RESULTS COMPARISON

CDS-SectionDesigner / Cubs-Fagus

ANALYSIS 1 – Reinforced Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		0	2000.0	0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	0.	1.	-0.86	-15.305	1.76
C1	C40/50	0.	-1.	4.03	0.	1.76
P1	B500B	0.3	0.6	0.17	33.83	1.15
P4	B500B	0.	-0.8	3.54	434.783	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	0.	1.	-3.344
C1	1.	0.	-1.	3.344

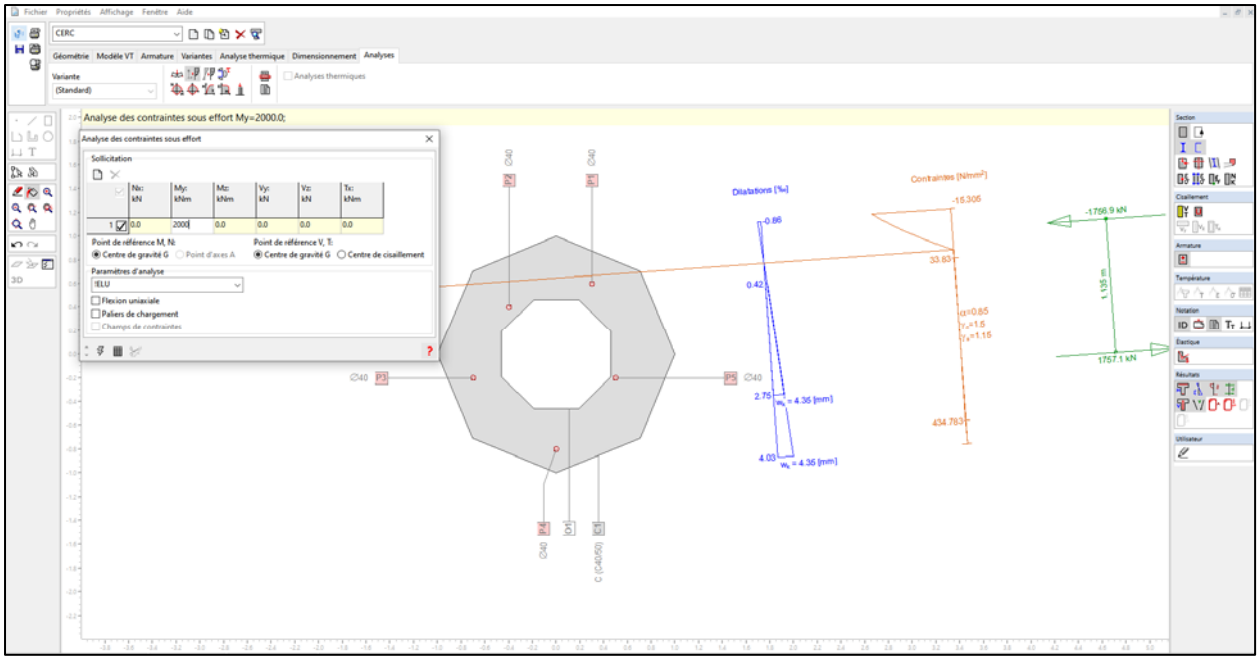
État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km-1]	χ_z [km-1]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
0.2	1999.9	0.1	1.58	2.4	-0.2	115.49	818238.09	470.01

Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-1756.9	0.	-1756.9	M_c=	-1440.1	z_c=	0.82	x_c =	0.351
Tract. F_s=	0.	1757.1	1757.1	M_s =	-554.8	z_s =	0.316	d =	1.313
N =			0.2	M =	-1994.9	z =	1.135	x/d =	0.27

Calcul des fissures



CDS-SectionDesigner

Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	1.58	1.58	0.0
Curvature about Y (e^{-3})	2.4	2.4	0.0
Curvature about Z (e^{-3})	-0.2	-0.2	0.0
Stress - Concrete (MPa)	-15.3	-15.3	0.0
Stress Rebar – Steel Min (MPa)	33.8	33.8	0.0
Stress Rebar – Steel Max (MPa)	434.8	434.8	0.0

ANALYSIS 2 – Reinforced Concrete Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		0	0	2000.0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	1.	0.	-0.94	-16.325	1.76
C1	C40/50	-1.	0.	4.45	0.	1.76
P5	B500B	0.5	-0.2	0.38	75.806	1.15
P3	B500B	-0.7	-0.2	3.61	434.783	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	1.	0.	-3.344
C1	1.	-1.	0.	3.344

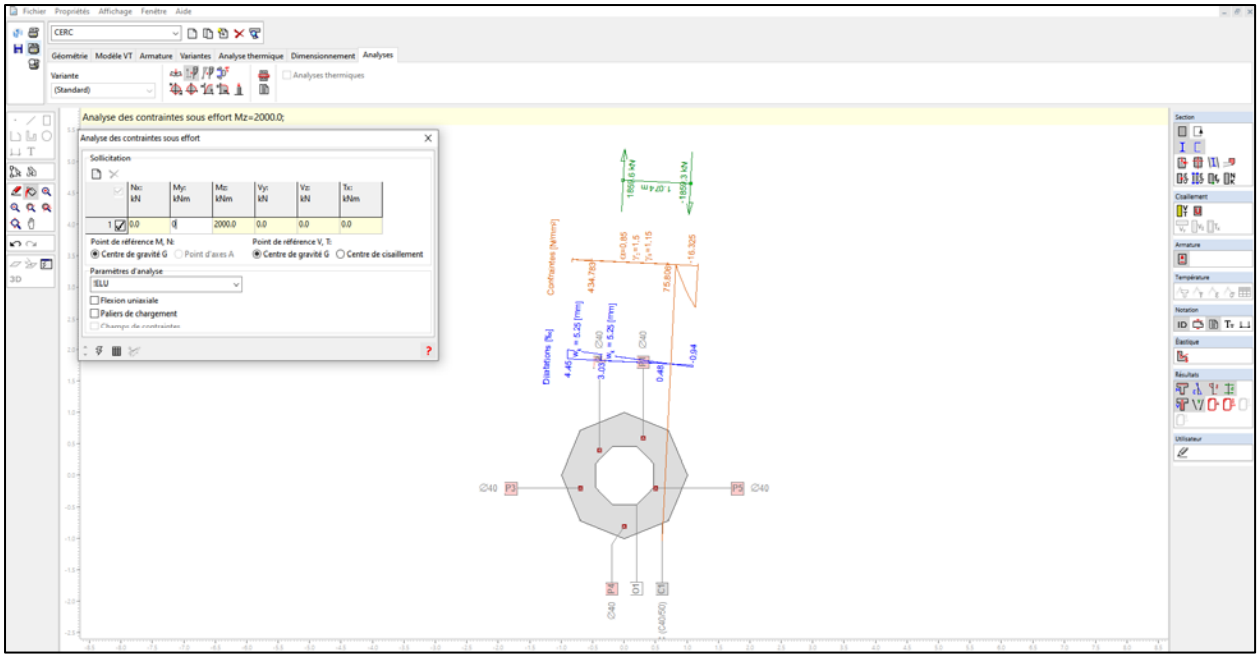
État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km-1]	χ_z [km-1]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
0.4	0.1	1999.7	1.75	-0.1	2.7	209.82	779.39	741655.25

Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-1859.3	0.	-1859.3	M_c=	-1526.1	z_c=	0.821	x_c =	0.349
Tract. F_s=	0.	1859.6	1859.6	M_s =	-471.1	z_s =	0.253	d =	1.252
N =			0.4	M =	-1997.2	z =	1.074	x/d =	0.28

Calcul des fissures



CDS-SectionDesigner

Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	1.75	1.75	0.0
Curvature about Y (e^{-3})	-0.1	-0.1	0.0
Curvature about Z (e^{-3})	2.7	2.7	0.0
Stress - Concrete (MPa)	-16.3	-16.3	0.0
Stress Rebar – Steel Min (MPa)	75.8	75.8	0.0
Stress Rebar – Steel Max (MPa)	434.8	434.8	0.0

ANALYSIS 3 – Reinforced Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		-10000.0	8000.0	2000.0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	0.	1.	-2.22	-22.667	1.76
C1	C40/50	0.	-1.	4.32	0.	1.76
P1	B500B	0.3	0.6	-1.15	-230.239	1.15
P4	B500B	0.	-0.8	3.67	434.783	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	0.	1.	-18.092
C1	1.	0.	-1.	8.663

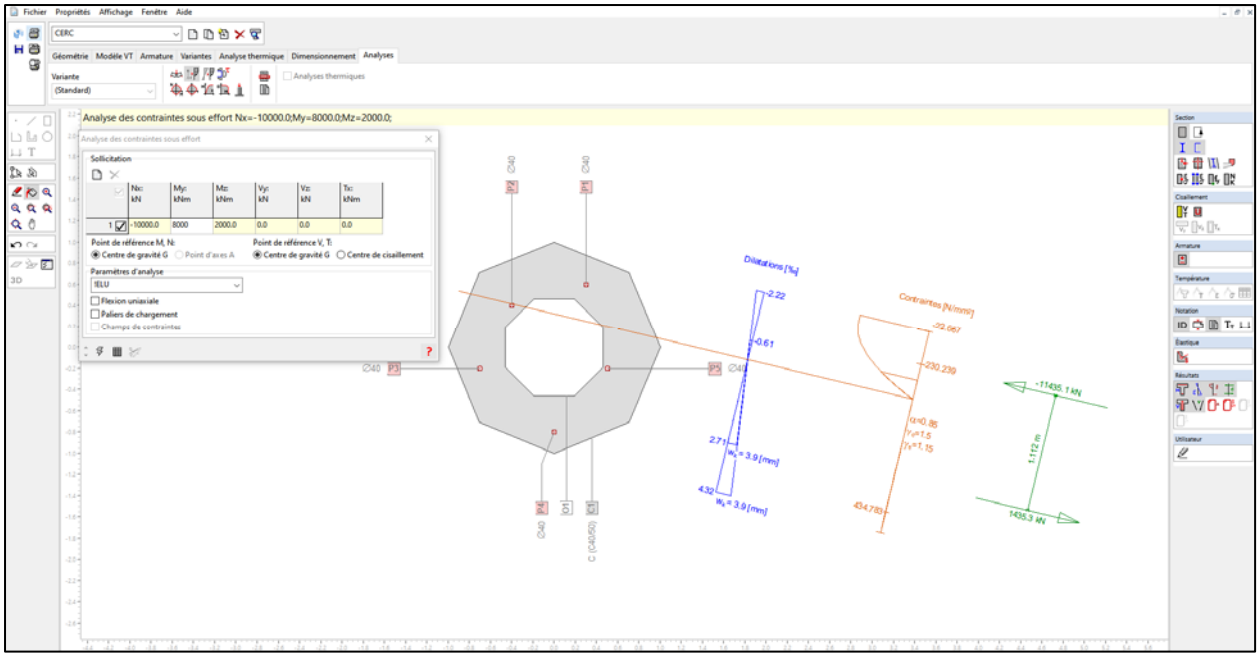
État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km⁻¹]	χ_z [km⁻¹]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
-9999.8	7999.8	1999.8	1.05	3.3	0.8	9538974.69	2444630.57	2541393.7

Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-11145.8	-289.3	-11435.1	M_c=	-7603.5	z_c=	0.665	x_c =	0.661
Tract. F_s=	0.	1435.3	1435.3	M_s =	-642.1	z_s =	0.447	d =	1.42
N =			-9999.8	M =	-8245.6	z =	1.112	x/d =	0.47

Calcul des fissures



CDS-SectionDesigner

Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	1.04	1.05	-1.0
Curvature about Y (e^{-3})	3.3	3.3	0.0
Curvature about Z (e^{-3})	0.8	0.8	0.0
Stress - Concrete (MPa)	-22.7	-22.7	0.0
Stress Rebar – Steel Min (MPa)	-229.2	-230.2	-0.4
Stress Rebar – Steel Max (MPa)	434.8	434.8	0.0

ANALYSIS 4 – Reinforced Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		2000.0	600.0	-50.0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	-0.707	0.707	-0.52	-10.251	1.76
C1	C40/50	0.707	-0.707	8.16	0.	1.76
P2	B500B	-0.4	0.4	1.37	273.02	1.15
P4	B500B	0.	-0.8	7.24	434.783	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	-0.707	0.707	0.174
C1	1.	0.707	-0.707	1.711

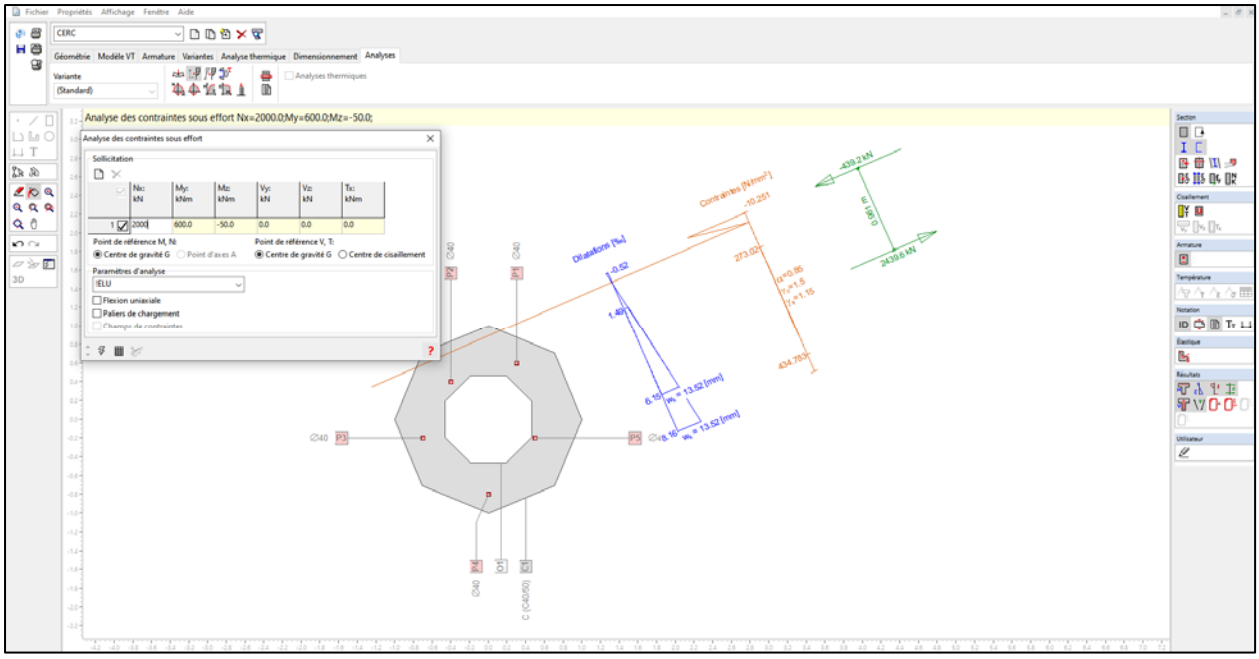
État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km⁻¹]	χ_z [km⁻¹]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
2000.3	599.6	-49.9	3.82	4.3	-1.9	523508.83	140436.02	26684.2

Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-439.2	0.	-439.2	M_c=	-389.6	z_c=	0.887	x_c =	0.112
Tract. F_s=	0.	2439.6	2439.6	M_s =	-179.6	z_s =	0.074	d =	1.005
N =			2000.3	M =	-569.2	z =	0.961	x/d =	0.11

Calcul des fissures



CDS-SectionDesigner

Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	3.82	3.82	0.0
Curvature about Y (e^{-3})	4.3	4.3	0.0
Curvature about Z (e^{-3})	-1.9	-1.9	0.0
Stress - Concrete (MPa)	-10.3	-10.2	1.0
Stress Rebar – Steel Min (MPa)	273.1	273.0	0.0
Stress Rebar – Steel Max (MPa)	434.8	434.8	0.0

ANALYSIS 5 – Prestressed Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		0	2000.0	0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	0.	1.	-0.31	-6.485	1.76
C1	C40/50	0.	-1.	0.26	0.	1.76
P1	B500B	0.3	0.6	-0.19	-38.865	1.15
P4	B500B	0.	-0.8	0.21	41.268	1.15
PP2	S1500/1670	-0.2	0.7	4.78	931.175	1.15
PP3	S1500/1670	-0.5	-0.7	5.18	1009.305	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	0.	1.	-5.486
C1	1.	0.	-1.	2.022

État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km⁻¹]	χ_z [km⁻¹]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
1.3	1999.3	0.	-0.02	0.3	-0.0	56567.12	6967929.42	11707.69

Forces de précontrainte P(t=o) au début du chargement

N_p [kN]	M_{yp} [kNm]	M_{zp} [kNm]
-3673.8	244.9	0

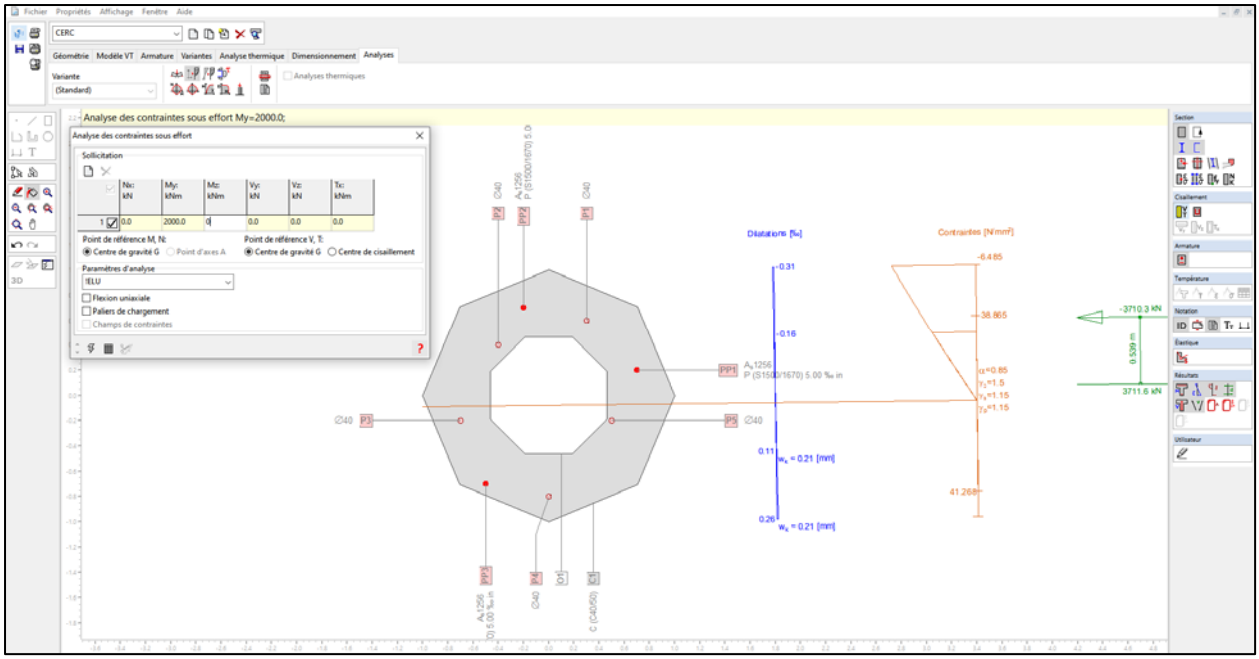
Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-3626.4	-83.8	-3710.3	M_c=	-2127.	z_c=	0.573	x_c =	1.081
Tract. F_s=	0.	3711.6	3711.6	M_s =	127.8	z_s =	-0.034	d =	1.034
N =			1.3	M =	-1999.2	z =	0.539		

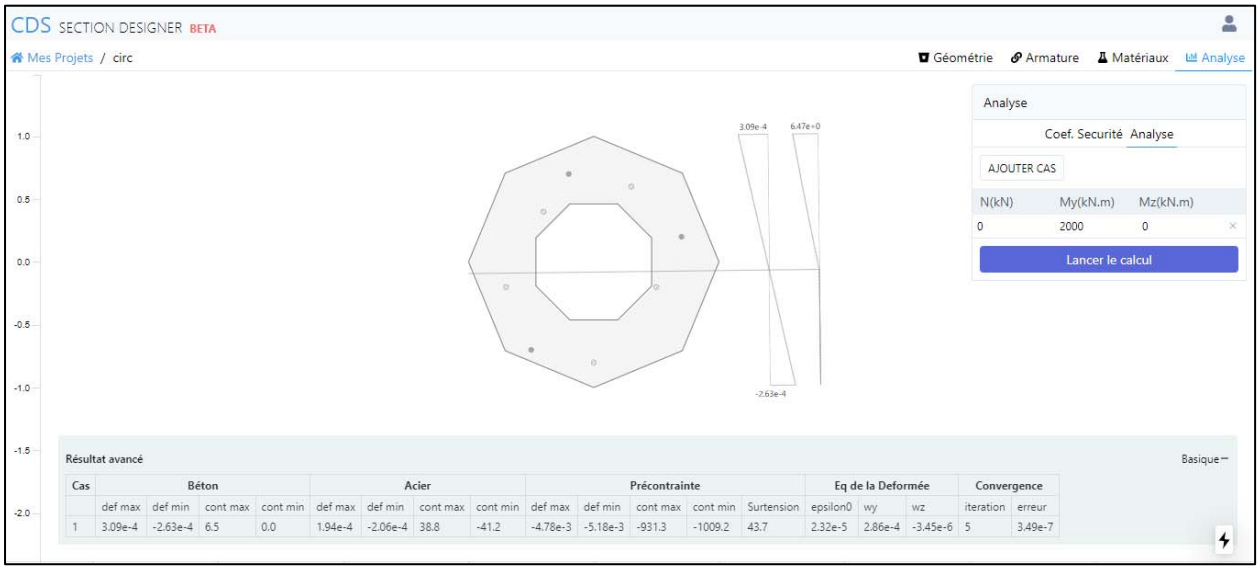
Calcul des fissures

Points de résultat

Formule / Résultat	Nom	Max	Min	Unité
σ(PP3(-0.508,-0.694))	σ_{PT}	1008.96	1008.96	N/mm²
Δσ((0.,0.))	$\Delta\sigma_{PT}$	0.	0.	N/mm²



CDS-SectionDesigner



Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	-0.02	-0.02	0.0
Curvature about Y (e^{-3})	0.3	0.3	0.0
Curvature about Z (e^{-3})	0.0	0.0	0.0
Stress - Concrete (MPa)	-6.5	-6.5	0.3
Stress – Steel Min (MPa)	-38.8	-38.9	-0.3
Stress – Steel Max (MPa)	41.2	41.3	-0.2
Stress – PT Min (MPa)	931.3	931.2	0.0
Stress – PT Max (MPa)	1009.2	1009.3	0.0

ANALYSIS 6 – Prestressed Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		0	2000.0	2000.0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	0.707	0.707	-0.5	-9.999	1.76
C1	C40/50	-0.707	-0.707	0.78	0.	1.76
P1	B500B	0.3	0.6	-0.28	-55.722	1.15
P3	B500B	-0.7	-0.2	0.53	106.696	1.15
PP1	S1500/1670	0.7	0.2	4.74	924.308	1.15
PP3	S1500/1670	-0.5	-0.7	5.69	1108.755	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	0.707	0.707	-6.75
C1	1.	-0.707	-0.707	3.286

État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km⁻¹]	χ_z [km⁻¹]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
1.3	1999.4	1999.5	0.14	0.5	0.4	9414.92	4191141.73	4645240.54

Forces de précontrainte P(t=o) au début du chargement

N_p [kN]	M_{yp} [kNm]	M_{zp} [kNm]
-3673.8	244.9	0

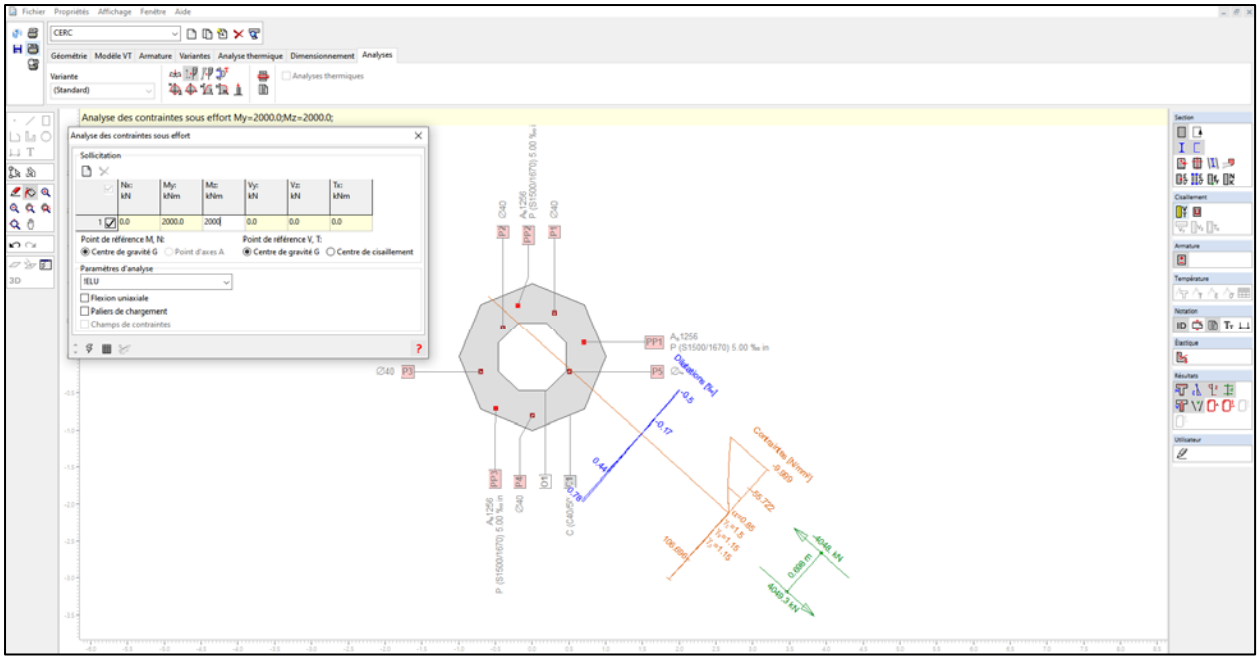
Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-3978.	-70.	-4048.	M_c=	-2653.9	z_c=	0.656	x_c =	0.786
Tract. F_s=	0.	4049.3	4049.3	M_s =	-170.	z_s =	0.042	d =	1.041
N =			1.3	M =	-2823.9	z =	0.698	x/d =	0.76

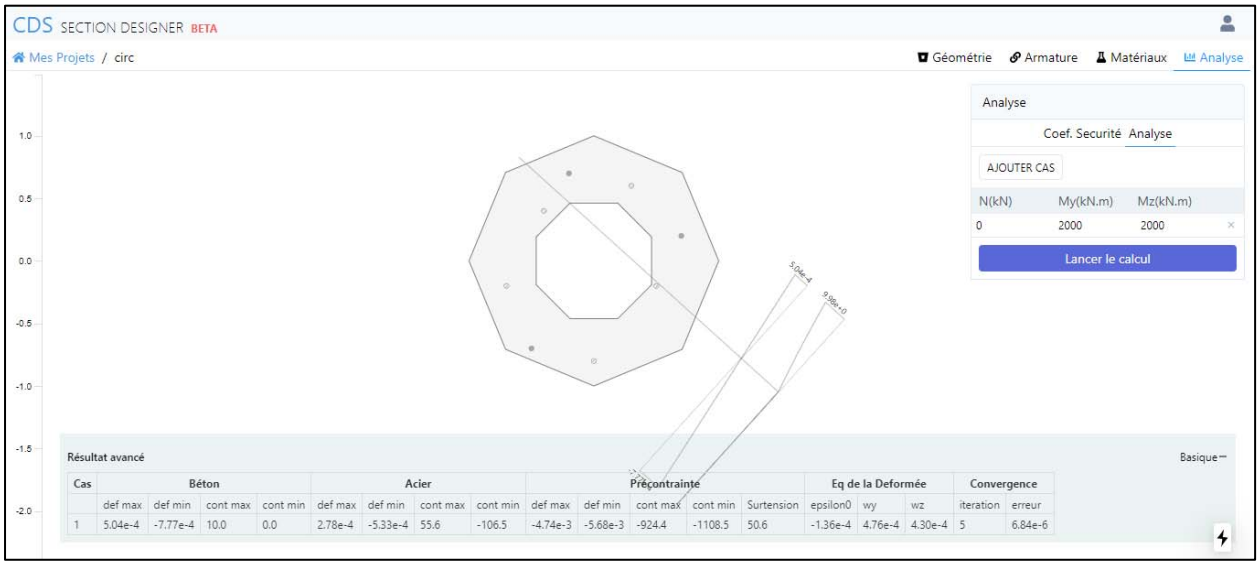
Calcul des fissures

Points de résultat

Formule / Résultat	Nom	Max	Min	Unité
σ(PP3(0.098,-0.855))	σ_{PT}	1072.973	1072.973	N/mm²
Δσ((0.,0.))	$\Delta\sigma_{PT}$	0.	0.	N/mm²



CDS-SectionDesigner



Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	0.14	0.14	0.0
Curvature about Y (e^{-3})	0.5	0.5	0.0
Curvature about Z (e^{-3})	0.4	0.4	0.0
Stress - Concrete (MPa)	-10.0	-10.0	0.0
Stress – Steel Min (MPa)	-55.6	-55.7	-0.2
Stress – Steel Max (MPa)	106.5	106.7	-0.2
Stress – PT Min (MPa)	924.4	924.3	0.0
Stress – PT Max (MPa)	1108.5	1108.8	0.0

ANALYSIS 7 – Prestressed Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		-10000.0	5000.0	0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	0.	1.	-0.76	-13.983	1.76
C1	C40/50	0.	-1.	0.15	0.	1.76
P1	B500B	0.3	0.6	-0.58	-115.612	1.15
P4	B500B	0.	-0.8	0.06	12.627	1.15
PP2	S1500/1670	-0.2	0.7	4.37	853.121	1.15
PP3	S1500/1670	-0.5	-0.7	5.02	978.154	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	0.	1.	-15.217
C1	1.	0.	-1.	2.324

État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km⁻¹]	χ_z [km⁻¹]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
-9996.4	4998.7	0.	-0.30	0.5	-0.0	32921438.6	10902916.5	18150.87

Forces de précontrainte P(t=o) au début du chargement

N_p [kN]	M_{yp} [kNm]	M_{zp} [kNm]
-3673.8	244.9	0

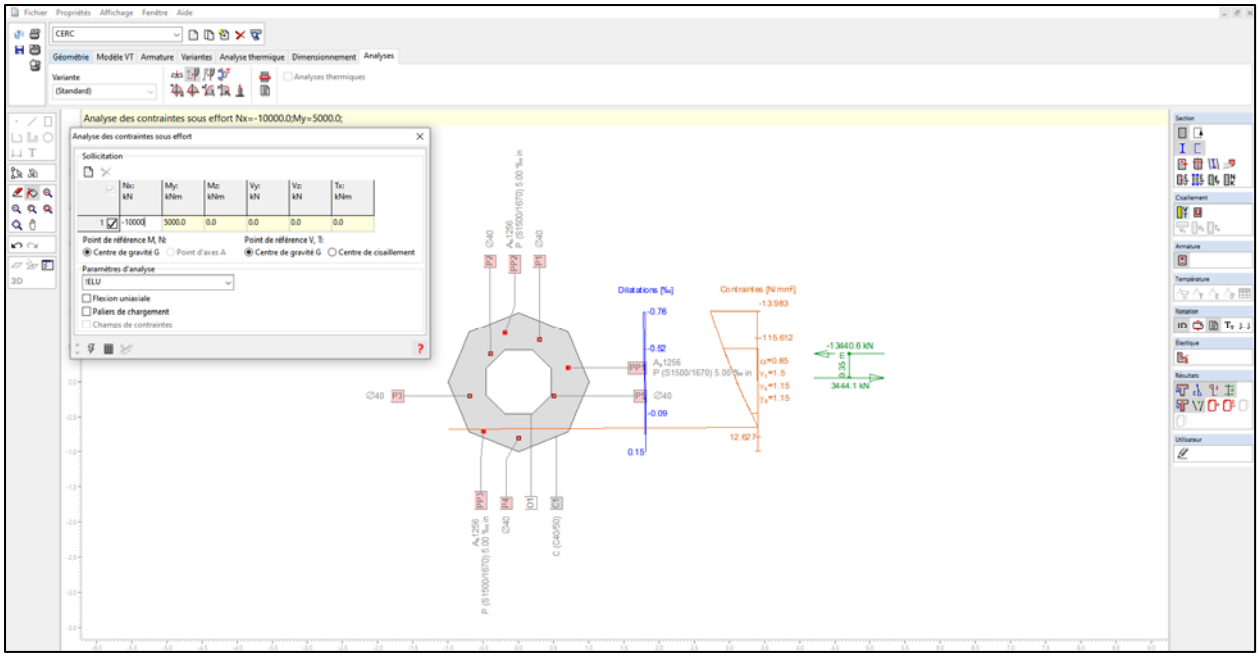
Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-13066.1	-374.5	-13440.6	M_c=	-5101.9	z_c=	0.38	x_c =	1.662
Tract. F_s=	0.	3444.1	3444.1	M_s =	103.2	z_s =	-0.03	d =	1.03
N =			-9996.4	M =	-4998.6	z =	0.35		

Calcul des fissures

Points de résultat

Formule / Résultat	Nom	Max	Min	Unité
σ(PP3(-0.503,-0.698))	σ_{PT}	977.934	977.934	N/mm²
Δσ((0.,0.))	$\Delta\sigma_{PT}$	0.	0.	N/mm²



CDS-SectionDesigner

Cas	Béton				Acier				Précontrainte					Eq de la Deformée			Convergence	
	def max	def min	cont max	cont min	def max	def min	cont max	cont min	def max	def min	cont max	cont min	Surtension	epsilon0	wy	wz	iteration	erreur
1	7.60e-4	-1.55e-4	14.0	0.0	5.77e-4	-6.32e-5	115.3	-12.6	-4.38e-3	-5.02e-3	-853.4	-978.2	121.6	3.03e-4	4.57e-4	-2.06e-6	4	3.92e-8

Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	-0.3	-0.3	0.0
Curvature about Y (e^{-3})	0.5	0.5	0.0
Curvature about Z (e^{-3})	0.0	0.0	0.0
Stress - Concrete (MPa)	-14.0	-14.0	0.0
Stress – Steel Min (MPa)	-115.3	-115.6	-0.3
Stress – Steel Max (MPa)	12.6	12.6	0.0
Stress – PT Min (MPa)	853.4	853.1	0.0
Stress – PT Max (MPa)	978.2	978.1	0.0

ANALYSIS 8 – Prestressed Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		-10000.0	0	5000.0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	1.	0.	-0.74	-13.714	1.76
C1	C40/50	-1.	0.	0.13	0.	1.76
P5	B500B	0.5	-0.2	-0.52	-104.144	1.15
P3	B500B	-0.7	-0.2	0.	0.935	1.15
PP1	S1500/1670	0.7	0.2	4.38	855.034	1.15
PP3	S1500/1670	-0.5	-0.7	4.93	960.524	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	1.	0.	-14.807
C1	1.	-1.	0.	1.914

État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km-1]	χ_z [km-1]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
-9996.4	0.	4998.6	-0.31	0.0	0.4	32746624.2	1813.29	11416899.1

Forces de précontrainte P(t=o) au début du chargement

N_p [kN]	M_{yp} [kNm]	M_{zp} [kNm]
-3673.8	244.9	0

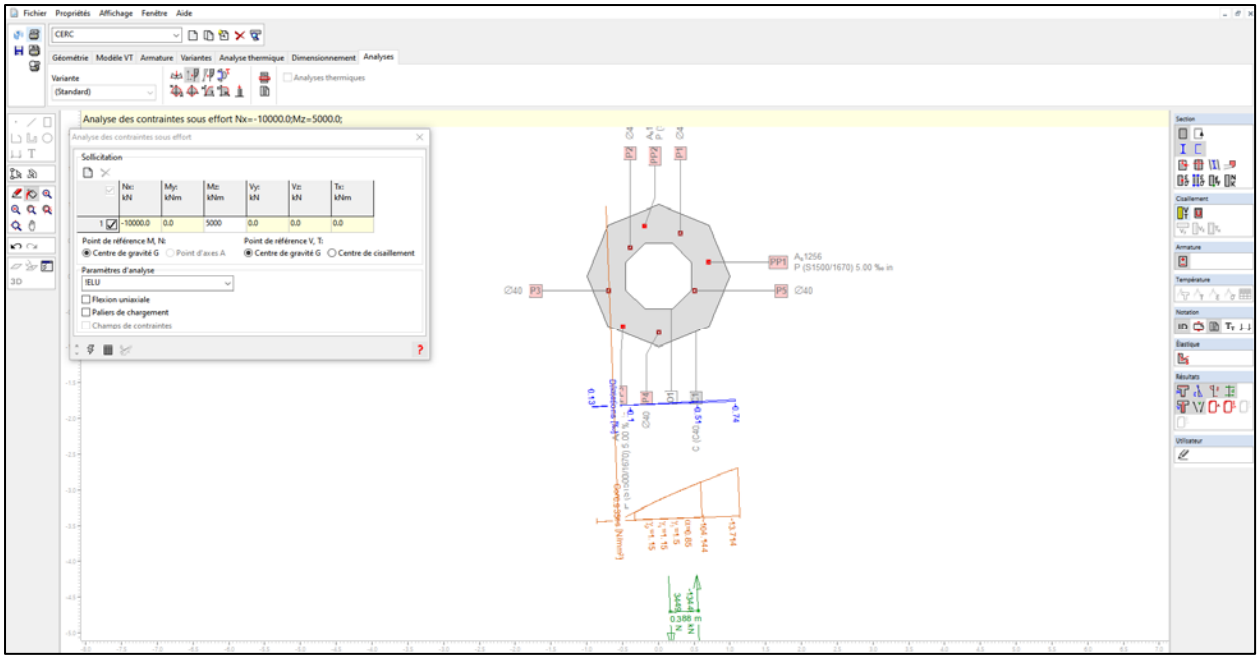
Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-13095.5	-350.8	-13446.3	M_c=	-4916.3	z_c=	0.366	x_c =	1.696
Tract. F_s=	0.	3449.9	3449.9	M_s =	-78.4	z_s =	0.023	d =	1.022
N =			-9996.4	M =	-4994.7	z =	0.388		

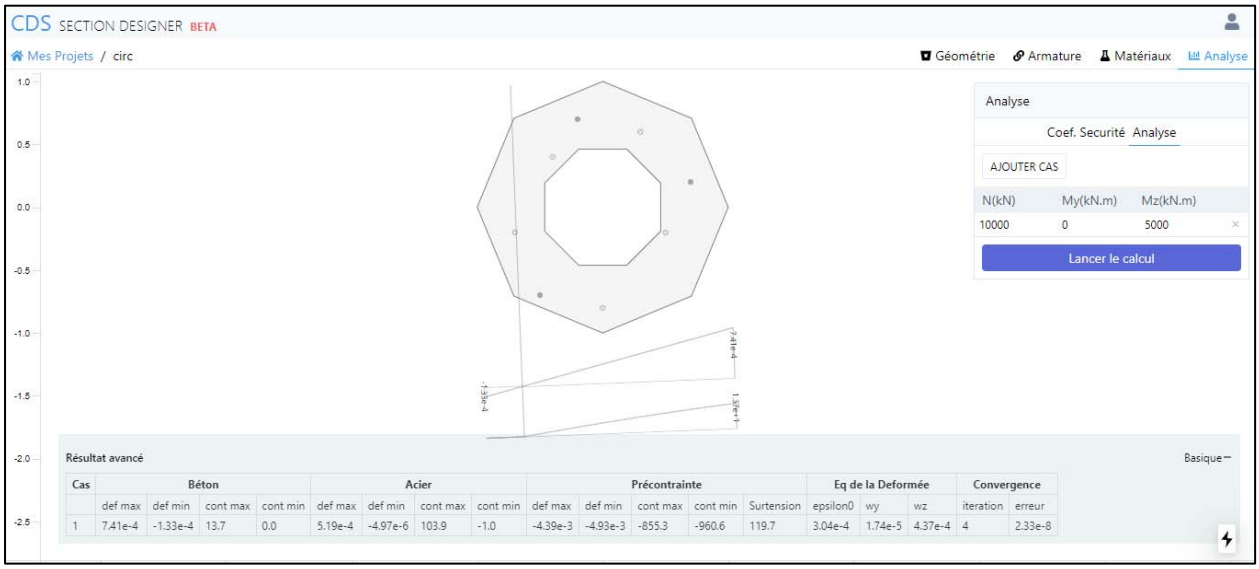
Calcul des fissures

Points de résultat

Formule / Résultat	Nom	Max	Min	Unité
σ(PP2(-0.707,-0.172))	σ_{PT}	976.446	976.446	N/mm²
Δσ((0.,0.))	$\Delta\sigma_{PT}$	0.	0.	N/mm²



CDS-SectionDesigner



Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	-0.3	-0.31	-3.2
Curvature about Y (e^{-3})	0.0	0.0	0.0
Curvature about Z (e^{-3})	0.4	0.4	0.0
Stress - Concrete (MPa)	-13.7	-13.7	0.0
Stress – Steel Min (MPa)	-103.9	-104.1	-0.2
Stress – Steel Max (MPa)	1.0	0.9	11 (0.1 MPa)
Stress – PT Min (MPa)	855.3	855.0	0.0
Stress – PT Max (MPa)	960.6	960.6	0.0

ANALYSIS 9 – Prestressed Concrete

CUBUS-FAGUS

Analyse des contraintes sous effort

Sollicitations

No	AP	P	Flexion et effort normal N [kN]	M_y [kNm]	M_z [kNm]	Effort tranchant et torsion V_y [kN]	V_z [kN]	T [kNm]	Remarques -
1	!ELU		1000.0	-2000.0	0				

Paramètres d'analyse "!ELU" Norme: Eurocode EN

Contraintes et dilatations extrêmes

Nom	Classe	y_q [m]	z_q [m]	ε [‰]	σ_d [N/mm²]	γ [-]
C1	C40/50	0.	-1.	-0.25	-5.335	1.76
C1	C40/50	0.	1.	0.26	0.	1.76
P4	B500B	0.	-0.8	-0.2	-40.056	1.15
P1	B500B	0.3	0.6	0.15	30.921	1.15
PP3	S1500/1670	-0.5	-0.7	4.83	941.266	1.15
PP2	S1500/1670	-0.2	0.7	5.18	1010.469	1.15

Contraintes calculées dans la section homogène (matériau linéaire)

Nom	Pondération	y_q [m]	z_q [m]	σ_{elas} [N/mm²]
C1	1.	0.	-1.	-4.195
C1	1.	0.	1.	1.674

État au dernier pas d'itération

Efforts intérieurs N [kN]	M_y [kNm]	M_z [kNm]	Élongation et courbures ε_x [‰]	χ_y [km-1]	χ_z [km-1]	Rigidités N/ε_x [kN]	M_y/χ_y [kNm²]	M_z/χ_z [kNm²]
1000.2	-1999.9	0.	0.00	-0.3	0.0	317730676.	7864742.97	2184.92

Forces de précontrainte P(t=o) au début du chargement

N_p [kN]	M_{yp} [kNm]	M_{zp} [kNm]
-3673.8	244.9	0

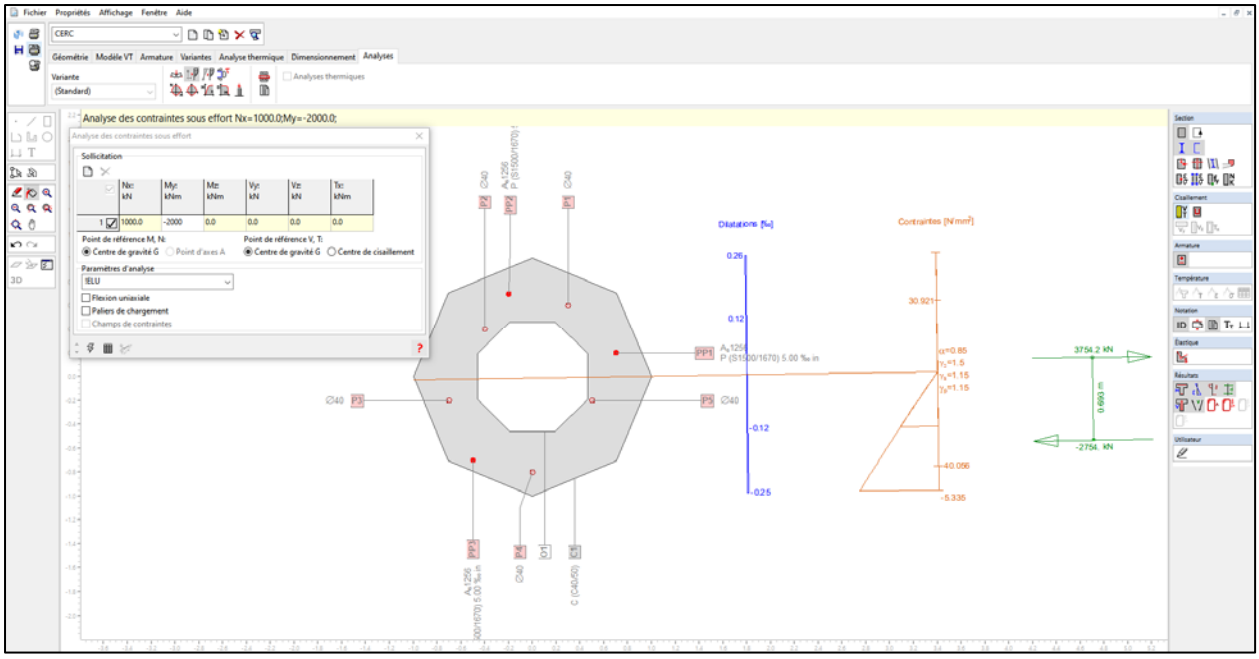
Efforts internes comme un couple de forces :

Efforts intérieurs de traction et compression	Sct princip. [kN]	Armature [kN]	Somme [kN]	Moments M	Unité [kNm]	Valeurs géométriques z	Unité [m]	x, d	Unité [m]
Compr. F_c=	-2679.9	-74.1	-2754.	M_c=	-1657.8	z_c=	0.602	x_c =	0.988
Tract. F_s=	0.	3754.2	3754.2	M_s =	-341.9	z_s =	0.091	d =	1.091
N =			1000.2	M =	-1999.7	z =	0.693	x/d =	0.91

Calcul des fissures

Points de résultat

Formule / Résultat	Nom	Max	Min	Unité
σ(PP3(0.51,0.693))	σ_{PT}	1009.588	1009.588	N/mm²
Δσ((0.,0.))	$\Delta\sigma_{PT}$	0.	0.	N/mm²



CDS-SectionDesigner

Results comparison

	CDS-SectionDesigner	Fagus	Error (%)
Deformation at COG (e^{-3})	0	0	0.0
Curvature about Y (e^{-3})	-0.3	-0.3	0.0
Curvature about Z (e^{-3})	0.0	0.0	0.0
Stress - Concrete (MPa)	-5.3	-5.3	0.0
Stress – Steel Min (MPa)	-39.9	-40.0	-0.3
Stress – Steel Max (MPa)	30.8	30.9	-0.3
Stress – PT Min (MPa)	941.4	941.3	0.0
Stress – PT Max (MPa)	1010.3	1010.4	0.0