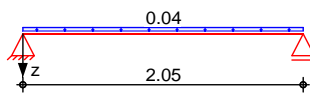
Belastungen **Belastungen auf das System**

Grafik **Belastungsgrafiken (einwirkungsbezogen)**

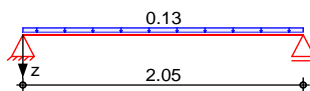
Einwirkungen

Gk

Qk. N



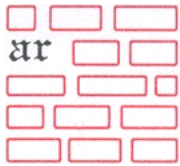
Qk. S



Streckenlasten
in z-Richtung

Gleichlasten
Feld Komm.

		a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
Einw. Gk	1 Eiengew	0.00	2.05		0.04	-0.4
Einw. Qk. N	1 p+s	0.00	2.05		0.80	0.0
Einw. Qk. S	1 p+s	0.00	2.05		0.13	0.0

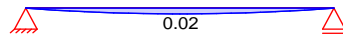


Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen

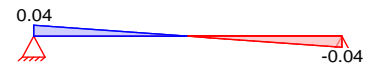
Grafik Schnittgrößen und Verformungen (je Einwirkung)

Einw. *Gk*

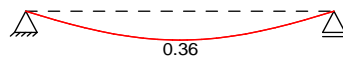
Moment $M_{y,k}$ [kNm]



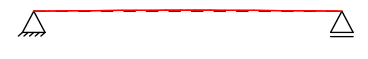
Querkraft $V_{z,k}$ [kN]



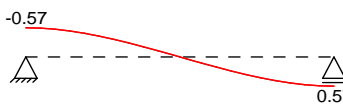
Verschiebung $w_{z,k}$ [mm]



Verdrehung φ_x [mrad]

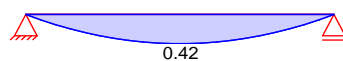


Verdrehung φ_y [mrad]

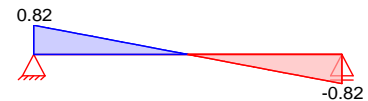


Einw. *Qk.N*

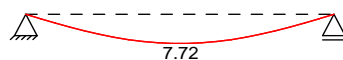
Moment $M_{y,k}$ [kNm]



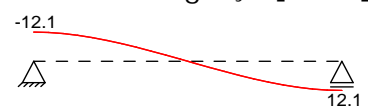
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

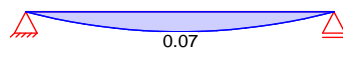


Verdrehung φ_y [mrad]

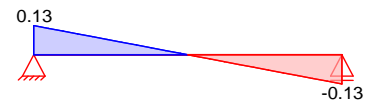


Einw. *Qk.S*

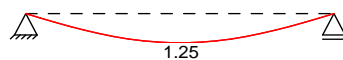
Moment $M_{y,k}$ [kNm]



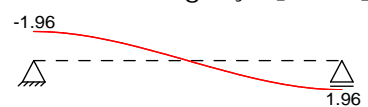
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]



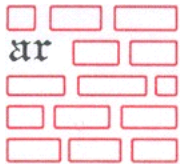
Verdrehung φ_y [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
Einw. <i>Gk</i>	1	0.00	0.00	0.04	0.04*
	1.03	0.02	0.02*	0.00	0.00
	2.05	0.00	0.00	-0.04*	-0.04
Einw. <i>Qk.N</i>	1	0.00	0.00	0.82	0.82*
	1.03	0.42	0.42*	0.00	0.00
	2.05	0.00	0.00	-0.82*	-0.82
Einw. <i>Qk.S</i>	1	0.00	0.00	0.13	0.13*
	1.03	0.07	0.07*	0.00	0.00
	2.05	0.00	0.00	-0.13*	-0.13



Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
			Wz, k, max	y, k, max	x, k, max
			[mm]	[mrad]	[mrad]
Einw. Gk	1	0.00	0.00	-0.57*	0.00
		1.03	0.36	0.00	0.00
		2.05	0.00	0.00	0.00
Einw. Qk. N	1	0.00	0.00	-12.05*	0.00
		1.03	7.72	0.00	0.00
		2.05	0.00	12.05	0.00
Einw. Qk. S	1	0.00	0.00	-1.96*	0.00
		1.03	1.25	0.00	0.00
		2.05	0.00	1.96*	0.00

Kombinationen

Kombinationsbildung nach DIN EN 1990
 Darstellung der maßgebenden Kombinationen

	Ek	Imp.	(**EW)
ständig/vorüberg.	31	1	1.35*Gk +1.50*Qk. N +1.50*Qk. S
quasi-ständig	12		1.00*Gk +0.80*Qk. N

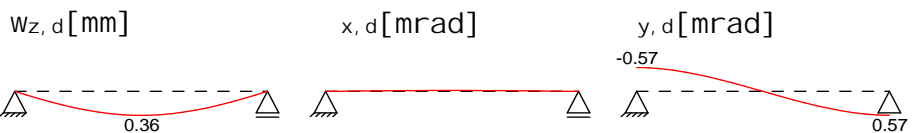
Bem.-verformungen

Bemessungsverformungen

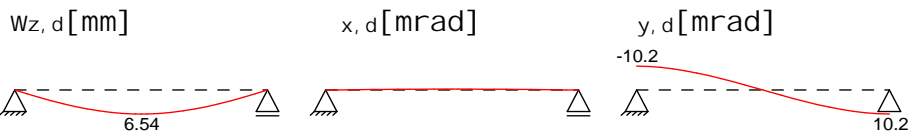
Grafik

Verformungen (je Kombination)

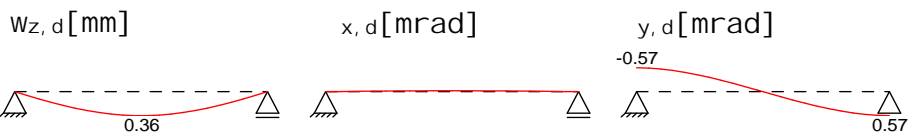
Komb. 11



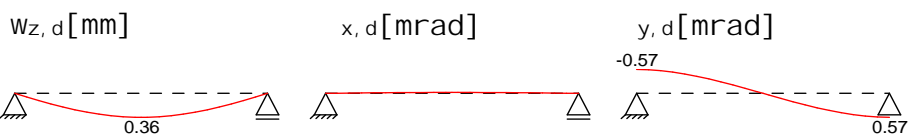
Komb. 12

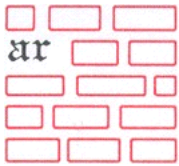


Komb. 43

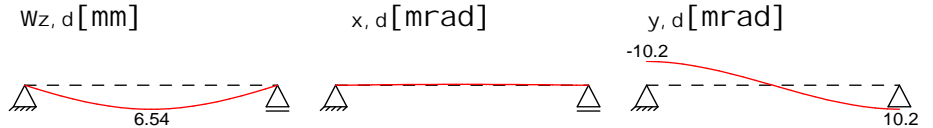


Komb. 44

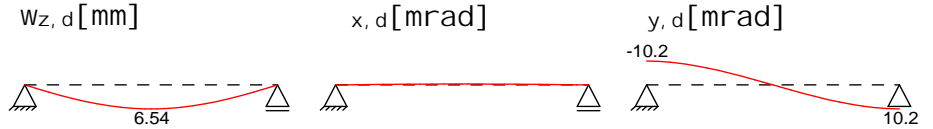




Komb. 45



Komb. 46



Tabelle

Verformungen (je Kombination)

Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 11	0.00	0.00	-0.57*	0.00
	1.03	0.36*	0.00	0.00
	2.05	0.00	0.57*	0.00
Komb. 12	0.00	0.00	-10.21*	0.00
	1.03	6.54*	0.00	0.00
	2.05	0.00	10.21*	0.00
Komb. 43	0.00	0.00	-0.57*	0.00
	1.03	0.36*	0.00	0.00
	2.05	0.00	0.57*	0.00
Komb. 44	0.00	0.00	-0.57*	0.00
	1.03	0.36*	0.00	0.00
	2.05	0.00	0.57*	0.00
Komb. 45	0.00	0.00	-10.21*	0.00
	1.03	6.54*	0.00	0.00
	2.05	0.00	10.21*	0.00
Komb. 46	0.00	0.00	-10.21*	0.00
	1.03	6.54*	0.00	0.00
	2.05	0.00	10.21*	0.00

Mat. / Querschnitt

Material- und Querschnittswerte

Aluminium

Material	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
EN-AW 6063, T66, EP	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

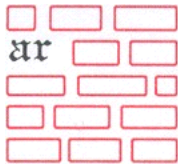
QS Profil	A [cm ²]	S _y [cm ³]	I _y [cm ⁴]	W _y [cm ³]
1 AVADIELE40 40	13.9	10.2	35.2	17.2
		41.6	647.4	51.0

Hauptachsen

QS Profil	[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1 AVADIELE40 40	87.42	-27.6	648.7	34.0

Torsion

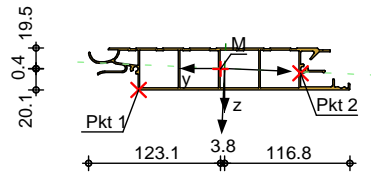
QS Profil	I _t [cm ⁴]	I [cm ⁶]
1 AVADIELE40 40	73.1	0.0



Grafik

Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte

Charakteristische Auflagerkräfte (gl obal)

Char. Auflagerkr.

	Aufl.	$M_{x, k, \min}$	$F_{z, k, \min}$	$F_{y, k, \min}$
		$M_{x, k, \max}$	$F_{z, k, \max}$	$F_{y, k, \max}$
		[kNm]	[kN]	[kN]
Ei nw. Gk	A	0.00	0.04	0.00
	B	0.00	0.04	0.00
Ei nw. Qk. N	A	0.00	0.82	0.00
	B	0.00	0.82	0.00
Ei nw. Qk. S	A	0.00	0.13	0.00
	B	0.00	0.13	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E OK 0.33 [-]

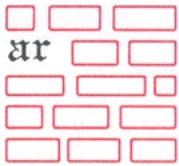
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK 0.96 [-]

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-4-200- Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²) (I/200)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Einfeldträger

M 1:145



Abmessungen
Mat./Querschnitt

Feld	l [m]	Lage [°]	Achsen
1	2.35	0.0	frei

Feld	Material	Profil
1	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager

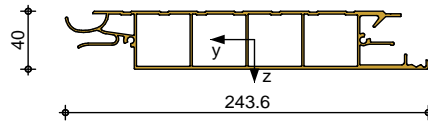
Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw. [kNm/rad]	K _{T,y} [kNm/rad]	K _{R,z} bzw. [kNm/rad]	Gabel l. Wölbbeh.
A	0.00	fest	frei	fest	frei	fest
B	2.35	fest	frei	fest	frei	fest

Lager	b [cm]
A, B	10.0

Grafik

Querschnittsgrafik

M 1:5



Belastungen

Belastungen auf das System

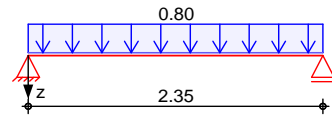
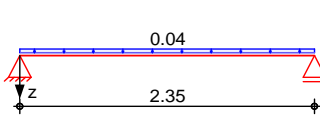
Grafik

Belastungsgrafiken (einwirkungsbezogen)

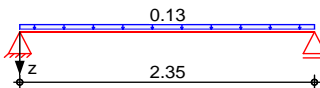
Einwirkungen

Gk

Qk. N



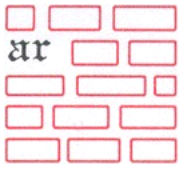
Qk. S



Streckenlasten
in z-Richtung

Gleichlasten
Feld Komm.

		a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
Einw. Gk	Eigengew	0.00	2.35		0.04	-0.4
Einw. Qk. N	p+s	0.00	2.35		0.80	0.0
Einw. Qk. S	p+s	0.00	2.35		0.13	0.0

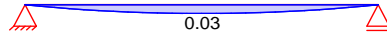


Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen

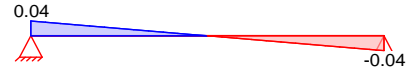
Grafik Schnittgrößen und Verformungen (je Einwirkung)

Einw. *Gk*

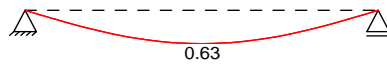
Moment $M_{y,k}$ [kNm]



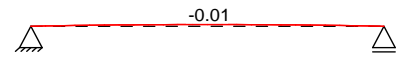
Querkraft $V_{z,k}$ [kN]



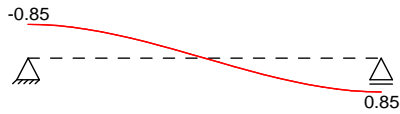
Verschiebung $w_{z,k}$ [mm]



Verdrehung φ_x [mrad]

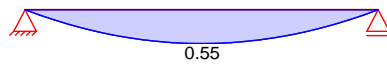


Verdrehung φ_y [mrad]

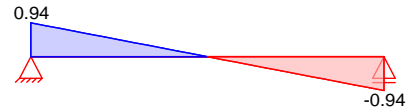


Einw. *Qk.N*

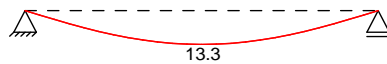
Moment $M_{y,k}$ [kNm]



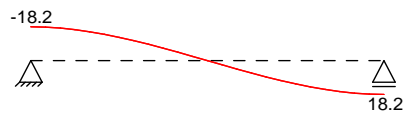
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

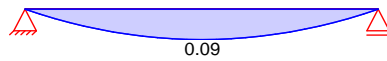


Verdrehung φ_y [mrad]

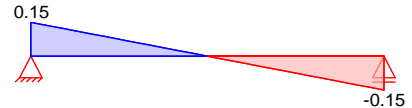


Einw. *Qk.S*

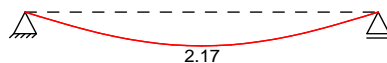
Moment $M_{y,k}$ [kNm]



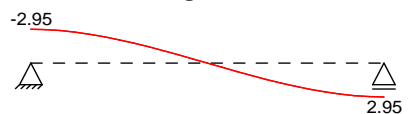
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]



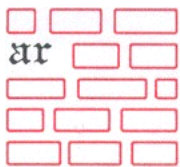
Verdrehung φ_y [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

Einw.	Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
<i>Gk</i>	1	0.00	0.00	0.00	0.04	0.04*
		1.18	0.03	0.03*	0.00	0.00
		2.35	0.00	0.00	-0.04*	-0.04
<i>Qk.N</i>	1	0.00	0.00	0.00	0.94	0.94*
		1.18	0.55	0.55*	0.00	0.00
		2.35	0.00	0.00	-0.94*	-0.94
<i>Qk.S</i>	1	0.00	0.00	0.00	0.15	0.15*
		1.18	0.09	0.09*	0.00	0.00
		2.35	0.00	0.00	-0.15*	-0.15



Verformungen (je Einwirkung)

Fel d	x [m]	Wz, k, mi n	y, k, mi n	x, k, mi n	
		Wz, k, max [mm]	y, k, max [mrad]	x, k, max [mrad]	
Ei nw. Gk	1	0.00	-0.85*	0.00	
		1.18	0.00	0.00	
		2.35	0.63*	0.00	-0.01*
Ei nw. Qk. N	1	0.00	0.85*	0.00	
		1.18	0.00	-18.16*	0.00
		2.35	13.33*	18.16*	0.00
Ei nw. Qk. S	1	0.00	-2.95*	0.00	
		1.18	0.00	-2.95	0.00
		2.35	2.17*	2.95*	0.00

Kombi nati onen

Kombi nati onsbil dung nach DIN EN 1990
Darstellung der maßgebenden Kombi nati onen

stän di g/vorü berg.	Ek	Imp.	(* *EW)
quasi -stän di g	31	1	1.35*Gk +1.50*Qk. N +1.50*Qk. S (1)
	12		1.00*Gk +0.80*Qk. N (1)

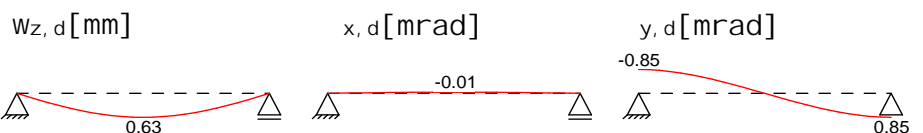
Bem. -verformungen

Bemessungsverformungen

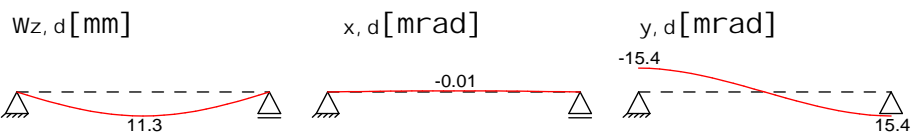
Grafi k

Verformungen (je Kombi nati on)

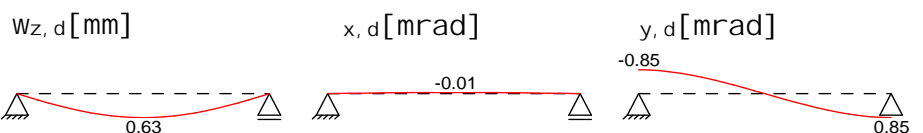
Komb. 11



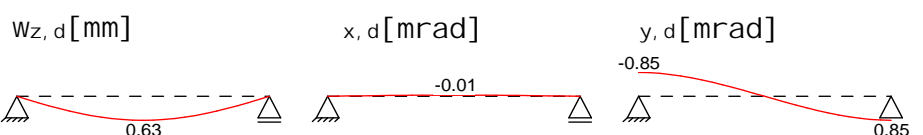
Komb. 12

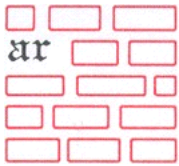


Komb. 43

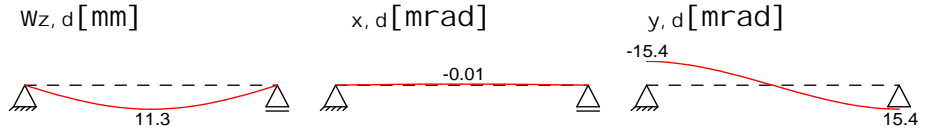


Komb. 44

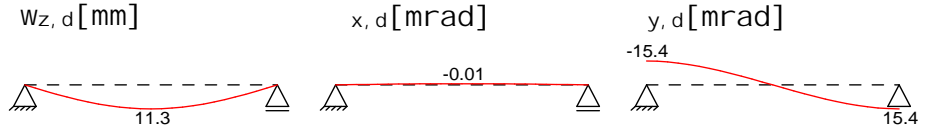




Komb. 45



Komb. 46



Tabelle

Verformungen (je Kombination)

Komb.	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
11	1	0.00	0.00	-0.85*	0.00
		1.18	0.63*	0.00	-0.01*
		2.35	0.00	0.85*	0.00
12	1	0.00	0.00	-15.38*	0.00
		1.18	11.30*	0.00	-0.01*
		2.35	0.00	15.38*	0.00
43	1	0.00	0.00	-0.85*	0.00
		1.18	0.63*	0.00	-0.01*
		2.35	0.00	0.85*	0.00
44	1	0.00	0.00	-0.85*	0.00
		1.18	0.63*	0.00	-0.01*
		2.35	0.00	0.85*	0.00
45	1	0.00	0.00	-15.38*	0.00
		1.18	11.30*	0.00	-0.01*
		2.35	0.00	15.38*	0.00
46	1	0.00	0.00	-15.38*	0.00
		1.18	11.30*	0.00	-0.01*
		2.35	0.00	15.38*	0.00

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
EN-AW 6063, T66, EP	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

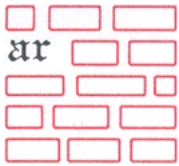
QS Profil	A [cm ²]	S _y [cm ³]	I _y [cm ⁴]	W _y [cm ³]
1 AVADIELE40 40	13.9	10.2	35.2	17.2
		41.6	647.4	51.0

Hauptachsen

QS Profil	[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1 AVADIELE40 40	87.42	-27.6	648.7	34.0

Torsion

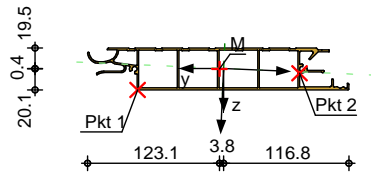
QS Profil	I _t [cm ⁴]	I [cm ⁶]
1 AVADIELE40 40	73.1	0.0



Grafik

Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte

Charakteristische Auflagerkräfte (gl obal)

Char. Auflagerkr.

	Aufl.	$M_{x, k, \min}$	$F_{z, k, \min}$	$F_{y, k, \min}$
		$M_{x, k, \max}$	$F_{z, k, \max}$	$F_{y, k, \max}$
		[kNm]	[kN]	[kN]
Ei nw. <i>Gk</i>	A	0.00	0.04	0.00
	B	0.00	0.04	0.00
Ei nw. <i>Qk. N</i>	A	0.00	0.94	0.00
	B	0.00	0.94	0.00
Ei nw. <i>Qk. S</i>	A	0.00	0.15	0.00
	B	0.00	0.15	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E OK [-] 0.43

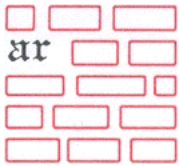
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK [-] 0.96

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

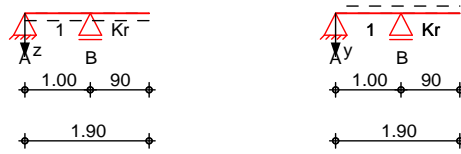


Pos. AL2-4- Alu Bpr Kragarm (VL, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:115



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	1.00	0.0	frei
	Kr	0.90	0.0	frei

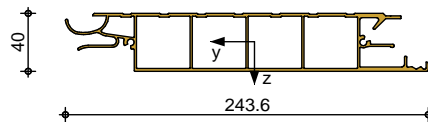
Feld	Material	Profil
1-Kr	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _R	Gabel I.	Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest	frei
	B	1.00	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	10.0

Grafik Querschnittsgrafik

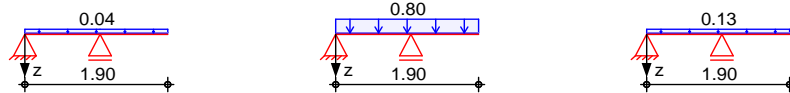
M 1:5



Belastungen Belastungen auf das System

Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen Gk Qk.N Qk.S



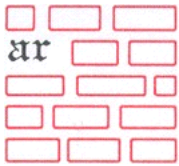
Streckenlasten in z-Richtung

Gleichlasten		a	s	q _{li}	q _{re}	e
Feld	Komm.	[m]	[m]	[kN/m]	[kN/m]	[cm]
1	Eigengew	0.00	1.00		0.04	-0.4
Kr	Eigengew	0.00	0.90		0.04	-0.4
1	p+s	0.00	1.90		0.80	0.0
1	p+s	0.00	1.90		0.13	0.0

Einw. Gk

Einw. Qk.N

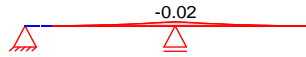
Einw. Qk.S



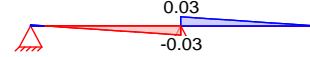
Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen
 Grafik Schnittgrößen und Verformungen (je Einwirkung)

Einw. *Gk*

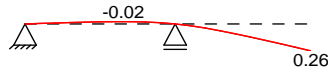
Moment $M_{y,k}$ [kNm]



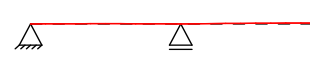
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]



Verdrehung φ_x [mrad]

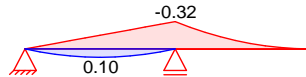


Verdrehung φ_y [mrad]

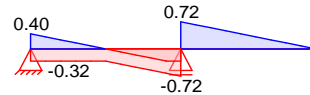


Einw. *Qk, N*

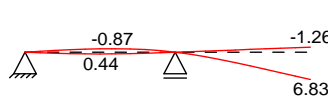
Moment $M_{y,k}$ [kNm]



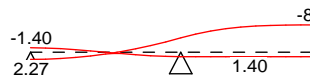
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]



Verdrehung φ_y [mrad]

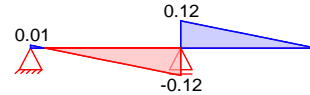


Einw. *Qk, S*

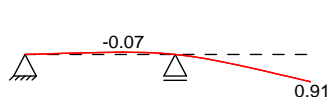
Moment $M_{y,k}$ [kNm]



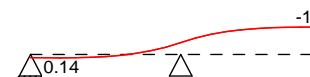
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]



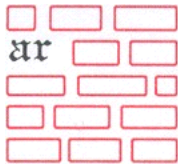
Verdrehung φ_y [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
Einw. <i>Gk</i>	1	0.00	0.00	0.00	0.00	0.00
		0.10	0.00	0.00	0.00	0.00
		1.00	-0.02*	-0.02	-0.03*	-0.03
Kr	0.90	0.00	-0.02	-0.02	0.03	0.03*
		0.90	0.00	0.00	0.00	0.00
		1.00	0.00	0.00	0.00	0.00
Einw. <i>Qk, N</i>	1	0.00	0.00	0.00	-0.32	0.40
		0.50	-0.16	0.10*	-0.32	0.00
		1.00	-0.32*	0.00	-0.72*	-0.32
Kr	0.90	0.00	-0.32	0.00	0.00	0.72*
		0.90	0.00	0.00	0.00	0.00
		1.00	0.00	0.00	0.00	0.00
Einw. <i>Qk, S</i>	1	0.00	0.00	0.00	0.01	0.01
		0.10	0.00	0.00	0.00	0.00
		1.00	-0.05*	-0.05	-0.12*	-0.12
Kr	0.90	0.00	-0.05	-0.05	0.12	0.12*
		0.90	0.00	0.00	0.00	0.00
		1.00	0.00	0.00	0.00	0.00



Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min	
			Wz, k, max [mm]	y, k, max [mrad]	x, k, max [mrad]	
Einw. Gk	1	0.00	0.00	0.04	0.00	
		0.19	-0.01	0.04	0.00	
	Kr	0.00	0.00	-0.15	0.00	
		0.90	0.26	-0.34*	0.00	
	Einw. Qk. N	1	0.00	0.00	-1.40	0.00
			1.00	0.00	-4.53	0.00
Kr		0.00	0.00	-4.53	0.00	
		0.90	-1.26	-8.61*	0.00	
Einw. Qk. S		1	0.00	0.00	0.14	0.00
			0.19	-0.03	0.14	0.00
	Kr	0.00	0.00	-0.51	0.00	
		0.90	0.91	-1.17*	0.00	

Kombinationen

Kombinationsbildung nach DIN EN 1990
 Darstellung der maßgebenden Kombinationen

	Ek	Imp.	(**EW)		
ständig/vorüberg.	37	1	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	38	2	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
quasi-ständig	16		1.00*Gk	+0.80*Qk. N (2)	

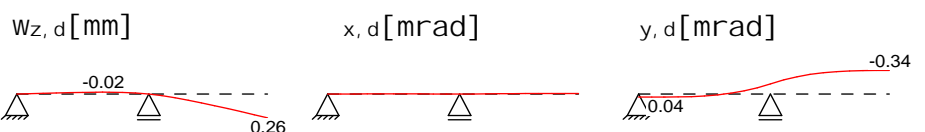
Bem.-verformungen

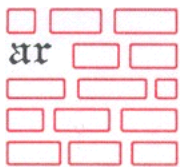
Bemessungsverformungen

Grafik

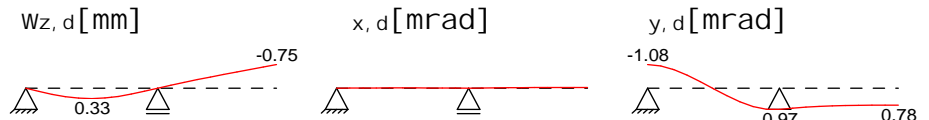
Verformungen (je Kombination)

Komb. 14

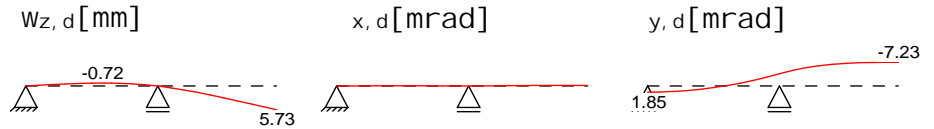




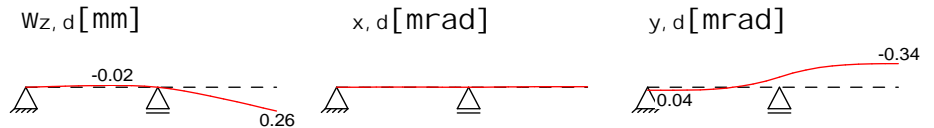
Komb. 15



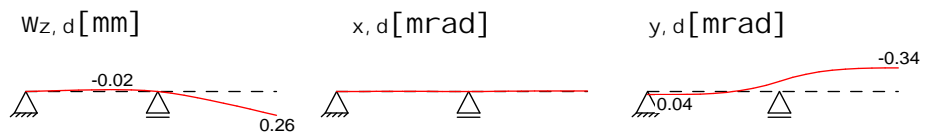
Komb. 16



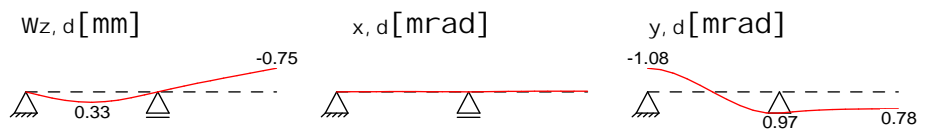
Komb. 55



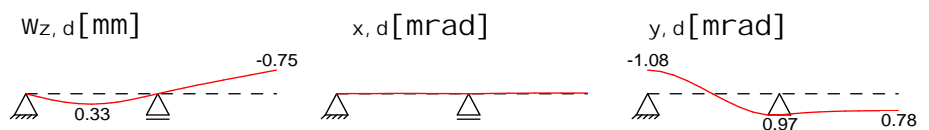
Komb. 56



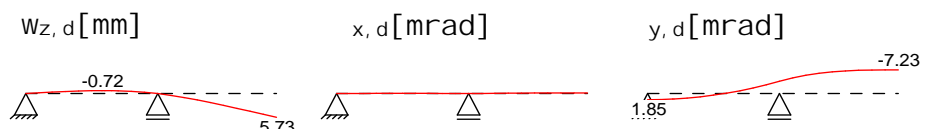
Komb. 57



Komb. 58



Komb. 59



Komb. 60

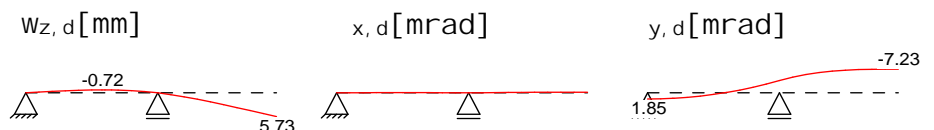
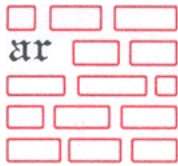


Tabelle Verformungen (je Kombination)

Komb.	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
14	1	0.00	0.00	0.04	0.00
		0.19	-0.01	0.04*	0.00
		0.65	-0.02*	0.00	0.00
	Kr	1.00	0.00	-0.15	0.00
		0.90	0.26*	-0.34*	0.00
15	1	0.00	0.00	-1.08*	0.00
		0.50	0.33*	0.03	0.00
		1.00	0.00	0.97*	0.00
	Kr	0.00	0.00	0.97	0.00
		0.90	-0.75*	0.78	0.00
16	1	0.00	0.00	1.85*	0.00



		0.58	-0.72*	0.00	0.00
		1.00	0.00	-3.77	0.00
	Kr	0.00	0.00	-3.77	0.00
		0.90	5.73*	-7.23*	0.00
Komb. 55	1	0.00	0.00	0.04	0.00
		0.19	-0.01	0.04*	0.00
		0.65	-0.02*	0.00	0.00
		1.00	0.00	-0.15	0.00
	Kr	0.00	0.00	-0.15	0.00
		0.90	0.26*	-0.34*	0.00
Komb. 56	1	0.00	0.00	0.04	0.00
		0.19	-0.01	0.04*	0.00
		0.65	-0.02*	0.00	0.00
		1.00	0.00	-0.15	0.00
	Kr	0.00	0.00	-0.15	0.00
		0.90	0.26*	-0.34*	0.00
Komb. 57	1	0.00	0.00	-1.08*	0.00
		0.50	0.33*	0.03	0.00
		1.00	0.00	0.97*	0.00
	Kr	0.00	0.00	0.97	0.00
		0.90	-0.75*	0.78	0.00
Komb. 58	1	0.00	0.00	-1.08*	0.00
		0.50	0.33*	0.03	0.00
		1.00	0.00	0.97*	0.00
	Kr	0.00	0.00	0.97	0.00
		0.90	-0.75*	0.78	0.00
Komb. 59	1	0.00	0.00	1.85*	0.00
		0.58	-0.72*	0.00	0.00
		1.00	0.00	-3.77	0.00
	Kr	0.00	0.00	-3.77	0.00
		0.90	5.73*	-7.23*	0.00
Komb. 60	1	0.00	0.00	1.85*	0.00
		0.58	-0.72*	0.00	0.00
		1.00	0.00	-3.77	0.00
	Kr	0.00	0.00	-3.77	0.00
		0.90	5.73*	-7.23*	0.00

Mat. / Querschnitt Material - und Querschnittswerte

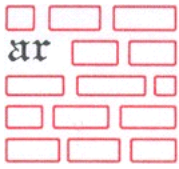
Aluminium	Material	t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
	<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
		25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt	QS Profil	A [cm ²]	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
1	<i>AVADIELE40 40</i>	13.9	10.2 41.6	35.2 647.4	17.2 51.0

Hauptachsen	QS Profil	[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1	<i>AVADIELE40 40</i>	87.42	-27.6	648.7	34.0

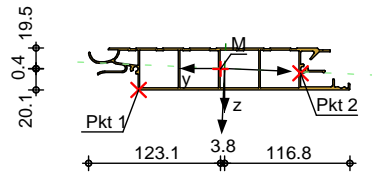
Torsion	QS Profil	I _t [cm ⁴]	I [cm ⁶]
1	<i>AVADIELE40 40</i>	73.1	0.0



Grafik

Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte

Charakteristische Auflagerkräfte (gl obal)

Char. Auflagerkr.

	Aufl.	M_x, k, \min	F_z, k, \min	F_y, k, \min
		M_x, k, \max	F_z, k, \max	F_y, k, \max
		[kNm]	[kN]	[kN]
Ei nw. <i>Gk</i>	A	0.00	0.00	0.00
	B	0.00	0.07	0.00
Ei nw. <i>Qk. N</i>	A	0.00	-0.32	0.00
	B	0.00	0.40	0.00
Ei nw. <i>Qk. S</i>	A	0.00	1.44	0.00
	B	0.00	0.01	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E OK 0.25

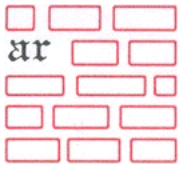
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK 0.95

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
 Kürzere Spannweiten sind möglich!

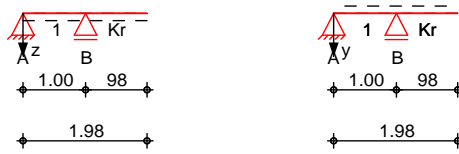


Pos. AL2-4-200 Alu Bpr Kragarm (VL, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:120



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	1.00	0.0	frei
	Kr	0.98	0.0	frei

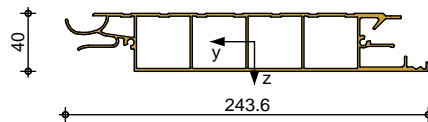
Feld	Material	Profil
1-Kr	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel I.	Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest	frei
	B	1.00	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	10.0

Grafik Querschnittsgrafik

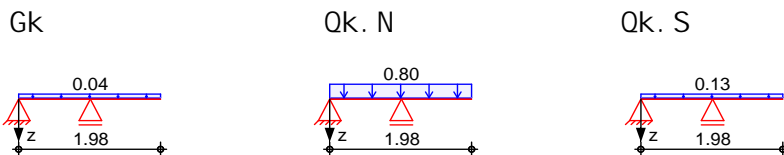
M 1:5



Belastungen Belastungen auf das System

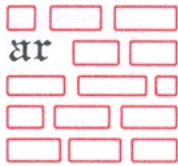
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen



Streckenlasten in z-Richtung

Gleichlasten		a	s	q _{li}	q _{re}	e
Feld	Komm.	[m]	[m]	[kN/m]	[kN/m]	[cm]
1	Einengew	0.00	1.00		0.04	-0.4
Kr	Einengew	0.00	0.98		0.04	-0.4
1	p+s	0.00	1.98		0.80	0.0
1	p+s	0.00	1.98		0.13	0.0

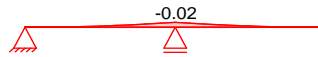


Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen

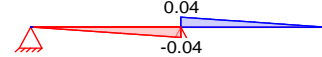
Grafik Schnittgrößen und Verformungen (je Einwirkung)

Einw. *Gk*

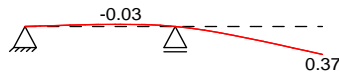
Moment $M_{y,k}$ [kNm]



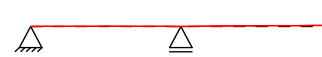
Querkraft $V_{z,k}$ [kN]



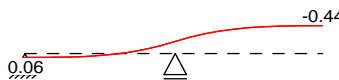
Verschiebung $w_{z,k}$ [mm]



Verdrehung φ_x [mrad]

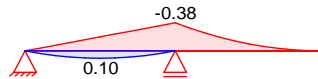


Verdrehung φ_y [mrad]

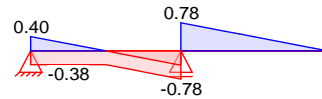


Einw. *Qk, N*

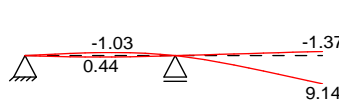
Moment $M_{y,k}$ [kNm]



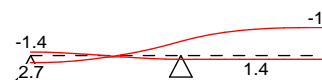
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

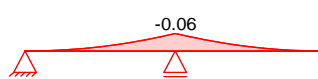


Verdrehung φ_y [mrad]

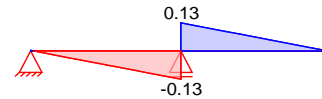


Einw. *Qk, S*

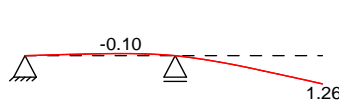
Moment $M_{y,k}$ [kNm]



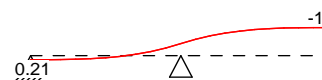
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]



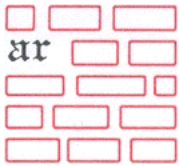
Verdrehung φ_y [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

Einw.	Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
<i>Gk</i>	1	0.00	0.00	0.00	0.00	0.00
		1.00	-0.02*	-0.02	-0.04*	-0.04
	Kr	0.00	-0.02	-0.02	0.04	0.04*
		0.98	0.00	0.00	0.00	0.00
<i>Qk, N</i>	1	0.00	0.00	0.00	-0.38	0.40
		0.50	-0.19	0.10*	-0.38	0.00
		1.00	-0.38*	0.00	-0.78*	-0.38
	Kr	0.00	-0.38	0.00	0.00	0.78*
0.98		0.00	0.00	0.00	0.00	
<i>Qk, S</i>	1	0.00	0.00	0.00	0.00	0.00
		1.00	-0.06*	-0.06	-0.13*	-0.13
		0.00	-0.06	-0.06	0.13	0.13*
	Kr	0.00	-0.06	-0.06	0.13	0.13*
0.98		0.00	0.00	0.00	0.00	



Verformungen (je Einwirkung)

Einw.	Gk	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
				Wz, k, max	y, k, max	x, k, max
				[mm]	[mrad]	[mrad]
1	Gk	1	0.00	0.00	0.06	0.00
			0.63	-0.03*	0.06*	0.00
			1.00	-0.03	0.00	0.00
		Kr	0.00	0.00	-0.19	0.00
			0.98	0.37	-0.19	0.00
				0.37*	-0.44*	0.00
1	Qk. N	1	0.00	0.00	-1.40	0.00
			1.00	0.00	2.69*	0.00
				0.00	-5.37	0.00
		Kr	0.00	0.00	1.40	0.00
			0.98	0.00	-5.37	0.00
				0.00	1.40	0.00
1	Qk. S	1	0.00	0.00	0.21	0.00
			0.63	-0.10*	0.21*	0.00
			1.00	-0.10	0.00	0.00
		Kr	0.00	0.00	-0.65	0.00
			0.98	0.00	-0.65	0.00
				0.00	-0.65	0.00

Kombinationen

Kombinationsbildung nach DIN EN 1990
 Darstellung der maßgebenden Kombinationen

ständig/vorüberg.	Ek	Imp.	(**EW)
37	1	1.35*	Gk +1.50*Qk. N (1, 2) +1.50*Qk. S
			Gk +1.50*Qk. N (1, 2) +1.50*Qk. S
quasi-ständig	16	1.00*	Gk +0.80*Qk. N (2)

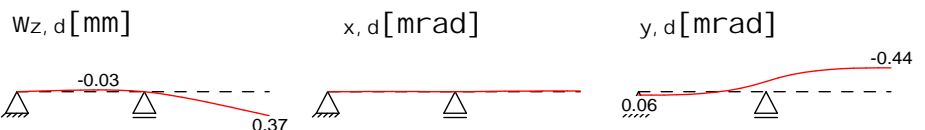
Bem.-verformungen

Bemessungsverformungen

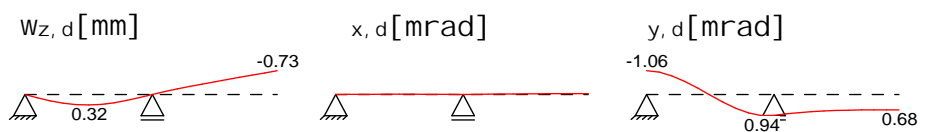
Grafik

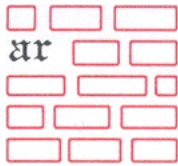
Verformungen (je Kombination)

Komb. 14

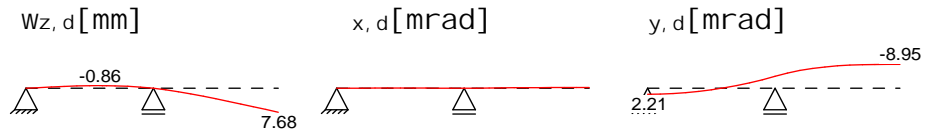


Komb. 15

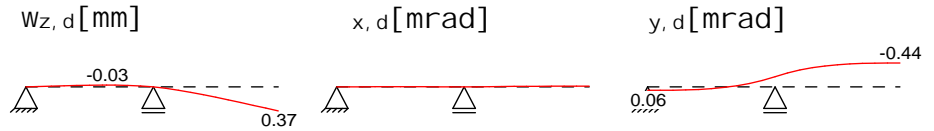




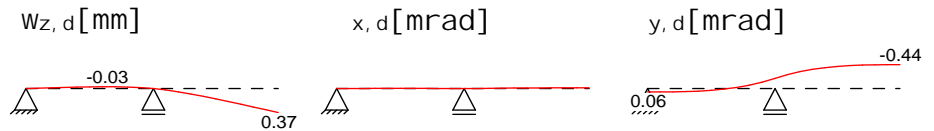
Komb. 16



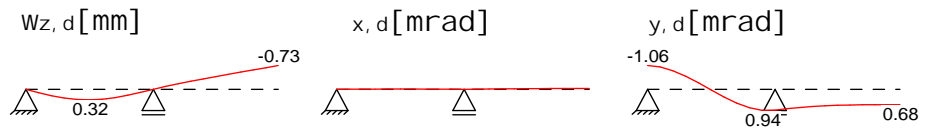
Komb. 55



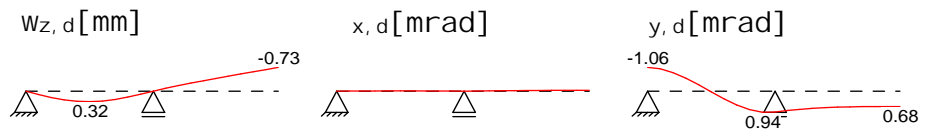
Komb. 56



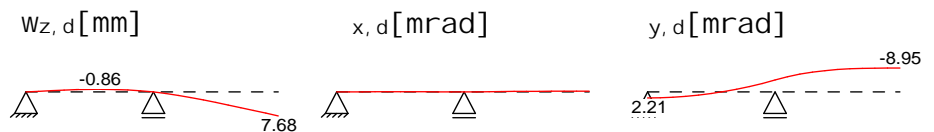
Komb. 57



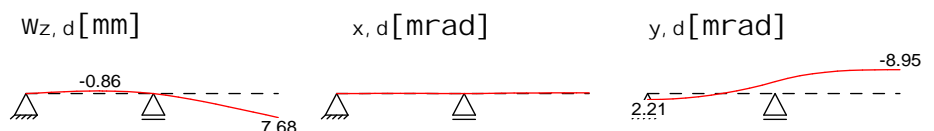
Komb. 58



Komb. 59



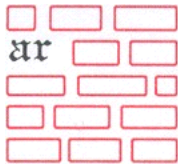
Komb. 60



Tabelle

Verformungen (je Kombination)

Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 14	1	0.00	0.00	0.00
		0.63	-0.03*	0.00
		1.00	0.00	0.00
Komb. 15	Kr	0.00	0.00	0.00
		0.98	0.37*	0.00
		1.00	0.00	0.00
Komb. 16	1	0.00	0.00	0.00
		0.58	-0.86*	0.00
		1.00	0.00	0.00
	Kr	0.00	0.00	0.00
		0.98	7.68*	0.00
		1.00	0.00	0.00
Komb. 55	1	0.00	0.00	0.00
		0.63	-0.03*	0.00
		1.00	0.00	0.00



		1.00	0.00	-0.19	0.00
	Kr	0.00	0.00	-0.19	0.00
		0.98	0.37*	-0.44*	0.00
Komb. 56	1	0.00	0.00	0.06*	0.00
		0.63	-0.03*	0.00	0.00
		1.00	0.00	-0.19	0.00
	Kr	0.00	0.00	-0.19	0.00
		0.98	0.37*	-0.44*	0.00
Komb. 57	1	0.00	0.00	-1.06*	0.00
		0.50	0.32*	0.03	0.00
		0.90	0.09	0.94*	0.00
		1.00	0.00	0.93	0.00
	Kr	0.00	0.00	0.93	0.00
		0.98	-0.73*	0.68	0.00
Komb. 58	1	0.00	0.00	-1.06*	0.00
		0.50	0.32*	0.03	0.00
		0.90	0.09	0.94*	0.00
		1.00	0.00	0.93	0.00
	Kr	0.00	0.00	0.93	0.00
		0.98	-0.73*	0.68	0.00
Komb. 59	1	0.00	0.00	2.21*	0.00
		0.58	-0.86*	0.00	0.00
		1.00	0.00	-4.49	0.00
	Kr	0.00	0.00	-4.49	0.00
		0.98	7.68*	-8.95*	0.00
Komb. 60	1	0.00	0.00	2.21*	0.00
		0.58	-0.86*	0.00	0.00
		1.00	0.00	-4.49	0.00
	Kr	0.00	0.00	-4.49	0.00
		0.98	7.68*	-8.95*	0.00

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material

t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
10 ^b	200	70000	A
25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil

A	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
1	AVADIELE40 40 13.9	10.2 41.6	35.2 647.4
			17.2 51.0

Hauptachsen

QS Profil

[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1	AVADIELE40 40 87.42	-27.6	648.7
			34.0

Torsion

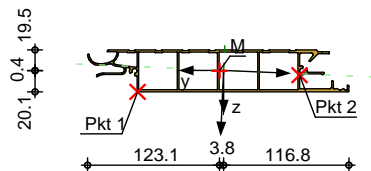
QS Profil

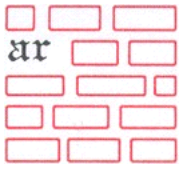
I _t [cm ⁴]	I [cm ⁶]	
1	AVADIELE40 40 73.1	0.0

Grafik

Querschnittsgrafik [mm]

M 1:7





Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	M_x, k, \min	F_z, k, \min	F_y, k, \min
		M_x, k, \max [kNm]	F_z, k, \max [kN]	F_y, k, \max [kN]
Ei nw. <i>Gk</i>	A	0.00	0.00	0.00
	B	0.00	0.07	0.00
Ei nw. <i>Qk. N</i>	A	0.00	-0.38	0.00
	B	0.00	0.40	0.00
Ei nw. <i>Qk. S</i>	A	0.00	1.57	0.00
	B	0.00	0.25	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E OK 0.30 [-]

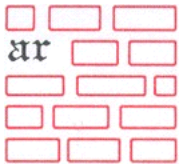
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK 0.98 [-]

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
 Kürzere Spannweiten sind möglich!

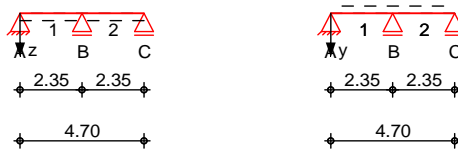


Pos. AL1-4-2-Feld Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1: 285



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-2	2.35	0.0	frei

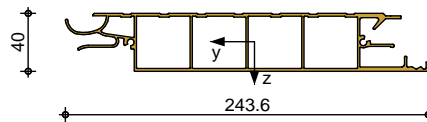
Feld	Material	Profil
1-2	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	2.35	fest	frei	fest	frei	fest
	C	4.70	fest	frei	fest	frei	fest

Lager	b [cm]
A, B, C	8.0

Grafik Querschnittsgrafik

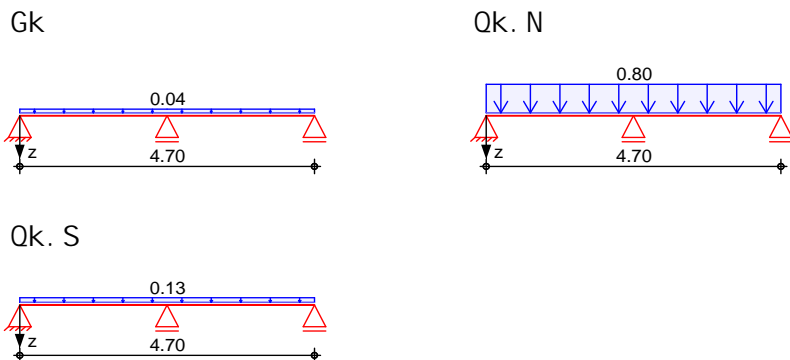
M 1: 5



Belastungen Belastungen auf das System

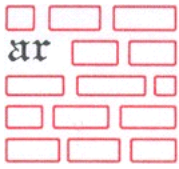
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen

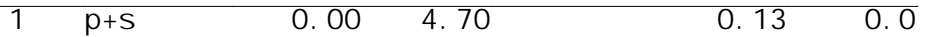


Streckenlasten in z-Richtung

Gleichlasten		a	s	q _{li}	q _{re}	e
Feld Komm.		[m]	[m]	[kN/m]	[kN/m]	[cm]
Einw. Gk	1 Eiengew	0.00	2.35	0.04	-0.4	
	2 Eiengew	0.00	2.35	0.04	-0.4	
Einw. Qk.N	1 p+s	0.00	4.70	0.80	0.0	



Ei nw. Qk. S



Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

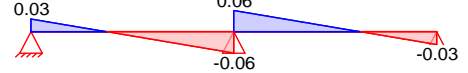
Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Ei nw. Gk

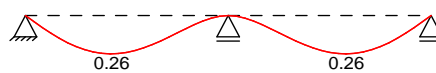
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]

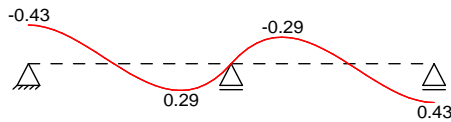


Verschiebung $w_{z,k}$ [mm]

Verdrehung α_x [mrad]



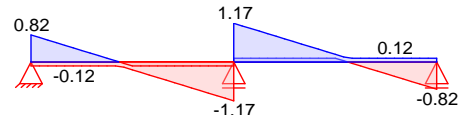
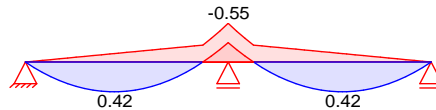
Verdrehung α_y [mrad]



Ei nw. Qk. N

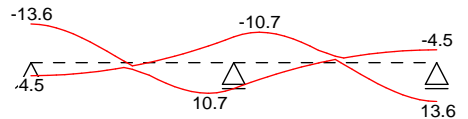
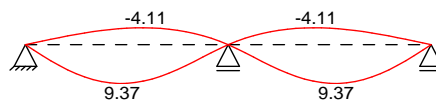
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

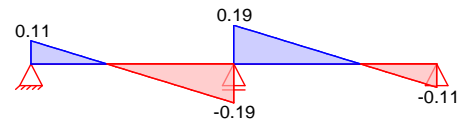
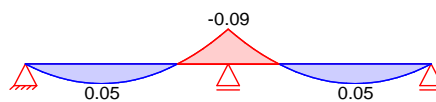
Verdrehung α_y [mrad]



Ei nw. Qk. S

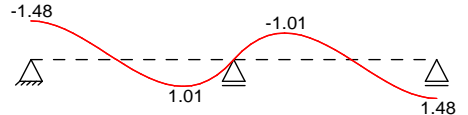
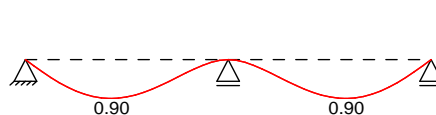
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

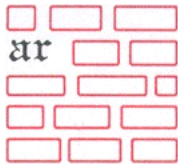
Verdrehung α_y [mrad]



Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
Ei nw. Gk	1	0.00	0.00	0.00	0.03	0.03
		0.88	0.01	0.01*	0.00	0.00
		2.35	-0.03*	-0.03	-0.06*	-0.06
Ei nw. Qk. N	2	0.00	-0.03	-0.03	0.06	0.06*
		2.35	0.00	0.00	-0.03	-0.03
Ei nw. Qk. S	1	0.00	0.00	0.00	-0.12	0.82
		1.03	-0.12	0.42*	-0.14	0.00
		2.35	-0.55*	-0.28	-1.17*	-0.12



Ei nw. Qk. S	2	0.00	-0.55	-0.28	0.12	1.17*
		2.35	0.00	0.00	-0.82	0.12
Ei nw. Qk. S	1	0.00	0.00	0.00	0.11	0.11
		0.88	0.05	0.05*	0.00	0.00
	2.35	-0.09*	-0.09	-0.19*	-0.19	
	2	0.00	-0.09	-0.09	0.19	0.19*
		2.35	0.00	0.00	-0.11	-0.11

Verformungen (je Einwirkung)

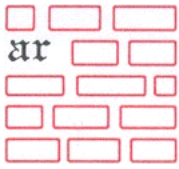
Fel d	x	Wz, k, mi n	y, k, mi n	x, k, mi n	
		Wz, k, max	y, k, max	x, k, max	
	[m]	[mm]	[mrad]	[mrad]	
Ei nw. Gk	1	0.00	0.00	-0.43*	0.00
			0.00	-0.43	0.00
		0.99	0.26	0.00	0.00
			0.26*	0.00	0.00
		1.18	0.25	0.11	-0.01*
			0.25	0.11	-0.01
	2.35	0.00	0.00	0.00	0.00
		0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	
		0.00	0.00	0.00	
	2.35	0.00	0.43	0.00	
		0.00	0.43*	0.00	
Ei nw. Qk. N	1	0.00	0.00	-13.62*	0.00
			0.00	4.54	0.00
		1.11	-3.91	0.00	0.00
			9.37*	1.88	0.00
		1.36	-4.11*	0.00	0.00
			8.84	4.25	0.00
	2.35	0.00	-9.08	0.00	
		0.00	9.08	0.00	
2	0.00	0.00	-9.08	0.00	
		0.00	9.08	0.00	
	2.35	0.00	-4.54	0.00	
		0.00	13.62*	0.00	
Ei nw. Qk. S	1	0.00	0.00	-1.48*	0.00
			0.00	-1.48	0.00
		0.99	0.90	0.00	0.00
			0.90*	0.00	0.00
		2.35	0.00	0.00	0.00
		0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
		2.35	0.00	1.48	0.00
		0.00	1.48*	0.00	

Kombi nati onen

Kombi nati onsbi l d u n g n a c h D I N E N 1990

Darst el l u n g d e r m a ß g e b e n d e n K o m b i n a t i o n e n

	Ek	Imp.	(* *EW)	
ständi g/vorüberg.	38	1	1.35*Gk	+1.50*Qk. N (1, 2)
				+1.50*Qk. S
quasi -ständi g	15		1.00*Gk	+0.80*Qk. N (1)
	16		1.00*Gk	+0.80*Qk. N (2)



Bem. -verformungen

Bemessungsverformungen

Grafik

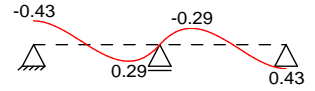
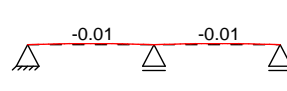
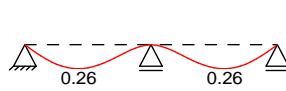
Verformungen (je Kombination)

Komb. 14

Wz, d [mm]

x, d [mrad]

y, d [mrad]

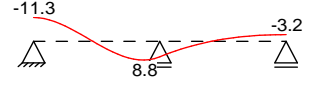
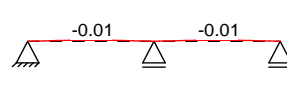
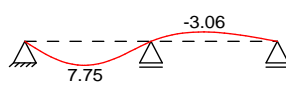


Komb. 15

Wz, d [mm]

x, d [mrad]

y, d [mrad]

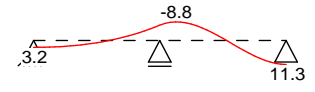
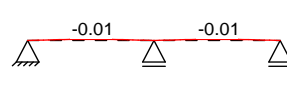
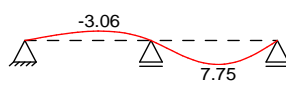


Komb. 16

Wz, d [mm]

x, d [mrad]

y, d [mrad]

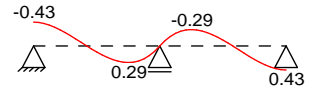
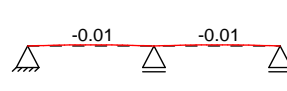
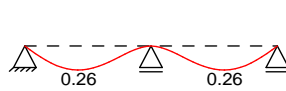


Komb. 56

Wz, d [mm]

x, d [mrad]

y, d [mrad]

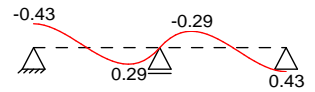
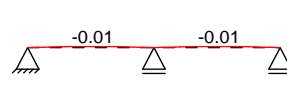
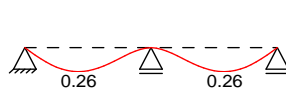


Komb. 57

Wz, d [mm]

x, d [mrad]

y, d [mrad]

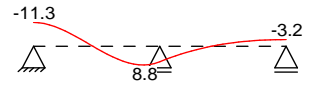
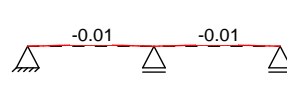
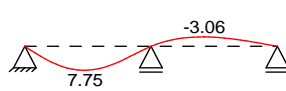


Komb. 58

Wz, d [mm]

x, d [mrad]

y, d [mrad]

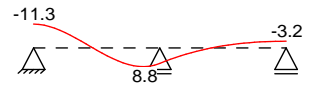
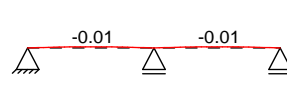
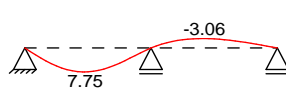


Komb. 59

Wz, d [mm]

x, d [mrad]

y, d [mrad]

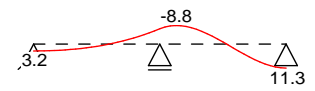
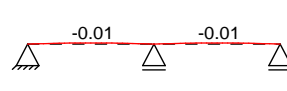
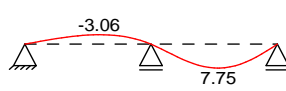


Komb. 60

Wz, d [mm]

x, d [mrad]

y, d [mrad]

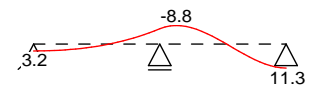
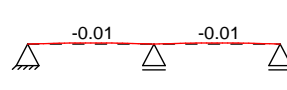
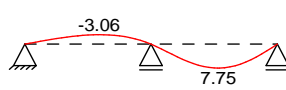


Komb. 61

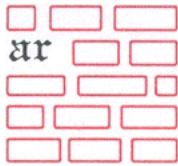
Wz, d [mm]

x, d [mrad]

y, d [mrad]

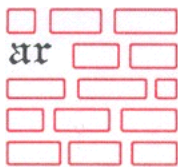


Tabelle



Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 14	1	0.00	0.00	-0.43*	0.00
		0.99	0.26*	0.00	0.00
		1.18	0.25	0.11	-0.01*
		2.35	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
Komb. 15	1	0.00	0.00	-11.32*	0.00
		1.11	7.75*	0.07	-0.01
		1.18	7.72	1.01	-0.01*
		2.06	2.43	8.80*	0.00
	2	0.00	0.00	7.26	0.00
Komb. 16	1	0.00	0.00	3.20	0.00
		1.18	-2.95	1.01	-0.01*
		1.37	-3.06*	0.13	0.00
		2.35	0.00	-7.26	0.00
	2	0.00	0.00	-7.26	0.00
Komb. 56	1	0.00	0.00	-0.43*	0.00
		0.99	0.26*	0.00	0.00
		1.18	0.25	0.11	-0.01*
		2.35	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
Komb. 57	1	0.00	0.00	-0.43*	0.00
		0.99	0.26*	0.00	0.00
		1.18	0.25	0.11	-0.01*
		2.35	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
Komb. 58	1	0.00	0.00	-11.32*	0.00
		1.11	7.75*	0.07	-0.01
		1.18	7.72	1.01	-0.01*
		2.06	2.43	8.80*	0.00
	2	0.00	0.00	7.26	0.00
Komb. 59	1	0.00	0.00	-11.32*	0.00
		1.11	7.75*	0.07	-0.01
		1.18	7.72	1.01	-0.01*
		2.06	2.43	8.80*	0.00
	2	0.00	0.00	7.26	0.00
Komb. 60	1	0.00	0.00	3.20	0.00
		1.18	-2.95	1.01	-0.01*
		1.37	-3.06*	0.13	0.00
		2.35	0.00	-7.26	0.00
	2	0.00	0.00	-7.26	0.00
Komb. 61	1	0.00	0.00	3.20	0.00
		1.18	-2.95	1.01	-0.01*
		1.37	-3.06*	0.13	0.00
		2.35	0.00	-7.26	0.00
	2	0.00	0.00	-7.26	0.00



	1. 37	-3. 06 *	0. 13	0. 00
	2. 35	0. 00	-7. 26	0. 00
2	0. 00	0. 00	-7. 26	0. 00
	0. 29	2. 43	-8. 80 *	0. 00
	1. 24	7. 75 *	-0. 07	-0. 01
	2. 35	0. 00	11. 32 *	0. 00

Mat. /Querschnitt

Material - und Querschnittswerte

Aluminium

Material

t_{Max} [mm]	f_o [N/mm ²]	E [N/mm ²]	BC
-------------------	-------------------------------	---------------------------	----

EN-AW 6063, T66, EP

10^b 200 70000 A

25^b 180 70000 A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3. 2b, Fußnote 3)

Querschnitt

QS Profil

A

S_y

I_y

W_y

S_z

I_z

W_z

	[cm ²]	[cm ³]	[cm ⁴]	[cm ³]
1 AVADIELE40 40	13. 9	10. 2 41. 6	35. 2 647. 4	17. 2 51. 0

Hauptachsen

QS Profil

[°]

I_{yz}

I

I

	[°]	[cm ⁴]	[cm ⁴]	[cm ⁴]
1 AVADIELE40 40	87. 42	-27. 6	648. 7	34. 0

Torsion

QS Profil

I_t

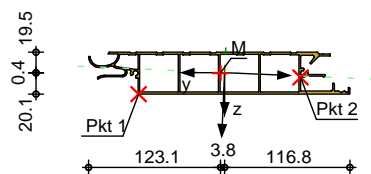
I

	[cm ⁴]	[cm ⁶]
1 AVADIELE40 40	73. 1	0. 0

Grafik

Querschnittsgrafik [mm]

M 1:7

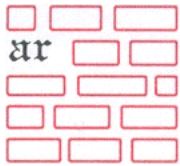


Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

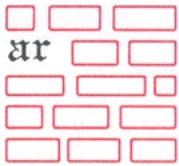
Aufl.	$M_{x, k, min}$	$F_{z, k, min}$	$F_{y, k, min}$	
	$M_{x, k, max}$	$F_{z, k, max}$	$F_{y, k, max}$	
	[kNm]	[kN]	[kN]	
Ei nw. <i>Gk</i>	A	0. 00	0. 03	0. 00
		0. 00	0. 03	0. 00
	B	0. 00	0. 11	0. 00
		0. 00	0. 11	0. 00
	C	0. 00	0. 03	0. 00
Ei nw. <i>Qk, N</i>	A	0. 00	-0. 12	0. 00
		0. 00	0. 82	0. 00
	B	0. 00	1. 17	0. 00
		0. 00	2. 35	0. 00
	C	0. 00	-0. 12	0. 00
Ei nw. <i>Qk, S</i>	A	0. 00	0. 11	0. 00
		0. 00	0. 11	0. 00
	B	0. 00	0. 38	0. 00
		0. 00	0. 38	0. 00
	C	0. 00	0. 11	0. 00



PROJEKT	19259-1a AVA Diele 40	SEITE	37
POSITION	AL1-4-2-Feld Alu Bpr. (Verkehrslastansatz 10 kN/m²)	PROJ.-NR.	19259_1a
			10.07.2019
	0.00	0.11	0.00

Zusammenfassung	Zusammenfassung der Nachweise		
Nachweise (GZT)	Nachweise im Grenzzustand der Tragfähigkeit		
	Nachweis		
	Nachweis E-E	OK	$[-]$ 0.43
Nachweise (GZG)	Nachweise im Grenzzust. der Gebrauchstauglichkeit		
	Nachweis		
	Verformung	OK	$[-]$ 0.99

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

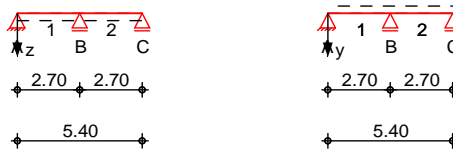


Pos. AL1-4-2-Feld-200 Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:325



Abmessungen
Mat./Querschnitt

Feld	l [m]	Lage [°]	Achsen
1-2	2.70	0.0	frei

Feld	Material	Profil
1-2	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager

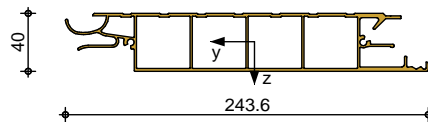
Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw. [kNm/rad]	K _{T,y} [kNm/rad]	K _{R,z} bzw. [kNm/rad]	Gabel l. Wölbbeh.	
A	0.00	fest	frei	fest	frei	fest	frei
B	2.70	fest	frei	fest	frei	fest	frei
C	5.40	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B, C	8.0

Grafik

Querschnittsgrafik

M 1:5



Belastungen

Belastungen auf das System

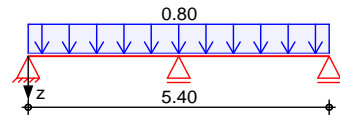
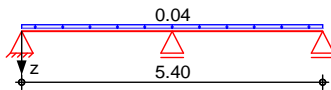
Grafik

Belastungsgrafiken (einwirkungsbezogen)

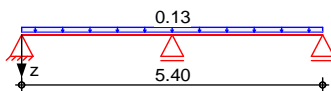
Einwirkungen

Gk

Qk.N



Qk.S



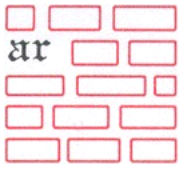
Streckenlasten
in z-Richtung

Gleichlasten
Feld Komm.

Einw. Gk

Einw. Qk.N

		a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
1	Eigengew	0.00	2.70	0.04	0.04	-0.4
2	Eigengew	0.00	2.70	0.04	0.04	-0.4
1	p+s	0.00	5.40	0.80	0.80	0.0



Ei nw. Qk. S

1 p+s 0.00 5.40 0.13 0.0

Char. Schni ttgrößen

charakteri stische Schni ttgrößen und Verformungen

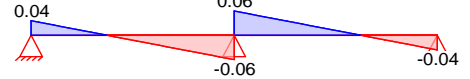
Grafi k

Schni ttgrößen und Verformungen (je Ei nwi rkung)

Ei nw. Gk

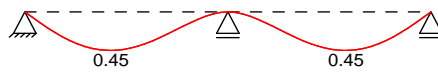
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]

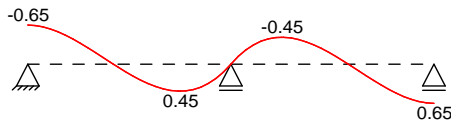


Verschi ebung w_z [mm]

Verdrehung α_x [mrad]



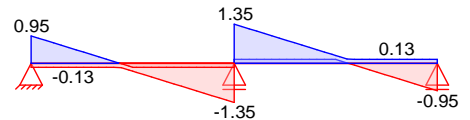
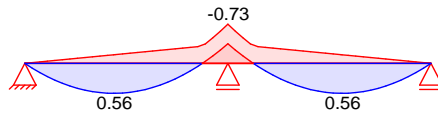
Verdrehung α_y [mrad]



Ei nw. Qk. N

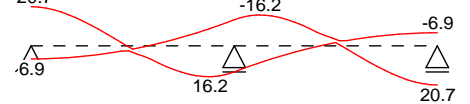
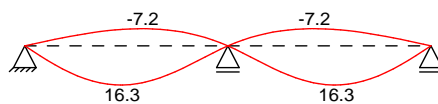
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschi ebung w_z [mm]

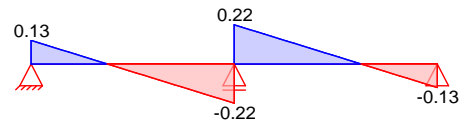
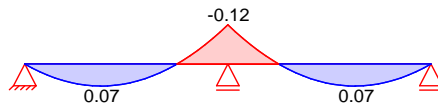
Verdrehung α_y [mrad]



Ei nw. Qk. S

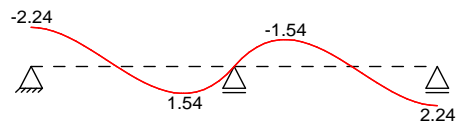
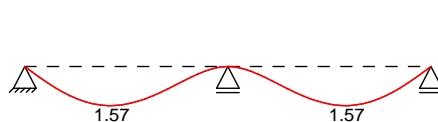
Moment $M_{y,k}$ [kNm]

Querkraft $V_{z,k}$ [kN]



Verschi ebung w_z [mm]

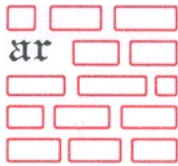
Verdrehung α_y [mrad]



Tabel l e

Schni ttgrößen (je Ei nwi rkung)

	Fel d	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
Ei nw. Gk	1	0.00	0.00	0.00	0.04	0.04
		1.01	0.02	0.02*	0.00	0.00
		2.70	-0.03*	-0.03	-0.06*	-0.06
2	2	0.00	-0.03	-0.03	0.06	0.06*
		2.70	0.00	0.00	-0.04	-0.04
Ei nw. Qk. N	1	0.00	0.00	0.00	-0.13	0.95
		1.18	-0.16	0.56*	-0.15	0.00



Ei nw. Qk. S	2	2.70	-0.73*	-0.36	-1.35*	-0.13
		0.00	-0.73	-0.36	0.13	1.35*
		2.70	0.00	0.00	-0.95	0.13
	1	0.00	0.00	0.00	0.13	0.13
		1.01	0.07	0.07*	0.00	0.00
		2.70	-0.12*	-0.12	-0.22*	-0.22
2	0.00	-0.12	-0.12	0.22	0.22*	
	2.70	0.00	0.00	-0.13	-0.13	

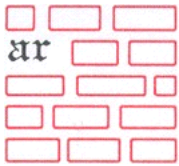
Verformungen (je Ei nwi rkung)

Ei nw.	Feld	x [m]	Wz, k, mi n	y, k, mi n	x, k, mi n
			Wz, k, max [mm]	y, k, max [mrad]	x, k, max [mrad]
Ei nw. Gk	1	0.00	0.00	-0.65*	0.00
		1.14	0.45	0.00	-0.01
		1.35	0.45*	0.00	-0.01*
		2.70	0.44	0.16	-0.01
		2.70	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00
		2.70	0.00	0.00	0.00
		2.70	0.00	0.65	0.00
		2.70	0.00	0.65*	0.00
		2.70	0.00	0.00	0.00
Ei nw. Qk. N	1	0.00	0.00	-20.65*	0.00
		1.28	0.00	6.88	0.00
		1.56	-6.82	0.00	0.00
		2.70	16.33*	2.70	0.00
		2.70	-7.15*	-0.01	0.00
	2	0.00	15.39	6.53	0.00
		2.70	0.00	-13.77	0.00
		2.70	0.00	13.77	0.00
		2.70	0.00	-13.77	0.00
		2.70	0.00	13.77	0.00
Ei nw. Qk. S	1	0.00	0.00	-2.24*	0.00
		1.14	0.00	-2.24	0.00
		2.70	1.57	0.00	0.00
	2	0.00	1.57*	0.00	0.00
		2.70	0.00	0.00	0.00
		2.70	0.00	0.00	0.00
		2.70	0.00	0.00	0.00

Kombi nati onen

Kombi nati onsbi ldu ng nach DIN EN 1990
Darstel lung der maßgebenden Kombi nati onen

	Ek	(* *EW)
ständi g/vorüberg.	5	1.35*Gk +1.50*Qk. N +1.50*Qk. S (1, 2)
quasi -ständi g	15	1.00*Gk +0.80*Qk. N (1)
	16	1.00*Gk +0.80*Qk. N (2)



Bem. -verformungen

Bemessungsverformungen

Grafik

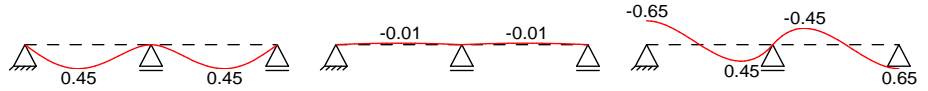
Verformungen (je Kombination)

Komb. 14

Wz, d [mm]

x, d [mrad]

y, d [mrad]

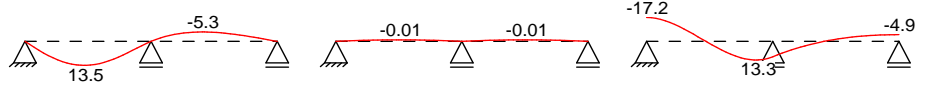


Komb. 15

Wz, d [mm]

x, d [mrad]

y, d [mrad]

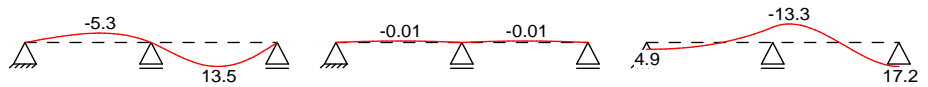


Komb. 16

Wz, d [mm]

x, d [mrad]

y, d [mrad]



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 14	1	0.00	0.00	-0.65*	0.00
		1.14	0.45*	0.00	-0.01
		1.35	0.44	0.16	-0.01*
	2	2.70	0.00	0.00	0.00
		0.00	0.00	0.00	0.00
Komb. 15	1	0.00	0.00	-17.17*	0.00
		1.28	13.51*	0.10	-0.01
		1.35	13.43	1.53	-0.01*
	2	2.36	4.23	13.34*	0.00
		2.70	0.00	11.02	0.00
		0.00	0.00	11.02	0.00
		1.10	-5.34*	-0.03	-0.01
Komb. 16	1	0.00	0.00	-4.86	0.00
		1.35	-5.13	1.53	-0.01*
		1.60	-5.34*	0.03	-0.01
	2	2.70	0.00	-11.02	0.00
		0.00	0.00	-11.02	0.00
		0.34	4.23	-13.34*	0.00
		1.42	13.51*	-0.10	-0.01
2.70	0.00	17.17*	0.00		

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material

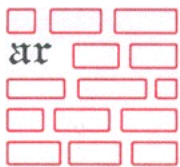
t _{Max} [mm]	f ₀ [N/mm ²]	E [N/mm ²]	BC
10 ^b	200	70000	A
25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil

A [cm ²]	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]	
1 AVADIELE40	13.9	10.2 41.6	35.2 647.4	17.2 51.0



Hauptachsen

QS	Profil	[°]	I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1	AVADIELE40 40	87.42	-27.6	648.7	34.0

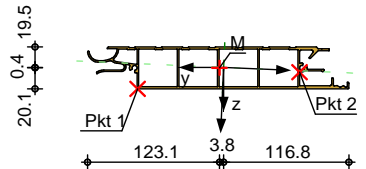
Torsion

QS	Profil	I_t [cm ⁴]	I [cm ⁶]
1	AVADIELE40 40	73.1	0.0

Grafik

Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	M_x, k, min	F_z, k, min	F_y, k, min
		M_x, k, max [kNm]	F_z, k, max [kN]	F_y, k, max [kN]
Ei nw. <i>Gk</i>	A	0.00	0.04	0.00
	B	0.00	0.13	0.00
	C	0.00	0.13	0.00
		0.00	0.04	0.00
Ei nw. <i>Qk. N</i>	A	0.00	-0.13	0.00
	B	0.00	0.95	0.00
	C	0.00	2.70	0.00
		0.00	-0.13	0.00
Ei nw. <i>Qk. S</i>	A	0.00	0.95	0.00
	B	0.00	0.13	0.00
	C	0.00	0.13	0.00
		0.00	0.44	0.00

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E [-]
OK 0.56

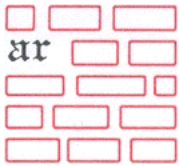
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung [-]
OK 1.00

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-4-3-Feld Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:415

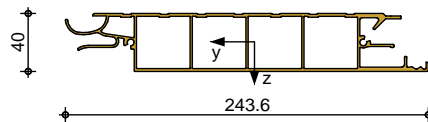


Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-3	2.30	0.0	frei
	Feld	Material	Profil	
	1-3	EN-AW 6063, T66, EP	AVADIELE40 40	

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	2.30	fest	frei	fest	frei	fest
	C	4.60	fest	frei	fest	frei	fest
	D	6.90	fest	frei	fest	frei	fest
	Lager						b [cm]
	A, B, C, D						8.0

Grafik Querschnittsgrafik

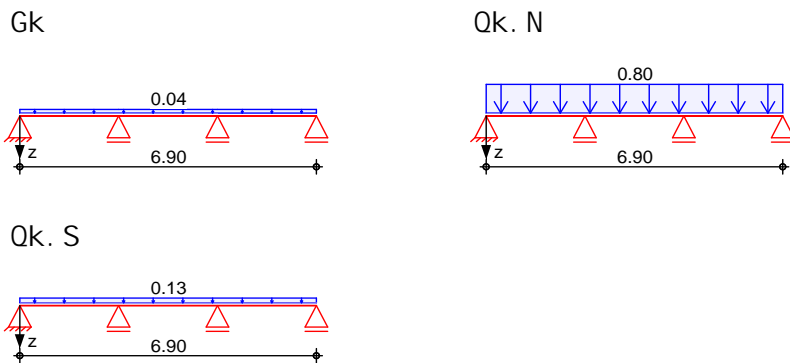
M 1:5

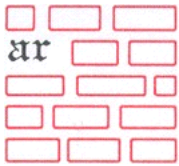


Belastungen Belastungen auf das System

Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen





Streckenlasten
in z-Richtung

Gleichlasten
Feld Komm.

Einw. Gk

		a	S	Q _{li}	Q _{re}	e
		[m]	[m]	[kN/m]	[kN/m]	[cm]
1	Ei gengew	0.00	2.30		0.04	-0.4
2	Ei gengew	0.00	2.30		0.04	-0.4
3	Ei gengew	0.00	2.30		0.04	-0.4
1	p+s	0.00	6.90		0.80	0.0
1	p+s	0.00	6.90		0.13	0.0

Einw. Qk. N

Einw. Qk. S

Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

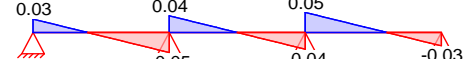
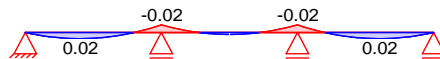
Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Einw. Gk

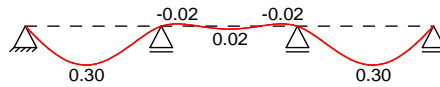
Moment M_y, k [kNm]

Querkraft V_z, k [kN]

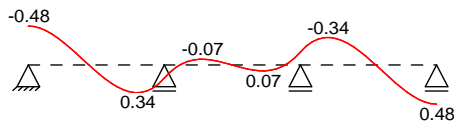


Verschiebung w_z, k [mm]

Verdrehung x, k [mrad]



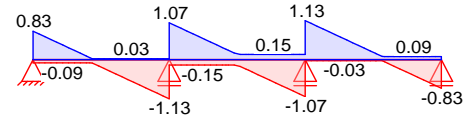
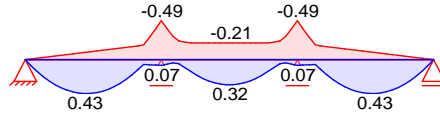
Verdrehung y, k [mrad]



Einw. Qk. N

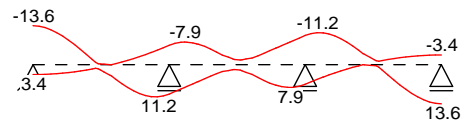
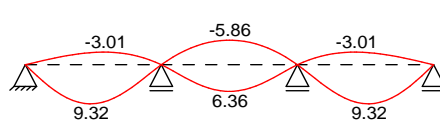
Moment M_y, k [kNm]

Querkraft V_z, k [kN]



Verschiebung w_z, k [mm]

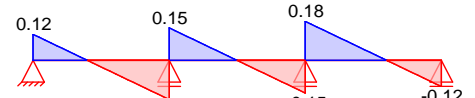
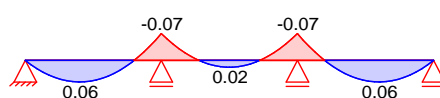
Verdrehung y, k [mrad]



Einw. Qk. S

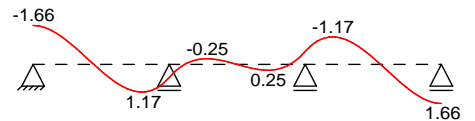
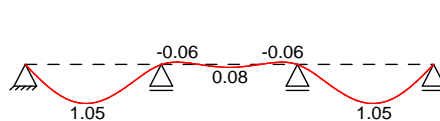
Moment M_y, k [kNm]

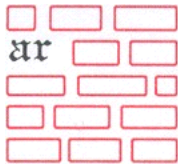
Querkraft V_z, k [kN]



Verschiebung w_z, k [mm]

Verdrehung y, k [mrad]





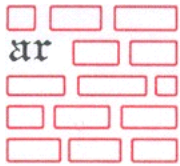
Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	$M_{y, k, \min}$ [kNm]	$M_{y, k, \max}$ [kNm]	$V_{z, k, \min}$ [kN]	$V_{z, k, \max}$ [kN]	
Einw. <i>Gk</i>	1	0.00	0.00	0.00	0.03	0.03	
		0.92	0.02	0.02*	0.00	0.00	
		2.30	-0.02*	-0.02	-0.05*	-0.05	
	2	0.00	-0.02	-0.02	0.04	0.04	
		2.30	-0.02	-0.02	-0.04	-0.04	
	3	0.00	-0.02	-0.02	0.05	0.05*	
2.30		0.00	0.00	-0.03	-0.03		
Einw. <i>Qk, N</i>	1	0.00	0.00	0.00	-0.09	0.83	
		1.00	-0.09	0.43*	-0.09	0.03	
		2.30	-0.49*	0.07	-1.13*	0.03	
	2	0.00	-0.49	0.07	-0.15	1.07	
		2.30	-0.49	0.07	-1.07	0.15	
	3	0.00	-0.49	0.07	-0.03	1.13*	
		2.30	0.00	0.00	-0.83	0.09	
	Einw. <i>Qk, S</i>	1	0.00	0.00	0.00	0.12	0.12
			0.92	0.06	0.06*	0.00	0.00
2.30			-0.07*	-0.07	-0.18*	-0.18	
2		0.00	-0.07	-0.07	0.15	0.15	
		2.30	-0.07	-0.07	-0.15	-0.15	
3		0.00	-0.07	-0.07	0.18	0.18*	
		2.30	0.00	0.00	-0.12	-0.12	

Verformungen (je Einwirkung)

	Feld	x [m]	W_z, k, \min [mm]	y, k, \min [mrad]	x, k, \min [mrad]	
			W_z, k, \max [mm]	y, k, \max [mrad]	x, k, \max [mrad]	
Einw. <i>Gk</i>	1	0.00	0.00	-0.48*	0.00	
		1.03	0.30	0.00	0.00	
		2.30	0.00	0.16	0.00	
	2	0.00	0.00	0.16	0.00	
		0.26	-0.02*	0.00	0.00	
		1.15	0.02	0.00	0.00	
		2.30	0.00	-0.16	0.00	
		3	0.00	0.00	-0.16	0.00
		2.30	0.00	0.48	0.00	
	Einw. <i>Qk, N</i>	1	0.00	0.00	-13.62*	0.00
			1.10	-2.89	3.40	0.00
			2.30	9.32*	-0.36	0.00
		2	0.00	0.00	1.38	0.00
			1.20	-5.86*	-6.81	0.00
			2.30	6.35	10.21	0.00
3		0.00	0.00	-6.81	0.00	
		2.30	0.00	10.21	0.00	
		3	0.00	0.00	-10.21	0.00



		2.30	0.00	-3.40	0.00
			0.00	13.62*	0.00
Ei nw. Qk. S	1	0.00	0.00	-1.66*	0.00
			0.00	-1.66	0.00
		1.03	1.05	0.00	0.00
			1.05*	0.00	0.00
		2.30	0.00	0.55	0.00
	2	0.00	0.00	0.55	0.00
			0.00	0.55	0.00
		0.26	-0.06*	0.01	0.00
			-0.06	0.01	0.00
		2.30	0.00	-0.55	0.00
			0.00	-0.55	0.00
	3	0.00	0.00	-0.55	0.00
			0.00	-0.55	0.00
		2.30	0.00	1.66	0.00
			0.00	1.66*	0.00

Kombi nati onen

Kombi nati onsbi ldu ng nach DIN EN 1990
Darstellung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	47	4	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	48	5	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	53	6	1.35*Gk	+1.50*Qk. N (2, 3)	+1.50*Qk. S
	55	8	1.35*Gk	+1.50*Qk. N (2)	+1.50*Qk. S
quasi -ständi g	22		1.00*Gk	+0.80*Qk. N (1, 3)	
	23		1.00*Gk	+0.80*Qk. N (2)	

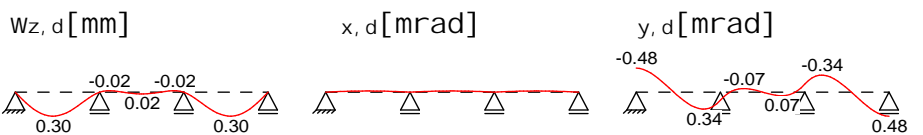
Bem. -verformungen

Bemessungsverformungen

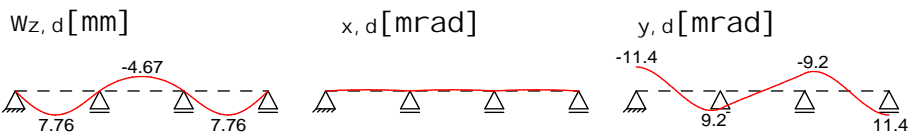
Grafi k

Verformungen (j e Kombi nati on)

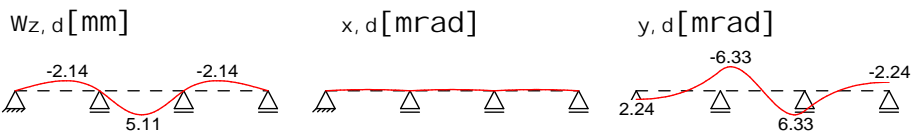
Komb. 21



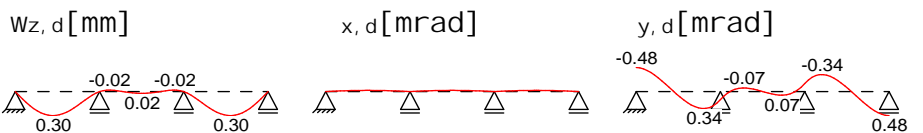
Komb. 22

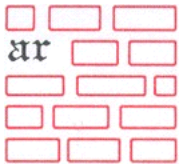


Komb. 23

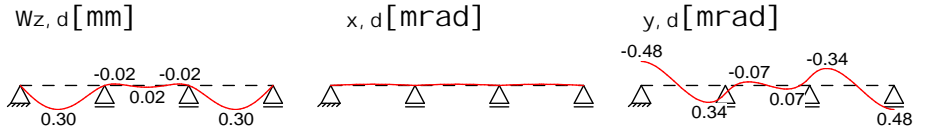


Komb. 79

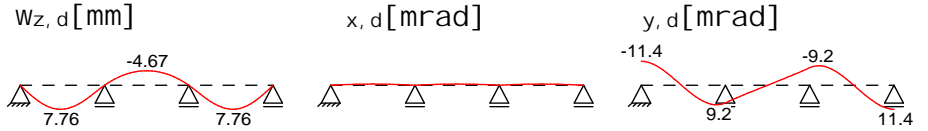




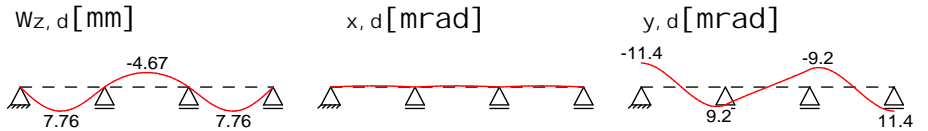
Komb. 80



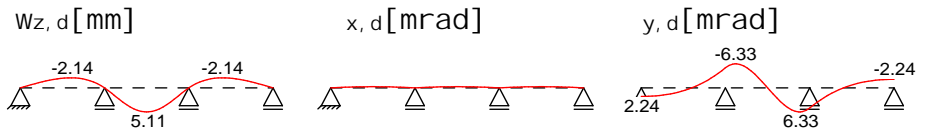
Komb. 81



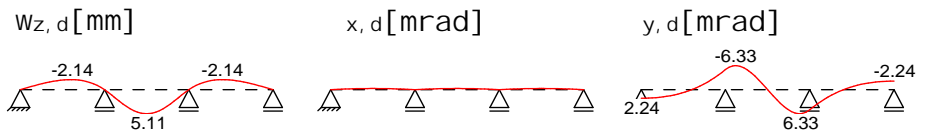
Komb. 82



Komb. 83



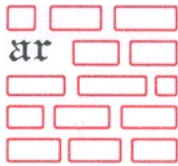
Komb. 84



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 21	1	0.00	0.00	-0.48*	0.00
		1.03	0.30*	0.00	0.00
		2.30	0.00	0.16	0.00
	2	0.00	0.00	0.16	0.00
		0.26	-0.02*	0.00	0.00
		1.15	0.02	0.00	0.00
3	2.30	0.00	-0.16	0.00	
	0.00	0.00	-0.16	0.00	
	2.30	0.00	0.48*	0.00	
Komb. 22	1	0.00	0.00	-11.38*	0.00
		1.10	7.76*	0.02	0.00
		2.30	0.00	8.33	0.00
	2	0.00	0.00	8.33	0.00
		1.15	-4.67	0.00	0.00
		1.20	-4.67*	-0.34	0.00
	3	2.30	0.00	-8.33	0.00
		0.00	0.00	-8.33	0.00
		2.30	0.00	11.38*	0.00
Komb. 23	1	0.00	0.00	2.24	0.00
		1.40	-2.14*	-0.08	0.00
		2.30	0.00	-5.29	0.00
	2	0.00	0.00	-5.29	0.00
		0.26	1.55	-6.33*	0.00
		1.15	5.11*	0.00	0.00
	3	2.04	1.55	6.33*	0.00
		2.30	0.00	5.29	0.00
		0.00	0.00	5.29	0.00
79	1	0.00	0.00	-0.48*	0.00
		1.03	0.30*	0.00	0.00



		2.30	0.00	0.16	0.00
	2	0.00	0.00	0.16	0.00
		0.26	-0.02*	0.00	0.00
		1.15	0.02	0.00	0.00
		2.30	0.00	-0.16	0.00
	3	0.00	0.00	-0.16	0.00
		2.30	0.00	0.48*	0.00
Komb. 80	1	0.00	0.00	-0.48*	0.00
		1.03	0.30*	0.00	0.00
		2.30	0.00	0.16	0.00
	2	0.00	0.00	0.16	0.00
		0.26	-0.02*	0.00	0.00
		1.15	0.02	0.00	0.00
		2.30	0.00	-0.16	0.00
	3	0.00	0.00	-0.16	0.00
		2.30	0.00	0.48*	0.00
Komb. 81	1	0.00	0.00	-11.38*	0.00
		1.10	7.76*	0.02	0.00
		2.30	0.00	8.33	0.00
	2	0.00	0.00	8.33	0.00
		1.15	-4.67	0.00	0.00
		1.20	-4.67*	-0.34	0.00
		2.30	0.00	-8.33	0.00
	3	0.00	0.00	-8.33	0.00
		2.30	0.00	11.38*	0.00
Komb. 82	1	0.00	0.00	-11.38*	0.00
		1.10	7.76*	0.02	0.00
		2.30	0.00	8.33	0.00
	2	0.00	0.00	8.33	0.00
		1.15	-4.67	0.00	0.00
		1.20	-4.67*	-0.34	0.00
		2.30	0.00	-8.33	0.00
	3	0.00	0.00	-8.33	0.00
		2.30	0.00	11.38*	0.00
Komb. 83	1	0.00	0.00	2.24	0.00
		1.40	-2.14*	-0.08	0.00
		2.30	0.00	-5.29	0.00
	2	0.00	0.00	-5.29	0.00
		0.26	1.55	-6.33*	0.00
		1.15	5.11*	0.00	0.00
		2.04	1.55	6.33*	0.00
		2.30	0.00	5.29	0.00
	3	0.00	0.00	5.29	0.00
		2.30	0.00	-2.24	0.00
Komb. 84	1	0.00	0.00	2.24	0.00
		1.40	-2.14*	-0.08	0.00
		2.30	0.00	-5.29	0.00
	2	0.00	0.00	-5.29	0.00
		0.26	1.55	-6.33*	0.00
		1.15	5.11*	0.00	0.00
		2.04	1.55	6.33*	0.00
		2.30	0.00	5.29	0.00
	3	0.00	0.00	5.29	0.00
		2.30	0.00	-2.24	0.00

Mat. / Querschnitt

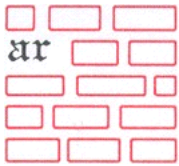
Material - und Querschnittswerte

Aluminium

Material

	t_{Max} [mm]	f_o [N/mm ²]	E [N/mm ²]	BC
<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)



Querschnitt

QS	Profil	A	S_y S_z	I_y I_z	W_y W_z
		[cm ²]	[cm ³]	[cm ⁴]	[cm ³]
1	AVADIELE40 40	13.9	10.2 41.6	35.2 647.4	17.2 51.0

Hauptachsen

QS	Profil	[°]	I_{yz}	I	I
			[cm ⁴]	[cm ⁴]	[cm ⁴]
1	AVADIELE40 40	87.42	-27.6	648.7	34.0

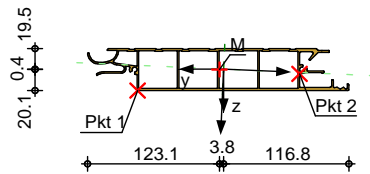
Torsion

QS	Profil	I_t	I
		[cm ⁴]	[cm ⁶]
1	AVADIELE40 40	73.1	0.0

Grafik

Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

Aufl.	$M_{x, k, \min}$	$F_{z, k, \min}$	$F_{y, k, \min}$	
	$M_{x, k, \max}$	$F_{z, k, \max}$	$F_{y, k, \max}$	
	[kNm]	[kN]	[kN]	
Ei nw. <i>Gk</i>	A	0.00	0.03	0.00
	B	0.00	0.10	0.00
	C	0.00	0.10	0.00
	D	0.00	0.10	0.00
		0.00	0.03	0.00
		0.00	0.03	0.00
Ei nw. <i>Qk. N</i>	A	0.00	-0.09	0.00
	B	0.00	0.83	0.00
	C	0.00	-0.18	0.00
	D	0.00	2.21	0.00
		0.00	-0.18	0.00
		0.00	2.21	0.00
Ei nw. <i>Qk. S</i>	A	0.00	-0.09	0.00
	B	0.00	0.83	0.00
	C	0.00	0.12	0.00
	D	0.00	0.12	0.00
		0.00	0.33	0.00
		0.00	0.33	0.00

Zusammenfassung

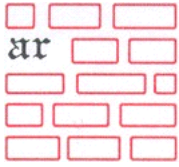
Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E	OK	0.37
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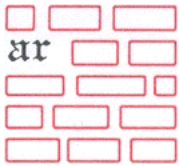
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK $\frac{[-]}{1.01}$

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-4-3-Feld-200 Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:480



Abmessungen
Mat./Querschnitt

Feld	l [m]	Lage [°]	Achsen
1-3	2.65	0.0	frei

Feld	Material	Profil
1-3	EN-AW 6063, T66, EP	AVADIELE40

Auflager

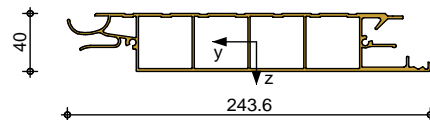
Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.	
A	0.00	fest	frei	fest	frei	fest	frei
B	2.65	fest	frei	fest	frei	fest	frei
C	5.30	fest	frei	fest	frei	fest	frei
D	7.95	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B, C, D	8.0

Grafik

Querschnittsgrafik

M 1:5



Belastungen

Belastungen auf das System

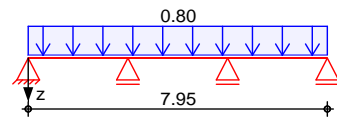
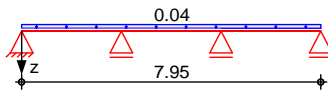
Grafik

Belastungsgrafiken (einwirkungsbezogen)

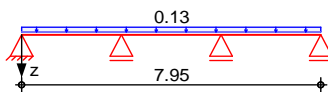
Einwirkungen

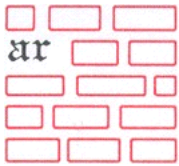
Gk

Qk.N



Qk.S





Streckenlasten
in z-Richtung

Gleichlasten
Feld Komm.

Einw. *Gk*

		a	S	Q_{li}	Q_{re}	e
		[m]	[m]	[kN/m]	[kN/m]	[cm]
1	Eigengew	0.00	2.65		0.04	-0.4
2	Eigengew	0.00	2.65		0.04	-0.4
3	Eigengew	0.00	2.65		0.04	-0.4
1	p+s	0.00	7.95		0.80	0.0
1	p+s	0.00	7.95		0.13	0.0

Einw. *Qk.N*

Einw. *Qk.S*

Char. Schnittgrößen

charakteristische Schnittgrößen und Verformungen

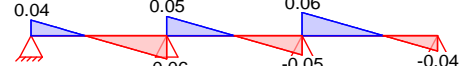
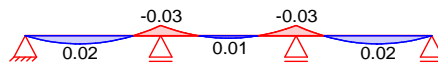
Grafik

Schnittgrößen und Verformungen (je Einwirkung)

Einw. *Gk*

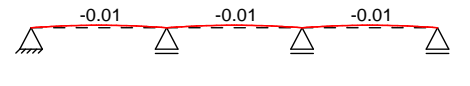
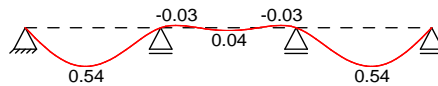
Moment M_y , k [kNm]

Querkraft V_z , k [kN]

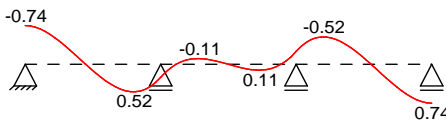


Verschiebung w_z , k [mm]

Verdrehung α_x , k [mrad]



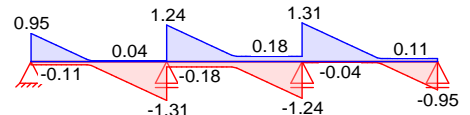
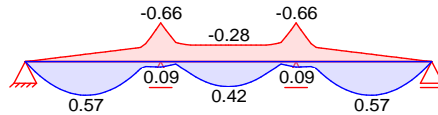
Verdrehung α_y , k [mrad]



Einw. *Qk.N*

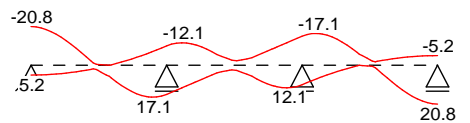
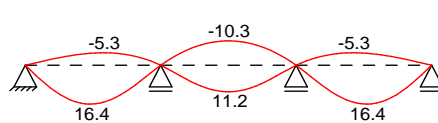
Moment M_y , k [kNm]

Querkraft V_z , k [kN]



Verschiebung w_z , k [mm]

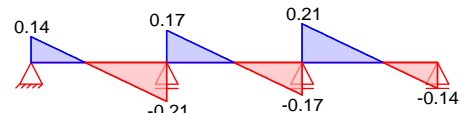
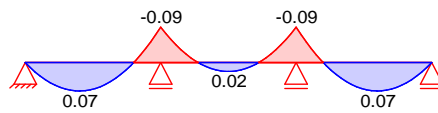
Verdrehung α_y , k [mrad]



Einw. *Qk.S*

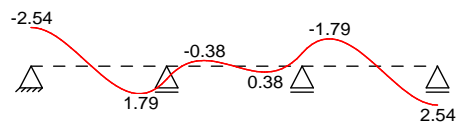
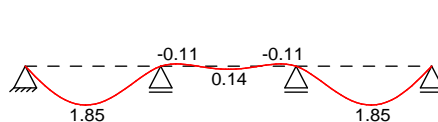
Moment M_y , k [kNm]

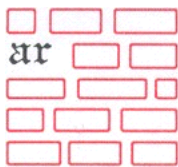
Querkraft V_z , k [kN]



Verschiebung w_z , k [mm]

Verdrehung α_y , k [mrad]





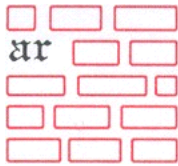
Tabelle

Schnittgrößen (je Einwirkung)

Einw.	Gk	Feld	x	My, k, min	My, k, max	Vz, k, min	Vz, k, max	
			[m]	[kNm]	[kNm]	[kN]	[kN]	
Einw. Gk	1	1	0.00	0.00	0.00	0.04	0.04	
			1.06	0.02	0.02*	0.00	0.00	
			2.65	-0.03*	-0.03	-0.06*	-0.06	
	2	2	0.00	-0.03	-0.03	0.05	0.05	
			2.65	-0.03	-0.03	-0.05	-0.05	
			0.00	-0.03	-0.03	0.06	0.06*	
	3	3	2.65	0.00	0.00	-0.04	-0.04	
			0.00	0.00	0.00	-0.11	0.95	
			1.18	-0.12	0.57*	-0.13	0.04	
Einw. Qk, N	1	1	2.65	-0.66*	0.09	-1.31*	0.04	
			0.00	-0.66	0.09	-0.18	1.24	
			2.65	-0.66	0.09	-1.24	0.18	
	2	2	0.00	-0.66	0.09	-0.04	1.31*	
			2.65	0.00	0.00	-0.95	0.11	
			0.00	0.00	0.00	0.14	0.14	
	Einw. Qk, S	1	1	1.06	0.07	0.07*	0.00	0.00
				2.65	-0.09*	-0.09	-0.21*	-0.21
				0.00	-0.09	-0.09	0.17	0.17
2		2	2.65	-0.09	-0.09	-0.17	-0.17	
			0.00	-0.09	-0.09	0.21	0.21*	
			2.65	0.00	0.00	-0.14	-0.14	
3		3	0.00	-0.09	-0.09	0.21	0.21*	
			2.65	0.00	0.00	-0.14	-0.14	
			0.00	-0.09	-0.09	0.21	0.21*	

Verformungen (je Einwirkung)

Einw.	Gk	Feld	x	Wz, k, min	y, k, min	x, k, min
			[m]	Wz, k, max	y, k, max	x, k, max
				[mm]	[mrad]	[mrad]
Einw. Gk	1	1	0.00	0.00	-0.74*	0.00
			1.18	0.54	0.00	-0.01
			2.65	0.54*	0.00	-0.01
			0.00	0.00	0.25	0.00
			1.18	0.00	0.25	0.00
			2.65	0.00	0.25	0.00
			0.00	0.00	0.25	0.00
			0.30	-0.03*	0.00	0.00
			1.33	-0.03	0.00	0.00
	2	2	1.33	0.04	0.00	-0.01*
			2.65	0.04	0.00	-0.01
			0.00	0.00	-0.25	0.00
			0.00	0.00	-0.25	0.00
			0.00	0.00	-0.25	0.00
			0.00	0.00	-0.25	0.00
			0.00	0.00	0.74	0.00
			2.65	0.00	0.74*	0.00
			0.00	0.00	0.74*	0.00
Einw. Qk, N	1	1	0.00	0.00	-20.83*	0.00
			1.28	0.00	5.21	0.00
			2.65	-5.10	-0.53	0.00
			0.00	16.42*	2.25	0.00
			1.28	0.00	-10.41	0.00
			2.65	0.00	15.62	0.00
			0.00	0.00	-10.41	0.00
			1.37	0.00	15.62	0.00
			2.65	-10.34*	-2.45	0.00
Einw. Qk, S	2	2	2.65	11.19	2.74	0.00
			0.00	0.00	-15.62	0.00
			0.00	0.00	10.41	0.00
			0.00	0.00	-15.62	0.00
			0.00	0.00	10.41	0.00
			0.00	0.00	-15.62	0.00
			0.00	0.00	10.41	0.00
			0.00	0.00	-15.62	0.00
			0.00	0.00	10.41	0.00



		2.65	0.00	-5.21	0.00
			0.00	20.83*	0.00
Ei nw. Qk. S	1	0.00	0.00	-2.54*	0.00
			0.00	-2.54	0.00
		1.18	1.85	0.00	0.00
			1.85*	0.00	0.00
		2.65	0.00	0.85	0.00
			0.00	0.85	0.00
	2	0.00	0.00	0.85	0.00
			0.00	0.85	0.00
		0.30	-0.11*	0.00	0.00
			-0.11	0.00	0.00
		2.65	0.00	-0.85	0.00
			0.00	-0.85	0.00
	3	0.00	0.00	-0.85	0.00
			0.00	-0.85	0.00
		2.65	0.00	2.54	0.00
			0.00	2.54*	0.00

Kombi nati onen

Kombi nati onsbi ldu ng nach DIN EN 1990
Darstellung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	47	4	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	48	5	1.35*Gk	+1.50*Qk. N (1, 2)	+1.50*Qk. S
	53	6	1.35*Gk	+1.50*Qk. N (2, 3)	+1.50*Qk. S
	55	8	1.35*Gk	+1.50*Qk. N (2)	+1.50*Qk. S
quasi -ständi g	22		1.00*Gk	+0.80*Qk. N (1, 3)	
	23		1.00*Gk	+0.80*Qk. N (2)	

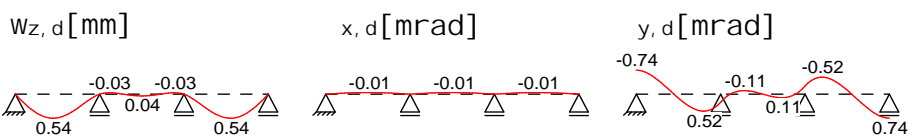
Bem. -verformungen

Bemessungsverformungen

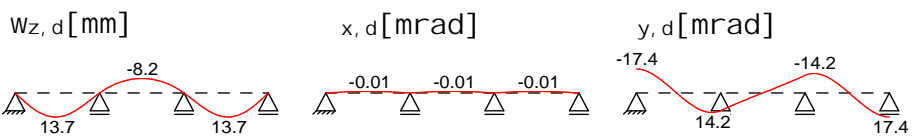
Grafi k

Verformungen (je Kombi nati on)

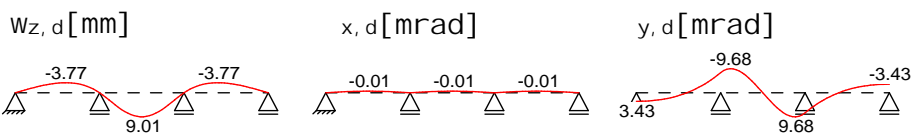
Komb. 21



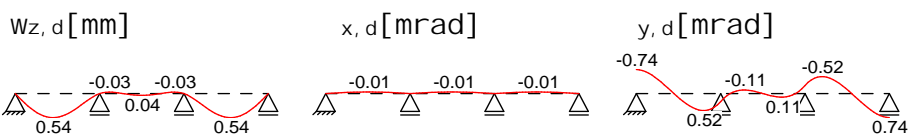
Komb. 22

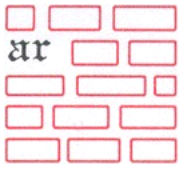


Komb. 23

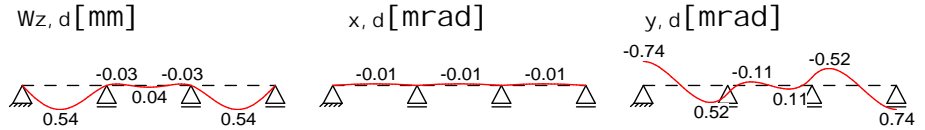


Komb. 79

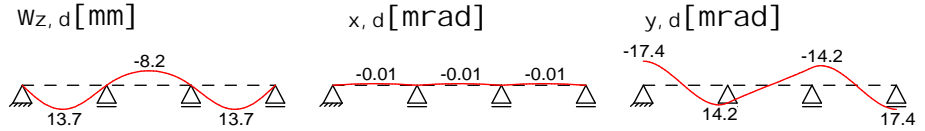




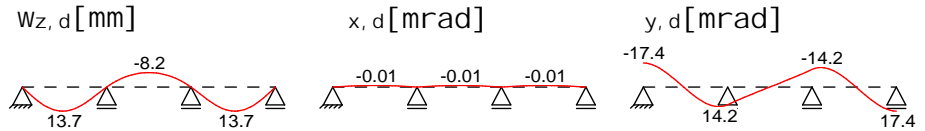
Komb. 80



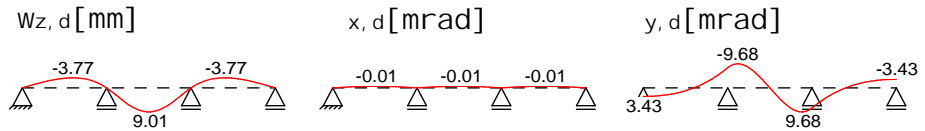
Komb. 81



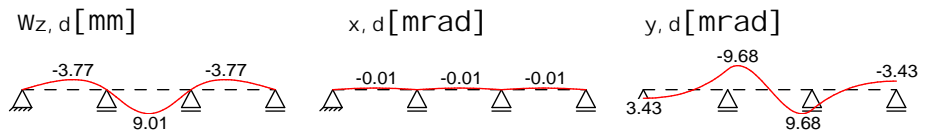
Komb. 82



Komb. 83



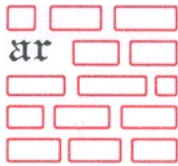
Komb. 84



Tabelle

Verformungen (je Kombination)

	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 21	1	0.00	0.00	-0.74*	0.00
		1.18	0.54*	0.00	-0.01
	2	2.65	0.00	0.25	0.00
		0.00	0.00	0.25	0.00
		0.30	-0.03*	0.00	0.00
		1.33	0.04	0.00	-0.01*
3	2.65	0.00	-0.25	0.00	
	0.00	0.00	-0.25	0.00	
	2.65	0.00	0.74*	0.00	
	0.00	0.00	0.74*	0.00	
Komb. 22	1	0.00	0.00	-17.40*	0.00
		1.28	13.67*	0.19	-0.01
	2	2.65	0.00	12.74	0.00
		0.00	0.00	12.74	0.00
		1.33	-8.23	0.00	-0.01*
		1.37	-8.23*	-0.45	-0.01
	3	2.65	0.00	-12.74	0.00
		0.00	0.00	-12.74	0.00
		2.65	0.00	17.40*	0.00
		0.00	0.00	17.40*	0.00
Komb. 23	1	0.00	0.00	3.43	0.00
		1.57	-3.77*	0.09	-0.01
	2	2.65	0.00	-8.09	0.00
		0.00	0.00	-8.09	0.00
		0.30	2.73	-9.68*	0.00
		1.33	9.01*	0.00	-0.01*
	3	2.35	2.73	9.68*	0.00
		2.65	0.00	8.09	0.00
		0.00	0.00	8.09	0.00
		2.65	0.00	-3.43	0.00
Komb. 79	1	0.00	0.00	-0.74*	0.00
		1.18	0.54*	0.00	-0.01



		2.65	0.00	0.25	0.00
	2	0.00	0.00	0.25	0.00
		0.30	-0.03*	0.00	0.00
		1.33	0.04	0.00	-0.01*
		2.65	0.00	-0.25	0.00
	3	0.00	0.00	-0.25	0.00
		2.65	0.00	0.74*	0.00
Komb. 80	1	0.00	0.00	-0.74*	0.00
		1.18	0.54*	0.00	-0.01
		2.65	0.00	0.25	0.00
	2	0.00	0.00	0.25	0.00
		0.30	-0.03*	0.00	0.00
		1.33	0.04	0.00	-0.01*
		2.65	0.00	-0.25	0.00
	3	0.00	0.00	-0.25	0.00
		2.65	0.00	0.74*	0.00
Komb. 81	1	0.00	0.00	-17.40*	0.00
		1.28	13.67*	0.19	-0.01
		2.65	0.00	12.74	0.00
	2	0.00	0.00	12.74	0.00
		1.33	-8.23	0.00	-0.01*
		1.37	-8.23*	-0.45	-0.01
		2.65	0.00	-12.74	0.00
	3	0.00	0.00	-12.74	0.00
		2.65	0.00	17.40*	0.00
Komb. 82	1	0.00	0.00	-17.40*	0.00
		1.28	13.67*	0.19	-0.01
		2.65	0.00	12.74	0.00
	2	0.00	0.00	12.74	0.00
		1.33	-8.23	0.00	-0.01*
		1.37	-8.23*	-0.45	-0.01
		2.65	0.00	-12.74	0.00
	3	0.00	0.00	-12.74	0.00
		2.65	0.00	17.40*	0.00
Komb. 83	1	0.00	0.00	3.43	0.00
		1.57	-3.77*	0.09	-0.01
		2.65	0.00	-8.09	0.00
	2	0.00	0.00	-8.09	0.00
		0.30	2.73	-9.68*	0.00
		1.33	9.01*	0.00	-0.01*
		2.35	2.73	9.68*	0.00
		2.65	0.00	8.09	0.00
	3	0.00	0.00	8.09	0.00
		2.65	0.00	-3.43	0.00
Komb. 84	1	0.00	0.00	3.43	0.00
		1.57	-3.77*	0.09	-0.01
		2.65	0.00	-8.09	0.00
	2	0.00	0.00	-8.09	0.00
		0.30	2.73	-9.68*	0.00
		1.33	9.01*	0.00	-0.01*
		2.35	2.73	9.68*	0.00
		2.65	0.00	8.09	0.00
	3	0.00	0.00	8.09	0.00
		2.65	0.00	-3.43	0.00

Mat. /Querschnitt

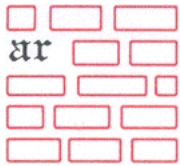
Material - und Querschnittswerte

Aluminium

Material

	t _{Max} [mm]	f _o [N/mm ²]	E [N/mm ²]	BC
<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)



Querschnitt

QS	Profil	A	S _y S _z	I _y I _z	W _y W _z
		[cm ²]	[cm ³]	[cm ⁴]	[cm ³]
1	AVADIELE40 40	13.9	10.2 41.6	35.2 647.4	17.2 51.0

Hauptachsen

QS	Profil	[°]	I _{yz}	I	I
			[cm ⁴]	[cm ⁴]	[cm ⁴]
1	AVADIELE40 40	87.42	-27.6	648.7	34.0

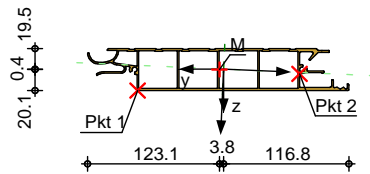
Torsion

QS	Profil	I _t	I
		[cm ⁴]	[cm ⁶]
1	AVADIELE40 40	73.1	0.0

Grafik

Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

Aufl.	M _{x, k, min} M _{x, k, max} [kNm]	F _{z, k, min} F _{z, k, max} [kN]	F _{y, k, min} F _{y, k, max} [kN]
Ei nw. Gk			
A	0.00	0.04	0.00
B	0.00	0.11	0.00
C	0.00	0.11	0.00
D	0.00	0.11	0.00
Ei nw. Qk. N			
A	0.00	-0.11	0.00
B	0.00	0.95	0.00
C	0.00	-0.21	0.00
D	0.00	2.54	0.00
Ei nw. Qk. S			
A	0.00	0.14	0.00
B	0.00	0.14	0.00
C	0.00	0.38	0.00
D	0.00	0.38	0.00

Zusammenfassung

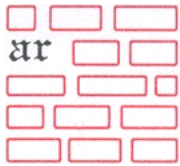
Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E	OK	0.50
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Nachweise (GZG)

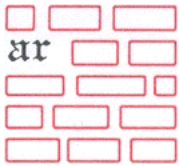
Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung

OK 1.03 [-]

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-4-4-Feld Alu Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System **Durchlaufträger**

M 1: 555



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-4	2.30	0.0	frei

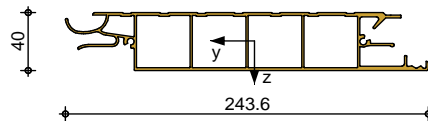
Feld	Material	Profil
1-4	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	2.30	fest	frei	fest	frei	fest
	C	4.60	fest	frei	fest	frei	fest
	D	6.90	fest	frei	fest	frei	fest
	E	9.20	fest	frei	fest	frei	fest

Lager	b [cm]
A, B, C, D, E	8.0

Grafik **Querschnittsgrafik**

M 1: 5

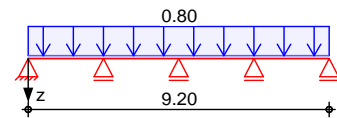
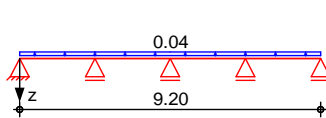


Belastungen **Belastungen auf das System**

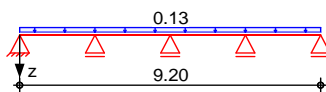
Grafik **Belastungsgrafiken (einwirkungsbezogen)**

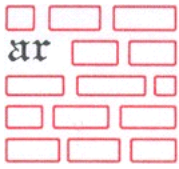
Einwirkungen

Gk **Qk. N**



Qk. S





Streckenlasten
in z-Richtung

Ei nw. *Gk*

Ei nw. *Qk. N*

Ei nw. *Qk. S*

Char. Schni ttgrößen

Grafi k

Ei nw. *Gk*

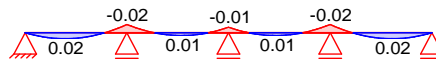
Gleichlasten
Feld Komm.

			a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
1	Ei gengew		0.00	2.30		0.04	-0.4
2	Ei gengew		0.00	2.30		0.04	-0.4
3	Ei gengew		0.00	2.30		0.04	-0.4
4	Ei gengew		0.00	2.30		0.04	-0.4
1	p+s		0.00	9.20		0.80	0.0
1	p+s		0.00	9.20		0.13	0.0

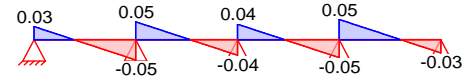
charakteristische Schni ttgrößen und Verformungen

Schni ttgrößen und Verformungen (je Ei nwirkung)

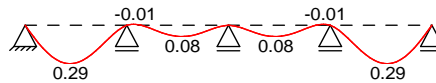
Moment M_y, k [kNm]



Querkraft V_z, k [kN]



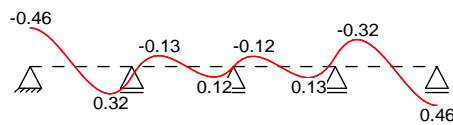
Verschi ebung w_z, k [mm]



Verdrehung α_x, k [mrad]

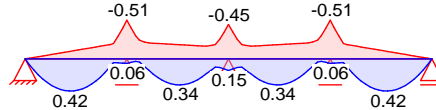


Verdrehung α_y, k [mrad]

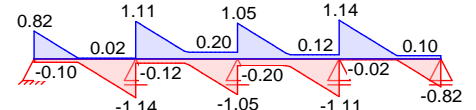


Ei nw. *Qk. N*

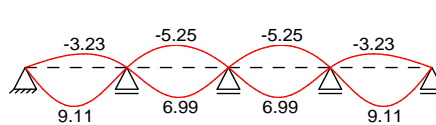
Moment M_y, k [kNm]



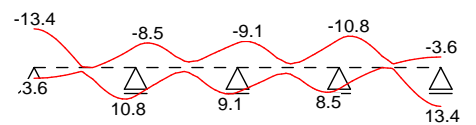
Querkraft V_z, k [kN]



Verschi ebung w_z, k [mm]

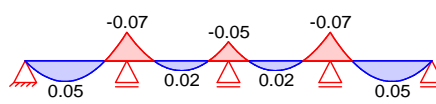


Verdrehung α_y, k [mrad]

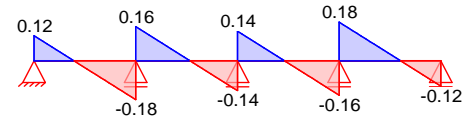


Ei nw. *Qk. S*

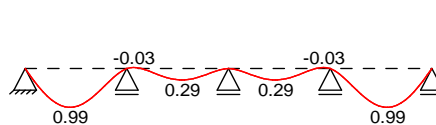
Moment M_y, k [kNm]



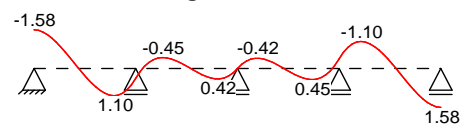
Querkraft V_z, k [kN]



Verschi ebung w_z, k [mm]



Verdrehung α_y, k [mrad]



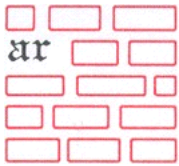
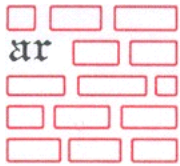


Tabelle Schnittgrößen (je Einwirkung)

Einw.	Gk	Feld	x [m]	My, k, [kNm]		Vz, k, [kN]		
				min	max	min	max	
Einw. Gk	1	1	0.00	0.00	0.00	0.03	0.03	
			0.90	0.02	0.02*	0.00	0.00	
		2	2.30	-0.02*	-0.02	-0.05*	-0.05	
			0.00	-0.02	-0.02	0.05	0.05	
		3	2.30	-0.01	-0.01	-0.04	-0.04	
			0.00	-0.01	-0.01	0.04	0.04	
	4	2.30	-0.02	-0.02	-0.05	-0.05		
		0.00	-0.02	-0.02	0.05	0.05*		
	Einw. Qk, N	1	1	0.00	0.00	0.00	-0.10	0.82
				1.00	-0.10	0.42*	-0.10	0.02
			2	2.30	-0.51*	0.06	-1.14*	0.02
				0.00	-0.51	0.06	-0.12	1.11
3			2.30	-0.45	0.15	-1.05	0.20	
			0.00	-0.45	0.15	-0.20	1.05	
4		2.30	-0.51	0.06	-1.11	0.12		
		0.00	-0.51	0.06	-0.02	1.14*		
Einw. Qk, S		1	1	0.00	0.00	0.00	0.12	0.12
				0.90	0.05	0.05*	0.00	0.00
			2	2.30	-0.07*	-0.07	-0.18*	-0.18
				0.00	-0.07	-0.07	0.16	0.16
	3		2.30	-0.05	-0.05	-0.14	-0.14	
			0.00	-0.05	-0.05	0.14	0.14	
	4	2.30	-0.07	-0.07	-0.16	-0.16		
		0.00	-0.07	-0.07	0.18	0.18*		
	2	1	2.30	0.00	0.00	-0.82	0.10	
			0.00	0.00	0.00	0.12	0.12	
		2	0.90	0.05	0.05*	0.00	0.00	
			2.30	-0.07*	-0.07	-0.18*	-0.18	
3		0.00	-0.07	-0.07	0.16	0.16		
		2.30	-0.05	-0.05	-0.14	-0.14		
4	0.00	-0.05	-0.05	0.14	0.14			
	2.30	-0.07	-0.07	-0.16	-0.16			
3	1	0.00	-0.07	-0.07	0.18	0.18*		
		2.30	0.00	0.00	-0.12	-0.12		
	2	0.00	0.00	0.00	0.12	0.12		
		0.90	0.05	0.05*	0.00	0.00		
	3	2.30	-0.07*	-0.07	-0.18*	-0.18		
		0.00	-0.07	-0.07	0.16	0.16		
4	2.30	-0.05	-0.05	-0.14	-0.14			
	0.00	-0.05	-0.05	0.14	0.14			
4	1	2.30	-0.07	-0.07	-0.16	-0.16		
		0.00	-0.07	-0.07	0.18	0.18*		
	2	2.30	0.00	0.00	-0.12	-0.12		
		0.00	0.00	0.00	0.12	0.12		
	3	0.90	0.05	0.05*	0.00	0.00		
		2.30	-0.07*	-0.07	-0.18*	-0.18		
4	0.00	-0.07	-0.07	0.16	0.16			
	2.30	-0.05	-0.05	-0.14	-0.14			

Verformungen (je Einwirkung)

Einw.	Gk	Feld	x [m]	Wz, k, [mm]		y, k, [mrad]		x, k, [mrad]		
				min	max	min	max	min	max	
Einw. Gk	1	1	0.00	0.00	0.00	-0.46*	0.00	0.00	0.00	
			1.01	0.29	0.00	-0.46	0.00	0.00	0.00	
			2.30	0.29*	0.00	0.00	0.11	0.00	0.00	
			0.00	0.00	0.00	0.11	0.00	0.00	0.00	
			2	0.00	0.00	0.00	0.11	0.00	0.00	0.00
				0.15	-0.01*	0.00	0.00	0.00	0.00	0.00
		3	1.15	0.08	0.00	-0.03	0.00	0.00	0.00	
			2.30	0.08	0.00	-0.03	0.00	0.00	0.00	
		2	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				2.30	0.00	0.00	0.00	0.00	0.00	0.00
			2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
				2.30	0.00	0.00	-0.11	0.00	0.00	0.00
	3		0.00	0.00	0.00	-0.11	0.00	0.00	0.00	
			2.30	0.00	0.00	-0.11	0.00	0.00	0.00	
	Einw. Qk, N	1	1	0.00	0.00	0.00	-13.38*	0.00	0.00	
				1.10	0.00	0.00	3.65	0.00	0.00	
			2	1.10	-3.09	0.00	-0.29	0.00	0.00	
				2.30	9.11*	0.00	1.47	0.00	0.00	
			3	0.00	0.00	0.00	0.00	0.00	0.00	
				2.30	0.00	0.00	0.00	0.00	0.00	
		4	0.00	0.00	0.00	0.00	0.00	0.00		
			2.30	0.00	0.00	0.46	0.00	0.00		
		2	1	0.00	0.00	0.00	0.46*	0.00	0.00	
				1.10	-3.09	0.00	-0.29	0.00	0.00	
2			1.10	9.11*	0.00	1.47	0.00	0.00		
			2.30	0.00	0.00	0.00	0.00	0.00		
3	0.00		0.00	0.00	0.00	0.00	0.00			
	2.30		0.00	0.00	0.00	0.00	0.00			



		2.30	0.00	-7.30	0.00
			0.00	9.73	0.00
2		0.00	0.00	-7.30	0.00
			0.00	9.73	0.00
		1.10	-5.25*	-2.23	0.00
			6.96	1.31	0.00
		2.30	0.00	-8.51	0.00
			0.00	8.51	0.00
3		0.00	0.00	-8.51	0.00
			0.00	8.51	0.00
		2.30	0.00	-9.73	0.00
			0.00	7.30	0.00
4		0.00	0.00	-9.73	0.00
			0.00	7.30	0.00
		2.30	0.00	-3.65	0.00
			0.00	13.38*	0.00
Ei nw. Qk. S	1	0.00	0.00	-1.58*	0.00
			0.00	-1.58	0.00
		1.01	0.99	0.00	0.00
			0.99*	0.00	0.00
		2.30	0.00	0.40	0.00
			0.00	0.40	0.00
2		0.00	0.00	0.40	0.00
			0.00	0.40	0.00
		0.15	-0.03*	0.01	0.00
			-0.03	0.01	0.00
		2.30	0.00	0.00	0.00
			0.00	0.00	0.00
3		0.00	0.00	0.00	0.00
			0.00	0.00	0.00
		2.30	0.00	-0.40	0.00
			0.00	-0.40	0.00
4		0.00	0.00	-0.40	0.00
			0.00	-0.40	0.00
		2.30	0.00	1.58	0.00
			0.00	1.58*	0.00

Kombi nati onen

Kombi nati onsbil dung nach DIN EN 1990
Darstellung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	58	7	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	59	8	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	60	5	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
	61	6	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
quasi -ständi g	28		1.00*Gk	+0.80*Qk. N (1, 3)	
	29		1.00*Gk	+0.80*Qk. N (2, 4)	

Bem. -verformungen

Bemessungsverformungen

Grafi k

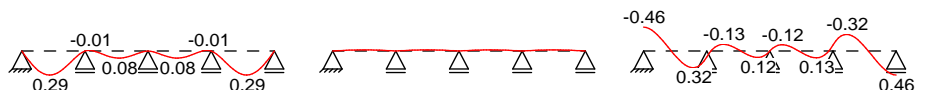
Verformungen (j e Kombi nati on)

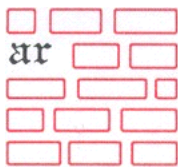
Komb. 27

w_{z, d} [mm]

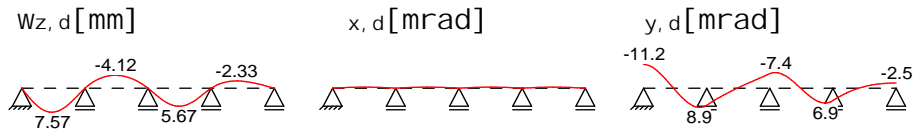
x, d [mrad]

y, d [mrad]

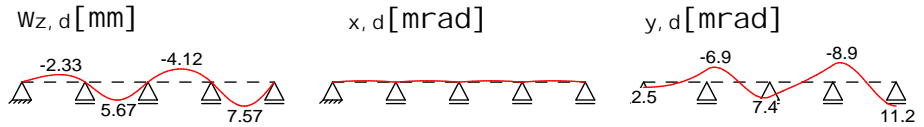




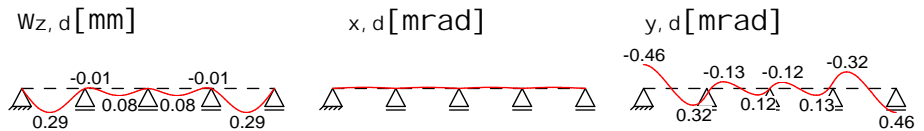
Komb. 28



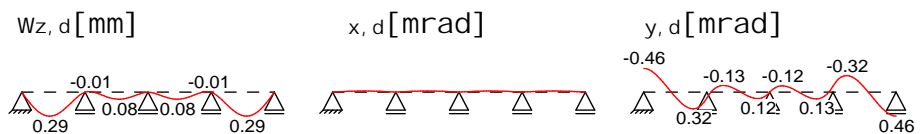
Komb. 29



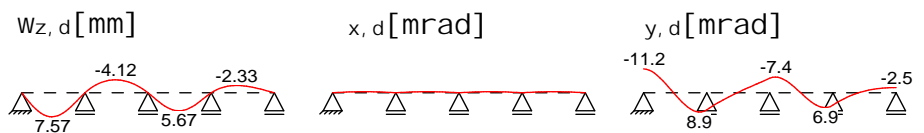
Komb. 102



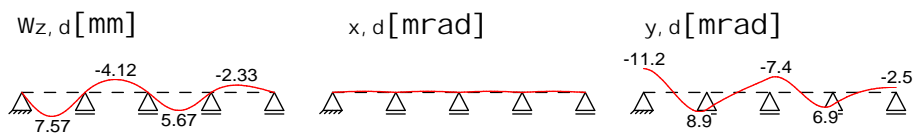
Komb. 103



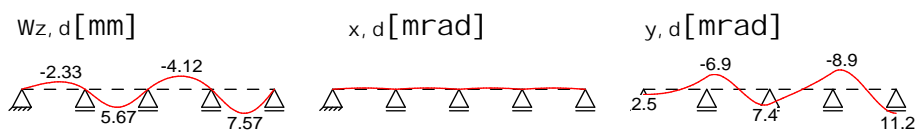
Komb. 104



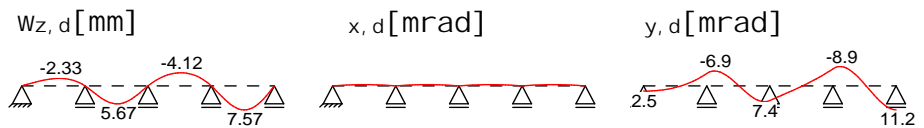
Komb. 105



Komb. 106



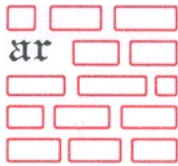
Komb. 107



Tabelle

Verformungen (je Kombination)

Komb.	Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 27	1	0.00	0.00	-0.46*	0.00
		1.01	0.29*	0.00	0.00
		2.30	0.00	0.11	0.00
	2	0.00	0.00	0.11	0.00
		0.15	-0.01*	0.00	0.00
		1.15	0.08	-0.03	0.00
3	2.30	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00
	2.30	0.00	-0.11	0.00	0.00
4	0.00	0.00	-0.11	0.00	0.00
	2.30	0.00	0.46*	0.00	0.00
	1	0.00	0.00	-11.16*	0.00



PROJEKT **19259-1a AVA Diele 40**

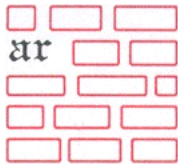
PROJ.-NR.

19259_1a

POSITION **AL1-4-4-Feld Alu Bpr. (Verkehrslastansatz 210 kN/m²)**

10.07.2019

		1. 10	7. 57*	0. 08	0. 00
		2. 00	2. 60	8. 94*	0. 00
		2. 30	0. 00	7. 90	0. 00
	2	0. 00	0. 00	7. 90	0. 00
		1. 10	-4. 12*	0. 03	0. 00
		1. 15	-4. 11	-0. 27	0. 00
		2. 30	0. 00	-6. 81	0. 00
	3	0. 00	0. 00	-6. 81	0. 00
		2. 30	0. 00	5. 72	0. 00
	4	0. 00	0. 00	5. 72	0. 00
		2. 30	0. 00	-2. 46	0. 00
Komb. 29	1	0. 00	0. 00	2. 46	0. 00
		2. 30	0. 00	-5. 72	0. 00
	2	0. 00	0. 00	-5. 72	0. 00
		1. 15	5. 67	-0. 27	0. 00
		2. 30	0. 00	6. 81	0. 00
	3	0. 00	0. 00	6. 81	0. 00
		1. 20	-4. 12*	-0. 03	0. 00
		2. 30	0. 00	-7. 90	0. 00
	4	0. 00	0. 00	-7. 90	0. 00
		0. 30	2. 60	-8. 94*	0. 00
		1. 20	7. 57*	-0. 08	0. 00
		2. 30	0. 00	11. 16*	0. 00
Komb. 102	1	0. 00	0. 00	-0. 46*	0. 00
		1. 01	0. 29*	0. 00	0. 00
		2. 30	0. 00	0. 11	0. 00
	2	0. 00	0. 00	0. 11	0. 00
		0. 15	-0. 01*	0. 00	0. 00
		1. 15	0. 08	-0. 03	0. 00
		2. 30	0. 00	0. 00	0. 00
	3	0. 00	0. 00	0. 00	0. 00
		2. 30	0. 00	-0. 11	0. 00
	4	0. 00	0. 00	-0. 11	0. 00
		2. 30	0. 00	0. 46*	0. 00
Komb. 103	1	0. 00	0. 00	-0. 46*	0. 00
		1. 01	0. 29*	0. 00	0. 00
		2. 30	0. 00	0. 11	0. 00
	2	0. 00	0. 00	0. 11	0. 00
		0. 15	-0. 01*	0. 00	0. 00
		1. 15	0. 08	-0. 03	0. 00
		2. 30	0. 00	0. 00	0. 00
	3	0. 00	0. 00	0. 00	0. 00
		2. 30	0. 00	-0. 11	0. 00
	4	0. 00	0. 00	-0. 11	0. 00
		2. 30	0. 00	0. 46*	0. 00
Komb. 104	1	0. 00	0. 00	-11. 16*	0. 00
		1. 10	7. 57*	0. 08	0. 00
		2. 00	2. 60	8. 94*	0. 00
		2. 30	0. 00	7. 90	0. 00
	2	0. 00	0. 00	7. 90	0. 00
		1. 10	-4. 12*	0. 03	0. 00
		1. 15	-4. 11	-0. 27	0. 00
		2. 30	0. 00	-6. 81	0. 00
	3	0. 00	0. 00	-6. 81	0. 00
		2. 30	0. 00	5. 72	0. 00
	4	0. 00	0. 00	5. 72	0. 00
		2. 30	0. 00	-2. 46	0. 00
Komb. 105	1	0. 00	0. 00	-11. 16*	0. 00
		1. 10	7. 57*	0. 08	0. 00
		2. 00	2. 60	8. 94*	0. 00
		2. 30	0. 00	7. 90	0. 00
	2	0. 00	0. 00	7. 90	0. 00
		1. 10	-4. 12*	0. 03	0. 00
		1. 15	-4. 11	-0. 27	0. 00



		2.30	0.00	-6.81	0.00
	3	0.00	0.00	-6.81	0.00
		2.30	0.00	5.72	0.00
	4	0.00	0.00	5.72	0.00
		2.30	0.00	-2.46	0.00
Komb. 106	1	0.00	0.00	2.46	0.00
		2.30	0.00	-5.72	0.00
	2	0.00	0.00	-5.72	0.00
		1.15	5.67	-0.27	0.00
		2.30	0.00	6.81	0.00
	3	0.00	0.00	6.81	0.00
		1.20	-4.12*	-0.03	0.00
		2.30	0.00	-7.90	0.00
	4	0.00	0.00	-7.90	0.00
		0.30	2.60	-8.94*	0.00
		1.20	7.57*	-0.08	0.00
		2.30	0.00	11.16*	0.00
Komb. 107	1	0.00	0.00	2.46	0.00
		2.30	0.00	-5.72	0.00
	2	0.00	0.00	-5.72	0.00
		1.15	5.67	-0.27	0.00
		2.30	0.00	6.81	0.00
	3	0.00	0.00	6.81	0.00
		1.20	-4.12*	-0.03	0.00
		2.30	0.00	-7.90	0.00
	4	0.00	0.00	-7.90	0.00
		0.30	2.60	-8.94*	0.00
		1.20	7.57*	-0.08	0.00
		2.30	0.00	11.16*	0.00

Mat. /Querschnitt

Material - und Querschnittswerte

Aluminium

Material

t_{Max} [mm] f_o [N/mm²] E [N/mm²] BC

EN-AW 6063, T66, EP

10^b 200 70000 A

25^b 180 70000 A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil

A [cm²] S_y [cm³] I_y [cm⁴] W_y [cm³]
S_z [cm³] I_z [cm⁴] W_z [cm³]

1 AVADIELE40 40 13.9 10.2 35.2 17.2
41.6 647.4 51.0

Hauptachsen

QS Profil

[°] I_{yz} [cm⁴] I [cm⁴] I [cm⁴]

1 AVADIELE40 40 87.42 -27.6 648.7 34.0

Torsion

QS Profil

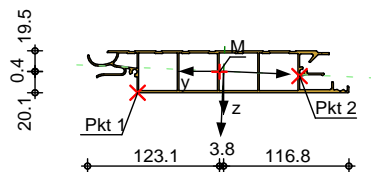
I_t [cm⁴] I [cm⁶]

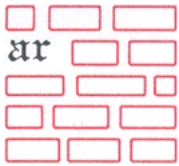
1 AVADIELE40 40 73.1 0.0

Grafik

Querschnittsgrafik [mm]

M 1:7





Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	M _{x, k, min}	F _{z, k, min}	F _{y, k, min}
		M _{x, k, max} [kNm]	F _{z, k, max} [kN]	F _{y, k, max} [kN]
Ei nw. <i>Gk</i>	A	0.00	0.03	0.00
	B	0.00	0.03	0.00
	C	0.00	0.10	0.00
	D	0.00	0.10	0.00
	E	0.00	0.08	0.00
			0.00	0.08
Ei nw. <i>Qk. N</i>	A	0.00	0.10	0.00
	B	0.00	0.82	0.00
	C	0.00	-0.15	0.00
	D	0.00	2.25	0.00
	E	0.00	-0.39	0.00
			0.00	2.10
Ei nw. <i>Qk. S</i>	A	0.00	-0.15	0.00
	B	0.00	2.25	0.00
	C	0.00	-0.10	0.00
	D	0.00	0.82	0.00
	E	0.00	0.12	0.00
			0.00	0.12

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E [-]
 OK 0.39

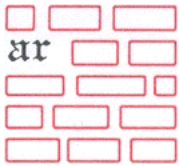
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung [-]
 OK 0.99

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
 Kürzere Spannweiten sind möglich!

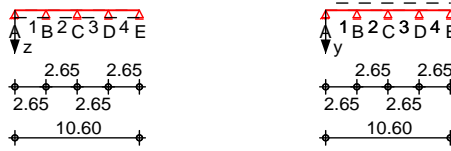


Pos. AL1-4-4-Feld-200 Bpr. (Verkehrslastansatz, 4.0 kN/m²)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1: 640



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1-4	2.65	0.0	frei

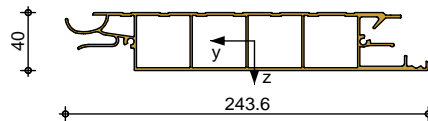
Feld	Material	Profil
1-4	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _{R,z}	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	2.65	fest	frei	fest	frei	fest
	C	5.30	fest	frei	fest	frei	fest
	D	7.95	fest	frei	fest	frei	fest
	E	10.6	fest	frei	fest	frei	fest

Lager	b [cm]
A, B, C, D, E	8.0

Grafik Querschnittsgrafik

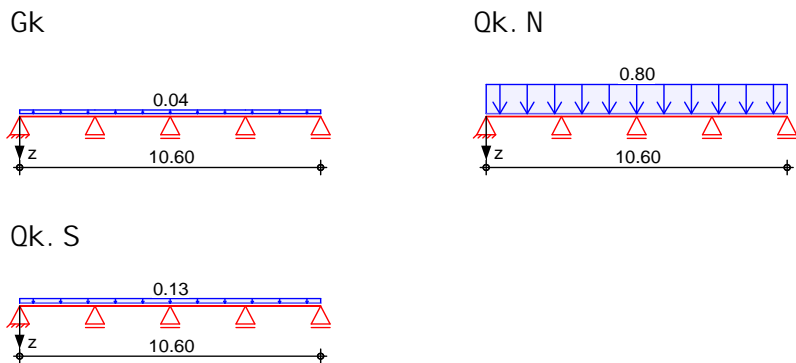
M 1: 5

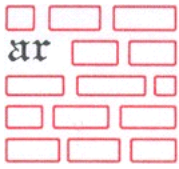


Belastungen Belastungen auf das System

Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen





Streckenlasten
in z-Richtung

Ei nw. *Gk*

Ei nw. *Qk. N*

Ei nw. *Qk. S*

Char. Schni ttgrößen

Grafi k

Ei nw. *Gk*

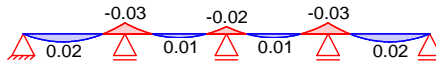
Gleichlasten
Feld Komm.

			a [m]	s [m]	q_{li} [kN/m]	q_{re} [kN/m]	e [cm]
1	Ei gengew		0.00	2.65		0.04	-0.4
2	Ei gengew		0.00	2.65		0.04	-0.4
3	Ei gengew		0.00	2.65		0.04	-0.4
4	Ei gengew		0.00	2.65		0.04	-0.4
1	p+s		0.00	10.60		0.80	0.0
1	p+s		0.00	10.60		0.13	0.0

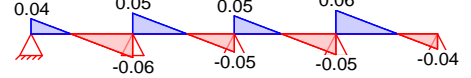
charakteristische Schni ttgrößen und Verformungen

Schni ttgrößen und Verformungen (je Ei nwirkung)

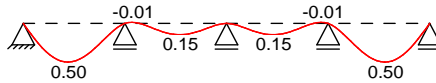
Moment $M_y, k [kNm]$



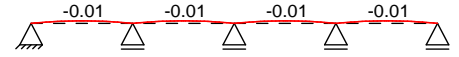
Querkraft $V_z, k [kN]$



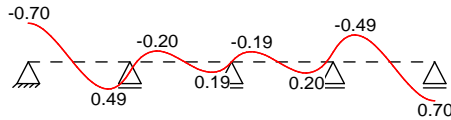
Verschi ebung $w_z, k [mm]$



Verdrehung $\alpha_x, k [mrad]$

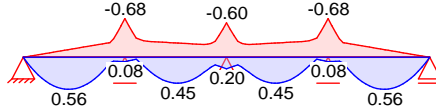


Verdrehung $\alpha_y, k [mrad]$

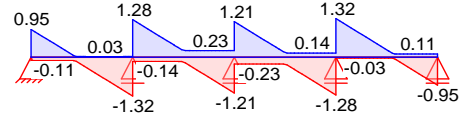


Ei nw. *Qk. N*

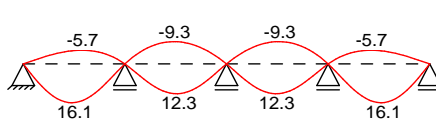
Moment $M_y, k [kNm]$



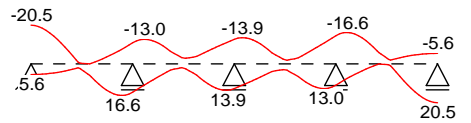
Querkraft $V_z, k [kN]$



Verschi ebung $w_z, k [mm]$

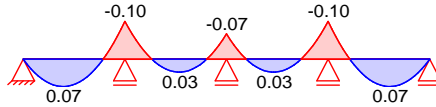


Verdrehung $\alpha_y, k [mrad]$

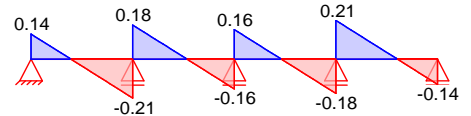


Ei nw. *Qk. S*

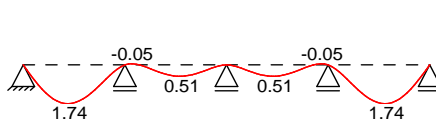
Moment $M_y, k [kNm]$



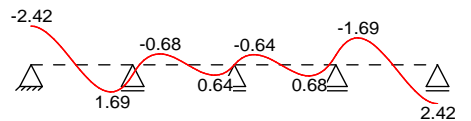
Querkraft $V_z, k [kN]$

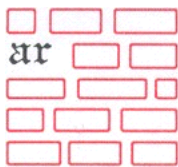


Verschi ebung $w_z, k [mm]$



Verdrehung $\alpha_y, k [mrad]$





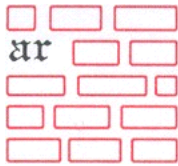
Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	My, k, min	My, k, max	Vz, k, min	Vz, k, max	
			[kNm]	[kNm]	[kN]	[kN]	
Einw. Gk	1	0.00	0.00	0.00	0.04	0.04	
		1.04	0.02	0.02*	0.00	0.00	
		2.65	-0.03*	-0.03	-0.06*	-0.06	
	2	0.00	-0.03	-0.03	0.05	0.05	
		2.65	-0.02	-0.02	-0.05	-0.05	
	3	0.00	-0.02	-0.02	0.05	0.05	
		2.65	-0.03	-0.03	-0.05	-0.05	
	4	0.00	-0.03	-0.03	0.06	0.06*	
		2.65	0.00	0.00	-0.04	-0.04	
	Einw. Qk, N	1	0.00	0.00	0.00	-0.11	0.95
			1.18	-0.13	0.56*	-0.14	0.03
2.65			-0.68*	0.08	-1.32*	0.03	
2		0.00	-0.68	0.08	-0.14	1.28	
		2.65	-0.60	0.20	-1.21	0.23	
3		0.00	-0.60	0.20	-0.23	1.21	
		2.65	-0.68	0.08	-1.28	0.14	
4		0.00	-0.68	0.08	-0.03	1.32*	
		2.65	0.00	0.00	-0.95	0.11	
Einw. Qk, S		1	0.00	0.00	0.00	0.14	0.14
			1.04	0.07	0.07*	0.00	0.00
	2.65		-0.10*	-0.10	-0.21*	-0.21	
	2	0.00	-0.10	-0.10	0.18	0.18	
		2.65	-0.07	-0.07	-0.16	-0.16	
	3	0.00	-0.07	-0.07	0.16	0.16	
		2.65	-0.10	-0.10	-0.18	-0.18	
	4	0.00	-0.10	-0.10	0.21	0.21*	
		2.65	0.00	0.00	-0.14	-0.14	

Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
			Wz, k, max	y, k, max	x, k, max
			[mm]	[mrad]	[mrad]
Einw. Gk	1	0.00	0.00	-0.70*	0.00
		1.17	0.00	-0.70	0.00
		2.65	0.50*	0.00	-0.01
	2	0.00	0.00	0.18	0.00
		0.17	0.00	0.18	0.00
	3	1.33	-0.01*	0.00	0.00
		2.65	-0.01	0.00	0.00
			0.14	-0.04	-0.01*
	4	2.65	0.14	-0.04	-0.01
		0.00	0.00	0.00	0.00
		2.65	0.00	0.00	0.00
	4	0.00	0.00	0.00	0.00
2.65		0.00	-0.18	0.00	
		0.00	-0.18	0.00	
4	0.00	0.00	-0.18	0.00	
	2.65	0.00	-0.18	0.00	
		0.00	0.70	0.00	
4	0.00	0.00	0.70*	0.00	
Einw. Qk, N	1	0.00	0.00	-20.46*	0.00
		1.28	0.00	5.58	0.00
			-5.47	-0.42	0.00
		16.06*	2.38	0.00	



		2.65	0.00	-11.16	0.00
			0.00	14.88	0.00
	2	0.00	0.00	-11.16	0.00
			0.00	14.88	0.00
		1.28	-9.25*	-3.31	0.00
			12.28	1.97	0.00
		2.65	0.00	-13.02	0.00
			0.00	13.02	0.00
	3	0.00	0.00	-13.02	0.00
			0.00	13.02	0.00
		2.65	0.00	-14.88	0.00
			0.00	11.16	0.00
	4	0.00	0.00	-14.88	0.00
			0.00	11.16	0.00
		2.65	0.00	-5.58	0.00
			0.00	20.46*	0.00
Ei nw. Qk. S	1	0.00	0.00	-2.42*	0.00
			0.00	-2.42	0.00
		1.17	1.74	0.00	0.00
			1.74*	0.00	0.00
		2.65	0.00	0.60	0.00
			0.00	0.60	0.00
	2	0.00	0.00	0.60	0.00
			0.00	0.60	0.00
		0.17	-0.05*	0.01	0.00
			-0.05	0.01	0.00
		2.65	0.00	0.00	0.00
			0.00	0.00	0.00
	3	0.00	0.00	0.00	0.00
			0.00	0.00	0.00
		2.65	0.00	-0.60	0.00
			0.00	-0.60	0.00
	4	0.00	0.00	-0.60	0.00
			0.00	-0.60	0.00
		2.65	0.00	2.42	0.00
			0.00	2.42*	0.00

Kombi nati onen

Kombi nati onsbil dung nach DIN EN 1990
Darstel lung der maßgebenden Kombi nati onen

	Ek	Imp.	(* *EW)		
ständi g/vorüberg.	58	7	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	59	8	1.35*Gk	+1.50*Qk. N (1, 2, 4)	+1.50*Qk. S
	60	5	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
	61	6	1.35*Gk	+1.50*Qk. N (1, 3, 4)	+1.50*Qk. S
quasi -ständi g	28		1.00*Gk	+0.80*Qk. N (1, 3)	
	29		1.00*Gk	+0.80*Qk. N (2, 4)	

Bem. -verformungen

Bemessungsverformungen

Grafi k

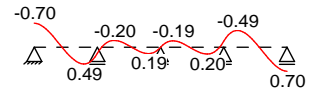
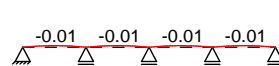
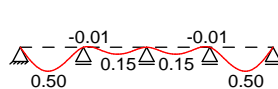
Verformungen (j e Kombi nati on)

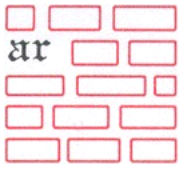
Komb. 27

wz, d [mm]

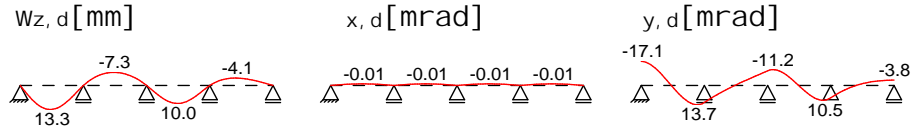
x, d [mrad]

y, d [mrad]

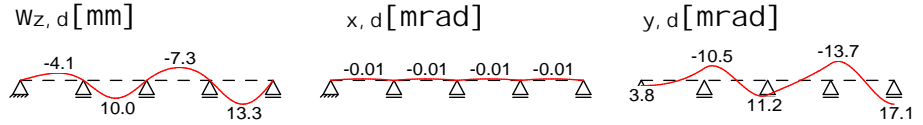




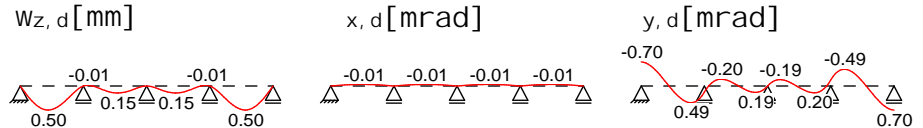
Komb. 28



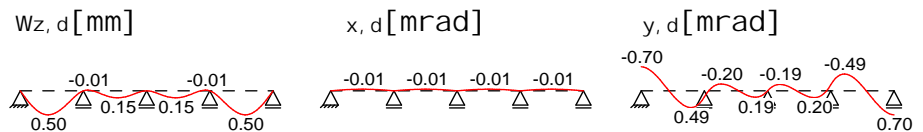
Komb. 29



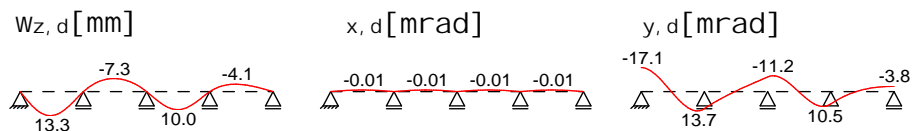
Komb. 102



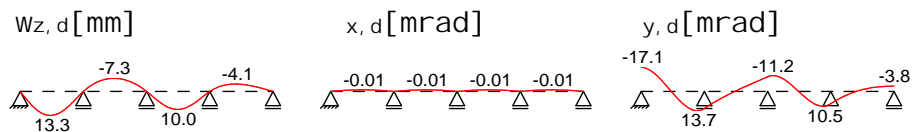
Komb. 103



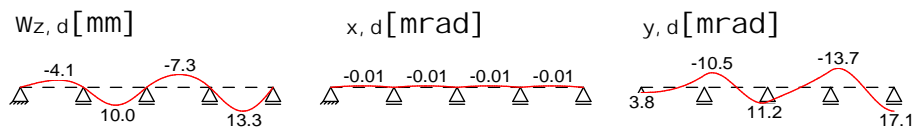
Komb. 104



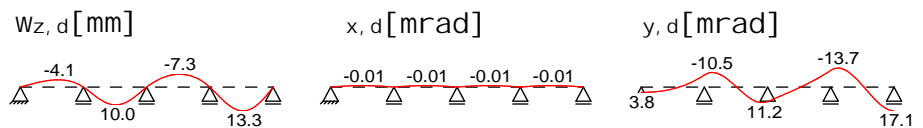
Komb. 105



Komb. 106



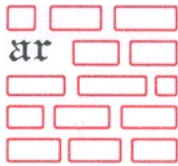
Komb. 107



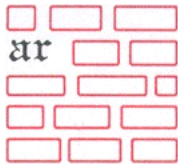
Tabelle

Verformungen (je Kombination)

Komb.	Feld	x [m]	Wz, d [mm]	y, d [mrad]		x, d [mrad]
Komb. 27	1	0.00	0.00	-0.70*	0.00	
		1.17	0.50*	0.00	-0.01	
		2.65	0.00	0.18	0.00	
	2	0.00	0.00	0.18	0.00	
		0.17	-0.01*	0.00	0.00	
		1.33	0.14	-0.04	-0.01*	
3	0.00	0.00	0.00	0.00		
	2.65	0.00	-0.18	0.00		
	0.00	0.00	-0.18	0.00		
Komb. 28	1	0.00	0.00	-17.07*	0.00	
		2.65	0.00	0.70*	0.00	
		0.00	0.00	0.00	0.00	



		1. 28	13. 34 *	0. 29	-0. 01
		2. 36	3. 88	13. 71 *	0. 00
		2. 65	0. 00	12. 08	0. 00
	2	0. 00	0. 00	12. 08	0. 00
		1. 28	-7. 26 *	-0. 02	-0. 01
		1. 33	-7. 24	-0. 41	-0. 01 *
		2. 65	0. 00	-10. 41	0. 00
	3	0. 00	0. 00	-10. 41	0. 00
		2. 65	0. 00	8. 75	0. 00
	4	0. 00	0. 00	8. 75	0. 00
		2. 65	0. 00	-3. 76	0. 00
Komb. 29	1	0. 00	0. 00	3. 76	0. 00
		2. 65	0. 00	-8. 75	0. 00
	2	0. 00	0. 00	-8. 75	0. 00
		1. 33	10. 00	-0. 41	-0. 01 *
		2. 65	0. 00	10. 41	0. 00
	3	0. 00	0. 00	10. 41	0. 00
		1. 37	-7. 26 *	0. 02	-0. 01
		2. 65	0. 00	-12. 08	0. 00
	4	0. 00	0. 00	-12. 08	0. 00
		0. 29	3. 88	-13. 71 *	0. 00
		1. 37	13. 34 *	-0. 29	-0. 01
		2. 65	0. 00	17. 07 *	0. 00
Komb. 102	1	0. 00	0. 00	-0. 70 *	0. 00
		1. 17	0. 50 *	0. 00	-0. 01
		2. 65	0. 00	0. 18	0. 00
	2	0. 00	0. 00	0. 18	0. 00
		0. 17	-0. 01 *	0. 00	0. 00
		1. 33	0. 14	-0. 04	-0. 01 *
		2. 65	0. 00	0. 00	0. 00
	3	0. 00	0. 00	0. 00	0. 00
		2. 65	0. 00	-0. 18	0. 00
	4	0. 00	0. 00	-0. 18	0. 00
		2. 65	0. 00	0. 70 *	0. 00
Komb. 103	1	0. 00	0. 00	-0. 70 *	0. 00
		1. 17	0. 50 *	0. 00	-0. 01
		2. 65	0. 00	0. 18	0. 00
	2	0. 00	0. 00	0. 18	0. 00
		0. 17	-0. 01 *	0. 00	0. 00
		1. 33	0. 14	-0. 04	-0. 01 *
		2. 65	0. 00	0. 00	0. 00
	3	0. 00	0. 00	0. 00	0. 00
		2. 65	0. 00	-0. 18	0. 00
	4	0. 00	0. 00	-0. 18	0. 00
		2. 65	0. 00	0. 70 *	0. 00
Komb. 104	1	0. 00	0. 00	-17. 07 *	0. 00
		1. 28	13. 34 *	0. 29	-0. 01
		2. 36	3. 88	13. 71 *	0. 00
		2. 65	0. 00	12. 08	0. 00
	2	0. 00	0. 00	12. 08	0. 00
		1. 28	-7. 26 *	-0. 02	-0. 01
		1. 33	-7. 24	-0. 41	-0. 01 *
		2. 65	0. 00	-10. 41	0. 00
	3	0. 00	0. 00	-10. 41	0. 00
		2. 65	0. 00	8. 75	0. 00
	4	0. 00	0. 00	8. 75	0. 00
		2. 65	0. 00	-3. 76	0. 00
Komb. 105	1	0. 00	0. 00	-17. 07 *	0. 00
		1. 28	13. 34 *	0. 29	-0. 01
		2. 36	3. 88	13. 71 *	0. 00
		2. 65	0. 00	12. 08	0. 00
	2	0. 00	0. 00	12. 08	0. 00
		1. 28	-7. 26 *	-0. 02	-0. 01
		1. 33	-7. 24	-0. 41	-0. 01 *



		2.65	0.00	-10.41	0.00
	3	0.00	0.00	-10.41	0.00
		2.65	0.00	8.75	0.00
	4	0.00	0.00	8.75	0.00
		2.65	0.00	-3.76	0.00
Komb. 106	1	0.00	0.00	3.76	0.00
		2.65	0.00	-8.75	0.00
	2	0.00	0.00	-8.75	0.00
		1.33	10.00	-0.41	-0.01*
		2.65	0.00	10.41	0.00
	3	0.00	0.00	10.41	0.00
		1.37	-7.26*	0.02	-0.01
		2.65	0.00	-12.08	0.00
	4	0.00	0.00	-12.08	0.00
		0.29	3.88	-13.71*	0.00
		1.37	13.34*	-0.29	-0.01
		2.65	0.00	17.07*	0.00
Komb. 107	1	0.00	0.00	3.76	0.00
		2.65	0.00	-8.75	0.00
	2	0.00	0.00	-8.75	0.00
		1.33	10.00	-0.41	-0.01*
		2.65	0.00	10.41	0.00
	3	0.00	0.00	10.41	0.00
		1.37	-7.26*	0.02	-0.01
		2.65	0.00	-12.08	0.00
	4	0.00	0.00	-12.08	0.00
		0.29	3.88	-13.71*	0.00
		1.37	13.34*	-0.29	-0.01
		2.65	0.00	17.07*	0.00

Mat. / Querschnitt

Material - und Querschnittswerte

Aluminium

Material

t_{Max} [mm]	f_o [N/mm ²]	E [N/mm ²]	BC
10 ^b	200	70000	A
25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt

QS Profil

A [cm ²]	S_y S_z [cm ³]	I_y I_z [cm ⁴]	W_y W_z [cm ³]		
1	AVADIELE40 40	13.9	10.2 41.6	35.2 647.4	17.2 51.0

Hauptachsen

QS Profil

I_{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]			
1	AVADIELE40 40	87.42	-27.6	648.7	34.0

Torsion

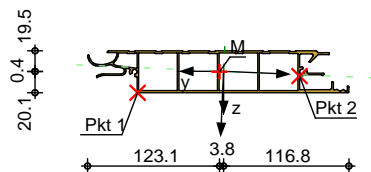
QS Profil

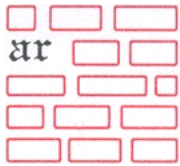
I_t [cm ⁴]	I [cm ⁶]		
1	AVADIELE40 40	73.1	0.0

Grafik

Querschnittsgrafik [mm]

M 1:7





Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

	Aufl.	M _{x, k, min}	F _{z, k, min}	F _{y, k, min}
		M _{x, k, max} [kNm]	F _{z, k, max} [kN]	F _{y, k, max} [kN]
Ei nw. GK	A	0.00	0.04	0.00
	B	0.00	0.04	0.00
	C	0.00	0.11	0.00
	D	0.00	0.11	0.00
	E	0.00	0.09	0.00
			0.00	0.09
Ei nw. Qk. N	A	0.00	0.11	0.00
	B	0.00	0.95	0.00
	C	0.00	-0.17	0.00
	D	0.00	2.59	0.00
	E	0.00	-0.45	0.00
			0.00	2.42
Ei nw. Qk. S	A	0.00	-0.17	0.00
	B	0.00	2.59	0.00
	C	0.00	-0.11	0.00
	D	0.00	0.95	0.00
	E	0.00	0.14	0.00
			0.00	0.14

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E	OK	[-] 0.51
--------------	----	-------------

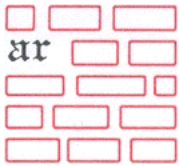
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung	OK	[-] 1.01
------------	----	-------------

Die Auflagerspannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!



Pos. AL1-MI - Alu Bpr. (Mannlastansatz 1.0 kN)

Die Mannlast 1,0 kN wird auf 3 Dielen verteilt.

System Einfeldträger

M 1:145



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	2.35	0.0	frei

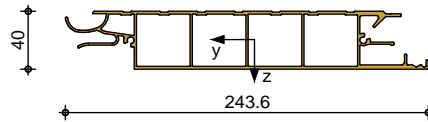
Feld	Material	Profil
1	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager	Lager	x [m]	$K_{T,z}$ [kN/m]	$K_{R,y}$ bzw.	$K_{T,y}$ [kNm/rad]	$K_{R,z}$	Gabel l. Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest
	B	2.35	fest	frei	fest	frei	fest

Lager	b [cm]
A, B	10.0

Grafik Querschnittsgrafik

M 1:5

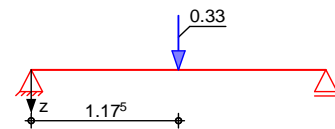
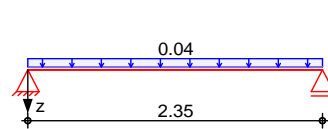


Belastungen Belastungen auf das System

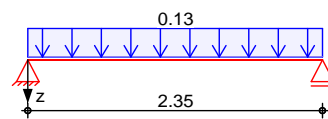
Grafik Belastungsgrafiken (einwirkungsbezogen)

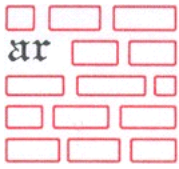
Einwirkungen

Gk Qk. N



Qk. S





Streckenlasten
 in z-Richtung

Ei nw. *Gk*
 Ei nw. *Qk. S*

Gleichlasten
 Feld Komm.

		a [m]	s [m]	q_{li} [kN/m]	q_{re} [kN/m]	e [cm]
1	Ei gengew	0.00	2.35		0.04	-0.4
1	s	0.00	2.35		0.13	0.0

Punktlasten
 in z-Richtung

Ei nw. *Qk. N*

Einzellasten
 Feld Komm.

		a [m]	F_z [kN]	e [cm]
1	MI	1.18	0.33	0.0

Char. Schnittgrößen

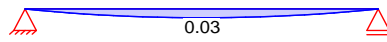
charakteristische Schnittgrößen und Verformungen

Grafik

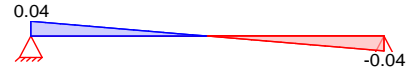
Schnittgrößen und Verformungen (je Einwirkung)

Ei nw. *Gk*

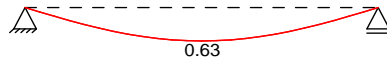
Moment $M_{y,k}$ [kNm]



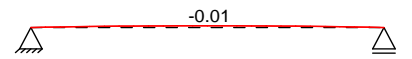
Querkraft $V_{z,k}$ [kN]



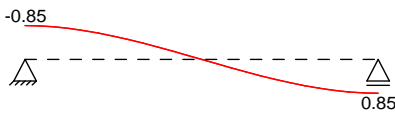
Verschiebung $w_{z,k}$ [mm]



Verdrehung φ_x [mrad]

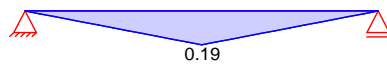


Verdrehung φ_y [mrad]

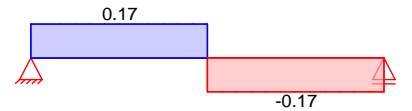


Ei nw. *Qk. N*

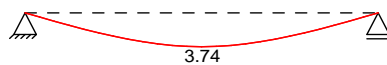
Moment $M_{y,k}$ [kNm]



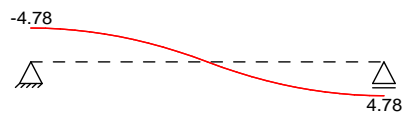
Querkraft $V_{z,k}$ [kN]



Verschiebung $w_{z,k}$ [mm]

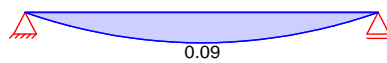


Verdrehung φ_y [mrad]

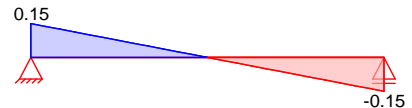


Ei nw. *Qk. S*

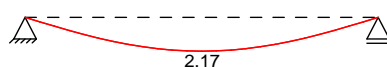
Moment $M_{y,k}$ [kNm]



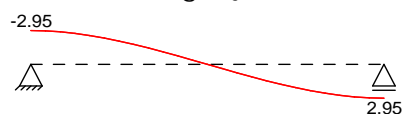
Querkraft $V_{z,k}$ [kN]

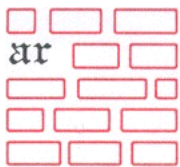


Verschiebung $w_{z,k}$ [mm]



Verdrehung φ_y [mrad]





Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	$M_{y, k, min}$ [kNm]	$M_{y, k, max}$ [kNm]	$V_{z, k, min}$ [kN]	$V_{z, k, max}$ [kN]
Einw. Gk	1	0.00	0.00	0.00	0.04	0.04*
		1.18	0.03	0.03*	0.00	0.00
		2.35	0.00	0.00	-0.04*	-0.04
Einw. Qk. N	1	0.00	0.00	0.00	0.17	0.17*
		1.18	0.19	0.19*	0.17	0.17
		1.18	0.19	0.19	-0.17*	-0.17
		2.35	0.00	0.00	-0.17	-0.17
Einw. Qk. S	1	0.00	0.00	0.00	0.15	0.15*
		1.18	0.09	0.09*	0.00	0.00
		2.35	0.00	0.00	-0.15*	-0.15

Verformungen (je Einwirkung)

	Feld	x [m]	$w_{z, k, min}$ [mm]	$w_{z, k, max}$ [mm]	y, k, min [mrad]	y, k, max [mrad]	x, k, min [mrad]	x, k, max [mrad]
Einw. Gk	1	0.00	0.00	0.00	-0.85*	0.00	0.00	0.00
		1.18	0.63	0.63*	0.00	0.00	-0.01*	-0.01
		2.35	0.00	0.00	0.85	0.85*	0.00	0.00
					0.00	0.85*	0.00	0.00
Einw. Qk. N	1	0.00	0.00	0.00	-4.78*	0.00	0.00	0.00
		1.18	3.74	3.74*	0.00	0.00	0.00	0.00
		2.35	0.00	0.00	4.78	4.78*	0.00	0.00
					0.00	4.78*	0.00	0.00
Einw. Qk. S	1	0.00	0.00	0.00	-2.95*	0.00	0.00	0.00
		1.18	2.17	2.17*	0.00	0.00	0.00	0.00
		2.35	0.00	0.00	2.95	2.95*	0.00	0.00
					0.00	2.95*	0.00	0.00

Kombinationen

Kombinationsbildung nach DIN EN 1990
Darstellung der maßgebenden Kombinationen

	Ek	Imp.	(* *EW)
ständig/vorüberg.	31	1	1.35*Gk +1.50*Qk. N +1.50*Qk. S (1)
quasi-ständig	12		1.00*Gk +0.80*Qk. N (1)

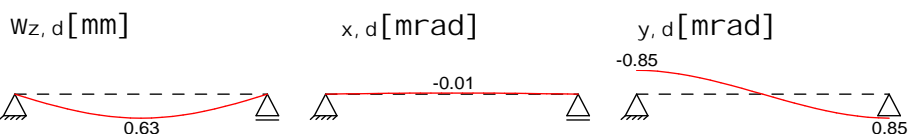
Bem.-verformungen

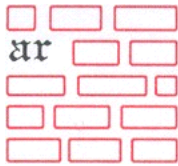
Bemessungsverformungen

Grafik

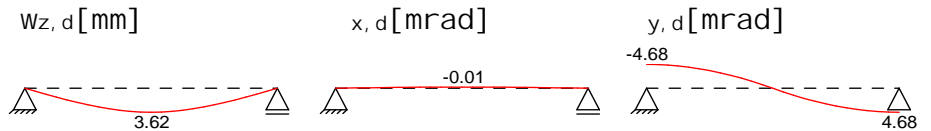
Verformungen (je Kombination)

Komb. 11

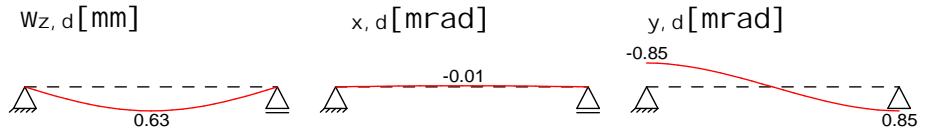




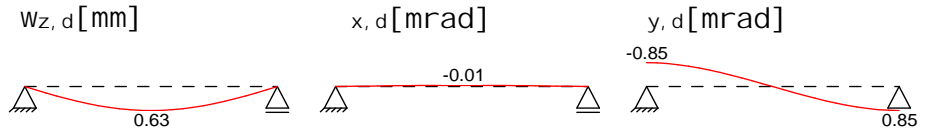
Komb. 12



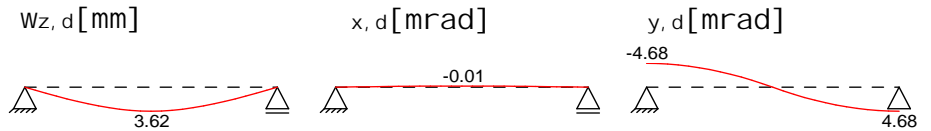
Komb. 43



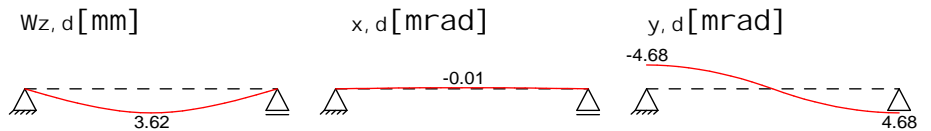
Komb. 44



Komb. 45



Komb. 46



Tabelle

Verformungen (je Kombination)

Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 11	0.00	0.00	-0.85*	0.00
	1.18	0.63*	0.00	-0.01*
	2.35	0.00	0.85*	0.00
Komb. 12	0.00	0.00	-4.68*	0.00
	1.18	3.62*	0.00	-0.01*
	2.35	0.00	4.68*	0.00
Komb. 43	0.00	0.00	-0.85*	0.00
	1.18	0.63*	0.00	-0.01*
	2.35	0.00	0.85*	0.00
Komb. 44	0.00	0.00	-0.85*	0.00
	1.18	0.63*	0.00	-0.01*
	2.35	0.00	0.85*	0.00
Komb. 45	0.00	0.00	-4.68*	0.00
	1.18	3.62*	0.00	-0.01*
	2.35	0.00	4.68*	0.00
Komb. 46	0.00	0.00	-4.68*	0.00
	1.18	3.62*	0.00	-0.01*
	2.35	0.00	4.68*	0.00

Mat. / Querschnitt

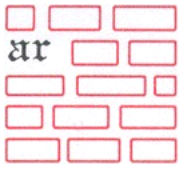
Material - und Querschnittswerte

Aluminium

Material

	t _{Max} [mm]	f _o [N/mm ²]	E [N/mm ²]	BC
EN-AW 6063, T66, EP	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)



Querschnitt

QS	Profil	A	S _y S _z	I _y I _z	W _y W _z
		[cm ²]	[cm ³]	[cm ⁴]	[cm ³]
1	AVADIELE40 40	13.9	10.2 41.6	35.2 647.4	17.2 51.0

Hauptachsen

QS	Profil	[°]	I _{yz}	I	I
			[cm ⁴]	[cm ⁴]	[cm ⁴]
1	AVADIELE40 40	87.42	-27.6	648.7	34.0

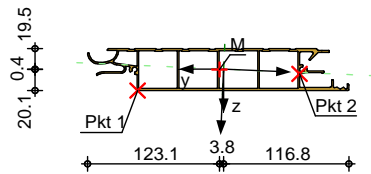
Torsion

QS	Profil	I _t	I
		[cm ⁴]	[cm ⁶]
1	AVADIELE40 40	73.1	0.0

Grafik

Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte

Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

Aufl.	M _{x, k, min} M _{x, k, max} [kNm]	F _{z, k, min} F _{z, k, max} [kN]	F _{y, k, min} F _{y, k, max} [kN]
Ei nw. Gk	A	0.00	0.04
	B	0.00	0.04
		0.00	0.04
Ei nw. Qk. N	A	0.00	0.17
	B	0.00	0.17
		0.00	0.17
Ei nw. Qk. S	A	0.00	0.15
	B	0.00	0.15
		0.00	0.15

Zusammenfassung

Zusammenfassung der Nachweise

Nachweise (GZT)

Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

Nachweis E-E	OK	[-]
		0.20

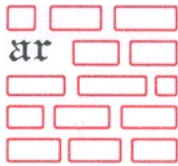
Nachweise (GZG)

Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung	OK	[-]
		0.46

Die Auflager Spannweite ist als Grenzspannweite festgelegt.
Kürzere Spannweiten sind möglich!

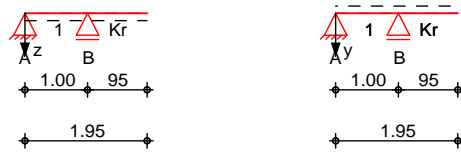


Pos. AL2-4-MI Alu Bpr Kragarm (ML, 1.0 kN)

Die Verkehrslast 4,0 kN/m² wird auf 5 Dielen je Meter verlegte Elemente verteilt.

System Durchlaufträger

M 1:120



Abmessungen Mat./Querschnitt	Feld	l [m]	Lage [°]	Achsen
	1	1.00	0.0	frei
	Kr	0.95	0.0	frei

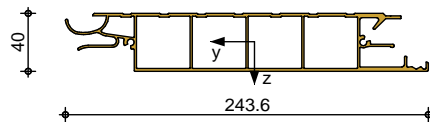
Feld	Material	Profil
1-Kr	EN-AW 6063, T66, EP	AVADIELE40 40

Auflager	Lager	x [m]	K _{T,z} [kN/m]	K _{R,y} bzw.	K _{T,y} [kNm/rad]	K _R	Gabel I.	Wölbbeh.
	A	0.00	fest	frei	fest	frei	fest	frei
	B	1.00	fest	frei	fest	frei	fest	frei

Lager	b [cm]
A, B	10.0

Grafik Querschnittsgrafik

M 1:5



Belastungen Belastungen auf das System

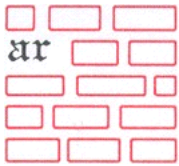
Grafik Belastungsgrafiken (einwirkungsbezogen)

Einwirkungen Gk Qk. N-1 Qk. S



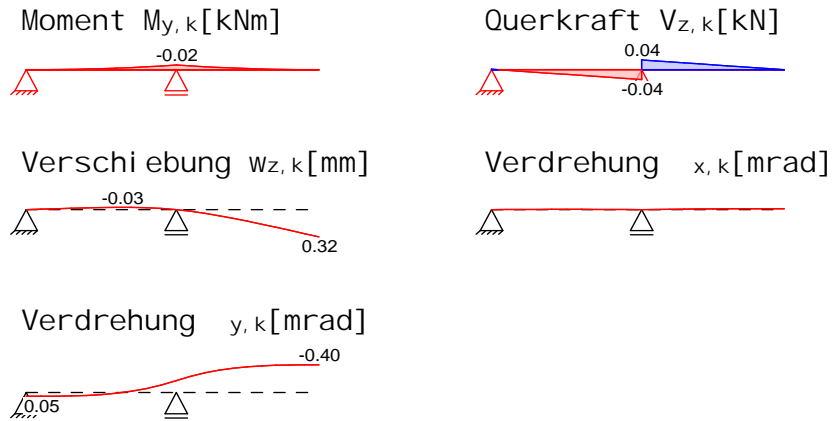
Streckenlasten in z-Richtung	Gleichlasten Feld Komm.	a [m]	s [m]	q _{li} [kN/m]	q _{re} [kN/m]	e [cm]
Einw. Gk	1 Eigengew	0.00	1.00		0.04	-0.4
Einw. Qk. S	Kr Eigengew	0.00	0.95		0.04	-0.4
	1 p+s	0.00	1.95		0.13	0.0

Punktlasten in z-Richtung	Einzelasten Feld Komm.	a [m]	F _z [kN]	e [cm]
Einw. Qk. N-1	Kr MI	0.95	0.33	0.0

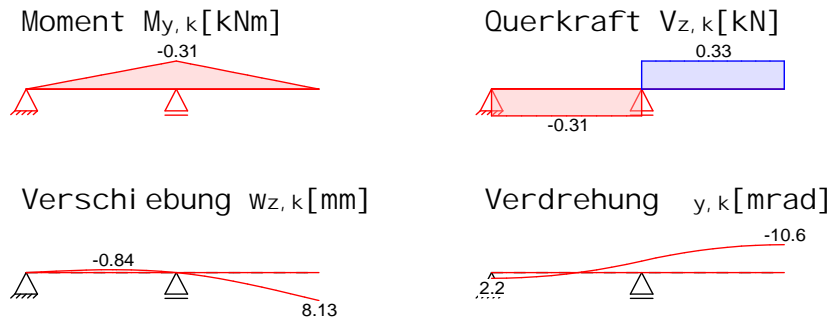


Char. Schnittgrößen charakteristische Schnittgrößen und Verformungen
 Grafik Schnittgrößen und Verformungen (je Einwirkung)

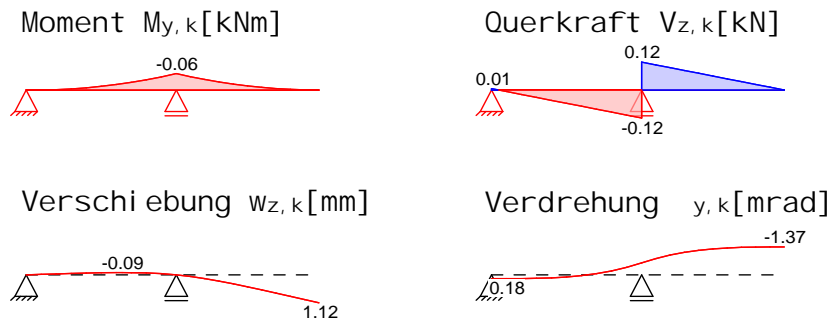
Einw. *Gk*



Einw. *Qk, N-1*



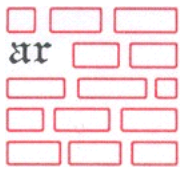
Einw. *Qk, S*



Tabelle

Schnittgrößen (je Einwirkung)

	Feld	x [m]	$M_{y,k, \min}$ [kNm]	$M_{y,k, \max}$ [kNm]	$V_{z,k, \min}$ [kN]	$V_{z,k, \max}$ [kN]
Einw. <i>Gk</i>	1	0.00	0.00	0.00	0.00	0.00
		1.00	-0.02*	-0.02	-0.04*	-0.04
	Kr	0.00	-0.02	-0.02	0.04	0.04*
		0.95	0.00	0.00	0.00	0.00
Einw. <i>Qk, N-1</i>	1	0.00	0.00	0.00	-0.31*	0.00
		1.00	-0.31*	0.00	-0.31	0.00
	Kr	0.00	-0.31	0.00	0.00	0.33*
		0.95	0.00	0.00	0.00	0.33
Einw. <i>Qk, S</i>	1	0.00	0.00	0.00	0.01	0.01
		1.00	-0.06*	-0.06	-0.12*	-0.12
	Kr	0.00	-0.06	-0.06	0.12	0.12*
		0.95	0.00	0.00	0.00	0.00



Verformungen (je Einwirkung)

	Feld	x [m]	Wz, k, min	y, k, min	x, k, min
			Wz, k, max [mm]	y, k, max [mrad]	x, k, max [mrad]
Einw. Gk	1	0.00	0.00	0.05	0.00
		0.10	-0.01	0.05	0.00
		0.64	-0.03*	0.05*	0.00
	Kr	1.00	0.00	0.00	0.00
		0.00	0.00	-0.17	0.00
		0.95	0.32	-0.17	0.00
Einw. Qk. N-1	1	0.00	0.00	0.00	0.00
		0.58	-0.84*	2.19*	0.00
		1.00	0.00	0.00	0.00
	Kr	0.00	0.00	-4.39	0.00
		0.95	0.00	0.00	0.00
		0.95	0.00	-10.64*	0.00
Einw. Qk. S	1	0.00	0.00	0.18	0.00
		0.10	-0.02	0.18	0.00
		0.64	-0.02	0.18*	0.00
	Kr	1.00	-0.09*	0.00	0.00
		0.00	0.00	-0.59	0.00
		0.95	1.12	-0.59	0.00
0.95	1.12*	-1.37*	0.00		

Kombinationen

Kombinationsbildung nach DIN EN 1990
 Darstellung der maßgebenden Kombinationen

	Ek	Imp.	(* *EW)
ständig/vorüberg.	33	1	1.35*Gk +1.50*Qk. N-1 +0.75*Qk. S (2)
	34	2	1.35*Gk +1.50*Qk. N-1 +0.75*Qk. S (2)
quasi-ständig	16		1.00*Gk +0.30*Qk. N-1 (2)

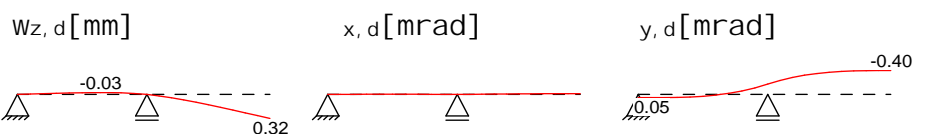
Bem.-verformungen

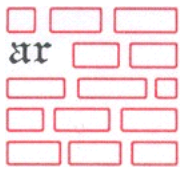
Bemessungsverformungen

Grafik

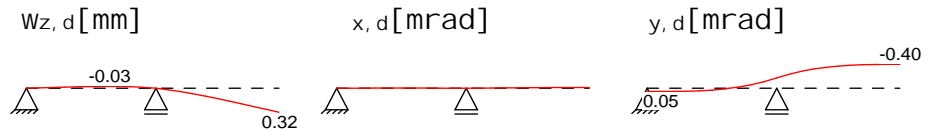
Verformungen (je Kombination)

Komb. 14

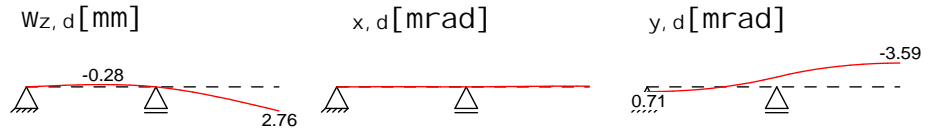




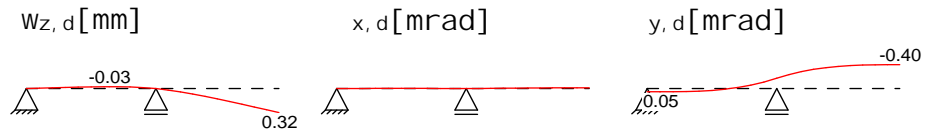
Komb. 15



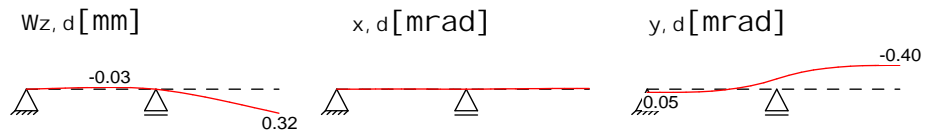
Komb. 16



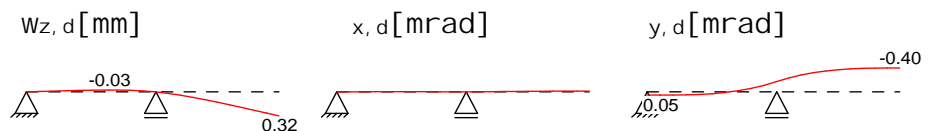
Komb. 55



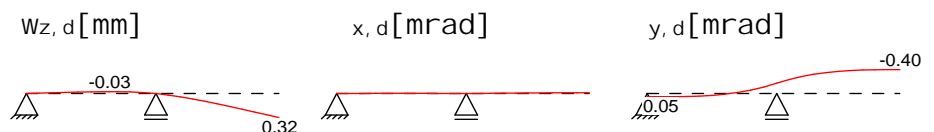
Komb. 56



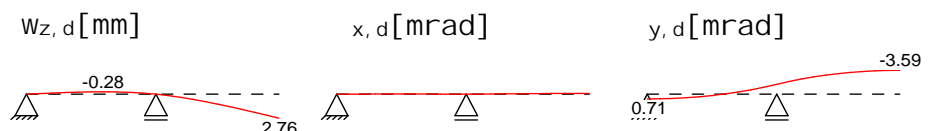
Komb. 57



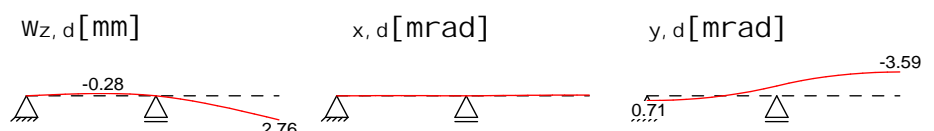
Komb. 58



Komb. 59



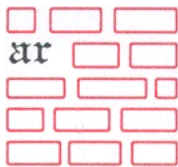
Komb. 60



Tabelle

Verformungen (je Kombination)

Feld	x [m]	Wz, d [mm]	y, d [mrad]	x, d [mrad]
Komb. 14	1	0.00	0.00	0.00
		0.10	-0.01	0.05*
		0.64	-0.03*	0.00
		1.00	0.00	-0.17
Komb. 15	Kr	0.00	0.00	0.00
		0.95	0.32*	-0.40*
	1	0.00	0.00	0.00
		0.10	-0.01	0.05*
	0.64	-0.03*	0.00	0.00
	1.00	0.00	-0.17	0.00
	Kr	0.00	0.00	0.00
	0.95	0.32*	-0.40*	0.00



Komb. 16	1	0.00	0.00	0.71*	0.00	
		0.58	-0.28*	0.01	0.00	
		1.00	0.00	-1.49	0.00	
		Kr	0.00	0.00	-1.49	0.00
		0.95	2.76*	-3.59*	0.00	
Komb. 55	1	0.00	0.00	0.05	0.00	
		0.10	-0.01	0.05*	0.00	
		0.64	-0.03*	0.00	0.00	
		1.00	0.00	-0.17	0.00	
		Kr	0.00	0.00	-0.17	0.00
Komb. 56	1	0.00	0.00	0.05	0.00	
		0.10	-0.01	0.05*	0.00	
		0.64	-0.03*	0.00	0.00	
		1.00	0.00	-0.17	0.00	
		Kr	0.00	0.00	-0.17	0.00
Komb. 57	1	0.00	0.00	0.05	0.00	
		0.10	-0.01	0.05*	0.00	
		0.64	-0.03*	0.00	0.00	
		1.00	0.00	-0.17	0.00	
		Kr	0.00	0.00	-0.17	0.00
Komb. 58	1	0.00	0.00	0.05	0.00	
		0.10	-0.01	0.05*	0.00	
		0.64	-0.03*	0.00	0.00	
		1.00	0.00	-0.17	0.00	
		Kr	0.00	0.00	-0.17	0.00
Komb. 59	1	0.00	0.00	0.71*	0.00	
		0.58	-0.28*	0.01	0.00	
		1.00	0.00	-1.49	0.00	
		Kr	0.00	0.00	-1.49	0.00
		0.95	2.76*	-3.59*	0.00	
Komb. 60	1	0.00	0.00	0.71*	0.00	
		0.58	-0.28*	0.01	0.00	
		1.00	0.00	-1.49	0.00	
		Kr	0.00	0.00	-1.49	0.00
		0.95	2.76*	-3.59*	0.00	

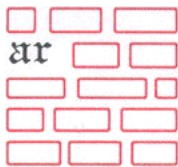
Mat. / Querschnitt Material - und Querschnittswerte

Material	t _{Max} [mm]	f _o [N/mm ²]	E [N/mm ²]	BC
<i>EN-AW 6063, T66, EP</i>	10 ^b	200	70000	A
	25 ^b	180	70000	A

b: Es werden die ungünstigeren Festigkeiten je Querschnitt angesetzt (Tab. 3.2b, Fußnote 3)

Querschnitt	QS Profil	A [cm ²]	S _y S _z [cm ³]	I _y I _z [cm ⁴]	W _y W _z [cm ³]
1	<i>AVADIELE40 40</i>	13.9	10.2 41.6	35.2 647.4	17.2 51.0

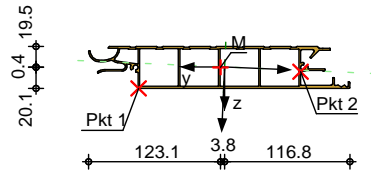
Hauptachsen	QS Profil	[°]	I _{yz} [cm ⁴]	I [cm ⁴]	I [cm ⁴]
1	<i>AVADIELE40 40</i>	87.42	-27.6	648.7	34.0



Torsion	QS	Profil	I_t [cm ⁴]	I [cm ⁶]
	1	AVADIELE40	73.1	0.0

Grafik Querschnittsgrafik [mm]

M 1:7



Auflagerkräfte Charakteristische Auflagerkräfte (global)

Char. Auflagerkr.

Ei nw.	Gk	Aufl .	$M_{x, k, \min}$	$F_{z, k, \min}$	$F_{y, k, \min}$
			$M_{x, k, \max}$	$F_{z, k, \max}$	$F_{y, k, \max}$
			[kNm]	[kN]	[kN]
Ei nw. Gk		A	0.00	0.00	0.00
		B	0.00	0.00	0.00
			0.00	0.07	0.00
Ei nw. Qk. N-1		A	0.00	-0.31	0.00
		B	0.00	0.00	0.00
			0.00	0.64	0.00
Ei nw. Qk. S		A	0.00	0.01	0.00
		B	0.00	0.01	0.00
			0.00	0.25	0.00
			0.00	0.25	0.00

Zusammenfassung Zusammenfassung der Nachweise

Nachweise (GZT) Nachweise im Grenzzustand der Tragfähigkeit

Nachweis

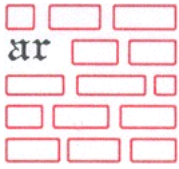
Nachweis E-E OK [-] 0.23

Nachweise (GZG) Nachweise im Grenzzust. der Gebrauchstauglichkeit

Nachweis

Verformung OK [-] 0.44

Die Auflager Spannweite ist als Grenzspannweite festgelegt.
 Kürzere Spannweiten sind möglich!



PROJEKT **19259-1a AVA Diele 40**
POSITION **ALSchT_01 Schlusstext**

SEITE **86**
PROJ.-NR. **19259_1a**
DATUM **10.07.2019**

Pos. ALSchT_01 Schlusstext

Die in der Berechnung betrachteten Stützweiten sind Grenzstützweiten!
Kürzere Stützweiten sind ohne weitere Nachweise möglich!
Weitere Stützweiten sind in gesonderten Nachweisen zu überprüfen!

Zur Verankerung des Belags sind die einschlägigen Richtlinien zu beachten, insbesondere für Windsog und Winddruck!

Rheinfelden,

Juli 2019,

Aufgestellt:

