Composite steel curved double I-girder bridge

CONTENTS

.

1. ALLMÄNT / MÅTT

1.1 KONSTBYGGNADSTYP

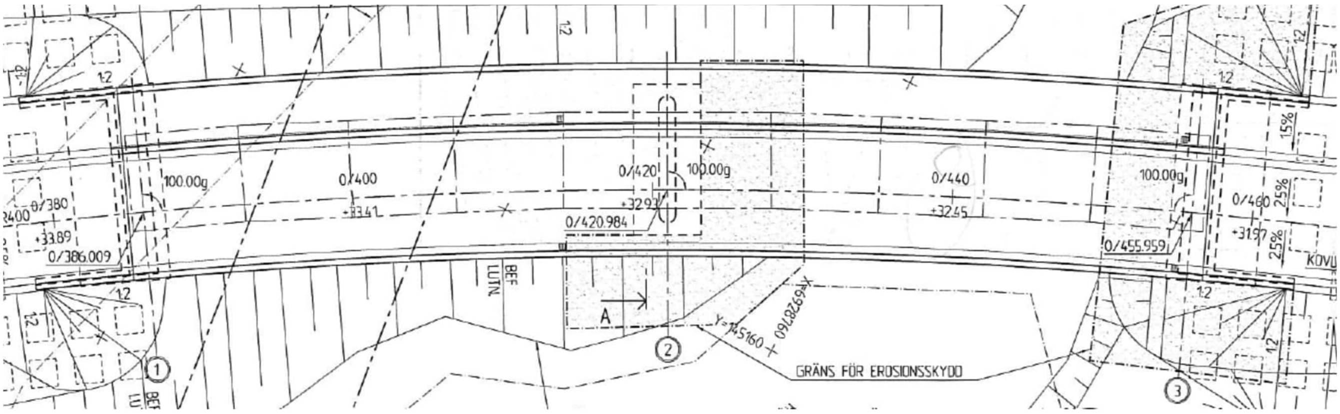
Samverkans bro i stål med 2 spann och utförd med 2 st huvudbalkar.

Brons plankrökning upptas med vinkeländring i balkskarvar.

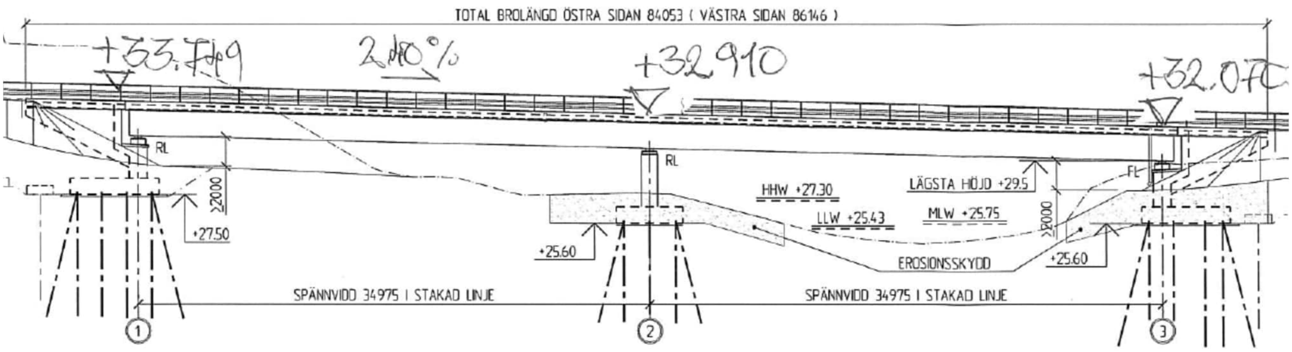
Ändstöd utförs som fristående landfästen.

Grundläggning utförs med spetsburna betongpålar.

1.2 MÅTT

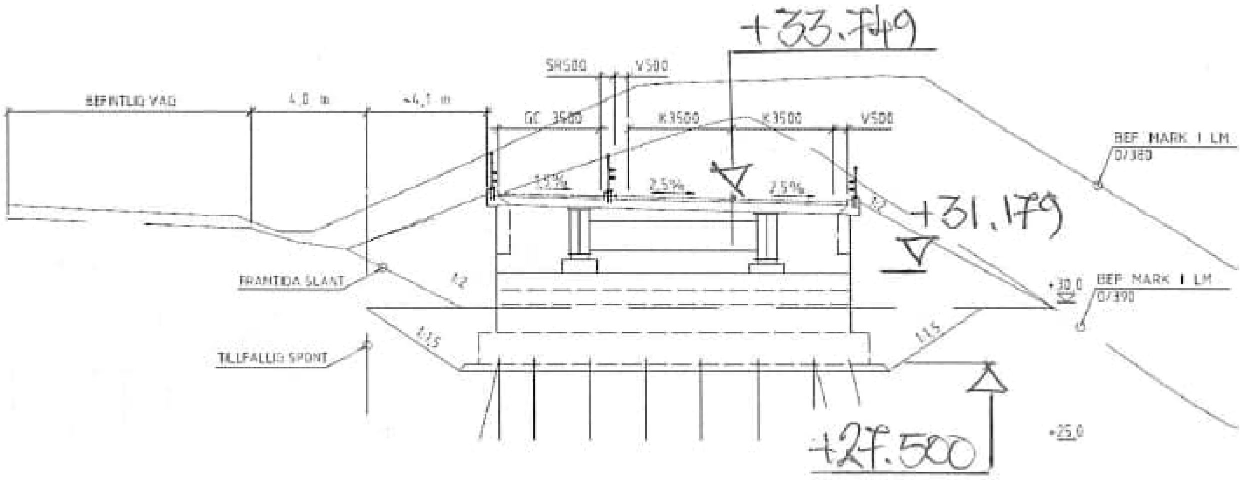


PLAN

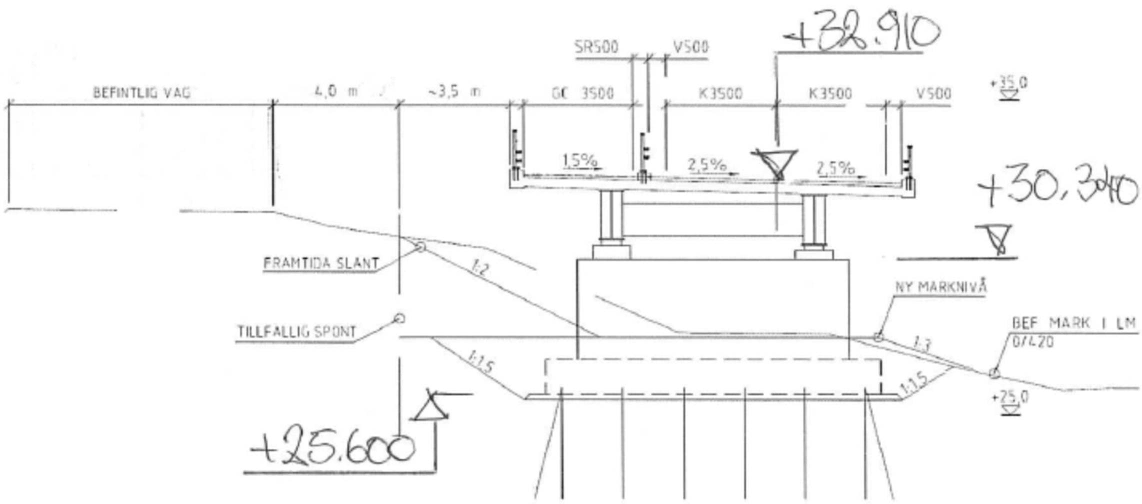


ELEVATION

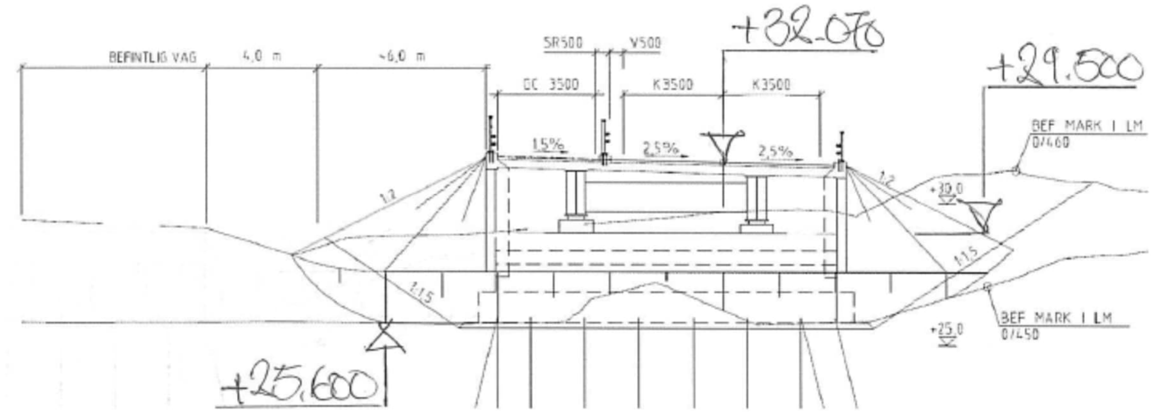
Lägsta höjd stålbalk +29.8 (= +32.070– 2.27 m) > +29.5



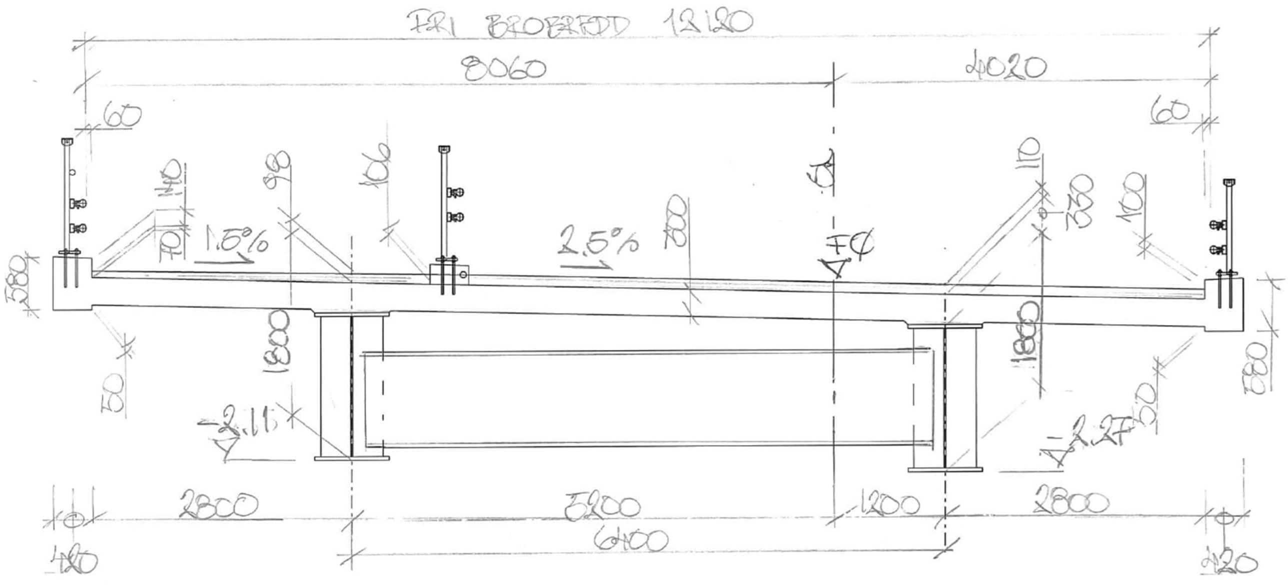
<u>SEKTION A-A</u>
Stöd 1



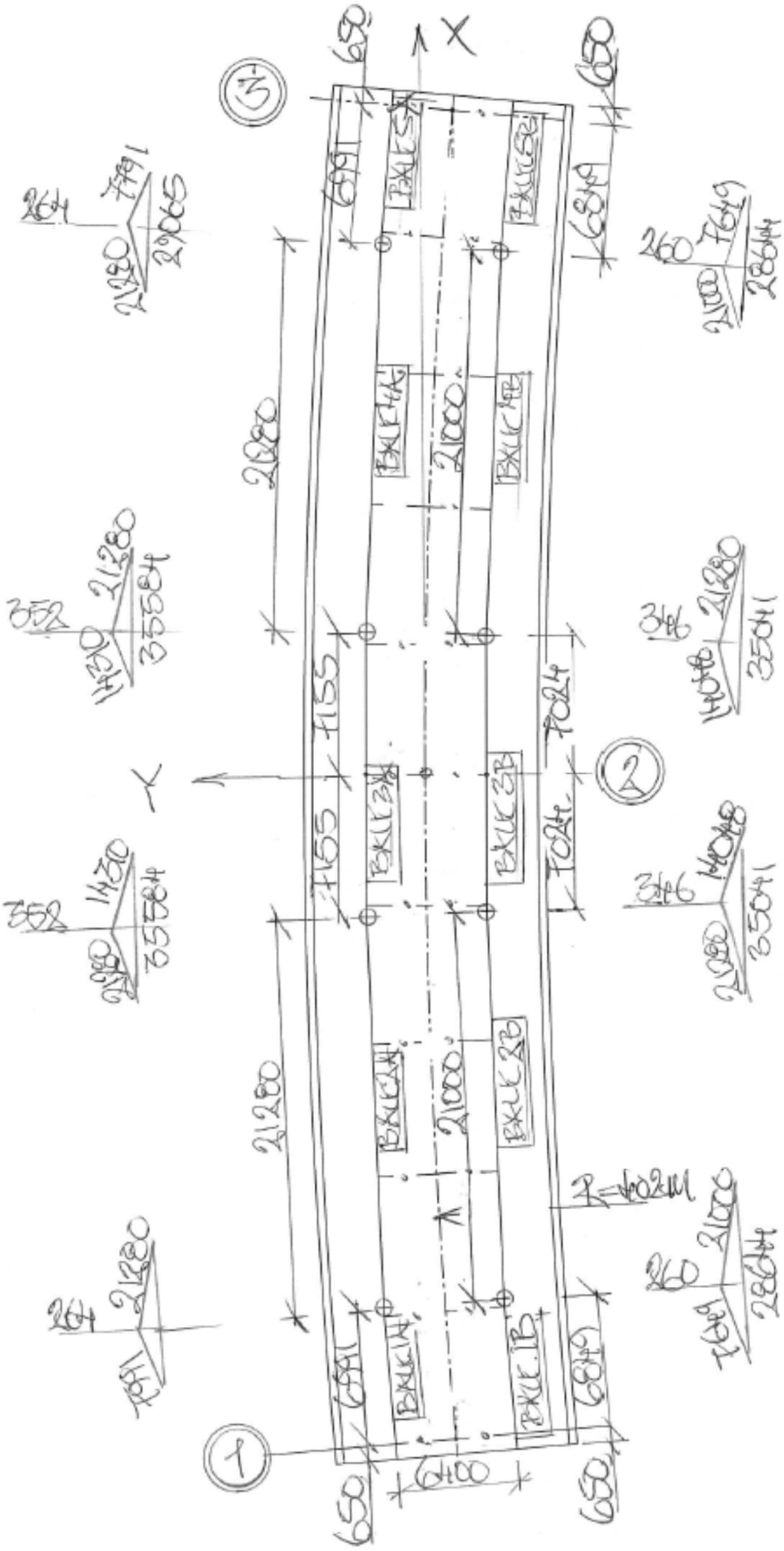
<u>SEKTION B-B</u>
Stöd 2



SEKTION C-C
Stöd 3

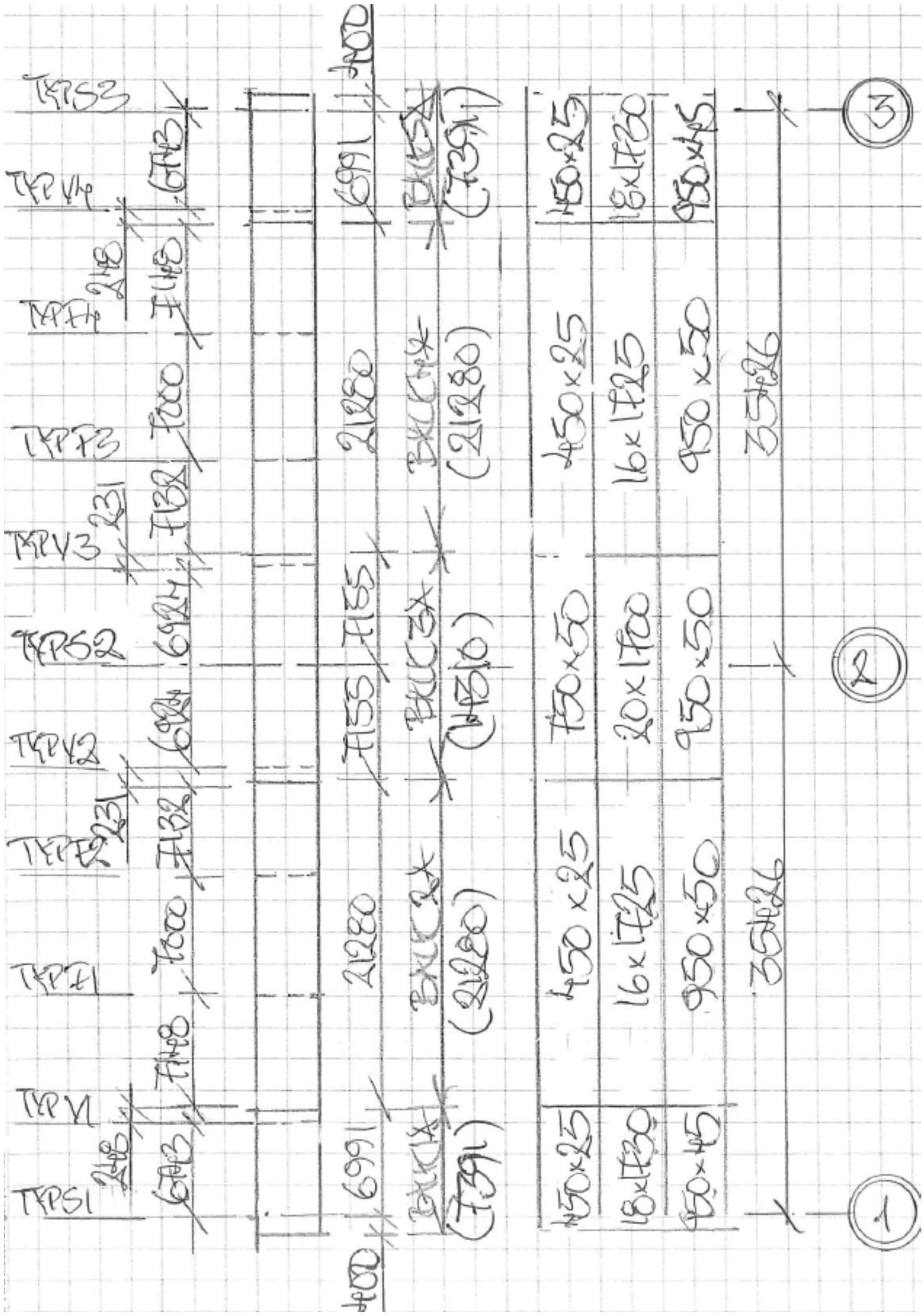


<u>SEKTION B-B</u>
Stålöverbyggnad



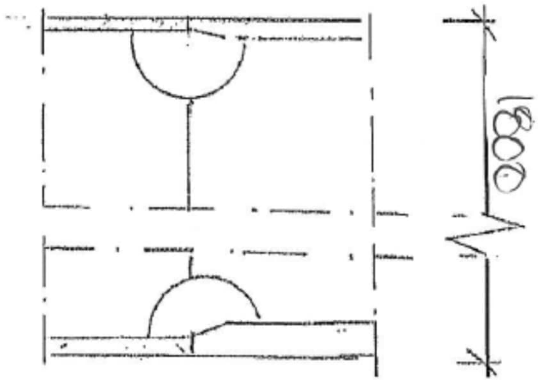
PLAN

	Part A -CALCULATION ASSUMPTIONS Composite steel curved doubled I-girder bridge	Status :	Page : A1:8
		Date :	Created : .

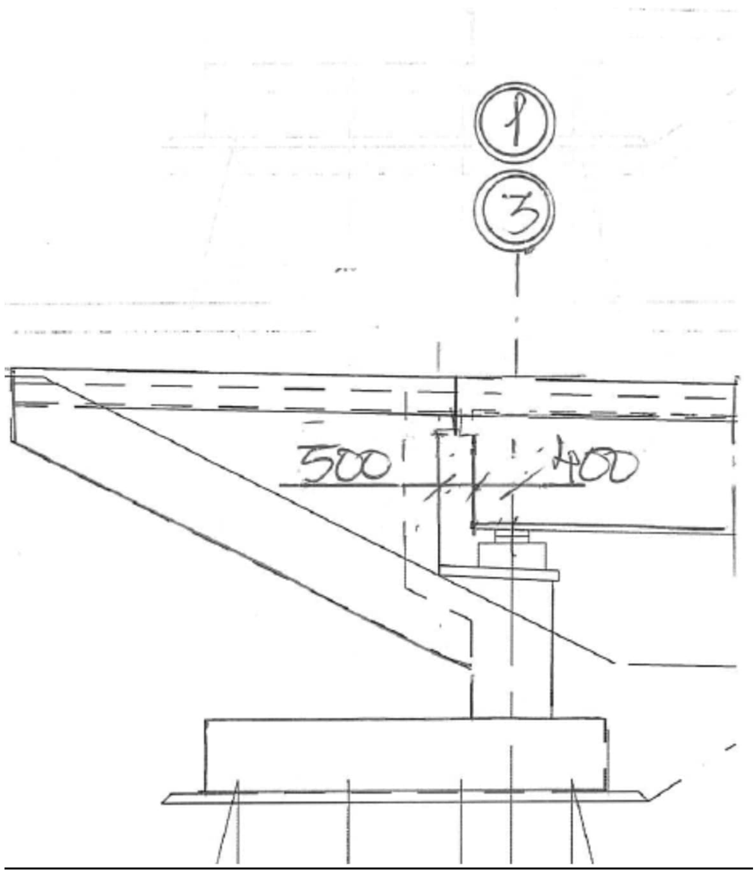


ELEVATION STÅLBALK
BALK 1A - 5A

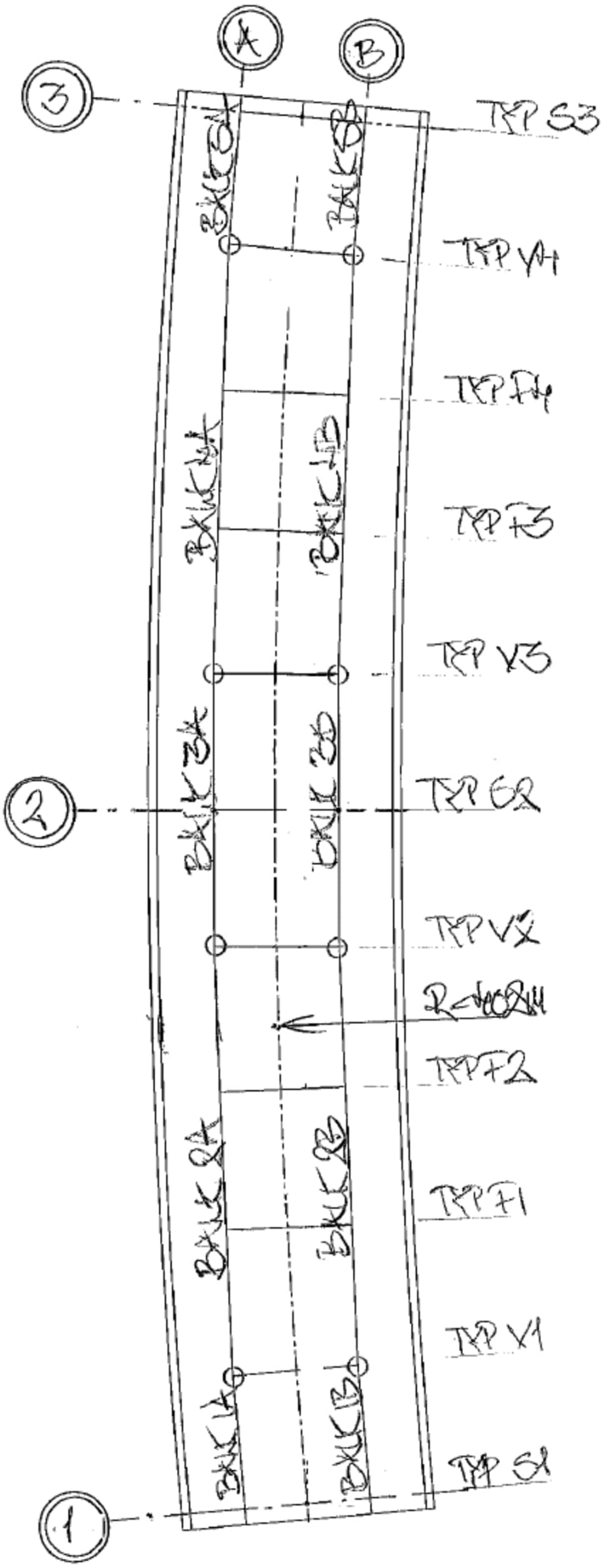
ELEVATION STÅLBALK
BALK 1B – 5B



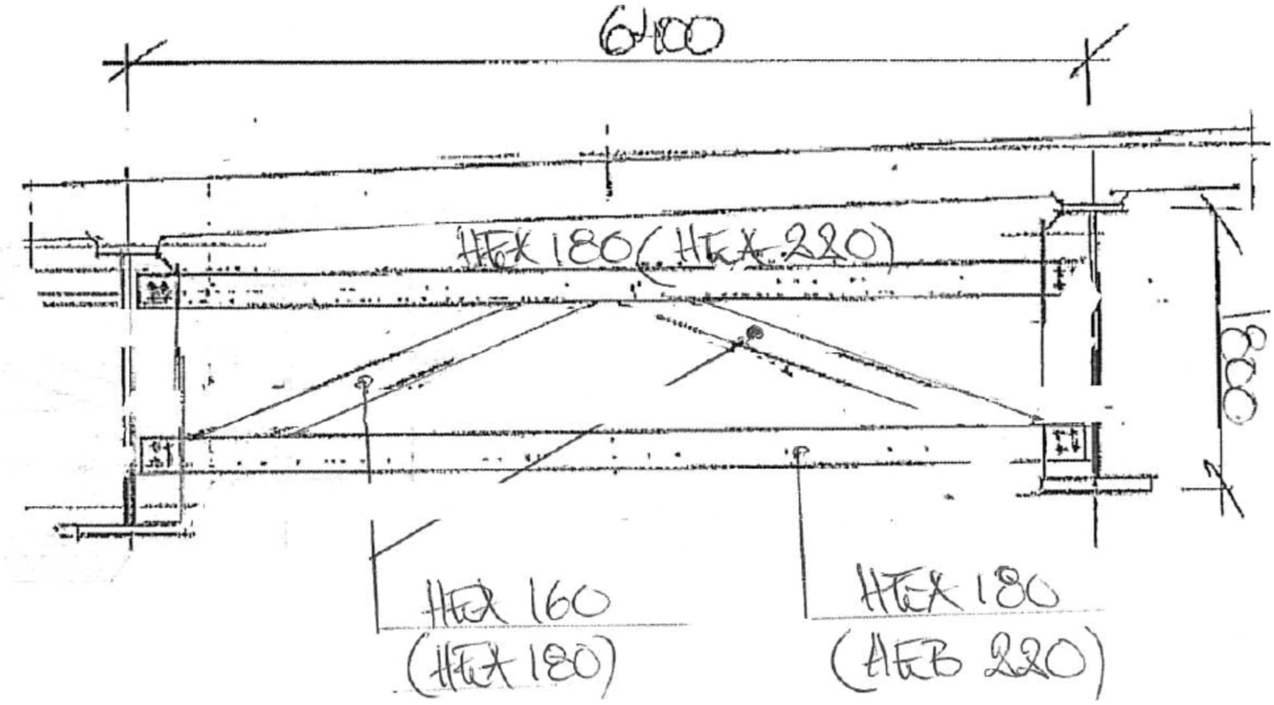
BALKSKARV



ELEVATION
BROÄNDE

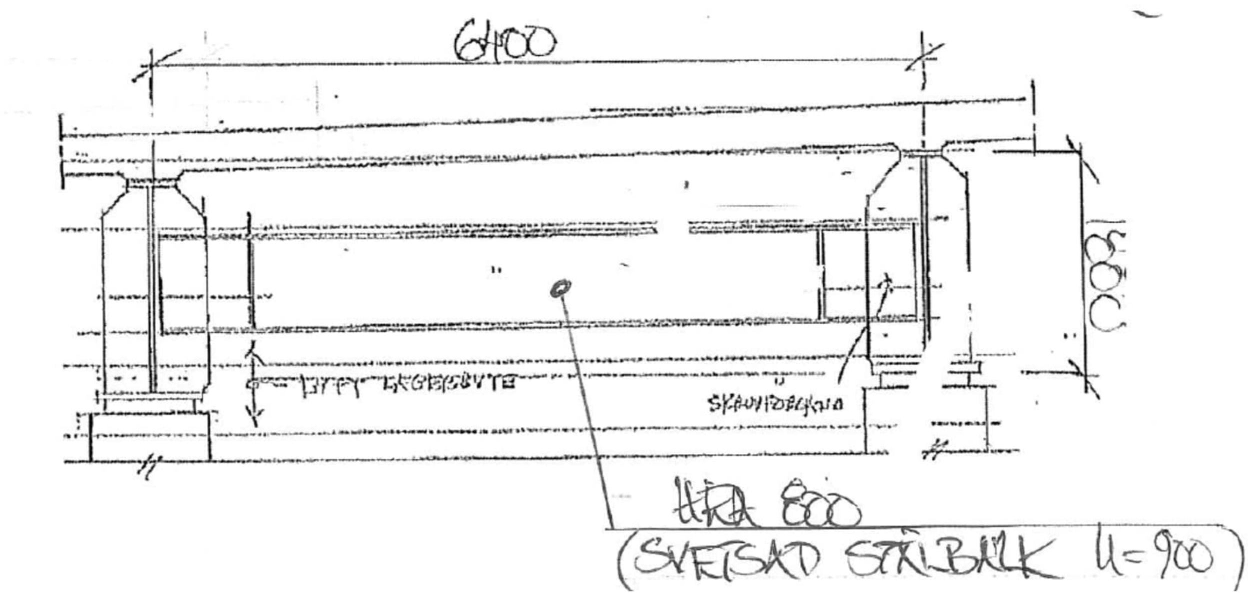


PLAN TVÄRBALKAR



( ) = Profil som ändrats i sent konstruktionsskede.

<u>Tvärförband - fält</u>
Typ F1-F3 och V1-V4.



( ) = Profil som ändrats i sent konstruktionsskede.

<u>Tvärförband - stöd</u>
Typ S1-S3

1.3 GRUNDLÄGGNING

Grundläggning sker på spetsburna betongpålar.

	Stöd 1	Stöd 2	Stöd 3
Nivå PPL	+33.749	+32.910	+32.070
UK stålbalk B	-2.270	-2.270	-2.270
UK lagerklack	-0.300	-0.300	-0.300
Nivå ÖK stöd	+31.179	+30.340	+29.500
UK bottenplatta	+27.500	+25.600	+25.600
Nivå PAP	+27.700	+25.800	+25.800
Bedömd nivå pålstopp	+14.200	+14.300	+16.800
Bedömd pållängd	13.5	11.5	9.0
-	m	m	m

1.4 NORMER OCH FÖRFRÅGNINGSNDERLAG

- Krav Brobyggande (TDOK 2016:0204 version 1.0 2016-10-03)
- Europastandarder SS-EN 1990 tom SS-EN 1999 enligt TRVK Bro A 1.2.3.2
- Trafikverkets författningssamling (TRVFS 2011:12)
- Bärighetsberäkning av broar version 3.0 (TDOK 2013:0267)

1.5 TEKNISK LIVSLÄNGD

Teknisk livslängd 100 år gäller för hela bron.

1.6 MILJÖ

Vägmiljö anses råda för vägbanan.

Miljöer för enskilda betongytor se tabell avsnitt 1.11.

1.7 MATERIAL

Betong (se SS-EN 1992-1-1, Tabell 3.1) : C35/45 (f_{ck} = 35 MPa) för överbyggnad
C30/37 (f_{ck} = 30 MPa) för underbyggnad

Armering (SS-EN 10080 och SS 212540) : K500CT (f_{yk} = 500MPa)

Stål : S355 och S460 (SS-ENM 1993-1-1 tabell 3.1) och seghetsklasser ML/NL

Motfyllning : Sprängsten enligt AMA CEB.521 (ϕ_k = 45°, $\gamma = 18\frac{kN}{m^3}$ och $\gamma' = 11\frac{kN}{m^3}$)

Beläggning vägbana : Uppbyggnad 2aIA enligt Råd Brobyggnade G.3.2.5 med tjocklek 110 mm.

Beläggning gångbana : Uppbyggnad enligt nedan med varierande tjocklek (70 mm -106 mm).

ABT $\geq$11 /B160/220
Tätskiktsmatta 5 mm

1.8 GEOTEKNISK KLASS

Geoteknisk klass GK2

1.9 SÄKERHETSKLASS

Geoteknisk bärförmåga : säkerhetsklass 2

Konstbyggnad i övrigt : säkerhetsklass 3

Val av säkerhetsklass enligt TRVFS 2011:12 kapitel 1 avsnitt 10§ C.

1.10 TB OCH SPRICKKRITERIER

Exponeringsklasser är bestämda enligt Råd Brobyggande avsnitt D.1.3 samt SS-EN 206-1.

Klassindelningar bro :

Konstruktionsdel	Säkerhetsklass	Livslängdsklass	Exponeringsklass
Stöd 1 och 3 :			
▫ Vingmur mot fyllning	3	L100	XD1/XF4
▫ Vingmur från fyllning	3	L100	XD1/XF4
▫ Frontmur under mark	3	L100	XC2/XF3
▫ Frontmur över mark	3	L100	XC4/XF3
▫ Grusskift mot fyllning	3	L100	XD1/XF4
▫ Grusskift från fyllning	3	L100	XC4/XF3
▫ UK bottenplatta	3	L100	XC2/XF3
▫ Bottenplatta i övrigt	3	L100	XC2/XF3
Stöd 2 :			
▫ UK bottenplatta	3	L100	XC2/XF3
▫ Bottenplatta i övrigt	3	L100	XC2/XF3
▫ Skiva	3	L100	XC4/XF3
Överbyggnad :			
▫ Kantbalk	3	L100	XD3 / XF4
▫ I övrigt	3	L100	XD1 / XF4

Anm. Definition av vägmiljö se TRVFS kapitel 22 §5.

Dimensioneringsparametrar för föga korrosionskänslig :

$c_{min.dur}$: minsta täckskikt med hänsyn till miljöpåverkan
$c_{min.b}$: minsta täckskikt med hänsyn till krav på vidhäftning
Δc_{dev} : utförandetolerans enligt SS-EN 1992-1-1 §.4.4.1.3
$c_{\min} = \max\{c_{\min.b}; c_{\min.dur}; 10mm\}$: SS-EN 1992-1-1 ekvation 4.2
$c_{nom} = c_{\min} + \Delta c_{dev}$: SS-EN 1992-1-1 ekvation 4.1 som redovisas på ritning

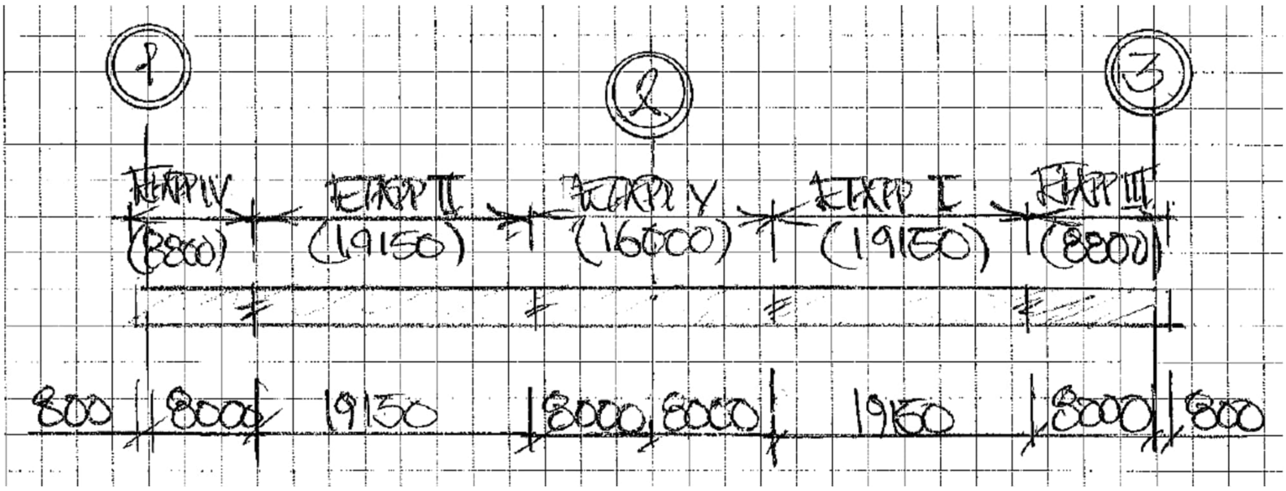
Konstruktionsdel	ζ 1.)	w_k 2.)	vct_{ekv} 3.)	$c_{min.dur}$ 4.)	$c_{min.b}$ 4.)	c_{min}	Δc_{dev} 6.)	c_{nom} 8.)
Stöd 1 och 3 :								
▫ Vingmur mot fyllning	1.5	0.20	0.45	30	40	40	65 7.)	50
▫ Vingmur från fyllning	1.5	0.20	0.45	30	40	40	10	50
▫ Frontmur under mark	1.0	0.40	0.50	15	40	40	10	50
▫ Frontmur över mark	1.2	0.30	0.50	20	40	40	10	50
▫ Grusskift mot fyllning	1.5	0.20	0.45	25	40	40	10	50
▫ Grusskift från fyllning	1.2	0.30	0.50	20	40	40	10	50
▫ UK bottenplatta	1.0	0.40	0.50	15	40	40	65 7.)	250 9.)
▫ Bottenplatta i övrigt	1.0	0.40	0.50	15	40	40	10	50
Stöd 2 :								
▫ UK bottenplatta	1.0	0.40	0.50	15	40	40	65	250 9.)
▫ Bottenplatta i övrigt	1.0	0.40	0.50	15	40	40	10	50
▫ Skiva	1.2	0.30	0.50	20	40	40	10	50
Överbyggnad :								
▫ Kantbalk	1.8	0.15	0.40	45	40	45	10	55
▫ I övrigt	1.5	0.20	0.40	25	40	40	10	50
	-	mm	-	mm	mm	mm	mm	mm

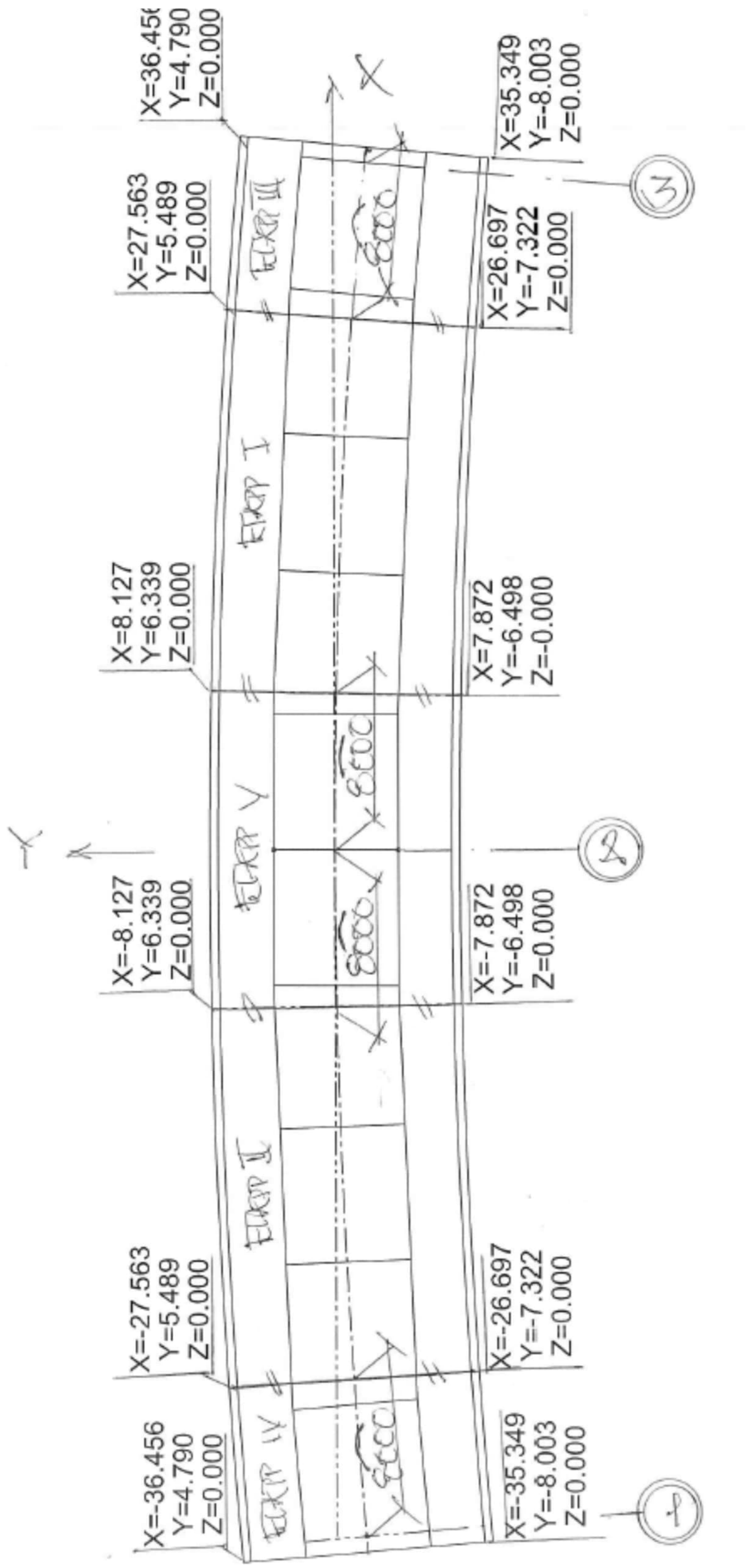
Fotnoter

1.) Enligt TRVFS 2011:12 kapitel 21 tabell c
2.) Enligt TRVFS 2011:12 kapitel 21 tabell b
3.) Enligt TRVFS 2011:12 kapitel 21 tabell a
4.) Enligt TRVFS 2011:12 kapitel 21 tabell a
5.) Enligt SS-EN 1992-1-1 tabell 4.2. Maximal stångdiameter ϕ20 förutsätts.
6.) Enligt SS-EN 1992-1-1- avsnitt 4.4.1.3.
7.) Enligt TRVFS 2011:12 kapitel 21 §6 och Råd Brobyggande avsnitt D.1.3.3 skall vid gjutning mot packad fyllning större utförandetolernas beaktas.
8.) Nominellt täckskikt som anges på ritning. Utökas så att lika inom varje konstruktionsdel.
9.) Krav Brobyggande avsnitt D.2.2.1.4 anger att vid dimensionering är dock 50 mm statisk overksam. Läge för pålavskärningsplan gör att 250 mm väljs.

1.11 GJUTORDNING

Farbanan gjuts 5 etapper enligt redovisning nedan.





PLAN
Gjutetappindelning

1.12 BESKRIVNING MATHCAD

Typsnitt

Kommenterande text skrivs med typsnitt Arial som denna text visar.

Aktiv matematisk text (indata, formler, utdata m.m.) skrivs med typsnitt ”Times New Roman” som denna text visar.

In- och utdata, olika likhetstecken med mera.

För indata används i de flesta fall ($a := 1$), dessa indata gäller inom området efter deras plats i dokumentet, d.v.s. till höger och under dem. Indata skrafferas för att synas tydligare.
Vissa värden anges som "globala" med tre streck i likhetstecknet ($a \equiv 1$) och gäller i hela dokumentet oavsett plats.
I "underrutiner", markerade med vertikala streck, används ($a \leftarrow 1$) för indata.
Resultatutskrift beställs med vanligt likhetstecken, ($a = 1$)

Talserier skapas med ($m, a .. n$) som ger en talserie från (m) till (n) med steget (a). Utan (a) fås steget 1.

Index på variabelnamn kan vara:

- del av namnet (M_{IV})
- elementnummer för ett vektorelement (n_i om är det i:te elementet av vektorn n)
- elementnummer för ett matriselement ($n_{s,t}$ där s är rad och t kolumn)

Båda indextyperna samtidigt förekommer också (s_{rm_i}).

Förklaringar till vanligt förekommande funktioner

Funktioner som skrivs på samma sätt som i normalt matematiskt bruk förklaras inte här.

Ekvationslösning

root(uttryck,var)	värdet av var då uttryck = 0.
given..uttryck.. find(x,y..)	värdet av x,y.. då uttrycken mellan given och find är uppfyllda. Kan också användas för att lösa olikheter och system av ekvationer eller olikheter.

Trigonometri

deg	konstant = π/180 för konvertering av grader (360) till radianer, används som multiplikator i trigonometriska uttryck där indata är i grader.
gon	som ovan men = π/200, definierad av oss då gon används som indata.

Avrundningar

floor(x)	heltalsdelen av x.
ceil(x)	närmaste heltal större än x.

Villkorssatser

if(villkor,a,b) — a om villkor är sant, annars b. Villkoret är normalt en olikhet och a resp. b kan vara matematiska uttryck eller ännu en villkorssats som nedan.

if(villkor 1,a, if(villkor 2,b, if(villkor 3,c,d)))

villkorssats i flera steg där villkoren ordnas i stigande eller fallande ordning. Om första villkoret är falskt forsätter kontrollen efter andra kommatecknet med nästa villkorssats o.s.v. Exemplet läses:

”a” om ”villkor 1” är sant annars ”if(villkor 2,b, if(villkor 3,c,d))”
”b” om ”villkor 2” är sant annars ”if(villkor 3,c,d)”
”c” om ”villkor 3” är sant annars ”d” om inget av villkoren är sanna.

Och kan ritas som flödesschema så här:

villkor 1, sant: ⟶ a
falskt: ⟶ villkor 2, sant: ⟶ b
falskt: ⟶ villkor 3, sant: ⟶ c
falskt: ⟶ d

I vissa fall används Mathcads programmeringsfunktion för att lösa villkorssituationer. Programmeringsfunktionen utmärks av ett lodrätt streck längs högra ledets vänsterkant och ger större möjligheter till logiska jämförelser än if-satsen ovan. Här nedan görs t.ex. en jämförelse av en textsträng som logisk variabel, om värdet av ”Tryckt” är ”ja” sätts tryckzonshöjden till tvärsnitthöjden ”H”, och i annat fall används produkten ”$\xi \cdot d$”.

$$\xi d := \left| \begin{array}{l} H \text{ if } Tryckt = \text{"ja"} \\ \xi \cdot d \text{ otherwise} \end{array} \right.$$

Programmeringsfunktionen kan också användas för att göra beräkningsslingor som avbryts när ett villkor inte längre är uppfyllt. I exemplet nedan får x värdet av j första gången som $V_{sx}(j)$ är större än noll i en slingberäkning där j ökar i steg om 10 för varje varv i slingan.

$$x := \left| \begin{array}{l} j \leftarrow 0 \\ \text{while } V_{sx}(j) \le 0 \\ \quad j \leftarrow j + 10 \\ j \end{array} \right.$$

Matrisfunktioner

linterp(vx,vy,x)	linjärt interpolerat värde vid x längs en linje mellan punkter definierade av vektorerna vx och vy som utgör listor av punkternas x- resp. y-koordinater.
max(A)	största element i matrisen A.
min(A)	minsta element i matrisen A.
median(A)	medianvärdet av elementen i A, används för funktioner som begränsas av max- och minvärden.
rows(A)	antal rader i matrisen A.
cols(A)	antal kolumner i matrisen A.
sort(v)	sorterar elementen i vektorn v i stigande ordning.
csort(A,n)	sorterar raderna i matrisen A efter elementen i kolumn n.
rsort(A,n)	sorterar kolumnerna i matrisen A efter elementen i rad n.
reverse(A)	omvänd ordning på raderna i matris A.
$M := \overrightarrow{\left(M - e_N \cdot 10^{-3} \cdot N\right)}$	en pil över ett uttryck innebär att vektorelementen behandlas i tur och ordning istället för med strikt vektoralgebra. Vektorerna fungerar då enbart som datalistor.

Då sorteringsfunktionerna ovan används på en matris som skrivs in direkt i funktionens parentes fås dubbla parenteser som nedan där största värdet av a och b ska väljas. Det ena parentesparet hör till funktionen och det andra till matrisen:

$\max(\blacksquare) \qquad \begin{pmatrix} a \\ b \end{pmatrix} \qquad \max\left(\begin{pmatrix} a \\ b \end{pmatrix}\right)$

2. STATISKT SYSTEM

2.1 ALLMÄNT

Bron är en samverkansbro. Bron är utförd i två spann med 2 st huvudbalkar i stål. Bron är plankrökt dock tillverkas huvudbalkarna i horisontell polygonform.

Fullständig samverkan mellan huvudbalkar och betongfarbana förutsätts.

Bron grundläggs på spetsburna pålar.

Stöd 1 och stöd 2 är försedda med rörliga lager i längsled. Stöd 3 utformas med fast lager i längsled.

Kantbalkar anses inte bidra med någon styvhet dock som last.

Inverkan av skjuvdeformationer, krypning och uppsprickning beaktas i den statiska modellen vid bestämning av tvärsnittskonstanter.

Systemberäkning utförs med *FEM-ROGRAM* där farbanan modelleras som en ortotrop platta med försumbar styvhet i längsled (X-riktning). Farbanans styvhet i längsled beaktas genom att införa ekvivalent stålbalkar i längsled.

FEM-program erbjuder möjlighet till etappvis utbyggnad i samma statiska beräkning. Totalt används 7 st olika statiska systemen. Dessa betecknas Stage I, II, III, IV, V, Drift-P och Drift-V.

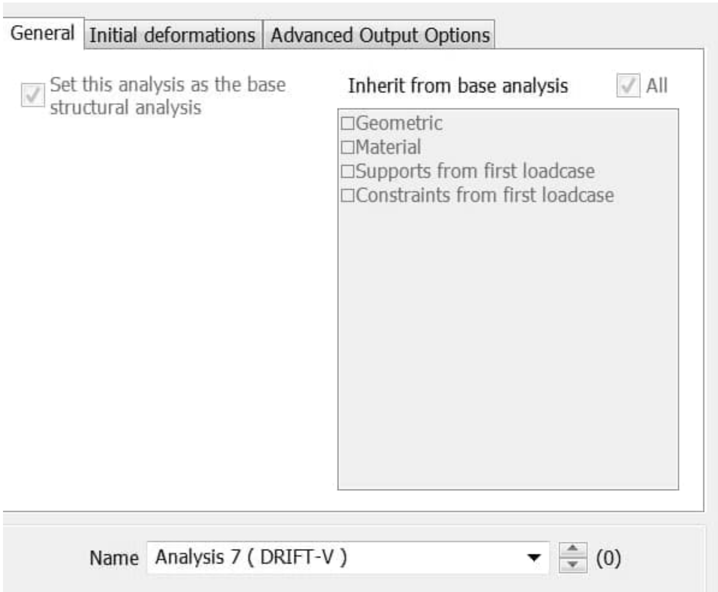
Den geometriska modellen är lika för dessa dock kan de ha olika randvillkor, materialegenskaper, tvärsnittskonstanter och laster. Utöver detta kan även enskilda konstruktionsdelar aktivera/deaktiveras.

FEM-program har även ett fristående beräkningsprogram *Ponti_EC4* som fungerar som ”SK94” dvs bestämmer tvärsnittskonstanter som sedan exporteras till *FEM-program*. Programmet har även möjlighet att importera resultat ifrån *FEM-program* och bestämma bärförmåga och tillhörande utnyttjandegrader.

För att påvisa att beräkningsmodell i *FEM-program* är korrekt utförd så sker en oberoende kontrollberäkning med *STEP 2.* Kontrollberäkningen utföres en stålbalk med spännvidd motsvarande medelvärdet av västra balken (Balk 1A-5A) och östra balken (Balk 1B-5B).

Vid bestämning av lasteffekter så beaktas inverkan av farbanans uppsprickning genom att bortse ifrån styvheten i dragen betong. Endast inverkan av förekommande armering beaktas. Uppsprickning anses uppträda när $\sigma_{SLS-K} > 2f_{ctm}$ enligt EC4-2 avsnitt 5.4.2.3 och 1.5.2.12 dock tillämpas på sida villkoret $1.4f_{ctm}$, se även sidor B1:42-46.

Det finns total 7 st analyser. Analysis 7 införes som ”Base Analysis”. Det är utifrån detta statiska system som förändringar av statiskt genomförs. Det är även detta system som används för trafiklastutvärdering/VLO.



Sammanställning av statiska modeller SYSTEM 001
(* = Base analysis)

Nr.	Analysis	Skede	Gjutetapp
1	Stage I	Bygg	I
2	Stage II	Bygg	II
3	Stage III	Bygg	III
4	Stage IV	Bygg	IV
5	Stage V	Bygg	V
6	Drift-P	Drift	-
7*	Drift-V	Drift	-

Bilagor

Bilaga 1 - Indatakvitto SYSTEM 001

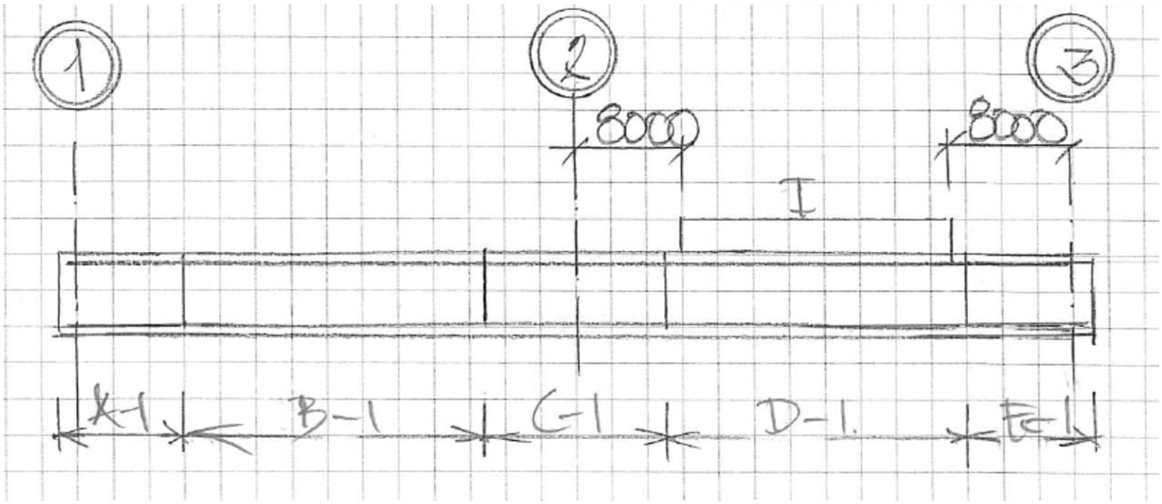
Bilaga 2 - Resultat SYSTEM 001 (upplagskrafter)

Bilaga 3 - Resultat SYSTEM 001 (lagerkrafter)

Bilaga 4 - Resultat SYSTEM 001 (huvudbalkar)

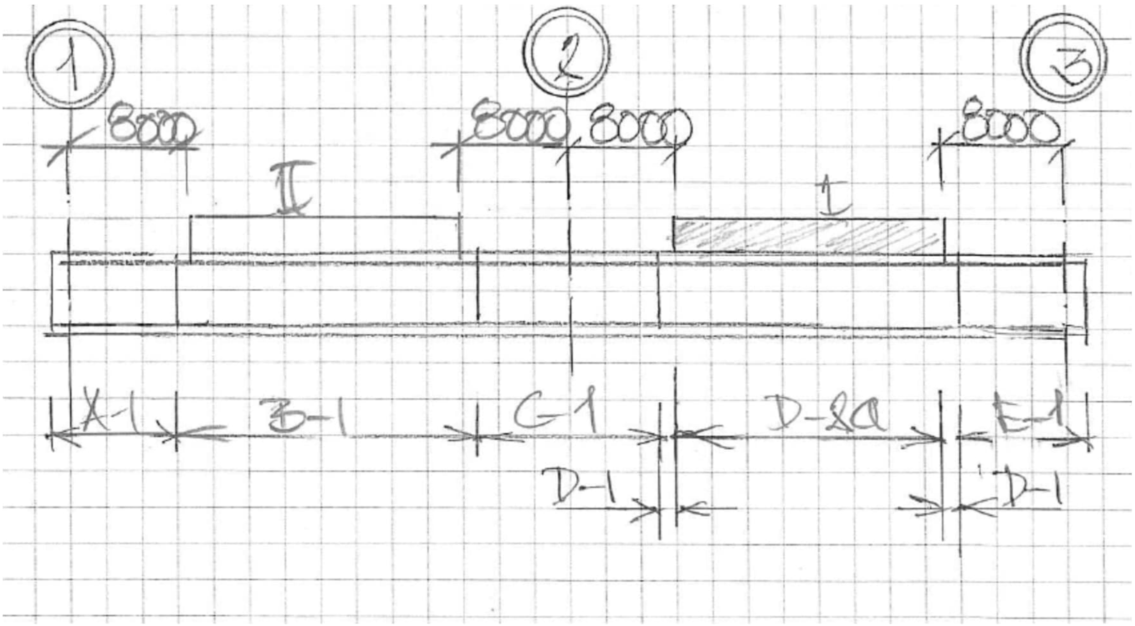
Bilaga 5 - Resultat SYSTEM 001 (tvärbalkar)

Bilaga 6 - Resultat SYSTEM 001 (farbana)

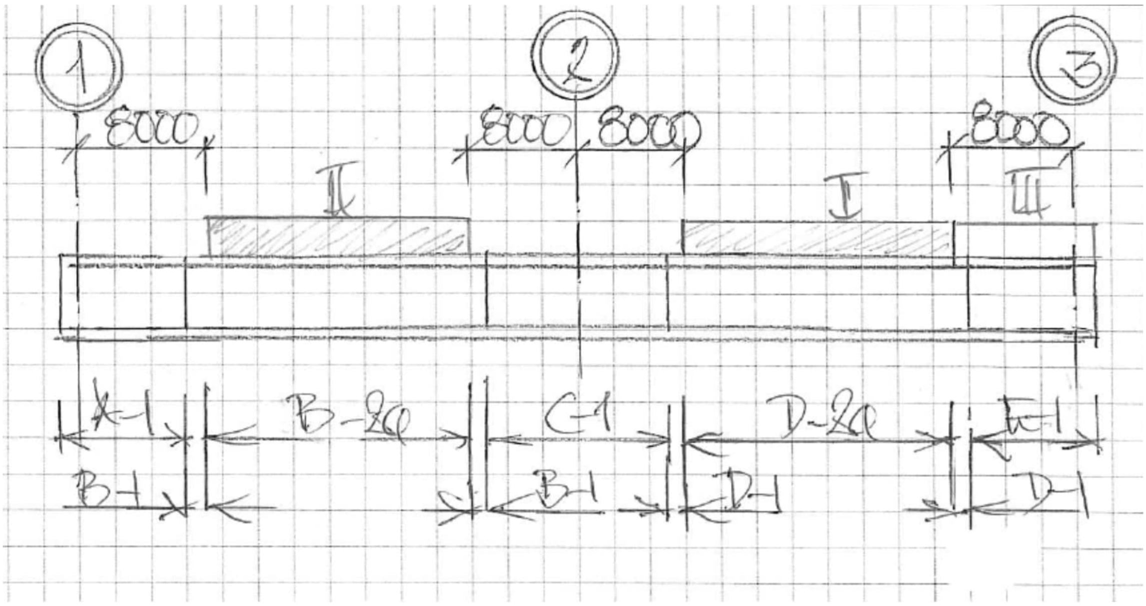


Analysis : Stage I

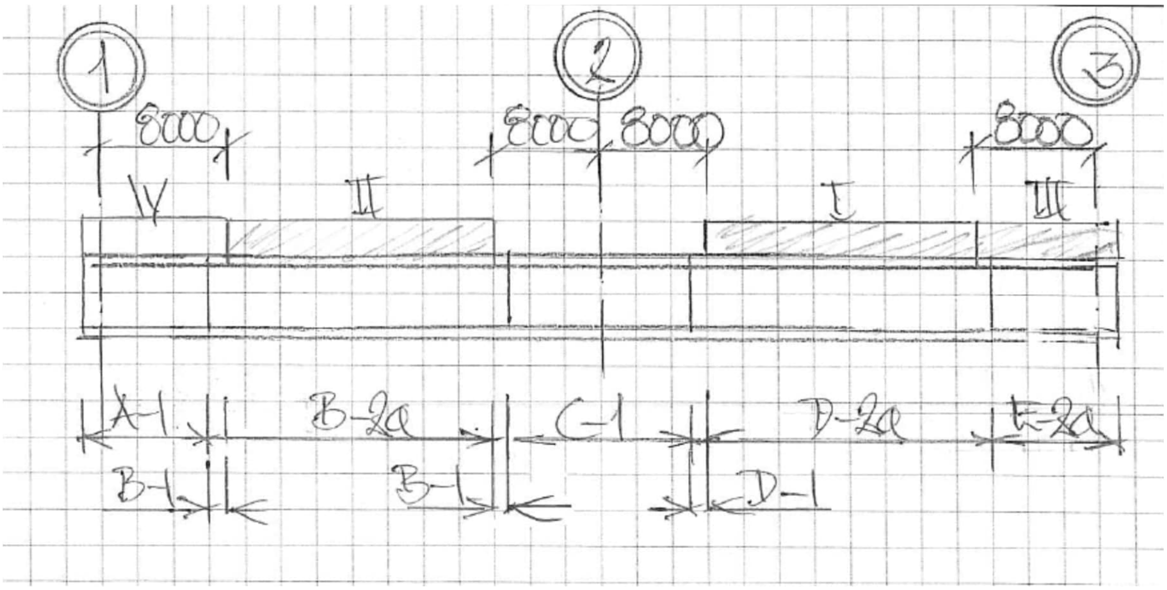
(Byggskede : Våt betong gjutetapp I)



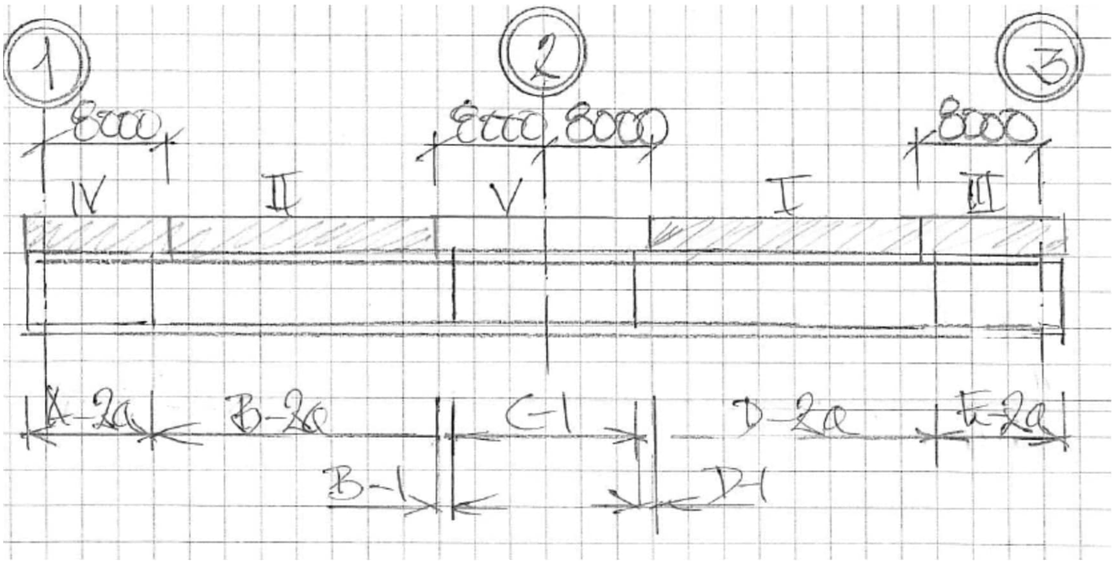
<u>Analysis : Stage II</u>
(Byggskede : Våt betong gjutetapp II)



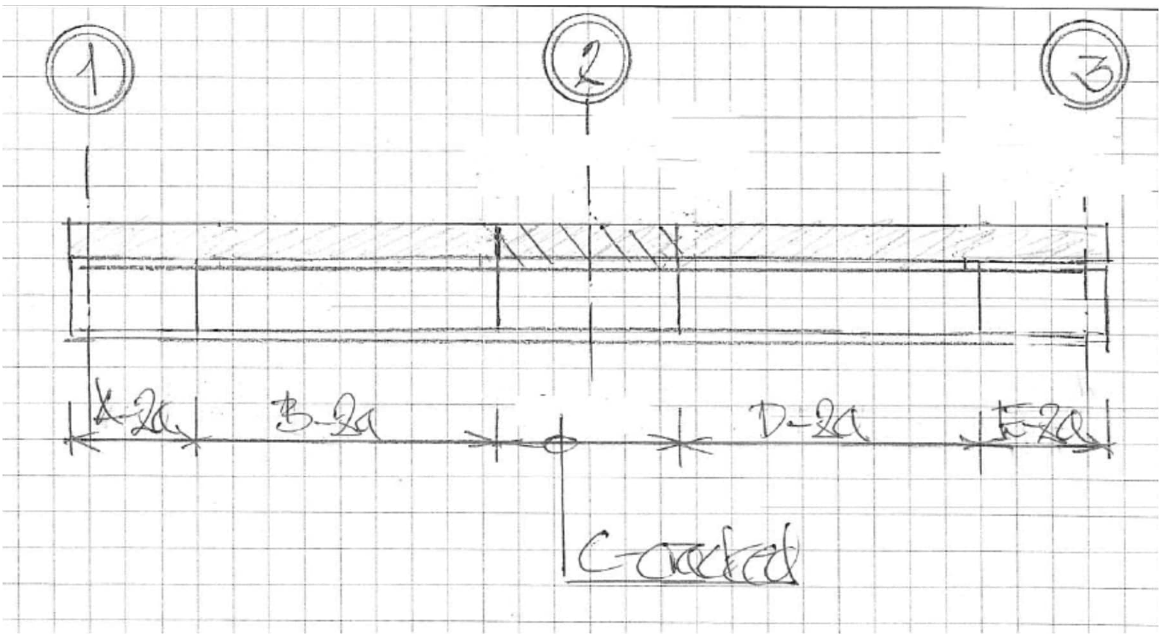
<u>Analysis : Stage III</u>
(Byggskede : Våt betong gjutetapp III)



Analysis : Stage IV
(Byggskede : Våt betong gjutetapp IV)

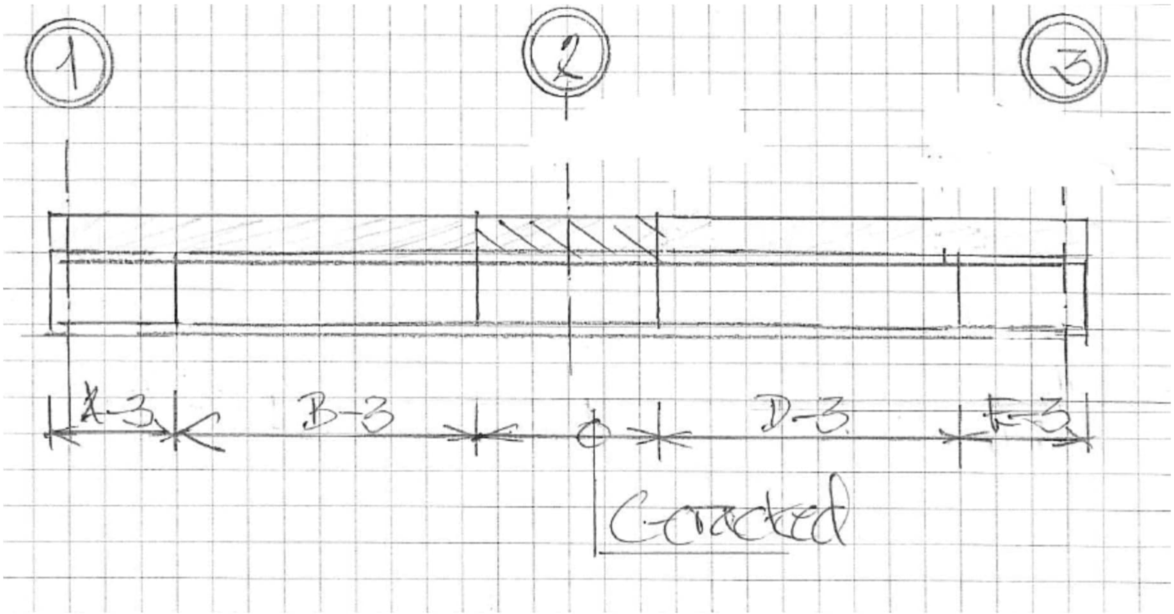


Analysis : Stage V
(Byggskede : Våt betong gjutetapp V)



Analysis : Drift-P

(Driftskede med uppsprucken betong lokalt kring stöd 2)



<u>Analysis : Drift-V</u>
(Driftskede med uppsprucken betong lokalt kring stöd 2)

2.2 SYSTEMSKISS

2.2.1 Geometri

För att beskriva geometri i FEM-PROGRAM krävs först att *POINTS* definieras. Utifrån dessa genereras *LINES* och *SURFACES*.

Balkelement definieras genom att införa attribut på *LINES*.
Skalelement definieras genom att införa attribut på *SURFACES*.

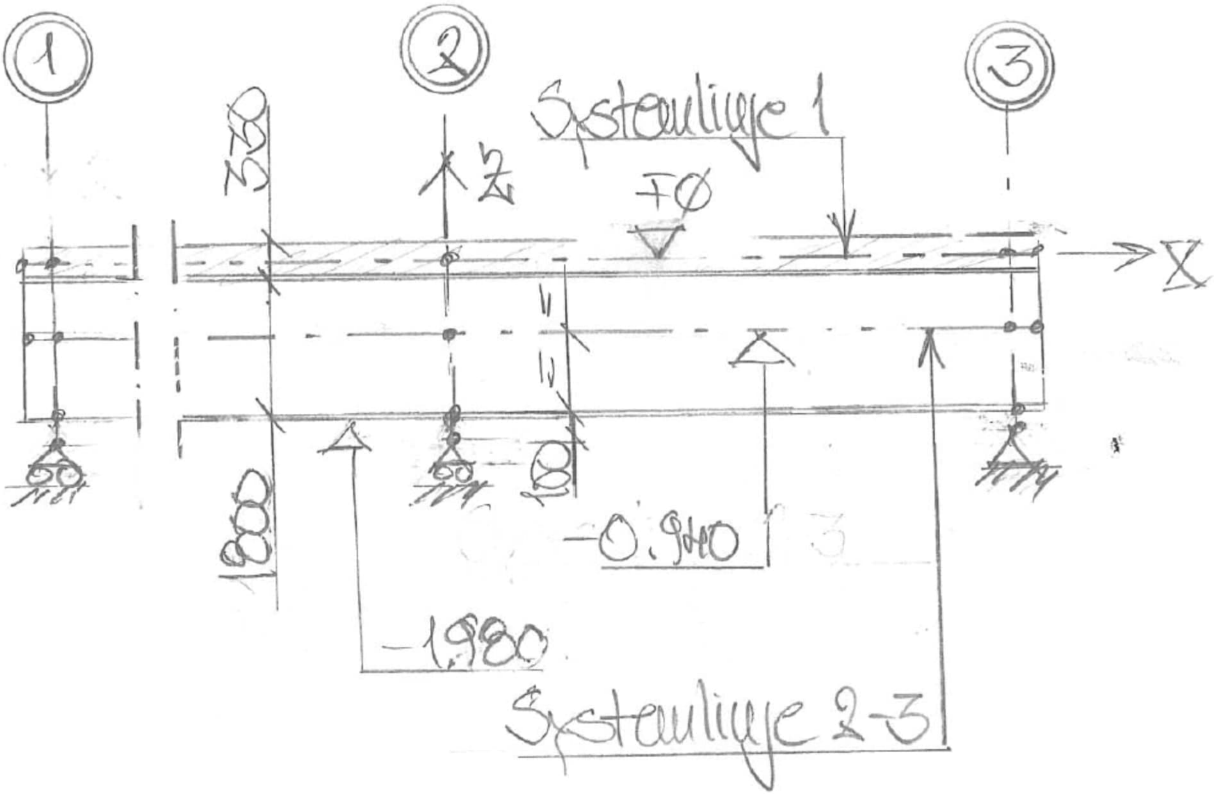
Bifogade bilder är hämtade ifrån gjord analys och ger en grafisk kvittens av *POINTS*, *LINES* och *SURFACES.*

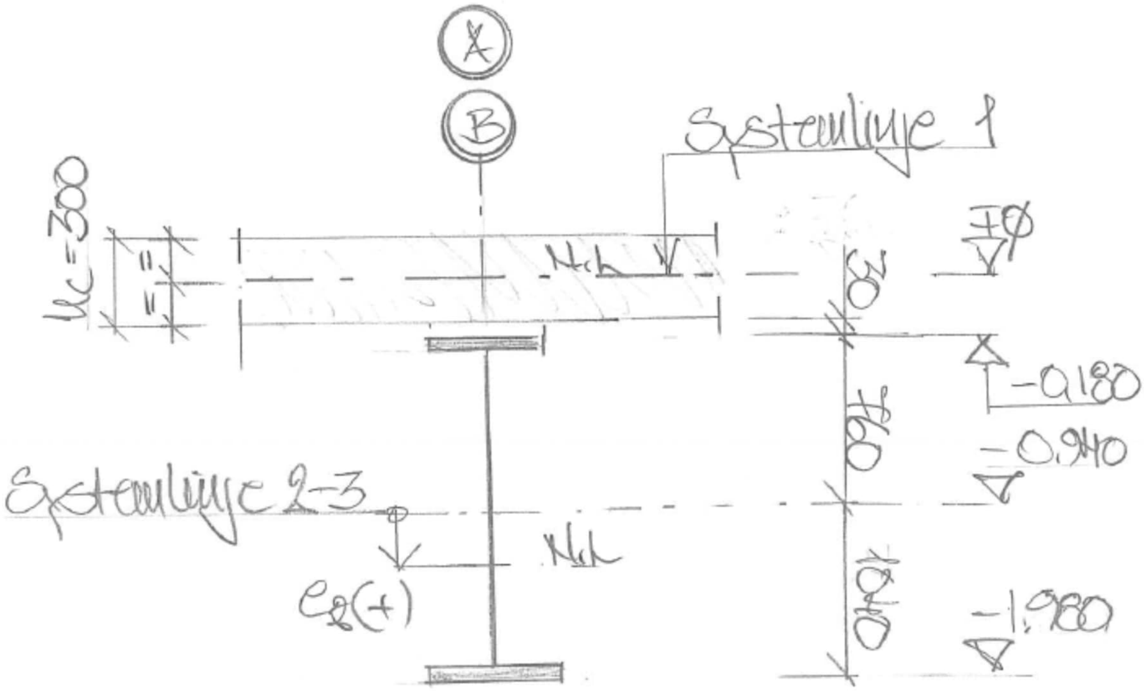
Alla koordinater för att beskriva *POINTS* återfinns i bilaga 1.

Samtliga *POINTS* som beskriver *LINES* återfinns i bilaga 1.

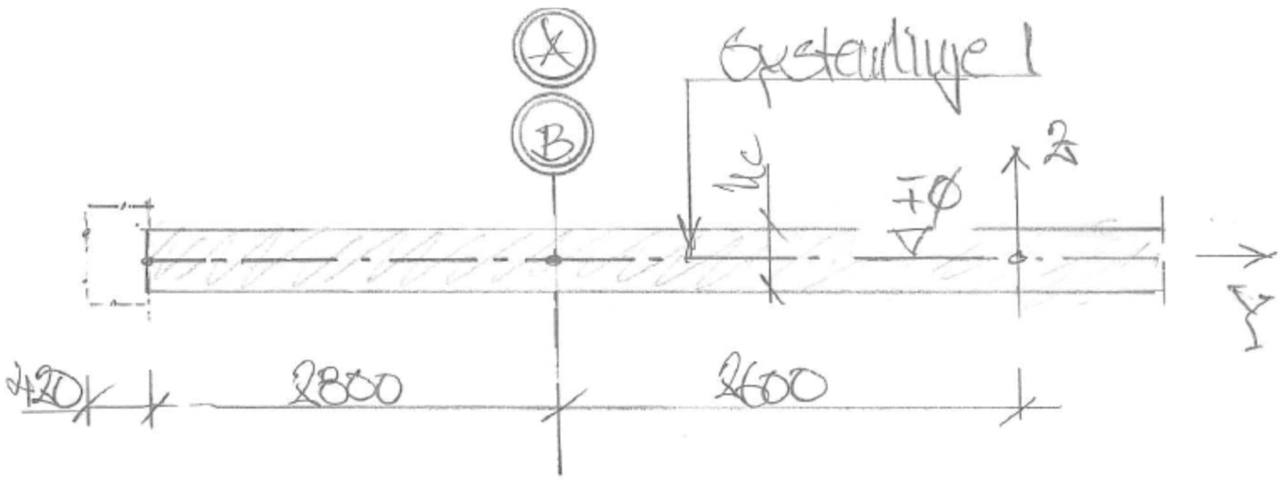
Samtliga *LINES* som beskriver *SURFACES* återfinns i bilaga 1.

Överbyggnad modelleras med totalt 3 st systemlinjer belägna på fiktiva nivåer enligt redovisning nedan.

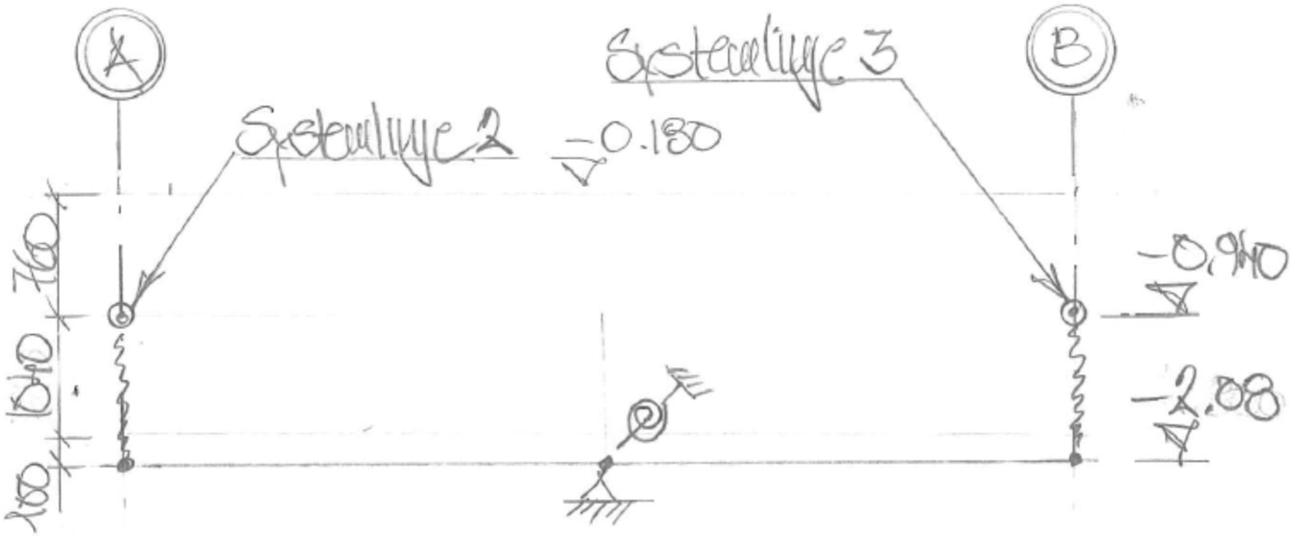




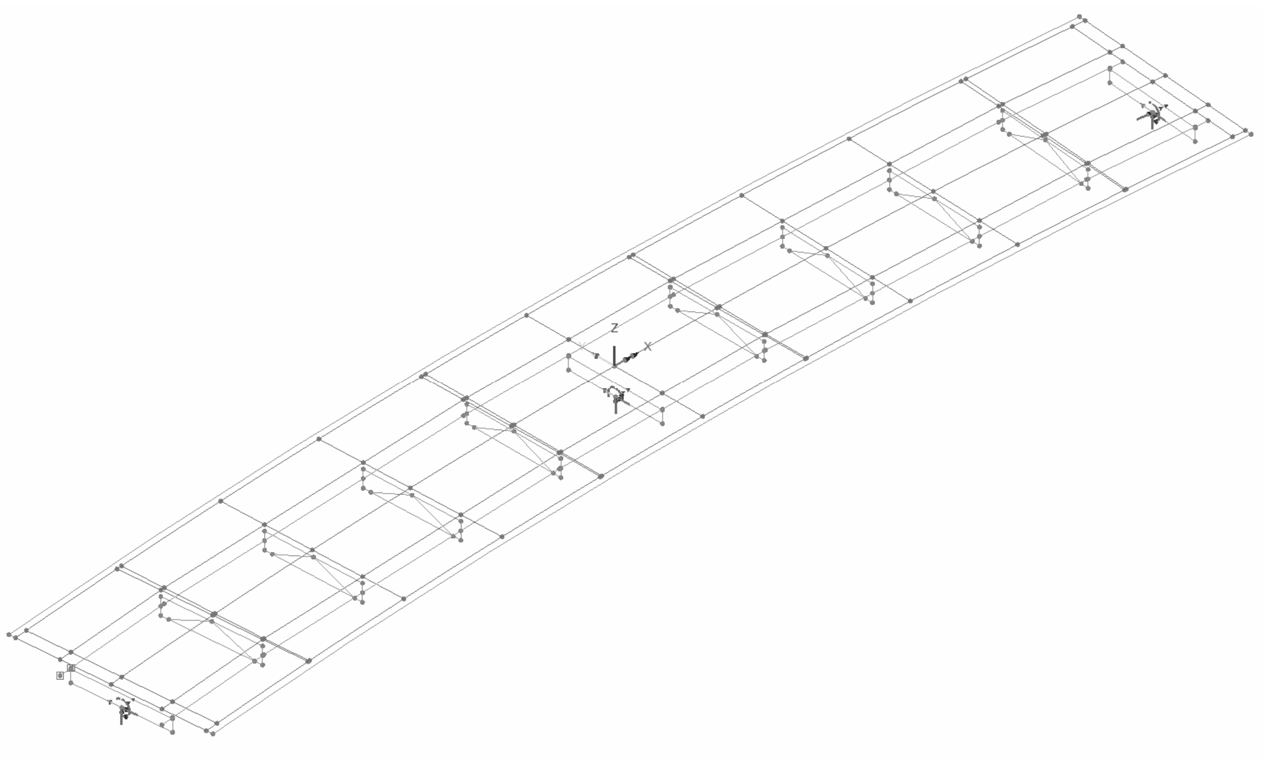
A
B
Systemlinje 1
$h_c = 300$
=
=
$N_{c,L}$
±0
80
-0,180
760
-0,940
Systemlinje 2-3
$N_{c,L}$
$e_2(+)$
1040
-1,980



A
B
Systemlinje 1
h_c
±0
z
y
420
2800
2600

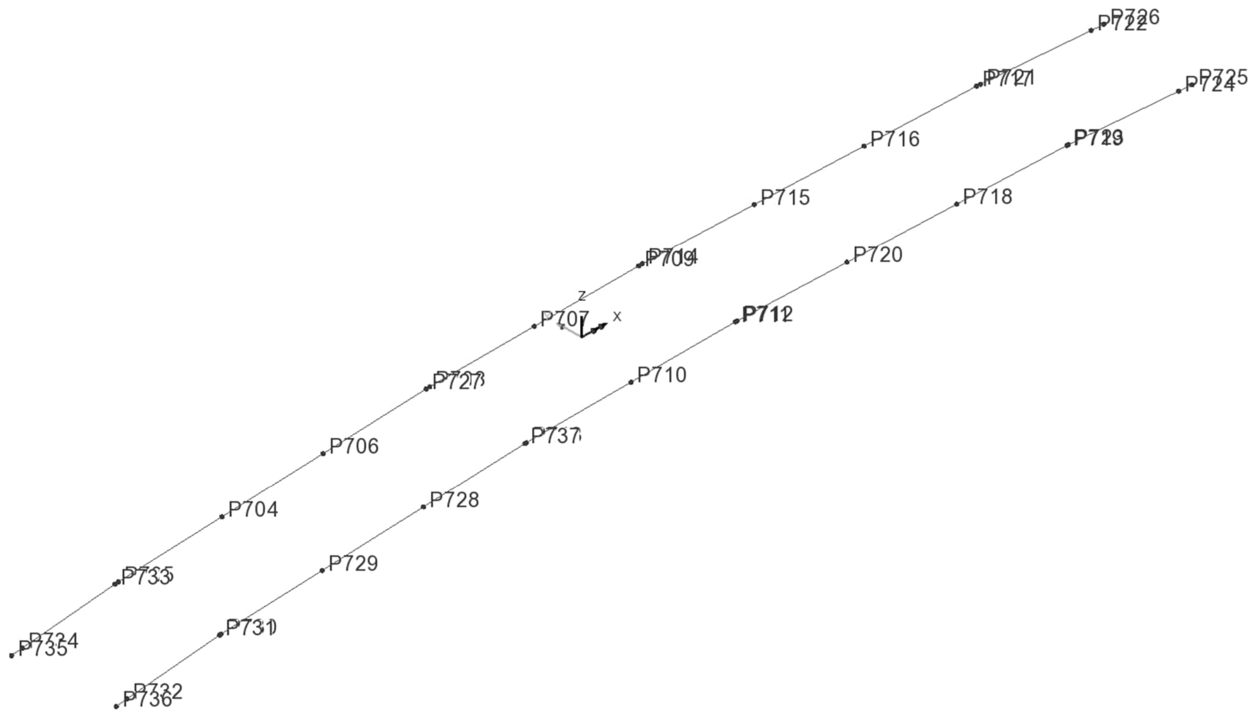

A
B
Systemlinje 2
Systemlinje 3
-0.180
-0,940
-2,08
760
1040
200

Overview :

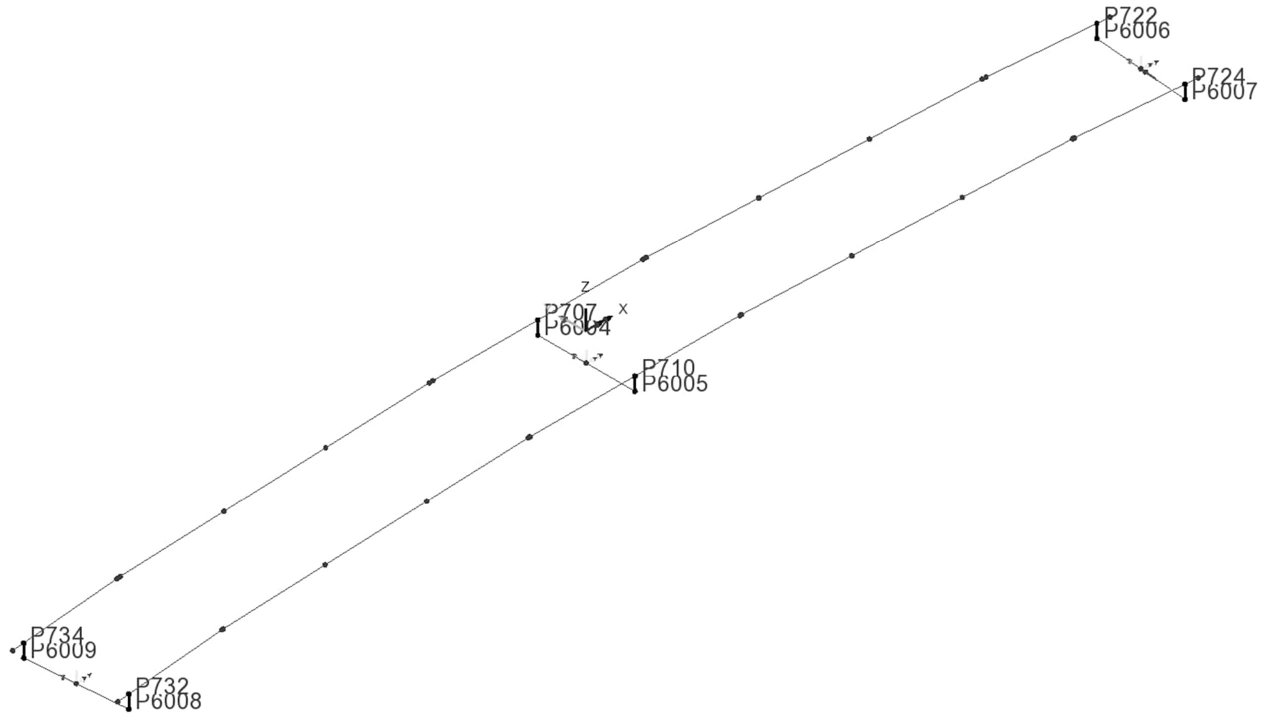


2.2.1.1 Geometri : POINTS

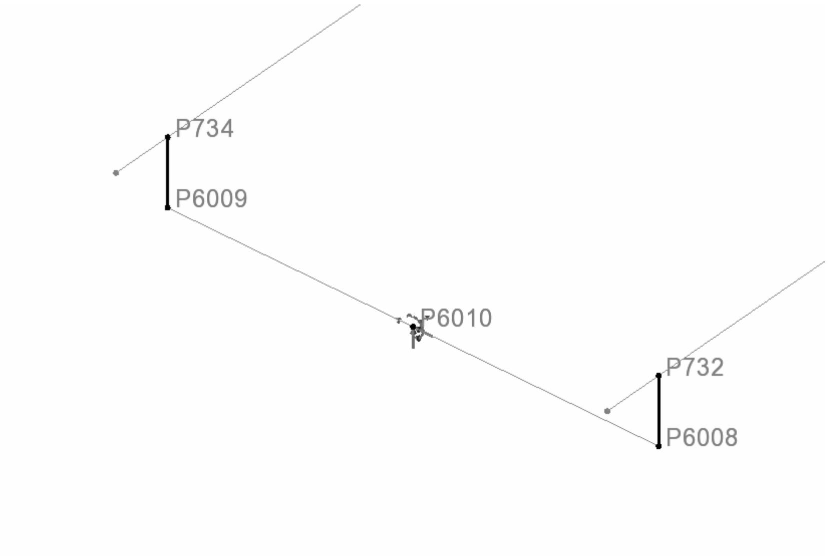
Girders :



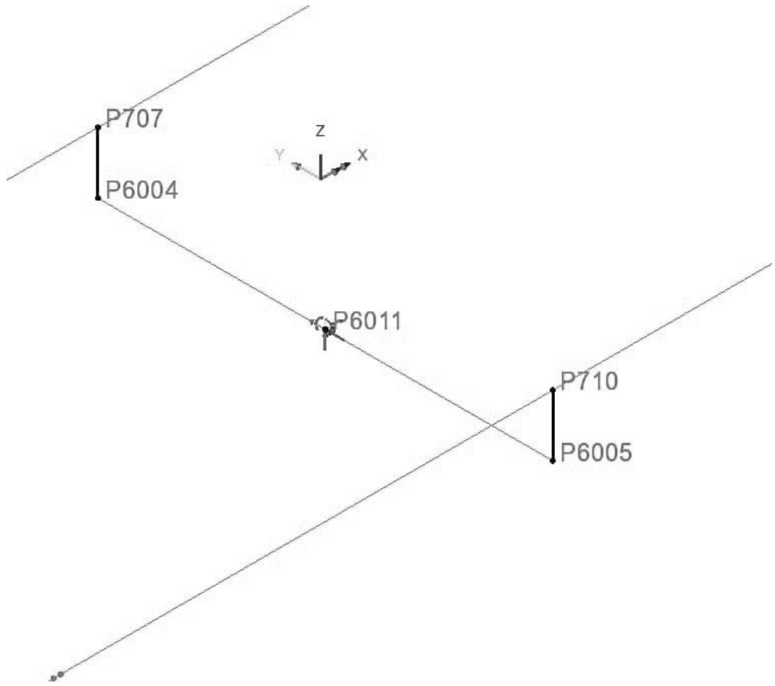
Bearings - overview :



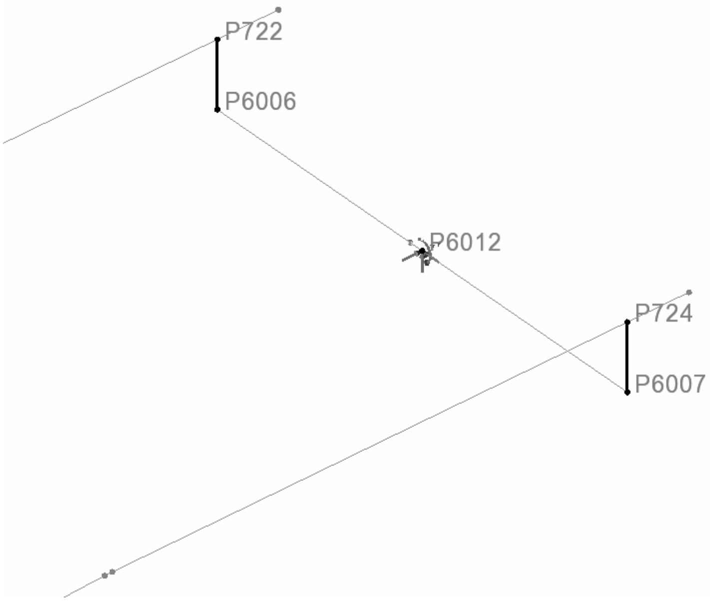
Bearings – Support 1 :



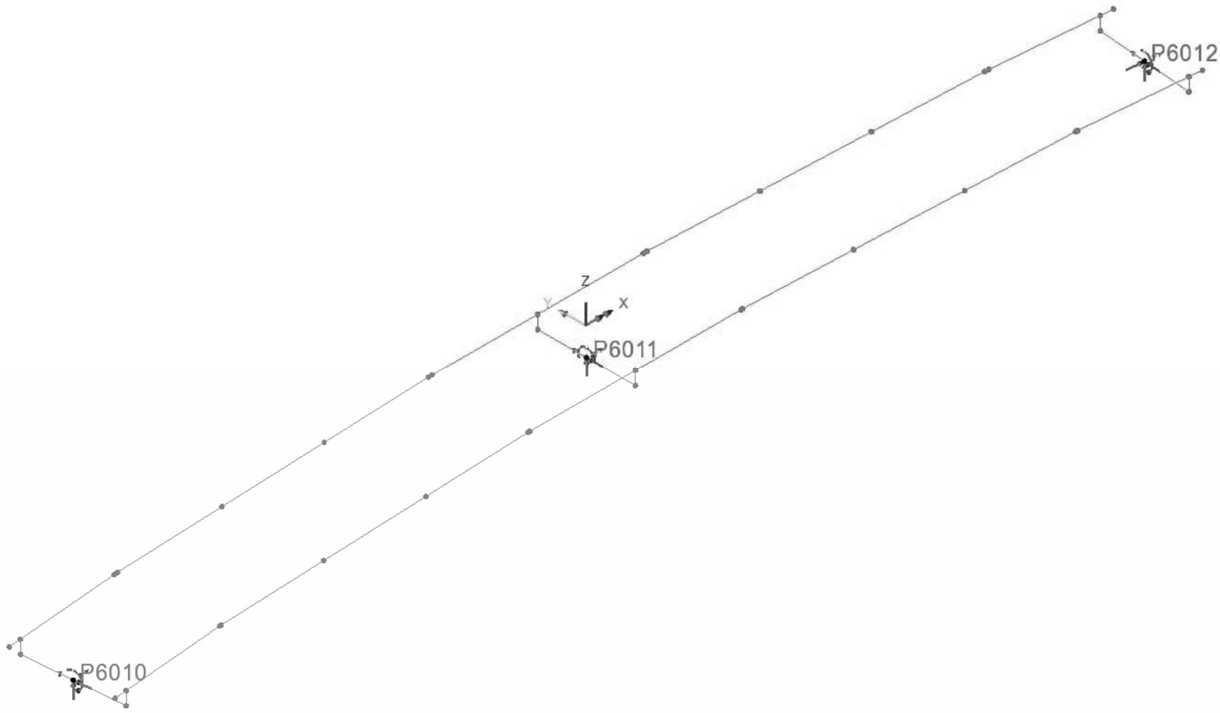
Bearings – Support 2 :



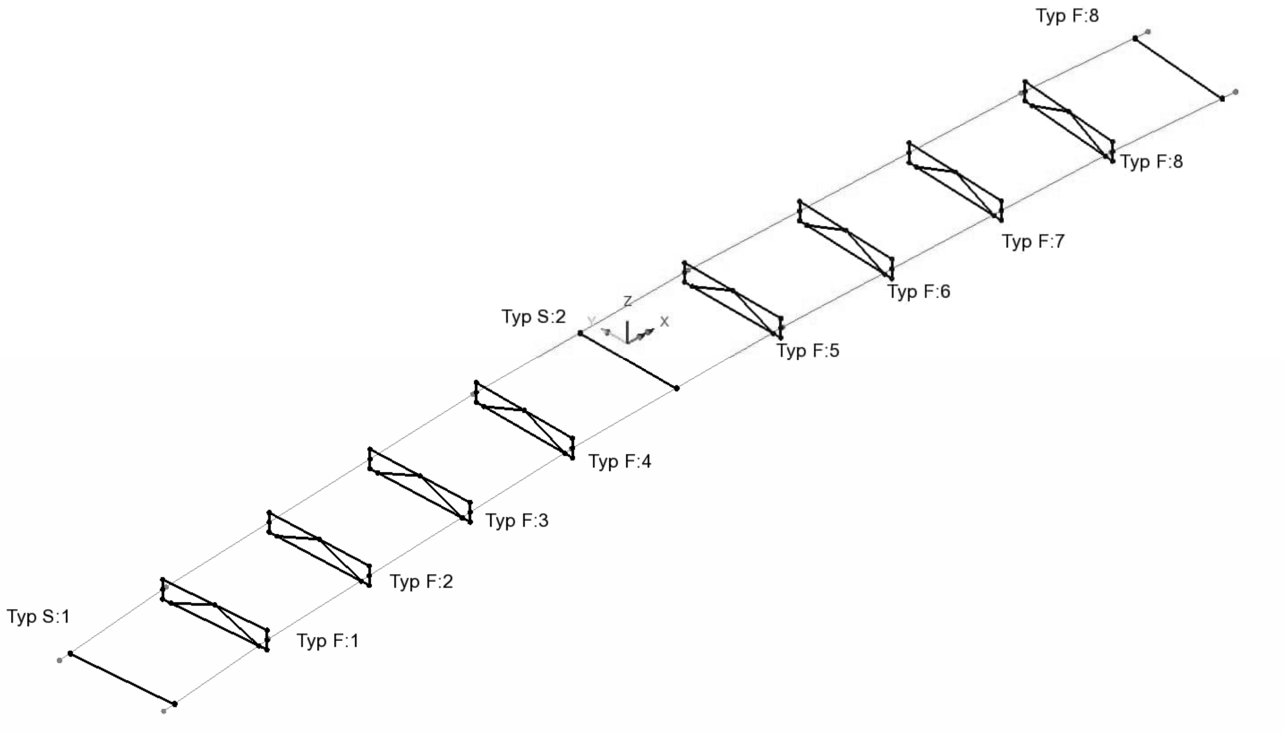
Bearings – Support 3 :



Supernodes - overview :

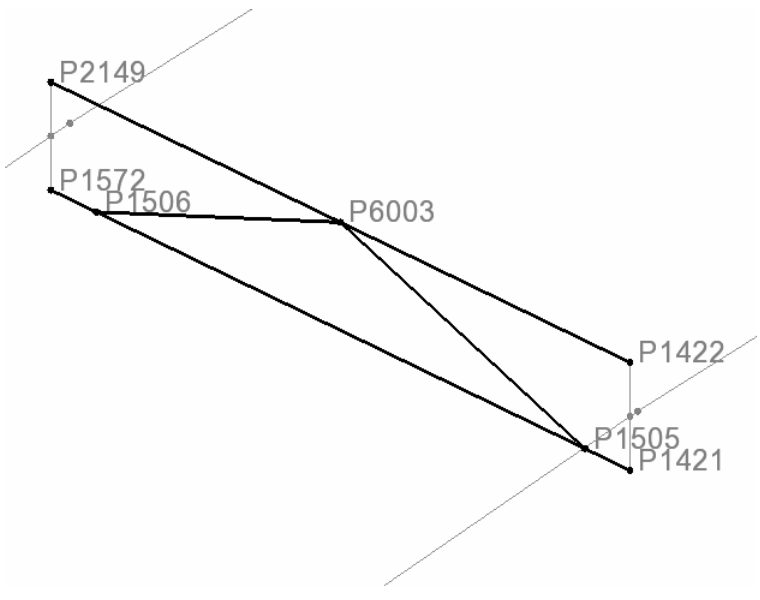


Diaphragms - overview :

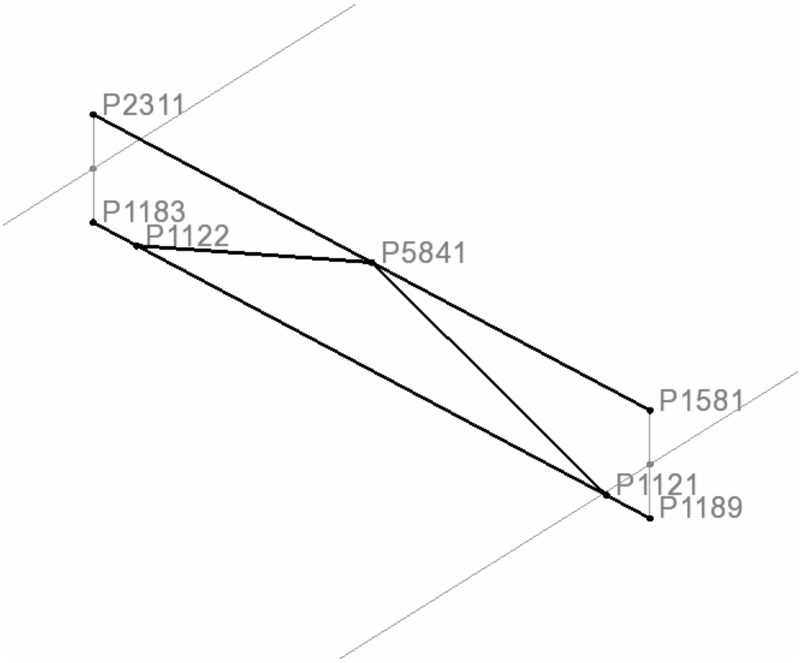


Diaphragm – Typ S:1 :

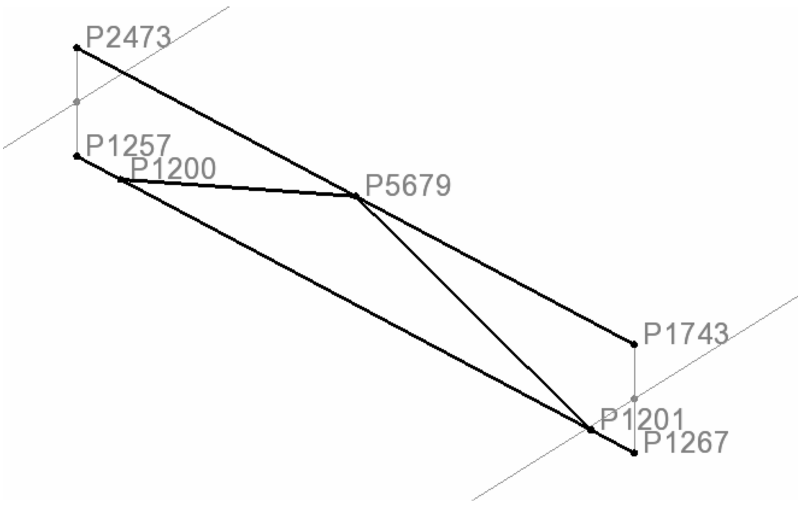
Diaphragm – Typ F:1 :



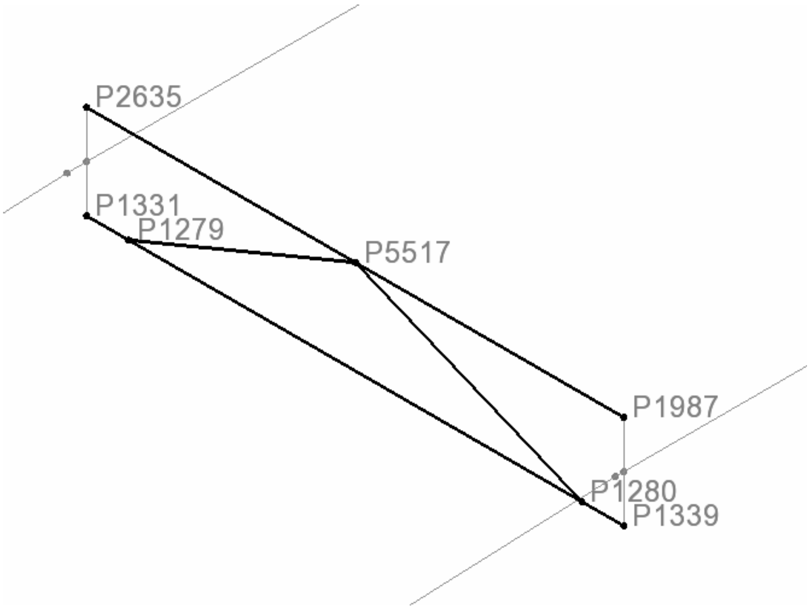
Diaphragm – Typ F:2 :



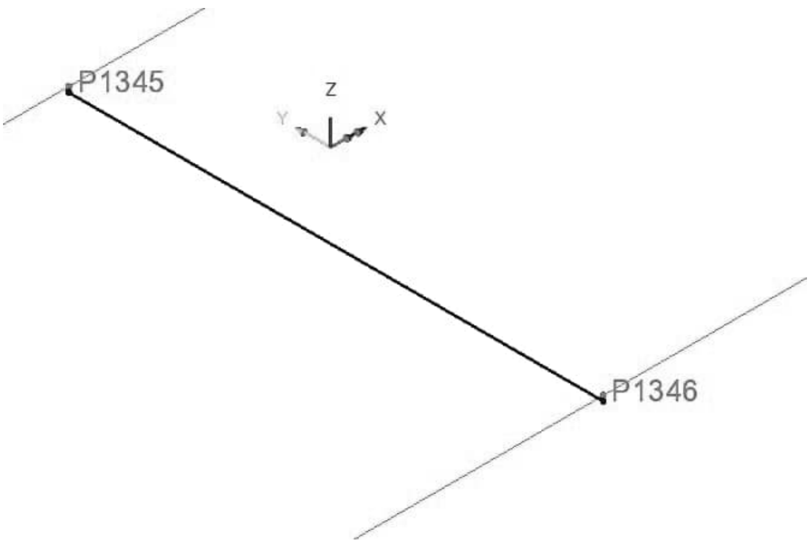
Diaphragm – Typ F:3 :



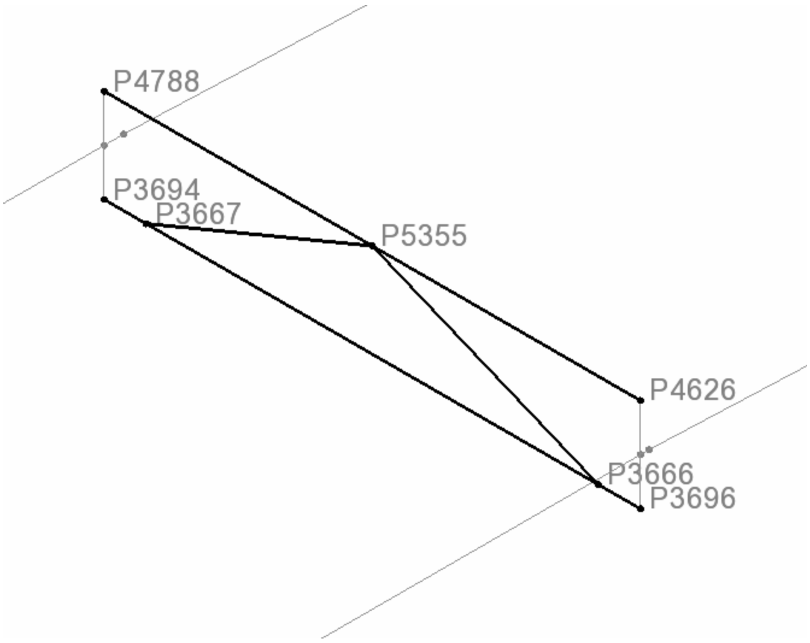
Diaphragm – Typ F:4 :



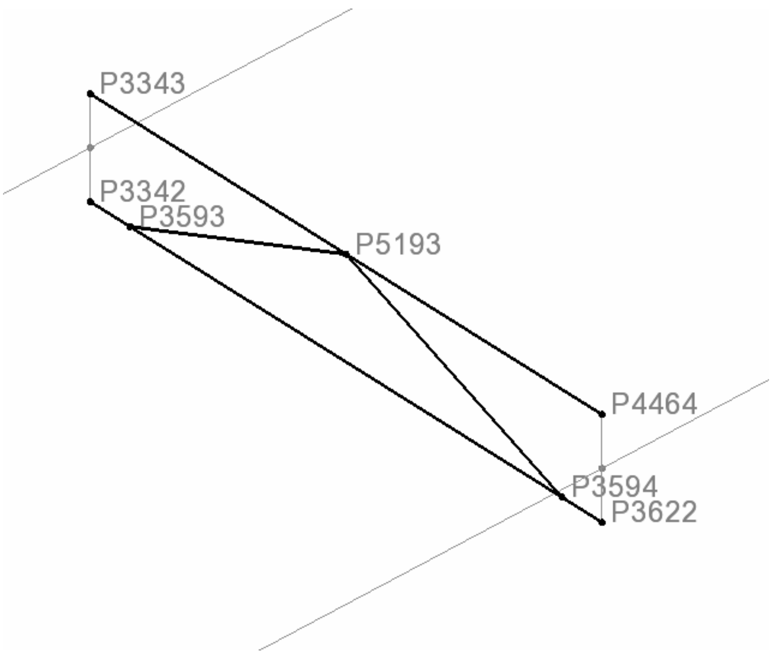
Diaphragm – Typ S:2 :



Diaphragm – Typ F:5 :

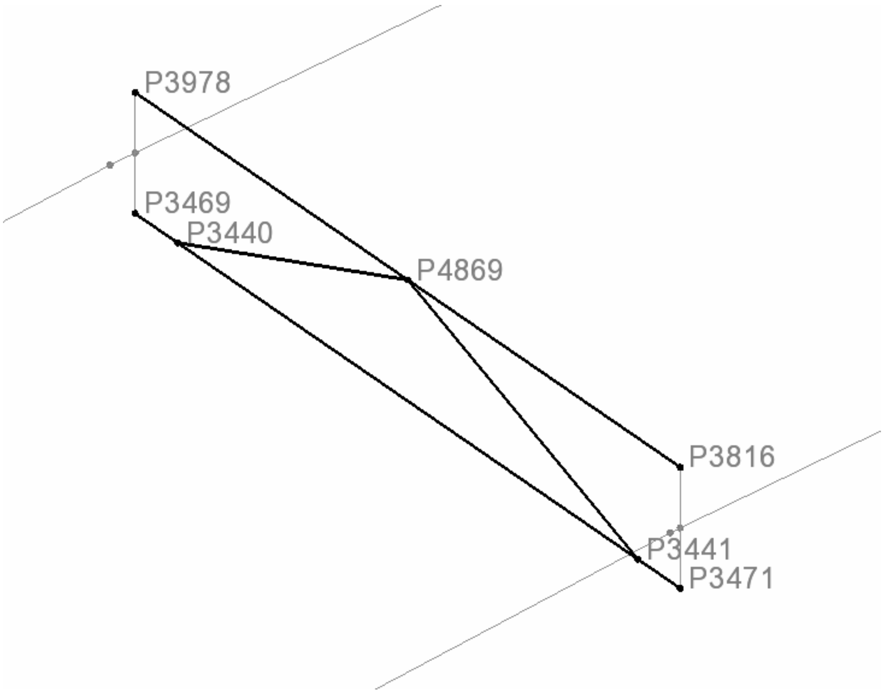


Diaphragm – Typ F:6 :

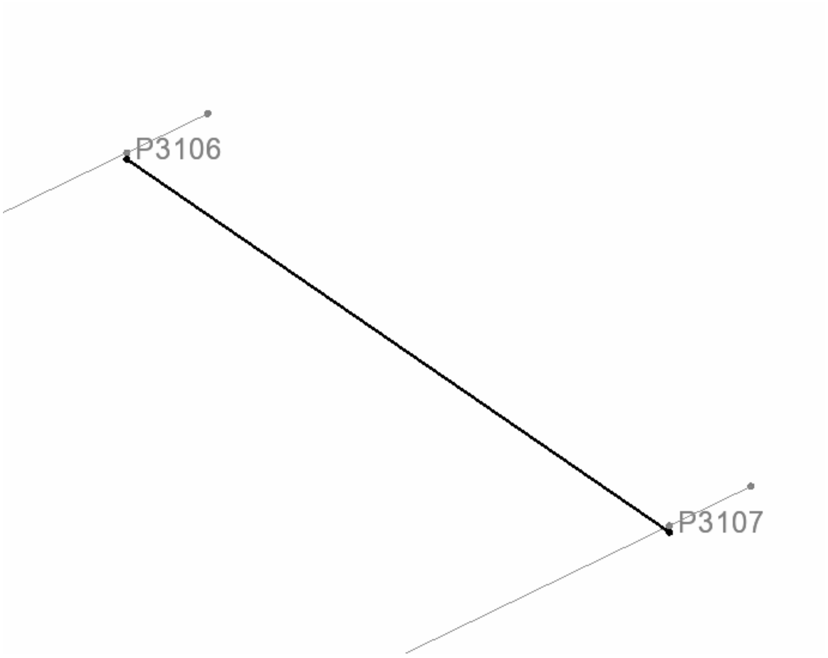


Diaphragm – Typ F:7 :

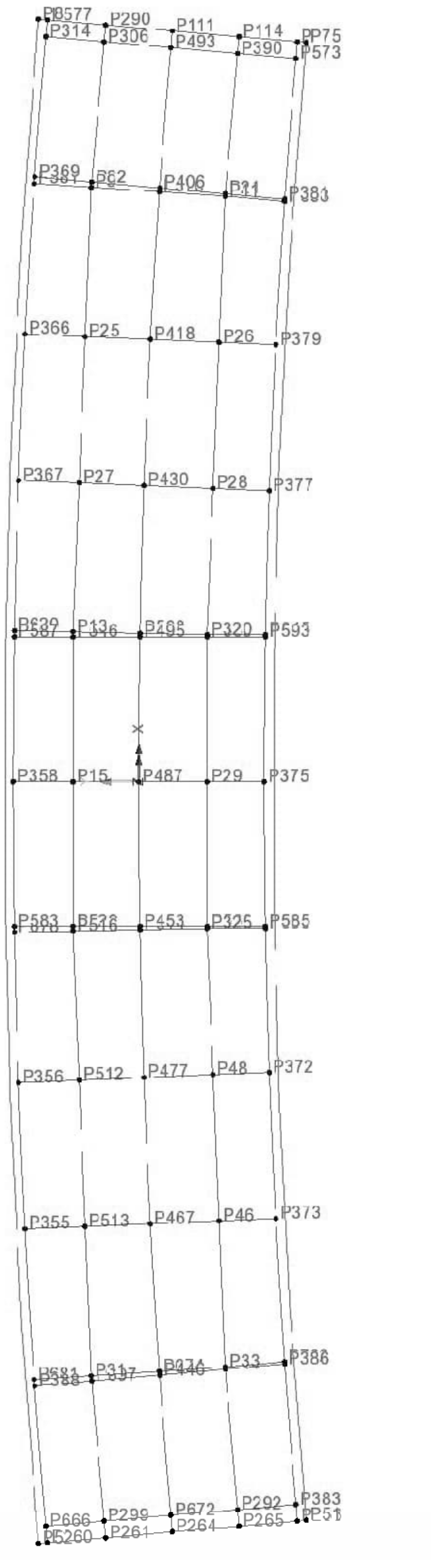
Diaphragm – Typ F:8 :



Diaphragm – Typ S:3 :

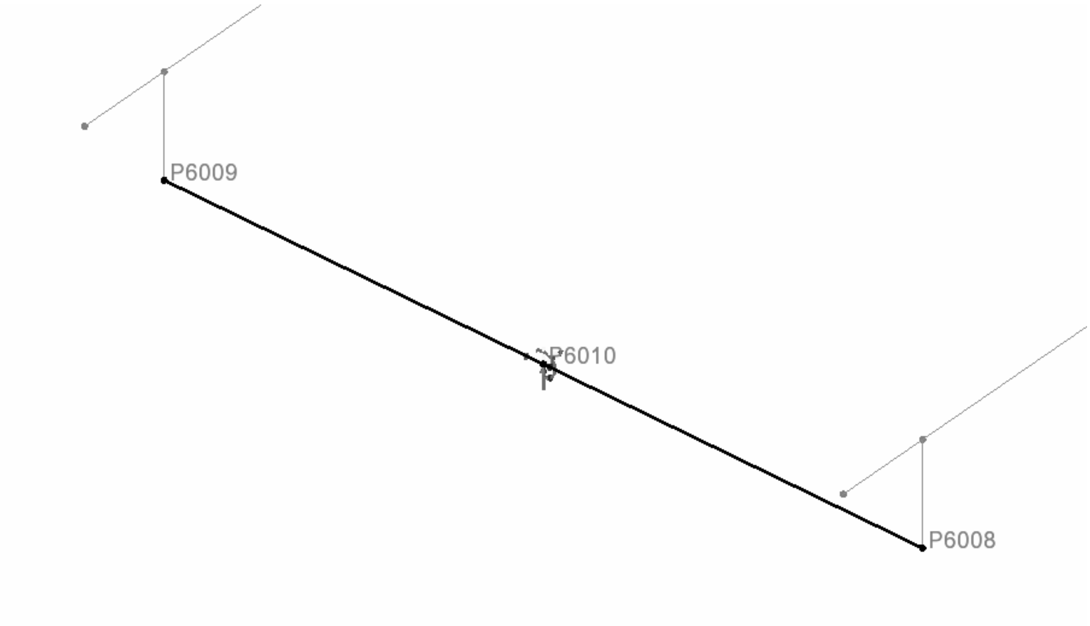


Deck :

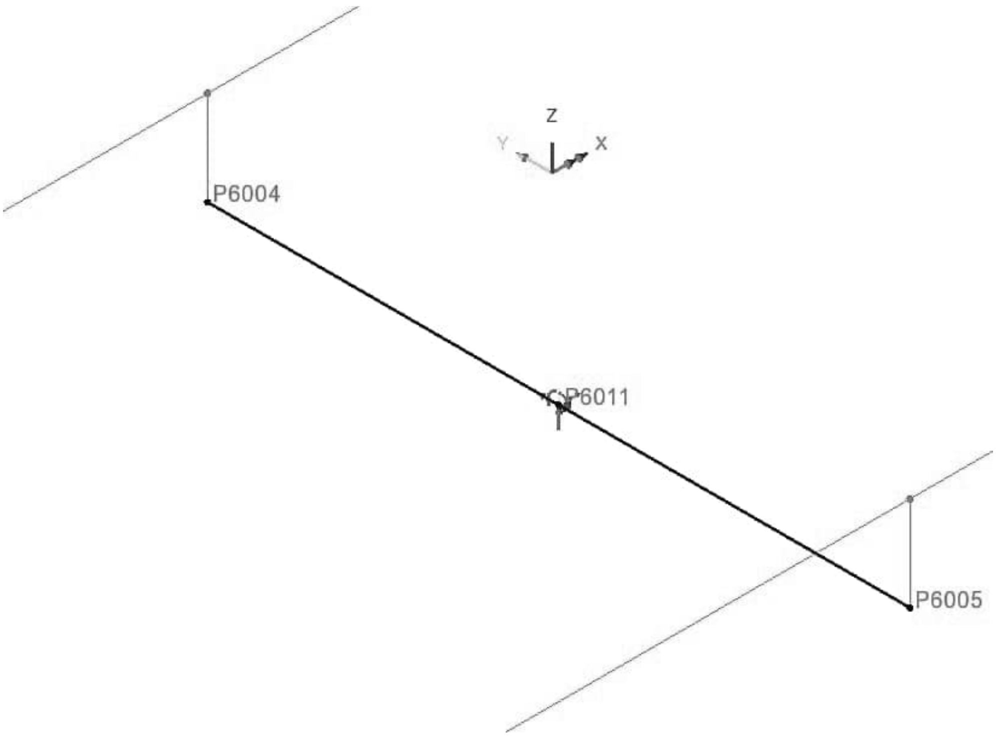


P290
P111
P114
P314
P306
P493
P390
P573
P406
P366
P25
P418
P26
P379
P367
P27
P430
P28
P377
P593
P358
P15
P487
P29
P375
P585
P356
P512
P477
P48
P372
P355
P513
P467
P46
P373
P33
P386
P666
P299
P672
P292
P383
P261
P264
P265

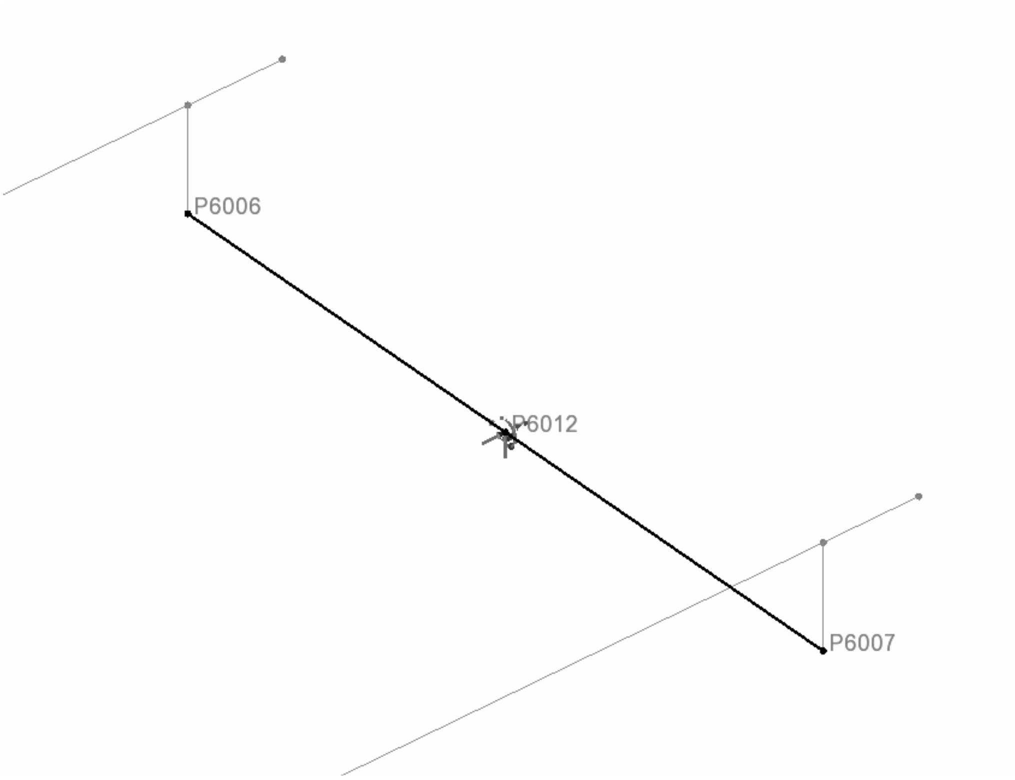
Rigid beam – Support 1 :



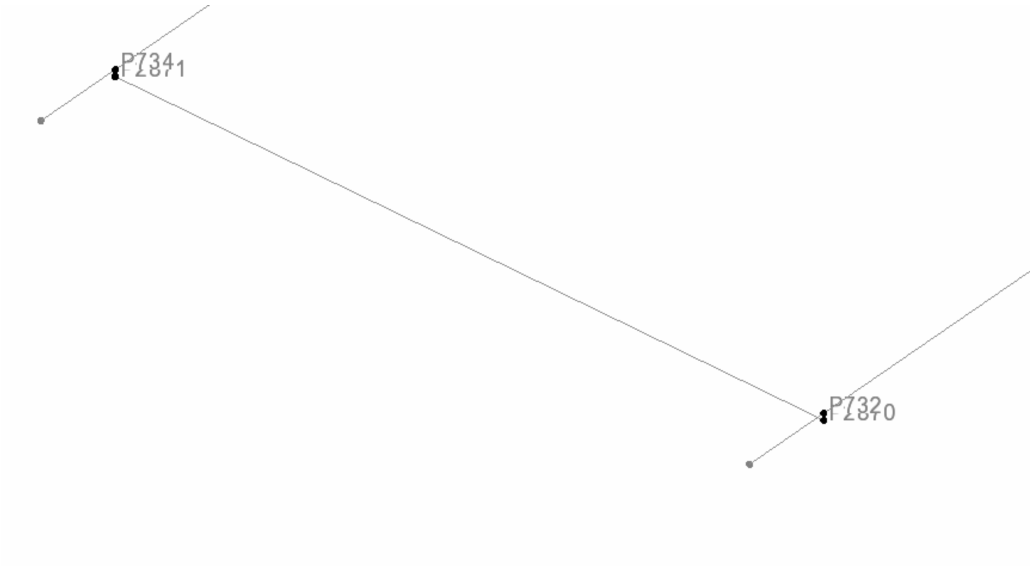
Rigid beam – Support 2 :



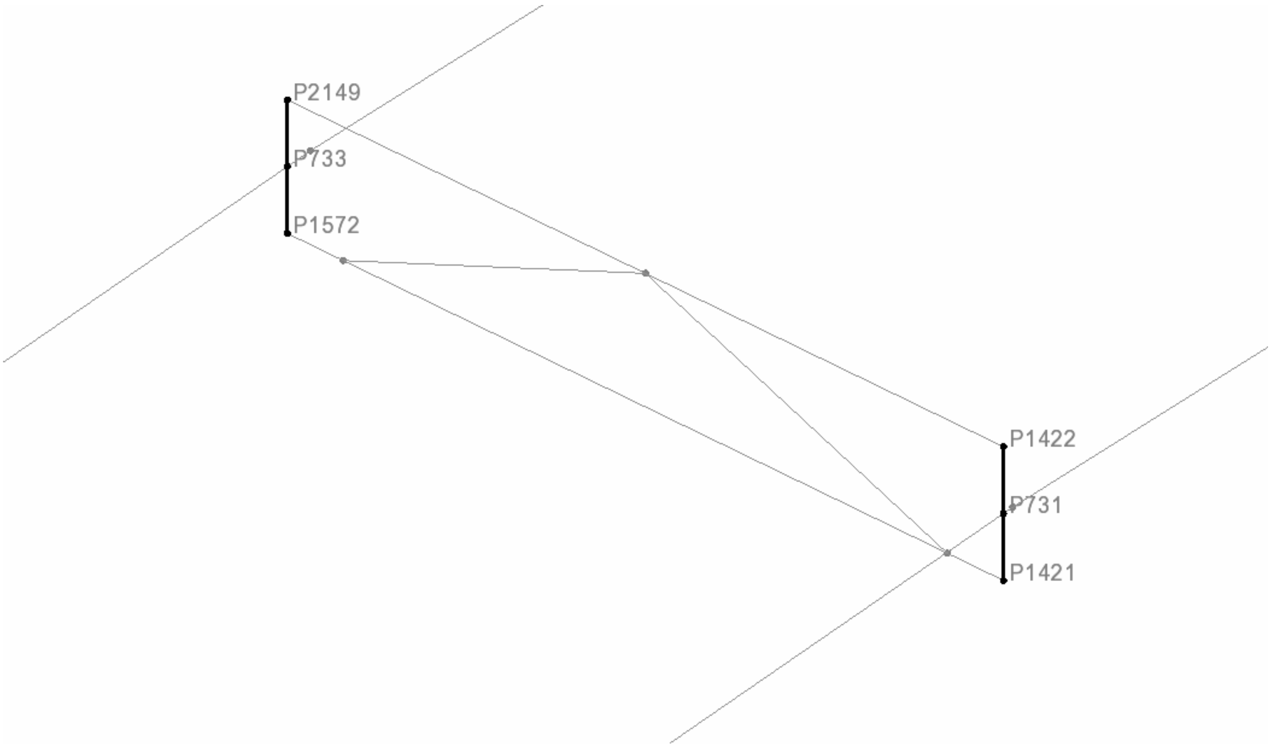
Rigid beam – Support 3 :



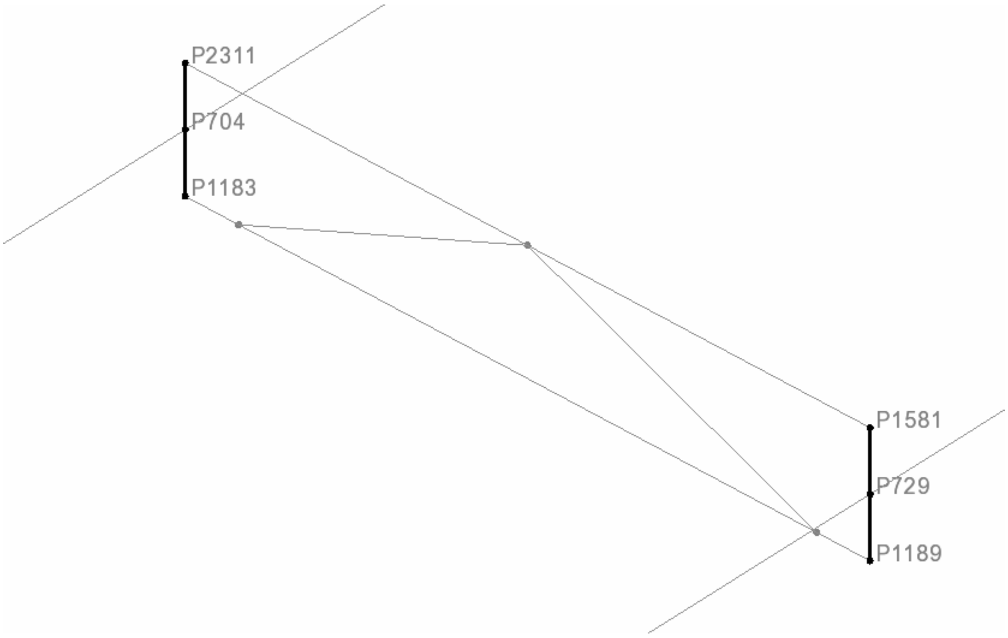
Rigid beam - diaphragm Typ S:1 :



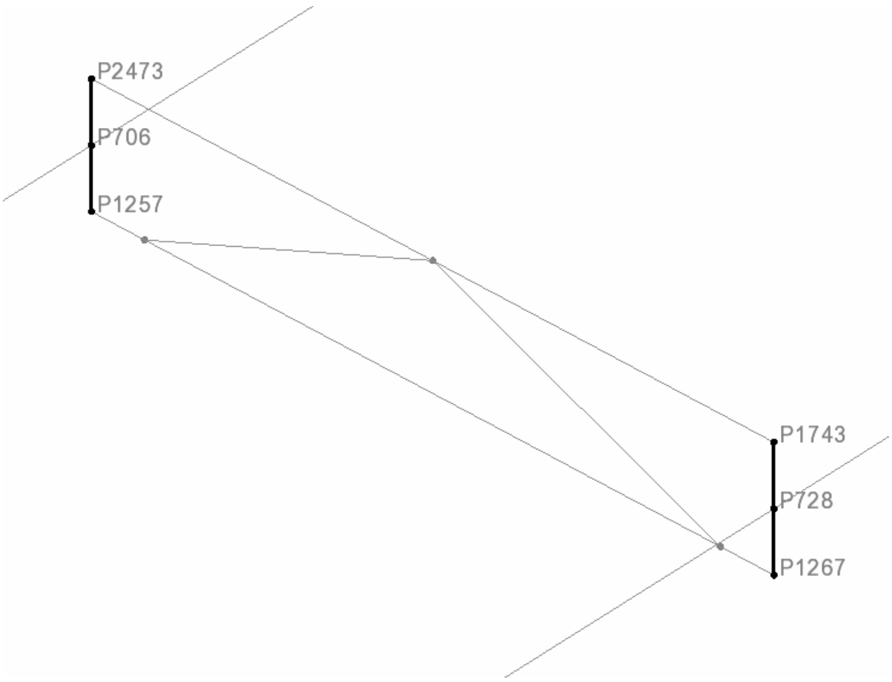
Rigid beam - diaphragm Typ F:1 :



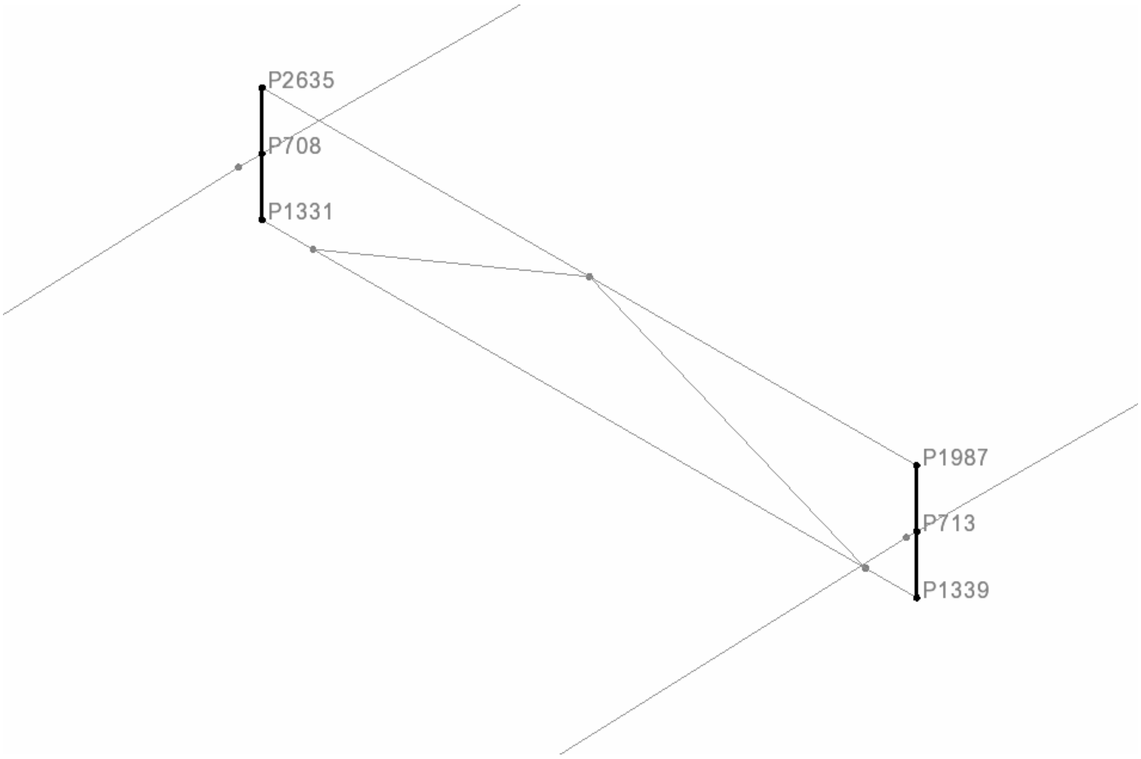
Rigid beam - diaphragm Typ F:2 :



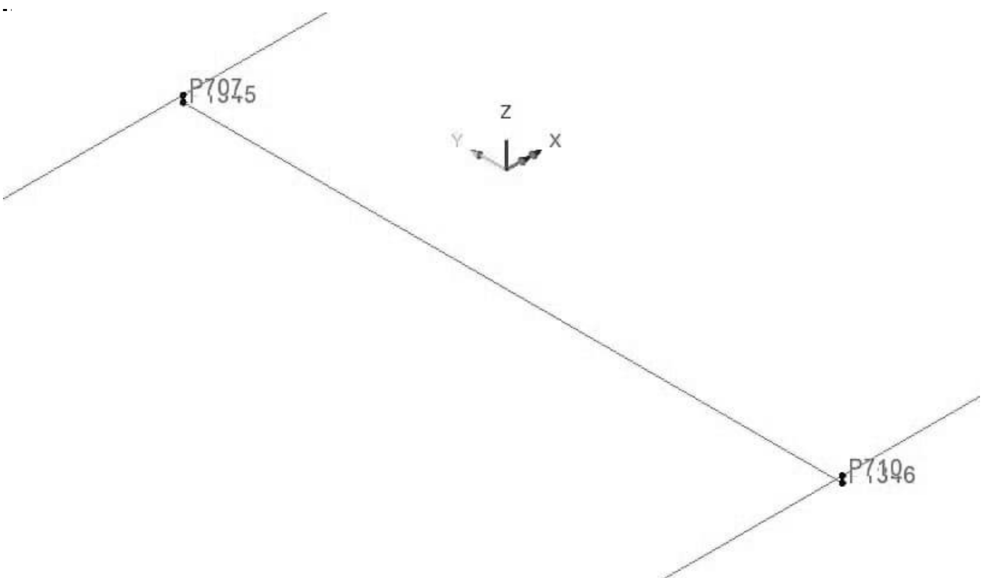
Rigid beam - diaphragm Typ F:3 :



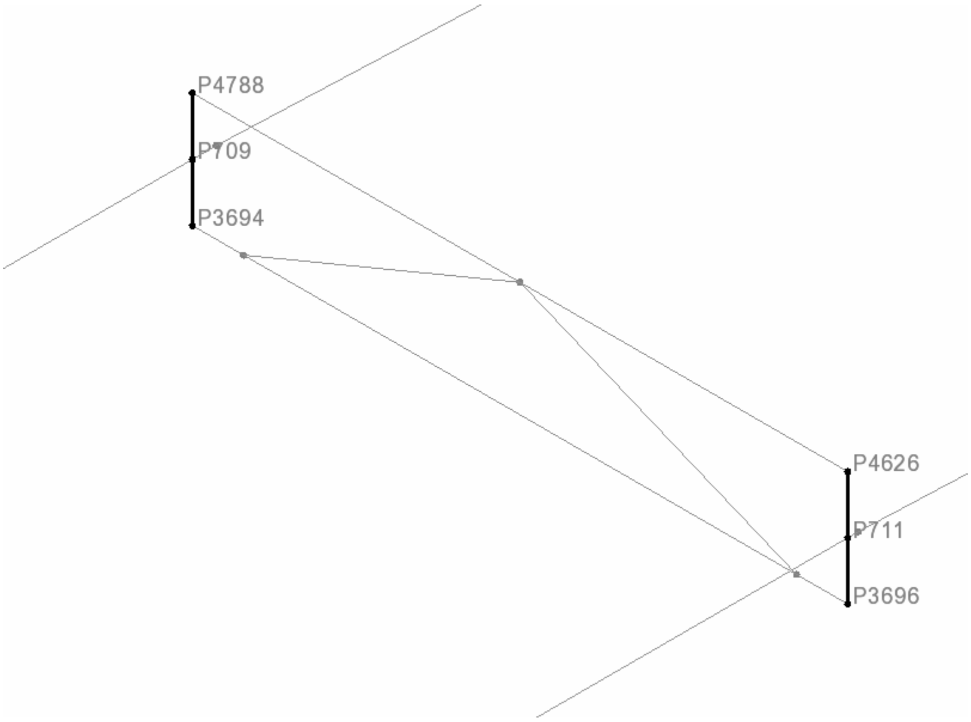
Rigid beam - diaphragm Typ F:4 :



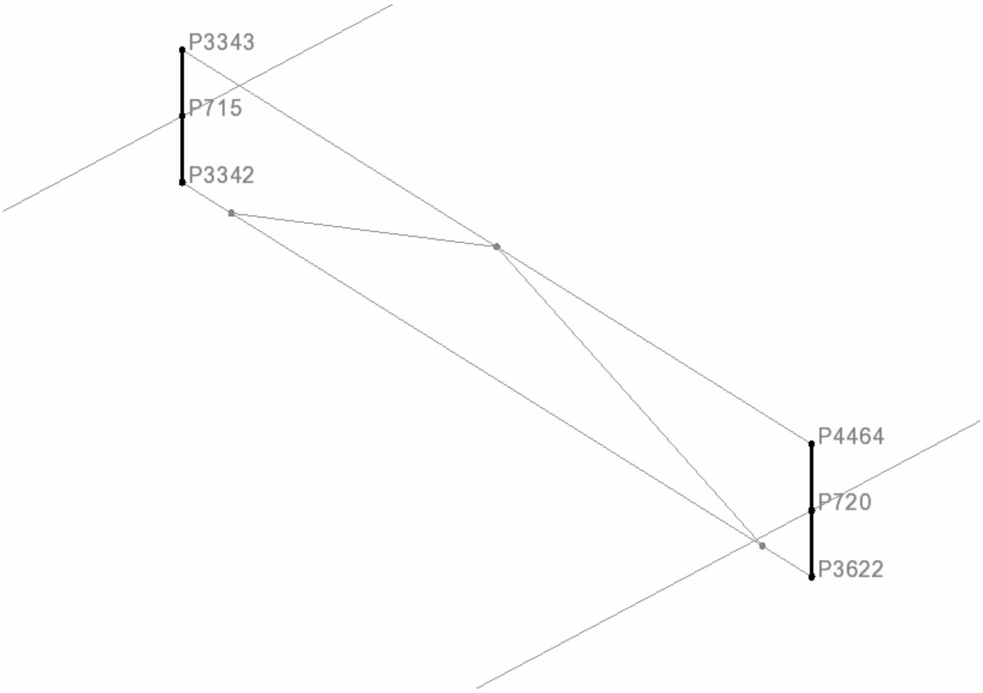
Rigid beam - diaphragm Typ S:2 :



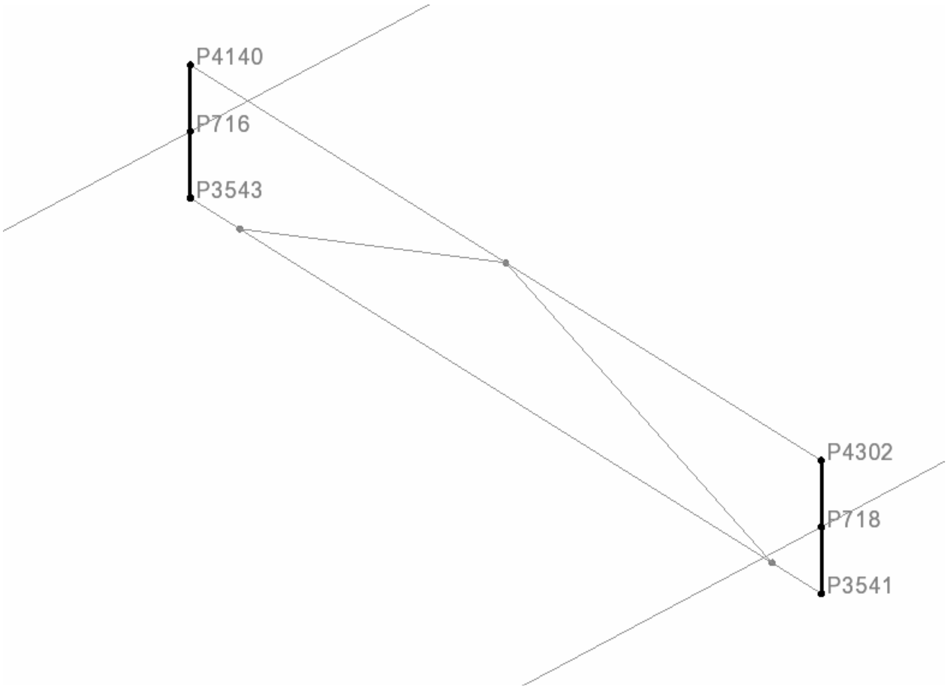
Rigid beam - diaphragm Typ F:5 :



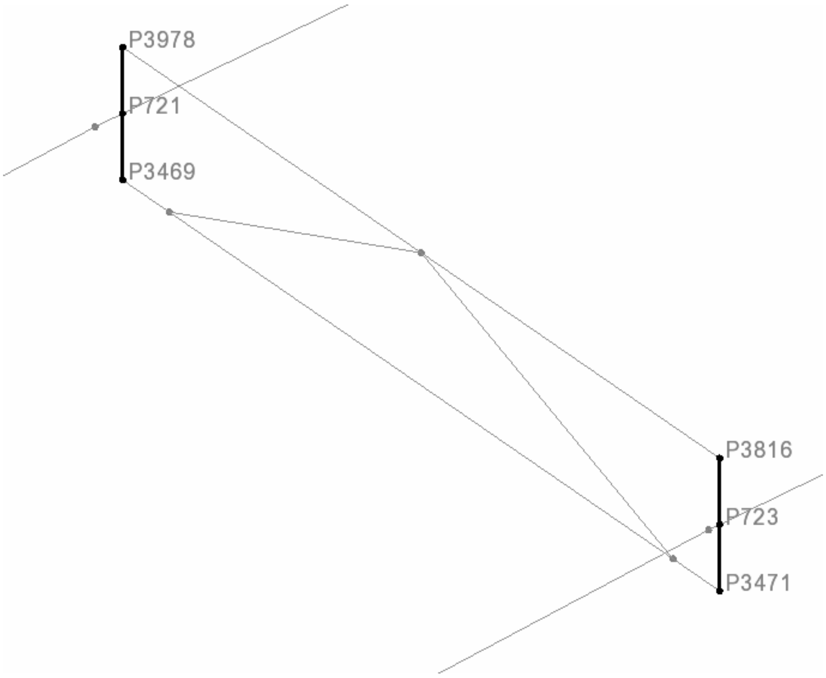
Rigid beam - diaphragm Typ F:6 :



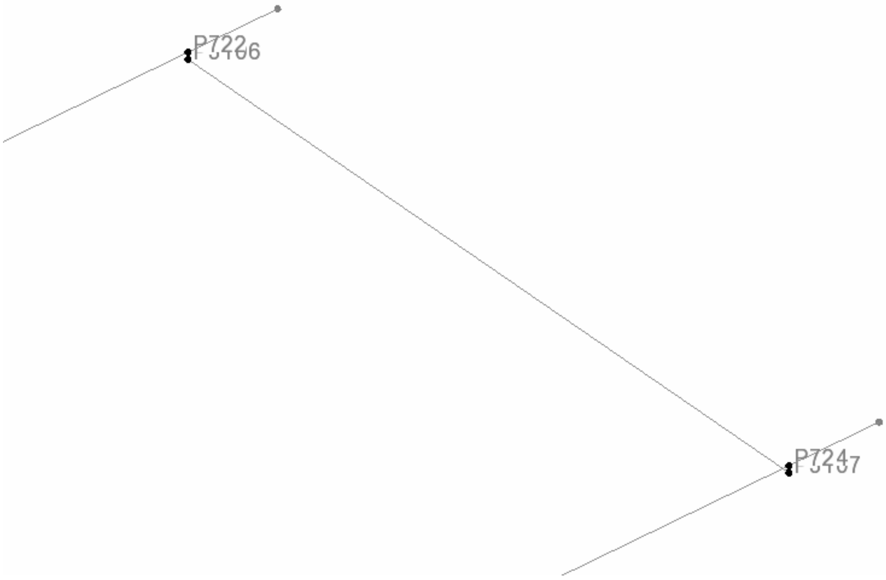
Rigid beam - diaphragm Typ F:7 :



Rigid beam - diaphragm Typ F:8 :



Rigid beam - diaphragm Typ S:3 :

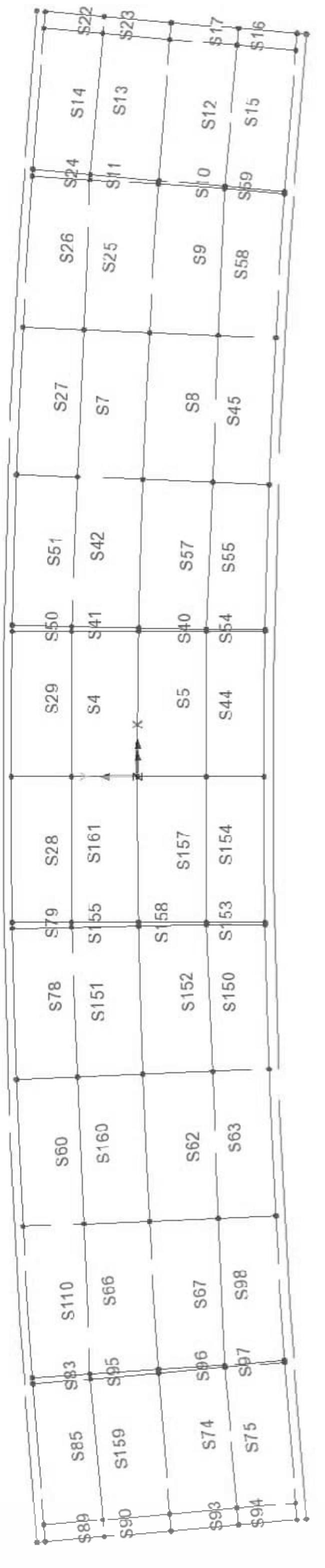


2.2.1.2 Geometri : LINES

Se bilaga 1.

2.2.1.3 Geometri : SURFACES

Deck :



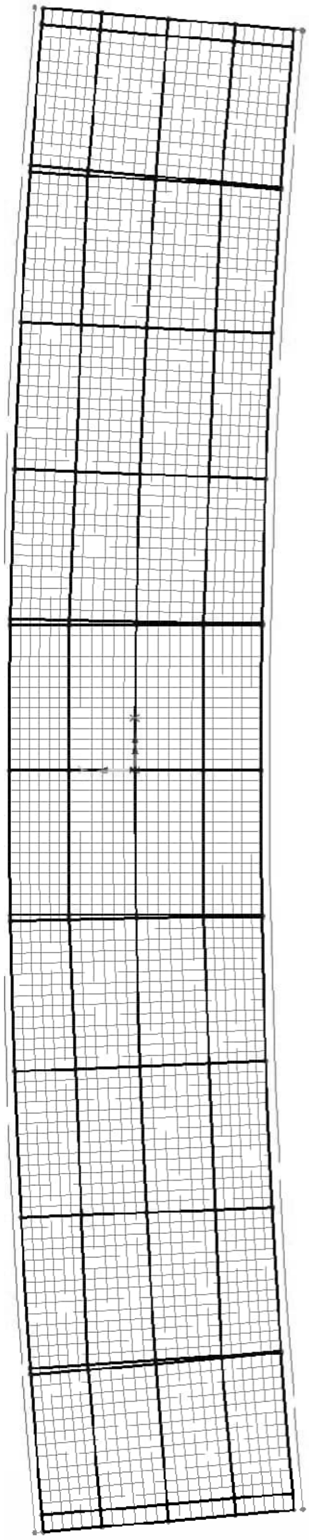
2.2.2 MESH

2.2.2.1 MESH : Skalement

Skalement uppstår när de föregående definierade SURFACES tilldelas attribut
”Thick shell” /QTS4.

Vid skapande av MESH så uppstår automatiskt ELEMENTS och NODES. Dessa redovisas i bilagor för resultatutskrift.

Deck :

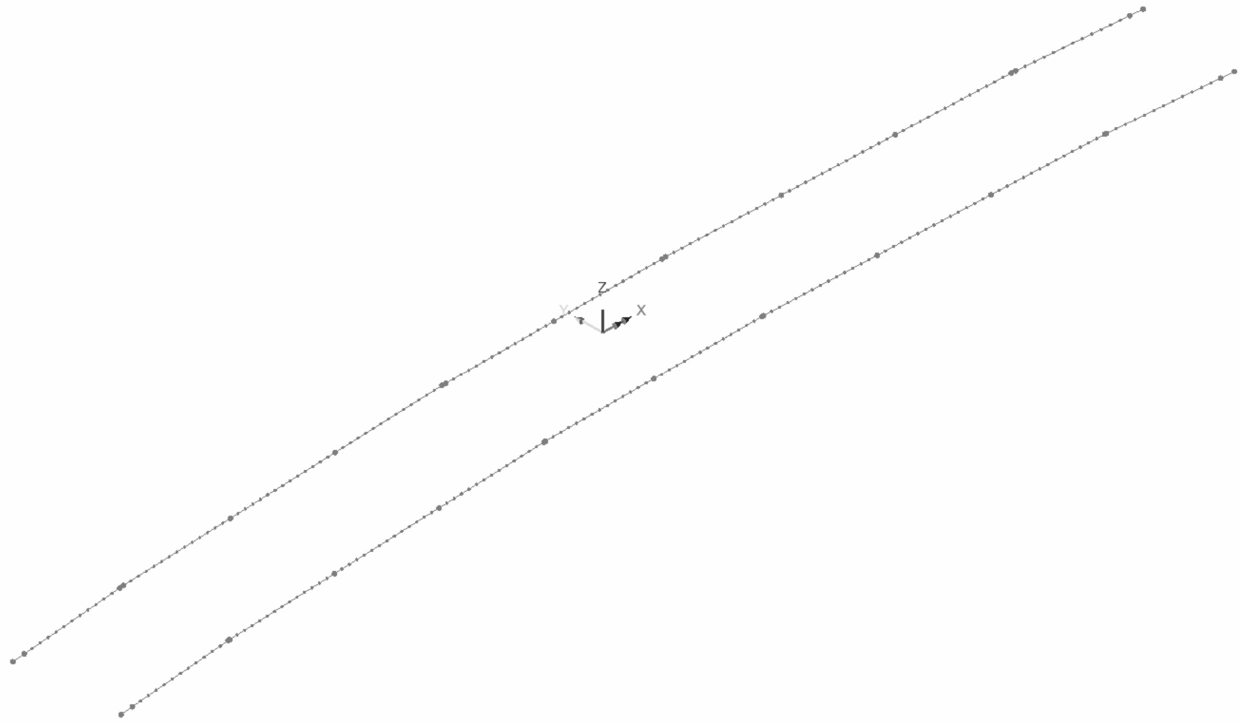


2.2.2.2 MESH : 3D-balkelement

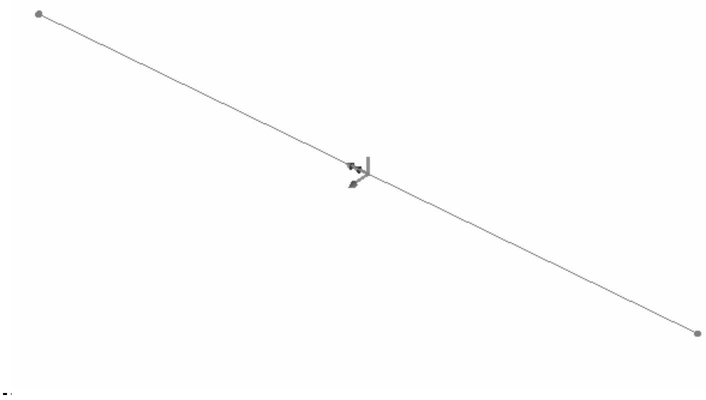
Balkelement uppstår när de föregående definierade LINES tilldelas attribut
"Thick beam" /BMI21.

Vid skapande av MESH så uppstår automatiskt ELEMENTS och NODES. Dessa redovisas i bilagor för resultatutskrift.

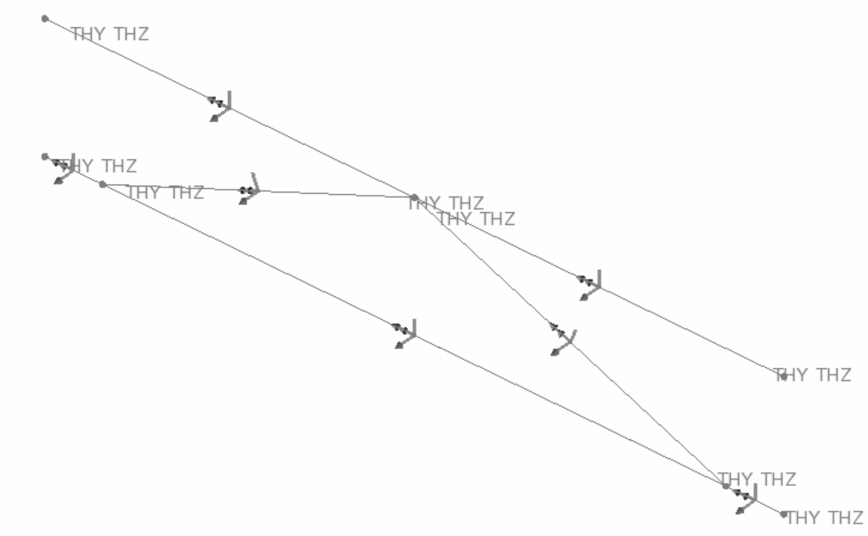
Main girder :



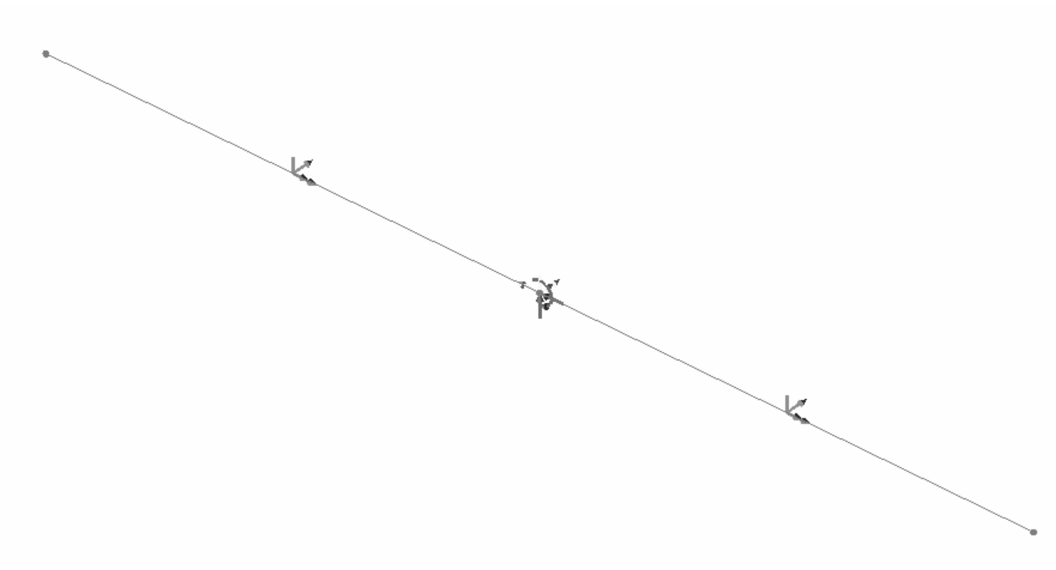
Diaphragm – Typ S:1, S:2 och S:3 :



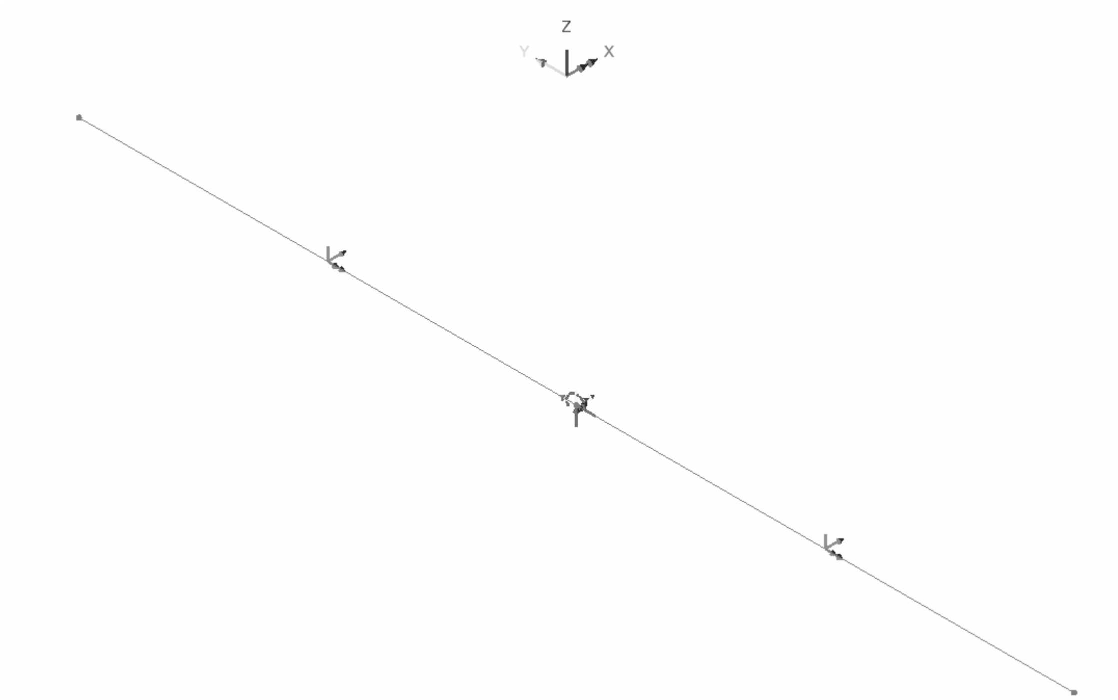
Diaphragm – Typ F:1, F:2, F:3, F:4, F:5, F:6, F:7 och F:8 :



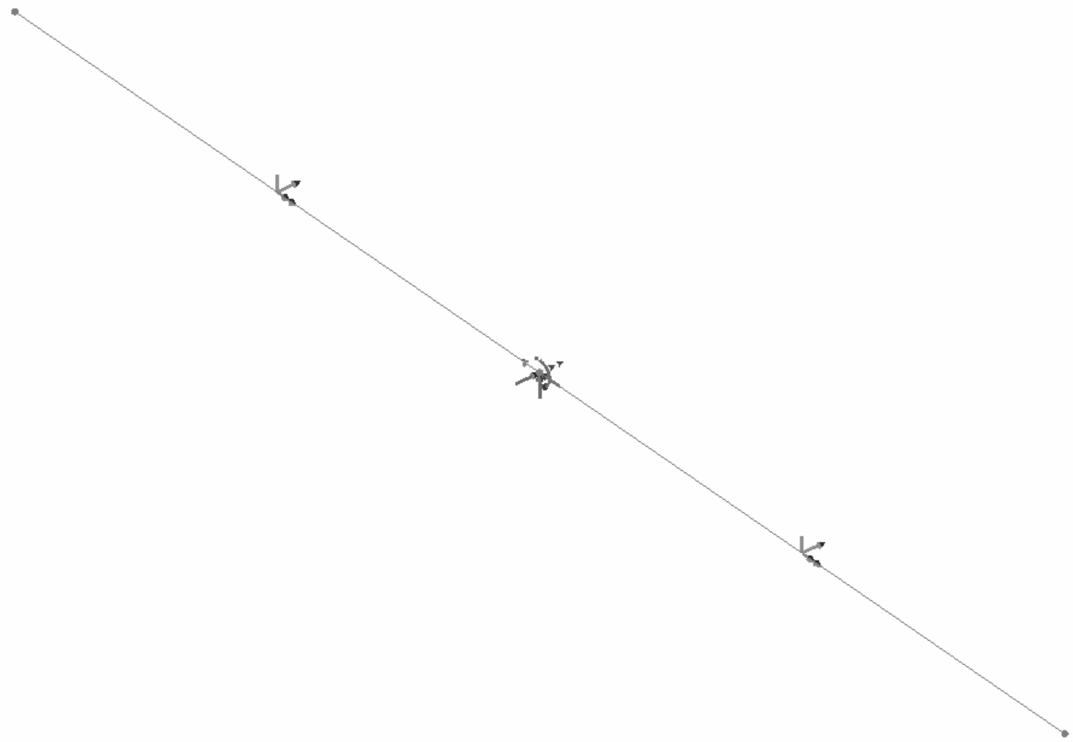
Rigidbeam – Support 1 :



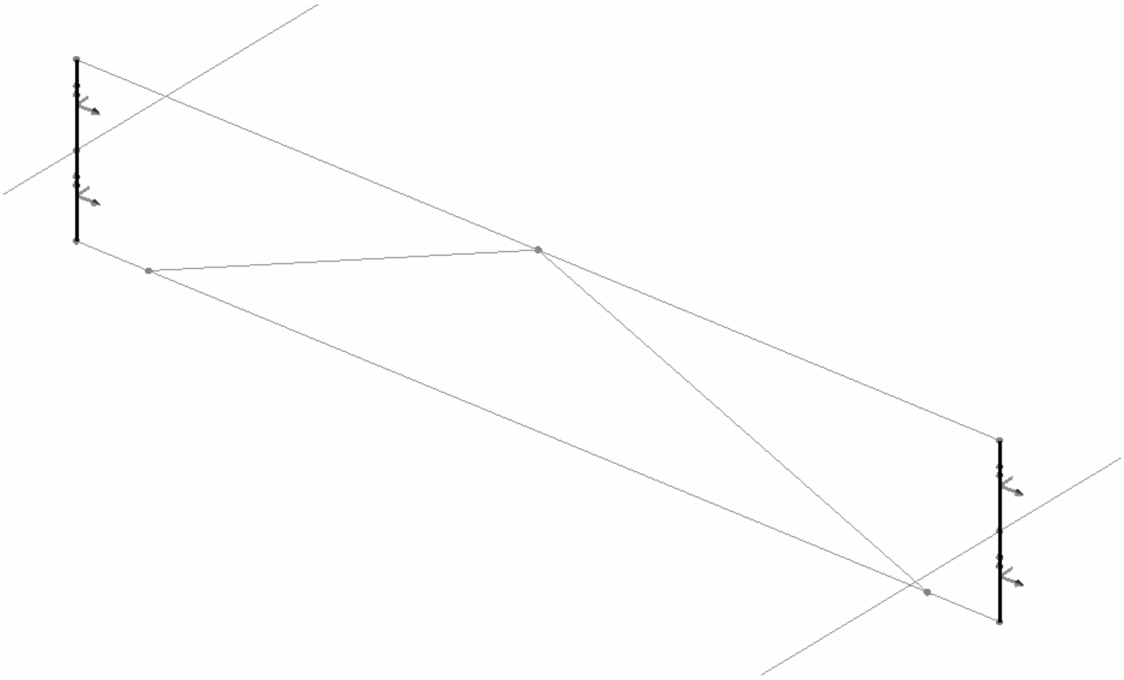
Rigidbeam – Support 2 :



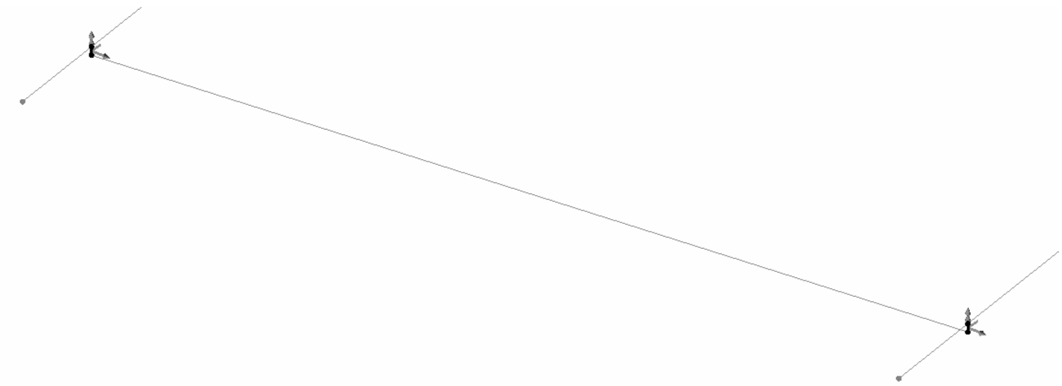
Rigidbeam – Support 3 :



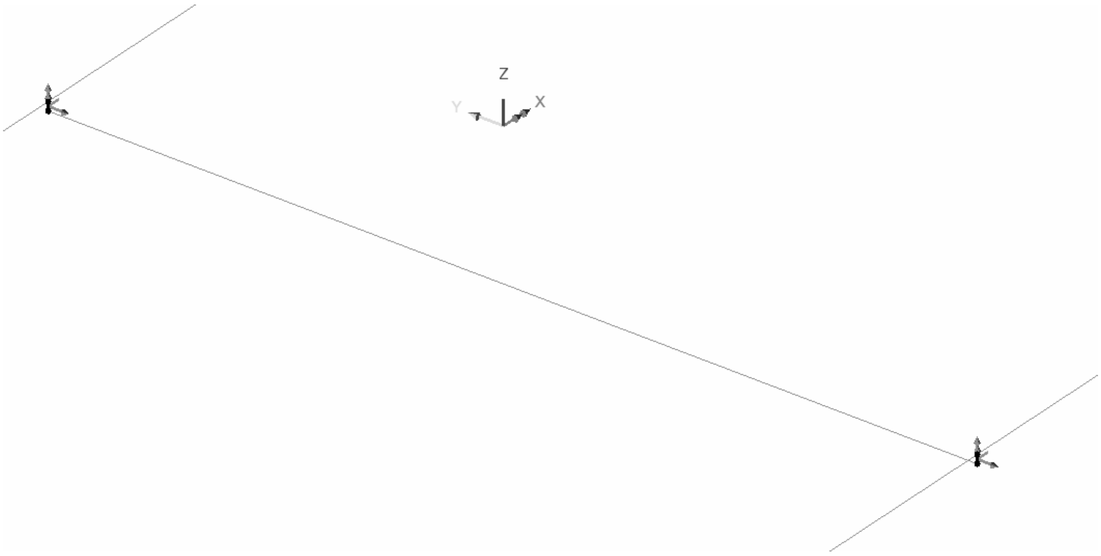
Rigid beam - diaphragm Typ F:1, F:2, F:3, F:4, F:5, F:6, F:7 och F:8 :



Rigid beam - diaphragm Typ S:1 :

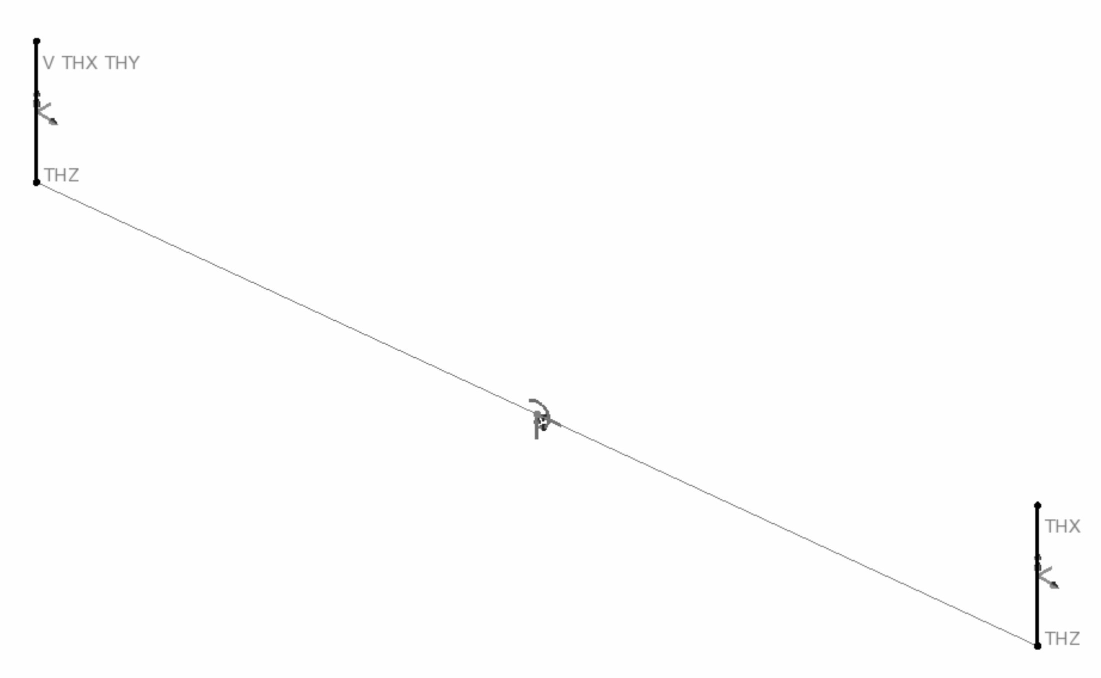


Rigid beam - diaphragm Typ S:2 :

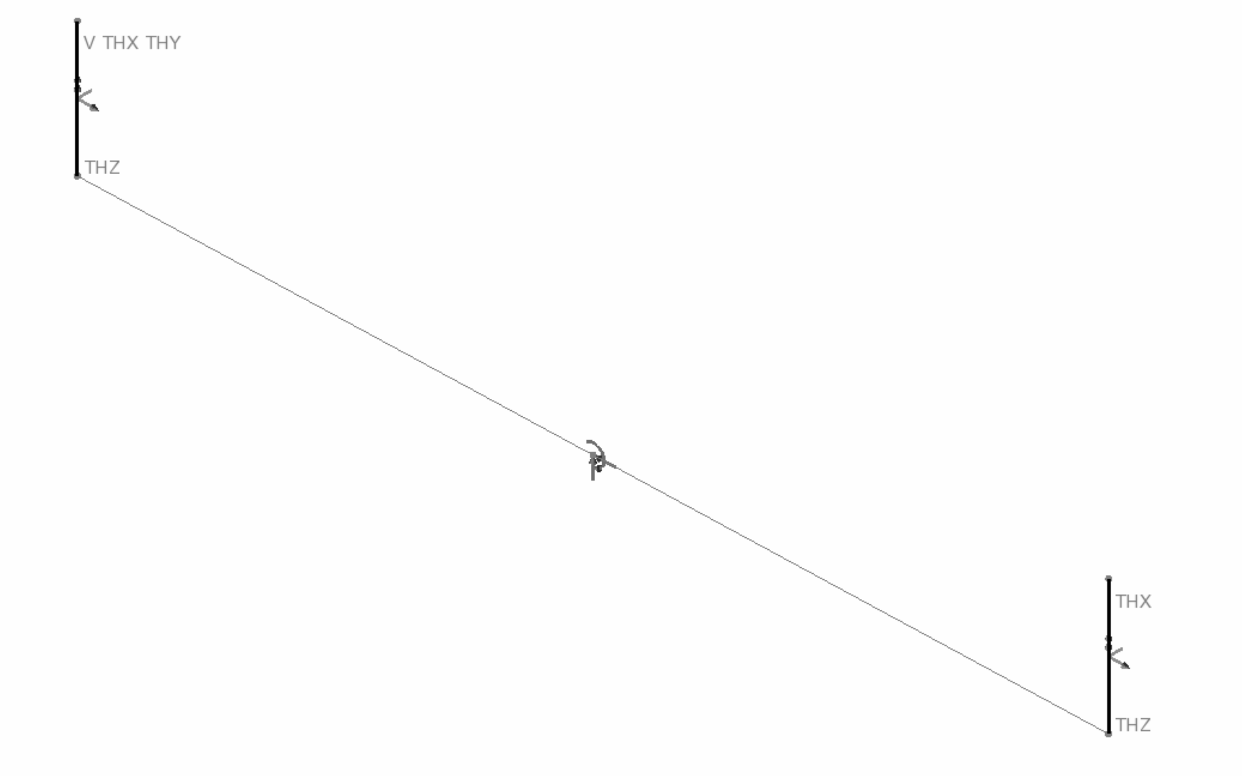


Rigid beam - diaphragm Typ S:3 :

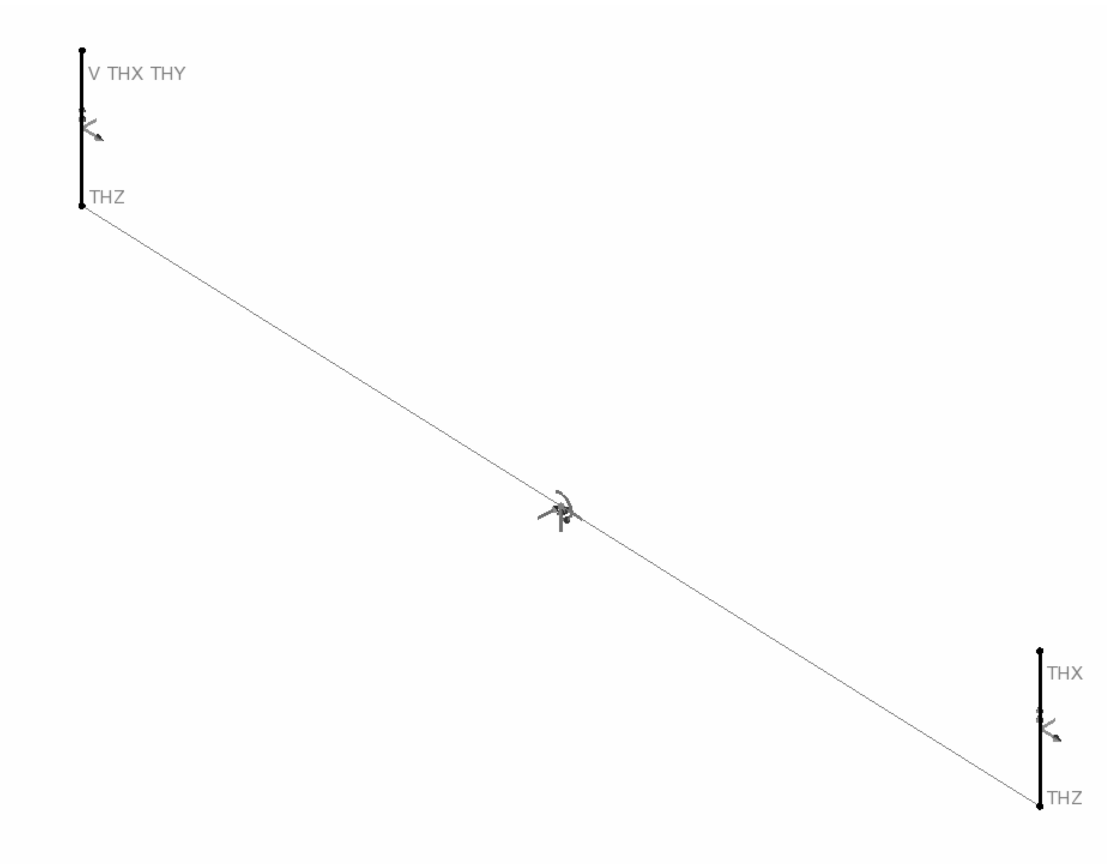
Lager – Support 1 :



Lager – Support 2 :



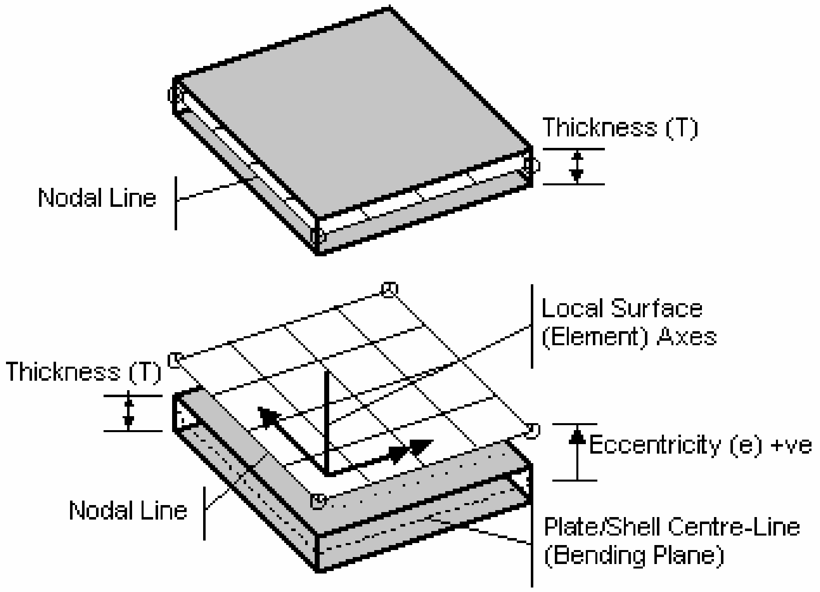
Lager – Support 3 :



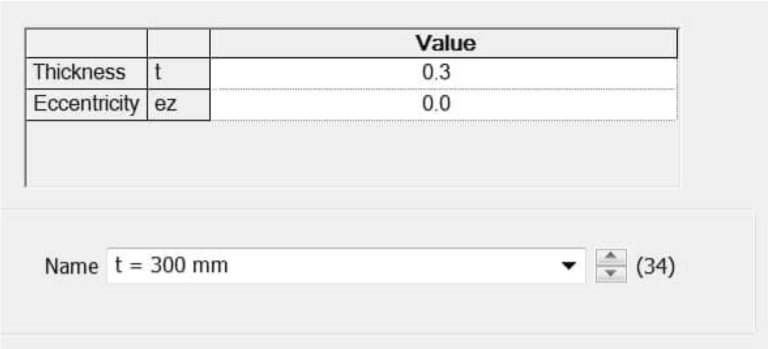
2.3 TVÄRSNITTSKONSTANTEER

2.3.1 Farbana

Princip figur av geometrin tillhörande skalelement (”Thick shell” / QTS8) redovisas nedan.

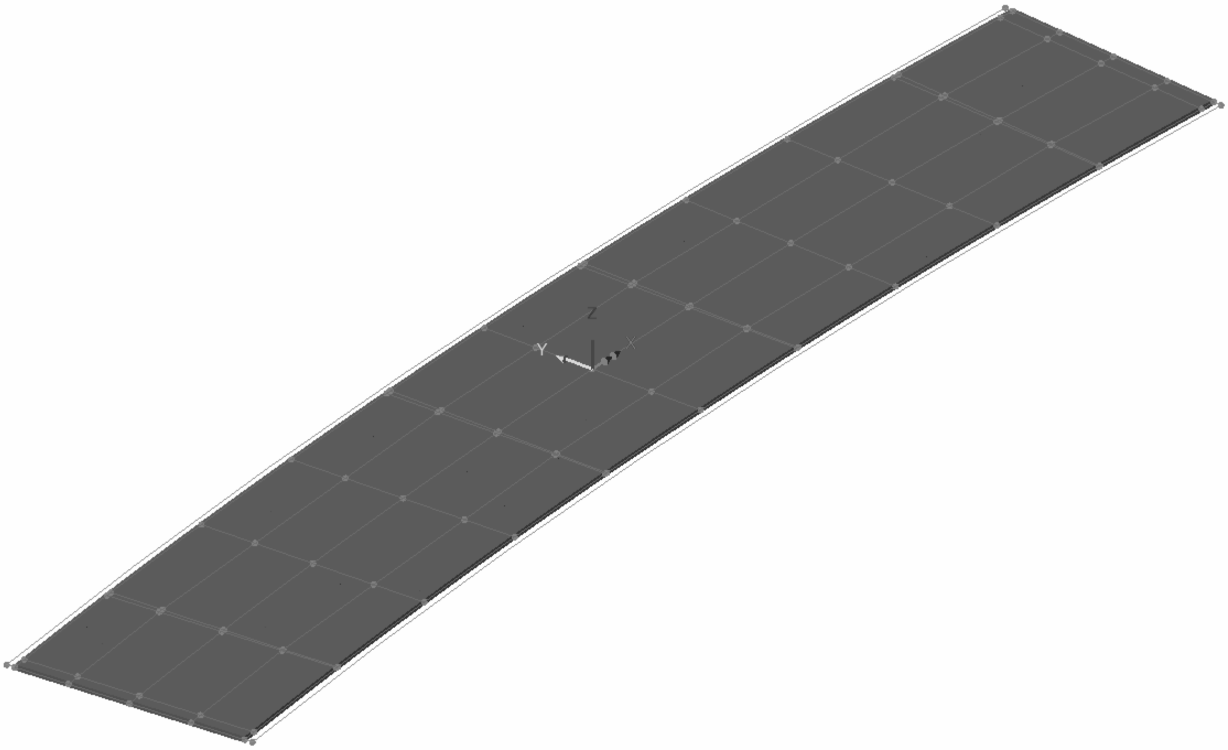


Deck :



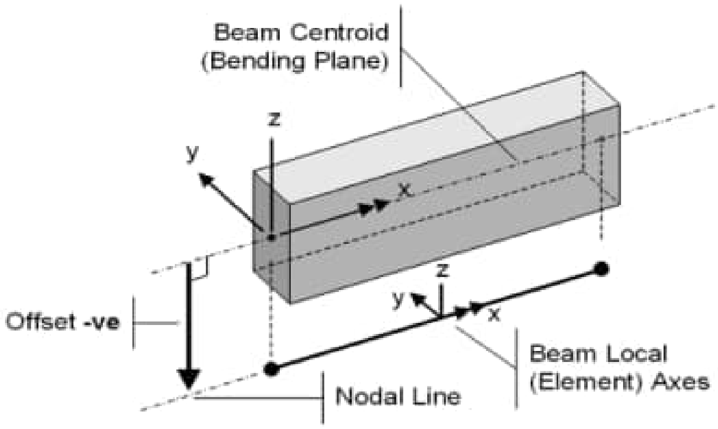
		Value
Thickness	t	0.3
Eccentricity	ez	0.0

Name t = 300 mm (34)

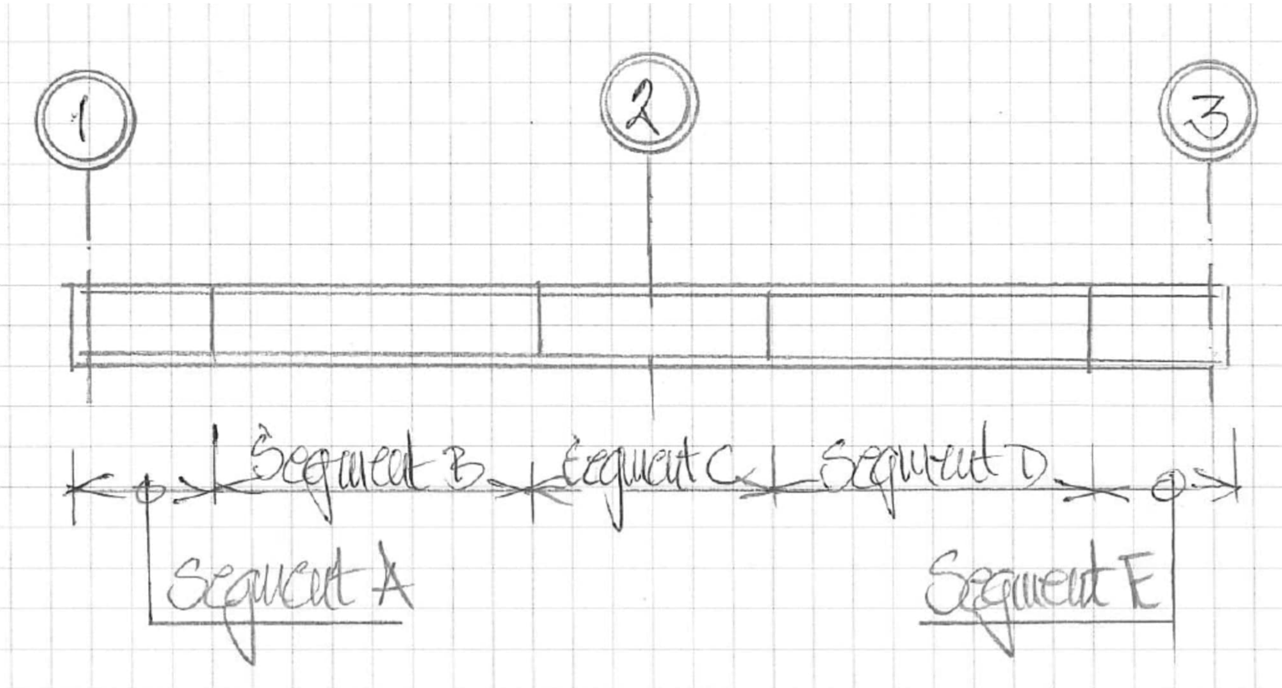


2.3.2 Huvudbalkar (”Thick beam” / BMS3)

Princip figur av geometrin tillhörande balkeelement (”Thick beam” BMS3 och BMI31) redovisas nedan.



Stålbalken är utförd med 5 balkar (Segment A, B, C, D och E) enligt redovisning nedan.



Tvärsnittskontanter tillhörande huvudbalkarna modelleras med och utan inverkan av betongfarbana beroende på vilken analys som studeras.

Analysis Stage I-V : Byggskede (gjutetapper I-V)

Analysis Drift-P : Driftskede – permanent

Analysis Drift-V : Driftskede – variabla laster

Tvärsnittskonstanter för samverkanstvärsnitt uttrycks som ett ekvivalent ståltvärsnitt.

Vid bestämning av inverkan av betongfarbana beaktas skjuvdeformationer, krypning samt uppsprickning av betong.

Bestämning av tvärsnittskonstanter är utförd med *Ponti_EC4* dock har en separat oberoende kontroll utförts för att påvisa att erhållna resultat är korrekta.

2.3.2.1 Sammanställning resultat Ponti_EC4

Resultat inklusive inverkan av skjuvdeformationer redovisas för totalt 6 st tvärsnittstyper (Type) enligt redovisning nedan.

Type	n	Skede	Betong	Last
1	∞	Bygg	Våt	Egentyngd:P
2a	20	Drift	Osprucken	Egentyngd:P
2b	13	Drift	Osprucken	Krympning:P
2c	20	Drift	Osprucken	Stödsättning:P
3	6	Drift	Osprucken	Variabla:V
Cracked	∞	Drift	Sprucken	Variabla:V

Modular ratios	Värde	Anmärkning
n0	6	Variabla last
nL, perm	20	Permanenta last
nL, sh	13	Krympning
nL, stöd	20	Stödsättning

Analysis I-V :

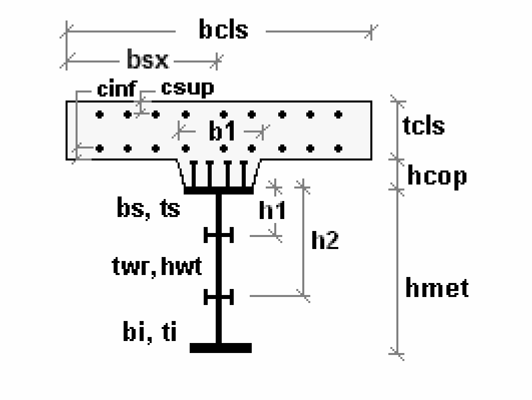
Byggskede se sidor A2:4-7.

Analysis DRIFT-P :

Permanenta laster i driftskede, se sida A2:8.

Analysis DRIFT-V :

Variabla laster i driftskede, se sida A2:9.



Sammanställning indata – stål :

Sections	hmet (mm)	bs (mm)	ts (mm)	hw (mm)	tw (mm)	bi (mm)	ti (mm)
A	1800	450	25	1730	18	950	45
B	1800	450	25	1725	16	950	50
C	1800	750	50	1700	20	950	50
D	1800	450	25	1725	16	950	50
E	1800	450	25	1730	18	950	45

Sammanställning indata – betong :

Sections	tconc (mm)	hcop (mm)	bcls (mm)	bsx (mm)	b1 (mm)
A	300	30	6000	2800	450
B	300	30	6000	2800	450
C	300	30	6000	2800	750
D	300	30	6000	2800	450
E	300	30	6000	2800	450

Sammanställning indata – armering :

Sections	Fisup (mm)	ssup (mm)	csup (mm)	Fiinf (mm)	pbbot (mm)	cinf (mm)
A	16	160	50	16	160	50
B	16	160	50	16	160	50
C	16	130	50	16	130	50
D	16	160	50	16	160	50
E	16	160	50	16	160	50

Main properties : Section A

Main data

Steel section height	1800 mm
Top flange	450x25 mm
Bottom flange	950x45 mm
Web	18x1730 mm, Skew: 0
Slab	6000x300 mm
Haunch	450x30 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. bottom slab face-bar centre 50 mm
Studs	diameter 0 mm, height 0 mm, number 0/m

Geometric properties of gross cross section

	Phase 1	*Phase 2a*	*Phase 2b*	*Phase 2c*	*Phase 3*	*Cracked*
A (mm^2)	8.514E+4	1.902E+5	2.387E+5	1.902E+5	4.002E+5	1.002E+5
z_G (mm)	580.322	1353.521	1480.721	1353.521	1682.242	790.926
J_y (mm^4)	4.086E+10	1.338E+11	1.493E+11	1.338E+11	1.746E+11	6.61E+10
$W_{y,0}$ (mm^3)	-7.04E+7	-9.887E+7	-1.009E+8	-9.887E+7	-1.038E+8	-8.358E+7
$W_{y,1}$ (mm^3)	-7.632E+7	-1.023E+8	-1.04E+8	-1.023E+8	-1.066E+8	-8.862E+7
$W_{y,3}$ (mm^3)	3.42E+7	3.175E+8	5.075E+8	3.175E+8	1.882E+9	6.717E+7
$W_{y,4}$ (mm^3)	3.35E+7	2.997E+8	4.678E+8	2.997E+8	1.482E+9	6.551E+7
$W_{y,5}$ (mm^3)	1E+300	2.809E+8	4.276E+8	2.809E+8	1.181E+9	6.362E+7
$W_{y,6}$ (mm^3)	1E+300	2.542E+8	3.74E+8	2.542E+8	8.827E+8	6.07E+7
$W_{y,7}$ (mm^3)	1E+300	1.842E+8	2.492E+8	1.842E+8	4.389E+8	5.128E+7
$W_{y,8}$ (mm^3)	1E+300	1.723E+8	2.3E+8	1.723E+8	3.899E+8	4.937E+7
$S_{y,1}$(mm^3)	2.385E+7	5.69E+7	6.234E+7	5.69E+7	7.095E+7	3.285E+7
$S_{y,2}$(mm^3)	2.643E+7	7.231E+7	8.089E+7	7.231E+7	9.508E+7	3.786E+7
$S_{y,3}$(mm^3)	1.358E+7	7.071E+7	8.011E+7	7.071E+7	9.5E+7	2.914E+7
$S_{y,4}$(mm^3)	-5.588E-9	6.583E+7	7.666E+7	6.583E+7	9.382E+7	1.793E+7
n_E	1E+300	20	13	20	6	1E+300

Plastic characteristics of the single components (classification refers to the composite section in Phase 3)

Components	N_{pl} *(N)*	z_N *(mm)*	z_{max} *(mm)*	z_{min} *(mm)*
Concrete layer above top reinforcing bars	5.875E+6	2105.31	2130	2080.63
Concrete layer between top and bottom reinforcing bars	2.365E+7	1980	2079.37	1880.63
Concrete layer below top reinforcing bars	5.875E+6	1854.69	1879.37	1830
Top reinforcing bars	2.95E+6	2080	2080.63	2079.37
Bottom reinforcing bars	2.95E+6	1880	1880.63	1879.37
Concrete haunch slab	0E+00	1815	1830	1800
Top flange of steel beam	3.804E+6	1787.5	1800	1775
Web of steel beam	1.053E+7	910	1775	45
Bottom flange of steel beam	1.364E+7	22.5	45	0
Ultimate compression force for the full section	-6.927E+7			
Ultimate tension force for the full section	3.387E+7			
Ultimate compression force for the web less section	-5.874E+7			
Ultimate tensile force for the web less section	2.334E+7			

Flanges classification

	c/t	ε	*Hogging bending moment (M+)*	*Sagging bending moment (M-)*
Top flange	8.64	0.814	1	0
Bottom flange	10.35	0.838	3	1

Web classification

	c/t	ε	α	ψ	*class*
Hogging bending moment (M+)	96.111	0.814	0.313	-1.319	2
Sagging bending moment (M-)	96.111	0.814	0	-0.057	1

Anm. God överensstämmelse med beräkning utförd med PROG T030, se sidor A2:84-102.

Main properties : Section B

Main data

Steel section height	1800 mm
Top flange	450x25 mm
Bottom flange	950x50 mm
Web	16x1725 mm, Skew: 0
Slab	6000x300 mm
Haunch	450x30 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. bottom slab face-bar centre 50 mm
Studs	diameter 0 mm, height 0 mm, number 0/m

Geometric properties of gross cross section

	Phase 1	*Phase 2a*	*Phase 2b*	*Phase 2c*	*Phase 3*	*Cracked*
A (mm^2)	8.635E+4	1.914E+5	2.399E+5	1.914E+5	4.014E+5	1.014E+5
z_G (mm)	538.296	1329.677	1461.052	1329.677	1669.881	752.636
J_y (mm^4)	4.079E+10	1.401E+11	1.569E+11	1.401E+11	1.841E+11	6.762E+10
$W_{y,0}$ (mm^3)	-7.578E+7	-1.054E+8	-1.074E+8	-1.054E+8	-1.102E+8	-8.985E+7
$W_{y,1}$ (mm^3)	-8.354E+7	-1.095E+8	-1.112E+8	-1.095E+8	-1.136E+8	-9.624E+7
$W_{y,3}$ (mm^3)	3.298E+7	3.147E+8	4.996E+8	3.147E+8	1.751E+9	6.614E+7
$W_{y,4}$ (mm^3)	3.233E+7	2.98E+8	4.628E+8	2.98E+8	1.415E+9	6.457E+7
$W_{y,5}$ (mm^3)	1E+300	2.801E+8	4.251E+8	2.801E+8	1.15E+9	6.277E+7
$W_{y,6}$ (mm^3)	1E+300	2.546E+8	3.744E+8	2.546E+8	8.76E+8	5.998E+7
$W_{y,7}$ (mm^3)	1E+300	1.868E+8	2.534E+8	1.868E+8	4.488E+8	5.095E+7
$W_{y,8}$ (mm^3)	1E+300	1.751E+8	2.345E+8	1.751E+8	4E+8	4.91E+7
$S_{y,1}$(mm^3)	2.438E+7	6.197E+7	6.821E+7	6.197E+7	7.813E+7	3.456E+7
$S_{y,2}$(mm^3)	2.629E+7	7.507E+7	8.414E+7	7.507E+7	9.912E+7	3.851E+7
$S_{y,3}$(mm^3)	1.405E+7	7.349E+7	8.335E+7	7.349E+7	9.904E+7	3.015E+7
$S_{y,4}$(mm^3)	1.863E-9	6.834E+7	7.968E+7	6.834E+7	9.771E+7	1.851E+7
n_E	1E+300	20	13	20	6	1E+300

Plastic characteristics of the single components (classification refers to the composite section in Phase 3)

Components	N_{pl} *(N)*	z_N *(mm)*	z_{max} *(mm)*	z_{min} *(mm)*
Concrete layer above top reinforcing bars	5.875E+6	2105.31	2130	2080.63
Concrete layer between top and bottom reinforcing bars	2.365E+7	1980	2079.37	1880.63
Concrete layer below top reinforcing bars	5.875E+6	1854.69	1879.37	1830
Top reinforcing bars	2.95E+6	2080	2080.63	2079.37
Bottom reinforcing bars	2.95E+6	1880	1880.63	1879.37
Concrete haunch slab	0E+00	1815	1830	1800
Top flange of steel beam	3.804E+6	1787.5	1800	1775
Web of steel beam	9.331E+6	912.5	1775	50
Bottom flange of steel beam	1.515E+7	25	50	0
Ultimate compression force for the full section	-6.959E+7			
Ultimate tension force for the full section	3.419E+7			
Ultimate compression force for the web less section	-6.026E+7			
Ultimate tensile force for the web less section	2.486E+7			

Flanges classification

	c/t	ε	*Hogging bending moment (M+)*	*Sagging bending moment (M-)*
Top flange	8.68	0.814	1	0
Bottom flange	9.34	0.838	3	1

Web classification

	c/t	ε	α	ψ	*class*
Hogging bending moment (M+)	107.812	0.814	0.208	-1.455	1
Sagging bending moment (M-)	107.812	0.814	0	-0.065	1
Compression (N)	107.812	0.814	1	1	4

<u>Anm.</u>   God överensstämmelse med beräkning utförd med PROG T030, se sidor A2:84-102.

Main properties : Section C

Main data

Steel section height	1800 mm
Top flange	750x50 mm
Bottom flange	950x50 mm
Web	20x1700 mm, Skew: 0
Slab	6000x300 mm
Haunch	750x30 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 130 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 130 mm, dist. bottom slab face-bar centre 50 mm
Studs	diameter 0 mm, height 0 mm, number 0/m

Geometric properties of gross cross section

	Phase 1	*Phase 2a*	*Phase 2b*	*Phase 2c*	*Phase 3*	*Cracked*
A (mm^2)	1.19E+5	2.276E+5	2.76E+5	2.276E+5	4.376E+5	1.376E+5
z_G (mm)	826.471	1376.773	1482.683	1376.773	1666.283	982.105
J_y (mm^4)	7.264E+10	1.49E+11	1.639E+11	1.49E+11	1.904E+11	9.419E+10
$W_{y,0}$ (mm^3)	-8.789E+7	-1.083E+8	-1.106E+8	-1.083E+8	-1.142E+8	-9.591E+7
$W_{y,1}$ (mm^3)	-9.355E+7	-1.123E+8	-1.144E+8	-1.123E+8	-1.178E+8	-1.011E+8
$W_{y,3}$ (mm^3)	7.866E+7	3.993E+8	6.133E+8	3.993E+8	2.274E+9	1.227E+8
$W_{y,4}$ (mm^3)	7.462E+7	3.522E+8	5.167E+8	3.522E+8	1.424E+9	1.152E+8
$W_{y,5}$ (mm^3)	1E+300	3.288E+8	4.72E+8	3.288E+8	1.163E+9	1.111E+8
$W_{y,6}$ (mm^3)	1E+300	2.962E+8	4.126E+8	2.962E+8	8.907E+8	1.049E+8
$W_{y,7}$ (mm^3)	1E+300	2.119E+8	2.745E+8	2.119E+8	4.601E+8	8.579E+7
$W_{y,8}$ (mm^3)	1E+300	1.979E+8	2.533E+8	1.979E+8	4.105E+8	8.205E+7
$S_{y,1}$(mm^3)	3.807E+7	6.421E+7	6.924E+7	6.421E+7	7.796E+7	4.546E+7
$S_{y,2}$(mm^3)	4.41E+7	8.181E+7	8.977E+7	8.181E+7	1.041E+8	5.415E+7
$S_{y,3}$(mm^3)	3.557E+7	8.042E+7	8.905E+7	8.042E+7	1.04E+8	4.825E+7
$S_{y,4}$(mm^3)	7.451E-9	6.549E+7	7.809E+7	6.549E+7	9.994E+7	1.852E+7
n_E	1E+300	20	13	20	6	1E+300

Plastic characteristics of the single components (classification refers to the composite section in Phase 3)

Components	N_{pl} *(N)*	z_N *(mm)*	z_{max} *(mm)*	z_{min} *(mm)*
Concrete layer above top reinforcing bars	5.858E+6	2105.39	2130	2080.77
Concrete layer between top and bottom reinforcing bars	2.362E+7	1980	2079.23	1880.77
Concrete layer below top reinforcing bars	5.858E+6	1854.61	1879.23	1830
Top reinforcing bars	3.631E+6	2080	2080.77	2079.23
Bottom reinforcing bars	3.631E+6	1880	1880.77	1879.23
Concrete haunch slab	0E+00	1815	1830	1800
Top flange of steel beam	1.196E+7	1775	1800	1750
Web of steel beam	1.15E+7	900	1750	50
Bottom flange of steel beam	1.515E+7	25	50	0
Ultimate compression force for the full section	-8.121E+7			
Ultimate tension force for the full section	4.588E+7			
Ultimate compression force for the web less section	-6.971E+7			
Ultimate tensile force for the web less section	3.438E+7			

Flanges classification

	c/t	ε	*Hogging bending moment (M+)*	*Sagging bending moment (M-)*
Top flange	7.3	0.838	1	0
Bottom flange	9.3	0.838	3	1

Web classification

	c/t	ε	α	ψ	*class*
Hogging bending moment (M+)	85	0.814	0.677	-0.824	3
Sagging bending moment (M-)	85	0.814	0	-0.052	1
Compression (N)	85	0.814	1	1	4

Anm. God överensstämmelse med beräkning utförd med PROG T030, se sidor A2:84-102.

Main properties : Section D

Main data

Steel section height	1800 mm
Top flange	450x25 mm
Bottom flange	950x50 mm
Web	16x1725 mm, Skew: 0
Slab	6000x300 mm
Haunch	450x30 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. bottom slab face-bar centre 50 mm
Studs	diameter 0 mm, height 0 mm, number 0/m

Geometric properties of gross cross section

	Phase 1	*Phase 2a*	*Phase 2b*	*Phase 2c*	*Phase 3*	*Cracked*
A (mm^2)	8.635E+4	1.914E+5	2.399E+5	1.914E+5	4.014E+5	1.014E+5
z_G (mm)	538.296	1329.677	1461.052	1329.677	1669.881	752.636
J_y (mm^4)	4.079E+10	1.401E+11	1.569E+11	1.401E+11	1.841E+11	6.762E+10
$W_{y,0}$ (mm^3)	-7.578E+7	-1.054E+8	-1.074E+8	-1.054E+8	-1.102E+8	-8.985E+7
$W_{y,1}$ (mm^3)	-8.354E+7	-1.095E+8	-1.112E+8	-1.095E+8	-1.136E+8	-9.624E+7
$W_{y,3}$ (mm^3)	3.298E+7	3.147E+8	4.996E+8	3.147E+8	1.751E+9	6.614E+7
$W_{y,4}$ (mm^3)	3.233E+7	2.98E+8	4.628E+8	2.98E+8	1.415E+9	6.457E+7
$W_{y,5}$ (mm^3)	1E+300	2.801E+8	4.251E+8	2.801E+8	1.15E+9	6.277E+7
$W_{y,6}$ (mm^3)	1E+300	2.546E+8	3.744E+8	2.546E+8	8.76E+8	5.998E+7
$W_{y,7}$ (mm^3)	1E+300	1.868E+8	2.534E+8	1.868E+8	4.488E+8	5.095E+7
$W_{y,8}$ (mm^3)	1E+300	1.751E+8	2.345E+8	1.751E+8	4E+8	4.91E+7
$S_{y,1}$(mm^3)	2.438E+7	6.197E+7	6.821E+7	6.197E+7	7.813E+7	3.456E+7
$S_{y,2}$(mm^3)	2.629E+7	7.507E+7	8.414E+7	7.507E+7	9.912E+7	3.851E+7
$S_{y,3}$(mm^3)	1.405E+7	7.349E+7	8.335E+7	7.349E+7	9.904E+7	3.015E+7
$S_{y,4}$(mm^3)	1.863E-9	6.834E+7	7.968E+7	6.834E+7	9.771E+7	1.851E+7
n_E	1E+300	20	13	20	6	1E+300

Plastic characteristics of the single components (classification refers to the composite section in Phase 3)

Components	*N_{pl} (N)*	*z_N (mm)*	*z_{max} (mm)*	*z_{min} (mm)*
Concrete layer above top reinforcing bars	5.875E+6	2105.31	2130	2080.63
Concrete layer between top and bottom reinforcing bars	2.365E+7	1980	2079.37	1880.63
Concrete layer below top reinforcing bars	5.875E+6	1854.69	1879.37	1830
Top reinforcing bars	2.95E+6	2080	2080.63	2079.37
Bottom reinforcing bars	2.95E+6	1880	1880.63	1879.37
Concrete haunch slab	0E+00	1815	1830	1800
Top flange of steel beam	3.804E+6	1787.5	1800	1775
Web of steel beam	9.331E+6	912.5	1775	50
Bottom flange of steel beam	1.515E+7	25	50	0
Ultimate compression force for the full section	-6.959E+7			
Ultimate tension force for the full section	3.419E+7			
Ultimate compression force for the web less section	-6.026E+7			
Ultimate tensile force for the web less section	2.486E+7			

Flanges classification

	c/t	*ε*	*Hogging bending moment (M+)*	*Sagging bending moment (M-)*
Top flange	8.68	0.814	1	0
Bottom flange	9.34	0.838	3	1

Web classification

	c/t	*ε*	*α*	*ψ*	*class*
Hogging bending moment (M+)	107.812	0.814	0.208	-1.455	1
Sagging bending moment (M-)	107.812	0.814	0	-0.065	1
Compression (N)	107.812	0.814	1	1	4

<u>Anm.</u> God överensstämmelse med beräkning utförd med PROG T030, se sidor A2:84-102.

Main properties : Section E

Steel section height	1800 mm
Top flange	450x25 mm
Bottom flange	950x45 mm
Web	18x1730 mm, Skew: 0
Slab	6000x300 mm
Haunch	450x30 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 160 mm, dist. bottom slab face-bar centre 50 mm
Studs	diameter 0 mm, height 0 mm, number 0/m

Geometric properties of gross cross section

	Phase 1	*Phase 2a*	*Phase 2b*	*Phase 2c*	*Phase 3*	*Cracked*
A (mm^2)	8.514E+4	1.902E+5	2.387E+5	1.902E+5	4.002E+5	1.002E+5
z_G (mm)	580.322	1353.521	1480.721	1353.521	1682.242	790.926
J_y (mm^4)	4.086E+10	1.338E+11	1.493E+11	1.338E+11	1.746E+11	6.61E+10
$W_{y,0}$ (mm^3)	-7.04E+7	-9.887E+7	-1.009E+8	-9.887E+7	-1.038E+8	-8.358E+7
$W_{y,1}$ (mm^3)	-7.632E+7	-1.023E+8	-1.04E+8	-1.023E+8	-1.066E+8	-8.862E+7
$W_{y,3}$ (mm^3)	3.42E+7	3.175E+8	5.075E+8	3.175E+8	1.882E+9	6.717E+7
$W_{y,4}$ (mm^3)	3.35E+7	2.997E+8	4.678E+8	2.997E+8	1.482E+9	6.551E+7
$W_{y,5}$ (mm^3)	1E+300	2.809E+8	4.276E+8	2.809E+8	1.181E+9	6.362E+7
$W_{y,6}$ (mm^3)	1E+300	2.542E+8	3.74E+8	2.542E+8	8.827E+8	6.07E+7
$W_{y,7}$ (mm^3)	1E+300	1.842E+8	2.492E+8	1.842E+8	4.389E+8	5.128E+7
$W_{y,8}$ (mm^3)	1E+300	1.723E+8	2.3E+8	1.723E+8	3.899E+8	4.937E+7
$S_{y,1}$(mm^3)	2.385E+7	5.69E+7	6.234E+7	5.69E+7	7.095E+7	3.285E+7
$S_{y,2}$(mm^3)	2.643E+7	7.231E+7	8.089E+7	7.231E+7	9.508E+7	3.786E+7
$S_{y,3}$(mm^3)	1.358E+7	7.071E+7	8.011E+7	7.071E+7	9.5E+7	2.914E+7
$S_{y,4}$(mm^3)	-5.588E-9	6.583E+7	7.666E+7	6.583E+7	9.382E+7	1.793E+7
n_E	1E+300	20	13	20	6	1E+300

Plastic characteristics of the single components (classification refers to the composite section in Phase 3)

Components	N_{pl} *(N)*	z_N *(mm)*	z_{max} *(mm)*	z_{min} *(mm)*
Concrete layer above top reinforcing bars	5.875E+6	2105.31	2130	2080.63
Concrete layer between top and bottom reinforcing bars	2.365E+7	1980	2079.37	1880.63
Concrete layer below top reinforcing bars	5.875E+6	1854.69	1879.37	1830
Top reinforcing bars	2.95E+6	2080	2080.63	2079.37
Bottom reinforcing bars	2.95E+6	1880	1880.63	1879.37
Concrete haunch slab	0E+00	1815	1830	1800
Top flange of steel beam	3.804E+6	1787.5	1800	1775
Web of steel beam	1.053E+7	910	1775	45
Bottom flange of steel beam	1.364E+7	22.5	45	0
Ultimate compression force for the full section	-6.927E+7			
Ultimate tension force for the full section	3.387E+7			
Ultimate compression force for the web less section	-5.874E+7			
Ultimate tensile force for the web less section	2.334E+7			

Flanges classification

	c/t	ε	*Hogging bending moment (M+)*	*Sagging bending moment (M-)*
Top flange	8.64	0.814	1	0
Bottom flange	10.35	0.838	3	1

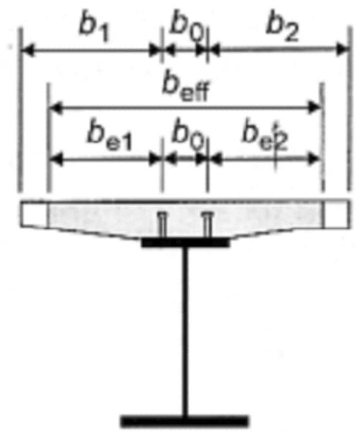
Web classification

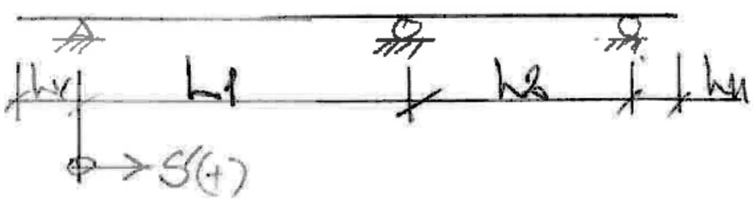
	c/t	ε	α	ψ	*class*
Hogging bending moment (M+)	96.111	0.814	0.313	-1.319	2
Sagging bending moment (M-)	96.111	0.814	0	-0.057	1
Compression (N)	96.111	0.814	1	1	4

Anm. God överensstämmelse med beräkning utförd med PROG T030, se sidor A2:84-102.

2.3.2.2 Inverkan av skjuvdeformationer

Inverkan av skjuvdeformationer beaktas genom att bestämma medverkande flänsbredd enligt EC4 avsnitt 5.4.1.2.





$L_v = 0m$, $L_1 = \frac{34.9m+35.4m}{2} = 35.2m,$, $L_2 = 35.2m$ och $L_h = 0m$

$L_e = 0.85L_1 = 0.85 \cdot 35.2m = 29.9m$: $0\text{ m} < s' \leq \dfrac{3L_1}{4}$

$L_e = 0.25(L_1 + L_2) = 0.50 \cdot 35.2m = 17.6m$: $\dfrac{3L_1}{4} < s' \leq L_1$

$$b_{e1} = \min(b_1, \frac{L_e}{8}) \text{ och } b_{e2} = \min(b_2, \frac{L_e}{8})$$

$$b_{eff} = b_{e1} + b_0 + b_{e2}$$

Spann	s'	L_e	L_e / 8	b_0	b_{e1}	b_{e2}	b_{eff}
1	**0**	x	x	450	2383 [1.)]	2167 [2.)]	5.0
1	6.9	x	x	x	x	x	5.8[3.)]
1	**8.8**	29.9	3740	450	2975	2575	6.0
1	**26.4**	29.9	3740	450	2975	2575	6.0
1	28.1	x	x	x	x	x	5.8[4.)]
1	**35.2**	17.6	2200	750	2200	2200	5.2
2	**0**	17.6	2200	750	2200	2200	5.2
2	7.1	x	x	x	x	x	5.8[4.)]
2	**8.8**	29.9	3740	450	2975	2575	6.0
2	**26.5**	29.9	3740	450	2975	2575	6.0
2	28.3	x	x	x	x	x	5.8[3.)]
2	**35.2**	x	x	450	2383 [1.)]	2167 [2.)]	5.0
-	m	m	mm	mm	mm	mm	m

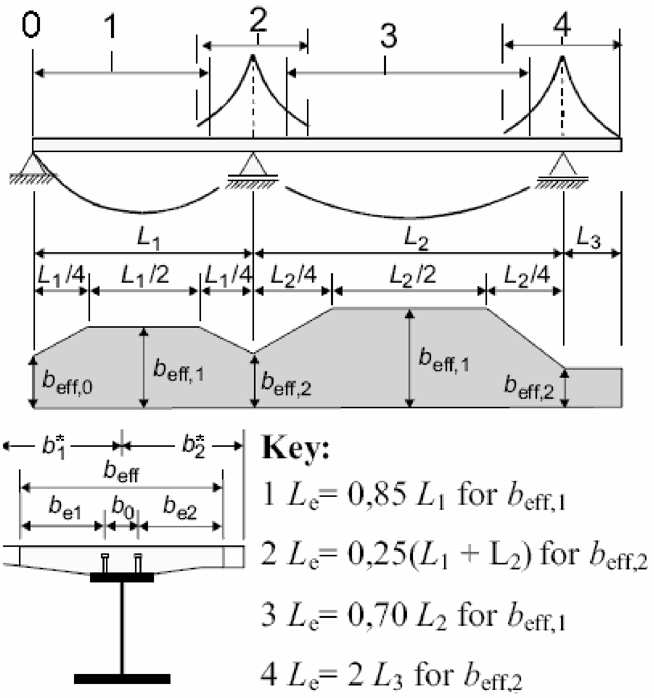
[1.)] $= 0.55 \cdot b_{e1} + 0.025 \cdot 0.85L_1 = 0.55 \cdot 2975\text{ mm} + 0.025 \cdot 0.85 \cdot 35.4\text{ m} = 2383\text{ mm}$

[2.)] $= 0.55 \cdot b_{e2} + 0.025 \cdot 0.85L_1 = 0.55 \cdot 2575\text{ mm} + 0.025 \cdot 0.85 \cdot 35.4\text{ m} = 2167\text{ mm}$

[3.)] $= 5.0\text{ m} + 1.0\text{ m} \cdot 6.9\text{ m} / 8.8\text{ m} = 5.8\text{ m}$

[4.)] $= 6.0\text{ m} - 0.8\text{ m} \cdot 1.7\text{ m} / 8.8\text{ m} = 5.8\text{ m}$

Beräkning utförd med Pont EC4 :



Type	Anmärkning
0	Ändupplag
1	Fältområde
2	Stödområde

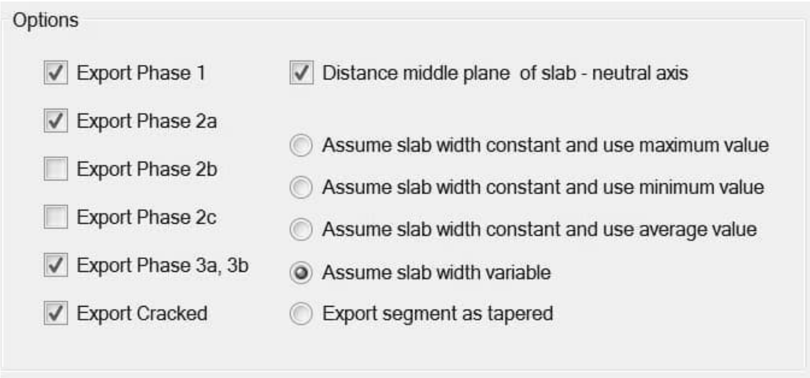
Array of spans (m) eg. 36,50,60,.. 35.2, 35.2

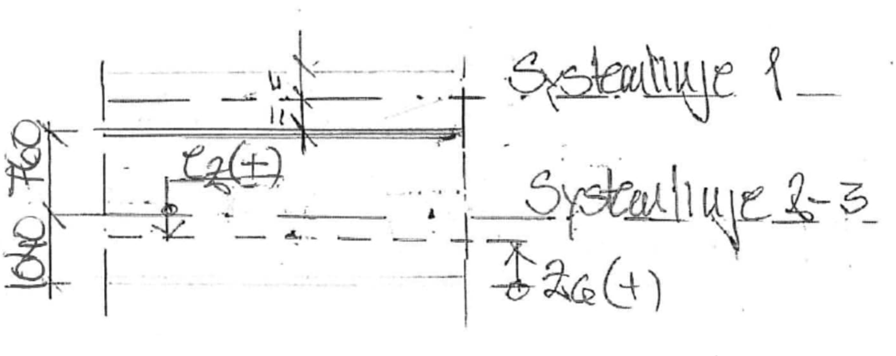
X (m)	b1* (mm)	b2* (mm)	b0 (mm)	Type	beff (mm)	Le (m)	be1 (mm)	be2 (mm)	beta1	beta2
0	3200	2800	450	0	4 999	29.92	2 975	2 575	0.801	0.840
8.8	3200	2800	450	1	6 000	29.92	2 975	2 575	1.000	1.000
26.4	3200	2900	450	1	6 100	29.92	2 975	2 675	1.000	1.000
35.2	3200	2800	750	2	5 150	17.60	2 200	2 200	1.000	1.000
44.0	3200	2800	450	1	6 000	29.92	2 975	2 575	1.000	1.000
61.7	3200	2800	450	1	6 000	29.92	2 975	2 575	1.000	1.000
70.4	3200	2800	450	0	4 999	29.92	2 975	2 575	0.801	0.840

2.3.2.3 Tvärsnittskonstanter samverkanstvärsnitt

Tvärsnittskonstanter tillhörande samverkans tvärsnitt bestäms med beräkningsprogram Point_EC4.

Vid Import av tvärsnittskontstanter ifrån Point_EC4 förutsätts tyngdpunkt för tvärsnitt belägna i mitten av farbana, dvs systemlinje 1, se redovisning nedan. En manuell justering sker dock i FEM-PROGRAM så tvärsnittskonstanter redovisas i förhållande till systemlinje 2-3.

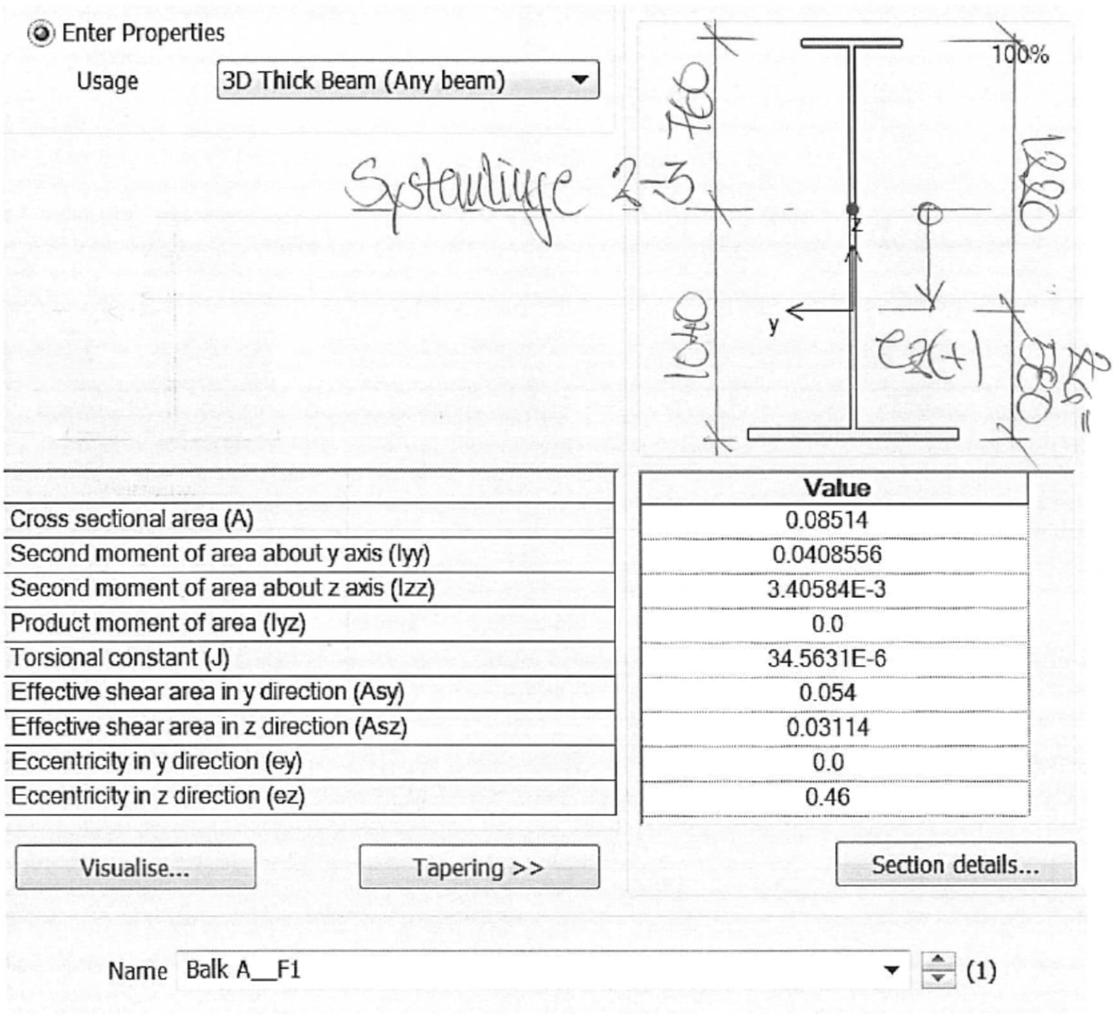




Anm. För att påvisa rimligheten används PROG T030.

2.3.2.4.1 Main girder - Segment A

Segment A – Phase 1 (ståltvärsnitt) :



	Value
Cross sectional area (A)	0.08514
Second moment of area about y axis (Iyy)	0.0408556
Second moment of area about z axis (Izz)	3.40584E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	34.5631E-6
Effective shear area in y direction (Asy)	0.054
Effective shear area in z direction (Asz)	0.03114
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.46

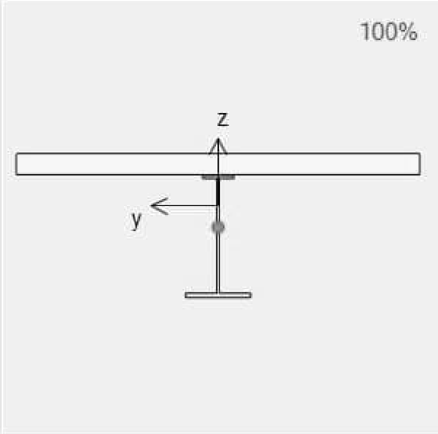
e_z = 1.040 m $- z_G$ = 1.040 m - 0.580 m =0.460 m

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 9, se sida A2:83 ger god överensstämmelse.

Segment A – Phase 2a (osprucket samverkanstvärsnitt - permanent last) :

Enter Properties

Usage 3D Thick Beam (Any beam)



	Value
Cross sectional area (A)	0.19022
Second moment of area about y axis (Iyy)	0.133822
Second moment of area about z axis (Izz)	0.273406
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.38456E-3
Effective shear area in y direction (Asy)	0.054
Effective shear area in z direction (Asz)	0.03114
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.314

Visualise... Tapering >> Section details...

Name Balk A__F2a (2)

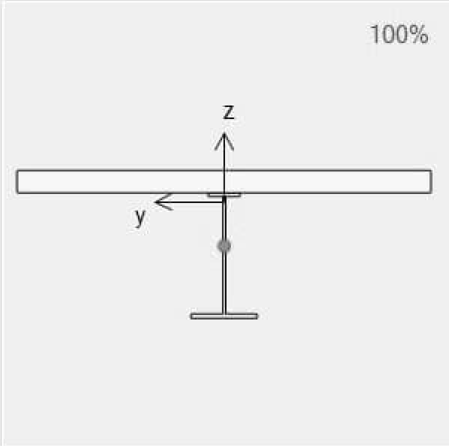
e_z = 1.040 m $-z_G$ = 1.040 m – 1.354 m = -0.314 m

<u>Anm</u> Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 1, se sida A2:84 ger god överensstämmelse.

Segment A – Phase 3 (osprucket samverkanstvärsnitt – variabla laster) :

Enter Properties

Usage 3D Thick Beam (Any beam)



	Value
Cross sectional area (A)	0.40022
Second moment of area about y axis (Iyy)	0.174571
Second moment of area about z axis (Izz)	0.903406
Product moment of area (Iyz)	0.0
Torsional constant (J)	4.53456E-3
Effective shear area in y direction (Asy)	0.054
Effective shear area in z direction (Asz)	0.03114
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.642

Visualise...   Tapering >>   Section details...

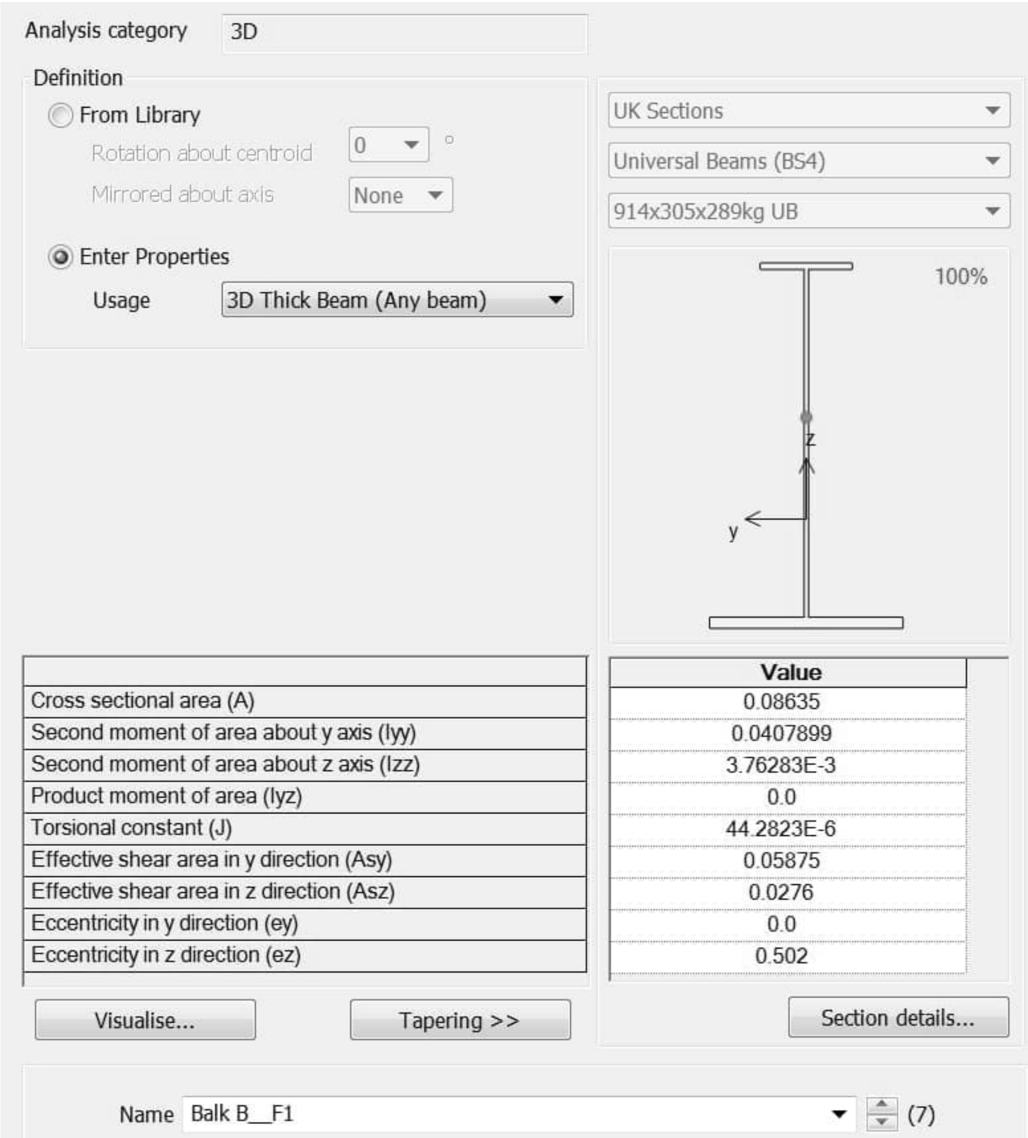
Name Balk A__F3 (5)

$e_z = 1.040 \text{ m} - z_G = 1.040 \text{ m} - 1.682 \text{ m} = -0.642 \text{ m}$

<u>Anm</u> Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 5, se sida A2:84 ger god överensstämmelse.

2.3.2.4.2 Main girder – Segment B

Segment B – Phase 1 (ståltvärsnitt) :

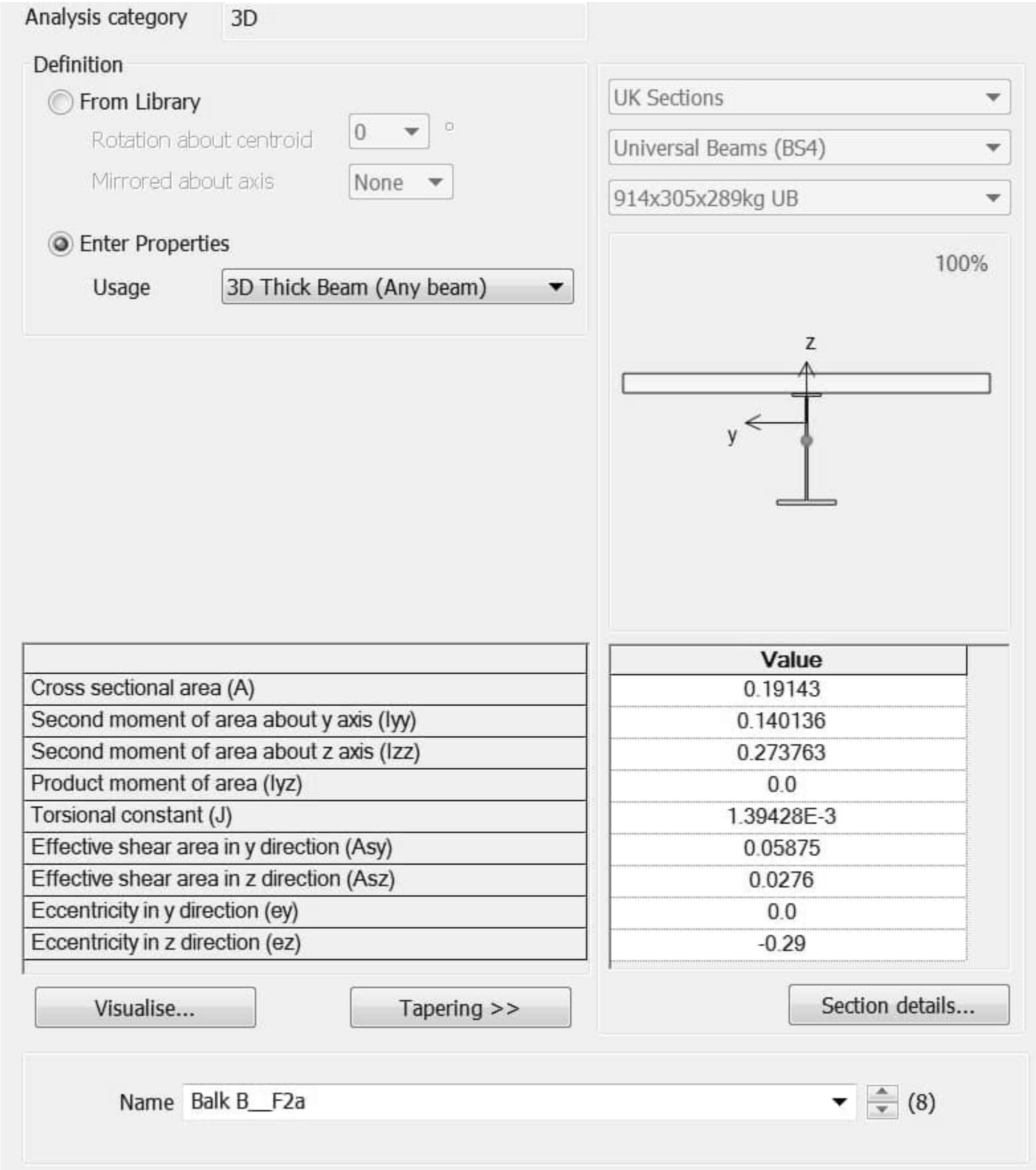


	Value
Cross sectional area (A)	0.08635
Second moment of area about y axis (Iyy)	0.0407899
Second moment of area about z axis (Izz)	3.76283E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	44.2823E-6
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.502

e_z = 1.040 m $-z_G$ = 1.040 m – 0.538 m = 0.502 m

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 9, se sida A2:83 ger god överensstämmelse.

Segment B – Phase 2a (osprucket samverkanstvärsnitt - permanent last) :

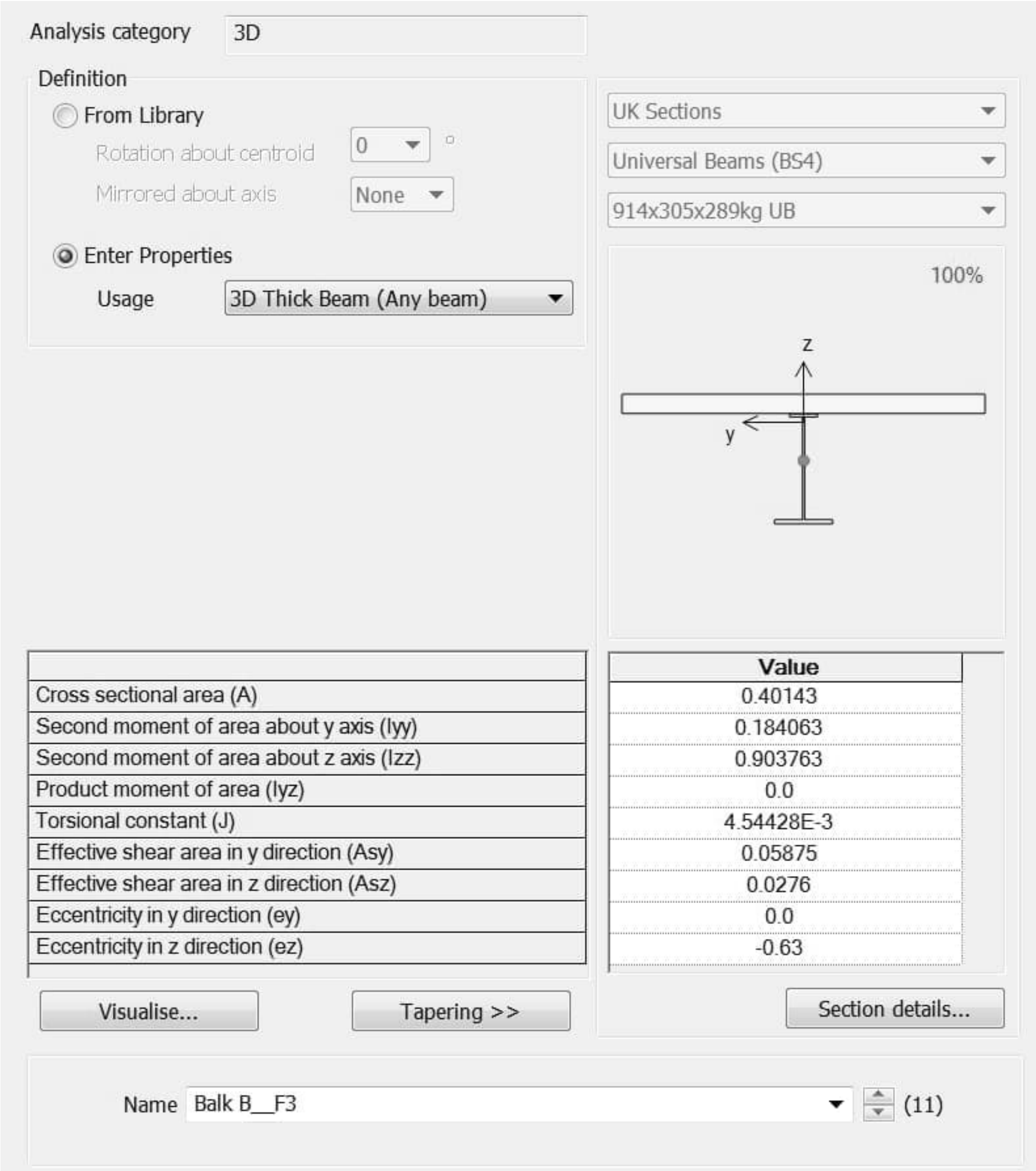


	Value
Cross sectional area (A)	0.19143
Second moment of area about y axis (Iyy)	0.140136
Second moment of area about z axis (Izz)	0.273763
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.39428E-3
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.29

$e_z = 1.040 \text{ m} - z_G = 1.040 \text{ m} – 1.330 \text{ m} = -0.290 \text{ m}$

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 1, se sida A2:84 ger god överensstämmelse.

Segment B – Phase 3 (osprucket samverkanstvärsnitt – variabla laster) :


Analysis category 3D

Definition

From Library

Rotation about centroid 0 °

Mirrored about axis None

Enter Properties

Usage 3D Thick Beam (Any beam)

UK Sections

Universal Beams (BS4)

914x305x289kg UB

100%

	Value
Cross sectional area (A)	0.40143
Second moment of area about y axis (Iyy)	0.184063
Second moment of area about z axis (Izz)	0.903763
Product moment of area (Iyz)	0.0
Torsional constant (J)	4.54428E-3
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.63

Visualise... Tapering >> Section details...

Name Balk B__F3 (11)

$e_z =$ 1.040 m $- z_G$ = 1.040 m – 1.670 m = -0.630 m

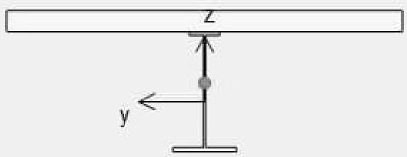
Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 5, se sida A2:84 ger god överensstämmelse.

Segment B – Cracked (sprucket samverkanstvärsnitt) :

Enter Properties

Usage 3D Thick Beam (Any beam)

100%



	Value
Cross sectional area (A)	0.10143
Second moment of area about y axis (Iyy)	0.0676241
Second moment of area about z axis (Izz)	3.76283E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	44.2823E-6
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.287

Visualise... Tapering >> Section details...

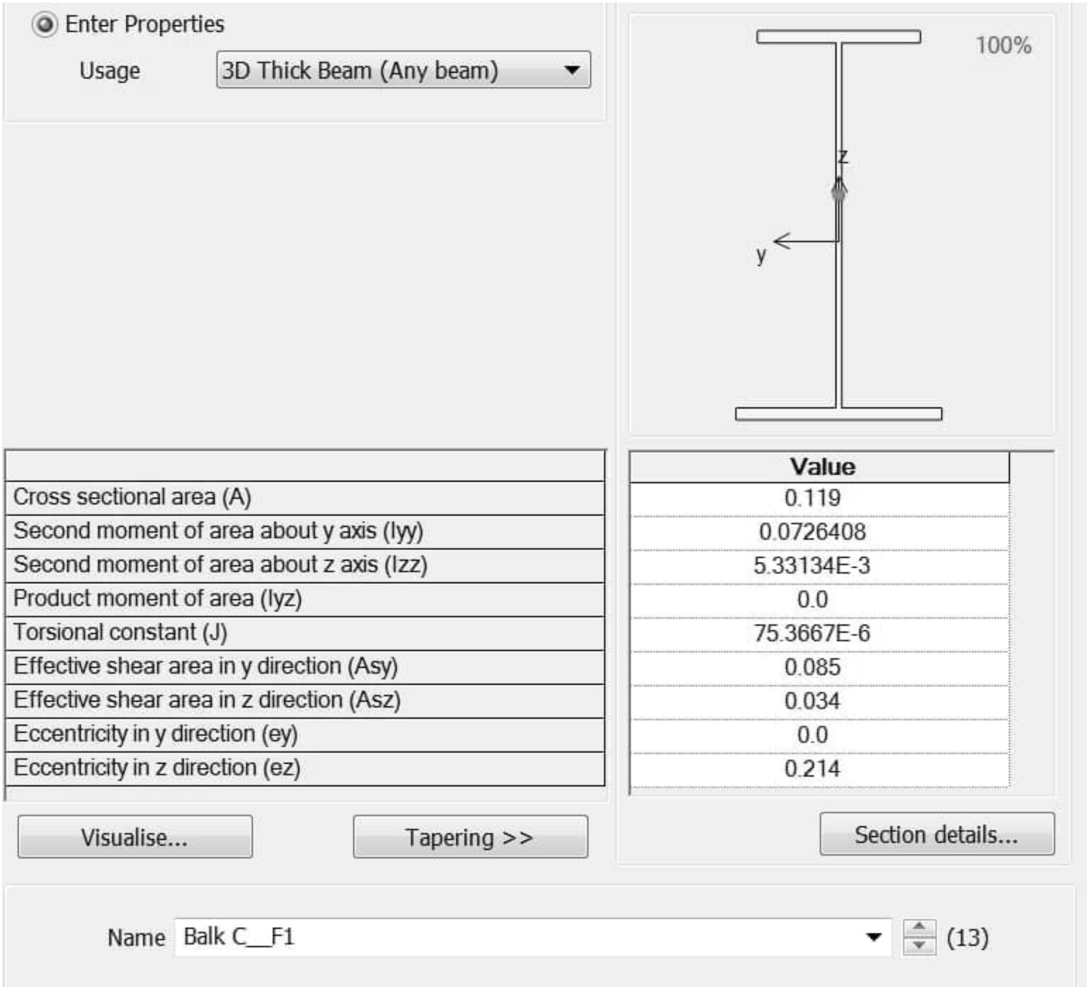
Name Balk B__cracked (4)

$e_z = 1.040 \text{ m} - z_G = 1.040 \text{ m} – 0.753 \text{ m} = 0.287 \text{ m}$

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 6, se sida A2:84 ger god överensstämmelse.

2.3.2.4.3 Main girder – Segment C

Segment C – Phase 1 (ståltvärsnitt) :



	Value
Cross sectional area (A)	0.119
Second moment of area about y axis (Iyy)	0.0726408
Second moment of area about z axis (Izz)	5.33134E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	75.3667E-6
Effective shear area in y direction (Asy)	0.085
Effective shear area in z direction (Asz)	0.034
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.214

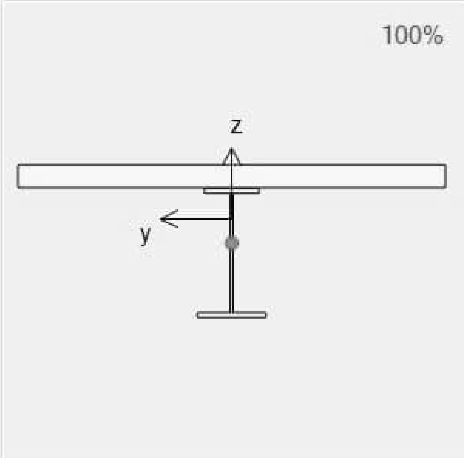
$e_z =$ 1.040 m $-z_G$ = 1.040 m – 0.826 m = 0.214 m

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 9, se sida A2:83 ger god överensstämmelse.

Segment C – Phase 2a (osprucket samverkanstvärsnitt - permanent last) :

Enter Properties

Usage: 3D Thick Beam (Any beam)



	Value
Cross sectional area (A)	0.22756
Second moment of area about y axis (Iyy)	0.149041
Second moment of area about z axis (Izz)	0.275331
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.42537E-3
Effective shear area in y direction (Asy)	0.085
Effective shear area in z direction (Asz)	0.034
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.337

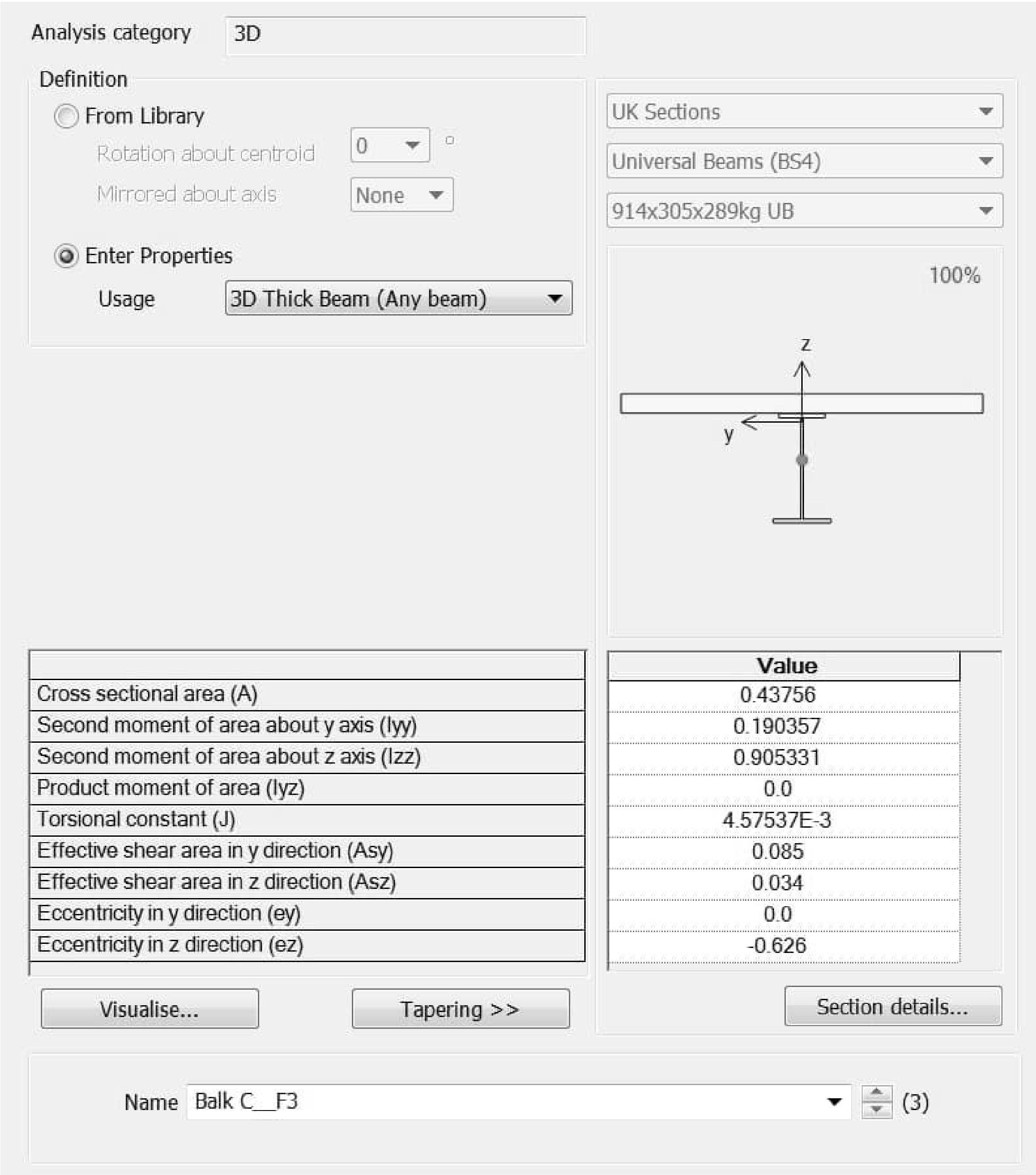
Visualise... Tapering >> Section details...

Name: Balk C__F2a (14)

$e_z = 1.040 \text{ m} - z_G = 1.040 \text{ m} – 1.377 \text{ m} = -0.337 \text{ m}$

<u>Anm</u> Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 1, se sida A2:84 ger god överensstämmelse.

Segment C – Phase 3 (osprucket samverkanstvärsnitt – variabla laster) :

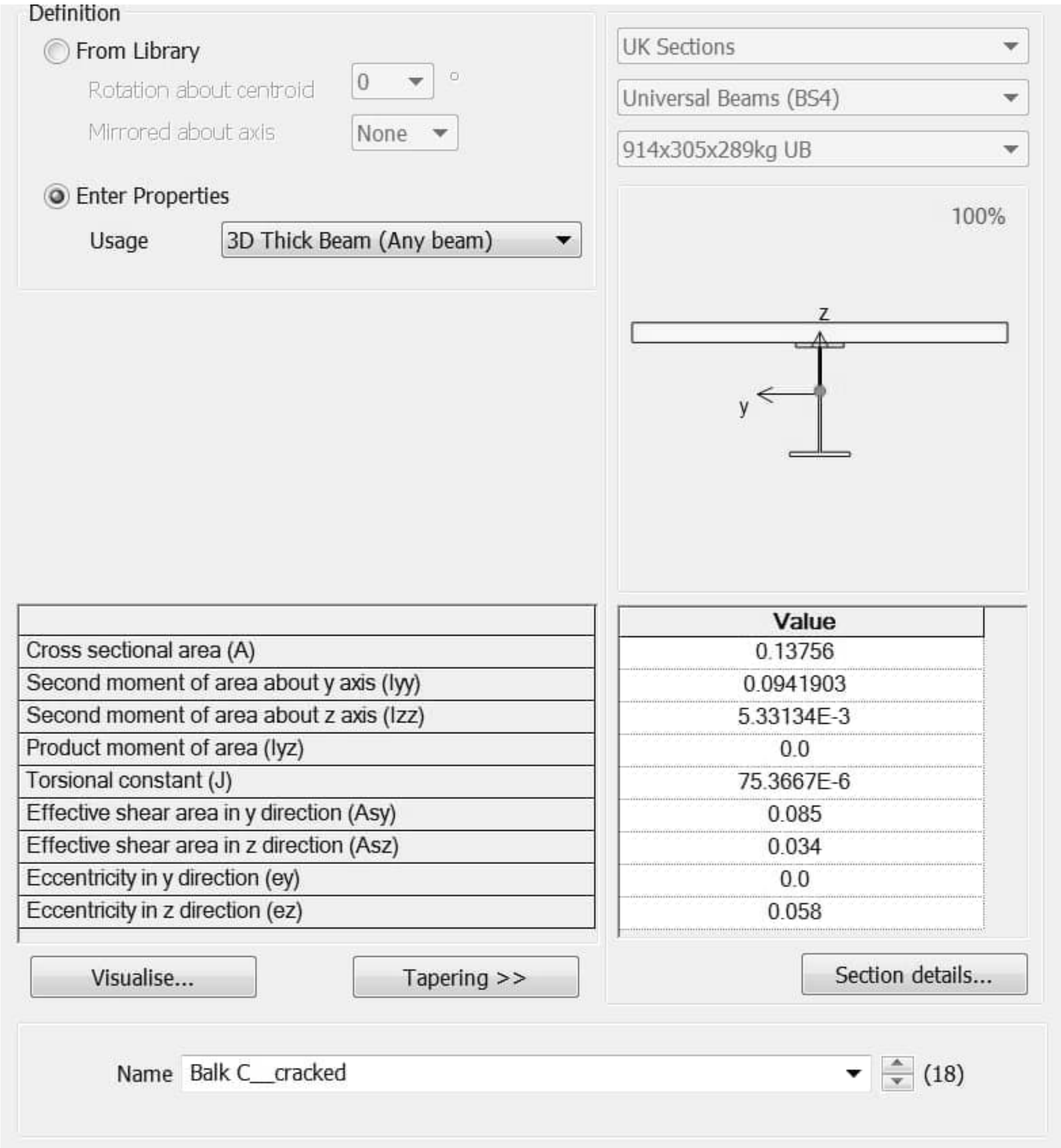


	Value
Cross sectional area (A)	0.43756
Second moment of area about y axis (Iyy)	0.190357
Second moment of area about z axis (Izz)	0.905331
Product moment of area (Iyz)	0.0
Torsional constant (J)	4.57537E-3
Effective shear area in y direction (Asy)	0.085
Effective shear area in z direction (Asz)	0.034
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.626

$e_z =$ 1.040 m $-z_G$ = 1.040 m – 1.666 m = -0.626 m

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 5, se sida A2:84 ger god överensstämmelse.

Segment C – Cracked (sprucket samverkanstvärsnitt) :



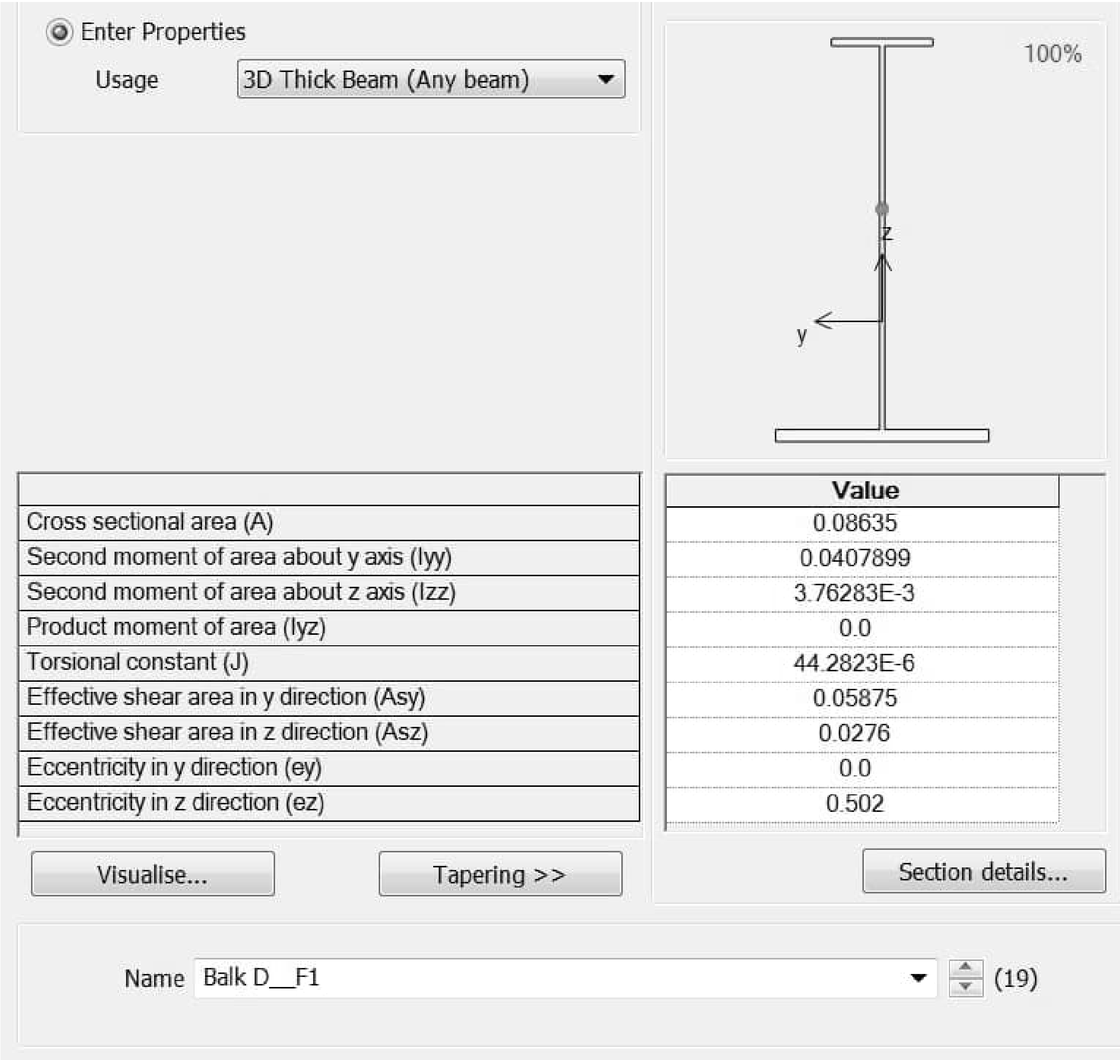
	Value
Cross sectional area (A)	0.13756
Second moment of area about y axis (Iyy)	0.0941903
Second moment of area about z axis (Izz)	5.33134E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	75.3667E-6
Effective shear area in y direction (Asy)	0.085
Effective shear area in z direction (Asz)	0.034
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.058

$e_z = \; 1.040 \text{ m} - z_G = 1.040 \text{ m} - 0.982 \text{ m} = 0.058 \text{ m}$

<u>Anm</u> Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 6, se sida A2:84 ger god överensstämmelse.

2.3.2.4.4 Main girder – Segment D

Segment D – Phase 1 (ståltvärsnitt) :



	Value
Cross sectional area (A)	0.08635
Second moment of area about y axis (Iyy)	0.0407899
Second moment of area about z axis (Izz)	3.76283E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	44.2823E-6
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.502

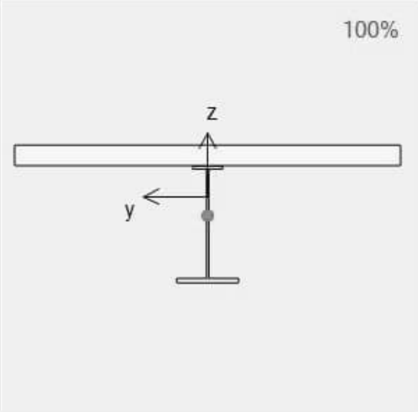
$e_z = 1.040 \text{ m} - z_G = 1.040 \text{ m} - 0.538 \text{ m} = 0.502 \text{ m}$

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 9, se sida A2:83 ger god överensstämmelse.

Segment D – Phase 2a (osprucket samverkanstvärsnitt - permanent last) :

Enter Properties

Usage 3D Thick Beam (Any beam)



	Value
Cross sectional area (A)	0.19143
Second moment of area about y axis (Iyy)	0.140136
Second moment of area about z axis (Izz)	0.273763
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.39428E-3
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.29

Visualise... Tapering >> Section details...

Name Balk D__F2a (20)

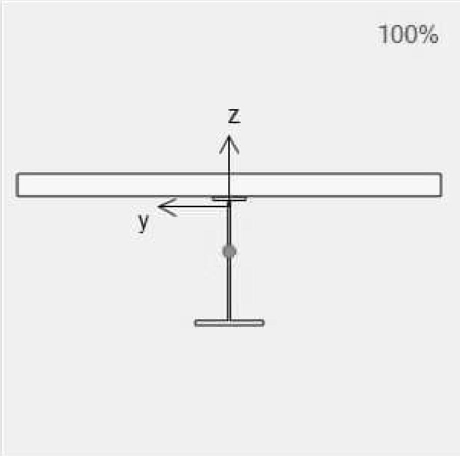
e_z = 1.040 m $-z_G$ = 1.040 m – 1.330 m = -0.290 m

<u>Anm</u> Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 1, se sida A2:84 ger god överensstämmelse.

Segment D – Phase 3 (osprucket samverkanstvärsnitt – variabla laster) :

Enter Properties

Usage: 3D Thick Beam (Any beam)



	Value
Cross sectional area (A)	0.40143
Second moment of area about y axis (Iyy)	0.184063
Second moment of area about z axis (Izz)	0.903763
Product moment of area (Iyz)	0.0
Torsional constant (J)	4.54428E-3
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.63

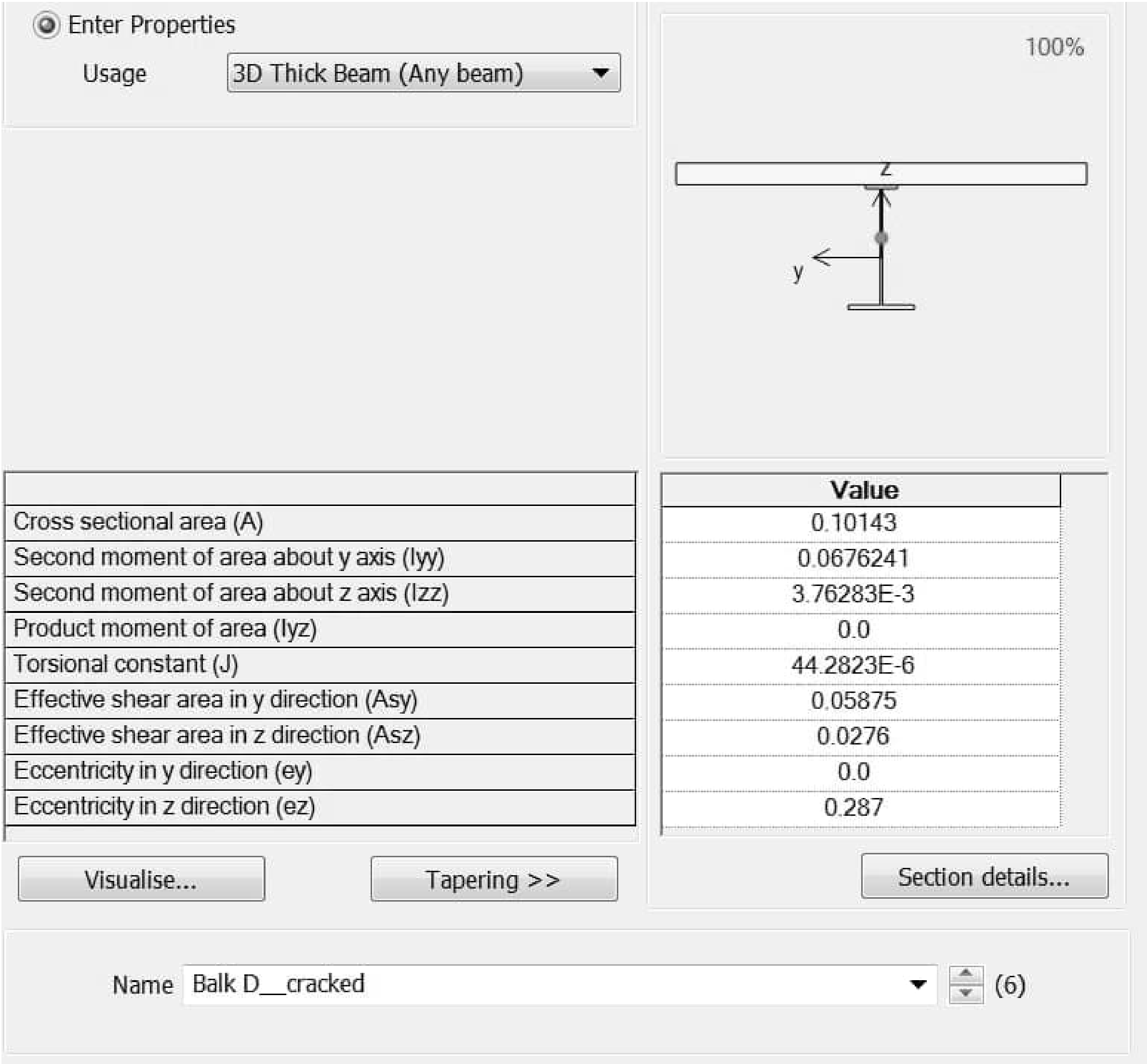
Visualise... Tapering >> Section details...

Name: Balk D__F3 (23)

e_z = 1.040 m $-z_G$ = 1.040 m – 1.670 m = -0.630 m

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 5, se sida A2:84 ger god överensstämmelse.

Segment D – Cracked (sprucket samverkanstvärsnitt) :



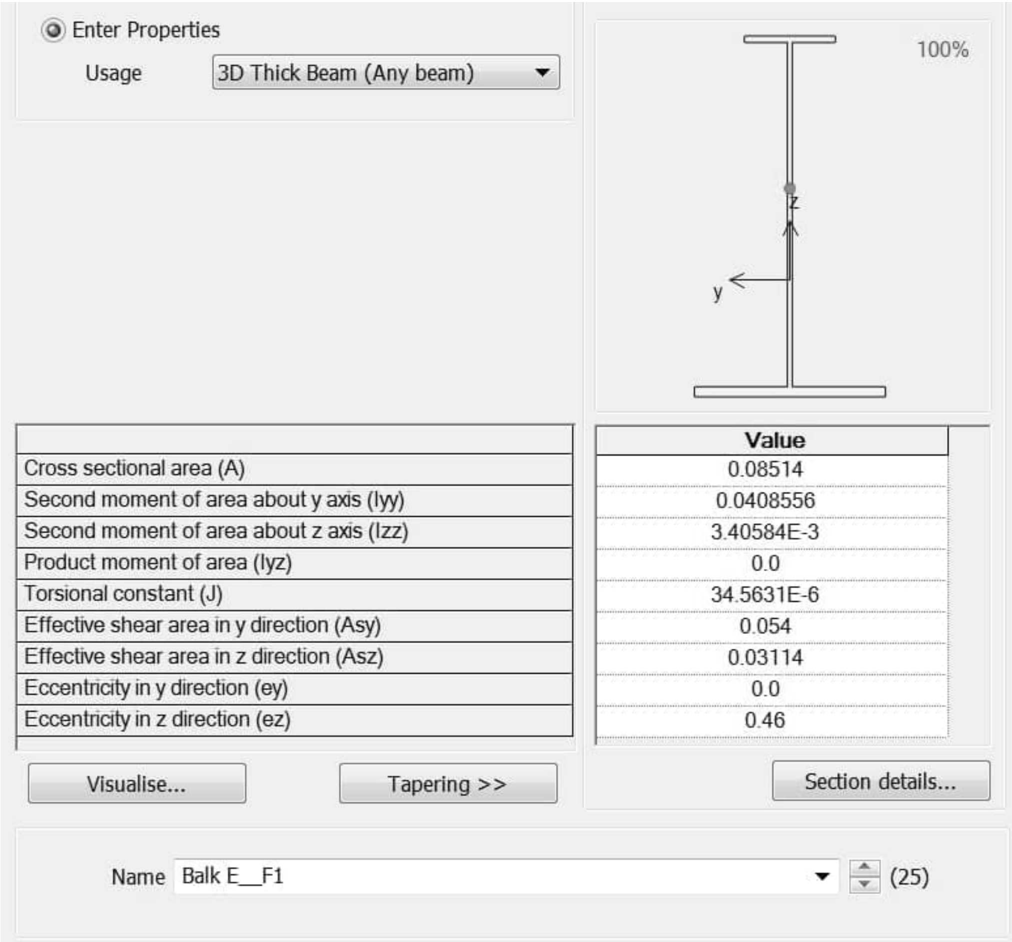
	Value
Cross sectional area (A)	0.10143
Second moment of area about y axis (Iyy)	0.0676241
Second moment of area about z axis (Izz)	3.76283E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	44.2823E-6
Effective shear area in y direction (Asy)	0.05875
Effective shear area in z direction (Asz)	0.0276
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.287

e_z = 1.040 m -z_G = 1.040 m – 0.753 m = 0.287 m

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 6, se sida A2:84 ger god överensstämmelse.

2.3.2.4.5 Main girder – Segment E

Segment E – Phase 1 (ståltvärsnitt) :



	Value
Cross sectional area (A)	0.08514
Second moment of area about y axis (Iyy)	0.0408556
Second moment of area about z axis (Izz)	3.40584E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	34.5631E-6
Effective shear area in y direction (Asy)	0.054
Effective shear area in z direction (Asz)	0.03114
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.46

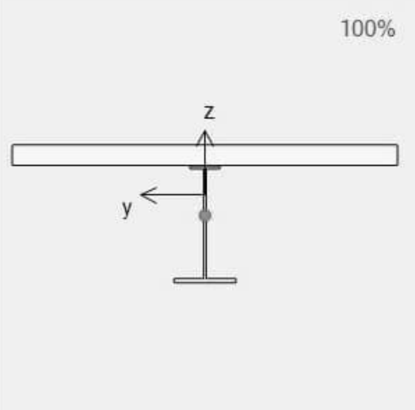
$e_z = 1.040 \text{ m} - z_G = 1.040 \text{ m} – 0.580 \text{ m} = 0.460 \text{ m}$

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 9, se sida A2:83 ger god överensstämmelse.

Segment E – Phase 2a (osprucket samverkanstvärsnitt - permanent last) :

Enter Properties

Usage: 3D Thick Beam (Any beam)



	Value
Cross sectional area (A)	0.19022
Second moment of area about y axis (Iyy)	0.133822
Second moment of area about z axis (Izz)	0.273406
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.38456E-3
Effective shear area in y direction (Asy)	0.054
Effective shear area in z direction (Asz)	0.03114
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.314

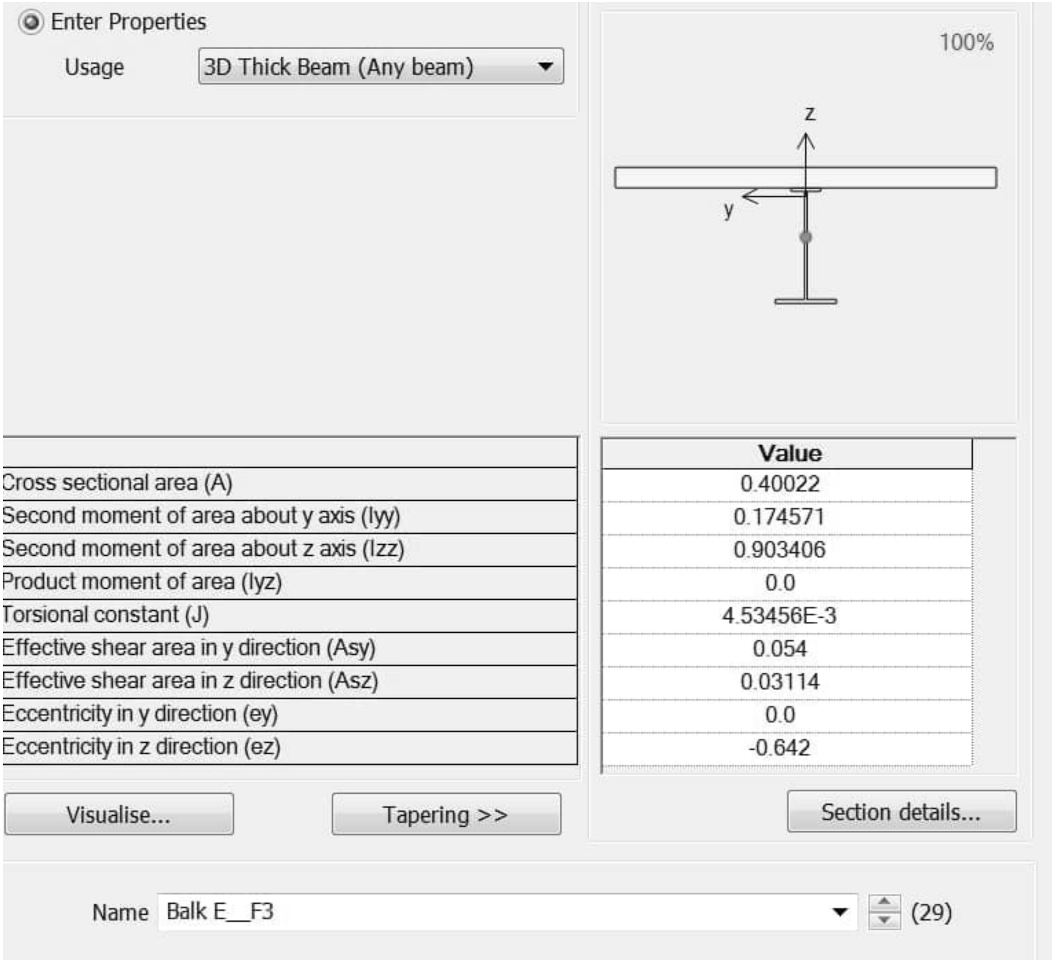
Visualise... | Tapering >> | Section details...

Name: Balk E__F2a (26)

e_z = 1.040 m - z_G = 1.040 m – 1.354 m = -0.314 m

Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 1, se sida A2:84 ger god överensstämmelse.

Segment E – Phase 3 (osprucket samverkanstvärsnitt – variabla laster) :



	Value
Cross sectional area (A)	0.40022
Second moment of area about y axis (Iyy)	0.174571
Second moment of area about z axis (Izz)	0.903406
Product moment of area (Iyz)	0.0
Torsional constant (J)	4.53456E-3
Effective shear area in y direction (Asy)	0.054
Effective shear area in z direction (Asz)	0.03114
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.642

e_z = 1.040 m $-z_G$ = 1.040 m – 1.682 m = -0.642 m

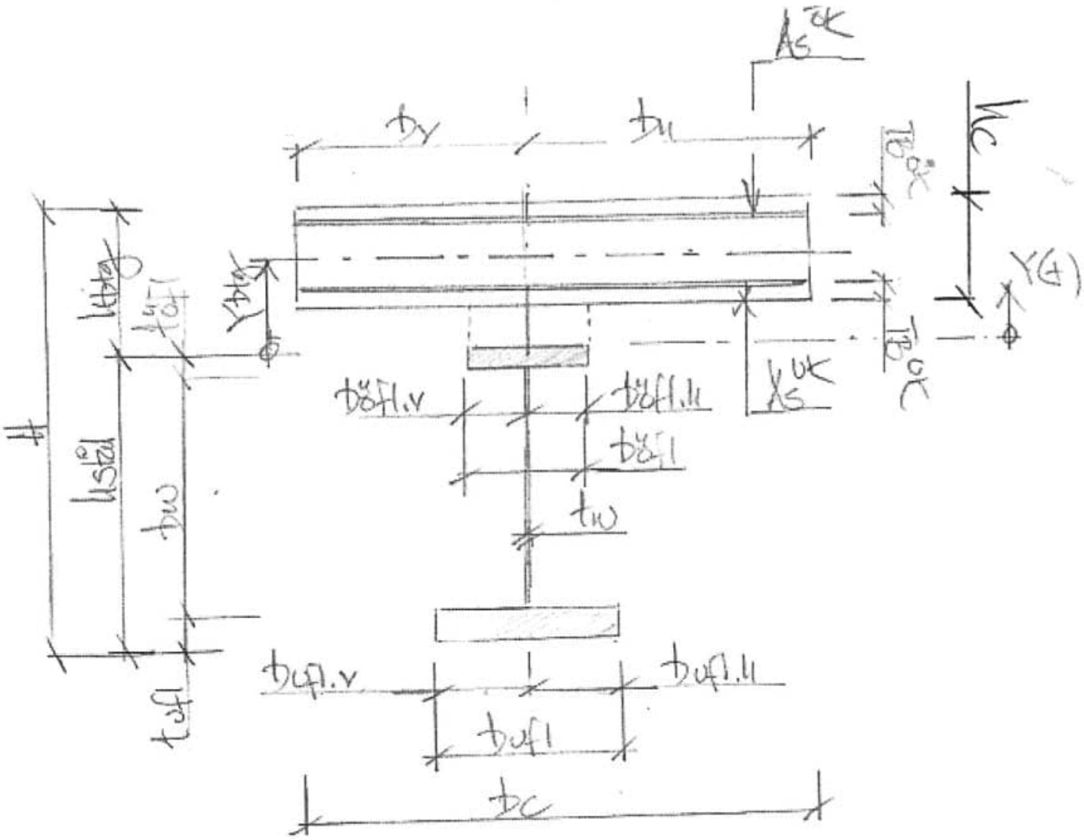
Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 5, se sida A2:84 ger god överensstämmelse.

2.3.2.4.3 Verifiering av tvärsnittskonstanter

Verifiering sker med beräkningsprogram PROG T030 utförd i Mathcad.
Samtliga formler och delresultat redovisas.

Objekt: Huvudbalk A

PRINCIPFIGUR



TEORI

Totalt studeras 9 st olika typer av tvärsnitt. Tvärsnitt typ 1-8 avser samverkanstvärsnitt som antingen är spruckna eller ospruckna. Tvärsnitt typ 9 respresenterar tvärsnitt utan samverkan.

Samtliga tvärsnittskonstanter för samverkans tvärsnitt avser redovisning såsom ekvivalent stålarea.

För spruckna samverktvärsnitt tillgodoräknas inte betongen vilket motsvarar n_L =.∞ enligt redovisning nedan.

Typ	Laster	Tvärsnitt	n_L-värde	Tvärsnitt
1	Permanenta exkl. krympning	Osprucket	$n_{L,1}$	Stål + betong + armering
2	Permanenta exkl. krympning	Sprucket	$n_{L,2}$	Stål + armering
3	Krympning	Osprucket	$n_{L,3}$	Stål + betong + armering
4	Krympning	Sprucket	$n_{L,4}$	Stål + armering
5	Variabla exkl. temperatur	Osprucket	$n_{L,5}$	Stål + betong + armering
6	Variabla exkl. temperatur	Sprucket	$n_{L,6}$	Stål + armering
7	Temperatur	Osprucket	$n_{L,7}$	Stål + betong + armering
8	Temperatur	Sprucket	$n_{L,8}$	Stål + armering
9	-	Ingen samverkan	-	Stålbalk

Tvärsnittskonstanter samverkansbalk

INDATA

Antal snitt

N = 12st

s´	Element	s	Balk
0	203	0	001
6.92:V	203	6.92:V	001
6.92:H	203	6.92:H	002
28.06:V	203	28.06:V	002
28.06:H	203	28:06:H	003
35.15:V	203	35.15:V	003
35.15:H	304	0	003
42.24:V	304	7.09:V	003
42.24:H	304	7.09:H	004
63.38:V	304	28.23	004
63.38:H	304	28.23	005
70.30	304	35.15	005
m	-	m	-

Material

Betong farbaneplatta

Betong (C30/37, C35/45, C40/50 , C45/55 och C50/60): $BTG = "C35/45"$

Indatakvitto

$E_{cm} = 34.1 \cdot GPa$

Armering farbaneplatta

s'	Överkantsarmering $\Phi_{ök}$	c/c	$TB_{ök}$	Kvalitet	Underkantsarmering Φ_{uk}	c/c	TB_{uk}	Kvalitet
0	16	200	50	B500	16	200	50	B500
6.92:V	16	200	50	B500	16	200	50	B500
6.92:H	16	200	50	B500	16	200	50	B500
28.06:V	16	200	50	B500	16	200	50	B500
28.06:H	16	200	50	B500	16	200	50	B500
35.15:V	16	200	50	B500	16	200	50	B500
35.15:H	16	200	50	B500	16	200	50	B500
42.24:V	16	200	50	B500	16	200	50	B500
42.24:H	16	200	50	B500	16	200	50	B500
63.38:V	16	200	50	B500	16	200	50	B500
63.38:H	16	200	50	B500	16	200	50	B500
70.30	16	200	50	B500	16	200	50	B500
m	mm	mm	mm	-	mm	mm	mm	-

Karakteristisk E-modul stål / armering

$E_a = 210GPa$

Geometri

Stålbalk

s´	Överfläns				Liv			Underfläns			
	$b_{öfl.v}$	$b_{öfl.h}$	$t_{öfl}$	f_{yk}	b_w	t_w	f_{yk}	$b_{ufl.v}$	$b_{ufl.h}$	t_{ufl}	f_{yk}
0	225	225	25	460	1730	18	460	475	475	45	430
6.92:V	225	225	25	460	1730	18	460	475	475	45	430
6.92:H	225	225	25	460	1725	16	460	475	475	50	430
28.06:V	225	225	25	460	1725	16	460	475	475	50	430
28.06:H	375	375	50	430	1700	20	460	475	475	50	430
35.15:V	375	375	50	430	1700	20	460	475	475	50	430
35.15:H	375	375	50	430	1700	20	460	475	475	50	430
42.24:V	375	375	50	430	1700	20	460	475	475	50	430
42.24:H	225	225	25	460	1725	16	460	475	475	50	430
63.38:V	225	225	25	460	1725	16	460	475	475	50	430
63.38:H	225	225	25	460	1730	18	460	475	475	45	430
70.30	225	225	25	460	1730	18	460	475	475	45	430
m	mm	mm	mm	MPa	mm	mm	MPa	mm	mm	mm	MPa

Farbaneplatta :

Läget för farbaneplattans tyngdpunktsaxel relativt ÖK stålbalk betecknas y_{btg}.
Tröghetsmomentet relativt denna tyngdpunktsaxel betecknas I_c.

s´	b_v	b_h	h_c	h_{btg}	y_{btg}	A_c	$10^3 \cdot I_c$
0	2500	2500	300	330	180	1.500	11.250
6.92:V	2900	2900	300	330	180	1.740	13.050
6.92:H	3000	3000	300	330	180	1.800	13.500
28.06:V	3000	3000	300	330	180	1.800	13.500
28.06:H	2900	2900	300	330	180	1.740	13.050
35.15:V	2600	2600	300	330	180	1.560	11.700
35.15:H	2600	2600	300	330	180	1.560	11.700
42.24:V	2900	2900	300	330	180	1.740	13.050
42.24:H	3000	3000	300	330	180	1.800	13.500
63.38:V	3000	3000	300	330	180	1.800	13.500
63.38:H	2900	2900	300	330	180	1.740	13.050
70.30	2500	2500	300	330	180	1.500	11.250
m	mm	mm	mm	mm	mm	m^2	m^4

Krypfaktorer enligt EC 4 avsnitt 5.4.2.2 :

$\psi_{L.p} = 1.10$

$\psi_{L.k} = 0.55$

BERÄKNING

Beräkning av n-värden för samverkanstvärsnitt

Modulkvot för korttidslast

$$n_o = \frac{E_a}{E_{cm}} = 6.162$$

Kryptal :

$\varphi_p = 2.10$: permanenta laster inkl. krympning

$\varphi_v = 0$: variabla laster exkl. temperatur

$\varphi_t = 0$: temperatur

Permanenta laster exkl. krympning

$n_{L_1} = n_o \cdot \left(1 + \psi_{L.p} \cdot \varphi_p\right) = 20.398$: osprucket tvärsnitt

$n_{L_2} = \infty$: sprucket tvärsnitt

Krympning

$n_{L_3} = n_o \cdot \left(1 + \psi_{L.k} \cdot \varphi_p\right) = 13.28$: osprucket tvärsnitt

$n_{L_4} = \infty$: sprucket tvärsnitt

Variabla laster exkl. temperatur

$n_{L_5} = n_o \cdot \left(1 + \varphi_v\right) = 6.162$: osprucket tvärsnitt

$n_{L_6} = \infty$: sprucket tvärsnitt

Temperatur

$n_{L_7} = n_o \cdot \left(1 + \varphi_t\right) = 6.162$: osprucket tvärsnitt

$n_{L_8} = \infty$: sprucket tvärsnitt

Balkhöjd

$$h_{stål} = t_{öfl} + b_w + t_{ufl}$$

$$H = h_{stål} + h_{btg}$$

Farbaneplatta

$$b_c = \left(b_v + b_h\right)$$: total bredd

Armering

$$y_{ök} = h_{btg} - TB_{ök} - \frac{\phi_{ök}}{2}$$: läge tyngdpunkt ÖK armering

$$y_{uk} = h_{btg} - h_c + TB_{uk} + \frac{\phi_{uk}}{2}$$: läge tyngdpunkt UK armering

Stålbalk

Överfläns :

$$b_{öfl} = b_{öfl.v} + b_{öfl.h}$$

$$A_{öfl} = b_{öfl} \cdot t_{öfl}$$

$$I_{o.öfl} = \frac{b_{öfl} \cdot t_{öfl}^{3}}{12}$$

$$y_{öfl} = -\frac{t_{öfl}}{2}$$

Liv :

$$A_{liv} = b_{w} \cdot t_{w}$$

$$I_{o.liv} = \frac{t_{w} \cdot b_{w}^{3}}{12}$$

$$y_{tp.liv} = -t_{öfl} - \frac{b_{w}}{2}$$

Underfläns :

$$b_{ufl} = b_{ufl.v} + b_{ufl.h}$$

$$A_{ufl} = b_{ufl} \cdot t_{ufl}$$

$$I_{o.ufl} = \frac{b_{ufl} \cdot t_{ufl}^{3}}{12}$$

$$y_{ufl} = -h_{stål} + \frac{t_{ufl}}{2}$$

Sammansatt stålbalk

$$A_{stål} = A_{öfl} + A_{liv} + A_{ufl}$$

$$y_{stål} = \frac{\left(A_{öfl} \cdot y_{öfl} + A_{liv} \cdot y_{tp.liv} + A_{ufl} \cdot y_{ufl}\right)}{A_{stål}}$$

$$I_{stål} = I_{o.öfl} + I_{o.liv} + I_{o.ufl} \;... \\ + A_{öfl} \cdot \left(y_{öfl} - y_{stål}\right)^{2} + A_{liv} \cdot \left(y_{tp.liv} - y_{stål}\right)^{2} + A_{ufl} \cdot \left(y_{ufl} - y_{stål}\right)^{2}$$

Funktion - ekvivalent armeringsarea

Underkantsarmering

$$A_{s.UK} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..9 \\ \quad \quad \left| \begin{array}{l} \dfrac{b_{c_j}}{s_{uk_j}} \cdot \pi \cdot \dfrac{\left(\phi_{uk_j}\right)^2}{4} \cdot \left(1 - \dfrac{1}{n_{L_j}}\right) \text{ if } Typ \le 8 \\ 0mm^2 \text{ if } Typ = 9 \end{array} \right. \end{array} \right.$$

Överkantsarmering

$$A_{s.ÖK} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..9 \\ \quad \quad \left| \begin{array}{l} \dfrac{b_{c_j}}{s_{ök_j}} \cdot \pi \cdot \dfrac{\left(\phi_{uk_j}\right)^2}{4} \cdot \left(1 - \dfrac{1}{n_{L_j}}\right) \text{ if } Typ \le 8 \\ 0mm^2 \text{ if } j = 9 \end{array} \right. \end{array} \right.$$

Total armeringsarea

$$A_{arm} = A_{s.ÖK} + A_{s.UK}$$

Funktion - ekvivalent bredd, area och tröghetsmoment tillhörande farbaneplatta

$$B_{btg} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..8 \\ \quad\quad \dfrac{b_{c_j}}{n_{L_j}} \end{array} \right.$$

$$A_{btg} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..8 \\ \quad\quad \dfrac{A_{c_i}}{n_{L_j}} \end{array} \right.$$

$$I_{btg} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..8 \\ \quad\quad \dfrac{I_{c_i}}{n_{L_j}} \end{array} \right.$$

Funktion - ekvivalent area samverkanstvärsnitt

$$A_{sam} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..8 \\ \quad\quad A_{btg_{i,j}} + A_{arm_{i,j}} + A_{stål_i} \end{array} \right.$$

Funktion - tyngdpunkt för samverkanstvärsnitt

$$y_{sam} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..8 \\ \quad\quad \dfrac{A_{btg_{i,j}} \cdot y_{btg_i} + A_{s.UK_{i,j}} \cdot y_{uk_i} + A_{s.ÖK_{i,j}} \cdot y_{ök_i} + A_{stål_i} \cdot y_{stål_i}}{A_{sam_{i,j}}} \end{array} \right.$$

Funktion - tröghetsmoment för samverkanstvärsnitt

$$I_{sam} = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..8 \\ \quad\quad I_{btg_{i,j}} + A_{btg_{i,j}} \cdot \left(y_{btg_i} - y_{sam_{i,j}}\right)^2 \cdots \\ \quad\quad + A_{s.ÖK_{i,j}} \cdot \left(y_{ök_i} - y_{sam_{i,j}}\right)^2 + A_{s.UK_{i,j}} \cdot \left(y_{uk_i} - y_{sam_{i,j}}\right)^2 \cdots \\ \quad\quad + I_{stål_i} + A_{stål_i} \cdot \left(y_{stål_i} - y_{sam_{i,j}}\right)^2 \end{array} \right.$$

Funktion - statiska momentet för nivån ÖK stålbalk (y = 0 m)

$$y_1 = h_{stål}$$

$$S_1 = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..9 \\ \quad\quad \left| \begin{array}{l} A_{btg_{i,j}} \cdot \left(y_{btg_i} - y_{sam_{i,j}}\right) + A_{s.UK_{i,j}} \cdot \left(y_{uk_i} - y_{sam_{i,j}}\right) + A_{s.ÖK_{i,j}} \cdot \left(y_{ök_i} - y_{sam_{i,j}}\right) \text{ if } j \le 8 \\ 0cm^3 \text{ if } j = 9 \end{array} \right. \end{array} \right.$$

Funktion - statiska momentet för nivån övre halssvets (y = - $t_{öfl}$)

$$y_2 = -t_{öfl}$$

$$S_2 = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..9 \\ \quad\quad \left| \begin{array}{l} A_{btg_{i,j}} \cdot \left(y_{btg_i} - y_{sam_{i,j}}\right) + A_{s.UK_{i,j}} \cdot \left(y_{uk_i} - y_{sam_{i,j}}\right) + A_{s.ÖK_{i,j}} \cdot \left(y_{ök_i} - y_{sam_{i,j}}\right) + A_{öfl_i} \cdot \left(y_{öfl_i} - y_{sam_{i,j}}\right) \text{ if } j \le 8 \\ A_{öfl_i} \cdot \left(y_{öfl_i} - y_{stål_i}\right) \text{ if } j = 9 \end{array} \right. \end{array} \right.$$

Funktion - statiska momentet för nivån undre halssvets (y = -$h_{stål}$ + t_{ufl})

$$y_3 = -h_{stål} + t_{ufl}$$

$$S_3 = \left| \begin{array}{l} \text{for } i \in 1..N \\ \quad \text{for } j \in 1..9 \\ \quad\quad \left| \begin{array}{l} A_{ufl_i} \cdot \left(y_{sam_{i,j}} - y_{ufl_i}\right) \text{ if } j \le 8 \\ A_{ufl_i} \cdot \left(y_{ufl_i} - y_{stål_i}\right) \text{ if } j = 9 \end{array} \right. \end{array} \right.$$

RESULTAT

Farbaneplatta

Effektiv bredd

s´	B_{btg} Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8
0	245	0	377	0	811	0	811	0
6.92:V	284	0	437	0	941	0	941	0
6.92:H	294	0	452	0	974	0	974	0
28.06:V	294	0	452	0	974	0	974	0
28.06:H	284	0	437	0	941	0	941	0
35.15:V	255	0	392	0	844	0	844	0
35.15:H	255	0	392	0	844	0	844	0
42.24:V	284	0	437	0	941	0	941	0
42.24:H	294	0	452	0	974	0	974	0
63.38:V	294	0	452	0	974	0	974	0
63.38:H	284	0	437	0	941	0	941	0
70.300	245	0	377	0	811	0	811	0
m	mm	mm	mm	mm	mm	mm	mm	mm

Effektiv area

s´	A_{btg} Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	y_{btg}
0	735	0	1130	0	2434	0	2434	0	180
6.92:V	853	0	1310	0	2824	0	2824	0	180
6.92:H	882	0	1355	0	2921	0	2921	0	180
28.06:V	882	0	1355	0	2921	0	2921	0	180
28.06:H	853	0	1310	0	2824	0	2824	0	180
35.15:V	765	0	1175	0	2531	0	2531	0	180
35.15:H	765	0	1175	0	2531	0	2531	0	180
42.24:V	853	0	1310	0	2824	0	2824	0	180
42.24:H	882	0	1355	0	2921	0	2921	0	180
63.38:V	882	0	1355	0	2921	0	2921	0	180
63.38:H	853	0	1310	0	2824	0	2824	0	180
70.300	735	0	1130	0	2434	0	2434	0	180
m	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	mm

Tvärsnittskonstanter samverkansbalk

Effektiv tröghetsmoment

	I_{btg}							
s´	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8
0	5.515	0	8.471	0	18.256	0	18.256	0
6.92:V	6.398	0	9.827	0	21.177	0	21.177	0
6.92:H	6.618	0	10.166	0	21.907	0	21.907	0
28.06:V	6.618	0	10.166	0	21.907	0	21.907	0
28.06:H	6.398	0	9.827	0	21.177	0	21.177	0
35.15:V	5.736	0	8.810	0	18.986	0	18.986	0
35.15:H	5.736	0	8.810	0	18.986	0	18.986	0
42.24:V	6.398	0	9.827	0	21.177	0	21.177	0
42.24:H	6.618	0	10.166	0	21.907	0	21.907	0
63.38:V	6.618	0	10.166	0	21.907	0	21.907	0
63.38:H	6.398	0	9.827	0	21.177	0	21.177	0
70.300	5.515	0	8.471	0	18.256	0	18.256	0
m	dm^4	dm^4	dm^4	dm^4	dm^4	dm^4	dm^4	dm^4

Medverkande armering

Armeringsarea i överkant + tyngdpunkt

s´	$A_{s.ÖK}$ Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	Typ 9	$y_{ök}$
0	4780	5027	4648	5027	4211	5027	4211	5027	0	272
6.92:V	5545	5831	5392	5831	4885	5831	4885	5831	0	272
6.92:H	5736	6032	5578	6032	5053	6032	5053	6032	0	272
28.06:V	5736	6032	5578	6032	5053	6032	5053	6032	0	272
28.06:H	5545	5831	5392	5831	4885	5831	4885	5831	0	272
35.15:V	4971	5228	4834	5228	4379	5228	4379	5228	0	272
35.15:H	4971	5228	4834	5228	4379	5228	4379	5228	0	272
42.24:V	5545	5831	5392	5831	4885	5831	4885	5831	0	272
42.24:H	5736	6032	5578	6032	5053	6032	5053	6032	0	272
63.38:V	5736	6032	5578	6032	5053	6032	5053	6032	0	272
63.38:H	5545	5831	5392	5831	4885	5831	4885	5831	0	272
70.300	4780	5027	4648	5027	4211	5027	4211	5027	0	272
m	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm

Armeringsarea i underkant + tyngpunkt

s´	$A_{s.UK}$ Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	Typ 9	y_{uk}
0	4780	5027	4648	5027	4211	5027	4211	5027	0	88
6.92:V	5545	5831	5392	5831	4885	5831	4885	5831	0	88
6.92:H	5736	6032	5578	6032	5053	6032	5053	6032	0	88
28.06:V	5736	6032	5578	6032	5053	6032	5053	6032	0	88
28.06:H	5545	5831	5392	5831	4885	5831	4885	5831	0	88
35.15:V	4971	5228	4834	5228	4379	5228	4379	5228	0	88
35.15:H	4971	5228	4834	5228	4379	5228	4379	5228	0	88
42.24:V	5545	5831	5392	5831	4885	5831	4885	5831	0	88
42.24:H	5736	6032	5578	6032	5053	6032	5053	6032	0	88
63.38:V	5736	6032	5578	6032	5053	6032	5053	6032	0	88
63.38:H	5545	5831	5392	5831	4885	5831	4885	5831	0	88
70.300	4780	5027	4648	5027	4211	5027	4211	5027	0	88
m	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm

Tvärsnittskonstanter samverkansbalk

Stålbalk

s´	$y_{stål}$	$A_{stål}$	$I_{stål}$	$h_{stål}$	H
0	-1220	851	409	1800	2130
6.92:V	-1220	851	409	1800	2130
6.92:H	-1262	864	408	1800	2130
28.06:V	-1262	864	408	1800	2130
28.06:H	-974	1190	726	1800	2130
35.15:V	-974	1190	726	1800	2130
35.15:H	-974	1190	726	1800	2130
42.24:V	-974	1190	726	1800	2130
42.24:H	-1262	864	408	1800	2130
63.38:V	-1262	864	408	1800	2130
63.38:H	-1220	851	409	1800	2130
70.300	-1220	851	409	1800	2130
m	mm	cm^2	dm^4	mm	mm

Tyngdpunkt samverkanstvärsnitt

s	y_{sam} Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8
0	-528	-1072	-395	-1072	-174	-1072	-174	-1072
6.92:V	-476	-1051	-345	-1051	-136	-1051	-136	-1051
6.92:H	-489	-1085	-354	-1085	-140	-1085	-140	-1085
28.06:V	-489	-1085	-354	-1085	-140	-1085	-140	-1085
28.06:H	-457	-871	-346	-871	-154	-871	-154	-871
35.15:V	-488	-880	-378	-880	-180	-880	-180	-880
35.15:H	-488	-880	-378	-880	-180	-880	-180	-880
42.24:V	-457	-871	-346	-871	-154	-871	-154	-871
42.24:H	-489	-1085	-354	-1085	-140	-1085	-140	-1085
63.38:V	-489	-1085	-354	-1085	-140	-1085	-140	-1085
63.38:H	-476	-1051	-345	-1051	-136	-1051	-136	-1051
70.300	-528	-1072	-395	-1072	-174	-1072	-174	-1072
m	mm	mm	mm	mm	mm	mm	mm	mm

Area samverkanstvärsnitt

s´	A_{sam} Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8
0	1682	952	2074	952	3370	952	3370	952
6.92:V	1815	968	2269	968	3773	968	3773	968
6.92:H	1861	984	2330	984	3885	984	3885	984
28.06:V	1861	984	2330	984	3885	984	3885	984
28.06:H	2154	1307	2608	1307	4111	1307	4111	1307
35.15:V	2054	1295	2461	1295	3809	1295	3809	1295
35.15:H	2054	1295	2461	1295	3809	1295	3809	1295
42.24:V	2154	1307	2608	1307	4111	1307	4111	1307
42.24:H	1861	984	2330	984	3885	984	3885	984
63.38:V	1861	984	2330	984	3885	984	3885	984
63.38:H	1815	968	2269	968	3773	968	3773	968
70.300	1682	952	2074	952	3370	952	3370	952
m	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2

Tröghetsmoment samverkanstvärsnitt

s´	I_{sam} Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8
0	1239	586	1401	586	1674	586	1674	586
6.92:V	1302	610	1462	610	1722	610	1722	610
6.92:H	1377	629	1549	629	1827	629	1827	629
28.06:V	1377	629	1549	629	1827	629	1827	629
28.06:H	1442	869	1598	869	1874	869	1874	869
35.15:V	1399	855	1554	855	1835	855	1835	855
35.15:H	1399	855	1554	855	1835	855	1835	855
42.24:V	1442	869	1598	869	1874	869	1874	869
42.24:H	1377	629	1549	629	1827	629	1827	629
63.38:V	1377	629	1549	629	1827	629	1827	629
63.38:H	1302	610	1462	610	1722	610	1722	610
70.300	1239	586	1401	586	1674	586	1674	586
m	dm^4	dm^4	dm^4	dm^4	dm^4	dm^4	dm^4	dm^4

Statiska momentet

Nivå ÖK stålbalk (y_1 = 0 m)

s´	S_1								
	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	Typ 9
0	58861	12585	70245	12585	89059	12585	89059	12585	0
6.92:V	63278	14356	74462	14356	92275	14356	92275	14356	0
6.92:H	66717	15260	78364	15260	96824	15260	96824	15260	0
28.06:V	66717	15260	78364	15260	96824	15260	96824	15260	0
28.06:H	61431	12251	74637	12251	97537	12251	97537	12251	0
35.15:V	57750	11086	70904	11086	94385	11086	94385	11086	0
35.15:H	57750	11086	70904	11086	94385	11086	94385	11086	0
42.24:V	61431	12251	74637	12251	97537	12251	97537	12251	0
42.24:H	66717	15260	78364	15260	96824	15260	96824	15260	0
63.38:V	66717	15260	78364	15260	96824	15260	96824	15260	0
63.38:H	63278	14356	74462	14356	92275	14356	92275	14356	0
70.300	58861	12585	70245	12585	89059	12585	89059	12585	0
m	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3

Nivå övre halssvets ($y_2 = - t_{öfl}$)

s´	S_2								
	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	Typ 9
0	64664	24503	74544	24503	90872	24503	90872	24503	13581
6.92:V	68497	26040	78204	26040	93663	26040	93663	26040	13581
6.92:H	72079	27326	82208	27326	98263	27326	98263	27326	14054
28.06:V	72079	27326	82208	27326	98263	27326	98263	27326	14054
28.06:H	77643	43961	86687	43961	102370	43961	102370	43961	35570
35.15:V	75121	43163	84130	43163	100212	43163	100212	43163	35570
35.15:H	75121	43163	84130	43163	100212	43163	100212	43163	35570
42.24:V	77643	43961	86687	43961	102370	43961	102370	43961	35570
42.24:H	72079	27326	82208	27326	98263	27326	98263	27326	14054
63.38:V	72079	27326	82208	27326	98263	27326	98263	27326	14054
63.38:H	68497	26040	78204	26040	93663	26040	93663	26040	13581
70.300	64664	24503	74544	24503	90872	24503	90872	24503	13581
m	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3

Tvärsnittskonstanter samverkansbalk

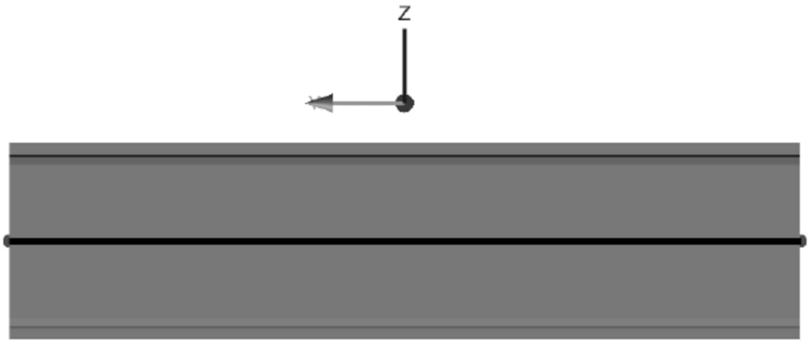
Nivå undre halssvets ($y_3 = - h_{stål} + t_{ufl}$)

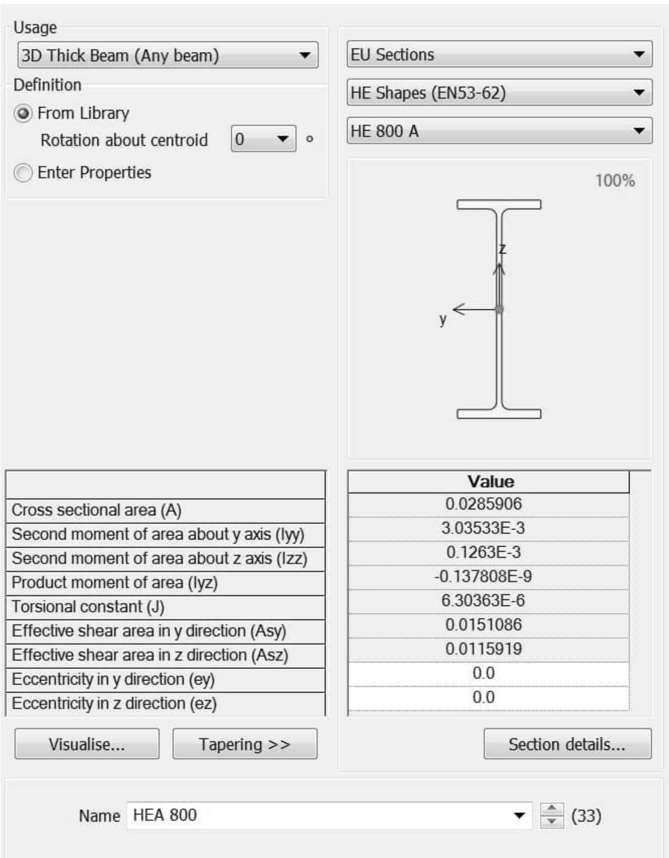
s´	S_3								
	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	Typ 9
0	53402	30166	59118	30166	68565	30166	68565	30166	23847
6.92:V	55620	31055	61235	31055	70179	31055	70179	31055	23847
6.92:H	61082	32776	67488	32776	77643	32776	77643	32776	24382
28.06:V	61082	32776	67488	32776	77643	32776	77643	32776	24382
28.06:H	62591	42960	67862	42960	77003	42960	77003	42960	38070
35.15:V	61121	42495	66372	42495	75744	42495	75744	42495	38070
35.15:H	61121	42495	66372	42495	75744	42495	75744	42495	38070
42.24:V	62591	42960	67862	42960	77003	42960	77003	42960	38070
42.24:H	61082	32776	67488	32776	77643	32776	77643	32776	24382
63.38:V	61082	32776	67488	32776	77643	32776	77643	32776	24382
63.38:H	55620	31055	61235	31055	70179	31055	70179	31055	23847
70.300	53402	30166	59118	30166	68565	30166	68565	30166	23847
m	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3

2.3.3 Tvärbalkar (”Thick beam” / BMS3)

2.3.3.1 Typ ”Stod”

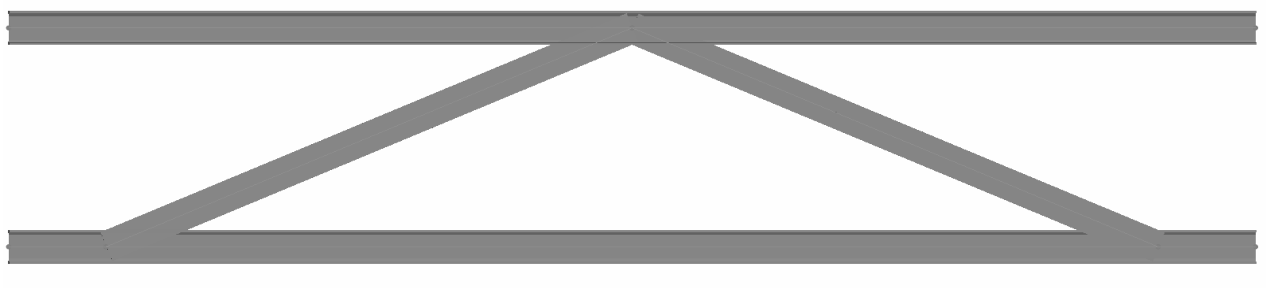
Tvärförband utgörs av en HEA 800 enligt figur nedan.



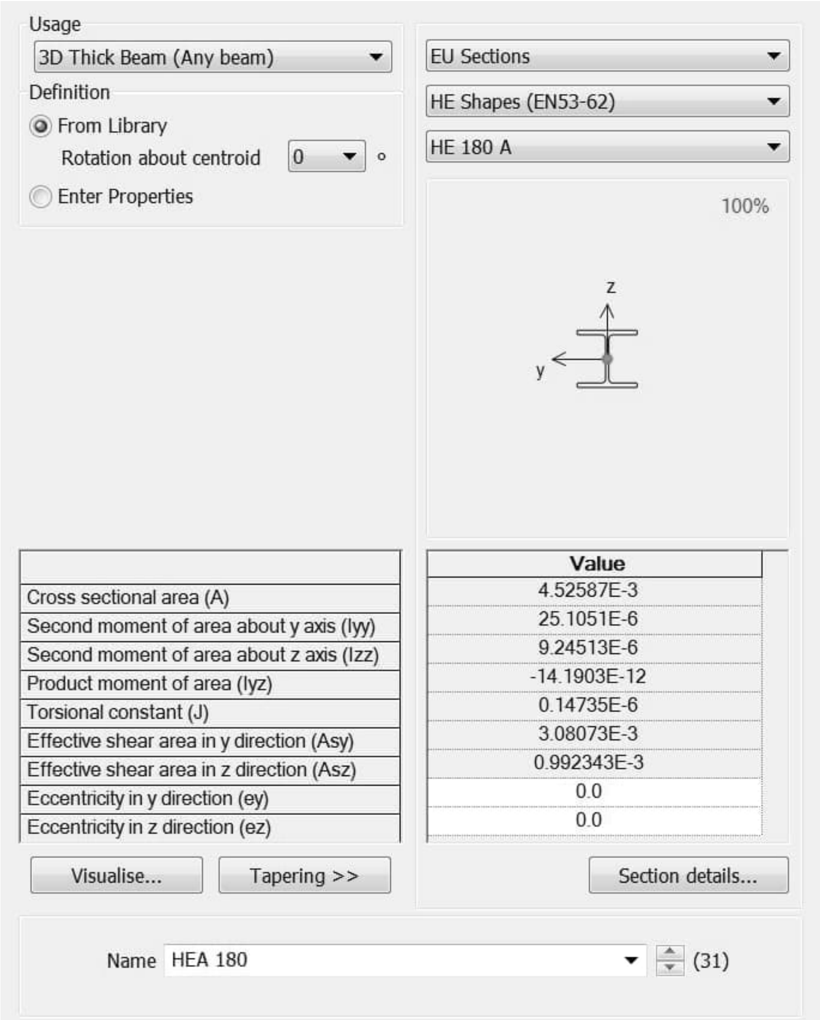


2.3.3.2 Typ 2

Tvärförband utgörs av 1 st överram, 1 st underram samt 2 st diagonaler enligt figur nedan.

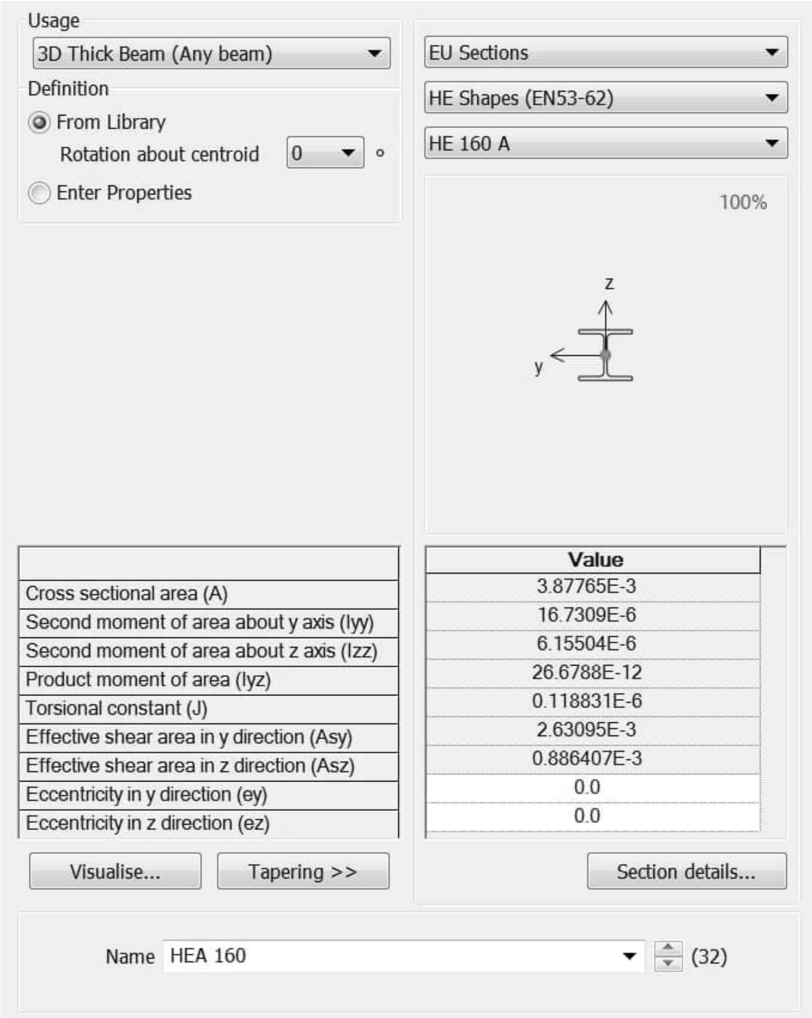


Överram (1 st) :

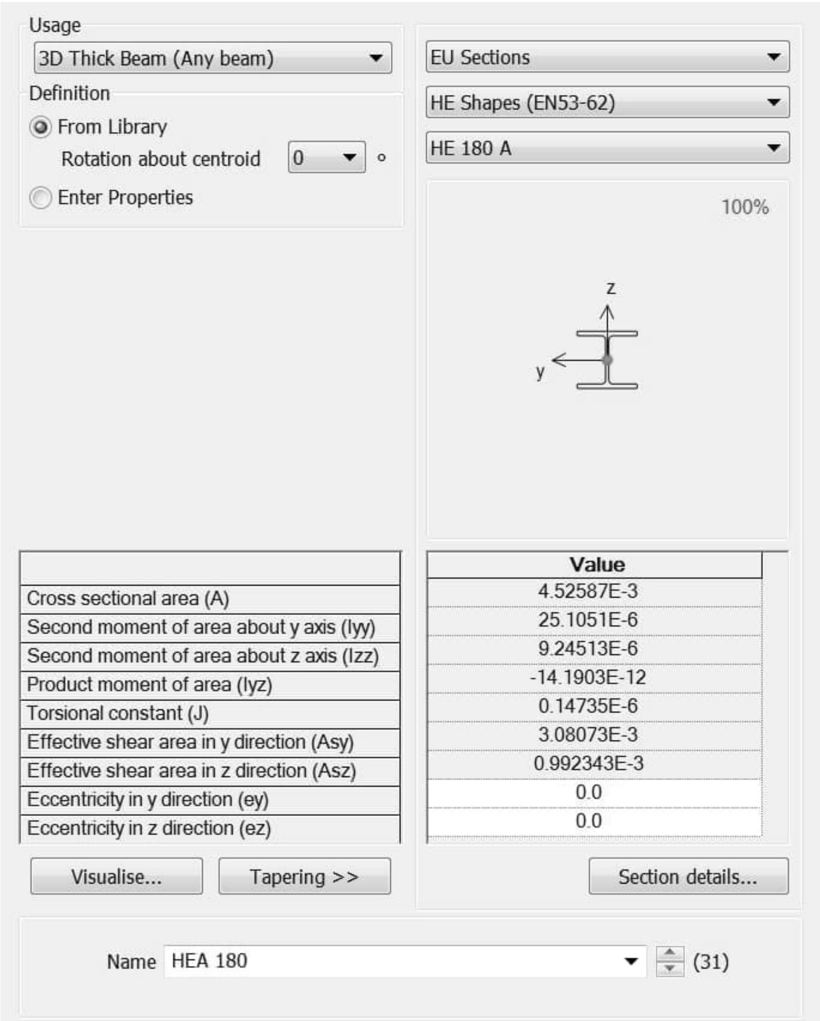


Usage
3D Thick Beam (Any beam)
Definition
From Library
Rotation about centroid
0
Enter Properties
EU Sections
HE Shapes (EN53-62)
HE 180 A
100%
z
y
Value
Cross sectional area (A) 4.52587E-3
Second moment of area about y axis (Iyy) 25.1051E-6
Second moment of area about z axis (Izz) 9.24513E-6
Product moment of area (Iyz) -14.1903E-12
Torsional constant (J) 0.14735E-6
Effective shear area in y direction (Asy) 3.08073E-3
Effective shear area in z direction (Asz) 0.992343E-3
Eccentricity in y direction (ey) 0.0
Eccentricity in z direction (ez) 0.0
Visualise...
Tapering >>
Section details...
Name
HEA 180
(31)

Diagonaler (2 st):



Underram (1 st) :



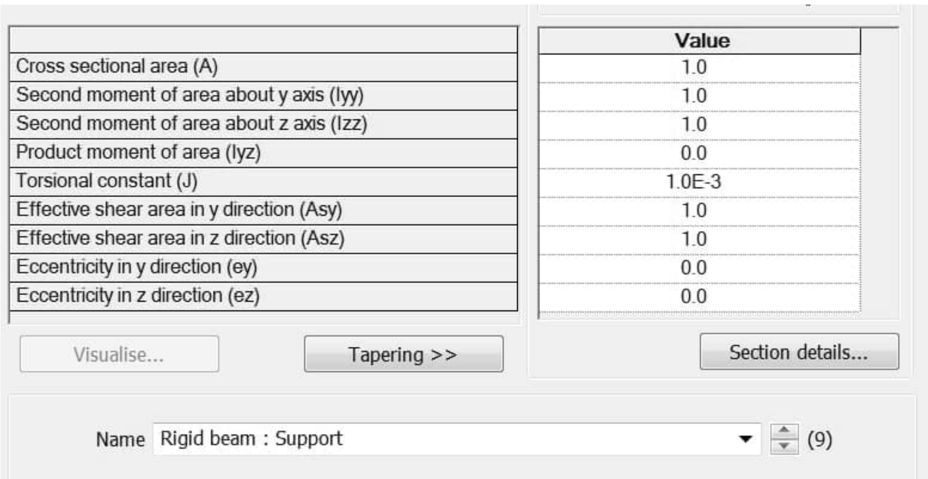
	Value
Cross sectional area (A)	4.52587E-3
Second moment of area about y axis (Iyy)	25.1051E-6
Second moment of area about z axis (Izz)	9.24513E-6
Product moment of area (Iyz)	-14.1903E-12
Torsional constant (J)	0.14735E-6
Effective shear area in y direction (Asy)	3.08073E-3
Effective shear area in z direction (Asz)	0.992343E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.0

Visualise... Tapering >> Section details...

Name HEA 180 (31)

2.3.5 Rigid beam: support (”Thick beam” / BMS3)

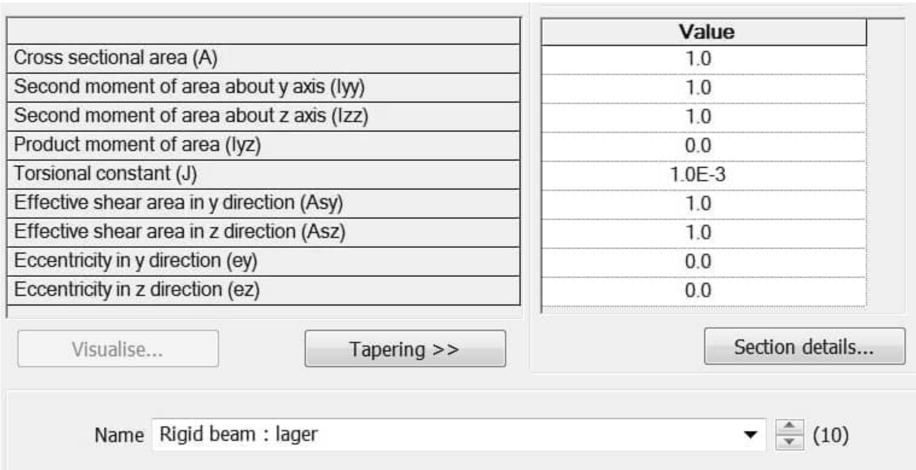
En fiktiv styv balk som används för förbinda lager till supernoder vid respektive stöd.



	Value
Cross sectional area (A)	1.0
Second moment of area about y axis (Iyy)	1.0
Second moment of area about z axis (Izz)	1.0
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.0E-3
Effective shear area in y direction (Asy)	1.0
Effective shear area in z direction (Asz)	1.0
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.0

2.3.6 Rigid beam : lager (”Thick beam” / BMS3)

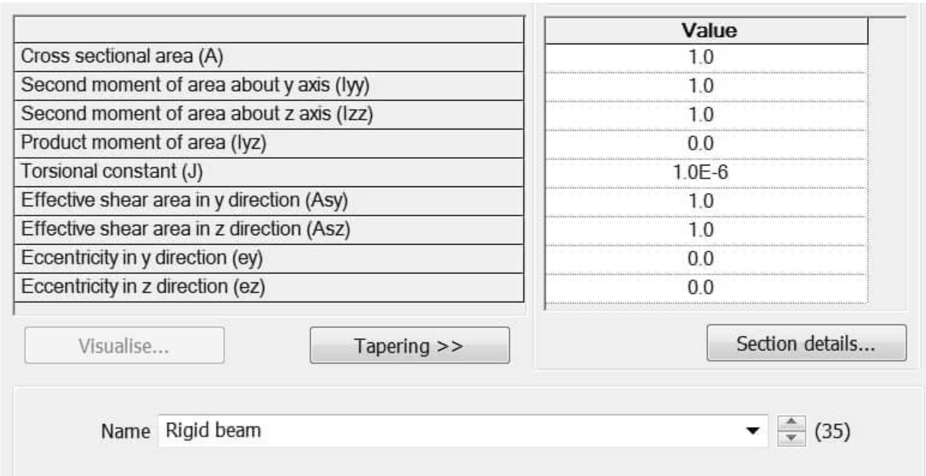
En fiktiv styv balk med försumbar vridstyvhet används för att förbinda huvudbalk med lager.



	Value
Cross sectional area (A)	1.0
Second moment of area about y axis (Iyy)	1.0
Second moment of area about z axis (Izz)	1.0
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.0E-3
Effective shear area in y direction (Asy)	1.0
Effective shear area in z direction (Asz)	1.0
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.0

2.3.7 Rigid beam (”Thick beam” / BMS3)

En fiktiv styv balk med försumbar vridstyvhet används för att förbinda tvärförband med huvudbalk.

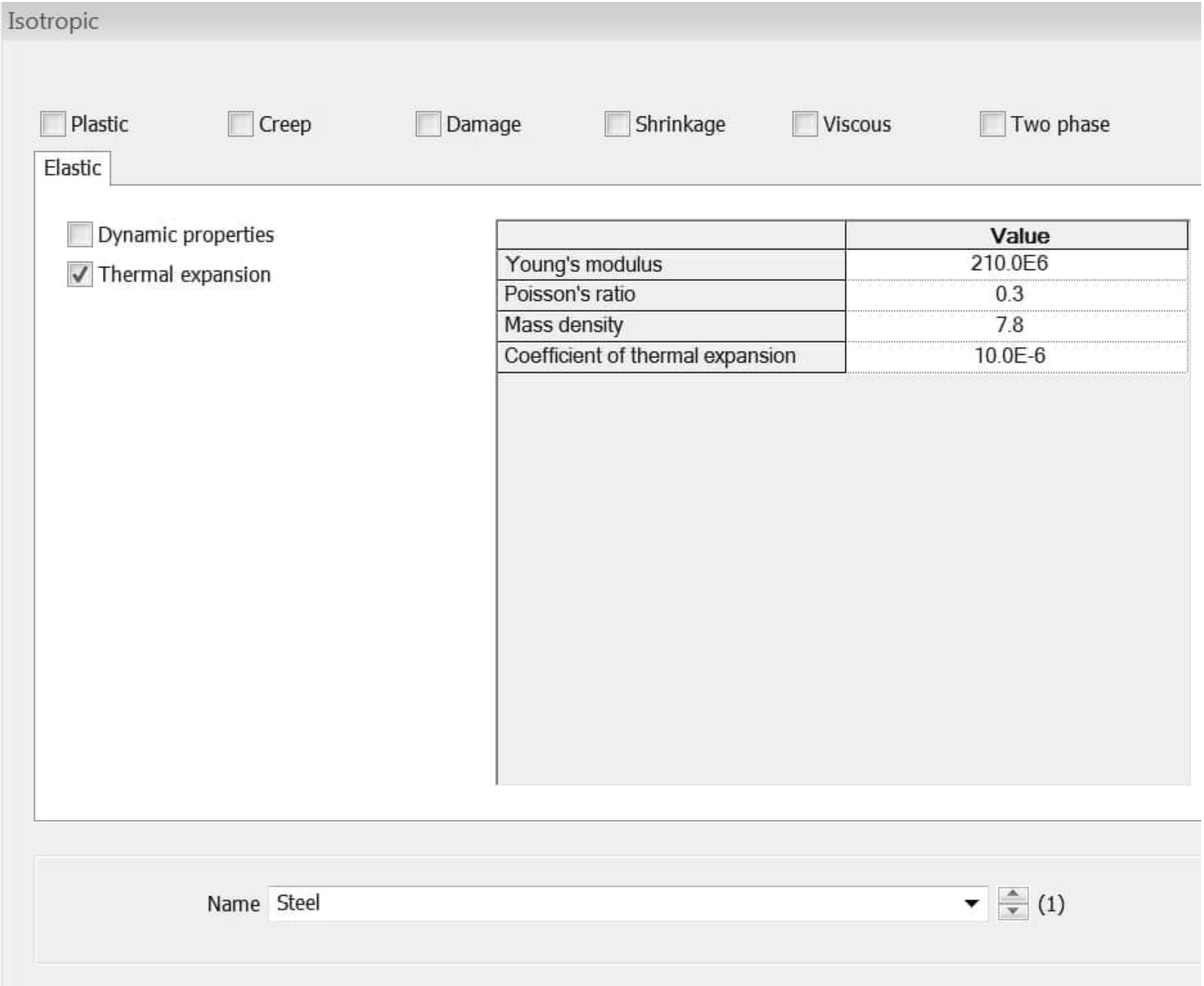


	Value
Cross sectional area (A)	1.0
Second moment of area about y axis (Iyy)	1.0
Second moment of area about z axis (Izz)	1.0
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.0E-6
Effective shear area in y direction (Asy)	1.0
Effective shear area in z direction (Asz)	1.0
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.0

2.4 MATERIAL

2.4.1 Stål

Stål : $E_s = 210$ GPa



Anm. I ett sent konstruktionsskede påträffades avvikelse vid val längdkoefficient då $\alpha = 10^{-5}$ tillämpats istället för $1.2 \cdot 10^{-5}$. Avvikelse anses försumbar.

2.4.2 Betong

Totalt förekommer 7 skeden varav 5 st byggskeden och två driftskede. Med hänsyn till detta varierar farbanans materialegenskaper.

Det förekommer två typer av betong beroende på hurvida betong våt eller inte enligt redovisning nedan :

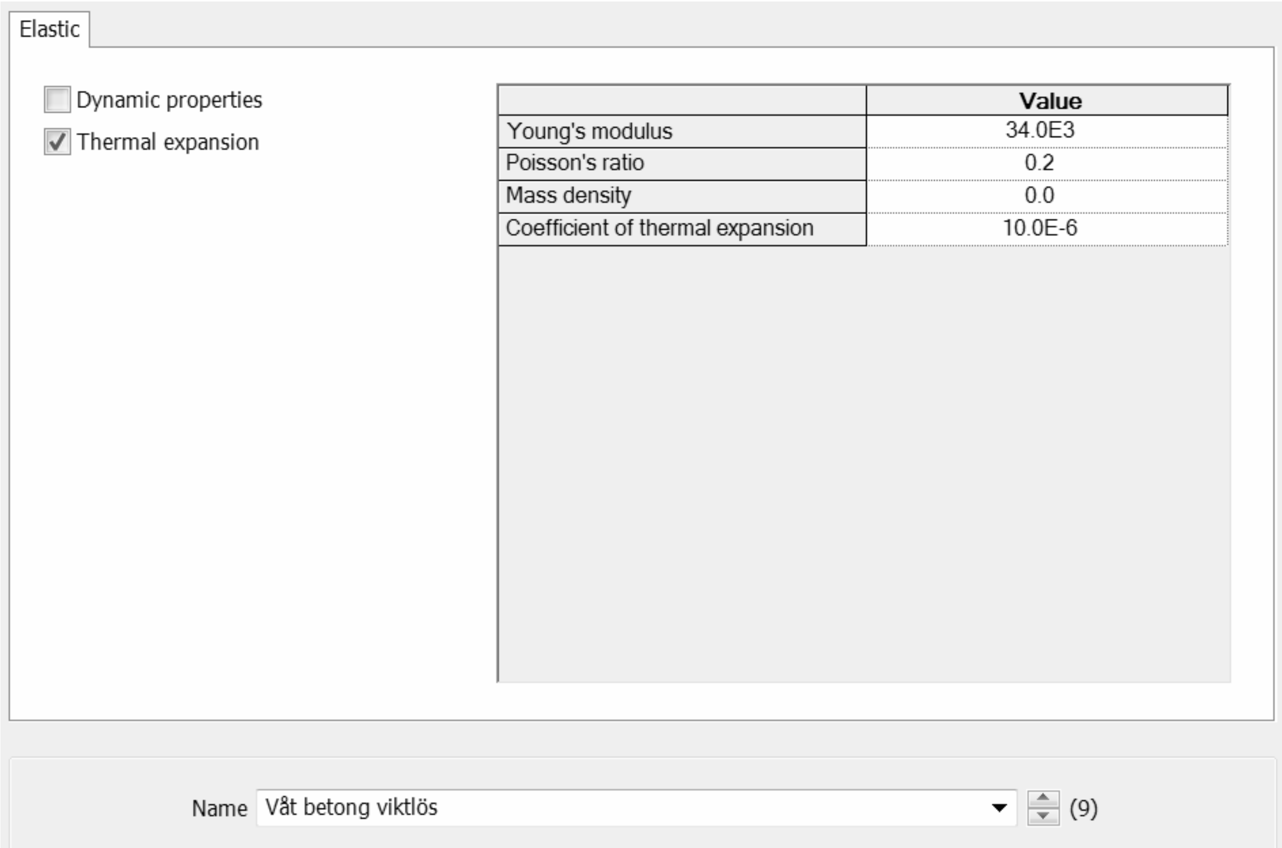
- Våt betong viktlös (isotrop)
- Betong viktlös (ortotrop)

Betong C35/45 i överbyggnad : $E_{cm} = 34 \cdot 10^6$ kPa

2.4.2.1 Material : Våt betong viktlös

Den isoptropa betongen har försumbar (E_{cm}/1000). Materialet modelleras såsom viktlös.

$E = 34 \cdot 10^3$ kPa


Elastic

Dynamic properties

Thermal expansion

	Value
Young's modulus	34.0E3
Poisson's ratio	0.2
Mass density	0.0
Coefficient of thermal expansion	10.0E-6

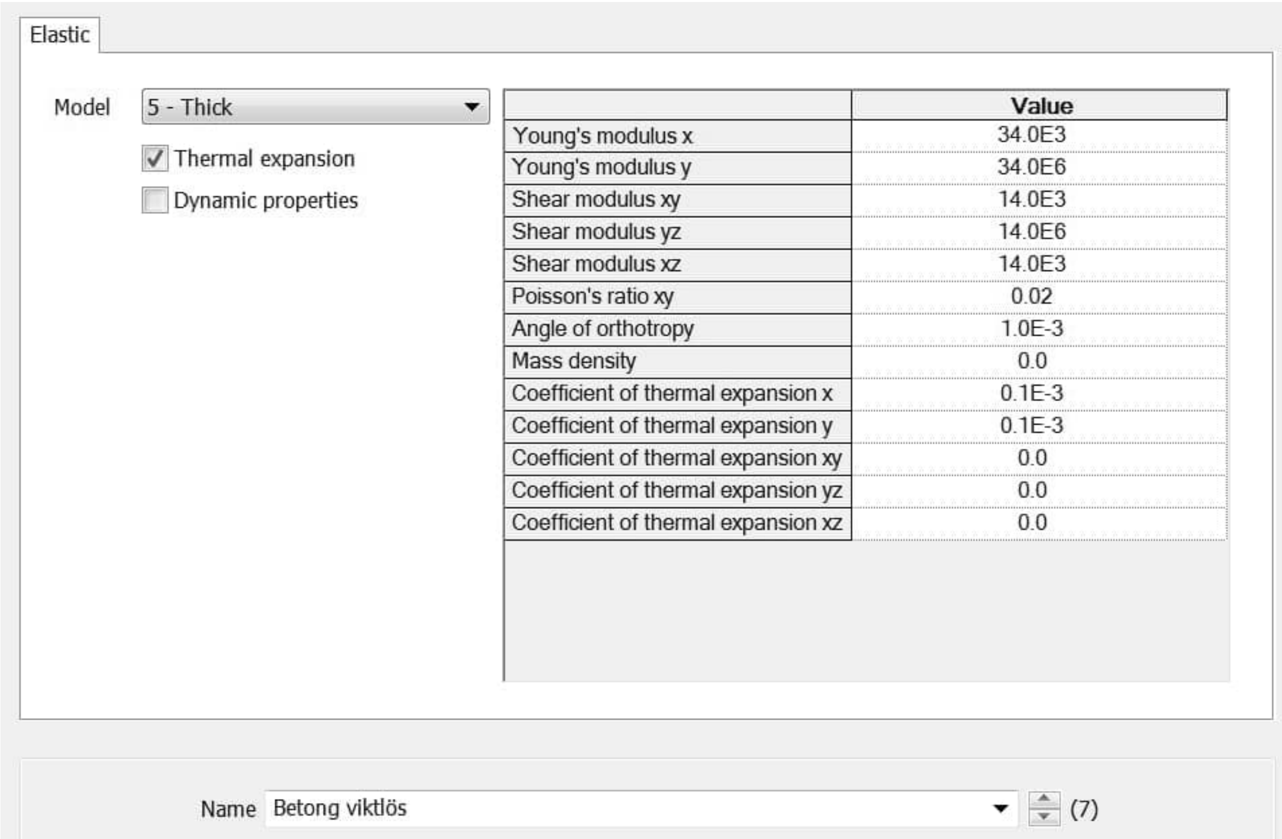
Name Våt betong viktlös (9)

2.4.2.2 Material : Betong viktlös

Den ortotropa betongen har försumbar styvhet i längsled (X-riktning). Materialet modelleras såsom viktlös.

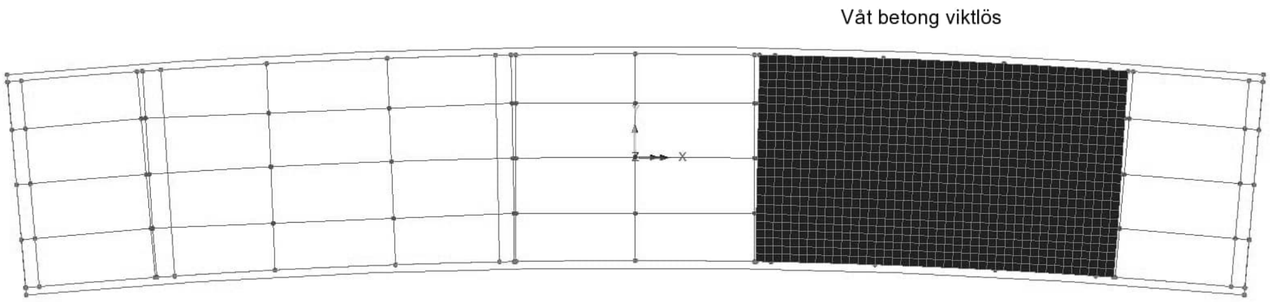
$E_x = 34 \cdot 10^3$ kPa

$E_y = 34 \cdot 10^6$ kPa

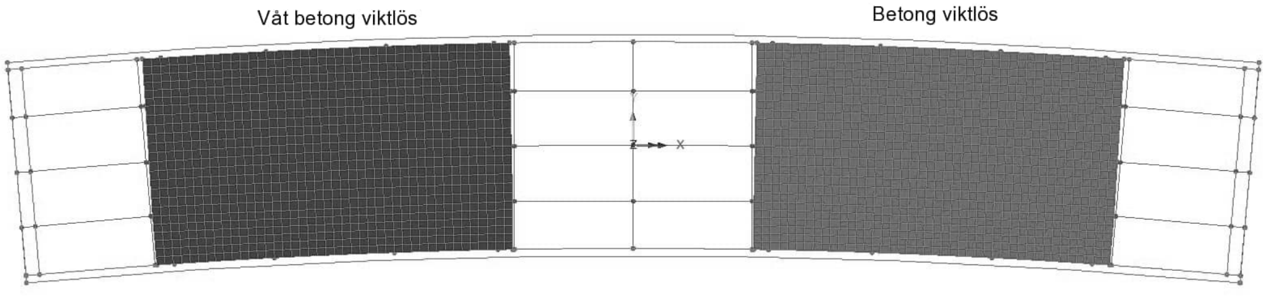


	Value
Young's modulus x	34.0E3
Young's modulus y	34.0E6
Shear modulus xy	14.0E3
Shear modulus yz	14.0E6
Shear modulus xz	14.0E3
Poisson's ratio xy	0.02
Angle of orthotropy	1.0E-3
Mass density	0.0
Coefficient of thermal expansion x	0.1E-3
Coefficient of thermal expansion y	0.1E-3
Coefficient of thermal expansion xy	0.0
Coefficient of thermal expansion yz	0.0
Coefficient of thermal expansion xz	0.0

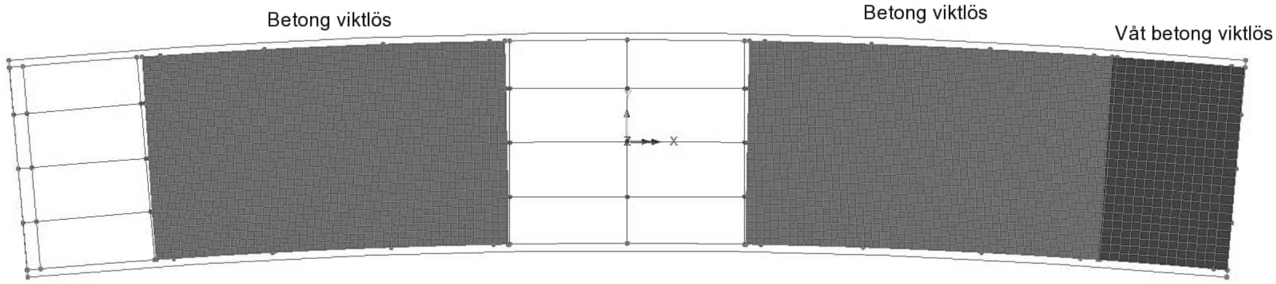
2.4.2.3 *Analysis 1 (Gjut 1)*



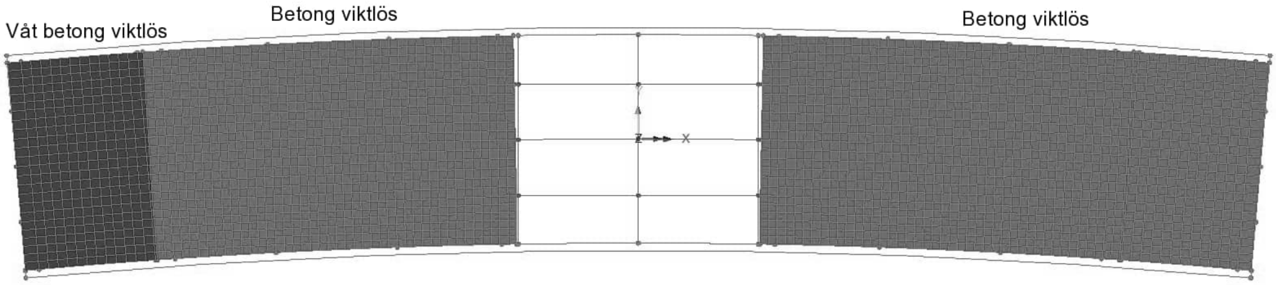
2.4.2.4 *Analysis 2 (Gjut 2)*



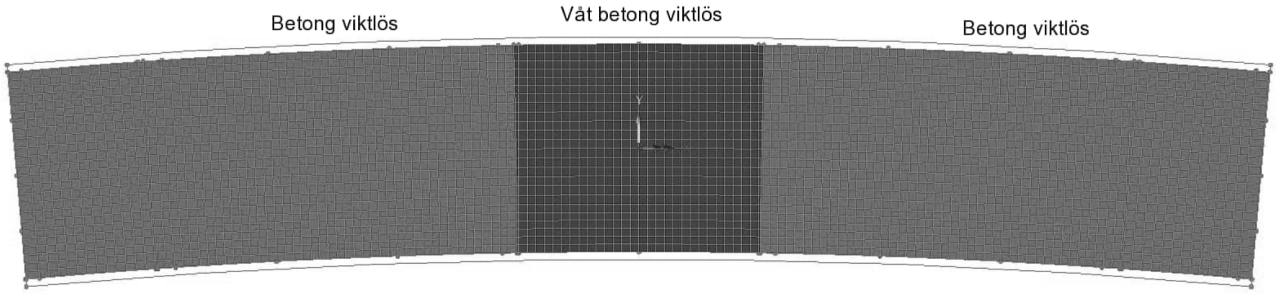
2.4.2.5 *Analysis 3 (Gjut 3)*



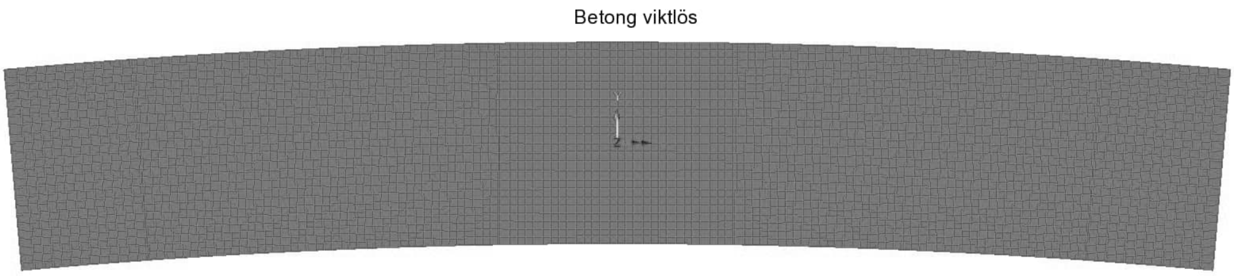
2.4.2.6 *Analysis 4 (Gjut 4)*



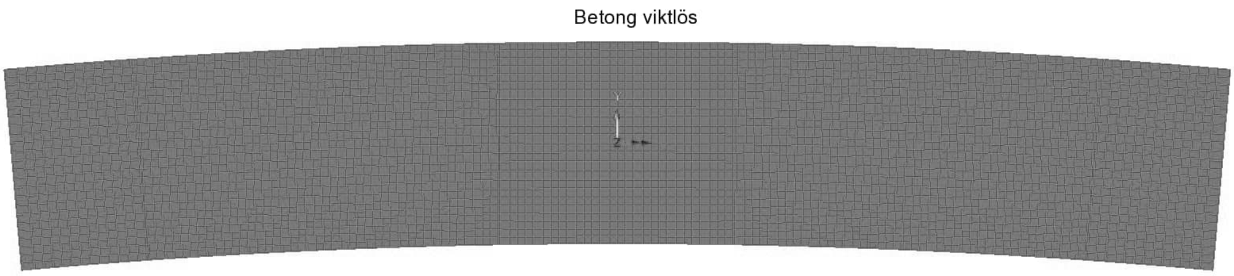
2.4.2.7 *Analysis 5 (Gjut 5)*



2.4.2.8 *Analysis 6 (DRIFT-P)*

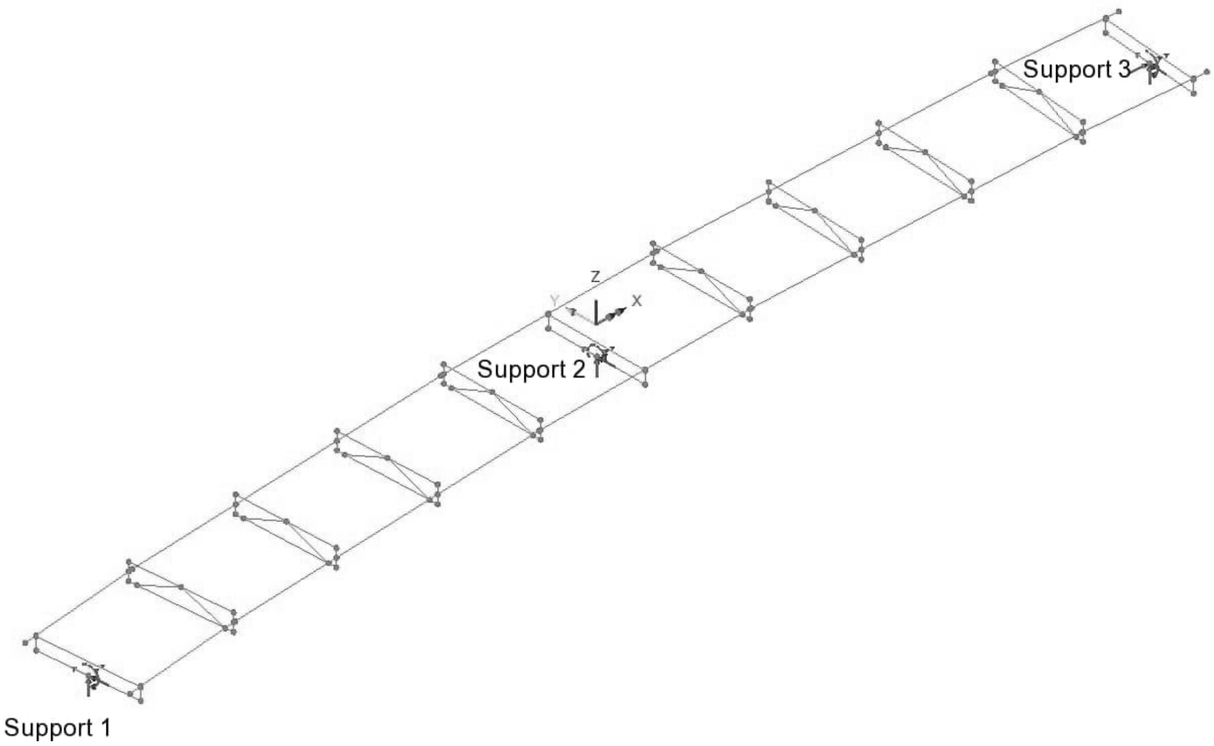


2.4.2.9 *Analysis 7 (DRIFT-V)*



2.5 RANDVILLKOR

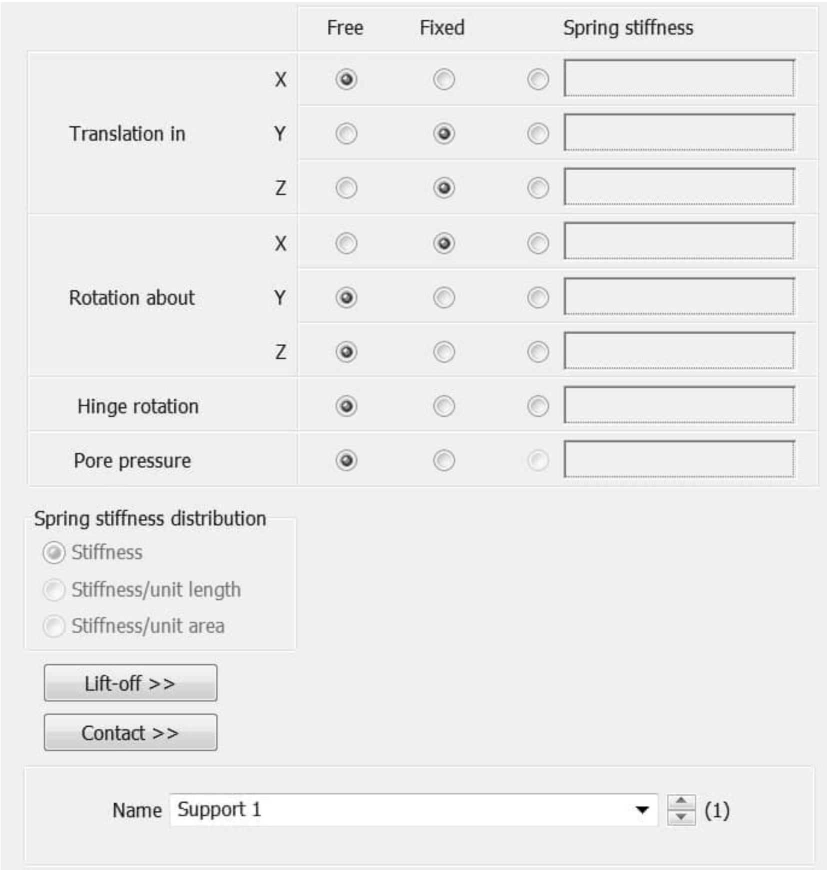
Randvillkor för ”supernoder” vid respektive stöd.



Översikt 3D

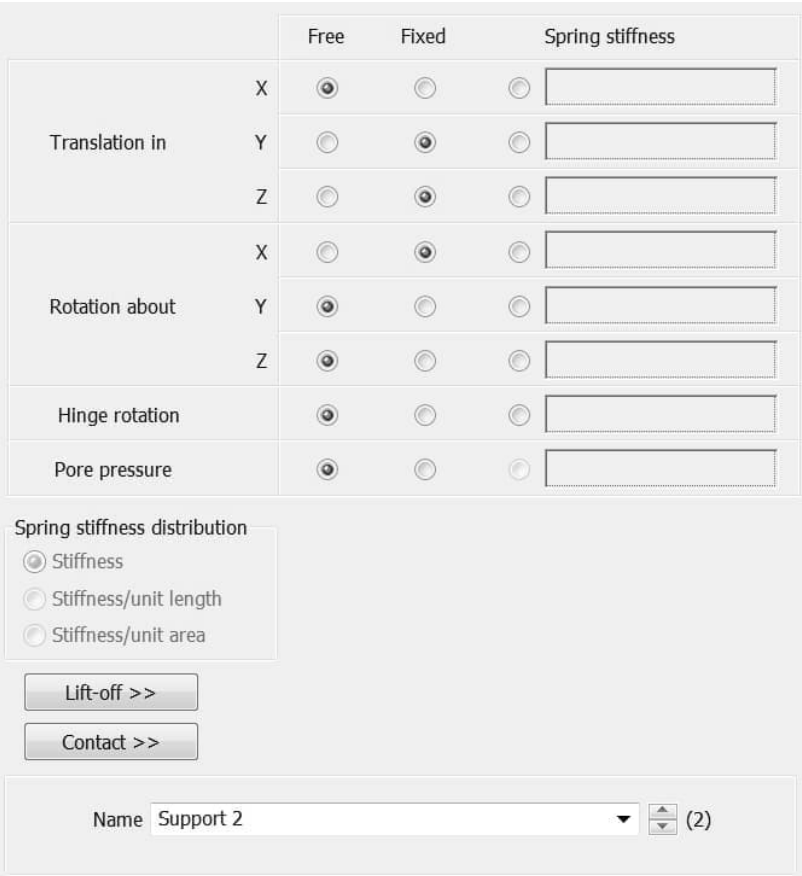
2.5.1 Randvillkor : stöd 1

Lagren är utförda såsom ensidigt rörliga lager i längsled (X-riktning).



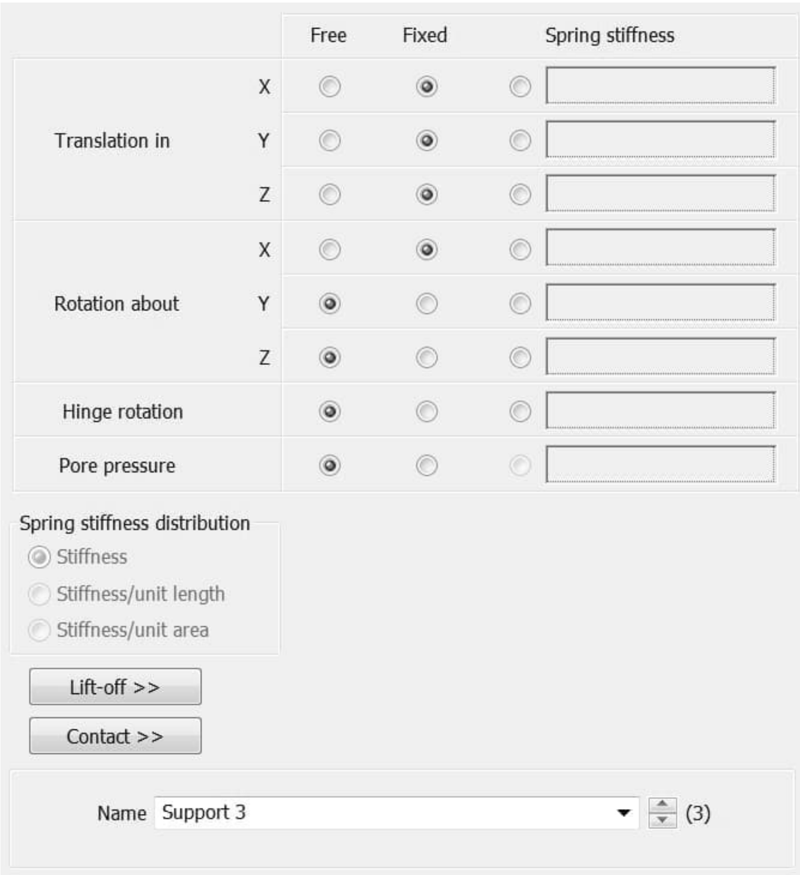
2.5.2 Randvillkor : stöd 2

Lagren är utförda såsom ensidigt rörliga lager i längsled (X-riktning).



2.5.3 Randvillkor : stöd 3

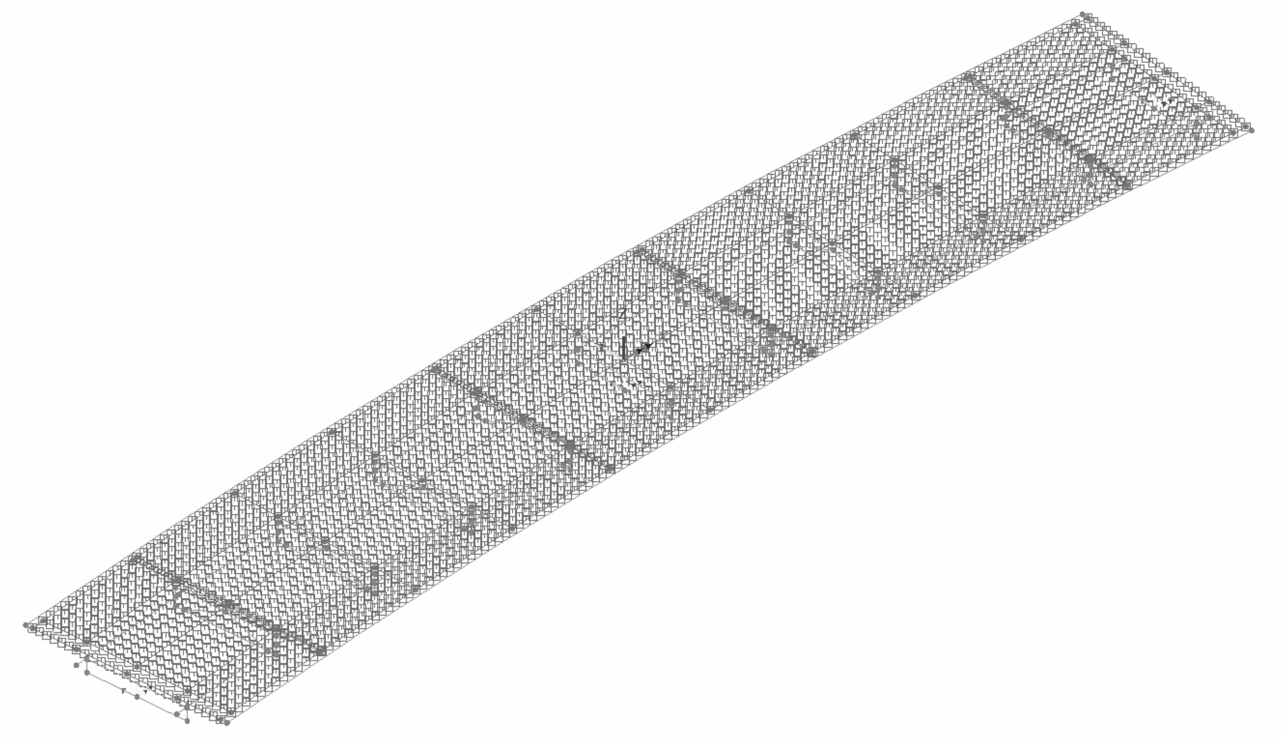
Lagren är utförda såsom fasta lager.



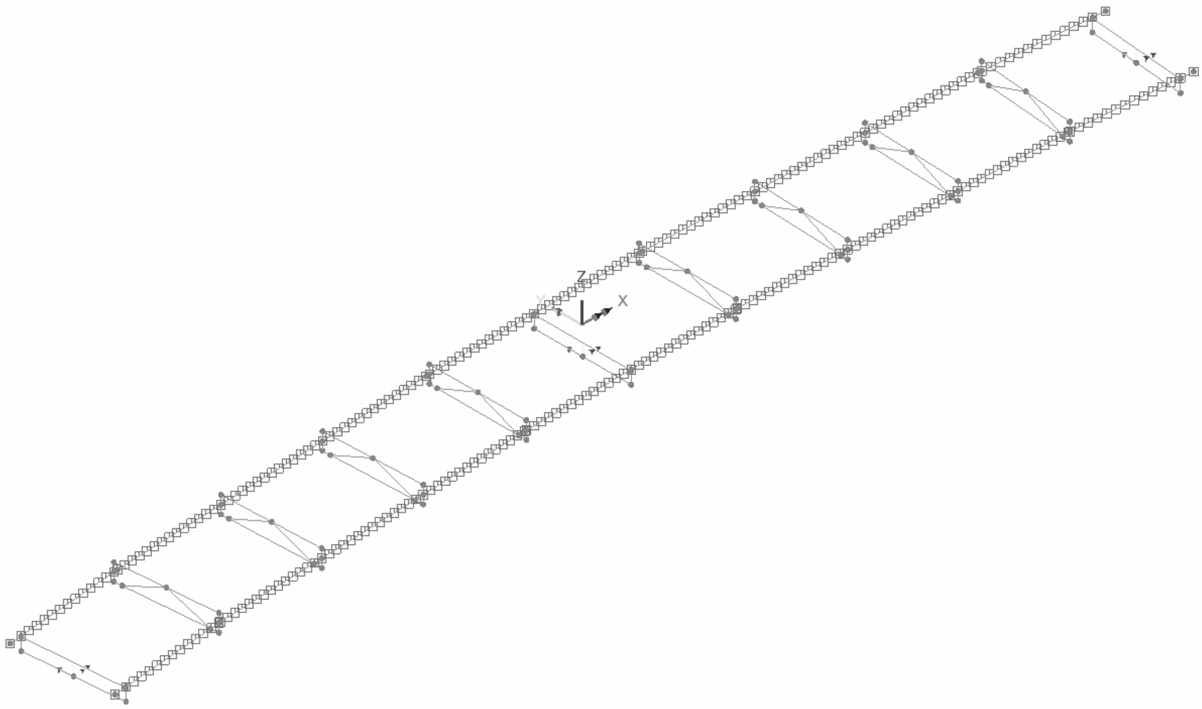
2.6 BELASTNINGSYTOR

Diskreta last kan påföras konstruktionen genom olika belastningsytor. Dessa betecknas *Search Area* i FEM-PROGRAM.

Konstruktionsdel : *Deck*



Konstruktionsdel : *Girder*



2.7 MESH

2.7.1 Skalelement (QTS4): linear

Skalement utför regelbundna. Det förekommer totalt 5 st elementtyper enligt redovisning nedan.

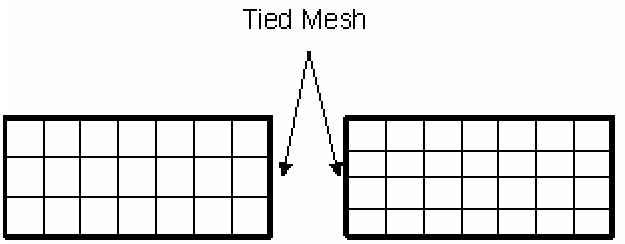
Typ	x-divisions	y-divisions
Element 1 x 6	1	6
Element 12 x 6	12	6
Element 14 x 6	14	6

2.7.2 Balklelement (BMI21) : linear

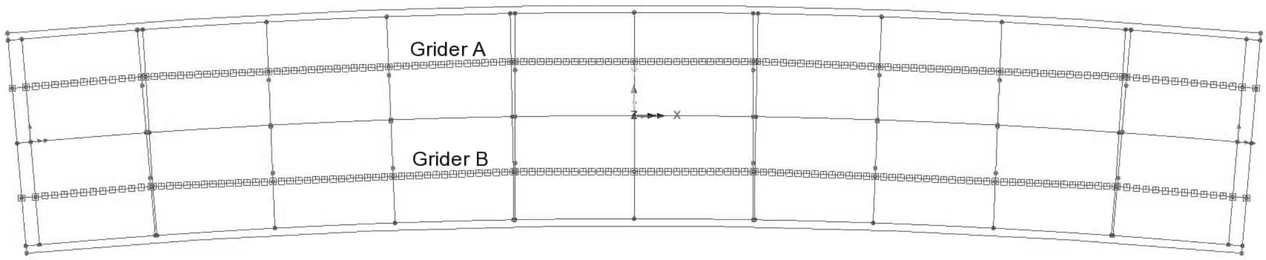
Typ	Divisions	End release: Start	End release: End	Konstruktionsdel
Element 1	1	None	None	Huvudbalk
Element 12	12	None	None	-”-
Element 14	14	None	None	-”-
Element 2	2	None	None	Rigid beams
BEAM x 1 : Pinned (start)	1	Pinned	None	Tvärförband typ F
BEAM x 1 : Pinned (end)	1	None	Pinned	Tvärförband typ F
BEAM x 2 : Pinned (start)	2	Pinned	None	Tvärförband typ F
BEAM x 2 : Pinned (end)	2	None	Pinned	Tvärförband typ F
BEAM x 2 : Pinned (both)	2	Pinned	Pinned	Tvärförband typ F

2.7.3 Anslutningar

Anslutning mellan farbana och huvudbalkar är utförda med stela länkar. Denna anslutning är av typen *Contraint : Tied Mesh.*



Farbana utformas som *Master* medan *huvudbalkar* som *Slave.* Applicering sker genom att för ”drag-drop” *line Master* och därefter motsvarande för *line Slave.*



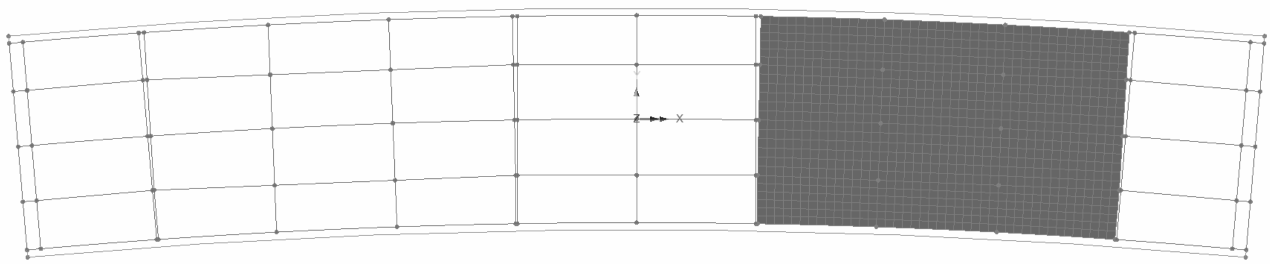
2.8 ETAPPVISUTBYGGNAD

Totalt förekommer 6 skeden varav 4 st byggskeden och två driftskede. I de olika skedena aktiveras/deaktiveras farbanan. Förändring utförs i förhållande till system 6 (Base Analysis).

Detta hanteras genom tillämpa ”Deactivate” i förekommande skeden. Vid applicering på statiskt system måste tilldelning sker för varje enskilt lastfall.

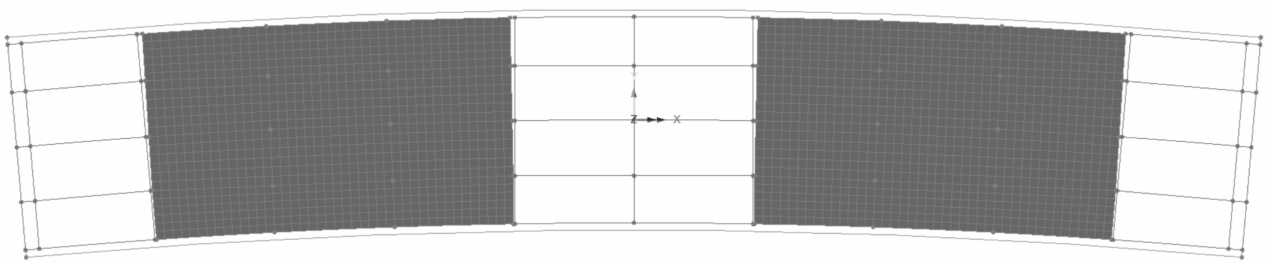
2.8.1 *Analysis 1 (Gjut 1)*

Deactivate : Gjutetapp II-V



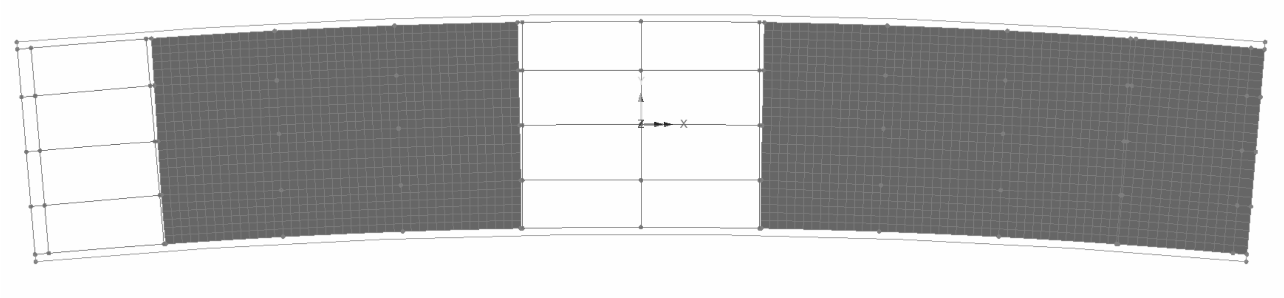
2.8.2 *Analysis Stage II (Gjut 2)*

Deactivate : Gjutetapp III-V



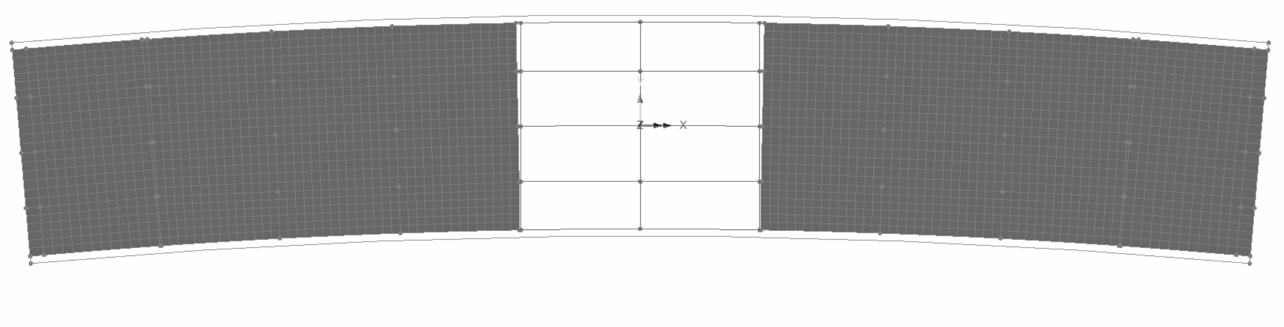
2.8.3 *Analysis 3 (Gjut 3)*

Deactivate : Gjutetapp IV-V



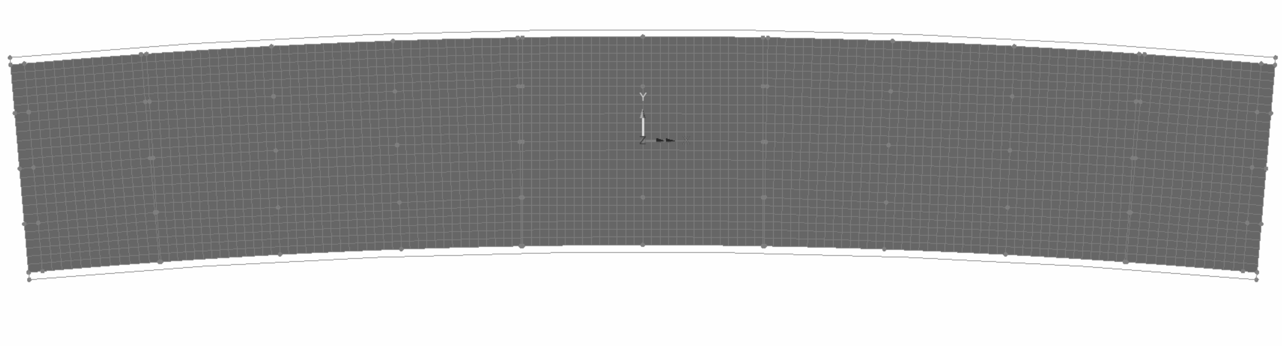
2.8.4 *Analysis 4 (Gjut 4)*

Deactivate : Gjutetapp V



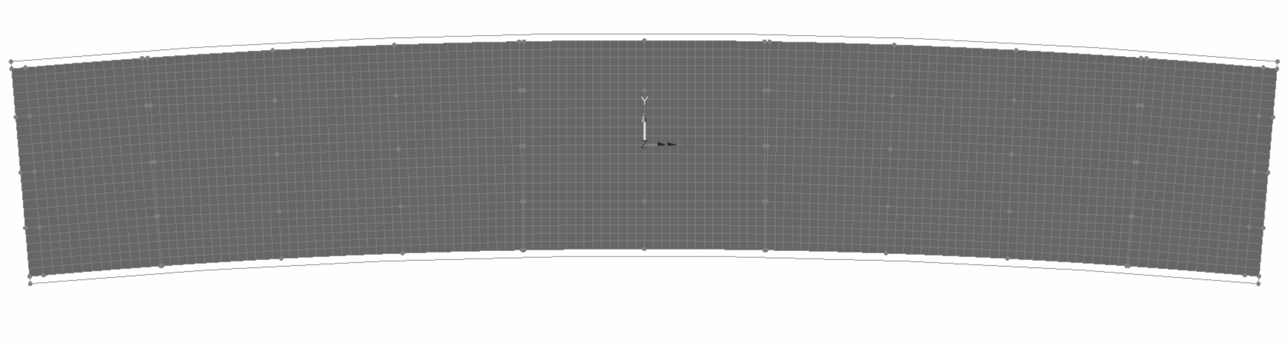
2.8.5 *Analysis 5 (Gjut 5)*

Deactivate : None



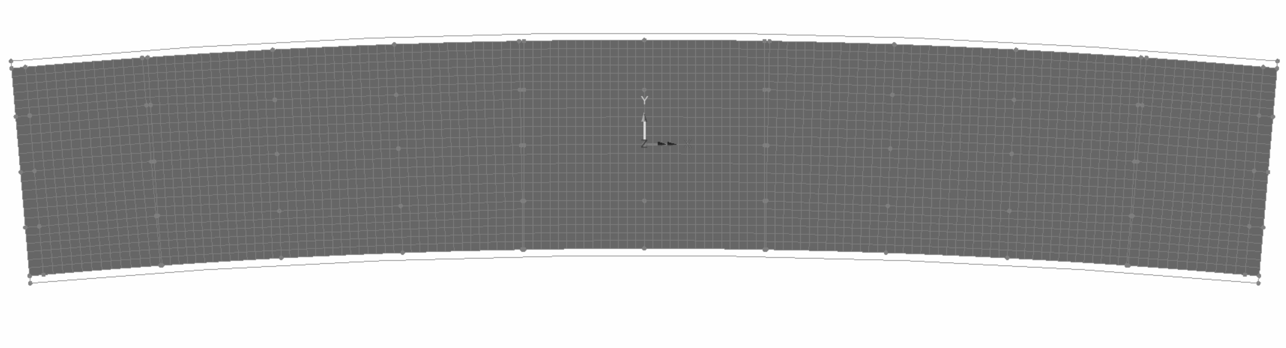
2.8.6 *Analysis 6 (DRIFT-P)*

Deactivate : None



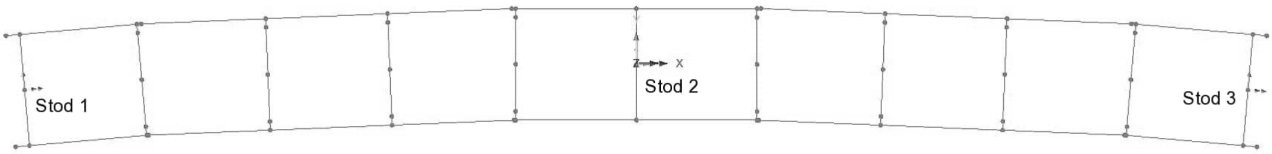
2.8.7 *Analysis 7 (DRIFT-V)*

Deactivate : None

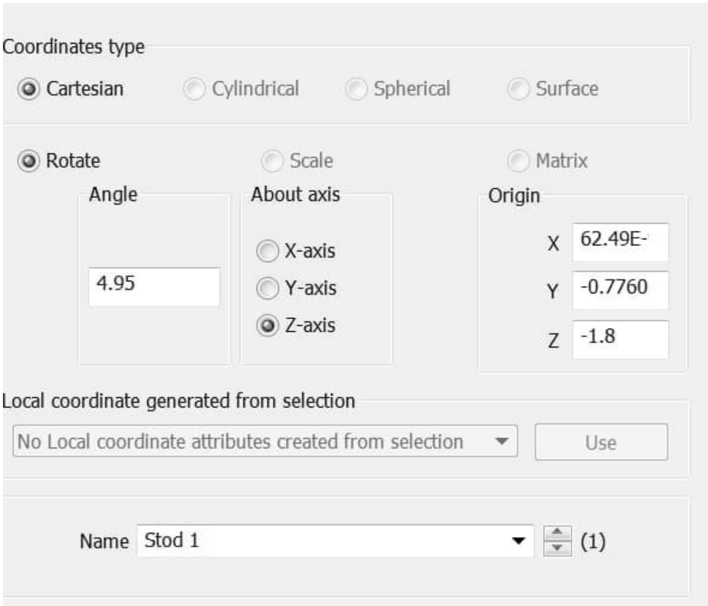


2.9 LOKALA KOORDINATSYSTEM

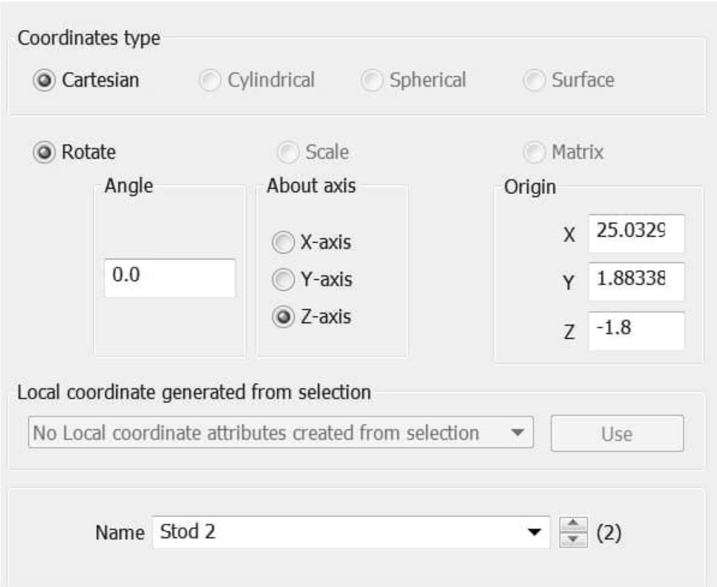
Vid tilldelning av laster och randvillkor används lokala koordinatsystem vid respektive stodlinje enligt redovisning nedan.



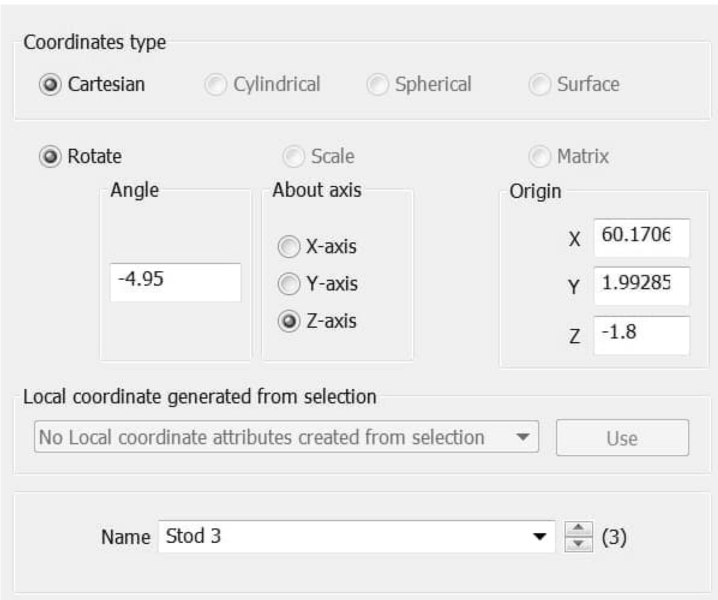
Koordinatsystem "Stod 1" :



Koordinatsystem "Stod 2" :

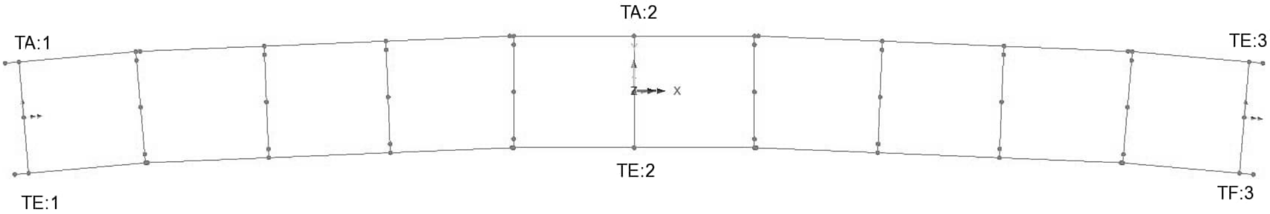


Koordinatsystem "Stod 3" :

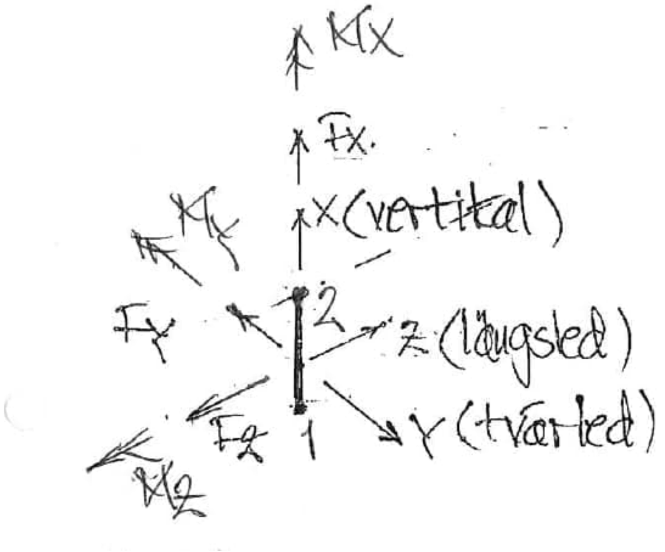


2.9 LAGER

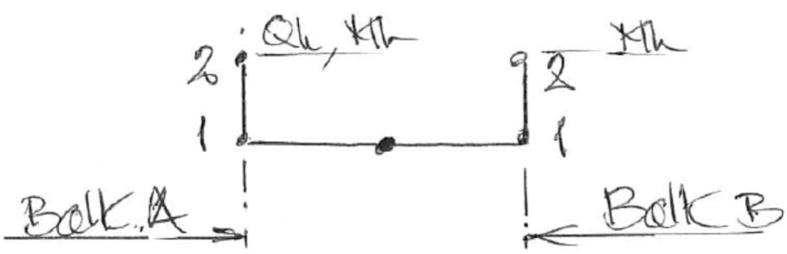
Lager är modellerade med villkor enligt nedan.



PLAN
Översikt

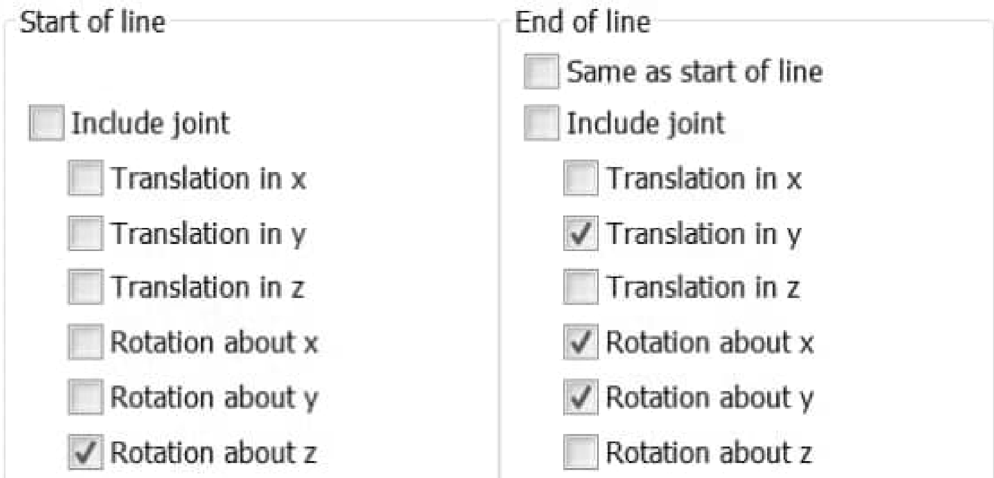


Principfigur

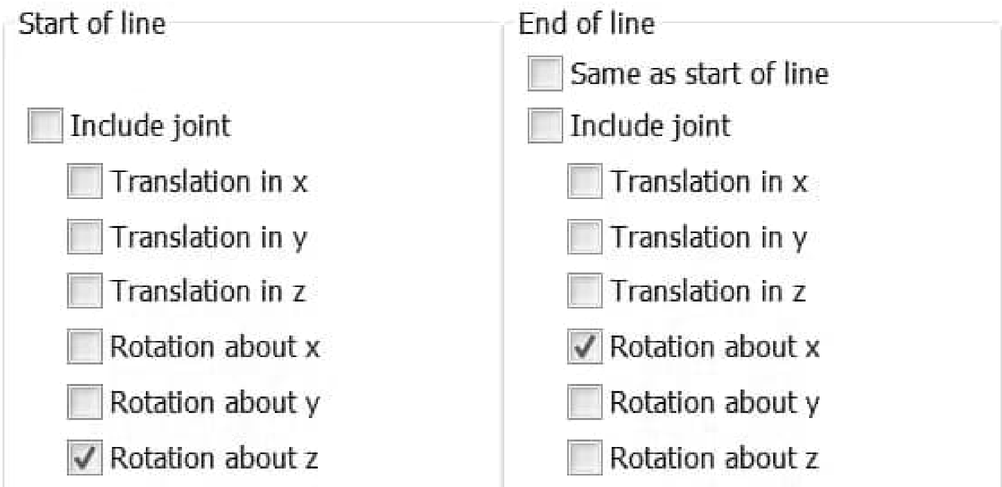


Randvillkor i tvärled

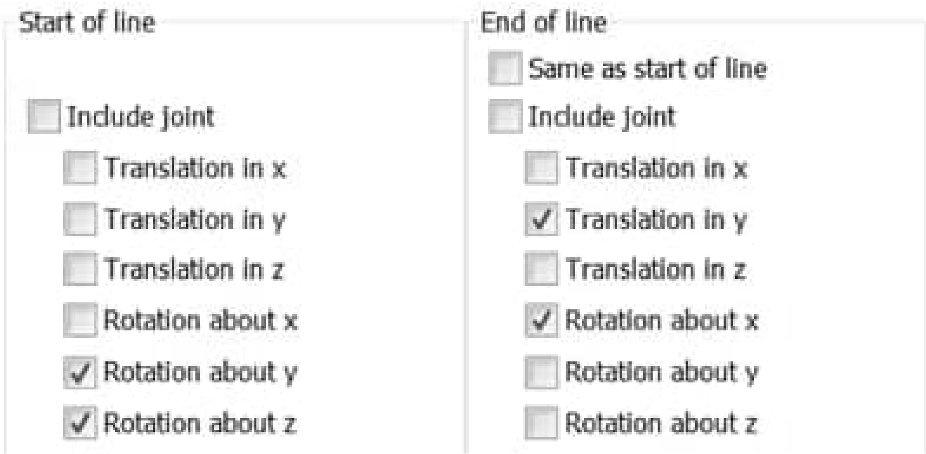
End releases "Element 1 – Lager balk A12" :



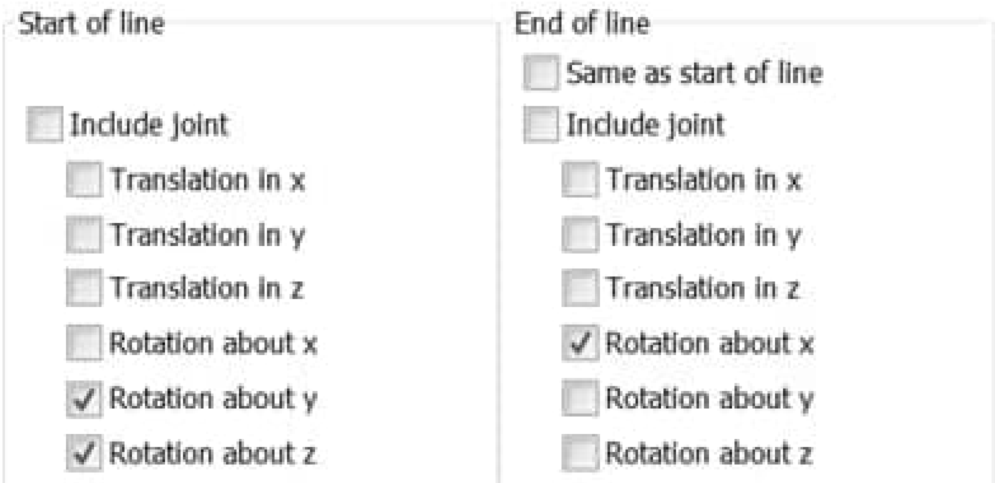
End releases "Element 1 – Lager balk B12" :



End releases "Element 1 – Lager balk A3" :



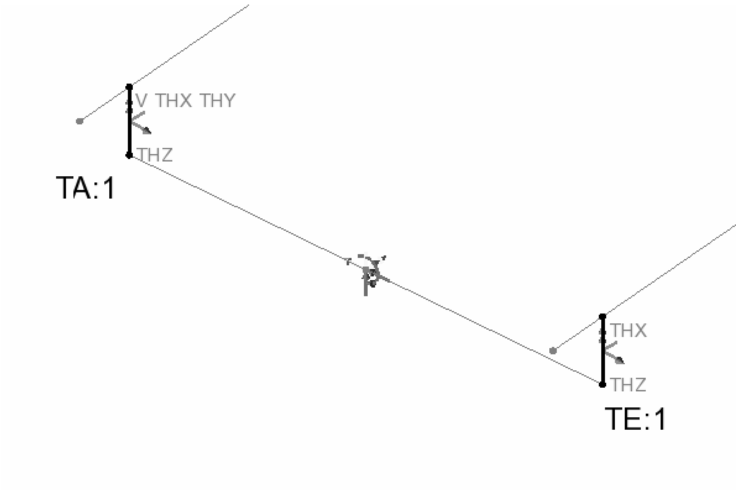
End releases "Element 1 – Lager balk B3" :



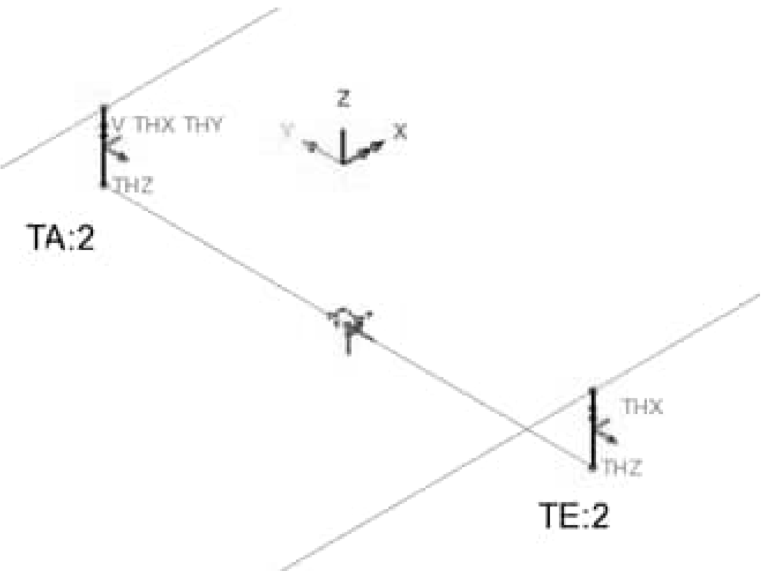
Sammanställning lager :

Stöd	Balk	Lager	β	Mesh	Geometric
1	A	TA:1	-4.95	Element 1 - Lager Balk A12	Rigid beam: lager
1	B	TE:1	-4.95	Element 1 - Lager Balk B12	Rigid beam: lager
2	A	TA:2	0	Element 1 - Lager Balk A12	Rigid beam: lager
2	B	TE:2	0	Element 1 - Lager Balk B12	Rigid beam: lager
3	A	TE:3	4.95	Element 1 - Lager Balk A3	Rigid beam: lager
3	B	TF:3	4.95	Element 1 - Lager Balk B3	Rigid beam: lager
-	-	-	deg	-	-

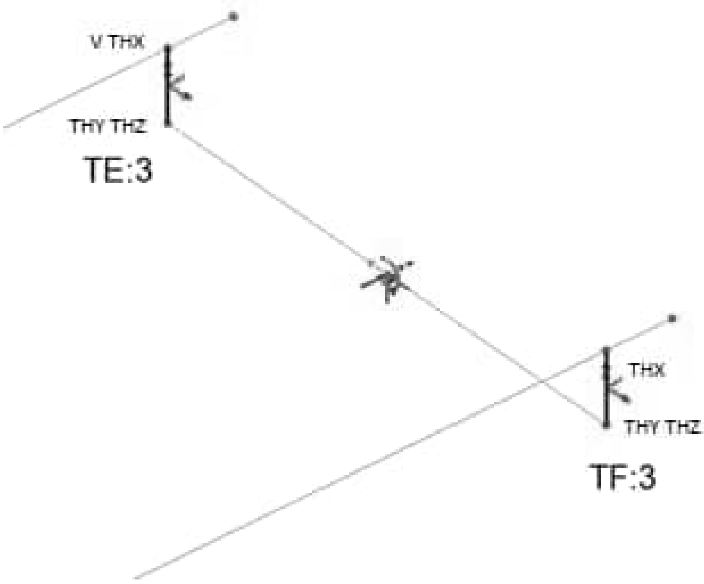
Lager ”Stod 1” :



Lager ”Stod 2” :



Lager ”Stod 3” :



3. LASTER

3.1 EGENTYNGD

$\gamma_c = 25 \cdot \frac{kN}{m^3}$: betong

$\gamma_s = 77 \cdot \frac{kN}{m^3}$: stål

3.1.1 Vikt stålbalkkonstruktion (EGEN_1-1)

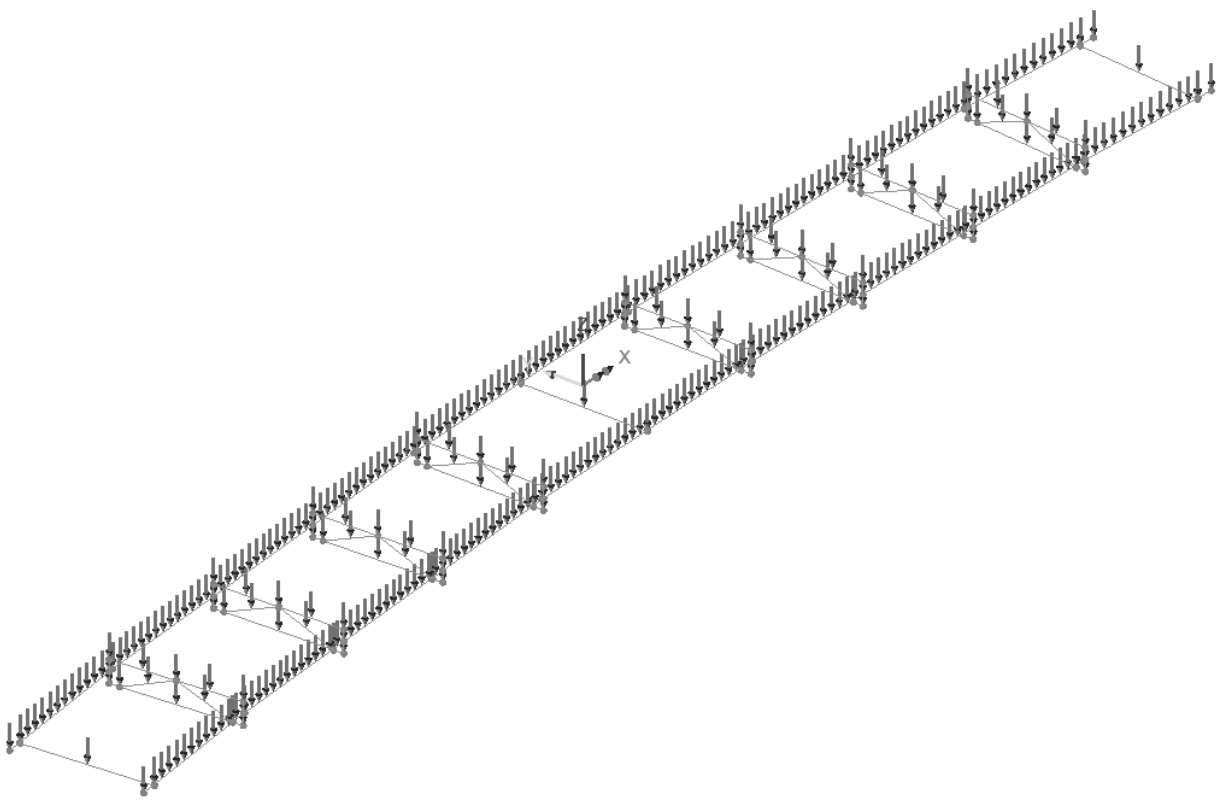
Load : EGEN 1-1

Structural loading : Body force

Linear acceleration in Z direction (a_z) : $-10\frac{m}{s^2}$

Loadcase : EGEN 1-1

Analys : Analysis 1 (Gjut 1)



3.1.2 Farbana gjutetapp I (EGEN_1-2)

$$q_z = t \cdot \gamma = 0.30m \cdot 25\frac{kN}{m^3} = -7.5\frac{kN}{m^2}$$

Load : EGEN 1-2

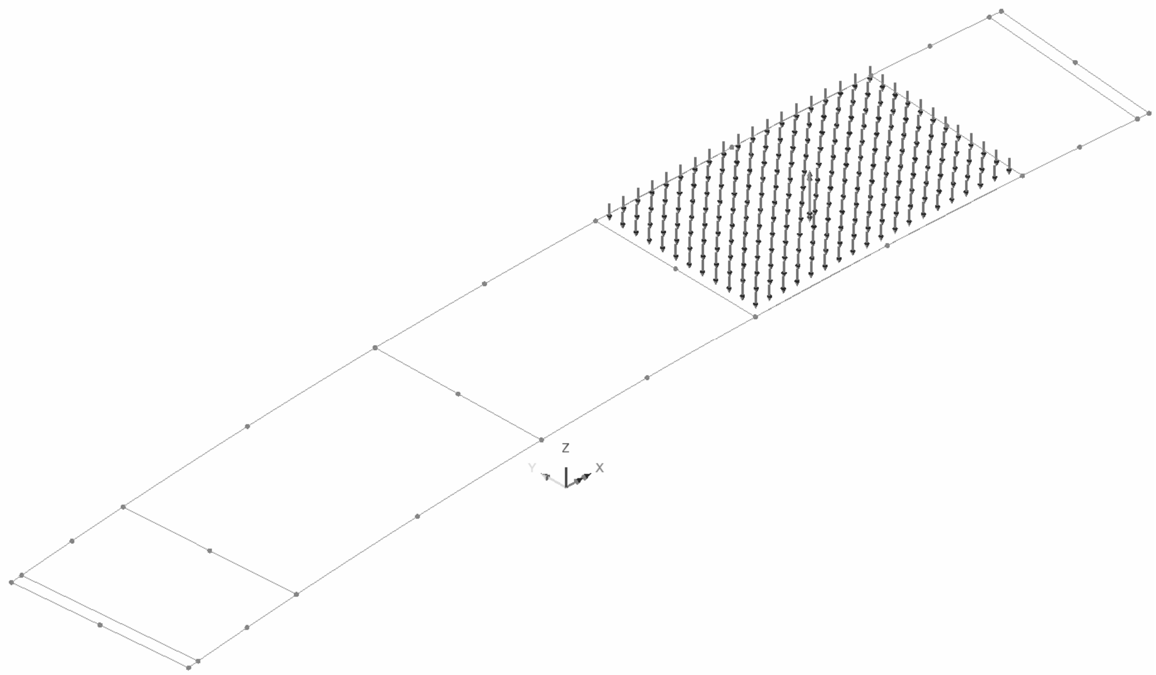
Discrete loading : 8 node patch

Point	X	Y	Z	q_z
1	8.119	5.919	+10	-7.5
2	17.832	5.610	+10	-7.5
3	27.535	5.069	+10	-7.5
4	27.130	-0.916	+10	-7.5
5	26.726	-6.903	+10	-7.5
6	17.307	-6.378	+10	-7.5
7	7.880	-6.078	+10	-7.5
8	7.999	-0.079	+10	-7.5
-	m	m	m	kPa

Search area : Deck

Loadcase : EGEN_1-2

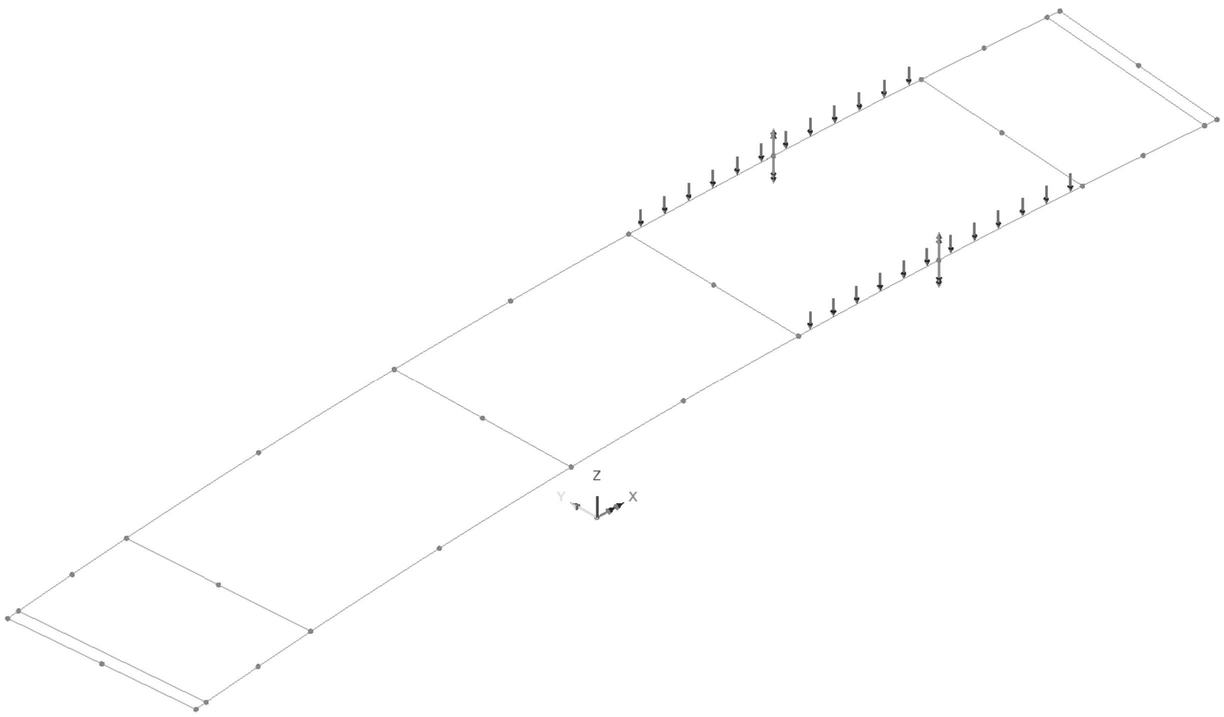
Analys : Analysis 1 (Gjut 1)



3.1.3 Kantbalk gjutetapp I (EGEN_1-3)

En fiktiv last av kantbalk som även inkluderar vikt av räcke tillämpas.

$$p_z = p_{räcke} + p_{KB} = 1.0\frac{kN}{m} + 0.42m \cdot 0.58m \cdot 25\frac{kN}{m^3} = -7.1\frac{kN}{m}$$



Load : EGEN 1-3A

Discrete loading : Curve

Point	X	Y	Z	p_z
1	8.118	5.919	10	-7.1
2	17.831	5.610	10	-7.1
3	27.534	5.069	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_1-3

Analys : Analysis 1 (Gjut 1)

Load : EGEN 1-3B

Discrete loading : Curve

Point	X	Y	Z	p_z
1	7.880	-6.078	10	-7.1
2	17.308	-6.378	10	-7.1
3	26.725	-6.902	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_1-3

Analys : Analysis 1 (Gjut 1)

3.1.4 Farbana gjutetapp II (EGEN_2-1)

$$q_z = t \cdot \gamma = 0.30m \cdot 25\frac{kN}{m^3} = -7.5\frac{kN}{m^2}$$

Load : EGEN 2-1

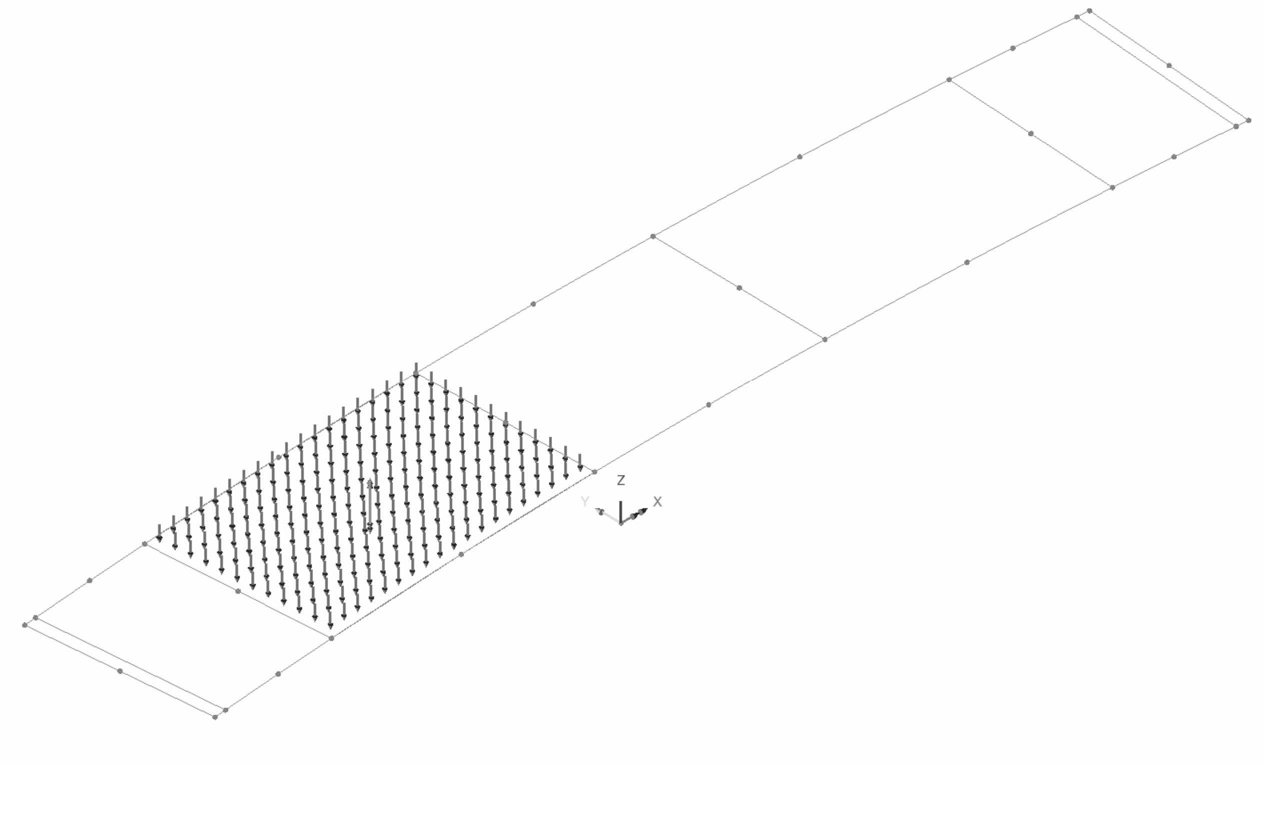
Discrete loading : 8 node patch

Point	X	Y	Z	q_z
1	-27.534	5.069	10	-7.5
2	-17.832	5.610	10	-7.5
3	-8.118	5.919	10	-7.5
4	-7.999	-0.079	10	-7.5
5	-7.880	-6.078	10	-7.5
6	-17.307	-6.378	10	-7.5
7	-26.725	-6.902	10	-7.5
8	-27.130	-0.917	10	-7.5
-	m	m	m	kPa

Search area : Deck

Loadcase : EGEN_2-1

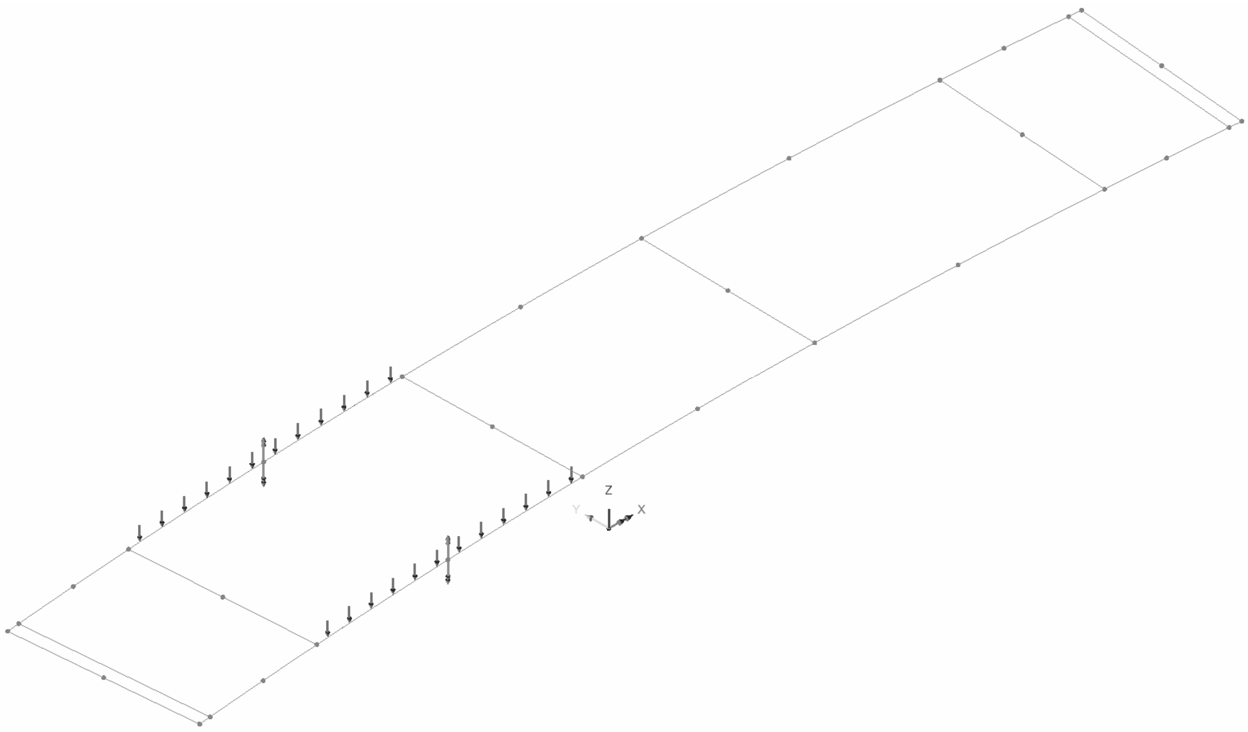
Analys : Analysis 2 (Gjut 2)



3.1.5 Kantbalk gjutetapp II (EGEN_2-2)

En fiktiv last av kantbalk som även inkluderar vikt av räcke tillämpas.

$$p_z = p_{räcke} + p_{KB} = 1.0\frac{kN}{m} + 0.42m \cdot 0.58m \cdot 25\frac{kN}{m^3} = -7.1\frac{kN}{m}$$



Load : EGEN 2-2A

Discrete loading : Curve

Point	X	Y	Z	p_z
1	-27.534	5.069	10	-7.1
2	-17.832	5.610	10	-7.1
3	-8.118	5.919	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_2-2

Analys : Analysis 2 (Gjut 2)

Load : EGEN 2-2B

Discrete loading : Curve

Point	X	Y	Z	p_z
1	-26.725	-6.902	10	-7.1
2	-17.308	-6.378	10	-7.1
3	-7.880	-6.078	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_2-2

Analys : Analysis 2 (Gjut 2)

3.1.6 Farbana gjutetapp III (EGEN_3-1)

$$q_z = t \cdot \gamma = 0.30m \cdot 25\frac{kN}{m^3} = -7.5\frac{kN}{m^2}$$

Load : EGEN 3-1

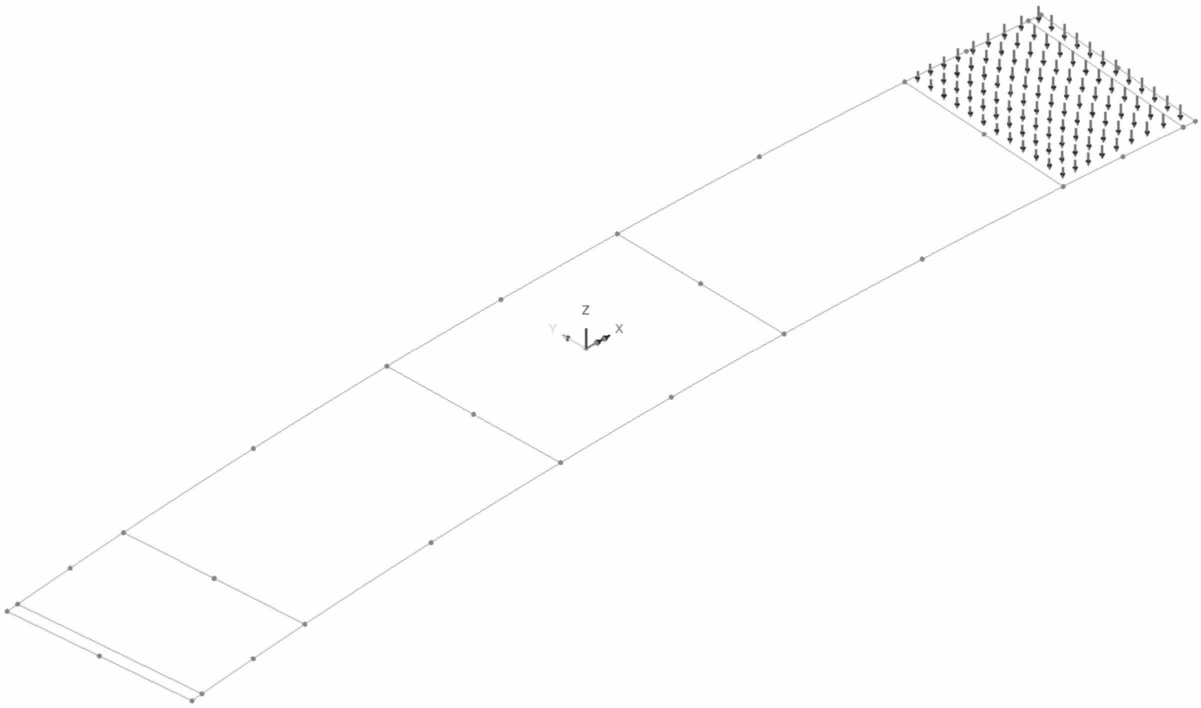
Discrete loading : 8 node patch

Point	X	Y	Z	q_z
1	26.725	-6.902	10	-7.5
2	30.653	-7.188	10	-7.5
3	35.366	-7.582	10	-7.5
4	35.902	-1.606	10	-7.5
5	36.438	4.369	10	-7.5
6	31.582	4.775	10	-7.5
7	27.534	5.069	10	-7.5
8	27.129	-0.916	10	-7.5
-	m	m	m	kPa

Search area : Deck

Loadcase : EGEN_3-1

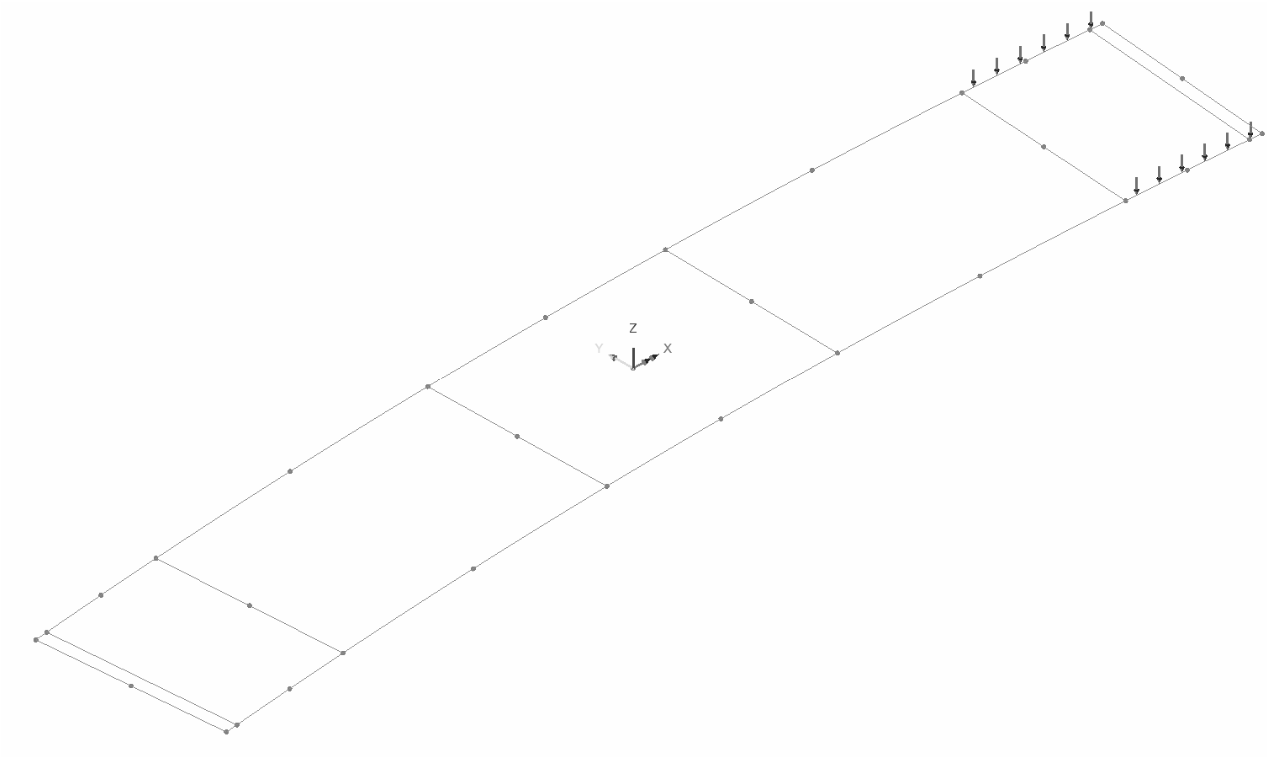
Analys : Analysis 3 (Gjut 3)



3.1.7 Kantbalk gjutetapp III (EGEN_3-2)

En fiktiv last av kantbalk som även inkluderar vikt av räcke tillämpas.

$$p_z = p_{räcke} + p_{KB} = 1.0\frac{kN}{m} + 0.42m \cdot 0.58m \cdot 25\frac{kN}{m^3} = -7.1\frac{kN}{m}$$



Load : EGEN 3-2A

Discrete loading : Curve

Point	X	Y	Z	p_z
1	27.534	5.069	10	-7.1
2	31.582	4.775	10	-7.1
3	36.438	4.369	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_3-2

Analys : Analysis 3 (Gjut 3)

Load : EGEN 3-2B

Discrete loading : Curve

Point	X	Y	Z	p_z
1	26.725	-6.902	10	-7.1
2	30.653	-7.188	10	-7.1
3	35.366	-7.582	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_3-2

Analys : Analysis 3 (Gjut 3)

3.1.8 Farbana gjutetapp IV (EGEN_4-1)

$$q_z = t \cdot \gamma = 0.30m \cdot 25\frac{kN}{m^3} = -7.5\frac{kN}{m^2}$$

Load : EGEN 4-1

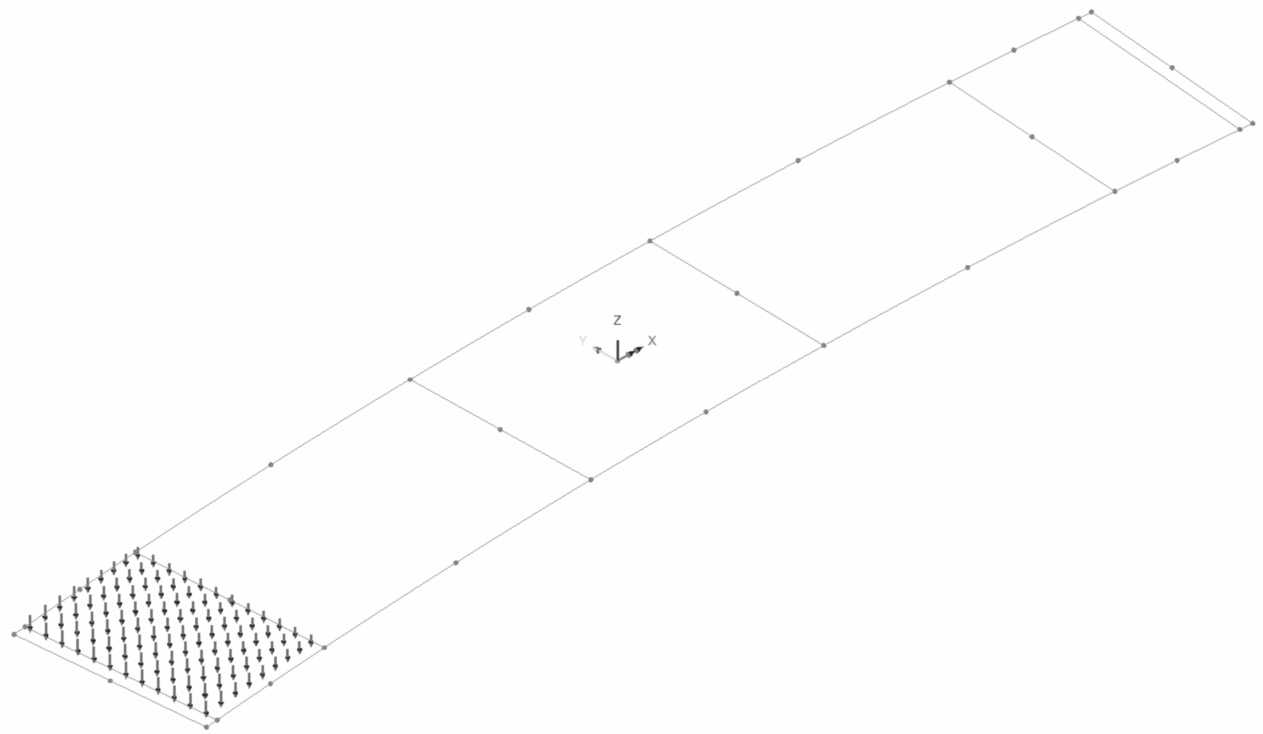
Discrete loading : 8 node patch

Point	X	Y	Z	q_z
1	-35.366	-7.582	10	-7.5
2	-30.658	-7.188	10	-7.5
3	-26.725	-6.902	10	-7.5
4	-27.130	-0.916	10	-7.5
5	-27.534	5.069	10	-7.5
6	-31.581	4.775	10	-7.5
7	-36.438	4.369	10	-7.5
8	-35.902	-1.606	10	-7.5
-	m	m	m	kPa

Search area : Deck

Loadcase : EGEN_4-1

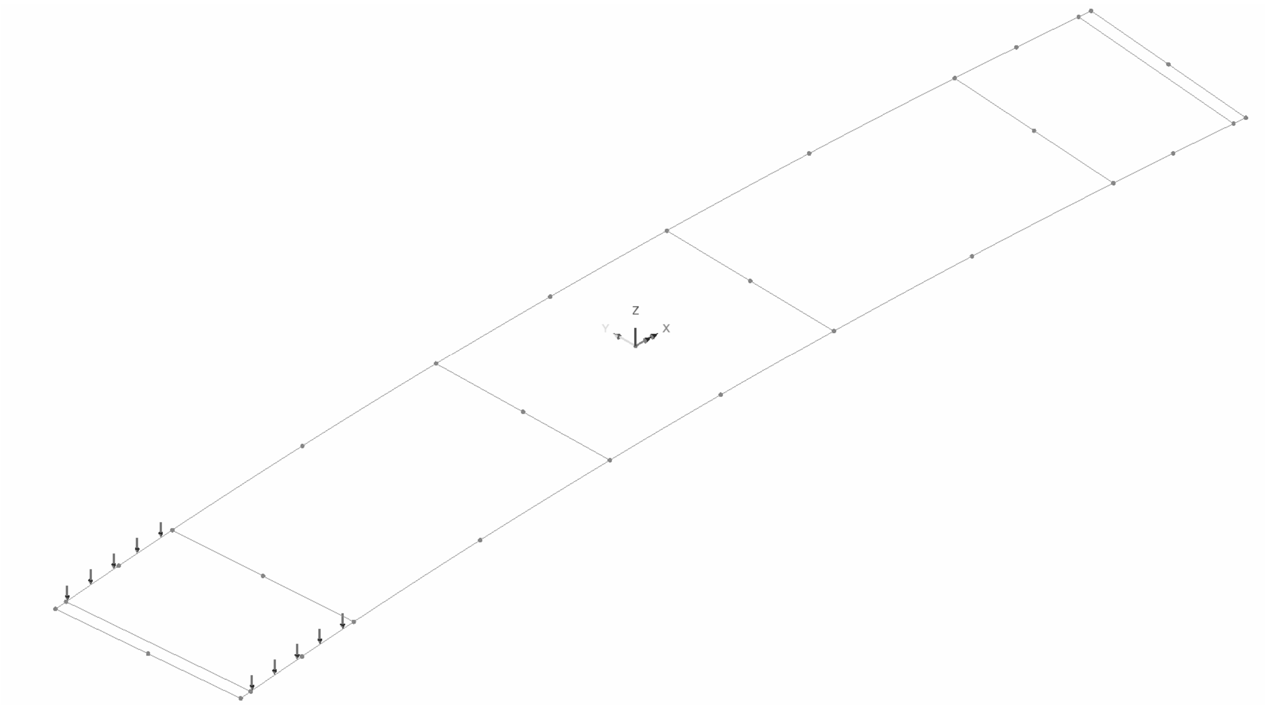
Analys : Analysis 4 (Gjut 4)



3.1.9 Kantbalk gjutetapp IV (EGEN_4-2)

En fikitiv last av kantbalk som även inkluderar vikt av räcke tillämpas.

$$p_z = p_{räcke} + p_{KB} = 1.0\frac{kN}{m} + 0.42m \cdot 0.58m \cdot 25\frac{kN}{m^3} = -7.1\frac{kN}{m}$$



Load : EGEN 4-2A

Discrete loading : Curve

Point	X	Y	Z	p_z
1	-36.438	4.369	10	-7.1
2	-31.581	4.775	10	-7.1
3	-27.534	5.069	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_4-2

Analys : Analysis 4 (Gjut 4)

Load : EGEN 4-2B

Discrete loading : Curve

Point	X	Y	Z	p_z
1	-35.366	-7.582	10	-7.1
2	-30.658	-7.188	10	-7.1
3	-26.725	-6.902	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_4-2

Analys : Analysis 4 (Gjut 4)

3.1.10 Farbana gjutetapp V (EGEN_5-1)

$$q_z = t \cdot \gamma = 0.30m \cdot 25\frac{kN}{m^3} = -7.5\frac{kN}{m^2}$$

Load : EGEN 5-1

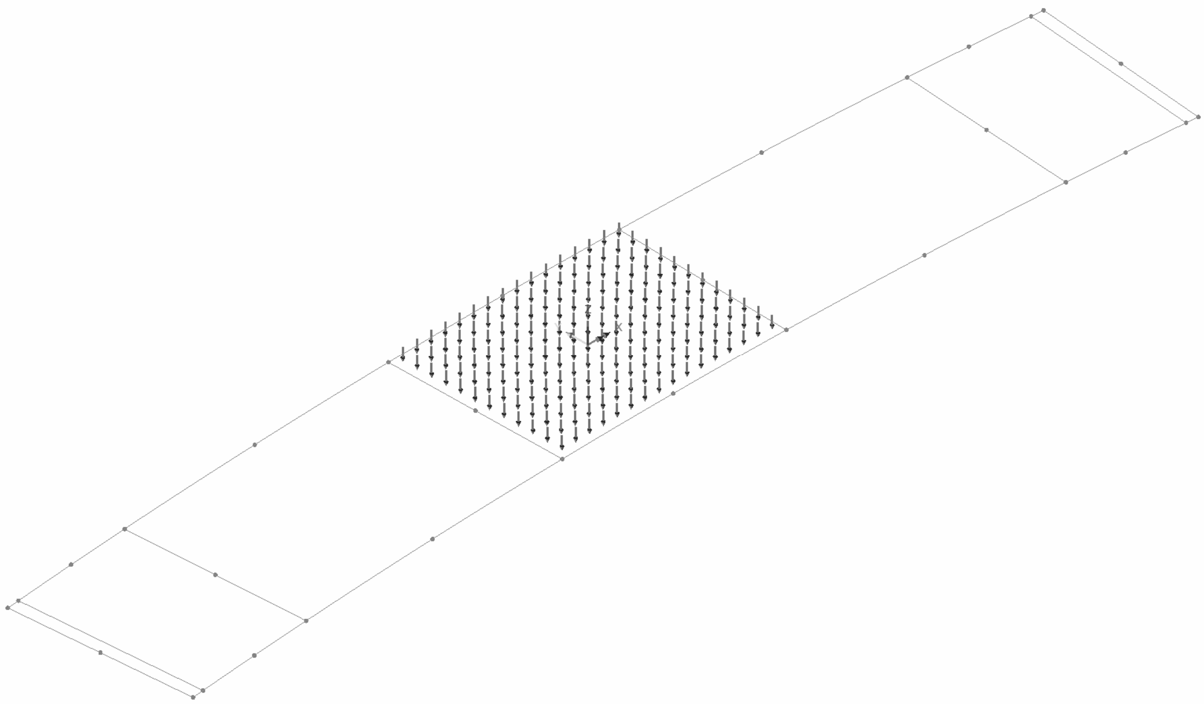
Discrete loading : 8 node patch

Point	X	Y	Z	q_z
1	-7.880	-6.078	10	-7.5
2	-0.004	-6.000	10	-7.5
3	7.880	-6.078	10	-7.5
4	7.999	-0.079	10	-7.5
5	8.118	5.919	10	-7.5
6	0.001	6.000	10	-7.5
7	-8.118	5.919	10	-7.5
8	-7.999	-0.079	10	-7.5
-	m	m	m	kPa

Search area : Deck

Loadcase : EGEN_5-1

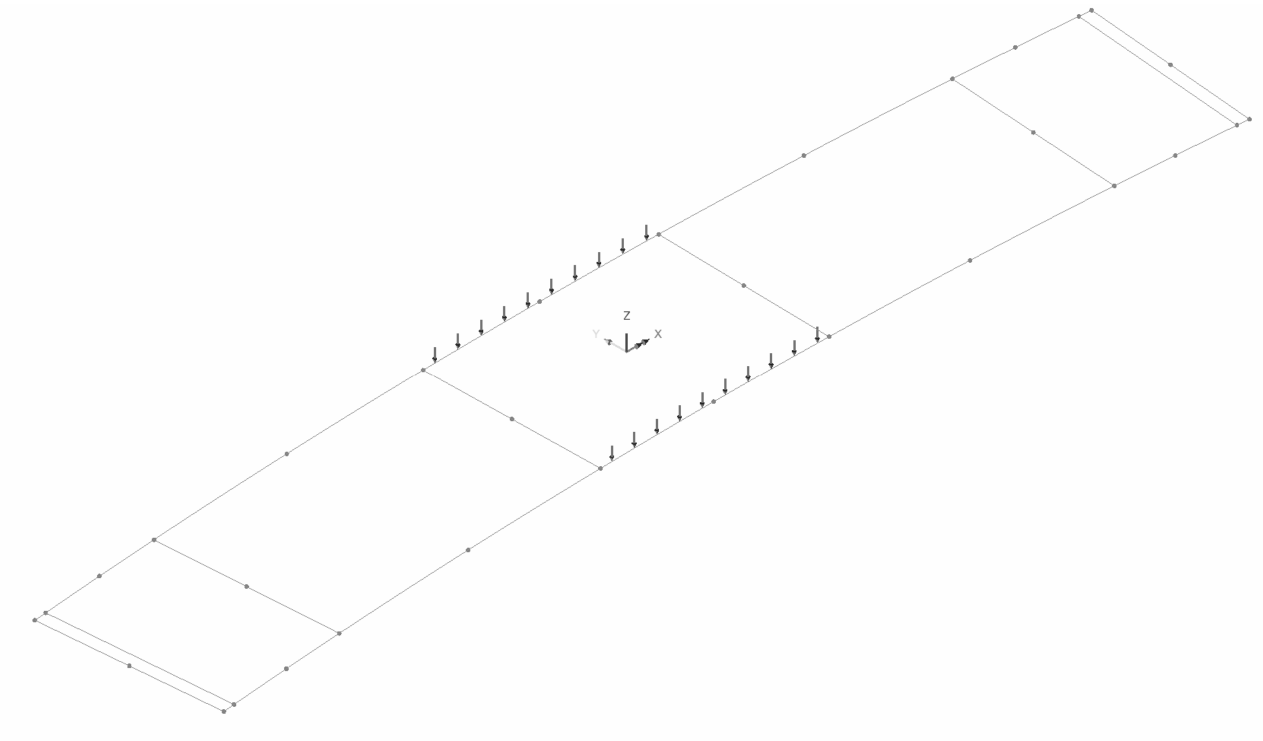
Analys : Analysis 5 (Gjut 5)



3.1.11 Kantbalk gjutetapp V (EGEN_5-2)

En fikitiv last av kantbalk som även inkluderar vikt av räcke tillämpas.

$$p_z = p_{räcke} + p_{KB} = 1.0\frac{kN}{m} + 0.42m \cdot 0.58m \cdot 25\frac{kN}{m^3} = -7.1\frac{kN}{m}$$



Load : EGEN 5-2A

Discrete loading : Curve

Point	X	Y	Z	p_z
1	-8.118	5.919	10	-7.1
2	0.001	6.000	10	-7.1
3	8.118	5.919	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_5-2

Analys : Analysis 5 (Gjut 5)

Load : EGEN 5-2B

Discrete loading : Curve

Point	X	Y	Z	p_z
1	-7.880	-6.078	10	-7.1
2	-0.005	-6.000	10	-7.1
3	7.880	-6.078	10	-7.1
-	m	m	m	kN/m

Search area : Deck

Loadcase : EGEN_5-2

Analys : Analysis 5 (Gjut 5)

3.1.12 Sammanställning egentyngd (EGEN)

Basic loadcomination EGEN_1 :

Loadcase	Factor
EGEN_1-1	1.00
EGEN_1-2	1.00
EGEN_1-3	1.00

Basic loadcomination EGEN_2 :

Loadcase	Factor
EGEN_2-1	1.00
EGEN_2-2	1.00

Basic loadcomination EGEN_3 :

Loadcase	Factor
EGEN_3-1	1.00
EGEN_3-2	1.00

Basic loadcomination EGEN_4 :

Loadcase	Factor
EGEN_4-1	1.00
EGEN_4-2	1.00

Basic loadcomination EGEN_5 :

Loadcase	Factor
EGEN_5-1	1.00
EGEN_5-2	1.00

Basic loadcomination EGEN :

Loadcase	Factor
EGEN 1	1.00
EGEN 2	1.00
EGEN 3	1.00
EGEN 4	1.00
EGEN 5	1.00

3.1.13 Vikt form (FORM+)

Bedömd vikt för formställning 0.50 kPa.

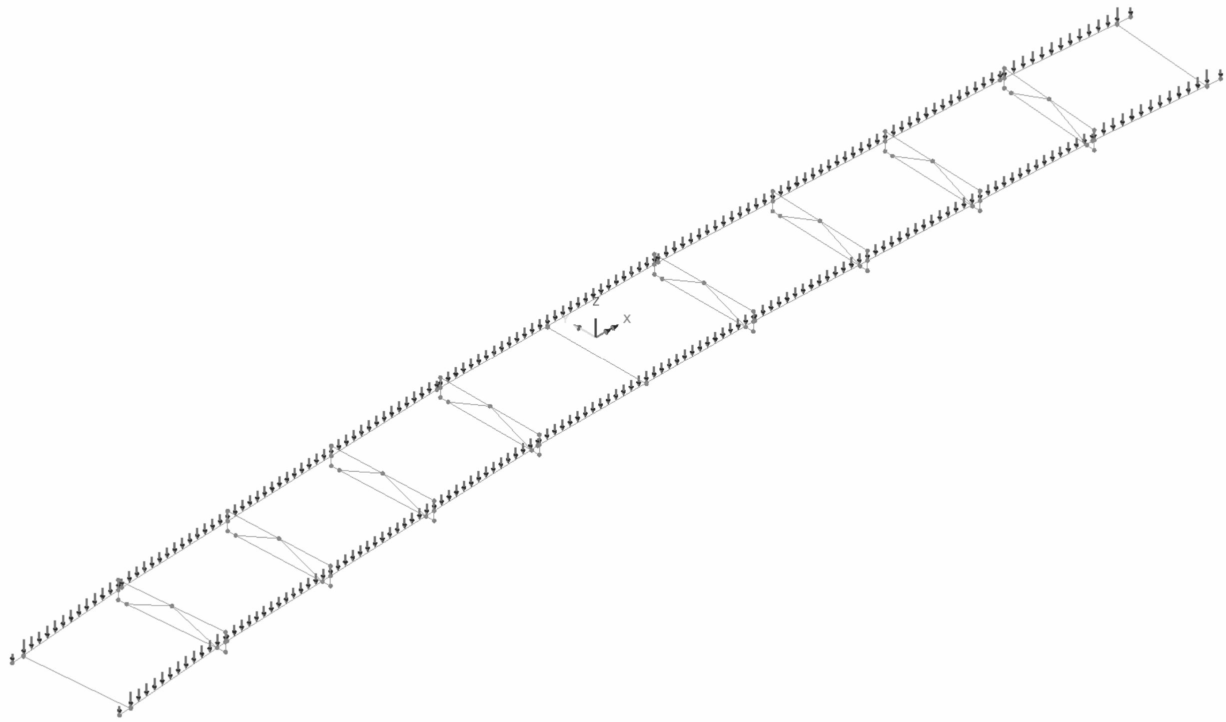
$$p_g = 0.50 \frac{kN}{m^2} \cdot \frac{12.84m}{2} = 3.2 \frac{kN}{m}$$

Load : FORM+
Structural loading : Global distributed

Load per unit length in Z direction (p_z) : -3.2 $\frac{kN}{m}$

Loadcase : FORM+

Analys : Analysis 1 (Gjut 1)

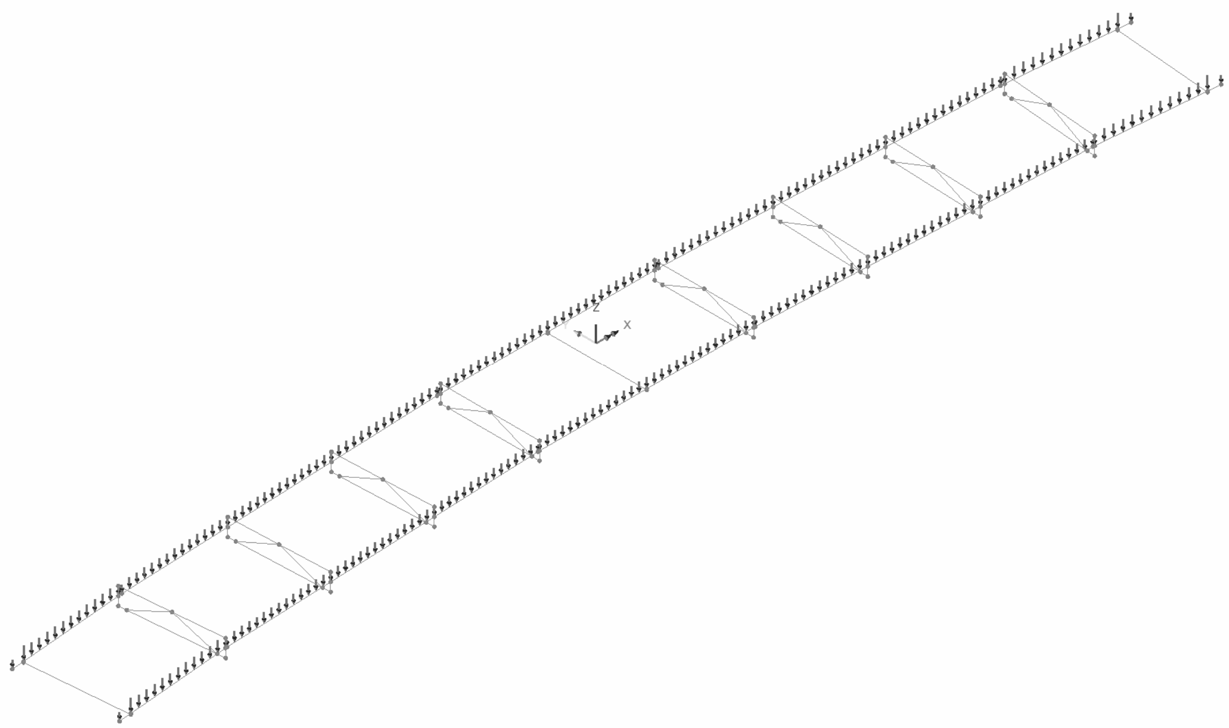


Load : FORM-
Structural loading : Global distributed

Load per unit length in Z direction (p_z) : $+3.2\,\frac{kN}{m}$

Loadcase : FORM-

Analys : Analysis 6 (DRIFT-P)



3.2 BELÄGGNING

Laster för beläggning enligt redovisning nedan.

$$q_{bel} = \gamma_{beläggning} \cdot t + q_{matta} = 24\frac{kN}{m^3} \cdot 0.105m + 0.11kPa = 2.6\frac{kN}{m^2}$$

Anm.
Vid dimensionering av överbyggnad har trafiklast förutsatts på hela bron. Detta antagande är på säker sida. Vid en sådan trafiksituation förutsätts samma vägbeläggning råda på hela bron.

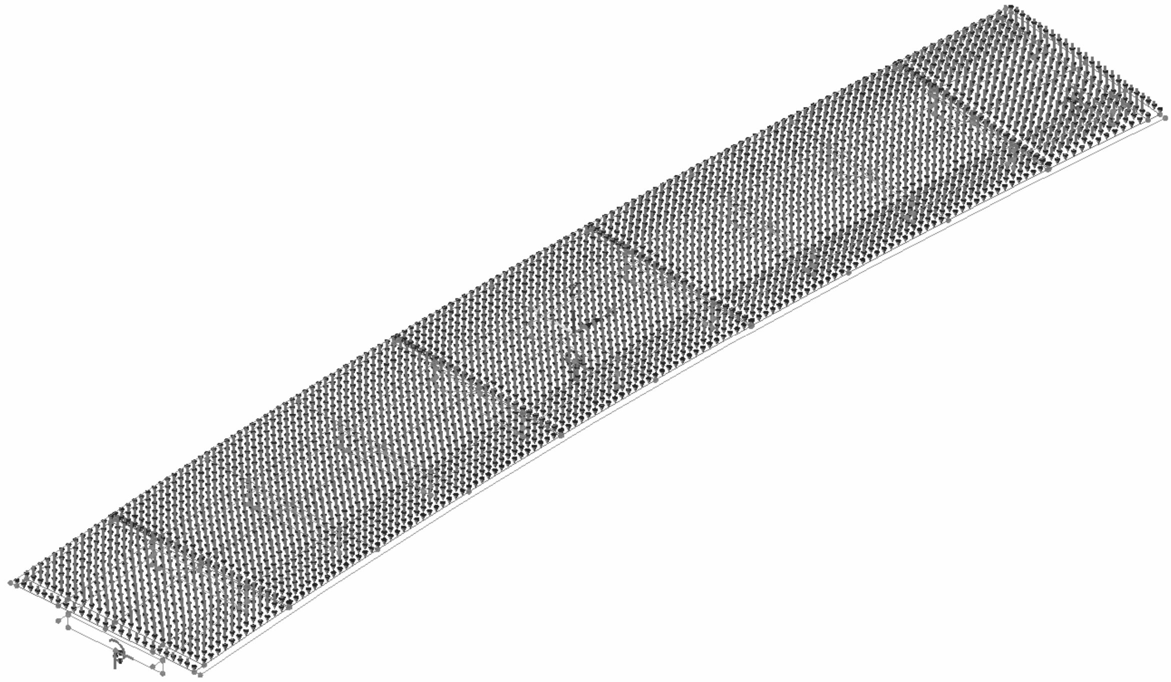
Load : BELAGG

Structural loading : Global distributed

Load per unit area in Z direction (q_z) : -2.6 $\frac{kN}{m^2}$

Loadcase : BELAGG

Analys : Analysis 6 (DRIFT-P)



3.3 JORDTRYCK

Jordtryck bestäms motsvarande sprängsten enligt TK Geo 11 tabell 5.2-1 och tabell 5.2-4 enligt redovisning nedan.

$\gamma_{m.\phi} = 1.30$: PM Geoteknik

$\gamma_{m.E} = 1.0$: PM Geoteknik

$\phi_k = 45°$: TK Geo av 5.2.2.8

$$\gamma = 18 \frac{kN}{m^3}$$

$$\gamma' = 11 \frac{kN}{m^3}$$

$$X_d = \frac{1}{\gamma_m} \cdot \eta \cdot \overline{X} \equiv \frac{1}{\gamma_m} \cdot X_k$$

$$\Rightarrow \phi_d = \arctan\left(\frac{\tan\phi_k}{\gamma_{m,\phi}}\right) = \arctan\left(\frac{\tan 45°}{1.3}\right) = 38°$$

$$K_0 = 1 - \sin\phi_d = 0.39$$

$$K_p = \tan^2(45° + \phi_d / 2) = 4.20$$

Anm. Lasten är inte införd i statisk beräkning ty fristående landfäste.

3.4 STÖDFÖRSKJUTNING

Stödförskjutningen bestäms enligt TRVR Bro 11 avsnitt B.3.1.4.

Vertikal sättning differens motsvarande stödsättning 10 mm anses uppträda för samtliga stöd.

Horisontell förskjutning (x- och y-riktning) uppgår till ±10 mm men anses inte ge upphov till några tvångskrafter.

Inverkan bör beaktas i bruksgränstillstånd enligt SS-EN 1992-1-1 §2.3.1.3. Om så sker får en bör en gradvis sprickutveckling tillämpas enligt SS-EN 1992-1-1 §5.4(3).

Inverkan behöver ej beaktas i brottgränstillstånd enligt SS-EN 1992-1-1 §2.3.1.3. Om så sker får en reducerad styvhet tillämpas enligt SS-EN 1992-1-1 §5.4(3).

3.4.1 Vertikal stödförskjutning

Load: STOD_1Z

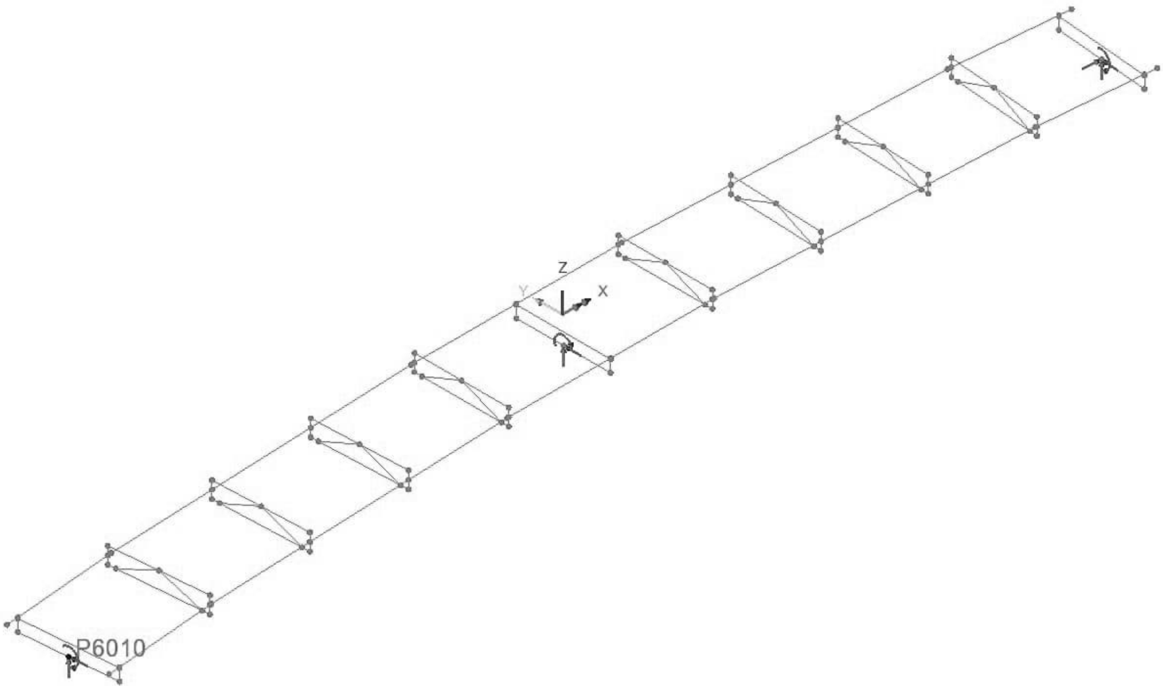
Structural loading : Perscribed Displacement

Translation at point in Z direction : -0.010 m (pålgrundläggning)

Loadcase : STOD_1Z

Point : P6010

Analys : Analysis 6 (DRIFT-P)



Load : STOD_2Z

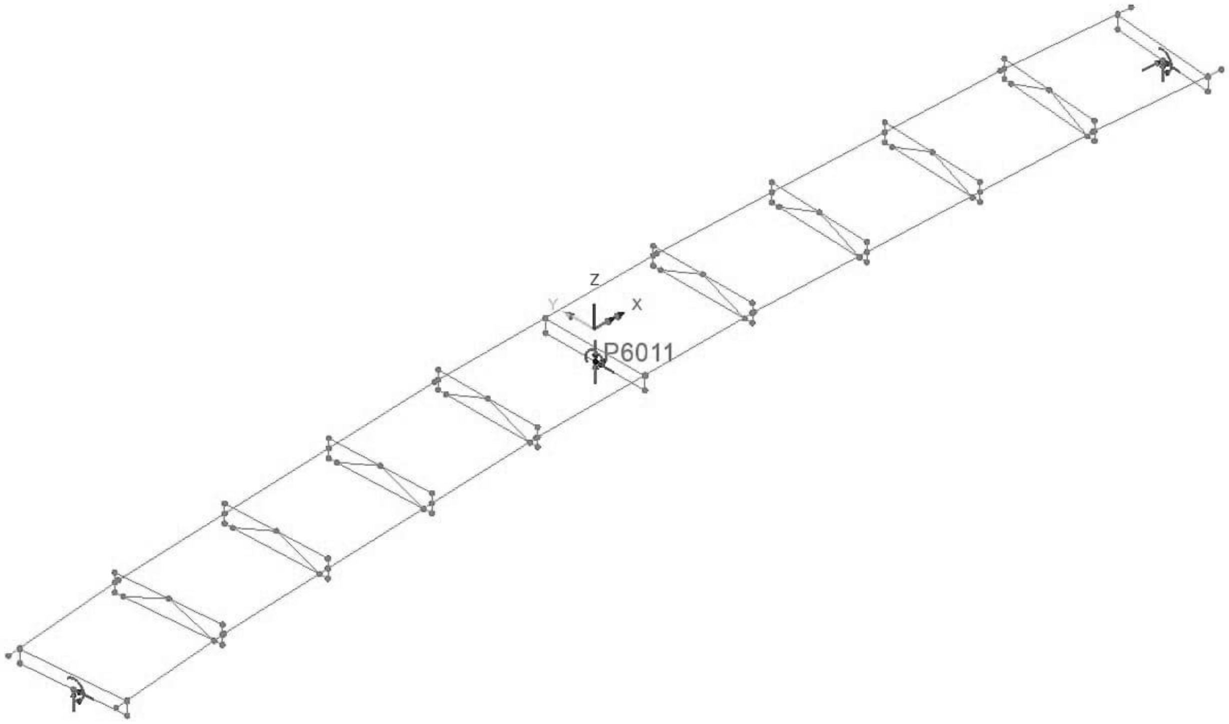
Structural loading : Perscribed Displacement

Translation at point in Z direction : -0.010 m (pålgrundläggning)

Loadcase : STOD_2Z

Point : P6011

Analys : Analysis 6 (DRIFT-P)



Load: STOD_3Z

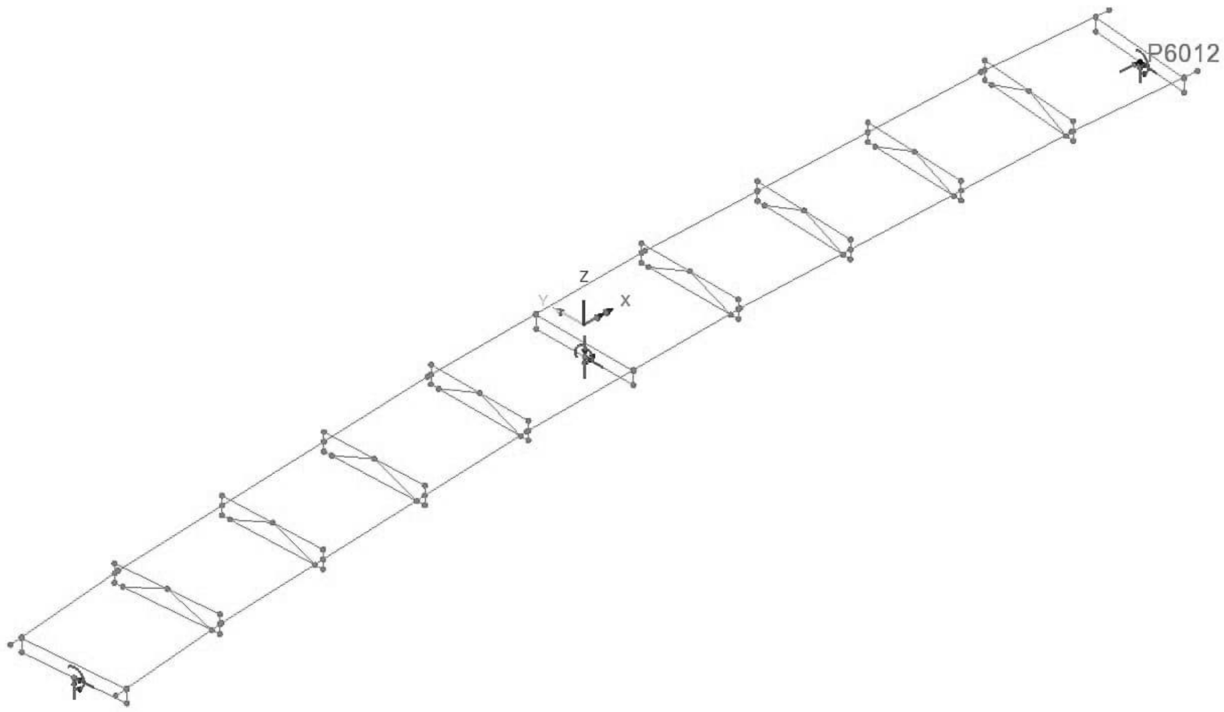
Structural loading : Perscribed Displacement

Translation at point in Z direction : -0.010 m (pålgrundläggning)

Loadcase : STOD_3Z

Point : P6012

Analys : Analysis 6 (DRIFT-P)



3.4.2 Horisontell stödförskjutning

Load : STOD_1Y

Structural loading : Perscribed Displacement

Translation at point in Y direction : 0.010 m

Loadcase : STOD_1Y+

Point : P6010

Analys : Analysis 6 (DRIFT-P)

Load : STOD_2Y

Structural loading : Perscribed Displacement

Translation at point in Z direction : 0.010 m

Loadcase : STOD_2Y+

Point : P6011

Analys : Analysis 6 (DRIFT-P)

Load : STOD_3Y

Structural loading : Perscribed Displacement

Translation at point in Z direction : 0.010 m

Loadcase : STOD_3Y+

Point : P6012

Analys : Analysis 6 (DRIFT-P)

3.4.3 Kombinerad stödförskjutning

Basic loadcases :

Loadcase	Load	Factor
STOD_1Y-	STOD_1Y	-1
STOD_2Y-	STOD_2Y	-1
STOD_3Y-	STOD_3Y	-1

Smart loadcombination STOD-Y :

Loadcase	Permanent factor	Variable factor
STOD_1Y+	0	1
STOD_2Y+	0	1
STOD_3Y+	0	1
STOD_1Y-	0	1
STOD_2Y-	0	1
STOD_3Y-	0	1

Smart loadcombination STOD-Z :

Loadcase	Permanent factor	Variable factor
STOD_1Z	0	1
STOD_2Z	0	1
STOD_3Z	0	1

Envelope STOD :

Loadcase
STOD-Y
STOD-Z

3.5 KRYPNING

Total krypning bestäms enligt SS-EN 1992-1-1 §3.1.4 och TK Bro B.3.3.6 för RH 80% efter tidpunkten t_1.

Tidpunkten för pålastning anses motsvara tidpunkt för formrivning. Denna betecknas t_0.

Utvärdering sker för ekvivalent jämntjock farbaneplatta.

Inverkan bör beaktas i bruksgränstillstånd enligt SS-EN 1992-1-1 §2.3.2.2(1). Om så sker får en bör en gradvis sprickutveckling tillämpas enligt SS-EN 1992-1-1 §5.4(3).

Inverkan behöver ej beaktas i brottgränstillstånd enligt SS-EN 1992-1-1 §2.3.2.2(2). Om så sker får en reducerad styvhet tillämpas enligt SS-EN 1992-1-1 §5.4(3).

Utvärdering av kryptalet sker med beräkningsark T001 utförd i Mathcad där samtliga formler och delresultat redovisas.

$t_0 = 5dag$

$t_1 = 100år$

t	$\varphi(t_1, t_0)$	Anm.
3009	2.1	Sida A3:32
mm	-	-

Kryptalet $\varphi(t_1, t_0) = 2.0$ tillämpas på samtliga konstruktionsdelar.

$$\varepsilon_{cc}(t_1, t_0) = \varphi(t_1, t_0) \cdot \frac{\sigma_c}{E_c}$$

För att studera inverkan på konstruktionens styvhet enligt SS-EN 1992-1-1 5.8.7 så tillämpas kryptal enligt nedan.

Last	φ
Permanenta	2.1
Variabla inkl. temperatur	0

Objekt: Farbana bro - t = 100 år

Betong (C30/37, C35/45, C40/50 och C45/55): $BTG = \text{"C35/45"}$

Relativ fuktighet : $RH = 80\%$

Tvärsnittetsbredd : $b = 12.0m$

Tvärsnittetshöjd : $h = 300mm$

Tvärsnittsarea : $A_c = b \cdot h = 3.60 \cdot m^2$

Omkrets i kontakt med "luft" : $u = 2 \cdot b = 24\,m$

Bärverkets ekvivalenta tjocklek : $h_0 = \frac{2 \cdot A_c}{u} = 0.3\,m$

Studerad tidpunkt för bestämning av krypning : $t_1 = 100år$ $t_1 = 36500 \cdot dag$

Tidpunkt för pålastning (= formrivning): $t_0 = 5dag$

Indatakvitto

$f_{cm} = 43 \cdot MPa$

BERÄKNING

Uttryck för bestämning av kryptalet är hämtat från SS-EN 1992-1-1 Bilaga B.1.

$$\alpha_1 = \left(\frac{35MPa}{f_{cm}}\right)^{0.7} = 0.87$$

$$\alpha_2 = \left(\frac{35MPa}{f_{cm}}\right)^{0.2} = 0.96$$

$$\alpha_3 = \left(\frac{35MPa}{f_{cm}}\right)^{0.5} = 0.9$$

$$\varphi_{RH} = \begin{vmatrix} 1 + \dfrac{1 - RH}{0.1\sqrt[3]{\dfrac{h_0}{mm}}} & \text{if } f_{cm} \le 35MPa \\ \left(1 + \dfrac{1 - RH}{0.1\sqrt[3]{\dfrac{h_0}{mm}}}\cdot\alpha_1\right)\cdot\alpha_2 & \text{otherwise} \end{vmatrix} = 1.21$$

$$\beta_0 = \frac{1}{0.1 + t_0^{\,0.20}} = 0.68$$

$$\beta_{fcm} = \frac{16.8}{\sqrt{\dfrac{f_{cm}}{MPa}}} = 2.56$$

$$\beta_H = \begin{array}{|l} \text{if } f_{cm} \le 35\text{MPa} \\ \quad \begin{array}{|l} \beta_{H.max} \leftarrow 1500 \\ \beta_H \leftarrow \beta_{H.max} \text{ if } 1.5\cdot\left[1 + (0.012\cdot 100RH)^{18}\right]\cdot\dfrac{h_0}{mm} + 250 > \beta_{H.max} \\ \beta_H \leftarrow 1.5\cdot\left[1 + (0.012\cdot 100RH)^{18}\right]\cdot\dfrac{h_0}{mm} + 250 \text{ otherwise} \end{array} \\ \text{if } f_{cm} > 35\text{MPa} \\ \quad \begin{array}{|l} \beta_{H.max} \leftarrow 1500\cdot\alpha_3 \\ \beta_H \leftarrow \beta_{H.max} \text{ if } 1.5\cdot\left[1 + (0.012\cdot 100RH)^{18}\right]\cdot\dfrac{h_0}{mm} + 250 > \beta_{H.max} \\ \beta_H \leftarrow 1.5\cdot\left[1 + (0.012\cdot 100RH)^{18}\right]\cdot\dfrac{h_0}{mm} + 250\cdot\alpha_3 \text{ otherwise} \end{array} \\ \beta_H \end{array}$$

$$\beta_H = 891$$

$$\beta_c = \left(\frac{t_1 - t_0}{\beta_H + t_1 - t_0}\right)^{0.3} = 0.99$$

$$\varphi_{t0} = \varphi_{RH}\cdot\beta_{fcm}\cdot\beta_0 = 2.09$$

$$\varphi_{t1} = \varphi_{t0}\cdot\beta_c = 2.1$$

3.6 KRYMPNING

Total krympningen bestäms enligt SS-EN 1992-1-1 §3.1.4 och TK Bro B.3.3.6 för RH 80%.

Vid bestämning av tillhörande lasteffekter reduceras dock värdet med hänsyn till krypning.

Krympning bestäms efter tidpunkten t_1.

Inverkan bör beaktas i bruksgränstillstånd enligt SS-EN 1992-1-1 §2.3.2.2(1). Om så sker får en bör en gradvis sprickutveckling tillämpas enligt SS-EN 1992-1-1 §5.4(3).

Inverkan behöver ej beaktas i brottgränstillstånd enligt SS-EN 1992-1-1 §2.3.2.2(2). Om så sker får en reducerad styvhet tillämpas enligt SS-EN 1992-1-1 §5.4(3).

Total krympning :

Tidpunkten då uttorkningskrympning påbörjas betecknas t_s.

Utvärdering sker för ekvivalent jämntjock farbaneplatta.

Utvärdering av kryptalet sker med beräkningsark T002 utförd i Mathcad där samtliga formler och delresultat redovisas.

$t_s = 0 dag$

$t_1 = 100 år$

t	$\varepsilon_{cs}(t_1)$	Anm.
300	0.025	Sida A3:36
mm	%	-

Total krympning $\varepsilon_{cs}(t_1) = 0.025\%$ tillämpas på samtliga konstruktionsdelar på säker sida.

Total krympningen bestäms enligt SS-EN 1992-1-1 §3.1.4 och TK Bro B.3.3.6 för RH 80%.

Vid bestämning av tillhörande lasteffekter reduceras dock värdet med hänsyn till krypning.

Krympning bestäms efter tidpunkten t_1.

Objekt: Farbana - t = 100 år

Betong (C30/37, C35/45, C40/50 och C45/55): BTG = "C35/45"

Relativ fuktighet (se TK Bro B.3.3.6): RH = 80%

Tvärsnittetsbredd : $b = 12.0m$

Tvärsnittetshöjd : $h = 0.300m$

Tvärsnittsarea : $A_c = b \cdot h = 3.60 \cdot m^2$

Omkrets i kontakt med "luft" : $u = 2 \cdot b = 24\,m$

Bärverkets ekvivalenta tjocklek : $h_0 = \frac{2 \cdot A_c}{u} = 0.3\,m$

Studerad tidpunkt för bestämning av krympning : $t_1 = 100\text{år}$ $t_1 = 36500 \cdot dag$

Tidpunkt för pålastning (= formrivning): $t_0 = 5dag$

Cementklass (S, N, R) : Klass = "N"

Betongens ålder då uttorkningskrympning påbörjas : $t_s = 0dag$

Indatakvitto

$f_{cm} = 43 \cdot MPa$ $f_{ck} = 35 \cdot MPa$ $f_{ck.kub} = 45 \cdot MPa$

BERÄKNING

Grundvärdet för krympning från uttorkning (SS-EN 1992-1-1 Bilaga B.2)

$$\alpha_{ds1} = \begin{vmatrix} 3.0 \ \text{ if } \ \text{Klass} = \text{"S"} \\ 4.0 \ \text{ if } \ \text{Klass} = \text{"N"} \\ 6.0 \ \text{ if } \ \text{Klass} = \text{"R"} \end{vmatrix} = 4.00$$

$$\alpha_{ds2} = \begin{vmatrix} 0.13 \ \text{ if } \ \text{Klass} = \text{"S"} \\ 0.12 \ \text{ if } \ \text{Klass} = \text{"N"} \\ 0.11 \ \text{ if } \ \text{Klass} = \text{"R"} \end{vmatrix} = 0.12$$

$$RH_o = 100 \cdot \%$$

$$\beta_{RH} = 1.55 \cdot \left[1 - \left(\frac{RH}{RH_o} \right)^3 \right] = 0.76$$

$$\varepsilon_{cd.0} = 0.85 \left[\left(220 + 110 \cdot \alpha_{ds1} \right) \cdot e^{-\alpha_{ds2} \cdot \frac{f_{cm}}{f_{cmo}}} \right] \cdot 10^{-6} \cdot \beta_{RH} = 0.025 \cdot \%$$

Grundvärdet för krympning från uttorkning (SS-EN 1992-1-1 avsnitt 3.1.4 ekv. 3.9 och 3.10)

$$k_h = \text{linterp}\left[\left(0 \ \ 100 \ \ 200 \ \ 300 \ \ 500 \ \ 10^4 \right) \text{mm}^T, \left(1.00 \ \ 1.00 \ \ 0.85 \ \ 0.75 \ \ 0.70 \ \ 0.70 \right)^T, h_0 \right] = 0.75$$

$$\beta_{ds} = \frac{t_1 - t_s}{t_1 - t_s + 0.04 \sqrt{\left(\frac{h_0}{mm} \right)^3}} = 0.99$$

$$\varepsilon_{cd} = \beta_{ds} \cdot k_h \cdot \varepsilon_{cd.0} = 0.019 \cdot \%$$

Autogen krympning (SS-EN 1992-1-1 avsnitt 3.1.4 ekv. 3.11, 3.12 och 3.13)

$$k_h = \mathrm{linterp}\left[\left(0 \quad 100 \quad 200 \quad 300 \quad 500 \quad 10^4\right)\mathrm{mm}^T, \left(1.00 \quad 1.00 \quad 0.85 \quad 0.75 \quad 0.70 \quad 0.70\right)^T, h_0\right] = 0.75$$

$$\beta_{as} = 1 - e^{-0.2\cdot\sqrt{t_1}} = 1.00$$

$$\varepsilon_{ca.\propto} = 2.5\cdot\left(\frac{f_{ck}}{MPa} - 10\right)\cdot 10^{-6} = 0.006\cdot\%$$

$$\varepsilon_{ca} = \beta_{as}\cdot\varepsilon_{ca.\propto} = 0.006\cdot\%$$

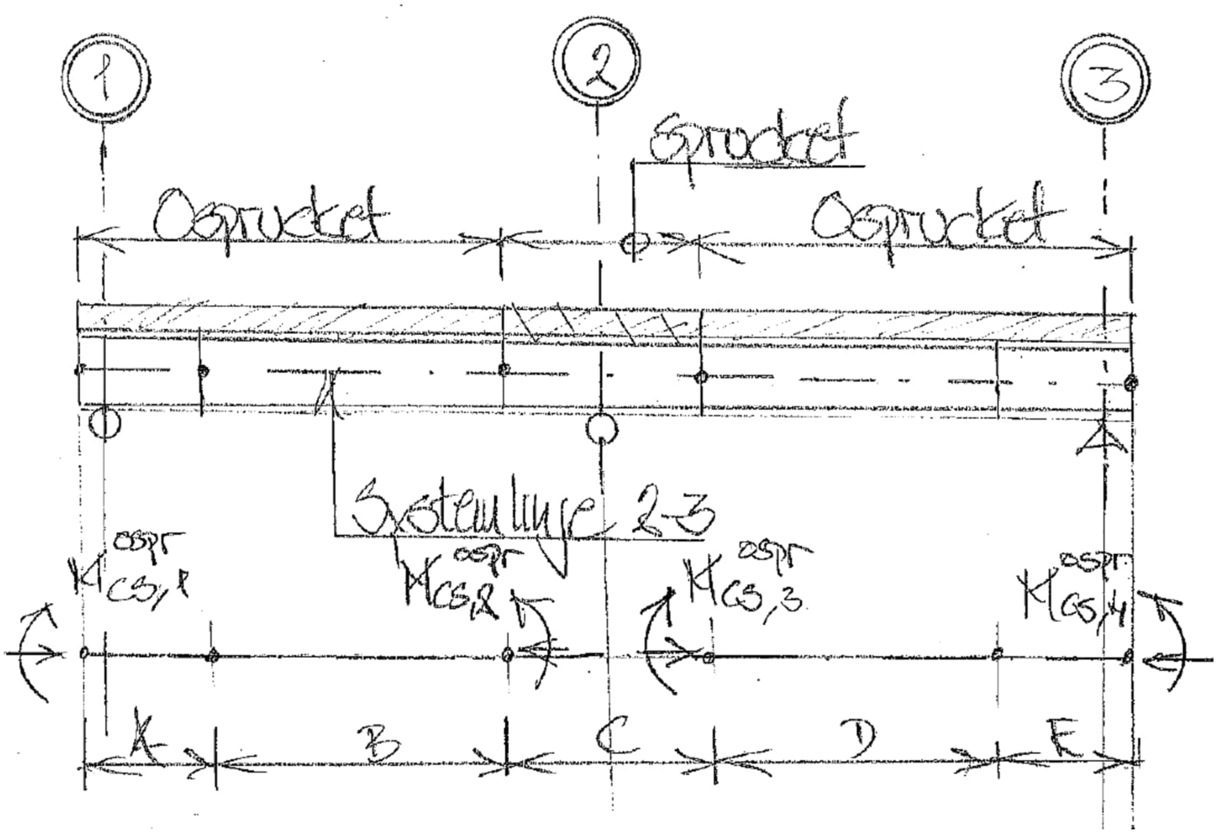
Total krympning (SS-EN 1992-1-1 avsnitt 3.1.4 ekv. 3.8)

$$\varepsilon_{cs} = \varepsilon_{cd} + \varepsilon_{ca} = 0.025\cdot\%$$

3.6.1 Dimensionerande lasteffekter

Inverkan av krympning utgår i spruckna områden medan de beaktas i ospruckna områden enligt nedan.

Lasten påföres huvudbalken i som punkt last och moment enligt redovisning. Lasten är införd i Systemlinjer 2-3.



$A_c = 6.0m \cdot 0.3m + 0.24m^2 = 2.04m^2$

3.6.1.1 Segment A

Osprucken betong (KRYMP-1) :

$$N_{cs}^{ospr}(t_1) = -\varepsilon_{cs}(t_1) \cdot \frac{E_{cm}}{1+\psi_L \cdot \varphi_{t1}} \cdot A_c = -0.25 \cdot 10^{-3} \cdot \frac{34 \cdot 10^6 kPa}{1+0.55 \cdot 2.10} \cdot 2.04m^2 = -8046kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:89

y_{sam} = -0.425 m : samverkanstvärsnitt typ 3, se sida A2:101

$$M_{cs}^{ospr}(t_1) = -N_{cs}(t_1) \cdot (y_{btg} - y_{sam}) = 8045kN \cdot (0.180m + 0.425m) = 4868kNm$$

Sprucken betong :

$N_{cs}^{spr} = 0kN$ och $M_{cs}^{ospr} = 0kNm$

3.6.1.2 Segment B

Osprucken betong (KRYMP-2) :

$$N_{cs}^{ospr}(t_1) = -\varepsilon_{cs}(t_1) \cdot \frac{E_{cm}}{1+\psi_L \cdot \varphi_{t1}} \cdot A_c = -0.25 \cdot 10^{-3} \cdot \frac{34 \cdot 10^6 kPa}{1+0.55 \cdot 2.10} \cdot 2.04m^2 = -8046kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:59

y_{sam} = -0.354 m : samverkanstvärsnitt typ 3, se sida A2:101

$$M_{cs}^{ospr}(t_1) = -N_{cs}(t_1) \cdot (y_{btg} - y_{sam}) = 8045kN \cdot (0.180m + 0.354m) = 4296kNm$$

Sprucken betong :

$N_{cs}^{spr} = 0kN$ och $M_{cs}^{ospr} = 0kNm$

3.6.1.3 Segment C

Hela balken anses sprucken.

3.6.1.4 Segment D

Osprucken betong (KRYMP-3) :

$$N_{cs}^{ospr}(t_1) = -\varepsilon_{cs}(t_1) \cdot \frac{E_{cm}}{1+\psi_L \cdot \varphi_{t1}} \cdot A_c = -0.25 \cdot 10^{-3} \cdot \frac{34 \cdot 10^6 kPa}{1+0.55 \cdot 2.10} \cdot 2.04 m^2 = -8046 kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:89

y_{sam} = -0.354 m : samverkanstvärsnitt typ 3, se sida A2:101

$$M_{cs}^{ospr}(t_1) = -N_{cs}(t_1) \cdot (y_{btg} - y_{sam}) = 8045 kN \cdot (0.180 m + 0.354 m) = 4296 kNm$$

Sprucken betong :

$N_{cs}^{spr} = 0kN$ och $M_{cs}^{ospr} = 0kNm$

3.6.1.5 Segment E

Osprucken betong (KRYMP-4) :

$$N_{cs}^{ospr}(t_1) = -\varepsilon_{cs}(t_1) \cdot \frac{E_{cm}}{1+\psi_L \cdot \varphi_{t1}} \cdot A_c = -0.25 \cdot 10^{-3} \cdot \frac{34 \cdot 10^6 kPa}{1+0.55 \cdot 2.10} \cdot 2.04 m^2 = -8046 kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:89

y_{sam} = -0.425 m : samverkanstvärsnitt typ 3, se sida A2:101

$$M_{cs}^{ospr}(t_1) = -N_{cs}(t_1) \cdot (y_{btg} - y_{sam}) = 8045 kN \cdot (0.180 m + 0.425 m) = 4868 kNm$$

Sprucken betong :

$N_{cs}^{spr} = 0kN$ och $M_{cs}^{ospr} = 0kNm$

3.6.1.6 Definition laster LUSAS

Load : KRYMP-1

Structural loading : Internal beam point

Point load in X direction (P_x) : 8046 kN

Point moment around Y direction (M_y) : +4868 kNm

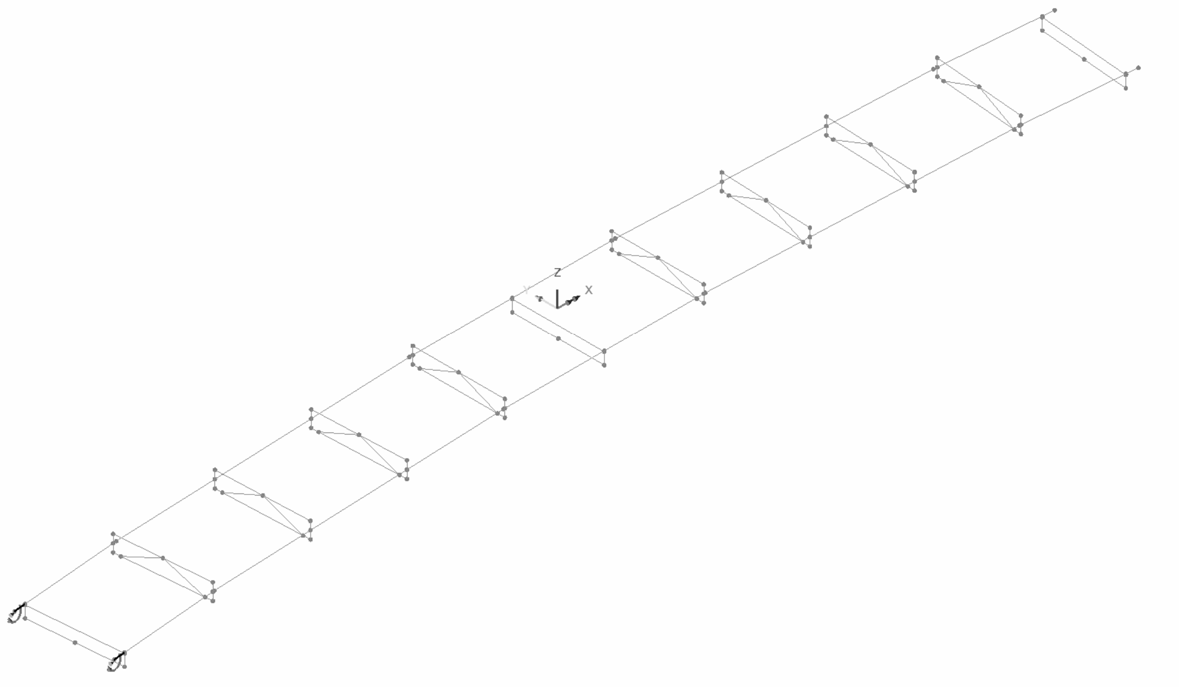
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About beam axis

Loadcase : KRYMP-1

Analys : Analysis 6 (Drift-P)



Load : KRYMP-2

Structural loading : Internal beam point

Point load in X direction (P_x) : -8046 kN

Point moment around Y direction (M_y) : -4296 kNm

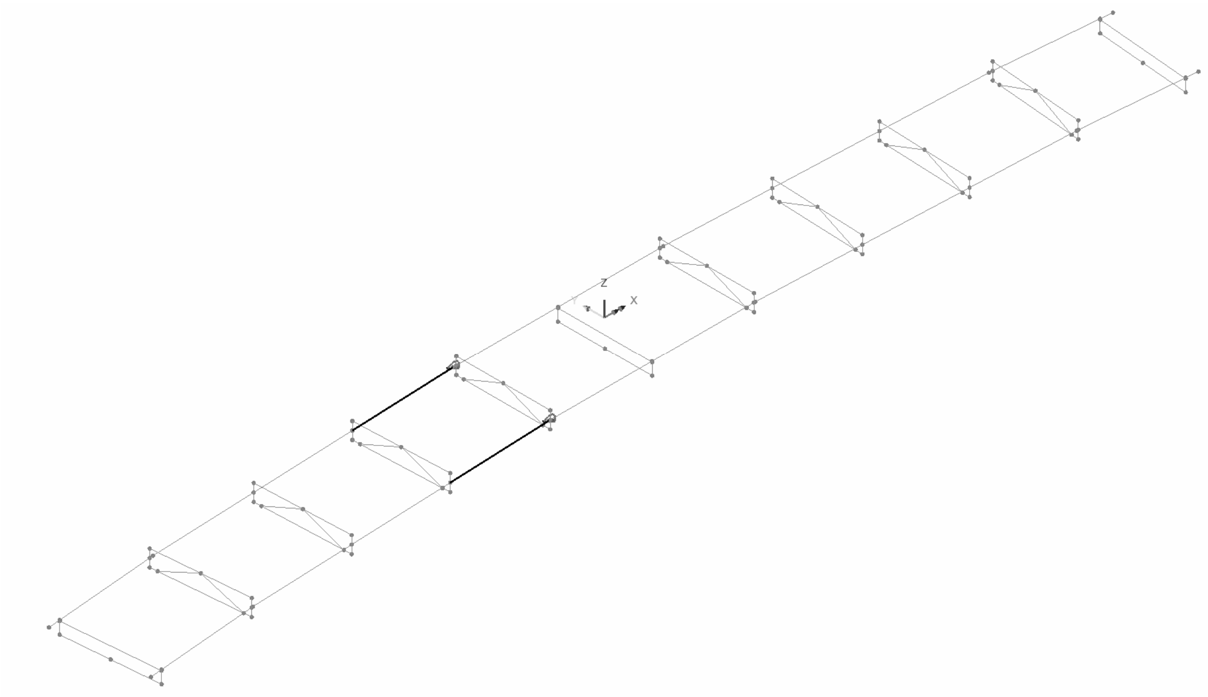
Distance along local element (parametric) : 1

Load direction : Element local

Load position : About beam axis

Loadcase : KRYMP-2

Analys : Analysis 6 (Drift-P)



Load : KRYMP-3

Structural loading : Internal beam point

Point load in X direction (P_x) : 8046 kN

Point moment around Y direction (M_y) : +4296 kNm

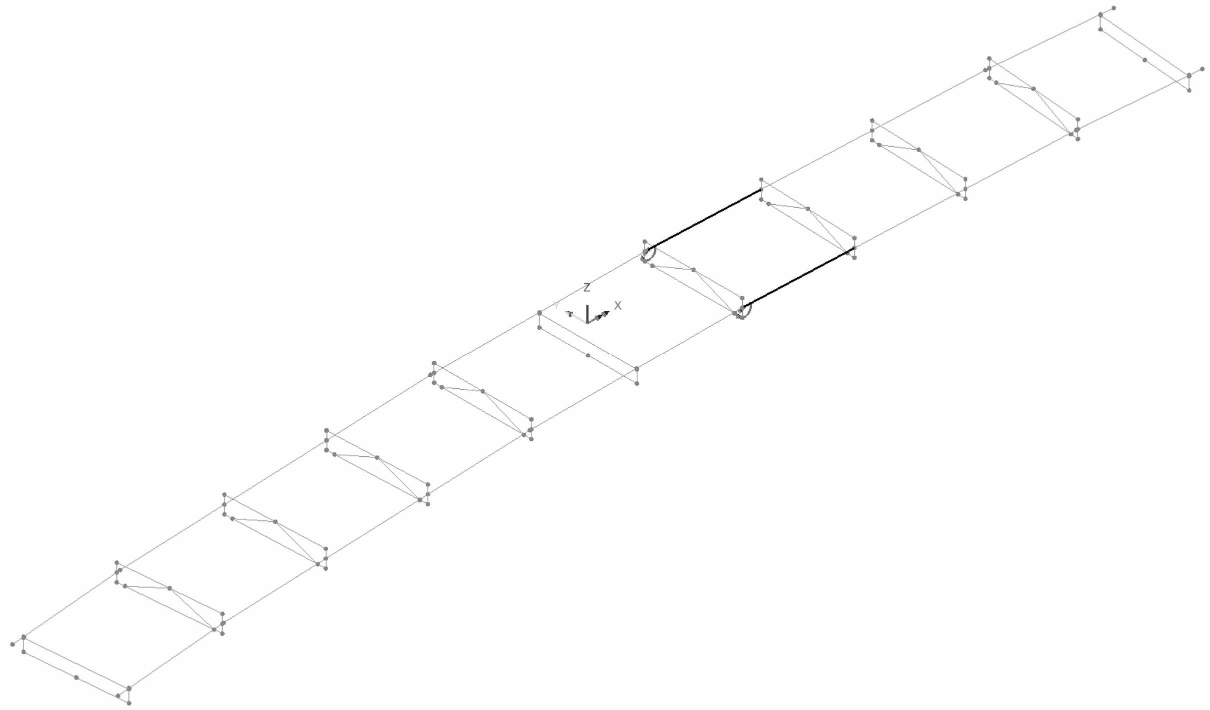
Distance along local element (parametric): 0

Load direction : Element local

Load position : About beam axis

Loadcase : KRYMP-3

Analys : Analysis 6 (Drift-P)



Load : KRYMP-4

Structural loading : Internal beam point

Point load in X direction (P_x) : -8946 kN

Point moment around Y direction (M_y) : -4868 kNm

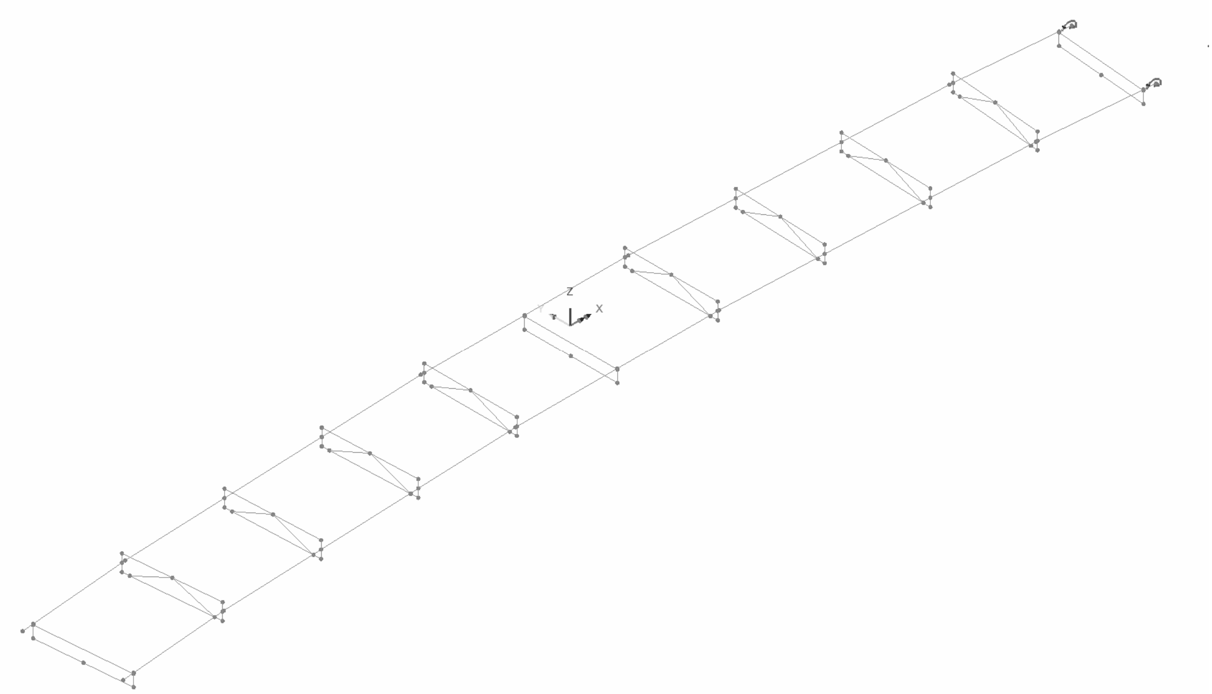
Distance along local element (parametric): 1

Load direction : Element local

Load position : About beam axis

Loadcase : KRYMP-4

Analys : Analysis 6 (Drift-P)



Basic loadcombination KRYMP :

Loadcase	Factor
KRYMP-1	1
KRYMP-2	1
KRYMP-3	1
KRYMP-4	1

3.7 TRAFIKLAST

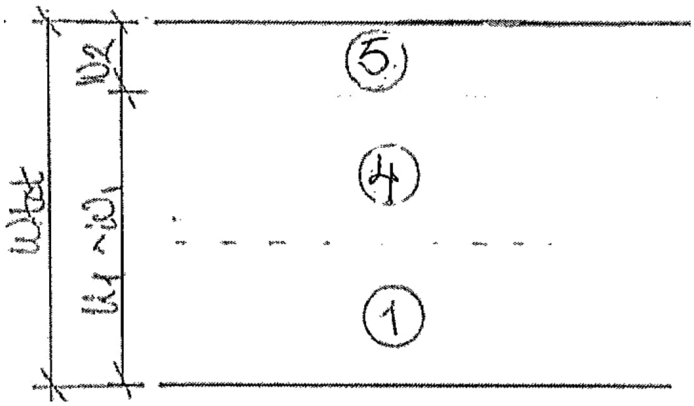
Utvärdering sker av vertikala trafiklaster tillhörande lastmodell 1 och lastmodell 2 enligt SS-EN 1991-2 avsnitt 4.3 samt för EG A/B = 180kN/300 kN enligt TRVFS 2011:12 kapitel 6 punkt 3§.

Vid utvärdering förutsätts på säker sida att även brons gångbana trafikerad av vägtrafik. Detta för att möjliggöra framtida körfältindelning.

Som en konsekvens av detta tillämpas vid dimensionering :

- Samma beläggning på beläggning GC-bana som på körbana
- Vikt av räcke mellan körbana och GC-bana utgår.
- Vikt av räcke mellan GC-bana och körbana.

3.7.1 Körfältsindelning



Total traffic width : $w_{tot} = 12.12m$

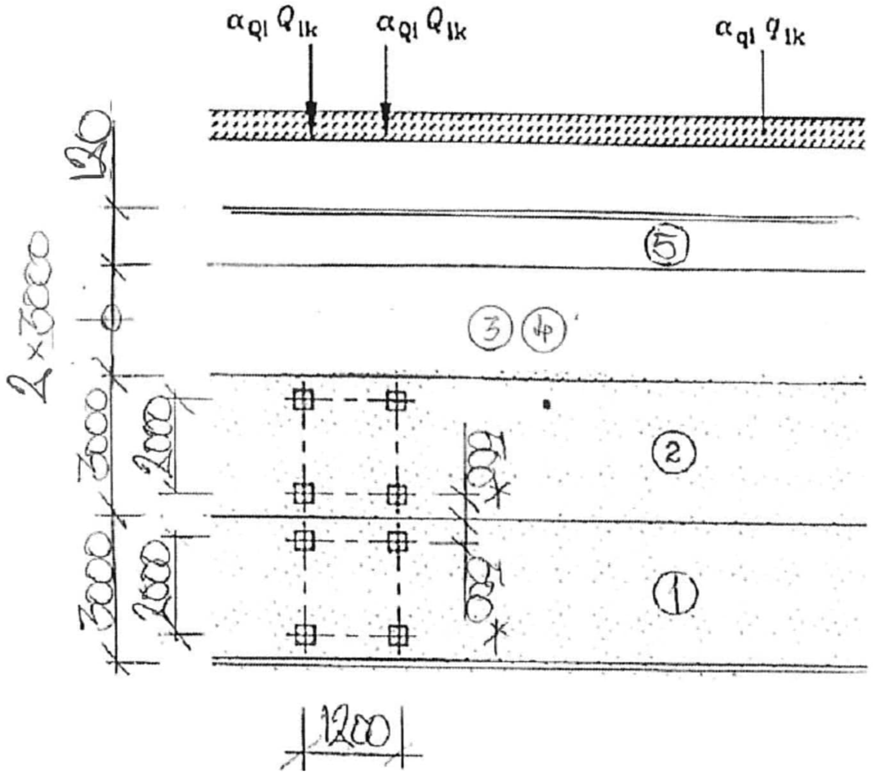
Number of traffic lanes : $n_1 = Integer\left[\dfrac{w}{3.0m}\right] = 4st$

Full traffic width : $w_1 = 3.00m$

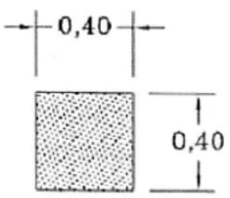
Remaining width : $w_2 = w_{tot} - w_1 \cdot n_1 = 0.12m$

3.7.2 Lastmodell 1 (LM 1)

Karakteristiska värden på vertikala laster enligt EN 1991-2 §4.3.2.



* = Vid kontroll av lokala effekter skall 250 mm förutsättas.



Axellaster :

α_Q : anpassningssfaktorer enligt TRVFS 2011:12 tabell 7.1

$Q'_k = \alpha_Q \cdot Q_k$: karakteristisk värde inklusive nationella anpassningsfaktorer

Lastfält	Q_k	α_Q	Q'_k	Anm.
1	300	0,9	270	LM1- 2 x 270 kN
2	200	0,9	180	LM1- 2 x 180 kN
3-9	100	0	0	Ingen last
-	kN	-	kN	-

Utbredda laster :

α_q : anpassningssfaktorer enligt TRVFS 2011:12 tabell 7.1

$q'_k = \alpha_q \cdot q_k$: karakteristisk värde ink. nationella anpassningsfaktorer

Lastfält	q_k	α_q	q'_k
1	9.0	0.8	7.2
2-9	2.5	1.0	2.5
-	kPa	-	kPa

3.7.3 Lastmodell 2 (LM 2)

Karakteristiska värden på vertikala laster enligt EN 1991-2 §4.3.3.

$\beta_Q = \alpha_Q = 0.90$: nationell anpassningsfaktor

$Q_k = 400$ kN : karakteriskt värde exklusive nationella anpassningsfaktorer

$Q'_k = \beta_k \cdot Q_k = 360$ kN : karakteriskt värde inklusive nationella anpassningsfaktorer

3.7.4 Lastmodell EG A/B

Beräkningen utföres för typfordon EG A/ B = 180 kN / 300 kN exkl. dynamiskt tillskott.

Antalet lastfält med typfordon är högst 2 st. Ena lastfältet multipliceras med faktorn 1.0 medan andra körfältet 0.80. Vid beräkning studeras såväl avståndet 1.7 m som 2.3 m mellan axlarna.

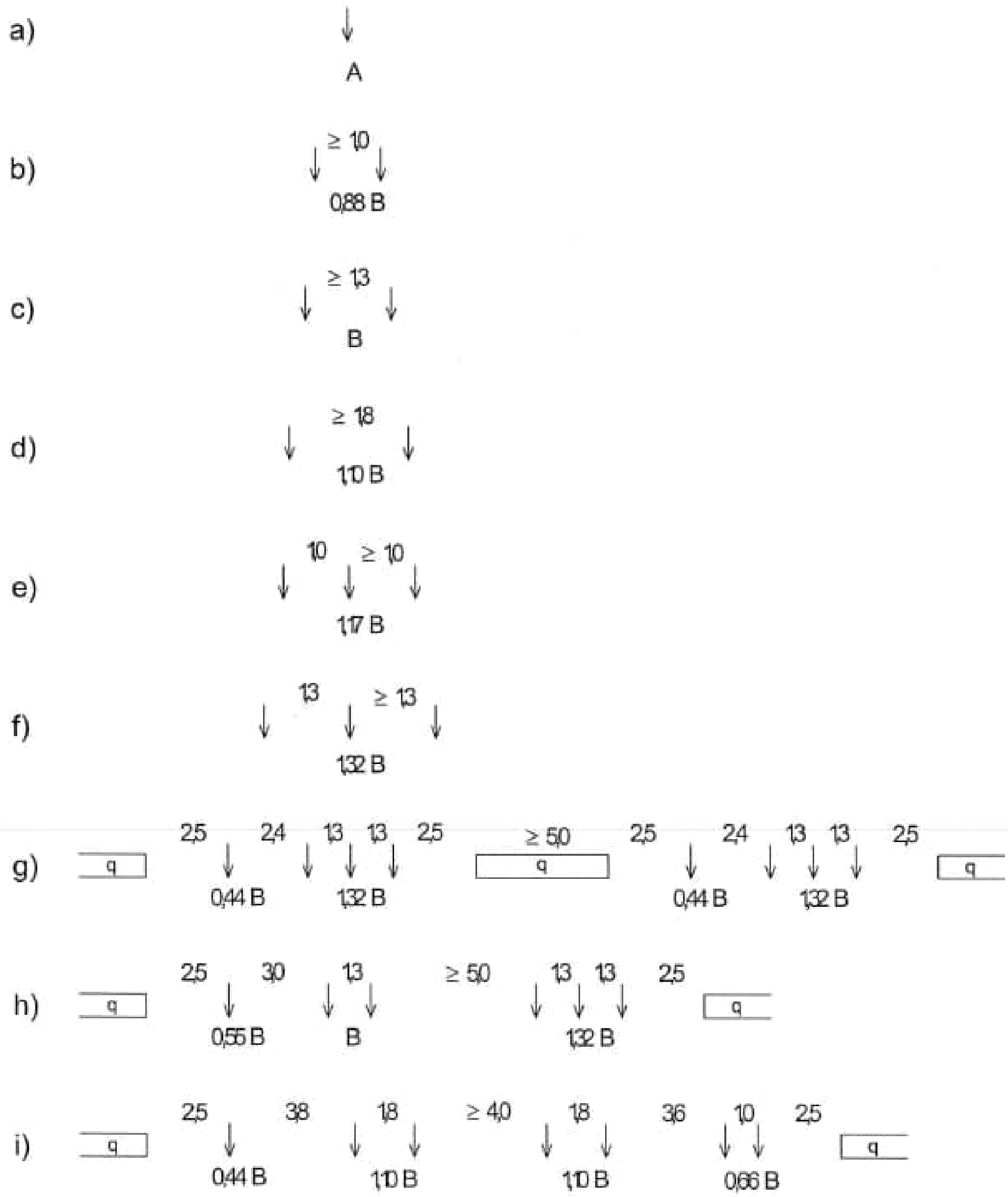
$\varepsilon_{dyn} = 25\ \%$: dynamiskt tillskott*

$A' = A \cdot (1 + \varepsilon_{dyn}) = 180\ kN \cdot (1+0.25) = 225\ kN$: axellast inklusive dynamiskt tillskott

$B' = B \cdot (1 + \varepsilon_{dyn}) = 300\ kN \cdot (1+0.25) = 375\ kN$: boggielast inklusive dynamiskt tillskott

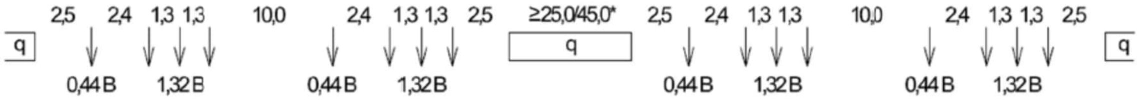
$p = 5 \dfrac{kN}{m}$: ytlast

* = se Krav Brobyggnade avsnitt B.3.2.1.3 punkt c.a.



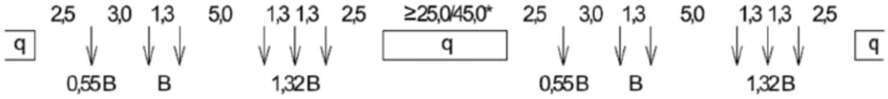
a)
A
b)
≥ 1,0
0,88 B
c)
≥ 1,3
B
d)
≥ 1,8
1,10 B
e)
1,0
≥ 1,0
1,17 B
f)
1,3
≥ 1,3
1,32 B
g)
q
2,5
2,4
1,3
1,3
2,5
0,44 B
1,32 B
≥ 5,0
q
2,5
2,4
1,3
1,3
2,5
0,44 B
1,32 B
q
h)
q
2,5
3,0
1,3
0,55 B
B
≥ 5,0
1,3
1,3
2,5
1,32 B
q
i)
q
2,5
3,8
1,8
0,44 B
1,10 B
≥ 4,0
1,8
3,6
1,0
2,5
1,10 B
0,66 B
q

j)



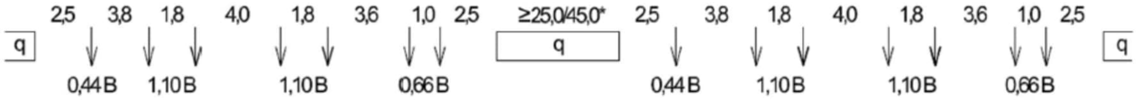
2,5 2,4 1,3 1,3 10,0 2,4 1,3 1,3 2,5 ≥25,0/45,0* 2,5 2,4 1,3 1,3 10,0 2,4 1,3 1,3 2,5
q
0,44B 1,32B 0,44B 1,32B 0,44B 1,32B 0,44B 1,32B

k)



2,5 3,0 1,3 5,0 1,3 1,3 2,5 ≥25,0/45,0* 2,5 3,0 1,3 5,0 1,3 1,3 2,5
q
0,55B B 1,32B 0,55B B 1,32B

l)

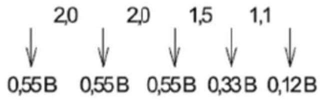


2,5 3,8 1,8 4,0 1,8 3,6 1,0 2,5 ≥25,0/45,0* 2,5 3,8 1,8 4,0 1,8 3,6 1,0 2,5
q
0,44B 1,10B 1,10B 0,66B 0,44B 1,10B 1,10B 0,66B

m)

1,3 1,8 3,4 1,8 1,3
0,33B B 1,32B

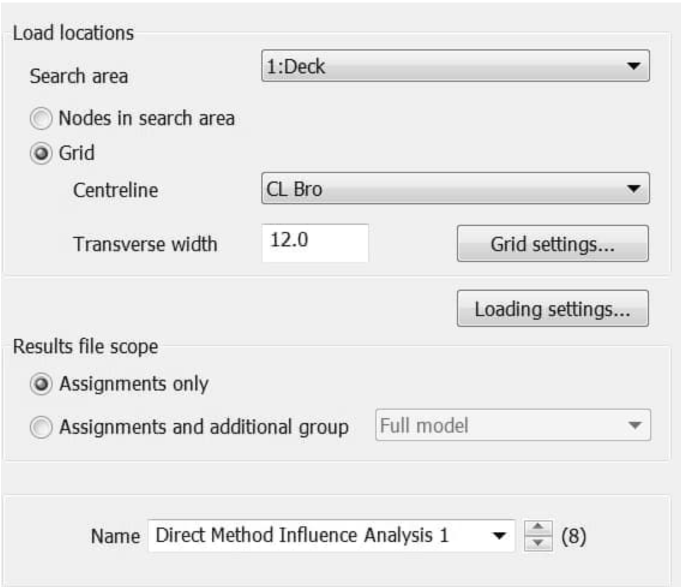
n)



2,0 2,0 1,5 1,1
0,55B 0,55B 0,55B 0,33B 0,12B

3.7.5 Vehicule Load Optimisation (VLO)

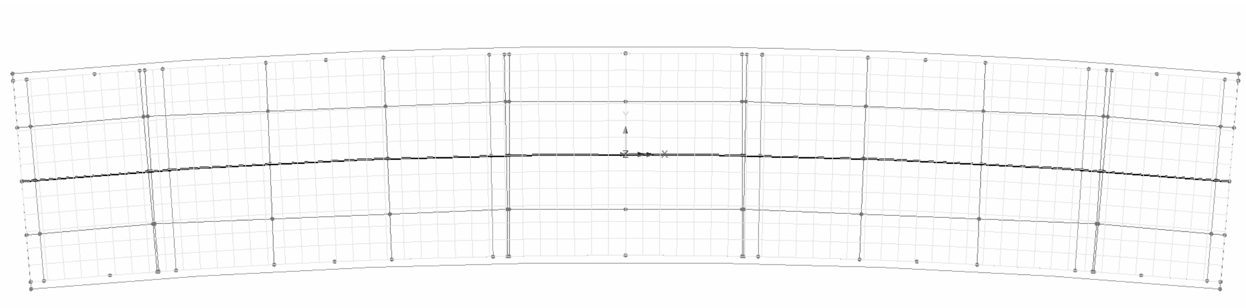
Influence surfaces are created using *"Direct Method Influence"* with parameters seen below.



In *LUSAS* loadable searcharea is termed *Grid"*, see parameters below.

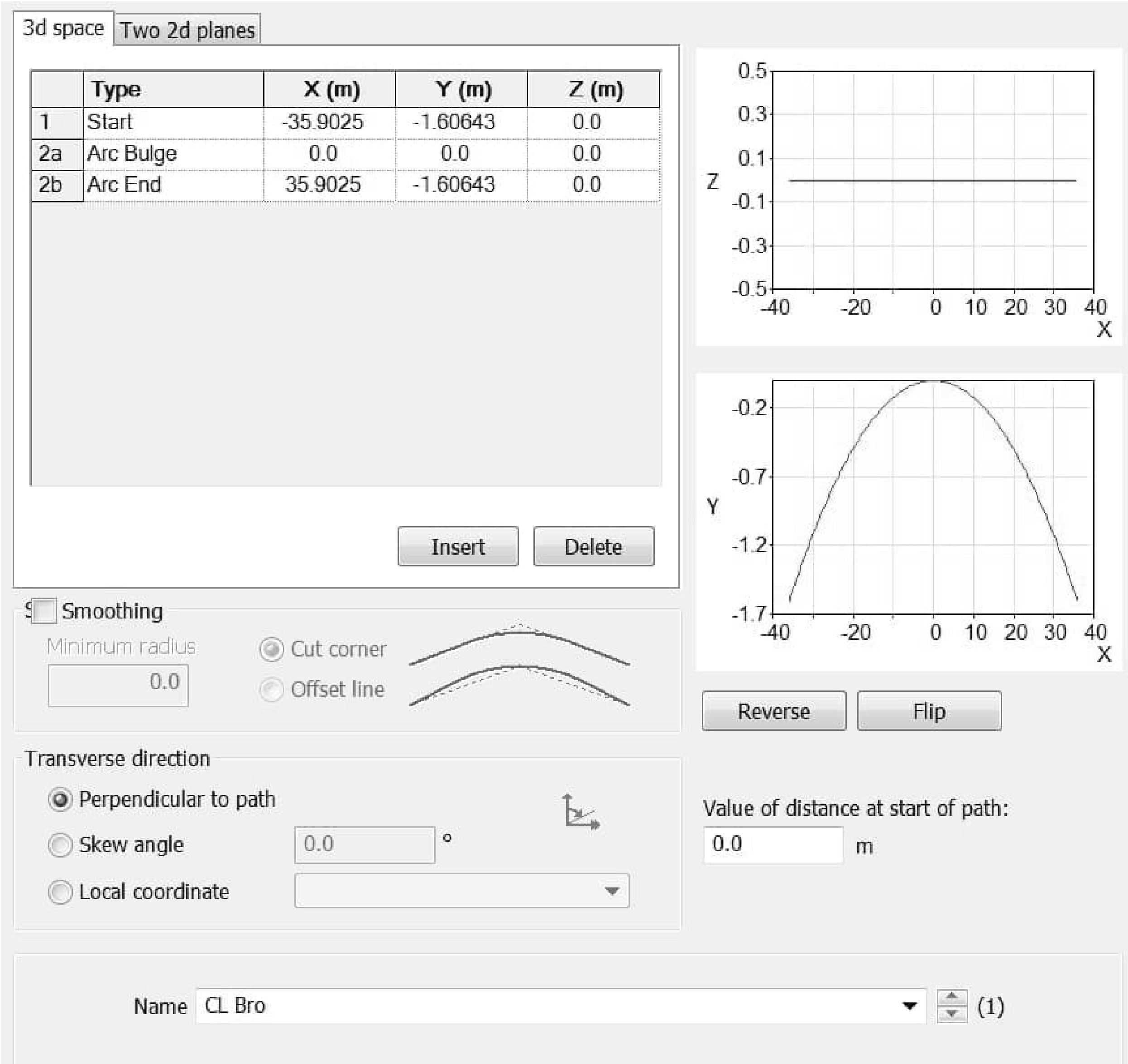
Number of spacings longitudinal direction : min. 70

Distance of spacing in transversal direction : 1.0 m



Remark *"Grid"* is defined relative *"Reference Path"*.

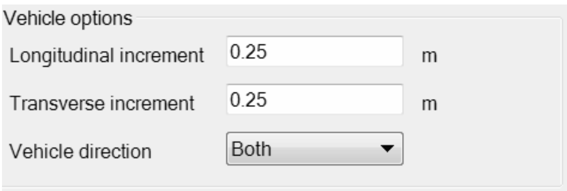
Definition “Reference Path” :



Influence components (utvärdering av balkar, lager och reaktioner) :

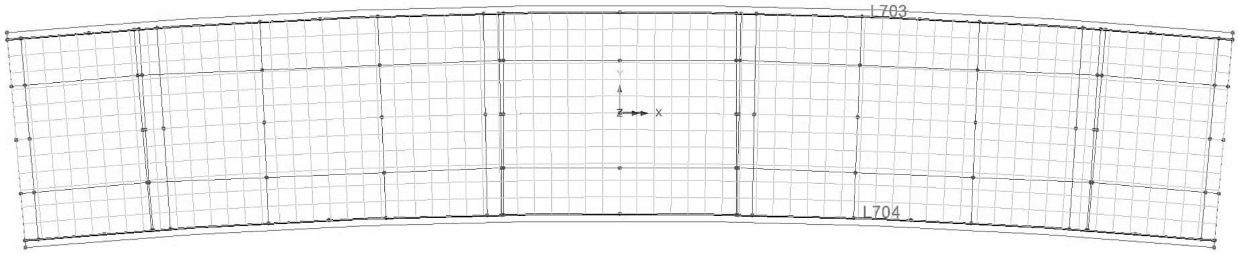
Attribute nr.	Name	Entity
1	Inf1 – Girder (Fx)	Force/moment – Thick 3D Beam : Local
2	Inf2 – Girder (Fy)	-”-
3	Inf3 – Girder (Fz)	-”-
4	Inf4 – Girder (Mx)	-”-
5	Inf5 – Girder (My)	-”-
6	Inf6 – Girder (Mz)	-”-
7	Inf7 – Support 1(FX)	Reaction : Local Coords ”Stod 1”
8	Inf8 – Support 1 (FY)	-”-
9	Inf9 – Support 1 (FZ)	-”-
10	Inf10 – Support 1 (MX)	-”-
11	Inf11 – Support 1 (MY)	-”-
12	Inf12 – Support 2 (FX)	Reaction : Local Coords ”Stod 2”
13	Inf13 – Support 2 (FY)	-”-
14	Inf14 – Support 2 (FZ)	-”-
15	Inf15 – Support 2 (MX)	-”-
16	Inf16 – Support 2 (MY)	-”-
17	Inf17 – Support 3 (FX)	Reaction : Local Coords ”Stod 3”
18	Inf18 – Support 3 (FY)	-”-
19	Inf19 – Support 3 (FZ)	-”-
20	Inf20 – Support 3 (MX)	-”-
21	Inf21 – Support 3 (MY)	-”-

VLO options :



Definition carriageway :

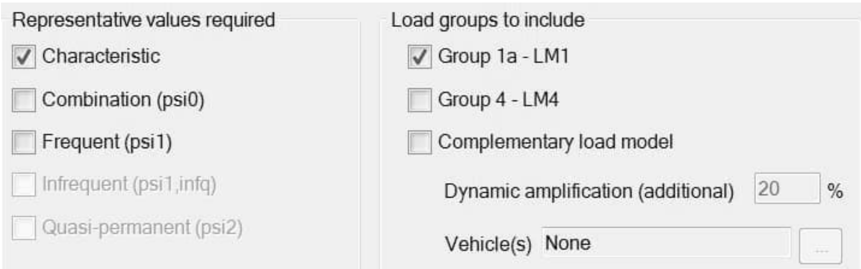
Kerbs L703 and L704 are used to define carriageway as seen below.

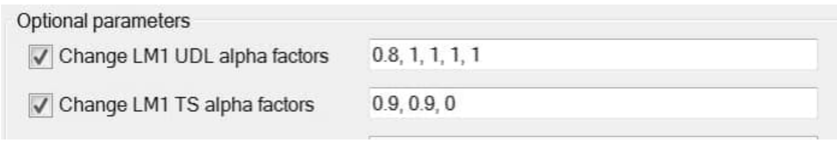


3.7.5.1 Envelopp : LM 1

Laster är skapade genom att tillämpa influensytor skapade av ”Direct Method Influence” och parametrar nedan.

Parametrar för VLO för LM 1 :





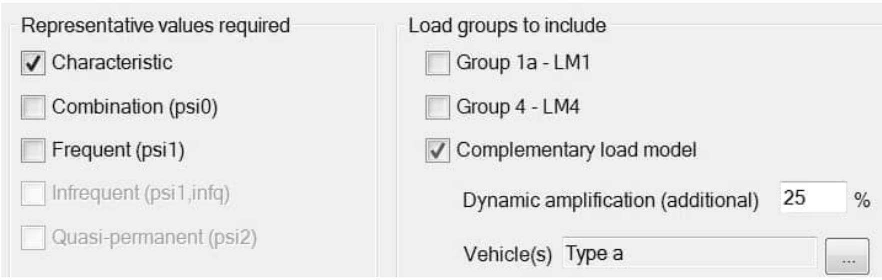
Envelope LM1 :

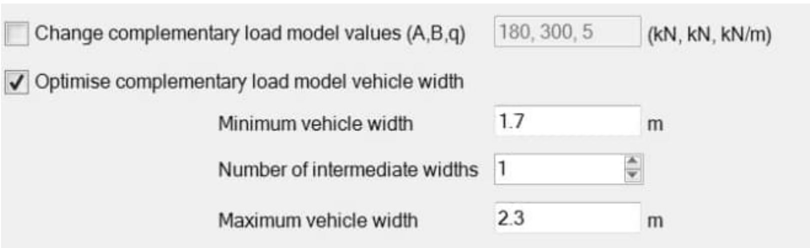
Loadcases	Name
1532...1585	VLO Analysis 1 – LM 1

3.7.5.2 Envelopp : EG A

Laster är skapade genom att tillämpa influensytor skapade av ”Direct Method Influence” och parameterar nedan.

Parametrar för VLO för EG A (vehicule type a) :





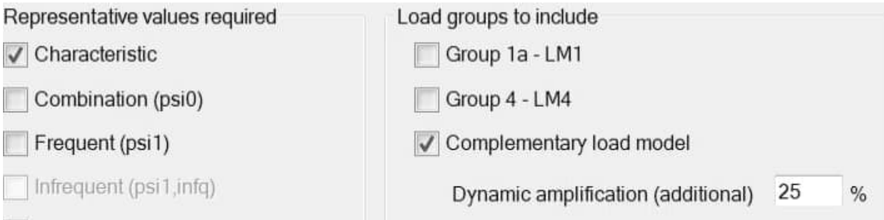
Envelope EG A :

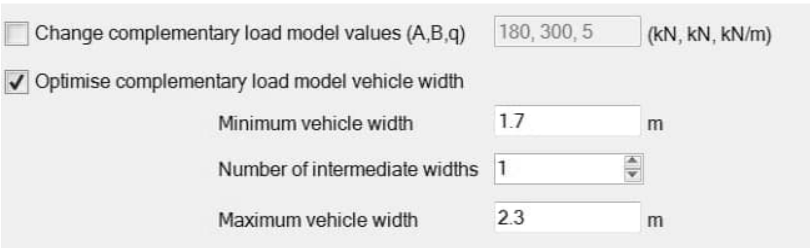
Loadcases	Name
1588...1641	VLO Analysis 2 – EG A

3.7.5.3 Envelopp : EG B

Laster är skapade genom att tillämpa influensytor skapade av ”Direct Method Influence” och parameterar nedan.

Parametrar för VLO för EG B (vehicule type b-n) :



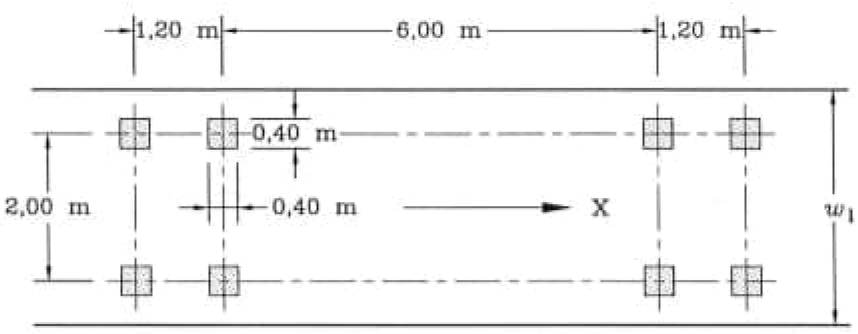


Envelope EG B :

Loadcases	Name
1644...1697	VLO Analysis 3 – EG B

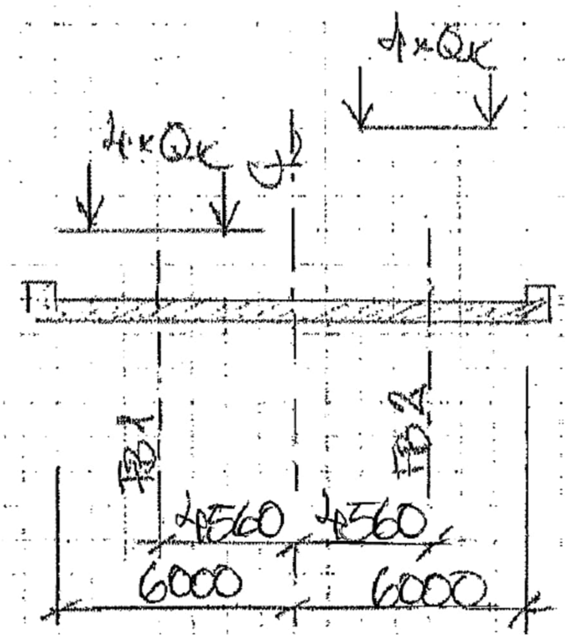
3.7.6 Utmattningsmodell

På säker sida sker utvärdering enligt utmattningsmodell 3 (LM 3) enligt SS-EN 1991-2 avsnitt 4.6.4.

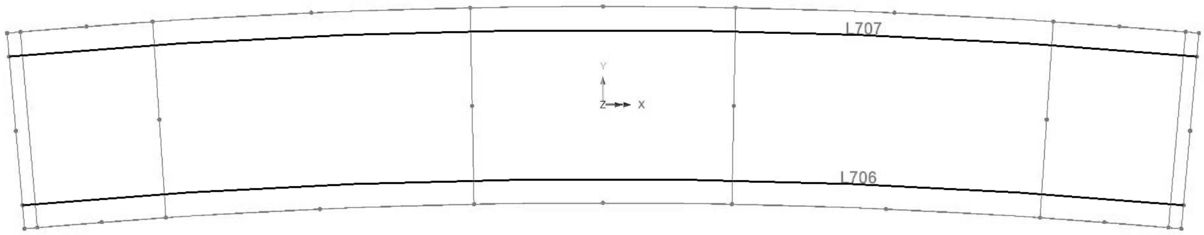


Q_k = 120 kN : karakteristik värde exklusive nationella anpassningsfaktorer

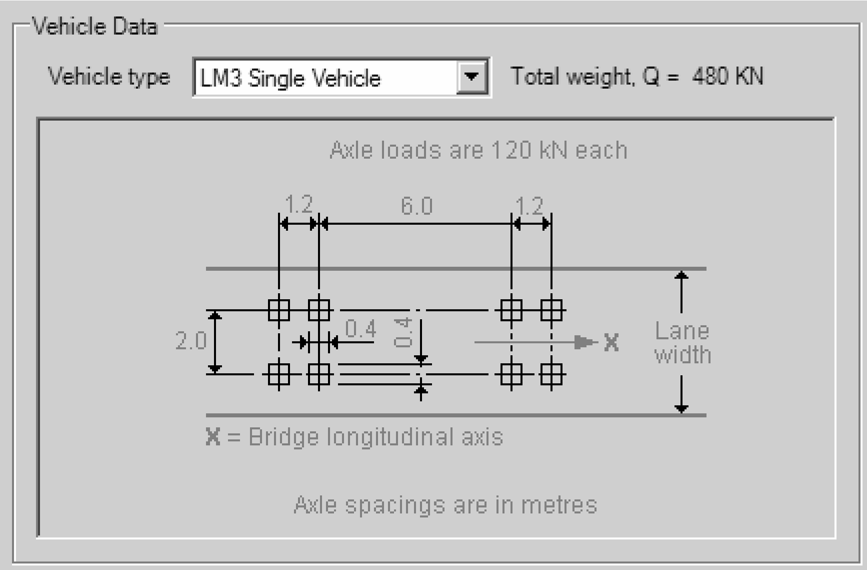
Vid utvärdering av samtliga konstruktionsdelar förutom farbaneplatta tillämpas FB 1 och FB 2 enligt redovisning nedan.



Vid utvärdering tillämpas funktion ”Moving Load” vilket innebär att trafiklasterna vandrar 0.5 m längs de olika farbanorna. Varje förflyttning ger upphov ett lastfall. För att finna farligast lastställning tillämpas enveloppet för de förekommande lastfallen.



Discrete point load : UTM 3 (attribute nr 8):



Load attributes :

Load attribute nr	Load attribute
8	UTM 3

Loadcases :

Loadcase	Load attribute nr	Line	Farbana
52000..52142	8	706	FB1
53000..53145	8	707	FB2

Envelope UTM :

Envelope	Loadcase
UTM - FB1	52000..52142
UTM - FB2	53000..53145

3.8 BROMSKRAFT

Bromskraft bestäms enligt SS-EN 1991-2 §4.4.1.

Uppträdande last anses verka i nivå med beläggning.

$$L = 0.8m + 35.0m + 35.0m + 0.8m = 71.6m$$

Lastmodell LM 1 :

$$Q_{lk} = 0.6\alpha_{Q1} \cdot (2Q_{ik}) + 0.1\alpha_{q1} \cdot q_{1k} \cdot w_1 \cdot L$$

$$180kN \cdot \alpha_{Q1} \leq Q_{lk} \leq 900kN$$

$$Q_{broms} = 0.6 \cdot (2 \cdot 270\,kN) + 0.1 \cdot 7.2kPa \cdot 3.0m \cdot 71.6m = 478\,kN < 900\,kN$$

Lastmodell EG B = 300 kN (se : TRVFS 2011:12 kapitel 6 punkt 3§) :

Typfordon g.) anses dimensionerande.

$$Q_{lk} = 0.35 \cdot (8 \cdot 0.44B) + 0.1 \cdot p \cdot L_q$$

$$Q_{lk} \leq 500kN$$

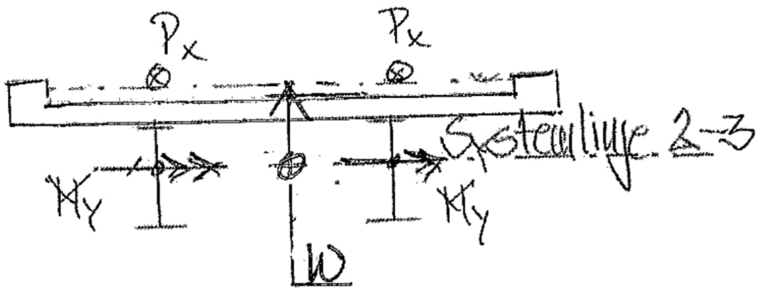
$$Q_{broms} = 0.35 \cdot (8 \cdot 0.44B) = 0.35 \cdot (8 \cdot 0.44 \cdot 300kN) = 370kN < 500kN$$

Anm.
Bromskraften tillhörande LM 1 tillämpas på säker sida i systemberäkning. Bromkraft anses endast uppträda i ett lastfält med godtycklig placering.

Lasten nedan införs i statisk modell på säker sida genom att införa punktlaster vid respektive stöd.

$$Px = \frac{P_{broms}}{2} = \frac{478kN}{2} = 239kN$$

$$My = Px \cdot (0.76m + 0.33m + 0.11m) = \pm 287kNm$$



Load : BROMS 1+

Structural loading : Internal beam point

Point load in X direction (P_x) : +239 kN

Point moment around Y direction (M_y) : +287 kNm

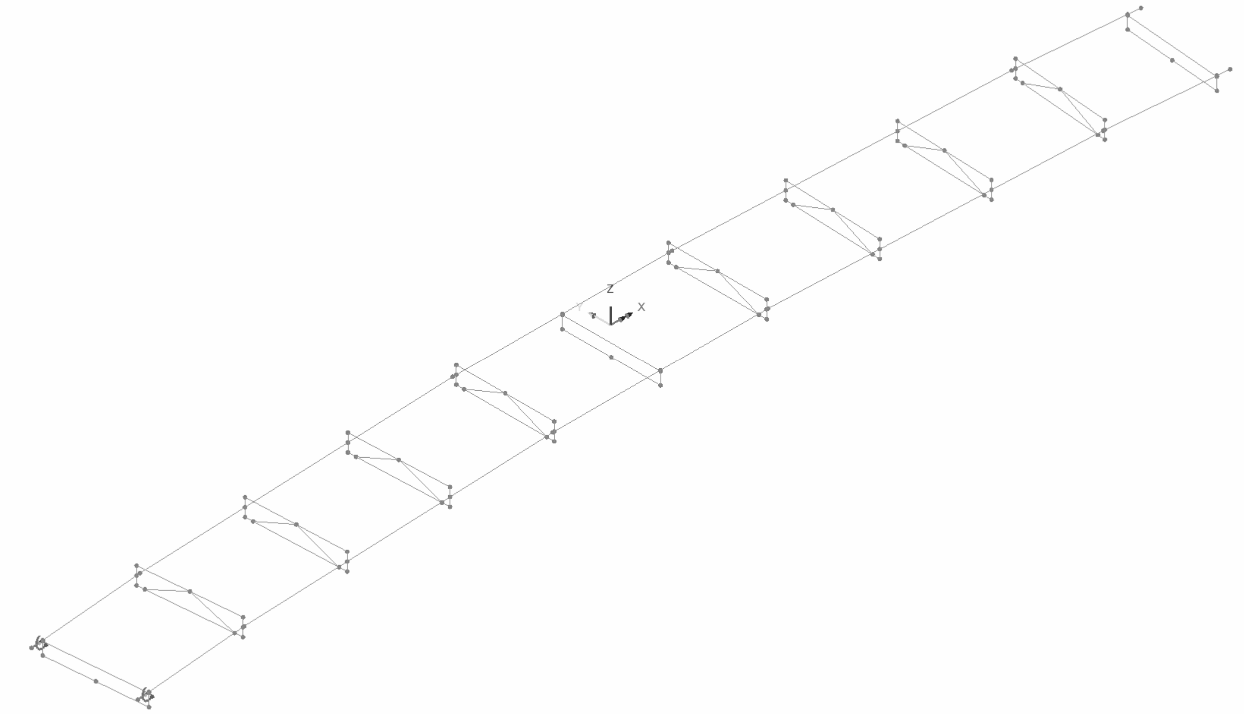
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About nodal line

Loadcase : BROMS 1+

Analys : Analysis 7 (Drift-V)



Load : BROMS 2+

Structural loading : Internal beam point

Point load in X direction (P_x) : +239 kN

Point moment around Y direction (M_y) : +287 kNm

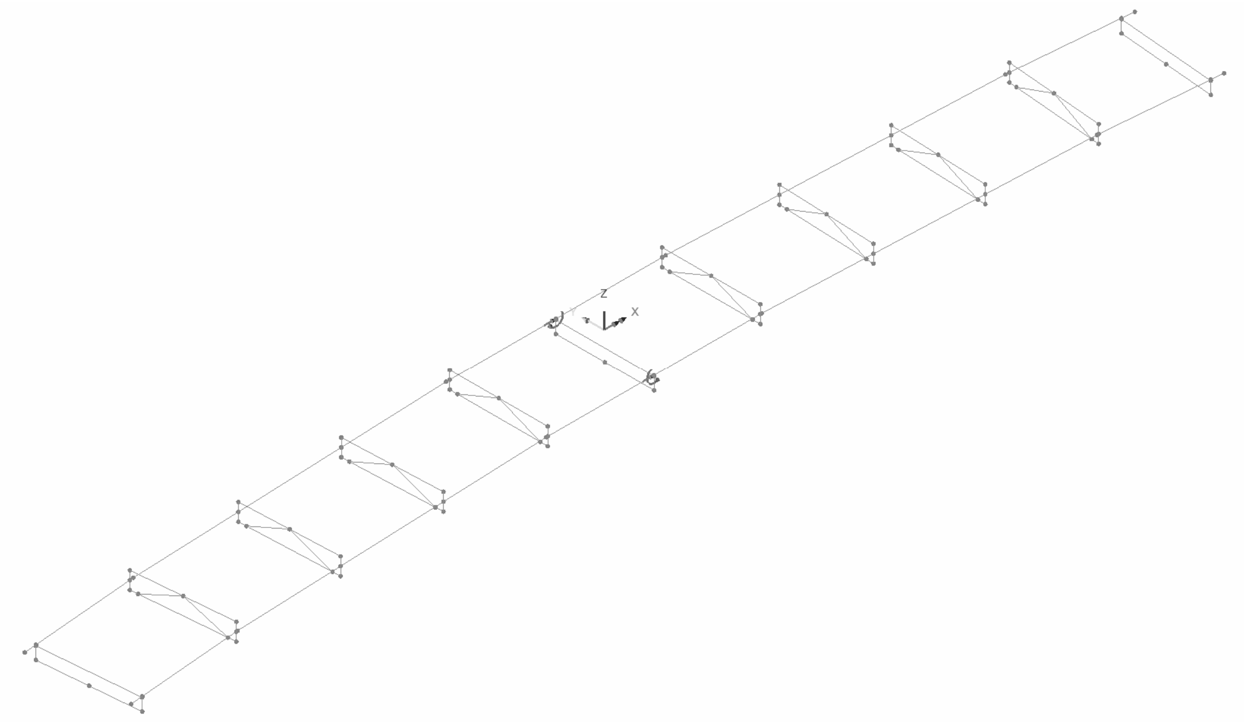
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About nodal line

Loadcase : BROMS 2+

Analys : Analysis 7 (Drift-V)



Load : BROMS 3+

Structural loading : Internal beam point

Point load in X direction (P_x) : +239 kN

Point moment around Y direction (M_y) : +287 kNm

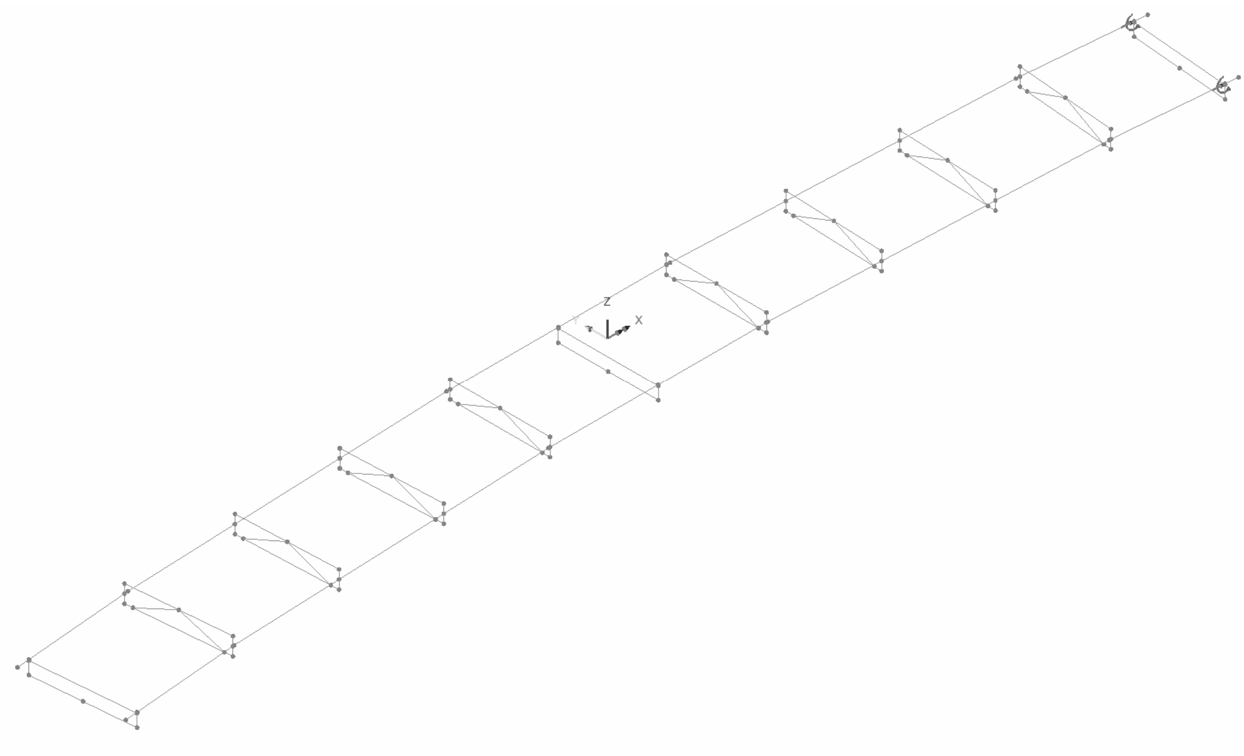
Distance along local element : 0 m

Load direction : Element local

Load position : About nodal line

Loadcase : BROMS 3+

Analys : Analysis 7 (Drift-V)



Load : BROMS 1-

Structural loading : Internal beam point

Point load in X direction (P_x) : -239 kN

Point moment around Y direction (M_y) : -287 kNm

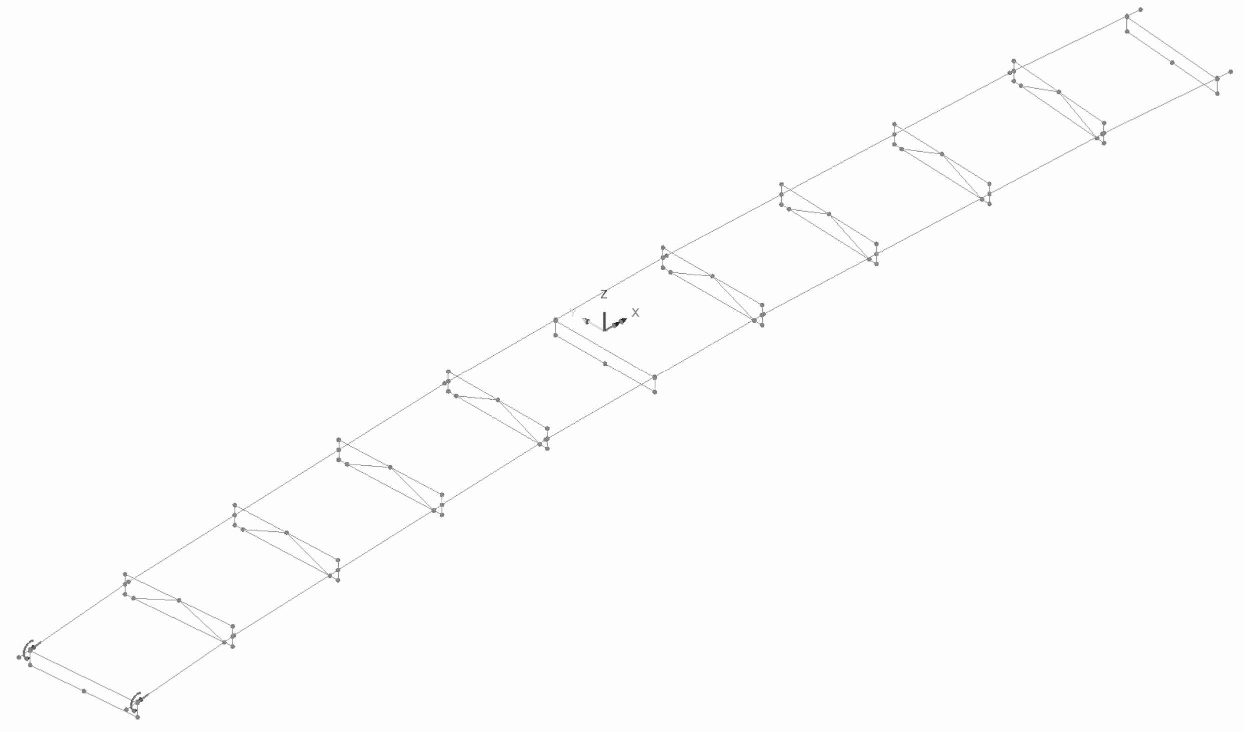
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About nodal line

Loadcase : BROMS 1-

Analys : Analysis 7 (Drift-V)



Load : BROMS 2-

Structural loading : Internal beam point

Point load in X direction (P_x) : -239 kN

Point moment around Y direction (M_y) : -287 kNm

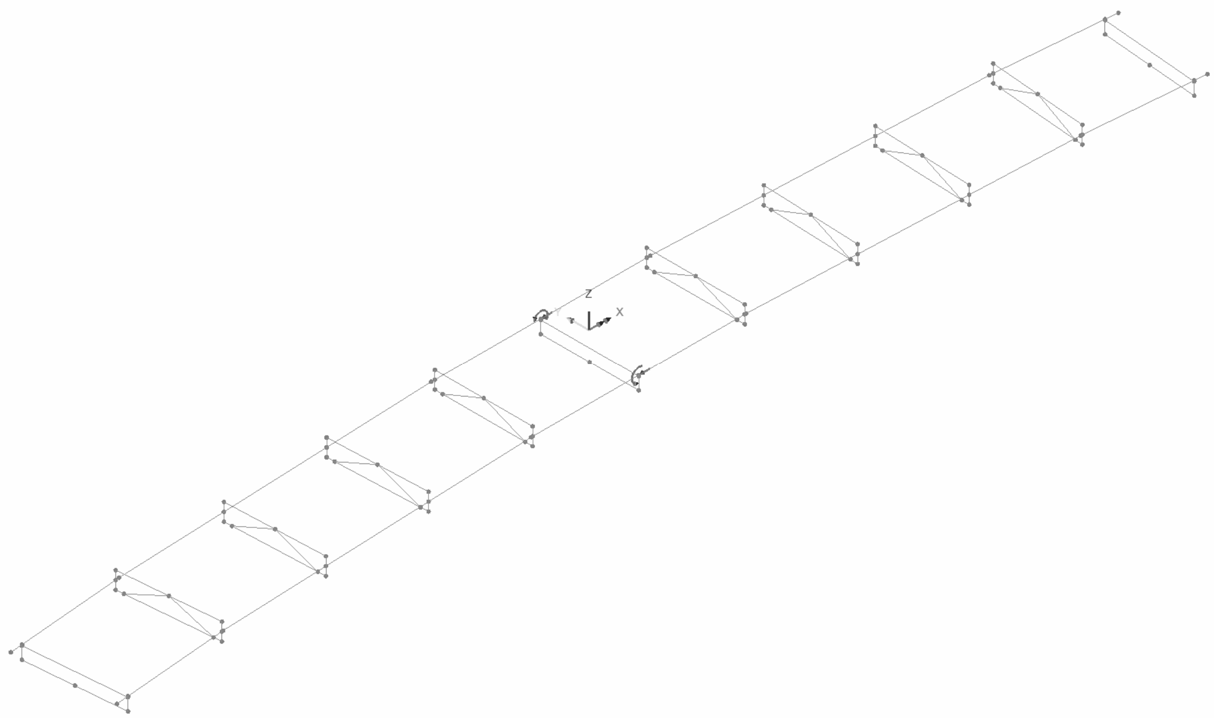
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About nodal line

Loadcase : BROMS 2-

Analys : Analysis 7 (Drift-V)



Load : BROMS 3-

Structural loading : Internal beam point

Point load in X direction (P_x) : -239 kN

Point moment around Y direction (M_y) : -287 kNm

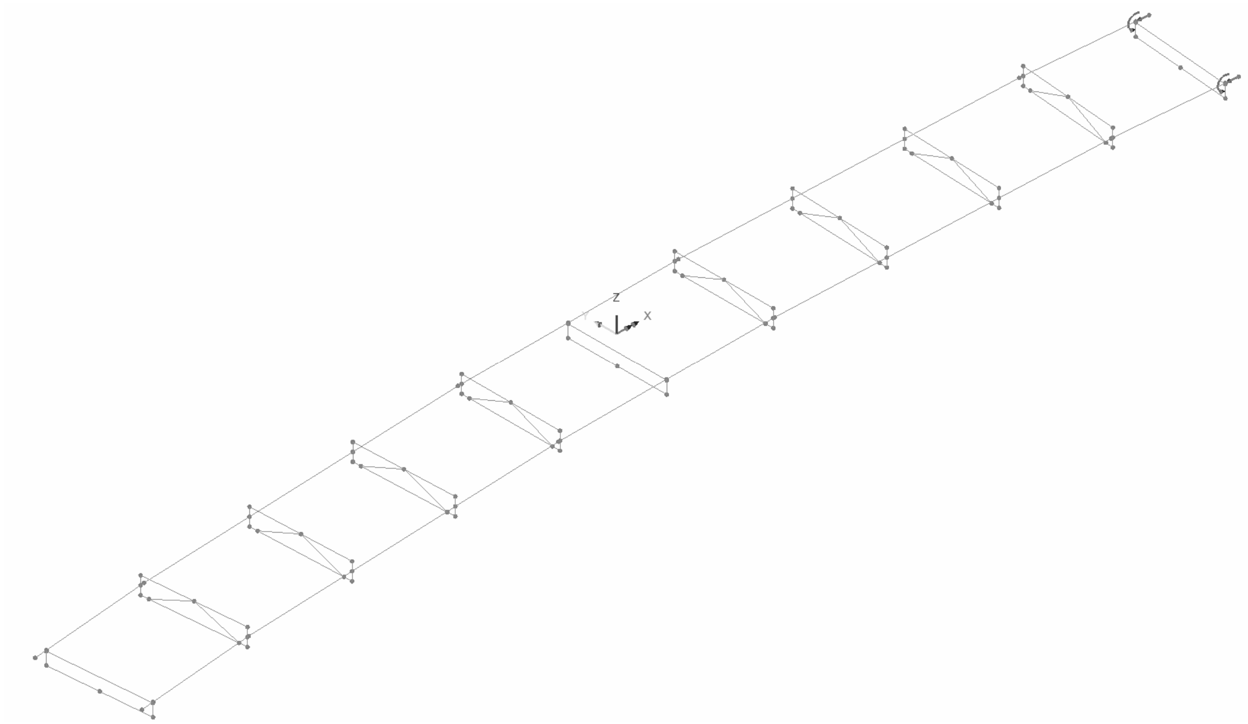
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About nodal line

Loadcase : BROMS 3-

Analys : Analysis 7 (Drift-V)



Envelopes BROMS :

Loadcase
BROMS 1+
BROMS 2+
BROMS 3+
BROMS 1-
BROMS 2-
BROMS 3-

3.9 SIDOKRAFT

Sidokraften bestäms enligt SS-EN 1991-2 §4.4.2. Lasten är uppträder ortogonalt bromslasten och anses uppträda till följd av sned inbromsning eller av centrifugalkrafter (R = 402 m).

Lastmodell LM 1 :

$Q_{tk} = 0.25Q_{lk} = 0.25 \cdot 478\,kN = 120\,kN$: sned inbromsning

$Q_{tk.2} = \frac{40m}{R} \sum \alpha_{Qi} \cdot (2Q_{ik}) = \frac{40m}{402m} \cdot 2 \cdot (270kN + 180kN) = 89kN$: centrigulkraft

Lastmodell EG B = 300 kN (se : TRVFS 2011:12 kapitel 6 punkt 3§) :

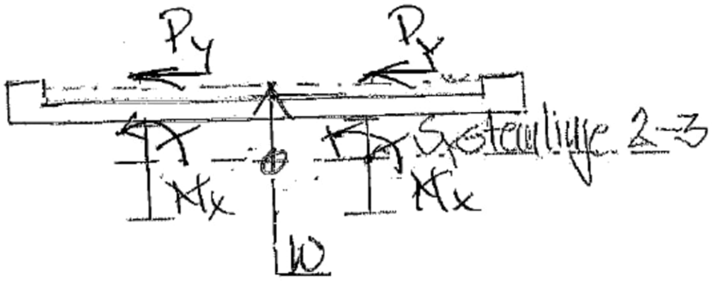
$Q_{tk} = 0.25Q_{lk} = 0.25 \cdot 370\,kN = 92\,kN$: sned inbromsning

$Q_{tk.2} = \frac{40m}{R} \cdot Q_v = \frac{40m}{402m} \cdot (8 \cdot 0.44 \cdot 300kN) = 105kN$: centrigulkraft

Lasten nedan införs i statisk modell på säker sida genom att införa punktlaster vid tvärbalkar för respektive stöd.

$$Py = \frac{P_{sido}}{2} = \frac{120kN}{2} = 60kN$$

$$My = Px \cdot (0.76m + 0.33m + 0.11m) = 72kNm$$



Sidokraften motsvarande sned inbromsning tillhörande LM 1 tillämpas på säker sida i systemberäkning.

Load : SIDO 1+

Structural loading : Internal beam point

Point load in Y direction (P_y) : +60 kN

Point moment around X direction (M_x) : +72 kNm

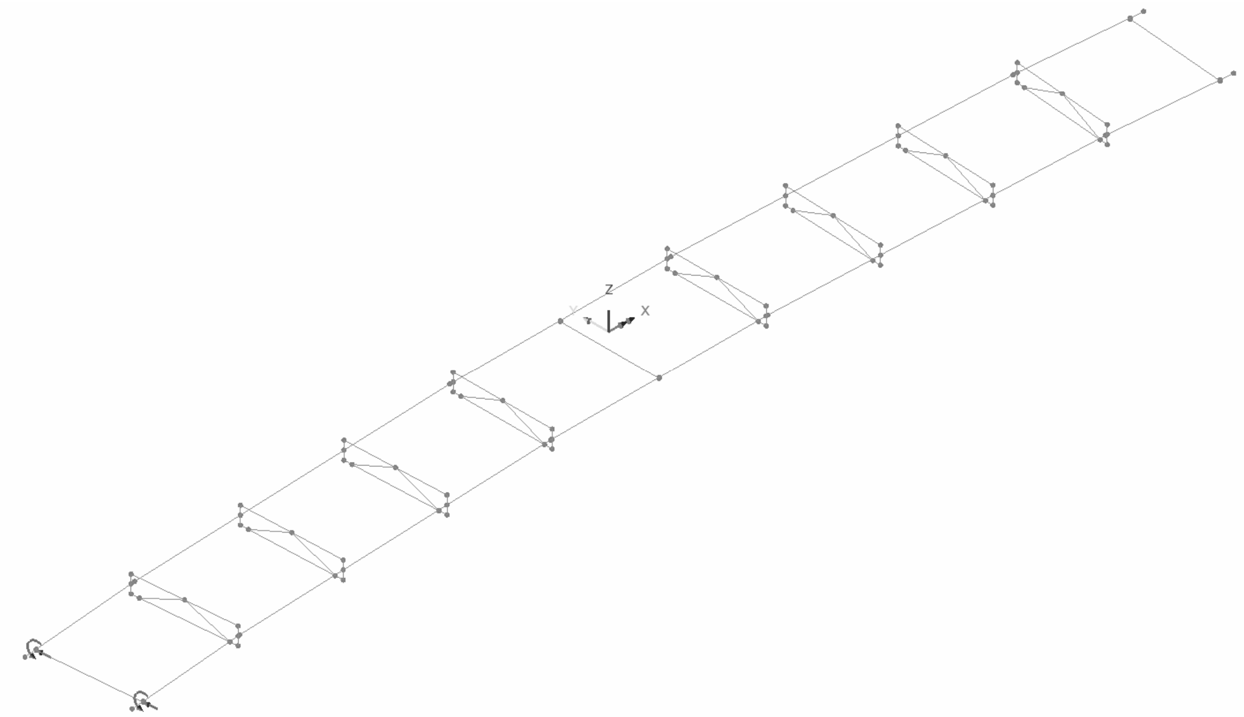
Distance along local element (actual) : 0 m and 6.4 m

Load direction : Element local

Load position : About nodal line

Loadcase : SIDO 1+

Analys : Analysis 7 (Drift-V)



Load : SIDO 2+

Structural loading : Internal beam point

Point load in Y direction (P_y) : +60 kN

Point moment around X direction (M_x) : +72 kNm

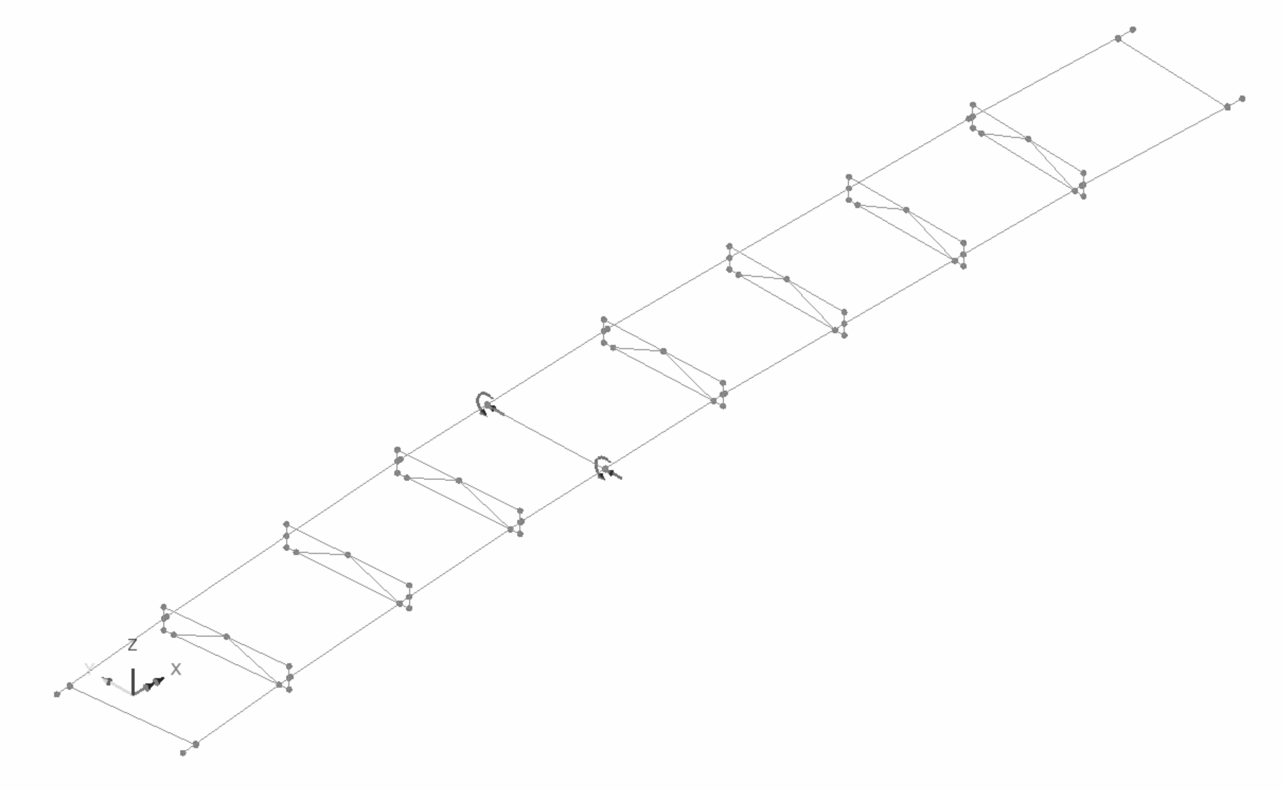
Distance along local element (actual) : 0 m and 6.4 m

Load direction : Element local

Load position : About nodal line

Loadcase : SIDO 2+

Analys : Analysis 7 (Drift-V)



Load : SIDO 3+

Structural loading : Internal beam point

Point load in Y direction (P_y) : +60 kN

Point moment around X direction (M_x) : +72 kNm

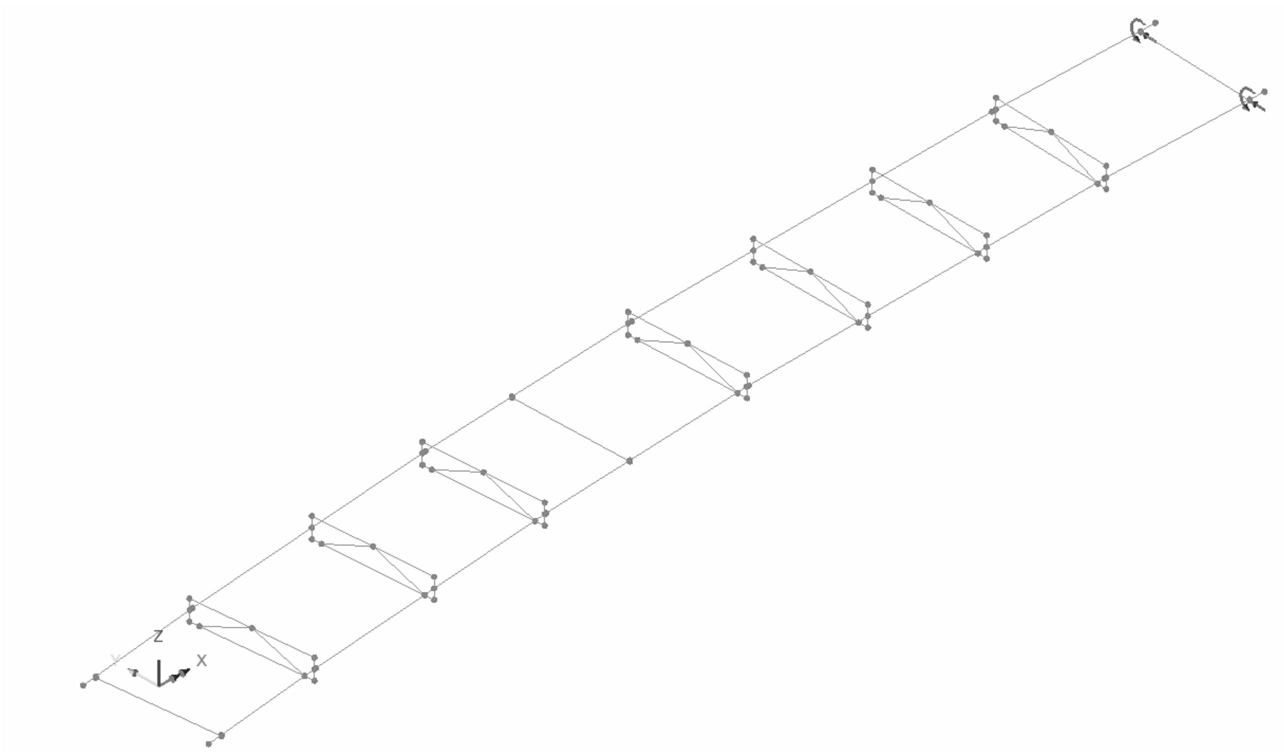
Distance along local element (actual) : 0 m and 6.4 m

Load direction : Element local

Load position : About nodal line

Loadcase : SIDO 3+

Analys : Analysis 7 (Drift-V)



Load : SIDO 1-

Structural loading : Internal beam point

Point load in Y direction (P_y) : -60 kN

Point moment around X direction (M_x) : -72 kNm

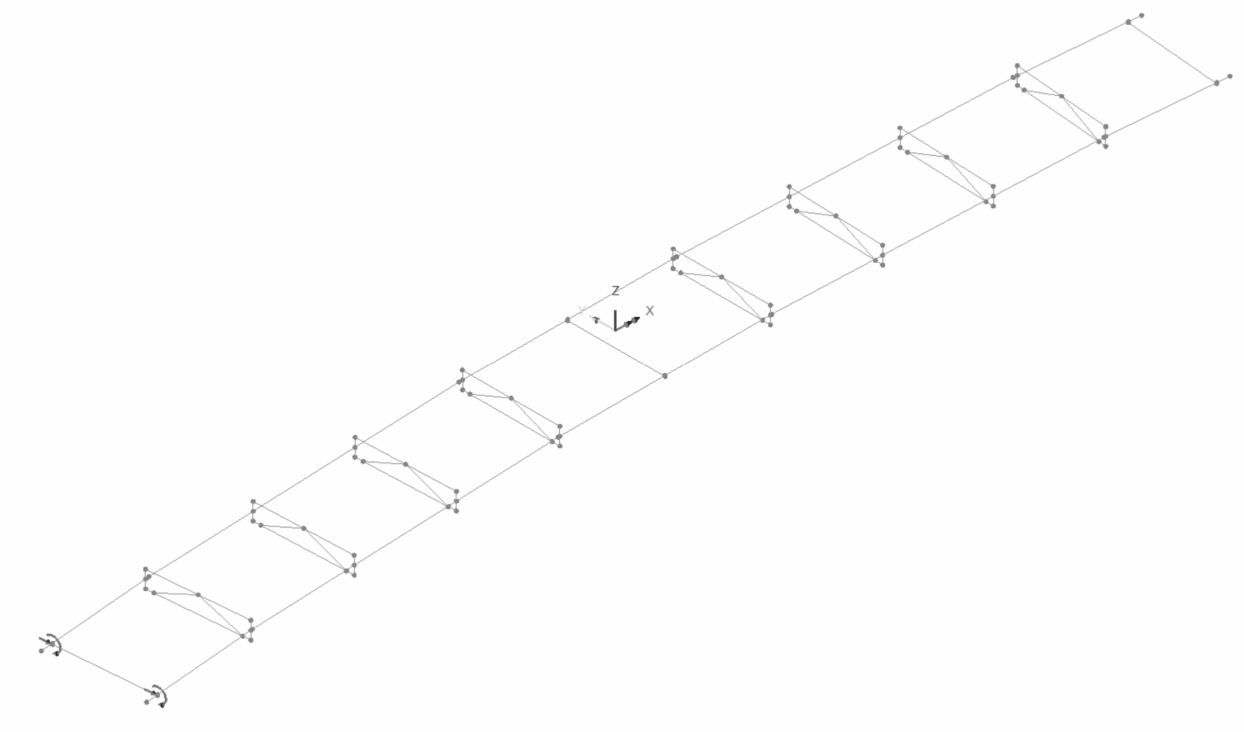
Distance along local element (actual) : 0 m and 6.4 m

Load direction : Element local

Load position : About nodal line

Loadcase : SIDO 1-

Analys : Analysis 7 (Drift-V)



Load : SIDO 2-

Structural loading : Internal beam point

Point load in Y direction (P_y) : -60 kN

Point moment around X direction (M_x) : -72 kNm

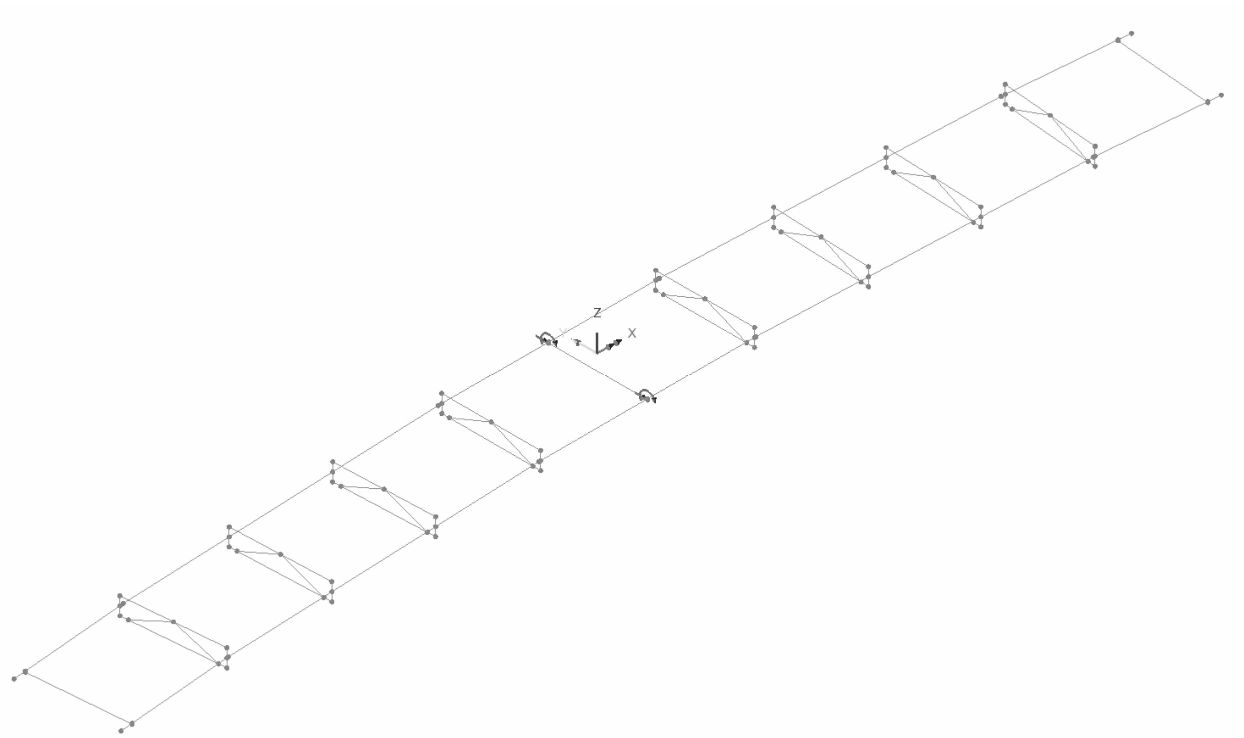
Distance along local element (actual) : 0 m and 6.4 m

Load direction : Element local

Load position : About nodal line

Loadcase : SIDO 2-

Analys : Analysis 7 (Drift-V)



Load : SIDO 3-

Structural loading : Internal beam point

Point load in Y direction (P_y) : -60 kN

Point moment around X direction (M_x) : -72 kNm

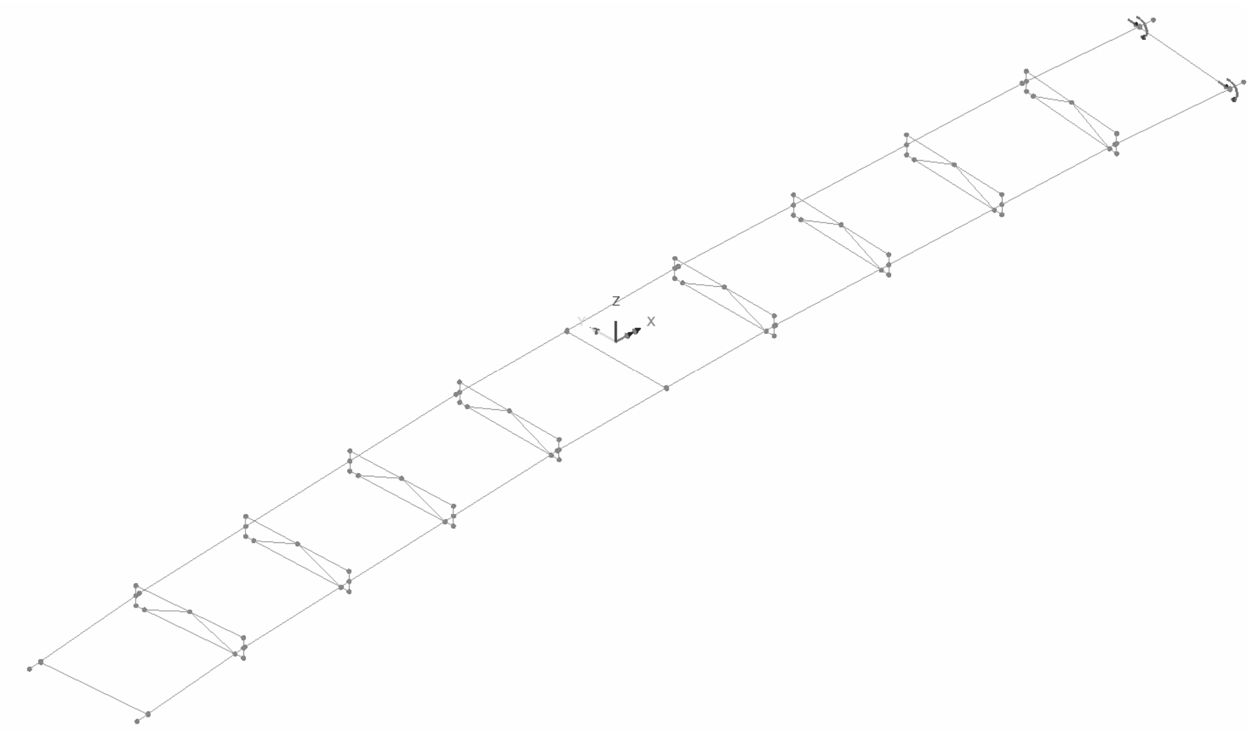
Distance along local element (actual) : 0 m and 6.4 m

Load direction : Element local

Load position : About nodal line

Loadcase : SIDO 3-

Analys : Analysis 7 (Drift-V)



Envelopes SIDO :

Loadcase
SIDO 1+
SIDO 2+
SIDO 3+
SIDO 1-
SIDO 2-
SIDO 3-

3.10 ÖVERLAST

Överlast bestäms enligt SS-EN 1991-2 avsnitt 4.9.1 (1) och samt TRVFS kapitel 6 i12 enligt redovisning nedan :

$q_{ytlast.1} = 20kPa$: vertikal belastning på bredden 6.0 m

$q_{ytlast.2} = 10kPa$: vertikal belastning på övrig bredd 6.12 m

3.11 TEMPERATUR

Temperaturpåverkan på broar anges i Krav Brobyggande avsnitt B.3.2.5 och EN 1991-1-5 kapitel 6.

Inverkan av jämn temperatur (SS-EN 1991-1-5 avsnitt 6.1.3) och ojämn temperatur (SS-EN 1991-1-5 avsnitt 6.1.4) skall kombineras enligt SS-EN 1991-1-5 avsnitt 6.1.5.

Inverkan beaktas i bruksgränstillstånd enligt SS-EN 1992-1-1 §2.3.1.2. Om så sker får en bör en gradvis sprickutveckling tillämpas enligt SS-EN 1992-1-1 §5.4(3).

På säker sida tillgodoräknas ingen reduktion av uppsprickning dock beaktas inverkan av reducerad styvhet till följd av krypning.

Krav Brobyggande avsnitt B.3.2.5 anger att reduktion med hänsyn till krypning inte får tillämpas för ojämn temperaturändring över tvärsnittet.

Monteringstemperatur : $T_{mont} = +10° C$ EN 1991-1-5A.1(3)

Längdutvidningskoefficient : $\alpha = 12 \cdot 10^{-6}$

Betongplatta $\Rightarrow$ typ 2

Ort : Sundsvall

$T_{max} = +34°C$: TRVFS 2011:12 Bilaga 2

$T_{min} = -42°C$: TRVFS 2011:12 Bilaga 2

Varaktighetskoefficienter :

Koefficienter enligt SS-EN 1990/A1 tabell A2.3

$\psi_0 = 0.60$
$\psi_1 = 0.60$
$\psi_2 = 0.50$

3.11.1 Jämn temperatur över hela bron

Jämn temperaturändring över hela bron ges EN 1991-1-5 avsnitt 6.1.3.3. Denna temperaturändring är säsongsberoende och ger huvudsakligen upphov till translation mot brons rörelsecentrum beläget lager TF:3 beläget vid stöd 3.

Funktion enligt SS EN 1991-1-5 figur 6.1 (funktion till bro typ 2) :

$$T_e(T) = \text{linterp}\left[\left(-50 \quad 0 \quad 30 \quad 50\right)^T \cdot °C, \left(-46 \quad 5 \quad 34 \quad 54\right)^T \cdot °C, T \right]$$

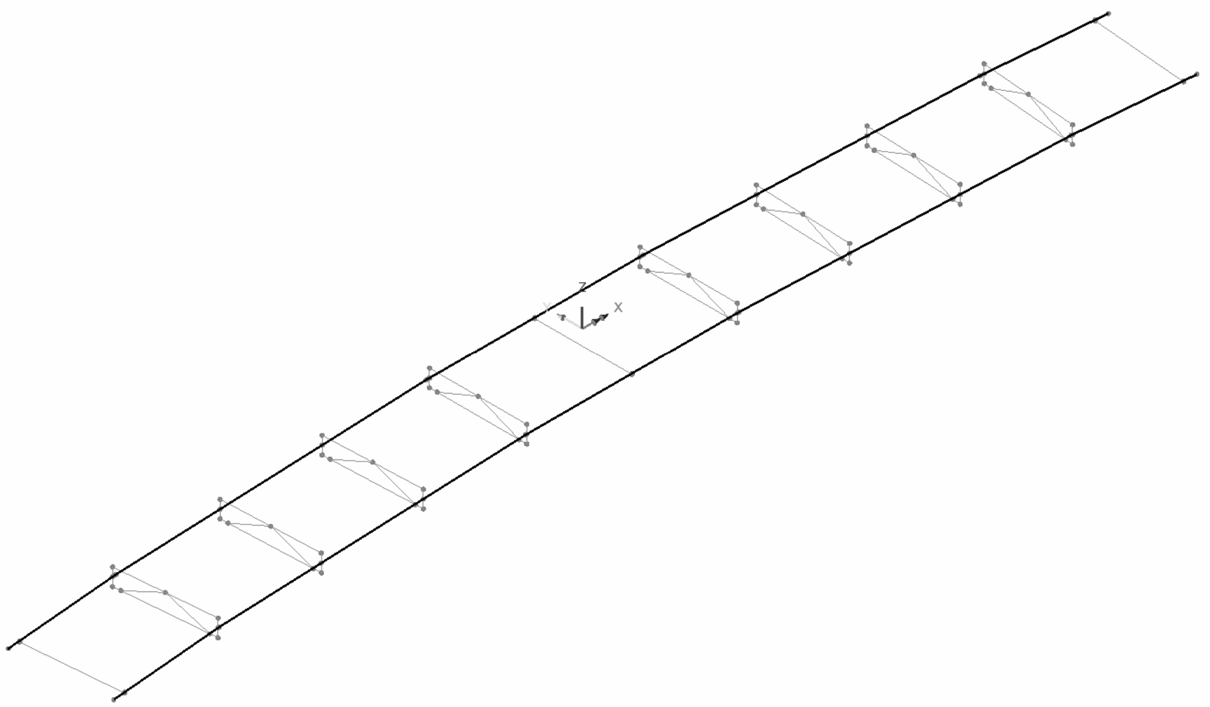
$$T_{e.max} = T_e\left(T_{max}\right) = 38\,°C$$

$$T_{e.min} = T_e\left(T_{min}\right) = -38\,°C$$

$$T^+ = T_{e.max} - T_0 = +38℃ - 10℃ = +28℃$$

$$T^- = T_{e.min} - T_0 = -38℃ - 10℃ = -48℃$$

Jämn temperaturändring påföres huvudbalkarna enligt figur nedan.



Load : JTEMP+

Structural loading : Temperature

Final temperature : +27C

Initial temperature : ±0 C

Loadcase : JTEMP+

Analys : Analysis (Drift-V)

Load : JTEMP-

Structural loading : Temperature

Final temperature : -34C

Initial temperature : ±0 C

Loadcase : JTEMP+

Analys : Analysis (Drift-V)

Envelopes JTEMP :

Loadcase
JTEMP+
JTEMP-

3.11.2 Ojämn temperatur mellan konstruktionsdelar i sammansatt tvärsnitt (OJTEMP)

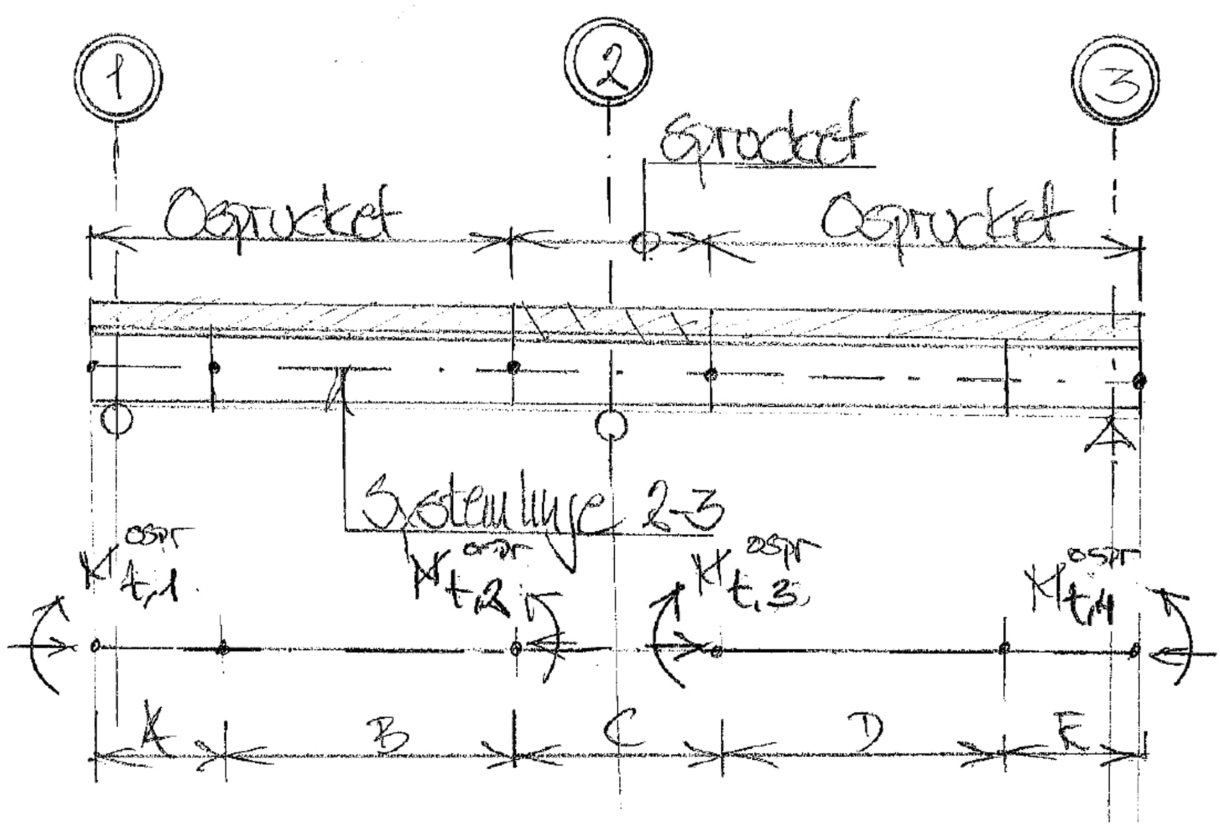
Linjär temperaturskillnad över tvärsnitt bestäms enligt förenklade förfarande enligt EN 1991-1-5 avsnitt 6.1.4.2 (metod 2). Broöverbyggnad typ 2 (samverkansbro).

$\Delta T_{\max} = +10°C$: överyta varmare

$\Delta T_{\min} = -10°C$: underyta varmare

Inverkan av temperatur utgår i spruckna områden medan de beaktas i ospruckna områden enligt nedan.

Lasten påföres huvudbalken i som punkt last och moment enligt redovisning. Lasten är införd i Systemlinje 2-3.



3.11.2.1 Segment A

Osprucken betong (OJTEMP-1) :

$\varphi_t = 0$: se sida A2:26

$A_c = 2.04m^2$: se sida A3:39

$$N_t^{ospr} = \pm\alpha \cdot \frac{E_{cm}}{1+\varphi_t} \cdot \Delta T \cdot A_c = \pm 10^{-5} \cdot \frac{34 \cdot 10^6 kPa}{1+0} \cdot 10°C \cdot 2.04m^2 = \pm 6936kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:89

y_{sam} = -0.198 m : samverkanstvärsnitt typ 7, se sida A2:101

$$M_t^{ospr} = \pm N_t^{ospr} \cdot (y_{btg} - y_{sam}) = \pm 6936kN \cdot (0.180m + 0.198m) = \pm 2652kNm$$

Sprucken betong :

$N_t^{spr} = 0kN$ och $M_t^{ospr} = 0kNm$

3.11.2.2 Segment B

Osprucken betong (OJTEMP-2) :

$$N_t^{ospr} = \pm\alpha \cdot \frac{E_{cm}}{1+\varphi_t} \cdot \Delta T \cdot A_c = \pm 10^{-5} \cdot \frac{34 \cdot 10^6 kPa}{1+0} \cdot 10°C \cdot 2.04m^2 = \pm 6936kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:89

y_{sam} = -0.140 m : samverkanstvärsnitt typ 7, se sida A2:101

$$M_t^{ospr} = \pm N_t^{ospr} \cdot (y_{btg} - y_{sam}) = \pm 6936kN \cdot (0.180m + 0.140m) = \pm 2220kNm$$

Sprucken betong :

$N_{cs}^{spr} = 0kN$ och $M_{cs}^{ospr} = 0kNm$

3.11.2.3 Segment C

Hela balken anses osprucken.

3.11.2.4 Segment D

Osprucken betong (OJTEMP-3) :

$$N_t^{ospr} = \pm\alpha \cdot \frac{E_{cm}}{1+\varphi_t} \cdot \Delta T \cdot A_c = \pm 10^{-5} \cdot \frac{34 \cdot 10^6 kPa}{1+0} \cdot 10°C \cdot 2.04m^2 = \pm 6936kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:89

y_{sam} = -0.140 m : samverkanstvärsnitt typ 7, se sida A2:101

$$M_t^{ospr} = \pm N_t^{ospr} \cdot \left(y_{btg} - y_{sam}\right) = \pm 6936kN \cdot (0.180m + 0.140m) = \pm 2220kNm$$

Sprucken betong :

$N_{cs}^{spr} = 0kN$ och $M_{cs}^{ospr} = 0kNm$

3.11.2.5 Segment E

Osprucken betong (OJTEMP-4) :

$$N_t^{ospr} = \pm\alpha \cdot \frac{E_{cm}}{1+\varphi_t} \cdot \Delta T \cdot A_c = \pm 10^{-5} \cdot \frac{34 \cdot 10^6 kPa}{1+0} \cdot 10°C \cdot 2.04m^2 = \pm 6936kN$$

$y_{btg} = +0.180m$: tyngdpunkt för betongfarbana, se sida A2:89

y_{sam} = -0.198 m : samverkanstvärsnitt typ 7, se sida A2:101

$$M_t^{ospr} = \pm N_t^{ospr} \cdot \left(y_{btg} - y_{sam}\right) = \pm 6936kN \cdot (0.180m + 0.198m) = \pm 2652kNm$$

Sprucken betong :

$N_t^{spr} = 0kN$ och $M_t^{ospr} = 0kNm$

3.11.2.6 Definition laster LUSAS

Load : OJTEMP-1

Structural loading : Internal beam point

Point load in X direction (P_x) : +6936 kN

Point moment around Y direction (M_y) : +2652 kNm

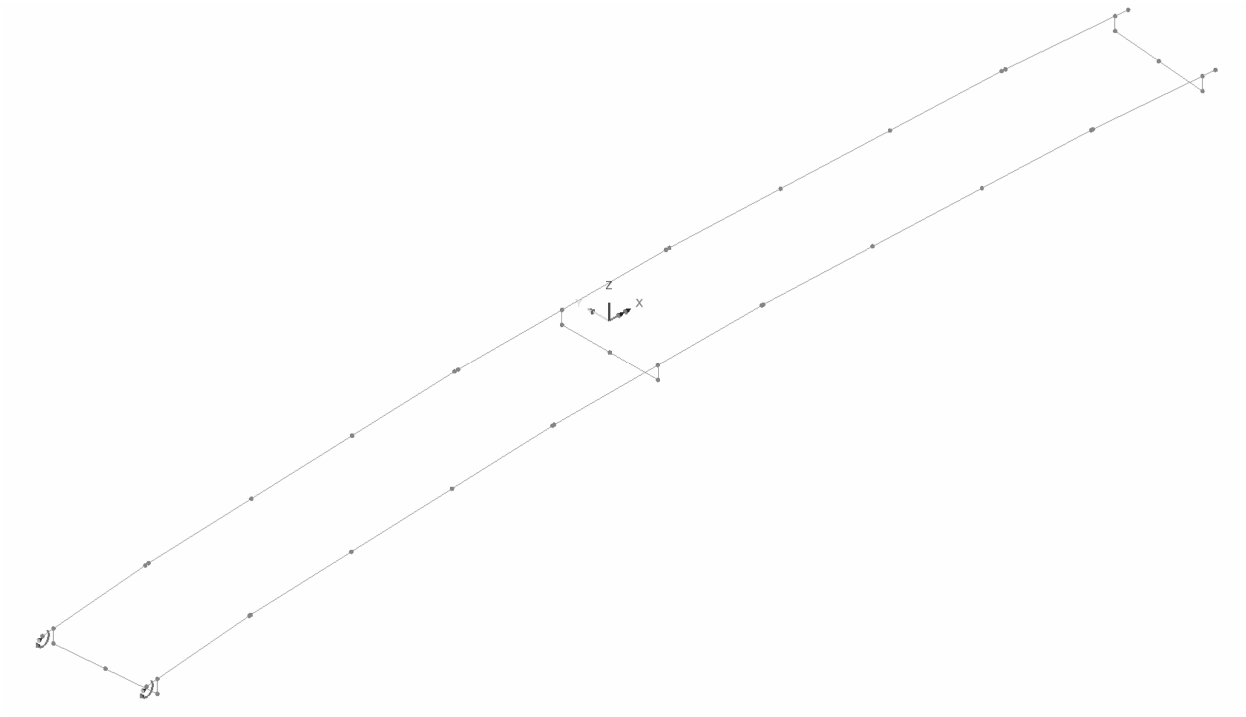
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About beam axis

Loadcase : OJTEMP-1

Analys : Analysis 7 (Drift-V)



Load : OJTEMP-2

Structural loading : Internal beam point

Point load in X direction (P_x) : -6936 kN

Point moment around Y direction (M_y) : -2220 kNm

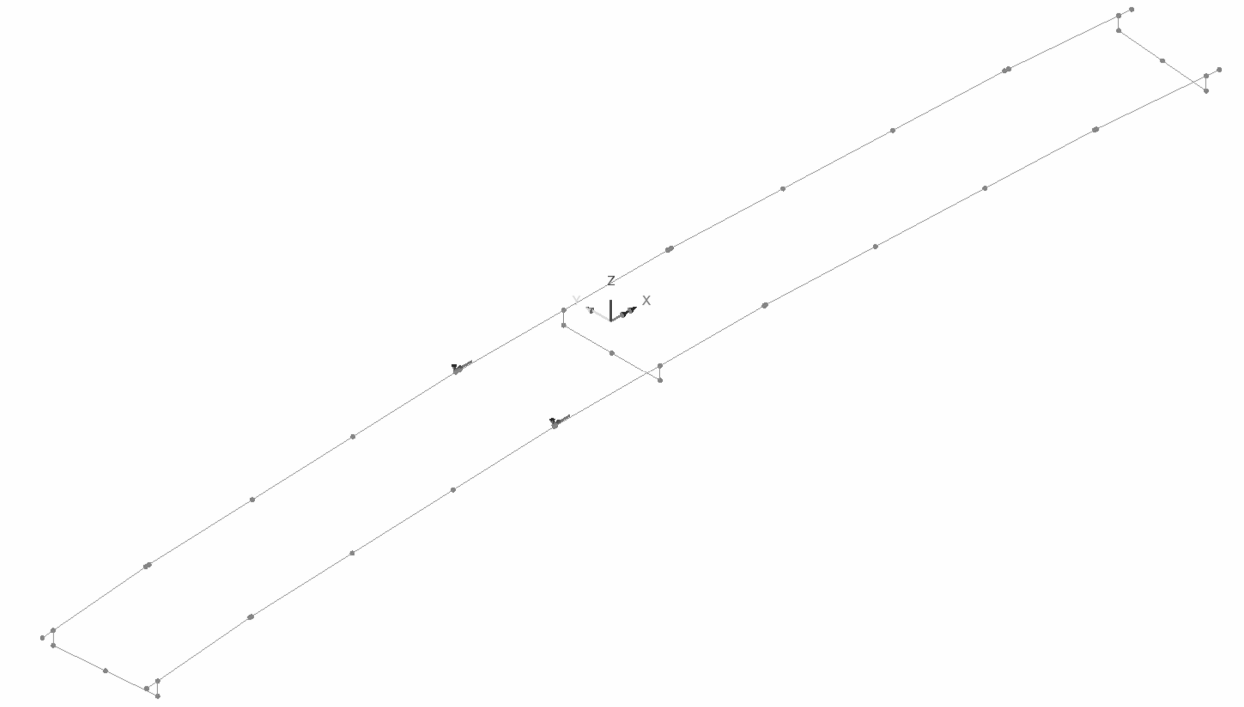
Distance along local element (parametric) : 1

Load direction : Element local

Load position : About beam axis

Loadcase : OJTEMP-2

Analys : Analysis 7 (Drift-V)



Load : OJTEMP-3

Structural loading : Internal beam point

Point load in X direction (P_x) : 6936 kN

Point moment around Y direction (M_y) : +2220 kNm

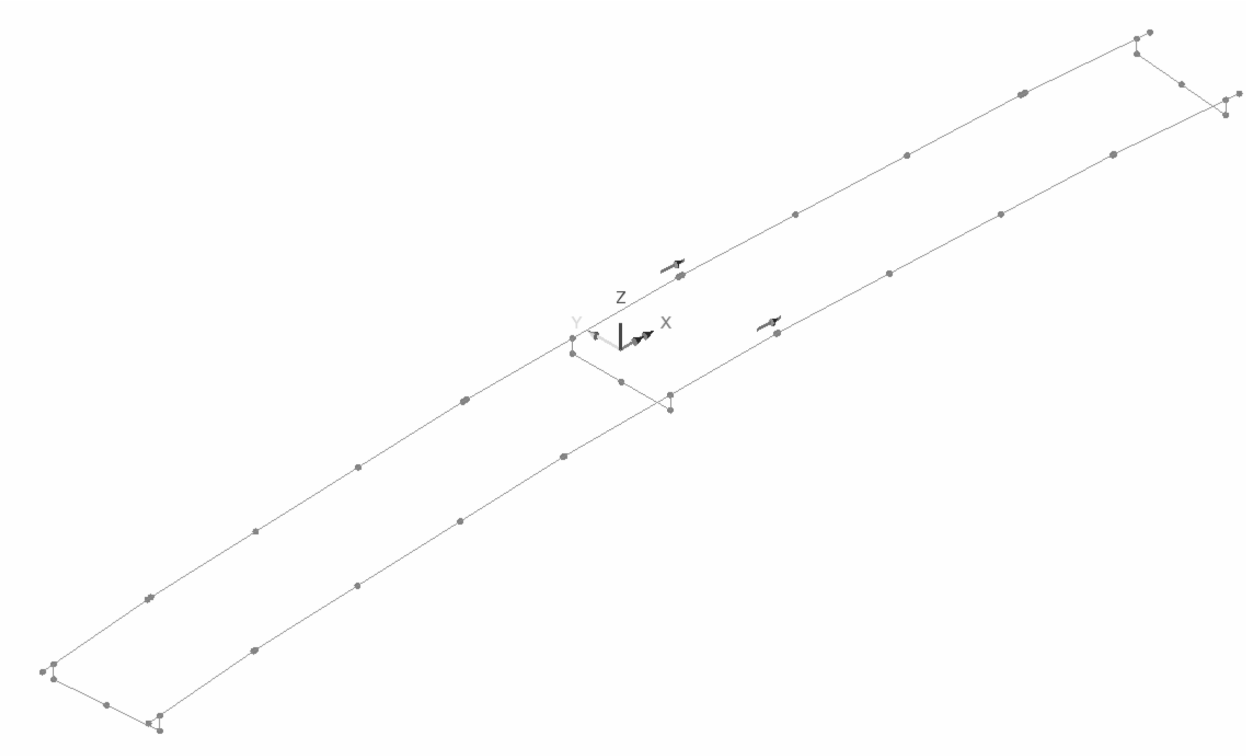
Distance along local element (parametric) : 0

Load direction : Element local

Load position : About beam axis

Loadcase : OJTEMP-3

Analys : Analysis 7 (Drift-V)



Load : OJTEMP-4

Structural loading : Internal beam point

Point load in X direction (P_x) : -6936 kN

Point moment around Y direction (M_y) : -2652 kNm

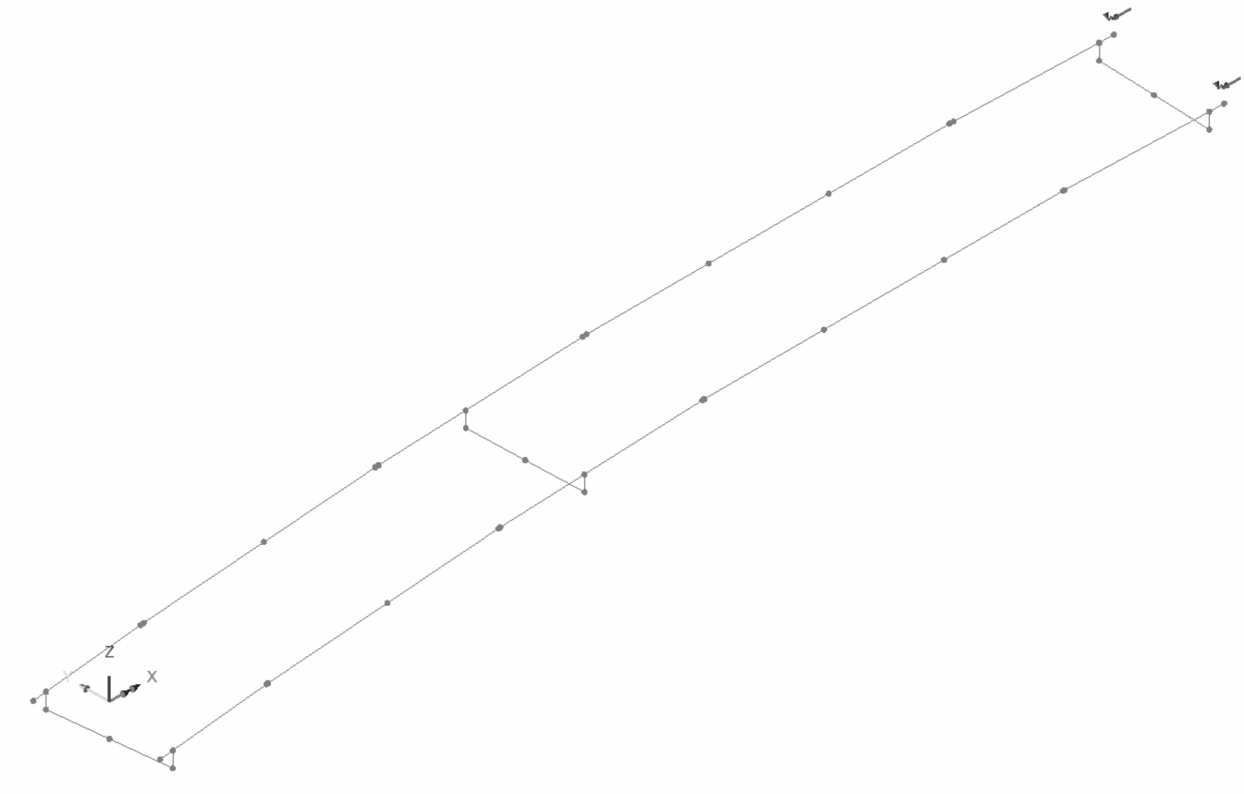
Distance along local element (parametric) : 1

Load direction : Element local

Load position : About beam axis

Loadcase : OJTEMP-4

Analys : Analysis 7 (Drift-V)



Basic loadcombination OJTEMP+ :

Loadcase	Factor
OJTEMP-1	1
OJTEMP-2	1
OJTEMP-3	1
OJTEMP-4	1

Basic loadcombination OJTE*MP- :*

Loadcase	Permanent factor	Variable factor
OJTEMP+	0	-1.00

3.11.3 Ojämn temperatur över hela tvärsnittet (metod 1)

Linjär temperaturskillnad över tvärsnitt bestäms enligt EN 1991-1-5 § 6.1.4.1 för beläggningstjocklek 100 mm och typ 2 (samverkansbro).

$k_{1.sur} = 1.00$

$k_{2.sur} = 1.00$

$\Delta T_{\max} = +15°C \cdot k_{1.sur} = +15°C$: överyta varmare

$\Delta T_{\min} = -18°C \cdot k_{2.sur} = -18°C$: underyta varmare

Anm. Ojämn temperatur över tvärsnittet ger anses ge lägre lasteffekt än mellan konstruktionsdelar. Lastfall utgår i fortsatt kontroll.

3.11.4 Kombination av jämn och ojämn temperatur

Kombinering sker enligt SS-EN 1991-1-5 avsnitt 6.1.5.

Vid dimensionering tillämpas dock $\omega_M = 1.0$ och $\omega_N = 1.0$ på säker sida på säker sida vilket ger lastkombination enligt nedan.

Loadcombination smart *TEMP* :

Loadcase	Permanent factor	Variable factor
JTEMP+	0	1.00
JTEMP-	0	1.00
OJTEMP+	0	1.00
OJTEMP-	0	1.00

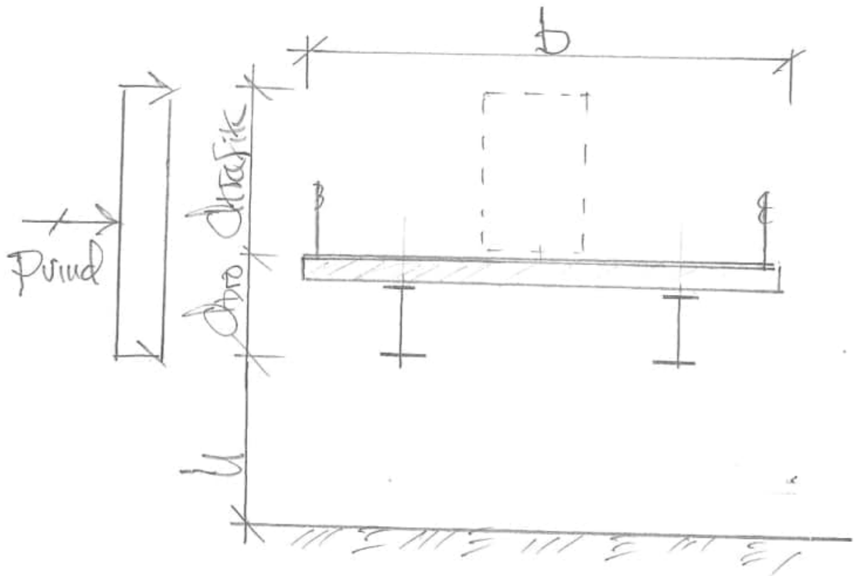
3.12 VINDLAST

Vindlast på broar anges i EN 1991-1-4 kapitel 8.

Varaktighetskoefficienter (koefficienter enligt SS-EN 1990 bilaga A2 tabell A2.1) :

$\psi_k = 1.00$
$\psi_0 = 0.30$
$\psi_1 = 0.20$
$\psi_2 = 0$

Lastintensiteter :



Terrängtyp II tillämpas på säker sida enligt SS-EN 1991-1-4 Tabell 4.1

$h = 3m$ men 4.0 m väljs på säker sida ! : avstånd från mark till UK farbana

d_{bro} = 2.3 m : höjd inkl. beläggning, se A1:6

$d_{trafik} = 2.0m$: höjd vägtrafik

$\Rightarrow d_{tot}$ = 2.3 m + 2.0 m = 4.3 m

$v_b(Sundsvall; z = 10m; z_0 = 0.05m) = 23\frac{m}{s}$: TRVFS 2011:12 Bilaga 4 tabell 4.1

$q_p(h = 4m; Terrängtyp\_II, v_b = 23\frac{m}{s}) = 0.54\frac{kN}{m^2}$: TRVFS 2011:12 Bilaga 4 tabell 4.2

$$q_b = \frac{1}{2}\cdot\rho\cdot v_b^2 = \frac{1}{2}\cdot 1.25\frac{kg}{m^3}\cdot\left(23\frac{m}{s}\right)^2 = 0.33\frac{kN}{m^2}$$

$$c_e = \frac{q_p}{q_b} = \frac{0.54kPa}{0.33kPa} = 1.64$$

$d_{tot} = 4.3m$

$$\rightarrow \frac{b}{d_{tot}} = 3.0$$

$b = 12.84m$

$c_{f.x}\left(\frac{b}{d_{tot}} = 3.0\right) = 1.7$: SS-EN 1991-1-4 figur 8.3

$$C = c_e \cdot c_{f.x} = 1.64 \cdot 1.7 = 2.79$$

Vindlast mot bro :

$$\frac{A_{ref.x}^{bro}}{L} = d_{bro}$$

$$p_{vind}^{bro} = \frac{F_w}{L} = \frac{1}{2}\cdot\rho\cdot v_b^2\cdot C\cdot\frac{A_{ref.x}^{bro}}{L} = \frac{1}{2}\cdot 1.25\frac{kg}{m^3}\cdot\left(23\frac{m}{s}\right)^2\cdot 2.79\cdot 2.3m = 2.1\frac{kN}{m}$$

Vindlast mot trafik :

$$\frac{A_{ref.x}^{trafik}}{L} = d_{trafik}$$

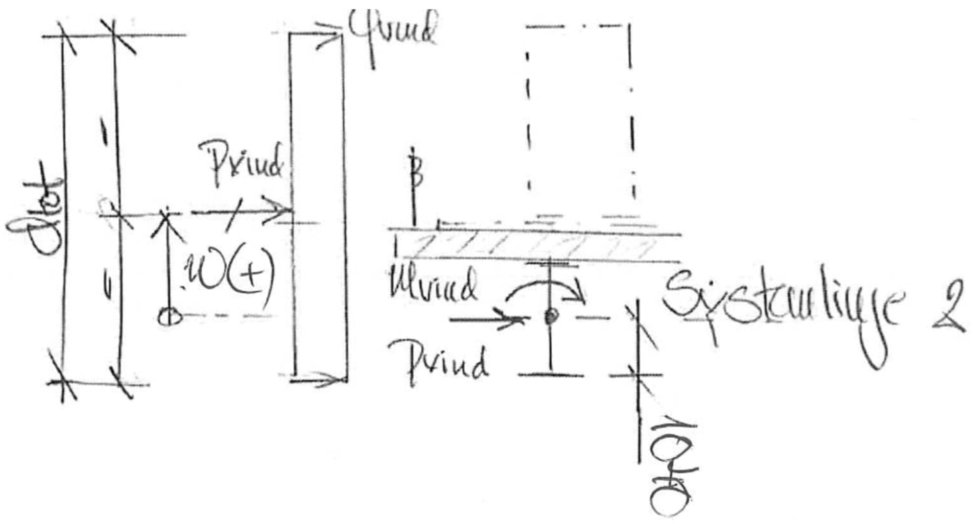
$$p_{vind}^{trafik} = \frac{F_w}{L} = \frac{1}{2}\cdot\rho\cdot v_b^2\cdot C\cdot\frac{A_{ref.x}^{trafik}}{L} = \frac{1}{2}\cdot 1.25\frac{kg}{m^3}\cdot\left(23\frac{m}{s}\right)^2\cdot 2.79\cdot 2.0m = 1.8\frac{kN}{m}$$

Lasten införs i den statiska modellen på säker sida genom att införa linjelaster utmed respektive huvudbalk.

$$p_{vind} = p_{vind}^{bro} + p_{vind}^{trafik} = 2.1\frac{kN}{m} + 1.8\frac{kN}{m} = 3.9\frac{kN}{m}$$

$$w = \frac{d_{tot}}{2} - 1.04m = \frac{4.3m}{2} - 1.04m = 1.11m$$

$$m_{vind} = p_{vind} \cdot w = \pm 3.9\frac{kN}{m} \cdot 1.11m = 4.3\frac{kNm}{m}$$



Load : VIND+

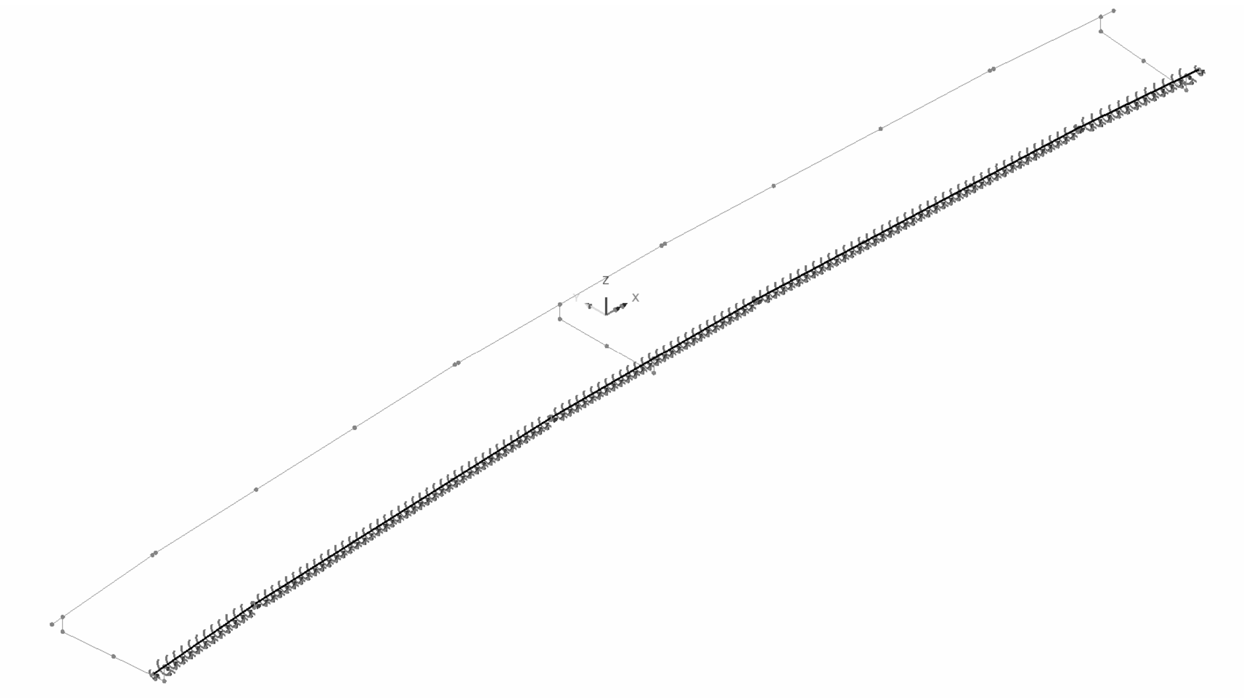
Structural loading : Global distributed

Line load in Y direction (p_y) : +3.9 $\frac{kN}{m}$

Line moment about X axis (m_x) : -4.3 $\frac{kNm}{m}$

Loadcase : VIND+

Analys : Analysis 7 (Drift-V)



Load : VIND-

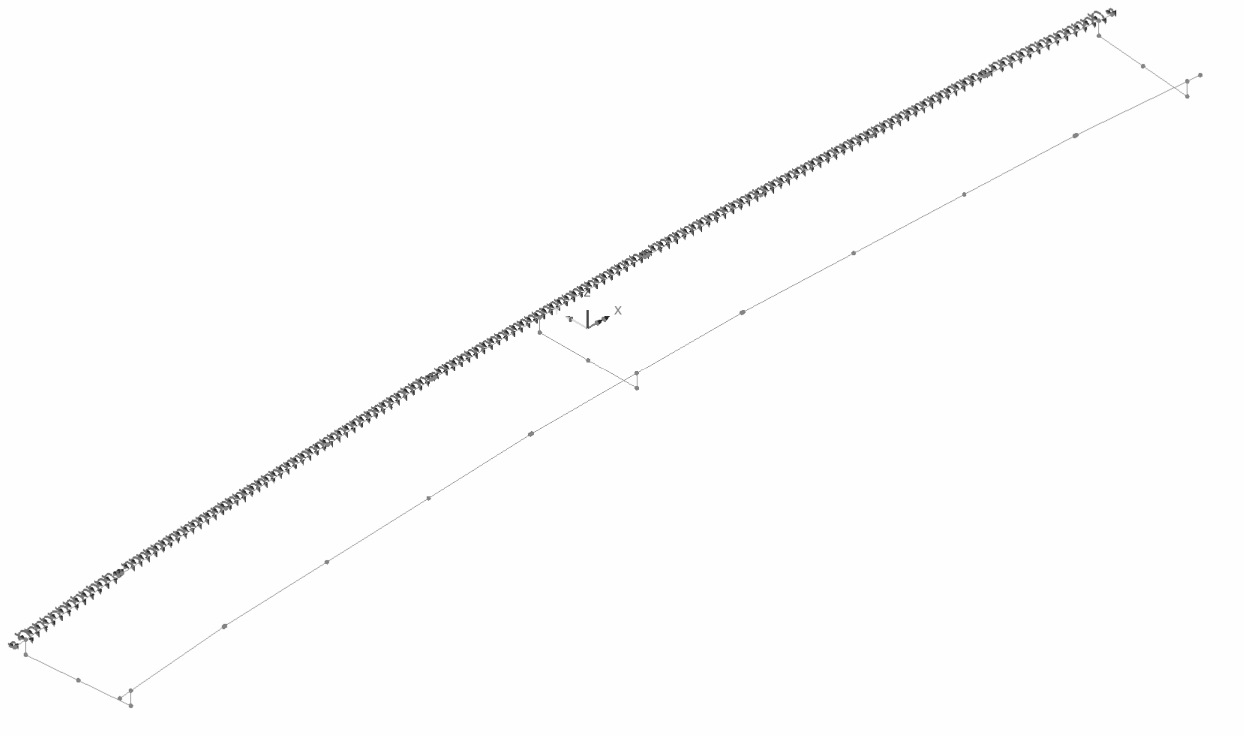
Structural loading : Global distributed

Line load in Y direction (p_y) : +3.9 $\frac{kN}{m}$

Line moment about X axis (m_x) : -4.3 $\frac{kNm}{m}$

Loadcase : VIND+

Analys : Analysis 7 (Drift-V)



Envelopes VIND :

Loadcase
VIND+
VIND-

3.13 LASTKOMBINATIONER

Kontroll av bärförmågan skall utföras med de två förekommande skedena enligt redovisning nedan.

Vid dimensionering tillämpas partialkoefficientmetoden enligt EN-1990.

Bärförmågan skall verifieras för brottgränstillstånd och bruksgränstillstånd.

Vid kontroll av brottgränstillstånd varierar lastkoefficienterna med hänsyn till brott typ enligt redovisning nedan.

STR : Verifiering av statisk bärförmåga

GEO : Verifiering av geoteknisk bärförmåga

3.13.1 Brottgränstillstånd ULS

Denna lastkombination avser huvudbelastning för normal belastningssituation där de variabla lasterna är dominerande.

Krav Brobyggande avsnitt B.3.3.1 krav på lastkombinering enligt nedan :

- Metod 2 (uppsättning B) enligt SS-EN 1990 avsnitt A.2.3.1 skall tillämpas för STR.
- Metod 3 (uppsättning C) enligt SS-EN 1990 avsnitt A.2.3.1 skall tillämpas för GEO.

Vid dimensionering tillämpas på säker sida uppsättning B för GEO.

Lastkombination ULS metodemetod 2 (uppsättning B) definieras enligt EN-1990 ekvation 6.10a och 6.10b enligt redovisning nedan.

$$E_{Sd}^{10a} = \sum_{j \geq 1} \gamma_{G.j} \cdot G_{k,j} + \gamma_{Q.1} \cdot \psi_{0,1} \cdot Q_{k.1} + \sum_{i>1} \gamma_{Q.i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi \gamma_{ULS-A} \cdot (\sum_{j>1} G_{k,j} + \sum_{i>1} Q_{k,i})$$

$$E_{sd}^{10b} = \sum_{j \geq 1} \xi_j \cdot \gamma_{G.j} \cdot G_{k,j} + \gamma_{Q.1} \cdot Q_{k.1} + \sum_{i>1} \gamma_{Q.i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi \gamma_{ULS-B} \cdot (\sum_{j>1} G_{k,j} + \sum_{i>1} Q_{k,i})$$

Vid dimensionering tillämpas dock en ”förenklad metod” där lastkoefficienter tillhörande ekvation 6.10a betecknas ULS-A medan lastkoefficienter tillhörande ekvation 6.10b betecknas ULS-B.

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3.13.1 Brottgränstillstånd ULS

Denna lastkombination avser huvudbelastning för normal belastningssituation där de variabla lasterna är dominerande.

Lastkombination tillämpas vid verifiering enligt STR/GEO (uppsättning B).

Lastkombination definieras enligt EN-1990 ekvation 6.10a och 6.10b enligt redovisning nedan.

$$E_{Sd}^{10a} = \sum_{j\geq 1} \gamma_{G.j} \cdot G_{k,j} + \gamma_{Q.1} \cdot \psi_{0,1} \cdot Q_{k.1} + \sum_{i>1} \gamma_{Q.i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi\gamma_{ULS-A} \cdot (\sum_{j>1} G_{k,j} + \sum_{i>1} Q_{k,i})$$

$$E_{sd}^{10b} = \sum_{j\geq 1} \xi_j \cdot \gamma_{G.j} \cdot G_{k,j} + \gamma_{Q.1} \cdot Q_{k.1} + \sum_{i>1} \gamma_{Q.i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi\gamma_{ULS-B} \cdot (\sum_{j>1} G_{k,j} + \sum_{i>1} Q_{k,i})$$

Vid dimensionering tillämpas dock EN 1990 bilaga NA tabell A1.2(B).

Vid dimensionering tillämpas en ”förenklad metod” där lastkoefficienter tillhörande ekvation 6.10a betecknas ULS-A medan lastkoefficienter tillhörande ekvation 6.10b betecknas ULS-B.

Vid dimensionering tillämpas en ”förenklad metod” för lastkoefficienter tillhörande ekvationer 6.10a och 6.10b.

Förenklad metod (se sida A3:126)

Nr	Last		$\psi\gamma_{ULS-A}$	$\psi\gamma_{ULS-B}$
	Permanenta laster			
1	Egentyngd	max	1,35	1,20
		min	1,00	1,00
2	Beläggning	max	1,35	1,20
		min	1,00	1,00
3	Överfyllnad	max	1,35	1,20
		min	1,00	1,00
4	Jordtryck	max	1,35	1,20
		min	1,00	1,00
5	Vattentryck	max	1,35	1,20
		min	1,00	1,00
6	Stödförskjutning [1.)]	max	1,35	1,20
		min	1,00	1,00
7	Krympning [2.)]	max	1,35	1,20
		min	1,00	1,00
8	Spännkraft	max	1,35	1,35
		min	1,00	1,00
	Variabla laster			
	Lastmodell LM 1 :			
9	Boggiesystem		1.13/0.84	1.13/1.50
10	Utbredd last		0.60/0.24	0.60/1.50
11	Bromskraft		0.84/1.13	1.13/1.50
12	Sidokraft		0.84/1.13	1.13/1.50
13	Centrifugalkraft		0.84/1.13	1.13/1.50
	Lastmodell LM 2 :			
14	Enstaka axellast		0	0/1.50
	Typfordon EG A/B :			
15	Typfordon EG A/B		1.13/0.84	1.13/1.50
20	Bromskraft		0.84/1.13	1.13/1.50
21	Sidokraft		0.84/1.13	1.13/1.50
22	Centrifugalkraft		0.84/1.13	1.13/1.50
16	Temperatur [3.)]		0.90	0.90/1.50
	Vindlaster:			
17	Vindlast mot bro		0.45	0.45/1.50
18	Vindlast mot trafik		0.45	0.45/1.50
19	Överlast		1.13	1.13/1.50

[1.)] Behöver ej beaktas SS-EN 1992-1-1 §2.3.1.3
[2.)] Behöver ej beaktas SS-EN 1992-1-1 §2.3.2.2(2)
[3.)] Behöver ej beaktas enligt SS-EN 1992-1-1 §2.3.1.2

3.13.1.1 Byggskede

Endast ekvation 6.10a enligt EN-1990 beaktas ty anses dimensionerande framför ekvation 6.10b.

Loadcombination smart *ULS-BP1 :*
(Laster gjutetapp 1)

Loadcase	Permanent factor	Variable factor
EGEN 1	1.00	0.35
FORM+	1.00	0.35

Loadcombination smart *ULS-BP2 :*
(Last gjutetapp 2)

Loadcase	Permanent factor	Variable factor
EGEN 2	1.00	0.35

Loadcombination smart *ULS-BP3 :*
(Last gjutetapp 3)

Loadcase	Permanent factor	Variable factor
EGEN 3	1.00	0.35

Loadcombination smart *ULS-BP4 :*
(Last gjutetapp 4)

Loadcase	Permanent factor	Variable factor
EGEN 4	1.00	0.35

Loadcombination smart *ULS-BP5 :*
(Last gjutetapp 5)

Loadcase	Permanent factor	Variable factor
EGEN 5	1.00	0.35

3.13.1.2 Driftskede

Endast ekvation 6.10b enligt EN-1990 beaktas ty anses dimensionerande framför ekvation 6.10a.

Loadcombination smart *ULS-DP :*

Loadcase	Permanent factor	Variable factor
FORM-	1.00	0
BELAGG	1.00	0.20
STOD	1.00	0.20

Loadcombination smart *ULS-DK :*

Loadcase	Factor
KRYMP	1.20

Envelope *TRAFIK :*

Loadcase
LM 1
EG A
EG B

Loadcombination smart *ULS-DV :*
(Loadcases to consider : 5 / Variable loadcases : 1)

Loadcase	Permanent factor	Variable factor
TRAFIK	1.13	0.37
SIDO	1.13	0.37
BROMS	1.13	0.37
TEMP	0.90	0.60
VIND	0.45	1.05

Anm. Kontroll utförd med STEP 2 utvisar att ULS-B är dimensionerande. Med anledning av detta tillämpas endast dess lastkoefficienter i LUSAS.

I beräkningsprogram Point_EC4 förusätts namngiva lastkombinationer enligt nedan.

Tillstånd	Phase	Lastkombination
ULS	1	ULS-Phase 1
"-"	2a	ULS-Phase 2a
"-"	2b	ULS-Phase 2b
"-"	3a	ULS-Phase 3a
"-"	3b	ULS-Phase 3b

Loadcombination smart *ULS-Phase 1 :*
(Permanenta laster utan samverkan)

Loadcase	Permanent factor	Variable factor
EGEN 1	1.00	0.20
FORM+	1.20	0
EGEN 2	1.00	0.20
EGEN 3	1.00	0.20
EGEN 4	1.00	0.20
EGEN 5	1.00	0.20

Loadcombination smart *ULS-Phase 2a :*
(Permanenta laster med samverkan)

Loadcase	Permanent factor	Variable factor
FORM-	1.20	0
BELAGG	1.00	0.20

Loadcombination smart *ULS-Phase 2b :*
(Krympning och stödsättning med samverkan)

Loadcase	Permanent factor	Variable factor
STOD	0	1.20
KRYMP	0	1.20

Loadcombination smart ULS-Phase 3a :
(Temperatur last med samverkan)

Loadcase	Permanent factor	Variable factor
TEMP	0	1.00

Loadcombination smart *ULS-Phase 3b (Loadcases to consider : 4 / Variable loadcases : 1) :*
(Variabla laster)

Loadcase	Permanent factor	Variable factor
TRAFIK	1.13	0.37
BROMS	1.13	0.37
SIDO	1.13	0.37
VIND	0.45	1.05

3.13.2 Bruksgränstillstillstånd

Bruksgränstillståndet är uppdelat i 3 st lastlastkombinationer beroende på dess varaktighet. Lastkombinationerna redovisas nedan.

Lastkombination	Varaktighet
SLS:K	Karakteristisk
SLS:F	Frekvent
SLS:Q	Kvasipermanent

Lastkombination SLS:K enligt EN 1990 ekv. 6.14b redovisas nedan.

$$E_{Sd} = \sum_{j\geq 1} G_{k,j} + Q_{k.1} + \sum_{i>1} \psi_{0,i} \cdot Q_{k,i} = \psi\gamma_{SLS.K} \cdot (\sum_{j>1} G_{k,j} + \sum_{i>1} Q_{k,i})$$

Lastkombination SLS:F enligt EN 1990 ekv. 6.15b redovisas nedan.

$$E_{Sd} = \sum_{j\geq 1} G_{k,j} + \psi_1 \cdot Q_{k.1} + \sum_{i>1} \psi_{2,i} \cdot Q_{k,i} = \psi\gamma_{SLS.2} \cdot (\sum_{j>1} G_{k,j} + \sum_{i>1} Q_{k,i})$$

Lastkombination SLS:Q enligt EN 1990 ekv. 6.16b redovisas nedan.

$$E_{Sd} = \sum_{j\geq 1} G_{k,j} + \sum_{i>0} \psi_{2,i} \cdot Q_{k,i} = \psi\gamma_{SLS.Q} \cdot (\sum_{j>1} G_{k,j} + \sum_{i>1} Q_{k,i})$$

Vid dimensionering tillämpas en ”förenklad metod” för lastkoefficienter tillhörande ekvationer 6.14a, 6.15b och 6.16b.

Förenklad metod (se sida A3:130)

Nr	Last		$\psi\gamma_{SLS\text{-}K}$	$\psi\gamma_{SLS\text{-}F}$	$\psi\gamma_{SLS\text{-}Q}$
	Permanenta laster				
1	Egentyngd	max	1,00	1,00	1,00
		min	1,00	1,00	1,00
2	Beläggning	max	1,10	1,10	1,10
		min	0,90	0,90	0,90
3	Överfyllnad	max	1,10	1,10	1,10
		min	0,90	0,90	0,90
4	Jordtryck	max	1,10	1,10	1,10
		min	0,90	0,90	0,90
5	Vattentryck	max	1,00	1,00	1,00
		min	1,00	1,00	1,00
6	Stödförskjutning	max	1,00	1,00	1,00
		min	1,00	1,00	1,00
7	Krympning	max	1,00	1,00	1,00
		min	1,00	1,00	1,00
8	Spännkraft	max	1,00	1,00	1,00
		min	1,00	1,00	1,00
	Variabla laster				
	Lastmodell LM 1 :				
9	Boggiesystem		0.75/1.00	0/0.75	0
10	Utbredd last		0.40/1.00	0/0.40	0
11	Bromskraft		0.56/0.75	0/0.56	0
12	Sidokraft		0.56/0.75	0/0.56	0
13	Centrifugalkraft		0.56/0.75	0/0.56	0
	Lastmodell LM 2 :				
14	Enstaka axellast		0.75/1.00	0/0.75	0
	Typfordon EG A/B :				
15	Typfordon EG A/B		0.75/1.00	0/0.75	0
20	Bromskraft		0.56/0.75	0/0.56	0
22	Sidokraft		0.56/0.75	0/0.56	0
22	Centrifugalkraft		0.56/0.75	0/0.56	0
16	Temperatur		0.60/1.00	0.50/0.60	0.50
	Vindlaster:				
17	Vindlast mot bro		0.30/1.00	0/0.30	0
18	Vindlast mot trafik		0.30/1.00	0/0.30	0
19	Överlast		0.75/1.00	0/0.75	0

Loadcombination smart SLS-PERM :

Loadcase	Permanent factor	Variable factor
EGEN	1.00	0
BELÄGG	0.90	0.20
STOD	0	1.00

Loadcombination smart *SLS-DK :*

Loadcase	Permanent factor	Variable factor
KRYMP	0	1.00

Loadcombination smart *SLS-VAR-K :*
(Loadcases to consider : 5 / Variable loadcases : 1)

Loadcase	Permanent factor	Variable factor
TRAFIK	0.75	0.25
BROMS	0.56	0.19
SIDO	0.56	0.19
TEMP	0.60	0.40
VIND	0.30	0.70

Loadcombination smart *SLS-VAR-F :*

Loadcase	Permanent factor	Variable factor
TRAFIK	0	0.75
BROMS	0	0.56
SIDO	0	0.56
TEMP	0	0.60
VIND	0	0.30

Loadcombination smart *SLS-VAR-Q :*

Loadcase	Permanent factor	Variable factor
TEMP	0	0.50

Loadcombination smart *SLS-K :*

Loadcase	Permanent factor	Variable factor
SLS-PERM	1	0
SLS-DK	0	1
SLS-K-VAR	0	1

Loadcombination smart *SLS-F :*

Loadcase	Permanent factor	Variable factor
SLS-PERM	1	0
SLS-DK	0	1
SLS-F-VAR	0	1

Loadcombination smart *SLS-Q :*

Loadcase	Permanent factor	Variable factor
SLS-PERM	1	0
SLS-DK	0	1
SLS-Q-VAR	0	1

I beräkningsprogram Point_EC4 förusätts namngiva lastkombinationer enligt nedan.

Tillstånd	Phase	Lastkombination
SLS:K	1	SLS C-Phase 1
"-"	2a	SLS C-Phase 2a
"-"	2b	SLS C-Phase 2b
"-"	3a	SLS C-Phase 3a
"-"	3b	SLS C-Phase 3b
SLS:F	1	SLS F-Phase 1
"-"	2a	SLS F-Phase 2a
"-"	2b	SLS F-Phase 2b
"-"	3a	SLS F-Phase 3a
"-"	3b	SLS F-Phase 3b

Loadcombination smart *SLS C-Phase 1 :*
(Permanenta laster utan samverkan)

Loadcase	Permanent factor	Variable factor
FORM+	1.00	0
EGEN 1	1.00	0
EGEN 2	1.00	0
EGEN 3	1.00	0
EGEN 4	1.00	0
EGEN 5	1.00	0

Loadcombination smart *SLS C-Phase 2a :*
(Permanenta laster med samverkan)

Loadcase	Permanent factor	Variable factor
FORM-	1.00	0
BELAGG	0.90	0.20

Loadcombination smart *SLS C-Phase 2b :*
(Krympning och stödsättning med samverkan)

Loadcase	Permanent factor	Variable factor
STOD	0	1.00
KRYMP	0	1.00

Loadcombination smart SLS C-Phase 3a :
(Temperatur last med samverkan)

Loadcase	Permanent factor	Variable factor
TEMP	0	1.00

Loadcombination smart *SLS C-Phase 3b (Loadcases to consider : 4 / Variable loadcases : 1) :*
(Variabla laster)

Loadcase	Permanent factor	Variable factor
TRAFIK	0.75	0.25
BROMS	0.56	0.19
SIDO	0.56	0.19
VIND	0.30	0.70

Loadcombination smart *SLS F-Phase 1 :*
(Permanenta laster utan samverkan)

Loadcase	Permanent factor	Variable factor
FORM+	1.00	0
EGEN 1	1.00	0
EGEN 2	1.00	0
EGEN 3	1.00	0
EGEN 4	1.00	0
EGEN 5	1.00	0

Loadcombination smart *SLS F-Phase 2a :*
(Permanenta laster med samverkan)

Loadcase	Permanent factor	Variable factor
FORM-	1.00	0
BELAGG	0.90	0.20

Loadcombination smart *SLS F-Phase 2b :*
(Krympning och stödsättning med samverkan)

Loadcase	Permanent factor	Variable factor
STOD	0	1.00
KRYMP	0	1.00

Loadcombination smart SLS F-Phase 3a *:*
(Temperatur last med samverkan)

Loadcase	Permanent factor	Variable factor
TEMP	0	0.60

Loadcombination smart *SLS F-Phase 3b :*
(Variabla laster)

Loadcase	Permanent factor	Variable factor
TRAFIK	0	0.75
BROMS	0	0.56
SIDO	0	0.56
VIND	0	0.30

3.13.3 Utmattning

Kontrollen av risken för utmattning sker med förenklad kontroll, betecknad λ-metoden.

Lastkombination enligt ekvation SS-EN 1992-1-1 avsnitt 6.8.3 ekvation 6.69.

I denna laskombination anses trafiklasten utgöras av UTM varvid övriga trafiklaster utgår.

$$E_{Sd} = \sum_{j \geq 1} G_{k,j} + P + \psi_{1,1} \cdot Q_{k,1} + \sum_{i>1} \psi_{2,i} \cdot Q_{k,i} + Q_{fat} = \psi\gamma_{UTM} \cdot (\sum_{j \geq 1} G_{k,j} + P + \sum_{i \geq 1} Q_{k,i} + Q_{fat})$$

Se sammanställning enligt se sida A3:132

Nr	Last		$\psi\gamma_{UTM}$
	Permanenta laster		
1	Egentyngd	max	1,00
		min	1,00
2	Beläggning	max	1,00
		min	1,00
3	Överfyllnad	max	1,00
		min	1,00
4	Jordtryck	max	1,00
		min	1,00
5	Vattentryck	max	1,00
		min	1,00
6	Stödförskjutning	max	1,00
		min	1,00
7	Krympning	max	1,00
		min	1,00
8	Spännkraft	max	1,00
		min	1,00
	Variabla laster		
	Lastmodell LM 1 :		
9	Boggiesystem		-
10	Utbredd last		-
11	Bromskraft		-
12	Sidokraft		-
13	Centrifugalkraft		-
	Lastmodell LM 2 :		
14	Enstaka axellast		-
	Typfordon EG A/B :		
15	Typfordon EG A/B		-
20	Bromskraft		-
22	Sidokraft		-
22	Centrifugalkraft		-
16	Temperatur		0.60[a.)]
	Vindlaster:		
17	Vindlast mot bro		0.30[a.)]
18	Vindlast mot trafik		0.30[a.)]
19	Överlast		0.75[a.)]
23	ULM3		1.00

[a.)] Dessa laster är inte att betrakta som utmattningslaster vid bestämning av spänningsvidder.

Loadcombination smart FAT-PERM :

Loadcase	Permanent factor	Variable factor
EGEN 1	1.00	0
EGEN 2	1.00	0
EGEN 3	1.00	0
EGEN 4	1.00	0
EGEN 5	1.00	0
BELÄGG	1.00	0

Loadcombination smart *FAT-VAR* .:

Loadcase	Permanent factor	Variable factor
UTM	0	1.00

Title: Indatakvitto

Model Units: kN,m,t,s,C
Report Units: kN,m,t,s,C

Model Title: System 001
Model File: System 001

Table of Contents

1. Points

Point	X coordinate	Y coordinate	Z coordinate
7	35.35	-8.00	0.00
8	36.46	4.79	0.00
9	28.42	2.26	0.00
11	28.01	-4.13	0.00
13	7.16	3.14	0.00
15	0.00	3.14	0.00
21	28.11	-4.13	0.00
22	28.66	2.24	0.00
25	21.28	2.56	0.00
26	21.01	-3.84	0.00
27	14.28	2.84	0.00
28	14.02	-3.55	0.00
29	0.00	-3.26	0.00
31	-28.42	2.26	0.00
33	-28.01	-4.13	0.00
41	-28.11	-4.13	0.00
46	-21.01	-3.84	0.00
48	-14.02	-3.55	0.00
51	-35.35	-8.00	0.00
52	-36.46	4.79	0.00
111	35.90	-1.61	0.00
114	35.63	-4.79	0.00
115	35.38	-7.58	0.00
260	-36.42	4.37	0.00
261	-36.18	1.58	0.00
264	-35.90	-1.61	0.00
265	-35.63	-4.79	0.00
266	-35.38	-7.58	0.00
290	36.18	1.58	0.00
292	-34.83	-4.72	0.00
299	-35.38	1.65	0.00
306	35.38	1.65	0.00
314	35.63	4.44	0.00
320	7.02	-3.26	0.00
325	-7.02	-3.26	0.00
355	-21.39	5.44	0.00
356	-14.40	5.75	0.00
358	0.00	6.00	0.00
366	21.39	5.44	0.00
367	14.40	5.75	0.00
369	28.90	4.97	0.00
372	-13.91	-6.24	0.00
373	-20.90	-6.55	0.00
375	0.00	-6.00	0.00
377	13.91	-6.24	0.00
379	20.90	-6.55	0.00
381	27.86	-6.98	0.00
383	-34.59	-7.51	0.00
386	-27.86	-6.98	0.00
388	-28.90	4.97	0.00
390	34.82	-4.72	0.00
406	28.38	-1.00	0.00
418	21.15	-0.56	0.00
430	14.15	-0.25	0.00
446	-28.38	-1.00	0.00
453	-6.92	-0.06	0.00
467	-21.15	-0.56	0.00
477	-14.15	-0.25	0.00
487	0.00	0.00	0.00
493	35.10	-1.54	0.00
495	6.92	-0.06	0.00

512	-14.28	2.84	0.00
513	-21.28	2.56	0.00
516	-7.16	3.14	0.00
529	-6.92	3.14	0.00
546	6.92	3.14	0.00
563	6.92	-3.26	0.00
566	-6.92	-3.26	0.00
568	7.09	-0.06	0.00
570	28.21	-0.99	0.00
573	34.58	-7.51	0.00
577	36.42	4.37	0.00
581	28.59	5.00	0.00
583	-6.92	5.94	0.00
585	-6.92	-6.06	0.00
587	6.92	5.94	0.00
593	6.92	-6.06	0.00
614	-7.09	-0.06	0.00
620	7.21	5.94	0.00
639	-7.02	-6.06	0.00
645	7.02	-6.06	0.00
658	27.76	-6.97	0.00
666	-35.62	4.44	0.00
672	-35.11	-1.54	0.00
674	-28.21	-0.99	0.00
678	-7.21	5.94	0.00
681	-28.59	5.00	0.00
697	-28.66	2.24	0.00
702	-27.76	-6.97	0.00
704	-21.28	2.56	-0.94
705	-28.42	2.26	-0.94
706	-14.28	2.84	-0.94
707	0.00	3.14	-0.94
708	-6.92	3.14	-0.94
709	6.92	3.14	-0.94
710	0.00	-3.26	-0.94
711	6.92	-3.26	-0.94
712	7.02	-3.26	-0.94
713	-6.92	-3.26	-0.94
714	7.16	3.14	-0.94
715	14.28	2.84	-0.94
716	21.28	2.56	-0.94
717	28.42	2.26	-0.94
718	21.01	-3.84	-0.94
719	28.01	-4.13	-0.94
720	14.02	-3.55	-0.94
721	28.66	2.24	-0.94
722	35.38	1.65	-0.94
723	28.11	-4.13	-0.94
724	34.82	-4.72	-0.94
725	35.63	-4.79	-0.94
726	36.18	1.58	-0.94
727	-7.16	3.14	-0.94
728	-14.02	-3.55	-0.94
729	-21.01	-3.84	-0.94
730	-28.01	-4.13	-0.94
731	-28.11	-4.13	-0.94
732	-34.83	-4.72	-0.94
733	-28.66	2.24	-0.94
734	-35.38	1.65	-0.94
735	-36.18	1.58	-0.94
736	-35.63	-4.79	-0.94
737	-7.02	-3.26	-0.94
1121	-21.03	-3.34	-1.78
1122	-21.25	2.06	-1.78
1183	-21.28	2.56	-1.78
1189	-21.01	-3.84	-1.78
1200	-14.26	2.34	-1.78
1201	-14.04	-3.05	-1.78

1257	-14.28	2.84	-1.78
1267	-14.02	-3.55	-1.78
1279	-6.92	2.64	-1.78
1280	-6.92	-2.76	-1.78
1331	-6.92	3.14	-1.78
1339	-6.92	-3.26	-1.78
1345	0.00	3.14	-1.28
1346	0.00	-3.26	-1.28
1421	-28.11	-4.13	-1.78
1422	-28.11	-4.13	-0.38
1505	-28.15	-3.64	-1.78
1506	-28.62	1.74	-1.78
1572	-28.66	2.24	-1.78
1581	-21.01	-3.84	-0.38
1743	-14.02	-3.55	-0.38
1987	-6.92	-3.26	-0.38
2149	-28.66	2.24	-0.38
2311	-21.28	2.56	-0.38
2473	-14.28	2.84	-0.38
2635	-6.92	3.14	-0.38
2870	-34.83	-4.72	-1.28
2871	-35.38	1.65	-1.28
3106	35.38	1.65	-1.28
3107	34.82	-4.72	-1.28
3342	14.28	2.84	-1.78
3343	14.28	2.84	-0.38
3440	28.62	1.74	-1.78
3441	28.15	-3.64	-1.78
3469	28.66	2.24	-1.78
3471	28.11	-4.13	-1.78
3513	21.25	2.06	-1.78
3514	21.03	-3.34	-1.78
3541	21.01	-3.84	-1.78
3543	21.28	2.56	-1.78
3593	14.26	2.34	-1.78
3594	14.04	-3.05	-1.78
3622	14.02	-3.55	-1.78
3666	6.92	-2.76	-1.78
3667	6.92	2.64	-1.78
3694	6.92	3.14	-1.78
3696	6.92	-3.26	-1.78
3816	28.11	-4.13	-0.38
3978	28.66	2.24	-0.38
4140	21.28	2.56	-0.38
4302	21.01	-3.84	-0.38
4464	14.02	-3.55	-0.38
4626	6.92	-3.26	-0.38
4788	6.92	3.14	-0.38
4869	28.39	-0.95	-0.38
5031	21.14	-0.64	-0.38
5193	14.15	-0.35	-0.38
5355	6.92	-0.06	-0.38
5517	-6.92	-0.06	-0.38
5679	-14.15	-0.35	-0.38
5841	-21.14	-0.64	-0.38
6003	-28.39	-0.95	-0.38
6004	0.00	3.14	-2.08
6005	0.00	-3.26	-2.08
6006	35.38	1.65	-2.08
6007	34.82	-4.72	-2.08
6008	-34.83	-4.72	-2.08
6009	-35.38	1.65	-2.08
6010	-35.11	-1.54	-2.08
6011	0.00	-0.06	-2.08
6012	35.10	-1.54	-2.08
6034	-35.37	-7.58	0.00
6038	35.37	-7.58	0.00
6043	-36.44	4.37	0.00

6047	36.44	4.37	0.00
6098	0.00	6.00	0.00
6099	0.00	-6.00	0.00
6105	-27.53	5.07	0.00
6108	-26.73	-6.90	0.00
6113	-8.12	5.92	0.00
6118	-7.88	-6.08	0.00
6124	8.12	5.92	0.00
6127	7.88	-6.08	0.00
6133	27.53	5.07	0.00
6136	26.73	-6.90	0.00
6137	-17.83	5.61	0.00
6138	17.83	5.61	0.00
6139	31.58	4.78	0.00
6140	30.65	-7.19	0.00
6141	17.31	-6.38	0.00
6142	-17.31	-6.38	0.00
6143	-30.66	-7.19	0.00
6144	-31.58	4.78	0.00
6145	27.13	-0.92	0.00
6146	8.00	-0.08	0.00
6148	-8.00	-0.08	0.00
6149	-27.13	-0.92	0.00
6150	-35.37	-7.58	10.00
6151	-34.59	-7.51	10.00
6152	34.58	-7.51	10.00
6153	35.37	-7.58	10.00
6154	-36.44	4.37	10.00
6155	-35.62	4.44	10.00
6156	35.63	4.44	10.00
6157	36.44	4.37	10.00
6158	-8.12	5.92	10.00
6159	0.00	6.00	10.00
6160	-7.88	-6.08	10.00
6161	0.00	-6.00	10.00
6162	8.12	5.92	10.00
6163	7.88	-6.08	10.00
6164	-27.53	5.07	10.00
6165	-17.83	5.61	10.00
6166	17.83	5.61	10.00
6167	27.53	5.07	10.00
6168	31.58	4.78	10.00
6169	26.73	-6.90	10.00
6170	30.65	-7.19	10.00
6171	17.31	-6.38	10.00
6172	-26.73	-6.90	10.00
6173	-17.31	-6.38	10.00
6174	-30.66	-7.19	10.00
6175	-31.58	4.78	10.00
6176	27.13	-0.92	10.00
6177	8.00	-0.08	10.00
6178	35.90	-1.61	10.00
6179	-8.00	-0.08	10.00
6180	-27.13	-0.92	10.00
6181	-35.90	-1.61	10.00
6184	-35.50	-6.15	10.00
6185	35.50	-6.15	10.00
6186	-36.31	2.94	10.00
6187	36.31	2.94	10.00
6188	-35.00	-6.10	10.00
6189	-34.50	-6.06	10.00
6190	-34.00	-6.02	10.00
6191	-33.50	-5.97	10.00
6192	-33.00	-5.93	10.00
6193	-32.50	-5.89	10.00
6194	-32.00	-5.85	10.00
6195	-31.50	-5.81	10.00
6196	-31.01	-5.77	10.00

6197	-30.51	-5.73	10.00
6198	-30.01	-5.69	10.00
6199	-29.51	-5.66	10.00
6200	-29.01	-5.62	10.00
6201	-28.51	-5.58	10.00
6202	-28.01	-5.55	10.00
6203	-27.51	-5.51	10.00
6204	-27.01	-5.48	10.00
6205	-26.51	-5.45	10.00
6206	-26.01	-5.41	10.00
6207	-25.51	-5.38	10.00
6208	-25.01	-5.35	10.00
6209	-24.51	-5.32	10.00
6210	-24.01	-5.29	10.00
6211	-23.51	-5.26	10.00
6212	-23.01	-5.23	10.00
6213	-22.51	-5.20	10.00
6214	-22.02	-5.17	10.00
6215	-21.52	-5.14	10.00
6216	-21.02	-5.12	10.00
6217	-20.52	-5.09	10.00
6218	-20.02	-5.06	10.00
6219	-19.52	-5.04	10.00
6220	-19.02	-5.02	10.00
6221	-18.52	-4.99	10.00
6222	-18.02	-4.97	10.00
6223	-17.52	-4.95	10.00
6224	-17.02	-4.92	10.00
6225	-16.52	-4.90	10.00
6226	-16.01	-4.88	10.00
6227	-15.51	-4.86	10.00
6228	-15.01	-4.84	10.00
6229	-14.51	-4.83	10.00
6230	-14.01	-4.81	10.00
6231	-13.51	-4.79	10.00
6232	-13.01	-4.77	10.00
6233	-12.51	-4.76	10.00
6234	-12.01	-4.74	10.00
6235	-11.51	-4.73	10.00
6236	-11.01	-4.71	10.00
6237	-10.51	-4.70	10.00
6238	-10.01	-4.69	10.00
6239	-9.51	-4.67	10.00
6240	-9.01	-4.66	10.00
6241	-8.51	-4.65	10.00
6242	-8.01	-4.64	10.00
6243	-7.51	-4.63	10.00
6244	-7.01	-4.62	10.00
6245	-6.51	-4.61	10.00
6246	-6.01	-4.61	10.00
6247	-5.51	-4.60	10.00
6248	-5.01	-4.59	10.00
6249	-4.51	-4.59	10.00
6250	-4.00	-4.58	10.00
6251	-3.50	-4.58	10.00
6252	-3.00	-4.57	10.00
6253	-2.50	-4.57	10.00
6254	-2.00	-4.57	10.00
6255	-1.50	-4.56	10.00
6256	-1.00	-4.56	10.00
6257	-0.50	-4.56	10.00
6258	0.00	-4.56	10.00
6259	0.50	-4.56	10.00
6260	1.00	-4.56	10.00
6261	1.50	-4.56	10.00
6262	2.00	-4.57	10.00
6263	2.50	-4.57	10.00
6264	3.00	-4.57	10.00

6265	3.50	-4.58	10.00
6266	4.00	-4.58	10.00
6267	4.51	-4.59	10.00
6268	5.01	-4.59	10.00
6269	5.51	-4.60	10.00
6270	6.01	-4.61	10.00
6271	6.51	-4.61	10.00
6272	7.01	-4.62	10.00
6273	7.51	-4.63	10.00
6274	8.01	-4.64	10.00
6275	8.51	-4.65	10.00
6276	9.01	-4.66	10.00
6277	9.51	-4.67	10.00
6278	10.01	-4.69	10.00
6279	10.51	-4.70	10.00
6280	11.01	-4.71	10.00
6281	11.51	-4.73	10.00
6282	12.01	-4.74	10.00
6283	12.51	-4.76	10.00
6284	13.01	-4.77	10.00
6285	13.51	-4.79	10.00
6286	14.01	-4.81	10.00
6287	14.51	-4.83	10.00
6288	15.01	-4.84	10.00
6289	15.51	-4.86	10.00
6290	16.01	-4.88	10.00
6291	16.52	-4.90	10.00
6292	17.02	-4.92	10.00
6293	17.52	-4.95	10.00
6294	18.02	-4.97	10.00
6295	18.52	-4.99	10.00
6296	19.02	-5.02	10.00
6297	19.52	-5.04	10.00
6298	20.02	-5.06	10.00
6299	20.52	-5.09	10.00
6300	21.02	-5.12	10.00
6301	21.52	-5.14	10.00
6302	22.02	-5.17	10.00
6303	22.51	-5.20	10.00
6304	23.01	-5.23	10.00
6305	23.51	-5.26	10.00
6306	24.01	-5.29	10.00
6307	24.51	-5.32	10.00
6308	25.01	-5.35	10.00
6309	25.51	-5.38	10.00
6310	26.01	-5.41	10.00
6311	26.51	-5.45	10.00
6312	27.01	-5.48	10.00
6313	27.51	-5.51	10.00
6314	28.01	-5.55	10.00
6315	28.51	-5.58	10.00
6316	29.01	-5.62	10.00
6317	29.51	-5.66	10.00
6318	30.01	-5.69	10.00
6319	30.51	-5.73	10.00
6320	31.01	-5.77	10.00
6321	31.50	-5.81	10.00
6322	32.00	-5.85	10.00
6323	32.50	-5.89	10.00
6324	33.00	-5.93	10.00
6325	33.50	-5.97	10.00
6326	34.00	-6.02	10.00
6327	34.50	-6.06	10.00
6328	35.00	-6.10	10.00
6329	-35.81	2.98	10.00
6330	-35.31	3.02	10.00
6331	-34.81	3.07	10.00
6332	-34.31	3.11	10.00

6333	-33.81	3.15	10.00
6334	-33.31	3.19	10.00
6335	-32.81	3.23	10.00
6336	-32.31	3.27	10.00
6337	-31.81	3.31	10.00
6338	-31.31	3.35	10.00
6339	-30.81	3.39	10.00
6340	-30.31	3.43	10.00
6341	-29.81	3.47	10.00
6342	-29.31	3.50	10.00
6343	-28.81	3.54	10.00
6344	-28.31	3.57	10.00
6345	-27.81	3.61	10.00
6346	-27.31	3.64	10.00
6347	-26.81	3.68	10.00
6348	-26.31	3.71	10.00
6349	-25.81	3.74	10.00
6350	-25.31	3.77	10.00
6351	-24.81	3.80	10.00
6352	-24.31	3.83	10.00
6353	-23.81	3.86	10.00
6354	-23.31	3.89	10.00
6355	-22.81	3.92	10.00
6356	-22.31	3.95	10.00
6357	-21.80	3.97	10.00
6358	-21.30	4.00	10.00
6359	-20.80	4.03	10.00
6360	-20.30	4.05	10.00
6361	-19.80	4.08	10.00
6362	-19.30	4.10	10.00
6363	-18.80	4.13	10.00
6364	-18.30	4.15	10.00
6365	-17.80	4.17	10.00
6366	-17.30	4.19	10.00
6367	-16.80	4.21	10.00
6368	-16.29	4.23	10.00
6369	-15.79	4.25	10.00
6370	-15.29	4.27	10.00
6371	-14.79	4.29	10.00
6372	-14.29	4.31	10.00
6373	-13.79	4.33	10.00
6374	-13.29	4.34	10.00
6375	-12.79	4.36	10.00
6376	-12.28	4.37	10.00
6377	-11.78	4.39	10.00
6378	-11.28	4.40	10.00
6379	-10.78	4.42	10.00
6380	-10.28	4.43	10.00
6381	-9.78	4.44	10.00
6382	-9.28	4.45	10.00
6383	-8.78	4.47	10.00
6384	-8.27	4.48	10.00
6385	-7.77	4.49	10.00
6386	-7.27	4.49	10.00
6387	-6.77	4.50	10.00
6388	-6.27	4.51	10.00
6389	-5.77	4.52	10.00
6390	-5.27	4.53	10.00
6391	-4.76	4.53	10.00
6392	-4.26	4.54	10.00
6393	-3.76	4.54	10.00
6394	-3.26	4.55	10.00
6395	-2.76	4.55	10.00
6396	-2.26	4.55	10.00
6397	-1.76	4.56	10.00
6398	-1.25	4.56	10.00
6399	-0.75	4.56	10.00
6400	-0.25	4.56	10.00

6401	0.25	4.56	10.00
6402	0.75	4.56	10.00
6403	1.25	4.56	10.00
6404	1.76	4.56	10.00
6405	2.26	4.55	10.00
6406	2.76	4.55	10.00
6407	3.26	4.55	10.00
6408	3.76	4.54	10.00
6409	4.26	4.54	10.00
6410	4.76	4.53	10.00
6411	5.27	4.53	10.00
6412	5.77	4.52	10.00
6413	6.27	4.51	10.00
6414	6.77	4.50	10.00
6415	7.27	4.49	10.00
6416	7.77	4.49	10.00
6417	8.27	4.48	10.00
6418	8.78	4.47	10.00
6419	9.28	4.45	10.00
6420	9.78	4.44	10.00
6421	10.28	4.43	10.00
6422	10.78	4.42	10.00
6423	11.28	4.40	10.00
6424	11.78	4.39	10.00
6425	12.28	4.37	10.00
6426	12.79	4.36	10.00
6427	13.29	4.34	10.00
6428	13.79	4.33	10.00
6429	14.29	4.31	10.00
6430	14.79	4.29	10.00
6431	15.29	4.27	10.00
6432	15.79	4.25	10.00
6433	16.29	4.23	10.00
6434	16.80	4.21	10.00
6435	17.30	4.19	10.00
6436	17.80	4.17	10.00
6437	18.30	4.15	10.00
6438	18.80	4.13	10.00
6439	19.30	4.10	10.00
6440	19.80	4.08	10.00
6441	20.30	4.05	10.00
6442	20.80	4.03	10.00
6443	21.30	4.00	10.00
6444	21.80	3.97	10.00
6445	22.31	3.95	10.00
6446	22.81	3.92	10.00
6447	23.31	3.89	10.00
6448	23.81	3.86	10.00
6449	24.31	3.83	10.00
6450	24.81	3.80	10.00
6451	25.31	3.77	10.00
6452	25.81	3.74	10.00
6453	26.31	3.71	10.00
6454	26.81	3.68	10.00
6455	27.31	3.64	10.00
6456	27.81	3.61	10.00
6457	28.31	3.57	10.00
6458	28.81	3.54	10.00

6459	29.31	3.50	10.00
6460	29.81	3.47	10.00
6461	30.31	3.43	10.00
6462	30.81	3.39	10.00
6463	31.31	3.35	10.00
6464	31.81	3.31	10.00
6465	32.31	3.27	10.00
6466	32.81	3.23	10.00
6467	33.31	3.19	10.00
6468	33.81	3.15	10.00
6469	34.31	3.11	10.00
6470	34.81	3.07	10.00
6471	35.31	3.02	10.00
6472	35.81	2.98	10.00
VLO load anchor	0.00	0.00	0.00

2. Lines

Line	Points	Line	Points
9	111,290	20	356,355
29	266,265	37	265,264
38	264,261	39	261,260
42	314,369	46	314,306
50	115,114	52	15,358
55	366,367	56	27,367
58	25,366	59	22,369
61	372,373	62	46,373
63	383,292	66	29,375
69	28,377	71	379,377
72	26,379	79	383,266
81	386,383	84	21,406
90	41,446	109	493,111
111	493,390	117	513,31
118	512,513	119	513,355
120	512,356	121	513,467
122	512,477	124	15,529
126	453,529	128	453,487
129	15,546	131	495,546
132	495,487	133	15,487
134	29,563	135	563,320
136	487,29	137	563,495
138	29,566	142	568,495
143	430,568	145	320,568
146	13,27	147	25,9
148	27,25	149	25,418
150	27,430	151	430,418
153	26,11	154	28,26
155	418,26	156	430,28
157	9,22	158	22,306
159	406,22	160	406,493
161	306,493	163	418,570
164	570,406	165	570,9
166	11,570	167	21,11
168	21,390	169	381,21
170	115,573	171	573,381
172	390,573	173	114,390
174	111,114	175	290,306
181	577,290	184	314,577
186	581,369	187	581,366
189	9,581	194	358,583
197	583,529	198	375,585
200	566,585	202	587,358
204	546,587	205	568,13
206	13,546	208	593,375
209	593,563	213	477,614
215	516,512	223	516,529
225	367,620	226	620,587
228	13,620	231	320,28
232	585,639	234	377,645
235	645,593	238	645,320
239	48,372	243	639,372
245	658,381	246	658,379
247	658,11	248	467,46
249	467,477	250	477,48
251	48,46	252	46,33
253	299,666	255	388,666
256	666,260	257	292,672
258	672,299	260	264,672
261	672,446	263	446,674
264	674,467	265	31,674
266	674,33	267	33,41
268	41,292	269	41,386
271	583,678	272	678,356

274	678,516	276	355,681
280	31,697	281	697,299
282	388,697	283	446,697
284	681,388	285	681,31
286	261,299	287	265,292
289	373,702	290	702,386
291	33,702	294	325,566
295	639,325	296	325,48
297	516,614	298	325,614
299	453,614	300	566,453
301	705,704	306	711,712
308	714,715	310	715,716
311	718,719	313	717,721
315	719,723	317	724,725
318	722,726	319	709,714
320	706,727	321	727,708
324	730,729	325	731,730
326	732,731	327	733,705
329	735,734	330	736,732
331	737,713	332	728,737
366	729,728	368	713,710
371	734,733	379	704,706
380	708,707	413	723,724
416	721,722	419	716,717
422	720,718	425	712,720
428	710,711	431	707,709
466	1122,1183	467	1121,1122
468	1189,1121	469	1200,1257
470	1267,1201	471	1201,1200
472	1279,1331	473	1339,1280
474	1280,1279	475	1346,1345
477	1506,1572	478	1505,1506
479	1421,1505	480	729,1581
481	1267,728	482	728,1743
483	1189,729	484	1339,713
485	713,1987	486	1572,733
487	733,2149	488	1183,704
489	704,2311	490	1257,706
491	706,2473	492	1331,708
493	708,2635	494	1345,707
495	1346,710	496	2870,2871
497	2871,734	498	2870,732
499	3107,3106	500	3106,722
501	3107,724	503	3440,3469
504	3471,3441	505	3441,3440
506	3513,3543	507	3541,3514
508	3514,3513	509	3622,3594
510	3594,3593	511	3593,3342
512	3667,3694	513	3666,3667
514	3696,3666	515	3471,723
516	723,3816	517	3469,721
518	721,3978	519	3543,716
520	716,4140	521	3541,718
522	718,4302	523	3622,720
524	720,4464	525	3696,711
526	711,4626	527	3694,709
528	709,4788	529	4869,3978
530	3816,4869	531	5031,4140
532	4302,5031	533	5193,3343
534	4464,5193	535	5355,4788
536	4626,5355	537	5517,2635
538	1987,5517	539	5679,2473
540	1743,5679	541	5841,2311
542	1581,5841	543	6003,2149
544	1422,6003	545	3441,4869
546	4869,3440	547	3514,5031
548	5031,3513	549	3594,5193
550	5193,3593	551	5355,3667

552	3666,5355	553	1280,5517
554	5517,1279	555	1201,5679
556	5679,1200	557	5841,1122
558	1121,5841	559	6003,1506
560	1505,6003	561	1421,731
562	731,1422	563	3342,715
564	715,3343	565	6007,724
566	6006,722	569	6004,707
570	6005,710	571	6009,734
572	6008,732	577	6009,6010
578	6010,6008	579	6004,6011
580	6011,6005	581	6006,6012
582	6012,6007		

3. Surfaces

Surface	Lines	Surface	Lines
4	132,131,129,133	5	134,137,132,136
7	151,149,148,150	8	154,155,151,156
9	153,166,163,155	10	167,84,164,166
11	164,159,157,165	12	168,111,160,84
13	160,161,158,159	14	158,46,42,59
15	171,172,168,169	16	170,50,173,172
17	173,174,109,111	22	175,181,184,46
23	109,9,175,161	24	157,59,186,189
25	163,165,147,149	26	147,189,187,58
27	148,58,55,56	28	124,52,194,197
29	129,204,202,52	40	135,145,142,137
41	142,205,206,131	42	143,150,146,205
44	208,209,134,66	45	71,72,154,69
50	206,228,226,204	51	146,56,225,228
54	235,238,135,209	55	234,69,231,238
57	231,156,143,145	58	246,247,153,72
59	245,169,167,247	60	118,120,20,119
62	251,250,249,248	63	61,239,251,62
66	264,121,117,265	67	252,248,264,266
74	268,90,261,257	75	81,269,268,63
78	215,274,272,120	79	223,197,271,274
83	280,285,284,282	85	281,282,255,253
89	286,253,256,39	90	260,258,286,38
93	287,257,260,37	94	79,63,287,29
95	263,265,280,283	96	267,266,263,90
97	290,291,267,269	98	289,62,252,291
110	117,119,276,285	150	243,295,296,239
151	213,297,215,122	152	296,298,213,250
153	232,200,294,295	154	198,66,138,200
155	299,126,223,297	157	138,136,128,300
158	294,300,299,298	159	261,283,281,258
160	249,122,118,121	161	128,133,124,126

4. MESH:Line

Attribute: 1 Title: Element 1
Sub Type = Line Mesh Element Type = BMI21

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	1	None	None

Assignment to Lines: Beta angle = 0.0
306;313;315;317;318;319;321;325;327;329;330;331;469;470;473;480;481T495;497;498;500;501;515T528;561T564;577T582

Attribute: 3 Title: Element 12
Sub Type = Line Mesh Element Type = BMI21

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	12	None	None

Assignment to Lines: Beta angle = 0.0
326;371;413;416

Attribute: 4 Title: Element 14
Sub Type = Line Mesh Element Type = BMI21

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	14	None	None

Assignment to Lines: Beta angle = 0.0
301;308;310;311;320;324;332;366;368;379;380;419;422T431I3

Attribute: 6 Title: Element 2
Sub Type = Line Mesh Element Type = BMI21

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	2	None	None

Assignment to Lines: Beta angle = 0.0
467;471;474;475;478;496;499;505;508;510;513;539;540;555;556

Attribute: 14 Title: Beam x 2 : Pinned (start)
Sub Type = Line Mesh Element Type = BMI21

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	2	THY THZ	None

Assignment to Lines: Beta angle = 0.0
530T538I2;542;544

Attribute: 15 Title: Beam x 2 : Pinned (end)
Sub Type = Line Mesh Element Type = BMI21

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	2	None	THY THZ

Assignment to Lines: Beta angle = 0.0
529T537I2;541;543

Attribute: 16 Title: Beam x 2 : Pinned (both)

Sub Type = Line Mesh **Element Type = BMI21**

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	2	THY THZ	THY THZ

Assignment to Lines: Beta angle = 0.0
545T554;557T560

Attribute: 17 Title: Beam x 1 : Pinned (start)

Sub Type = Line Mesh **Element Type = BMI21**

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	1	THY THZ	None

Assignment to Lines: Beta angle = 0.0
468;479;504;507;509;514

Attribute: 18 Title: Beam x 1 : Pinned (end)

Sub Type = Line Mesh **Element Type = BMI21**

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	1	None	THY THZ

Assignment to Lines: Beta angle = 0.0
466;472;477;503;506;511;512

Attribute: 19 Title: Element 1: Lager Balk B

Sub Type = Line Mesh **Element Type = BMI21**

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	1	THZ	THX

Assignment to Lines: Beta angle = -4.95
572
Assignment to Lines: Beta angle = 0.0
570
Assignment to Lines: Beta angle = 4.95
565

Attribute: 20 Title: Element 1: Lager Balk A

Sub Type = Line Mesh **Element Type = BMI21**

Mesh spacing	Nr. of elements	Start node end releases:	End node end releases:
Uniform	1	THZ	V THX THY

Assignment to Lines: Beta angle = -4.95
571
Assignment to Lines: Beta angle = 0.0
569
Assignment to Lines: Beta angle = 4.95
566

5. MESH:Surface

Attribute: 8 Title: Element 12 x 6

Sub Type = Surface Mesh Element Type = QTS4

Property	Symbol	Value
Element size	size	0.00
Number of divisions in x	xDivisions	12
Number of divisions in y	yDivisions	6
Transition mesh	transition	true
Allow irregular mesh	allowIrregular	true
Element defined by name	DefinedByName	false

Assignment to Surfaces:
12T15;74;75;85;159

Attribute: 9 Title: Element 14 x 6

Sub Type = Surface Mesh Element Type = QTS4

Property	Symbol	Value
Element size	size	0.00
Number of divisions in x	xDivisions	14
Number of divisions in y	yDivisions	6
Transition mesh	transition	true
Allow irregular mesh	allowIrregular	true
Element defined by name	DefinedByName	false

Assignment to Surfaces:
4;5;7T9;25T29;42;44;45;51;55;57;58T62I2;63;66;67;78;98;110;150T152;154T160I3;161

Attribute: 10 Title: Element 1 x 6

Sub Type = Surface Mesh Element Type = QTS4

Property	Symbol	Value
Element size	size	0.00
Number of divisions in x	xDivisions	1
Number of divisions in y	yDivisions	6
Transition mesh	transition	true
Allow irregular mesh	allowIrregular	true
Element defined by name	DefinedByName	false

Assignment to Surfaces:
10;11;16;17;22T24;40;41;50;54;59;79;83;89;90;93;94T97;153;155;158

6. Geometric : Line

Attribute: 1 Title: Balk A__F1

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	0.09
Second moment of area about y axis	Iyy	0.04
Second moment of area about z axis	Izz	0.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.46
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.05
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
325T327;329;330;371

Attribute: 2 Title: Balk A__F2a

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	0.19
Second moment of area about y axis	Iyy	0.13
Second moment of area about z axis	Izz	0.27
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.31
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.05
Element type	elementType	"3D Thick Beam

Assigned in: Analysis 1-4
Assignment to Lines:
325T327;329;330;371

Attribute: 5 Title: Balk A__F3

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.40
Second moment of area about y axis	Iyy	0.17
Second moment of area about z axis	Izz	0.90
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.64
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.05
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4

Assignment to Lines:
325T327;329;330;371

Attribute: 7 Title: Balk B__F1

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.09
Second moment of area about y axis	Iyy	0.04
Second moment of area about z axis	Izz	0.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.50
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.06
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4

Assignment to Lines:
301;320;324;332;366;379

Attribute: 8 Title: Balk B__F2a

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.19
Second moment of area about y axis	Iyy	0.14
Second moment of area about z axis	Izz	0.27
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.29
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.06
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4

Assignment to Lines:
301;320;324;332;366;379

Attribute: 9 Title: Rigid beam : Support

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	1.00
Second moment of area about y axis	Iyy	1.00
Second moment of area about z axis	Izz	1.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.00
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	1.00
Effective shear area in local y direction	Asy	1.00
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4

Assignment to Lines:
577T582

Attribute: 10 Title: Rigid beam : lager

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	1.00
Second moment of area about y axis	Iyy	1.00
Second moment of area about z axis	Izz	1.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.00
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	1.00
Effective shear area in local y direction	Asy	1.00
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
565;566;569T572

Attribute: 11 Title: Balk B__F3

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	0.40
Second moment of area about y axis	Iyy	0.18
Second moment of area about z axis	Izz	0.90
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.63
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.06
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
301;320;324;332;366;379

Attribute: 13 Title: Balk C__F1

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.12
Second moment of area about y axis	Iyy	0.07
Second moment of area about z axis	Izz	0.01
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.21
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.09
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
306;319;321;331;368;380;428;431

Attribute: 18 Title: Balk C__cracked

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.14
Second moment of area about y axis	Iyy	0.09
Second moment of area about z axis	Izz	0.01
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.06
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.09
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
306;319;321;331;368;380;428;431

Attribute: 19 Title: Balk D__F1

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.09
Second moment of area about y axis	Iyy	0.04
Second moment of area about z axis	Izz	0.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.50
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.06
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
308;310;311;419;422;425

Attribute: 20 Title: Balk D__F2a

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.19
Second moment of area about y axis	Iyy	0.14
Second moment of area about z axis	Izz	0.27
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.29
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.06
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
308;310;311;419;422;425

Attribute: 23 Title: Balk D__F3

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.40
Second moment of area about y axis	Iyy	0.18
Second moment of area about z axis	Izz	0.90
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.63
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.06
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
308;310;311;419;422;425

Attribute: 25 Title: Balk E__F1

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.09
Second moment of area about y axis	Iyy	0.04
Second moment of area about z axis	Izz	0.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.46
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.05
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
313T317I2;318;413;416

Attribute: 26 Title: Balk E__F2a

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.19
Second moment of area about y axis	Iyy	0.13
Second moment of area about z axis	Izz	0.27
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.31
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.05
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4

Assignment to Lines:
313T317I2;318;413;416

Attribute: 29 Title: Balk E__F3

Sub Type = Line Geometric

Property	Symbol	Value
Cross sectional area	A	0.40
Second moment of area about y axis	Iyy	0.17
Second moment of area about z axis	Izz	0.90
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	-0.64
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.03
Effective shear area in local y direction	Asy	0.05
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4

Assignment to Lines:
313T317I2;318;413;416

Attribute: 31 Title: HEA 180 (HE 180 A major y)

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	0.00
Second moment of area about y axis	Iyy	0.00
Second moment of area about z axis	Izz	0.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.00
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.00
Effective shear area in local y direction	Asy	0.00
Plastic area	Ap	0.00
Plastic modulus for bending about y	Zpy	0.00
Plastic modulus for bending about z	Zpz	0.00
Plastic neutral axis, distance from centroid along y axis	yp	0.00
Plastic neutral axis, distance from centroid along z axis	zp	0.00
Plastic torsional section modulus	Zpt	0.00
Warping torsional constant about shear centre	Cw	0.00
Shear centre about y axis	yo	0.00
Shear centre about z axis	zo	0.00
Monosymmetry constant about y	betay	0.00
Monosymmetry constant about z	betaz	0.00
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
466T474;477T479;503T514;529T544

Attribute: 32 Title: HEA 160 (HE 160 A major y)

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	0.00
Second moment of area about y axis	Iyy	0.00
Second moment of area about z axis	Izz	0.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.00
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.00
Effective shear area in local y direction	Asy	0.00
Plastic area	Ap	0.00
Plastic modulus for bending about y	Zpy	0.00
Plastic modulus for bending about z	Zpz	0.00
Plastic neutral axis, distance from centroid along y axis	yp	0.00
Plastic neutral axis, distance from centroid along z axis	zp	0.00
Plastic torsional section modulus	Zpt	0.00
Warping torsional constant about shear centre	Cw	0.00
Shear centre about y axis	yo	0.00
Shear centre about z axis	zo	0.00
Monosymmetry constant about y	betay	0.00
Monosymmetry constant about z	betaz	0.00
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
545T560

Attribute: 33 Title: HEA 800 (HE 800 A major y)

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	0.03
Second moment of area about y axis	Iyy	0.00
Second moment of area about z axis	Izz	0.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.00
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	0.01
Effective shear area in local y direction	Asy	0.02
Plastic area	Ap	0.03
Plastic modulus for bending about y	Zpy	0.01
Plastic modulus for bending about z	Zpz	0.00
Plastic neutral axis, distance from centroid along y axis	yp	0.00
Plastic neutral axis, distance from centroid along z axis	zp	0.00
Plastic torsional section modulus	Zpt	0.00
Warping torsional constant about shear centre	Cw	0.00
Shear centre about y axis	yo	0.00
Shear centre about z axis	zo	0.00
Monosymmetry constant about y	betay	0.00
Monosymmetry constant about z	betaz	0.00
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
475;496;499

Attribute: 35 Title: Rigid beam

Sub Type = Line Geometric

Property	**Symbol**	**Value**
Cross sectional area	A	1.00
Second moment of area about y axis	Iyy	1.00
Second moment of area about z axis	Izz	1.00
Product moment of area	Iyz	0.00
Torsional constant	J	0.00
Eccentricity in local z direction	ez	0.00
Eccentricity in local y direction	ey	0.00
Wagner constant 1st moment of square radius about y (Iyr)	Iyr	0.00
Wagner constant 1st moment of square radius about z (Izr)	Izr	0.00
Wagner constant 4th moment of area about origin (Irr)	Irr	0.00
Wagner constant 2nd moment of warping about origin (Iwr)	Iwr	0.00
Effective shear area in local z direction	Asz	1.00
Effective shear area in local y direction	Asy	1.00
Element type	elementType	"3D Thick Beam"

Assigned in: Analysis 1-4
Assignment to Lines:
480T495;497;498;500;501;515T528;561T564

7. Geometric : Surface

Attribute: 34 Title: t = 300 mm
Sub Type = Surface Geometric
Assigned in: Analysis 7 (DRIFT-V)

Property	**Symbol**	**Value**
Thickness	t	0.30
Eccentricity in local z direction	ez	0.00

Assignment to Surfaces:
4;5;7T17;22T29;40T42;44;45;50;51;54;55;57T60;62;63;66;67;74;75;78;79;83;85;89;90;93T98;110;150;151T155;157T161

8. Isotropic material

Attribute: 1 Title: Steel
Sub Type = Isotropic Material

Property	Symbol	Value
Young's modulus	E	210000000.00
Poisson's ratio	nu	0.30
Density	rho	7.80
Coefficient of thermal expansion	alpha	0.00

Assigned in: Analysis 1-7
Assignment to Lines:
301;306;308;310;311T317I2;318T321;324T327;329T332;366;368;371;379;380;413;416T431I3;466T475;477T501;503T566;569T572;577T582

Attribute: 9 Title: Våt betong viktlös
Sub Type = Isotropic Material

Property	Symbol	Value
Young's modulus	E	34000.00
Poisson's ratio	nu	0.20
Density	rho	0.00
Coefficient of thermal expansion	alpha	0.00

Assigned in: Analysis 1
Assignment to Surfaces:
4;5;7T17;22T29;40T42;44;45;50;51;54;55;57T60;62;63;66;67;74;75;78;79;83;85;89;90;93T98;110;150;151T155;157T161

Assigned in: Analysis 2
Assignment to Surfaces:
4;5;10T17;22T24;28;29;40;41;44;50;54;59;60;62;63;66;67;74;75;78;79;83;85;89;90;93;94T98;110;150;151T155;157T161

Assigned in: Analysis 3
Assignment to Surfaces:
4;5;10T17;22T24;28;29;40;41;44;50;54;59;74;75;79;83;85;89;90;93;94T97;153T155;157T159;161

Assigned in: Analysis 4
Assignment to Surfaces:
4;5;28;29;40;41;44;50;54;74;75T83I4;85;89;90;93;94T97;153T155;157T159;161

9. Orthotropic material

Attribute: 7 Title: Betong viktlös

Sub Type = Orthotropic Material

Property	Symbol	Value
Shear modulus in yz	Gyz	14000000.00
Shear modulus in xz	Gzx	14000.00
Coefficient of thermal expansion in yz	ayz	0.00
Coefficient of thermal expansion in xz	azx	0.00
Shear modulus in xy	Gxy	14000.00
Coefficient of thermal expansion in yz	axy	0.00
Young's modulus in x	Ex	34000.00
Young's modulus in y	Ey	34000000.00
Poisson's ration in xy	nuxy	0.02
Angle of othotropy	angle	0.00
Density	rho	0.00
Coefficient of thermal expansion in x	ax	0.00
Coefficient of thermal expansion in y	ay	0.00
Mass Rayleigh damping constant	ar	0.00
Stiffness Rayleigh damping constant	br	0.00

Assigned in: Analysis 2
Assignment to Surfaces:
7T9;25T27;42;45;51;55;57;58

Assigned in: Analysis 3
Assignment to Surfaces:
7T9;25T27;42;45;51;55;57;58;60;62;63;66;67;78;98;110;150T152;160

Assigned in: Analysis 4
Assignment to Surfaces:
7T17;22T27;42;45;51;55;57T60;62;63;66;67;78;98;110;150;151;152;160

Assigned in: Analysis 5
Assignment to Surfaces:
4;5;7T17;22T29;40T42;44;45;50;51;54;55;57T60;62;63;66;67;74;75;78;79;83;85;89;90;93T98;110;150;151T155;157T161

Assigned in: Analysis 6
Assignment to Surfaces:
4;5;7T17;22T29;40T42;44;45;50;51;54;55;57T60;62;63;66;67;74;75;78;79;83;85;89;90;93T98;110;150;151T155;157T161

Assigned in: Analysis 7
Assignment to Surfaces:
4;5;7T17;22T29;40T42;44;45;50;51;54;55;57T60;62;63;66;67;74;75;78;79;83;85;89;90;93T98;110;150;151T155;157T161

10. Support

Attribute: 1 Title: Support 1

Sub Type = Structural Support

Property	**Symbol**	**Value**
Translation in X	U	"F"
Translation in Y	V	"R"
Translation in Z	W	"R"
Rotation about X	THX	"R"
Rotation about Y	THY	"F"
Rotation about Z	THZ	"F"
Torsional warping	Torsion	"F"
Moment about hinge	L1	"F"
Pore pressure	pore	"F"

Assigned in: Analysis 1-7
Assignment to Points:
6010

Attribute: 2 Title: Support 2

Sub Type = Structural Support

Property	**Symbol**	**Value**
Translation in X	U	"F"
Translation in Y	V	"R"
Translation in Z	W	"R"
Rotation about X	THX	"R"
Rotation about Y	THY	"F"
Rotation about Z	THZ	"F"
Torsional warping	Torsion	"F"
Moment about hinge	L1	"F"
Pore pressure	pore	"F"

Assigned in: Analysis 1-7
Assignment to Points:
6011

Attribute: 3 Title: Support 3

Sub Type = Structural Support

Property	**Symbol**	**Value**
Translation in X	U	"R"
Translation in Y	V	"R"
Translation in Z	W	"R"
Rotation about X	THX	"R"
Rotation about Y	THY	"F"
Rotation about Z	THZ	"F"
Torsional warping	Torsion	"F"
Moment about hinge	L1	"F"
Pore pressure	pore	"F"

Assigned in: Analysis 1-7
Assignment to Points:
6012

11. Body force load

Attribute: 1 Title: EGEN 1-1

Sub Type = Body Force Load

Property	Symbol	Value
Acceleration in X direction	AccX	0.00
Acceleration in Y direction	AccY	0.00
Acceleration in Z direction	AccZ	-10.00
Angular velocity about X axis	AngVelX	0.00
Angular velocity about Y axis	AngVelY	0.00
Angular velocity about Z axis	AngVelZ	0.00
Angular acceleration about X axis	AngAccX	0.00
Angular acceleration about Y axis	AngAccY	0.00
Angular acceleration about Z axis	AngAccZ	0.00
Linear acceleration In X fluid phase	lnFlAccX	0.00
Linear acceleration In Y fluid phase	lnFlAccY	0.00
Linear acceleration In Z fluid phase	lnFlAccZ	-10.00

Loadcase ID: 52 Title: EGEN 1-1 Factor = 1

Assigned in: Analysis 1

Assignment to Lines:

301;306;308;310;311T317I2;318T321;324T327;329T332;366;368;371;379;380;413;416T431I3

12. Beam point load

Attribute: 19 Title: KRYMP-1

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	0.00
Point load in x direction	Px	8046.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	4868
Moment about z axis	Mz	0.00

Loadcase ID: 51457 Title: KRYMP-1 Factor = 1
Assigned in : Analysis 6
Assignment to Lines:
329;330

Attribute: 20 Title: KRYMP-2

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	1.00
Point load in x direction	Px	-8046.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-4296
Moment about z axis	Mz	0.00

Loadcase ID: 51458 Title: KRYMP-2 Factor = 1
Assigned in : Analysis 6
Assignment to Lines:
320;332

Attribute: 21 Title: KRYMP-3

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	0.00
Point load in x direction	Px	8046.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	4296
Moment about z axis	Mz	0.00

Loadcase ID: 51459 Title: KRYMP-3 Factor = 1
Assigned in : Analysis 6
Assignment to Lines:
308;425

Attribute: 22 Title: KRYMP-4

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	0.80
Point load in x direction	Px	-8046.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-4868
Moment about z axis	Mz	0.00

Loadcase ID: 51460 Title: KRYMP-4 Factor = 1
Assigned in : Analysis 6
Assignment to Lines:
317;318

Attribute: 23 Title: BROMS 1+

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	1
Distance	d	0.00
Point load in x direction	Px	239.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	287.00
Moment about z axis	Mz	0.00

Loadcase ID: 51461 Title: BROMS 1+ Factor = 1
Assigned in : Analysis 7
Assignment to Lines:
326;371

Attribute: 24 Title: BROMS 2+

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	1
Distance	d	0.00
Point load in x direction	Px	239.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	287.00
Moment about z axis	Mz	0.00

Loadcase ID: 51462 Title: BROMS 2+ Factor = 1
Assigned in : Analysis 7
Assignment to Lines:
428;431

Attribute: 25 Title: BROMS 3+

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	1
Distance	d	0.00
Point load in x direction	Px	229.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	275.00
Moment about z axis	Mz	0.00

Loadcase ID: 51463 Title: BROMS 3+ Factor = 1
Assigned in : Analysis 7
Assignment to Lines:
317;318

Attribute: 26 Title: BROMS 1-

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	1
Distance	d	0.00
Point load in x direction	Px	-239.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-287.00
Moment about z axis	Mz	0.00

Loadcase ID: 51464 Title: BROMS 1- Factor = 1
Assigned in : Analysis 7
Assignment to Lines:
326;371

Attribute: 27 Title: BROMS 2-

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	1
Distance	d	0.00
Point load in x direction	Px	-239.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-287.00
Moment about z axis	Mz	0.00

Loadcase ID: 51465 Title: BROMS 2- Factor = 1
Assigned in : Analysis 7
Assignment to Lines:
428;431

Attribute: 28 **Title: BROMS 3-**

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	1
Distance	d	0.00
Point load in x direction	Px	-239.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-287.00
Moment about z axis	Mz	0.00

Loadcase ID: 51466 **Title: BROMS 3-** **Factor = 1**

Assigned in : Analysis 7

Assignment to Lines:

317;318

Attribute: 29 Title: SIDO 1+

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	1
Load direction	dirType	1
Distance	d	0.00
Distance	d	6.40
Point load in x direction	Px	60.00
Point load in x direction	Px	60.00
Point load in y direction	Py	0.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	72.00
Moment about y axis	My	72.00
Moment about z axis	Mz	0.00
Moment about z axis	Mz	0.00

Loadcase ID: 51467 Title: SIDO 1+ Factor = 1

Assignment to Lines:

496

Attribute: 30 Title: SIDO 2+

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	1
Load direction	dirType	1
Distance	d	0.00
Distance	d	6.40
Point load in x direction	Px	60.00
Point load in x direction	Px	60.00
Point load in y direction	Py	0.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	72.00
Moment about y axis	My	72.00
Moment about z axis	Mz	0.00
Moment about z axis	Mz	0.00

Loadcase ID: 51468 Title: SIDO 2+ Factor = 1

Assignment to Lines:

475

Attribute: 31 Title: SIDO 3+
Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	1
Load direction	dirType	1
Distance	d	0.00
Distance	d	6.40
Point load in x direction	Px	60.00
Point load in x direction	Px	60.00
Point load in y direction	Py	0.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	72.00
Moment about y axis	My	72.00
Moment about z axis	Mz	0.00
Moment about z axis	Mz	0.00

Loadcase ID: 51469 Title:
SIDO 3+ Factor = 1 Assignment
to Lines:
499

Attribute: 32 Title: SIDO 1-
Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	1
Load direction	dirType	1
Distance	d	0.00
Distance	d	6.40
Point load in x direction	Px	-60.00
Point load in x direction	Px	-60.00
Point load in y direction	Py	0.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-72.00
Moment about y axis	My	-72.00
Moment about z axis	Mz	0.00
Moment about z axis	Mz	0.00

Loadcase ID: 51470 Title:
SIDO 1- Factor = 1 Assignment
to Lines:
496

Attribute: 33 Title: SIDO 2-
Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	1
Load direction	dirType	1
Distance	d	0.00
Distance	d	6.40
Point load in x direction	Px	-60.00
Point load in x direction	Px	-60.00
Point load in y direction	Py	0.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-72.00
Moment about y axis	My	-72.00
Moment about z axis	Mz	0.00
Moment about z axis	Mz	0.00

Loadcase ID: 51471 Title: SIDO 2- Factor = 1 Assignment to Lines:

475

Attribute: 34 Title: SIDO 3-
Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	1
Load direction	dirType	1
Distance	d	0.00
Distance	d	6.40
Point load in x direction	Px	-60.00
Point load in x direction	Px	-60.00
Point load in y direction	Py	0.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-72.00
Moment about y axis	My	-72.00
Moment about z axis	Mz	0.00
Moment about z axis	Mz	0.00

Loadcase ID: 51472 Title: SIDO 3- Factor = 1 Assignment to Lines:

499

Attribute: 35 Title: JTEMP+

Sub Type = Temperature Load

Property	Symbol	Value
Attribute type	type	"nodal"
Final temperature	T	27.00
Final temperature gradient dT/dx	dT/dX	0.00
Final temperature gradient dT/dy	dT/dY	0.00
Final temperature gradient dT/dz	dT/dZ	0.00
Initial temperature	T0	0.00
Initial temperature gradient dT/dx	dT0/dX	0.00
Initial temperature gradient dT/dy	dT0/dY	0.00
Initial temperature gradient dT/dz	dT0/dZ	0.00

Loadcase ID: 51473 Title: JTEMP+ Factor = 1
Assigned in : Analysis 7
Assignment to Lines:

301;306;308;310;311T317I2;318T321;324T327;329T332;366;368;371;379;380;413;416T431I3

Attribute: 36 Title: JTEMP-

Sub Type = Temperature Load

Property	Symbol	Value
Attribute type	type	"nodal"
Final temperature	T	-34.00
Final temperature gradient dT/dx	dT/dX	0.00
Final temperature gradient dT/dy	dT/dY	0.00
Final temperature gradient dT/dz	dT/dZ	0.00
Initial temperature	T0	0.00
Initial temperature gradient dT/dx	dT0/dX	0.00
Initial temperature gradient dT/dy	dT0/dY	0.00
Initial temperature gradient dT/dz	dT0/dZ	0.00

Loadcase ID: 51474 Title: JTEMP- Factor = 1
Assigned in : Analysis 7
Assignment to Lines:
301;306;308;310;311T317I2;318T321;324T327;329T3
32;366;368;371;379;380;413;416T431I3

Attribute: 37 Title: OJTEMP-1

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	0.00
Point load in x direction	Px	6936.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	2652
Moment about z axis	Mz	0.00

Loadcase ID: 51475 Title: OJTEMP-1 Factor = 1
Assigned in : Analysis 7
Assignment to Lines:
329;330

Attribute: 38 Title: OJTEMP-2

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	1.00
Point load in x direction	Px	-6936.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-2220
Moment about z axis	Mz	0.00

Loadcase ID: 51476 Title: OJTEMP-2 Factor = 1
Assigned in : Analysis 7
Assignment to Lines: 320;332

Attribute: 39 Title: OJTEMP-3

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	0.00
Point load in x direction	Px	6936.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	2220
Moment about z axis	Mz	0.00

Loadcase ID: 51477 Title: OJTEMP-3 Factor = 1
Assigned in : Analysis 7
Assignment to Lines: 308;425

Attribute: 40 Title: OJTEMP-4

Sub Type = Beam Point Load

Property	Symbol	Value
Distance type	type	0
Load direction	dirType	4
Distance	d	1.00
Point load in x direction	Px	-6936.00
Point load in y direction	Py	0.00
Point load in z direction	Pz	0.00
Moment about x axis	Mx	0.00
Moment about y axis	My	-2652
Moment about z axis	Mz	0.00

Loadcase ID: 51478 Title: OJTEMP-4 Factor = 1
Assigned in : Analysis 7
Assignment to Lines: 317;318

13. Global distributed load

Attribute: 10 Title: FORM+
Sub Type = Global Distributed Load

Property	Symbol	Value
Attribute type	type	"Length"
Load in X direction	WX	0.00
Load in Y direction	WY	0.00
Load in Z direction	WZ	-3.20
Moment about X axis	MX	0.00
Moment about Y axis	MY	0.00
Moment about Z axis	MZ	0.00
Moment about hinge	Hinge	0.00

Loadcase ID: 51448 Title: FORM+ Factor = 1 Assigned in : Analysis 1
Assignment to Lines:
301;306;308;310;311T317I2;318T321;324T327;329T332;366;368;371;379;380;413;416T431I3

Attribute: 11 Title: FORM-
Sub Type = Global Distributed Load

Property	Symbol	Value
Attribute type	type	"Length"
Load in X direction	WX	0.00
Load in Y direction	WY	0.00
Load in Z direction	WZ	3.20
Moment about X axis	MX	0.00
Moment about Y axis	MY	0.00
Moment about Z axis	MZ	0.00
Moment about hinge	Hinge	0.00

Loadcase ID: 51449 Title: FORM- Factor = 1
Assigned in : Analysis 6
Assignment to Lines:
301;306;308;310;311T317I2;318T321;324T327;329T332;366;368;371;379;380;413;416T431I3

Attribute: 12 Title: BELAGG
Sub Type = Global Distributed Load

Property	Symbol	Value
Attribute type	type	"Area"
Load in X direction	WX	0.00
Load in Y direction	WY	0.00
Load in Z direction	WZ	-2.60

Loadcase ID: 51450 Title: BELAGG Factor = 1
Assignment to Surfaces:
4;5;7T17;22T29;40T42;44;45;50;51;54;55;57T60;62;63;66;67;74;75;78;79;83;85;89;90;93T98; 110;150;151T155;157T161

Attribute: 41 Title: VIND+

Sub Type = Global Distributed Load

Property	Symbol	Value
Attribute type	type	"Length"
Load in X direction	WX	0.00
Load in Y direction	WY	3.90
Load in Z direction	WZ	0.00
Moment about X axis	MX	-4.30
Moment about Y axis	MY	0.00
Moment about Z axis	MZ	0.00
Moment about hinge	Hinge	0.00

Loadcase ID: 51479 Title: VIND+ Factor = 1

Assigned in : Analysis 7

Assignment to Lines:

306;311;315;317;324;326;330;332;366;368;413;422;425;428

Attribute: 42 Title: VIND-

Sub Type = Global Distributed Load

Property	Symbol	Value
Attribute type	type	"Length"
Load in X direction	WX	0.00
Load in Y direction	WY	-3.90
Load in Z direction	WZ	0.00
Moment about X axis	MX	4.30
Moment about Y axis	MY	0.00
Moment about Z axis	MZ	0.00
Moment about hinge	Hinge	0.00

Loadcase ID: 51480 Title: VIND- Factor = 1

Assigned in : Analysis 7

Assignment to Lines:

301;308;310;313;318T321;329;371;379;380;416;419;431

14. Prescribed load

Attribute: 13 Title: STOD 1Z
Sub Type = Prescribed Load

Property	Symbol	Value
Attribute type	type	"Total"
Prescribed displacement in X	U	0.00
Prescribed displacement in Y	V	0.00
Prescribed displacement in Z	W	-0.02
Prescribed rotation about X	THX	0.00
Prescribed rotation about Y	THY	0.00
Prescribed rotation about Z	THZ	0.00
Prescribed hinge rotation	L2	0.00
Pore pressure	PorePressure	0.00
Fixed displacement in X	haveDispX	false
Fixed displacement in Y	haveDispY	false
Fixed displacement in Z	haveDispZ	true
Fixed rotation about X	haveRotX	false
Fixed rotation about Y	haveRotY	false
Fixed rotation about Z	haveRotZ	false
Fixed hinge rotation	haveRotLocal	false
Fixed pore pressure	havePorePres	false

Loadcase ID: 51451 Title: STOD 1Z Factor = 1 Assignment to Points:

6010

Attribute: 14 Title: STOD 2Z
Sub Type = Prescribed Load

Property	Symbol	Value
Attribute type	type	"Total"
Prescribed displacement in X	U	0.00
Prescribed displacement in Y	V	0.00
Prescribed displacement in Z	W	-0.01
Prescribed rotation about X	THX	0.00
Prescribed rotation about Y	THY	0.00
Prescribed rotation about Z	THZ	0.00
Prescribed hinge rotation	L2	0.00
Pore pressure	PorePressure	0.00
Fixed displacement in X	haveDispX	false
Fixed displacement in Y	haveDispY	false
Fixed displacement in Z	haveDispZ	true
Fixed rotation about X	haveRotX	false
Fixed rotation about Y	haveRotY	false
Fixed rotation about Z	haveRotZ	false
Fixed hinge rotation	haveRotLocal	false
Fixed pore pressure	havePorePres	false

Loadcase ID: 51452 Title: STOD 2Z Factor = 1 Assignment to Points:

6011

Attribute: 15 Title: STOD 3Z

Sub Type = Prescribed Load

Property	Symbol	Value
Attribute type	type	"Total"
Prescribed displacement in X	U	0.00
Prescribed displacement in Y	V	0.00
Prescribed displacement in Z	W	-0.01
Prescribed rotation about X	THX	0.00
Prescribed rotation about Y	THY	0.00
Prescribed rotation about Z	THZ	0.00
Prescribed hinge rotation	L2	0.00
Pore pressure	PorePressure	0.00
Fixed displacement in X	haveDispX	false
Fixed displacement in Y	haveDispY	false
Fixed displacement in Z	haveDispZ	true
Fixed rotation about X	haveRotX	false
Fixed rotation about Y	haveRotY	false
Fixed rotation about Z	haveRotZ	false
Fixed hinge rotation	haveRotLocal	false
Fixed pore pressure	havePorePres	false

Loadcase ID: 51453 Title: STOD 3Z Factor = 1

Assigned in: Analysis 6

Assignment to Points:

6012

Attribute: 16 Title: STOD 1Y
Sub Type = Prescribed Load

Property	Symbol	Value
Attribute type	type	"Total"
Prescribed displacement in X	U	0.00
Prescribed displacement in Y	V	0.01
Prescribed displacement in Z	W	0.00
Prescribed rotation about X	THX	0.00
Prescribed rotation about Y	THY	0.00
Prescribed rotation about Z	THZ	0.00
Prescribed hinge rotation	L2	0.00
Pore pressure	PorePressure	0.00
Fixed displacement in X	haveDispX	false
Fixed displacement in Y	haveDispY	true
Fixed displacement in Z	haveDispZ	false
Fixed rotation about X	haveRotX	false
Fixed rotation about Y	haveRotY	false
Fixed rotation about Z	haveRotZ	false
Fixed hinge rotation	haveRotLocal	false
Fixed pore pressure	havePorePres	false

Loadcase ID: 51454 Title: STOD 1Y+ Factor = 1
Assignment to Points:
6010

Attribute: 17 Title: STOD 2Y
Sub Type = Prescribed Load

Property	Symbol	Value
Attribute type	type	"Total"
Prescribed displacement in X	U	0.00
Prescribed displacement in Y	V	0.01
Prescribed displacement in Z	W	0.00
Prescribed rotation about X	THX	0.00
Prescribed rotation about Y	THY	0.00
Prescribed rotation about Z	THZ	0.00
Prescribed hinge rotation	L2	0.00
Pore pressure	PorePressure	0.00
Fixed displacement in X	haveDispX	false
Fixed displacement in Y	haveDispY	true
Fixed displacement in Z	haveDispZ	false
Fixed rotation about X	haveRotX	false
Fixed rotation about Y	haveRotY	false
Fixed rotation about Z	haveRotZ	false
Fixed hinge rotation	haveRotLocal	false
Fixed pore pressure	havePorePres	false

Loadcase ID: 51455 Title: STOD 2Y+ Factor = 1
Assigned in: Analysis 6
Assignment to Points:
6011

Attribute: 18 Title: STOD 3Y

Sub Type = Prescribed Load

Property	Symbol	Value
Attribute type	type	"Total"
Prescribed displacement in X	U	0.00
Prescribed displacement in Y	V	0.01
Prescribed displacement in Z	W	0.00
Prescribed rotation about X	THX	0.00
Prescribed rotation about Y	THY	0.00
Prescribed rotation about Z	THZ	0.00
Prescribed hinge rotation	L2	0.00
Pore pressure	PorePressure	0.00
Fixed displacement in X	haveDispX	false
Fixed displacement in Y	haveDispY	true
Fixed displacement in Z	haveDispZ	false
Fixed rotation about X	haveRotX	false
Fixed rotation about Y	haveRotY	false
Fixed rotation about Z	haveRotZ	false
Fixed hinge rotation	haveRotLocal	false
Fixed pore pressure	havePorePres	false

Loadcase ID: 51456 Title:

STOD 3Y+ Factor = 1

Assigned in: Analysis 6

Assignment to Points:

6012

15. Tied mesh constraint

Attribute: 1 Title: Main girder A
Sub Type = Normal Tied Mesh Constraint
doRigid
true

Assigned in: Analysis 1-7
Master assignment to Lines:
286,281,280,117,118,215,223,124,129,206,146,148,147,157,158,175

Slave assignment to Lines:
329,371,327,301,379,320,321,380,431,319,308,310,419,313,416,318

Attribute: 2 Title: Main girder B
Sub Type = Normal Tied Mesh Constraint
doRigid
true

Assigned in: Analysis 1-7
Master assignment to Lines:
287,268,267,252,251,296,294,138,134,135,231,154,153,167,168,173

Slave assignment to Lines:
330,326,325,324,366,332,331,368,428,306,425,422,311,315,413,317

16. Deactivate

Attribute: 1 Title: Gjutetapp II-V
Sub Type = Deactivate

Property	**Symbol**	**Value**
Percentage of internal forces to be redistributed	percent	100.00
Stiffness reduction factor	stfscl	0.00
Process constraint equations	createConstr	false
Constraint equation type	constrEquType	"none"

Assigned in: Analysis 1
Assignment to Surfaces:
4;5;10T17;22T24;28;29;40;41;44;50;54;59;60;62;63;66;67;74;75;78;79;83;85;89;90;93;94T98;110;150;151T155;157T161

Attribute: 2 Title: Gjutetapp III-V
Sub Type = Deactivate

Property	**Symbol**	**Value**
Percentage of internal forces to be redistributed	percent	100.00
Stiffness reduction factor	stfscl	0.00
Process constraint equations	createConstr	false
Constraint equation type	constrEquType	"none"

Assigned in: Analysis 2
Assignment to Surfaces:
4;5;10T17;22T24;28;29;40;41;44;50;54;59;74;75;79;83;85;89;90;93;94T97;153T155;157T159;161

Attribute: 3 Title: Gjutetapp IV-V
Sub Type = Deactivate

Property	**Symbol**	**Value**
Percentage of internal forces to be redistributed	percent	100.00
Stiffness reduction factor	stfscl	0.00
Process constraint equations	createConstr	false
Constraint equation type	constrEquType	"none"

Assigned in: Analysis 3
Assignment to Surfaces:
4;5;28;29;40;41;44;50;54;74;75T83I4;85;89;90;93;94T97;153T155;157T159;161

Attribute: 4 Title: Gjutetapp V
Sub Type = Deactivate

Property	**Symbol**	**Value**
Percentage of internal forces to be redistributed	percent	100.00
Stiffness reduction factor	stfscl	0.00
Process constraint equations	createConstr	false
Constraint equation type	constrEquType	"none"

Assigned in: Analysis 4
Assignment to Surfaces:
4;5;28;29;40;41;44;50;54;79;153T155;157;158;161

17. Search Area

Attribute: 1 Title: Deck
Sub Type = Search Area

Assignment to Surfaces:
4;5;7T17;22T29;40T42;44;45;50;51;54;55;57T60;62;63;66;67;74;75;78;79;83;85;89;90;93T98;110;150;151T155;157T161

Attribute: 2 Title: Girder
Sub Type = Search Area

Assignment to Lines:
301;306;308;310;311T317I2;318T321;324T327;329T332;366;368;371;379;380;413;416T431I3

18. Basic combination

Loadcase ID: 41 Title: EGEN 1

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
52	0	1.0	EGEN 1-1	
53	0	1.0	EGEN 1-2	
55	0	1.0	EGEN 1-3	

Loadcase ID: 62 Title: EGEN 2

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51439	0	1.0	EGEN 2-1	
51440	0	1.0	EGEN 2-2	

Loadcase ID: 63 Title: EGEN 3

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51441	0	1.0	EGEN 3-1	
51442	0	1.0	EGEN 3-2	

Loadcase ID: 64 Title: EGEN 4

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51443	0	1.0	EGEN 4-1	
51444	0	1.0	EGEN 4-2	

Loadcase ID: 73 Title: STOD 1Y-

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51454	0	-1.0	STOD 1Y+	

Loadcase ID: 74 Title: STOD 2Y-

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51455	0	-1.0	STOD 2Y+	

Loadcase ID: 75 Title: STOD 3Y-

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51456	0	-1.0	STOD 3Y+	

Loadcase ID: 86   Title: KRYMP

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51457	0	1.0	KRYMP-1	
51458	0	1.0	KRYMP-2	
51459	0	1.0	KRYMP-3	
51460	0	1.0	KRYMP-4	

Loadcase ID: 1147   Title: OJTEMP+

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51475	0	1.0	OJTEMP-1	
51476	0	1.0	OJTEMP-2	
51477	0	1.0	OJTEMP-3	
51478	0	1.0	OJTEMP-4	

Loadcase ID: 1148   Title: OJTEMP-

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
1147	0	-1.0	OJTEMP+	

Loadcase ID: 51249   Title: EGEN

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
41	0	1.0	EGEN 1	
62	0	1.0	EGEN 2	
63	0	1.0	EGEN 3	
64	0	1.0	EGEN 4	
51447	0	1.0	EGEN 5	

Loadcase ID: 51447   Title: EGEN 5

Sub Type: Basic Combination

Loadcase	ResultsFile	Factor	Title	Type
51445	0	1.0	EGEN 5-1	
51446	0	1.0	EGEN 5-2	

19. Smart combination

Loadcase ID: 76 Title: STOD-Y

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51454	0	0.0	1.0	STOD 1Y+	
51455	0	0.0	1.0	STOD 2Y+	
51456	0	0.0	1.0	STOD 3Y+	
73	0	0.0	1.0	STOD 1Y-	
74	0	0.0	1.0	STOD 2Y-	
75	0	0.0	1.0	STOD 3Y-	

Loadcase ID: 78 Title: STOD-Z Sub Type: Smart Combination Loadcases to consider: All

Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51451	0	0.0	1.0	STOD 1Z	
51452	0	0.0	1.0	STOD 2Z	
51453	0	0.0	1.0	STOD 3Z	

Loadcase ID: 1153 Title: ULS-BP1

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
41	0	1.0	0.35	EGEN 1	

Loadcase ID: 1155 Title: ULS-BP2

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
62	0	1.0	0.35	EGEN 2	

Loadcase ID: 1157 Title: ULS-BP3

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
63	0	1.0	0.35	EGEN 3	

Loadcase ID: 1159 Title: ULS-BP4

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
64	0	1.0	0.35	EGEN 4	

Loadcase ID: 1161 Title: ULS-DP

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51449	0	1.0	0.0	FORM-	
51450	0	1.0	0.2	BELAGG	
80	0	1.0	0.2	STOD (Max)	
81	0	1.0	0.2	STOD (Min)	

Loadcase ID: 1163 Title: ULS-DK

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
86	0	0.0	1.2	KRYMP	

Loadcase ID: 1167 Title: TEMP

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1141	0	0.0	1.0	JTEMP (Max)	
1142	0	0.0	1.0	JTEMP (Min)	
1147	0	0.0	1.0	OJTEMP+	
1148	0	0.0	1.0	OJTEMP-	

Loadcase ID: 1169 Title: ULS-DV

Sub Type: Smart Combination Loadcases to consider: 5 Variable Loadcases: 1

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1134	0	1.13	0.37	BROMS (Max)	
1135	0	1.13	0.37	BROMS (Min)	
1136	0	1.13	0.37	SIDO (Max)	
1137	0	1.13	0.37	SIDO (Min)	
1167	0	0.9	0.6	TEMP (Max)	
1168	0	0.9	0.6	TEMP (Min)	
1151	0	0.45	1.05	VIND (Max)	
1152	0	0.45	1.05	VIND (Min)	
1700	0	1.13	0.37	TRAFIK (Max)	
1701	0	1.13	0.37	TRAFIK (Min)	

Loadcase ID: 1704 Title: ULS-Phase 2a

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51449	0	1.2	0.0	FORM-	
51450	0	1.0	0.2	BELAGG	

Loadcase ID: 1706 Title: ULS-Phase 2b

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
80	0	0.0	1.2	STOD (Max)	
81	0	0.0	1.2	STOD (Min)	
86	0	0.0	1.2	KRYMP	

Loadcase ID: 1708 Title: ULS-Phase 3a

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1167	0	0.0	1.0	TEMP (Max)	
1168	0	0.0	1.0	TEMP (Min)	

Loadcase ID: 1710 Title: ULS-Phase 3b

Sub Type: Smart Combination
Loadcases to consider: 4
Variable Loadcases: 1

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1700	0	1.13	0.37	TRAFIK (Max)	
1701	0	1.13	0.37	TRAFIK (Min)	
1134	0	1.13	0.37	BROMS (Max)	
1135	0	1.13	0.37	BROMS (Min)	
1136	0	1.13	0.37	SIDO (Max)	
1137	0	1.13	0.37	SIDO (Min)	
1151	0	0.45	1.05	VIND (Max)	
1152	0	0.45	1.05	VIND (Min)	

Loadcase ID: 1712 Title: SLS-PERM

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
41	0	1.0	0.0	EGEN 1	
62	0	1.0	0.0	EGEN 2	
63	0	1.0	0.0	EGEN 3	
64	0	1.0	0.0	EGEN 4	
51447	0	1.0	0.0	EGEN 5	
51450	0	0.9	0.2	BELAGG	
80	0	0.0	0.0	STOD (Max)	
81	0	0.0	1.0	STOD (Min)	

Loadcase ID: 1714 Title: SLS-DK

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
86	0	0.0	1.0	KRYMP	

Loadcase ID: 1716 Title: SLS-VAR-K

Sub Type: Smart Combination Loadcases to consider: 5 Variable Loadcases: 1

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1134	0	0.56	0.19	BROMS (Max)	
1135	0	0.56	0.19	BROMS (Min)	
1136	0	0.56	0.19	SIDO (Max)	
1137	0	0.56	0.18	SIDO (Min)	
1167	0	0.6	0.4	TEMP (Max)	
1168	0	0.6	0.6	TEMP (Min)	
1151	0	0.3	0.7	VIND (Max)	
1152	0	0.3	0.7	VIND (Min)	
1700	0	0.75	0.25	TRAFIK (Max)	
1701	0	0.75	0.25	TRAFIK (Min)	

Loadcase ID: 1718 Title: SLS-VAR-F

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1134	0	0.0	0.56	BROMS (Max)	
1135	0	0.0	0.56	BROMS (Min)	
1136	0	0.0	0.56	SIDO (Max)	
1137	0	0.0	0.56	SIDO (Min)	
1167	0	0.0	0.6	TEMP (Max)	
1168	0	0.0	0.6	TEMP (Min)	
1151	0	0.0	0.3	VIND (Max)	
1152	0	0.0	0.3	VIND (Min)	
1700	0	0.0	0.75	TRAFIK (Max)	
1701	0	0.0	0.75	TRAFIK (Min)	

Loadcase ID: 1720 Title: SLS-VAR-Q

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1167	0	0.0	0.5	TEMP (Max)	
1168	0	0.0	0.5	TEMP (Min)	

Loadcase ID: 1722 Title: SLS-K

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1712	0	1.0	0.0	SLS-PERM (Max)	
1713	0	1.0	0.0	SLS-PERM (Min)	
1714	0	0.0	1.0	SLS-DK (Max)	
1715	0	0.0	1.0	SLS-DK (Min)	
1716	0	0.0	1.0	SLS-VAR-K (Max)	
1717	0	0.0	1.0	SLS-VAR-K (Min)	

Loadcase ID: 1724 Title: SLS-F

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1712	0	1.0	0.0	SLS-PERM (Max)	
1713	0	1.0	0.0	SLS-PERM (Min)	
1714	0	0.0	1.0	SLS-DK (Max)	
1715	0	0.0	1.0	SLS-DK (Min)	
1718	0	0.0	1.0	SLS-VAR-F (Max)	
1719	0	0.0	1.0	SLS-VAR-F (Min)	

Loadcase ID: 1726 Title: SLS-Q

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1712	0	1.0	0.0	SLS-PERM (Max)	
1713	0	1.0	0.0	SLS-PERM (Min)	
1714	0	0.0	1.0	SLS-DK (Max)	
1715	0	0.0	1.0	SLS-DK (Min)	
1720	0	0.0	1.0	SLS-VAR-Q (Max)	
1721	0	0.0	1.0	SLS-VAR-Q (Min)	

Loadcase ID: 1728 Title: SLS C-Phase 1

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
41	0	1.0	0.0	EGEN 1	
62	0	1.0	0.0	EGEN 2	
63	0	1.0	0.0	EGEN 3	
64	0	1.0	0.0	EGEN 4	
51447	0	1.0	0.0	EGEN 5	
51448	0	1.0	0.0	FORM+	

Loadcase ID: 1730 Title: SLS C-Phase 2a

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51449	0	1.0	0.0	FORM-	
51450	0	0.9	0.2	BELAGG	

Loadcase ID: 1732 Title: SLS C-Phase 2b

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
80	0	0.0	1.0	STOD (Max)	
81	0	0.0	1.0	STOD (Min)	
86	0	0.0	1.0	KRYMP	

Loadcase ID: 1734 Title: SLS C-Phase 3a

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1167	0	0.0	1.0	TEMP (Max)	
1168	0	0.0	1.0	TEMP (Min)	

Loadcase ID: 1736 Title: SLS C-Phase 3b

Sub Type: Smart Combination Loadcases to consider: 4 Variable Loadcases: 1

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1700	0	0.75	0.25	TRAFIK (Max)	
1701	0	0.75	0.25	TRAFIK (Min)	
1134	0	0.56	0.19	BROMS (Max)	
1135	0	0.56	0.19	BROMS (Min)	
1136	0	0.56	0.19	SIDO (Max)	
1137	0	0.56	0.19	SIDO (Min)	
1151	0	0.3	0.7	VIND (Max)	
1152	0	0.3	0.7	VIND (Min)	

Loadcase ID: 53965 Title: Lk ULS

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51249	0	1.0	0.0	EGEN	
51448	0	1.0	0.0	FORM+	
1161	0	1.0	0.0	ULS-DP (Max)	
1162	0	1.0	0.0	ULS-DP (Min)	
1169	0	1.0	0.0	ULS-DV (Max)	
1170	0	1.0	0.0	ULS-DV (Min)	

Loadcase ID: 1738 Title: SLS F-Phase 1

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
41	0	1.0	0.0	EGEN 1	
62	0	1.0	0.0	EGEN 2	
63	0	1.0	0.0	EGEN 3	
64	0	1.0	0.0	EGEN 4	
51447	0	1.0	0.0	EGEN 5	
51448	0	1.0	0.0	FORM+	

Loadcase ID: 1740 Title: SLS F-Phase 2a

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51449	0	1.0	0.0	FORM-	
51450	0	0.9	0.2	BELAGG	

Loadcase ID: 1742 Title: SLS F-Phase 2b

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
80	0	0.0	1.0	STOD (Max)	
81	0	0.0	1.0	STOD (Min)	
86	0	0.0	1.0	KRYMP	

Loadcase ID: 1744 Title: SLS F-Phase 3a

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1167	0	0.0	0.6	TEMP (Max)	
1168	0	0.0	0.6	TEMP (Min)	

Loadcase ID: 1746 Title: SLS F-Phase 3b

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1700	0	0.0	0.75	TRAFIK (Max)	
1701	0	0.0	0.75	TRAFIK (Min)	
1134	0	0.0	0.56	BROMS (Max)	
1135	0	0.0	0.56	BROMS (Min)	
1136	0	0.0	0.56	SIDO (Max)	
1137	0	0.0	0.56	SIDO (Min)	
1151	0	0.0	0.3	VIND (Max)	
152	0	0.0	0.3	VIND (Min)	

Loadcase ID: 1748 Title: FAT-PERM

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
41	0	1.0	0.0	EGEN 1	
62	0	1.0	0.0	EGEN 2	
63	0	1.0	0.0	EGEN 3	
64	0	1.0	0.0	EGEN 4	
51447	0	1.0	0.0	EGEN 5	
51450	0	1.0	0.0	BELAGG	

Loadcase ID: 1750 Title: FAT-VAR

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
1530	0	0.0	0.0	UTM (Max)	
1531	0	0.0	1.0	UTM (Min)	

Loadcase ID: 53963 Title: ULS-BP5

Sub Type: Smart Combination Loadcases to consider: All Variable Loadcases: All

Loadcase	ResultsFile	PermanentFactor	VariableFactor	Title	Type
51447	0	1.0	0.0	EGEN 5	

20. Envelopes

Loadcase ID: 80 Title: STOD

Sub Type: Envelope

Loadcase	ResultsFile	Title	Type
76	0	STOD-Y (Max)	
77	0	STOD-Y (Min)	
78	0	STOD-Z (Max)	
79	0	STOD-Z (Min)	

Loadcase ID: 1134 Title: BROMS

Sub Type: Envelope

Loadcase	ResultsFile	Title	Type
51461	0	BROMS 1+	
51462	0	BROMS 2+	
51463	0	BROMS 3+	
51464	0	BROMS 1-	
51465	0	BROMS 2-	
51466	0	BROMS 3-	

Loadcase ID: 1136 Title: SIDO

Sub Type: Envelope

Loadcase	ResultsFile	Title	Type
51467	0	SIDO 1+	
51468	0	SIDO 2+	
51469	0	SIDO 3+	
51470	0	SIDO 1-	
51471	0	SIDO 2-	
51472	0	SIDO 3-	

Loadcase ID: 1141 Title: JTEMP

Sub Type: Envelope

Loadcase	ResultsFile	Title	Type
1139	0	LC(1139,0,-1,-1)	
1140	0	LC(1140,0,-1,-1)	

Loadcase ID: 1151 Title: VIND

Sub Type: Envelope

Loadcase	ResultsFile	Title	Type
51479	0	VIND+	
51480	0	VIND-	

Loadcase ID: 1530 Title: UTM

Sub Type: Envelope

Loadcase	ResultsFile	Title	Type
52143	0	UTM-FB1 (Max)	
52144	0	UTM-FB1 (Min)	
53146	0	UTM-FB2 (Max)	
53147	0	UTM-FB2 (Min)	

Loadcase ID: 1330 Title: UTM - FB1

Sub Type: Envelope

Loadcase File	Results Title	Type
1200	0	LoadID=68476 Line=911 Dir=Fwd Pos=1
1201	0	LoadID=68476 Line=911 Dir=Fwd Pos=2
1202	0	LoadID=68476 Line=911 Dir=Fwd Pos=3
1203	0	LoadID=68476 Line=911 Dir=Fwd Pos=4
1204	0	LoadID=68476 Line=911 Dir=Fwd Pos=5
1205	0	LoadID=68476 Line=911 Dir=Fwd Pos=6
1206	0	LoadID=68476 Line=911 Dir=Fwd Pos=7
1207	0	LoadID=68476 Line=911 Dir=Fwd Pos=8
1208	0	LoadID=68476 Line=911 Dir=Fwd Pos=9
1209	0	LoadID=68476 Line=911 Dir=Fwd Pos=10
1210	0	LoadID=68476 Line=911 Dir=Fwd Pos=11
1211	0	LoadID=68476 Line=911 Dir=Fwd Pos=12
1212	0	LoadID=68476 Line=911 Dir=Fwd Pos=13
1213	0	LoadID=68476 Line=911 Dir=Fwd Pos=14
1214	0	LoadID=68476 Line=911 Dir=Fwd Pos=15
1215	0	LoadID=68476 Line=911 Dir=Fwd Pos=16
1216	0	LoadID=68476 Line=911 Dir=Fwd Pos=17
1217	0	LoadID=68476 Line=911 Dir=Fwd Pos=18
1218	0	LoadID=68476 Line=911 Dir=Fwd Pos=19
1219	0	LoadID=68476 Line=911 Dir=Fwd Pos=20
1220	0	LoadID=68476 Line=911 Dir=Fwd Pos=21
1221	0	LoadID=68476 Line=911 Dir=Fwd Pos=22
1222	0	LoadID=68476 Line=911 Dir=Fwd Pos=23
1223	0	LoadID=68476 Line=911 Dir=Fwd Pos=24
1224	0	LoadID=68476 Line=911 Dir=Fwd Pos=25
1225	0	LoadID=68476 Line=911 Dir=Fwd Pos=26
1226	0	LoadID=68476 Line=911 Dir=Fwd Pos=27
1227	0	LoadID=68476 Line=911 Dir=Fwd Pos=28
1228	0	LoadID=68476 Line=911 Dir=Fwd Pos=29
1229	0	LoadID=68476 Line=911 Dir=Fwd Pos=30
1230	0	LoadID=68476 Line=911 Dir=Fwd Pos=31
1231	0	LoadID=68476 Line=911 Dir=Fwd Pos=32
1232	0	LoadID=68476 Line=911 Dir=Fwd Pos=33
1233	0	LoadID=68476 Line=911 Dir=Fwd Pos=34
1234	0	LoadID=68476 Line=911 Dir=Fwd Pos=35
1235	0	LoadID=68476 Line=911 Dir=Fwd Pos=36
1236	0	LoadID=68476 Line=911 Dir=Fwd Pos=37
1237	0	LoadID=68476 Line=911 Dir=Fwd Pos=38
1238	0	LoadID=68476 Line=911 Dir=Fwd Pos=39
1239	0	LoadID=68476 Line=911 Dir=Fwd Pos=40
1240	0	LoadID=68476 Line=911 Dir=Fwd Pos=41
1241	0	LoadID=68476 Line=911 Dir=Fwd Pos=42
1242	0	LoadID=68476 Line=911 Dir=Fwd Pos=43
1243	0	LoadID=68476 Line=911 Dir=Fwd Pos=44
1244	0	LoadID=68476 Line=911 Dir=Fwd Pos=45
1245	0	LoadID=68476 Line=911 Dir=Fwd Pos=46
1246	0	LoadID=68476 Line=911 Dir=Fwd Pos=47
1247	0	LoadID=68476 Line=911 Dir=Fwd Pos=48
1248	0	LoadID=68476 Line=911 Dir=Fwd Pos=49
1249	0	LoadID=68476 Line=911 Dir=Fwd Pos=50
1250	0	LoadID=68476 Line=911 Dir=Fwd Pos=51
1251	0	LoadID=68476 Line=911 Dir=Fwd Pos=52
1252	0	LoadID=68476 Line=911 Dir=Fwd Pos=53
1253	0	LoadID=68476 Line=911 Dir=Fwd Pos=54
1254	0	LoadID=68476 Line=911 Dir=Fwd Pos=55
1255	0	LoadID=68476 Line=911 Dir=Fwd Pos=56
1256	0	LoadID=68476 Line=911 Dir=Fwd Pos=57
1257	0	LoadID=68476 Line=911 Dir=Fwd Pos=58
1258	0	LoadID=68476 Line=911 Dir=Fwd Pos=59
1259	0	LoadID=68476 Line=911 Dir=Fwd Pos=60
1260	0	LoadID=68476 Line=911 Dir=Fwd Pos=61

1261	0	LoadID=68476 Line=911 Dir=Fwd Pos=62
1262	0	LoadID=68476 Line=911 Dir=Fwd Pos=63
1263	0	LoadID=68476 Line=911 Dir=Fwd Pos=64
1264	0	LoadID=68476 Line=911 Dir=Fwd Pos=65
1265	0	LoadID=68476 Line=911 Dir=Fwd Pos=66
1266	0	LoadID=68476 Line=911 Dir=Fwd Pos=67
1267	0	LoadID=68476 Line=911 Dir=Fwd Pos=68
1268	0	LoadID=68476 Line=911 Dir=Fwd Pos=69
1269	0	LoadID=68476 Line=911 Dir=Fwd Pos=70
1270	0	LoadID=68476 Line=911 Dir=Fwd Pos=71
1271	0	LoadID=68476 Line=911 Dir=Fwd Pos=72
1272	0	LoadID=68476 Line=911 Dir=Fwd Pos=73
1273	0	LoadID=68476 Line=911 Dir=Fwd Pos=74
1274	0	LoadID=68476 Line=911 Dir=Fwd Pos=75
1275	0	LoadID=68476 Line=911 Dir=Fwd Pos=76
1276	0	LoadID=68476 Line=911 Dir=Fwd Pos=77
1277	0	LoadID=68476 Line=911 Dir=Fwd Pos=78
1278	0	LoadID=68476 Line=911 Dir=Fwd Pos=79
1279	0	LoadID=68476 Line=911 Dir=Fwd Pos=80
1280	0	LoadID=68476 Line=911 Dir=Fwd Pos=81
1281	0	LoadID=68476 Line=911 Dir=Fwd Pos=82
1282	0	LoadID=68476 Line=911 Dir=Fwd Pos=83
1283	0	LoadID=68476 Line=911 Dir=Fwd Pos=84
1284	0	LoadID=68476 Line=911 Dir=Fwd Pos=85
1285	0	LoadID=68476 Line=911 Dir=Fwd Pos=86
1286	0	LoadID=68476 Line=911 Dir=Fwd Pos=87
1287	0	LoadID=68476 Line=911 Dir=Fwd Pos=88
1288	0	LoadID=68476 Line=911 Dir=Fwd Pos=89
1289	0	LoadID=68476 Line=911 Dir=Fwd Pos=90
1290	0	LoadID=68476 Line=911 Dir=Fwd Pos=91
1291	0	LoadID=68476 Line=911 Dir=Fwd Pos=92
1292	0	LoadID=68476 Line=911 Dir=Fwd Pos=93
1293	0	LoadID=68476 Line=911 Dir=Fwd Pos=94

1294	0	LoadID=68476 Line=911 Dir=Fwd Pos=95
1295	0	LoadID=68476 Line=911 Dir=Fwd Pos=96
1296	0	LoadID=68476 Line=911 Dir=Fwd Pos=97
1297	0	LoadID=68476 Line=911 Dir=Fwd Pos=98
1298	0	LoadID=68476 Line=911 Dir=Fwd Pos=99
1299	0	LoadID=68476 Line=911 Dir=Fwd Pos=100
1300	0	LoadID=68476 Line=911 Dir=Fwd Pos=101
1301	0	LoadID=68476 Line=911 Dir=Fwd Pos=102
1302	0	LoadID=68476 Line=911 Dir=Fwd Pos=103
1303	0	LoadID=68476 Line=911 Dir=Fwd Pos=104
1304	0	LoadID=68476 Line=911 Dir=Fwd Pos=105
1305	0	LoadID=68476 Line=911 Dir=Fwd Pos=106
1306	0	LoadID=68476 Line=911 Dir=Fwd Pos=107
1307	0	LoadID=68476 Line=911 Dir=Fwd Pos=108
1308	0	LoadID=68476 Line=911 Dir=Fwd Pos=109
1309	0	LoadID=68476 Line=911 Dir=Fwd Pos=110
1310	0	LoadID=68476 Line=911 Dir=Fwd Pos=111
1311	0	LoadID=68476 Line=911 Dir=Fwd Pos=112
1312	0	LoadID=68476 Line=911 Dir=Fwd Pos=113
1313	0	LoadID=68476 Line=911 Dir=Fwd Pos=114
1314	0	LoadID=68476 Line=911 Dir=Fwd Pos=115
1315	0	LoadID=68476 Line=911 Dir=Fwd Pos=116
1316	0	LoadID=68476 Line=911 Dir=Fwd Pos=117
1317	0	LoadID=68476 Line=911 Dir=Fwd Pos=118
1318	0	LoadID=68476 Line=911 Dir=Fwd Pos=119
1319	0	LoadID=68476 Line=911 Dir=Fwd Pos=120
1320	0	LoadID=68476 Line=911 Dir=Fwd Pos=121
1321	0	LoadID=68476 Line=911 Dir=Fwd Pos=122
1322	0	LoadID=68476 Line=911 Dir=Fwd Pos=123
1323	0	LoadID=68476 Line=911 Dir=Fwd Pos=124
1324	0	LoadID=68476 Line=911 Dir=Fwd Pos=125
1325	0	LoadID=68476 Line=911 Dir=Fwd Pos=126
1326	0	LoadID=68476 Line=911 Dir=Fwd Pos=127
1327	0	LoadID=68476 Line=911 Dir=Fwd Pos=128
1328	0	LoadID=68476 Line=911 Dir=Fwd Pos=129
1329	0	LoadID=68476 Line=911 Dir=Fwd Pos=130

Loadcase ID: 1528 Title: UTM - FB2

Sub Type: Envelope

Loadcase File	Results Title	Type
1400	0	LoadID=68476 Line=908 Dir=Fwd Pos=1
1401	0	LoadID=68476 Line=908 Dir=Fwd Pos=2
1402	0	LoadID=68476 Line=908 Dir=Fwd Pos=3
1403	0	LoadID=68476 Line=908 Dir=Fwd Pos=4
1404	0	LoadID=68476 Line=908 Dir=Fwd Pos=5
1405	0	LoadID=68476 Line=908 Dir=Fwd Pos=6
1406	0	LoadID=68476 Line=908 Dir=Fwd Pos=7
1407	0	LoadID=68476 Line=908 Dir=Fwd Pos=8
1408	0	LoadID=68476 Line=908 Dir=Fwd Pos=9
1409	0	LoadID=68476 Line=908 Dir=Fwd Pos=10
1410	0	LoadID=68476 Line=908 Dir=Fwd Pos=11
1411	0	LoadID=68476 Line=908 Dir=Fwd Pos=12
1412	0	LoadID=68476 Line=908 Dir=Fwd Pos=13
1413	0	LoadID=68476 Line=908 Dir=Fwd Pos=14
1414	0	LoadID=68476 Line=908 Dir=Fwd Pos=15
1415	0	LoadID=68476 Line=908 Dir=Fwd Pos=16
1416	0	LoadID=68476 Line=908 Dir=Fwd Pos=17
1417	0	LoadID=68476 Line=908 Dir=Fwd Pos=18
1418	0	LoadID=68476 Line=908 Dir=Fwd Pos=19
1419	0	LoadID=68476 Line=908 Dir=Fwd Pos=20
1420	0	LoadID=68476 Line=908 Dir=Fwd Pos=21
1421	0	LoadID=68476 Line=908 Dir=Fwd Pos=22
1422	0	LoadID=68476 Line=908 Dir=Fwd Pos=23
1423	0	LoadID=68476 Line=908 Dir=Fwd Pos=24
1424	0	LoadID=68476 Line=908 Dir=Fwd Pos=25
1425	0	LoadID=68476 Line=908 Dir=Fwd Pos=26
1426	0	LoadID=68476 Line=908 Dir=Fwd Pos=27
1427	0	LoadID=68476 Line=908 Dir=Fwd Pos=28
1428	0	LoadID=68476 Line=908 Dir=Fwd Pos=29
1429	0	LoadID=68476 Line=908 Dir=Fwd Pos=30
1430	0	LoadID=68476 Line=908 Dir=Fwd Pos=31
1431	0	LoadID=68476 Line=908 Dir=Fwd Pos=32
1432	0	LoadID=68476 Line=908 Dir=Fwd Pos=33
1433	0	LoadID=68476 Line=908 Dir=Fwd Pos=34
1434	0	LoadID=68476 Line=908 Dir=Fwd Pos=35
1435	0	LoadID=68476 Line=908 Dir=Fwd Pos=36
1436	0	LoadID=68476 Line=908 Dir=Fwd Pos=37
1437	0	LoadID=68476 Line=908 Dir=Fwd Pos=38
1438	0	LoadID=68476 Line=908 Dir=Fwd Pos=39
1439	0	LoadID=68476 Line=908 Dir=Fwd Pos=40
1440	0	LoadID=68476 Line=908 Dir=Fwd Pos=41
1441	0	LoadID=68476 Line=908 Dir=Fwd Pos=42
1442	0	LoadID=68476 Line=908 Dir=Fwd Pos=43
1443	0	LoadID=68476 Line=908 Dir=Fwd Pos=44
1444	0	LoadID=68476 Line=908 Dir=Fwd Pos=45
1445	0	LoadID=68476 Line=908 Dir=Fwd Pos=46
1446	0	LoadID=68476 Line=908 Dir=Fwd Pos=47
1447	0	LoadID=68476 Line=908 Dir=Fwd Pos=48
1448	0	LoadID=68476 Line=908 Dir=Fwd Pos=49
1449	0	LoadID=68476 Line=908 Dir=Fwd Pos=50
1450	0	LoadID=68476 Line=908 Dir=Fwd Pos=51
1451	0	LoadID=68476 Line=908 Dir=Fwd Pos=52
1452	0	LoadID=68476 Line=908 Dir=Fwd Pos=53
1453	0	LoadID=68476 Line=908 Dir=Fwd Pos=54
1454	0	LoadID=68476 Line=908 Dir=Fwd Pos=55
1455	0	LoadID=68476 Line=908 Dir=Fwd Pos=56
1456	0	LoadID=68476 Line=908 Dir=Fwd Pos=57
1457	0	LoadID=68476 Line=908 Dir=Fwd Pos=58
1458	0	LoadID=68476 Line=908 Dir=Fwd Pos=59
1459	0	LoadID=68476 Line=908 Dir=Fwd Pos=60
1460	0	LoadID=68476 Line=908 Dir=Fwd Pos=61

1461	0	LoadID=68476 Line=908 Dir=Fwd Pos=62
1462	0	LoadID=68476 Line=908 Dir=Fwd Pos=63
1463	0	LoadID=68476 Line=908 Dir=Fwd Pos=64
1464	0	LoadID=68476 Line=908 Dir=Fwd Pos=65
1465	0	LoadID=68476 Line=908 Dir=Fwd Pos=66
1466	0	LoadID=68476 Line=908 Dir=Fwd Pos=67
1467	0	LoadID=68476 Line=908 Dir=Fwd Pos=68
1468	0	LoadID=68476 Line=908 Dir=Fwd Pos=69
1469	0	LoadID=68476 Line=908 Dir=Fwd Pos=70
1470	0	LoadID=68476 Line=908 Dir=Fwd Pos=71
1471	0	LoadID=68476 Line=908 Dir=Fwd Pos=72
1472	0	LoadID=68476 Line=908 Dir=Fwd Pos=73
1473	0	LoadID=68476 Line=908 Dir=Fwd Pos=74
1474	0	LoadID=68476 Line=908 Dir=Fwd Pos=75
1475	0	LoadID=68476 Line=908 Dir=Fwd Pos=76
1476	0	LoadID=68476 Line=908 Dir=Fwd Pos=77
1477	0	LoadID=68476 Line=908 Dir=Fwd Pos=78
1478	0	LoadID=68476 Line=908 Dir=Fwd Pos=79
1479	0	LoadID=68476 Line=908 Dir=Fwd Pos=80
1480	0	LoadID=68476 Line=908 Dir=Fwd Pos=81
1481	0	LoadID=68476 Line=908 Dir=Fwd Pos=82
1482	0	LoadID=68476 Line=908 Dir=Fwd Pos=83
1483	0	LoadID=68476 Line=908 Dir=Fwd Pos=84
1484	0	LoadID=68476 Line=908 Dir=Fwd Pos=85
1485	0	LoadID=68476 Line=908 Dir=Fwd Pos=86
1486	0	LoadID=68476 Line=908 Dir=Fwd Pos=87
1487	0	LoadID=68476 Line=908 Dir=Fwd Pos=88
1488	0	LoadID=68476 Line=908 Dir=Fwd Pos=89
1489	0	LoadID=68476 Line=908 Dir=Fwd Pos=90
1490	0	LoadID=68476 Line=908 Dir=Fwd Pos=91
1491	0	LoadID=68476 Line=908 Dir=Fwd Pos=92
1492	0	LoadID=68476 Line=908 Dir=Fwd Pos=93
1493	0	LoadID=68476 Line=908 Dir=Fwd Pos=94
1494	0	LoadID=68476 Line=908 Dir=Fwd Pos=95
1495	0	LoadID=68476 Line=908 Dir=Fwd Pos=96
1496	0	LoadID=68476 Line=908 Dir=Fwd Pos=97
1497	0	LoadID=68476 Line=908 Dir=Fwd Pos=98
1498	0	LoadID=68476 Line=908 Dir=Fwd Pos=99
1499	0	LoadID=68476 Line=908 Dir=Fwd Pos=100
1500	0	LoadID=68476 Line=908 Dir=Fwd Pos=101
1501	0	LoadID=68476 Line=908 Dir=Fwd Pos=102
1502	0	LoadID=68476 Line=908 Dir=Fwd Pos=103
1503	0	LoadID=68476 Line=908 Dir=Fwd Pos=104
1504	0	LoadID=68476 Line=908 Dir=Fwd Pos=105
1505	0	LoadID=68476 Line=908 Dir=Fwd Pos=106
1506	0	LoadID=68476 Line=908 Dir=Fwd Pos=107
1507	0	LoadID=68476 Line=908 Dir=Fwd Pos=108
1508	0	LoadID=68476 Line=908 Dir=Fwd Pos=109
1509	0	LoadID=68476 Line=908 Dir=Fwd Pos=110

1510	0	LoadID=68476 Line=908 Dir=Fwd Pos=111
1511	0	LoadID=68476 Line=908 Dir=Fwd Pos=112
1512	0	LoadID=68476 Line=908 Dir=Fwd Pos=113
1513	0	LoadID=68476 Line=908 Dir=Fwd Pos=114
1514	0	LoadID=68476 Line=908 Dir=Fwd Pos=115
1515	0	LoadID=68476 Line=908 Dir=Fwd Pos=116
1516	0	LoadID=68476 Line=908 Dir=Fwd Pos=117
1517	0	LoadID=68476 Line=908 Dir=Fwd Pos=118
1518	0	LoadID=68476 Line=908 Dir=Fwd Pos=119
1519	0	LoadID=68476 Line=908 Dir=Fwd Pos=120
1520	0	LoadID=68476 Line=908 Dir=Fwd Pos=121
1521	0	LoadID=68476 Line=908 Dir=Fwd Pos=122
1522	0	LoadID=68476 Line=908 Dir=Fwd Pos=123
1523	0	LoadID=68476 Line=908 Dir=Fwd Pos=124
1524	0	LoadID=68476 Line=908 Dir=Fwd Pos=125
1525	0	LoadID=68476 Line=908 Dir=Fwd Pos=126
1526	0	LoadID=68476 Line=908 Dir=Fwd Pos=127
1527	0	LoadID=68476 Line=908 Dir=Fwd Pos=128

7Loadcase ID: 1586 Title: LM 1

Sub Type: VLO Analysis 1 – LM 1

Loadcase File	Results Title	Type
1444	0	Inf1 - Girder (Fx)
1445	0	Inf2 - Girder (Fy)
1446	0	Inf3 - Girder (Fz)
1447	0	Inf4 - Girder (Mx)
1448	0	Inf5 - Girder (My)
1449	0	Inf6 - Girder (Mz)
1450	0	Inf7 - Support 1 (FX)
1451	0	Inf8 - Support 1 (FY)
1452	0	Inf9 - Support 1 (FZ)
1453	0	Inf10 - Support 1 (MX)
1454	0	Inf11 - Support 1 (MY)
1455	0	Inf12 - Support 2 (FX)
1456	0	Inf13 - Support 2 (FY)
1457	0	Inf14 - Support 2 (FZ)
1458	0	Inf15 - Support 2 (MX)
1459	0	Inf16 - Support 2 (MY)
1460	0	Inf17 - Support 3 (FX)
1461	0	Inf18 - Support 3 (FY)
1462	0	Inf19 - Support 3 (FZ)
1463	0	Inf20 - Support 3 (MX)
1464	0	Inf21 - Support 3 (MY)

Loadcase ID: 1642 Title: EG A

Sub Type: VLO Analysis 2 – EG A

Loadcase File	Results Title	Type
1544	0	Inf1 - Girder (Fx)
1545	0	Inf2 - Girder (Fy)
1546	0	Inf3 - Girder (Fz)
1547	0	Inf4 - Girder (Mx)
1548	0	Inf5 - Girder (My)
1549	0	Inf6 - Girder (Mz)
1550	0	Inf7 - Support 1 (FX)
1551	0	Inf8 - Support 1 (FY)
1552	0	Inf9 - Support 1 (FZ)
1553	0	Inf10 - Support 1 (MX)
1554	0	Inf11 - Support 1 (MY)
1555	0	Inf12 - Support 2 (FX)
1556	0	Inf13 - Support 2 (FY)
1557	0	Inf14 - Support 2 (FZ)
1558	0	Inf15 - Support 2 (MX)
1559	0	Inf16 - Support 2 (MY)
1560	0	Inf17 - Support 3 (FX)
1561	0	Inf18 - Support 3 (FY)
1562	0	Inf19 - Support 3 (FZ)
1563	0	Inf20 - Support 3 (MX)
1564	0	Inf21 - Support 3 (MY)

Loadcase ID: 1698 Title: EG B

Sub Type: VLO Analysis 3 – EG B

Loadcase File	Results Title	Type
1644	0	Inf1 - Girder (Fx)
1645	0	Inf2 - Girder (Fy)
1646	0	Inf3 - Girder (Fz)
1647	0	Inf4 - Girder (Mx)
1648	0	Inf5 - Girder (My)
1649	0	Inf6 - Girder (Mz)
1650	0	Inf7 - Support 1 (FX)
1651	0	Inf8 - Support 1 (FY)
1652	0	Inf9 - Support 1 (FZ)
1653	0	Inf10 - Support 1 (MX)
1654	0	Inf11 - Support 1 (MY)
1655	0	Inf12 - Support 2 (FX)
1656	0	Inf13 - Support 2 (FY)
1657	0	Inf14 - Support 2 (FZ)
1658	0	Inf15 - Support 2 (MX)
1659	0	Inf16 - Support 2 (MY)
1660	0	Inf17 - Support 3 (FX)
1661	0	Inf18 - Support 3 (FY)
1662	0	Inf19 - Support 3 (FZ)
1663	0	Inf20 - Support 3 (MX)
1664	0	Inf21 - Support 3 (MY)

Loadcase ID: 1700   Title: TRAFIK

Sub Type: Envelope

Loadcase File	Results Title	Type
1586	0	LM 1 (Max)
1587	0	LM 1 (Min)
1642	0	EG A (Max)
1643	0	EG A (Min)
1698	0	EG B (Max)
1699	0	EG B (Min)

21. Local coordinates

Attribute: 1 Title: Stod 1

Sub Type = Local Coordinates

Property	**Symbol**	**Value**
Attribute type	type	"Cartesian"
Rotation angle	angle	4.95
Origin	originPos0	0.00
Origin	originPos1	0.00
Origin	originPos2	-1.80
Type	plane	"XY_Angle"

Assignment to Points:

6010

Attribute: 2 Title: Stod 2

Sub Type = Local Coordinates

Property	**Symbol**	**Value**
Attribute type	type	"Cartesian"
Rotation angle	angle	0.00
Origin	originPos0	25.03
Origin	originPos1	1.88
Origin	originPos2	-1.80
Type	plane	"XY_Angle"

Assignment to Points:

6011

Attribute: 3 Title: Stod 3

Sub Type = Local Coordinates

Property	**Symbol**	**Value**
Attribute type	type	"Cartesian"
Rotation angle	angle	-4.95
Origin	originPos0	60.17
Origin	originPos1	1.99
Origin	originPos2	-1.80
Type	plane	"XY_Angle"

Assignment to Points:

6012

22. Direct influence method

Attribute: 7 Title: Inf7 - Support 1 (FX)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6010

Attribute: 8 Title: Inf8 - Support 1 (FY)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6010

Attribute: 9 Title: Inf9 - Support 1 (FZ)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6010

Attribute: 10 Title: Inf10 - Support 1 (MX)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6010

Attribute: 11 Title: Inf11 - Support 1 (MY)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6010

Attribute: 12 Title: Inf12 - Support 2 (FX)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6011

Attribute: 13 Title: Inf13 - Support 2 (FY)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6011

Attribute: 14 Title: Inf14 - Support 2 (FZ)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6011

Attribute: 15 Title: Inf15 - Support 2 (MX)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6011

Attribute: 16 Title: Inf16 - Support 2 (MY)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6011

Attribute: 17 Title: Inf17 - Support 3 (FX)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6012

Attribute: 18 Title: Inf18 - Support 3 (FY)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6012

Attribute: 19 Title: Inf19 - Support 3 (FZ)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6012

Attribute: 20 Title: Inf20 - Support 3 (MX)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6012

Attribute: 21 Title: Inf21 - Support 3 (MY)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
6012

Attribute: 22 Title: Inf22 - Bearings Fx (Fx)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
707;710;722;724;732;734;6004T6009

Attribute: 23 Title: Inf22 - Bearings Fy (Fy)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
707;710;722;724;732;734;6004T6009

Attribute: 24 Title: Inf24 - Bearings Fz (Fz)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Points:
707;710;722;724;732;734;6004T6009

Attribute: 1 Title: Inf1 - Girder (Fx)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Lines:
……….

Attribute: 2 Title: Inf2 - Girder (Fy)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Lines:
……….

Attribute: 3 Title: Inf3 - Girder (Fz)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Lines:
……….

Attribute: 4 Title: Inf4 - Girder (Mx)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Lines:
……….

Attribute: 5 Title: Inf5 - Girder (My)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Lines:
……….

Attribute: 6 Title: Inf6 - Girder (Mz)
Sub Type = Direct method influence

Assigned in: Analysis 7
Assignment to Lines:
……….

23. Discrete point load

Symbol	Property
dirType	Load direction
pDir	Projection vector
nGridX	X Grid size
nGridY	Y Grid size
pos	Coordinates
P	Load

Attribute: 68476 Title: UTM 3 (Fatigue LM3 Single Vehicle, W= 480.0kN)

Sub Type = Discrete Point Load
Assigned in: Analysis 7

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	4	2

pos_x	pos_y	pos_z	Pz
-4.2	-1.0	0.0	-60.0
-3.0	-1.0	0.0	-60.0
3.0	-1.0	0.0	-60.0
4.2	-1.0	0.0	-60.0
4.2	1.0	0.0	-60.0
3.0	1.0	0.0	-60.0
-3.0	1.0	0.0	-60.0
-4.2	1.0	0.0	-60.0

24. VLO Analysis

Title VLO : LM 1
Representative values : Charateristic
Design code : EN 1991-2 Sweden 2011
Load groups : LM1
Longitudinal increment : 0.25 m
Transverse increment : 0.25
Vehicule direction : Both
Kerbs : L906, L907
UDL alfa factor : 0.8, 1, 1 , 1, 1
TS alfa factor : 0.9, 0.9,0
Influence attributes :
Inf1 - Girder (Fx)
Inf2 - Girder (Fy)
Inf3 - Girder (Fz)
Inf4 - Girder (Mx)
Inf5 - Girder (My)
Inf6 - Girder (Mz)
Inf7 - Support 1 (FX)
Inf8 - Support 1 (FY)
Inf9 - Support 1 (FZ)
Inf10 - Support 1 (MX)
Inf11 - Support 1 (MY)
Inf12 - Support 2 (FX)
Inf13 - Support 2 (FY)
Inf14 - Support 2 (FZ)
Inf15 - Support 2 (MX)
Inf16 - Support 2 (MY)
Inf17 - Support 3 (FX)
Inf18 - Support 3 (FY)
Inf19 - Support 3 (FZ)
Inf20 - Support 3 (MX)
Inf21 - Support 3 (MY)

Title VLO : EG A

Representative values : Charateristic
Design code : EN 1991-2 Sweden 2011
Load groups : Complementary load modell
Dynamic amplification : 25 %
Load model value A : 180 kN
Load model value B : 300 kN
Load modell valute q : 5 kN/m
Lane vehicule factor most onerous lane : 1.0
Lane vehicule factor second lane : 0.8
Type vehicules : a
Minimum width vehicule : 1.7 m
Maximum width vehicle : 2.3 m
Influence attributes :

Inf1 - Girder (Fx)
Inf2 - Girder (Fy)
Inf3 - Girder (Fz)
Inf4 - Girder (Mx)
Inf5 - Girder (My)
Inf6 - Girder (Mz)
Inf7 - Support 1 (FX)
Inf8 - Support 1 (FY)
Inf9 - Support 1 (FZ)
Inf10 - Support 1 (MX)
Inf11 - Support 1 (MY)
Inf12 - Support 2 (FX)
Inf13 - Support 2 (FY)
Inf14 - Support 2 (FZ)
Inf15 - Support 2 (MX)
Inf16 - Support 2 (MY)
Inf17 - Support 3 (FX)
Inf18 - Support 3 (FY)
Inf19 - Support 3 (FZ)
Inf20 - Support 3 (MX)
Inf21 - Support 3 (MY)

Title VLO : EG B

Representative values : Charateristic
Design code : EN 1991-2 Sweden 2011
Load groups : Complementary load modell
Dynamic amplification : 25 %
Load model value A : 180 kN
Load model value B : 300 kN
Load modell valute q : 5 kN/m
Lane vehicule factor most onerous lane : 1.0
Lane vehicule factor second lane : 0.8
Type vehicules : b, c, d, e, f, g, h, i, j, k,l,m, n
Minimum width vehicule : 1.7 m
Maximum width vehicle : 2.3 m
Influence attributes :
Inf1 - Girder (Fx)
Inf2 - Girder (Fy)
Inf3 - Girder (Fz)
Inf4 - Girder (Mx)
Inf5 - Girder (My)
Inf6 - Girder (Mz)
Inf7 - Support 1 (FX)
Inf8 - Support 1 (FY)
Inf9 - Support 1 (FZ)
Inf10 - Support 1 (MX)
Inf11 - Support 1 (MY)
Inf12 - Support 2 (FX)
Inf13 - Support 2 (FY)
Inf14 - Support 2 (FZ)
Inf15 - Support 2 (MX)
Inf16 - Support 2 (MY)
Inf17 - Support 3 (FX)
Inf18 - Support 3 (FY)
Inf19 - Support 3 (FZ)
Inf20 - Support 3 (MX)
Inf21 - Support 3 (MY)

25. Loadcases

Loadcase	Gravity	Title	Analysis	Type
52		EGEN 1-1	Analysis 1 (Gjut 1)	
53		EGEN 1-2	Analysis 1 (Gjut 1)	
55		EGEN 1-3	Analysis 1 (Gjut 1)	
1138		FORM+	Analysis 1 (Gjut 1)	
56		EGEN 2-1	Analysis 2 (Gjut 2)	
57		EGEN 2-2	Analysis 2 (Gjut 2)	
58		EGEN 3-1	Analysis 3 (Gjut 3)	
59		EGEN 3-2	Analysis 3 (Gjut 3)	
60		EGEN 4-1	Analysis 4 (Gjut 4)	
61		EGEN 4-2	Analysis 4 (Gjut 4)	
65		FORM-	Analysis 5 (Drift-P)	
66		BELAGG	Analysis 5 (Drift-P)	
67		STOD 1Z	Analysis 5 (Drift-P)	
68		STOD 2Z	Analysis 5 (Drift-P)	
69		STOD 3Z	Analysis 5 (Drift-P)	
70		STOD 1Y+	Analysis 5 (Drift-P)	
71		STOD 2Y+	Analysis 5 (Drift-P)	
72		STOD 3Y+	Analysis 5 (Drift-P)	
82		KRYMP-1	Analysis 5 (Drift-P)	
83		KRYMP-2	Analysis 5 (Drift-P)	
84		KRYMP-3	Analysis 5 (Drift-P)	
85		KRYMP-4	Analysis 5 (Drift-P)	
1122		BROMS 1+	Analysis 6 (Drift-V)	
1123		BROMS 2+	Analysis 6 (Drift-V)	
1124		BROMS 3+	Analysis 6 (Drift-V)	
1125		BROMS 1-	Analysis 6 (Drift-V)	
1126		BROMS 2-	Analysis 6 (Drift-V)	
1127		BROMS 3-	Analysis 6 (Drift-V)	
1128		SIDO 1+	Analysis 6 (Drift-V)	
1129		SIDO 2+	Analysis 6 (Drift-V)	
1130		SIDO 3+	Analysis 6 (Drift-V)	
1131		SIDO 1-	Analysis 6 (Drift-V)	
1132		SIDO 2-	Analysis 6 (Drift-V)	
1133		SIDO 3-	Analysis 6 (Drift-V)	
1139		JTEMP+	Analysis 6 (Drift-V)	
1140		JTEMP-	Analysis 6 (Drift-V)	
1143		OJTEMP-1	Analysis 6 (Drift-V)	
1144		OJTEMP-2	Analysis 6 (Drift-V)	
1145		OJTEMP-3	Analysis 6 (Drift-V)	
1146		OJTEMP-4	Analysis 6 (Drift-V)	
1149		VIND+	Analysis 6 (Drift-V)	
1150		VIND-	Analysis 6 (Drift-V)	

1200	LoadID=68476 Line=911 Dir=Fwd Pos=1	Analysis 6 (Drift-V)
1201	LoadID=68476 Line=911 Dir=Fwd Pos=2	Analysis 6 (Drift-V)
1202	LoadID=68476 Line=911 Dir=Fwd Pos=3	Analysis 6 (Drift-V)
1203	LoadID=68476 Line=911 Dir=Fwd Pos=4	Analysis 6 (Drift-V)
1204	LoadID=68476 Line=911 Dir=Fwd Pos=5	Analysis 6 (Drift-V)
1205	LoadID=68476 Line=911 Dir=Fwd Pos=6	Analysis 6 (Drift-V)
1206	LoadID=68476 Line=911 Dir=Fwd Pos=7	Analysis 6 (Drift-V)
1207	LoadID=68476 Line=911 Dir=Fwd Pos=8	Analysis 6 (Drift-V)
1208	LoadID=68476 Line=911 Dir=Fwd Pos=9	Analysis 6 (Drift-V)
1209	LoadID=68476 Line=911 Dir=Fwd Pos=10	Analysis 6 (Drift-V)
1210	LoadID=68476 Line=911 Dir=Fwd Pos=11	Analysis 6 (Drift-V)
1211	LoadID=68476 Line=911 Dir=Fwd Pos=12	Analysis 6 (Drift-V)
1212	LoadID=68476 Line=911 Dir=Fwd Pos=13	Analysis 6 (Drift-V)
1213	LoadID=68476 Line=911 Dir=Fwd Pos=14	Analysis 6 (Drift-V)
1214	LoadID=68476 Line=911 Dir=Fwd Pos=15	Analysis 6 (Drift-V)
1215	LoadID=68476 Line=911 Dir=Fwd Pos=16	Analysis 6 (Drift-V)
1216	LoadID=68476 Line=911 Dir=Fwd Pos=17	Analysis 6 (Drift-V)
1217	LoadID=68476 Line=911 Dir=Fwd Pos=18	Analysis 6 (Drift-V)
1218	LoadID=68476 Line=911 Dir=Fwd Pos=19	Analysis 6 (Drift-V)
1219	LoadID=68476 Line=911 Dir=Fwd Pos=20	Analysis 6 (Drift-V)
1220	LoadID=68476 Line=911 Dir=Fwd Pos=21	Analysis 6 (Drift-V)
1221	LoadID=68476 Line=911 Dir=Fwd Pos=22	Analysis 6 (Drift-V)
1222	LoadID=68476 Line=911 Dir=Fwd Pos=23	Analysis 6 (Drift-V)
1223	LoadID=68476 Line=911 Dir=Fwd Pos=24	Analysis 6 (Drift-V)
1224	LoadID=68476 Line=911 Dir=Fwd Pos=25	Analysis 6 (Drift-V)
1225	LoadID=68476 Line=911 Dir=Fwd Pos=26	Analysis 6 (Drift-V)
1226	LoadID=68476 Line=911 Dir=Fwd Pos=27	Analysis 6 (Drift-V)
1227	LoadID=68476 Line=911 Dir=Fwd Pos=28	Analysis 6 (Drift-V)
1228	LoadID=68476 Line=911 Dir=Fwd Pos=29	Analysis 6 (Drift-V)
1229	LoadID=68476 Line=911 Dir=Fwd Pos=30	Analysis 6 (Drift-V)
1230	LoadID=68476 Line=911 Dir=Fwd Pos=31	Analysis 6 (Drift-V)
1231	LoadID=68476 Line=911 Dir=Fwd Pos=32	Analysis 6 (Drift-V)
1232	LoadID=68476 Line=911 Dir=Fwd Pos=33	Analysis 6 (Drift-V)
1233	LoadID=68476 Line=911 Dir=Fwd Pos=34	Analysis 6 (Drift-V)
1234	LoadID=68476 Line=911 Dir=Fwd Pos=35	Analysis 6 (Drift-V)
1235	LoadID=68476 Line=911 Dir=Fwd Pos=36	Analysis 6 (Drift-V)
1236	LoadID=68476 Line=911 Dir=Fwd Pos=37	Analysis 6 (Drift-V)
1237	LoadID=68476 Line=911 Dir=Fwd Pos=38	Analysis 6 (Drift-V)
1238	LoadID=68476 Line=911 Dir=Fwd Pos=39	Analysis 6 (Drift-V)
1239	LoadID=68476 Line=911 Dir=Fwd Pos=40	Analysis 6 (Drift-V)
1240	LoadID=68476 Line=911 Dir=Fwd Pos=41	Analysis 6 (Drift-V)
1241	LoadID=68476 Line=911 Dir=Fwd Pos=42	Analysis 6 (Drift-V)
1242	LoadID=68476 Line=911 Dir=Fwd Pos=43	Analysis 6 (Drift-V)
1243	LoadID=68476 Line=911 Dir=Fwd Pos=44	Analysis 6 (Drift-V)
1244	LoadID=68476 Line=911 Dir=Fwd Pos=45	Analysis 6 (Drift-V)
1245	LoadID=68476 Line=911 Dir=Fwd Pos=46	Analysis 6 (Drift-V)
1246	LoadID=68476 Line=911 Dir=Fwd Pos=47	Analysis 6 (Drift-V)
1247	LoadID=68476 Line=911 Dir=Fwd Pos=48	Analysis 6 (Drift-V)
1248	LoadID=68476 Line=911 Dir=Fwd Pos=49	Analysis 6 (Drift-V)
1249	LoadID=68476 Line=911 Dir=Fwd Pos=50	Analysis 6 (Drift-V)
1250	LoadID=68476 Line=911 Dir=Fwd Pos=51	Analysis 6 (Drift-V)
1251	LoadID=68476 Line=911 Dir=Fwd Pos=52	Analysis 6 (Drift-V)
1252	LoadID=68476 Line=911 Dir=Fwd Pos=53	Analysis 6 (Drift-V)
1253	LoadID=68476 Line=911 Dir=Fwd Pos=54	Analysis 6 (Drift-V)
1254	LoadID=68476 Line=911 Dir=Fwd Pos=55	Analysis 6 (Drift-V)
1255	LoadID=68476 Line=911 Dir=Fwd Pos=56	Analysis 6 (Drift-V)
1256	LoadID=68476 Line=911 Dir=Fwd Pos=57	Analysis 6 (Drift-V)
1257	LoadID=68476 Line=911 Dir=Fwd Pos=58	Analysis 6 (Drift-V)
1258	LoadID=68476 Line=911 Dir=Fwd Pos=59	Analysis 6 (Drift-V)
1259	LoadID=68476 Line=911 Dir=Fwd Pos=60	Analysis 6 (Drift-V)
1260	LoadID=68476 Line=911 Dir=Fwd Pos=61	Analysis 6 (Drift-V)
1261	LoadID=68476 Line=911 Dir=Fwd Pos=62	Analysis 6 (Drift-V)
1262	LoadID=68476 Line=911 Dir=Fwd Pos=63	Analysis 6 (Drift-V)
1263	LoadID=68476 Line=911 Dir=Fwd Pos=64	Analysis 6 (Drift-V)
1264	LoadID=68476 Line=911 Dir=Fwd Pos=65	Analysis 6 (Drift-V)
1265	LoadID=68476 Line=911 Dir=Fwd Pos=66	Analysis 6 (Drift-V)
1266	LoadID=68476 Line=911 Dir=Fwd Pos=67	Analysis 6 (Drift-V)
1267	LoadID=68476 Line=911 Dir=Fwd Pos=68	Analysis 6 (Drift-V)

1268	LoadID=68476 Line=911 Dir=Fwd Pos=69 Analysis 6 (Drift-V)
1269	LoadID=68476 Line=911 Dir=Fwd Pos=70 Analysis 6 (Drift-V)
1270	LoadID=68476 Line=911 Dir=Fwd Pos=71 Analysis 6 (Drift-V)
1271	LoadID=68476 Line=911 Dir=Fwd Pos=72 Analysis 6 (Drift-V)
1272	LoadID=68476 Line=911 Dir=Fwd Pos=73 Analysis 6 (Drift-V)
1273	LoadID=68476 Line=911 Dir=Fwd Pos=74 Analysis 6 (Drift-V)
1274	LoadID=68476 Line=911 Dir=Fwd Pos=75 Analysis 6 (Drift-V)
1275	LoadID=68476 Line=911 Dir=Fwd Pos=76 Analysis 6 (Drift-V)
1276	LoadID=68476 Line=911 Dir=Fwd Pos=77 Analysis 6 (Drift-V)
1277	LoadID=68476 Line=911 Dir=Fwd Pos=78 Analysis 6 (Drift-V)
1278	LoadID=68476 Line=911 Dir=Fwd Pos=79 Analysis 6 (Drift-V)
1279	LoadID=68476 Line=911 Dir=Fwd Pos=80 Analysis 6 (Drift-V)
1280	LoadID=68476 Line=911 Dir=Fwd Pos=81 Analysis 6 (Drift-V)
1281	LoadID=68476 Line=911 Dir=Fwd Pos=82 Analysis 6 (Drift-V)
1282	LoadID=68476 Line=911 Dir=Fwd Pos=83 Analysis 6 (Drift-V)
1283	LoadID=68476 Line=911 Dir=Fwd Pos=84 Analysis 6 (Drift-V)
1284	LoadID=68476 Line=911 Dir=Fwd Pos=85 Analysis 6 (Drift-V)
1285	LoadID=68476 Line=911 Dir=Fwd Pos=86 Analysis 6 (Drift-V)
1286	LoadID=68476 Line=911 Dir=Fwd Pos=87 Analysis 6 (Drift-V)
1287	LoadID=68476 Line=911 Dir=Fwd Pos=88 Analysis 6 (Drift-V)
1288	LoadID=68476 Line=911 Dir=Fwd Pos=89 Analysis 6 (Drift-V)
1289	LoadID=68476 Line=911 Dir=Fwd Pos=90 Analysis 6 (Drift-V)
1290	LoadID=68476 Line=911 Dir=Fwd Pos=91 Analysis 6 (Drift-V)
1291	LoadID=68476 Line=911 Dir=Fwd Pos=92 Analysis 6 (Drift-V)
1292	LoadID=68476 Line=911 Dir=Fwd Pos=93 Analysis 6 (Drift-V)
1293	LoadID=68476 Line=911 Dir=Fwd Pos=94 Analysis 6 (Drift-V)
1294	LoadID=68476 Line=911 Dir=Fwd Pos=95 Analysis 6 (Drift-V)
1295	LoadID=68476 Line=911 Dir=Fwd Pos=96 Analysis 6 (Drift-V)
1296	LoadID=68476 Line=911 Dir=Fwd Pos=97 Analysis 6 (Drift-V)
1297	LoadID=68476 Line=911 Dir=Fwd Pos=98 Analysis 6 (Drift-V)
1298	LoadID=68476 Line=911 Dir=Fwd Pos=99 Analysis 6 (Drift-V)
1299	LoadID=68476 Line=911 Dir=Fwd Pos=100 Analysis 6 (Drift-V)
1300	LoadID=68476 Line=911 Dir=Fwd Pos=101 Analysis 6 (Drift-V)
1301	LoadID=68476 Line=911 Dir=Fwd Pos=102 Analysis 6 (Drift-V)
1302	LoadID=68476 Line=911 Dir=Fwd Pos=103 Analysis 6 (Drift-V)
1303	LoadID=68476 Line=911 Dir=Fwd Pos=104 Analysis 6 (Drift-V)
1304	LoadID=68476 Line=911 Dir=Fwd Pos=105 Analysis 6 (Drift-V)
1305	LoadID=68476 Line=911 Dir=Fwd Pos=106 Analysis 6 (Drift-V)
1306	LoadID=68476 Line=911 Dir=Fwd Pos=107 Analysis 6 (Drift-V)
1307	LoadID=68476 Line=911 Dir=Fwd Pos=108 Analysis 6 (Drift-V)
1308	LoadID=68476 Line=911 Dir=Fwd Pos=109 Analysis 6 (Drift-V)
1309	LoadID=68476 Line=911 Dir=Fwd Pos=110 Analysis 6 (Drift-V)
1310	LoadID=68476 Line=911 Dir=Fwd Pos=111 Analysis 6 (Drift-V)
1311	LoadID=68476 Line=911 Dir=Fwd Pos=112 Analysis 6 (Drift-V)
1312	LoadID=68476 Line=911 Dir=Fwd Pos=113 Analysis 6 (Drift-V)
1313	LoadID=68476 Line=911 Dir=Fwd Pos=114 Analysis 6 (Drift-V)
1314	LoadID=68476 Line=911 Dir=Fwd Pos=115 Analysis 6 (Drift-V)
1315	LoadID=68476 Line=911 Dir=Fwd Pos=116 Analysis 6 (Drift-V)
1316	LoadID=68476 Line=911 Dir=Fwd Pos=117 Analysis 6 (Drift-V)
1317	LoadID=68476 Line=911 Dir=Fwd Pos=118 Analysis 6 (Drift-V)
1318	LoadID=68476 Line=911 Dir=Fwd Pos=119 Analysis 6 (Drift-V)
1319	LoadID=68476 Line=911 Dir=Fwd Pos=120 Analysis 6 (Drift-V)
1320	LoadID=68476 Line=911 Dir=Fwd Pos=121 Analysis 6 (Drift-V)
1321	LoadID=68476 Line=911 Dir=Fwd Pos=122 Analysis 6 (Drift-V)
1322	LoadID=68476 Line=911 Dir=Fwd Pos=123 Analysis 6 (Drift-V)
1323	LoadID=68476 Line=911 Dir=Fwd Pos=124 Analysis 6 (Drift-V)
1324	LoadID=68476 Line=911 Dir=Fwd Pos=125 Analysis 6 (Drift-V)
1325	LoadID=68476 Line=911 Dir=Fwd Pos=126 Analysis 6 (Drift-V)
1326	LoadID=68476 Line=911 Dir=Fwd Pos=127 Analysis 6 (Drift-V)
1327	LoadID=68476 Line=911 Dir=Fwd Pos=128 Analysis 6 (Drift-V)
1328	LoadID=68476 Line=911 Dir=Fwd Pos=129 Analysis 6 (Drift-V)
1329	LoadID=68476 Line=911 Dir=Fwd Pos=130 Analysis 6 (Drift-V)

1400	LoadID=68476 Line=908 Dir=Fwd Pos=1	Analysis 6 (Drift-V)
1401	LoadID=68476 Line=908 Dir=Fwd Pos=2	Analysis 6 (Drift-V)
1402	LoadID=68476 Line=908 Dir=Fwd Pos=3	Analysis 6 (Drift-V)
1403	LoadID=68476 Line=908 Dir=Fwd Pos=4	Analysis 6 (Drift-V)
1404	LoadID=68476 Line=908 Dir=Fwd Pos=5	Analysis 6 (Drift-V)
1405	LoadID=68476 Line=908 Dir=Fwd Pos=6	Analysis 6 (Drift-V)
1406	LoadID=68476 Line=908 Dir=Fwd Pos=7	Analysis 6 (Drift-V)
1407	LoadID=68476 Line=908 Dir=Fwd Pos=8	Analysis 6 (Drift-V)
1408	LoadID=68476 Line=908 Dir=Fwd Pos=9	Analysis 6 (Drift-V)
1409	LoadID=68476 Line=908 Dir=Fwd Pos=10	Analysis 6 (Drift-V)
1410	LoadID=68476 Line=908 Dir=Fwd Pos=11	Analysis 6 (Drift-V)
1411	LoadID=68476 Line=908 Dir=Fwd Pos=12	Analysis 6 (Drift-V)
1412	LoadID=68476 Line=908 Dir=Fwd Pos=13	Analysis 6 (Drift-V)
1413	LoadID=68476 Line=908 Dir=Fwd Pos=14	Analysis 6 (Drift-V)
1414	LoadID=68476 Line=908 Dir=Fwd Pos=15	Analysis 6 (Drift-V)
1415	LoadID=68476 Line=908 Dir=Fwd Pos=16	Analysis 6 (Drift-V)
1416	LoadID=68476 Line=908 Dir=Fwd Pos=17	Analysis 6 (Drift-V)
1417	LoadID=68476 Line=908 Dir=Fwd Pos=18	Analysis 6 (Drift-V)
1418	LoadID=68476 Line=908 Dir=Fwd Pos=19	Analysis 6 (Drift-V)
1419	LoadID=68476 Line=908 Dir=Fwd Pos=20	Analysis 6 (Drift-V)
1420	LoadID=68476 Line=908 Dir=Fwd Pos=21	Analysis 6 (Drift-V)
1421	LoadID=68476 Line=908 Dir=Fwd Pos=22	Analysis 6 (Drift-V)
1422	LoadID=68476 Line=908 Dir=Fwd Pos=23	Analysis 6 (Drift-V)
1423	LoadID=68476 Line=908 Dir=Fwd Pos=24	Analysis 6 (Drift-V)
1424	LoadID=68476 Line=908 Dir=Fwd Pos=25	Analysis 6 (Drift-V)
1425	LoadID=68476 Line=908 Dir=Fwd Pos=26	Analysis 6 (Drift-V)
1426	LoadID=68476 Line=908 Dir=Fwd Pos=27	Analysis 6 (Drift-V)
1427	LoadID=68476 Line=908 Dir=Fwd Pos=28	Analysis 6 (Drift-V)
1428	LoadID=68476 Line=908 Dir=Fwd Pos=29	Analysis 6 (Drift-V)
1429	LoadID=68476 Line=908 Dir=Fwd Pos=30	Analysis 6 (Drift-V)
1430	LoadID=68476 Line=908 Dir=Fwd Pos=31	Analysis 6 (Drift-V)
1431	LoadID=68476 Line=908 Dir=Fwd Pos=32	Analysis 6 (Drift-V)
1432	LoadID=68476 Line=908 Dir=Fwd Pos=33	Analysis 6 (Drift-V)
1433	LoadID=68476 Line=908 Dir=Fwd Pos=34	Analysis 6 (Drift-V)
1434	LoadID=68476 Line=908 Dir=Fwd Pos=35	Analysis 6 (Drift-V)
1435	LoadID=68476 Line=908 Dir=Fwd Pos=36	Analysis 6 (Drift-V)
1436	LoadID=68476 Line=908 Dir=Fwd Pos=37	Analysis 6 (Drift-V)
1437	LoadID=68476 Line=908 Dir=Fwd Pos=38	Analysis 6 (Drift-V)
1438	LoadID=68476 Line=908 Dir=Fwd Pos=39	Analysis 6 (Drift-V)
1439	LoadID=68476 Line=908 Dir=Fwd Pos=40	Analysis 6 (Drift-V)
1440	LoadID=68476 Line=908 Dir=Fwd Pos=41	Analysis 6 (Drift-V)
1441	LoadID=68476 Line=908 Dir=Fwd Pos=42	Analysis 6 (Drift-V)
1442	LoadID=68476 Line=908 Dir=Fwd Pos=43	Analysis 6 (Drift-V)
1443	LoadID=68476 Line=908 Dir=Fwd Pos=44	Analysis 6 (Drift-V)
1444	LoadID=68476 Line=908 Dir=Fwd Pos=45	Analysis 6 (Drift-V)
1445	LoadID=68476 Line=908 Dir=Fwd Pos=46	Analysis 6 (Drift-V)
1446	LoadID=68476 Line=908 Dir=Fwd Pos=47	Analysis 6 (Drift-V)
1447	LoadID=68476 Line=908 Dir=Fwd Pos=48	Analysis 6 (Drift-V)
1448	LoadID=68476 Line=908 Dir=Fwd Pos=49	Analysis 6 (Drift-V)
1449	LoadID=68476 Line=908 Dir=Fwd Pos=50	Analysis 6 (Drift-V)
1450	LoadID=68476 Line=908 Dir=Fwd Pos=51	Analysis 6 (Drift-V)
1451	LoadID=68476 Line=908 Dir=Fwd Pos=52	Analysis 6 (Drift-V)
1452	LoadID=68476 Line=908 Dir=Fwd Pos=53	Analysis 6 (Drift-V)
1453	LoadID=68476 Line=908 Dir=Fwd Pos=54	Analysis 6 (Drift-V)
1454	LoadID=68476 Line=908 Dir=Fwd Pos=55	Analysis 6 (Drift-V)
1455	LoadID=68476 Line=908 Dir=Fwd Pos=56	Analysis 6 (Drift-V)
1456	LoadID=68476 Line=908 Dir=Fwd Pos=57	Analysis 6 (Drift-V)
1457	LoadID=68476 Line=908 Dir=Fwd Pos=58	Analysis 6 (Drift-V)
1458	LoadID=68476 Line=908 Dir=Fwd Pos=59	Analysis 6 (Drift-V)
1459	LoadID=68476 Line=908 Dir=Fwd Pos=60	Analysis 6 (Drift-V)
1460	LoadID=68476 Line=908 Dir=Fwd Pos=61	Analysis 6 (Drift-V)
1461	LoadID=68476 Line=908 Dir=Fwd Pos=62	Analysis 6 (Drift-V)
1462	LoadID=68476 Line=908 Dir=Fwd Pos=63	Analysis 6 (Drift-V)
1463	LoadID=68476 Line=908 Dir=Fwd Pos=64	Analysis 6 (Drift-V)
1464	LoadID=68476 Line=908 Dir=Fwd Pos=65	Analysis 6 (Drift-V)
1465	LoadID=68476 Line=908 Dir=Fwd Pos=66	Analysis 6 (Drift-V)
1466	LoadID=68476 Line=908 Dir=Fwd Pos=67	Analysis 6 (Drift-V)
1467	LoadID=68476 Line=908 Dir=Fwd Pos=68	Analysis 6 (Drift-V)

1468	LoadID=68476 Line=908 Dir=Fwd Pos=69	Analysis 6 (Drift-V)
1469	LoadID=68476 Line=908 Dir=Fwd Pos=70	Analysis 6 (Drift-V)
1470	LoadID=68476 Line=908 Dir=Fwd Pos=71	Analysis 6 (Drift-V)
1471	LoadID=68476 Line=908 Dir=Fwd Pos=72	Analysis 6 (Drift-V)
1472	LoadID=68476 Line=908 Dir=Fwd Pos=73	Analysis 6 (Drift-V)
1473	LoadID=68476 Line=908 Dir=Fwd Pos=74	Analysis 6 (Drift-V)
1474	LoadID=68476 Line=908 Dir=Fwd Pos=75	Analysis 6 (Drift-V)
1475	LoadID=68476 Line=908 Dir=Fwd Pos=76	Analysis 6 (Drift-V)
1476	LoadID=68476 Line=908 Dir=Fwd Pos=77	Analysis 6 (Drift-V)
1477	LoadID=68476 Line=908 Dir=Fwd Pos=78	Analysis 6 (Drift-V)
1478	LoadID=68476 Line=908 Dir=Fwd Pos=79	Analysis 6 (Drift-V)
1479	LoadID=68476 Line=908 Dir=Fwd Pos=80	Analysis 6 (Drift-V)
1480	LoadID=68476 Line=908 Dir=Fwd Pos=81	Analysis 6 (Drift-V)
1481	LoadID=68476 Line=908 Dir=Fwd Pos=82	Analysis 6 (Drift-V)
1482	LoadID=68476 Line=908 Dir=Fwd Pos=83	Analysis 6 (Drift-V)
1483	LoadID=68476 Line=908 Dir=Fwd Pos=84	Analysis 6 (Drift-V)
1484	LoadID=68476 Line=908 Dir=Fwd Pos=85	Analysis 6 (Drift-V)
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1486	LoadID=68476 Line=908 Dir=Fwd Pos=87	Analysis 6 (Drift-V)
1487	LoadID=68476 Line=908 Dir=Fwd Pos=88	Analysis 6 (Drift-V)
1488	LoadID=68476 Line=908 Dir=Fwd Pos=89	Analysis 6 (Drift-V)
1489	LoadID=68476 Line=908 Dir=Fwd Pos=90	Analysis 6 (Drift-V)
1490	LoadID=68476 Line=908 Dir=Fwd Pos=91	Analysis 6 (Drift-V)
1491	LoadID=68476 Line=908 Dir=Fwd Pos=92	Analysis 6 (Drift-V)
1492	LoadID=68476 Line=908 Dir=Fwd Pos=93	Analysis 6 (Drift-V)
1493	LoadID=68476 Line=908 Dir=Fwd Pos=94	Analysis 6 (Drift-V)
1494	LoadID=68476 Line=908 Dir=Fwd Pos=95	Analysis 6 (Drift-V)
1495	LoadID=68476 Line=908 Dir=Fwd Pos=96	Analysis 6 (Drift-V)
1496	LoadID=68476 Line=908 Dir=Fwd Pos=97	Analysis 6 (Drift-V)
1497	LoadID=68476 Line=908 Dir=Fwd Pos=98	Analysis 6 (Drift-V)
1498	LoadID=68476 Line=908 Dir=Fwd Pos=99	Analysis 6 (Drift-V)
1499	LoadID=68476 Line=908 Dir=Fwd Pos=100	Analysis 6 (Drift-V)
1500	LoadID=68476 Line=908 Dir=Fwd Pos=101	Analysis 6 (Drift-V)
1501	LoadID=68476 Line=908 Dir=Fwd Pos=102	Analysis 6 (Drift-V)
1502	LoadID=68476 Line=908 Dir=Fwd Pos=103	Analysis 6 (Drift-V)
1503	LoadID=68476 Line=908 Dir=Fwd Pos=104	Analysis 6 (Drift-V)
1504	LoadID=68476 Line=908 Dir=Fwd Pos=105	Analysis 6 (Drift-V)
1505	LoadID=68476 Line=908 Dir=Fwd Pos=106	Analysis 6 (Drift-V)
1506	LoadID=68476 Line=908 Dir=Fwd Pos=107	Analysis 6 (Drift-V)
1507	LoadID=68476 Line=908 Dir=Fwd Pos=108	Analysis 6 (Drift-V)
1508	LoadID=68476 Line=908 Dir=Fwd Pos=109	Analysis 6 (Drift-V)
1509	LoadID=68476 Line=908 Dir=Fwd Pos=110	Analysis 6 (Drift-V)
1510	LoadID=68476 Line=908 Dir=Fwd Pos=111	Analysis 6 (Drift-V)
1511	LoadID=68476 Line=908 Dir=Fwd Pos=112	Analysis 6 (Drift-V)
1512	LoadID=68476 Line=908 Dir=Fwd Pos=113	Analysis 6 (Drift-V)
1513	LoadID=68476 Line=908 Dir=Fwd Pos=114	Analysis 6 (Drift-V)
1514	LoadID=68476 Line=908 Dir=Fwd Pos=115	Analysis 6 (Drift-V)
1515	LoadID=68476 Line=908 Dir=Fwd Pos=116	Analysis 6 (Drift-V)
1516	LoadID=68476 Line=908 Dir=Fwd Pos=117	Analysis 6 (Drift-V)
1517	LoadID=68476 Line=908 Dir=Fwd Pos=118	Analysis 6 (Drift-V)
1518	LoadID=68476 Line=908 Dir=Fwd Pos=119	Analysis 6 (Drift-V)
1519	LoadID=68476 Line=908 Dir=Fwd Pos=120	Analysis 6 (Drift-V)
1520	LoadID=68476 Line=908 Dir=Fwd Pos=121	Analysis 6 (Drift-V)
1521	LoadID=68476 Line=908 Dir=Fwd Pos=122	Analysis 6 (Drift-V)
1522	LoadID=68476 Line=908 Dir=Fwd Pos=123	Analysis 6 (Drift-V)
1523	LoadID=68476 Line=908 Dir=Fwd Pos=124	Analysis 6 (Drift-V)
1524	LoadID=68476 Line=908 Dir=Fwd Pos=125	Analysis 6 (Drift-V)
1525	LoadID=68476 Line=908 Dir=Fwd Pos=126	Analysis 6 (Drift-V)
1526	LoadID=68476 Line=908 Dir=Fwd Pos=127	Analysis 6 (Drift-V)
1527	LoadID=68476 Line=908 Dir=Fwd Pos=128	Analysis 6 (Drift-V)

26. Analysis

Title: Analysis 1
Analysis : Stage I

Title: Analysis 2
Analysis : Stage II

Title: Analysis 3
Analysis : Stage III

Title: Analysis 4
Analysis : Stage IV

Title: Analysis 5
Analysis : Stage V

Title: Analysis 6
Analysis : Drift-P

Title: Analysis 7
Analysis : Drift-V (Base Analysis)

27. Discrete patch load

patchType	Patch type
sweptAngle	Swept angle
xDivisions	Number of local x divisions
yDivisions	Number of local y divisions
dirType	Load direction
pDir	Projection vector
nGridX	X Grid size
nGridY	Y Grid size
pos	Coordinates
P	Load

Attribute: 2 Title: EGEN 1-3A

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
8.11866	5.91922	10.0	-7.1
17.8317	5.61014	10.0	-7.1
27.5347	5.06983	10.0	-7.1

Loadcase ID: 55 Title: EGEN 1-3 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 1
Assignment to Points:
487

Attribute: 3 Title: EGEN 2-1

Sub Type = Discrete Patch Load
Patch type: 8-noded quadrilateral

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
-27.5347	5.06982	10.0	-7.5
-17.8317	5.61014	10.0	-7.5
-8.11866	5.91922	10.0	-7.5
-7.9995	-0.0796	10.0	-7.5
-7.88033	-6.07842	10.0	-7.5
-17.3077	-6.37841	10.0	-7.5
-26.7253	-6.90285	10.0	-7.5
-27.13	-0.916514	10.0	-7.5

Loadcase ID: 51439 Title: EGEN 2-1 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 2
Assignment to Points:
487

Attribute: 4 Title: EGEN 2-2A

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
-27.5347	5.06982	10.0	-7.1
-17.8317	5.61014	10.0	-7.1
-8.11866	5.91922	10.0	-7.1

Loadcase ID: 51440 Title: EGEN 2-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 2
Assignment to Points:
487

Attribute: 5 Title: EGEN 2-2B

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
-26.7253	-6.90285	10.0	-7.1
-17.3077	-6.37841	10.0	-7.1
-7.88033	-6.07842	10.0	-7.1

Loadcase ID: 51440 Title: EGEN 2-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 2
Assignment to Points:
487

Attribute: 6 Title: EGEN 3-2A

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
27.5347	5.06983	10.0	-7.1
31.582	4.77583	10.0	-7.1
36.4384	4.36959	10.0	-7.1

Loadcase ID: 51442 Title: EGEN 3-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 3
Assignment to Points:
487

Attribute: 7 Title: EGEN 4-1

Sub Type = Discrete Patch Load
Patch type: 8-noded quadrilateral

dirType	**pDir_x**	**pDir_y**	**pDir_z**	**nGridX**	**nGridY**
Z	0.0	0.0	1.0	0	0

pos_x	**pos_y**	**pos_z**	**Pz**
-35.3667	-7.58246	0.0	-7.5
-30.6582	-7.18856	0.0	-7.5
-26.7253	-6.90285	0.0	-7.5
-27.13	-0.916514	0.0	-7.5
-27.5347	5.06982	0.0	-7.5
-31.5806	4.77594	0.0	-7.5
-36.4384	4.36959	0.0	-7.5
-35.9025	-1.60643	0.0	-7.5

Loadcase ID: 51443 Title: EGEN 4-1 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 4
Assignment to Points:
487

Attribute: 9 Title: EGEN 5-1

Sub Type = Discrete Patch Load
Patch type: 8-noded quadrilateral

dirType	**pDir_x**	**pDir_y**	**pDir_z**	**nGridX**	**nGridY**
Z	0.0	0.0	1.0	0	0

pos_x	**pos_y**	**pos_z**	**Pz**
-7.88033	-6.07842	10.0	-7.5
-4.80679E-3	-6.0	10.0	-7.5
7.88033	-6.07842	10.0	-7.5
7.9995	-0.0795998	10.0	-7.5
8.11866	5.91922	10.0	-7.5
1.46438E-3	6.0	10.0	-7.5
-8.11866	5.91922	10.0	-7.5
-7.9995	-0.0796	10.0	-7.5

Loadcase ID: 51445 Title: EGEN 5-1 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 5
Assignment to Points:
487

Attribute: 43 Title: EGEN 5-2A

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	**pDir_x**	**pDir_y**	**pDir_z**	**nGridX**	**nGridY**
Z	0.0	0.0	1.0	0	0

pos_x	**pos_y**	**pos_z**	**Pz**
-8.11866	5.91922	10.0	-7.1
1.46438E-3	6.0	10.0	-7.1
8.11866	5.91922	10.0	-7.1

Loadcase ID: 51446 Title: EGEN 5-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 5
Assignment to Points:
487

Attribute: 44 Title: EGEN 5-2B

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	**pDir_x**	**pDir_y**	**pDir_z**	**nGridX**	**nGridY**
Z	0.0	0.0	1.0	0	0

pos_x	**pos_y**	**pos_z**	**Pz**
-7.88033	-6.07842	10.0	-7.1
-4.80679E-3	-6.0	10.0	-7.1
7.88033	-6.07842	10.0	-7.1

Loadcase ID: 51446 Title: EGEN 5-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 5
Assignment to Points:
487

Attribute: 75181 Title: EGEN 1-2

Sub Type = Discrete Patch Load
Patch type: 8-noded quadrilateral

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
8.11866	5.91922	10.0	-7.5
17.8317	5.61014	10.0	-7.5
27.5347	5.06983	10.0	-7.5
27.13	-0.916513	10.0	-7.5
26.7253	-6.90285	10.0	-7.5
17.3077	-6.37841	10.0	-7.5
7.88033	-6.07842	10.0	-7.5
7.9995	-0.0795998	10.0	-7.5

Loadcase ID: 53 Title: EGEN 1-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 1
Assignment to Points:
487

Attribute: 75182 Title: EGEN 1-3B

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
7.88033	-6.07842	10.0	-7.1
17.3077	-6.37841	10.0	-7.1
26.7253	-6.90285	10.0	-7.1

Loadcase ID: 55 Title: EGEN 1-3 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 1
Assignment to Points:
487

Attribute: 75183 Title: EGEN 3-1

Sub Type = Discrete Patch Load
Patch type: 8-noded quadrilateral

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
26.7253	-6.90285	10.0	-7.5
30.6534	-7.18818	10.0	-7.5
35.3667	-7.58246	10.0	-7.5
35.9025	-1.60643	10.0	-7.5
36.4384	4.36959	10.0	-7.5
31.582	4.77583	10.0	-7.5
27.5347	5.06983	10.0	-7.5
27.13	-0.916513	10.0	-7.5

Loadcase ID: 51441 Title: EGEN 3-1 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 3
Assignment to Points:
487

Attribute: 75184 Title: EGEN 3-2B

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	pDir_x	pDir_y	pDir_z	nGridX	nGridY
Z	0.0	0.0	1.0	0	0

pos_x	pos_y	pos_z	Pz
26.7253	-6.90285	10.0	-7.1
30.6534	-7.18818	10.0	-7.1
35.3667	-7.58246	10.0	-7.1

Loadcase ID: 51442 Title: EGEN 3-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 3
Assignment to Points:
487

Attribute: 75185 Title: EGEN 4-2A

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	**pDir_x**	**pDir_y**	**pDir_z**	**nGridX**	**nGridY**
Z	0.0	0.0	1.0	0	0

pos_x	**pos_y**	**pos_z**	**Pz**
-36.4384	4.36959	10.0	-7.1
-31.5806	4.77594	10.0	-7.1
-27.5347	5.06982	10.0	-7.1

Loadcase ID: 51444 Title: EGEN 4-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 4
Assignment to Points:
487

Attribute: 75186 Title: EGEN 4-2B

Sub Type = Discrete Patch Load
Patch type: 3-noded edge

dirType	**pDir_x**	**pDir_y**	**pDir_z**	**nGridX**	**nGridY**
Z	0.0	0.0	1.0	0	0

pos_x	**pos_y**	**pos_z**	**Pz**
-35.3667	-7.58246	10.0	-7.1
-30.6582	-7.18856	10.0	-7.1
-26.7253	-6.90285	10.0	-7.1

Loadcase ID: 51444 Title: EGEN 4-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=Deck
Moving status = Exclude All Load Assign type = area
Assigned in: Analysis 4
Assignment to Points:
487