Tax cases

Project:	Recalculation IJssel Bridge A12	Date:	5/25/2018
Project number:	BF7387	Name:	EKL
Description:	Other variable taxes	Version:	F1.0

Hot water pipe

Tax case **1100-1199 = Hot water pipe**

The hot water pipe variable load is based on Strackee's [912-275.R01] calculation. It should be noted, however, that in this calculation horizontal loads are transferred to the bridge via a frame that transfers its load to three cross beams. The other frames wear in the calculate their load on one cross beam. This does not correspond to the drawings and what has been done outside. Be in consultation with Rijkswaterstaat the taxes are determined as follows

Vertical load	F_z =	20 kN per tube, per suspension point
Horizontal load longitudinal ri.	F_x =	5 kN per tube, per suspension point

The load has been translated per suspension point into 4 point loads on the cross beams

Variable load hot water pipe

Acceptance tax

Tax case **1400-1499 = Acceptance tax**

The acceptance load of 1 MN must be applied to a surface of 0.25 mx 3.0 m. For the global model, the load is applied to the bottom 0.25 m from the K-band, so that the load is transferred via the K-band to the main beam. Given the size of the load and the fact that the bridge is not designed for this load from the design, it is expected that the bridge will not meet this acceptance load.

K-related tax	F =	1000 kN
	h =	0.25 m
	q =	4000 kN / m over 0.25 m

Appendix

Appendix J - Tax combinations

IJssel Bridge

Page 3

Tax cases

Project:	Recalculation IJssel Bridge A12	Date:	10/19/2018
Project number:	BF7387	Name:	EKL
Description:	Tax combinations	Version:	F1.1

Tax combinations

Tax combinations

	Permanent taxes			Traffic (with ψ = 1)	Wind (with ψ = 1)	Others change rlijk (with ψ = 1)
	γ *Gj* , sup		γ *Gj* , inf			
	6.10a	6.10b (incl. ξ)	6.10a and 6.10b	γ Q, 1	γ Q, 1	γ Q, 1
New construction	1.4	1.25	0.9	1.5	1.65	1.65
Renovation	1.3	1.15	0.9	1.3	1.6	1.5
Use	1.25	1.15	0.9	1.25	1.5	1.3
Disapproval	1.25	1.1	0.9	1.25	1.5	1.3

6.10b

	Tax combinations												
	gr1a		gr1b	gr2		W b		T b		I	I	A1 a, b	
TS (LM1)	1	1	0	0.8	0.8	0.8	0.64	0.8	0.64	0	0	0.8	0.64
UDL (LM1)	1	1	0	0.8	0.8	0.8	0.64	0.8	0.64	0	0	0.8	0.64
Single axis (LM2)	0	0	1	0	0	0	0	0	0	0	0	0	0
Horizontal load	0.8	0.8	0	1	1	0.64	0.8	0.64	0.8	0	0	0.64	0.8
Wind c F wk	0.3	0	0	0.3	0	0	0	0.3	0.3	0.3	0	0	0
F * w	0	1	0	0	1	1	1	0	0	0	1	0	0
Temperature	0.3	0.3	0	0.3	0.3	0.3	0.3	1	1	0.3	0.3	0	0
Inspection path	0	0	0	0	0	0	0	0	0	1	1	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	0	0	0	1	1
Hot water pipe	1	1	1	1	1	1	1	1	1	1	1	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk

6.10a

	Tax combinations														
	gr1a		gr1b	gr2		W b				T b		I	I	A1 a, b	
TS (LM1)	0.8	0.8	0	0.64	0.64	0.8	0.8	0.64	0.64	0.8	0.64	0	0	0.8	0.64
UDL (LM1)	0.8	0.8	0	0.64	0.64	0.8	0.8	0.64	0.64	0.8	0.64	0	0	0.8	0.64
Single axis (LM2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horizontal load	0.64	0.64	0	0.8	0.8	0.64	0.64	0.8	0.8	0.64	0.8	0	0	0.64	0.8
Wind c F wk	0.3	0	0	0.3	0	0.3	0	0.3	0	0.3	0.3	0.3	0	0	0
F * w	0	1	0	0	1	0	1	0	1	0	0	0	1	0	0
Temperature	0.3	0.3	0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	0
Inspection path	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot water pipe	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk .

Tax cases

Project:	Recalculation IJssel Bridge A12	Date:	10/19/2018
Project number:	BF7387	Name:	EKL
Description:	Tax combinations	Version:	F1.1

Ultimate limit state

Level: **use**

	6.10a		6.10b						6.11b	
	gr1a	gr2	gr1a	gr1b	gr2	T b		I	A1 a, b	
Own weight	0.9 / 1.25	0.9 / 1.25	0.9 / 1.15	0.9 / 1.15	0.9 / 1.15	0.9 / 1.15	0 , 9 / 1.15		1	1
Resting load	0.9 / 1.25	0.9 / 1.25	0.9 / 1.15	0.9 / 1.15	0.9 / 1.15	0.9 / 1.15	0 , 9 / 1.15		1	1
Shrink and creep	1	1	1	1	1	1	1	1	1	1
Preload	1	1	1	1	1	1	1	1	1	1
TS (LM1)	1	0.8	1.25	0	1	1	0.8	0	0.8	0.64
UDL (LM1)	1	0.8	1.25	0	1	1	0.8	0	0.8	0.64
Single axis (LM2)	0	0	0	1.25	0	0	0	0	0	0
Horizontal load	0.8	1	1	0	1.25	0.8	1	0	0.64	0.8
Wind c F wk	0	0	0	0	0	0.45	0.45	0	0	0
F * w	1.5	1.5	1.5	0	1.5	0	0	1.5	0	0
Temperature	0.39	0.39	0.39	0	0.39	1.3	1.3	0.39	0	0
Inspection path	0	0	0	0	0	0	0	1.3	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	1	1
Hot water pipe	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk . For the combinations with ψ 0 * F wk is assuming the wind load F * w with a load factor 1.5 * ψ 0 * F wk / F * w = 1.5 * 0.3 * 1.056 = 0.48.

Level: **cultivation**

	6.10a		6.10b						6.11b	
	gr1a	gr2	gr1a	gr1b	gr2	T b		I	A1 a, b	
Own weight	0.9 / 1.3 0.9 / 1.3 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0 , 9 / 1.15								1	1
Resting load	0.9 / 1.3 0.9 / 1.3 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0 , 9 / 1.15								1	1
Shrink and creep	1	1	1	1	1	1	1	1	1	1
Preload	1	1	1	1	1	1	1	1	1	1
TS (LM1)	1.04	0.832	1.3	0	1.04	1.04	0.832	0	0.8	0.64
UDL (LM1)	1.04	0.832	1.3	0	1.04	1.04	0.832	0	0.8	0.64
Single axis (LM2)	0	0	0	1.3	0	0	0	0	0	0
Horizontal load	0.832	1.04	1.04	0	1.3	0.832	1.04	0	0.64	0.8
Wind c F wk	0	0	0	0	0	0.48	0.48	0	0	0
F * w	1.6	1.6	1.6	0	1.6	0	0	1.6	0	0
Temperature	0.45	0.45	0.45	0	0.45	1.5	1.5	0.45	0	0
Inspection path	0	0	0	0	0	0	0	1.5	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	1	1
Hot water pipe	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk . For the combinations with ψ 0 * F wk is

assuming the wind load F * w with a load factor 1.6 * ψ 0 * F wk / F * w = 1.6 * 0.3 * 1.056 = 0.51.

Tax cases

Project:	Recalculation IJssel Bridge A12	Date:	10/19/2018
Project number:	BF7387	Name:	EKL
Description:	Tax combinations	Version:	F1.1

Serviceability limit states

Characteristic load combinations - cf. 6.14b

	Characteristic load combinations (6.14)						
	gr1a	gr1b	gr2	W b	T b		I
Own weight	1	1	1	1	1	1	1
Resting load	1	1	1	1	1	1	1
Shrink and creep	1	1	1	1	1	1	1
Preload	1	1	1	1	1	1	1

TS (LM1)	1	0	0.8	0.80	0.64	0.8	0.64	0
UDL (LM1)	1	0	0.8	0.8	0.64	0.8	0.64	0
Single axis (LM2)	0	1	0	0	0	0	0	0
Horizontal load	0.8	0	1	0.64	0.8	0.64	0.8	0
Wind c F wk	0	0	0	0	0	0.3	0.3	0
F * w	1	0	1	1	1	0	0	1
Temperature	0.3	0	0.3	0.3	0.3	1	1	0.3
Inspection path	0	0	0	0	0	0	0	1
Impact on or under the bridge	0	0	0	0	0	0	0	0
Hot water pipe	1	1	1	1	1	1	1	1

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic loads gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk . For the combinations with ψ 0 * F wk assume the wind load F * w with a load factor 1.0 * ψ 0 * F wk / F * w = 1.0 * 0.3 * 1.056 = 0.32.

Frequent load combinations - cf. 6.15b for cracking

Frequent load combinations (6.15b)

	gr1a	gr1b	gr2	W.	T	I
Own weight	1	1	1	1	1	1
Resting load	1	1	1	1	1	1
Shrink and creep	1	1	1	1	1	1
Preload	1	1	1	1	1	1
TS (LM1)	0.8	0	0.8	0.4	0.4	0
UDL (LM1)	0.8	0	0.8	0.4	0.4	0
Single axis (LM2)	0	0.8	0	0	0	0
Horizontal load	0.8	0	0.8	0.4	0.4	0
Wind c F wk	0	0	0	0	0	0
F * w	0	0	0	0.6	0	0
Temperature	0.3	0	0.3	0.3	0.8	0.3
Inspection path	0	0	0	0	0	0
Impact on or under the bridge	0	0	0	0	0	0
Hot water pipe	1	1	1	1	1	1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead from F wk .

Quasi-permanent load combinations - cf. 6.16b

	Quasi-permanent tax combinations (6.16b)					
	gr1a	gr1b	gr2	W.	T	I
Own weight	1	1	1	1	1	1
Resting load	1	1	1	1	1	1
Shrink and creep	1	1	1	1	1	1
Preload	1	1	1	1	1	1
TS (LM1)	0.4	0	0	0.4	0.4	0
UDL (LM1)	0.4	0	0	0.4	0.4	0
Single axis (LM2)	0	0	0	0	0	0
Horizontal load	0.4	0	0	0.4	0.4	0
Wind F wk	0	0	0	0	0	0
F * w	0	0	0	0	0	0
Temperature	0.3	0.3	0.3	0.3	0.3	0.3
Inspection path	0	0	0	0	0	0
Impact on or under the bridge	0	0	0	0	0	0
Hot water pipe	1	1	1	1	1	1

Tax cases

Project:	Recalculation IJssel Bridge A12	Date:	10/19/2018
Project number:	BF7387	Name:	EKL
Description:	Reduced tax combinations Version:		F1.1

Tax combinations

Tax combinations

	Permanent taxes			Traffic (with ψ = 1)	Wind (with ψ = 1)	Others change rlijk (with ψ = 1)
	γ *Gj* , sup		γ *Gj* , inf			
	6.10a	6.10b (incl. ξ)	6.10a and 6.10b	γ Q, 1	γ Q, 1	γ Q, 1
New construction	1.4	1.25	0.9	1.5	1.65	1.65
Renovation	1.3	1.15	0.9	1.3	1.6	1.5
Use	1.25	1.15	0.9	1.25	1.5	1.3
Disapproval	1.25	1.1	0.9	1.25	1.5	1.3

6.10b

	Tax combinations												
	gr1a		gr1b	gr2		W b		T b		I	I	A1 a, b	
TS (LM1)	1	0.9	0	0.8	0.72	0.8	0.64	0.8	0.64	0	0	0.8	0.64
UDL (LM1)	1	0.9	0	0.8	0.72	0.8	0.64	0.8	0.64	0	0	0.8	0.64
Single axis (LM2)	0	0	1	0	0	0	0	0	0	0	0	0	0
Horizontal load	0.8	0.72	0	1	0.9	0.64	0.8	0.64	0.8	0	0	0.64	0.8
Wind c F wk	0.3	0	0	0.3	0	0	0	0.3	0.3	0.3	0	0	0
F * w	0	1	0	0	1	1	1	0	0	0	1	0	0
Temperature	0.3	0.3	0	0.3	0.3	0.3	0.3	1	1	0.3	0.3	0	0
Inspection path	0	0	0	0	0	0	0	0	0	1	1	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	0	0	0	1	1
Hot water pipe	1	1	1	1	1	1	1	1	1	1	1	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk

6.10a

	Tax combinations														
	gr1a		gr1b	gr2		W b				T b		I	I	A1 a, b	
TS (LM1)	0.8	0.72	0	0.64	0.576	0.8	0.8	0.64	0.64	0.8	0.64	0	0	0.8	0.64
UDL (LM1)	0.8	0.72	0	0.64	0.576	0.8	0.8	0.64	0.64	0.8	0.64	0	0	0.8	0.64
Single axis (LM2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horizontal load	0.64	0.576	0	0.8	0.72	0.64	0.64	0.8	0.8	0.64	0.8	0	0	0.64	0.8
Wind c F wk	0.3	0	0	0.3	0	0.3	0	0.3	0	0.3	0.3	0.3	0	0	0
F * w	0	1	0	0	1	0	1	0	1	0	0	0	1	0	0
Temperature	0.3	0.3	0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0	0
Inspection path	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot water pipe	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk .

Tax cases

Project:	Recalculation IJssel Bridge A12	Date:	10/19/2018
Project number:	BF7387	Name:	EKL
Description:	Reduced tax combinations Version:		F1.1

Ultimate limit state

Level: **use**

	6.10a						6.10b						6.11b	
	gr1a		gr2		gr1a	gr1b		gr2		T b		I	A1 a, b	
Own weight	0.9 / 1.25 0.9 / 1.25 0.9 / 1.25 0.9 / 1.25 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0 .9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15												1	1
Resting load	0.9 / 1.25 0.9 / 1.25 0.9 / 1.25 0.9 / 1.25 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0 .9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15												1	1
Shrink and creep	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Preload	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TS (LM1)	1	0.9	0.8	0.72	1.25	1,125	0	1	0.9	1	0.8	0	0.8	0.64
UDL (LM1)	1	0.9	0.8	0.72	1.25	1,125	0	1	0.9	1	0.8	0	0.8	0.64
Single axis (LM2)	0	0	0	0	0	0	1.25	0	0	0	0	0	0	0
Horizontal load	0.8	0.72	1	0.9	1	0.9	0	1.25	1,125	0.8	1	0	0.64	0.8
Wind c F wk	0.45	0	0.45	0	0.45	0	0	0.45	0	0.45	0.45	0	0	0
F * w	0	1.5	0	1.5	0	1.5	0	0	1.5	0	0	1.5	0	0
Temperature	0.39	0.39	0.39	0.39	0.39	0.39	0	0.39	0.39	1.3	1.3	0.39	0	0
Inspection path	0	0	0	0	0	0	0	0	0	0	0	1.3	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Hot water pipe	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk . For the combinations with ψ 0 * F wk , the wind load F * w with a is assumed

load factor 1.5 * ψ 0 * F wk / F * w = 1.5 * 0.3 * 1.056 = 0.48.

Level: **cultivation**

	6.10a						6.10b						6.11b	
	gr1a		gr2		gr1a	gr1b	gr1	gr2		T b		I	A1 a, b	
Own weight	0.9 / 1.3 0.9 / 1.3 0.9 / 1.3 0.9 / 1.3 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0 .9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15												1	1
Resting load	0.9 / 1.3 0.9 / 1.3 0.9 / 1.3 0.9 / 1.3 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0 .9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15 0.9 / 1.15												1	1
Shrink and creep	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Preload	1	1	1	1	1	1	1	1	1	1	1	1	1	1
TS (LM1)	1.04	0.936	0.832	0.7488	1.3	1.17	0	1.04	0.936	1.04	0.832	0	0.8	0.64
UDL (LM1)	1.04	0.936	0.832	0.7488	1.3	1.17	0	1.04	0.936	1.04	0.832	0	0.8	0.64
Single axis (LM2)	0	0	0	0	0	0	1.3	0	0	0	0	0	0	0
Horizontal load	0.832	0.7488	1.04	0.936	1.04	0.936	0	1.3	1.17	0.832	1.04	0	0.64	0.8
Wind c F wk	0.48	0	0.48	0	0.48	0	0	0.48	0	0.48	0.48	0	0	0
F * w	0	1.6	0	1.6	0	1.6	0	0	1.6	0	0	1.6	0	0
Temperature	0.45	0.45	0.45	0.45	0.45	0.45	0	0.45	0.45	1.5	1.5	0.45	0	0
Inspection path	0	0	0	0	0	0	0	0	0	0	0	1.5	0	0
Impact on or under the bridge	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Hot water pipe	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1	1

a A1 = collision on or under the bridge and collision

b In these combinations is in the first column gr1a * ψ 0 , and the second column gr2 * ψ 0 . For the definition of the group traffic load gr1a and gr2 see NEN-EN 1991-2 + C1

c Where traffic load is present on (parts of) the bridge, F * w may be used instead of F wk . For the combinations with ψ 0 * F wk , the wind load F * w with a is assumed

load factor 1.6 * ψ 0 * F wk / F * w = 1.6 * 0.3 * 1.056 = 0.51.

Appendix

Appendix K - Fatigue Taxes

IJssel Bridge

Main bridge connections

Detail Type A: Weld against end of thickening plate

Code	Cross beam	Additional description	Detail category	Source / explanation
A1	6-7	Thickening plate end 350 mm wide	58	Hot spot voltage based on TNO report [R11499]
A2	19-20	Thickening plate end 350 mm wide	58	Hot spot voltage based on TNO report [R11499]
A3	39-40	Thickening plate end 550 mm wide	58	Hot spot voltage based on TNO report [R11499]
A4	57-58	Thickening plate end 550 mm wide	58	Hot spot voltage based on TNO report [R11499]
A5	74-75	Thickening end 530 mm wide	58 (75.4 after repair)	Hot spot voltage based on report TNO [R11499] (after repair, see 100313038-A-VSS)

Detail Type B: Flange spacers at the level of rivet in section division

Code	Cross beam	Additional description	Detail category	Source / explanation
B1	11-12	Wideners above and below (narrow	46	Hot spot voltage based on TNO report [R11499]
B2	21-22	Extenders at the top (no cover plate)	40	Hot spot voltage based on TNO report [R11499]
B3	28-29	Extenders at the top (no cover plate)	46	Hot spot voltage based on TNO report [R11499]
B4	36-37	Extenders at the top (no cover plate)	40 (100 after repair)	Hot spot voltage based on report TNO [R11499] (after repair, see 100313038-A-VSS)
B5	46-47	Extenders at the top (no cover plate)	46	Hot spot voltage based on TNO report [R11499]
B6	60-61	Extenders at the top (no cover plate)	46	Hot spot voltage based on TNO report [R11499]
B7	69-70	Extenders at the top (no cover plate)	40 (100 after repair)	Hot spot voltage based on report TNO [R11499] (after repair, see 100313038-A-VSS)
B8	79-80	Extenders at the top (no cover plate)	46	Hot spot voltage based on TNO report [R11499]

Detail Type C: Riveted joints bridge sections

Code	Cross beam	Additional description	Detail category	Source / explanation
C1	11-12	Riveting in section division in field 1	80	RBK. Voltage based on net cross-section. Ratio of gross / net cross-section = 1.00
C2	21-22	Riveting in section division in field 1	80	RBK. Voltage based on net cross-section. Gross / net diameter ratio = 1.03
C3	28-29	Riveting in section division in field 2	80	RBK. Voltage based on net cross-section. Gross / net diameter ratio = 1.03
C4	36-37	Riveting in section division in field 2	80	RBK. Voltage based on net cross-section. Gross / net diameter ratio = 1.03
C5	46-47	Riveting in section division in field 2	80	RBK. Voltage based on net cross-section. Ratio gross / net diameter = 1.10
C6	60-61	Riveting in section division in field 3	80	RBK. Voltage based on net cross-section. Ratio of gross / net cross-section = 1.00
C7	69-70	Riveting in section division in field 3	80	RBK. Voltage based on net cross-section. Gross / net diameter ratio = 1.03
C8	79-80	Riveting in section division in field 3	80	RBK. Voltage based on net cross-section. Ratio gross / net diameter = 1.10

Detail Type D: Vertical pleat stiffeners inside - weld with main beam bottom flange

Code	Cross beam	Additional description	Detail category	Source / explanation
D1-D84	With each cross beam	Welded stiffener at the bottom vertical	69	Hot spot voltage based on TNO report [R11499]

Detail Type E: Vertical pleat stiffeners inside - weld with main beam body

Code	Cross beam	Additional description	Detail category	Source / explanation
E1-E84	With every crossbeam	Weld between stiffener and body flange	80	Hot spot voltage based on TNO report [R11499]

Detail Type F: Vertical outside crimp stiffener - weld with main beam bottom flange

Code	Cross beam	Additional description	Detail category	Source / explanation
F1-F28	With almost everyone	Flange stiffener across entire width	71	Based on report TNO [R11499], appendix D Table 8.4, Detail 1

Detail Type G: X-seam in the main spar bottom flange

Code	Cross beam	Additional description	Detail category	Source / explanation
G1	2	x-seam in main spar bottom flange	90	NEN-EN 1993-1-9 Table 8.3 Detail 5, For flange thickness t> 25 mm is the detail category
G2	5	x-seam in main spar bottom flange	90	multiplied by factor k = (25 mm / t) 0.2
G3	7	x-seam in main spar bottom flange	90	
G4	11	x-seam in main spar bottom flange	90	
G5	13	x-seam in main spar bottom flange	90	
G6	15	x-seam in main spar bottom flange	90	
G7	17	x-seam in main spar bottom flange	90	

G8	19	x-seam in main spar bottom flange	90
G9	22	x-seam in main spar bottom flange	90
G10	23	x-seam in main spar bottom flange	90
G11	25	x-seam in main spar bottom flange	90
G12	28	x-seam in main spar bottom flange	90

Detail Type H: Flange widener near supports

Code	Cross beam number	Additional description	Detail category	Source / explanation
H1	1	Welded flange widener on bottom flange	46	Hot spot voltage based on TNO report [R11499]
H2	26	Welded flange widener on bottom flange	46	Hot spot voltage based on TNO report [R11499]
H3	54	Welded flange widener on bottom flange	46	Hot spot voltage based on TNO report [R11499]

Detail Type I: Vertical pleat stiffener outside - weld with body Crossbeam

Code	Cross beam number	Additional description	Detail category	Source / explanation
I1-I28	With almost everyone cross-dressing	Weld between stiffener and body main beam	80	Based on report TNO [R11499], appendix D Table 8.4, Detail 7

Detail Type J: Welded body

Code	Cross beam number	Additional description	Detail category	Source / explanation
I1-I28	Over the entire length	Longitudinal weld between body profile and body plate	100	NEN-EN 1993-1-9 Table 8.2 Detail 7, for the voltage calculation by TNO taking into account the moment of resistance at the location of the weld. This is one factor 1.74 / 1.49 = 1.17 higher than the resistance moment for the lower flange.

Detail Type K: Rivet connection flange package

Code	Cross beam number	Additional description	Detail category	Source / explanation
K1	Over the entire length	Rivet connection between flanges in the flange package	101 (m 1 = 4.45; m 2 = 6.45, 1st breakpoint = 6	Obv "Fatigue IJssel bridge Rheden - non-absorbing rivet connections" section 4.2.

Detail Type M: Connection at intermediate supports

Code	Cross beam number	Additional description	Detail category	Source / explanation
M1	B and C.	plate on body for introduction forces	90	NEN-EN 1993-1-9 Table NB.2 detail 17

Detail Type N: Connections between main beam and cross beams

Code	Cross beam number	Additional description	Detail category	Source / explanation
N1	all cross bars	Read	36 *	NEN-EN 1993-1-9 Table 8.5 Detail 3
			40 (SN curve R value dependent)	Alternative method based on TNO reference 100315818 / ALL
N2	all cross bars	Rivets	50	NEN-EN 1993-1-9 Table 8.1 Detail 14

Detail Type O: Welded crossbeam with bulbs and cover plate

Code	Cross beam number	Additional description	Detail category	Source / explanation
O1	all cross bars	With every bulb	36 *	Based on report TNO [R10405], Table 4, Detail 19 (assessment based on the normal voltage interval Δσ wf in the root of the weld)
			80 (m = 5)	Based on report TNO [R10405], Table 4, Detail 19 (assessment based on the shear stress interval Δτ wf in the root of the weld) (damage category 36 * and 80 at add each other)
O2	all cross bars	weld with cover plate	36 *	Based on report TNO [R10405], Table 4, Detail 26 (assessment based on the normal voltage interval Δσ wf in the root of the weld)
			80 (m = 5)	Based on report TNO [R10405], Table 4, Detail 26 (assessment based on the shear stress interval Δτ wf in the root of the weld) (damage category 36 * and 80 at add each other)

Fatigue category connections

Detail Type 1: Weld against end of thickening plate

Code	Cross beam	Additional description	Detail category	Source / explanation
1-1	3-4	Thickening plate end 380 mm wide	58	Hot spot voltage
1-2	11-12	Thickening plate end 380 mm wide	58 (75.4 after repair)	Hot spot voltage (after repair, see 100313038-A-VSS)
1-3	15-16	Thickening plate end 380 mm wide	58	Hot spot voltage
1-4	18-19	Thickening plate end 380 mm wide	58	Hot spot voltage

Detail Type 2: Riveted joints bridge section

Code	Cross beam	Additional description	Detail category	Source / explanation
2-1	14-15	Both sides between supports	80 (m = 5)	RBK. Voltage based on net cross-section. Gross / net cross-section ratio = 1.13
2-2	19-20	Both sides between supports	80 (m = 5)	RBK. Voltage based on net cross-section. Gross / net cross-section ratio = 1.13
2-3	30-21	Both sides between supports	80 (m = 5)	RBK. Voltage based on net cross-section. Gross / net cross-section ratio = 1.13
2-4	35-36	Both sides between supports	80 (m = 5)	RBK. Voltage based on net cross-section. Gross / net cross-section ratio = 1.13

Detail Type 3: Vertical pleat stiffeners inside and outside weld with main beam bottom flange

Code	Cross beam	Additional description	Detail category	Source / explanation
3-1	With every	Weld between beveled pleat stiff and bottom flange	80	Appendix D Table 8.4, Detail 7
3-2	At support points	Weld between beveled pleat stiff and bottom flange	80	Appendix D Table 8.4, Detail 7

Detail Type 4: Riveted crossbeams with main beam

Code	Cross beam	Additional description	Detail category	Source / explanation
4-1	From 5 to 4 carriers	Riveted crossbeam connection with main beam	110 (m 1 = 4.45)	Obv "Fatigue IJssel bridge Rheden - non-absorbing rivet connections" paragraph 4.1.
4-2	1-17-33-49	Riveted crossbeam connection with main beam	110 (m 1 = 4.45)	Obv "Fatigue IJssel bridge Rheden - non-absorbing rivet connections"

paragraph 4.1.

Detail Type 5: X-seam in the main spar bottom flange

Code	Cross beam	Additional description	Detail category	Source / explanation
5-1	5-6	V-seam at section division in the main spar bottom flange	71	NEN-EN 1993-1-9 Table 8.3 Detail 5
5-2	9-10	V-seam at section division in the main spar bottom flange	71	NEN-EN 1993-1-9 Table 8.3 Detail 5
5-3	23-24	V-seam at section division in the main spar bottom flange	71	NEN-EN 1993-1-9 Table 8.3 Detail 5
5-4	26-27	V-seam at section division in the main spar bottom flange	71	NEN-EN 1993-1-9 Table 8.3 Detail 5
5-5	40-41	V-seam at section division in the main spar bottom flange	71	NEN-EN 1993-1-9 Table 8.3 Detail 5
5-6	44-45	V-seam at section division in the main spar bottom flange	71	NEN-EN 1993-1-9 Table 8.3 Detail 5

Detail Type 6: Flank seal between the top plate and bottom flange

Code	Cross beam	Additional description	Detail category	Source / explanation
6-1		In field	100	NEN-EN 1993-1-9 Table 8.3 Detail 7
6-2		At support points	100	NEN-EN 1993-1-9 Table 8.3 Detail 7

Detail Type 7: Riveted connections between main beam and cross beams

Code	Cross beam	Additional description	Detail category	Source / explanation
7-1	End cross beam	Read	36 *	NEN-EN 1993-1-9 Table 8.5 Detail 3
			40 (SN curve R value dependent)	Alternative method based on TNO reference 100315818 / ALL
7-1	End cross beam	Rivets	50	NEN-EN 1993-1-9 Table 8.1 Detail 14
7-2	Between cross beam	Read	36 *	NEN-EN 1993-1-9 Table 8.5 Detail 3
			40 (SN curve R value dependent)	Alternative method based on TNO reference 100315818 / ALL
7-2	Between cross beam	Rivets	50	NEN-EN 1993-1-9 Table 8.1 Detail 14

Detail Type 8: Connection at intermediate supports

Code	Cross beam	Additional description	Detail category	Source / explanation
8-1	17 and 33	plate on body for introduction forces	90	NEN-EN 1993-1-9 Table NB.2 detail 17

Fatigue load

Project:	Recalculation IJssel Bridge A12	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Numbers of trucks fatigue calculation	Version:	F1.0

ESTIMATE TOTAL NUMBER OF TRUCKS OVER THE LIFE

Right lane (current) parallel lane has always been loaded (formerly as main lane to Germany (heavy traffic), now as parallel lane (little traffic))
Left lane (current) parallel lane has always been lightly loaded
Right lane (current) main lane was lightly loaded until 1990, from 1990 heavily loaded with heavy traffic
Left lane (current) main lane was heavily loaded until 1990, from 1990 lightly loaded

Assumption: Left lane sees 10% of the N_{obs} of the right lane

HRB used to be
PRB now

			HRB	HRB	PRB	PRB
IJssel Bridge A12	50%		Judge Rice Cook	Left Rice Cook	Judge Rice Cook	Left Rice Cook
	base	base	direction	direction	always	always

				HRB	PRB	knocked down 1990	knocked down 1990	same direction	same direction
confuse	1 bridge	1961							
unloaded	Open	1962							
	2 directions	1963							
		1964		250000	125000	37500	375000	375000	37500
		1965		264706	132353	39706	397059	397059	39706
		1966		279412	139706	41912	419118	419118	41912
		1967		294118	147059	44118	441176	441176	44118
		1968		308824	154412	46324	463235	463235	46324
		1969		323529	161765	48529	485294	485294	48529
past	2 bridges	1970		338235	169118	50735	507353	507353	50735
	each	1971		352941	176471	52941	529412	529412	52941
	one direction	1972		367647	183824	55147	551471	551471	55147
		1973		382353	191176	57353	573529	573529	57353
		1974		397059	198529	59559	595588	595588	59559
		1975		411765	205882	61765	617647	617647	61765
		1976		426471	213235	63971	639706	639706	63971
		1977		441176	220588	66176	661765	661765	66176
		1978		455882	227941	68382	683824	683824	68382
		1979		470588	235294	70588	705882	705882	70588
		1980		485294	242647	72794	727941	727941	72794
		1981		500000	250000	75000	750000	750000	75000
		1982		514706	257353	77206	772059	772059	77206
		1983		529412	264706	79412	794118	794118	79412
		1984		544118	272059	81618	816176	816176	81618
		1985		558824	279412	83824	838235	838235	83824
		1986		573529	286765	86029	860294	860294	86029
		1987		588235	294118	88235	882353	882353	88235
		1988		602941	301471	90441	904412	904412	90441
		1989		617647	308824	92647	926471	926471	92647
		1990		632353	316176	632353	63235	316176	31618
		1991		647059	323529	647059	64706	323529	32353
		1992		661765	330882	661765	66176	330882	33088
current	3 bridges	1993		676471	338235	676471	67647	338235	33824
situation		1994		691176	345588	691176	69118	345588	34559
		1995		705882	352941	705882	70588	352941	35294
		1996		720588	360294	720588	72059	360294	36029
		1997		735294	367647	735294	73529	367647	36765
		1998		750000	375000	750000	75000	375000	37500
		1999		764706	382353	764706	76471	382353	38235
		2000		779412	389706	779412	77941	389706	38971
		2001		794118	397059	794118	79412	397059	39706
		2002		808824	404412	808824	80882	404412	40441
		2003		823529	411765	823529	82353	411765	41176
		2004		838235	419118	838235	83824	419118	41912
		2005		852941	426471	852941	85294	426471	42647
		2006		867647	433824	867647	86765	433824	43382
		2007		882353	441176	882353	88235	441176	44118
		2008		897059	448529	897059	89706	448529	44853
		2009		911765	455882	911765	91176	455882	45588
		2010		926471	463235	926471	92647	463235	46324
		2011		941176	470588	941176	94118	470588	47059
		2012		955882	477941	955882	95588	477941	47794
		2013		970588	485294	970588	97059	485294	48529
		2014		985294	492647	985294	98529	492647	49265
		2015	measurement 2015	1 million	500000	1 million	100000	500000	50000
		2016		1014706	507353	1014706	101471	507353	50735
		2017		1029412	514706	1029412	102941	514706	51471

	2018		1044118	522059	1044118	104412	522059	52206
	2019		1058824	529412	1058824	105882	529412	52941
	2020		1073529	536765	1073529	107353	536765	53676
	2021		1088235	544118	1088235	108824	544118	54412
	2022		1102941	551471	1102941	110294	551471	55147
	2023		1117647	558824	1117647	111765	558824	55882
	2024		1132353	566176	1132353	113235	566176	56618
	2025		1147059	573529	1147059	114706	573529	57353
Future	2026		1161765	580882	1161765	116176	580882	58088
	2027		1176471	588235	1176471	117647	588235	58824
	2028		1191176	595588	1191176	119118	595588	59559

2029	1205882	602941	1205882	120588	602941	60294
2030	1220588	610294	1220588	122059	610294	61029
2031	1235294	617647	1235294	123529	617647	61765
2032	1250000	625000	1250000	125000	625000	62500
2033	1264706	632353	1264706	126471	632353	63235
2034	1279412	639706	1279412	127941	639706	63971
2035	1294118	647059	1294118	129412	647059	64706
2036	1308824	654412	1308824	130882	654412	65441
2037	1323529	661765	1323529	132353	661765	66176
2038	1338235	669118	1338235	133824	669118	66912
2039	1352941	676471	1352941	135294	676471	67647
2040	1367647	683824	1367647	136765	683824	68382
2041	1382353	691176	1382353	138235	691176	69118
2042	1397059	698529	1397059	139706	698529	69853
2043	1411765	705882	1411765	141176	705882	70588
2044	1426471	713235	1426471	142647	713235	71324
2045	1441176	720588	1441176	144118	720588	72059
2046	1455882	727941	1455882	145588	727941	72794
2047	1470588	735294	1470588	147059	735294	73529
2048	1485294	742647	1485294	148529	742647	74265
2049	1500000	750000	1500000	150000	750000	75000
2050	1514706	757353	1514706	151471	757353	75735

1964 through 1989:

Western bridge Eastern bridge

PRB HL1 PRB HL2 HRB HL1 HRB HL2

towards Germany towards Utrecht

from 1990

Western bridge Eastern bridge

PRB HL1 PRB HL2 HRB HL1 HRB HL2

parallel track (PRB) main carriageway (HRB) main carriageway (HRB)

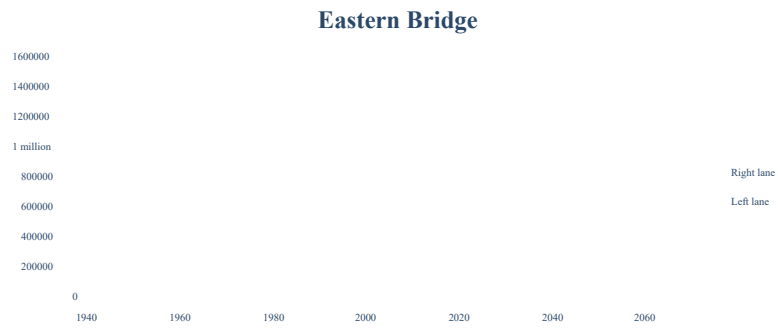
local towards Germany towards Utrecht

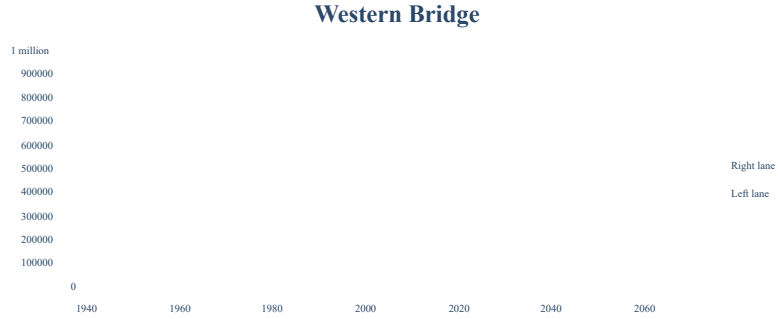
Total number	HRB Right	HRB Left	PRB Right	PRB Left
to 2017	24956618	19245588	28551471	2855147
to 2050	67177206	23467647	49661765	4966176

Total number	HRB Right	HRB Left	PRB Right	PRB Left
through 1990	2324265	16982353	17235294	1723529
1991 to 2010	15735294	1573529	7867647	786765
2011 through 2050	49117647	4911765	24558824	2455882

Average number	Eastern bridge (main carriageway) Right	Left	Western bridge Right	Left
through 1990	86084	628976	638344	63834
1991 to 2010	786765	78676	393382	39338
2011 through 2050	1227941	122794	613971	61397

Overview of numbers of heavy freight lanes per lane per bridge





Appendix

Appendix L - Influence lines

IJssel Bridge

Influence lines Main bridge

Influence line Main girder Field 1

L = 45 m

45 m

Influence line Main beam Support point pillar G

Support point G: L = 95 m

45 m 50 m

Influence line Main girder Field 2

Field 2: L = 50 m

50 m

Influence line Main beam Support point H

L = 155 m

50 m 105 m

Influence line Main girder Field 3

L = 105 m

105 m

Influence line Crossbeam

L = 12 m

12 m

Influence line bulb

L = 2 m

Bridge Influence Lines

Influence line Main girder Field 1 (and 3)

L = 40 m

40 m

Influence line Main beam Support point pillar D (and E)

L = 80 m

40 m 40 m

Influence line Main girder Field 2

L = 40 m

40 m

Influence line Crossbeam

L = 15 m

15 m

Appendix

Appendix M - Surcharge weight steel construction

IJssel Bridge

Tax cases

Project:	Recalculation IJssel Bridge	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description	Surcharge steel weight Main bridge	Version:	-

Resume

Surcharge percentages on the steel weight per part in Scia Engineer

On the basis of some representative parts of the steel construction, a surcharge percentage has been determined for the weight of steel for the input in Scia Engineer.

In Scia Engineer, only the net structural cross-section of the profiles is entered, without connecting plates, rivets, stiffeners, etc.
Therefore, on subsequent pages, the weight is based on the net areas of the cross sections compared to the total weight per part as it was actually performed, based on the running condition.
This difference can be expressed as a percentage. This percentage is taken into account when importing the weight of steel into Scia Engineer, so that the own weight of the steel construction can be correctly taken into account.

Part	Specific location	Surcharge percentage
Main spar	at the bottom flange 500x20	35
Main spar	at the bottom flange 500x30	25
Main spar	at the bottom flange 500x30 + 350 * 30	11
Main spar	at the bottom flange 500x30 + 530 * 10 (as 500x30 + 550 * 30)	20
Main spar	at the bottom flange 500x30 + 550 * 30	20
Cross bars / consoles		38
K-bandage (bottom edge / diagonal)		11
K-bandage (vertical)	(means of connection charged on main beam)	0
Portal A (horizontal / diagonal)		14
Portal B (bottom edge / diagonal)		81
Portal C (horizontal / diagonal)		24
Cover plate / bulbs / edge strip 445x10		8

Tax cases

Project:	Recalculation IJssel Bridge	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description	Weight steel weight Main bridge	Version:	-

Weights in accordance with Renvooistat

Section A	**L =**	**18825 mm**			
	St. 52	**St. 37**	**Total**	**Per part / piece**
4 main beams excl lasse	36856	4293	41149	10287 kg
2 floor plate	44371	4215	48586	24293 kg
2 end cross members	1248	1548	2796	1398 kg
6 cross bars	3576	2791	6367	1061 kg
14 intermediate cross bars	8541	1405	9946	710 kg
	94592	**14252**	**108844**	

Section B	**L =**	**18400 mm**			
	St. 52	**St. 37**	**Total**	**Per part / piece**
4 main beams excl lasse	37391	3180	40571	10143 kg
2 floor plate	43203	2708	45911	22956 kg
8 cross bars	4659	3726	8385	1048 kg
12 intermediate cross bars	7320	1604	8924	744 kg
	92573	**11218**	**103791**	

Section C	**L =**	**12185 mm**			
	St. 52	**St. 37**	**Total**	**Per part / piece**
4 main beams excl lasse	19854	4633	24487	6122 kg
2 floor plate	29237	1850	31087	15544 kg
2 cross bars	1192	912	2104	1052 kg
10 intermediate cross members	7294	1927	9221	922 kg
2 Portals B	1237	634	1871	936 kg
2 Anchor beams	2063	2311	4374	2187 kg
	60877	**12267**	**73144**	

Section D	**L =**	**14680 mm**			
	St. 52	**St. 37**	**Total**	**Per part / piece**
4 main beams excl lasse	24739	4458	29197	7299 kg
2 floor plate	34724	2170	36894	18447 kg
6 cross bars	3576	2781	6357	1060 kg
10 intermediate cross members	6103	1051	7154	715 kg
	69142	**10460**	**79602**	

Section E **L =** **17850 mm**

	St. 52	St. 37	Total	Per part / piece
4 main beams excl lasse	44821	6715	51536	12884 kg
2 floor plate	41923	2681	44604	22302 kg
8 cross bars	4796	4003	8799	1100 kg
12 intermediate cross bars	7321	1214	8535	711 kg
	98861	**14613**	**113474**	

Section F **L = 25135 mm**

	St. 52	St. 37	Total	Per part / piece
4 main beams excl lasse	79814	23322	103136	25784 kg
2 floor plate	62572	3720	66292	33146 kg
8 cross bars	4768	4806	9574	1197 kg
18 intermediate cross bars	10980	1826	12806	711 kg
2 Portals C	1225	4342	5567	2784 kg
	159359	**38016**	**197375**	

Section G **L = 15750 mm**

	St. 52	St. 37	Total	Per part / piece
4 main beams excl lasse	34864	7473	42337	10584 kg
2 floor plate	37299	2375	39674	19837 kg
6 cross bars	3644	3063	6707	1118 kg
12 intermediate cross bars	7321	1214	8535	711 kg
	83128	**14125**	**97253**	

Section H **L = 17125 mm**

	St. 52	St. 37	Total	Per part / piece
4 main beams excl lasse	38503	5004	43507	10877 kg
2 floor plate	42846	2581	45427	22714 kg
6 cross bars	3576	2953	6529	1088 kg
12 intermediate cross bars	8543	1421	9964	830 kg
	93468	**11959**	**105427**	

Section K **L = 15750 mm**

	St. 52	St. 37	Total	Per part / piece
2 main beams excl lasse	18428	2724	21152	10576 kg
1 floor plate	20328	1167	21495	21495 kg
3 cross bars	1788	1428	3216	1072 kg
6 intermediate cross bars	3661	607	4268	711 kg
	44205	**5926**	**50131**	

extra longitudinal rule floor	St. 52	St. 37	Total
1 strip 100x8		4118	4118
		4118	**4118**

Tax cases

Project:	Recalculation IJssel Bridge	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description	Weight steel weight Main bridge	Version:	-

Summary per part

Main girder		Welding
a	41149	2598 kg
B	40571	1773 kg
C	24487	1902 kg
D	29197	1989 kg
E	51536	4779 kg
F	103136	3684 kg
G	42337	2443 kg
H	43507	4276 kg
K	21152	0 kg
total	397072	23444 kg

Intermediate crossbars	
a	710 kg / piece
B	744 kg / piece
C	922 kg / piece
D	715 kg / piece
E	711 kg / piece
F	711 kg / piece
G	711 kg / piece

Crossbars with K-bandage	
a	1061 kg / piece
B	1048 kg / piece
C	1052 kg / piece
D	1060 kg / piece
E	1100 kg / piece
F	1197 kg / piece
G	1118 kg / piece

Portal A (end cross member)	
Portal A	1398 kg / piece
Portal B	
Portal B	936 kg / piece
Anchor beam	2187 kg / piece
Portal C	

H	830 kg / piece	H	1088 kg / piece	Portal C	2784 kg / piece
K	711 kg / piece	K	1072 kg / piece		
average	752 kg / piece	average	1088 kg / piece		

Deck construction

a	48586 kg
B	45911 kg
C	31087 kg
D	36894 kg
E	44604 kg
F	66292 kg
G	39674 kg
H	45427 kg
K	21495 kg
extra strip	4118 kg
total	384088 kg

Total

		Renovation States		
106 Intermediate cross members	752	79703		
53 Crossbars	1088	57684		
2 End crossbars	1398	2796		
2 Main beams		420516		
1 Deck construction		384088		
2 Portal B	3123	6245		
2 Portal C	2784	5567		
		956599	->	**9384 kN**
				9262 kN according to SCIA
				1% deviation

Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description	Surcharge steel weight	Version:	-

Main beam (bottom flange 500x20)

Net cross section (as entered in Scia Engineer)

Part C.		Part D	
A =	50603 [mm 2]	A =	50603 [mm 2]
L =	12185 [mm]	L =	14680 [mm]
V =	6.17E + 08 [mm 3]	V =	742852040 [mm 3]
number =	**4** x per 12185 mm	number =	**4** x per 14680 mm
Total =	**2.47E + 09** [mm 3]	**Total =**	**2.97E + 09** [mm 3]

Total weight, cf statement supplier

The allowance is determined on the basis of part C (axis 4-5).	The allowance is determined on the basis of part D (axis 5-7).
Weight Section C (4-5)	**Weight Section D (5-7)**

Weight =	24487 [kg]	Weight =	29197 [kg]
Welding =	1902 [kg]	Welding =	1989 [kg]
Total =	26389 [kg]	Total =	31186 [kg]
V =	3.36E + 09 [mm 3]	V =	3.97E + 09 [mm 3]
Total	**3.36E + 09** [mm 3]	**Total**	**3,973E + 09** [mm 3]

Resume

Net volume	**5.44E + 09 [mm 3]**	**100.0%**		
Total	**7.33E + 09 [mm 3]**	**134.9%**	**Surcharge percentage to be applied**	**35.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

Main beam (bottom flange 500x30)

Net cross section (as entered in Scia Engineer)

A = 55603 [mm 2]

L = 18825 [mm]
V = 1.05E + 09 [mm 3]
number = **4** x per 18825 mm
Total = **4.19E + 09** [mm 3]

Total weight, cf statement supplier

The allowance is determined on the basis of part A (axis 0-2). There is partly an extra top plate of 350x30 mm. This has been removed from the cross-section.

Weight Section A (0-2)

Weight =	41149 [kg]	
Welding =	2598 [kg]	
Plate =	-2933 [kg]	(Overcharged strip 350x10 over 8897 mm)
Total =	40814 [kg]	

V = 5.2E + 09 [mm 3]

Total **5.20E + 09** [mm 3]

Resume

Net volume	**4.19E + 09 [mm 3]**	**100.0%**		
Total	**5.20E + 09 [mm 3]**	**124.2%**	**Surcharge percentage to be applied**	**25.0%**

Project number BF7387 Name: EKL
Description: Surcharge steel weight Version: -

Main beam (bottom flange 500x30 + 350 * 30)

Net cross section (as entered in Scia Engineer)

A =	68103 [mm 2]
L =	18400 [mm]
V =	1.25E + 09 [mm 3]
number =	**4** x per 18400 mm
Total =	**5.01E + 09** [mm 3]

Total weight, cf statement supplier

The allowance is determined on the basis of part B (axis 2-4). In part, the extra 350x30 mm top plate is absent. The flange has also been reduced in size 500x30 to 500x20. The content has been corrected for this.

Weight Section B (2-4)

Weight =	40571 [kg]	
Welding =	1773 [kg]	
Plate =	990 [kg]	(Fictionally extending bottom flange plate 350x30 over 3003 mm)
Plate =	267 [kg]	(Fictionally extending bottom flange plate 500x30 instead of 500 * 20 over 1700 mm)
Total =	43601 [kg]	

V =	5.55E + 09 [mm 3]
Total	**5.55E + 09** [mm 3]

Resume

Net volume	**5.01E + 09 [mm 3]**	**100.0%**		
Total	**5.55E + 09 [mm 3]**	**110.8%**	**Surcharge percentage to be applied**	**11.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

Main beam (bottom flange 500x30 + 550 * 30)

Net cross section (as entered in Scia Engineer)

	Parts 14-16 and 18-20		Part 16-18
	h = 2995 mm at the middle of section 14-16		*h = 2825 mm at the middle of section 16-17*
A =	79243 [mm 2]	A =	77203 [mm 2]
L =	17125 [mm]	L =	15750 [mm]
V =	1.36E + 09 [mm 3]	V =	1215947250 [mm 3]
number =	**4** x per 17125 mm	number =	**2** x per 15750 mm
Total =	**5.43E + 09** [mm 3]	**Total =**	**2.43E + 09** [mm 3]

Total weight, cf statement supplier

The allowance is determined on the basis of parts H and K (axis 14-18). This is partly missing the extra 550x30 mm top plate, partly there is a plate of this 530x10 instead of 550x30 available. Also, the flange has been reduced 500x30 to 500x20. The content has been corrected for this.

Weight Section H (14-16)			**Weight Section K (16-17)**	
Weight =	43507 [kg]			
Welding =	4276 [kg]		Weight =	21152 [kg]
Plate =	1934 [kg]	(Fictionally extending bottom flange plate 550x30 instead of 530x10 over 5500 mm)	Welding =	0 [kg]
Plate =	2850 [kg]	(Fictionally extending bottom flange plate 550x30 over 1875 mm)	Total =	21152 [kg]
Plate =	102 [kg]	(Fictional pull-through bottom flange plate 500 * 30 instead of 500x20 over 650 mm)		
Total =	52669 [kg]			
			Weight per beam =	21152 [kg]
V =	6.71E + 09 [mm 3]		V =	2.69E + 09 [mm 3]
Total	**6.71E + 09** [mm 3]		**Total**	**2.69E + 09** [mm 3]

Resume

Net volume	**7.86E + 09 [mm 3]**	**100.0%**		
Total	**9.40E + 09 [mm 3]**	**119.6%**	**Surcharge percentage to be applied**	**20.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

Cross beam

Net cross section (as entered in Scia Engineer)

Cross beam		Console (straight part)		Console (running part	
A =	8000 [mm 2]	A =	7880 [mm 2]	A =	6380 [mm 2]
L =	5700 [mm]	L =	336 [mm]	L =	1459 [mm]
V =	45600000 [mm 3]	V =	2647680 [mm 3]	V =	9308420 [mm 3]
number =	**1** x per cross beam	number =	**2** x per cross beam	number =	**2** x per cross beam
Total =	**45600000** [mm 3]	**Total =**	**5.30E + 06** [mm 3]	**Total =**	**18616840** [mm 3]

Total weight, cf statement supplier

Intermediate cross member

Weight =	752 [kg / piece]	[Source: Renovation States]
V =	95784945 [mm 3]	
Total	**95784945** [mm 3]	

Resume

Net volume	**6.95E + 07 [mm 3]**	**100.0%**		
Really	**95784945 [mm 3]**	**137.8%**	**Surcharge percentage to be applied**	**38.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

K-bandage (diagonal + bottom edge)

Net cross section (as entered in Scia Engineer)

	1/2 DIN 20		L80x80x8	
A =	4138.4 [mm 2]		A =	2459.3 [mm 2]
L =	5700 [mm]		L =	3408 [mm]
V =	23588880 [mm 3]		V =	8381294.4 [mm 3]
number =	**1** x per K bandage		number =	**2** x per K bandage
Total =	**23588880** [mm 3]		**Total =**	**16762589** [mm 3]

Total weight, cf statement supplier

The weight is determined as the weight of the crossbars including K-band minus the weight of the intermediate crossbars including consoles

	Crossbars		Intermediate cross member		
Weight =	1061 [kg / piece]		Weight =	-710 [kg / piece]	[Source: Renovation States]
V =	1.35E + 08 [mm 3]		V =	-90500455 [mm 3]	
Total	**1.35E + 08** [mm 3]		**Total**	**-90500455** [mm 3]	

Resume

Net volume	**4.0E + 07 [mm 3]**	**100.0%**		
Really	**4.5E + 07 [mm 3]**	**110.7%**	**Surcharge percentage to be applied**	**11.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

Portal A - End transom (top edge + diagonal + bottom edge)

Net cross section (as entered in Scia Engineer)

1/2 INP 20		L100x10	
A =	4138.4 [mm 2]	A =	3831.5 [mm 2]
L =	5700 [mm]	L =	3321 [mm]
V =	23588880 [mm 3]	V =	12724411.5 [mm 3]
number =	**2** x per K bandage	number =	**2** x per K bandage
Total =	**47177760** [mm 3]	**Total =**	**25448823** [mm 3]

Total weight, cf statement supplier

The weight is determined as the weight of gantry A (end cross member) minus the weight of the intermediate cross members (including bracket)

End cross member		Intermediate cross member		
Weight =	1398 [kg / piece]	Weight =	-752 [kg / piece]	[Source: Renovation States]
V =	1.78E + 08 [mm 3]	V =	-95784945 [mm 3]	
Total	**1.78E + 08** [mm 3]	**Total**	**-95784945** [mm 3]	

Resume

Net volume	**7.3E + 07 [mm 3]**	**100.0%**		
Really	**8.2E + 07 [mm 3]**	**113.3%**	**Surcharge percentage to be applied**	**14.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

Portal B (top edge + diagonal + bottom edge)

Net cross section (as entered in Scia Engineer)

Bottom edge		2xL100x10	
A =	22680 [mm 2]	A =	3831.5 [mm 2]
L =	5700 [mm]	L =	5394 [mm]
V =	1.29E + 08 [mm 3]	V =	20667111 [mm 3]
number =	**1** x per portal	number =	**2** x per portal
Total =	**1.29E + 08** [mm 3]	**Total =**	**41334222** [mm 3]

Total weight, cf statement supplier

The weight of the portal is determined as the weight of portal C minus the weight of the intermediate cross members (including console)

[Source: Renovation States]

Bottom edge (anchor beam)	Portal B	Intermediate cross member

Weight =	2187 [kg / piece]	Weight =	936 [kg / piece]	Weight =	-710 [kg / piece]
V =	2.79E + 08 [mm 3]	V =	119171975 [mm 3]	V =	-9.05E + 07 [mm 3]
Total	**2.79E + 08** [mm 3]	**Total**	**1.19E + 08** [mm 3]	**Total**	**-9.05E + 07** [mm 3]

Resume

Net volume	**1.7E + 08 [mm 3]**	**100.0%**		
Really	**3.1E + 08 [mm 3]**	**180.1%**	**Surcharge percentage to be applied**	**81.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

Portal C (top edge + diagonal + bottom edge)

Net cross section (as entered in Scia Engineer)

	Top and bottom edge - double UNP 260		diagonal - double UNP 260
A =	9659 [mm 2]	A =	9659 [mm 2]
L =	5700 [mm]	L =	5394 [mm]
V =	55056300 [mm 3]	V =	52100646 [mm 3]

number =	**2** x per K bandage	number =	**2** x per K bandage
Total =	**1.1E + 08** [mm 3]	**Total =**	**104201292** [mm 3]

Total weight, cf statement supplier

The weight is determined as the weight of portal C minus the weight of the intermediate cross members (including console)

Portal C		Intermediate cross member		
Weight =	2784 [kg / piece]	Weight =	-711 [kg / piece]	[Source: Renovation States]
V =	3.55E + 08 [mm 3]	V =	-90605096 [mm 3]	
Total	**3.55E + 08** [mm 3]	**Total**	**-90605096** [mm 3]	

Resume

Net volume	**2.1E + 08 [mm 3]**	**100.0%**		
Really	**2.6E + 08 [mm 3]**	**123.2%**	**Surcharge percentage to be applied**	**24.0%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	EKL
Description:	Surcharge steel weight	Version:	-

Edge strip deck

Net cross section (as entered in Scia Engineer)

t = 10 mm		t = 12 mm		Bulbs 200%	
A =	94400 [mm 2]	A =	113280 [mm 2]	A =	3424.5 [mm 2]
L =	223627 [mm]	L =	72039 [mm]	L =	295666 [mm]
V =	2.11E + 10 [mm 3]	V =	8160577920 [mm 3]	V =	1.01E + 09 [mm 3]
number =	**1** x	number =	**1** x	number =	**4** x
Total =	**2.11E + 10** [mm 3]	**Total =**	**8.161E + 09** [mm 3]	**Total =**	**4.05E + 09** [mm 3]

Bulbs		Edge strip 100 * 8		Edge strip 445 * 10	
A =	5136.8 [mm 2]	A =	800 [mm 2]	A =	4450 [mm 2]
L =	295666 [mm]	L =	295666 [mm]	L =	295666 [mm]
V =	1.52E + 09 [mm 3]	V =	236532800 [mm 3]	V =	1.32E + 09 [mm 3]
number =	**6** x	number =	**2** x	number =	**2** x
Total =	**9.11E + 09** [mm 3]	**Total =**	**473065600** [mm 3]	**Total =**	**2.63E + 09** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Cover plates	[Source: Renovation States]
a	48586 [kg]
B	45911 [kg]
C	31087 [kg]
D	36894 [kg]
E	44604 [kg]
F	66292 [kg]
G	39674 [kg]
H	45427 [kg]
K	21495 [kg]
extra strip	4118 [kg]
Weight =	384088 [kg]
V =	4.89E + 10 [mm 3]
Total	**4.89E + 10** [mm 3]

Resume

Net volume	**4.6E + 10 [mm 3]**	**100.0%**		
Really	**4.9E + 10 [mm 3]**	**107.4%**	**Surcharge percentage to be applied**	**8.0%**

Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description	Supplement steel weight surcharge	Version:	-

Resume

Surcharge percentages on the steel weight per part in Scia Engineer

On the basis of some representative parts of the steel construction, a surcharge percentage has been determined for the weight of steel for the purpose of imports in Scia Engineer.

In Scia Engineer, only the net structural cross-section of the profiles is entered, without connecting plates, rivets, stiffeners, etc.
Therefore, on subsequent pages, the weight is based on the neat surfaces of the cross-sections compared to the total weight per part as it was actually executed.
this difference can be expressed as a percentage. This percentage is taken into account when importing the weight of steel into Scia Engineer, so that the self-weight of the steel construction can be correctly included.

Part	Specific location	Surcharge percentage
Cross beam	Between cross bars	0
Cross beam end	Cross beam at the end of the bridges	0
Longitudinal beam	Main beam without additional plate on the bottom flange	47
Longitudinal beam with plate	Main beam with additional plate on the bottom flange	41
Longitudinal beam prestressed	Main girder under the prestressed concrete part	168
Longitudinal beam buckle. with plate	Main beam with extra plate bottom fl. under the prestressed concrete part	107
Diagonal	K-bandages for normal cross bars	19
Bottom edge	K-bandages for normal cross bars	9
Bottom edge	K-bandages for supports	5

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

Cross beam

Net cross section (as entered in Scia Engineer)

	THAT 45		DIE 45 (T piece)		DIE 45 (Variable)	
A =	18259 [mm 2]	A =	10101 [mm 2]	A =	17659 [mm 2]	average area
L =	4726 [mm]	L =	162 [mm]	L =	325 [mm]	
V =	86292034 [mm 3]	V =	1636362 [mm 3]	V =	5739175 [mm 3]	
number =	**1** x per cross beam	number =	**2** x per cross beam	number =	**2** x per cross beam	
Total =	**86292034** [mm 3]	**Total =**	**3272724** [mm 3]	**Total =**	**11478350** [mm 3]	

Extra steel parts (not entered as profile cross-section in Scia Engineer)

	23mm	20mm
hkop =	14	12
Dkop =	35	30

I rivet =

23mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)	20mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)
	8171.54 [mm 3]		5145,929 [mm 3]

(* 2) = **16343.0886** [mm 3] (* 2) = **10291.86** [mm 3]

Resume

Net volume	**1.01E + 08** [mm 3]	**100.0%**		
Extra volume	**0** [mm 3]	**0.0%**	**Surcharge percentage to be applied**	**0.0%**
Total	**1.01E + 08** [mm 3]	**100.0%**		

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

End crossbeam

Net cross section (as entered in Scia Engineer)

DIE 45 + 300x20		DIE 45 + 300x20 (variable)		DIE 45 (Variable)	
A =	24259 [mm 2]	A =	23320 [mm 2]	A =	16192 [mm 2] average area
L =	6650 [mm]	L =	1000 [mm]	L =	325 [mm]
V =	1.61E + 08 [mm 3]	V =	23320000 [mm 3]	V =	5262400 [mm 3]
number =	**1** x per cross beam	number =	**2** x per cross beam	number =	**2** x per cross beam
Total =	**1.61E + 08** [mm 3]	**Total =**	**46640000** [mm 3]	**Total =**	**10524800** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

		23mm	20mm
	hkop =	14	12
	Dkop =	35	30

I rivet =

23mm	$(1/6) * \pi * h * (3 ((1/2) * D)^2 + h^2)$	20mm	$(1/6) * \pi * h * (3 ((1/2) * D)^2 + h^2)$
	8171.54 [mm 3]		5145,929 [mm 3]
(* 2) =	**16343.0886** [mm 3]	(* 2) =	**10291.86** [mm 3]

Resume

Net volume	**2.18E + 08** [mm 3]	**100.0%**		
Extra volume	**0** [mm 3]	**0.0%**	**Surcharge percentage to be applied**	**0.0%**
Total	**2.18E + 08** [mm 3]	**100.0%**		

Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

Main beam without additional plate bottom flange

Net cross section (as entered in Scia Engineer)

No extra plate at bottom flange

A =	42920 [mm 2]	A =	7771.9 [mm 2]
L =	5992 [mm]	L =	1670 [mm]
V =	2.57E + 08 [mm 3]	V =	12979073 [mm 3]
number =	**1** x per side member	number =	**1** x per side member
Total =	**2.57E + 08** [mm 3]	**Total =**	**12979073** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Horizontal stiffeners

A =	17112 [mm 2]
L =	5992 [mm]
V =	1.03E + 08 [mm 3]
number =	**1** x per side member
Total =	**1.03E + 08** [mm 3]

Coupling plate

A =	125400 [mm 2]
t =	12 [mm]
v	1504800 [mm 3]
number =	**3** x per stringer
Total =	**4514400** [mm 3]

Connection sleepers

A =	177000 [mm 2]
t =	12 [mm]
I =	2124000 [mm 3]
number =	**4** x per side member
Total =	**8496000** [mm 3]

Vertical stiffeners

A =	3885.9 [mm 2]
L =	1356 [mm]
I =	5269280 [mm 3]
number =	**2** x per side member
Total =	**10538561** [mm 3]

Number of rivets

Coupling plate	12
Total number of nails	**12**

I =	16343 [mm 3]	based on double "head" 23mm
number	12 -	
	196117 [mm 3]	

	23mm	20mm
hkop =	14	12
Dkop =	35	30

V rivet =

23mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)	20mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)
	8172 [mm 3]		5146 [mm 3]
(* 2) =	**16343** [mm 3]	(* 2) =	**10292** [mm 3]

Resume

Net volume	**2.70E + 08 [mm 3]**	**100.0%**		
Extra volume	**1.26E + 08 [mm 3]**	**46.7%**	**Surcharge percentage to be applied**	**47%**
Total	**3.96E + 08 [mm 3]**	**146.7%**		

Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

Main beam with additional plate bottom flange

Net cross section (as entered in Scia Engineer)

	Extra plate at bottom flange		
A =	50520 [mm 2]	A =	3885.9 [mm 2]
L =	19200 [mm]	L =	1770 [mm]
V =	9.7E + 08 [mm 3]	V =	6878043 [mm 3]
number =	**1** x per side member	number =	**2** x per side member
Total =	**9.7E + 08** [mm 3]	**Total =**	**13756086** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Horizontal stiffeners		*Coupling plate*		*Connection sleepers*	
A =	17112 [mm 2]	A =	125400 [mm 2]	A =	177000 [mm 2]
L =	19200 [mm]	t =	12 [mm]	t =	12 [mm]
V =	3.29E + 08 [mm 3]	V =	1504800 [mm 3]	V =	2124000 [mm 3]
number =	**1** x per side member	number =	**8** x per stringer	number =	**8** x per stringer
Total =	**3.29E + 08** [mm 3]	**Total =**	**12038400** [mm 3]	**Total =**	**16992000** [mm 3]

Vertical stiffeners

A = 3885.9 [mm 2]
L = 1770 [mm]
V = 6878043 [mm 3]
number = **6** x per side member
Total = **41268258** [mm 3]

Number of rivets

Coupling plate 96

Total number of nails **96**

V = 16343 [mm 3] based on double "head" 23mm
number 96 -
1568937 [mm 3]

	23mm	20mm
hkop =	14	12
Dkop =	35	30

V rivet =

23mm (1/6) * π * h * (3 ((1/2) * D) 2 + h 2) 20mm (1/6) * π * h * (3 ((1/2) * D) 2 + h 2)
8172 [mm 3] 5146 [mm 3]
(* 2) = **16343** [mm 3] (* 2) = **10292** [mm 3]

Resume

Net volume	**9.84E + 08** [mm 3]	**100.0%**
Extra volume	**4E + 08** [mm 3]	**40.7%**
Total	**1.38E + 09** [mm 3]	**140.7%**

Surcharge percentage to be applied **41%**

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Tax cases

Project: Recalculation Ijsselbrug Date: 5/25/2018
Project number BF7387 Name: Abd
Description: Supplement steel weight surcharge Version: -

Main beam without additional plate bottom flange at prestressed part

Net cross section (as entered in Scia Engineer)

No extra plate at bottom flange

A = 34480 [mm 2]
L = 8860 [mm]
V = 3.05E + 08 [mm 3]
number = **1** x per side member
Total = **3.05E + 08** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Horizontal stiffeners

A =	17112 [mm 2]
L =	8860 [mm]
V =	1.52E + 08 [mm 3]
number =	**2** x per side member
Total =	**3.03E + 08** [mm 3]

Coupling plate

A =	125400 [mm 2]
t =	12 [mm]
V =	1504800 [mm 3]
number =	**4** x per side member
Total =	**6019200** [mm 3]

Connection sleepers

A =	177000 [mm 2]
t =	12 [mm]
V =	2124000 [mm 3]
number =	**4** x per side member
Total =	**8496000** [mm 3]

Vertical stiffeners

A =	3885.9 [mm 2]
L =	1770 [mm]
V =	6878043 [mm 3]
number =	**4** x per side member
Total =	**27512172** [mm 3]

Body stiffeners

A =	2000 [mm 2]
L =	8860 [mm]
V =	17720000 [mm 3]
number =	**2** x per side member
Total =	**35440000** [mm 3]

Top flange stiffeners

A =	1440 [mm 2]
L =	8860 [mm]
V =	12758400 [mm 3]
number =	**1** x per side member
Total =	**12758400** [mm 3]

Joint transition stiffeners body

A =	3400 [mm 2]
L =	2060 [mm]
V =	7004000 [mm 3]
number =	**4** x per side member
Total =	**28016000** [mm 3]

Joint transition stiffeners top flange

A =	1980 [mm 2]
L =	670 [mm]
V =	1326600 [mm 3]
number =	**4** x per side member
Total =	**5306400** [mm 3]

Joint transition stiffeners lower flange

A =	3040 [mm 2]
L =	900 [mm]
V =	2736000 [mm 3]
number =	**4** x per side member
Total =	**10944000** [mm 3]

T piece top flange of main beam

A =	7000 [mm 2]
L =	8860 [mm]
V =	62020000 [mm 3]
number =	**1** x per side member
Total =	**62020000** [mm 3]

Number of M22 bolts

Coupling plate	48
Total number of bolts	**48**

V =	30400 [mm 3]	based on M22
number	48 -	
Total =	**1459200** [mm 3]	

Number of M20 bolts

Body horizontally	176
Body vertically	144
Top flange	56
Bottom flange	72
Total number of bolts	**448**

V =	25120 [mm 3]	based on M20
number	448 -	
Total =	**11253760** [mm 3]	

	a	V
M22	380	30400
M20	314	25120

	23mm	20mm
hkop =	14	12
Dkop =	35	30

V rivet =

23mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)	20mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)
	8172 [mm 3]		5146 [mm 3]
(* 2) =	**16343** [mm 3]	(* 2) =	**10292** [mm 3]

Resume

Net volume	**3.05E + 08 [mm 3]**	**100.0%**
Extra volume	**5.12E + 08 [mm 3]**	**167.7%**
Total	**8.18E + 08 [mm 3]**	**267.7%**

Surcharge percentage to be applied **168%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

Main beam with additional plate bottom flange at the prestressed part

Net cross section (as entered in Scia Engineer)

Extra plate at bottom flange

A =	42080 [mm 2]	A =	3885.9 [mm 2]
L =	4194 [mm]	L =	1770 [mm]
V =	1.76E + 08 [mm 3]	V =	6878043 [mm 3]
number =	**1** x per side member	number =	**2** x per side member
Total =	**1.76E + 08** [mm 3]	**Total =**	**13756086** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Horizontal stiffeners

A =	17112 [mm 2]
L =	4194 [mm]
V =	71767728 [mm 3]
number =	**2** x per side member
Total =	**1.44E + 08** [mm 3]

Coupling plate

A =	125400 [mm 2]
t =	12 [mm]
V =	1504800 [mm 3]
number =	**1** x per side member
Total =	**1504800** [mm 3]

Connection sleepers

A =	177000 [mm 2]
t =	12 [mm]
V =	2124000 [mm 3]
number =	**1** x per side member
Total =	**2124000** [mm 3]

T piece top flange of main beam

A =	7000 [mm 2]
L =	4194 [mm]
V =	29358000 [mm 3]
number =	**1** x per side member
Total =	**29358000** [mm 3]

Body stiffeners

A =	2000 [mm 2]
L =	4194 [mm]
V =	8388000 [mm 3]
number =	**2** x per side member
Total =	**16776000** [mm 3]

Top flange stiffeners

A =	1440 [mm 2]
L =	4194 [mm]
V =	6039360 [mm 3]
number =	**1** x per side member
Total =	**6039360** [mm 3]

Number of M22 bolts

Coupling plate	12
Total number of bolts	**12**

V =	30400 [mm 3]	based on M22
number	12 -	
Total =	**364800** [mm 3]	

Number of M20 bolts

Body horizontally	100
Total number of bolts	**100**

V =	25120 [mm 3]	based on M20
number	100 -	
Total =	**2512000** [mm 3]	

bolts	a	V
M22	380	30400
M20	314	25120

	23mm	20mm
hkop =	14	12
Dkop =	35	30

V rivet =

23mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)	20mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)
	8172 [mm 3]		5146 [mm 3]
(* 2) =	**16343** [mm 3]	(* 2) =	**10292** [mm 3]

Resume

Net volume	**1.90E + 08 [mm 3]**	**100.0%**
Extra volume	**2.02E + 08 [mm 3]**	**106.3%**
Total	**3.92E + 08 [mm 3]**	**206.3%**

Surcharge percentage to be applied **107%**

Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

Diagonal

Net cross section (as entered in Scia Engineer)

2L80x80x10

A =	3012.9 [mm 2]
L =	3355 [mm]
V =	10108280 [mm 3]
number =	**1** x per diagonal
Total =	**10108280** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Coupling plate diagonal

A =	114750 [mm 2]
t =	12 [mm]
V =	1377000 [mm 3]
number =	**1** x diagonal
Total =	**1377000** [mm 3]

Coupling plate between diagonal

A =	15000 [mm 2]
t =	12 [mm]
V =	180000 [mm 3]
number =	**2** x per diagonal
Total =	**360000** [mm 3]

Number of rivets

Coupling plate diagonal 6

Total number of nails **6**

V =	16343	based on double "head" 23mm
number	6	
Total =	**98059** [mm 3]	

		23mm	26mm
	hkop =	14	16
	Dkop =	35	40

V rivet =

23mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)	20mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)
	8172 [mm 3]		12198 [mm 3]
(* 2) =	**16343** [mm 3]	(* 2) =	**24396** [mm 3]

Resume

Net volume	**10108280** [mm 3]	**100.0%**
Extra volume	**1835059** [mm 3]	**18.2%**
Total	**11943338** [mm 3]	**118.2%**

Surcharge percentage to be applied **19%**

Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

Bottom edge 1/2 DIE 26

Net cross section (as entered in Scia Engineer)

1/2 THAT 26

A =	4363.3 [mm 2]
L =	5700 [mm]
V =	24870810 [mm 3]
number =	**1** x per bottom edge
Total =	**24870810** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Coupling plate diagonal 2

A =	73700 [mm 2]
t =	8 [mm]
V =	589600 [mm 3]
number =	**1** x per diagonal
Total =	**589600** [mm 3]

Connecting plate bottom edge

A =	55900 [mm 2]
t =	12 [mm]
V =	670800 [mm 3]
number =	**2** x per bottom edge
Total =	**1341600** [mm 3]

Number of rivets

Connecting plate bottom edge	6
Coupling plate diagonal 2	11
Total number of nails	**17**

V =	16343	based on double "head" 23mm
number	17	
Total =	**277833** [mm 3]	

	23mm	26mm
hkop =	14	16
Dkop =	35	40

V rivet =

23mm $(1/6) * \pi * h * (3 ((1/2) * D)^2 + h^2)$ = 8172 [mm 3]

(* 2) = **16343** [mm 3]

20mm $(1/6) * \pi * h * (3 ((1/2) * D)^2 + h^2)$ = 12198 [mm 3]

(* 2) = **24396** [mm 3]

Resume

Net volume	**24870810** [mm 3]	**100.0%**
Extra volume	**2209033** [mm 3]	**8.9%**
Total	**27079843** [mm 3]	**108.9%**

Surcharge percentage to be applied **9%**

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Tax cases

Project:	Recalculation Ijsselbrug	Date:	5/25/2018
Project number	BF7387	Name:	Abd
Description:	Supplement steel weight surcharge	Version:	-

Bottom edge 1/2 DIN 30

Net cross section (as entered in Scia Engineer)

1/2 DIN 30

A =	7701.6 [mm 2]
L =	5700 [mm]
V =	43899120 [mm 3]
number =	**1** x per bottom edge
Total =	**43899120** [mm 3]

Extra steel parts (not entered as profile cross-section in Scia Engineer)

Coupling plate diagonal

A =	46215 [mm 2]
t =	12 [mm]
V =	554580 [mm 3]
number =	**1** x per diagonal
Total =	**554580** [mm 3]

Connecting plate bottom edge

A =	55900 [mm 2]
t =	12 [mm]
V =	670800 [mm 3]
number =	**2** x per bottom edge
Total =	**1341600** [mm 3]

Number of rivets

Connecting plate bottom edge	7
Coupling plate diagonal	11
Total number of nails	**18**

V =	16343	based on double "head" 23mm
number	18	
Total =	**294176** [mm 3]	

	23mm	26mm
hkop =	14	16
Dkop =	35	40

V rivet =

23mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)	20mm	(1/6) * π * h * (3 ((1/2) * D) 2 + h 2)
	8172 [mm 3]		12198 [mm 3]

(* 2) = **16343** [mm 3] (* 2) = **24396** [mm 3]

Resume

Net volume	**43899120** [mm 3]	**100.0%**		
Extra volume	**2190356** [mm 3]	**5.0%**	**Surcharge percentage to be applied**	**5%**
Total	**46089476** [mm 3]	**105.0%**		

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Appendix

Appendix N - Concrete stiffness

IJssel Bridge

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Prestressed concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of modulus ratio of construction phase 3 (prestressing)

φ_o	=	$\varphi_{RH}\ \beta(f_{cm})\ \beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$= (35 / f_{cm})^{0.7}$	=	0.911	
α_2	=	$= (35 / f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8 / \sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1 / (0.1 + t_0^{20})$			formula B.5
$t_{0,T}$	=	21 days			
α	=	-1	cement class S		

t_0	=	17 days			
$\beta(t_0)$	=	$1 / (0.1 + t_0^{0.20})$	=	0.536	formula B.5
φ_o	=	1.81748			formula B.2
$\beta_c(t, t_0)$	=	$((t - t_0) / (\beta_H + (t - t_0)))^{0.3}$			formula B.7
t	=	24 days			
α_3	=	$= (35 / f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t, t_0)$	=	0.19645			formula B.7
$\varphi(t, t_o)$	=	$\varphi_o * \beta_c(t, t_0)$			formula B.1
$\varphi(t, t_o)$	=	0.35704			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$= E_a / E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		permanent loads			
$\psi_L =$	=	1.1			
n_L	=	$n_0 (1 + \psi_L \varphi(t, t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	9			
E_c	=	23700 N / mm²			

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Prestressed concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phase 4 (jacking)

φ_o	=	$\varphi_{RH} \beta(f_{cm}) \beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$= (35 / f_{cm})^{0.7}$	=	0.911	
α_2	=	$= (35 / f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			

φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8 / \sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1 / (0.1 + t_0^{0.20})$			formula B.5
$t_{0,T}$	=	28 days			
α	=	-1	cement class S		
t_0	=	24 days			
$\beta(t_0)$	=	$1 / (0.1 + t_0^{0.20})$	=	0.502	formula B.5
φ_o	=	1.70396			formula B.2
$\beta_c(t, t_0)$	=	$((t - t_0) / (\beta_H + t - t_0))^{0.3}$			formula B.7
t	=	36500 days		(see phase 6)	
α_3	=	$= (35 / f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t, t_0)$	=	0.99449			formula B.7
$\varphi(t, t_o)$	=	$\varphi_o * \beta_c(t, t_0)$			formula B.1
$\varphi(t, t_o)$	=	1.69457			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$= E_a / E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		prestressing by imposed deformations			
$\psi_L =$	=	1.5			
n_L	=	$n_0 (1 + \psi_L \varphi(t, t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	23			
E_c	=	9300 N / mm²			

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Prestressed concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phase 5 (pouring concrete)

φ_o	=	$\varphi_{RH}\,\beta(f_{cm})\,\beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$=(35/f_{cm})^{0.7}$	=	0.911	
α_2	=	$=(35/f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8/\sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$			formula B.5
$t_{0,T}$	=	60 days			
α	=	-1	cement class S		
t_0	=	56 days			
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$	=	0.427	formula B.5
φ_o	=	1.44985			formula B.2
$\beta_c(t,t_0)$	=	$((tt_0)/(\beta_H+tt_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$=(35/f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t,t_0)$	=	0.99449			formula B.7
$\varphi(t,t_o)$	=	$\varphi_o * \beta_c(t,t_0)$			formula B.1
$\varphi(t,t_o)$	=	1.44186			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$=E_a/E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		permanent loads			
$\psi_L =$	=	1.1			
n_L	=	$n_0(1+\psi_L\varphi(t,t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	16			
E_c	=	12800 N / mm²			

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Prestressed concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phase 6 (letting go)

φ_o	=	$\varphi_{RH}\,\beta(f_{cm})\,\beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$=(35/f_{cm})^{0.7}$	=	0.911	
α_2	=	$=(35/f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8/\sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$			formula B.5

$t_{0,T}$	=	90 days			
α	=	-1	cement class S		
t_0	=	87 days			
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$	=	0.394	formula B.5
φ_o	=	1.33531			formula B.2
$\beta_c(t,t_0)$	=	$((t-t_0)/(\beta_H+t-t_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$=(35/f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t,t_0)$	=	0.99448			formula B.7
$\varphi(t,t_o)$	=	$\varphi_o * \beta_c(t,t_0)$			formula B.1
$\varphi(t,t_o)$	=	1.32794			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$=E_a/E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		prestressing by imposed deformations			
$\psi_L =$	=	1.5			
n_L	=	$n_0(1+\psi_L\varphi(t,t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	19			
E_c	=	11000 N / mm²			

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Prestressed concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phases 7 and 8 (asphalt pavement and other permanent loads)

φ_o	=	$\varphi_{RH}\,\beta(f_{cm})\,\beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$=(35/f_{cm})^{0.7}$	=	0.911	
α_2	=	$=(35/f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8/\sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$			formula B.5

$t_{0,T}$	=	120 days			
α	=	-1	cement class S		
t_0	=	117 days			
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$	=	0.372	formula B.5
φ_o	=	1,26068			formula B.2
$\beta_c(t,t_0)$	=	$((t-t_0)/(\beta_H+t-t_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$=(35/f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t,t_0)$	=	0.99448			formula B.7
$\varphi(t,t_o)$	=	$\varphi_o * \beta_c(t,t_0)$			formula B.1
$\varphi(t,t_o)$	=	1.25372			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
n_0 =	=	$=E_a/E_{cm}$			NEN-EN 1994-2

n_0 =	=	6.36	
Tax type		permanent loads	
ψ_L =	=	1.1	
n_L	=	$n_0 (1 + \psi_L \varphi (t, t_0))$	NEN-EN 1994-2, formula 5.6
n_L	=	15	
E_c	=	13900 N / mm²	

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Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Prestressed concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phase 9 (shrinkage and creep)

φ_o	=	$\varphi_{RH} \beta (f_{cm}) \beta (t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$= (35 / f_{cm})^{0.7}$	=	0.911	
α_2	=	$= (35 / f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta (f_{cm})$	=	$16.8 / \sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta (t_0)$	=	$1 / (0.1 + t_0^{0.20})$			formula B.5
$t_{0,T}$	=	1 days			
α	=	-1	cement class S		
t_0	=	0 days			
$\beta (t_0)$	=	$1 / (0.1 + t_0^{0.20})$	=	1,166	formula B.5
φ_o	=	3,9539			formula B.2
$\beta_c (t, t_0)$	=	$((t - t_0) / (\beta_H + t - t_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$= (35 / f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c (t, t_0)$	=	0.9945			formula B.7
$\varphi (t, t_o)$	=	$\varphi_o * \beta_c (t, t_0)$			formula B.1
$\varphi (t, t_o)$	=	3.93214			
E_{cm}	=	33000 N / mm²			

E_a	=	210000 N / mm²	
n_0 =	=	$= E_a / E_{cm}$	NEN-EN 1994-2
n_0 =	=	6.36	

Tax type primary and secondary effects due to shrinkage

ψ_L =	=	0.55	
n_L	=	$n_0 (1 + \psi_L \varphi (t, t_0))$	NEN-EN 1994-2, formula 5.6
n_L	=	20	
E_c	=	10400 N / mm²	

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Prestressed concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phase 10 (pre-tension loss

φ_o	=	$\varphi_{RH} \beta (f_{cm}) \beta (t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$= (35 / f_{cm})^{0.7}$	=	0.911	
α_2	=	$= (35 / f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta (f_{cm})$	=	$16.8 / \sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta (t_0)$	=	$1 / (0.1 + t_0^{20})$			formula B.5
$t_{0,T}$	=	21 days			
α	=	-1	cement class S		
t_0	=	17 days			
$\beta (t_0)$	=	$1 / (0.1 + t_0^{20})$	=	0.536	formula B.5
φ_o	=	1.81748			formula B.2
$\beta_c (t, t_0)$	=	$((t - t_0) / (\beta_H + t - t_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$= (35 / f_{cm})^{0.5}$	=	0.935	
β_H					

$\beta_c(t, t_0)$	= 678 = 0.99449		formula B.8b formula B.7
$\varphi(t, t_o)$	= $\varphi_o * \beta_c(t, t_0)$		formula B.1
$\varphi(t, t_o)$	= 1.80747		
E_{cm}	= 33000 N / mm²		
E_a	= 210000 N / mm²		
$n_0 =$	= $= E_a / E_{cm}$		NEN-EN 1994-2
$n_0 =$	= 6.36		
Tax type	permanent loads		
$\psi_L =$	= 1.1		
n_L	= $n_0 (1 + \psi_L \varphi(t, t_0))$		NEN-EN 1994-2, formula 5.6
n_L	= 19		
E_c	= 11000 N / mm²		

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Reinforced concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phase 6 (letting go)

φ_o	=	$\varphi_{RH} \beta(f_{cm}) \beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$= (35 / f_{cm})^{0.7}$	=	0.911	
α_2	=	$= (35 / f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8 / \sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1 / (0.1 + t^{20})$			formula B.5

$t_{0,T}$	=	28 days			
α	=	-1	cement class S		
t_0	=	24 days			
$\beta(t_0)$	=	$1 / (0.1 + t_0^{20})$	=	0.502	formula B.5
φ_o	=	1.70396			formula B.2
$\beta_c(t, t_0)$	=	$((tt_0) / (\beta_H + tt_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$= (35 / f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t, t_0)$	=	0.99449			formula B.7
$\varphi(t, t_o)$	=	$\varphi_o * \beta_c(t, t_0)$			formula B.1
$\varphi(t, t_o)$	=	1.69457			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$= E_a / E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		prestressing by imposed deformations			
$\psi_L =$	=	1.5			
n_L	=	$n_0 (1 + \psi_L \varphi(t, t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	23			
E_c	=	9300 N / mm²			

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Reinforced concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phases 7 and 8 (asphalt pavement and other permanent loads)

φ_o	=	$\varphi_{RH} \beta(f_{cm}) \beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$= (35 / f_{cm})^{0.7}$	=	0.911	
α_2	=	$= (35 / f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b

Cement class		S			
$\beta (f_{cm})$	=	$16.8 / \sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta (t_0)$	=	$1 / (0.1 + t^{\beta 20})$			formula B.5

$t_{0,T}$	=	60 days			
α	=	-1	cement class S		
t_0	=	56 days			
$\beta (t_0)$	=	$1 / (0.1 + t^{\beta 20})$	=	0.427	formula B.5
φ_o	=	1.44985			formula B.2
$\beta_c (t, t_0)$	=	$((t t_0) / (\beta_H + t t_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$= (35 / f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c (t, t_0)$	=	0.99449			formula B.7
$\varphi (t, t_o)$	=	$\varphi_o * \beta_c (t, t_0)$			formula B.1
$\varphi (t, t_o)$	=	1.44186			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$= E_a / E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		permanent loads			
$\psi_L =$	=	1.1			
n_L	=	$n_0 (1 + \psi_L \varphi (t, t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	16			
E_c	=	12800 N / mm²			

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Reinforced concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phase 9 (shrinkage and creep)

φ_o	=	$\varphi_{RH} \beta(f_{cm}) \beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$= (35 / f_{cm})^{0.7}$	=	0.911	
α_2	=	$= (35 / f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8 / \sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1 / (0.1 + t_0^{20})$			formula B.5
$t_{0,T}$	=	1 days			
α	=	-1	cement class S		
t_0	=	0 days			
$\beta(t_0)$	=	$1 / (0.1 + t_0^{20})$	=	1,166	formula B.5
φ_o	=	3,9539			formula B.2
$\beta_c(t, t_0)$	=	$((t - t_0) / (\beta_H + t - t_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$= (35 / f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t, t_0)$	=	0.9945			formula B.7
$\varphi(t, t_o)$	=	$\varphi_o * \beta_c(t, t_0)$			formula B.1
$\varphi(t, t_o)$	=	3.93214			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$= E_a / E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		primary and secondary effects due to shrinkage			
$\psi_L =$	=	0.55			
n_L	=	$n_0 (1 + \psi_L \varphi(t, t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	20			
E_c	=	10400 N / mm²			

Rigidity of concrete in accordance with NEN-EN 1994-2 art 5.4.2.2

Project:	IJssel Bridge	Date:	5/25/2018
Project number:	BF7387	Name:	Ernst Klamer
Description:	Reinforced concrete deck	Version:	v0.5 Beta

Determination of stiffness per construction phase

Determination of the modulus ratio for construction phases 3 and 10 (prestressing)

φ_o	=	$\varphi_{RH}\,\beta(f_{cm})\,\beta(t_0)$			formula B.2
f_{cm}	=	40 N / mm²	>	35 N / mm²	
RH	=	80 %			
α_1	=	$=(35/f_{cm})^{0.7}$	=	0.911	
α_2	=	$=(35/f_{cm})^{0.2}$	=	0.974	
h_0	=	200 mm			
φ_{RH}	=	1.27692			formula B.3b
Cement class		S			
$\beta(f_{cm})$	=	$16.8/\sqrt{(f_{cm})}$	=	2,656	formula B.4
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$			formula B.5
$t_{0,T}$	=	21 days			
α	=	-1	cement class S		
t_0	=	17 days			
$\beta(t_0)$	=	$1/(0.1+t_0^{0.20})$	=	0.536	formula B.5
φ_o	=	1.81748			formula B.2
$\beta_c(t,t_0)$	=	$((t-t_0)/(\beta_H+t-t_0))^{0.3}$			formula B.7
t	=	36500 days			
α_3	=	$=(35/f_{cm})^{0.5}$	=	0.935	
β_H	=	678			formula B.8b
$\beta_c(t,t_0)$	=	0.99449			formula B.7
$\varphi(t,t_o)$	=	$\varphi_o * \beta_c(t,t_0)$			formula B.1
$\varphi(t,t_o)$	=	1.80747			
E_{cm}	=	33000 N / mm²			
E_a	=	210000 N / mm²			
$n_0 =$	=	$=E_a/E_{cm}$			NEN-EN 1994-2
$n_0 =$	=	6.36			
Tax type		permanent loads			
$\psi_L =$	=	1.1			
n_L	=	$n_0(1+\psi_L\varphi(t,t_0))$			NEN-EN 1994-2, formula 5.6
n_L	=	19			
E_c	=	11000 N / mm²			

Appendix

Appendix O - Import SCIA - Main bridge global model

IJssel Bridge

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

14. Solver settings 136

2. Project

License name	Royal HaskoningDHV
Project	IJssel Bridge
Part	Main bridge
Description	Global model
Author	Ernst Klamer
Date	03.05.2018
Construction	General XYZ
Number of knots:	6201
Number of bars:	3916
Number of plates:	528
Number of solids:	0
Number of cross sections used:	101
Number of load cases:	234
Number of materials used:	18
Gravitational acceleration [m / s 2]	9,810
National standard	EC - EN

3. Model overview

3.1. 3D rendering model with construction phases

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

3.2. Construction model 1st span

3.3. Construction model 2nd span

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

3.4. Construction model 3rd span

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

3.5. 1st span calculation model

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer

Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

3.6. 2nd span calculation model

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

3.7. Calculation model 3rd span (to middle)

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

3.8. Construction model

4. Construction phasing

4.1. Construction stages

Name	Phase sequence	Description	Global time [day]
ST1		1 placement part 0-14 and 20-34	
ST2		2 placement part 14-20	
ST3		3 Asphalt pavement	
ST4		4 Scratch side	
ST5		5 Inspection pad normal console	
ST6		6 Reinforced console inspection path	
ST7		7 Other permanent taxes	
ST8		8 Hot water pipe	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

4.2. Construction phase 1

4.3. Construction phase 2

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

5. Dimensions

The dimensions are shown up to the symmetry line of the bridge.

5.1. Construction model part 0-4

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

5.2. Construction model part 4-9

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

5.3. Construction model part 9-14

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

5.4. Construction model part 14-17

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

6. Impositions

6.1. Northern part bearings

The supports of the river pillars of the southern half were also longitudinally secured in the first phase, to keep the model stable in construction phase 1. In this construction phase, the two parts of the bridge are not yet connected. In construction phase 2, the supports removed and replaced for final bearings.

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

6.2. Bearings southern part - construction phase 1

6.3. Bearings southern part - construction phase 2

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

6.4. Button supports

Name	Button	System	Type	X	Y.	Z.	Rx	Ry	Rz	Add	remove
Sn4	K736	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn5	K737	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn6	K79	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn7	K80	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn14	K3947	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn15	K3948	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn16	K4598	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn17	K4599	GCS	Standard	Free	Fixed	Fixed	Fixed	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn19	K5810	GCS	Standard	Free	Free	Fixed	Free	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn20	K5809	GCS	Standard	Free	Free	Fixed	Free	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn21	K5810	GCS	Standard	Fixed	Free	Free	Free	Free	Free	ST1 - placement part 0-14 and 20-34	ST2 - placement part 14-20
Sn22	K5809	GCS	Standard	Fixed	Free	Free	Free	Free	Free	ST1 - placement part 0-14 and 20-34	ST2 - placement part 14-20
Sn28	K6497	GCS	Standard	Free	Fixed	Free	Free	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn8	N3	GCS	Standard	Fixed	Fixed	Fixed	Free	Free	Free	ST1 - placement part 0-14 and 20-34	No
Sn9	N4	GCS	Standard	Fixed	Fixed	Fixed	Free	Free	Free	ST1 - placement part 0-14 and 20-34	No

7. Materials

Steel EC3

Name	ρ [kg / m 3]	E mod [MPa] G mod [MPa]	μ α [m / mK]	Lower limit [mm]	Upper limit [mm]	F y [MPa]	F u [MPa]	Color
LQmc 52 (eg 324%)	25434.0	2.1000th + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	
LQmc 52 (eg 216%)	16956.0	2.1000th + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	
LQmc 52 (eg 181%)	14209.0	2.1000th + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	
LQmc 52 (eg 138%)	10833.0	2.1000e + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	
LQmc 52 (eg 135%)	10598.0	2.1000e + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	
LQmc 52 (eg 125%)	9813.0	2.1000e + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	
LQmc 52 (eg 120%)	9420.0	2.1000e + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	
LQmc 52 (eg 111%)	8714.0	2.1000e + 05	0.3	0.0	40.0	350.0	510.0	
		8.0769e + 04	0.00	40.0	80.0	350.0	510.0	

LQmc 52 (eg 108%)	8478.0 2.1000th + 05	0.3	0.0	40.0	350.0	510.0
	8.0769e + 04	0.00	40.0	80.0	350.0	510.0
LQmc 52	7850.0 2.1000e + 05	0.3	0.0	40.0	350.0	510.0
	8.0769e + 04	0.00	40.0	80.0	350.0	510.0
QMC 37 (eg 138%)	10833.0 2.1000e + 05	0.3	0.0	40.0	215.0	340.0
	8.0769e + 04	0.00	40.0	80.0	215.0	340.0
QMC 37 (eg 124%)	9734.0 2.1000th + 05	0.3	0.0	40.0	215.0	340.0
	8.0769e + 04	0.00	40.0	80.0	215.0	340.0
QMC 37 (eg 124%)	9734.0 2.1000th + 05	0.3	0.0	40.0	215.0	340.0
	8.0769e + 04	0.00	40.0	80.0	215.0	340.0
QMC 37 (eg 111%)	8714.0 2.1000e + 05	0.3	0.0	40.0	215.0	340.0
	8.0769e + 04	0.00	40.0	80.0	215.0	340.0
QMC 37 (eg 108%)	8478.0 2.1000th + 05	0.3	0.0	40.0	215.0	340.0
	8.0769e + 04	0.00	40.0	80.0	215.0	340.0
QMC 37 (eg 0%)	0.0 2.1000e + 05	0.3	0.0	40.0	215.0	340.0
	8.0769e + 04	0.00	40.0	80.0	215.0	340.0
S 235 J2 (EN 10025-2)	7850.0 2.1000e + 05	0.3	0.0	3.0	235.0	360.0
	8.0769e + 04	0.00	3.0	16.0	235.0	360.0
			16.0	40.0	225.0	360.0
			40.0	63.0	215.0	360.0
			63.0	80.0	215.0	360.0
			80.0	100.0	215.0	360.0
			100.0	150.0	195.0	350.0
			150.0	200.0	185.0	340.0
			200.0	250.0	175.0	340.0

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Name	ρ [kg / m 3]	E mod [MPa] G mod [MPa]	μ α [m / mK]	Lower limit [mm]	Upper limit [mm]	F y [MPa]	F u [MPa]	Color
				250.0	400.0	165.0	330.0	

8. Main beam

8.1. Construction model

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8.2. Main spar - Side view

8.3. Sections

The colors in the following figures show the differences in bottom flange
Red: 500x20
Green 500x30
Yellow: 500x30 + 350x30
Pink: 500x30 + 530x10
Blue: 500x30 + 550x30

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8.4. Main beam sections

8.5. Main beam sections

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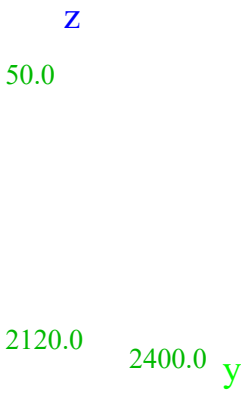
8.6. Sections

Main beam (500 * 20, h = 2400) 1

Type	Graphic cross section		
Extensive	2120.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		5,0603e-02	
A y [m 2], A z [m 2]		2.2610e-02	2.9113e-02
A L [m 2 / m], A D [m 2 / m]		6.3850e + 00	6.3850e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1439.1
α [deg]		0.00	
I y [m 4], I z [m 4]		4.2278e-02	2.9871e-04
i y [mm], i z [mm]		914.0	76.8
W el,y [m 3], W el,z [m 3]		2.9378e-02	1.1948e-03
W pl,y [m 3], W pl,z [m 3]		4.1339e-02	2.2378e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.45e + 07	1.45e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.83rd + 05	7.83rd + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3,8773e-06	0.0000e + 00
β y [mm], β z [mm]		310.4	0.0
Image			



Main beam (500 * 30, h = 2400) 1

Type	Graphic cross section		
Extensive	2120.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		5,5603e-02	
A y [m 2], A z [m 2]		2.7511e-02	2.9019e-02
A L [m 2 / m], A D [m 2 / m]		6.4050e + 00	6.4050e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1527.8
α [deg]		0.00	
I y [m 4], I z [m 4]		4,6701e-02	4,0287e-04

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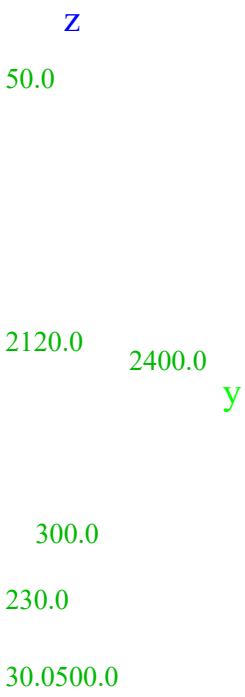
i_y [mm], i_z [mm]	916.5	85.1
$W_{el.y}$ [m^3], $W_{el.z}$ [m^3]	3.0568e-02	1.6115e-03
$W_{pl.y}$ [m^3], $W_{pl.z}$ [m^3]	4.4859e-02	2.8628e-03
$M_{pl.y.+}$ [Nm], $M_{pl.y.-}$ [Nm]	1.57th + 07	1.57th + 07
$M_{pl.z.+}$ [Nm], $M_{pl.z.-}$ [Nm]	1.00th + 06	1.00th + 06
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	5.1169e-06	0.0000e + 00
β_y [mm], β_z [mm]	443.7	0.0

Image



Main beam (500 * 30 + 350 * 30, h = 2400) 1

Type	Graphic cross section		
Extensive	2120.0; 30.0; 500.0; 30.0; 350.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 111%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m^2]		6.6103e-02	
A_y [m^2], A_z [m^2]		3,8472e-02	2.9312e-02
A_L [m^2 / m], A_D [m^2 / m]		6.4650e + 00	6.4650e + 00
$c_{Y.UCS}$ [mm], $c_{Z.UCS}$ [mm]		0.0	-1673.5
α [deg]		0.00	
I_y [m^4], I_z [m^4]		5.4132e-02	5.1006e-04
i_y [mm], i_z [mm]		904.9	87.8
$W_{el.y}$ [m^3], $W_{el.z}$ [m^3]		3,2347e-02	2.0402e-03
$W_{pl.y}$ [m^3], $W_{pl.z}$ [m^3]		4,9073e-02	3.7816e-03
$M_{pl.y.+}$ [Nm], $M_{pl.y.-}$ [Nm]		1.72e + 07	1.72e + 07
$M_{pl.z.+}$ [Nm], $M_{pl.z.-}$ [Nm]		1.32e + 06	1.32e + 06
d_y [mm], d_z [mm]		0.0	0.0
I_t [m^4], I_w [m^6]		8,8178e-06	0.0000e + 00
β_y [mm], β_z [mm]		673.5	0.0

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Project	IJssel Bridge
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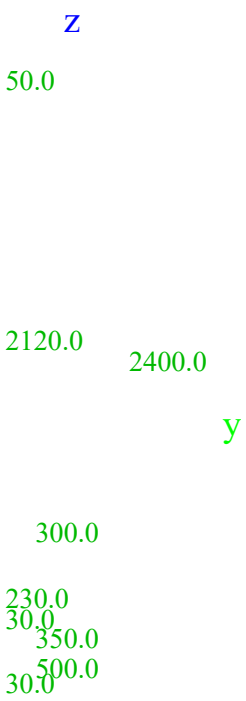
Image



Main beam (500 * 30 + 530 * 10, h = 3000) 1

Type	Graphic cross section		
Extensive	2720.0; 30.0; 500.0; 10.0; 530.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		6.8103e-02	
A y [m 2], A z [m 2]		3.2898e-02	3.6141e-02
A L [m 2 / m], A D [m 2 / m]		7.6850e + 00	7.6850e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1953.1
α [deg]		0.00	
I y [m 4], I z [m 4]		8,6126e-02	5.2702e-04
i y [mm], i z [mm]		1124.6	88.0
W el,y [m 3], W el,z [m 3]		4.4096e-02	1,9888e-03
W pl,y [m 3], W pl,z [m 3]		6.6858e-02	3,5867e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.34e + 07	2.34e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.26th + 06	1.26th + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		6.2441e-06	0.0000e + 00
β y [mm], β z [mm]		599.8	0.0

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Project	IJssel Bridge
Part	Main bridge
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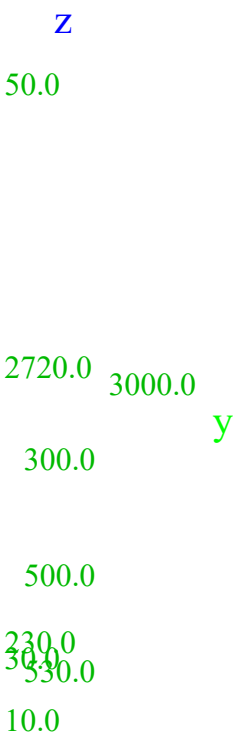
Image



Main beam (500 * 30 + 550 * 30, h = 3000) 1

Type	Graphic cross section		
Extensive	2720.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	7.9303e-02		
A y [m 2], A z [m 2]	4.3696e-02	3.6376e-02	
A L [m 2 / m], A D [m 2 / m]	7.7650e + 00	7.7650e + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2108.0	
α [deg]	0.00		

I_y [m^4], I_z [m^4]	9.7693e-02	8.1890e-04
i_y [mm], i_z [mm]	1109.9	101.6
$W_{el.y}$ [m^3], $W_{el.z}$ [m^3]	4.6344e-02	2,9778e-03
$W_{pl.y}$ [m^3], $W_{pl.z}$ [m^3]	7.2129e-02	5.1532e-03
$M_{pl.y.+}$ [Nm], $M_{pl.y.-}$ [Nm]	2.52nd + 07	2.52nd + 07
$M_{pl.z.+}$ [Nm], $M_{pl.z.-}$ [Nm]	1.80th + 06	1.80th + 06
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	1.0121e-05	0.0000e + 00
β_y [mm], β_z [mm]	843.3	0.0

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Project	IJssel Bridge
Part	Main bridge
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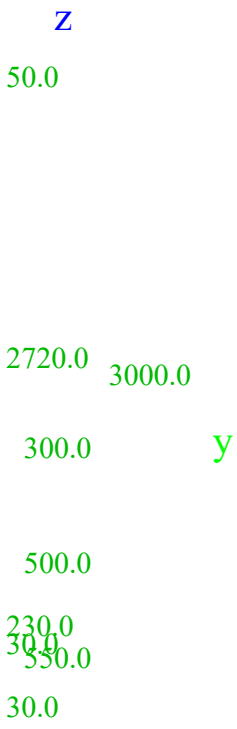
Image



Main beam (500 * 20, h = 2406) 1

Type	Graphic cross section
Extensive	2126.0; 20.0; 500.0

Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		5.0675e-02	
A y [m 2], A z [m 2]		2.2610e-02	2.9185e-02
A L [m 2 / m], A D [m 2 / m]		6.3970th + 00	6.3970th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1442.4
α [deg]		0.00	
I y [m 4], I z [m 4]		4.2528e-02	2.9871e-04
i y [mm], i z [mm]		916.1	76.8
W el,y [m 3], W el,z [m 3]		2.9485e-02	1.1948e-03
W pl,y [m 3], W pl,z [m 3]		4.1491e-02	2.2380e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.45e + 07	1.45e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.83rd + 05	7.83rd + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.8765e-06	0.0000e + 00
β y [mm], β z [mm]		310.5	0.0

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Project	IJssel Bridge
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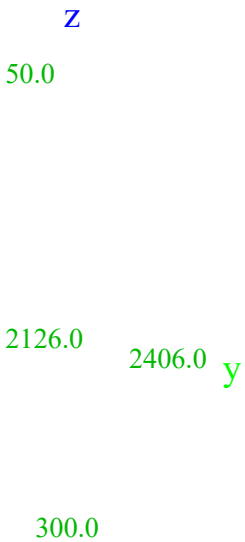
Image



230.0

20.0 500.0

Main beam (500 * 20, h = 2416) 1

Type	Graphic cross section		
Extensive	2136.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		5.0795e-02	
A y [m 2], A z [m 2]		2.2611e-02	2.9305e-02
A L [m 2 / m], A D [m 2 / m]		6.4170th + 00	6.4170th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1447.8
α [deg]		0.00	
I y [m 4], I z [m 4]		4.2948e-02	2.9871e-04
i y [mm], i z [mm]		919.5	76.7
W el,y [m 3], W el,z [m 3]		2.9665e-02	1.1948e-03
W pl,y [m 3], W pl,z [m 3]		4.1744e-02	2.2384e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.46e + 07	1.46e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.83rd + 05	7.83rd + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.8750e-06	0.0000e + 00
β y [mm], β z [mm]		310.7	0.0

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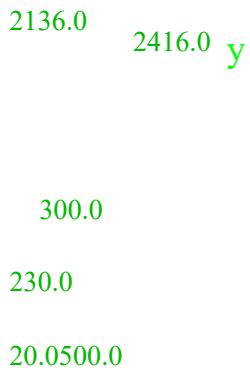
Image

50.0



Main beam (500 * 20, h = 2443) 1

Type	Graphic cross section		
Extensive	2163.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		5.1119e-02	
A y [m 2], A z [m 2]		2.2613e-02	2.9629e-02
A L [m 2 / m], A D [m 2 / m]		6.4710e + 00	6.4710e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1462.4
α [deg]		0.00	
I y [m 4], I z [m 4]		4.4095e-02	2.9871e-04
i y [mm], i z [mm]		928.8	76.4
W el,y [m 3], W el,z [m 3]		3,0152e-02	1.1948e-03
W pl,y [m 3], W pl,z [m 3]		4.2432e-02	2.2394e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.49e + 07	1.49e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.84e + 05	7.84e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.8715e-06	0.0000e + 00
β y [mm], β z [mm]		311.2	0.0

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Part	Main bridge
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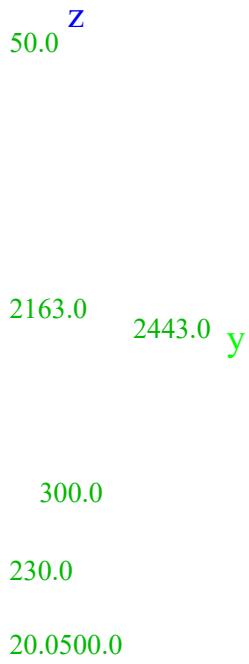
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 2476) 1

Type	Graphic cross section		
Extensive	2196.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		5.1515e-02	
A y [m 2], A z [m 2]		2.2615e-02	3.0025e-02
A L [m 2 / m], A D [m 2 / m]		6.5370th + 00	6.5370th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1480.3
α [deg]		0.00	
I y [m 4], I z [m 4]		4.5521e-02	2.9872e-04
i y [mm], i z [mm]		940.0	76.1
W el,y [m 3], W el,z [m 3]		3,0752e-02	1.1949e-03
W pl,y [m 3], W pl,z [m 3]		4.3279e-02	2.2405e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.51st + 07	1.51st + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.84e + 05	7.84e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3,8678e-06	0.0000e + 00
β y [mm], β z [mm]		311.7	0.0

Project	IJssel Bridge
Part	Main bridge
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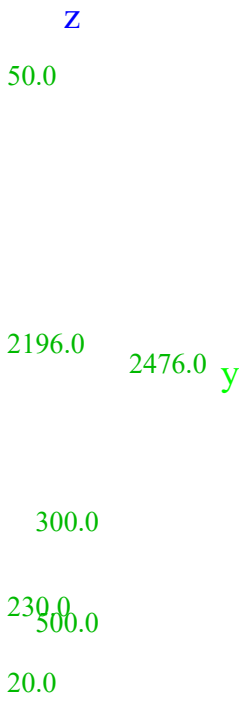
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 2508) 1

Type	Graphic cross section		
Extensive	2228.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		5.1899e-02	
A y [m 2], A z [m 2]		2.2618e-02	3,0408e-02
A L [m 2 / m], A D [m 2 / m]		6.6010th + 00	6.6010th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1497.5
α [deg]		0.00	
I y [m 4], I z [m 4]		4.6931e-02	2.9872e-04
i y [mm], i z [mm]		950.9	75.9
W el,y [m 3], W el,z [m 3]		3.1338e-02	1.1949e-03
W pl,y [m 3], W pl,z [m 3]		4.4106e-02	2.2417e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.54e + 07	1.54e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.85e + 05	7.85e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3,8647e-06	0.0000e + 00
β y [mm], β z [mm]		312.2	0.0

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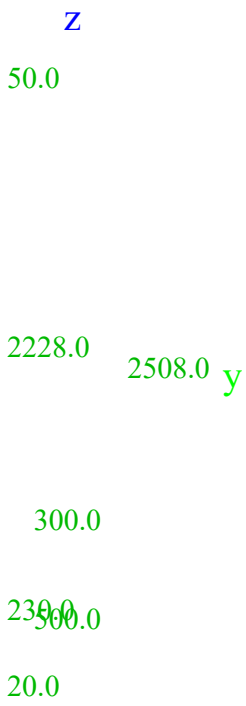
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 2541) 1

Type	Graphic cross section		
Extensive	2261.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	5.2295e-02		
A y [m 2], A z [m 2]	2.2620e-02	3,0802e-02	
A L [m 2 / m], A D [m 2 / m]	6.6670e + 00	6.6670e + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-1515.4	
α [deg]	0.00		
I y [m 4], I z [m 4]	4.8412e-02	2.9873e-04	
i y [mm], i z [mm]	962.2	75.6	
W el,y [m 3], W el,z [m 3]	3.1948e-02	1.1949e-03	
W pl,y [m 3], W pl,z [m 3]	4.4966e-02	2.2429e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	1.57th + 07	1.57th + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	7.85e + 05	7.85e + 05	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	3.8621e-06	0.0000e + 00	
β y [mm], β z [mm]	312.7	0.0	

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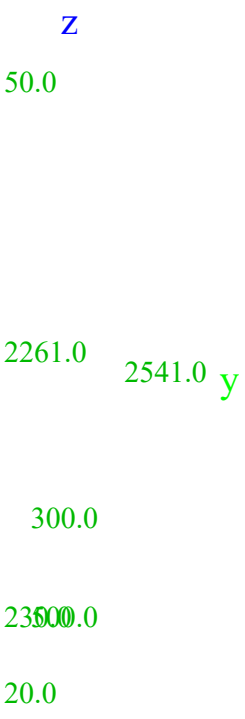
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 2593) 1

Type	Graphic cross section		
Extensive	2313.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	5.2919e-02		
A y [m 2], A z [m 2]	2.2624e-02	3.1423e-02	
A L [m 2 / m], A D [m 2 / m]	6.7710th + 00	6.7710th + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-1543.4	
α [deg]	0.00		
I y [m 4], I z [m 4]	5,0804e-02	2.9873e-04	
i y [mm], i z [mm]	979.8	75.1	
W el,y [m 3], W el,z [m 3]	3.2917e-02	1.1949e-03	

$W_{pl.y}$ [m^3], $W_{pl.z}$ [m^3]	4.6334e-02	2.2448e-03
$M_{pl.y.+}$ [Nm], $M_{pl.y.-}$ [Nm]	1.62e + 07	1.62e + 07
$M_{pl.z.+}$ [Nm], $M_{pl.z.-}$ [Nm]	7.86e + 05	7.86e + 05
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	3,8591e-06	0.0000e + 00
β_y [mm], β_z [mm]	313.4	0.0

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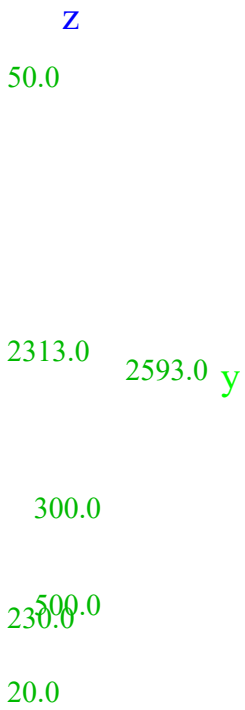
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 2657) 1

Type	Graphic cross section
Extensive	2377.0; 20.0; 500.0
Form type	Thin-walled
Part material	LQmc 52 (eg 135%)
Construction method	General

Color			
Nod yy, nod zz	d		d
A [m 2]		5.3687e-02	
A y [m 2], A z [m 2]		2.2628e-02	3.2186e-02
A L [m 2 / m], A D [m 2 / m]		6.8990th + 00	6.8990th + 00
c Y.UCS [mm], c Z.UCS [mm]		0.0	-1577.8
α [deg]		0.00	
I y [m 4], I z [m 4]		5.3846e-02	2.9874e-04
i y [mm], i z [mm]		1001.5	74.6
W el.y [m 3], W el.z [m 3]		3,4127e-02	1.1950e-03
W pl.y [m 3], W pl.z [m 3]		4,8039e-02	2.2471e-03
M pl.y.+ [Nm], M pl.y.- [Nm]		1.68e + 07	1.68e + 07
M pl.z.+ [Nm], M pl.z.- [Nm]		7.86e + 05	7.86e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.8572e-06	0.0000e + 00
β y [mm], β z [mm]		314.2	0.0

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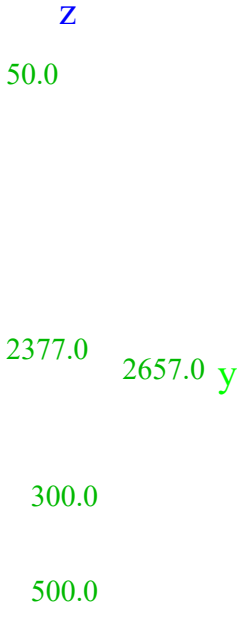
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



230.0

20.0

Main beam (500 * 20, h = 2720) 1

Type	Graphic cross section		
Extensive	2440.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		5.4443e-02	
A y [m 2], A z [m 2]		2.2632e-02	3.2934e-02
A L [m 2 / m], A D [m 2 / m]		7.0250e + 00	7.0250e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1611.6
α [deg]		0.00	
I y [m 4], I z [m 4]		5.6947e-02	2.9875e-04
i y [mm], i z [mm]		1022.7	74.1
W el,y [m 3], W el,z [m 3]		3.5335e-02	1.1950e-03
W pl,y [m 3], W pl,z [m 3]		4.9742e-02	2.2493e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.74e + 07	1.74e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.87e + 05	7.87e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.8569e-06	0.0000e + 00
β y [mm], β z [mm]		314.9	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
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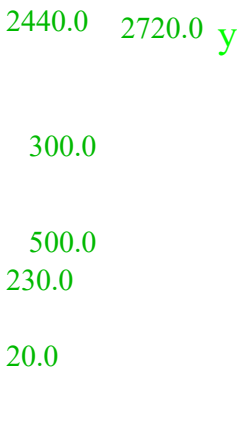
Project file name	Main Bridge v6.0.esa

Image

Z

50.0

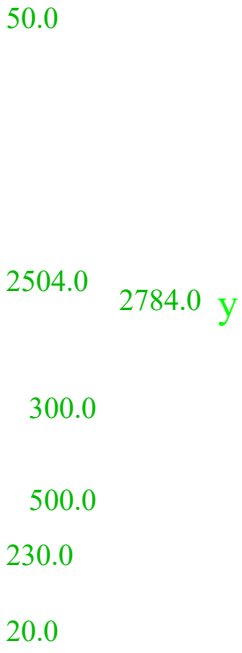


Main beam (500 * 20, h = 2784) 1

Type	Graphic cross section		
Extensive	2504.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		5.5211e-02	
A y [m 2], A z [m 2]		2.2636e-02	3.3693e-02
A L [m 2 / m], A D [m 2 / m]		7.1530th + 00	7.1530th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1645.9
α [deg]		0.00	
I y [m 4], I z [m 4]		6.0207e-02	2,9876e-04
i y [mm], i z [mm]		1044.3	73.6
W el,y [m 3], W el,z [m 3]		3.6579e-02	1.1950e-03
W pl,y [m 3], W pl,z [m 3]		5.1497e-02	2.2516e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.80th + 07	1.80th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.88e + 05	7.88e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3,8583e-06	0.0000e + 00
β y [mm], β z [mm]		315.5	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

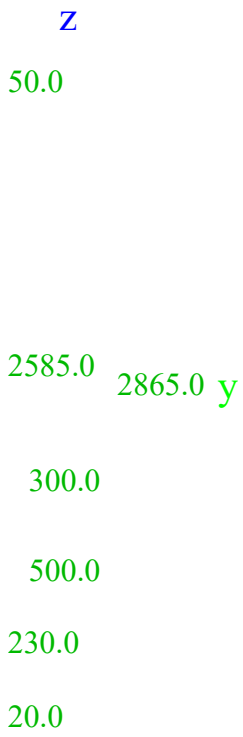


Main beam (500 * 20, h = 2865) 1

Type	Graphic cross section		
Extensive	2585.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		5.6183e-02	
A y [m 2], A z [m 2]		2,2641e-02	3,4651e-02
A L [m 2 / m], A D [m 2 / m]		7.3150th + 00	7.3150th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1689.2
α [deg]		0.00	
I y [m 4], I z [m 4]		6.4494e-02	2.9877e-04
i y [mm], i z [mm]		1071.4	72.9
W el,y [m 3], W el,z [m 3]		3,8179e-02	1.1951e-03
W pl,y [m 3], W pl,z [m 3]		5.3753e-02	2.2546e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.88th + 07	1.88th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.89e + 05	7.89e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.8623e-06	0.0000e + 00
β y [mm], β z [mm]		316.1	0.0

Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 2939) 1

Type	Graphic cross section		
Extensive	2659.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		5,7071e-02	
A y [m 2], A z [m 2]		2,2646e-02	3.5523e-02
A L [m 2 / m], A D [m 2 / m]		7.4630e + 00	7.4630e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1728.7
α [deg]		0.00	
I y [m 4], I z [m 4]		6.8572e-02	2,9878e-04
i y [mm], i z [mm]		1096.1	72.4
W el,y [m 3], W el,z [m 3]		3,9666e-02	1.1951e-03
W pl,y [m 3], W pl,z [m 3]		5.5848e-02	2.2572e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		1.95th + 07	1.95th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.90th + 05	7.90th + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3,8678e-06	0.0000e + 00
β y [mm], β z [mm]		316.5	0.0

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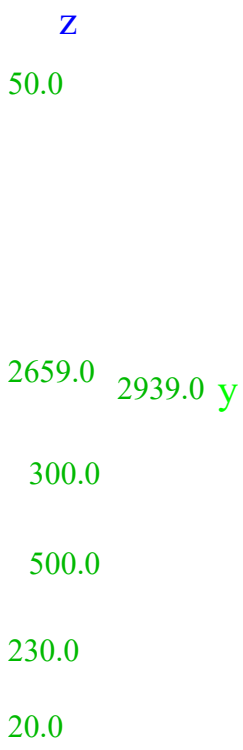
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

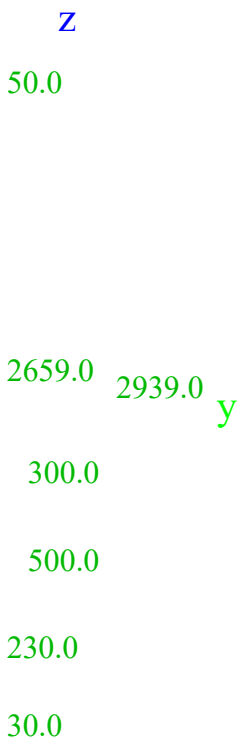


Main beam (500 * 30, h = 2939) 1

Type	Graphic cross section		
Extensive	2659.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	6.2071e-02		
A y [m 2], A z [m 2]	2,7554e-02	3,5530e-02	
A L [m 2 / m], A D [m 2 / m]	7.4830e + 00	7.4830e + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-1828.2	
α [deg]	0.00		
I y [m 4], I z [m 4]	7,5587e-02	4.0295e-04	
i y [mm], i z [mm]	1103.5	80.6	
W el,y [m 3], W el,z [m 3]	4.1344e-02	1.6118e-03	
W pl,y [m 3], W pl,z [m 3]	6.0716e-02	2.8822e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	2.13rd + 07	2.13rd + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.01st + 06	1.01st + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	4,9097e-06	0.0000e + 00	
β y [mm], β z [mm]	460.6	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30, h = 2963) 1

Type	Graphic cross section		
Extensive	2683.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.2359e-02	
A y [m 2], A z [m 2]		2,7555e-02	3,5817e-02
A L [m 2 / m], A D [m 2 / m]		7.5310e + 00	7.5310e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1841.5
α [deg]		0.00	
I y [m 4], I z [m 4]		7.7073e-02	4.0295e-04
i y [mm], i z [mm]		1111.7	80.4
W el,y [m 3], W el,z [m 3]		4.1854e-02	1.6118e-03
W pl,y [m 3], W pl,z [m 3]		6.1463e-02	2.8831e-03

$M_{pl.y.+}$ [Nm], $M_{pl.y.-}$ [Nm]	2.15e + 07	2.15e + 07
$M_{pl.z.+}$ [Nm], $M_{pl.z.-}$ [Nm]	1.01st + 06	1.01st + 06
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	4,9050e-06	0.0000e + 00
β_y [mm], β_z [mm]	461.1	0.0

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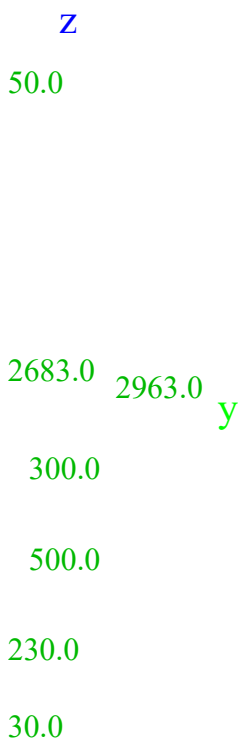
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



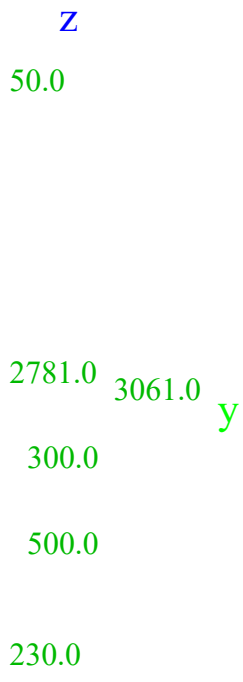
Main beam (500 * 30, h = 3061) 1

Type	Graphic cross section
Extensive	2781.0; 30.0; 500.0
Form type	Thin-walled
Part material	LQmc 52 (eg 125%)
Construction method	General

Color Nod yy, nod zz	d	d
A [m 2]	6.3535e-02	
A y [m 2], A z [m 2]	2,7562e-02	3.6989e-02
A L [m 2 / m], A D [m 2 / m]	7.7270e + 00	7.7270e + 00
c Y.UCS [mm], c Z.UCS [mm]	0.0	-1895.4
α [deg]	0.00	
I y [m 4], I z [m 4]	8,3328e-02	4,0297e-04
i y [mm], i z [mm]	1145.2	79.6
W el.y [m 3], W el.z [m 3]	4.3964e-02	1.6119e-03
W pl.y [m 3], W pl.z [m 3]	6.4547e-02	2.8866e-03
M pl.y. + [Nm], M pl.y.- [Nm]	2.26e + 07	2.26e + 07
M pl.z. + [Nm], M pl.z.- [Nm]	1.01st + 06	1.01st + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	4,8888e-06	0.0000e + 00
β y [mm], β z [mm]	463.1	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



30.0

Main beam (500 * 30, h = 3101) 1

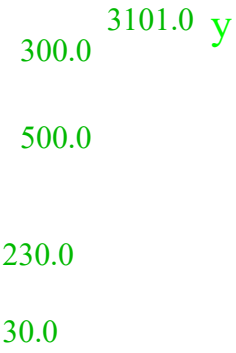
Type	Graphic cross section		
Extensive	2821.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.4015e-02	
A y [m 2], A z [m 2]		2,7565e-02	3.7466e-02
A L [m 2 / m], A D [m 2 / m]		7,8070th + 00	7,8070th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1917.3
α [deg]		0.00	
I y [m 4], I z [m 4]		8.5968e-02	4,0297e-04
i y [mm], i z [mm]		1158.8	79.3
W el,y [m 3], W el,z [m 3]		4.4837e-02	1.6119e-03
W pl,y [m 3], W pl,z [m 3]		6.5823e-02	2.8880e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.30th + 07	2.30th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.01st + 06	1.01st + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4.8835e-06	0.0000e + 00
β y [mm], β z [mm]		463.8	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

50.0

2821.0

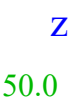


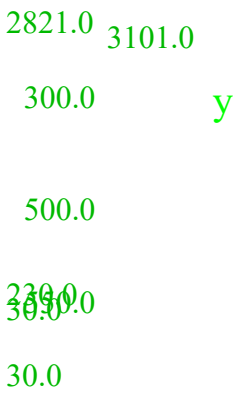
Main beam (500 * 30 + 550 * 30, h = 3101) 1

Type	Graphic cross section		
Extensive	2821.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		8.0515e-02	
A y [m 2], A z [m 2]		4.3708e-02	3.7252e-02
A L [m 2 / m], A D [m 2 / m]		7.9670th + 00	7.9670th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2169.1
α [deg]		0.00	
I y [m 4], I z [m 4]		1.0577e-01	8.1891e-04
i y [mm], i z [mm]		1146.2	100.9
W el,y [m 3], W el,z [m 3]		4.8763e-02	2,9779e-03
W pl,y [m 3], W pl,z [m 3]		7.6164e-02	5.1568e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.67e + 07	2.67e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.80th + 06	1.80th + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		9,9326e-06	0.0000e + 00
β y [mm], β z [mm]		852.2	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image





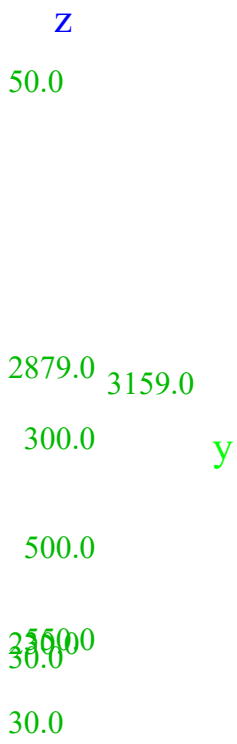
Main beam (500 * 30 + 550 * 30, h = 3159) 1

Type	Graphic cross section		
Extensive	2879.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	8.1211e-02		
A y [m 2], A z [m 2]	4.3715e-02	3.7713e-02	
A L [m 2 / m], A D [m 2 / m]	8.0830e + 00	8.0830e + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2204.1	
α [deg]	0.00		
I y [m 4], I z [m 4]	1.1059e-01	8.1892e-04	
i y [mm], i z [mm]	1166.9	100.4	
W el,y [m 3], W el,z [m 3]	5,0176e-02	2,9779e-03	
W pl,y [m 3], W pl,z [m 3]	7,8509e-02	5.1589e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	2.75e + 07	2.75e + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.81st + 06	1.81st + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	9.8327e-06	0.0000e + 00	
β y [mm], β z [mm]	857.0	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer

Current date 29.01.2019
Project file name Main Bridge v6.0.esa

Image

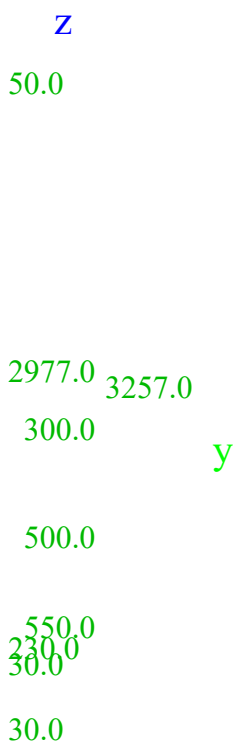


Main beam (500 * 30 + 550 * 30, h = 3257) 1

Type	Graphic cross section		
Extensive	2977.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		8.2387e-02	
A y [m 2], A z [m 2]		4.3726e-02	3.8863e-02
A L [m 2 / m], A D [m 2 / m]		8.2790e + 00	8.2790e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2262.9
α [deg]		0.00	
I y [m 4], I z [m 4]		1.1903e-01	8.1893e-04
i y [mm], i z [mm]		1202.0	99.7
W el,y [m 3], W el,z [m 3]		5.2601e-02	2,9779e-03
W pl,y [m 3], W pl,z [m 3]		8.2517e-02	5.1624e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.89e + 07	2.89e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.81st + 06	1.81st + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		9.6764e-06	0.0000e + 00
β y [mm], β z [mm]		864.8	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 550 * 30, h = 3374) 1

Type	Graphic cross section		
Extensive	3094.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	8,3791e-02		
A y [m 2], A z [m 2]	4.3739e-02	4,0256e-02	
A L [m 2 / m], A D [m 2 / m]	8.5130th + 00	8.5130th + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2332.7	
α [deg]	0.00		
I y [m 4], I z [m 4]	1.2960e-01	8.1895e-04	
i y [mm], i z [mm]	1243.7	98.9	
W el,y [m 3], W el,z [m 3]	5.5558e-02	2.9780e-03	
W pl,y [m 3], W pl,z [m 3]	8.7378e-02	5.1666e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	3.06e + 07	3.06e + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.81st + 06	1.81st + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	9.5085e-06	0.0000e + 00	
β y [mm], β z [mm]	873.5	0.0	

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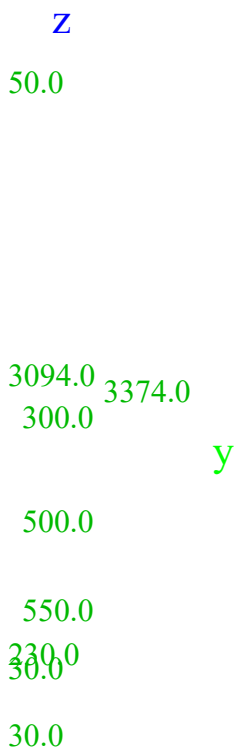
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 550 * 30, h = 3510) 1

Type	Graphic cross section		
Extensive	3230.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	8.5423e-02		
A y [m 2], A z [m 2]	4.3752e-02	4.1892e-02	
A L [m 2 / m], A D [m 2 / m]	8.7850e + 00	8.7850e + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2413.5	
α [deg]	0.00		
I y [m 4], I z [m 4]	1.4259e-01	8.1897e-04	
i y [mm], i z [mm]	1292.0	97.9	
W el,y [m 3], W el,z [m 3]	5,9079e-02	2.9781e-03	
W pl,y [m 3], W pl,z [m 3]	9.3131e-02	5.1715e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	3.26e + 07	3.26e + 07	

$M_{pl,z,+}$ [Nm], $M_{pl,z,-}$ [Nm]	1.81st + 06	1.81st + 06
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	9.3359e-06	0.0000e + 00
β_y [mm], β_z [mm]	882.9	0.0

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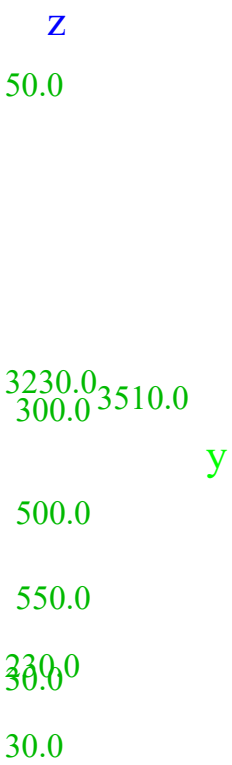
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



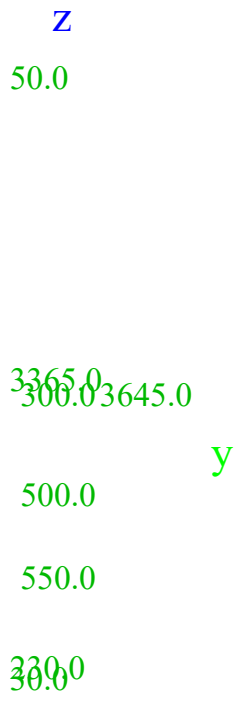
Main beam (500 * 30 + 550 * 30, h = 3645) 1

Type	Graphic cross section	
Extensive	3365.0; 30.0; 500.0; 30.0; 550.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d

A [m 2]	8.7043e-02	
A y [m 2], A z [m 2]	4.3765e-02	4.3525e-02
A L [m 2 / m], A D [m 2 / m]	9.0550th + 00	9.0550th + 00
c Y.UCS [mm], c Z.UCS [mm]	0.0	-2493.2
α [deg]	0.00	
I y [m 4], I z [m 4]	1.5623e-01	8.1899e-04
i y [mm], i z [mm]	1339.7	97.0
W el.y [m 3], W el.z [m 3]	6.2664e-02	2.9781e-03
W pl.y [m 3], W pl.z [m 3]	9.8952e-02	5.1764e-03
M pl.y.+ [Nm], M pl.y.- [Nm]	3.46e + 07	3.46e + 07
M pl.z.+ [Nm], M pl.z.- [Nm]	1.81st + 06	1.81st + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	9.1856e-06	0.0000e + 00
β y [mm], β z [mm]	891.3	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



30.0

Main beam (500 * 30 + 550 * 30, h = 3781) 1

Type	Graphic cross section	
Extensive	3501.0; 30.0; 500.0; 30.0; 550.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d
A [m 2]	8.8675e-02	
A y [m 2], A z [m 2]	4,3777e-02	4,5173e-02
A L [m 2 / m], A D [m 2 / m]	9.3270e + 00	9.3270e + 00
c Y.UCS [mm], c Z.UCS [mm]	0.0	-2573.0
α [deg]	0.00	
I y [m 4], I z [m 4]	1.7075e-01	8.1901e-04
i y [mm], i z [mm]	1387.7	96.1
W el.y [m 3], W el.z [m 3]	6.6365e-02	2.9782e-03
W pl.y [m 3], W pl.z [m 3]	1.0493e-01	5.1813e-03
M pl.y. + [Nm], M pl.y.- [Nm]	3.67e + 07	3.67e + 07
M pl.z. + [Nm], M pl.z.- [Nm]	1.81st + 06	1.81st + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	9.0526e-06	0.0000e + 00
β y [mm], β z [mm]	899.1	0.0

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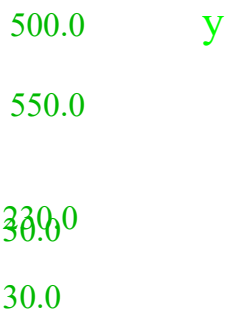
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

50.0

3501.0 3781.0

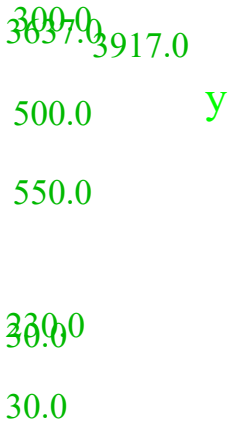


Main beam (500 * 30 + 550 * 30, h = 3917) 1

Type	Graphic cross section		
Extensive	3637.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		9.0307e-02	
A y [m 2], A z [m 2]		4.3789e-02	4.6819e-02
A L [m 2 / m], A D [m 2 / m]		9.5990th + 00	9.5990th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2652.4
α [deg]		0.00	
I y [m 4], I z [m 4]		1,8607e-01	8.1903e-04
i y [mm], i z [mm]		1435.4	95.2
W el,y [m 3], W el,z [m 3]		7.0154e-02	2.9783e-03
W pl,y [m 3], W pl,z [m 3]		1.1101e-01	5.1862e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		3.89e + 07	3.89e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.82nd + 06	1.82nd + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		8.9360e-06	0.0000e + 00
β y [mm], β z [mm]		906.1	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

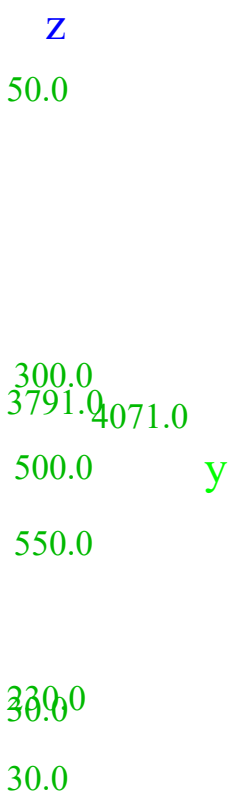


Main beam (500 * 30 + 550 * 30, h = 4071) 1

Type	Graphic cross section		
Extensive	3791.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	9.2155e-02		
A y [m 2], A z [m 2]	4,3801e-02	4,8677e-02	
A L [m 2 / m], A D [m 2 / m]	9.9070th + 00	9.9070th + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2741.8	
α [deg]	0.00		
I y [m 4], I z [m 4]	2.0440e-01	8.1905e-04	
i y [mm], i z [mm]	1489.3	94.3	
W el,y [m 3], W el,z [m 3]	7.4551e-02	2,9784e-03	
W pl,y [m 3], W pl,z [m 3]	1.1804e-01	5.1917e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	4.13rd + 07	4.13rd + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.82nd + 06	1.82nd + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	8.8213e-06	0.0000e + 00	
β y [mm], β z [mm]	913.4	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

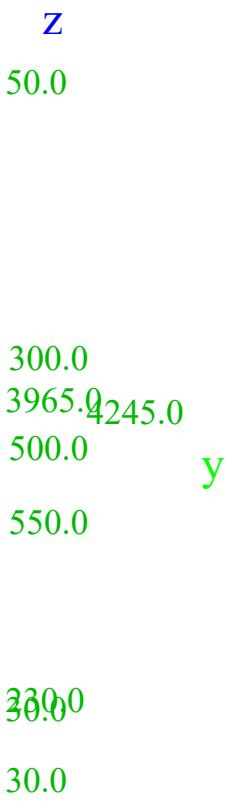


Main beam (500 * 30 + 550 * 30, h = 4245) 1

Type	Graphic cross section		
Extensive	3965.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	9.4243e-02		
A y [m 2], A z [m 2]	4.3814e-02	5.0768e-02	
A L [m 2 / m], A D [m 2 / m]	1.0255e + 01	1.0255e + 01	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2842.2	
α [deg]	0.00		
I y [m 4], I z [m 4]	2.2639e-01	8.1908e-04	
i y [mm], i z [mm]	1549.9	93.2	
W el,y [m 3], W el,z [m 3]	7.9654e-02	2.9785e-03	
W pl,y [m 3], W pl,z [m 3]	1.2614e-01	5.1980e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	4.42e + 07	4.42e + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.82nd + 06	1.82nd + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	8.7112e-06	0.0000e + 00	
β y [mm], β z [mm]	920.6	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 550 * 30, h = 4419) 1

Type	Graphic cross section		
Extensive	4139.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	9.6331e-02		
A y [m 2], A z [m 2]	4.3826e-02	5.2851e-02	
A L [m 2 / m], A D [m 2 / m]	1.0603rd + 01	1.0603rd + 01	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2942.0	
α [deg]	0.00		
I y [m 4], I z [m 4]	2.4978e-01	8.1910e-04	
i y [mm], i z [mm]	1610.3	92.2	
W el,y [m 3], W el,z [m 3]	8.4900e-02	2.9785e-03	
W pl,y [m 3], W pl,z [m 3]	1.3444e-01	5,2042e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	4.71e + 07	4.71e + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.82nd + 06	1.82nd + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	8,6189e-06	0.0000e + 00	
β y [mm], β z [mm]	927.0	0.0	

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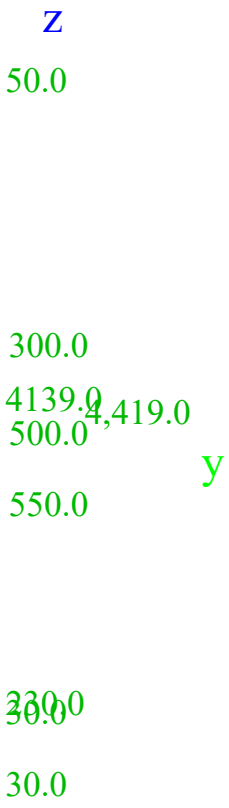
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 550 * 30, h = 4592) 1

Type	Graphic cross section	
Extensive	4312.0; 30.0; 500.0; 30.0; 550.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d
A [m 2]	9.8407e-02	
A y [m 2], A z [m 2]	4.3838e-02	5.4915e-02
A L [m 2 / m], A D [m 2 / m]	1.0949e + 01	1.0949e + 01
c Y,UCS [mm], c Z,UCS [mm]	0.0	-3040.8
α [deg]	0.00	
I y [m 4], I z [m 4]	2,7444e-01	8.1913e-04
i y [mm], i z [mm]	1670.0	91.2
W el,y [m 3], W el,z [m 3]	9.0255e-02	2.9786e-03
W pl,y [m 3], W pl,z [m 3]	1.4286e-01	5.2105e-03
M pl,y,+ [Nm], M pl,y,- [Nm]	5.00th + 07	5.00th + 07

$M_{pl.z.+}$ [Nm], $M_{pl.z.-}$ [Nm]	1.82nd + 06	1.82nd + 06
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	8.5426e-06	0.0000e + 00
β_y [mm], β_z [mm]	932.5	0.0

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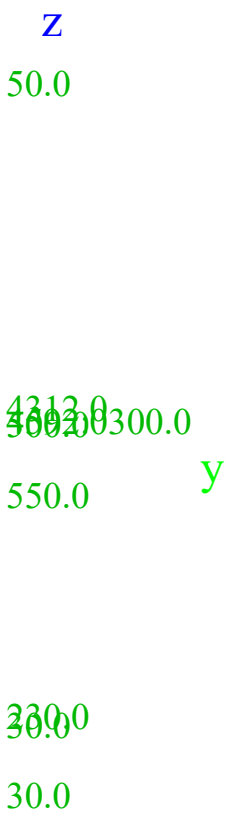
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



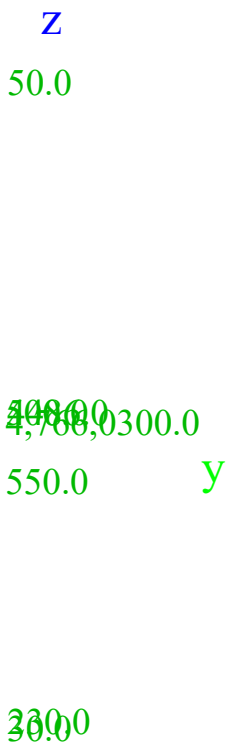
Main beam (500 * 30 + 550 * 30, h = 4766) 1

Type	Graphic cross section
Extensive	4486.0; 30.0; 500.0; 30.0; 550.0
Form type	Thin-walled
Part material	LQmc 52 (eg 120%)
Construction method	General
Color	

Nod yy, nod zz	d	d
A [m 2]	1.0050e-01	
A y [m 2], A z [m 2]	4.3849e-02	5.6984e-02
A L [m 2 / m], A D [m 2 / m]	1.1297e + 01	1.1297e + 01
c Y,UCS [mm], c Z,UCS [mm]	0.0	-3139.6
α [deg]	0.00	
I y [m 4], I z [m 4]	3.0071e-01	8.1915e-04
i y [mm], i z [mm]	1729.8	90.3
W el,y [m 3], W el,z [m 3]	9.5781e-02	2.9787e-03
W pl,y [m 3], W pl,z [m 3]	1.5151e-01	5.2167e-03
M pl,y,+ [Nm], M pl,y,- [Nm]	5.30th + 07	5.30th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]	1.83rd + 06	1.83rd + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	8.4795e-06	0.0000e + 00
β y [mm], β z [mm]	937.4	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



30.0

Main beam (500 * 30 + 550 * 30, h = 4950) 1

Type	Graphic cross section		
Extensive	4670.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	1.0270e-01		
A y [m 2], A z [m 2]	4.3860e-02	5,9163e-02	
A L [m 2 / m], A D [m 2 / m]	1.1665e + 01	1.1665e + 01	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-3243.5	
α [deg]	0.00		
I y [m 4], I z [m 4]	3,3011e-01	8.1918e-04	
i y [mm], i z [mm]	1792.8	89.3	
W el,y [m 3], W el,z [m 3]	1.0178e-01	2.9788e-03	
W pl,y [m 3], W pl,z [m 3]	1.6086e-01	5.2234e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	5.63rd + 07	5.63rd + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.83rd + 06	1.83rd + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	8.4258e-06	0.0000e + 00	
β y [mm], β z [mm]	941.7	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

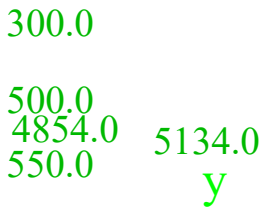
Image

Main beam (500 * 30 + 550 * 30, h = 5134) 1

Type	Graphic cross section		
Extensive	4854.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	1.0491e-01		
A y [m 2], A z [m 2]	4.3870e-02	6.1336e-02	
A L [m 2 / m], A D [m 2 / m]	1.2033rd + 01	1.2033rd + 01	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-3347.0	
α [deg]	0.00		
I y [m 4], I z [m 4]	3.6123e-01	8.1920e-04	
i y [mm], i z [mm]	1855.6	88.4	
W el,y [m 3], W el,z [m 3]	1.0793e-01	2.9789e-03	
W pl,y [m 3], W pl,z [m 3]	1.7041e-01	5.2300e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	5.96 + 07	5.96 + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.83rd + 06	1.83rd + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	8,3839e-06	0.0000e + 00	
β y [mm], β z [mm]	945.4	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

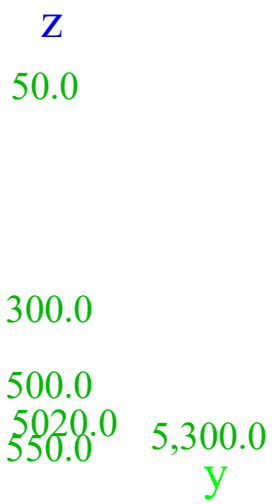


Main beam (500 * 30 + 550 * 30, h = 5300) 1

Type	Graphic cross section	
Extensive	5020.0; 30.0; 500.0; 30.0; 550.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d
A [m 2]	1.0690e-01	
A y [m 2], A z [m 2]	4.3879e-02	6.3290e-02
A L [m 2 / m], A D [m 2 / m]	1,2365e + 01	1,2365e + 01
c Y,UCS [mm], c Z,UCS [mm]	0.0	-3439.9
α [deg]	0.00	
I y [m 4], I z [m 4]	3,9080e-01	8.1923e-04
i y [mm], i z [mm]	1912.0	87.5
W el,y [m 3], W el,z [m 3]	1.1361e-01	2.9790e-03
W pl,y [m 3], W pl,z [m 3]	1.7920e-01	5.2360e-03
M pl,y,+ [Nm], M pl,y,- [Nm]	6.27th + 07	6.27th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]	1.83rd + 06	1.83rd + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	8,3551e-06	0.0000e + 00
β y [mm], β z [mm]	948.2	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

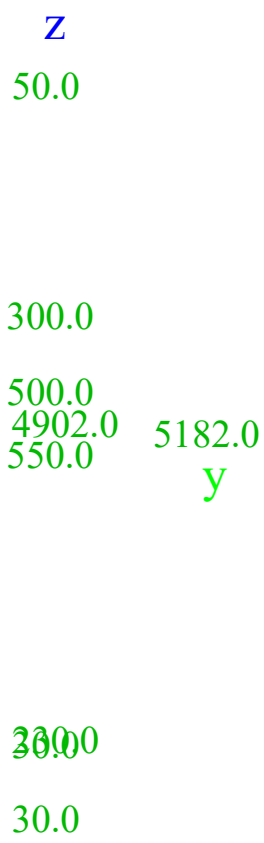


Main girder (500 * 30 + 550 * 30, h = 5182) 1

Type	Graphic cross section		
Extensive	4902.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	1.0549e-01		
A y [m 2], A z [m 2]	4.3873e-02	6.1901e-02	
A L [m 2 / m], A D [m 2 / m]	1.2129e + 01	1.2129e + 01	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-3373.9	
α [deg]	0.00		
I y [m 4], I z [m 4]	3,6963e-01	8.1921e-04	
i y [mm], i z [mm]	1871.9	88.1	
W el,y [m 3], W el,z [m 3]	1.0956e-01	2.9789e-03	
W pl,y [m 3], W pl,z [m 3]	1.7293e-01	5.2317e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	6.05e + 07	6.05e + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.83rd + 06	1.83rd + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	8.3748e-06	0.0000e + 00	
β y [mm], β z [mm]	946.3	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 550 * 30, h = 5026) 1

Type	Graphic cross section		
Extensive	4746.0; 30.0; 500.0; 30.0; 550.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		1.0362e-01	
A y [m 2], A z [m 2]		4.3864e-02	6.0061e-02
A L [m 2 / m], A D [m 2 / m]		1.1817th + 01	1.1817th + 01
c Y,UCS [mm], c Z,UCS [mm]		0.0	-3286.3
α [deg]		0.00	
I y [m 4], I z [m 4]		3.4275e-01	8.1919e-04
i y [mm], i z [mm]		1818.8	88.9
W el,y [m 3], W el,z [m 3]		1.0430e-01	2.9789e-03
W pl,y [m 3], W pl,z [m 3]		1,6478e-01	5.2261e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		5.77e + 07	5.77e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.83rd + 06	1.83rd + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		8.4072nd-06	0.0000e + 00
β y [mm], β z [mm]		943.3	0.0

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Project	IJssel Bridge
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Current date	29.01.2019
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Image

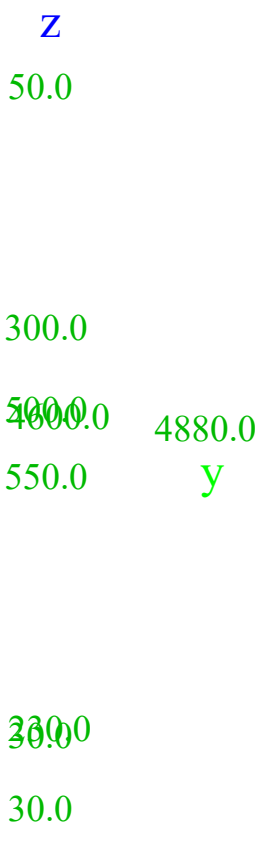
Main beam (500 * 30 + 550 * 30, h = 4880) 1

Type	Graphic cross section	
Extensive	4600.0; 30.0; 500.0; 30.0; 550.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d
A [m 2]	1.0186e-01	
A y [m 2], A z [m 2]	4.3856e-02	5.8335e-02
A L [m 2 / m], A D [m 2 / m]	1.1525e + 01	1.1525e + 01
c Y,UCS [mm], c Z,UCS [mm]	0.0	-3204.0
α [deg]	0.00	
I y [m 4], I z [m 4]	3,1873e-01	8.1917e-04
i y [mm], i z [mm]	1768.9	89.7
W el,y [m 3], W el,z [m 3]	9.9477e-02	2.9788e-03
W pl,y [m 3], W pl,z [m 3]	1.5728e-01	5.2208e-03
M pl,y,+ [Nm], M pl,y,- [Nm]	5.50th + 07	5.50th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]	1.83rd + 06	1.83rd + 06

d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	8.4448e-06	0.0000e + 00
β_y [mm], β_z [mm]	940.2	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main girder (500 * 30 + 550 * 30, h = 4822) 1

Type	Graphic cross section	
Extensive	4,542.0; 30.0; 500.0; 30.0; 550.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d
A [m^2]	1.0117e-01	

A_y [m^2], A_z [m^2]	4.3852e-02	5.7648e-02
A_L [m^2/m], A_D [m^2/m]	1.1409e + 01	1.1409e + 01
$c_{Y,UCS}$ [mm], $c_{Z,UCS}$ [mm]	0.0	-3171.3
α [deg]	0.00	
I_y [m^4], I_z [m^4]	3.0948e-01	8.1916e-04
i_y [mm], i_z [mm]	1749.0	90.0
$W_{el,y}$ [m^3], $W_{el,z}$ [m^3]	9.7589e-02	2.9788e-03
$W_{pl,y}$ [m^3], $W_{pl,z}$ [m^3]	1.5433e-01	5.2188e-03
$M_{pl,y,+}$ [Nm], $M_{pl,y,-}$ [Nm]	5.40th + 07	5.40th + 07
$M_{pl,z,+}$ [Nm], $M_{pl,z,-}$ [Nm]	1.83rd + 06	1.83rd + 06
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	8.4618e-06	0.0000e + 00
β_y [mm], β_z [mm]	938.8	0.0

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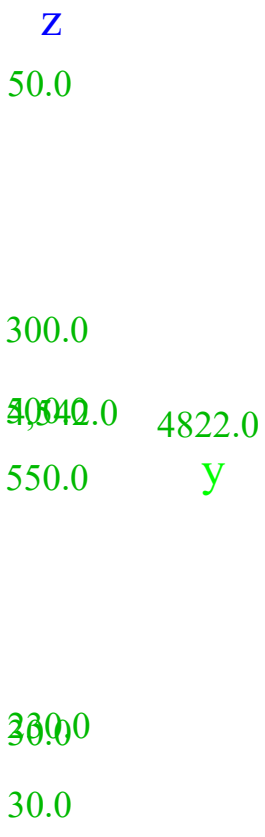
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30, h = 4822) 1

Type	Graphic cross section		
Extensive	4,542.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		8.4667e-02	
A y [m 2], A z [m 2]		2,7649e-02	5,7507e-02
A L [m 2 / m], A D [m 2 / m]		1.1249e + 01	1.1249e + 01
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2840.8
α [deg]		0.00	
I y [m 4], I z [m 4]		2,5279e-01	4,0322e-04
i y [mm], i z [mm]		1727.9	69.0
W el,y [m 3], W el,z [m 3]		8.8985e-02	1.6129e-03
W pl,y [m 3], W pl,z [m 3]		1.2979e-01	2.9500e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		4.54th + 07	4.54th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.03rd + 06	1.03rd + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		5.0821e-06	0.0000e + 00
β y [mm], β z [mm]		466.4	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
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Image

300.0

230.0

30.0500.0

Main beam (500 * 30, h = 4733) 1

Type	Graphic cross section		
Extensive	4453.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		8.3599e-02	
A y [m 2], A z [m 2]		2.7645e-02	5.6490e-02
A L [m 2 / m], A D [m 2 / m]		1.1071e + 01	1.1071e + 01
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2793.8
α [deg]		0.00	
I y [m 4], I z [m 4]		2.4136e-01	4,0321e-04
i y [mm], i z [mm]		1699.2	69.4
W el,y [m 3], W el,z [m 3]		8.6392e-02	1.6128e-03
W pl,y [m 3], W pl,z [m 3]		1.2605e-01	2.9468e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		4.41e + 07	4.41e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.03rd + 06	1.03rd + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		5.0592e-06	0.0000e + 00
β y [mm], β z [mm]		467.1	0.0

Project	IJssel Bridge
Part	Main bridge
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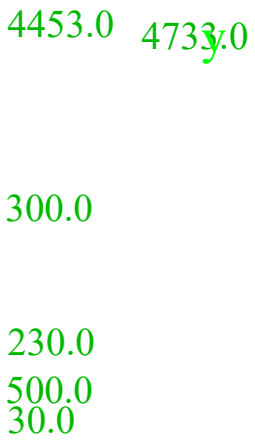
Image

Z

50.0

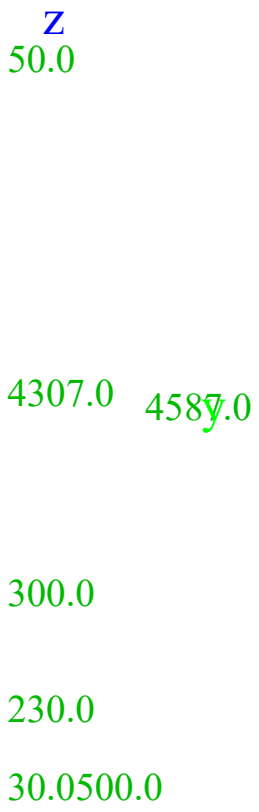


Main beam (500 * 30, h = 4587) 1

Type	Graphic cross section		
Extensive	4307.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		8.1847e-02	
A y [m 2], A z [m 2]		2.7639e-02	5.4818e-02
A L [m 2 / m], A D [m 2 / m]		1.0779th + 01	1.0779th + 01
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2716.6
α [deg]		0.00	
I y [m 4], I z [m 4]		2,2333e-01	4.0319e-04
i y [mm], i z [mm]		1651.9	70.2
W el,y [m 3], W el,z [m 3]		8.2210e-02	1.6127e-03
W pl,y [m 3], W pl,z [m 3]		1,2001e-01	2.9415e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		4.20th + 07	4.20th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.03rd + 06	1.03rd + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		5.0235e-06	0.0000e + 00
β y [mm], β z [mm]		468.2	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

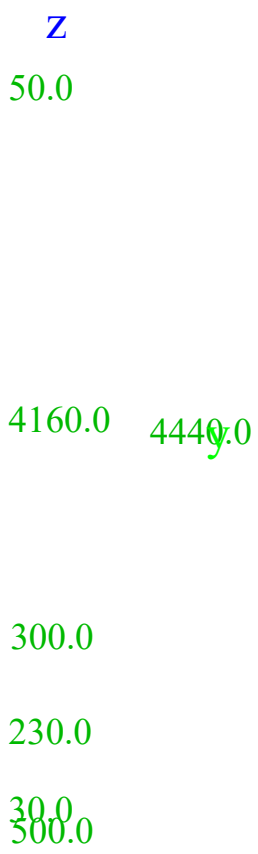


Main beam (500 * 30, h = 4440) 1

Type	Graphic cross section		
Extensive	4160.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		8.0083e-02	
A y [m 2], A z [m 2]		2.7633e-02	5.3130e-02
A L [m 2 / m], A D [m 2 / m]		1.0485e + 01	1.0485e + 01
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2638.6
α [deg]		0.00	
I y [m 4], I z [m 4]		2.0605e-01	4.0317e-04
i y [mm], i z [mm]		1604.1	71.0
W el,y [m 3], W el,z [m 3]		7,8092e-02	1.6127e-03
W pl,y [m 3], W pl,z [m 3]		1.1406e-01	2.9363e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		3.99th + 07	3.99th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.03rd + 06	1.03rd + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4,9903e-06	0.0000e + 00
β y [mm], β z [mm]		469.1	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30, h = 4301) 1

Type	Graphic cross section		
Extensive	4021.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		7.8415e-02	
A y [m 2], A z [m 2]		2.7627e-02	5.1528e-02
A L [m 2 / m], A D [m 2 / m]		1.0207th + 01	1.0207th + 01
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2564.7
α [deg]		0.00	
I y [m 4], I z [m 4]		1,9051e-01	4.0315e-04
i y [mm], i z [mm]		1558.7	71.7
W el,y [m 3], W el,z [m 3]		7.4281e-02	1.6126e-03
W pl,y [m 3], W pl,z [m 3]		1.0855e-01	2.9312e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		3.80th + 07	3.80th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.03rd + 06	1.03rd + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4.9616e-06	0.0000e + 00
β y [mm], β z [mm]		469.7	0.0

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
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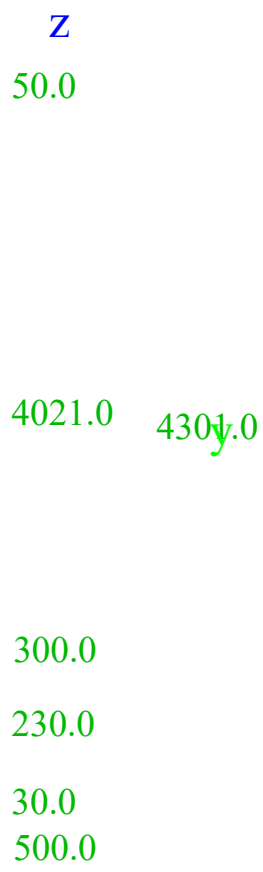
Image



Main beam (500 * 30, h = 4182) 1

Type	Graphic cross section		
Extensive	3902.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		7.6987e-02	
A y [m 2], A z [m 2]		2.7622e-02	5,0153e-02
A L [m 2 / m], A D [m 2 / m]		9.9690e + 00	9.9690e + 00
c Y.UCS [mm], c Z.UCS [mm]		0.0	-2501.3
α [deg]		0.00	
I y [m 4], I z [m 4]		1.7781e-01	4.0313e-04
i y [mm], i z [mm]		1519.7	72.4
W el.y [m 3], W el.z [m 3]		7.1085e-02	1.6125e-03
W pl.y [m 3], W pl.z [m 3]		1.0393e-01	2.9270e-03
M pl.y. + [Nm], M pl.y.- [Nm]		3.64e + 07	3.64e + 07
M pl.z. + [Nm], M pl.z.- [Nm]		1.02nd + 06	1.02nd + 06

d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	4.9393e-06	0.0000e + 00
β_y [mm], β_z [mm]	470.1	0.0

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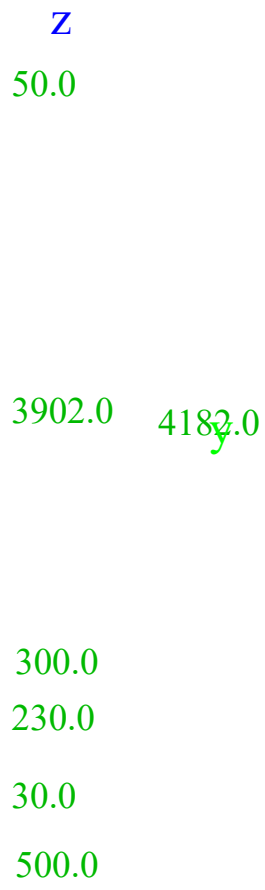
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30, h = 4063) 1

Type	Graphic cross section	
Extensive	3783.0; 30.0; 500.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 125%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d

A [m 2]	7,5559e-02	
A y [m 2], A z [m 2]	2.7617e-02	4,8773e-02
A L [m 2 / m], A D [m 2 / m]	9.7310th + 00	9.7310th + 00
c Y.UCS [mm], c Z.UCS [mm]	0.0	-2437.8
α [deg]	0.00	
I y [m 4], I z [m 4]	1.6564e-01	4.0311e-04
i y [mm], i z [mm]	1480.6	73.0
W el.y [m 3], W el.z [m 3]	6.7948e-02	1.6124e-03
W pl.y [m 3], W pl.z [m 3]	9.9390e-02	2.9227e-03
M pl.y. + [Nm], M pl.y.- [Nm]	3.48e + 07	3.48e + 07
M pl.z. + [Nm], M pl.z.- [Nm]	1.02nd + 06	1.02nd + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	4.9195e-06	0.0000e + 00
β y [mm], β z [mm]	470.3	0.0

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

500.0

Main beam (500 * 30, h = 4042) 1

Type	Graphic cross section		
Extensive	3762.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	7,5307e-02		
A y [m 2], A z [m 2]	2.7616e-02	4.8530e-02	
A L [m 2 / m], A D [m 2 / m]	9.6890th + 00	9.6890th + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2426.5	
α [deg]	0.00		
I y [m 4], I z [m 4]	1.6355e-01	4.0311e-04	
i y [mm], i z [mm]	1473.7	73.2	
W el,y [m 3], W el,z [m 3]	6.7401e-02	1.6124e-03	
W pl,y [m 3], W pl,z [m 3]	9.8598e-02	2.9219e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	3.45e + 07	3.45e + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.02nd + 06	1.02nd + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	4.9162e-06	0.0000e + 00	
β y [mm], β z [mm]	470.3	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

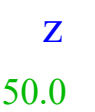
Image

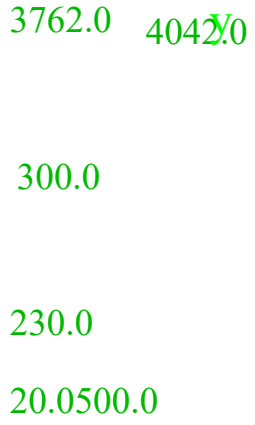
Main beam (500 * 20, h = 4042) 1

Type	Graphic cross section		
Extensive	3762.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		7.0307e-02	
A y [m 2], A z [m 2]		2.2700e-02	4.8295e-02
A L [m 2 / m], A D [m 2 / m]		9.6690th + 00	9.6690th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2309.9
α [deg]		0.00	
I y [m 4], I z [m 4]		1.4914e-01	2.9894e-04
i y [mm], i z [mm]		1456.4	65.2
W el,y [m 3], W el,z [m 3]		6.4566e-02	1.1958e-03
W pl,y [m 3], W pl,z [m 3]		9.0972e-02	2.2969e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		3.18th + 07	3.18th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		8.04e + 05	8.04e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4,0959e-06	0.0000e + 00
β y [mm], β z [mm]		314.0	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



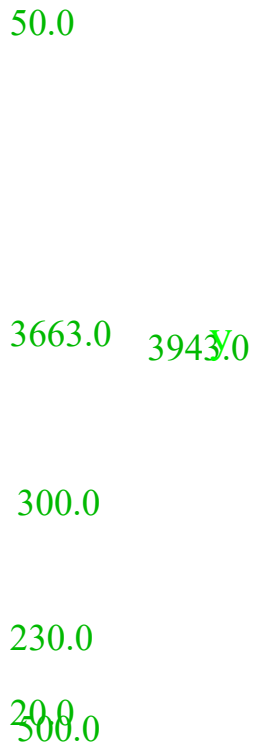


Main beam (500 * 20, h = 3943) 1

Type	Graphic cross section		
Extensive	3663.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		6,9119e-02	
A y [m 2], A z [m 2]		2.2695e-02	4.7164e-02
A L [m 2 / m], A D [m 2 / m]		9.4710th + 00	9.4710th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2258.2
α [deg]		0.00	
I y [m 4], I z [m 4]		1.4028e-01	2.9893e-04
i y [mm], i z [mm]		1424.6	65.8
W el,y [m 3], W el,z [m 3]		6.2123e-02	1.1957e-03
W pl,y [m 3], W pl,z [m 3]		8.7522e-02	2.2934e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		3.06e + 07	3.06e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		8.03rd + 05	8.03rd + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4.0675e-06	0.0000e + 00
β y [mm], β z [mm]		314.7	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 3823) 1

Type	Graphic cross section		
Extensive	3543.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		6.7679e-02	
A y [m 2], A z [m 2]		2.2690e-02	4.5790e-02
A L [m 2 / m], A D [m 2 / m]		9.2310th + 00	9.2310th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2195.4
α [deg]		0.00	
I y [m 4], I z [m 4]		1,3000th-01	2.9891e-04
i y [mm], i z [mm]		1386.0	66.5
W el,y [m 3], W el,z [m 3]		5.9216e-02	1.1956e-03
W pl,y [m 3], W pl,z [m 3]		8.3418e-02	2.2890e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.92e + 07	2.92e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		8.01st + 05	8.01st + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4,0347e-06	0.0000e + 00
β y [mm], β z [mm]		315.5	0.0

Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

Main beam (500 * 20, h = 3725) 1

Type	Graphic cross section		
Extensive	3445.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.6503e-02	
A y [m 2], A z [m 2]		2.2686e-02	4.4665e-02
A L [m 2 / m], A D [m 2 / m]		9.0350e + 00	9.0350e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2144.1
α [deg]		0.00	
I y [m 4], I z [m 4]		1.2197e-01	2.9890e-04
i y [mm], i z [mm]		1354.3	67.0
W el,y [m 3], W el,z [m 3]		5,6887e-02	1.1956e-03
W pl,y [m 3], W pl,z [m 3]		8.0130e-02	2.2855e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.80th + 07	2.80th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		8.00th + 05	8.00th + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4.0092e-06	0.0000e + 00
β y [mm], β z [mm]		316.1	0.0

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Project	IJssel Bridge
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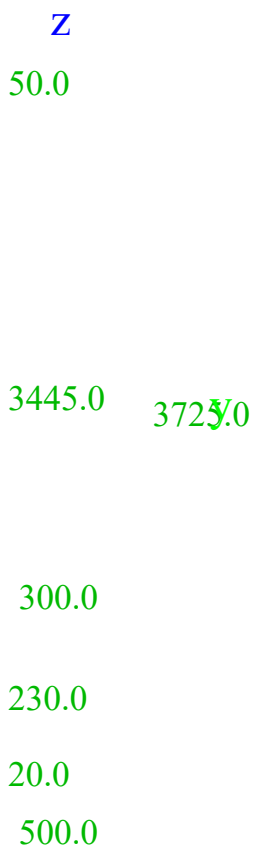
Image



Main beam (500 * 20, h = 3631) 1

Type	Graphic cross section		
Extensive	3351.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.5375e-02	
A y [m 2], A z [m 2]		2.2681e-02	4.3583e-02
A L [m 2 / m], A D [m 2 / m]		8.8470th + 00	8.8470th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2094.7
α [deg]		0.00	
I y [m 4], I z [m 4]		1.1456e-01	2,9888e-04
i y [mm], i z [mm]		1323.8	67.6
W el,y [m 3], W el,z [m 3]		5.4690e-02	1.1955e-03
W pl,y [m 3], W pl,z [m 3]		7.7031e-02	2.2821e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.70e + 07	2.70e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.99 + 05	7.99 + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.9861e-06	0.0000e + 00
β y [mm], β z [mm]		316.5	0.0

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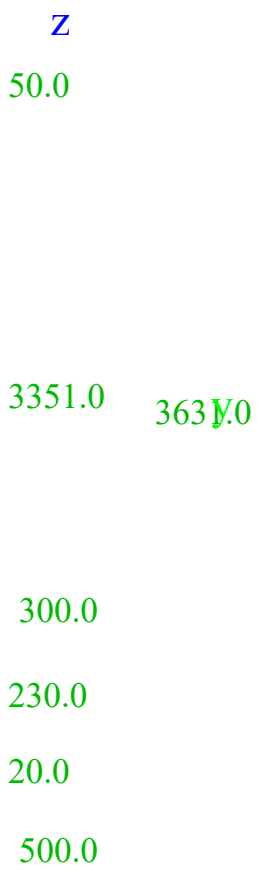
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 20, h = 3538) 1

Type	Graphic cross section		
Extensive	3258.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		6.4259e-02	
A y [m 2], A z [m 2]		2.2677e-02	4.2510e-02
A L [m 2 / m], A D [m 2 / m]		8.6610th + 00	8.6610th + 00

$c_{Y,UCS}$ [mm], $c_{Z,UCS}$ [mm]	0.0	-2045.8
α [deg]	0.00	
I_y [m^4], I_z [m^4]	1.0752e-01	2,9887e-04
i_y [mm], i_z [mm]	1293.5	68.2
$W_{el,y}$ [m^3], $W_{el,z}$ [m^3]	5.2554e-02	1.1955e-03
$W_{pl,y}$ [m^3], $W_{pl,z}$ [m^3]	7.4017e-02	2.2788e-03
$M_{pl,y,+}$ [Nm], $M_{pl,y,-}$ [Nm]	2.59th + 07	2.59th + 07
$M_{pl,z,+}$ [Nm], $M_{pl,z,-}$ [Nm]	7.98e + 05	7.98e + 05
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	3,9646e-06	0.0000e + 00
β_y [mm], β_z [mm]	316.9	0.0

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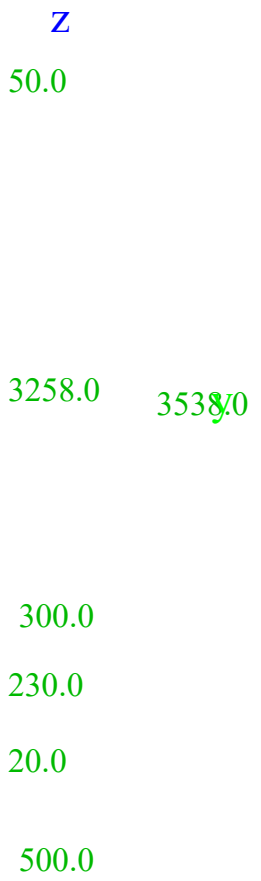
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

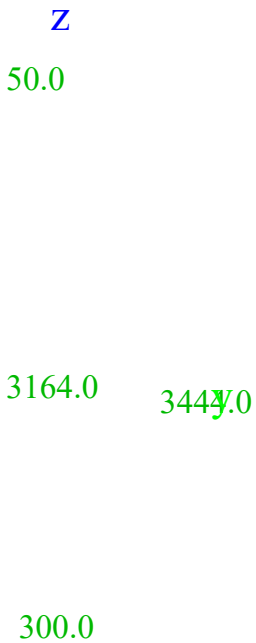


Main beam (500 * 20, h = 3444) 1

Type	Graphic cross section		
Extensive	3164.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.3131e-02	
A y [m 2], A z [m 2]		2.2673e-02	4.1422e-02
A L [m 2 / m], A D [m 2 / m]		8.4730th + 00	8.4730th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1996.3
α [deg]		0.00	
I y [m 4], I z [m 4]		1.0068e-01	2,9886e-04
i y [mm], i z [mm]		1262.8	68.8
W el,y [m 3], W el,z [m 3]		5.0431e-02	1.1954e-03
W pl,y [m 3], W pl,z [m 3]		7.1023e-02	2,2754e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.49th + 07	2.49th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.96e + 05	7.96e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3,9444e-06	0.0000e + 00
β y [mm], β z [mm]		317.1	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



230.0

20.0

500.0

Main beam (500 * 20, h = 3382) 1

Type	Graphic cross section		
Extensive	3102.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		6.2387e-02	
A y [m 2], A z [m 2]		2.2670e-02	4,0703e-02
A L [m 2 / m], A D [m 2 / m]		8.3490th + 00	8.3490th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	1963.7
α [deg]		0.00	
I y [m 4], I z [m 4]		9.6320e-02	2.9885e-04
i y [mm], i z [mm]		1242.5	69.2
W el,y [m 3], W el,z [m 3]		4,9051e-02	1.1954e-03
W pl,y [m 3], W pl,z [m 3]		6.9078e-02	2.2732e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.42e + 07	2.42e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.96e + 05	7.96e + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.9319e-06	0.0000e + 00
β y [mm], β z [mm]		317.3	0.0

Project	IJssel Bridge
Part	Main bridge
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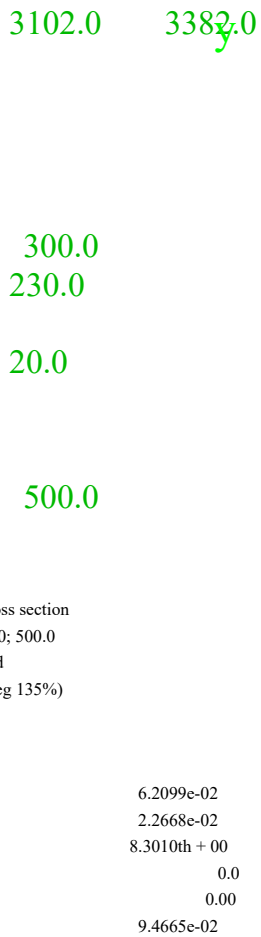
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

50.0

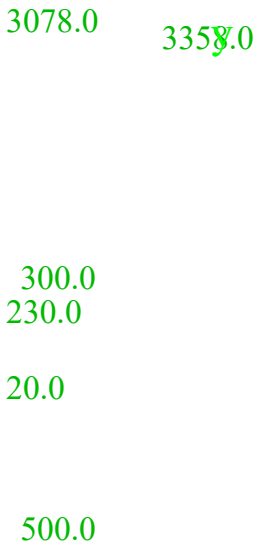


Main beam (500 * 20, h = 3358) 1

Type	Graphic cross section		
Extensive	3078.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d		d
A [m 2]		6.2099e-02	
A y [m 2], A z [m 2]		2.2668e-02	4.0424e-02
A L [m 2 / m], A D [m 2 / m]		8.3010th + 00	8.3010th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1951.0
α [deg]		0.00	
I y [m 4], I z [m 4]		9.4665e-02	2.9884e-04
i y [mm], i z [mm]		1234.7	69.4
W el,y [m 3], W el,z [m 3]		4.8522e-02	1.1954e-03
W pl,y [m 3], W pl,z [m 3]		6.8331e-02	2.2723e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.39e + 07	2.39e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.95th + 05	7.95th + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3,9273e-06	0.0000e + 00
β y [mm], β z [mm]		317.3	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



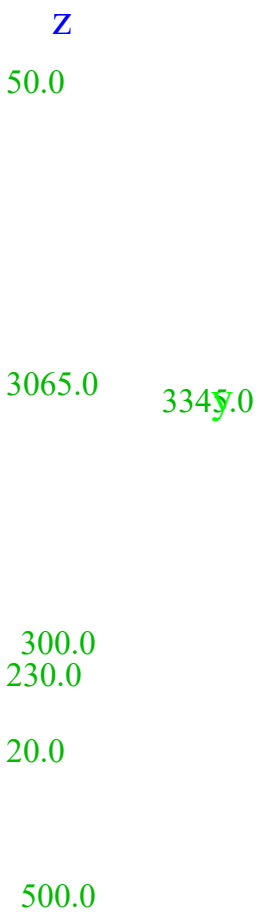
Main beam (500 * 20, h = 3345) 1

Type	Graphic cross section		
Extensive	3065.0; 20.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 135%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.1943e-02	
A y [m 2], A z [m 2]		2.2668e-02	4,0273e-02
A L [m 2 / m], A D [m 2 / m]		8.2750e + 00	8.2750e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	1944.1
α [deg]		0.00	
I y [m 4], I z [m 4]		9.3776e-02	2.9884e-04
i y [mm], i z [mm]		1230.4	69.5
W el,y [m 3], W el,z [m 3]		4.8236e-02	1.1954e-03
W pl,y [m 3], W pl,z [m 3]		6.7928e-02	2.2718e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.38th + 07	2.38th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		7.95th + 05	7.95th + 05
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		3.9248e-06	0.0000e + 00
β y [mm], β z [mm]		317.3	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer

Current date 29.01.2019
Project file name Main Bridge v6.0.esa

Image



Main beam (500 * 30, h = 3345) 1

Type	Graphic cross section		
Extensive	3065.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.6943e-02	
A y [m 2], A z [m 2]		2.7580e-02	4,0363e-02
A L [m 2 / m], A D [m 2 / m]		8.2950e + 00	8.2950e + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-2050.6
α [deg]		0.00	
I y [m 4], I z [m 4]		1.0318e-01	4,0301e-04
i y [mm], i z [mm]		1241.5	77.6
W el,y [m 3], W el,z [m 3]		5.0318e-02	1.6120e-03
W pl,y [m 3], W pl,z [m 3]		7.3811e-02	2,8968e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.58th + 07	2.58th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.01st + 06	1.01st + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		4,8659e-06	0.0000e + 00
β y [mm], β z [mm]		467.2	0.0

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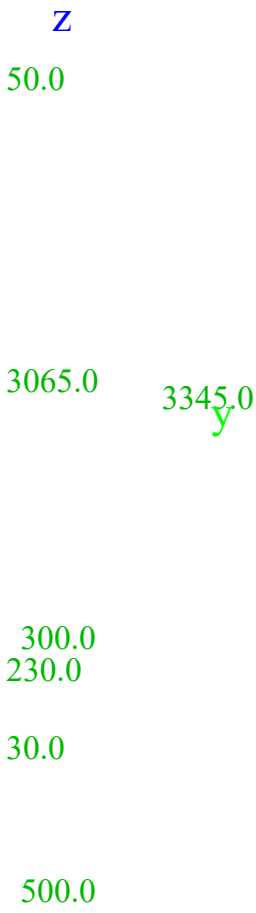
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



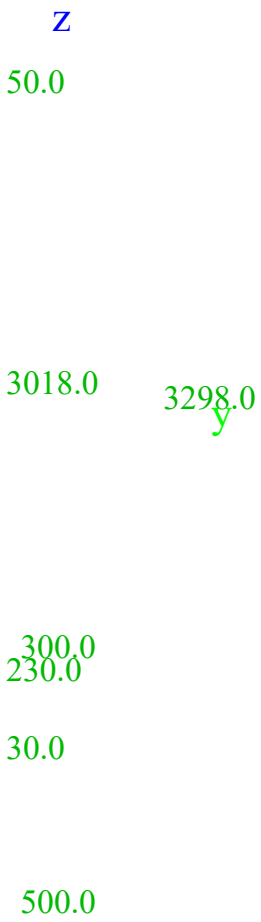
Main beam (500 * 30, h = 3298) 1

Type	Graphic cross section		
Extensive	3018.0; 30.0; 500.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 125%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	6.6379e-02		
A y [m 2], A z [m 2]	2.7577e-02	3,9807e-02	
A L [m 2 / m], A D [m 2 / m]	8.2010th + 00	8.2010th + 00	
c Y.UCS [mm], c Z.UCS [mm]	0.0	-2025.0	
α [deg]	0.00		
I y [m 4], I z [m 4]	9.9716e-02	4,0300e-04	
i y [mm], i z [mm]	1225.6	77.9	
W el.y [m 3], W el.z [m 3]	4.9242e-02	1.6120e-03	
W pl.y [m 3], W pl.z [m 3]	7.2245e-02	2,8951e-03	
M pl.y. + [Nm], M pl.y.- [Nm]	2.53rd + 07	2.53rd + 07	
M pl.z. + [Nm], M pl.z.- [Nm]	1.01st + 06	1.01st + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	4.8675e-06	0.0000e + 00	

β_y [mm], β_z [mm]	466.6	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 530 * 10, h = 3298) 1

Type	Graphic cross section		
Extensive	3018.0; 30.0; 500.0; 10.0; 530.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m^2]	7.1679e-02		
A_y [m^2], A_z [m^2]	3.2922e-02	3.9737e-02	
A_L [m^2 / m], A_D [m^2 / m]	8.2810th + 00	8.2810th + 00	

$c_{Y,UCS}$ [mm], $c_{Z,UCS}$ [mm]	0.0	-2121.7
α [deg]	0.00	
I_y [m^4], I_z [m^4]	1.0811e-01	5.2707e-04
i_y [mm], i_z [mm]	1228.1	85.8
$W_{el,y}$ [m^3], $W_{el,z}$ [m^3]	5,0955e-02	1,9889e-03
$W_{pl,y}$ [m^3], $W_{pl,z}$ [m^3]	7.7272e-02	3,5974e-03
$M_{pl,y,+}$ [Nm], $M_{pl,y,-}$ [Nm]	2.70e + 07	2.70e + 07
$M_{pl,z,+}$ [Nm], $M_{pl,z,-}$ [Nm]	1.26th + 06	1.26th + 06
d_y [mm], d_z [mm]	0.0	0.0
I_t [m^4], I_w [m^6]	6,1043e-06	0.0000e + 00
β_y [mm], β_z [mm]	610.4	0.0

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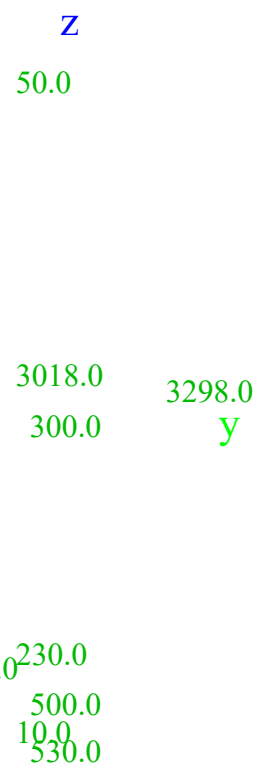
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 530 * 10, h = 3291) 1

Type	Graphic cross section
Extensive	3011.0; 30.0; 500.0; 10.0; 530.0
Form type	Thin-walled
Part material	LQmc 52 (eg 120%)
Construction method	General
Color	

Nod yy, nod zz	d	d
A [m 2]	7.1595e-02	
A y [m 2], A z [m 2]	3.2921e-02	3,9653e-02
A L [m 2 / m], A D [m 2 / m]	8.2670th + 00	8.2670th + 00
c Y.UCS [mm], c Z.UCS [mm]	0.0	-2117.8
α [deg]	0.00	
I y [m 4], I z [m 4]	1.0756e-01	5.2706e-04
i y [mm], i z [mm]	1225.7	85.8
W el.y [m 3], W el.z [m 3]	5.0789e-02	1,9889e-03
W pl.y [m 3], W pl.z [m 3]	7.7021st-02	3,5971e-03
M pl.y.+ [Nm], M pl.y.- [Nm]	2.70e + 07	2.70e + 07
M pl.z.+ [Nm], M pl.z.- [Nm]	1.26th + 06	1.26th + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	6,1069e-06	0.0000e + 00
β y [mm], β z [mm]	610.2	0.0

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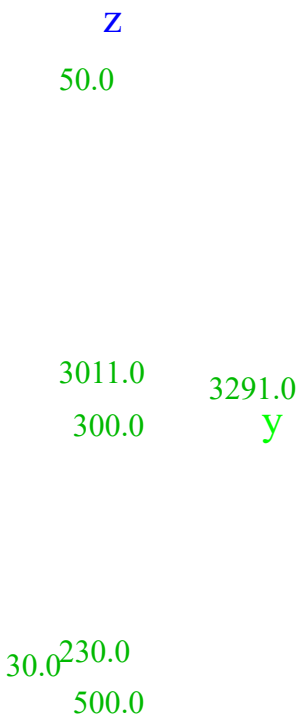
Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



1530.0

Main beam (500 * 30 + 530 * 10, h = 3224) 1

Type	Graphic cross section	
Extensive	2944.0; 30.0; 500.0; 10.0; 530.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d
A [m 2]	7.0791e-02	
A y [m 2], A z [m 2]	3.2916e-02	3.8847e-02
A L [m 2 / m], A D [m 2 / m]	8.1330e + 00	8.1330e + 00
c Y.UCS [mm], c Z.UCS [mm]	0.0	-2080.1
α [deg]	0.00	
I y [m 4], I z [m 4]	1.0237e-01	5.2705e-04
i y [mm], i z [mm]	1202.5	86.3
W el.y [m 3], W el.z [m 3]	4.9214e-02	1,9889e-03
W pl.y [m 3], W pl.z [m 3]	7.4636e-02	3,5947e-03
M pl.y. + [Nm], M pl.y.- [Nm]	2.61st + 07	2.61st + 07
M pl.z. + [Nm], M pl.z.- [Nm]	1.26th + 06	1.26th + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	6.1333e-06	0.0000e + 00
β y [mm], β z [mm]	608.1	0.0

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Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

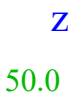
Image

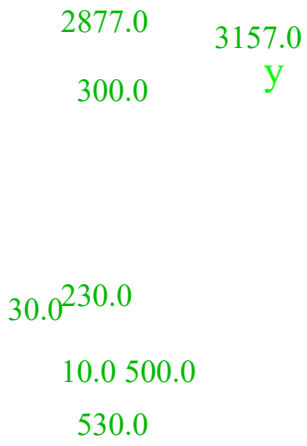
Main beam (500 * 30 + 530 * 10, h = 3157) 1

Type	Graphic cross section		
Extensive	2877.0; 30.0; 500.0; 10.0; 530.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	6,9987e-02		
A y [m 2], A z [m 2]	3.2911e-02	3,8040e-02	
A L [m 2 / m], A D [m 2 / m]	7,9990th + 00	7,9990th + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2042.2	
α [deg]	0.00		
I y [m 4], I z [m 4]	9.7329e-02	5.2705e-04	
i y [mm], i z [mm]	1179.3	86.8	
W el,y [m 3], W el,z [m 3]	4.7659e-02	1,9888e-03	
W pl,y [m 3], W pl,z [m 3]	7.2278e-02	3.5923e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	2.53rd + 07	2.53rd + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.26th + 06	1.26th + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	6.1626e-06	0.0000e + 00	
β y [mm], β z [mm]	605.8	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



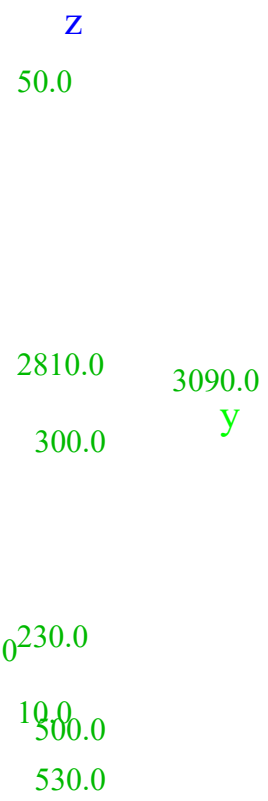


Main beam (500 * 30 + 530 * 10, h = 3090) 1

Type	Graphic cross section		
Extensive	2810.0; 30.0; 500.0; 10.0; 530.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]	6.9183e-02		
A y [m 2], A z [m 2]	3.2905e-02	3.7230e-02	
A L [m 2 / m], A D [m 2 / m]	7.8650e + 00	7.8650e + 00	
c Y,UCS [mm], c Z,UCS [mm]	0.0	2004.3	
α [deg]	0.00		
I y [m 4], I z [m 4]	9.2446e-02	5.2704e-04	
i y [mm], i z [mm]	1156.0	87.3	
W el,y [m 3], W el,z [m 3]	4.6125e-02	1,9888e-03	
W pl,y [m 3], W pl,z [m 3]	6.9947e-02	3,5899e-03	
M pl,y,+ [Nm], M pl,y,- [Nm]	2.45e + 07	2.45e + 07	
M pl,z,+ [Nm], M pl,z,- [Nm]	1.26th + 06	1.26th + 06	
d y [mm], d z [mm]	0.0	0.0	
I t [m 4], I w [m 6]	6.1951e-06	0.0000e + 00	
β y [mm], β z [mm]	603.4	0.0	

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image

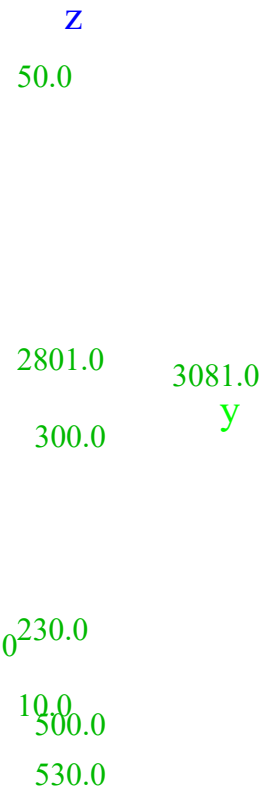


Main beam (500 * 30 + 530 * 10, h = 3081) 1

Type	Graphic cross section		
Extensive	2801.0; 30.0; 500.0; 10.0; 530.0		
Form type	Thin-walled		
Part material	LQmc 52 (eg 120%)		
Construction method	General		
Color			
Nod yy, nod zz	d	d	
A [m 2]		6.9075e-02	
A y [m 2], A z [m 2]		3.2904e-02	3.7122e-02
A L [m 2 / m], A D [m 2 / m]		7.8470th + 00	7.8470th + 00
c Y,UCS [mm], c Z,UCS [mm]		0.0	-1999.2
α [deg]		0.00	
I y [m 4], I z [m 4]		9.1802e-02	5.2703e-04
i y [mm], i z [mm]		1152.8	87.3
W el,y [m 3], W el,z [m 3]		4.5920e-02	1,9888e-03
W pl,y [m 3], W pl,z [m 3]		6.9636e-02	3,5896e-03
M pl,y,+ [Nm], M pl,y,- [Nm]		2.44th + 07	2.44th + 07
M pl,z,+ [Nm], M pl,z,- [Nm]		1.26th + 06	1.26th + 06
d y [mm], d z [mm]		0.0	0.0
I t [m 4], I w [m 6]		6.1997th-06	0.0000e + 00
β y [mm], β z [mm]		603.0	0.0

Project	IJssel Bridge
Part	Main bridge
Author	Ernst Klamer
Current date	29.01.2019
Project file name	Main Bridge v6.0.esa

Image



Main beam (500 * 30 + 550 * 30, h = 3081) 1

Type	Graphic cross section	
Extensive	2801.0; 30.0; 500.0; 30.0; 550.0	
Form type	Thin-walled	
Part material	LQmc 52 (eg 120%)	
Construction method	General	
Color		
Nod yy, nod zz	d	d
A [m 2]	8.0275e-02	
A y [m 2], A z [m 2]	4.3706e-02	3,7100e-02
A L [m 2 / m], A D [m 2 / m]	7.9270e + 00	7.9270e + 00
c Y,UCS [mm], c Z,UCS [mm]	0.0	-2157.0
α [deg]	0.00	
I y [m 4], I z [m 4]	1.0414e-01	8.1891e-04
i y [mm], i z [mm]	1139.0	101.0
W el,y [m 3], W el,z [m 3]	4.8280e-02	2,9778e-03
W pl,y [m 3], W pl,z [m 3]	7.5360e-02	5.1561e-03
M pl,y,+ [Nm], M pl,y,- [Nm]	2.64e + 07	2.64e + 07
M pl,z,+ [Nm], M pl,z,- [Nm]	1.80th + 06	1.80th + 06
d y [mm], d z [mm]	0.0	0.0
I t [m 4], I w [m 6]	9,9684e-06	0.0000e + 00
β y [mm], β z [mm]	850.5	0.0