ArcelorMittal

ACOBRI

(v5.01)

ArcelorMittal Composite Bridge Predesign

Preliminary design software for composite bridges

PRELIMINARY DESIGN NOTE

Company : DER-DF
User name : SUTEC/GEPRO
Project name : DF-095 (EPCL)
Project reference : Ponte Metálica
Comment : Projeto Básico
Date : 20/07/2019

BRIEF DESCRIPTION OF SOFTWARE

Purpose of software

The ACOBRI software is used for preliminary design of the rolled-steel main beams of a composite steel and concrete bridge superstructure. It is intended as a means of checking the feasibility of a design solution, optimizing a preliminary design through appropriate choice of parameters, and estimating the main quantities involved. It is not intended to produce a construction design calculation report

Scope of application

The kinds of bridges handled are road bridges, railway bridges, and footbridges with superstructures made made out of steel rolled girders and a participating reinforced concrete slab or with filler-beam decks. Decks may be simply supported or continuous in the case of multi-span bridges. Calculations and verifications are performed in accordance with Eurocodes EN and National Annexes.

Method of analysis and design checks

On the basis of a definition of bridge geometry, materials, and loads, the program calculates internal forces and moments in the main beams under the effect of: dead load, superimposed dead load and live load; concrete shrinkage; temperature differential; any support height adjustment. The analysis is performed with a finite element solver, using a grid model. The structure is discretized by bar elements corresponding to segments of the main beams, longitudinal and transverse strips of slab, and any crossbeams. For calculating flexural and torsional stiffnesses, account is taken of creep and any concrete cracking, depending on the type of internal forces or moments. Longitudinal and transverse influence lines are used to determine the position of mobile loads producing extreme effects at the different cross-sections considered.

To establish preliminary design of beams, the program calculates the main load combinations for the bridge in the in-service phase. The design checks for the serviceability limit state and ultimate limit state concern stresses in the beams and in the longitudinal reinforcement, compressive stresses in the concrete, the ultimate moment resistance, crack control and the vertical deformation and stress variation in beams at the fatigue limit state. The software also calculates reactions at supports and the number of connectors required to transfer shear forces between the beams and the slab. For filler-beam decks, the calculations include a number of special features in accordance with the specifications of the design codes.

Detailed information on the scope of application of the software, on the assumptions, methods, and approximations used and on the calculations performed are provided in the users manual and in the on-line help module.

Comments :

The program can deal with straight, unskewed bridges with a horizontal slab of constant thickness. If the bridge to be analyzed does not match these assumptions but does not vary substantively from them, the software can be used for an approximate calculation. In this case the user will have to use engineering judgment both to determine the adaptations to be made to the data entered and to assess the representativity of results given and, as required, adjust or complete the calculations and checks.

The software establishes a preliminary design for the main beams of the bridge under in-service conditions. It does not carry out any checks for construction phases. Lateral-torsional buckling of beams is not analyzed for the construction phase. Diaphragms and/or bracing may have to be implemented for the construction phase as well as the in-service phase.

ACOBRI is a preliminary design software tool which does not analyze all situations or perform in an exhaustive manner all the verification calculations required for construction design.

ACOBRI was developed by CTICM, Centre Technique Industriel de la Construction Métallique, France.

DATA

ROAD BRIDGE - Conventional beam and slab superstructure

Eurocodes EN

1 span **Span length = 40.000 m**

Slab dimensions

Width = 13.400 m Thickness = 30.0 cm

8 beam lines (Distance to left-hand edge of deck slab)

Line 1 : 0.400 m	
Line 2 : 2.200 m	Centre distance = 1.800 m
Line 3 : 4.000 m	Centre distance = 1.800 m
Line 4 : 5.800 m	Centre distance = 1.800 m
Line 5 : 7.600 m	Centre distance = 1.800 m
Line 6 : 9.400 m	Centre distance = 1.800 m
Line 7 : 11.200 m	Centre distance = 1.800 m
Line 8 : 13.000 m	Centre distance = 1.800 m

Profiled Steel sheeting : HI-BOND 55/750

Propping : No propping of main beams during deck slab concreting.

Overhang : Overhang formwork suspended from the two outermost beams only.

An equivalent superimposed dead load is taken into account in the calculation of the slab weight

Reinforcement

Layer	Top	Bottom
Rebars diameter (mm)	16.0	16.0
Rebars spacing (mm)	150.0	150.0
Concrete coverage (mm)	40.0	30.0

Concrete coverage :
- from the top face of the slab for the top layer
- from the upper face of the sheeting ribs for the bottom layer

Shear studs : Ø22x175 (P_{Rd}= 109.5 kN)

Reinforcing steel f_y = 500.00 N/mm^2

Structural steel S355 (WITH reduction of yield strength with thickness)

Density = 7850 kg/m^3

Concrete Class C30/37

Density = 2650 kg/m^3

Shrinkage strain = 200.10^{-6}
Temperature difference between slab and beams = 30 °C

Material properties used in calculations

Yield strength of the steel of girders	f_y = 345.0 MPa
Yield strength of the reinforcing steel	f_y = 500.0 MPa
Modulus of elasticity	E_{cm} = 32837 MPa
Limit compressive strenght of concrete	f_{ck} = 30 MPa

Steel sections

span 1	Left-hand edge beam	HL 1100 B_Ha
	Intermediate beams	HL 1100 B_Ha
	Right-hand edge beam	HL 1100 B_Ha

Cracked regions

Support lines	LH side (m)	RH side (m)
C0	-	-
C1	-	-

Footways and restraint systems

LH footway width: 3.000 m

RH footway, width: 2.000 m

LH restraint system, distance to LH edge of deck slab 3.000 m

RH restraint system, distance to RH edge of deck slab 2.000 m

Bridge class : 2

Superimposed dead loads of deck surfacing or ballast, footways or maintenance walkways etc - SDL1

Footways	Thickness = 20.0 cm LH footway width = 3.00 m RH footway width = 2.00 m	Density = 2400.0 kg/m^3	
Waterproofing	Thickness = 10.0 cm	Density = 2400.0 kg/m^3	
Surfacing	Thickness = 8.0 cm	Density = 2400.0 kg/m^3	
Restraint system	left-hand side right-hand side	x = 3.00 m x = 2.00 m	q = 1.00 kN/m q = 1.00 kN/m

Live loads on footways Distributed load = 3.00 kN/m^2

Left-hand footway	Width of loaded area = 0.00 m	Distance to slab edge = 0.00 m
Right-hand footway	Width of loaded area = 0.00 m	Distance to slab edge = 0.00 m

Definition of truck load models

Abnormal load : None

Fatigue load model : Load model on both edge lanes
Mean gross weight of truck : 450. kN
Number of trucks : 0.05 millions per year and slow lane
Service life (years) : 100

Support height ajustments and settlements

	Height adjustments	Settlements 1	Settlements 2
Support line No. 0	0 mm	0 mm	0 mm
Support line No. 1	0 mm	0 mm	0 mm

Assumptions for calculation and checks

Calculation coefficients

Diaphragms	Coefficient for inertia = 0.10 Coefficient for mass = 0.10
Slab elements	Coefficient for inertia - longitudinal = 1.00 Coefficient for inertia - transverse = 1.00

Serviceability Limit States

Deflection due to live loads limited to 1/ 300 of span length

Partial safety factor for the structural steel	$\gamma_{M,ser}$ = 1.00
Partial safety factor for shear resistance of studs	γ_v = 1.25

Ultimate Limit States

Partial safety factors :

for sections resistance	γ_{M0} = 1.00
for buckling resistance	γ_{M1} = 1.10
for slab concrete strength	γ_c = 1.50
for shear resistance of studs	γ_M = 1.15

Fatigue Limit States

Partial safety factors for fatigue loading	γ_{Ff} = 1.00
Top flange :	
Partial safety factor for fatigue strength	γ_{Mf} = 1.15
Detail category	80 MPa
Bottom flange :	
Partial safety factor for fatigue strength	γ_{Mf} = 1.15
Detail category	160 MPa

Weighting factors for SDL1 :

	Increase	Reduction
Waterproofing	1.20	0.80
Surfacing	1.40	0.80
Footways	1.00	1.00

Adjustment factors applied to load model 1 (UDL + TS) :

	α_{Q1}	α_{Qi} (i>1)	α_{q1}	$\alpha_{qi(i>1)}$	α_{qr}
Class 1	1.0	1.0	1.0	1.0	1.0
Class 2	1.0	1.0	1.0	1.0	1.0
Class 3	1.0	1.0	1.0	1.0	1.0

The class of the bridge is : Class 2

Partial factors for loads - Combination factors :

Partial factors for loads (ULS) :

Permanent loads	$\gamma_G = 1.35$
Traffic loads	$\gamma_Q = 1.35$
Other variable loads	$\gamma_Q = 1.50$
Height adjustments	$\gamma_P = 1.00$
Settlements	$\gamma_{G,set} = 1.20$
Shrinkage	$\gamma_S = 1.00$

Combination factors :

	Ψ_0	Ψ_1	Ψ_2	Ψ'_1
gr1a TS	0.75	0.75	0.00	0.80
gr1a UDL	0.40	0.40	0.00	0.80
gr5	0.00	0.00	0.00	1.00
TK	0.60	0.60	0.50	

LIST OF LOAD CASES

No.	Symbol	Name of load case	Modular ratio
1	G	Self-weight	-
2	GS	SDL1	17.20
3	GS+	Increased SDL1	17.20
4	GS-	Reduced SDL1	17.20
5	GL	SDL2	17.20
6	SH	Concrete shrinkage	17.40
7	TH+	Simpl. temp. load +DT°C	6.40
8	TH-	Simpl. temp. load -DT°C	6.40
9		Eigenmode	6.40
10	UDL	Load model 1 UDL	6.40
11	TS	Load model 1 TS	6.40

LIST OF ULS COMBINATIONS

	ULS combinations								
	1	3	4	5	6	7	8	10	11
	G	GS+	GS-	GL	SH	TH+	TH-	UDL	TS
1	1.35	1.35		1.35				1.35	1.35
2	1.35		1.35	1.35				1.35	1.35
3	1.35	1.35		1.35		1.50		0.54	1.01
4	1.35	1.35		1.35			1.50	0.54	1.01
5	1.35		1.35	1.35		1.50		0.54	1.01
6	1.35		1.35	1.35			1.50	0.54	1.01
7	1.35	1.35		1.35	1.00			1.35	1.35
8	1.35		1.35	1.35	1.00			1.35	1.35
9	1.35	1.35		1.35	1.00	1.50		0.54	1.01
10	1.35	1.35		1.35	1.00		1.50	0.54	1.01
11	1.35		1.35	1.35	1.00	1.50		0.54	1.01
12	1.35		1.35	1.35	1.00		1.50	0.54	1.01

LIST OF SLS COMBINATIONS

	Characteristics SLS combinations								
	1	3	4	5	6	7	8	10	11
	G	GS+	GS-	GL	SH	TH+	TH-	UDL	TS
1	1.00	1.00		1.00		0.60		1.00	1.00
2	1.00		1.00	1.00		0.60		1.00	1.00
3	1.00	1.00		1.00			0.60	1.00	1.00
4	1.00		1.00	1.00			0.60	1.00	1.00
5	1.00	1.00		1.00		1.00		0.40	0.75
6	1.00		1.00	1.00		1.00		0.40	0.75
7	1.00	1.00		1.00			1.00	0.40	0.75
8	1.00		1.00	1.00			1.00	0.40	0.75
9	1.00	1.00		1.00	1.00	0.60		1.00	1.00
10	1.00		1.00	1.00	1.00	0.60		1.00	1.00
11	1.00	1.00		1.00	1.00		0.60	1.00	1.00
12	1.00		1.00	1.00	1.00		0.60	1.00	1.00
13	1.00	1.00		1.00	1.00	1.00		0.40	0.75
14	1.00		1.00	1.00	1.00	1.00		0.40	0.75
15	1.00	1.00		1.00	1.00		1.00	0.40	0.75
16	1.00		1.00	1.00	1.00		1.00	0.40	0.75

	Frequent SLS combinations								
	1	3	4	5	6	7	8	10	11
	G	GS+	GS-	GL	SH	TH+	TH-	UDL	TS
17	1.00	1.00		1.00		0.50		0.40	0.75
18	1.00		1.00	1.00		0.50		0.40	0.75
19	1.00	1.00		1.00			0.50	0.40	0.75
20	1.00		1.00	1.00			0.50	0.40	0.75
21	1.00	1.00		1.00	1.00	0.50		0.40	0.75
22	1.00		1.00	1.00	1.00	0.50		0.40	0.75
23	1.00	1.00		1.00	1.00		0.50	0.40	0.75
24	1.00		1.00	1.00	1.00		0.50	0.40	0.75

	Quasi-permanent SLS combinations								
	1	3	4	5	6	7	8	10	11
	G	GS+	GS-	GL	SH	TH+	TH-	UDL	TS
25	1.00	1.00		1.00		0.50			
26	1.00	1.00		1.00			0.50		
27	1.00		1.00	1.00		0.50			
28	1.00		1.00	1.00			0.50		
29	1.00	1.00		1.00	1.00	0.50			
30	1.00	1.00		1.00	1.00		0.50		
31	1.00		1.00	1.00	1.00	0.50			
32	1.00		1.00	1.00	1.00		0.50		

	Infrequent SLS combinations								
	1	3	4	5	6	7	8	10	11
	G	GS+	GS-	GL	SH	TH+	TH-	UDL	TS
33	1.00	1.00		1.00		0.60		0.80	0.80
34	1.00		1.00	1.00		0.60		0.80	0.80
35	1.00	1.00		1.00			0.60	0.80	0.80
36	1.00		1.00	1.00			0.60	0.80	0.80
37	1.00	1.00		1.00	1.00	0.60		0.80	0.80
38	1.00		1.00	1.00	1.00	0.60		0.80	0.80
39	1.00	1.00		1.00	1.00		0.60	0.80	0.80
40	1.00		1.00	1.00	1.00		0.60	0.80	0.80

ESTIMATED QUANTITIES

Structural steel sections :

Steel grade : S355

				Lengths (m)				
Position	Span	Number	Profile	Nominal	On/Under	Sum	Weight (t)	Pre-camber (cm)
1	1	8	HL 1100 B_Ha	40.00	0.50	40.50	148.797	17.1
							148.797	

Shear connectors :

Position	Span	Number	Weight (t)
1	1	1456	0.826
			0.826

Slab concrete :

Surface of slab : 536.00 m^2

Position	Span	Volume (m^3)
1	1	146.1
		146.1

NB :

- *The indicated beam lengths and pre-cambers correspond to span lengths.*
  Supply specifications may differ, depending on the position of any splices.
  Constraints associated with fabrication, finishing, transport, and handling are to be checked on a case-by-case basis.
- *The quantities indicated for beams do not include stiffeners, bearing plates, diaphragms, end plates, etc.*
  These items are to be added in accordance with the features of the structure.
- *The number of shear connectors given includes a flat 30% increase over the theoretical quantity to take account of fabrication practice.*

Mass on slab :

Waterproofing (t)	Surfacing (t)	Footways (t)	Subtotal (t)
80.640	64.512	96.000	241.152

NUMBER OF CONNECTORS

Number of shear connectors according to User definition :

Ø22x175 : d = 22.0 mm - h = 175.0 mm - m = 0.6 kg/unit

span	Row 1	Row 2	Row 3	Row 4	Row 5	Row 6	Row 7	Row 8	Total	Weight (t)
1	182	182	182	182	182	182	182	182	1456	0.826

LIST OF CROSS-SECTIONS OF INTEREST

Bridge length : 40.00 m (11 cross-sections of interest)

Section No.	Position (m)	Type	span
1	0.00	Origin abutment	
2	0.40	Diaphragm	
3	6.00	Diaphragm	
4	11.60	Diaphragm	
5	17.20	Diaphragm	
6	20.00	Mid-span	**1**
7	22.80	Diaphragm	
8	28.40	Diaphragm	
9	34.00	Diaphragm	
10	39.60	Diaphragm	
11	40.00	End abutment	

FACTORS FOR FATIGUE LOADS

Additional dynamic amplification factor : $\Delta\varphi_{fat}$

Reference : EN 1991-2 : 2003 4.6.1 (6)

Cross-section	$\Delta\varphi_{fat}$
n°1	1.300
n°2	1.280
n°3	1.000
n°4	1.000
n°5	1.000
n°6	1.000
n°7	1.000
n°8	1.000
n°9	1.000
n°10	1.280
n°11	1.300

Damage equivalence factor : λ

Reference : EN 1993-2 : 2006 9.5.2

		Beam lines							
S	**L/R**	**n°1**	**n°2**	**n°3**	**n°4**	**n°5**	**n°6**	**n°7**	**n°8**
n°1	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°2	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°2	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°3	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°3	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°4	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°4	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°5	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°5	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°6	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°6	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°7	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°7	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°8	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°8	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°9	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°9	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°10	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°10	L	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331
n°11	R	1.331	1.331	1.331	1.343	1.389	1.332	1.331	1.331

S = Cross-section - R = Right - L = Left

Damage equivalence factor for reinforcement : λ_S

Reference : EN 1992-2, Annex NN

S	
n°1	1.520
n°2	1.520
n°3	1.520
n°4	1.520
n°5	1.520
n°6	1.520
n°7	1.520
n°8	1.520
n°9	1.520
n°10	1.520
n°11	1.520

S = Cross-section

Damage equivalence factor for connection : λ_V

Reference : EN 1994-2, 6.8.6.2

	Beam lines							
S	**n°1**	**n°2**	**n°3**	**n°4**	**n°5**	**n°6**	**n°7**	**n°8**
All	1.090	1.090	1.090	1.091	1.103	1.090	1.090	1.090

S = Cross-section

SLAB CRACKING

According to : EN 1994-2 Tables 7.1 and 7.2

Maximum bar diameter	ϕ_{max} = 25. mm	(Girder 1 - Node line 1)
Maximum bar spacing	e_{max} = 200. mm	(Girder 1 - Node line 1)

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			0.00	-316.76	0.00
SDL1	17.20			0.01	-134.22	0.00
Increased SDL1	17.20			0.06	-147.87	0.00
Reduced SDL1	17.20			-0.03	-124.79	0.00
SDL2	17.20			0.01	-3.31	0.00
Concrete shrinkage	17.40			554.77	-10.52	0.00
primary effect				554.75		
secondary effect				0.02	-10.52	
axial force - slab				N = -768.64 kN		
Simpl. temp. load +DT°C	6.40			-1605.87	15.30	0.00
primary effect				-1605.82		
secondary effect				-0.04	15.30	
axial force - slab				N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40			1605.87	-15.30	0.00
primary effect				1605.82		
secondary effect				0.04	-15.30	
axial force - slab				N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-95.47	0.00	0.00
Load model 1 TS	0.00	0.00			-5.67	0.00	0.00
Fatigue LM3 Left-hand slow lane	-0.28	0.05			0.00	-64.94	
Fatigue LM3 Right-hand slow lane	0.00	0.51			11.23	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	-1.87	18.00	0.10	No.5
Tensile stress in reinforcement (top layer) (MPa)	88.00	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	40.60	345.00	0.12	No.6
Stress in bottom fibre of steel section (MPa)	-12.99	345.00	0.04	No.6
Compressive stress in top fibre of concrete (MPa)	-0.93	13.50	0.07	No.1
Shear stress in steel sections (MPa)	-18.48	199.19	0.09	No.11
Normal stress / shear interaction (MPa)	-47.67	345.00	0.14	No.5
Shear in connection (kN/m)	107.62	418.75	0.26	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	778.78	6346.73	0.12	No.7
Sagging, Plastic resistance (kN.m)	2963.66	15343.74	0.19	No.10
Hogging, Plastic resistance (kN.m)	2408.84	11691.04	0.21	No.5
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.18	1.00	0.18	No.7
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.29	1.00	0.29	No.5

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.02	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.02	139.13	0.00	-
Bending stress range in reinforcement (MPa)	86.98	130.83	0.66	-
Shear stress range in connection (MPa)	34.95	90.00	0.39	-
Interaction connection / upper flange (MPa)	0.04	0.13	0.30	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	126.84	-316.76	126.83	-304.85	-0.38
SDL1	17.20	53.73	-134.22	53.72	-129.34	-0.10
Increased SDL1	17.20	59.24	-147.87	59.27	-142.88	-0.11
Reduced SDL1	17.20	49.91	-124.79	49.87	-119.95	-0.09
SDL2	17.20	1.33	-3.31	1.34	-3.23	0.00
Concrete shrinkage	17.40	558.97	-10.52	558.98	-8.53	-0.07
primary effect		554.75		554.75		
secondary effect		4.22	-10.52	4.23	-8.53	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1611.88	15.30	-1612.00	12.65	0.14
primary effect		-1605.82		-1605.82		
secondary effect		-6.05	15.30	-6.17	12.65	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1611.88	-15.30	1612.00	-12.65	-0.14
primary effect		1605.82		1605.82		
secondary effect		6.05	-15.30	6.17	-12.65	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	37.88	0.00	-95.47	0.00	-95.13	0.04	-0.06
Load model 1 TS	2.43	0.00	-5.67	0.00	-18.48	0.00	-0.06
Fatigue LM3 Left-hand slow lane	0.00	25.70	0.00	-64.94	0.00	-63.86	
Fatigue LM3 Right-hand slow lane	-3.86	0.00	11.23	0.00	11.18	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	[R]	-1.98	18.00	0.11	No.5
	[L]	-1.98	18.00	0.11	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	85.83	300.00	0.29	No.4
	[L]	85.83	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	[R]	35.35	345.00	0.10	No.6
	[L]	35.35	345.00	0.10	No.6
Stress in bottom fibre of steel section (MPa)	[R]	8.12	345.00	0.02	No.11
	[L]	8.12	345.00	0.02	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.01	13.50	0.08	No.1
	[L]	-1.01	13.50	0.08	No.1
Shear stress in steel sections (MPa)	[R]	-18.22	199.19	0.09	No.11
	[L]	-18.48	199.19	0.09	No.11
Normal stress / shear interaction (MPa)	[R]	-43.27	345.00	0.13	No.5
	[L]	-43.45	345.00	0.13	No.5
Shear in connection (kN/m)	[R]	110.96	418.75	0.26	No.11
	[L]	107.62	418.75	0.26	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	770.69	6346.73	0.12	No.7
	[L]	778.78	6346.73	0.12	No.7
Sagging, Plastic resistance (kN.m)	[R]	3252.95	15343.74	0.21	No.10
	[L]	3252.72	15343.74	0.21	No.10
Hogging, Plastic resistance (kN.m)	[R]	2177.64	11691.04	0.19	No.5
	[L]	2177.40	11691.04	0.19	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.18	1.00	0.18	No.7
	[L]	0.18	1.00	0.18	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.26	1.00	0.26	No.5
	[L]	0.26	1.00	0.26	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.32	69.57	0.00	-
	[L]	0.32	69.57	0.00	-
Bending stress range in bottom flange (MPa)	[R]	1.14	139.13	0.01	-
	[L]	1.15	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	33.84	90.00	0.38	-
	[L]	34.41	90.00	0.38	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.29	-
	[L]	0.04	0.13	0.30	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1657.68	-241.86	1657.69	-216.77	-5.48
SDL1	17.20	704.35	-102.72	704.56	-91.50	-1.47
Increased SDL1	17.20	788.28	-116.49	788.21	-102.96	-1.65
Reduced SDL1	17.20	646.51	-93.66	646.31	-84.16	-1.34
SDL2	17.20	20.07	-3.37	20.07	-2.20	-0.04
Concrete shrinkage	17.40	604.04	-7.32	604.07	-3.08	-0.87
primary effect		554.75		554.75		
secondary effect		49.29	-7.32	49.32	-3.08	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1676.15	9.93	-1675.92	4.72	1.78
primary effect		-1605.82		-1605.82		
secondary effect		-70.33	9.93	-70.09	4.72	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1676.15	-9.93	1675.92	-4.72	-1.78
primary effect		1605.82		1605.82		
secondary effect		70.33	-9.93	70.09	-4.72	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	557.85	0.00	-87.70	6.01	-71.04	6.12	-0.91
Load model 1 TS	418.09	0.00	-65.49	45.15	-47.38	37.90	-0.90
Fatigue LM3 Left-hand slow lane	0.00	368.82	0.00	-61.49	0.00	-49.57	
Fatigue LM3 Right-hand slow lane	-44.11	2.66	10.77	0.00	7.37	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.018	0.133	0.14	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.28	18.00	0.24	No.1
	[L]	-4.28	18.00	0.24	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	59.97	300.00	0.20	No.4
	[L]	59.95	300.00	0.20	No.4
Stress in top fibre of steel section (MPa)	[R]	-122.73	345.00	0.36	No.11
	[L]	-122.73	345.00	0.36	No.11
Stress in bottom fibre of steel section (MPa)	[R]	123.99	345.00	0.36	No.11
	[L]	124.00	345.00	0.36	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.01	13.50	0.15	No.1
	[L]	-2.01	13.50	0.15	No.1
Shear stress in steel sections (MPa)	[R]	-14.01	199.19	0.07	No.11
	[L]	-16.58	199.19	0.08	No.11
Normal stress / shear interaction (MPa)	[R]	-120.95	345.00	0.35	No.11
	[L]	-121.73	345.00	0.35	No.11
Shear in connection (kN/m)	[R]	97.05	418.75	0.23	No.11
	[L]	122.54	418.75	0.29	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	597.54	6346.73	0.09	No.7
	[L]	702.45	6346.73	0.11	No.7
Sagging, Plastic resistance (kN.m)	[R]	7171.55	15343.74	0.47	No.10
	[L]	7171.97	15343.74	0.47	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.14	1.00	0.14	No.7
	[L]	0.17	1.00	0.17	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.56	69.57	0.05	-
	[L]	3.56	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	12.82	139.13	0.09	-
	[L]	12.83	139.13	0.09	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	20.52	90.00	0.23	-
	[L]	25.46	90.00	0.28	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.21	-
	[L]	0.03	0.13	0.26	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2695.35	-154.03	2695.18	-124.98	-9.47
SDL1	17.20	1142.89	-64.54	1143.05	-52.81	-2.53
Increased SDL1	17.20	1290.11	-75.62	1290.30	-58.86	-2.86
Reduced SDL1	17.20	1041.30	-57.49	1041.28	-48.33	-2.31
SDL2	17.20	32.70	-2.27	32.70	-1.03	-0.07
Concrete shrinkage	17.40	619.85	-2.67	619.82	-1.20	-1.41
primary effect		554.75		554.75		
secondary effect		65.10	-2.67	65.07	-1.20	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1697.33	3.19	-1697.28	1.99	2.88
primary effect		-1605.82		-1605.82		
secondary effect		-91.50	3.19	-91.46	1.99	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1697.33	-3.19	1697.28	-1.99	-2.88
primary effect		1605.82		1605.82		
secondary effect		91.50	-3.19	91.46	-1.99	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	962.94	0.00	-58.43	12.87	-39.87	3.12	-1.58
Load model 1 TS	905.03	0.00	-57.28	51.93	-25.69	22.18	-1.57
Fatigue LM3 Left-hand slow lane	0.00	612.69	0.00	-46.17	1.41	-33.73	
Fatigue LM3 Right-hand slow lane	-59.50	1.78	7.51	0.00	5.83	-2.10	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.032	0.133	0.24	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.90	18.00	0.38	No.1
	[L]	-6.90	18.00	0.38	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.89	300.00	0.14	No.8
	[L]	41.88	300.00	0.14	No.8
Stress in top fibre of steel section (MPa)	[R]	-185.05	345.00	0.54	No.15
	[L]	-185.06	345.00	0.54	No.15
Stress in bottom fibre of steel section (MPa)	[R]	199.73	345.00	0.58	No.11
	[L]	199.73	345.00	0.58	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.72	13.50	0.20	No.1
	[L]	-2.72	13.50	0.20	No.1
Shear stress in steel sections (MPa)	[R]	-7.93	199.19	0.04	No.11
	[L]	-11.05	199.19	0.06	No.11
Normal stress / shear interaction (MPa)	[R]	-191.49	345.00	0.56	No.11
	[L]	-191.99	345.00	0.56	No.11
Shear in connection (kN/m)	[R]	53.88	418.75	0.13	No.11
	[L]	86.44	418.75	0.21	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	339.28	6346.73	0.05	No.7
	[L]	471.97	6346.73	0.07	No.7
Sagging, Plastic resistance (kN.m)	[R]	10026.60	15343.74	0.65	No.10
	[L]	10026.69	15343.74	0.65	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.08	1.00	0.08	No.7
	[L]	0.11	1.00	0.11	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.91	69.57	0.08	-
	[L]	5.91	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	21.30	139.13	0.15	-
	[L]	21.31	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	14.55	90.00	0.16	-
	[L]	19.11	90.00	0.21	-
Interaction connection / upper flange (MPa)	[R]	0.02	0.13	0.16	-
	[L]	0.03	0.13	0.22	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3218.37	-62.15	3218.14	-32.95	-11.64
SDL1	17.20	1363.41	-26.18	1363.15	-14.20	-3.11
Increased SDL1	17.20	1545.17	-31.78	1545.09	-14.39	-3.52
Reduced SDL1	17.20	1237.53	-22.22	1237.14	-14.24	-2.84
SDL2	17.20	38.68	-1.09	38.68	0.02	-0.09
Concrete shrinkage	17.40	625.73	-0.93	625.79	-0.02	-1.68
primary effect		554.75		554.75		
secondary effect		70.98	-0.93	71.05	-0.02	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1705.18	1.12	-1705.00	0.70	3.43
primary effect		-1605.82		-1605.82		
secondary effect		-99.35	1.12	-99.18	0.70	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1705.18	-1.12	1705.00	-0.70	-3.43
primary effect		1605.82		1605.82		
secondary effect		99.35	-1.12	99.18	-0.70	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1177.25	0.00	-31.71	3.93	-15.22	10.75	-1.96
Load model 1 TS	1178.85	0.00	-28.50	28.35	-2.98	3.65	-1.94
Fatigue LM3 Left-hand slow lane	0.00	739.75	3.06	-30.85	14.74	-18.37	
Fatigue LM3 Right-hand slow lane	-57.39	0.00	6.29	-2.45	4.65	-5.03	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.039	0.133	0.29	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.31	18.00	0.46	No.1
	[L]	-8.31	18.00	0.46	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	32.35	300.00	0.11	No.12
	[L]	32.34	300.00	0.11	No.12
Stress in top fibre of steel section (MPa)	[R]	-209.93	345.00	0.61	No.15
	[L]	-209.94	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	238.85	345.00	0.69	No.11
	[L]	238.86	345.00	0.69	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-3.08	13.50	0.23	No.1
	[L]	-3.08	13.50	0.23	No.1
Shear stress in steel sections (MPa)	[R]	-2.07	199.19	0.01	No.11
	[L]	-4.92	199.19	0.02	No.11
Normal stress / shear interaction (MPa)	[R]	-228.59	345.00	0.66	No.11
	[L]	-228.75	345.00	0.66	No.11
Shear in connection (kN/m)	[R]	13.32	283.27	0.05	No.11
	[L]	41.44	283.27	0.15	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	88.47	6346.73	0.01	No.7
	[L]	210.48	6346.73	0.03	No.7
Sagging, Plastic resistance (kN.m)	[R]	11495.17	15343.74	0.75	No.10
	[L]	11495.80	15343.74	0.75	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.02	1.00	0.02	No.7
	[L]	0.05	1.00	0.05	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	7.13	69.57	0.10	-
	[L]	7.13	69.57	0.10	-
Bending stress range in bottom flange (MPa)	[R]	25.72	139.13	0.18	-
	[L]	25.72	139.13	0.18	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	20.26	90.00	0.23	-
	[L]	20.75	90.00	0.23	-
Interaction connection / upper flange (MPa)	[R]	0.02	0.13	0.18	-
	[L]	0.03	0.13	0.23	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3273.25	-6.38	3274.15	8.34	-11.92
SDL1	17.20	1386.94	-3.27	1386.39	2.10	-3.19
Increased SDL1	17.20	1569.48	-3.22	1569.15	2.52	-3.60
Reduced SDL1	17.20	1260.14	-2.37	1260.45	3.06	-2.90
SDL2	17.20	38.63	-0.01	38.61	-0.03	-0.09
Concrete shrinkage	17.40	625.81	0.10	625.86	0.01	-1.71
primary effect		554.75		554.75		
secondary effect		71.06	0.10	71.11	0.01	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1705.41	-0.11	-1705.07	0.86	3.50
primary effect		-1605.82		-1605.82		
secondary effect		-99.59	-0.11	-99.24	0.86	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1705.41	0.11	1705.07	-0.86	-3.50
primary effect		1605.82		1605.82		
secondary effect		99.59	0.11	99.24	-0.86	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1183.18	0.00	-13.69	12.68	-12.47	14.02	-2.00
Load model 1 TS	1184.29	0.00	-0.15	1.04	-1.38	0.39	-1.99
Fatigue LM3 Left-hand slow lane	0.00	738.50	16.47	-17.22	17.32	-16.36	
Fatigue LM3 Right-hand slow lane	-53.09	0.00	4.86	-4.97	4.95	-4.88	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.040	0.133	0.30	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.37	18.00	0.46	No.1
	[L]	-8.37	18.00	0.46	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	31.43	300.00	0.10	No.12
	[L]	31.44	300.00	0.10	No.12
Stress in top fibre of steel section (MPa)	[R]	-212.34	345.00	0.62	No.15
	[L]	-212.32	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	241.83	345.00	0.70	No.11
	[L]	241.81	345.00	0.70	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-3.11	13.50	0.23	No.1
	[L]	-3.11	13.50	0.23	No.1
Shear stress in steel sections (MPa)	[R]	-0.83	199.19	0.00	-
	[L]	-0.74	199.19	0.00	-
Normal stress / shear interaction (MPa)	[R]	-231.43	345.00	0.67	No.11
	[L]	-231.41	345.00	0.67	No.11
Shear in connection (kN/m)	[R]	7.10	283.27	0.03	No.10
	[L]	6.66	283.27	0.02	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	34.82	6346.73	0.01	No.8
	[L]	31.66	6346.73	0.00	-
Sagging, Plastic resistance (kN.m)	[R]	11612.06	15343.74	0.76	No.10
	[L]	11611.77	15343.74	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.01	1.00	0.01	No.8
	[L]	0.01	1.00	0.01	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	7.12	69.57	0.10	-
	[L]	7.12	69.57	0.10	-
Bending stress range in bottom flange (MPa)	[R]	25.68	139.13	0.18	-
	[L]	25.69	139.13	0.18	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	20.61	90.00	0.23	-
	[L]	20.62	90.00	0.23	-
Interaction connection / upper flange (MPa)	[R]	0.02	0.13	0.18	-
	[L]	0.02	0.13	0.18	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3218.10	33.06	3218.13	61.68	-11.64
SDL1	17.20	1363.29	13.92	1363.45	26.28	-3.11
Increased SDL1	17.20	1545.04	14.47	1544.97	31.44	-3.52
Reduced SDL1	17.20	1237.09	14.35	1237.56	22.31	-2.84
SDL2	17.20	38.69	-0.03	38.70	1.11	-0.09
Concrete shrinkage	17.40	625.81	-0.01	625.71	0.89	-1.68
primary effect		554.75		554.75		
secondary effect		71.06	-0.01	70.96	0.89	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1705.57	0.49	-1705.05	-0.89	3.43
primary effect		-1605.82		-1605.82		
secondary effect		-99.75	0.49	-99.22	-0.89	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1705.57	-0.49	1705.05	0.89	-3.43
primary effect		1605.82		1605.82		
secondary effect		99.75	-0.49	99.22	0.89	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1177.00	0.00	-10.75	14.92	-3.91	31.71	-1.96
Load model 1 TS	1178.82	0.00	-3.03	3.34	-28.56	28.81	-1.94
Fatigue LM3 Left-hand slow lane	0.00	739.82	18.02	-14.66	30.68	-3.03	
Fatigue LM3 Right-hand slow lane	-57.38	0.00	5.04	-4.67	2.44	-6.30	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.039	0.133	0.29	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.31	18.00	0.46	No.1
	[L]	-8.31	18.00	0.46	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	32.34	300.00	0.11	No.12
	[L]	32.34	300.00	0.11	No.12
Stress in top fibre of steel section (MPa)	[R]	-209.93	345.00	0.61	No.15
	[L]	-209.94	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	238.84	345.00	0.69	No.11
	[L]	238.85	345.00	0.69	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-3.08	13.50	0.23	No.1
	[L]	-3.08	13.50	0.23	No.1
Shear stress in steel sections (MPa)	[R]	-4.90	199.19	0.02	No.11
	[L]	-2.07	199.19	0.01	No.1
Normal stress / shear interaction (MPa)	[R]	-228.73	345.00	0.66	No.11
	[L]	-228.59	345.00	0.66	No.11
Shear in connection (kN/m)	[R]	41.40	283.27	0.15	No.11
	[L]	13.36	283.27	0.05	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	209.81	6346.73	0.03	No.7
	[L]	88.78	6346.73	0.01	No.1
Sagging, Plastic resistance (kN.m)	[R]	11494.83	15343.74	0.75	No.10
	[L]	11495.77	15343.74	0.75	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.05	1.00	0.05	No.7
	[L]	0.02	1.00	0.02	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	7.13	69.57	0.10	-
	[L]	7.13	69.57	0.10	-
Bending stress range in bottom flange (MPa)	[R]	25.73	139.13	0.18	-
	[L]	25.73	139.13	0.18	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	20.63	90.00	0.23	-
	[L]	20.00	90.00	0.22	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.23	-
	[L]	0.02	0.13	0.18	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2695.42	124.52	2695.53	154.33	-9.47
SDL1	17.20	1142.95	52.99	1143.11	64.95	-2.53
Increased SDL1	17.20	1290.32	58.83	1290.22	75.80	-2.86
Reduced SDL1	17.20	1041.34	48.20	1041.33	57.55	-2.31
SDL2	17.20	32.70	1.01	32.70	2.26	-0.07
Concrete shrinkage	17.40	619.86	1.14	619.83	2.64	-1.41
primary effect		554.75		554.75		
secondary effect		65.11	1.14	65.08	2.64	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1697.26	-2.04	-1697.36	-3.24	2.88
primary effect		-1605.82		-1605.82		
secondary effect		-91.43	-2.04	-91.53	-3.24	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1697.26	2.04	1697.36	3.24	-2.88
primary effect		1605.82		1605.82		
secondary effect		91.43	2.04	91.53	3.24	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	962.97	0.00	-3.07	40.17	-12.85	58.20	-1.58
Load model 1 TS	905.16	0.00	-22.75	22.50	-52.33	56.99	-1.57
Fatigue LM3 Left-hand slow lane	0.00	612.70	33.80	-1.44	46.23	0.00	
Fatigue LM3 Right-hand slow lane	-59.50	1.78	2.09	-5.84	0.00	-7.52	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.032	0.133	0.24	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.90	18.00	0.38	No.1
	[L]	-6.90	18.00	0.38	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.88	300.00	0.14	No.8
	[L]	41.89	300.00	0.14	No.8
Stress in top fibre of steel section (MPa)	[R]	-185.07	345.00	0.54	No.15
	[L]	-185.06	345.00	0.54	No.15
Stress in bottom fibre of steel section (MPa)	[R]	199.75	345.00	0.58	No.11
	[L]	199.75	345.00	0.58	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.72	13.50	0.20	No.1
	[L]	-2.72	13.50	0.20	No.1
Shear stress in steel sections (MPa)	[R]	-11.05	199.19	0.06	No.11
	[L]	-7.83	199.19	0.04	No.11
Normal stress / shear interaction (MPa)	[R]	-192.01	345.00	0.56	No.11
	[L]	-191.50	345.00	0.56	No.11
Shear in connection (kN/m)	[R]	86.25	418.75	0.21	No.11
	[L]	52.22	418.75	0.12	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	471.87	6346.73	0.07	No.7
	[L]	334.66	6346.73	0.05	No.7
Sagging, Plastic resistance (kN.m)	[R]	10027.24	15343.74	0.65	No.10
	[L]	10027.11	15343.74	0.65	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.11	1.00	0.11	No.7
	[L]	0.08	1.00	0.08	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.91	69.57	0.08	-
	[L]	5.91	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	21.31	139.13	0.15	-
	[L]	21.31	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	19.14	90.00	0.21	-
	[L]	14.59	90.00	0.16	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.23	-
	[L]	0.02	0.13	0.16	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1657.65	216.83	1657.73	241.95	-5.48
SDL1	17.20	704.41	91.77	704.52	103.02	-1.47
Increased SDL1	17.20	788.28	102.85	788.28	116.51	-1.65
Reduced SDL1	17.20	646.46	83.90	646.36	93.41	-1.34
SDL2	17.20	20.07	2.20	20.07	3.37	-0.04
Concrete shrinkage	17.40	604.07	3.07	604.03	7.30	-0.87
primary effect		554.75		554.75		
secondary effect		49.32	3.07	49.28	7.30	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1676.06	-4.47	-1676.14	-9.89	1.78
primary effect		-1605.82		-1605.82		
secondary effect		-70.24	-4.47	-70.32	-9.89	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1676.06	4.47	1676.14	9.89	-1.78
primary effect		1605.82		1605.82		
secondary effect		70.24	4.47	70.32	9.89	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	557.86	0.00	-6.10	71.07	-6.02	87.62	-0.91
Load model 1 TS	418.13	0.00	-39.11	47.63	-47.29	65.86	-0.90
Fatigue LM3 Left-hand slow lane	0.00	368.85	49.49	0.00	61.41	0.00	
Fatigue LM3 Right-hand slow lane	-44.12	2.66	0.00	-7.36	0.00	-10.76	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.018	0.133	0.14	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.28	18.00	0.24	No.1
	[L]	-4.28	18.00	0.24	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	59.96	300.00	0.20	No.4
	[L]	59.96	300.00	0.20	No.4
Stress in top fibre of steel section (MPa)	[R]	-122.73	345.00	0.36	No.11
	[L]	-122.73	345.00	0.36	No.11
Stress in bottom fibre of steel section (MPa)	[R]	124.00	345.00	0.36	No.11
	[L]	124.00	345.00	0.36	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.01	13.50	0.15	No.1
	[L]	-2.01	13.50	0.15	No.1
Shear stress in steel sections (MPa)	[R]	-16.59	199.19	0.08	No.11
	[L]	-14.01	199.19	0.07	No.11
Normal stress / shear interaction (MPa)	[R]	-121.73	345.00	0.35	No.11
	[L]	-121.01	345.00	0.35	No.11
Shear in connection (kN/m)	[R]	122.70	418.75	0.29	No.11
	[L]	97.07	418.75	0.23	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	702.96	6346.73	0.11	No.7
	[L]	597.85	6346.73	0.09	No.7
Sagging, Plastic resistance (kN.m)	[R]	7172.05	15343.74	0.47	No.10
	[L]	7171.87	15343.74	0.47	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.17	1.00	0.17	No.7
	[L]	0.14	1.00	0.14	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.56	69.57	0.05	-
	[L]	3.56	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	12.83	139.13	0.09	-
	[L]	12.82	139.13	0.09	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	25.42	90.00	0.28	-
	[L]	20.49	90.00	0.23	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.26	-
	[L]	0.03	0.13	0.21	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	126.79	304.90	126.83	316.73	-0.38
SDL1	17.20	53.72	129.34	53.71	134.20	-0.10
Increased SDL1	17.20	59.26	142.90	59.22	147.83	-0.11
Reduced SDL1	17.20	49.89	119.94	49.91	124.78	-0.09
SDL2	17.20	1.34	3.23	1.33	3.31	0.00
Concrete shrinkage	17.40	558.99	8.52	558.98	10.59	-0.07
primary effect		554.75		554.75		
secondary effect		4.24	8.52	4.23	10.59	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1611.97	-12.69	-1611.89	-15.32	0.14
primary effect		-1605.82		-1605.82		
secondary effect		-6.14	-12.69	-6.06	-15.32	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1611.97	12.69	1611.89	15.32	-0.14
primary effect		1605.82		1605.82		
secondary effect		6.14	12.69	6.06	15.32	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	37.88	0.00	-0.04	95.16	0.00	95.45	-0.06
Load model 1 TS	2.43	0.00	0.00	23.71	0.00	5.66	-0.06
Fatigue LM3 Left-hand slow lane	-0.01	25.70	63.88	0.00	65.05	-0.03	
Fatigue LM3 Right-hand slow lane	-3.86	0.00	0.00	-11.18	0.00	-11.24	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	[R]	-1.98	18.00	0.11	No.5
	[L]	-1.98	18.00	0.11	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	85.83	300.00	0.29	No.4
	[L]	85.83	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	[R]	35.35	345.00	0.10	No.6
	[L]	35.35	345.00	0.10	No.6
Stress in bottom fibre of steel section (MPa)	[R]	8.11	345.00	0.02	No.11
	[L]	8.12	345.00	0.02	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.01	13.50	0.08	No.1
	[L]	-1.01	13.50	0.08	No.1
Shear stress in steel sections (MPa)	[R]	-18.48	199.19	0.09	No.11
	[L]	-18.39	199.19	0.09	No.11
Normal stress / shear interaction (MPa)	[R]	-43.44	345.00	0.13	No.5
	[L]	-43.39	345.00	0.13	No.5
Shear in connection (kN/m)	[R]	107.63	418.75	0.26	No.11
	[L]	113.87	418.75	0.27	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 1
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	778.72	6346.73	0.12	No.7
	[L]	777.87	6346.73	0.12	No.7
Sagging, Plastic resistance (kN.m)	[R]	3252.69	15343.74	0.21	No.10
	[L]	3252.84	15343.74	0.21	No.10
Hogging, Plastic resistance (kN.m)	[R]	2177.44	11691.04	0.19	No.5
	[L]	2177.63	11691.04	0.19	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.18	1.00	0.18	No.7
	[L]	0.18	1.00	0.18	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.26	1.00	0.26	No.5
	[L]	0.26	1.00	0.26	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.32	69.57	0.00	-
	[L]	0.32	69.57	0.00	-
Bending stress range in bottom flange (MPa)	[R]	1.15	139.13	0.01	-
	[L]	1.14	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	34.48	90.00	0.38	-
	[L]	33.85	90.00	0.38	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.30	-
	[L]	0.04	0.13	0.29	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 1
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	-0.01	316.73			0.00
SDL1	17.20	0.00	134.20			0.00
Increased SDL1	17.20	0.06	147.83			0.00
Reduced SDL1	17.20	-0.03	124.78			0.00
SDL2	17.20	0.01	3.31			0.00
Concrete shrinkage	17.40	554.76	10.59			0.00
primary effect		554.75				
secondary effect		0.01	10.59			
axial force - slab		N = -768.64 kN				
Simpl. temp. load +DT°C	6.40	-1605.87	-15.32			0.00
primary effect		-1605.82				
secondary effect		-0.04	-15.32			
axial force - slab		N = 3137.53 kN				
Simpl. temp. load -DT°C	6.40	1605.87	15.32			0.00
primary effect		1605.82				
secondary effect		0.04	15.32			
axial force - slab		N = -3137.53 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	95.45			0.00
Load model 1 TS	0.00	0.00	0.00	5.66			0.00
Fatigue LM3 Left-hand slow lane	-0.29	0.05	65.05	-0.03			
Fatigue LM3 Right-hand slow lane	0.00	0.51	0.00	-11.24			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 1
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	-1.87	18.00	0.10	No.5
Tensile stress in reinforcement (top layer) (MPa)	88.00	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	40.60	345.00	0.12	No.6
Stress in bottom fibre of steel section (MPa)	-12.99	345.00	0.04	No.6
Compressive stress in top fibre of concrete (MPa)	-0.93	13.50	0.07	No.1
Shear stress in steel sections (MPa)	-18.48	199.19	0.09	No.11
Normal stress / shear interaction (MPa)	-47.67	345.00	0.14	No.5
Shear in connection (kN/m)	107.63	418.75	0.26	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	778.72	6346.73	0.12	No.7
Sagging, Plastic resistance (kN.m)	2963.64	15343.74	0.19	No.10
Hogging, Plastic resistance (kN.m)	2408.84	11691.04	0.21	No.5
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.18	1.00	0.18	No.7
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.29	1.00	0.29	No.5

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.02	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.02	139.13	0.00	-
Bending stress range in reinforcement (MPa)	86.98	130.83	0.66	-
Shear stress range in connection (MPa)	35.02	90.00	0.39	-
Interaction connection / upper flange (MPa)	0.04	0.13	0.30	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			0.01	-327.03	0.00
SDL1	17.20			-0.02	-152.79	0.00
Increased SDL1	17.20			0.00	-173.04	0.00
Reduced SDL1	17.20			0.00	-138.63	0.00
SDL2	17.20			0.00	-5.32	0.00
Concrete shrinkage	17.40			703.59	9.20	0.00
primary effect				703.63		
secondary effect				-0.03	9.20	
axial force - slab				N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40			-1889.18	-13.56	0.00
primary effect				-1889.31		
secondary effect				0.13	-13.56	
axial force - slab				N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40			1889.18	13.56	0.00
primary effect				1889.31		
secondary effect				-0.13	13.56	
axial force - slab				N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-116.09	0.00	0.00
Load model 1 TS	0.00	0.00			-103.45	0.00	0.00
Fatigue LM3 Left-hand slow lane	-0.06	0.01			0.00	-79.03	
Fatigue LM3 Right-hand slow lane	0.00	0.01			0.00	-8.49	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.5
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.16
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.6
Stress in bottom fibre of steel section (MPa)	-13.89	345.00	0.04	No.6
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.1
Shear stress in steel sections (MPa)	-23.01	199.19	0.12	No.1
Normal stress / shear interaction (MPa)	-54.92	345.00	0.16	No.5
Shear in connection (kN/m)	197.56	418.75	0.47	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	978.66	6346.73	0.15	No.1
Sagging, Plastic resistance (kN.m)	3537.37	16342.70	0.22	No.10
Hogging, Plastic resistance (kN.m)	2833.76	11864.01	0.24	No.5
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.23	1.00	0.23	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.5

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.00	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.00	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	45.72	90.00	0.51	-
Interaction connection / upper flange (MPa)	0.05	0.13	0.39	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	130.96	-327.03	130.91	-313.93	-0.38
SDL1	17.20	61.11	-152.79	61.09	-146.87	-0.10
Increased SDL1	17.20	69.23	-173.04	69.25	-166.51	-0.12
Reduced SDL1	17.20	55.47	-138.63	55.46	-133.29	-0.09
SDL2	17.20	2.13	-5.32	2.13	-5.03	0.00
Concrete shrinkage	17.40	699.91	9.20	699.90	5.41	-0.07
primary effect		703.63		703.63		
secondary effect		-3.72	9.20	-3.73	5.41	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1883.70	-13.56	-1883.65	-8.41	0.14
primary effect		-1889.31		-1889.31		
secondary effect		5.61	-13.56	5.66	-8.41	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1883.70	13.56	1883.65	8.41	-0.14
primary effect		1889.31		1889.31		
secondary effect		-5.61	13.56	-5.66	8.41	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	46.34	0.00	-116.09	0.00	-111.18	0.07	-0.06
Load model 1 TS	41.41	0.00	-103.45	0.00	-106.64	0.00	-0.06
Fatigue LM3 Left-hand slow lane	0.00	31.54	0.00	-79.03	0.00	-75.79	
Fatigue LM3 Right-hand slow lane	0.00	3.39	0.00	-8.49	0.00	-8.38	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.44	18.00	0.08	No.5
	[L]	-1.44	18.00	0.08	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.83	300.00	0.27	No.16
	[L]	80.83	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.32	345.00	0.11	No.6
	[L]	38.31	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	9.73	345.00	0.03	No.3
	[L]	9.73	345.00	0.03	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-22.23	199.19	0.11	No.1
	[L]	-23.01	199.19	0.12	No.1
Normal stress / shear interaction (MPa)	[R]	-49.88	345.00	0.14	No.5
	[L]	-50.80	345.00	0.15	No.5
Shear in connection (kN/m)	[R]	192.39	418.75	0.46	No.1
	[L]	197.56	418.75	0.47	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	949.44	6346.73	0.15	No.1
	[L]	978.66	6346.73	0.15	No.1
Sagging, Plastic resistance (kN.m)	[R]	3865.41	16342.70	0.24	No.10
	[L]	3865.55	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2571.00	11864.01	0.22	No.5
	[L]	2571.01	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.22	1.00	0.22	No.1
	[L]	0.23	1.00	0.23	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.27	69.57	0.00	-
	[L]	0.27	69.57	0.00	-
Bending stress range in bottom flange (MPa)	[R]	1.36	139.13	0.01	-
	[L]	1.37	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	43.17	90.00	0.48	-
	[L]	45.01	90.00	0.50	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.37	-
	[L]	0.05	0.13	0.39	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1676.78	-238.33	1676.81	-222.24	-5.53
SDL1	17.20	775.14	-108.24	775.06	-104.61	-1.47
Increased SDL1	17.20	888.33	-126.18	888.23	-118.62	-1.68
Reduced SDL1	17.20	696.83	-95.97	696.72	-94.92	-1.32
SDL2	17.20	23.06	-2.49	23.06	-3.57	-0.04
Concrete shrinkage	17.40	674.57	3.61	674.47	-0.93	-0.88
primary effect		703.63		703.63		
secondary effect		-29.06	3.61	-29.16	-0.93	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1848.71	-4.21	-1848.74	1.04	1.79
primary effect		-1889.31		-1889.31		
secondary effect		40.60	-4.21	40.57	1.04	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1848.71	4.21	1848.74	-1.04	-1.79
primary effect		1889.31		1889.31		
secondary effect		-40.60	4.21	-40.57	-1.04	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	627.60	0.00	-92.34	4.71	-79.20	2.71	-0.88
Load model 1 TS	724.04	0.00	-118.55	20.24	-91.78	8.02	-0.88
Fatigue LM3 Left-hand slow lane	0.00	417.60	0.00	-68.49	7.17	-60.76	
Fatigue LM3 Right-hand slow lane	0.00	49.76	0.00	-8.06	0.00	-6.12	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.018	0.133	0.13	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.22	18.00	0.23	No.1
	[L]	-4.22	18.00	0.23	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	58.43	300.00	0.19	No.16
	[L]	58.42	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-139.84	345.00	0.41	No.15
	[L]	-139.85	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	133.08	345.00	0.39	No.11
	[L]	133.08	345.00	0.39	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.76	13.50	0.13	No.1
	[L]	-1.76	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-16.22	199.19	0.08	No.11
	[L]	-18.22	199.19	0.09	No.1
Normal stress / shear interaction (MPa)	[R]	-135.67	345.00	0.39	No.15
	[L]	-136.27	345.00	0.39	No.15
Shear in connection (kN/m)	[R]	145.09	418.75	0.35	No.11
	[L]	170.44	418.75	0.41	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	696.74	6346.73	0.11	No.7
	[L]	780.14	6346.73	0.12	No.1
Sagging, Plastic resistance (kN.m)	[R]	8013.51	16342.70	0.49	No.10
	[L]	8013.67	16342.70	0.49	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.16	1.00	0.16	No.7
	[L]	0.18	1.00	0.18	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.83	69.57	0.04	-
	[L]	2.83	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	14.11	139.13	0.10	-
	[L]	14.12	139.13	0.10	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	30.23	90.00	0.34	-
	[L]	30.48	90.00	0.34	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.27	-
	[L]	0.04	0.13	0.29	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2710.07	-146.23	2710.66	-129.82	-9.54
SDL1	17.20	1252.40	-65.99	1252.41	-61.98	-2.54
Increased SDL1	17.20	1438.35	-78.00	1438.56	-69.40	-2.91
Reduced SDL1	17.20	1123.92	-58.14	1123.59	-56.81	-2.28
SDL2	17.20	36.24	-1.14	36.23	-2.43	-0.08
Concrete shrinkage	17.40	679.99	-0.92	680.11	-0.42	-1.41
primary effect		703.63		703.63		
secondary effect		-23.64	-0.92	-23.52	-0.42	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1855.96	0.87	-1856.20	0.84	2.88
primary effect		-1889.31		-1889.31		
secondary effect		33.36	0.87	33.11	0.84	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1855.96	-0.87	1856.20	-0.84	-2.88
primary effect		1889.31		1889.31		
secondary effect		-33.36	-0.87	-33.11	-0.84	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1012.81	0.00	-64.05	2.57	-52.23	9.83	-1.52
Load model 1 TS	1200.69	0.00	-97.87	0.42	-70.70	28.79	-1.54
Fatigue LM3 Left-hand slow lane	0.00	660.76	9.07	-56.63	16.85	-48.06	
Fatigue LM3 Right-hand slow lane	0.00	81.28	0.00	-5.65	0.00	-3.69	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.031	0.133	0.23	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.38	18.00	0.35	No.1
	[L]	-6.38	18.00	0.35	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.56	300.00	0.14	No.16
	[L]	41.56	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-186.33	345.00	0.54	No.15
	[L]	-186.31	345.00	0.54	No.15
Stress in bottom fibre of steel section (MPa)	[R]	207.60	345.00	0.60	No.11
	[L]	207.56	345.00	0.60	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.43	13.50	0.18	No.1
	[L]	-2.43	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-10.22	199.19	0.05	No.11
	[L]	-12.20	199.19	0.06	No.11
Normal stress / shear interaction (MPa)	[R]	-199.16	345.00	0.58	No.11
	[L]	-199.68	345.00	0.58	No.11
Shear in connection (kN/m)	[R]	97.79	418.75	0.23	No.11
	[L]	122.69	418.75	0.29	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	438.60	6346.73	0.07	No.7
	[L]	523.76	6346.73	0.08	No.7
Sagging, Plastic resistance (kN.m)	[R]	10877.39	16342.70	0.67	No.10
	[L]	10875.84	16342.70	0.67	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.10	1.00	0.10	No.7
	[L]	0.12	1.00	0.12	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.48	69.57	0.06	-
	[L]	4.48	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	22.33	139.13	0.16	-
	[L]	22.33	139.13	0.16	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	28.88	90.00	0.32	-
	[L]	29.24	90.00	0.32	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.26	-
	[L]	0.04	0.13	0.27	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3228.87	-54.84	3228.61	-39.74	-11.73
SDL1	17.20	1492.00	-23.75	1491.77	-20.26	-3.12
Increased SDL1	17.20	1715.48	-29.95	1715.33	-20.56	-3.58
Reduced SDL1	17.20	1337.56	-20.01	1337.16	-19.76	-2.80
SDL2	17.20	43.02	0.00	43.00	-1.29	-0.09
Concrete shrinkage	17.40	683.32	-0.76	683.12	-0.11	-1.68
primary effect		703.63		703.63		
secondary effect		-20.31	-0.76	-20.50	-0.11	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1860.25	0.62	-1860.95	-1.42	3.43
primary effect		-1889.31		-1889.31		
secondary effect		29.06	0.62	28.36	-1.42	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1860.25	-0.62	1860.95	1.42	-3.43
primary effect		1889.31		1889.31		
secondary effect		-29.06	-0.62	-28.36	1.42	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1207.51	0.00	-40.90	13.18	-29.86	22.15	-1.87
Load model 1 TS	1452.01	0.00	-74.12	22.20	-44.12	51.39	-1.91
Fatigue LM3 Left-hand slow lane	0.00	770.47	21.62	-42.69	30.35	-34.39	
Fatigue LM3 Right-hand slow lane	0.00	95.65	0.00	-3.26	0.74	-1.23	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.038	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.48	18.00	0.42	No.1
	[L]	-7.49	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	33.07	300.00	0.11	No.16
	[L]	33.08	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-209.70	345.00	0.61	No.15
	[L]	-209.71	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	245.35	345.00	0.71	No.11
	[L]	245.35	345.00	0.71	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.76	13.50	0.20	No.1
	[L]	-2.76	13.50	0.20	No.1
Shear stress in steel sections (MPa)	[R]	-4.29	199.19	0.02	No.9
	[L]	-6.31	199.19	0.03	No.11
Normal stress / shear interaction (MPa)	[R]	-235.01	345.00	0.68	No.11
	[L]	-235.20	345.00	0.68	No.11
Shear in connection (kN/m)	[R]	49.82	283.27	0.18	No.9
	[L]	76.16	283.27	0.27	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	183.14	6346.73	0.03	No.7
	[L]	270.51	6346.73	0.04	No.7
Sagging, Plastic resistance (kN.m)	[R]	12329.14	16342.70	0.75	No.10
	[L]	12328.86	16342.70	0.75	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.04	1.00	0.04	No.7
	[L]	0.06	1.00	0.06	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.23	69.57	0.08	-
	[L]	5.23	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	26.04	139.13	0.19	-
	[L]	26.04	139.13	0.19	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	42.59	90.00	0.47	-
	[L]	42.30	90.00	0.47	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.36	-
	[L]	0.05	0.13	0.37	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3295.18	-8.14	3295.55	8.93	-12.01
SDL1	17.20	1525.82	-4.50	1525.52	3.89	-3.19
Increased SDL1	17.20	1750.55	-4.32	1750.39	3.96	-3.66
Reduced SDL1	17.20	1370.18	-4.52	1369.80	3.71	-2.87
SDL2	17.20	45.15	-0.25	45.14	0.23	-0.09
Concrete shrinkage	17.40	683.19	0.09	683.16	-0.15	-1.72
primary effect		703.63		703.63		
secondary effect		-20.44	0.09	-20.47	-0.15	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1860.59	0.44	-1860.49	-0.25	3.50
primary effect		-1889.31		-1889.31		
secondary effect		28.72	0.44	28.82	-0.25	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1860.59	-0.44	1860.49	0.25	-3.50
primary effect		1889.31		1889.31		
secondary effect		-28.72	-0.44	-28.82	0.25	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1220.96	0.00	-27.59	26.18	-26.07	27.47	-1.92
Load model 1 TS	1451.76	0.00	-47.82	50.53	-50.33	48.61	-1.96
Fatigue LM3 Left-hand slow lane	0.00	772.26	32.05	-32.67	33.21	-32.01	
Fatigue LM3 Right-hand slow lane	0.00	95.96	0.99	-1.09	1.10	-1.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.039	0.133	0.29	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.55	18.00	0.42	No.1
	[L]	-7.55	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	31.79	300.00	0.11	No.16
	[L]	31.78	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-212.56	345.00	0.62	No.15
	[L]	-212.55	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	249.09	345.00	0.72	No.11
	[L]	249.08	345.00	0.72	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.81	13.50	0.21	No.1
	[L]	-2.81	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-2.80	199.19	0.01	No.3
	[L]	-2.78	199.19	0.01	No.4
Normal stress / shear interaction (MPa)	[R]	-238.59	345.00	0.69	No.11
	[L]	-238.57	345.00	0.69	No.11
Shear in connection (kN/m)	[R]	43.07	283.27	0.15	No.3
	[L]	42.98	283.27	0.15	No.4

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	120.42	6346.73	0.02	No.1
	[L]	119.23	6346.73	0.02	No.2
Sagging, Plastic resistance (kN.m)	[R]	12476.07	16342.70	0.76	No.10
	[L]	12475.99	16342.70	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.03	1.00	0.03	No.1
	[L]	0.03	1.00	0.03	No.2
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.24	69.57	0.08	-
	[L]	5.24	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	26.11	139.13	0.19	-
	[L]	26.10	139.13	0.19	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	42.91	90.00	0.48	-
	[L]	42.57	90.00	0.47	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.37	-
	[L]	0.05	0.13	0.37	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3228.40	40.28	3228.51	54.20	-11.73
SDL1	17.20	1491.93	19.95	1491.88	23.58	-3.12
Increased SDL1	17.20	1715.48	20.23	1715.17	29.40	-3.58
Reduced SDL1	17.20	1337.32	19.43	1337.52	19.91	-2.80
SDL2	17.20	43.01	1.28	43.01	-0.02	-0.09
Concrete shrinkage	17.40	683.19	-0.01	683.20	0.56	-1.68
primary effect		703.63		703.63		
secondary effect		-20.44	-0.01	-20.43	0.56	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1859.81	-0.98	-1859.86	0.12	3.43
primary effect		-1889.31		-1889.31		
secondary effect		29.50	-0.98	29.45	0.12	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1859.81	0.98	1859.86	-0.12	-3.43
primary effect		1889.31		1889.31		
secondary effect		-29.50	0.98	-29.45	-0.12	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1207.67	0.00	-21.99	30.07	-13.15	40.60	-1.87
Load model 1 TS	1451.99	0.00	-51.48	43.90	-21.57	74.11	-1.91
Fatigue LM3 Left-hand slow lane	0.00	770.51	35.21	-30.36	42.99	-21.54	
Fatigue LM3 Right-hand slow lane	0.00	95.63	1.27	-0.78	3.26	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.038	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.49	18.00	0.42	No.1
	[L]	-7.49	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	33.10	300.00	0.11	No.16
	[L]	33.11	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-209.69	345.00	0.61	No.15
	[L]	-209.69	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	245.33	345.00	0.71	No.11
	[L]	245.33	345.00	0.71	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.76	13.50	0.20	No.1
	[L]	-2.76	13.50	0.20	No.1
Shear stress in steel sections (MPa)	[R]	-6.24	199.19	0.03	No.9
	[L]	-4.28	199.19	0.02	No.3
Normal stress / shear interaction (MPa)	[R]	-235.17	345.00	0.68	No.11
	[L]	-235.00	345.00	0.68	No.11
Shear in connection (kN/m)	[R]	75.50	283.27	0.27	No.9
	[L]	49.42	283.27	0.17	No.3

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	268.23	6346.73	0.04	No.7
	[L]	183.29	6346.73	0.03	No.1
Sagging, Plastic resistance (kN.m)	[R]	12327.29	16342.70	0.75	No.10
	[L]	12327.47	16342.70	0.75	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.06	1.00	0.06	No.7
	[L]	0.04	1.00	0.04	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.23	69.57	0.08	-
	[L]	5.23	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	26.04	139.13	0.19	-
	[L]	26.04	139.13	0.19	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	42.45	90.00	0.47	-
	[L]	43.13	90.00	0.48	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.37	-
	[L]	0.05	0.13	0.37	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2709.91	131.23	2710.38	146.83	-9.54
SDL1	17.20	1252.44	61.96	1252.54	66.25	-2.54
Increased SDL1	17.20	1438.45	69.51	1438.28	77.85	-2.91
Reduced SDL1	17.20	1123.71	56.61	1123.68	57.72	-2.28
SDL2	17.20	36.24	2.42	36.24	1.15	-0.08
Concrete shrinkage	17.40	680.15	0.35	680.03	1.00	-1.41
primary effect		703.63		703.63		
secondary effect		-23.47	0.35	-23.60	1.00	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1856.00	-1.20	-1856.26	-1.40	2.88
primary effect		-1889.31		-1889.31		
secondary effect		33.31	-1.20	33.05	-1.40	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1856.00	1.20	1856.26	1.40	-2.88
primary effect		1889.31		1889.31		
secondary effect		-33.31	1.20	-33.05	1.40	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1012.83	0.00	-9.84	52.23	-2.58	64.20	-1.52
Load model 1 TS	1200.59	0.00	-28.90	64.80	-0.19	97.99	-1.54
Fatigue LM3 Left-hand slow lane	0.00	660.69	47.92	-17.00	56.60	-9.08	
Fatigue LM3 Right-hand slow lane	0.00	81.27	3.69	0.00	5.65	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.031	0.133	0.23	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.38	18.00	0.35	No.1
	[L]	-6.38	18.00	0.35	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.56	300.00	0.14	No.16
	[L]	41.56	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-186.32	345.00	0.54	No.15
	[L]	-186.30	345.00	0.54	No.15
Stress in bottom fibre of steel section (MPa)	[R]	207.58	345.00	0.60	No.11
	[L]	207.56	345.00	0.60	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.43	13.50	0.18	No.1
	[L]	-2.43	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-12.24	199.19	0.06	No.11
	[L]	-10.08	199.19	0.05	No.11
Normal stress / shear interaction (MPa)	[R]	-199.69	345.00	0.58	No.11
	[L]	-199.13	345.00	0.58	No.11
Shear in connection (kN/m)	[R]	122.98	418.75	0.29	No.11
	[L]	94.43	418.75	0.23	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	524.82	6346.73	0.08	No.7
	[L]	432.61	6346.73	0.07	No.7
Sagging, Plastic resistance (kN.m)	[R]	10876.56	16342.70	0.67	No.10
	[L]	10875.89	16342.70	0.67	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.12	1.00	0.12	No.7
	[L]	0.10	1.00	0.10	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.48	69.57	0.06	-
	[L]	4.48	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	22.33	139.13	0.16	-
	[L]	22.33	139.13	0.16	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	29.23	90.00	0.32	-
	[L]	28.89	90.00	0.32	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.27	-
	[L]	0.03	0.13	0.26	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1676.78	222.25	1676.71	238.15	-5.53
SDL1	17.20	775.04	104.64	775.16	108.28	-1.47
Increased SDL1	17.20	888.34	118.41	888.33	126.15	-1.68
Reduced SDL1	17.20	696.89	94.61	696.84	95.98	-1.32
SDL2	17.20	23.06	3.57	23.06	2.48	-0.04
Concrete shrinkage	17.40	674.52	0.85	674.51	-3.73	-0.88
primary effect		703.63		703.63		
secondary effect		-29.11	0.85	-29.12	-3.73	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1848.66	-1.17	-1848.51	4.57	1.79
primary effect		-1889.31		-1889.31		
secondary effect		40.65	-1.17	40.80	4.57	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1848.66	1.17	1848.51	-4.57	-1.79
primary effect		1889.31		1889.31		
secondary effect		-40.65	1.17	-40.80	-4.57	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	627.57	0.00	-2.70	79.44	-4.69	92.20	-0.88
Load model 1 TS	724.06	0.00	-7.75	91.87	-21.31	118.46	-0.88
Fatigue LM3 Left-hand slow lane	0.00	417.78	60.81	-7.17	68.50	0.00	
Fatigue LM3 Right-hand slow lane	0.00	49.76	6.14	0.00	8.05	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.018	0.133	0.13	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.22	18.00	0.23	No.1
	[L]	-4.22	18.00	0.23	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	58.43	300.00	0.19	No.16
	[L]	58.43	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-139.84	345.00	0.41	No.15
	[L]	-139.85	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	133.07	345.00	0.39	No.11
	[L]	133.08	345.00	0.39	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.76	13.50	0.13	No.1
	[L]	-1.76	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-18.21	199.19	0.09	No.1
	[L]	-16.23	199.19	0.08	No.11
Normal stress / shear interaction (MPa)	[R]	-136.26	345.00	0.39	No.15
	[L]	-135.67	345.00	0.39	No.15
Shear in connection (kN/m)	[R]	170.44	418.75	0.41	No.1
	[L]	145.16	418.75	0.35	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	779.55	6346.73	0.12	No.1
	[L]	696.84	6346.73	0.11	No.7
Sagging, Plastic resistance (kN.m)	[R]	8013.21	16342.70	0.49	No.10
	[L]	8013.54	16342.70	0.49	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.18	1.00	0.18	No.1
	[L]	0.16	1.00	0.16	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.83	69.57	0.04	-
	[L]	2.83	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	14.12	139.13	0.10	-
	[L]	14.12	139.13	0.10	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	30.48	90.00	0.34	-
	[L]	30.25	90.00	0.34	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.29	-
	[L]	0.04	0.13	0.27	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	130.94	313.88	130.88	326.80	-0.38
SDL1	17.20	61.10	146.88	61.11	152.82	-0.10
Increased SDL1	17.20	69.23	166.54	69.27	173.20	-0.12
Reduced SDL1	17.20	55.45	133.31	55.47	138.62	-0.09
SDL2	17.20	2.13	5.04	2.13	5.33	0.00
Concrete shrinkage	17.40	699.92	-5.44	699.93	-9.09	-0.07
primary effect		703.63		703.63		
secondary effect		-3.71	-5.44	-3.69	-9.09	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1883.68	8.47	-1883.67	13.58	0.14
primary effect		-1889.31		-1889.31		
secondary effect		5.63	8.47	5.64	13.58	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1883.68	-8.47	1883.67	-13.58	-0.14
primary effect		1889.31		1889.31		
secondary effect		-5.63	-8.47	-5.64	-13.58	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	46.34	0.00	-0.07	111.16	0.00	116.07	-0.06
Load model 1 TS	41.41	0.00	0.00	109.73	0.00	103.46	-0.06
Fatigue LM3 Left-hand slow lane	-0.02	31.54	75.78	0.00	79.00	-0.03	
Fatigue LM3 Right-hand slow lane	-0.01	3.39	8.38	0.00	8.49	-0.02	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.44	18.00	0.08	No.5
	[L]	-1.44	18.00	0.08	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.83	300.00	0.27	No.16
	[L]	80.83	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.32	345.00	0.11	No.6
	[L]	38.32	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	9.73	345.00	0.03	No.3
	[L]	9.73	345.00	0.03	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-23.00	199.19	0.12	No.1
	[L]	-22.33	199.19	0.11	No.1
Normal stress / shear interaction (MPa)	[R]	-50.80	345.00	0.15	No.5
	[L]	-49.96	345.00	0.14	No.5
Shear in connection (kN/m)	[R]	197.64	418.75	0.47	No.1
	[L]	194.25	418.75	0.46	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 2
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	978.56	6346.73	0.15	No.1
	[L]	953.57	6346.73	0.15	No.1
Sagging, Plastic resistance (kN.m)	[R]	3865.47	16342.70	0.24	No.10
	[L]	3865.50	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2571.06	11864.01	0.22	No.5
	[L]	2571.02	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.23	1.00	0.23	No.1
	[L]	0.22	1.00	0.22	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.27	69.57	0.00	-
	[L]	0.27	69.57	0.00	-
Bending stress range in bottom flange (MPa)	[R]	1.37	139.13	0.01	-
	[L]	1.37	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	45.02	90.00	0.50	-
	[L]	43.17	90.00	0.48	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.39	-
	[L]	0.05	0.13	0.37	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 2
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	0.02	326.80			0.00
SDL1	17.20	-0.03	152.82			0.00
Increased SDL1	17.20	-0.03	173.20			0.00
Reduced SDL1	17.20	0.01	138.62			0.00
SDL2	17.20	0.00	5.33			0.00
Concrete shrinkage	17.40	703.58	-9.09			0.00
primary effect		703.63				
secondary effect		-0.05	-9.09			
axial force - slab		N = -1064.27 kN				
Simpl. temp. load +DT°C	6.40	-1889.15	13.58			0.00
primary effect		-1889.31				
secondary effect		0.16	13.58			
axial force - slab		N = 4344.28 kN				
Simpl. temp. load -DT°C	6.40	1889.15	-13.58			0.00
primary effect		1889.31				
secondary effect		-0.16	-13.58			
axial force - slab		N = -4344.28 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	116.07			0.00
Load model 1 TS	0.00	0.00	0.00	103.46			0.00
Fatigue LM3 Left-hand slow lane	-0.06	0.01	79.00	-0.03			
Fatigue LM3 Right-hand slow lane	-0.01	0.01	8.49	-0.02			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 2
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.64	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.89	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-23.00	199.19	0.12	No.1
Normal stress / shear interaction (MPa)	-54.92	345.00	0.16	No.5
Shear in connection (kN/m)	197.64	418.75	0.47	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	978.56	6346.73	0.15	No.1
Sagging, Plastic resistance (kN.m)	3537.34	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.74	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.23	1.00	0.23	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.00	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.00	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	45.72	90.00	0.51	-
Interaction connection / upper flange (MPa)	0.05	0.13	0.39	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			-0.02	-331.59	0.00
SDL1	17.20			0.01	-151.62	0.00
Increased SDL1	17.20			-0.02	-178.46	0.00
Reduced SDL1	17.20			-0.01	-133.28	0.00
SDL2	17.20			0.00	-5.28	0.00
Concrete shrinkage	17.40			703.62	0.08	0.00
primary effect				703.63		
secondary effect				-0.01	0.08	
axial force - slab				N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40			-1889.23	-0.39	0.00
primary effect				-1889.31		
secondary effect				0.08	-0.39	
axial force - slab				N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40			1889.23	0.39	0.00
primary effect				1889.31		
secondary effect				-0.08	0.39	
axial force - slab				N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-139.65	0.00	0.00
Load model 1 TS	0.00	0.00			-250.06	0.00	0.00
Fatigue LM3 Left-hand slow lane	-0.15	0.00			0.00	-133.63	
Fatigue LM3 Right-hand slow lane	-0.01	0.03			0.00	-23.39	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.90	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-28.41	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	-59.14	345.00	0.17	No.5
Shear in connection (kN/m)	292.82	418.75	0.70	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1221.79	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	3537.43	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.91	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.01	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	77.31	90.00	0.86	-
Interaction connection / upper flange (MPa)	0.00	0.13	0.00	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	132.75	-331.59	132.69	-317.60	-0.39
SDL1	17.20	60.68	-151.62	60.69	-145.52	-0.10
Increased SDL1	17.20	71.38	-178.46	71.36	-171.20	-0.12
Reduced SDL1	17.20	53.32	-133.28	53.30	-127.76	-0.09
SDL2	17.20	2.11	-5.28	2.11	-5.03	0.00
Concrete shrinkage	17.40	703.58	0.08	703.57	1.96	-0.07
primary effect		703.63		703.63		
secondary effect		-0.05	0.08	-0.06	1.96	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1889.02	-0.39	-1889.07	-2.64	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.29	-0.39	0.24	-2.64	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1889.02	0.39	1889.07	2.64	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.29	0.39	-0.24	2.64	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	55.65	0.00	-139.65	0.00	-132.80	0.15	-0.06
Load model 1 TS	99.92	0.00	-250.06	0.00	-231.73	0.00	-0.06
Fatigue LM3 Left-hand slow lane	0.00	53.29	0.00	-133.63	0.00	-120.83	
Fatigue LM3 Right-hand slow lane	0.00	9.37	0.00	-23.39	0.00	-22.69	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.52	18.00	0.08	No.5
	[L]	-1.52	18.00	0.08	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.58	300.00	0.27	No.16
	[L]	80.58	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.31	345.00	0.11	No.6
	[L]	38.31	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.18	345.00	0.04	No.3
	[L]	12.19	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-26.99	199.19	0.14	No.1
	[L]	-28.41	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	[R]	-53.74	345.00	0.16	No.5
	[L]	-55.15	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	276.34	418.75	0.66	No.1
	[L]	292.82	418.75	0.70	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1158.78	6346.73	0.18	No.1
	[L]	1221.79	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	[R]	3946.71	16342.70	0.24	No.10
	[L]	3946.77	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2579.67	11864.01	0.22	No.5
	[L]	2579.49	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.27	1.00	0.27	No.1
	[L]	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.46	69.57	0.01	-
	[L]	0.46	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	2.30	139.13	0.02	-
	[L]	2.31	139.13	0.02	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	68.82	90.00	0.76	-
	[L]	76.12	90.00	0.85	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.59	-
	[L]	0.09	0.13	0.66	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1694.46	-239.80	1694.71	-223.19	-5.56
SDL1	17.20	779.72	-111.38	779.72	-101.97	-1.47
Increased SDL1	17.20	909.16	-128.41	909.08	-119.81	-1.71
Reduced SDL1	17.20	690.14	-99.61	690.13	-89.62	-1.30
SDL2	17.20	24.00	-2.81	24.00	-3.58	-0.05
Concrete shrinkage	17.40	690.72	2.35	690.64	1.81	-0.88
primary effect		703.63		703.63		
secondary effect		-12.91	2.35	-12.99	1.81	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1869.87	-3.69	-1869.72	-2.37	1.79
primary effect		-1889.31		-1889.31		
secondary effect		19.44	-3.69	19.59	-2.37	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1869.87	3.69	1869.72	2.37	-1.79
primary effect		1889.31		1889.31		
secondary effect		-19.44	3.69	-19.59	2.37	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	620.45	0.00	-88.29	16.38	-99.48	8.96	-0.87
Load model 1 TS	927.06	0.00	-158.22	69.95	-176.98	56.63	-0.85
Fatigue LM3 Left-hand slow lane	0.00	436.77	37.36	-72.43	24.02	-94.54	
Fatigue LM3 Right-hand slow lane	0.00	133.85	0.00	-21.41	0.00	-16.64	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.017	0.133	0.13	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.57	18.00	0.25	No.1
	[L]	-4.57	18.00	0.25	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.26	300.00	0.19	No.16
	[L]	57.25	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-141.83	345.00	0.41	No.15
	[L]	-141.83	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	140.07	345.00	0.41	No.11
	[L]	140.06	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.77	13.50	0.13	No.1
	[L]	-1.77	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-19.60	199.19	0.10	No.1
	[L]	-19.45	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-137.82	345.00	0.40	No.15
	[L]	-138.32	345.00	0.40	No.15
Shear in connection (kN/m)	[R]	205.32	418.75	0.49	No.1
	[L]	193.15	418.75	0.46	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	841.11	6346.73	0.13	No.1
	[L]	833.67	6346.73	0.13	No.1
Sagging, Plastic resistance (kN.m)	[R]	8316.42	16342.70	0.51	No.10
	[L]	8316.51	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.1
	[L]	0.19	1.00	0.19	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.96	69.57	0.04	-
	[L]	2.96	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	14.77	139.13	0.11	-
	[L]	14.77	139.13	0.11	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	52.76	90.00	0.59	-
	[L]	48.86	90.00	0.54	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.46	-
	[L]	0.06	0.13	0.43	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2727.34	-144.86	2728.02	-130.37	-9.60
SDL1	17.20	1255.37	-68.21	1255.13	-59.49	-2.54
Increased SDL1	17.20	1460.48	-77.57	1460.33	-70.14	-2.95
Reduced SDL1	17.20	1113.05	-61.21	1113.20	-51.95	-2.25
SDL2	17.20	38.07	-1.45	38.07	-2.36	-0.08
Concrete shrinkage	17.40	681.43	1.51	681.48	0.47	-1.42
primary effect		703.63		703.63		
secondary effect		-22.20	1.51	-22.14	0.47	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1857.84	-1.61	-1857.88	-0.91	2.89
primary effect		-1889.31		-1889.31		
secondary effect		31.47	-1.61	31.43	-0.91	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1857.84	1.61	1857.88	0.91	-2.89
primary effect		1889.31		1889.31		
secondary effect		-31.47	1.61	-31.43	0.91	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	965.93	0.00	-63.94	29.93	-76.16	18.11	-1.49
Load model 1 TS	1371.88	0.00	-130.99	103.74	-155.46	80.26	-1.49
Fatigue LM3 Left-hand slow lane	0.00	631.57	54.83	-65.98	31.94	-90.33	
Fatigue LM3 Right-hand slow lane	0.00	216.98	0.00	-15.62	1.12	-12.08	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.030	0.133	0.22	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.62	18.00	0.37	No.1
	[L]	-6.62	18.00	0.37	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.77	300.00	0.14	No.16
	[L]	41.78	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-187.83	345.00	0.54	No.15
	[L]	-187.81	345.00	0.54	No.15
Stress in bottom fibre of steel section (MPa)	[R]	212.09	345.00	0.61	No.11
	[L]	212.07	345.00	0.61	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.45	13.50	0.18	No.1
	[L]	-2.45	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-13.65	199.19	0.07	No.1
	[L]	-13.17	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-203.59	345.00	0.59	No.11
	[L]	-203.96	345.00	0.59	No.11
Shear in connection (kN/m)	[R]	158.92	418.75	0.38	No.1
	[L]	142.10	418.75	0.34	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	586.54	6346.73	0.09	No.1
	[L]	565.39	6346.73	0.09	No.1
Sagging, Plastic resistance (kN.m)	[R]	11084.60	16342.70	0.68	No.10
	[L]	11083.77	16342.70	0.68	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.14	1.00	0.14	No.1
	[L]	0.13	1.00	0.13	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.28	69.57	0.06	-
	[L]	4.29	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.35	139.13	0.15	-
	[L]	21.35	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	54.41	90.00	0.60	-
	[L]	53.76	90.00	0.60	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.47	-
	[L]	0.06	0.13	0.48	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3242.96	-53.49	3242.82	-40.40	-11.80
SDL1	17.20	1492.75	-25.57	1492.78	-17.49	-3.12
Increased SDL1	17.20	1734.49	-27.96	1734.15	-22.66	-3.63
Reduced SDL1	17.20	1325.52	-24.14	1325.13	-15.12	-2.76
SDL2	17.20	45.30	-0.21	45.29	-1.16	-0.10
Concrete shrinkage	17.40	679.57	0.16	679.51	0.07	-1.69
primary effect		703.63		703.63		
secondary effect		-24.06	0.16	-24.12	0.07	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1854.84	-0.80	-1854.79	0.58	3.44
primary effect		-1889.31		-1889.31		
secondary effect		34.47	-0.80	34.52	0.58	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1854.84	0.80	1854.79	-0.58	-3.44
primary effect		1889.31		1889.31		
secondary effect		-34.47	0.80	-34.52	-0.58	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1133.72	0.00	-44.45	42.13	-58.52	29.20	-1.82
Load model 1 TS	1580.18	0.00	-120.77	124.98	-146.72	98.79	-1.86
Fatigue LM3 Left-hand slow lane	0.00	715.46	68.09	-51.84	45.79	-74.86	
Fatigue LM3 Right-hand slow lane	0.00	256.96	1.98	-11.10	6.34	-7.51	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.037	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.61	18.00	0.42	No.1
	[L]	-7.61	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	33.80	300.00	0.11	No.16
	[L]	33.78	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-210.73	345.00	0.61	No.15
	[L]	-210.74	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	247.63	345.00	0.72	No.11
	[L]	247.64	345.00	0.72	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.79	13.50	0.21	No.1
	[L]	-2.79	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-8.47	199.19	0.04	No.3
	[L]	-7.76	199.19	0.04	No.1
Normal stress / shear interaction (MPa)	[R]	-237.28	345.00	0.69	No.11
	[L]	-237.42	345.00	0.69	No.11
Shear in connection (kN/m)	[R]	124.04	283.27	0.44	No.3
	[L]	104.38	283.27	0.37	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	363.76	6346.73	0.06	No.1
	[L]	333.28	6346.73	0.05	No.1
Sagging, Plastic resistance (kN.m)	[R]	12453.89	16342.70	0.76	No.10
	[L]	12454.69	16342.70	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.08	1.00	0.08	No.1
	[L]	0.08	1.00	0.08	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.85	69.57	0.07	-
	[L]	4.85	69.57	0.07	-
Bending stress range in bottom flange (MPa)	[R]	24.18	139.13	0.17	-
	[L]	24.19	139.13	0.17	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	79.37	90.00	0.88	-
	[L]	78.90	90.00	0.88	-
Interaction connection / upper flange (MPa)	[R]	0.09	0.13	0.68	-
	[L]	0.09	0.13	0.68	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3310.17	-7.40	3310.39	7.86	-12.08
SDL1	17.20	1522.52	-3.79	1522.41	3.56	-3.19
Increased SDL1	17.20	1771.42	-4.28	1771.62	4.70	-3.71
Reduced SDL1	17.20	1350.50	-4.12	1349.76	2.52	-2.83
SDL2	17.20	47.21	-0.25	47.20	0.22	-0.10
Concrete shrinkage	17.40	679.46	0.00	679.59	0.29	-1.72
primary effect		703.63		703.63		
secondary effect		-24.17	0.00	-24.04	0.29	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1854.90	-0.28	-1855.21	-0.42	3.51
primary effect		-1889.31		-1889.31		
secondary effect		34.41	-0.28	34.10	-0.42	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1854.90	0.28	1855.21	0.42	-3.51
primary effect		1889.31		1889.31		
secondary effect		-34.41	0.28	-34.10	0.42	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1182.25	0.00	-44.42	38.48	-38.66	43.98	-1.87
Load model 1 TS	1632.17	0.00	-126.90	115.94	-117.19	125.60	-1.91
Fatigue LM3 Left-hand slow lane	0.00	747.73	54.38	-58.22	58.16	-53.50	
Fatigue LM3 Right-hand slow lane	0.00	256.93	6.93	-7.17	7.16	-6.93	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.038	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.83	18.00	0.43	No.1
	[L]	-7.83	18.00	0.44	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	32.79	300.00	0.11	No.16
	[L]	32.78	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-213.92	345.00	0.62	No.15
	[L]	-213.91	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	253.68	345.00	0.74	No.11
	[L]	253.66	345.00	0.74	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.84	13.50	0.21	No.1
	[L]	-2.84	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-5.74	199.19	0.03	No.11
	[L]	-5.76	199.19	0.03	No.1
Normal stress / shear interaction (MPa)	[R]	-243.13	345.00	0.70	No.11
	[L]	-243.01	345.00	0.70	No.11
Shear in connection (kN/m)	[R]	96.66	283.27	0.34	No.11
	[L]	97.28	283.27	0.34	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	246.47	6346.73	0.04	No.7
	[L]	247.40	6346.73	0.04	No.1
Sagging, Plastic resistance (kN.m)	[R]	12677.81	16342.70	0.78	No.10
	[L]	12676.69	16342.70	0.78	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.06	1.00	0.06	No.7
	[L]	0.06	1.00	0.06	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.07	69.57	0.07	-
	[L]	5.07	69.57	0.07	-
Bending stress range in bottom flange (MPa)	[R]	25.27	139.13	0.18	-
	[L]	25.29	139.13	0.18	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	73.45	90.00	0.82	-
	[L]	74.07	90.00	0.82	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.63	-
	[L]	0.08	0.13	0.63	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3243.30	39.31	3242.80	53.13	-11.80
SDL1	17.20	1492.85	17.35	1492.98	25.99	-3.12
Increased SDL1	17.20	1734.49	21.90	1734.44	27.86	-3.63
Reduced SDL1	17.20	1325.44	14.47	1325.23	23.65	-2.76
SDL2	17.20	45.31	1.13	45.31	0.22	-0.10
Concrete shrinkage	17.40	679.48	-0.01	679.43	-0.40	-1.69
primary effect		703.63		703.63		
secondary effect		-24.15	-0.01	-24.20	-0.40	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1855.38	0.69	-1855.28	0.04	3.44
primary effect		-1889.31		-1889.31		
secondary effect		33.93	0.69	34.03	0.04	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1855.38	-0.69	1855.28	-0.04	-3.44
primary effect		1889.31		1889.31		
secondary effect		-33.93	-0.69	-34.03	-0.04	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1133.88	0.00	-29.29	58.11	-42.32	44.35	-1.82
Load model 1 TS	1580.24	0.00	-99.64	146.08	-125.63	120.37	-1.86
Fatigue LM3 Left-hand slow lane	0.00	716.10	74.33	-45.72	51.69	-67.52	
Fatigue LM3 Right-hand slow lane	0.00	256.89	7.61	-6.32	11.07	-1.99	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.037	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.61	18.00	0.42	No.1
	[L]	-7.61	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	33.78	300.00	0.11	No.16
	[L]	33.77	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-210.73	345.00	0.61	No.15
	[L]	-210.75	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	247.64	345.00	0.72	No.11
	[L]	247.67	345.00	0.72	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.79	13.50	0.21	No.1
	[L]	-2.79	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-7.72	199.19	0.04	No.1
	[L]	-8.38	199.19	0.04	No.1
Normal stress / shear interaction (MPa)	[R]	-237.42	345.00	0.69	No.11
	[L]	-237.31	345.00	0.69	No.11
Shear in connection (kN/m)	[R]	103.79	283.27	0.37	No.1
	[L]	123.17	283.27	0.43	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	332.01	6346.73	0.05	No.1
	[L]	359.81	6346.73	0.06	No.1
Sagging, Plastic resistance (kN.m)	[R]	12455.07	16342.70	0.76	No.10
	[L]	12456.02	16342.70	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.08	1.00	0.08	No.1
	[L]	0.08	1.00	0.08	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.86	69.57	0.07	-
	[L]	4.86	69.57	0.07	-
Bending stress range in bottom flange (MPa)	[R]	24.21	139.13	0.17	-
	[L]	24.21	139.13	0.17	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	78.42	90.00	0.87	-
	[L]	78.98	90.00	0.88	-
Interaction connection / upper flange (MPa)	[R]	0.09	0.13	0.68	-
	[L]	0.09	0.13	0.68	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2727.90	130.58	2728.04	146.06	-9.60
SDL1	17.20	1255.13	59.52	1255.26	68.01	-2.54
Increased SDL1	17.20	1460.35	70.13	1460.43	77.50	-2.95
Reduced SDL1	17.20	1112.84	52.58	1113.13	61.33	-2.25
SDL2	17.20	38.08	2.35	38.07	1.45	-0.08
Concrete shrinkage	17.40	681.40	-0.35	681.45	-1.46	-1.42
primary effect		703.63		703.63		
secondary effect		-22.23	-0.35	-22.18	-1.46	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1857.95	0.99	-1857.59	2.05	2.89
primary effect		-1889.31		-1889.31		
secondary effect		31.36	0.99	31.72	2.05	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1857.95	-0.99	1857.59	-2.05	-2.89
primary effect		1889.31		1889.31		
secondary effect		-31.36	-0.99	-31.72	-2.05	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	966.03	0.00	-18.02	76.11	-29.95	64.07	-1.49
Load model 1 TS	1371.94	0.00	-81.56	161.13	-105.11	130.61	-1.49
Fatigue LM3 Left-hand slow lane	0.00	631.56	90.33	-32.03	65.99	-54.94	
Fatigue LM3 Right-hand slow lane	0.00	216.94	12.05	-1.11	15.55	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.030	0.133	0.22	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.62	18.00	0.37	No.1
	[L]	-6.62	18.00	0.37	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.78	300.00	0.14	No.16
	[L]	41.78	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-187.83	345.00	0.54	No.15
	[L]	-187.83	345.00	0.54	No.15
Stress in bottom fibre of steel section (MPa)	[R]	212.09	345.00	0.61	No.11
	[L]	212.09	345.00	0.61	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.45	13.50	0.18	No.1
	[L]	-2.45	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-13.21	199.19	0.07	No.1
	[L]	-13.84	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-203.98	345.00	0.59	No.11
	[L]	-203.58	345.00	0.59	No.11
Shear in connection (kN/m)	[R]	142.06	418.75	0.34	No.1
	[L]	162.29	418.75	0.39	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	566.58	6346.73	0.09	No.1
	[L]	594.41	6346.73	0.09	No.1
Sagging, Plastic resistance (kN.m)	[R]	11084.43	16342.70	0.68	No.10
	[L]	11084.60	16342.70	0.68	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.13	1.00	0.13	No.1
	[L]	0.14	1.00	0.14	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.29	69.57	0.06	-
	[L]	4.28	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.35	139.13	0.15	-
	[L]	21.35	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	53.81	90.00	0.60	-
	[L]	54.45	90.00	0.61	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.48	-
	[L]	0.06	0.13	0.47	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1694.83	222.94	1694.49	239.84	-5.56
SDL1	17.20	779.75	101.89	779.67	111.27	-1.47
Increased SDL1	17.20	908.90	120.14	908.95	128.03	-1.71
Reduced SDL1	17.20	690.16	89.55	690.04	99.43	-1.30
SDL2	17.20	24.00	3.58	24.00	2.81	-0.05
Concrete shrinkage	17.40	690.62	-1.77	690.65	-2.49	-0.88
primary effect		703.63		703.63		
secondary effect		-13.01	-1.77	-12.98	-2.49	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1869.85	2.57	-1869.81	3.78	1.79
primary effect		-1889.31		-1889.31		
secondary effect		19.47	2.57	19.50	3.78	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1869.85	-2.57	1869.81	-3.78	-1.79
primary effect		1889.31		1889.31		
secondary effect		-19.47	-2.57	-19.50	-3.78	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	620.44	0.00	-8.96	99.50	-16.39	88.31	-0.87
Load model 1 TS	927.00	0.00	-58.92	176.53	-73.44	157.50	-0.85
Fatigue LM3 Left-hand slow lane	-0.01	436.85	94.36	-23.25	72.23	-36.58	
Fatigue LM3 Right-hand slow lane	-0.01	133.84	16.68	0.00	21.41	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.017	0.133	0.13	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.57	18.00	0.25	No.1
	[L]	-4.57	18.00	0.25	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.26	300.00	0.19	No.16
	[L]	57.25	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-141.82	345.00	0.41	No.15
	[L]	-141.83	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	140.05	345.00	0.41	No.11
	[L]	140.07	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.77	13.50	0.13	No.1
	[L]	-1.77	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-19.42	199.19	0.10	No.1
	[L]	-19.59	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-138.31	345.00	0.40	No.15
	[L]	-137.82	345.00	0.40	No.15
Shear in connection (kN/m)	[R]	192.59	418.75	0.46	No.1
	[L]	205.28	418.75	0.49	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	832.27	6346.73	0.13	No.1
	[L]	840.64	6346.73	0.13	No.1
Sagging, Plastic resistance (kN.m)	[R]	8316.02	16342.70	0.51	No.10
	[L]	8316.45	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.19	1.00	0.19	No.1
	[L]	0.20	1.00	0.20	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.96	69.57	0.04	-
	[L]	2.96	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	14.77	139.13	0.11	-
	[L]	14.77	139.13	0.11	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	48.42	90.00	0.54	-
	[L]	52.33	90.00	0.58	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.43	-
	[L]	0.06	0.13	0.45	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	132.69	317.58	132.75	331.62	-0.39
SDL1	17.20	60.70	145.53	60.70	151.72	-0.10
Increased SDL1	17.20	71.38	171.18	71.39	178.49	-0.12
Reduced SDL1	17.20	53.30	127.78	53.32	133.30	-0.09
SDL2	17.20	2.11	5.03	2.11	5.28	0.00
Concrete shrinkage	17.40	703.56	-1.95	703.62	0.16	-0.07
primary effect		703.63		703.63		
secondary effect		-0.06	-1.95	-0.01	0.16	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1889.03	2.59	-1889.04	0.26	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.28	2.59	0.27	0.26	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1889.03	-2.59	1889.04	-0.26	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.28	-2.59	-0.27	-0.26	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	55.66	0.00	-0.15	132.79	0.00	139.68	-0.06
Load model 1 TS	99.92	0.00	0.00	223.59	0.00	250.05	-0.06
Fatigue LM3 Left-hand slow lane	0.00	53.16	120.57	-0.02	133.28	0.00	
Fatigue LM3 Right-hand slow lane	0.00	9.36	22.69	-0.01	23.37	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.52	18.00	0.08	No.5
	[L]	-1.52	18.00	0.08	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.57	300.00	0.27	No.16
	[L]	80.58	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.31	345.00	0.11	No.6
	[L]	38.31	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.19	345.00	0.04	No.3
	[L]	12.18	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-28.42	199.19	0.14	No.9
	[L]	-26.73	199.19	0.13	No.1
Normal stress / shear interaction (MPa)	[R]	-55.15	345.00	0.16	No.5
	[L]	-53.50	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	292.87	418.75	0.70	No.9
	[L]	271.47	418.75	0.65	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 3
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1222.06	6346.73	0.19	No.7
	[L]	1147.72	6346.73	0.18	No.1
Sagging, Plastic resistance (kN.m)	[R]	3946.84	16342.70	0.24	No.10
	[L]	3946.69	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2579.52	11864.01	0.22	No.5
	[L]	2579.60	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.29	1.00	0.29	No.7
	[L]	0.27	1.00	0.27	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.46	69.57	0.01	-
	[L]	0.46	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	2.30	139.13	0.02	-
	[L]	2.30	139.13	0.02	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	75.92	90.00	0.84	-
	[L]	68.69	90.00	0.76	-
Interaction connection / upper flange (MPa)	[R]	0.09	0.13	0.65	-
	[L]	0.08	0.13	0.59	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 3
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	-0.04	331.62			0.00
SDL1	17.20	0.00	151.72			0.00
Increased SDL1	17.20	-0.02	178.49			0.00
Reduced SDL1	17.20	-0.01	133.30			0.00
SDL2	17.20	0.00	5.28			0.00
Concrete shrinkage	17.40	703.56	0.16			0.00
primary effect		703.63				
secondary effect		-0.07	0.16			
axial force - slab		N = -1064.27 kN				
Simpl. temp. load +DT°C	6.40	-1889.20	0.26			0.00
primary effect		-1889.31				
secondary effect		0.11	0.26			
axial force - slab		N = 4344.28 kN				
Simpl. temp. load -DT°C	6.40	1889.20	-0.26			0.00
primary effect		1889.31				
secondary effect		-0.11	-0.26			
axial force - slab		N = -4344.28 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	139.68			0.00
Load model 1 TS	0.00	0.00	0.00	250.05			0.00
Fatigue LM3 Left-hand slow lane	-0.16	0.00	133.28	0.00			
Fatigue LM3 Right-hand slow lane	-0.01	0.03	23.37	0.00			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 3
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.64	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.90	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-28.42	199.19	0.14	No.9
Normal stress / shear interaction (MPa)	-59.14	345.00	0.17	No.5
Shear in connection (kN/m)	292.87	418.75	0.70	No.9

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1222.06	6346.73	0.19	No.7
Sagging, Plastic resistance (kN.m)	3537.30	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.89	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.29	1.00	0.29	No.7
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.01	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	77.10	90.00	0.86	-
Interaction connection / upper flange (MPa)	0.00	0.13	0.00	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			-0.04	-333.09	0.00
SDL1	17.20			-0.01	-151.00	0.00
Increased SDL1	17.20			0.01	-181.08	0.00
Reduced SDL1	17.20			-0.02	-130.20	0.00
SDL2	17.20			0.00	-4.20	0.00
Concrete shrinkage	17.40			703.60	1.31	0.00
primary effect				703.63		
secondary effect				-0.03	1.31	
axial force - slab				N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40			-1889.23	-2.06	0.00
primary effect				-1889.31		
secondary effect				0.08	-2.06	
axial force - slab				N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40			1889.23	2.06	0.00
primary effect				1889.31		
secondary effect				-0.08	2.06	
axial force - slab				N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-131.94	0.00	0.00
Load model 1 TS	0.00	0.00			-299.44	0.00	0.00
Fatigue LM3 Left-hand slow lane	-0.12	0.00			0.00	-113.35	
Fatigue LM3 Right-hand slow lane	-0.02	0.04			0.00	-41.14	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.5
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.16
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.6
Stress in bottom fibre of steel section (MPa)	-13.90	345.00	0.04	No.6
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.1
Shear stress in steel sections (MPa)	-29.85	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	-60.63	345.00	0.18	No.5
Shear in connection (kN/m)	320.00	418.75	0.76	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1282.17	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	3537.42	16342.70	0.22	No.10
Hogging, Plastic resistance (kN.m)	2833.92	11864.01	0.24	No.5
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.5

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.01	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	65.63	90.00	0.73	-
Interaction connection / upper flange (MPa)	0.00	0.13	0.00	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	133.34	-333.09	133.23	-319.07	-0.39
SDL1	17.20	60.41	-151.00	60.39	-145.19	-0.10
Increased SDL1	17.20	72.46	-181.08	72.44	-173.79	-0.12
Reduced SDL1	17.20	52.07	-130.20	52.05	-125.38	-0.09
SDL2	17.20	1.68	-4.20	1.69	-4.03	0.00
Concrete shrinkage	17.40	703.07	1.31	703.05	1.14	-0.07
primary effect		703.63		703.63		
secondary effect		-0.56	1.31	-0.57	1.14	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1888.36	-2.06	-1888.36	-1.66	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.95	-2.06	0.95	-1.66	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1888.36	2.06	1888.36	1.66	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.95	2.06	-0.95	1.66	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	52.58	0.00	-131.94	0.00	-124.41	0.07	-0.06
Load model 1 TS	119.59	0.00	-299.44	0.00	-276.91	0.00	-0.06
Fatigue LM3 Left-hand slow lane	0.00	45.20	0.00	-113.35	0.00	-104.14	
Fatigue LM3 Right-hand slow lane	0.00	16.46	0.00	-41.14	0.00	-39.89	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.54	18.00	0.09	No.5
	[L]	-1.54	18.00	0.09	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.68	300.00	0.27	No.16
	[L]	80.68	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.31	345.00	0.11	No.6
	[L]	38.30	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.75	345.00	0.04	No.3
	[L]	12.76	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-28.22	199.19	0.14	No.1
	[L]	-29.85	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	[R]	-55.00	345.00	0.16	No.5
	[L]	-56.68	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	299.79	418.75	0.72	No.1
	[L]	320.00	418.75	0.76	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1212.60	6346.73	0.19	No.1
	[L]	1282.17	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	[R]	3965.00	16342.70	0.24	No.10
	[L]	3965.19	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2580.13	11864.01	0.22	No.5
	[L]	2579.96	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.28	1.00	0.28	No.1
	[L]	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.40	69.57	0.01	-
	[L]	0.40	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	1.97	139.13	0.01	-
	[L]	1.98	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	59.38	90.00	0.66	-
	[L]	64.62	90.00	0.72	-
Interaction connection / upper flange (MPa)	[R]	0.07	0.13	0.51	-
	[L]	0.07	0.13	0.56	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1703.40	-241.57	1703.59	-223.25	-5.58
SDL1	17.20	777.77	-111.20	777.58	-102.26	-1.47
Increased SDL1	17.20	921.69	-129.87	921.54	-121.18	-1.73
Reduced SDL1	17.20	677.93	-97.91	677.89	-89.17	-1.28
SDL2	17.20	25.07	-4.29	25.06	-2.77	-0.05
Concrete shrinkage	17.40	696.47	1.10	696.44	2.13	-0.88
primary effect		703.63		703.63		
secondary effect		-7.16	1.10	-7.19	2.13	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1878.23	-1.81	-1878.13	-2.80	1.79
primary effect		-1889.31		-1889.31		
secondary effect		11.08	-1.81	11.18	-2.80	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1878.23	1.81	1878.13	2.80	-1.79
primary effect		1889.31		1889.31		
secondary effect		-11.08	1.81	-11.18	2.80	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	603.84	0.00	-85.24	10.12	-90.30	9.45	-0.82
Load model 1 TS	976.32	0.00	-168.71	106.25	-206.63	73.99	-0.80
Fatigue LM3 Left-hand slow lane	0.00	387.42	28.76	-63.77	19.88	-79.64	
Fatigue LM3 Right-hand slow lane	0.00	233.32	0.00	-37.29	0.00	-30.07	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.016	0.133	0.12	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.63	18.00	0.26	No.1
	[L]	-4.63	18.00	0.26	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.15	300.00	0.19	No.16
	[L]	57.14	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-142.59	345.00	0.41	No.15
	[L]	-142.58	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	141.88	345.00	0.41	No.11
	[L]	141.88	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.78	13.50	0.13	No.1
	[L]	-1.78	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-20.27	199.19	0.10	No.1
	[L]	-19.80	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-138.96	345.00	0.40	No.11
	[L]	-139.70	345.00	0.40	No.11
Shear in connection (kN/m)	[R]	219.23	418.75	0.52	No.1
	[L]	198.66	418.75	0.47	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	869.57	6346.73	0.14	No.1
	[L]	850.06	6346.73	0.13	No.1
Sagging, Plastic resistance (kN.m)	[R]	8406.00	16342.70	0.51	No.10
	[L]	8406.11	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.1
	[L]	0.20	1.00	0.20	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.65	69.57	0.04	-
	[L]	2.65	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	13.21	139.13	0.09	-
	[L]	13.22	139.13	0.09	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	44.33	90.00	0.49	-
	[L]	41.22	90.00	0.46	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.39	-
	[L]	0.05	0.13	0.37	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2738.49	-146.38	2738.06	-130.73	-9.64
SDL1	17.20	1253.30	-67.92	1253.19	-59.33	-2.53
Increased SDL1	17.20	1476.15	-77.43	1476.28	-70.17	-2.98
Reduced SDL1	17.20	1098.87	-61.09	1098.93	-51.55	-2.22
SDL2	17.20	41.09	-2.95	41.09	-1.33	-0.08
Concrete shrinkage	17.40	684.40	2.23	684.47	1.37	-1.42
primary effect		703.63		703.63		
secondary effect		-19.23	2.23	-19.16	1.37	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1861.43	-2.70	-1861.45	-2.17	2.89
primary effect		-1889.31		-1889.31		
secondary effect		27.88	-2.70	27.86	-2.17	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1861.43	2.70	1861.45	2.17	-2.89
primary effect		1889.31		1889.31		
secondary effect		-27.88	2.70	-27.86	2.17	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	926.07	0.00	-61.97	26.07	-69.40	20.22	-1.42
Load model 1 TS	1389.81	0.00	-138.64	144.88	-184.20	98.25	-1.41
Fatigue LM3 Left-hand slow lane	0.00	548.68	45.51	-56.64	28.88	-75.89	
Fatigue LM3 Right-hand slow lane	0.00	369.74	1.11	-28.21	6.27	-22.92	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.028	0.133	0.21	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.60	18.00	0.37	No.1
	[L]	-6.60	18.00	0.37	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.94	300.00	0.14	No.16
	[L]	41.95	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-188.47	345.00	0.55	No.15
	[L]	-188.48	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	212.56	345.00	0.62	No.11
	[L]	212.57	345.00	0.62	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.47	13.50	0.18	No.1
	[L]	-2.47	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-14.35	199.19	0.07	No.1
	[L]	-13.46	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-204.00	345.00	0.59	No.11
	[L]	-204.46	345.00	0.59	No.11
Shear in connection (kN/m)	[R]	172.98	418.75	0.41	No.1
	[L]	146.76	418.75	0.35	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	615.38	6346.73	0.10	No.1
	[L]	576.95	6346.73	0.09	No.1
Sagging, Plastic resistance (kN.m)	[R]	11128.74	16342.70	0.68	No.10
	[L]	11129.04	16342.70	0.68	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.14	1.00	0.14	No.1
	[L]	0.13	1.00	0.13	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.76	69.57	0.05	-
	[L]	3.76	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	18.72	139.13	0.13	-
	[L]	18.72	139.13	0.13	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	46.67	90.00	0.52	-
	[L]	45.50	90.00	0.51	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.41	-
	[L]	0.05	0.13	0.40	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3251.78	-53.37	3251.61	-40.25	-11.84
SDL1	17.20	1489.78	-25.60	1489.53	-17.81	-3.11
Increased SDL1	17.20	1749.42	-27.48	1749.58	-21.90	-3.66
Reduced SDL1	17.20	1310.02	-24.30	1309.60	-14.70	-2.73
SDL2	17.20	49.06	-1.52	49.06	0.09	-0.10
Concrete shrinkage	17.40	677.41	1.13	677.33	0.01	-1.69
primary effect		703.63		703.63		
secondary effect		-26.22	1.13	-26.29	0.01	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1851.86	-1.81	-1851.69	0.58	3.44
primary effect		-1889.31		-1889.31		
secondary effect		37.45	-1.81	37.62	0.58	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1851.86	1.81	1851.69	-0.58	-3.44
primary effect		1889.31		1889.31		
secondary effect		-37.45	1.81	-37.62	-0.58	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1077.77	0.00	-44.71	39.22	-53.69	31.02	-1.73
Load model 1 TS	1565.08	0.00	-135.44	165.63	-188.13	114.63	-1.76
Fatigue LM3 Left-hand slow lane	0.00	615.78	58.38	-45.11	40.22	-63.39	
Fatigue LM3 Right-hand slow lane	0.00	437.43	8.61	-21.28	14.50	-16.34	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.035	0.133	0.26	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.51	18.00	0.42	No.1
	[L]	-7.51	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	34.43	300.00	0.11	No.16
	[L]	34.41	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-211.07	345.00	0.61	No.15
	[L]	-211.07	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	246.56	345.00	0.71	No.11
	[L]	246.57	345.00	0.71	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.82	13.50	0.21	No.1
	[L]	-2.82	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-9.55	199.19	0.05	No.3
	[L]	-8.27	199.19	0.04	No.1
Normal stress / shear interaction (MPa)	[R]	-236.24	345.00	0.68	No.11
	[L]	-236.39	345.00	0.69	No.11
Shear in connection (kN/m)	[R]	145.58	283.27	0.51	No.3
	[L]	113.93	283.27	0.40	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	410.24	6346.73	0.06	No.1
	[L]	354.40	6346.73	0.06	No.1
Sagging, Plastic resistance (kN.m)	[R]	12439.34	16342.70	0.76	No.10
	[L]	12439.69	16342.70	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.10	1.00	0.10	No.1
	[L]	0.08	1.00	0.08	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.22	69.57	0.06	-
	[L]	4.22	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.01	139.13	0.15	-
	[L]	21.01	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	68.22	90.00	0.76	-
	[L]	68.15	90.00	0.76	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.59	-
	[L]	0.08	0.13	0.59	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3319.00	-7.59	3319.67	9.00	-12.12
SDL1	17.20	1519.54	-3.97	1519.47	3.82	-3.18
Increased SDL1	17.20	1787.05	-4.39	1787.34	5.00	-3.75
Reduced SDL1	17.20	1334.30	-3.57	1333.88	2.68	-2.79
SDL2	17.20	48.90	0.00	48.89	-0.04	-0.10
Concrete shrinkage	17.40	677.36	-0.21	677.41	0.32	-1.72
primary effect		703.63		703.63		
secondary effect		-26.27	-0.21	-26.22	0.32	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1852.14	0.80	-1851.66	0.25	3.51
primary effect		-1889.31		-1889.31		
secondary effect		37.18	0.80	37.65	0.25	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1852.14	-0.80	1851.66	-0.25	-3.51
primary effect		1889.31		1889.31		
secondary effect		-37.18	-0.80	-37.65	-0.25	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1115.58	0.00	-43.28	38.81	-38.73	43.20	-1.77
Load model 1 TS	1639.49	0.00	-157.56	141.77	-143.41	156.11	-1.81
Fatigue LM3 Left-hand slow lane	0.00	640.68	48.12	-50.11	50.37	-47.58	
Fatigue LM3 Right-hand slow lane	0.00	432.24	15.45	-15.79	15.64	-15.44	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.036	0.133	0.27	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.75	18.00	0.43	No.1
	[L]	-7.75	18.00	0.43	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	33.53	300.00	0.11	No.16
	[L]	33.50	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-214.32	345.00	0.62	No.15
	[L]	-214.29	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	252.87	345.00	0.73	No.11
	[L]	252.85	345.00	0.73	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.86	13.50	0.21	No.1
	[L]	-2.86	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-6.71	199.19	0.03	No.9
	[L]	-6.70	199.19	0.03	No.11
Normal stress / shear interaction (MPa)	[R]	-242.38	345.00	0.70	No.11
	[L]	-242.21	345.00	0.70	No.11
Shear in connection (kN/m)	[R]	114.41	283.27	0.40	No.9
	[L]	115.20	283.27	0.41	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	288.25	6346.73	0.05	No.7
	[L]	287.52	6346.73	0.05	No.7
Sagging, Plastic resistance (kN.m)	[R]	12677.74	16342.70	0.78	No.10
	[L]	12677.15	16342.70	0.78	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.07	1.00	0.07	No.7
	[L]	0.07	1.00	0.07	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.38	69.57	0.06	-
	[L]	4.39	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.85	139.13	0.16	-
	[L]	21.86	139.13	0.16	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	64.50	90.00	0.72	-
	[L]	64.68	90.00	0.72	-
Interaction connection / upper flange (MPa)	[R]	0.07	0.13	0.56	-
	[L]	0.07	0.13	0.55	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3251.94	39.51	3251.39	52.63	-11.84
SDL1	17.20	1489.56	17.71	1489.47	25.04	-3.11
Increased SDL1	17.20	1749.28	22.51	1749.32	27.29	-3.66
Reduced SDL1	17.20	1309.98	13.88	1309.77	23.85	-2.73
SDL2	17.20	49.06	-0.09	49.07	1.53	-0.10
Concrete shrinkage	17.40	677.44	-0.22	677.46	-1.03	-1.69
primary effect		703.63		703.63		
secondary effect		-26.19	-0.22	-26.17	-1.03	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1852.17	0.46	-1851.87	1.81	3.44
primary effect		-1889.31		-1889.31		
secondary effect		37.15	0.46	37.45	1.81	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1852.17	-0.46	1851.87	-1.81	-3.44
primary effect		1889.31		1889.31		
secondary effect		-37.15	-0.46	-37.45	-1.81	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1077.78	0.00	-31.03	53.67	-39.22	44.66	-1.73
Load model 1 TS	1565.19	0.00	-115.46	186.75	-167.04	134.33	-1.76
Fatigue LM3 Left-hand slow lane	0.00	616.06	63.00	-40.62	45.29	-57.91	
Fatigue LM3 Right-hand slow lane	0.00	437.44	16.32	-14.31	21.32	-8.65	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.035	0.133	0.26	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.51	18.00	0.42	No.1
	[L]	-7.51	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	34.42	300.00	0.11	No.16
	[L]	34.40	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-211.06	345.00	0.61	No.15
	[L]	-211.08	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	246.55	345.00	0.71	No.11
	[L]	246.58	345.00	0.71	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.82	13.50	0.21	No.1
	[L]	-2.82	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-8.21	199.19	0.04	No.1
	[L]	-9.50	199.19	0.05	No.1
Normal stress / shear interaction (MPa)	[R]	-236.38	345.00	0.69	No.11
	[L]	-236.26	345.00	0.68	No.11
Shear in connection (kN/m)	[R]	113.17	283.27	0.40	No.1
	[L]	144.98	283.27	0.51	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	351.59	6346.73	0.06	No.1
	[L]	408.16	6346.73	0.06	No.1
Sagging, Plastic resistance (kN.m)	[R]	12439.21	16342.70	0.76	No.10
	[L]	12440.31	16342.70	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.08	1.00	0.08	No.1
	[L]	0.10	1.00	0.10	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.22	69.57	0.06	-
	[L]	4.22	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.02	139.13	0.15	-
	[L]	21.01	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	67.96	90.00	0.76	-
	[L]	68.23	90.00	0.76	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.59	-
	[L]	0.08	0.13	0.59	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2738.54	129.97	2738.33	146.09	-9.64
SDL1	17.20	1253.30	59.16	1253.09	67.57	-2.53
Increased SDL1	17.20	1476.16	70.36	1476.11	77.34	-2.98
Reduced SDL1	17.20	1098.99	51.48	1099.00	61.34	-2.22
SDL2	17.20	41.09	1.33	41.08	2.93	-0.08
Concrete shrinkage	17.40	684.55	-1.51	684.51	-2.03	-1.42
primary effect		703.63		703.63		
secondary effect		-19.08	-1.51	-19.12	-2.03	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1861.42	2.13	-1861.15	3.28	2.89
primary effect		-1889.31		-1889.31		
secondary effect		27.89	2.13	28.16	3.28	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1861.42	-2.13	1861.15	-3.28	-2.89
primary effect		1889.31		1889.31		
secondary effect		-27.89	-2.13	-28.16	-3.28	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	926.33	0.00	-20.23	69.62	-26.09	61.84	-1.42
Load model 1 TS	1389.91	0.00	-100.75	197.19	-146.40	137.95	-1.41
Fatigue LM3 Left-hand slow lane	0.00	548.48	75.84	-29.06	56.42	-45.78	
Fatigue LM3 Right-hand slow lane	0.00	369.72	23.00	-6.32	28.13	-1.13	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.028	0.133	0.21	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.60	18.00	0.37	No.1
	[L]	-6.60	18.00	0.37	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	41.95	300.00	0.14	No.16
	[L]	41.94	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-188.48	345.00	0.55	No.15
	[L]	-188.49	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	212.57	345.00	0.62	No.11
	[L]	212.58	345.00	0.62	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.47	13.50	0.18	No.1
	[L]	-2.47	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-13.44	199.19	0.07	No.1
	[L]	-14.74	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-204.46	345.00	0.59	No.11
	[L]	-204.02	345.00	0.59	No.11
Shear in connection (kN/m)	[R]	146.45	418.75	0.35	No.1
	[L]	180.86	418.75	0.43	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	575.30	6346.73	0.09	No.1
	[L]	632.43	6346.73	0.10	No.1
Sagging, Plastic resistance (kN.m)	[R]	11128.67	16342.70	0.68	No.10
	[L]	11129.48	16342.70	0.68	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.13	1.00	0.13	No.1
	[L]	0.15	1.00	0.15	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.75	69.57	0.05	-
	[L]	3.75	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	18.71	139.13	0.13	-
	[L]	18.71	139.13	0.13	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	45.52	90.00	0.51	-
	[L]	46.73	90.00	0.52	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.40	-
	[L]	0.05	0.13	0.41	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1703.51	223.36	1703.31	241.43	-5.58
SDL1	17.20	777.66	102.10	777.66	111.02	-1.47
Increased SDL1	17.20	921.66	120.96	921.74	129.97	-1.73
Reduced SDL1	17.20	677.95	89.07	678.10	98.22	-1.28
SDL2	17.20	25.06	2.77	25.06	4.27	-0.05
Concrete shrinkage	17.40	696.37	-2.02	696.41	-1.22	-0.88
primary effect		703.63		703.63		
secondary effect		-7.26	-2.02	-7.22	-1.22	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1878.22	2.97	-1878.11	2.01	1.79
primary effect		-1889.31		-1889.31		
secondary effect		11.09	2.97	11.20	2.01	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1878.22	-2.97	1878.11	-2.01	-1.79
primary effect		1889.31		1889.31		
secondary effect		-11.09	-2.97	-11.20	-2.01	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	603.89	0.00	-9.44	90.24	-10.13	85.31	-0.82
Load model 1 TS	976.34	0.00	-77.14	205.26	-112.14	167.69	-0.80
Fatigue LM3 Left-hand slow lane	0.00	387.45	79.48	-19.24	63.54	-28.13	
Fatigue LM3 Right-hand slow lane	0.00	233.35	30.03	0.00	37.32	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.016	0.133	0.12	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.63	18.00	0.26	No.1
	[L]	-4.63	18.00	0.26	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.14	300.00	0.19	No.16
	[L]	57.14	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-142.58	345.00	0.41	No.15
	[L]	-142.59	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	141.87	345.00	0.41	No.11
	[L]	141.88	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.78	13.50	0.13	No.1
	[L]	-1.78	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-19.77	199.19	0.10	No.1
	[L]	-20.22	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-139.70	345.00	0.40	No.11
	[L]	-138.97	345.00	0.40	No.11
Shear in connection (kN/m)	[R]	198.19	418.75	0.47	No.1
	[L]	218.35	418.75	0.52	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	848.70	6346.73	0.13	No.1
	[L]	867.49	6346.73	0.14	No.1
Sagging, Plastic resistance (kN.m)	[R]	8405.87	16342.70	0.51	No.10
	[L]	8406.16	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.1
	[L]	0.20	1.00	0.20	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.65	69.57	0.04	-
	[L]	2.65	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	13.22	139.13	0.09	-
	[L]	13.22	139.13	0.09	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	40.83	90.00	0.45	-
	[L]	43.97	90.00	0.49	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.36	-
	[L]	0.05	0.13	0.38	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	133.27	319.04	133.27	332.83	-0.39
SDL1	17.20	60.41	145.17	60.40	150.97	-0.10
Increased SDL1	17.20	72.48	173.72	72.45	181.11	-0.12
Reduced SDL1	17.20	52.05	125.41	52.05	130.02	-0.09
SDL2	17.20	1.69	4.03	1.69	4.21	0.00
Concrete shrinkage	17.40	703.05	-1.14	703.06	-1.31	-0.07
primary effect		703.63		703.63		
secondary effect		-0.58	-1.14	-0.57	-1.31	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1888.37	1.63	-1888.43	1.74	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.94	1.63	0.88	1.74	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1888.37	-1.63	1888.43	-1.74	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.94	-1.63	-0.88	-1.74	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	52.58	0.00	-0.07	124.39	0.00	132.01	-0.06
Load model 1 TS	119.59	0.00	0.00	263.06	0.00	299.44	-0.06
Fatigue LM3 Left-hand slow lane	-0.04	45.10	103.93	0.00	113.10	-0.08	
Fatigue LM3 Right-hand slow lane	-0.05	16.46	39.90	0.00	41.11	-0.13	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.54	18.00	0.09	No.5
	[L]	-1.54	18.00	0.09	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.68	300.00	0.27	No.16
	[L]	80.68	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.31	345.00	0.11	No.6
	[L]	38.31	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.76	345.00	0.04	No.3
	[L]	12.76	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-29.84	199.19	0.15	No.1
	[L]	-27.78	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	[R]	-56.67	345.00	0.16	No.5
	[L]	-54.58	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	319.93	418.75	0.76	No.1
	[L]	291.52	418.75	0.70	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 4
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1281.96	6346.73	0.20	No.1
	[L]	1193.74	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	[R]	3965.17	16342.70	0.24	No.10
	[L]	3965.13	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2580.18	11864.01	0.22	No.5
	[L]	2580.10	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.30	1.00	0.30	No.1
	[L]	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.40	69.57	0.01	-
	[L]	0.40	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	1.97	139.13	0.01	-
	[L]	1.97	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	64.53	90.00	0.72	-
	[L]	59.26	90.00	0.66	-
Interaction connection / upper flange (MPa)	[R]	0.07	0.13	0.56	-
	[L]	0.07	0.13	0.51	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 4
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	-0.01	332.83			0.00
SDL1	17.20	0.00	150.97			0.00
Increased SDL1	17.20	-0.02	181.11			0.00
Reduced SDL1	17.20	0.03	130.02			0.00
SDL2	17.20	0.00	4.21			0.00
Concrete shrinkage	17.40	703.60	-1.31			0.00
primary effect		703.63				
secondary effect		-0.03	-1.31			
axial force - slab		N = -1064.27 kN				
Simpl. temp. load +DT°C	6.40	-1889.18	1.74			0.00
primary effect		-1889.31				
secondary effect		0.14	1.74			
axial force - slab		N = 4344.28 kN				
Simpl. temp. load -DT°C	6.40	1889.18	-1.74			0.00
primary effect		1889.31				
secondary effect		-0.14	-1.74			
axial force - slab		N = -4344.28 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	132.01			0.00
Load model 1 TS	0.00	0.00	0.00	299.44			0.00
Fatigue LM3 Left-hand slow lane	-0.12	0.00	113.10	-0.08			
Fatigue LM3 Right-hand slow lane	-0.02	0.04	41.11	-0.13			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 4
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.89	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-29.84	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	-60.61	345.00	0.18	No.5
Shear in connection (kN/m)	319.93	418.75	0.76	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1281.96	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	3537.39	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.79	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.01	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	65.54	90.00	0.73	-
Interaction connection / upper flange (MPa)	0.07	0.13	0.56	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			-0.01	-332.83	0.00
SDL1	17.20			-0.03	-150.58	0.00
Increased SDL1	17.20			-0.02	-181.86	0.00
Reduced SDL1	17.20			0.00	-128.76	0.00
SDL2	17.20			0.00	-4.22	0.00
Concrete shrinkage	17.40			703.62	1.40	0.00
primary effect				703.63		
secondary effect				-0.01	1.40	
axial force - slab				N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40			-1889.25	-2.17	0.00
primary effect				-1889.31		
secondary effect				0.06	-2.17	
axial force - slab				N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40			1889.25	2.17	0.00
primary effect				1889.31		
secondary effect				-0.06	2.17	
axial force - slab				N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-136.95	0.00	0.00
Load model 1 TS	0.00	0.00			-294.73	0.00	0.00
Fatigue LM3 Left-hand slow lane	-0.04	0.04			0.00	-52.62	
Fatigue LM3 Right-hand slow lane	-0.03	0.01			0.00	-71.51	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.90	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-29.87	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	-60.59	345.00	0.18	No.5
Shear in connection (kN/m)	319.83	418.75	0.76	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1283.31	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	3537.49	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.91	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.00	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.00	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	41.87	90.00	0.47	-
Interaction connection / upper flange (MPa)	0.00	0.13	0.00	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	133.27	-332.83	133.25	-319.07	-0.39
SDL1	17.20	60.22	-150.58	60.20	-144.73	-0.10
Increased SDL1	17.20	72.74	-181.86	72.76	-174.51	-0.12
Reduced SDL1	17.20	51.51	-128.76	51.52	-124.07	-0.09
SDL2	17.20	1.69	-4.22	1.69	-4.28	0.00
Concrete shrinkage	17.40	703.05	1.40	703.05	1.15	-0.07
primary effect		703.63		703.63		
secondary effect		-0.58	1.40	-0.58	1.15	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1888.33	-2.17	-1888.38	-1.67	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.98	-2.17	0.93	-1.67	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1888.33	2.17	1888.38	1.67	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.98	2.17	-0.93	1.67	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	54.56	0.00	-136.95	0.00	-129.25	0.12	-0.06
Load model 1 TS	117.75	0.00	-294.73	0.00	-269.09	0.00	-0.06
Fatigue LM3 Left-hand slow lane	0.00	21.05	0.00	-52.62	0.00	-49.31	
Fatigue LM3 Right-hand slow lane	0.00	28.58	0.00	-71.51	0.00	-68.75	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.54	18.00	0.09	No.5
	[L]	-1.54	18.00	0.09	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.70	300.00	0.27	No.16
	[L]	80.70	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.31	345.00	0.11	No.6
	[L]	38.31	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.77	345.00	0.04	No.3
	[L]	12.77	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-28.16	199.19	0.14	No.1
	[L]	-29.87	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	[R]	-54.88	345.00	0.16	No.5
	[L]	-56.65	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	297.75	418.75	0.71	No.1
	[L]	319.83	418.75	0.76	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1209.89	6346.73	0.19	No.1
	[L]	1283.31	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	[R]	3964.71	16342.70	0.24	No.10
	[L]	3964.64	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2580.85	11864.01	0.22	No.5
	[L]	2580.76	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.28	1.00	0.28	No.1
	[L]	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.26	69.57	0.00	-
	[L]	0.26	69.57	0.00	-
Bending stress range in bottom flange (MPa)	[R]	1.29	139.13	0.01	-
	[L]	1.29	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	39.63	90.00	0.44	-
	[L]	41.22	90.00	0.46	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.34	-
	[L]	0.05	0.13	0.36	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1703.48	-241.75	1703.54	-223.36	-5.58
SDL1	17.20	774.71	-110.59	774.36	-102.30	-1.46
Increased SDL1	17.20	926.47	-130.65	926.48	-121.35	-1.74
Reduced SDL1	17.20	669.42	-96.34	669.55	-88.28	-1.27
SDL2	17.20	25.42	-4.15	25.41	-3.26	-0.05
Concrete shrinkage	17.40	696.47	1.10	696.44	2.15	-0.88
primary effect		703.63		703.63		
secondary effect		-7.15	1.10	-7.19	2.15	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1878.25	-1.75	-1878.01	-2.57	1.79
primary effect		-1889.31		-1889.31		
secondary effect		11.06	-1.75	11.30	-2.57	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1878.25	1.75	1878.01	2.57	-1.79
primary effect		1889.31		1889.31		
secondary effect		-11.06	1.75	-11.30	2.57	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	600.37	0.00	-84.40	15.05	-94.84	10.73	-0.85
Load model 1 TS	976.47	0.00	-168.66	98.54	-201.04	73.13	-0.82
Fatigue LM3 Left-hand slow lane	0.00	284.77	0.00	-45.50	4.01	-36.65	
Fatigue LM3 Right-hand slow lane	0.00	353.40	0.45	-57.16	8.50	-52.23	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.017	0.133	0.13	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.63	18.00	0.26	No.1
	[L]	-4.63	18.00	0.26	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.45	300.00	0.19	No.16
	[L]	57.44	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-142.65	345.00	0.41	No.15
	[L]	-142.65	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	141.94	345.00	0.41	No.11
	[L]	141.94	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.78	13.50	0.13	No.1
	[L]	-1.78	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-20.25	199.19	0.10	No.1
	[L]	-19.79	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-139.00	345.00	0.40	No.11
	[L]	-139.69	345.00	0.40	No.11
Shear in connection (kN/m)	[R]	218.15	418.75	0.52	No.1
	[L]	198.51	418.75	0.47	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	869.19	6346.73	0.14	No.1
	[L]	849.97	6346.73	0.13	No.1
Sagging, Plastic resistance (kN.m)	[R]	8411.16	16342.70	0.51	No.10
	[L]	8411.47	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.1
	[L]	0.20	1.00	0.20	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.50	69.57	0.04	-
	[L]	2.50	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	12.47	139.13	0.09	-
	[L]	12.47	139.13	0.09	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	27.35	90.00	0.30	-
	[L]	25.95	90.00	0.29	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.24	-
	[L]	0.03	0.13	0.24	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2738.05	-145.60	2738.46	-130.07	-9.64
SDL1	17.20	1248.83	-67.74	1248.88	-58.88	-2.52
Increased SDL1	17.20	1483.06	-77.33	1483.51	-70.33	-3.00
Reduced SDL1	17.20	1086.40	-60.68	1086.30	-51.26	-2.19
SDL2	17.20	42.85	-2.96	42.86	-1.67	-0.09
Concrete shrinkage	17.40	684.45	2.14	684.53	1.47	-1.42
primary effect		703.63		703.63		
secondary effect		-19.17	2.14	-19.10	1.47	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1861.11	-3.25	-1861.27	-1.82	2.89
primary effect		-1889.31		-1889.31		
secondary effect		28.20	-3.25	28.05	-1.82	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1861.11	3.25	1861.27	1.82	-2.89
primary effect		1889.31		1889.31		
secondary effect		-28.20	3.25	-28.05	1.82	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	913.73	0.00	-61.59	32.34	-75.09	21.98	-1.46
Load model 1 TS	1396.63	0.00	-139.30	136.25	-179.40	97.14	-1.45
Fatigue LM3 Left-hand slow lane	0.00	426.24	5.97	-35.15	13.47	-29.38	
Fatigue LM3 Right-hand slow lane	0.00	529.89	13.81	-47.43	18.71	-43.36	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.029	0.133	0.22	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.60	18.00	0.37	No.1
	[L]	-6.60	18.00	0.37	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	42.35	300.00	0.14	No.16
	[L]	42.36	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-188.60	345.00	0.55	No.15
	[L]	-188.58	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	212.68	345.00	0.62	No.11
	[L]	212.65	345.00	0.62	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.49	13.50	0.18	No.1
	[L]	-2.48	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-14.36	199.19	0.07	No.1
	[L]	-13.46	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-204.12	345.00	0.59	No.11
	[L]	-204.51	345.00	0.59	No.11
Shear in connection (kN/m)	[R]	172.76	418.75	0.41	No.1
	[L]	147.14	418.75	0.35	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	616.35	6346.73	0.10	No.1
	[L]	576.14	6346.73	0.09	No.1
Sagging, Plastic resistance (kN.m)	[R]	11141.46	16342.70	0.68	No.10
	[L]	11139.97	16342.70	0.68	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.14	1.00	0.14	No.1
	[L]	0.13	1.00	0.13	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.75	69.57	0.05	-
	[L]	3.75	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	18.69	139.13	0.13	-
	[L]	18.70	139.13	0.13	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	27.96	90.00	0.31	-
	[L]	27.58	90.00	0.31	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.25	-
	[L]	0.03	0.13	0.25	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3251.16	-52.22	3251.61	-40.25	-11.84
SDL1	17.20	1484.62	-25.54	1484.29	-17.84	-3.10
Increased SDL1	17.20	1757.54	-27.36	1757.08	-23.53	-3.68
Reduced SDL1	17.20	1295.39	-23.74	1295.35	-14.18	-2.70
SDL2	17.20	51.41	-1.36	51.43	-0.15	-0.11
Concrete shrinkage	17.40	677.44	1.08	677.36	0.03	-1.69
primary effect		703.63		703.63		
secondary effect		-26.19	1.08	-26.27	0.03	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1851.94	-1.67	-1851.85	0.29	3.44
primary effect		-1889.31		-1889.31		
secondary effect		37.37	-1.67	37.46	0.29	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1851.94	1.67	1851.85	-0.29	-3.44
primary effect		1889.31		1889.31		
secondary effect		-37.37	1.67	-37.46	-0.29	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1059.39	0.00	-45.44	46.06	-60.31	32.70	-1.79
Load model 1 TS	1578.09	0.00	-134.29	156.89	-178.00	113.66	-1.81
Fatigue LM3 Left-hand slow lane	0.00	491.54	15.51	-28.30	21.64	-23.05	
Fatigue LM3 Right-hand slow lane	0.00	608.68	23.93	-37.24	28.70	-33.44	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.036	0.133	0.27	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.52	18.00	0.42	No.1
	[L]	-7.52	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	34.87	300.00	0.12	No.16
	[L]	34.86	300.00	0.12	No.16
Stress in top fibre of steel section (MPa)	[R]	-211.21	345.00	0.61	No.15
	[L]	-211.20	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	246.70	345.00	0.72	No.11
	[L]	246.70	345.00	0.72	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.83	13.50	0.21	No.1
	[L]	-2.83	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-9.49	199.19	0.05	No.3
	[L]	-8.21	199.19	0.04	No.1
Normal stress / shear interaction (MPa)	[R]	-236.38	345.00	0.69	No.11
	[L]	-236.50	345.00	0.69	No.11
Shear in connection (kN/m)	[R]	143.25	283.27	0.51	No.3
	[L]	113.40	283.27	0.40	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	408.01	6346.73	0.06	No.1
	[L]	351.90	6346.73	0.06	No.1
Sagging, Plastic resistance (kN.m)	[R]	12456.19	16342.70	0.76	No.10
	[L]	12456.37	16342.70	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.10	1.00	0.10	No.1
	[L]	0.08	1.00	0.08	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.31	69.57	0.06	-
	[L]	4.31	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.47	139.13	0.15	-
	[L]	21.47	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	41.37	90.00	0.46	-
	[L]	40.73	90.00	0.45	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.35	-
	[L]	0.05	0.13	0.36	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3319.01	-7.64	3318.51	6.51	-12.12
SDL1	17.20	1514.08	-3.27	1514.20	3.51	-3.17
Increased SDL1	17.20	1795.51	-4.90	1795.26	4.37	-3.77
Reduced SDL1	17.20	1319.79	-3.30	1319.59	2.88	-2.76
SDL2	17.20	51.69	-0.04	51.68	0.02	-0.11
Concrete shrinkage	17.40	677.38	-0.26	677.22	-0.07	-1.72
primary effect		703.63		703.63		
secondary effect		-26.25	-0.26	-26.41	-0.07	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1851.73	-0.10	-1851.70	0.15	3.51
primary effect		-1889.31		-1889.31		
secondary effect		37.58	-0.10	37.61	0.15	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1851.73	0.10	1851.70	-0.15	-3.51
primary effect		1889.31		1889.31		
secondary effect		-37.58	0.10	-37.61	-0.15	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1105.77	0.00	-47.54	41.89	-41.72	47.12	-1.83
Load model 1 TS	1644.16	0.00	-151.75	136.82	-136.97	150.18	-1.86
Fatigue LM3 Left-hand slow lane	0.00	486.17	22.52	-22.92	22.67	-22.75	
Fatigue LM3 Right-hand slow lane	0.00	609.19	30.37	-31.79	31.54	-30.53	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.037	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.76	18.00	0.43	No.1
	[L]	-7.76	18.00	0.43	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	33.97	300.00	0.11	No.16
	[L]	33.95	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-214.41	345.00	0.62	No.15
	[L]	-214.43	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	253.00	345.00	0.73	No.11
	[L]	253.03	345.00	0.73	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.88	13.50	0.21	No.1
	[L]	-2.88	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-6.54	199.19	0.03	No.1
	[L]	-6.66	199.19	0.03	No.9
Normal stress / shear interaction (MPa)	[R]	-242.49	345.00	0.70	No.11
	[L]	-242.38	345.00	0.70	No.11
Shear in connection (kN/m)	[R]	112.20	283.27	0.40	No.1
	[L]	113.66	283.27	0.40	No.9

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	281.08	6346.73	0.04	No.1
	[L]	286.29	6346.73	0.05	No.7
Sagging, Plastic resistance (kN.m)	[R]	12689.95	16342.70	0.78	No.10
	[L]	12691.18	16342.70	0.78	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.07	1.00	0.07	No.1
	[L]	0.07	1.00	0.07	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.31	69.57	0.06	-
	[L]	4.31	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.49	139.13	0.15	-
	[L]	21.49	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	41.33	90.00	0.46	-
	[L]	41.39	90.00	0.46	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.36	-
	[L]	0.05	0.13	0.36	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3251.80	39.85	3252.05	53.84	-11.84
SDL1	17.20	1484.07	18.38	1484.38	25.12	-3.10
Increased SDL1	17.20	1757.53	22.59	1757.49	27.20	-3.68
Reduced SDL1	17.20	1295.58	13.66	1295.18	23.41	-2.70
SDL2	17.20	51.42	0.17	51.42	1.38	-0.11
Concrete shrinkage	17.40	677.35	-0.02	677.43	-1.10	-1.69
primary effect		703.63		703.63		
secondary effect		-26.28	-0.02	-26.20	-1.10	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1852.30	0.74	-1852.03	1.48	3.44
primary effect		-1889.31		-1889.31		
secondary effect		37.01	0.74	37.28	1.48	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1852.30	-0.74	1852.03	-1.48	-3.44
primary effect		1889.31		1889.31		
secondary effect		-37.01	-0.74	-37.28	-1.48	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1059.40	0.00	-33.03	60.32	-45.88	45.43	-1.79
Load model 1 TS	1577.93	0.00	-114.57	177.16	-158.04	133.81	-1.81
Fatigue LM3 Left-hand slow lane	0.00	491.54	22.89	-21.35	28.43	-15.56	
Fatigue LM3 Right-hand slow lane	0.00	608.74	33.53	-28.88	37.30	-24.03	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.036	0.133	0.27	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-7.52	18.00	0.42	No.1
	[L]	-7.52	18.00	0.42	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	34.87	300.00	0.12	No.16
	[L]	34.84	300.00	0.12	No.16
Stress in top fibre of steel section (MPa)	[R]	-211.23	345.00	0.61	No.15
	[L]	-211.22	345.00	0.61	No.15
Stress in bottom fibre of steel section (MPa)	[R]	246.73	345.00	0.72	No.11
	[L]	246.72	345.00	0.72	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.83	13.50	0.21	No.1
	[L]	-2.83	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-8.24	199.19	0.04	No.1
	[L]	-9.43	199.19	0.05	No.1
Normal stress / shear interaction (MPa)	[R]	-236.53	345.00	0.69	No.11
	[L]	-236.40	345.00	0.69	No.11
Shear in connection (kN/m)	[R]	112.98	283.27	0.40	No.1
	[L]	142.51	283.27	0.50	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	353.23	6346.73	0.06	No.1
	[L]	405.13	6346.73	0.06	No.1
Sagging, Plastic resistance (kN.m)	[R]	12457.50	16342.70	0.76	No.10
	[L]	12457.52	16342.70	0.76	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.08	1.00	0.08	No.1
	[L]	0.09	1.00	0.09	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.31	69.57	0.06	-
	[L]	4.31	69.57	0.06	-
Bending stress range in bottom flange (MPa)	[R]	21.48	139.13	0.15	-
	[L]	21.47	139.13	0.15	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	40.83	90.00	0.45	-
	[L]	41.55	90.00	0.46	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.36	-
	[L]	0.05	0.13	0.36	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2738.32	130.38	2738.74	146.81	-9.64
SDL1	17.20	1249.05	58.59	1248.57	67.30	-2.52
Increased SDL1	17.20	1483.28	70.71	1483.18	77.56	-3.00
Reduced SDL1	17.20	1086.45	50.99	1086.30	60.47	-2.19
SDL2	17.20	42.85	1.69	42.84	2.95	-0.09
Concrete shrinkage	17.40	684.54	-1.51	684.60	-1.88	-1.42
primary effect		703.63		703.63		
secondary effect		-19.09	-1.51	-19.03	-1.88	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1861.54	2.34	-1860.95	3.57	2.89
primary effect		-1889.31		-1889.31		
secondary effect		27.77	2.34	28.36	3.57	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1861.54	-2.34	1860.95	-3.57	-2.89
primary effect		1889.31		1889.31		
secondary effect		-27.77	-2.34	-28.36	-3.57	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	913.50	0.00	-22.03	75.00	-32.32	61.58	-1.46
Load model 1 TS	1396.41	0.00	-98.89	188.45	-137.92	138.41	-1.45
Fatigue LM3 Left-hand slow lane	0.00	426.22	29.57	-13.50	34.98	-5.95	
Fatigue LM3 Right-hand slow lane	0.00	529.79	43.27	-18.83	47.25	-13.78	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.029	0.133	0.22	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-6.60	18.00	0.37	No.1
	[L]	-6.60	18.00	0.37	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	42.36	300.00	0.14	No.16
	[L]	42.34	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-188.60	345.00	0.55	No.15
	[L]	-188.59	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	212.67	345.00	0.62	No.11
	[L]	212.66	345.00	0.62	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.48	13.50	0.18	No.1
	[L]	-2.48	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-13.48	199.19	0.07	No.1
	[L]	-14.68	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-204.53	345.00	0.59	No.11
	[L]	-204.10	345.00	0.59	No.11
Shear in connection (kN/m)	[R]	146.82	418.75	0.35	No.1
	[L]	178.46	418.75	0.43	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	576.87	6346.73	0.09	No.1
	[L]	629.40	6346.73	0.10	No.1
Sagging, Plastic resistance (kN.m)	[R]	11140.61	16342.70	0.68	No.10
	[L]	11141.01	16342.70	0.68	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.13	1.00	0.13	No.1
	[L]	0.15	1.00	0.15	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.75	69.57	0.05	-
	[L]	3.75	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	18.69	139.13	0.13	-
	[L]	18.69	139.13	0.13	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	27.48	90.00	0.31	-
	[L]	27.97	90.00	0.31	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.25	-
	[L]	0.03	0.13	0.25	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1703.62	223.20	1703.30	241.43	-5.58
SDL1	17.20	774.61	101.88	774.74	110.66	-1.46
Increased SDL1	17.20	926.52	121.27	926.59	130.83	-1.74
Reduced SDL1	17.20	669.46	88.42	669.59	96.65	-1.27
SDL2	17.20	25.41	3.26	25.41	4.14	-0.05
Concrete shrinkage	17.40	696.43	-2.11	696.44	-1.17	-0.88
primary effect		703.63		703.63		
secondary effect		-7.20	-2.11	-7.19	-1.17	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1878.14	2.83	-1877.97	2.25	1.79
primary effect		-1889.31		-1889.31		
secondary effect		11.17	2.83	11.34	2.25	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1878.14	-2.83	1877.97	-2.25	-1.79
primary effect		1889.31		1889.31		
secondary effect		-11.17	-2.83	-11.34	-2.25	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	600.43	0.00	-10.74	95.12	-15.03	84.10	-0.85
Load model 1 TS	976.41	0.00	-76.10	200.29	-103.43	167.88	-0.82
Fatigue LM3 Left-hand slow lane	0.00	284.83	36.53	-4.02	45.47	0.00	
Fatigue LM3 Right-hand slow lane	0.00	353.46	52.22	-8.46	57.16	-0.43	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.017	0.133	0.13	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.63	18.00	0.26	No.1
	[L]	-4.63	18.00	0.26	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.45	300.00	0.19	No.16
	[L]	57.45	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-142.64	345.00	0.41	No.15
	[L]	-142.65	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	141.93	345.00	0.41	No.11
	[L]	141.94	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.78	13.50	0.13	No.1
	[L]	-1.78	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-19.76	199.19	0.10	No.1
	[L]	-20.24	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-139.68	345.00	0.40	No.11
	[L]	-139.00	345.00	0.40	No.11
Shear in connection (kN/m)	[R]	198.17	418.75	0.47	No.1
	[L]	217.89	418.75	0.52	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	848.30	6346.73	0.13	No.1
	[L]	868.24	6346.73	0.14	No.1
Sagging, Plastic resistance (kN.m)	[R]	8410.90	16342.70	0.51	No.10
	[L]	8411.48	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.1
	[L]	0.20	1.00	0.20	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	2.50	69.57	0.04	-
	[L]	2.50	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	12.47	139.13	0.09	-
	[L]	12.47	139.13	0.09	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	25.93	90.00	0.29	-
	[L]	27.33	90.00	0.30	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.24	-
	[L]	0.03	0.13	0.25	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	133.27	319.05	133.26	332.73	-0.39
SDL1	17.20	60.21	144.73	60.19	150.44	-0.10
Increased SDL1	17.20	72.75	174.56	72.75	181.85	-0.12
Reduced SDL1	17.20	51.53	124.07	51.54	128.90	-0.09
SDL2	17.20	1.69	4.28	1.69	4.22	0.00
Concrete shrinkage	17.40	703.05	-1.14	703.06	-1.36	-0.07
primary effect		703.63		703.63		
secondary effect		-0.58	-1.14	-0.57	-1.36	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1888.39	1.68	-1888.35	2.04	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.92	1.68	0.96	2.04	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1888.39	-1.68	1888.35	-2.04	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.92	-1.68	-0.96	-2.04	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	54.57	0.00	-0.12	129.26	0.00	137.12	-0.06
Load model 1 TS	117.76	0.00	0.00	257.35	0.00	294.75	-0.06
Fatigue LM3 Left-hand slow lane	-0.01	21.05	49.33	0.00	52.62	-0.03	
Fatigue LM3 Right-hand slow lane	0.00	28.58	68.74	0.00	71.50	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.54	18.00	0.09	No.5
	[L]	-1.54	18.00	0.09	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.70	300.00	0.27	No.16
	[L]	80.70	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.31	345.00	0.11	No.6
	[L]	38.31	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.77	345.00	0.04	No.3
	[L]	12.77	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-29.87	199.19	0.15	No.1
	[L]	-27.79	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	[R]	-56.64	345.00	0.16	No.5
	[L]	-54.53	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	319.86	418.75	0.76	No.1
	[L]	290.79	418.75	0.69	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 5
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1283.41	6346.73	0.20	No.1
	[L]	1194.06	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	[R]	3964.69	16342.70	0.24	No.10
	[L]	3964.75	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2580.76	11864.01	0.22	No.5
	[L]	2580.82	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.30	1.00	0.30	No.1
	[L]	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.26	69.57	0.00	-
	[L]	0.26	69.57	0.00	-
Bending stress range in bottom flange (MPa)	[R]	1.29	139.13	0.01	-
	[L]	1.29	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	41.22	90.00	0.46	-
	[L]	39.63	90.00	0.44	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.36	-
	[L]	0.04	0.13	0.34	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 5
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	0.02	332.73			0.00
SDL1	17.20	0.00	150.44			0.00
Increased SDL1	17.20	0.00	181.85			0.00
Reduced SDL1	17.20	-0.03	128.90			0.00
SDL2	17.20	0.00	4.22			0.00
Concrete shrinkage	17.40	703.61	-1.36			0.00
primary effect		703.63				
secondary effect		-0.02	-1.36			
axial force - slab		N = -1064.27 kN				
Simpl. temp. load +DT°C	6.40	-1889.22	2.04			0.00
primary effect		-1889.31				
secondary effect		0.09	2.04			
axial force - slab		N = 4344.28 kN				
Simpl. temp. load -DT°C	6.40	1889.22	-2.04			0.00
primary effect		1889.31				
secondary effect		-0.09	-2.04			
axial force - slab		N = -4344.28 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	137.12			0.00
Load model 1 TS	0.00	0.00	0.00	294.75			0.00
Fatigue LM3 Left-hand slow lane	-0.05	0.04	52.62	-0.03			
Fatigue LM3 Right-hand slow lane	-0.06	0.01	71.50	0.00			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 5
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.5
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.16
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.6
Stress in bottom fibre of steel section (MPa)	-13.89	345.00	0.04	No.6
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.1
Shear stress in steel sections (MPa)	-29.87	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	-60.59	345.00	0.18	No.5
Shear in connection (kN/m)	319.86	418.75	0.76	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1283.41	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	3537.47	16342.70	0.22	No.10
Hogging, Plastic resistance (kN.m)	2833.84	11864.01	0.24	No.5
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.5

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.00	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.00	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	41.87	90.00	0.47	-
Interaction connection / upper flange (MPa)	0.05	0.13	0.36	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			-0.04	-331.59	0.00
SDL1	17.20			0.01	-149.89	0.00
Increased SDL1	17.20			-0.03	-181.35	0.00
Reduced SDL1	17.20			0.00	-128.24	0.00
SDL2	17.20			0.00	-5.03	0.00
Concrete shrinkage	17.40			703.61	0.11	0.00
primary effect				703.63		
secondary effect				-0.02	0.11	
axial force - slab				N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40			-1889.23	-0.30	0.00
primary effect				-1889.31		
secondary effect				0.08	-0.30	
axial force - slab				N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40			1889.23	0.30	0.00
primary effect				1889.31		
secondary effect				-0.08	0.30	
axial force - slab				N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-153.74	0.00	0.00
Load model 1 TS	0.00	0.00			-290.89	0.00	0.00
Fatigue LM3 Left-hand slow lane	-0.02	0.03			0.00	-32.71	
Fatigue LM3 Right-hand slow lane	-0.13	0.01			0.00	-135.45	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.90	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-30.22	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	-60.63	345.00	0.18	No.5
Shear in connection (kN/m)	324.50	418.75	0.77	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1299.50	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	3537.41	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.95	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.01	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	78.36	90.00	0.87	-
Interaction connection / upper flange (MPa)	0.00	0.13	0.00	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	132.73	-331.59	132.69	-317.58	-0.39
SDL1	17.20	59.98	-149.89	59.99	-143.87	-0.10
Increased SDL1	17.20	72.53	-181.35	72.51	-173.81	-0.12
Reduced SDL1	17.20	51.31	-128.24	51.30	-123.14	-0.09
SDL2	17.20	2.02	-5.03	2.02	-4.70	0.00
Concrete shrinkage	17.40	703.56	0.11	703.58	1.98	-0.07
primary effect		703.63		703.63		
secondary effect		-0.07	0.11	-0.05	1.98	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1889.06	-0.30	-1889.05	-2.65	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.25	-0.30	0.26	-2.65	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1889.06	0.30	1889.05	2.65	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.25	0.30	-0.26	2.65	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	61.33	0.00	-153.74	0.00	-146.23	0.15	-0.07
Load model 1 TS	116.25	0.00	-290.89	0.00	-267.52	0.00	-0.07
Fatigue LM3 Left-hand slow lane	0.00	13.08	0.00	-32.71	0.00	-31.57	
Fatigue LM3 Right-hand slow lane	0.00	54.04	0.00	-135.45	0.00	-123.16	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.54	18.00	0.09	No.5
	[L]	-1.54	18.00	0.09	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.65	300.00	0.27	No.16
	[L]	80.65	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.33	345.00	0.11	No.6
	[L]	38.33	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.94	345.00	0.04	No.3
	[L]	12.94	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-28.60	199.19	0.14	No.1
	[L]	-30.22	199.19	0.15	No.1
Normal stress / shear interaction (MPa)	[R]	-55.08	345.00	0.16	No.5
	[L]	-56.70	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	304.60	418.75	0.73	No.1
	[L]	324.50	418.75	0.77	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1228.28	6346.73	0.19	No.1
	[L]	1299.50	6346.73	0.20	No.1
Sagging, Plastic resistance (kN.m)	[R]	3967.73	16342.70	0.24	No.10
	[L]	3967.79	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2582.46	11864.01	0.22	No.5
	[L]	2582.41	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.29	1.00	0.29	No.1
	[L]	0.30	1.00	0.30	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.47	69.57	0.01	-
	[L]	0.47	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	2.34	139.13	0.02	-
	[L]	2.34	139.13	0.02	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	70.16	90.00	0.78	-
	[L]	77.15	90.00	0.86	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.60	-
	[L]	0.09	0.13	0.66	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1694.70	-240.25	1694.69	-223.23	-5.56
SDL1	17.20	771.18	-110.29	771.19	-100.81	-1.45
Increased SDL1	17.20	922.85	-130.13	922.75	-121.66	-1.73
Reduced SDL1	17.20	666.14	-96.45	666.25	-86.40	-1.26
SDL2	17.20	28.12	-4.60	28.12	-3.13	-0.05
Concrete shrinkage	17.40	690.63	2.53	690.63	1.79	-0.88
primary effect		703.63		703.63		
secondary effect		-13.00	2.53	-13.00	1.79	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1869.75	-3.91	-1869.71	-2.34	1.79
primary effect		-1889.31		-1889.31		
secondary effect		19.56	-3.91	19.60	-2.34	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1869.75	3.91	1869.71	2.34	-1.79
primary effect		1889.31		1889.31		
secondary effect		-19.56	3.91	-19.60	2.34	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	694.47	0.00	-99.10	16.43	-109.38	9.57	-0.97
Load model 1 TS	1032.07	0.00	-176.90	87.86	-204.94	67.68	-0.95
Fatigue LM3 Left-hand slow lane	0.00	184.09	0.00	-29.29	0.00	-23.08	
Fatigue LM3 Right-hand slow lane	0.00	460.13	36.27	-76.18	23.15	-97.77	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.019	0.133	0.14	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.90	18.00	0.27	No.1
	[L]	-4.90	18.00	0.27	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.99	300.00	0.19	No.16
	[L]	58.00	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-142.61	345.00	0.41	No.15
	[L]	-142.61	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	145.11	345.00	0.42	No.11
	[L]	145.11	345.00	0.42	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.79	13.50	0.13	No.1
	[L]	-1.79	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-20.83	199.19	0.10	No.1
	[L]	-20.50	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-142.24	345.00	0.41	No.11
	[L]	-142.91	345.00	0.41	No.11
Shear in connection (kN/m)	[R]	226.95	418.75	0.54	No.1
	[L]	210.70	418.75	0.50	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	894.17	6346.73	0.14	No.1
	[L]	878.82	6346.73	0.14	No.1
Sagging, Plastic resistance (kN.m)	[R]	8486.68	16342.70	0.52	No.10
	[L]	8486.89	16342.70	0.52	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.21	1.00	0.21	No.1
	[L]	0.20	1.00	0.20	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.12	69.57	0.04	-
	[L]	3.12	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	15.56	139.13	0.11	-
	[L]	15.56	139.13	0.11	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	53.81	90.00	0.60	-
	[L]	50.04	90.00	0.56	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.47	-
	[L]	0.06	0.13	0.44	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2727.71	-145.52	2727.90	-130.54	-9.60
SDL1	17.20	1242.19	-67.46	1242.33	-58.44	-2.51
Increased SDL1	17.20	1481.24	-78.20	1481.41	-70.77	-2.99
Reduced SDL1	17.20	1076.61	-59.83	1076.62	-50.23	-2.17
SDL2	17.20	45.43	-3.03	45.44	-1.64	-0.09
Concrete shrinkage	17.40	681.52	1.36	681.33	0.22	-1.42
primary effect		703.63		703.63		
secondary effect		-22.11	1.36	-22.30	0.22	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1857.59	-2.09	-1857.26	0.18	2.89
primary effect		-1889.31		-1889.31		
secondary effect		31.72	-2.09	32.05	0.18	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1857.59	2.09	1857.26	-0.18	-2.89
primary effect		1889.31		1889.31		
secondary effect		-31.72	2.09	-32.05	-0.18	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1085.23	0.00	-71.77	30.91	-83.06	18.97	-1.67
Load model 1 TS	1534.58	0.00	-149.58	123.66	-181.20	91.63	-1.67
Fatigue LM3 Left-hand slow lane	0.00	293.54	0.00	-21.42	3.43	-17.51	
Fatigue LM3 Right-hand slow lane	0.00	680.82	52.97	-69.25	30.86	-92.51	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.033	0.133	0.25	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-7.14	18.00	0.40	No.1
	[L]	-7.14	18.00	0.40	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	42.88	300.00	0.14	No.16
	[L]	42.87	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-189.05	345.00	0.55	No.15
	[L]	-189.04	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	220.03	345.00	0.64	No.11
	[L]	220.03	345.00	0.64	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.49	13.50	0.18	No.1
	[L]	-2.49	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-14.67	199.19	0.07	No.3
	[L]	-14.10	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-211.31	345.00	0.61	No.11
	[L]	-211.78	345.00	0.61	No.11
Shear in connection (kN/m)	[R]	176.98	418.75	0.42	No.3
	[L]	157.79	418.75	0.38	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	630.72	6346.73	0.10	No.1
	[L]	604.93	6346.73	0.10	No.1
Sagging, Plastic resistance (kN.m)	[R]	11350.92	16342.70	0.69	No.10
	[L]	11351.10	16342.70	0.69	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.15	1.00	0.15	No.1
	[L]	0.14	1.00	0.14	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.62	69.57	0.07	-
	[L]	4.62	69.57	0.07	-
Bending stress range in bottom flange (MPa)	[R]	23.03	139.13	0.17	-
	[L]	23.03	139.13	0.17	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	54.90	90.00	0.61	-
	[L]	54.39	90.00	0.60	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.48	-
	[L]	0.06	0.13	0.49	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3242.65	-52.96	3243.00	-39.98	-11.80
SDL1	17.20	1477.38	-25.16	1477.18	-18.09	-3.08
Increased SDL1	17.20	1758.62	-27.76	1758.77	-22.52	-3.68
Reduced SDL1	17.20	1282.95	-23.85	1282.44	-14.55	-2.67
SDL2	17.20	54.36	-1.56	54.35	-0.08	-0.11
Concrete shrinkage	17.40	679.44	0.40	679.45	-0.05	-1.69
primary effect		703.63		703.63		
secondary effect		-24.18	0.40	-24.18	-0.05	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1855.16	-0.27	-1855.41	-0.78	3.44
primary effect		-1889.31		-1889.31		
secondary effect		34.15	-0.27	33.90	-0.78	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1855.16	0.27	1855.41	0.78	-3.44
primary effect		1889.31		1889.31		
secondary effect		-34.15	0.27	-33.90	0.78	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1276.95	0.00	-49.11	43.88	-61.63	31.44	-2.05
Load model 1 TS	1774.22	0.00	-138.88	146.69	-172.62	113.21	-2.08
Fatigue LM3 Left-hand slow lane	0.00	345.39	5.38	-16.03	10.58	-12.07	
Fatigue LM3 Right-hand slow lane	0.00	776.84	66.92	-53.61	46.02	-74.81	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.041	0.133	0.31	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.23	18.00	0.46	No.1
	[L]	-8.23	18.00	0.46	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	35.03	300.00	0.12	No.16
	[L]	35.02	300.00	0.12	No.16
Stress in top fibre of steel section (MPa)	[R]	-212.20	345.00	0.62	No.15
	[L]	-212.18	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	257.15	345.00	0.75	No.11
	[L]	257.13	345.00	0.75	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.83	13.50	0.21	No.1
	[L]	-2.83	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-9.33	199.19	0.05	No.9
	[L]	-8.49	199.19	0.04	No.1
Normal stress / shear interaction (MPa)	[R]	-246.52	345.00	0.71	No.11
	[L]	-246.66	345.00	0.71	No.11
Shear in connection (kN/m)	[R]	140.35	283.27	0.50	No.9
	[L]	117.54	283.27	0.41	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	400.75	6346.73	0.06	No.7
	[L]	364.86	6346.73	0.06	No.1
Sagging, Plastic resistance (kN.m)	[R]	12774.27	16342.70	0.78	No.10
	[L]	12773.25	16342.70	0.78	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.09	1.00	0.09	No.7
	[L]	0.09	1.00	0.09	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.27	69.57	0.08	-
	[L]	5.27	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	26.27	139.13	0.19	-
	[L]	26.28	139.13	0.19	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	79.49	90.00	0.88	-
	[L]	79.29	90.00	0.88	-
Interaction connection / upper flange (MPa)	[R]	0.09	0.13	0.68	-
	[L]	0.09	0.13	0.68	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3310.46	-7.94	3310.65	8.44	-12.08
SDL1	17.20	1506.71	-3.39	1506.64	3.23	-3.16
Increased SDL1	17.20	1796.53	-4.61	1796.54	4.65	-3.77
Reduced SDL1	17.20	1306.36	-3.14	1306.59	3.63	-2.74
SDL2	17.20	54.45	0.00	54.46	0.02	-0.11
Concrete shrinkage	17.40	679.35	0.21	679.41	-0.08	-1.72
primary effect		703.63		703.63		
secondary effect		-24.28	0.21	-24.22	-0.08	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1855.04	0.05	-1855.28	-0.58	3.51
primary effect		-1889.31		-1889.31		
secondary effect		34.27	0.05	34.03	-0.58	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1855.04	-0.05	1855.28	0.58	-3.51
primary effect		1889.31		1889.31		
secondary effect		-34.27	-0.05	-34.03	0.58	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1327.80	0.00	-47.97	41.11	-41.23	47.06	-2.09
Load model 1 TS	1837.25	0.00	-147.49	134.34	-135.40	146.13	-2.14
Fatigue LM3 Left-hand slow lane	0.00	343.01	11.32	-11.69	11.68	-11.37	
Fatigue LM3 Right-hand slow lane	0.00	807.51	54.32	-58.08	58.17	-53.92	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.042	0.133	0.32	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.47	18.00	0.47	No.1
	[L]	-8.47	18.00	0.47	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	34.13	300.00	0.11	No.16
	[L]	34.15	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-215.42	345.00	0.62	No.15
	[L]	-215.41	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	263.49	345.00	0.76	No.11
	[L]	263.48	345.00	0.76	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.88	13.50	0.21	No.1
	[L]	-2.88	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-6.49	199.19	0.03	No.3
	[L]	-6.53	199.19	0.03	No.3
Normal stress / shear interaction (MPa)	[R]	-252.68	345.00	0.73	No.11
	[L]	-252.54	345.00	0.73	No.11
Shear in connection (kN/m)	[R]	110.05	283.27	0.39	No.3
	[L]	111.04	283.27	0.39	No.3

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	278.52	6346.73	0.04	No.1
	[L]	280.80	6346.73	0.04	No.1
Sagging, Plastic resistance (kN.m)	[R]	13007.80	16342.70	0.80	No.10
	[L]	13007.06	16342.70	0.80	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.06	1.00	0.06	No.1
	[L]	0.07	1.00	0.07	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.48	69.57	0.08	-
	[L]	5.48	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	27.30	139.13	0.20	-
	[L]	27.32	139.13	0.20	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	73.74	90.00	0.82	-
	[L]	73.94	90.00	0.82	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.64	-
	[L]	0.08	0.13	0.63	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3242.54	40.88	3243.00	53.47	-11.80
SDL1	17.20	1477.57	17.20	1477.78	25.87	-3.08
Increased SDL1	17.20	1758.76	22.51	1758.62	27.72	-3.68
Reduced SDL1	17.20	1282.50	14.42	1282.80	23.58	-2.67
SDL2	17.20	54.36	0.05	54.35	1.54	-0.11
Concrete shrinkage	17.40	679.52	-0.11	679.43	-0.42	-1.69
primary effect		703.63		703.63		
secondary effect		-24.11	-0.11	-24.20	-0.42	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1854.78	-0.61	-1855.44	-0.26	3.44
primary effect		-1889.31		-1889.31		
secondary effect		34.53	-0.61	33.87	-0.26	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1854.78	0.61	1855.44	0.26	-3.44
primary effect		1889.31		1889.31		
secondary effect		-34.53	0.61	-33.87	0.26	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1276.59	0.00	-31.34	61.80	-43.84	48.76	-2.05
Load model 1 TS	1774.30	0.00	-114.13	172.63	-147.70	138.39	-2.08
Fatigue LM3 Left-hand slow lane	0.00	345.32	12.24	-10.68	16.01	-5.35	
Fatigue LM3 Right-hand slow lane	0.00	777.22	74.60	-46.23	53.45	-66.36	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.041	0.133	0.31	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.23	18.00	0.46	No.1
	[L]	-8.23	18.00	0.46	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	35.02	300.00	0.12	No.16
	[L]	35.05	300.00	0.12	No.16
Stress in top fibre of steel section (MPa)	[R]	-212.20	345.00	0.62	No.15
	[L]	-212.18	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	257.13	345.00	0.75	No.11
	[L]	257.11	345.00	0.75	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.83	13.50	0.21	No.1
	[L]	-2.83	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-8.48	199.19	0.04	No.3
	[L]	-9.36	199.19	0.05	No.3
Normal stress / shear interaction (MPa)	[R]	-246.67	345.00	0.71	No.11
	[L]	-246.50	345.00	0.71	No.11
Shear in connection (kN/m)	[R]	117.06	283.27	0.41	No.3
	[L]	140.34	283.27	0.50	No.3

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	364.35	6346.73	0.06	No.1
	[L]	402.12	6346.73	0.06	No.1
Sagging, Plastic resistance (kN.m)	[R]	12773.99	16342.70	0.78	No.10
	[L]	12772.66	16342.70	0.78	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.08	1.00	0.08	No.1
	[L]	0.09	1.00	0.09	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.28	69.57	0.08	-
	[L]	5.27	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	26.29	139.13	0.19	-
	[L]	26.28	139.13	0.19	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	78.81	90.00	0.88	-
	[L]	79.49	90.00	0.88	-
Interaction connection / upper flange (MPa)	[R]	0.09	0.13	0.68	-
	[L]	0.09	0.13	0.68	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2728.10	130.24	2727.89	145.84	-9.60
SDL1	17.20	1242.30	58.51	1242.24	67.49	-2.51
Increased SDL1	17.20	1481.17	71.24	1481.03	77.86	-2.99
Reduced SDL1	17.20	1076.76	49.98	1076.56	59.75	-2.17
SDL2	17.20	45.43	1.65	45.44	3.05	-0.09
Concrete shrinkage	17.40	681.45	-0.44	681.36	-1.63	-1.42
primary effect		703.63		703.63		
secondary effect		-22.18	-0.44	-22.27	-1.63	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1857.89	0.92	-1857.58	2.06	2.89
primary effect		-1889.31		-1889.31		
secondary effect		31.42	0.92	31.73	2.06	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1857.89	-0.92	1857.58	-2.06	-2.89
primary effect		1889.31		1889.31		
secondary effect		-31.42	-0.92	-31.73	-2.06	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1085.02	0.00	-19.06	82.66	-30.97	71.40	-1.67
Load model 1 TS	1534.62	0.00	-93.52	188.40	-124.43	148.42	-1.67
Fatigue LM3 Left-hand slow lane	0.00	293.51	17.43	-3.41	21.47	0.00	
Fatigue LM3 Right-hand slow lane	0.00	680.78	92.15	-31.14	68.90	-53.22	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.033	0.133	0.25	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-7.14	18.00	0.40	No.1
	[L]	-7.14	18.00	0.40	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	42.87	300.00	0.14	No.16
	[L]	42.85	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-189.05	345.00	0.55	No.15
	[L]	-189.06	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	220.02	345.00	0.64	No.11
	[L]	220.04	345.00	0.64	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.49	13.50	0.18	No.1
	[L]	-2.49	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-14.05	199.19	0.07	No.1
	[L]	-14.90	199.19	0.07	No.1
Normal stress / shear interaction (MPa)	[R]	-211.77	345.00	0.61	No.11
	[L]	-211.32	345.00	0.61	No.11
Shear in connection (kN/m)	[R]	156.78	418.75	0.37	No.1
	[L]	181.56	418.75	0.43	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	602.86	6346.73	0.09	No.1
	[L]	640.16	6346.73	0.10	No.1
Sagging, Plastic resistance (kN.m)	[R]	11350.81	16342.70	0.69	No.10
	[L]	11351.84	16342.70	0.69	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.14	1.00	0.14	No.1
	[L]	0.15	1.00	0.15	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.62	69.57	0.07	-
	[L]	4.62	69.57	0.07	-
Bending stress range in bottom flange (MPa)	[R]	23.02	139.13	0.17	-
	[L]	23.03	139.13	0.17	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	54.34	90.00	0.60	-
	[L]	54.87	90.00	0.61	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.48	-
	[L]	0.06	0.13	0.48	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1694.93	222.76	1694.69	240.19	-5.56
SDL1	17.20	771.10	100.97	771.05	110.04	-1.45
Increased SDL1	17.20	922.84	121.49	922.82	130.09	-1.73
Reduced SDL1	17.20	665.93	86.97	666.09	96.35	-1.26
SDL2	17.20	28.12	3.13	28.11	4.59	-0.05
Concrete shrinkage	17.40	690.58	-1.70	690.67	-2.45	-0.88
primary effect		703.63		703.63		
secondary effect		-13.04	-1.70	-12.96	-2.45	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1869.69	2.31	-1870.01	3.46	1.79
primary effect		-1889.31		-1889.31		
secondary effect		19.62	2.31	19.30	3.46	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1869.69	-2.31	1870.01	-3.46	-1.79
primary effect		1889.31		1889.31		
secondary effect		-19.62	-2.31	-19.30	-3.46	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	694.58	0.00	-9.57	109.38	-16.43	99.33	-0.97
Load model 1 TS	1032.09	0.00	-70.53	204.03	-92.06	176.41	-0.95
Fatigue LM3 Left-hand slow lane	0.00	184.11	23.09	0.00	29.30	0.00	
Fatigue LM3 Right-hand slow lane	-0.01	460.24	97.56	-22.41	76.13	-35.50	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.019	0.133	0.14	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.90	18.00	0.27	No.1
	[L]	-4.90	18.00	0.27	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	57.99	300.00	0.19	No.16
	[L]	58.01	300.00	0.19	No.16
Stress in top fibre of steel section (MPa)	[R]	-142.61	345.00	0.41	No.15
	[L]	-142.62	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	145.12	345.00	0.42	No.11
	[L]	145.12	345.00	0.42	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.79	13.50	0.13	No.1
	[L]	-1.79	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-20.48	199.19	0.10	No.1
	[L]	-20.78	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-142.93	345.00	0.41	No.11
	[L]	-142.24	345.00	0.41	No.11
Shear in connection (kN/m)	[R]	210.33	418.75	0.50	No.1
	[L]	226.31	418.75	0.54	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	878.32	6346.73	0.14	No.1
	[L]	892.05	6346.73	0.14	No.1
Sagging, Plastic resistance (kN.m)	[R]	8487.33	16342.70	0.52	No.10
	[L]	8487.14	16342.70	0.52	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.1
	[L]	0.21	1.00	0.21	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.12	69.57	0.04	-
	[L]	3.12	69.57	0.04	-
Bending stress range in bottom flange (MPa)	[R]	15.57	139.13	0.11	-
	[L]	15.57	139.13	0.11	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	49.68	90.00	0.55	-
	[L]	53.39	90.00	0.59	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.44	-
	[L]	0.06	0.13	0.46	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	132.72	317.55	132.67	331.27	-0.39
SDL1	17.20	59.98	143.87	59.99	149.97	-0.10
Increased SDL1	17.20	72.48	173.89	72.48	181.14	-0.12
Reduced SDL1	17.20	51.29	123.17	51.29	128.15	-0.09
SDL2	17.20	2.02	4.70	2.02	5.03	0.00
Concrete shrinkage	17.40	703.55	-1.93	703.59	0.01	-0.07
primary effect		703.63		703.63		
secondary effect		-0.08	-1.93	-0.04	0.01	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1889.06	2.63	-1889.02	0.35	0.14
primary effect		-1889.31		-1889.31		
secondary effect		0.26	2.63	0.29	0.35	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1889.06	-2.63	1889.02	-0.35	-0.14
primary effect		1889.31		1889.31		
secondary effect		-0.26	-2.63	-0.29	-0.35	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	61.34	0.00	-0.15	146.22	0.00	153.88	-0.07
Load model 1 TS	116.25	0.00	0.00	257.36	0.00	290.90	-0.07
Fatigue LM3 Left-hand slow lane	0.00	13.07	31.58	0.00	32.70	0.00	
Fatigue LM3 Right-hand slow lane	0.00	53.92	122.92	-0.02	135.14	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.54	18.00	0.09	No.5
	[L]	-1.54	18.00	0.09	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.66	300.00	0.27	No.16
	[L]	80.66	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.34	345.00	0.11	No.6
	[L]	38.33	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	12.94	345.00	0.04	No.3
	[L]	12.94	345.00	0.04	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-30.21	199.19	0.15	No.9
	[L]	-28.29	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	[R]	-56.68	345.00	0.16	No.5
	[L]	-54.78	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	324.50	418.75	0.77	No.9
	[L]	298.60	418.75	0.71	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 6
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1299.00	6346.73	0.20	No.7
	[L]	1214.62	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	[R]	3967.62	16342.70	0.24	No.10
	[L]	3967.69	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2582.46	11864.01	0.22	No.5
	[L]	2582.45	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.30	1.00	0.30	No.7
	[L]	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.47	69.57	0.01	-
	[L]	0.47	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	2.34	139.13	0.02	-
	[L]	2.33	139.13	0.02	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	76.98	90.00	0.86	-
	[L]	70.03	90.00	0.78	-
Interaction connection / upper flange (MPa)	[R]	0.09	0.13	0.66	-
	[L]	0.08	0.13	0.60	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 6
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	0.02	331.27			0.00
SDL1	17.20	-0.01	149.97			0.00
Increased SDL1	17.20	0.01	181.14			0.00
Reduced SDL1	17.20	0.02	128.15			0.00
SDL2	17.20	0.00	5.03			0.00
Concrete shrinkage	17.40	703.60	0.01			0.00
primary effect		703.63				
secondary effect		-0.03	0.01			
axial force - slab		N = -1064.27 kN				
Simpl. temp. load +DT°C	6.40	-1889.21	0.35			0.00
primary effect		-1889.31				
secondary effect		0.10	0.35			
axial force - slab		N = 4344.28 kN				
Simpl. temp. load -DT°C	6.40	1889.21	-0.35			0.00
primary effect		1889.31				
secondary effect		-0.10	-0.35			
axial force - slab		N = -4344.28 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	153.88			0.00
Load model 1 TS	0.00	0.00	0.00	290.90			0.00
Fatigue LM3 Left-hand slow lane	-0.03	0.02	32.70	0.00			
Fatigue LM3 Right-hand slow lane	-0.12	0.02	135.14	0.00			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 6
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.89	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-30.21	199.19	0.15	No.9
Normal stress / shear interaction (MPa)	-60.62	345.00	0.18	No.5
Shear in connection (kN/m)	324.50	418.75	0.77	No.9

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1299.00	6346.73	0.20	No.7
Sagging, Plastic resistance (kN.m)	3537.47	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.78	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.30	1.00	0.30	No.7
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.01	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	78.18	90.00	0.87	-
Interaction connection / upper flange (MPa)	0.09	0.13	0.67	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			-0.03	-327.09	0.00
SDL1	17.20			-0.01	-149.62	0.00
Increased SDL1	17.20			0.01	-177.97	0.00
Reduced SDL1	17.20			0.02	-130.01	0.00
SDL2	17.20			0.00	-6.76	0.00
Concrete shrinkage	17.40			703.59	9.16	0.00
primary effect				703.63		
secondary effect				-0.04	9.16	
axial force - slab				N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40			-1889.17	-13.63	0.00
primary effect				-1889.31		
secondary effect				0.14	-13.63	
axial force - slab				N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40			1889.17	13.63	0.00
primary effect				1889.31		
secondary effect				-0.14	13.63	
axial force - slab				N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-153.59	0.00	0.00
Load model 1 TS	0.00	0.00			-211.20	0.00	0.00
Fatigue LM3 Left-hand slow lane	-0.01	0.01			0.00	-18.03	
Fatigue LM3 Right-hand slow lane	-0.10	0.02			0.00	-126.54	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.89	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-27.77	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	-58.62	345.00	0.17	No.5
Shear in connection (kN/m)	281.14	418.75	0.67	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1183.44	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	3537.33	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.78	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.00	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	73.20	90.00	0.81	-
Interaction connection / upper flange (MPa)	0.00	0.13	0.00	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	130.95	-327.09	130.93	-313.91	-0.38
SDL1	17.20	59.85	-149.62	59.92	-143.87	-0.10
Increased SDL1	17.20	71.22	-177.97	71.23	-171.22	-0.12
Reduced SDL1	17.20	52.03	-130.01	52.03	-125.03	-0.09
SDL2	17.20	2.70	-6.76	2.70	-6.55	0.00
Concrete shrinkage	17.40	699.92	9.16	699.90	5.41	-0.07
primary effect		703.63		703.63		
secondary effect		-3.71	9.16	-3.73	5.41	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1883.67	-13.63	-1883.66	-8.41	0.14
primary effect		-1889.31		-1889.31		
secondary effect		5.65	-13.63	5.65	-8.41	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1883.67	13.63	1883.66	8.41	-0.14
primary effect		1889.31		1889.31		
secondary effect		-5.65	13.63	-5.65	8.41	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	61.31	0.00	-153.59	0.00	-146.32	0.04	-0.07
Load model 1 TS	84.36	0.00	-211.20	0.00	-202.70	0.00	-0.07
Fatigue LM3 Left-hand slow lane	0.00	7.21	0.00	-18.03	0.00	-17.76	
Fatigue LM3 Right-hand slow lane	0.00	50.48	0.00	-126.54	0.00	-118.28	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.51	18.00	0.08	No.5
	[L]	-1.51	18.00	0.08	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.94	300.00	0.27	No.16
	[L]	80.94	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.35	345.00	0.11	No.6
	[L]	38.35	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	11.71	345.00	0.03	No.3
	[L]	11.71	345.00	0.03	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-26.54	199.19	0.13	No.1
	[L]	-27.77	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	[R]	-53.27	345.00	0.15	No.5
	[L]	-54.64	345.00	0.16	No.5
Shear in connection (kN/m)	[R]	267.88	418.75	0.64	No.1
	[L]	281.14	418.75	0.67	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1134.95	6346.73	0.18	No.1
	[L]	1183.44	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	[R]	3920.47	16342.70	0.24	No.10
	[L]	3920.51	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2574.84	11864.01	0.22	No.5
	[L]	2574.82	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.26	1.00	0.26	No.1
	[L]	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.44	69.57	0.01	-
	[L]	0.44	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	2.18	139.13	0.02	-
	[L]	2.19	139.13	0.02	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	67.37	90.00	0.75	-
	[L]	72.08	90.00	0.80	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.58	-
	[L]	0.08	0.13	0.62	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1676.69	-238.15	1676.60	-222.59	-5.53
SDL1	17.20	761.98	-106.98	761.98	-102.23	-1.44
Increased SDL1	17.20	909.52	-128.47	909.46	-121.86	-1.72
Reduced SDL1	17.20	659.81	-92.03	659.86	-88.69	-1.25
SDL2	17.20	28.79	-2.81	28.80	-4.95	-0.06
Concrete shrinkage	17.40	674.53	3.70	674.48	-0.90	-0.88
primary effect		703.63		703.63		
secondary effect		-29.10	3.70	-29.14	-0.90	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1848.91	-3.87	-1848.72	1.06	1.79
primary effect		-1889.31		-1889.31		
secondary effect		40.40	-3.87	40.59	1.06	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1848.91	3.87	1848.72	-1.06	-1.79
primary effect		1889.31		1889.31		
secondary effect		-40.40	3.87	-40.59	-1.06	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	757.54	0.00	-110.36	6.55	-107.94	5.95	-1.07
Load model 1 TS	942.55	0.00	-159.44	41.09	-168.40	32.26	-1.06
Fatigue LM3 Left-hand slow lane	0.00	104.93	0.00	-17.02	0.00	-13.40	
Fatigue LM3 Right-hand slow lane	0.00	508.71	23.27	-84.28	16.62	-95.88	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.021	0.133	0.16	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.86	18.00	0.27	No.1
	[L]	-4.86	18.00	0.27	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	59.59	300.00	0.20	No.16
	[L]	59.58	300.00	0.20	No.16
Stress in top fibre of steel section (MPa)	[R]	-141.28	345.00	0.41	No.15
	[L]	-141.29	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	142.67	345.00	0.41	No.11
	[L]	142.68	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.79	13.50	0.13	No.1
	[L]	-1.79	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-19.69	199.19	0.10	No.11
	[L]	-20.13	199.19	0.10	No.1
Normal stress / shear interaction (MPa)	[R]	-139.83	345.00	0.41	No.11
	[L]	-140.58	345.00	0.41	No.11
Shear in connection (kN/m)	[R]	205.45	418.75	0.49	No.11
	[L]	203.81	418.75	0.49	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	845.65	6346.73	0.13	No.7
	[L]	862.96	6346.73	0.14	No.1
Sagging, Plastic resistance (kN.m)	[R]	8341.02	16342.70	0.51	No.10
	[L]	8341.54	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.7
	[L]	0.20	1.00	0.20	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.45	69.57	0.05	-
	[L]	3.45	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	17.20	139.13	0.12	-
	[L]	17.20	139.13	0.12	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	50.06	90.00	0.56	-
	[L]	47.86	90.00	0.53	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.44	-
	[L]	0.06	0.13	0.43	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2710.37	-146.79	2710.14	-130.79	-9.54
SDL1	17.20	1231.41	-65.43	1231.32	-60.66	-2.49
Increased SDL1	17.20	1472.10	-79.25	1472.19	-71.67	-2.98
Reduced SDL1	17.20	1064.71	-55.71	1064.59	-52.96	-2.16
SDL2	17.20	46.37	-1.31	46.38	-3.43	-0.10
Concrete shrinkage	17.40	680.08	-1.10	679.89	-0.81	-1.41
primary effect		703.63		703.63		
secondary effect		-23.55	-1.10	-23.74	-0.81	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1855.88	0.73	-1855.86	1.49	2.88
primary effect		-1889.31		-1889.31		
secondary effect		33.43	0.73	33.45	1.49	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1855.88	-0.73	1855.86	-1.49	-2.88
primary effect		1889.31		1889.31		
secondary effect		-33.43	-0.73	-33.45	-1.49	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1214.13	0.00	-77.63	16.35	-75.78	14.14	-1.85
Load model 1 TS	1524.32	0.00	-133.36	66.16	-140.72	57.28	-1.85
Fatigue LM3 Left-hand slow lane	0.00	173.40	0.00	-12.45	0.00	-8.81	
Fatigue LM3 Right-hand slow lane	0.00	786.78	38.44	-73.35	26.32	-85.74	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.037	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-7.34	18.00	0.41	No.1
	[L]	-7.34	18.00	0.41	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	43.40	300.00	0.14	No.16
	[L]	43.39	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-188.51	345.00	0.55	No.15
	[L]	-188.52	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	222.12	345.00	0.64	No.11
	[L]	222.13	345.00	0.64	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.48	13.50	0.18	No.1
	[L]	-2.48	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-13.31	199.19	0.07	No.11
	[L]	-13.81	199.19	0.07	No.11
Normal stress / shear interaction (MPa)	[R]	-213.39	345.00	0.62	No.11
	[L]	-213.91	345.00	0.62	No.11
Shear in connection (kN/m)	[R]	151.73	418.75	0.36	No.11
	[L]	150.47	418.75	0.36	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	571.04	6346.73	0.09	No.7
	[L]	592.86	6346.73	0.09	No.7
Sagging, Plastic resistance (kN.m)	[R]	11371.44	16342.70	0.70	No.10
	[L]	11371.84	16342.70	0.70	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.13	1.00	0.13	No.7
	[L]	0.14	1.00	0.14	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.34	69.57	0.08	-
	[L]	5.34	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	26.59	139.13	0.19	-
	[L]	26.59	139.13	0.19	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	49.87	90.00	0.55	-
	[L]	49.75	90.00	0.55	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.44	-
	[L]	0.06	0.13	0.45	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3228.73	-54.62	3229.01	-39.02	-11.73
SDL1	17.20	1467.00	-23.78	1466.60	-19.96	-3.06
Increased SDL1	17.20	1755.20	-29.51	1755.06	-22.23	-3.66
Reduced SDL1	17.20	1267.58	-19.96	1267.22	-17.67	-2.65
SDL2	17.20	55.38	0.24	55.40	-1.89	-0.12
Concrete shrinkage	17.40	683.27	-0.69	683.30	0.23	-1.68
primary effect		703.63		703.63		
secondary effect		-20.36	-0.69	-20.33	0.23	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1859.96	0.12	-1860.58	-0.61	3.43
primary effect		-1889.31		-1889.31		
secondary effect		29.35	0.12	28.73	-0.61	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1859.96	-0.12	1860.58	0.61	-3.43
primary effect		1889.31		1889.31		
secondary effect		-29.35	-0.12	-28.73	0.61	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1445.59	0.00	-50.49	29.53	-49.76	28.79	-2.27
Load model 1 TS	1818.24	0.00	-112.93	93.95	-123.66	83.70	-2.31
Fatigue LM3 Left-hand slow lane	0.00	208.41	0.30	-7.89	3.17	-4.29	
Fatigue LM3 Right-hand slow lane	0.00	907.26	54.46	-55.54	43.73	-67.05	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.046	0.133	0.34	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.59	18.00	0.48	No.1
	[L]	-8.59	18.00	0.48	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	35.22	300.00	0.12	No.16
	[L]	35.23	300.00	0.12	No.16
Stress in top fibre of steel section (MPa)	[R]	-212.26	345.00	0.62	No.15
	[L]	-212.25	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	262.16	345.00	0.76	No.11
	[L]	262.15	345.00	0.76	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.83	13.50	0.21	No.1
	[L]	-2.83	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-7.44	199.19	0.04	No.1
	[L]	-7.79	199.19	0.04	No.11
Normal stress / shear interaction (MPa)	[R]	-251.39	345.00	0.73	No.11
	[L]	-251.55	345.00	0.73	No.11
Shear in connection (kN/m)	[R]	106.59	283.27	0.38	No.1
	[L]	102.97	283.27	0.36	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	319.36	6346.73	0.05	No.1
	[L]	334.56	6346.73	0.05	No.7
Sagging, Plastic resistance (kN.m)	[R]	12899.04	16342.70	0.79	No.10
	[L]	12897.87	16342.70	0.79	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.07	1.00	0.07	No.1
	[L]	0.08	1.00	0.08	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	6.15	69.57	0.09	-
	[L]	6.15	69.57	0.09	-
Bending stress range in bottom flange (MPa)	[R]	30.67	139.13	0.22	-
	[L]	30.67	139.13	0.22	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	72.88	90.00	0.81	-
	[L]	72.37	90.00	0.80	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.62	-
	[L]	0.08	0.13	0.63	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3295.36	-8.53	3295.69	9.24	-12.01
SDL1	17.20	1499.03	-3.33	1499.06	3.38	-3.14
Increased SDL1	17.20	1792.39	-4.00	1792.70	4.66	-3.75
Reduced SDL1	17.20	1296.45	-3.96	1296.44	3.95	-2.71
SDL2	17.20	58.60	-0.37	58.60	0.39	-0.12
Concrete shrinkage	17.40	683.24	-0.01	683.31	0.17	-1.72
primary effect		703.63		703.63		
secondary effect		-20.39	-0.01	-20.32	0.17	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1860.27	-0.21	-1860.47	-0.22	3.50
primary effect		-1889.31		-1889.31		
secondary effect		29.04	-0.21	28.84	-0.22	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1860.27	0.21	1860.47	0.22	-3.50
primary effect		1889.31		1889.31		
secondary effect		-29.04	0.21	-28.84	0.22	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1481.86	0.00	-40.85	36.67	-36.52	40.99	-2.33
Load model 1 TS	1865.65	0.00	-108.00	99.55	-101.10	106.48	-2.37
Fatigue LM3 Left-hand slow lane	0.00	208.84	3.73	-3.85	3.87	-3.67	
Fatigue LM3 Right-hand slow lane	0.00	925.96	51.14	-53.90	54.05	-50.06	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.047	0.133	0.35	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.78	18.00	0.49	No.1
	[L]	-8.78	18.00	0.49	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	34.02	300.00	0.11	No.16
	[L]	34.03	300.00	0.11	No.16
Stress in top fibre of steel section (MPa)	[R]	-215.39	345.00	0.62	No.15
	[L]	-215.38	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	267.79	345.00	0.78	No.11
	[L]	267.76	345.00	0.78	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.88	13.50	0.21	No.1
	[L]	-2.88	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-5.09	199.19	0.03	No.11
	[L]	-5.08	199.19	0.03	No.9
Normal stress / shear interaction (MPa)	[R]	-256.82	345.00	0.74	No.11
	[L]	-256.72	345.00	0.74	No.11
Shear in connection (kN/m)	[R]	83.91	283.27	0.30	No.11
	[L]	84.38	283.27	0.30	No.9

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	218.54	6346.73	0.03	No.7
	[L]	218.39	6346.73	0.03	No.7
Sagging, Plastic resistance (kN.m)	[R]	13111.63	16342.70	0.80	No.10
	[L]	13110.39	16342.70	0.80	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.05	1.00	0.05	No.7
	[L]	0.05	1.00	0.05	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	6.28	69.57	0.09	-
	[L]	6.28	69.57	0.09	-
Bending stress range in bottom flange (MPa)	[R]	31.29	139.13	0.22	-
	[L]	31.31	139.13	0.23	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	68.49	90.00	0.76	-
	[L]	69.10	90.00	0.77	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.59	-
	[L]	0.08	0.13	0.59	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3228.23	40.64	3228.82	54.74	-11.73
SDL1	17.20	1466.89	19.31	1467.25	24.18	-3.06
Increased SDL1	17.20	1754.78	22.83	1754.94	29.03	-3.66
Reduced SDL1	17.20	1267.56	16.93	1267.70	20.18	-2.65
SDL2	17.20	55.38	1.93	55.39	-0.22	-0.12
Concrete shrinkage	17.40	683.22	-0.08	683.19	0.54	-1.68
primary effect		703.63		703.63		
secondary effect		-20.41	-0.08	-20.44	0.54	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1860.32	0.11	-1860.35	-0.79	3.43
primary effect		-1889.31		-1889.31		
secondary effect		28.99	0.11	28.96	-0.79	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1860.32	-0.11	1860.35	0.79	-3.43
primary effect		1889.31		1889.31		
secondary effect		-28.99	-0.11	-28.96	0.79	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1445.71	0.00	-28.95	50.31	-29.58	50.47	-2.27
Load model 1 TS	1818.42	0.00	-83.97	123.40	-94.48	112.54	-2.31
Fatigue LM3 Left-hand slow lane	0.00	208.37	4.28	-3.18	7.88	-0.28	
Fatigue LM3 Right-hand slow lane	0.00	907.71	66.91	-43.77	55.61	-53.83	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.046	0.133	0.34	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	No cracking			No.17
	[L]	No cracking			No.17
Compressive stress in top fibre of concrete (MPa)	[R]	-8.59	18.00	0.48	No.1
	[L]	-8.59	18.00	0.48	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	35.22	300.00	0.12	No.16
	[L]	35.22	300.00	0.12	No.16
Stress in top fibre of steel section (MPa)	[R]	-212.25	345.00	0.62	No.15
	[L]	-212.23	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	262.15	345.00	0.76	No.11
	[L]	262.13	345.00	0.76	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.83	13.50	0.21	No.1
	[L]	-2.83	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-7.77	199.19	0.04	No.11
	[L]	-7.51	199.19	0.04	No.1
Normal stress / shear interaction (MPa)	[R]	-251.55	345.00	0.73	No.11
	[L]	-251.36	345.00	0.73	No.11
Shear in connection (kN/m)	[R]	102.70	283.27	0.36	No.11
	[L]	106.79	283.27	0.38	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	333.40	6346.73	0.05	No.7
	[L]	322.80	6346.73	0.05	No.1
Sagging, Plastic resistance (kN.m)	[R]	12898.39	16342.70	0.79	No.10
	[L]	12897.36	16342.70	0.79	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.08	1.00	0.08	No.7
	[L]	0.08	1.00	0.08	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	6.16	69.57	0.09	-
	[L]	6.16	69.57	0.09	-
Bending stress range in bottom flange (MPa)	[R]	30.68	139.13	0.22	-
	[L]	30.69	139.13	0.22	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	71.99	90.00	0.80	-
	[L]	72.81	90.00	0.81	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.62	-
	[L]	0.08	0.13	0.62	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2710.41	130.29	2710.23	146.44	-9.54
SDL1	17.20	1231.64	60.09	1231.29	65.19	-2.49
Increased SDL1	17.20	1472.05	71.93	1472.18	79.41	-2.98
Reduced SDL1	17.20	1064.90	52.44	1064.91	56.09	-2.16
SDL2	17.20	46.38	3.43	46.37	1.31	-0.10
Concrete shrinkage	17.40	680.07	0.51	679.98	0.90	-1.41
primary effect		703.63		703.63		
secondary effect		-23.56	0.51	-23.65	0.90	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1856.25	-0.77	-1856.03	-1.02	2.88
primary effect		-1889.31		-1889.31		
secondary effect		33.06	-0.77	33.28	-1.02	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1856.25	0.77	1856.03	1.02	-2.88
primary effect		1889.31		1889.31		
secondary effect		-33.06	0.77	-33.28	1.02	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1214.02	0.00	-13.94	75.92	-16.41	78.06	-1.85
Load model 1 TS	1524.31	0.00	-58.48	146.04	-66.74	133.29	-1.85
Fatigue LM3 Left-hand slow lane	0.00	173.41	8.76	0.00	12.46	0.00	
Fatigue LM3 Right-hand slow lane	0.00	786.71	85.77	-26.52	73.23	-38.44	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.037	0.133	0.28	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-7.34	18.00	0.41	No.1
	[L]	-7.34	18.00	0.41	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	43.38	300.00	0.14	No.16
	[L]	43.37	300.00	0.14	No.16
Stress in top fibre of steel section (MPa)	[R]	-188.52	345.00	0.55	No.15
	[L]	-188.52	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	222.13	345.00	0.64	No.11
	[L]	222.13	345.00	0.64	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.48	13.50	0.18	No.1
	[L]	-2.48	13.50	0.18	No.1
Shear stress in steel sections (MPa)	[R]	-13.81	199.19	0.07	No.11
	[L]	-13.45	199.19	0.07	No.11
Normal stress / shear interaction (MPa)	[R]	-213.90	345.00	0.62	No.11
	[L]	-213.40	345.00	0.62	No.11
Shear in connection (kN/m)	[R]	150.71	418.75	0.36	No.11
	[L]	154.68	418.75	0.37	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	592.89	6346.73	0.09	No.7
	[L]	577.78	6346.73	0.09	No.7
Sagging, Plastic resistance (kN.m)	[R]	11371.80	16342.70	0.70	No.10
	[L]	11372.31	16342.70	0.70	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.14	1.00	0.14	No.7
	[L]	0.13	1.00	0.13	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	5.34	69.57	0.08	-
	[L]	5.34	69.57	0.08	-
Bending stress range in bottom flange (MPa)	[R]	26.59	139.13	0.19	-
	[L]	26.59	139.13	0.19	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	49.69	90.00	0.55	-
	[L]	49.97	90.00	0.56	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.45	-
	[L]	0.06	0.13	0.44	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1676.85	222.15	1676.56	237.91	-5.53
SDL1	17.20	761.81	102.54	761.94	106.91	-1.44
Increased SDL1	17.20	909.46	121.88	909.36	128.21	-1.72
Reduced SDL1	17.20	659.70	88.96	659.85	92.13	-1.25
SDL2	17.20	28.79	4.97	28.79	2.81	-0.06
Concrete shrinkage	17.40	674.51	0.86	674.52	-3.70	-0.88
primary effect		703.63		703.63		
secondary effect		-29.12	0.86	-29.10	-3.70	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1848.50	-1.46	-1848.55	4.50	1.79
primary effect		-1889.31		-1889.31		
secondary effect		40.81	-1.46	40.76	4.50	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1848.50	1.46	1848.55	-4.50	-1.79
primary effect		1889.31		1889.31		
secondary effect		-40.81	1.46	-40.76	-4.50	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	757.50	0.00	-5.93	108.18	-6.55	110.53	-1.07
Load model 1 TS	942.51	0.00	-33.64	167.76	-43.55	159.04	-1.06
Fatigue LM3 Left-hand slow lane	0.00	104.94	13.37	0.00	17.04	0.00	
Fatigue LM3 Right-hand slow lane	0.00	508.89	95.76	-15.93	84.24	-23.05	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.021	0.133	0.16	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-4.86	18.00	0.27	No.1
	[L]	-4.86	18.00	0.27	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	59.59	300.00	0.20	No.16
	[L]	59.60	300.00	0.20	No.16
Stress in top fibre of steel section (MPa)	[R]	-141.28	345.00	0.41	No.15
	[L]	-141.29	345.00	0.41	No.15
Stress in bottom fibre of steel section (MPa)	[R]	142.66	345.00	0.41	No.11
	[L]	142.68	345.00	0.41	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.79	13.50	0.13	No.1
	[L]	-1.79	13.50	0.13	No.1
Shear stress in steel sections (MPa)	[R]	-20.12	199.19	0.10	No.1
	[L]	-19.67	199.19	0.10	No.11
Normal stress / shear interaction (MPa)	[R]	-140.55	345.00	0.41	No.11
	[L]	-139.84	345.00	0.41	No.11
Shear in connection (kN/m)	[R]	203.75	418.75	0.49	No.1
	[L]	205.32	418.75	0.49	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	861.97	6346.73	0.14	No.1
	[L]	844.52	6346.73	0.13	No.7
Sagging, Plastic resistance (kN.m)	[R]	8340.55	16342.70	0.51	No.10
	[L]	8340.98	16342.70	0.51	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.1
	[L]	0.20	1.00	0.20	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	3.45	69.57	0.05	-
	[L]	3.45	69.57	0.05	-
Bending stress range in bottom flange (MPa)	[R]	17.20	139.13	0.12	-
	[L]	17.20	139.13	0.12	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	47.74	90.00	0.53	-
	[L]	49.70	90.00	0.55	-
Interaction connection / upper flange (MPa)	[R]	0.06	0.13	0.43	-
	[L]	0.06	0.13	0.44	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	130.96	313.86	130.95	327.09	-0.38
SDL1	17.20	59.89	143.92	59.89	149.71	-0.10
Increased SDL1	17.20	71.20	171.26	71.22	178.06	-0.12
Reduced SDL1	17.20	52.04	125.00	52.03	130.06	-0.09
SDL2	17.20	2.70	6.55	2.70	6.76	0.00
Concrete shrinkage	17.40	699.90	-5.40	699.93	-9.13	-0.07
primary effect		703.63		703.63		
secondary effect		-3.73	-5.40	-3.70	-9.13	
axial force - slab		N = -1064.27 kN		N = -1064.27 kN		
Simpl. temp. load +DT°C	6.40	-1883.66	8.43	-1883.67	13.75	0.14
primary effect		-1889.31		-1889.31		
secondary effect		5.65	8.43	5.64	13.75	
axial force - slab		N = 4344.28 kN		N = 4344.28 kN		
Simpl. temp. load -DT°C	6.40	1883.66	-8.43	1883.67	-13.75	-0.14
primary effect		1889.31		1889.31		
secondary effect		-5.65	-8.43	-5.64	-13.75	
axial force - slab		N = -4344.28 kN		N = -4344.28 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	61.31	0.00	-0.04	146.34	0.00	153.44	-0.07
Load model 1 TS	84.35	0.00	0.00	197.13	0.00	211.20	-0.07
Fatigue LM3 Left-hand slow lane	0.00	7.21	17.76	0.00	18.06	-0.01	
Fatigue LM3 Right-hand slow lane	-0.05	50.40	118.09	0.00	126.33	-0.11	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.001	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-1.51	18.00	0.08	No.5
	[L]	-1.51	18.00	0.08	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	80.94	300.00	0.27	No.16
	[L]	80.94	300.00	0.27	No.16
Stress in top fibre of steel section (MPa)	[R]	38.35	345.00	0.11	No.6
	[L]	38.35	345.00	0.11	No.6
Stress in bottom fibre of steel section (MPa)	[R]	11.71	345.00	0.03	No.3
	[L]	11.71	345.00	0.03	No.3
Compressive stress in top fibre of concrete (MPa)	[R]	-0.72	13.50	0.05	No.1
	[L]	-0.72	13.50	0.05	No.1
Shear stress in steel sections (MPa)	[R]	-27.77	199.19	0.14	No.1
	[L]	-26.37	199.19	0.13	No.1
Normal stress / shear interaction (MPa)	[R]	-54.65	345.00	0.16	No.5
	[L]	-53.11	345.00	0.15	No.5
Shear in connection (kN/m)	[R]	281.15	418.75	0.67	No.1
	[L]	264.60	418.75	0.63	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 7
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	1183.35	6346.73	0.19	No.1
	[L]	1127.43	6346.73	0.18	No.1
Sagging, Plastic resistance (kN.m)	[R]	3920.53	16342.70	0.24	No.10
	[L]	3920.47	16342.70	0.24	No.10
Hogging, Plastic resistance (kN.m)	[R]	2574.82	11864.01	0.22	No.5
	[L]	2574.80	11864.01	0.22	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.28	1.00	0.28	No.1
	[L]	0.26	1.00	0.26	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.30	1.00	0.30	No.5
	[L]	0.30	1.00	0.30	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.44	69.57	0.01	-
	[L]	0.44	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	2.18	139.13	0.02	-
	[L]	2.18	139.13	0.02	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	72.02	90.00	0.80	-
	[L]	67.27	90.00	0.75	-
Interaction connection / upper flange (MPa)	[R]	0.08	0.13	0.62	-
	[L]	0.08	0.13	0.58	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 7
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.80 m

… for stress calculation (2) : 1.80 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-196213.	-78696.	-78044.	-196213.	-36870.
S. modulus, bottom fibre (cm3) (2)	28240.	39377.	35776.	35731.	39377.	30579.
S. modulus, concrete slab (cm3) (2)		-579466.	-833905.	-838270.	-579466.	
S. modulus, top reinf. layer (cm3) (2)						-26865.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		16343.	16343.	16343.	16343.	
Plastic neutral axis (M > 0) (mm) (2)		1313.26	1313.26	1313.26	1313.26	
Elastic neutral axis (mm) (1)	770.00	1282.60	1058.70	1056.36	1282.60	
Bending moment of inertia (cm4) (1)	2174500.	5050455.	3787638.	3774527.	5050455.	
Torsional moment of inertia (cm4) (1)	1681.83	70667.35	27329.78	27032.07	70667.35	
Cross-sectional area (cm2) (1)	585.03	1274.60	841.41	838.43	1274.60	
Bending moment of inertia (cm4) (2)	2174500.	5050455.	3787638.	3774527.	5050455.	2574183.
Elastic neutral axis (mm) (2)	770.00	1282.60	1058.70	1056.36	1282.60	841.82
Cross-sectional area (cm2) (2)	585.03	1274.60	841.41	838.43	1274.60	633.29
Static moment (cm3) (2)		29989.05	16889.86	16753.06	29989.05	60384.38
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						82.63

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	-0.03	327.09			0.00
SDL1	17.20	-0.01	149.71			0.00
Increased SDL1	17.20	-0.02	178.06			0.00
Reduced SDL1	17.20	0.00	130.06			0.00
SDL2	17.20	0.00	6.76			0.00
Concrete shrinkage	17.40	703.58	-9.13			0.00
primary effect		703.63				
secondary effect		-0.04	-9.13			
axial force - slab		N = -1064.27 kN				
Simpl. temp. load +DT°C	6.40	-1889.22	13.75			0.00
primary effect		-1889.31				
secondary effect		0.09	13.75			
axial force - slab		N = 4344.28 kN				
Simpl. temp. load -DT°C	6.40	1889.22	-13.75			0.00
primary effect		1889.31				
secondary effect		-0.09	-13.75			
axial force - slab		N = -4344.28 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	153.44			0.00
Load model 1 TS	0.00	0.00	0.00	211.20			0.00
Fatigue LM3 Left-hand slow lane	-0.01	0.01	18.06	-0.01			
Fatigue LM3 Right-hand slow lane	-0.11	0.01	126.33	-0.11			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 7
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.23
Compressive stress in top fibre of concrete (MPa)	-1.26	18.00	0.07	No.6
Tensile stress in reinforcement (top layer) (MPa)	82.63	300.00	0.28	No.15
Stress in top fibre of steel section (MPa)	43.71	345.00	0.13	No.5
Stress in bottom fibre of steel section (MPa)	-13.90	345.00	0.04	No.5
Compressive stress in top fibre of concrete (MPa)	-0.63	13.50	0.05	No.27
Shear stress in steel sections (MPa)	-27.77	199.19	0.14	No.1
Normal stress / shear interaction (MPa)	-58.62	345.00	0.17	No.5
Shear in connection (kN/m)	281.15	418.75	0.67	No.1

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	1183.35	6346.73	0.19	No.1
Sagging, Plastic resistance (kN.m)	3537.36	16342.70	0.22	No.12
Hogging, Plastic resistance (kN.m)	2833.89	11864.01	0.24	No.3
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.28	1.00	0.28	No.1
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.33	1.00	0.33	No.3

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.01	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.01	139.13	0.00	-
Bending stress range in reinforcement (MPa)	81.65	130.83	0.62	-
Shear stress range in connection (MPa)	73.14	90.00	0.81	-
Interaction connection / upper flange (MPa)	0.00	0.13	0.00	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-			-0.02	-316.79	0.00
SDL1	17.20			0.00	-131.25	0.00
Increased SDL1	17.20			0.03	-152.70	0.00
Reduced SDL1	17.20			0.03	-116.23	0.00
SDL2	17.20			-0.01	-5.45	0.00
Concrete shrinkage	17.40			554.78	-10.49	0.00
primary effect				554.75		
secondary effect				0.03	-10.49	
axial force - slab				N = -768.64 kN		
Simpl. temp. load +DT°C	6.40			-1605.87	15.22	0.00
primary effect				-1605.82		
secondary effect				-0.04	15.22	
axial force - slab				N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40			1605.87	-15.22	0.00
primary effect				1605.82		
secondary effect				0.04	-15.22	
axial force - slab				N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00			-127.36	0.00	0.00
Load model 1 TS	0.00	0.00			-29.37	0.00	0.00
Fatigue LM3 Left-hand slow lane	0.00	0.41			3.75	-6.07	
Fatigue LM3 Right-hand slow lane	-0.45	0.04			0.00	-85.03	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 1
Node line No. : 1
Type of cross-section : Support
Position : 0.00 m Origin abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	-1.87	18.00	0.10	No.5
Tensile stress in reinforcement (top layer) (MPa)	88.00	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	40.60	345.00	0.12	No.6
Stress in bottom fibre of steel section (MPa)	-12.99	345.00	0.04	No.6
Compressive stress in top fibre of concrete (MPa)	-0.93	13.50	0.07	No.1
Shear stress in steel sections (MPa)	-20.44	199.19	0.10	No.11
Normal stress / shear interaction (MPa)	-48.86	345.00	0.14	No.5
Shear in connection (kN/m)	135.70	418.75	0.32	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	863.25	6346.73	0.14	No.7
Sagging, Plastic resistance (kN.m)	2963.59	15343.74	0.19	No.10
Hogging, Plastic resistance (kN.m)	2408.79	11691.04	0.21	No.5
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.20	1.00	0.20	No.7
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.29	1.00	0.29	No.5

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.02	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.03	139.13	0.00	-
Bending stress range in reinforcement (MPa)	86.98	130.83	0.66	-
Shear stress range in connection (MPa)	45.76	90.00	0.51	-
Interaction connection / upper flange (MPa)	0.03	0.13	0.21	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	126.84	-316.79	126.82	-304.84	-0.38
SDL1	17.20	52.53	-131.25	52.55	-126.33	-0.10
Increased SDL1	17.20	61.15	-152.70	61.17	-147.59	-0.12
Reduced SDL1	17.20	46.55	-116.23	46.57	-111.64	-0.09
SDL2	17.20	2.18	-5.45	2.17	-5.21	0.00
Concrete shrinkage	17.40	558.96	-10.49	558.98	-8.53	-0.07
primary effect		554.75		554.75		
secondary effect		4.21	-10.49	4.23	-8.53	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1611.84	15.22	-1611.97	12.69	0.14
primary effect		-1605.82		-1605.82		
secondary effect		-6.02	15.22	-6.15	12.69	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1611.84	-15.22	1611.97	-12.69	-0.14
primary effect		1605.82		1605.82		
secondary effect		6.02	-15.22	6.15	-12.69	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	50.35	0.00	-127.36	0.00	-125.82	0.08	-0.08
Load model 1 TS	11.92	0.00	-29.37	0.00	-45.97	0.00	-0.08
Fatigue LM3 Left-hand slow lane	-1.11	2.91	3.75	-6.07	3.54	-5.66	
Fatigue LM3 Right-hand slow lane	0.00	33.56	0.00	-85.03	0.00	-83.64	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.002	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	[R]	-2.01	18.00	0.11	No.5
	[L]	-2.01	18.00	0.11	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	85.92	300.00	0.29	No.4
	[L]	85.93	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	[R]	35.39	345.00	0.10	No.6
	[L]	35.39	345.00	0.10	No.6
Stress in bottom fibre of steel section (MPa)	[R]	8.94	345.00	0.03	No.11
	[L]	8.94	345.00	0.03	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.02	13.50	0.08	No.1
	[L]	-1.02	13.50	0.08	No.1
Shear stress in steel sections (MPa)	[R]	-20.26	199.19	0.10	No.11
	[L]	-20.44	199.19	0.10	No.11
Normal stress / shear interaction (MPa)	[R]	-44.52	345.00	0.13	No.5
	[L]	-44.65	345.00	0.13	No.5
Shear in connection (kN/m)	[R]	140.61	418.75	0.34	No.11
	[L]	135.70	418.75	0.32	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 2
Node line No. : 2
Type of cross-section : Diaphragm
Position : 0.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	858.26	6346.73	0.14	No.7
	[L]	863.25	6346.73	0.14	No.7
Sagging, Plastic resistance (kN.m)	[R]	3272.92	15343.74	0.21	No.10
	[L]	3272.70	15343.74	0.21	No.10
Hogging, Plastic resistance (kN.m)	[R]	2180.94	11691.04	0.19	No.5
	[L]	2180.76	11691.04	0.19	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.7
	[L]	0.20	1.00	0.20	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.26	1.00	0.26	No.5
	[L]	0.26	1.00	0.26	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.41	69.57	0.01	-
	[L]	0.42	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	1.49	139.13	0.01	-
	[L]	1.50	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	44.32	90.00	0.49	-
	[L]	45.06	90.00	0.50	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.38	-
	[L]	0.05	0.13	0.39	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1657.71	-241.94	1657.81	-216.53	-5.48
SDL1	17.20	687.68	-100.13	687.54	-89.77	-1.43
Increased SDL1	17.20	815.09	-120.92	815.18	-106.18	-1.71
Reduced SDL1	17.20	599.33	-85.46	599.38	-78.08	-1.24
SDL2	17.20	29.49	-4.64	29.48	-3.41	-0.06
Concrete shrinkage	17.40	604.04	-7.33	604.03	-3.12	-0.87
primary effect		554.75		554.75		
secondary effect		49.30	-7.33	49.29	-3.12	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1676.18	9.97	-1676.00	4.56	1.78
primary effect		-1605.82		-1605.82		
secondary effect		-70.35	9.97	-70.18	4.56	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1676.18	-9.97	1676.00	-4.56	-1.78
primary effect		1605.82		1605.82		
secondary effect		70.35	-9.97	70.18	-4.56	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	727.49	0.00	-113.21	9.33	-91.41	4.81	-1.16
Load model 1 TS	673.46	0.00	-107.43	66.58	-66.13	34.63	-1.16
Fatigue LM3 Left-hand slow lane	-7.86	50.15	2.99	-5.18	0.00	-3.40	
Fatigue LM3 Right-hand slow lane	0.00	477.17	0.00	-80.10	0.00	-65.66	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.023	0.133	0.17	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-5.24	18.00	0.29	No.1
	[L]	-5.24	18.00	0.29	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	61.45	300.00	0.20	No.4
	[L]	61.45	300.00	0.20	No.4
Stress in top fibre of steel section (MPa)	[R]	-138.45	345.00	0.40	No.15
	[L]	-138.45	345.00	0.40	No.15
Stress in bottom fibre of steel section (MPa)	[R]	136.16	345.00	0.39	No.11
	[L]	136.15	345.00	0.39	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.06	13.50	0.15	No.1
	[L]	-2.06	13.50	0.15	No.1
Shear stress in steel sections (MPa)	[R]	-15.36	199.19	0.08	No.11
	[L]	-18.88	199.19	0.09	No.11
Normal stress / shear interaction (MPa)	[R]	-134.28	345.00	0.39	No.15
	[L]	-135.17	345.00	0.39	No.15
Shear in connection (kN/m)	[R]	116.96	418.75	0.28	No.11
	[L]	157.79	418.75	0.38	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 3
Node line No. : 7
Type of cross-section : Diaphragm
Position : 6.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	656.05	6346.73	0.10	No.7
	[L]	801.31	6346.73	0.13	No.7
Sagging, Plastic resistance (kN.m)	[R]	7571.10	15343.74	0.49	No.10
	[L]	7571.13	15343.74	0.49	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.15	1.00	0.15	No.7
	[L]	0.19	1.00	0.19	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.60	69.57	0.07	-
	[L]	4.60	69.57	0.07	-
Bending stress range in bottom flange (MPa)	[R]	16.59	139.13	0.12	-
	[L]	16.60	139.13	0.12	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	27.18	90.00	0.30	-
	[L]	33.16	90.00	0.37	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.28	-
	[L]	0.04	0.13	0.33	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2695.43	-154.14	2695.09	-125.11	-9.47
SDL1	17.20	1115.32	-62.57	1115.49	-51.72	-2.47
Increased SDL1	17.20	1334.51	-79.29	1334.06	-61.17	-2.95
Reduced SDL1	17.20	964.05	-51.84	964.19	-45.20	-2.14
SDL2	17.20	46.69	-2.82	46.69	-1.76	-0.10
Concrete shrinkage	17.40	619.86	-2.67	619.83	-1.17	-1.41
primary effect		554.75		554.75		
secondary effect		65.11	-2.67	65.08	-1.17	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1697.65	3.82	-1697.36	1.86	2.88
primary effect		-1605.82		-1605.82		
secondary effect		-91.83	3.82	-91.53	1.86	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1697.65	-3.82	1697.36	-1.86	-2.88
primary effect		1605.82		1605.82		
secondary effect		91.83	-3.82	91.53	-1.86	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1224.73	0.00	-76.47	11.73	-54.34	2.21	-2.01
Load model 1 TS	1274.36	0.00	-88.16	59.80	-37.77	9.15	-2.02
Fatigue LM3 Left-hand slow lane	0.00	77.33	0.00	-2.65	0.83	-5.24	
Fatigue LM3 Right-hand slow lane	0.00	781.95	0.00	-61.60	7.02	-47.26	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.040	0.133	0.30	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-8.34	18.00	0.46	No.1
	[L]	-8.34	18.00	0.46	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	44.38	300.00	0.15	No.8
	[L]	44.37	300.00	0.15	No.8
Stress in top fibre of steel section (MPa)	[R]	-188.72	345.00	0.55	No.15
	[L]	-188.75	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	217.89	345.00	0.63	No.11
	[L]	217.92	345.00	0.63	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.80	13.50	0.21	No.1
	[L]	-2.80	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-8.86	199.19	0.04	No.11
	[L]	-12.74	199.19	0.06	No.11
Normal stress / shear interaction (MPa)	[R]	-209.07	345.00	0.61	No.11
	[L]	-209.81	345.00	0.61	No.11
Shear in connection (kN/m)	[R]	67.28	418.75	0.16	No.11
	[L]	112.30	418.75	0.27	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 4
Node line No. : 12
Type of cross-section : Diaphragm
Position : 11.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	379.39	6346.73	0.06	No.7
	[L]	543.85	6346.73	0.09	No.7
Sagging, Plastic resistance (kN.m)	[R]	10619.88	15343.74	0.69	No.10
	[L]	10621.42	15343.74	0.69	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.09	1.00	0.09	No.7
	[L]	0.13	1.00	0.13	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	7.54	69.57	0.11	-
	[L]	7.54	69.57	0.11	-
Bending stress range in bottom flange (MPa)	[R]	27.19	139.13	0.20	-
	[L]	27.20	139.13	0.20	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	22.47	90.00	0.25	-
	[L]	25.50	90.00	0.28	-
Interaction connection / upper flange (MPa)	[R]	0.03	0.13	0.21	-
	[L]	0.04	0.13	0.30	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3218.20	-61.86	3218.40	-32.41	-11.64
SDL1	17.20	1330.33	-24.89	1330.05	-14.62	-3.04
Increased SDL1	17.20	1597.86	-33.42	1597.75	-14.45	-3.63
Reduced SDL1	17.20	1145.28	-19.26	1145.23	-13.66	-2.63
SDL2	17.20	54.92	-1.22	54.90	-0.30	-0.13
Concrete shrinkage	17.40	625.74	-0.96	625.66	-0.31	-1.68
primary effect		554.75		554.75		
secondary effect		70.99	-0.96	70.91	-0.31	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1705.30	1.33	-1705.47	-0.29	3.43
primary effect		-1605.82		-1605.82		
secondary effect		-99.47	1.33	-99.65	-0.29	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1705.30	-1.33	1705.47	0.29	-3.43
primary effect		1605.82		1605.82		
secondary effect		99.47	-1.33	99.65	0.29	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1479.74	0.00	-44.61	1.32	-24.45	19.35	-2.48
Load model 1 TS	1596.09	0.00	-51.49	30.37	-1.27	22.73	-2.50
Fatigue LM3 Left-hand slow lane	0.00	79.70	1.98	-4.86	3.40	-4.58	
Fatigue LM3 Right-hand slow lane	0.00	931.87	11.17	-43.66	25.75	-29.34	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.050	0.133	0.37	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-9.95	18.00	0.55	No.1
	[L]	-9.95	18.00	0.55	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	35.34	300.00	0.12	No.12
	[L]	35.34	300.00	0.12	No.12
Stress in top fibre of steel section (MPa)	[R]	-214.17	345.00	0.62	No.15
	[L]	-214.17	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	259.66	345.00	0.75	No.11
	[L]	259.66	345.00	0.75	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-3.18	13.50	0.24	No.1
	[L]	-3.18	13.50	0.24	No.1
Shear stress in steel sections (MPa)	[R]	-2.30	199.19	0.01	No.9
	[L]	-6.10	199.19	0.03	No.11
Normal stress / shear interaction (MPa)	[R]	-248.76	345.00	0.72	No.11
	[L]	-248.97	345.00	0.72	No.11
Shear in connection (kN/m)	[R]	16.08	283.27	0.06	No.9
	[L]	59.89	283.27	0.21	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 5
Node line No. : 17
Type of cross-section : Diaphragm
Position : 17.20 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	98.71	6346.73	0.02	No.7
	[L]	260.96	6346.73	0.04	No.7
Sagging, Plastic resistance (kN.m)	[R]	12174.88	15343.74	0.79	No.10
	[L]	12174.60	15343.74	0.79	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.02	1.00	0.02	No.7
	[L]	0.06	1.00	0.06	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	8.99	69.57	0.13	-
	[L]	8.99	69.57	0.13	-
Bending stress range in bottom flange (MPa)	[R]	32.40	139.13	0.23	-
	[L]	32.41	139.13	0.23	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	33.71	90.00	0.37	-
	[L]	33.55	90.00	0.37	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.30	-
	[L]	0.04	0.13	0.33	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3273.25	-6.40	3273.29	6.48	-11.92
SDL1	17.20	1353.73	-2.65	1353.75	2.72	-3.11
Increased SDL1	17.20	1622.03	-2.97	1621.93	2.75	-3.72
Reduced SDL1	17.20	1167.97	-2.41	1168.57	3.69	-2.69
SDL2	17.20	55.37	-0.06	55.38	0.07	-0.13
Concrete shrinkage	17.40	625.83	0.07	625.89	0.07	-1.71
primary effect		554.75		554.75		
secondary effect		71.08	0.07	71.14	0.07	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1705.82	0.77	-1705.92	-0.98	3.50
primary effect		-1605.82		-1605.82		
secondary effect		-100.00	0.77	-100.10	-0.98	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1705.82	-0.77	1705.92	0.98	-3.50
primary effect		1605.82		1605.82		
secondary effect		100.00	-0.77	100.10	0.98	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1486.60	0.00	-23.15	22.31	-22.24	22.83	-2.54
Load model 1 TS	1584.75	0.00	-9.50	13.69	-13.68	9.12	-2.56
Fatigue LM3 Left-hand slow lane	0.00	75.33	3.95	-4.16	4.17	-3.90	
Fatigue LM3 Right-hand slow lane	0.00	927.53	27.90	-28.39	28.62	-27.67	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.051	0.133	0.38	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-9.98	18.00	0.55	No.1
	[L]	-9.98	18.00	0.55	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	34.38	300.00	0.11	No.12
	[L]	34.41	300.00	0.11	No.12
Stress in top fibre of steel section (MPa)	[R]	-216.47	345.00	0.63	No.15
	[L]	-216.47	345.00	0.63	No.15
Stress in bottom fibre of steel section (MPa)	[R]	262.22	345.00	0.76	No.11
	[L]	262.21	345.00	0.76	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-3.21	13.50	0.24	No.1
	[L]	-3.21	13.50	0.24	No.1
Shear stress in steel sections (MPa)	[R]	-1.34	199.19	0.01	No.12
	[L]	-1.33	199.19	0.01	No.3
Normal stress / shear interaction (MPa)	[R]	-251.20	345.00	0.73	No.11
	[L]	-251.19	345.00	0.73	No.11
Shear in connection (kN/m)	[R]	15.67	283.27	0.06	No.12
	[L]	15.62	283.27	0.06	No.3

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 6
Node line No. : 20
Type of cross-section : Mid-span
Position : 20.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	57.03	6346.73	0.01	No.8
	[L]	56.80	6346.73	0.01	No.1
Sagging, Plastic resistance (kN.m)	[R]	12275.40	15343.74	0.80	No.10
	[L]	12275.26	15343.74	0.80	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.01	1.00	0.01	No.8
	[L]	0.01	1.00	0.01	No.1
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	8.94	69.57	0.13	-
	[L]	8.94	69.57	0.13	-
Bending stress range in bottom flange (MPa)	[R]	32.25	139.13	0.23	-
	[L]	32.25	139.13	0.23	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	34.44	90.00	0.38	-
	[L]	34.45	90.00	0.38	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.29	-
	[L]	0.04	0.13	0.29	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	3218.36	32.51	3218.21	61.86	-11.64
SDL1	17.20	1330.13	14.43	1330.19	24.63	-3.04
Increased SDL1	17.20	1597.83	14.22	1597.72	33.20	-3.63
Reduced SDL1	17.20	1145.20	13.73	1145.39	19.46	-2.63
SDL2	17.20	54.93	0.25	54.92	1.22	-0.13
Concrete shrinkage	17.40	625.63	0.36	625.76	0.98	-1.68
primary effect		554.75		554.75		
secondary effect		70.89	0.36	71.01	0.98	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1705.25	-0.17	-1705.21	-1.20	3.43
primary effect		-1605.82		-1605.82		
secondary effect		-99.43	-0.17	-99.39	-1.20	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1705.25	0.17	1705.21	1.20	-3.43
primary effect		1605.82		1605.82		
secondary effect		99.43	0.17	99.39	1.20	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1479.79	0.00	-19.29	23.76	-1.54	44.50	-2.48
Load model 1 TS	1595.96	0.00	-20.64	1.04	-31.45	51.30	-2.50
Fatigue LM3 Left-hand slow lane	0.00	79.70	4.56	-3.42	4.86	-2.01	
Fatigue LM3 Right-hand slow lane	0.00	932.01	29.46	-25.77	43.88	-11.07	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.050	0.133	0.37	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-9.95	18.00	0.55	No.1
	[L]	-9.95	18.00	0.55	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	35.34	300.00	0.12	No.12
	[L]	35.35	300.00	0.12	No.12
Stress in top fibre of steel section (MPa)	[R]	-214.16	345.00	0.62	No.15
	[L]	-214.17	345.00	0.62	No.15
Stress in bottom fibre of steel section (MPa)	[R]	259.65	345.00	0.75	No.11
	[L]	259.66	345.00	0.75	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-3.18	13.50	0.24	No.1
	[L]	-3.18	13.50	0.24	No.1
Shear stress in steel sections (MPa)	[R]	-6.08	199.19	0.03	No.11
	[L]	-2.27	199.19	0.01	No.11
Normal stress / shear interaction (MPa)	[R]	-248.96	345.00	0.72	No.11
	[L]	-248.76	345.00	0.72	No.11
Shear in connection (kN/m)	[R]	59.63	283.27	0.21	No.11
	[L]	15.55	283.27	0.05	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 7
Node line No. : 23
Type of cross-section : Diaphragm
Position : 22.80 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	260.29	6346.73	0.04	No.7
	[L]	97.27	6346.73	0.02	No.7
Sagging, Plastic resistance (kN.m)	[R]	12174.22	15343.74	0.79	No.10
	[L]	12174.51	15343.74	0.79	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.06	1.00	0.06	No.7
	[L]	0.02	1.00	0.02	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	8.99	69.57	0.13	-
	[L]	8.99	69.57	0.13	-
Bending stress range in bottom flange (MPa)	[R]	32.41	139.13	0.23	-
	[L]	32.41	139.13	0.23	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	33.63	90.00	0.37	-
	[L]	33.80	90.00	0.38	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.32	-
	[L]	0.04	0.13	0.29	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	2695.15	125.02	2694.94	153.28	-9.47
SDL1	17.20	1115.53	51.66	1115.65	63.13	-2.47
Increased SDL1	17.20	1334.37	60.63	1334.52	79.29	-2.95
Reduced SDL1	17.20	964.26	45.05	964.11	51.94	-2.14
SDL2	17.20	46.69	1.77	46.70	2.84	-0.10
Concrete shrinkage	17.40	619.94	0.99	619.91	2.76	-1.41
primary effect		554.75		554.75		
secondary effect		65.19	0.99	65.16	2.76	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1697.23	-2.14	-1697.42	-3.34	2.88
primary effect		-1605.82		-1605.82		
secondary effect		-91.41	-2.14	-91.59	-3.34	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1697.23	2.14	1697.42	3.34	-2.88
primary effect		1605.82		1605.82		
secondary effect		91.41	2.14	91.59	3.34	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	1224.79	0.00	-2.23	54.05	-11.76	76.36	-2.01
Load model 1 TS	1274.28	0.00	-10.12	29.26	-60.57	88.27	-2.02
Fatigue LM3 Left-hand slow lane	0.00	77.35	5.22	-0.85	2.66	0.00	
Fatigue LM3 Right-hand slow lane	0.00	781.94	47.45	-7.04	61.72	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.040	0.133	0.30	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-8.34	18.00	0.46	No.1
	[L]	-8.34	18.00	0.46	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	44.38	300.00	0.15	No.8
	[L]	44.38	300.00	0.15	No.8
Stress in top fibre of steel section (MPa)	[R]	-188.73	345.00	0.55	No.15
	[L]	-188.73	345.00	0.55	No.15
Stress in bottom fibre of steel section (MPa)	[R]	217.90	345.00	0.63	No.11
	[L]	217.90	345.00	0.63	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.80	13.50	0.21	No.1
	[L]	-2.80	13.50	0.21	No.1
Shear stress in steel sections (MPa)	[R]	-12.70	199.19	0.06	No.11
	[L]	-8.57	199.19	0.04	No.11
Normal stress / shear interaction (MPa)	[R]	-209.78	345.00	0.61	No.11
	[L]	-209.08	345.00	0.61	No.11
Shear in connection (kN/m)	[R]	112.21	418.75	0.27	No.11
	[L]	62.28	418.75	0.15	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 8
Node line No. : 28
Type of cross-section : Diaphragm
Position : 28.40 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	542.82	6346.73	0.09	No.7
	[L]	366.48	6346.73	0.06	No.7
Sagging, Plastic resistance (kN.m)	[R]	10620.43	15343.74	0.69	No.10
	[L]	10620.26	15343.74	0.69	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.13	1.00	0.13	No.7
	[L]	0.09	1.00	0.09	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	7.54	69.57	0.11	-
	[L]	7.54	69.57	0.11	-
Bending stress range in bottom flange (MPa)	[R]	27.20	139.13	0.20	-
	[L]	27.19	139.13	0.20	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	25.55	90.00	0.28	-
	[L]	22.56	90.00	0.25	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.30	-
	[L]	0.03	0.13	0.21	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	1657.78	216.58	1657.52	241.59	-5.48
SDL1	17.20	687.66	89.56	687.68	100.12	-1.43
Increased SDL1	17.20	815.15	106.26	815.16	121.04	-1.71
Reduced SDL1	17.20	599.41	77.99	599.37	85.52	-1.24
SDL2	17.20	29.48	3.40	29.49	4.64	-0.06
Concrete shrinkage	17.40	604.06	3.08	604.09	7.42	-0.87
primary effect		554.75		554.75		
secondary effect		49.31	3.08	49.34	7.42	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1675.99	-4.59	-1676.03	-9.69	1.78
primary effect		-1605.82		-1605.82		
secondary effect		-70.16	-4.59	-70.20	-9.69	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1675.99	4.59	1676.03	9.69	-1.78
primary effect		1605.82		1605.82		
secondary effect		70.16	4.59	70.20	9.69	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	727.70	0.00	-4.82	91.34	-9.33	113.33	-1.16
Load model 1 TS	673.41	0.00	-36.37	66.59	-70.00	107.99	-1.16
Fatigue LM3 Left-hand slow lane	-7.86	50.15	3.40	0.00	5.18	-2.99	
Fatigue LM3 Right-hand slow lane	-0.01	477.16	65.63	0.00	80.08	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.023	0.133	0.17	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.24
Compressive stress in top fibre of concrete (MPa)	[R]	-5.24	18.00	0.29	No.1
	[L]	-5.24	18.00	0.29	No.1
Tensile stress in reinforcement (top layer) (MPa)	[R]	61.45	300.00	0.20	No.4
	[L]	61.45	300.00	0.20	No.4
Stress in top fibre of steel section (MPa)	[R]	-138.44	345.00	0.40	No.15
	[L]	-138.45	345.00	0.40	No.15
Stress in bottom fibre of steel section (MPa)	[R]	136.15	345.00	0.39	No.11
	[L]	136.16	345.00	0.39	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-2.06	13.50	0.15	No.1
	[L]	-2.06	13.50	0.15	No.1
Shear stress in steel sections (MPa)	[R]	-18.89	199.19	0.09	No.11
	[L]	-15.38	199.19	0.08	No.11
Normal stress / shear interaction (MPa)	[R]	-135.16	345.00	0.39	No.15
	[L]	-134.29	345.00	0.39	No.15
Shear in connection (kN/m)	[R]	158.13	418.75	0.38	No.11
	[L]	117.21	418.75	0.28	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 9
Node line No. : 33
Type of cross-section : Diaphragm
Position : 34.00 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	802.03	6346.73	0.13	No.7
	[L]	656.71	6346.73	0.10	No.7
Sagging, Plastic resistance (kN.m)	[R]	7570.83	15343.74	0.49	No.10
	[L]	7571.08	15343.74	0.49	No.10
Hogging, Plastic resistance (kN.m)	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.19	1.00	0.19	No.7
	[L]	0.15	1.00	0.15	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.00	0.00	-	-
	[L]	0.00	0.00	-	-

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	4.60	69.57	0.07	-
	[L]	4.60	69.57	0.07	-
Bending stress range in bottom flange (MPa)	[R]	16.60	139.13	0.12	-
	[L]	16.59	139.13	0.12	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	33.15	90.00	0.37	-
	[L]	27.17	90.00	0.30	-
Interaction connection / upper flange (MPa)	[R]	0.04	0.13	0.33	-
	[L]	0.04	0.13	0.28	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	126.83	304.86	126.83	316.69	-0.38
SDL1	17.20	52.54	126.36	52.49	131.08	-0.10
Increased SDL1	17.20	61.20	147.56	61.17	152.81	-0.12
Reduced SDL1	17.20	46.56	111.64	46.56	116.34	-0.09
SDL2	17.20	2.17	5.21	2.18	5.46	0.00
Concrete shrinkage	17.40	558.99	8.52	558.94	10.40	-0.07
primary effect		554.75		554.75		
secondary effect		4.24	8.52	4.19	10.40	
axial force - slab		N = -768.64 kN		N = -768.64 kN		
Simpl. temp. load +DT°C	6.40	-1611.95	-12.73	-1611.83	-15.13	0.14
primary effect		-1605.82		-1605.82		
secondary effect		-6.13	-12.73	-6.01	-15.13	
axial force - slab		N = 3137.53 kN		N = 3137.53 kN		
Simpl. temp. load -DT°C	6.40	1611.95	12.73	1611.83	15.13	-0.14
primary effect		1605.82		1605.82		
secondary effect		6.13	12.73	6.01	15.13	
axial force - slab		N = -3137.53 kN		N = -3137.53 kN		

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	50.37	0.00	-0.08	125.83	0.00	127.65	-0.08
Load model 1 TS	11.92	0.00	0.00	54.52	0.00	29.36	-0.08
Fatigue LM3 Left-hand slow lane	-1.11	2.91	5.66	-3.54	6.07	-3.75	
Fatigue LM3 Right-hand slow lane	0.00	33.58	83.63	0.00	85.05	0.00	

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

SERVICEABILITY LIMIT STATE		Value	Limit	Ratio	Combination
Deflections (m)		0.002	0.133	0.01	UDL + TS
Minimum reinforcement (%)	[R]	1.04	1.09	0.95	-
	[L]	1.04	1.09	0.95	-
Slab cracking	[R]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
	[L]	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	[R]	-2.01	18.00	0.11	No.5
	[L]	-2.01	18.00	0.11	No.5
Tensile stress in reinforcement (top layer) (MPa)	[R]	85.93	300.00	0.29	No.4
	[L]	85.92	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	[R]	35.39	345.00	0.10	No.6
	[L]	35.39	345.00	0.10	No.6
Stress in bottom fibre of steel section (MPa)	[R]	8.94	345.00	0.03	No.11
	[L]	8.94	345.00	0.03	No.11
Compressive stress in top fibre of concrete (MPa)	[R]	-1.02	13.50	0.08	No.1
	[L]	-1.02	13.50	0.08	No.1
Shear stress in steel sections (MPa)	[R]	-20.45	199.19	0.10	No.11
	[L]	-20.53	199.19	0.10	No.11
Normal stress / shear interaction (MPa)	[R]	-44.66	345.00	0.13	No.5
	[L]	-44.73	345.00	0.13	No.5
Shear in connection (kN/m)	[R]	135.79	418.75	0.32	No.11
	[L]	145.33	418.75	0.35	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

Beam line No. : 8
Section No. : 10
Node line No. : 38
Type of cross-section : Diaphragm
Position : 39.60 m Span No. : 1

ULTIMATE LIMIT STATE		Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	[R]	863.56	6346.73	0.14	No.7
	[L]	869.78	6346.73	0.14	No.7
Sagging, Plastic resistance (kN.m)	[R]	3272.69	15343.74	0.21	No.10
	[L]	3272.96	15343.74	0.21	No.10
Hogging, Plastic resistance (kN.m)	[R]	2180.74	11691.04	0.19	No.5
	[L]	2180.92	11691.04	0.19	No.5
Bending / shear interaction (sagging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	[R]	-	-	-	-
	[L]	-	-	-	-
Shear buckling: force criterion	[R]	0.20	1.00	0.20	No.7
	[L]	0.20	1.00	0.20	No.7
Shear buckling: bending / shear interaction	[R]	-	-	-	-
	[L]	-	-	-	-
LTBuckling	[R]	0.26	1.00	0.26	No.5
	[L]	0.26	1.00	0.26	No.5

FATIGUE LIMIT STATE		Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	[R]	0.42	69.57	0.01	-
	[L]	0.41	69.57	0.01	-
Bending stress range in bottom flange (MPa)	[R]	1.50	139.13	0.01	-
	[L]	1.49	139.13	0.01	-
Bending stress range in reinforcement (MPa)	[R]	0.00	130.83	0.00	-
	[L]	0.00	130.83	0.00	-
Shear stress range in connection (MPa)	[R]	45.07	90.00	0.50	-
	[L]	44.31	90.00	0.49	-
Interaction connection / upper flange (MPa)	[R]	0.05	0.13	0.39	-
	[L]	0.05	0.13	0.38	-

CROSS-SECTION CHARACTERISTICS

Beam line No. : 8
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

Effective slab width … for internal force and moment calculation (1) : 1.30 m

… for stress calculation (2) : 1.30 m

Concrete state	Casting	Uncracked				Cracked
Loads	Permanent	Permanent			Live	-
Modular ratio	-	6.40	17.20	17.40	6.40	
S. modulus, top flange (cm3) (2)	-28240.	-138031.	-63562.	-63119.	-138031.	-34439.
S. modulus, bottom fibre (cm3) (2)	28240.	38273.	34541.	34497.	38273.	30005.
S. modulus, concrete slab (cm3) (2)		-465249.	-703899.	-708143.	-465249.	
S. modulus, top reinf. layer (cm3) (2)						-25274.
Shear area (cm2)	318.63					
Plastic moment (M > 0) (kN.m) (2)		15344.	15344.	15344.	15344.	
Plastic neutral axis (M > 0) (mm) (2)		1162.36	1162.36	1162.36	1162.36	
Elastic neutral axis (mm) (1)	770.00	1205.69	997.78	995.77	1205.69	
Bending moment of inertia (cm4) (1)	2174500.	4614520.	3446412.	3435140.	4614520.	
Torsional moment of inertia (cm4) (1)	1681.83	51504.71	20205.35	19990.33	51504.71	
Cross-sectional area (cm2) (1)	585.03	1083.06	770.19	768.04	1083.06	
Bending moment of inertia (cm4) (2)	2174500.	4614520.	3446412.	3435140.	4614520.	2469344.
Elastic neutral axis (mm) (2)	770.00	1205.69	997.78	995.77	1205.69	822.99
Cross-sectional area (cm2) (2)	585.03	1083.06	770.19	768.04	1083.06	619.88
Static moment (cm3) (2)		25489.27	13326.13	13208.30	25489.27	44548.57
$\Delta\sigma$ EN 1994-2 7.4 (3) (MPa) (2)						88.00

NB : - Section modulus is positive for fibres below elastic neutral axis.
- Section modulus is negative for fibres above elastic neutral axis.
- The position of the neutral axis is measured from the bottom fibre of the bottom steel section flange.

INTERNAL FORCES AND MOMENTS IN CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

M : Bending moment
V : Shear force
d : Deflection
n : Modular ratio

PERMANENT LOADS

		left-hand side		right-hand side		
Load case	**n**	**M (kN.m)**	**V (kN)**	**M (kN.m)**	**V (kN)**	**d (cm)**
Self-weight	-	0.01	316.69			0.00
SDL1	17.20	0.03	131.08			0.00
Increased SDL1	17.20	0.01	152.81			0.00
Reduced SDL1	17.20	-0.01	116.34			0.00
SDL2	17.20	-0.01	5.46			0.00
Concrete shrinkage	17.40	554.79	10.40			0.00
primary effect		554.75				
secondary effect		0.04	10.40			
axial force - slab		N = -768.64 kN				
Simpl. temp. load +DT°C	6.40	-1605.89	-15.13			0.00
primary effect		-1605.82				
secondary effect		-0.06	-15.13			
axial force - slab		N = 3137.53 kN				
Simpl. temp. load -DT°C	6.40	1605.89	15.13			0.00
primary effect		1605.82				
secondary effect		0.06	15.13			
axial force - slab		N = -3137.53 kN				

LIVE LOADS

Modular ratio = 6.40

			left-hand side		right-hand side		
Load case	**Mmax (kN.m)**	**Mmin (kN.m)**	**Vmax (kN)**	**Vmin (kN)**	**Vmax (kN)**	**Vmin (kN)**	**d (cm)**
Load model 1 UDL	0.00	0.00	0.00	127.65			0.00
Load model 1 TS	0.00	0.00	0.00	29.36			0.00
Fatigue LM3 Left-hand slow lane	0.00	0.41	6.07	-3.75			
Fatigue LM3 Right-hand slow lane	-0.46	0.04	85.05	0.00			

CHECKING CROSS-SECTION OF INTEREST

Beam line No. : 8
Section No. : 11
Node line No. : 39
Type of cross-section : Support
Position : 40.00 m End abutment

SERVICEABILITY LIMIT STATE	Value	Limit	Ratio	Combination
Deflections (m)	0.000	0.133	0.00	-
Minimum reinforcement (%)	1.04	1.09	0.95	-
Slab cracking	ϕ_{max} = 25. mm or e_{max} = 200. mm			No.22
Compressive stress in top fibre of concrete (MPa)	-1.87	18.00	0.10	No.5
Tensile stress in reinforcement (top layer) (MPa)	88.00	300.00	0.29	No.4
Stress in top fibre of steel section (MPa)	40.60	345.00	0.12	No.6
Stress in bottom fibre of steel section (MPa)	-12.99	345.00	0.04	No.6
Compressive stress in top fibre of concrete (MPa)	-0.93	13.50	0.07	No.1
Shear stress in steel sections (MPa)	-20.45	199.19	0.10	No.11
Normal stress / shear interaction (MPa)	-48.86	345.00	0.14	No.5
Shear in connection (kN/m)	135.79	418.75	0.32	No.11

NB : - The minimum reinforcement for Serviceability Limit States has been checked for the maximum bar diameter : φ^*_s = 20 mm.
The reinforcement ratio is shown as "Limit" and must be greater than the strength value shown as "Value".
- Tensile stresses are positive; compressive stresses are negative.

ULTIMATE LIMIT STATE	Value	Limit	Ratio	Combination
Plastic shear resistance (kN)	863.56	6346.73	0.14	No.7
Sagging, Plastic resistance (kN.m)	2963.65	15343.74	0.19	No.10
Hogging, Plastic resistance (kN.m)	2408.83	11691.04	0.21	No.5
Bending / shear interaction (sagging) (kN.m)	-	-	-	-
Bending / shear interaction (hogging) (kN.m)	-	-	-	-
Shear buckling: force criterion	0.20	1.00	0.20	No.7
Shear buckling: bending / shear interaction	-	-	-	-
LTBuckling	0.29	1.00	0.29	No.5

FATIGUE LIMIT STATE	Value	Limit	Ratio	Combination
Bending stress range in top flange (MPa)	0.02	69.57	0.00	-
Bending stress range in bottom flange (MPa)	0.03	139.13	0.00	-
Bending stress range in reinforcement (MPa)	86.99	130.83	0.66	-
Shear stress range in connection (MPa)	45.77	90.00	0.51	-
Interaction connection / upper flange (MPa)	0.05	0.13	0.39	-

REACTIONS AT SUPPORTS UNDER PERMANENT LOADING

All reaction forces are displayed in kN

Loading : Self-weight - ΣF_Z = 5284.99 kN

	C0	C1
Line 1	319.45	319.44
Line 2	330.38	330.42
Line 3	334.92	334.87
Line 4	336.62	336.31
Line 5	336.18	336.31
Line 6	335.07	334.87
Line 7	330.66	330.42
Line 8	319.64	319.44
Σ	2642.92	2642.07

Loading : SDL1 - ΣF_Z = 2365.37 kN

	C0	C1
Line 1	135.24	135.28
Line 2	154.52	154.63
Line 3	153.26	153.27
Line 4	152.61	152.55
Line 5	152.07	152.07
Line 6	151.45	151.44
Line 7	151.37	151.52
Line 8	132.01	132.08
Σ	1182.52	1182.85

Loading : Increased SDL1 - ΣF_Z = 2776.71 kN

	C0	C1
Line 1	148.42	148.39
Line 2	175.13	175.22
Line 3	180.50	180.47
Line 4	183.24	183.29
Line 5	183.85	184.05
Line 6	183.36	183.38
Line 7	180.17	180.22
Line 8	153.51	153.51
Σ	1388.18	1388.53

Reactions at supports (continued)

All reaction forces are displayed in kN

Loading : Reduced SDL1 - ΣF_Z = 2081.17 kN

	C0	C1
Line 1	126.22	126.21
Line 2	140.27	140.38
Line 3	134.59	134.45
Line 4	131.31	131.26
Line 5	130.14	129.93
Line 6	129.42	129.33
Line 7	131.53	131.66
Line 8	117.23	117.24
Σ	1040.71	1040.46

Loading : SDL2 - ΣF_Z = 79.99 kN

	C0	C1
Line 1	3.25	3.25
Line 2	5.48	5.48
Line 3	5.39	5.39
Line 4	4.17	4.17
Line 5	4.21	4.21
Line 6	5.01	5.02
Line 7	6.96	6.96
Line 8	5.52	5.52
Σ	39.99	40.00

Loading : Concrete shrinkage - ΣF_Z = 0.12 kN

	C0	C1
Line 1	10.18	10.12
Line 2	-8.88	-8.83
Line 3	0.01	0.01
Line 4	-1.25	-1.31
Line 5	-1.38	-1.31
Line 6	0.01	0.01
Line 7	-8.86	-8.83
Line 8	10.29	10.12
Σ	0.12	0.00

Reactions at supports (continued)

All reaction forces are displayed in kN

Loading : Simpl. temp. load +DT°C - ΣF_Z = 1.04 kN

	C0	C1
Line 1	-14.48	-14.47
Line 2	12.75	12.64
Line 3	0.12	0.05
Line 4	1.83	1.77
Line 5	2.19	1.77
Line 6	-0.07	0.05
Line 7	12.76	12.64
Line 8	-14.06	-14.47
Σ	1.04	0.00

Loading : Simpl. temp. load -DT°C - ΣF_Z = -1.04 kN

	C0	C1
Line 1	14.48	14.47
Line 2	-12.75	-12.64
Line 3	-0.12	-0.05
Line 4	-1.83	-1.77
Line 5	-2.19	-1.77
Line 6	0.07	-0.05
Line 7	-12.76	-12.64
Line 8	14.06	14.47
Σ	-1.04	0.00

ENVELOPES OF THE REACTIONS AT SUPPORTS UNDER LIVE LOADING

All reaction forces are displayed in kN

Loading : Load model 1 UDL - Maximum reaction forces

	C0	C1
Line 1	97.22	97.29
Line 2	116.82	116.71
Line 3	143.91	143.94
Line 4	135.27	135.29
Line 5	141.35	141.33
Line 6	158.23	158.32
Line 7	155.18	155.25
Line 8	130.79	130.96

Loading : Load model 1 UDL - Minimum reaction forces

	C0	C1
Line 1	-0.61	-0.61
Line 2	0.01	0.01
Line 3	0.01	0.01
Line 4	0.01	0.01
Line 5	0.01	0.01
Line 6	0.01	0.01
Line 7	-0.06	-0.06
Line 8	-1.27	-1.27

Loading : Load model 1 TS - Maximum reaction forces

	C0	C1
Line 1	102.31	102.43
Line 2	127.40	127.34
Line 3	263.88	251.19
Line 4	320.86	300.14
Line 5	313.71	296.11
Line 6	308.29	292.25
Line 7	219.32	211.91
Line 8	140.46	140.51

Reactions at supports (continued)

All reaction forces are displayed in kN

Loading : Load model 1 TS - Minimum reaction forces

	C0	C1
Line 1	-11.55	-11.57
Line 2	0.96	1.11
Line 3	1.05	1.64
Line 4	1.29	2.01
Line 5	1.30	2.03
Line 6	1.24	1.95
Line 7	-3.51	0.46
Line 8	-1.65	-1.69

ENVELOPES OF THE REACTIONS AT SUPPORTS UNDER SLS COMBINATIONS

All reaction forces are displayed in kN

Maximum reaction forces

	C0	C1
Line 1	689.52	689.60
Line 2	762.86	762.75
Line 3	928.69	915.91
Line 4	981.25	960.26
Line 5	980.61	963.07
Line 6	990.02	973.88
Line 7	899.95	892.35
Line 8	768.64	768.74

Minimum reaction forces

	C0	C1
Line 1	425.52	425.50
Line 2	455.23	455.65
Line 3	475.57	475.89
Line 4	469.99	470.17
Line 5	467.95	468.90
Line 6	470.36	470.63
Line 7	444.87	447.89
Line 8	426.58	425.95

CALCULATION OF TRANSVERSE SUPPORT BEAMS

RL : Vertical reaction at LHS support of the support beam
RR : Vertical reaction at RHS support of the support beam
ML : Bending moment in the beam in the axis of its LHS support
MR : Bending moment in the beam in the axis of its RHS support
MS1 : Bending moment in the beam in the axis of the first girder of the bridge
...
MSi : Bending moment in the beam in the axis of the girder no i

Transverse support beam at abutment C0

Permanent load cases

	G	GS	GS+	GS-	GL	SH	TH+	TH-
RR [kN]	1321.	594.8	688.6	530.1	18.2	0.0	0.3	-0.3
RL [kN]	1322.	587.8	699.6	510.6	21.7	0.1	0.7	-0.7
MRR [kN.m]	-191.7	-81.1	-89.0	-75.7	-1.9	-6.1	8.7	-8.7
MRL [kN.m]	-191.8	-79.2	-92.1	-70.3	-3.3	-6.2	8.4	-8.4
MS1 [kN.m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MS2 [kN.m]	1010.	470.3	559.1	408.9	16.0	-18.3	26.4	-26.4
MS3 [kN.m]	2219.	1019.	1216.	883.4	33.2	-20.6	30.1	-30.1
MS4 [kN.m]	2825.	1292.	1548.	1116.	40.6	-23.0	33.5	-33.5
MS5 [kN.m]	2824.	1291.	1551.	1111.	40.5	-23.1	33.7	-33.7
MS6 [kN.m]	2219.	1016.	1222.	873.1	32.8	-20.7	29.9	-29.9
MS7 [kN.m]	1011.	467.7	563.2	401.7	16.2	-18.4	26.2	-26.2
MS8 [kN.m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Live load cases and enveloppe of ULS combinations

	UDL	TS	ULS
RR [kN]	461.8 / 0.0	576.2 / 0.0	4139. / 2523.
RL [kN]	532.6 / 0.0	662.2 / 0.0	4371. / 2502.
MRR [kN.m]	0.4 / -58.3	6.9 / -61.4	-343.4 / -549.3
MRL [kN.m]	0.8 / -78.5	1.0 / -84.3	-344.3 / -613.6
MS1 [kN.m]	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0
MS2 [kN.m]	389.2 / 0.0	695.3 / 0.0	3605. / 1880.
MS3 [kN.m]	845.2 / 0.0	1562. / 0.0	7932. / 4167.
MS4 [kN.m]	1061. / 0.0	1954. / 0.0	10029. / 5301.
MS5 [kN.m]	1075. / 0.0	1909. / 0.0	9989. / 5295.
MS6 [kN.m]	848.3 / 0.0	1537. / 0.0	7909. / 4153.
MS7 [kN.m]	404.0 / 0.0	767.0 / 0.0	3727. / 1871.
MS8 [kN.m]	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0

Transverse support beam at abutment C1

Permanent load cases

	G	GS	GS+	GS-	GL	SH	TH+	TH-
RR [kN]	1321.	594.9	688.7	529.9	18.2	0.0	0.0	0.0
RL [kN]	1321.	588.0	699.8	510.5	21.8	0.0	0.0	0.0
MRR [kN.m]	-191.7	-81.2	-89.0	-75.7	-1.9	-6.1	8.7	-8.7
MRL [kN.m]	-191.7	-79.2	-92.1	-70.3	-3.3	-6.1	8.7	-8.7
MS1 [kN.m]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MS2 [kN.m]	1010.	470.4	559.4	408.8	16.0	-18.2	26.0	-26.0
MS3 [kN.m]	2218.	1019.	1217.	882.8	33.2	-20.6	29.3	-29.3
MS4 [kN.m]	2824.	1292.	1549.	1115.	40.6	-22.9	32.5	-32.5
MS5 [kN.m]	2824.	1292.	1550.	1110.	40.5	-22.9	32.5	-32.5
MS6 [kN.m]	2218.	1016.	1222.	872.5	32.9	-20.6	29.3	-29.3

MS7 [kN.m]

1010.

467.8

563.5

401.6

26.0

-26.0

MS8 [kN.m]

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

Live load cases and enveloppe of ULS combinations

	UDL	TS	ULS
RR [kN]	461.8 / 0.0	567.8 / 0.0	4128. / 2523.
RL [kN]	532.9 / 0.0	652.5 / 0.0	4358. / 2502.
MRR [kN.m]	0.4 / -58.4	6.9 / -61.5	-343.3 / -549.4
MRL [kN.m]	0.8 / -78.6	1.0 / -84.3	-343.7 / -613.5
MS1 [kN.m]	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0
MS2 [kN.m]	389.2 / 0.0	673.3 / 0.0	3575. / 1880.
MS3 [kN.m]	845.4 / 0.0	1501. / 0.0	7849. / 4167.
MS4 [kN.m]	1061. / 0.0	1876. / 0.0	9922. / 5300.
MS5 [kN.m]	1075. / 0.0	1834. / 0.0	9888. / 5294.
MS6 [kN.m]	848.1 / 0.0	1474. / 0.0	7825. / 4153.
MS7 [kN.m]	403.9 / 0.0	732.1 / 0.0	3680. / 1871.
MS8 [kN.m]	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0

NATURAL FREQUENCY

Natural frequency of principal bending mode (Rayleigh method) : f = 2.02 Hz

SUMMARY OF RESULTS

Criterion : Shear stress range in connection (Fatigue Limit State)

Max. ratio = 0.88 < 1.00 SATISFACTORY

Beam line No.6 - Cross-section No.17 : Position = 17.20 m

Checking minimum reinforcement criterion

Reference : EN 1994-2:2005 7.4.2
Slab reinforcement ratio : 0.89 %

Caution: The criterion is not satisfied for all design cross-sections.
The most critical cross-section with respect to this criterion is the design cross-section n°1 of the beam line n°1.
For this cross-section the minimum reinforcement ratio required is : 1.04 %

Slab cracking ;

Maximum bar diameter (EN1994-2:2005 Table 7.1; wk = 0,2 mm) Φ_{max} = 24.97 mm
Maximum bar spacing (EN1994-2:2005 Table 7.2; wk = 0,2 mm) s_{max} = 200.00 mm

For upper layer of reinforcement : Φ = 16.00 mm
s = 150.00 mm

Caution: reinforcement must meet at least one of these two conditions.

WARNING!

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